

Revised Emission Inventory Supporting Information

Cascade Steel Rolling Mills, Inc. – Air Permit Number: 36-5034

Cleaner Air Oregon Emissions Inventory

May 9, 2022

Revised February 13, 2023

Revised July 3, 2023

Introduction

The purpose of this document is to provide information supporting the current air toxics emissions inventory including process flow diagrams and descriptions, TEU identification, source test data, emission factor references, analytical data and supporting engineering calculations.

Process Description & Emission Calculations

Figure A-1 provides a process flow diagram and emission system schematic for Cascade's facility. The diagram includes the identification of emission units used in Cascade's Title V air permit. Emission point identifications for sources of CAO regulated toxic air contaminants are also included. The descriptions below provide the following information in support of the air toxics emissions inventory being submitted:

- A description of the process step or supporting activity that could generate TAC emissions.
- A description of how TAC emissions are generated.
- A general description of the methodologies used to calculate TAC emission rates. More details regarding these calculations are also provided in the emission calculation spreadsheet provided with this submission.

Scrap Preparation and Handling

Scrap ferrous metal is transported to the scrap storage yards by rail and by truck. There are two scrap storage yards. The Main Yard is where the scrap is transported to the electric arc furnace (EAF) using scrap buckets, which are filled by electromagnets and grapples that pick up the scrap. The Secondary Yard is essentially a surge pile where scrap can be temporarily stockpiled prior to transfer to the Main Yard. Scrap handling can generate fugitive dust emissions that may contain TACs.

Infrequently larger pieces of scrap are cut to size to accommodate further handling. Cuts are made using hand held natural gas fueled torches. This activity is referred to as scrap preparation and it occurs within the charge bay of the melt shop with emissions controlled by the baghouse BH-1/1A system. Emissions of TACs during scrap preparation include byproducts of natural gas combustion which are gas combustion TEU's under OAR 340-245-0050(4)(b) and

qualify for the gas combustion exemption under OAR 340-245-0050(5). When the torch creates a kerf cutting through the metal scrap small amounts of fugitive metal TACs are emitted.

As shown in the Figure A-1 Process Flow Diagram there are four TEUs associated with scrap preparation and scrap handling.

- EU-9sp – Scrap preparation with metal TACs from torch creating kerf in scrap controlled by baghouses BH-1/BH-1A.
- EU-9ng – Scrap preparation torch gas combustion TEU primarily emitted through BH-1/BH-1A.
- EU-09sh_Main – Scrap handling at the Main Yard generating fugitive dust that may contain TACs emitted at fugitive emission point SH_Main.
- EU-09sh_Sec – Scrap handling at the Secondary Yard generating fugitive dust that may contain TACs emitted at fugitive emission point SH_Sec.

On January 30, 2023 Cascade submitted to DEQ a Dust Sampling Plan to collect and analyze scrap dust samples to support the speciation of TAC emissions in scrap dust. DEQ approved the plan on February 8, 2023. Scrap dust analytical data are included with this submission and the results are incorporated into the emissions inventory.

Melt Shop

The melt shop consists of three major processes: the electric arc furnace (EAF), the ladle furnace, and the continuous caster. These processes and their potential TAC emissions are discussed below.

Electric Arc Furnace

The scrap from the scrap storage yard is transferred into the EAF. The charge bucket deposits the scrap into the EAF to produce molten steel which is poured into a ladle from a bottom tap in the EAF. Dolomitic lime, calcium carbide, and carbon, in the form of coal or coke, can also be added to arrive at the specified metallurgical properties in the melt. The EAF has three auxiliary burners that are fueled by natural gas.

Melted nonferrous scrap constituents, which are lighter than the molten metal, float to the top of the EAF vessel and are decanted off into a slag pit. Slag containing sufficient residual ferrous material is reclaimed by magnet and returned to the EAF.

Ladle Furnace

After initial melting and gross refining of the metal in the EAF, the chemistry of the molten metal is fine-tuned in the ladle furnace (LF) through the addition of alloys and other additives. The ladle furnace also utilizes an electric arc to melt and refine steel.

After the final chemistry and temperature adjustments are made, the ladle is moved to the casting area. Natural gas fired vertical preheaters (EU-4) are utilized to pre-heat ladles prior to filling with molten steel.

Continuous Caster

From the ladle furnace, the molten metal is transferred to the continuous caster area in the ladle. In the caster area there are four natural gas fired heaters that are used to pre-heat a cold tundish prior to the first introduction of molten steel.

The molten metal is poured from the ladle into the tundish (a reservoir above the continuous caster molds). Molten metal funnels from the tundish into a continuous caster with a series of five molds. The solidified metal billets exiting the bottom of the mold are cut into appropriate lengths for rolling. After cooling and scale removal, the billets are transferred to the Rolling Mill for further processing. The process can generate off-spec billets that need to be cut down in size (using torches) so they can be reprocessed at the EAF. This scrap billet cutting occurs within the EAF charge bay with emissions primarily being controlled by baghouses BH-1/BH-1A.

The primary TEUs and emission points associated with the Melt Shop processes are as follows:

- EU-1 – Organic and inorganic TACs generated from Melt Shop process activities exhausted to baghouses BH-1, BH-1A and BH-2 emitted through emission points BH01, BH01A and BH02.
- EU-3_RM - Organic and inorganic TACs generated from Melt Shop process activities not captured by the baghouses and emitted through the west end Melt Shop roof monitor (emission point RMELT). This emissions unit is identified on page 28 of DEQ's Review Report as "EU-3 Roof monitor".
- EU-3_MF - Organic and inorganic TACs generated from Melt Shop process activities not captured by the baghouses and not emitted through the west end Melt Shop roof monitor but emitted through Melt Shop "other openings" (emission point MELTFUG). This emissions unit is identified on page 28 of DEQ's Review Report as "EU-3 Other openings". DEQ's Review Report indicates that emissions from the emissions unit are estimated based on 5% of the emissions exiting the roof monitor and this estimation methodology is used in this EI as appropriate.

- EU-4 Vertical Preheater natural gas combustion byproduct TEU emitted through stack emission point VERTP.
- EU-10 – Metal TACs released from billet kerf and exhausted through a vent (emission point BC01).
- EU-10ng – Torch natural gas combustion byproducts exhausted through a vent (emission point BC01).
- EU-12 – Metal TACs released from scrap billet kerf and exhausted to baghouses BH-1/BH-1A (emission points BH01 and BH-1A) and other Melt Shop openings (emission point MELTFUG).
- EU-12ng – Torch natural gas combustion byproducts exhausted to baghouses BH-1/BH-1A (emission points BH01 and BH-1A) and other Melt Shop openings (emission point MELTFUG).
- EU-16ng – From multiple Melt Shop heaters, natural gas combustion byproducts exhausted to baghouses BH-1/BH-1A (emission points BH01 and BH-1A), the roof monitor (emission point RMELT) and other Melt Shop openings (emission point MELTFUG).

Slag Handling

Slag generated at the melt shop pit is dumped along a wall just northeast of the melt shop and wetted with city water. An oxidizing agent for hydrogen sulfide control is added to the water. Slag handling can generate dust containing TACs and sulfur present in the slag can generate hydrogen sulfide emissions upon wetting of the slag.

Additional details of the slag wetting process are as follows:

- It is a batch process.
- The approximate temperature of the slag is 1800F.
- The oxidizing agent is added via inline injection to a recirculating loop. A spray bar equipped with ~10 nozzles is used to wet the slag.
- The spray bars apply about 120 gpm of water to the slag over a period of about 10 hours. At this flow rate and duration and assuming 370 tons of slag produced in a batch the amount of water applied would be about 195 gallons per ton of slag

The TEU associated the melt shop slag handling is as follows:

- EU-5 – Fugitive particulate TACs and hydrogen sulfide generated from slag material transfers emitted at fugitive emission point SHF01.

Rod and Bar Mill

In the rod and bar mill billets are reformed into bars, smooth rods, rebar coils, wire rod and bar-length products. The rod and bar mill includes a large natural gas fired reheat furnace with a dedicated stack. Minor components of the rod and bar mill include the Aggregate Insignificant Activities (AIA) listed in the facility air permit: Merchant Bar Band Saw and Merchant Bar Straightener. These two activities are no longer operated.

The primary TEU associated the rod and bar mill is as follows:

- EU-7 – Reheat furnace natural gas combustion byproducts exhausted to a dedicated stack [RFS2].

Gasoline Dispensing Facility (GDF)

The facility includes a gasoline storage tank that dispenses fuel to vehicles. Organic TACs are emitted due to tank standing and working losses and during fuel transfer to vehicles.

The TEU associated the GDF is as follows:

- EU-15 – Organic vapor TAC emissions at gasoline dispensing facility emitted at emission point GDF.

Unpaved Roads

Vehicle traffic on unpaved roads can generate dust emissions. The dust may contain TACs. CSRM conducted a review of vehicle travel on unpaved roads at the facility and details are provided in the supporting calculations. The unpaved road at the facility will be constructed out of gravel and is located at a scrap handling area and the scrap handling emissions TAC speciation data will be used to estimate emissions.

The TEU associated the unpaved road is as follows:

- EU-11 – TAC emissions in dust generated from vehicle travel on an unpaved road segment (emission points SCRAP1).

Welding

Electric arc welding occurs at three maintenance shops at the facility with a majority of the welding occurring at the Maintenance and Fabrication Shop.

The TEU associated with welding is as follows:

- EU-17 – Metal TAC emissions from electric arc welding fumes controlled by a fume extractor/filter system that exhausts into the shop (emission point MaintFab).

Material Handling

Silicon manganese and ferro manganese alloys are brought to the site via trucks which dump the aggregate-like material into a three-side and roofed storage bin. The alloys are then transferred to a feeder-hooper to convey the materials into the Melt Shop.

Dolomitic Lime and Quick Lime are stored in super sacks and periodically the entire super sack will be placed into a charge bucket containing scrap. The super sack can break during this transfer process and produce emissions of the lime materials.

The TEU associated with material handling is as follows:

- EU-18 – TAC emissions from handling materials including truck dumps of alloys [ALLOYTD], alloy unloading to feeder [ALLOYULD] and lime materials transferred to charge buckets [LIMEBCKT].

Aggregate Insignificant Activities

The following is a description of the TEU status of other Aggregate Insignificant Activities listed in the facility's permit:

- Thermal Treatment Oven: Small natural gas combustion source with TEU designation (EU-14) emitted through stack with emission point designation [TTO]
- Mill Scale Handling: Not a source of TACs, composition is iron oxide.
- Merchant Bar Band Saw (no longer operated)
- Merchant Bar Straightener (no longer operated)
- Baghouse Dust Handling: The Review Report detail sheets indicate a PM loss rate of 0.001% based on a "DEQ Estimate". We believe this loss rate estimate is out of date because the dust handling system has been enclosed with air displacements routed back to the baghouse BH-1/BH-1A system.

Categorically Insignificant Activities no Longer Categorically Exempt under CAO

See Attachment I for an assessment of CETEU's.

List of Attachments

Attachment A – Figure A-1: Process Flow Diagram

Attachment B – Emission Calculations (This attachment provided as password protected electronic spreadsheet file)

Attachment C – August 6-8, 2019 Source Test Report (See 5/9/22 submittal. No changes with this revision.)

Attachment D – 2013 Filter Analysis Report (See 5/9/22 submittal. No changes with this revision.)

Attachment E – May 21-23, 2013 Source Test Report (See 5/9/22 submittal. No changes with this revision.)

Attachment F – Slag Composition Analytical Report (See 5/9/22 submittal. No changes with this revision.)

Attachment G – APEX Laboratories Analytical Report – Scrap Handling Dust (See 2/13/23 submittal. No changes with this revision.)

Attachment H – January 20, 2023 letter from Cascade to DEQ regarding Fluoride emissions (See 2/13/23 submittal. No changes with this revision.)

Attachment I – Discussion of TEU status of previously exempt Categorically Insignificant Activities (See 2/13/23 submittal. No changes with this revision)

Attachment J – Raw material usage information and safety data sheets (See 2/13/23 submittal. No changes with this revision.)

Attachment K – Wastewater PFD and Description (See 2/13/23 submittal. No changes with this revision)

Attachment L – March 10, 2023 letter from Cascade to DEQ regarding Fluorides & appended with Nucor Berkley air permit

Attachment M – Welding Materials SDSs

Attachment N – Slag Oxidizer SDSs

Attachment O – Cooling Tower SDSs

Attachment P – Slag Analytical Report for Fluoride

Attachment A

Figure A-1: Process Flow Diagram

(Revised 2/13/23)

(Revised 7/3/23)

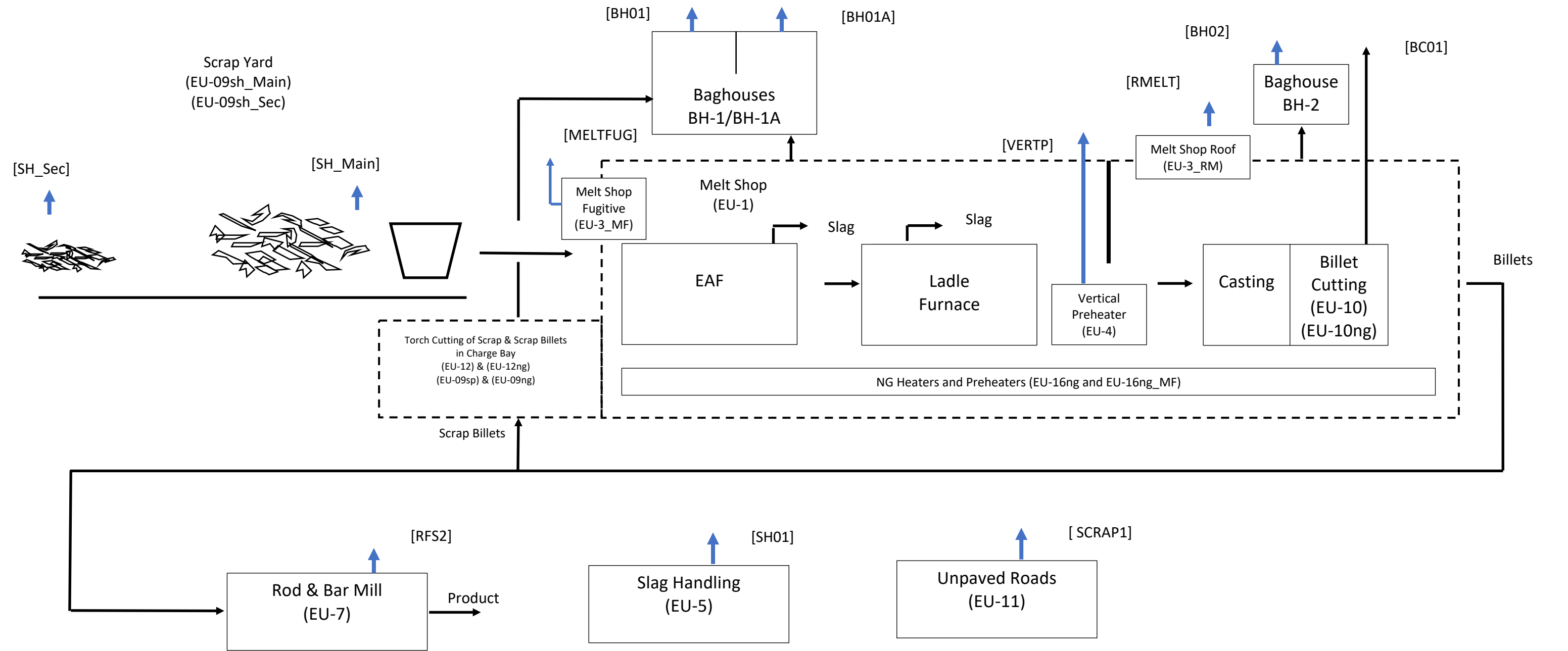


Figure A-1
Process Flow Diagram
(Revised 2/13/23)
(Revised 7/3/23)

Attachment B Emission Calculations

(This attachment provided as password protected electronic spreadsheet file – Revised
2/13/23)

(Revised 7/3/23)

Attachment C

August 6-8, 2019 Source Test

(See 5/9/22 submittal. No changes with this revision.)

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(See 2/13/23 submittal. No changes with this revision)

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(See 2/13/23 submittal. No changes with this revision.)

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(See 2/13/23 submittal. No changes with this revision.)

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Wastewater PFD and Description
(See 2/13/23 submittal. No changes with this revision.)

Attachment L
March 10, 2023 Letter from Cascade to DEQ Regarding
Fluorides



A **Schnitzer**  Company

Cascade Steel Rolling Mills, Inc.

3200 North Hwy 99W
McMinnville, OR 97128

800-283-2776 - 503-472-4181 - 503-434-9843 (Fax)

March 10, 2023

Mr. Mike Eisele, PE
Oregon Department of Environmental Quality
Western Region
4026 Fairview Industrial Drive
Salem, OR 97302

Re: Response to Request for Information related to Fluoride Dated January 30, 2023

Dear Mike:

Cascade Steel Rolling Mills (CSRM) received your January 30, 2023 information request relating to Fluorides. This response is timely consistent with your email dated February 8, 2023 granting an extension of our response deadline for Questions 1 through 3 to March 10, 2023.

Response to Information Request

1. *How long has CSRM used fluxes that contain fluorides? Provide information on usage of these materials, including quantities, concentrations, and locations where the flux was added (similar to the information provided for the January 20th submittal), as far back as that information is available.*

Based on information from long term employees, CSRM has been using fluoride containing fluxes since at least the mid 1970's. It is likely that CSRM has been using fluorspar since the mill began operations in 1969 as this would be consistent with the history of fluorspar use as a flux in steel manufacturing since the late 1800's. CSRM's Purchasing and Operational records only go back to 2008 as our enterprise accounting software was changed that year. Therefore, CSRM does not have documentation of our fluoride containing flux use prior to 2008.

See the attached file "Fluoride Flux Usage 2008-2022.pdf" for annual fluoride flux usage data.

CSRM's use of fluoride containing fluxes increased from 2020 onwards due to the replacement of calcium aluminate fluxes with calcium fluoride fluxes. This change was made to improve quality by improving the castability of the steel.

2. *Provide DEQ copies of any and all notifications that CSRM has provided to DEQ regarding its use of fluoride containing flux.*

CSRM is not aware of any notifications provided to DEQ regarding the use of fluoride containing flux.

3. *Using best available information, submit a calculation of the CSRM facility's potential to emit hydrogen fluoride, according to the definition in OAR 340-200-0020(124).*

CSRM does not believe that it emits material amounts of HF but has never performed testing specific to that pollutant. You have requested that CSRM perform site-specific stack testing for Fluorides and HF and CSRM is moving forward with this effort. Until that testing is complete, it is not possible to accurately calculate our potential to emit. However, we have done our best with the benefit of an emission factor derived from another mini-mill (Nucor-Berkeley).

The HF emission factors used in the CSRM estimates are shown in Table 1 below:

Table 1. Hydrogen Fluoride Emission Factors

Emission Factor	Stack (a)	Melt Shop Fugitives (b)	Stack plus Fugitives
lb HF-/ton metal	0.000958	0.00000383	0.000962

- (a) Factor obtained from Nucor Berkeley permit. EAF and LF Baghouse stacks HF limit: 0.6226 lb/hr (p. 120 - sum of limits for two stacks) divided by maximum hourly melt shop production limit: 650 tons/hr (p.21).
- (b) Factor obtained from Nucor Berkeley permit. Melt Shop fugitives HF limit: 0.00249 lb/hr (p. 121) divided by maximum hourly melt shop production limit: 650 tons/hr (p.21).

Using the emission factors in Table 1, HF emissions were calculated for the maximum output ever achieved by the melt shop. The resulting HF emissions are shown in Table 2 below:

Table 2: Estimated Hydrogen Fluoride Emissions

	Historical Maximum
Production (tons metal/yr)	790,229 (a)
Stack plus Fugitives HF Emissions (tons/yr)	0.38

- (a) Maximum production achieved in 2007 when two rolling mills were in operation. Recent year production has been considerably lower (e.g., 444,518 tons in 2021) as the result of the permanent shutdown of Rolling Mill 1 in 2016. This calculation likely overstates the mill's current potential to emit. Production capacity is not believed to exceed 720,000 tons/yr.

Please let me know if you have any questions after reviewing this response. We believe that this letter fully answers your questions 1-3 in their entirety. Questions 4 and 5 will be addressed in subsequent submittals.

Sincerely,



Jim Spahr
EHS Director

cc: Daniel Lee
Tim Sturdavant
Stanley N. Alpert
Tom Wood
John Browning

2008					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	18,400	6,494	3
SLAG BLEND LBLD "SPARMIX"	249	36.7%	149,800	55,029	28
				Total Tons used as CaF2	31
				Total Tons used as F	15

2009					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	14,400	5,082	3
SLAG BLEND LBLD "SPARMIX"	249	36.7%	770,200	282,933	141
				Total Tons used as CaF2	144
				Total Tons used as F	70

2010					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	173,300	61,165	31
SLAG BLEND LBLD "SPARMIX"	249	36.7%	1,524,000	559,841	280
				Total Tons used as CaF2	311
				Total Tons used as F	151

2011					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	180,500	63,706	32
SLAG BLEND LBLD "SPARMIX"	249	36.7%	2,520,000	925,722	463
				Total Tons used as CaF2	495
				Total Tons used as F	241

2012					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	162,700	57,423	29
SLAG BLEND LBLD "SPARMIX"	249	36.7%	1,978,000	726,618	363
				Total Tons used as CaF2	392
				Total Tons used as F	191

2013					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	188,100	66,388	33
SLAG BLEND LBLD "SPARMIX"	249	36.7%	1,984,000	728,822	364
				Total Tons used as CaF2	398
				Total Tons used as F	194

2014					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	245,100	86,506	43
SLAG BLEND LBLD "SPARMIX"	249	36.7%	1,856,800	682,095	341
				Total Tons used as CaF2	384
				Total Tons used as F	187

2015					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	202,620	71,513	36
SLAG BLEND LBLD "SPARMIX"	249	36.7%	1,022,500	375,615	188
				Total Tons used as CaF2	224
				Total Tons used as F	109

2016					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	159,600	56,329	28
SLAG BLEND LBLD "SPARMIX"	249	36.7%	820,600	301,447	151
				Total Tons used as CaF2	179
				Total Tons used as F	87

2017					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	219,200	77,364	39
SLAG BLEND LBLD "SPARMIX"	249	36.7%	1,478,092	542,977	271
				Total Tons used as CaF2	310
				Total Tons used as F	151

2018					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	226,100	79,800	40
SLAG BLEND LBLD "SPARMIX"	249	36.7%	1,213,100	445,632	223
				Total Tons used as CaF2	263
				Total Tons used as F	128

2019					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	49,400	17,435	9
SLAG BLEND LBLD "SPARMIX"	249	36.7%	1,095,900	402,579	201
				Total Tons used as CaF2	210
				Total Tons used as F	102

2020					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	30,400	10,729	5
SLAG BLEND LBLD "SPARMIX"	249	36.7%	846,960	311,131	156
LADLE SLAG " AS " (1600)	9139910	18.8%	4,153,600	778,800	389
			Total Tons used as CaF2		550
			Total Tons used as F		268

2021					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	35.3%	79,800	28,165	14
SLAG BLEND LBLD "SPARMIX"	249	36.7%	489,100	179,671	90
LADLE SLAG " AS " (1600)	9139910	18.8%	4,857,600	910,800	455
ARTIFICIAL SLAG - "WR" 1700	9141581	36.7%	1,105,400	406,069	203
Fluorspar 50LBS Bags 3000lbs pal	9141631	100%	1,950,000	1,950,000	975
			Total Tons used as CaF2		1,737
			Total Tons used as F		846

2022					
Flux Material	ID	% CaF2	Total Material Lbs	Lbs. Used CaF2	Tons Used
LADLE SLAG "MMFX" (1900)	242	18.8%	6,995,520	1,311,660	656
LADLE SLAG " AS " (1600)	9139910	35.3%	89,300	31,518	16
ARTIFICIAL SLAG - "WR" 1700	9141581	36.7%	2,060,415	756,893	378
Fluorspar 50LBS Bags 3000lbs pal	9141631	100%	42,000	42,000	21
			Total Tons used as CaF2		1,071
			Total Tons used as F		522



Bureau of Air Quality Title V Operating Permit

**Nucor Steel - Berkeley
1455 Hagan Avenue
Huger, South Carolina 29450
Berkeley County**

In accordance with the provisions of the Pollution Control Act, Sections 48-1-50(5), 48-1-100(A), and 48-1-110(a), the 1976 Code of Laws of South Carolina, as amended, and South Carolina Regulation 61-62, Air Pollution Control Regulations and Standards, the Bureau of Air Quality authorizes the operation of this facility and the equipment specified herein in accordance with valid construction permits, and the plans, specifications, and other information submitted in the Title V permit application received on June 30, 2005, as amended. All official correspondence, plans, permit applications, and written statements are an integral part of the permit. Any false information or misrepresentation in the application for a construction permit may be grounds for permit revocation.

The operation of this facility is subject to and conditioned upon the terms, limitations, standards, and schedules contained herein or as specified by this permit and its accompanying attachments.

Permit Number: TV-0420-0060

Issue Date:	December 19, 2019	Effective Date:	January 1, 2020
Expiration Date:	December 31, 2024	Renewal Due Date:	June 30, 2024

**Steve McCaslin, P. E., Director
Air Permitting Division
Bureau of Air Quality**

Nucor Steel - Berkeley

TV-0420-0060

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RECORD OF REVISIONS		
Date	Type	Description of Changes
<DATE>	MM	This revision is for the partial replacement of equipment covered under Construction Permit 0420-0060-DZ. Section B.3 has been modified to reflect four (4) new tundish preheaters (Unit ID 02, Equipment ID TP, Source IDs TP-A, TP-B, TP-C, TP-D) and one (1) new ladle preheater (Unit ID 02, Equipment ID LP, Source ID LP-A). Condition C.73, which affects the new tundish preheaters/dryers only, has been added.
<DATE>	AA	This revision updates the source testing requirements for the Caster Spray Vent 2 (CSP-2) and Beam Mill Spray Vent (BMSV) and revises the fluoride limit for the Furnace Baghouse (BAG-1), the filterable PM PSD grain loading limit for the Beam Mill Caster Spray Vent, and the inspection frequency of the parts washers covered under PSD Construction Permit 0420-0060-DX. Conditions C.23, C.24, C.28, C.29, C.30, C.37, C.40, C.41, C.43, C.49, and C.55 have been modified. In addition, typographical errors were corrected in the emission rates in Condition C.41.

AA Administrative Amendment
MM Minor Modification
SM Significant Modification

Nucor Steel - Berkeley

TV-0420-0060

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A. EMISSION UNIT DESCRIPTION

Emission Unit ID	Emission Unit Description
01	Melt Shop Equipment
02	Ancillary Equipment
03	Melt Shop Baghouse Dust Handling System
04	Vacuum Tank Degasser System
05	Tunnel Furnaces/Hot Mill
06	Reheat Furnace/Beam Mill
07	Pickle Line Equipment
08	Cold Reversing Mills
09	Galvanizing Line Equipment
10	Annealing Furnaces
11	Debris/Mill Scale/Slag Processing
12	Emergency Generators
13	On-Site Barge Unloading
14	Contact Cooling Towers
15	DRI Handling
16	Tension Leveler
17	Raw Material Handling and Processing
18	Non-contact Cooling Towers

B. EQUIPMENT AND CONTROL DEVICE(S)

B.1 EQUIPMENT FOR EMISSION UNIT 01 – Melt Shop Equipment

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
EAF-1	Electric Arc Furnace No. 1	1996/2018	BAG-1 BAG-1A LNOX-EAF-1	100 100A
EAF-2	Electric Arc Furnace No. 2	1996/2018	BAG-1 BAG-1A LNOX-EAF-2	100 100A
LMS-1	Ladle Metallurgy Station No. 1	1996/2018	BAG-1 BAG-1A	100, 100A (stacks) 101 (fugitives)
LMS-2	Ladle Metallurgy Station No. 2	1996/2018	BAG-1 BAG-1A	100, 100A (stacks) 101 (fugitives)

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B.1 EQUIPMENT FOR EMISSION UNIT 01 – Melt Shop Equipment

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
EAF-1_FUG	Electric Arc Furnace (EAF) Fugitives/Melt Shop Fugitives	1996/2018	None	DOOR20
EAF-2_FUG	Electric Arc Furnace (EAF) Fugitives/Melt Shop Fugitives	1996/2018	None	DOOR20
CC-1	Continuous Caster No. 1	1996/ 2005, 2012	BAG-1A	100A (stack) 101 (fugitives)
CC-2	Continuous Caster No. 2	1996/2005	BAG-1A	100A (stack) 101 (fugitives)
CSP1	CSP Spray Vent 1	1996/2018	None	CSP1
CSP2	CSP Spray Vent 2	1996	None	CSP2
BMC	Beam Mill Caster	1998/2005	BAG-1A	100A
BMSV	Beam Mill Caster Spray Vent	1998/2018	None	BM

B.2 CONTROL DEVICE(S) FOR EMISSION UNIT 01 – Melt Shop Equipment

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
BAG-1	Furnace Baghouse	1996/ 2005, 2008, 2018	PM, PM ₁₀ , PM _{2.5} , Fluoride
BAG-1A	Canopy Baghouse	2005/2018	PM, PM ₁₀ , PM _{2.5}
LNOX-EAF-1	EAF 1 Low NO _x Burners (inherent)	1996	NO _x
LNOX-EAF-2	EAF 2 Low NO _x Burners (inherent)	1996	NO _x

B.3 EQUIPMENT FOR EMISSION UNIT 02 – Ancillary Equipment

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
LP	1 new Ladle Preheater/Dryer (12 Million Btu/hr), 3 existing Ladle Preheaters/Dryers (9.9 Million Btu/hr, each), 2 Ladle Preheaters/Dryers (10 Million Btu/hr, each), and 2 Ladle Preheaters/Dryers (12 Million Btu/hr, each), natural gas-fired, total rating of 85.7 Million Btu/hr	1996/ 1998, 2018, 2020	LNOX-LP	101/102/105
TP	4 new Tundish Preheaters/Dryers with 2 burners each (5 Million Btu/hr, each burner), 13 existing Tundish Preheaters/Dryers (3 Million Btu/hr, each) and 3 Tundish Preheaters/Dryers (2 Million	1996/ 1998, 2018, 2020	LNOX-TP	101/102/105

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Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
	Btu/hr, each), natural gas-fired, total rating of 73 Million Btu/hr			
TNP	4 Tundish Nozzle Preheaters (1.4 Million Btu/hr, each), natural gas-fired, total rating of 5.6 Million Btu/hr	1996/ 2003, 2018	LNOX-TNP	102

B.4 CONTROL DEVICE(S) FOR EMISSION UNIT 02 – Ancillary Equipment

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
LNOX-LP	Ladle Preheaters Low NO _x Burners (inherent)	1996/1998, 2020	NO _x
LNOX-TP	Tundish Preheaters Low NO _x Burners (inherent)	1996/1998, 2020	NO _x
LNOX-TNP	Tundish Nozzle Preheaters Low NO _x Burners (inherent)	1996/2003	NO _x

B.5 EQUIPMENT FOR EMISSION UNIT 03 – Melt Shop Baghouse Dust Handling System

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
BDS	Baghouse Dust Silo	1996/2005	BAG-1	100

B.6 CONTROL DEVICE(S) FOR EMISSION UNIT 03 – Melt Shop Baghouse Dust Handling System

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
BAG-1	Furnace Baghouse	1996/ 2005, 2008, 2018	PM, PM ₁₀ , PM _{2.5} , Fluoride

B.7 EQUIPMENT FOR EMISSION UNIT 04 – Vacuum Tank Degasser System

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
VDT	Vacuum Degasser Tanks No. 1 and No. 2	2003	Flare-1 Flare-2	701A/701B
DB1	Vacuum Tank Degasser Boiler No. 1, natural gas-fired, rated 50.213 Million Btu/hr	2003	LNOX-DB1	702

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Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
DB2	Vacuum Tank Degasser Boiler No. 2, natural gas-fired, rated 50.213 Million Btu/hr	2018	LNOX-DB2	703

B.8 CONTROL DEVICE(S) FOR EMISSION UNIT 04 – Vacuum Tank Degasser System

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
Flare-1	Vacuum Tank Degasser Flare	2003	CO
Flare-2	Vacuum Tank Degasser Flare	2018	CO
LNOX-DB1	Vacuum Tank Degasser Boiler No. 1 Low NO _x Burner (inherent)	2003	NO _x
LNOX-DB2	Vacuum Tank Degasser Boiler No. 2 Low NO _x Burner (inherent)	2018	NO _x

B.9 EQUIPMENT FOR EMISSION UNIT 05 – Tunnel Furnaces/Hot Mill

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
TF-1	Tunnel Furnace No. 1, natural gas-fired, rated 107 Million Btu/hr	1996/2012	LNOX-TF-1	200/201
TF-2	Tunnel Furnace No. 2, natural gas-fired, rated 92 Million Btu/hr	2000/2012	LNOX-TF-2	202/206
HMMV	Hot Mill Monovent Fugitives	1996/2018	None	HM1, HM2, HM3

B.10 CONTROL DEVICE(S) FOR EMISSION UNIT 05 – Tunnel Furnaces/Hot Mill

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
LNOX-TF-1	Tunnel Furnace No. 1 Low NO _x Burners (inherent)	1996/2012	NO _x
LNOX-TF-2	Tunnel Furnace No. 2 Low NO _x Burners (inherent)	2000/2012	NO _x

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B.11 EQUIPMENT FOR EMISSION UNIT 06 – Reheat Furnace/Beam Mill

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
RF	Reheat Furnace, natural gas-fired, rated 185 Million Btu/hr	1998	LNOX-RF	204
BMMV	Beam Mill Monovent Fugitives	1998/2018	None	BM1, BM2, BM3

B.12 CONTROL DEVICE(S) FOR EMISSION UNIT 06 – Reheat Furnace/Beam Mill

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
LNOX-RF	Reheat Furnace Low NO _x Burners (inherent)	1998	NO _x

B.13 EQUIPMENT FOR EMISSION UNIT 07 – Pickle Line Equipment

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
PL-1	Pickle Line No. 1	1996/2012	SCB-1	300
PL-2	Pickle Line No. 2	1999/2012	SCB-2	306
PLB-1	Pickle Line Boiler No. 1, natural gas-fired, rated 15.4 Million Btu/hr	1996	LNOX-PLB-1	301
PLB-2	Pickle Line Boiler No. 2, natural gas-fired, rated 15.4 Million Btu/hr	1996	LNOX-PLB-2	302
PLB-3	Pickle Line Boiler No. 3, natural gas-fired, rated 15.4 Million Btu/hr	1999	LNOX-PLB-3	307
PLB-4	Pickle Line Boiler No. 4, natural gas-fired, rated 15.4 Million Btu/hr	1999	LNOX-PLB-4	308
PLV1 – PLV20	Pickle Line Fugitives	1996/1999, 2012, 2018	None	PLV1 - PLV20
PL-ESO	Pickle Line Electrostatic Oilers	1996/2018	None	PLV1 - PLV20

B.14 CONTROL DEVICE(S) FOR EMISSION UNIT 07 – Pickle Line Equipment

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
SCB-1	Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator	1996/2018	PM, PM ₁₀ , PM _{2.5} , HCl
SCB-2	Pickle Line No. 2 Wet Fume Scrubber/Mist Eliminator	1999	PM, PM ₁₀ , PM _{2.5} , HCl
LNOX-PLB-1	Low NO _x Burners (inherent)	1996	NO _x

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B.14 CONTROL DEVICE(S) FOR EMISSION UNIT 07 – Pickle Line Equipment

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
LNOX-PLB-2	Low NO _x Burners (inherent)	1996	NO _x
LNOX-PLB-3	Low NO _x Burners (inherent)	1999	NO _x
LNOX-PLB-4	Low NO _x Burners (inherent)	1999	NO _x

B.15 EQUIPMENT FOR EMISSION UNIT 08 – Cold Reversing Mills/Cold Mill

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
CRM-1	Cold Reversing Mill No. 1	1996/2018/2019	CRM1ME1 CRM1ME2	303
CRM-2	Cold Reversing Mill No. 2	2000/2013	CRM2ME1 CRM2ME2	309
CMMV	Cold Mill Monovent Fugitives	1996/2018	None	CM1, CM2, CM3
TM-ESO	Temper Mill Electrostatic Oiler	1996/2019	None	CM1, CM2, CM3

B.16 CONTROL DEVICE(S) FOR EMISSION UNIT 08 – Cold Reversing Mills/Cold Mill

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
CRM1ME1	Mist Eliminator and Fume Exhaust System	1996/2018	PM, PM ₁₀ , PM _{2.5}
CRM1ME2	Mist Eliminator and Fume Exhaust System	1996/2018	PM, PM ₁₀ , PM _{2.5}
CRM2ME1	Mist Eliminator	2000	PM, PM ₁₀ , PM _{2.5}
CRM2ME2	Mist Eliminator	2013	PM, PM ₁₀ , PM _{2.5}

B.17 EQUIPMENT FOR EMISSION UNIT 09 – Galvanizing Line Equipment

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
GL-PF	Galvanizing Line – Preheat, natural gas-fired, rated 71.5 Million Btu/hr	1997/2008	NOX1	305
GL-RF	Galvanizing Line – Radiant, natural gas-fired, rated 27.8 Million Btu/hr	1997/2008	NOX1	305
GL-GF	Galvanizing Line – Galvanneal Furnace	1997/1998, 2016	LNOX-GL-GF	314
GL-ALHT	Galvanizing Line/Alkali Cleaning Section Heaters, natural gas-fired, rated 10.3 Million Btu/hr	2014/2018	None	CM2, GL1V (strip)

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B.17 EQUIPMENT FOR EMISSION UNIT 09 – Galvanizing Line Equipment

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
				dryer)
GL-CS	Galvanizing Line Cleaning Section	2014	GL1-ME	CLSEC313
GL-MC	Galvanizing Line Metal Coating (Chemtreat)	2016	None	CM2
GL-SP	Galvanizing Line Skin Pass Section	2017	None	CM2
GL-ZD	Galvanizing Line Zinc Dipping Section	1997	None	GL1V
GL-ST	Galvanizing Line Stenciling	1997/2019	None	CM1, CM2, CM3
GL-ESO	Galvanizing Line Electrostatic Oiler	1997/2019	None	CM1, CM2, CM3

B.18 CONTROL DEVICE(S) FOR EMISSION UNIT 09 – Galvanizing Line Equipment

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
NOX1	SNCR/SCR Hybrid, preheat furnace uses Selective Non-catalytic Reduction (SNCR) and radiant tube furnace uses Selective Catalytic Reduction (SCR)	1997	NO _x
LNOX-GL-GF	Low NO _x Burners (inherent)	1997/1998, 2016	NO _x
GL1-ME	Mist Eliminator	2013	PM, PM ₁₀ , PM _{2.5}

B.19 EQUIPMENT FOR EMISSION UNIT 10 – Annealing Furnaces

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
ANF	Annealing Furnaces, natural gas-fired, rated 120 Million Btu/hr	1996/2002	LNOX-ANF	304

B.20 CONTROL DEVICE(S) FOR EMISSION UNIT 10 – Annealing Furnaces

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
LNOX-ANF	Low NO _x Burners (inherent)	1996/2002	NO _x

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B.21 EQUIPMENT FOR EMISSION UNIT 11 – Debris/Mill Scale/Slag Processing

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
5'x12' Screen	5' x 12' Screen (2)	1996/2002	WS	600
SDDS	DD Screen	1996/2002	WS	600
SFS	Fe Screen	1996/2002	WS	600
STDS	TD Screen	1996/2002	WS	600
Feeder	Feeder	1996/2002	WS	600
SFCS-2	Fe Conveyor 2	1996/2002	WS	600
SFCS-3	Fe Conveyor 3	1996/2002	WS	600
SFCS-4	Fe Conveyor 4	1996/2002	WS	600
SGF	Grizzly Feeder	1996/2002	WS	600
SC-9	Conveyor No. 9	1996/2002	WS	600
SC-7	Conveyor No. 7	1996/2002	WS	600
SC-6	Conveyor No. 6	1996/2002	WS	600
SC-5A	Conveyor No. 5A	1996/2002	WS	600
SC-8	Conveyor No. 8	1996/2002	WS	600
SC-5B	Conveyor No. 5B	1996/2013	WS	600
SFC-5	Conveyor No. 5	1996/2002	WS	600
SC-1	Conveyor No. 1	1996/2002	WS	600
SS-1	Stacker No. 1	1996/2002	WS	600
SS-2	Stacker No. 2	1996/2002	WS	600
SS-3	Stacker No. 3	1996/2002	WS	600
SS-4	Stacker No. 4	1996/2002	WS	600
SNBC	Norberg Crusher	1996/2002	WS	600
SKKC	Norberg Jaws Crusher	1996/2002, 2015	WS	600
600-Slag Storage	Slag Storage	1996/2013	WS	600
SB	Misc. Sand Blasting	1996	WS	600

B.22 CONTROL DEVICE(S) FOR EMISSION UNIT 11 – Debris/Mill Scale/Slag Processing

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
WS	Wet Suppression	1996	PM, PM ₁₀ , PM _{2.5}

B.23 EQUIPMENT FOR EMISSION UNIT 12 – Emergency Generators

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
EG-1	Emergency Generator No. 1	1996	None	EMGEN1

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B.23 EQUIPMENT FOR EMISSION UNIT 12 – Emergency Generators

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
	(CM Alco, diesel-fired, 2,860 Hp)			
EG-2	Emergency Generator No. 2 (Mega Alco, diesel-fired, 2,860 Hp)	1996	None	EMGEN2

B.24 EQUIPMENT FOR EMISSION UNIT 13 – On-Site Barge Unloading

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
BARGE	Barge Unloading Operations	1996/2018	None	FUG1B

B.25 EQUIPMENT FOR EMISSION UNIT 14 – Contact Cooling Towers

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
CT-1	Contact Cooling Tower No. 4 - Mega	1996/2018	None	CT4A, CT4B
CT-2	Contact Cooling Tower No. 5 - Laminar	1996/2018	None	CT5A, CT5B
CT-3	Contact Cooling Tower No. 14 - Kilo	1996/2018	None	CT14A, CT14B
CT-4	Contact Cooling Tower Degasser	1996/2018	None	DG
CT-1A	Contact Cooling Tower System 4 Addition	2019	None	CT-1A

B.26 EQUIPMENT FOR EMISSION UNIT 15 – DRI Handling

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
807	Hopper	2015	DRI-SH1	807
807F	Fugitives from Equipment 807 Hopper	2015	None	807F
808	Hopper	2016	DRI-SH2	808
808F	Fugitives from Equipment 808 Hopper	2016	None	808F
809	Conveyor Transition Point	2016	DRI-DC1	809
809F	Fugitives from Equipment 809 Conveyor Transition Point	2016	None	809F
810/812	Conveyor Transition Points	2015	DRI-DC2 DRI-DC4	810/812
810F/812F	Fugitives from Equipment 810/812 Conveyor Transition Points	2015	None	810F/812F
811	Conveyor	2015	DRI-DC3	811

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B.26 EQUIPMENT FOR EMISSION UNIT 15 – DRI Handling

Equipment ID	Equipment Description	Installation/ Modification Date	Control Device ID	Emission Point ID
811F	Fugitives from Equipment 811 Conveyor	2015	None	811F
817	Conveyor	2015	DRI-DC9	817
817F	Fugitives from Equipment 817 Conveyor	2015	None	817F
818	Conveyor	2015	DRI-DC10	818
818F	Fugitives from Equipment 818 Conveyor	2015	None	818F
819	Conveyor Transition Point	2015	DRI-DC11	819
819F	Fugitives from Equipment 819 Conveyor Transition Point	2015	None	819F
822	Grizzly	2015	DRI-DC14	822
822F	Fugitives from Equipment 822 Grizzly	2015	None	822F
824	Conveyors	2015	DRI-DC16	824
824F	Fugitives from Equipment 824 Conveyors	2015	None	824F
825/826	Silos	2015	DRI-DC17 DRI-DC18	825/826
825F/826F	Fugitives from Equipment 825/826 Silos	2015	None	825F/826F
827	Silos	2014	DRI-DC19	827
827F	Fugitives from Equipment 827 Silos	2014	None	827F
828	Silos	2014	DRI-DC20	828
828F	Fugitives from Equipment 828 Silos	2014	None	828F
829	Silos	2014	DRI-DC21	829
829F	Fugitives from Equipment 829 Silos	2014	None	829F
830	Silo	2014	DRI-DC19 DRI-DC20 DRI-DC21	827 828 829
830F	Fugitives from Equipment 830 Silo	2014	None	830F
831	Silo	2014	DRI-DC19 DRI-DC20 DRI-DC21	827 828 829
831F	Fugitives from Equipment 831 Silo	2014	None	831F
832	Conveyor/Day Bins	2014	DRI-DC24	832
832F	Fugitives from Equipment 832 Conveyor/Day Bins	2014	None	832F
833	Conveyor	2014	DRI-DC25	833
833F	Fugitives from Equipment 833 Conveyor	2014	None	833F
834	Conveyor	2014	DRI-DC26	834
834F	Fugitives from Equipment 834 Conveyor	2014	None	834F
835	Conveyor	2014	DRI-DC27	835
835F	Fugitives from Equipment 835 Conveyor	2014	None	835F
836	Conveyor	2014	DRI-DC28	836
836F	Fugitives from Equipment 836 Conveyor	2014	None	836F
1B	Barge to Truck (facility utilizes low drop height)	2016	None	1B

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B.26 EQUIPMENT FOR EMISSION UNIT 15 – DRI Handling

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
3B	Truck to Existing Building (facility utilizes low drop height; 3-sided building)	2016	None	3B
8B	Loader/Truck (facility utilizes low drop height)	2016	None	8B

B.27 CONTROL DEVICE(S) FOR EMISSION UNIT 15 – DRI Handling

Control Device ID	Control Device Description	Installation/Modification Date	Pollutant(s) Controlled
DRI-SH1	Hopper Baghouse	2015	PM, PM ₁₀ , PM _{2.5}
DRI-SH2	Hopper Baghouse	2016	PM, PM ₁₀ , PM _{2.5}
DRI-DC1	Conveyor Transition Point Baghouse	2016	PM, PM ₁₀ , PM _{2.5}
DRI-DC2 DRI-DC4	Conveyor Transition Point Baghouse	2015	PM, PM ₁₀ , PM _{2.5}
DRI-DC3	Conveyor Baghouse	2015	PM, PM ₁₀ , PM _{2.5}
DRI-DC9	Conveyor Baghouse	2015	PM, PM ₁₀ , PM _{2.5}
DRI-DC10	Conveyor Baghouse	2015	PM, PM ₁₀ , PM _{2.5}
DRI-DC11	Conveyor Baghouse	2015	PM, PM ₁₀ , PM _{2.5}
DRI-DC14	Grizzly Baghouse	2015	PM, PM ₁₀ , PM _{2.5}
DRI-DC16	Conveyors Baghouse	2015	PM, PM ₁₀ , PM _{2.5}
DRI-DC17 DRI-DC18	Silos Baghouse	2015	PM, PM ₁₀ , PM _{2.5}
DRI-DC19	Silos Baghouse	2014	PM, PM ₁₀ , PM _{2.5}
DRI-DC20	Silos Baghouse	2014	PM, PM ₁₀ , PM _{2.5}
DRI-DC21	Silos Baghouse	2014	PM, PM ₁₀ , PM _{2.5}
DRI-DC24	Conveyor/Day Bins Baghouse	2014	PM, PM ₁₀ , PM _{2.5}
DRI-DC25	Conveyor Baghouse	2014	PM, PM ₁₀ , PM _{2.5}
DRI-DC26	Conveyor Baghouse	2014	PM, PM ₁₀ , PM _{2.5}
DRI-DC27	Conveyor Baghouse	2014	PM, PM ₁₀ , PM _{2.5}
DRI-DC28	Conveyor Baghouse	2014	PM, PM ₁₀ , PM _{2.5}

B.28 EQUIPMENT FOR EMISSION UNIT 16 – Tension Leveler

Equipment ID	Equipment Description	Installation/Modification Date	Control Device ID	Emission Point ID
TL1	Tension Leveler Alkali Wash	2010	TL1-ME	310
TL2	Tension Leveler Burner	2010	None	311
TL3	Tension Leveler Dryer	2010	None	312

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B.29 CONTROL DEVICE(S) FOR EMISSION UNIT 16 – Tension Leveler

Control Device ID	Control Device Description	Installation/ Modification Date	Pollutant(s) Controlled
TL1-ME	Mist Eliminator	2010	PM, PM ₁₀ , PM _{2.5}

B.30 EQUIPMENT FOR EMISSION UNIT 17 – Raw Material Handling and Processing

Equipment ID	Equipment Description	Installation/ Modification Date	Control Device ID	Emission Point ID
802	EAF Top Feed “new”	2011	802	802
803	EAF Top Feed “old”	1996/2011	803	803
804	Alloy Grizzly	1996/2009, 2018	804	804
804F	Alloy Grizzly Fugitives	1996/2009, 2018	None	804F
804V – MS-Debris	Miscellaneous Debris (Cleanup Sand, etc.)	1996/2018	None	804V
805	Lime/Carbon Silos and Briquetter Filter	1996/2009, 2018	805	805
805F	Lime Dump Fugitives	1996/2009, 2018	None	805F
806	Carbon Dump	1996/2009, 2018	806	806
806F	Carbon Dump Fugitives	1996/2009, 2018	None	806F
601 – Coil Cutting	Coil Cutting	1996/2010	601	601

B.31 CONTROL DEVICE(S) FOR EMISSION UNIT 17 – Raw Material Handling and Processing

Control Device ID	Control Device Description	Installation/ Modification Date	Pollutant(s) Controlled
802	Baghouse	1996/2009	PM, PM ₁₀ , PM _{2.5}
803	Baghouse	1996/2009	PM, PM ₁₀ , PM _{2.5}
804	Baghouse	1996/2009	PM, PM ₁₀ , PM _{2.5}
805	Baghouse	1996/2009	PM, PM ₁₀ , PM _{2.5}
806	Baghouse	1996/2009	PM, PM ₁₀ , PM _{2.5}
601	Baghouse	2010	PM, PM ₁₀ , PM _{2.5}

B.32 EQUIPMENT FOR EMISSION UNIT 18 – Non-contact Cooling Towers

Equipment ID	Equipment Description	Installation/ Modification Date	Control Device ID	Emission Point ID
NCT1	Non-contact Cooling Tower No. 1 – Furnace Cooling	1996	None	NCT1_1, NCT1_2,

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B.32 EQUIPMENT FOR EMISSION UNIT 18 – Non-contact Cooling Towers

Equipment ID	Equipment Description	Installation/ Modification Date	Control Device ID	Emission Point ID
				NCT1_3, NCT1_4
NCT3	Non-contact Cooling Tower No. 3 – Machine Cooling	1996	None	NCT3_1, NCT3_2, NCT3_3, NCT3_4
NCT13	Non-contact Cooling Tower No. 13 – Kilo	1998	None	NCT13_1, NCT13_2
NCS3A	Non-contact Cooling Tower System 3 Addition	2019	None	NCS3A

C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
C.1	<p>Emission Unit ID: All Equipment ID: All Control Device ID: All</p> <p>Equipment capacities provided under the Equipment Description column of the Equipment Tables above are not intended to be permit limits unless otherwise specified within the Table of Conditions for the particular equipment. However, this condition does not exempt the facility from the construction permitting process, from PSD review, nor from any other applicable requirements that must be addressed prior to increasing production rates.</p>
C.2	<p>Emission Unit ID: All Equipment ID: All Control Device ID: All</p> <p>(S.C. Regulation 61-62.1, Section II.J.1.g) A copy of the Department issued construction and/or operating permit must be kept readily available at the facility at all times. The owner or operator shall maintain such operational records; make reports; install, use, and maintain monitoring equipment or methods; sample and analyze emissions or discharges in accordance with prescribed methods at locations, intervals, and procedures as the Department shall prescribe; and provide such other information as the Department reasonably may require. All records required to demonstrate compliance with the limits established under this permit shall be maintained on site for a period of at least 5 years from the date the record was generated and shall be made available to a Department representative upon request.</p>
C.3	<p>Emission Unit ID: 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 15, 16, and 17 Equipment ID: EAF-1, EAF-2, LMS-1, LMS-2, CC-1, CC-2, BMC, LP, TP, TNP, BDS, VDT, DB1, DB2, TF-1, TF-2, RF, PL-1, PL-2, PLB-1, PLB-2, PLB-3, PLB-4, CRM-1, CRM-2, GL-PF, GL-RF, GL-GF, GL-CS, ANF, 5'x12'</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>Screen, SDDS, SFS, STDS, Feeder, SFCS-2, SFCS-3, SFCS-4, SGF, SC-9, SC-7, SC-6, SC-5A, SC-8, SC-5B, SFC-5, SC-1, SS-1, SS-2, SS-3, SS-4, SNBC, SKKC, 600 – Slag Storage, SB, 807, 808, 809, 810/812, 811, 817, 818, 819, 822, 824, 825/826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, TL1, 802, 803, 804, 805, 806, and 601 – Coil Cutting</p> <p>Control Device ID: BAG-1, BAG-1A, LNOX-EAF-1, LNOX-EAF-2, LNOX-LP, LNOX-TP, LNOX-TNP, Flare-1, Flare-2, LNOX-DB1, LNOX-DB2, LNOX-TF-1, LNOX-TF-2, LNOX-RF, SCB-1, SCB-2, LNOX-PLB-1, LNOX-PLB-2, LNOX-PLB-3, LNOX-PLB-4, CRM1ME1, CRM1ME2, CRM2ME1, CRM2ME2, NOX1, LNOX-GL-GF, GL1-ME, LNOX-AF, WS, DRI-SH1, DRI-SH2, DRI-DC1, DRI-DC2, DRI-DC4, DRI-DC3, DRI-DC9, DRI-DC10, DRI-DC11, DRI-DC14, DRI-DC16, DRI-DC17, DRI-DC18, DRI-DC19, DRI-DC20, DRI-DC21, DRI-DC24, DRI-DC25, DRI-DC25, DRI-DC26, DRI-DC27, DRI-DC28 TL1-ME, 802, 803, 804, 805, 806, and 601</p> <p>The owner/operator shall inspect, calibrate, adjust, and maintain continuous monitoring systems, monitoring devices, and gauges in accordance with manufacturer's specifications or good engineering practices. The owner/operator shall maintain on file all measurements including continuous monitoring system or monitoring device performance measurements; all continuous monitoring system performance evaluations; all continuous monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and all other information required in a permanent form suitable for inspection by Department personnel.</p> <p>(S.C. Regulation 61-62.1, Section II.J.1.d) Sources required to have continuous emission monitors shall submit reports as specified in applicable parts of the permit, law, regulations, or standards.</p>
C.4	<p>Emission Unit ID: 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 15, 16, and 17</p> <p>Equipment ID: EAF-1, EAF-2, LMS-1, LMS-2, CC-1, CC-2, BMC, LP, TP, TNP, BDS, VDT, DB1, DB2, TF-1, TF-2, RF, PL-1, PL-2, PLB-1, PLB-2, PLB-3, PLB-4, CRM-1, CRM-2, GL-PF, GL-RF, GL-GF, GL-CS, ANF, 5'x12' Screen, SDDS, SFS, STDS, Feeder, SFCS-2, SFCS-3, SFCS-4, SGF, SC-9, SC-7, SC-6, SC-5A, SC-8, SC-5B, SFC-5, SC-1, SS-1, SS-2, SS-3, SS-4, SNBC, SKKC, 600 – Slag Storage, SB, 807, 808, 809, 810/812, 811, 817, 818, 819, 822, 824, 825/826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, TL1, 802, 803, 804, 805, 806, and 601 – Coil Cutting</p> <p>Control Device ID: BAG-1, BAG-1A, LNOX-EAF-1, LNOX-EAF-2, LNOX-LP, LNOX-TP, LNOX-TNP, Flare-1, Flare-2, LNOX-DB1, LNOX-DB2, LNOX-TF-1, LNOX-TF-2, LNOX-RF, SCB-1, SCB-2, LNOX-PLB-1, LNOX-PLB-2, LNOX-PLB-3, LNOX-PLB-4, CRM1ME1, CRM1ME2, CRM2ME1, CRM2ME2, NOX1, LNOX-GL-GF, GL1-ME, LNOX-AF, WS, DRI-SH1, DRI-SH2, DRI-DC1, DRI-DC2, DRI-DC4, DRI-DC3, DRI-DC9, DRI-DC10, DRI-DC11, DRI-DC14, DRI-DC16, DRI-DC17, DRI-DC18, DRI-DC19, DRI-DC20, DRI-DC21, DRI-DC24, DRI-DC25, DRI-DC25, DRI-DC26, DRI-DC27, DRI-DC28 TL1-ME, 802, 803, 804, 805, 806, and 601</p> <p>All gauges shall be readily accessible and easily read by operating personnel and Department personnel (i.e. on ground level or easily accessible roof level). Monitoring parameter readings (i.e., pressure drop readings, etc.) and inspection checks shall be maintained in logs (written or electronic), along with any corrective action taken when deviations occur. Each incidence of operation outside the operational ranges, including date and time, cause, and corrective action taken, shall be recorded</p>

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>and kept on site. Exceedance of operational range shall not be considered a violation of an emission limit of this permit, unless the exceedance is also accompanied by other information demonstrating that a violation of an emission limit has taken place. Reports of these incidences shall be submitted semiannually. If no incidences occurred during the reporting period then a letter shall be submitted to indicate such.</p> <p>Any alternative method for monitoring control device performance must be preapproved by the Bureau and shall be incorporated into the permit as set forth in SC Regulation 61-62.70.7.</p>
C.5	<p>Emission Unit ID: 01, 03, 05, 06, 07, 08, 09, 11, 13, and 15 Equipment ID: EAF-1, EAF-2, LMS-1, LMS-2, CC-1, CC-2, CSP1, CSP2, BMC, BMSV, BDS, TF-1, TF-2, RF, PL-1, PL-2, CRM-1, CRM-2, GL-MC, GL-ST, 5' x 12' Screen, SDDS, SFS, STDS, Feeder, SFCS-2, SFCS-3, SFCS-4, SGF, SC-9, SC-7, SC-6, SC-5A, SC-8, SC-5B, SFC-5, SC-1, SS-1, SS-2, SS-3, SS-4, SNBC, SKKC, 600-Slag Storage, SB, BARGE, 807, 807F, 808, 808F, and 1B Control Device ID: BAG-1, BAG-1A, LNOX-EAF-1, LNOX-EAF-2, LNOX-TF-1, LNOX-TF-2, LNOX-RF, SCB-1, SCB-2, CRM1ME1, CRM1ME2, CRM2ME1, CRM2ME2, WS, DRI-SH1, and DRI-SH2</p> <p>For any source test required under an applicable standard or permit condition, the owner, operator, or representative shall comply with S.C. Regulation 61-62.1, Section IV - Source Tests.</p> <p>Unless approved otherwise by the Department, the owner, operator, or representative shall ensure that source tests are conducted while the source is operating at the maximum expected production rate or other production rate or operating parameter which would result in the highest emissions for the pollutants being tested. Some sources may have to spike fuels or raw materials to avoid being subjected to a more restrictive feed or process rate. Any source test performed at a production rate less than the rated capacity may result in permit limits on emission rates, including limits on production if necessary.</p> <p>The owner or operator shall comply with any limits that result from conducting a source test at less than rated capacity. A copy of the most recent Department issued source test summary letter, whether it imposes a limit or not, shall be maintained with the operating permit, for each source that is required to conduct a source test.</p> <p>Site-specific test plans and amendments, notifications, and source test reports shall be submitted to the Manager of the Source Evaluation Section, Bureau of Air Quality.</p>
C.6	<p>Emission Unit ID: 01, 03, 04, 07, and 09 Equipment ID: EAF-1, EAF-2, EAF-1_FUG, EAF-2_FUG, BDS, DB1, DB2, PLB-1, PLB-2, PLB-3, PLB-4, GL-MC and GL-ST Control Device ID: BAG-1, BAG-1A, LNOX-DB1, LNOX-DB2, LNOX-PLB-1, LNOX-PLB-2, LNOX-PLB-3 and LNOX-PLB-4 Insignificant Activity Equipment ID: IA-EG8, IA-WP1, IA-WP2, IA-WP9, IA-EG14 and IA-EG12</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>All references to NSPS or §60 in this permit, refer to both S.C. Regulation 61-62.60 - "South Carolina Designated Facility Plan And New Source Performance Standards" and Code of Federal Regulations Title 40, Part 60 - "Standards Of Performance For New Stationary Sources."</p> <p>All equipment specified in this permit as being subject to an NSPS are also subject to S.C. Regulation 61-62.60 and 40 CFR 60, Subpart A - General Provisions, and shall comply with all applicable provisions, in addition to those explicitly stated in this permit.</p>
C.7	<p>Emission Unit ID: 01, 02, 04, 05, 06, 07, 08, 09, 11, 12, 13, 14, 15, 16, 17 and 18</p> <p>Equipment ID: LMS-1, LMS-2, EAF-1_FUG, EAF-2_FUG, CC-1, CC-2, CSP1, CSP2, BMSV, LP, TP, TNP, VDT, HMMV, BMMV, PL-1 and PL-2, CMMV, GL-PF, GL-CS, GL-ZD, 5'x12' Screen, SDDS, SFS, STDS, Feeder, SFCS-2, SFCS-3, SFCS-4, SGF, SC-9, SC-7, SC-6, SC-5A, SC-8, SC-5B, SFC-5, SC-1, SS-1, SS-2, SS-3, SS-4, SNBC, SKKC, 600-Slag Storage, EG-1, EG-2, BARGE, CT-1, CT-2, CT-3, CT-4, CT-1A, 809, 809F, 810/812, 810F/812F, 811, 811F, 817, 817F, 818, 818F, 819, 819F, 822, 822F, 824, 824F, 825/826, 825F/826F, 827, 827F, 828, 828F, 829, 829F, 830, 830F, 831, 831F, 832, 832F, 833, 833F, 834, 834F, 835, 835F, 836, 836F, 3B, 8B, TL1, TL3, 802, 803, 804, 804F, 804V - MS-Debris, 805, 805F, 806, 806F, 601 - Coil Cutting, NCT1, NCT3, NCT13, and NCS3A</p> <p>Control Device ID: Flare-1, Flare-2, SCB-1, SCB-2, GL1-ME, WS, DRI-DC1, DRI-DC2, DRI-DC4, DRI-DC3, DRI-DC9, DRI-DC10, DRI-DC11, DRI-DC14, DRI-DC16, DRI-DC17, DRI-DC18, DRI-DC19, DRI-DC20, DRI-DC21, DRI-DC24, DRI-DC25, DRI-DC26, DRI-DC27, DRI-DC28, TL1-ME, 802, 803, 804, 805, 806, and 601</p> <p>Visual inspection means a qualitative observation of opacity during daylight hours where the inspector records results in a log, noting color, duration, density (heavy or light), cause, and corrective action taken for any abnormal emissions.</p> <p>The observer does not need to be certified to conduct valid visual inspections. However, at a minimum, the observer should be trained and knowledgeable about the effects on visibility of emissions caused by background contrast, ambient lighting, and observer position relative to lighting, wind, and the presence of uncombined water.</p>
C.8	<p>Emission Unit ID: 04, 05, 06, 07, 09, 10, and 16</p> <p>Equipment ID: DB1, DB2, TF-1, TF-2, RF, PLB-1, PLB-2, PLB-3, PLB-4, GL-RF, GL-GF, GL-ALHT, ANF, and TL2</p> <p>(S.C. Regulation 61-62.5, Standard No. 1, Section I) The fuel burning sources shall not discharge into the ambient air smoke which exceeds opacity of 20%, each. The owner/operator shall, to the extent practicable, maintain and operate any source including associated air pollution control equipment in a manner consistent with good air pollution control practices for minimizing emissions.</p> <p>(S.C. Regulation 61-62.5, Standard No. 1, Section II) The maximum allowable discharge of particulate matter resulting from fuel burning operations is based on the input heat rate of each source. For</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>sources operating below 1,300 Million BTU/hr heat input rate, the maximum allowable discharge of particulate matter from these sources is 0.6 pound per million BTU input, each.</p> <p>For sources operating equal to or above 1,300 million BTU/hr heat input rate, the limit is expressed as a function of the input heat rate per the following equation:</p> $E = 57.84 P^{-0.637}$ <p>Where E = the allowable emission rate in pounds per million BTU heat input And P = million BTU heat input per hour</p> <p>(S.C. Regulation 61-62.5, Standard No. 1, Section III) The maximum allowable discharge of sulfur dioxide (SO₂) resulting from these sources is 2.3 pounds per million BTU input, each.</p> <p>These sources are only permitted to burn natural gas as fuel. The use of any other substances as fuel is prohibited without prior approval from the Department.</p>
C.9	<p>Emission Unit ID: 11 Equipment ID: 5'x12' Screen, SDDS, SFS, STDS, Feeder, SFCS-2, SFCS-3, SFCS-4, SGF, SC-9, SC-7, SC-6, SC-5A, SC-8, SC-5B, SFC-5, SC-1, SS-1, SS-2, SS-3, SS-4, SNBC, SKKC, 600 – Slag Storage and SB Control Device ID: WS</p> <p>(S.C. Regulation 61-62.5, Standard No. 2) The EPA through guidance as outlined in their April 11, 1995 letter to the Bureau of Air Quality entitled "Use of Controlled Emission Factors in Non-Metallic Mining Industries" has defined saturated material as material with a moisture content (%) verified to be above 1.5%. The facility shall not process slag with a moisture content of less than 1.5% and shall analyze the unprocessed slag pile monthly for pile moisture content (%) using ASTM test method C566 or equivalent. If the moisture content is less than 1.5%, then the pile cannot be processed until the moisture content exceeds 1.5%. All test results shall be kept in a log and each log entry shall contain the test date, test time and test result. Each log entry shall be kept on site for a calendar period of five (5) years from the entry date and made available to Department personnel upon request. The Department reserves the right to impose a more frequent testing schedule.</p> <p>The facility shall keep a log detailing all slag processing activities. This log shall be kept on-site and made available to Department personnel upon request. Each log entry shall contain the date and the total amount in tons of slag processed per day. At the end of each month, the daily totals shall be totaled into a monthly subtotal in tons and entered into the log. Each log entry shall be kept for a calendar period of five (5) years from the entry date.</p>
C.10	<p>Emission Unit ID: 04 Equipment ID: VDT Control Device ID: Flare-1 and Flare-2</p> <p>(S.C. Regulation 61-62.5, Standard No. 3, Section III.I.1) Emissions from the flares shall not exhibit an</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>opacity greater than 20%, each.</p> <p>(S.C. Regulation 6162.5, Standard No. 3, Section III.I.2) Particulate matter emissions shall not exceed 0.5 lb/10⁶ Btu total heat input for each flare. The total heat input value from waste and virgin fuel used for production shall not exceed the Btus used to affect the combustion of the waste and shall not include any Btu input from auxiliary burners located outside of the primary combustion chamber such as those found in secondary combustion chambers, tertiary combustion chambers or afterburners unless those auxiliary burners are fired with waste. In the case where waste is fired in the auxiliary burners located outside of the primary combustion chamber, only the Btu value of the fuel for the auxiliary burner which is from waste shall be added to the total heat input value.</p> <p>The Vacuum Tank Degasser system shall not be operated without the associated flare in proper operation. The owner/operator shall always maintain a flare alarm in proper working order to notify an operator of a possible flare malfunction. If the Vacuum Degasser Tanks are in batch operation when a flare alarm is received, then operation may continue until the batch is finished, if necessary. Once the batch is finished, then the flares shall be checked and maintenance performed, if necessary, before processing any more batches. If the Vacuum Degasser Tanks can be paused during a batch operation without harm to the materials being processed, then the owner/operator shall do so and check the flares. If a batch must continue to completion when a flare alarm is received, then the owner/operator shall take all appropriate measures to limit emissions until the batch is completed. No more batches shall be processed until the flares are checked and determined to be in proper operation. A dated record of all flare inspections and maintenance activities shall be recorded in a log. This log shall also include a dated record of all flare alarms, the name(s) of the person(s) responding to the alarm, reason for the flare alarm, any problems clearly identified and corrective actions(s) taken listed. All log entries shall be maintained on site. Within 180 calendar days of startup of the modified Vacuum Tank Degasser system (per latest revision of PSD Permit 0420-0060-DX), the owner/operator shall define what constitutes proper flare operation, determine the necessary flare component inspections, determine the necessary flare maintenance, and submit this information to the Director of the Air Permitting Division. Proper flare operation, inspections, and maintenance shall be derived from manufacturer certification and specifications, operational history, and visual inspections, the combination of which demonstrate the proper operation of the flares. Any alternative method for monitoring flare performance must be preapproved by the Director of the Air Permitting Division and shall be incorporated into the permit as set forth in S.C. Regulation 61-62.70.7.</p>
C.11	<p>Emission Unit ID: 01 and 03 Equipment ID: EAF-1, EAF-2, LMS-1, LMS-2, CC-1, CC-2, BMC, and BDS Control Device ID: BAG-1 and BAG-1A</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section VIII) Particulate matter emissions shall be limited to the rate specified by use of the following equations:</p>

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions				
	<p>For process weight rates less than or equal to 30 tons per hour $E = (F) 4.10P^{0.67}$ and For process weight rates greater than 30 tons per hour $E = (F) 55.0P^{0.11} - 40$ Where E = the allowable emission rate in pounds per hour P = process weight rate in tons per hour F = effect factor from Table B in S.C. Regulation 61-62.5, Standard No. 4</p> <p>For the purposes of compliance with this condition, the process boundaries are defined as follows:</p> <table><tr><th>Process/Source IDs</th><th>Max Process Weight Rate (ton/hr)</th></tr><tr><td>Melt Shop Equipment/Furnace Baghouse (BAG-1) and Canopy Baghouse (BAG-1A)</td><td>650</td></tr></table> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these sources (including fugitive emissions) shall not exhibit an opacity greater than 20%, each.</p> <p>The process equipment shall be maintained at or below the process weight rate specified in the application.</p> <p>For the furnace baghouse (BAG-1), the owner or operator shall continue to operate the flow CEMS and continuous opacity monitoring system (COMS). The owner or operator shall continue to operate and maintain pressure drop gauges on each module of the baghouse, conduct monthly inspections of the furnace baghouse cleaning systems, dust collection hoppers and conveying systems for proper operation. The furnace baghouse shall be operational whenever processes controlled by the baghouse are running, except during periods of baghouse malfunction or mechanical failure.</p> <p>For the furnace baghouse (BAG-1), the owner/operator shall submit semiannual reports documenting that monthly inspections were conducted in accordance with this condition. The report shall include records of abnormal emissions if any and corrective actions taken. If the unit did not operate during the inspection period, the report shall so state. Records of monthly inspections shall be maintained on site.</p> <p>For the canopy baghouse (BAG-1A), the owner or operator shall continue to operate a Bag Leak Detection System (BLDS). A BLDS monitoring plan, with supporting documentation and quality assurance procedures has been submitted to the Department. The Department has reviewed and approved the BLDS monitoring plan. Changes or updates to the BLDS monitoring plan shall be reviewed and approved by the Department. The owner or operator shall continue to operate and</p>	Process/Source IDs	Max Process Weight Rate (ton/hr)	Melt Shop Equipment/Furnace Baghouse (BAG-1) and Canopy Baghouse (BAG-1A)	650
Process/Source IDs	Max Process Weight Rate (ton/hr)				
Melt Shop Equipment/Furnace Baghouse (BAG-1) and Canopy Baghouse (BAG-1A)	650				

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions						
	<p>maintain pressure drop gauges on each module of the baghouse, conduct monthly inspections of the canopy baghouse cleaning systems, dust collection hoppers and conveying systems for proper operation. The canopy baghouse shall be operational whenever processes controlled by the baghouse are running, except during periods of baghouse malfunction or mechanical failure.</p> <p>For the canopy baghouse, records shall be kept on-site to verify a BLDS monitoring plan and the proper operation and maintenance practices are being met. These records shall be made available to the Department upon request.</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section XII) An owner or operator of metallurgical furnaces greater than ten (10) tons per hour normal output, shall perform scheduled periodic tests for particulate matter emissions every two (2) years and shall ensure that source tests are conducted in accordance with SC Regulation 61-62.1, Section IV, Source Tests.</p>						
C.12	<p>Emission Unit ID: 01, 04, 05, 06, 08, 09, 16, and 17</p> <p>Equipment ID: LMS-1, LMS-2, EAF-1_FUG, EAF-2_FUG, CC-1, CC-2, CSP1, CSP2, BMSV, VDT, HMMV, BMMV, CMMV, GL-CS, GL-ZD, SC-8, SFS, SS-3, SS-4, SC-1, SS-1, SFCS-3, SFCS-4, SC-6, SKKC, SDDS, SC-5A, SC-5B, SS-2, SNBC, TL1, TL3, 802, 803, 804, 804V – MS-Debris, 805, 806, and 601 – Coil Cutting</p> <p>Control Device ID: GL1-ME, TL1-ME, 802, 803, 804, 805, 806, and 601</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section VIII) Particulate matter emissions shall be limited to the rate specified by use of the following equations:</p> <p style="padding-left: 40px;">For process weight rates less than or equal to 30 tons per hour $E = (F) 4.10P^{0.67} \text{ and}$ For process weight rates greater than 30 tons per hour $E = (F) 55.0P^{0.11} - 40$ Where E = the allowable emission rate in pounds per hour P = process weight rate in tons per hour F = effect factor from Table B in S.C. Regulation 61-62.5, Standard No. 4</p> <p>For the purposes of compliance with this condition, the process boundaries are defined as follows:</p> <table border="1"> <thead> <tr> <th>Unit ID/Process (Equipment Description/Equipment ID)</th><th>Max Process Weight Rate (ton/hr)</th></tr> </thead> <tbody> <tr> <td>01/Melt Shop Equipment (Ladle Metallurgy Furnace Fugitives/LMS-1 and LMS-2, Electric Arc Furnace Fugitives/EAF-1_FUG and EAF-2_FUG, Caster Fugitives/CC-1 and CC-2, CSP Spray Vent 1/CSP1, CSP Spray Vent 2/CSP2, and Beam Mill Caster Spray Vent/BMSV)</td><td>650</td></tr> <tr> <td>04/Vacuum Tank Degasser System</td><td>330, each</td></tr> </tbody> </table>	Unit ID/Process (Equipment Description/Equipment ID)	Max Process Weight Rate (ton/hr)	01/Melt Shop Equipment (Ladle Metallurgy Furnace Fugitives/LMS-1 and LMS-2, Electric Arc Furnace Fugitives/EAF-1_FUG and EAF-2_FUG, Caster Fugitives/CC-1 and CC-2, CSP Spray Vent 1/CSP1, CSP Spray Vent 2/CSP2, and Beam Mill Caster Spray Vent/BMSV)	650	04/Vacuum Tank Degasser System	330, each
Unit ID/Process (Equipment Description/Equipment ID)	Max Process Weight Rate (ton/hr)						
01/Melt Shop Equipment (Ladle Metallurgy Furnace Fugitives/LMS-1 and LMS-2, Electric Arc Furnace Fugitives/EAF-1_FUG and EAF-2_FUG, Caster Fugitives/CC-1 and CC-2, CSP Spray Vent 1/CSP1, CSP Spray Vent 2/CSP2, and Beam Mill Caster Spray Vent/BMSV)	650						
04/Vacuum Tank Degasser System	330, each						

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Condition Number	Conditions	
	(Vacuum Degasser Tanks No. 1 and No. 2)	
	05/Tunnel Furnaces/Hot Mill (Hot Mill Monovent Fugitives/HMMV)	650
	06/Reheat Furnace/Beam Mill (Beam Mill Monovent Fugitives/BMMV)	650
	08/Cold Reversing Mills/Cold Mill (Cold Mill Monovent Fugitives/CMMV)	650
	09/Galvanizing Line Equipment (Galvanizing Line Cleaning Section/GL-CS and Galvanizing Line Zinc Dipping Section/GL-ZD)	175, each
	16/Tension Leveler (Tension Leveler Alkali Wash/TL1 and Tension Leveler Dryer/TL3)	50, each
	17/Raw Material Handling and Processing (EAF Top Feed "new"/802, EAF Top Feed "old"/803, 804, 804V – MS-Debris, 805, 806, and 601 – Coil Cutting)	500
	<p>(S.C. Regulation 61-62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these sources (including fugitive emissions) shall not exhibit an opacity greater than 20%, each.</p> <p>The Tension Leveler Dryer (Equipment ID TL3) is only permitted to burn natural gas as fuel. The use of any other substances as fuel is prohibited without prior approval from the Department.</p> <p>The process equipment shall be maintained at or below the process weight rate specified in the application. The owner/operator shall perform a visual inspection on each emission point, while the equipment is operating, on a semiannual basis.</p> <p>The owner/operator shall submit semiannual reports documenting that visual inspections were conducted in accordance with this condition. The report shall include records of abnormal emissions if any and corrective actions taken. If the unit did not operate during the inspection period, the report shall so state. Records of visual inspection shall be maintained on site.</p>	
C.13	<p>Emission Unit ID: 07 Equipment ID: PL-1 and PL-2 Control Device ID: SCB-1 and SCB-2</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section VIII) Particulate matter emissions shall be limited to the rate specified by use of the following equations:</p> <p style="padding-left: 40px;">For process weight rates less than or equal to 30 tons per hour E = (F) 4.10P^{0.67} and</p> <p style="padding-left: 40px;">For process weight rates greater than 30 tons per hour</p>	

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions				
	$E = (F) 55.0P^{0.11} - 40$ <p>Where E = the allowable emission rate in pounds per hour P = process weight rate in tons per hour F = effect factor from Table B in S.C. Regulation 61-62.5, Standard No. 4</p> <p>For the purposes of compliance with this condition, the process boundaries are defined as follows:</p> <table border="1"> <thead> <tr> <th>Unit ID/Process (Equipment Description/Equipment ID)</th><th>Max Process Weight Rate (ton/hr)</th></tr> </thead> <tbody> <tr> <td>07/Pickle Line Equipment (Pickle Line No. 1/PL-1 and Pickle Line No. 2/PL-2)</td><td>500, each</td></tr> </tbody> </table> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these sources (including fugitive emissions) shall not exhibit an opacity greater than 20%, each.</p> <p>The owner/operator shall perform a visual inspection on each emission point, while the equipment is operating, on a semiannual basis.</p> <p>The owner/operator shall submit semiannual reports documenting that visual inspections were conducted in accordance with this condition. The report shall include records of abnormal emissions if any and corrective actions taken. If the unit did not operate during the inspection period, the report shall so state. Records of visual inspection shall be maintained on site.</p> <p>The process equipment shall be maintained at or below the process weight rate specified in the application.</p> <p>The owner or operator shall follow good operating and maintenance practices as defined in the facility's Pickle Line Operating and Maintenance Plan developed for compliance with NESHAP Subpart CCC along with daily differential pressure and water flow recordkeeping. The wet scrubbers and mist eliminators (SCB-1 and SCB-2) shall be in place and operational whenever processes controlled by the scrubbers are running, except during periods of scrubber malfunction or mechanical failure.</p> <p>Records shall be kept on-site to verify that proper operation and maintenance is being met. These records shall be made available to the Department upon request.</p>	Unit ID/Process (Equipment Description/Equipment ID)	Max Process Weight Rate (ton/hr)	07/Pickle Line Equipment (Pickle Line No. 1/PL-1 and Pickle Line No. 2/PL-2)	500, each
Unit ID/Process (Equipment Description/Equipment ID)	Max Process Weight Rate (ton/hr)				
07/Pickle Line Equipment (Pickle Line No. 1/PL-1 and Pickle Line No. 2/PL-2)	500, each				
C.14	<p>Emission Unit ID: 08 Equipment ID: CRM-1 and CRM-2 Control Device ID: CRM1ME1, CRM1ME2, CRM2ME1, and CRM2ME2</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section VIII) Particulate matter emissions shall be limited to</p>				

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions				
	<p>the rate specified by use of the following equations:</p> <p>For process weight rates less than or equal to 30 tons per hour $E = (F) 4.10P^{0.67}$ and</p> <p>For process weight rates greater than 30 tons per hour $E = (F) 55.0P^{0.11} - 40$</p> <p>Where E = the allowable emission rate in pounds per hour P = process weight rate in tons per hour F = effect factor from Table B in S.C. Regulation 61-62.5, Standard No. 4</p> <p>For the purposes of compliance with this condition, the process boundaries are defined as follows:</p> <table border="1"> <thead> <tr> <th>Unit ID/Process (Equipment Description/Equipment ID)</th><th>Max Process Weight Rate (ton/hr)</th></tr> </thead> <tbody> <tr> <td>08/Cold Reversing Mills/Cold Mill (Cold Reversing Mill No. 1/CRM-1 and Cold Reversing Mill No. 2/CRM-2)</td><td>150, each</td></tr> </tbody> </table> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these sources (including fugitive emissions) shall not exhibit an opacity greater than 20%, each.</p> <p>The process equipment shall be maintained at or below the process weight rate specified in the application.</p> <p>The owner or operator shall monitor the system fan amps daily and equipment shall be operated in accordance with manufacturer guidelines. The fan with mist eliminator controls (CRM1ME1, CRM1ME2, CRM2ME1, and CRM2ME2) shall be in place and operational whenever processes controlled by the fan with mist eliminator controls are running, except during periods of control device malfunction or mechanical failure.</p> <p>Records shall be kept on-site to verify that proper operation and maintenance is being met. These records shall be made available to the Department upon request.</p>	Unit ID/Process (Equipment Description/Equipment ID)	Max Process Weight Rate (ton/hr)	08/Cold Reversing Mills/Cold Mill (Cold Reversing Mill No. 1/CRM-1 and Cold Reversing Mill No. 2/CRM-2)	150, each
Unit ID/Process (Equipment Description/Equipment ID)	Max Process Weight Rate (ton/hr)				
08/Cold Reversing Mills/Cold Mill (Cold Reversing Mill No. 1/CRM-1 and Cold Reversing Mill No. 2/CRM-2)	150, each				
C.15	<p>Emission Unit ID: 11 and 13</p> <p>Equipment ID: 5'x12' Screen, Feeder, SFCS-2, SGF, SC-9, SFC-5, STDS, SC-7, 600-Slag Storage, and BARGE</p> <p>Control Device ID: WS</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section VIII) Particulate matter emissions shall be limited to the rate specified by use of the following equations:</p> <p>For process weight rates less than or equal to 30 tons per hour</p>				

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions																						
	<p> $E = (F) 4.10P^{0.67}$ and For process weight rates greater than 30 tons per hour $E = (F) 55.0P^{0.11} - 40$ Where E = the allowable emission rate in pounds per hour P = process weight rate in tons per hour F = effect factor from Table B in S.C. Regulation 61-62.5, Standard No. 4 </p> <p>For the purposes of compliance with this condition, the process boundaries are defined as follows:</p> <table> <tr> <th>Unit ID/Process (Equipment Description/Equipment ID)</th><th>Max Process Weight Rate (ton/hr)</th></tr> <tr> <td>11/Debris/Mill Scale/Slag Processing (Conveyor No. 8/SC-8 and Fe Screen/SFS)</td><td>25, each</td></tr> <tr> <td>11/Debris/Mill Scale/Slag Processing (Stacker No. 3/SS-3)</td><td>40</td></tr> <tr> <td>11/Debris/Mill Scale/Slag Processing (Stacker No. 4/SS-4)</td><td>60</td></tr> <tr> <td>11/Debris/Mill Scale/Slag Processing (Conveyor No. 1/SC-1 and Stacker No. 1/SS-1)</td><td>90, each</td></tr> <tr> <td>11/Debris/Mill Scale/Slag Processing (Fe Conveyor 3/SFCS-3, Fe Conveyor 4/SFCS-4, Conveyor No. 6/SC-6, Norberg Jaws Crusher/SKKC and DD Screen/SDDS)</td><td>100, each</td></tr> <tr> <td>11/Debris/Mill Scale/Slag Processing (Conveyor No. 5A/SC-5A, Conveyor No. 5B/SC-5B, Stacker No. 2/SS-2, and Norberg Crusher/SNBC)</td><td>110, each</td></tr> <tr> <td>11/Debris/Mill Scale/Slag Processing (5'x12' Screen (2)/5'x12' Screen and Fe Conveyor 2/SFCS-2)</td><td>200, each</td></tr> <tr> <td>11/Debris/Mill Scale/Slag Processing (Feeder/Feeder, Grizzly Feeder/SGF), Conveyor No. 9/SC-9, Conveyor No. 5/SFC-5, TD Screen/STDS, and Conveyor No. 7/SC-7)</td><td>300, each</td></tr> <tr> <td>11/Debris/Mill Scale/Slag Processing (Slag Storage/600-Slag Storage)</td><td>69</td></tr> <tr> <td>13/On-Site Barge Unloading (Barge Unloading Operations/BARGE)</td><td>1,000</td></tr> </table> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these sources (including fugitive emissions) shall not exhibit an opacity greater than 20%, each.</p> <p>The process equipment shall be maintained at or below the process weight rate specified in the</p>	Unit ID/Process (Equipment Description/Equipment ID)	Max Process Weight Rate (ton/hr)	11/Debris/Mill Scale/Slag Processing (Conveyor No. 8/SC-8 and Fe Screen/SFS)	25, each	11/Debris/Mill Scale/Slag Processing (Stacker No. 3/SS-3)	40	11/Debris/Mill Scale/Slag Processing (Stacker No. 4/SS-4)	60	11/Debris/Mill Scale/Slag Processing (Conveyor No. 1/SC-1 and Stacker No. 1/SS-1)	90, each	11/Debris/Mill Scale/Slag Processing (Fe Conveyor 3/SFCS-3, Fe Conveyor 4/SFCS-4, Conveyor No. 6/SC-6, Norberg Jaws Crusher/SKKC and DD Screen/SDDS)	100, each	11/Debris/Mill Scale/Slag Processing (Conveyor No. 5A/SC-5A, Conveyor No. 5B/SC-5B, Stacker No. 2/SS-2, and Norberg Crusher/SNBC)	110, each	11/Debris/Mill Scale/Slag Processing (5'x12' Screen (2)/5'x12' Screen and Fe Conveyor 2/SFCS-2)	200, each	11/Debris/Mill Scale/Slag Processing (Feeder/Feeder, Grizzly Feeder/SGF), Conveyor No. 9/SC-9, Conveyor No. 5/SFC-5, TD Screen/STDS, and Conveyor No. 7/SC-7)	300, each	11/Debris/Mill Scale/Slag Processing (Slag Storage/600-Slag Storage)	69	13/On-Site Barge Unloading (Barge Unloading Operations/BARGE)	1,000
Unit ID/Process (Equipment Description/Equipment ID)	Max Process Weight Rate (ton/hr)																						
11/Debris/Mill Scale/Slag Processing (Conveyor No. 8/SC-8 and Fe Screen/SFS)	25, each																						
11/Debris/Mill Scale/Slag Processing (Stacker No. 3/SS-3)	40																						
11/Debris/Mill Scale/Slag Processing (Stacker No. 4/SS-4)	60																						
11/Debris/Mill Scale/Slag Processing (Conveyor No. 1/SC-1 and Stacker No. 1/SS-1)	90, each																						
11/Debris/Mill Scale/Slag Processing (Fe Conveyor 3/SFCS-3, Fe Conveyor 4/SFCS-4, Conveyor No. 6/SC-6, Norberg Jaws Crusher/SKKC and DD Screen/SDDS)	100, each																						
11/Debris/Mill Scale/Slag Processing (Conveyor No. 5A/SC-5A, Conveyor No. 5B/SC-5B, Stacker No. 2/SS-2, and Norberg Crusher/SNBC)	110, each																						
11/Debris/Mill Scale/Slag Processing (5'x12' Screen (2)/5'x12' Screen and Fe Conveyor 2/SFCS-2)	200, each																						
11/Debris/Mill Scale/Slag Processing (Feeder/Feeder, Grizzly Feeder/SGF), Conveyor No. 9/SC-9, Conveyor No. 5/SFC-5, TD Screen/STDS, and Conveyor No. 7/SC-7)	300, each																						
11/Debris/Mill Scale/Slag Processing (Slag Storage/600-Slag Storage)	69																						
13/On-Site Barge Unloading (Barge Unloading Operations/BARGE)	1,000																						

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>application. Based on S.C. 62.5, Standard No. 7 – Prevention of Significant Deterioration requirements, the owner/operator shall conduct semiannual Method 9 readings on the Unit ID 11 and Unit ID 13 processes. This method serves to meet the compliance requirements for S.C. Regulation 61-62.5, Standard No. 4. If there are any changes to the method of compliance, the Department shall re-evaluate the monitoring requirements and the Title V permit may be revised.</p> <p>The owner/operator shall conduct a semiannual Method 9 on the debris/mill scale/slag processing and on-site barge unloading areas for monitoring opacity limits during periods of source operation. The Method 9 readings shall be made in accordance with reference Method 9 in Appendix A of 40 CFR 60. The readings shall be maintained in permanent logs, along with any corrective actions taken and made available to Department representatives upon request.</p> <p>Semiannual reports of the Method 9 readings shall be submitted to the Manager of the Technical Management Section, postmarked no later than 30 calendar days after the end of the reporting period.</p>
C.16	<p>Emission Unit ID: 15 Equipment ID: 807, 807F, 808, 808F, and 1B Control Device ID: DRI-SH1 and DRI-SH2</p> <p>(S.C. Regulation 61 62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these source(s) (including fugitive emissions) shall not exhibit an opacity greater than 10%, each.</p> <p>The owner/operator shall conduct visual observations once per day during the unloading of the barges using 40CFR60, Appendix A, Method 9 during daylight hours. Should excess visible emissions occur as a result of a malfunction in equipment, operator error, etc., operations shall immediately cease and shall not resume until the problem has been corrected.</p> <p>Records shall be kept of all visible emission observations. These records shall include the date, time of observation, the results of the Method 9 performed, the type of material being unloaded, the cause of any excess visible emissions, the duration of the excess visible emissions and the measures used to correct the occurrence. The owner/operator shall report all problems and the steps taken to correct the problem(s) to the Department's local Environmental Affairs Regional office within 24 hours of the occurrence. The owner/operator shall submit semiannual reports.</p>
C.17	<p>Emission Unit ID: 15 Equipment ID: 809, 809F, 810/812, 810F/812F, 811, 811F, 817, 817F, 818, 818F, 819, 819F, 822, 822F, 824, 824F, 825/826, 825F/826F, 827, 827F, 828, 828F, 829, 829F, 830, 830F, 831, 831F, 832, 832F, 833, 833F, 834, 834F, 835, 835F, 836, 836F, 3B, and 8B Control Device ID: DRI-DC1, DRI-DC2, DRI-DC4, DRI-DC3, DRI-DC9, DRI-DC10, DRI-DC10, DRI-DC11, DRI-DC14, DRI-DC16, DRI-DC17, DRI-DC18, DRI-DC19, DRI-DC20, DRI-DC21, DRI-DC24, DRI-DC25, DRI-</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>DC26, DRI-DC27, and DRI-DC28</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these source(s) (including fugitive emissions) shall not exhibit an opacity greater than 20%, each.</p> <p>Compliance shall be demonstrated by proper operation of the control device and monitoring system. Equipment IDs 825 and 826 (silos) shall not operate simultaneously. Equipment IDs 810 and 812 (conveyors) shall not operate simultaneously.</p> <p>The owner/operator shall perform a visual inspection on each emission point, while the equipment is operating, on a semiannual basis.</p> <p>The owner/operator shall submit semiannual reports documenting that visual inspections were conducted in accordance with this condition. The report shall include records of abnormal emissions if any and corrective actions taken. If the unit did not operate during the inspection period, the report shall so state. Records of visual inspection shall be maintained on site.</p>
C.18	<p>Emission Unit ID: 15 Equipment ID: 3B and 8B</p> <p>(S.C. Regulation 61 62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these source(s) (including fugitive emissions) shall not exhibit an opacity greater than 20%, each.</p> <p>The permittee shall perform a visual inspection on the equipment or process, once per operating period.</p> <p>The owner/operator shall submit semiannual reports documenting that visual inspections were conducted in accordance with this condition. The report shall include records of abnormal emissions if any and corrective actions taken. If the unit did not operate during the inspection period, the report shall so state. Records of visual inspection shall be maintained on site.</p>
C.19	<p>Emission Unit ID: 15 Equipment ID: 807, 808, 809, 810/812, 811, 817, 818, 819, 822, 824, 825/826, 827, 828, 829, 830, 831, 832, 833, 834, 835, and 836 Control Device ID: DRI-SH1, DRI-SH2, DRI-DC1, DRI-DC2, DRI-DC4, DRI-DC3, DRI-DC9, DRI-DC10, DRI-DC10, DRI-DC11, DRI-DC14, DRI-DC16, DRI-DC17, DRI-DC18, DRI-DC19, DRI-DC20, DRI-DC21, DRI-DC24, DRI-DC25, DRI-DC26, DRI-DC27, and DRI-DC28</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section VIII) Particulate matter emissions shall be limited to the rate specified by use of the following equations:</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions										
	<p>For process weight rates less than or equal to 30 tons per hour $E = (F) 4.10P^{0.67}$ and For process weight rates greater than 30 tons per hour $E = (F) 55.0P^{0.11} - 40$ Where E = the allowable emission rate in pounds per hour P = process weight rate in tons per hour F = effect factor from Table B in S.C. Regulation 61-62.5, Standard No. 4</p> <p>For the purposes of compliance with this condition, the process boundaries are defined as follows:</p> <table border="1"> <thead> <tr> <th>Unit ID/Process (Equipment Description/Equipment IDs)</th><th>Max Process Weight Rate (ton/hr)</th></tr> </thead> <tbody> <tr> <td>15/DRI Handling (Hopper/807, Hopper/808, Conveyor Transition Point/809, Conveyor/811, Conveyor Transition Point/819, and Grizzly/822)</td><td>600, each</td></tr> <tr> <td>15/DRI Handling (Conveyor Transition Points/810/812, Conveyor/817, Conveyor/818, Conveyors/824, and Silos/825/826)</td><td>1200, each</td></tr> <tr> <td>15/DRI Handling (Silos/827, Silos/828, Silos/829, Silo/830, Silo/831, and Conveyor/Day Bins/832)</td><td>350, each</td></tr> <tr> <td>15/DRI Handling (Conveyor/833, Conveyor/834, Conveyor/835, and Conveyor/836)</td><td>250, each</td></tr> </tbody> </table> <p>The process equipment shall be maintained at or below the process weight rate specified in the application.</p> <p>The owner/operator shall continue to operate and maintain pressure drop gauge(s) on each module of each baghouse. Pressure drop readings for each baghouse shall be recorded daily during source operation. Each baghouse shall be in place and operational whenever processes controlled by it are running, except during periods of baghouse malfunction or mechanical failure.</p> <p>Compliance shall be demonstrated by proper operation of the control device and monitoring system. Equipment IDs 825 and 826 (silos) shall not operate simultaneously. Equipment IDs 810 and 812 (conveyors) shall not operate simultaneously.</p> <p>Records shall be kept on-site to verify that pressure drop readings are being recorded and proper operation and maintenance is being met. These records shall be made available to the Department upon request.</p>	Unit ID/Process (Equipment Description/Equipment IDs)	Max Process Weight Rate (ton/hr)	15/DRI Handling (Hopper/807, Hopper/808, Conveyor Transition Point/809, Conveyor/811, Conveyor Transition Point/819, and Grizzly/822)	600, each	15/DRI Handling (Conveyor Transition Points/810/812, Conveyor/817, Conveyor/818, Conveyors/824, and Silos/825/826)	1200, each	15/DRI Handling (Silos/827, Silos/828, Silos/829, Silo/830, Silo/831, and Conveyor/Day Bins/832)	350, each	15/DRI Handling (Conveyor/833, Conveyor/834, Conveyor/835, and Conveyor/836)	250, each
Unit ID/Process (Equipment Description/Equipment IDs)	Max Process Weight Rate (ton/hr)										
15/DRI Handling (Hopper/807, Hopper/808, Conveyor Transition Point/809, Conveyor/811, Conveyor Transition Point/819, and Grizzly/822)	600, each										
15/DRI Handling (Conveyor Transition Points/810/812, Conveyor/817, Conveyor/818, Conveyors/824, and Silos/825/826)	1200, each										
15/DRI Handling (Silos/827, Silos/828, Silos/829, Silo/830, Silo/831, and Conveyor/Day Bins/832)	350, each										
15/DRI Handling (Conveyor/833, Conveyor/834, Conveyor/835, and Conveyor/836)	250, each										
C.20	Emission Unit ID: 17										

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>Equipment ID: 804F, 805F, and 806F</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section VIII) Particulate matter emissions shall be limited to the rate specified by use of the following equations:</p> <p style="padding-left: 40px;">For process weight rates less than or equal to 30 tons per hour $E = (F) 4.10P^{0.67}$ and</p> <p style="padding-left: 40px;">For process weight rates greater than 30 tons per hour $E = (F) 55.0P^{0.11} - 40$</p> <p style="padding-left: 40px;">Where E = the allowable emission rate in pounds per hour P = process weight rate in tons per hour F = effect factor from Table B in S.C. Regulation 61-62.5, Standard No. 4</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these sources (including fugitive emissions) shall not exhibit an opacity greater than 20%, each.</p> <p>The process equipment shall be maintained at or below the process weight rate specified in the application.</p> <p>The owner/operator shall perform a visual inspection on each emission point, while the equipment is operating, on a semiannual basis.</p> <p>The owner/operator shall submit semiannual reports documenting that visual inspections were conducted in accordance with this condition. The report shall include records of abnormal emissions if any and corrective actions taken. If the unit did not operate during the inspection period, the report shall so state. Records of visual inspection shall be maintained on site.</p>
C.21	<p>Emission Unit ID: 02, 04, 09, 12, 14, and 18 Equipment ID: LP, TP, TNP, GL-PF, EG-1, EG-2, CT-1, CT-2, CT-3, CT-4, CT-1A, NCT1, NCT3, NCT13, and NCS3A Control Device ID: Flare-1, Flare-2</p> <p>(S.C. Regulation 61-62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these sources (including fugitive emissions) shall not exhibit an opacity greater than 20%, each.</p> <p>The owner/operator shall perform a visual inspection on each emission point, while the equipment is operating, on a semiannual basis.</p> <p>The owner/operator shall submit semiannual reports documenting that visual inspections were conducted in accordance with this condition. The report shall include records of abnormal emissions</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions																		
	if any and corrective actions taken. If the unit did not operate during the inspection period, the report shall so state. Records of visual inspection shall be maintained on site.																		
C.22	Emission Unit ID: 01 Equipment ID: EAF-1, EAF-2, LMS-1, LMS-2, CC-1, CC-2, and BMC Control Device ID: BAG-1, BAG-1A, LNOX-EAF-1, and LNOX-EAF-2																		
	BACT for controlling SO2 emissions from the melt shop is the use of a scrap management program and good operating practices to meet a maximum SO2 emission rate from the melt shop of 0.2 lb/ton of steel produced, 438 TPY, and 130.0 lb/hr (at peak production).																		
	In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:																		
	<table><tr><th>Pollutant</th><th>BACT Limit (averaging period)</th><th>Control Method</th></tr><tr><td>SO2</td><td>0.2 lb/ton steel produced 130.0 lb/hr peak (30-day rolling average) 3120 lb/24 hour peak 438 tpy</td><td>Use of a scrap management program and good operating practices</td></tr><tr><td>CO</td><td>2.0 lb/ton steel produced 1300.0 lb/hr peak (30-day rolling average) 4380 tpy</td><td>Use of the foaming slag process combined with the Direct-shell Evacuation Control (DEC) system</td></tr><tr><td>NOx</td><td>0.35 lb/ton steel produced 227.5 lb/hr peak (30-day rolling average) 767 tpy</td><td>Oxy-fuel burners in the EAF shells shall utilize Low NOx burners</td></tr><tr><td>VOC</td><td>0.13 lb/ton steel produced 84.5 lb/hr peak 285 tpy</td><td>Utilization of a scrap management program to eliminate the purchase of heavily oiled scrap steel</td></tr><tr><td>Lead</td><td>0.0003675 lb/ton steel produced 0.184 lb/hr 0.81 tpy</td><td>None</td></tr></table>	Pollutant	BACT Limit (averaging period)	Control Method	SO2	0.2 lb/ton steel produced 130.0 lb/hr peak (30-day rolling average) 3120 lb/24 hour peak 438 tpy	Use of a scrap management program and good operating practices	CO	2.0 lb/ton steel produced 1300.0 lb/hr peak (30-day rolling average) 4380 tpy	Use of the foaming slag process combined with the Direct-shell Evacuation Control (DEC) system	NOx	0.35 lb/ton steel produced 227.5 lb/hr peak (30-day rolling average) 767 tpy	Oxy-fuel burners in the EAF shells shall utilize Low NOx burners	VOC	0.13 lb/ton steel produced 84.5 lb/hr peak 285 tpy	Utilization of a scrap management program to eliminate the purchase of heavily oiled scrap steel	Lead	0.0003675 lb/ton steel produced 0.184 lb/hr 0.81 tpy	None
	Pollutant	BACT Limit (averaging period)	Control Method																
	SO2	0.2 lb/ton steel produced 130.0 lb/hr peak (30-day rolling average) 3120 lb/24 hour peak 438 tpy	Use of a scrap management program and good operating practices																
	CO	2.0 lb/ton steel produced 1300.0 lb/hr peak (30-day rolling average) 4380 tpy	Use of the foaming slag process combined with the Direct-shell Evacuation Control (DEC) system																
	NOx	0.35 lb/ton steel produced 227.5 lb/hr peak (30-day rolling average) 767 tpy	Oxy-fuel burners in the EAF shells shall utilize Low NOx burners																
	VOC	0.13 lb/ton steel produced 84.5 lb/hr peak 285 tpy	Utilization of a scrap management program to eliminate the purchase of heavily oiled scrap steel																
	Lead	0.0003675 lb/ton steel produced 0.184 lb/hr 0.81 tpy	None																
The facility shall use a scrap management program and good operating practices to reduce SO2 emissions.																			
The facility shall use the foaming slag process combined with the DEC system in order to reduce CO emissions. The foaming slag process involves injecting carbon and oxygen into the furnace below the slag line.																			

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>The oxy-fuel burners in the EAF shells shall utilize Low NO_x burners to reduce NO_x emissions.</p> <p>The facility shall utilize a scrap management program to eliminate the purchase of heavily oiled scrap steel to reduce VOC emissions. A description of the scrap management program shall be included in the facility's Operations and Maintenance documentation. The facility shall operate according to the Scrap Metal Management Plan that was submitted to the Department. No changes in the method of operation specified in the Scrap Metal Management Plan can be made unless the facility submits a revised plan to the Department and receives written approval from the Department.</p> <p>Compliance with the VOC and Lead emission limits shall be demonstrated through source testing every two (2) years from the date of the previous test. Performance tests shall be conducted using a three (3) run average test cycle. These emission limits are cumulative for Baghouses BAG-1 and BAG-1A and source test results for BAG-1 and BAG-1A will be combined to determine compliance with these federally enforceable limits.</p> <p>A performance test for mercury emissions from the melt shop shall be conducted every 24 months from the date of the previous melt shop performance test.</p> <p>Continuous Emission Monitors (CEMS) for NO_x, SO₂, and CO are required in order to verify continuous compliance with peak lb/hr (30-day rolling average) rates for the Melt Shop (BAG-1 and BAG-1A). Quarterly reports detailing any excursions (if applicable) or downtime shall be submitted to the Manager of the Technical Management Section, Bureau of Air Quality postmarked no later than 30 calendar days after the end of the reporting period. These reports shall include the 30-day rolling average (rolling hourly) emission rates. Quarterly continuous emission monitor reports shall be submitted to the Manager of the Technical Management Section, Bureau of Air Quality no later than 30 calendar days after the end of the reporting period. The report shall include the following minimum information:</p> <p>All NO_x, SO₂, and CO measurements for periods during which the above emission limitations for NO_x, SO₂, and CO have been exceeded, together with their nature and cause.</p> <p>For periods of monitoring system malfunction:</p> <ol style="list-style-type: none">The date and time identifying each period during which the monitoring system was inoperative, except for zero and span checks.The nature of monitoring system repairs or adjustments.Proof of NO_x, SO₂, and CO monitoring system performance may be required by the Department whenever repairs or adjustments have been made. <p>The owner/operator shall continue to operate the CEMS according to 40 CFR 60, Appendix B and follow the quality assurance/quality control requirements of 40 CFR 60, Appendix F, Procedure 1.</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions												
C.23	<p>Emission Unit ID: 01 Equipment ID: EAF-1, EAF-2, LMS-1, and LMS-2 Control Device ID: BAG-1</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Pollutant</th><th>BACT Limit (averaging period)</th><th>Control Method</th></tr><tr><td>Filterable PM</td><td>0.0031 gr/dscf (12-hour block average) 37.3 lb/hr (12-hour block average)</td><td>Baghouse; Proper Operation and Maintenance</td></tr><tr><td>Filterable PM₁₀</td><td>0.0022 gr/dscf (12-hour block average) 26.1 lb/hr (12-hour block average)</td><td>Baghouse; Proper Operation and Maintenance</td></tr><tr><td>Fluoride {<i>does not include hydrogen fluoride (HF)</i>}</td><td>1.66 lb/hr (12-hour block average)</td><td>Baghouse; Minimized Fluorspar Usage (500 lbs of fluorspar/heat)</td></tr></table> <p>An initial source test for filterable PM, filterable PM₁₀, particulate fluoride, and gaseous fluoride emissions on the furnace baghouse (BAG-1) has been completed indicating compliance with the limits. The averaging period listed in the table above (12-hour block average) involves three (3) 4-hour test runs. Filterable PM and filterable PM₁₀ source testing shall be conducted every two (2) years thereafter. The Department may require subsequent testing for fluoride as needed.</p> <p>The facility will implement a monitoring program to track fluorspar usage per heat (approximately 175 tons of steel produced) to demonstrate compliance with the fluorspar usage limit of 500 lbs of fluorspar/heat. The facility shall keep records of fluorspar usage and calculate monthly average lbs of fluorspar per heat.</p> <p>The owner or operator shall continue to operate the flow CEMS and continuous opacity monitoring system (COMS). The owner or operator shall continue to operate and maintain pressure drop gauges on each module of the baghouse, conduct monthly inspections of the furnace baghouse cleaning systems, dust collection hoppers and conveying systems for proper operation. The furnace baghouse shall be operational whenever processes controlled by the baghouse are running, except during periods of baghouse malfunction or mechanical failure.</p> <p>Records shall be kept on-site, verifying that the monitoring program to track fluorspar usage and that the proper operation and maintenance practices are being met. These records shall be made available to the Department upon request.</p>	Pollutant	BACT Limit (averaging period)	Control Method	Filterable PM	0.0031 gr/dscf (12-hour block average) 37.3 lb/hr (12-hour block average)	Baghouse; Proper Operation and Maintenance	Filterable PM ₁₀	0.0022 gr/dscf (12-hour block average) 26.1 lb/hr (12-hour block average)	Baghouse; Proper Operation and Maintenance	Fluoride { <i>does not include hydrogen fluoride (HF)</i> }	1.66 lb/hr (12-hour block average)	Baghouse; Minimized Fluorspar Usage (500 lbs of fluorspar/heat)
Pollutant	BACT Limit (averaging period)	Control Method											
Filterable PM	0.0031 gr/dscf (12-hour block average) 37.3 lb/hr (12-hour block average)	Baghouse; Proper Operation and Maintenance											
Filterable PM ₁₀	0.0022 gr/dscf (12-hour block average) 26.1 lb/hr (12-hour block average)	Baghouse; Proper Operation and Maintenance											
Fluoride { <i>does not include hydrogen fluoride (HF)</i> }	1.66 lb/hr (12-hour block average)	Baghouse; Minimized Fluorspar Usage (500 lbs of fluorspar/heat)											
C.24	<p>Emission Unit ID: 01 Equipment ID: EAF-1, EAF-2, LMS-1, LMS-2, CC-1, CC-2, and BMC Control Device ID: BAG-1A</p>												

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions												
	<p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Pollutant</th><th>BACT Limit (averaging period)</th><th>Control Method</th></tr><tr><td>Filterable PM</td><td>0.0018 gr/dscf (12-hour block average) 18.51 lb/hr (12-hour block average)</td><td>Baghouse; Proper Operation and Maintenance</td></tr><tr><td>Filterable PM₁₀ + Condensable</td><td>0.0033 gr/dscf (12-hour block average) 33.9 lb/hr (12-hour block average)</td><td>Baghouse; Proper Operation and Maintenance</td></tr><tr><td>Filterable PM_{2.5} + Condensable</td><td>0.0021gr/dscf (12-hour block average) 21.6 lb/hr (12-hour block average)</td><td>Baghouse; Proper Operation and Maintenance</td></tr></table> <p>A source test for filterable PM, filterable PM₁₀, filterable PM_{2.5}, and condensable PM emissions on the canopy baghouse (BAG-1A) has been completed indicating compliance with the limits and every two (2) years thereafter. The averaging period listed in the table above (12-hour block average) involves three (3) 4-hour test runs.</p> <p>The owner or operator shall continue to operate a Bag Leak Detection System (BLDS). A BLDS monitoring plan, with supporting documentation and quality assurance procedures has been submitted to the Department. The Department has reviewed and approved the BLDS monitoring plan. Changes or updates to the BLDS monitoring plan shall be reviewed and approved by the Department. The owner or operator shall continue to operate and maintain pressure drop gauges on each module of the baghouse, conduct monthly inspections of the furnace baghouse cleaning systems, dust collection hoppers and conveying systems for proper operation. The canopy baghouse shall be operational whenever processes controlled by the baghouse are running, except during periods of baghouse malfunction or mechanical failure.</p> <p>Records shall be kept on-site to verify a BLDS monitoring plan and the proper operation and maintenance practices are being met. These records shall be made available to the Department upon request.</p>	Pollutant	BACT Limit (averaging period)	Control Method	Filterable PM	0.0018 gr/dscf (12-hour block average) 18.51 lb/hr (12-hour block average)	Baghouse; Proper Operation and Maintenance	Filterable PM ₁₀ + Condensable	0.0033 gr/dscf (12-hour block average) 33.9 lb/hr (12-hour block average)	Baghouse; Proper Operation and Maintenance	Filterable PM _{2.5} + Condensable	0.0021gr/dscf (12-hour block average) 21.6 lb/hr (12-hour block average)	Baghouse; Proper Operation and Maintenance
Pollutant	BACT Limit (averaging period)	Control Method											
Filterable PM	0.0018 gr/dscf (12-hour block average) 18.51 lb/hr (12-hour block average)	Baghouse; Proper Operation and Maintenance											
Filterable PM ₁₀ + Condensable	0.0033 gr/dscf (12-hour block average) 33.9 lb/hr (12-hour block average)	Baghouse; Proper Operation and Maintenance											
Filterable PM _{2.5} + Condensable	0.0021gr/dscf (12-hour block average) 21.6 lb/hr (12-hour block average)	Baghouse; Proper Operation and Maintenance											
C.25	<p>Emission Unit ID: 01 Equipment ID: EAF-1_FUG and EAF-2_FUG Control Device ID: BAG-1 and BAG-1A</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Pollutant</th><th>BACT Limit</th><th>Control Method</th></tr></table>	Pollutant	BACT Limit	Control Method									
Pollutant	BACT Limit	Control Method											

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions													
	Filterable PM	Good Work Practice Standards and Proper Operation and Maintenance of Baghouses	Good Work Practice Standards and Proper Operation and Maintenance											
	Fluoride {does not include hydrogen fluoride (HF)}	Usage of Fluorspar is limited to 500 lbs of fluorspar/heat	Minimized Fluorspar Usage											
C.26	<p>The owner or operator shall use good work practices and proper control device maintenance (furnace and canopy baghouse) through monthly capture system inspections.</p> <p>Records shall be kept on-site to verify monthly capture system inspections are being met.</p> <p>The facility will implement a monitoring program to track fluorspar usage per heat (approximately 175 tons of steel produced) to demonstrate compliance with the fluorspar usage limit of 500 lbs of fluorspar/heat. The facility shall keep records of fluorspar usage and calculate monthly average lbs of fluorspar per heat.</p> <p>Records shall be kept on-site to verify that good work practice standards, proper operation and maintenance, and a monitoring program to track fluorspar usage are being met. These records shall be made available to the Department upon request.</p>													
	<p>Emission Unit ID: 01 Equipment ID: LMS-1, LMS-2, CC-1, and CC-2 Control Device ID: BAG-1 and BAG-1A</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits have been established for fugitive emissions going to the melt shop roof monitors:</p> <table><tr><th>Process</th><th>Pollutant</th><th>BACT Limit</th></tr><tr><td>Fugitive emissions from Ladle Metallurgical Station #1 sent to melt shop roof monitors</td><td>PM</td><td>1.5 lb/hr and 6.7 tpy</td></tr><tr><td>Fugitive emissions from Ladle Metallurgical Station #2 sent to melt shop roof monitors</td><td>PM</td><td>1.5 lb/hr and 6.7 tpy</td></tr><tr><td>Fugitive emissions from Continuous Casting Machine sent to melt shop roof monitors</td><td>PM</td><td>0.7 lb/hr and 3.1 tpy</td></tr></table> <p>The owner or operator shall use good work practices and proper control device maintenance (furnace baghouse and canopy baghouse) through monthly capture system inspections.</p> <p>Records shall be kept on-site to verify monthly capture system inspections are being met. These</p>			Process	Pollutant	BACT Limit	Fugitive emissions from Ladle Metallurgical Station #1 sent to melt shop roof monitors	PM	1.5 lb/hr and 6.7 tpy	Fugitive emissions from Ladle Metallurgical Station #2 sent to melt shop roof monitors	PM	1.5 lb/hr and 6.7 tpy	Fugitive emissions from Continuous Casting Machine sent to melt shop roof monitors	PM
Process	Pollutant	BACT Limit												
Fugitive emissions from Ladle Metallurgical Station #1 sent to melt shop roof monitors	PM	1.5 lb/hr and 6.7 tpy												
Fugitive emissions from Ladle Metallurgical Station #2 sent to melt shop roof monitors	PM	1.5 lb/hr and 6.7 tpy												
Fugitive emissions from Continuous Casting Machine sent to melt shop roof monitors	PM	0.7 lb/hr and 3.1 tpy												

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions												
	records shall be made available to the Department upon request.												
C.27	<p>Emission Unit ID: 01 Equipment ID: CC-2 Control Device ID: BAG-1A</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis for filterable PM, filterable PM₁₀, filterable PM_{2.5}, and condensable PM, this source is subject to good work practice standards and proper operation and maintenance.</p> <p>The owner or operator shall use of good work practices and proper control device maintenance (canopy baghouse) through monthly capture system inspections.</p> <p>Records shall be kept on-site to verify monthly capture system inspections are being met. These records shall be made available to the Department upon request.</p>												
C.28	<p>Emission Unit ID: 01 Equipment ID: CSP1</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Pollutant</th><th>BACT Limit (averaging period)</th><th>Control Method</th></tr><tr><td>Filterable PM</td><td>1.43 lb/hr (3-hour block average)</td><td>Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.</td></tr><tr><td>VOC</td><td>0.53 lb/hr (3-hour block average)</td><td>Proper Operation and Maintenance VOC Minimization Plan</td></tr><tr><td>Fluoride {does not include hydrogen fluoride (HF)}</td><td>0.16 lb/hr, gaseous (3-hour block average)</td><td>Minimized Fluoride Containing Mold Powder Usage (limited to 0.5 lb of fluoride/ton of steel)</td></tr></table> <p>An initial source test for filterable PM, VOC, and gaseous fluoride emissions on the caster spray vent 1 (CSP1) has been completed indicating compliance with the limits. The averaging period listed in the</p>	Pollutant	BACT Limit (averaging period)	Control Method	Filterable PM	1.43 lb/hr (3-hour block average)	Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.	VOC	0.53 lb/hr (3-hour block average)	Proper Operation and Maintenance VOC Minimization Plan	Fluoride {does not include hydrogen fluoride (HF)}	0.16 lb/hr, gaseous (3-hour block average)	Minimized Fluoride Containing Mold Powder Usage (limited to 0.5 lb of fluoride/ton of steel)
Pollutant	BACT Limit (averaging period)	Control Method											
Filterable PM	1.43 lb/hr (3-hour block average)	Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.											
VOC	0.53 lb/hr (3-hour block average)	Proper Operation and Maintenance VOC Minimization Plan											
Fluoride {does not include hydrogen fluoride (HF)}	0.16 lb/hr, gaseous (3-hour block average)	Minimized Fluoride Containing Mold Powder Usage (limited to 0.5 lb of fluoride/ton of steel)											

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions			
	<p>table above (3-hour block average) involves three (3) 1-hour test runs. The Department may require subsequent testing as needed.</p> <p>The owner or operator shall follow work practices and proper operation and maintenance practices which include monthly monitoring of conductivity in cooling water systems 4 and 14 and operate in accordance with manufacturer guidelines.</p> <p>The facility shall follow a VOC Minimization Plan that includes but is not limited to: 1) Tracking of all bulk and non-bulk oil and grease purchases and deliveries; 2) Tracking spent oil and grease recovery, disposal, and recycling; 3) Performance of periodic maintenance, in accordance with manufacturer recommendations, to minimize leaks of oil and grease from seals and bearings; 4) Implementation of standard operating procedures and operator training on proper management and handling of oil and grease and leak/spill prevention; 5) Planned periodic maintenance of caster spray vents, rolling mill components, pickle line components, and ancillary equipment in accordance with manufacturing instructions; 6) Best management practices for use of parts washers including containment of waste solution, keeping parts covered while draining, and weekly inspection of parts washers for visible leaks; and 7) Continuation of the Management of Change Program which requires approval for any new oils or grease.</p> <p>The facility is limited to an input limit to the steel casting process of 0.5 lb of fluoride per ton of steel. The facility shall keep records of mold powder usage and calculate quarterly average lb of fluoride per ton of steel.</p> <p>Records shall be kept on-site to verify that good work practice standards, proper operation and maintenance, the VOC minimization plan, and mold powder usage are being met. These records shall be made available to the Department upon request.</p>			
C.29	<p>Emission Unit ID: 01 Equipment ID: CSP2</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Pollutant</th><th>BACT Limit (averaging period)</th><th>Control Method</th></tr></table>	Pollutant	BACT Limit (averaging period)	Control Method
Pollutant	BACT Limit (averaging period)	Control Method		

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions		
	Filterable PM	3.03E-03 gr/dscf (3-hour block average) 1.72 lb/hr (3-hour block average)	Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.
	Filterable PM ₁₀	4.85E-04 gr/dscf (3-hour block average) 0.274 lb/hr (3-hour block average)	Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.
	Filterable PM _{2.5}	6.06E-05 gr/dscf (3-hour block average) 0.034 lb/hr (3-hour block average)	Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.
	VOC	0.53 lb/hr (3-hour block average)	Proper Operation and Maintenance VOC Minimization Plan
<p>An initial source test for filterable PM and VOC emissions on the caster spray vent 2 (CSP2) has been completed indicating compliance with the limits. The averaging period listed in the table above (3-hour block average) involves three (3) 1-hour test runs. The Department may require subsequent testing as needed.</p> <p>The facility shall calculate emissions for filterable PM₁₀ based on results of the aforementioned source test using the Reisman and Frisbie method. The calculated emissions have been submitted to the Director of the Air Permitting Division.</p> <p>The owner or operator shall follow work practices and proper operation and maintenance practices which include monthly monitoring of conductivity in cooling water systems 4 and 14 and operate in</p>			

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions									
	<p>accordance with manufacturer guidelines.</p> <p>The facility shall follow a VOC Minimization Plan that includes but is not limited to: 1) Tracking of all bulk and non-bulk oil and grease purchases and deliveries; 2) Tracking spent oil and grease recovery, disposal, and recycling; 3) Performance of periodic maintenance, in accordance with manufacturer recommendations, to minimize leaks of oil and grease from seals and bearings; 4) Implementation of standard operating procedures and operator training on proper management and handling of oil and grease and leak/spill prevention; 5) Planned periodic maintenance of caster spray vents, rolling mill components, pickle line components, and ancillary equipment in accordance with manufacturing instructions; 6) Best management practices for use of parts washers including containment of waste solution, keeping parts covered while draining, and weekly inspection of parts washers for visible leaks; and 7) Continuation of the Management of Change Program which requires approval for any new oils or grease.</p> <p>Records shall be kept on-site to verify that good work practice standards, proper operation and maintenance, and the VOC minimization plan are being met. These records shall be made available to the Department upon request.</p>									
C.30	<p>Emission Unit ID: 01 Equipment ID: BMSV</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Pollutant</th><th>BACT Limit (averaging period)</th><th>Control Method</th></tr><tr><td>Filterable PM</td><td>7.44E-03 gr/dscf (3-hour block average) 5.52 lb/hr (3-hour block average)</td><td>Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.</td></tr><tr><td>Filterable PM₁₀</td><td>1.19E-03 gr/dscf (3-hour block average) 0.88 lb/hr (3-hour block average)</td><td>Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.</td></tr></table>	Pollutant	BACT Limit (averaging period)	Control Method	Filterable PM	7.44E-03 gr/dscf (3-hour block average) 5.52 lb/hr (3-hour block average)	Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.	Filterable PM ₁₀	1.19E-03 gr/dscf (3-hour block average) 0.88 lb/hr (3-hour block average)	Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.
Pollutant	BACT Limit (averaging period)	Control Method								
Filterable PM	7.44E-03 gr/dscf (3-hour block average) 5.52 lb/hr (3-hour block average)	Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.								
Filterable PM ₁₀	1.19E-03 gr/dscf (3-hour block average) 0.88 lb/hr (3-hour block average)	Proper Operation and Maintenance Monthly monitoring of conductivity in Cooling Water Systems 4 and 14. Operate in accordance with manufacturer guidelines.								

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions		
	VOC	0.87 lb/hr (3-hour block average)	Proper Operation and Maintenance VOC Minimization Plan
	<p>An initial source test for filterable PM and VOC emissions on the beam mill caster spray vent (BMSV) has been completed indicating compliance with the limits. The averaging period listed in the table above (3-hour block average) involves three (3) 1-hour test runs. The Department may require subsequent testing as needed.</p> <p>The facility shall calculate emissions for filterable PM₁₀ based on results of the aforementioned source test using the Reisman and Frisbie method. The calculated emissions have been submitted to the Director of the Air Permitting Division.</p> <p>The owner or operator shall follow work practices and proper operation and maintenance practices which include monthly monitoring of conductivity in cooling water systems 4 and 14 and operate in accordance with manufacturer guidelines.</p> <p>The facility shall follow a VOC Minimization Plan that includes but is not limited to: 1) Tracking of all bulk and non-bulk oil and grease purchases and deliveries; 2) Tracking spent oil and grease recovery, disposal, and recycling; 3) Performance of periodic maintenance, in accordance with manufacturer recommendations, to minimize leaks of oil and grease from seals and bearings; 4) Implementation of standard operating procedures and operator training on proper management and handling of oil and grease and leak/spill prevention; 5) Planned periodic maintenance of caster spray vents, rolling mill components, pickle line components, and ancillary equipment in accordance with manufacturing instructions; 6) Best management practices for use of parts washers including containment of waste solution, keeping parts covered while draining, and weekly inspection of parts washers for visible leaks; and 7) Continuation of the Management of Change Program which requires approval for any new oils or grease.</p> <p>Records shall be kept on-site to verify that good work practice standards, proper operation and maintenance, and the VOC minimization plan are being met. These records shall be made available to the Department upon request.</p>		
C.31	<p>Emission Unit ID: 01 and 03 Equipment ID: EAF-1, EAF-2, LMS-1, LMS-2, CC-1, CC-2, and BDS Control Device ID: BAG-1 and BAG-1A</p> <p>(S.C. Regulation 61-62.5, Standard No. 7)</p> <p>No roof or upper-half side openings in the Melt Shop shall be permitted other than those detailed</p>		

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>and previously approved by the Department. Small openings for brief maintenance or installation of equipment will be allowed. No other openings may be placed without prior written approval from the Department. No upper-half siding shall be removed from the melt shop building without prior approval from the Department.</p> <p>The Melt Shop design approved by the Department includes a solid wall separating the upper portion of the EAF aisle and the LMS aisle. The solid wall shall prevent fugitive emissions in the EAF aisle from exiting through the Melt Shop Roof Monitors in the LMS aisle.</p> <p>Each Electric Arc Furnace shall not be operated with a defective roof or with other disrepair that would significantly reduce the emission capture efficiency through the DEC system.</p> <p>The only materials which may be charged to the Electric Arc Furnaces are steel scrap, iron carbide, DRI, HBI, pig iron, Lime, Dolomitic Lime, Pebble Lime, carbon (coal and coke), alloy materials, dropout chamber contents, spark arrestor dust, slag conditioners, pour-back heats, roll grinding swarf, oily rags generated onsite which do not contain any chlorinated oils, baghouse bags generated on-site, personal protective equipment generated onsite, non-treated lumber, cardboard, pallets or paper products generated on-site, and weapons for destruction that contain metal content. The use of any other charge materials is prohibited without prior written approval from the Department.</p> <p>The Ladle Metallurgy Stations (LMS-1 and LMS-2) shall not be operated with a damaged capture hood or with other disrepair that will significantly reduce the emission capture efficiency. The estimated capture efficiency for the side draft hoods on the Ladle Metallurgy Stations (fugitives from LMS-1 and LMS-2) is 99%. Each Ladle Metallurgy Station will have one set of AC electrodes which will serve two (2) ladles.</p>
C.32	<p>Emission Unit ID: 01, 03, and 17 Equipment ID: EAF-1, EAF-2, LMS-1, LMS-2, CC-1, CC-2, BDS, 804, and 805 Control Device ID: BAG-1, BAG-1A, 804 and 805</p> <p>(S.C. Regulation 61-62.5, Standard No. 7) Ruptured or inoperative bags (Melt Shop, Dust Handling, Lime System, and Alloy System baghouses) shall be replaced promptly. No more than eight (8) Melt Shop Baghouse compartments will be off-line without curtailment of Melt Shop operations.</p>
C.33	<p>Emission Unit ID: 02, 05, and 06 Equipment ID: LP, TP, TNP, TF-2, and RF Control Device ID: LNOX-LP, LNOX-TP, LNOX-TNP, LNOX-TF-2, and LNOX-RF</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis for VOC, the sources shall comply with good combustion practices.</p> <p>The facility shall adhere to the following good combustion practices: 1) Controlling fuel/air mixing in</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions																																
	<p>the combustion zone, except during startup; 2) Maintaining adequate temperature for complete combustion; 3) Allowing for sufficient gas residence time to complete combustion; 4) Burning pipeline quality natural gas only; and 5) Implementing good operation and maintenance practices, including good burner maintenance and operation.</p> <p>The sources are only permitted to burn natural gas as fuel. The use of any other substances as fuel is prohibited without prior approval from the Department.</p>																																
C.34	<p>Emission Unit ID: 02, 07, 10 Equipment ID: LP, TP, PLB-1, PLB-2, ANF Control Device ID: LNOX-LP, LNOX-TP, LNOX-PB1, LNOX-PB2, LNOX-ANF</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Equipment</th><th>Pollutant</th><th>BACT Limit</th><th>Control Method</th></tr><tr><td>2 Ladle Dryouts (11 Million Btu/hr, each)</td><td>NO_x</td><td>3.1 lb/hr and 13.5 tpy (total)</td><td>Utilize low-NO_x burners</td></tr><tr><td>8 Ladle Preheaters (11 Million Btu/hr, each)</td><td>NO_x</td><td>12.3 lb/hr and 53.9 tpy (total)</td><td>Utilize low-NO_x burners</td></tr><tr><td>2 Vertical Holding Stations (11 Million Btu/hr, each)</td><td>NO_x</td><td>3.1 lb/hr and 13.5 tpy (total)</td><td>Utilize low-NO_x burners</td></tr><tr><td>2 Tundish Dryers (8 Million Btu/hr, each)</td><td>NO_x</td><td>1.6 lb/hr and 7.0 tpy (total)</td><td>Utilize low-NO_x burners</td></tr><tr><td>4 Tundish Preheaters (8 Million Btu/hr, each)</td><td>NO_x</td><td>3.2 lb/hr and 14.0 tpy (total)</td><td>Utilize low-NO_x burners</td></tr><tr><td>Pickle Line Boiler No. 1 and Pickle Line Boiler No. 2 (15.4 Million Btu/hr, each)</td><td>NO_x</td><td>4.31 lb/hr and 18.9 tpy (total)</td><td>Utilize low-NO_x burners</td></tr><tr><td>Annealing Furnaces (120 Million Btu/hr)</td><td>NO_x</td><td>10.2 lb/hr and 44.7 tpy (total)</td><td>Utilize low-NO_x burners</td></tr></table> <p>The owner or operator shall demonstrate compliance through the use of low NO_x burners.</p> <p>A single Annealing Furnace consists of an outer shell and an inner shell. The outer shell contains the burners which are the source of emissions. The inner shell provides for an air-tight seal around the steel coils. Therefore, only twenty (20) outer shells are permitted to operate simultaneously.</p> <p>These sources are only permitted to burn natural gas as fuel. The use of any other substances as fuel is prohibited without prior approval from the Department.</p>	Equipment	Pollutant	BACT Limit	Control Method	2 Ladle Dryouts (11 Million Btu/hr, each)	NO _x	3.1 lb/hr and 13.5 tpy (total)	Utilize low-NO _x burners	8 Ladle Preheaters (11 Million Btu/hr, each)	NO _x	12.3 lb/hr and 53.9 tpy (total)	Utilize low-NO _x burners	2 Vertical Holding Stations (11 Million Btu/hr, each)	NO _x	3.1 lb/hr and 13.5 tpy (total)	Utilize low-NO _x burners	2 Tundish Dryers (8 Million Btu/hr, each)	NO _x	1.6 lb/hr and 7.0 tpy (total)	Utilize low-NO _x burners	4 Tundish Preheaters (8 Million Btu/hr, each)	NO _x	3.2 lb/hr and 14.0 tpy (total)	Utilize low-NO _x burners	Pickle Line Boiler No. 1 and Pickle Line Boiler No. 2 (15.4 Million Btu/hr, each)	NO _x	4.31 lb/hr and 18.9 tpy (total)	Utilize low-NO _x burners	Annealing Furnaces (120 Million Btu/hr)	NO _x	10.2 lb/hr and 44.7 tpy (total)	Utilize low-NO _x burners
Equipment	Pollutant	BACT Limit	Control Method																														
2 Ladle Dryouts (11 Million Btu/hr, each)	NO _x	3.1 lb/hr and 13.5 tpy (total)	Utilize low-NO _x burners																														
8 Ladle Preheaters (11 Million Btu/hr, each)	NO _x	12.3 lb/hr and 53.9 tpy (total)	Utilize low-NO _x burners																														
2 Vertical Holding Stations (11 Million Btu/hr, each)	NO _x	3.1 lb/hr and 13.5 tpy (total)	Utilize low-NO _x burners																														
2 Tundish Dryers (8 Million Btu/hr, each)	NO _x	1.6 lb/hr and 7.0 tpy (total)	Utilize low-NO _x burners																														
4 Tundish Preheaters (8 Million Btu/hr, each)	NO _x	3.2 lb/hr and 14.0 tpy (total)	Utilize low-NO _x burners																														
Pickle Line Boiler No. 1 and Pickle Line Boiler No. 2 (15.4 Million Btu/hr, each)	NO _x	4.31 lb/hr and 18.9 tpy (total)	Utilize low-NO _x burners																														
Annealing Furnaces (120 Million Btu/hr)	NO _x	10.2 lb/hr and 44.7 tpy (total)	Utilize low-NO _x burners																														

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions																								
	The owner/operator shall record and maintain records of the amounts of fuel combusted by these sources. The amount of fuel combusted shall be recorded monthly and maintained on site.																								
C.35	<p>Emission Unit ID: 03 Equipment ID: BDS Control Device ID: BAG-1</p> <p>(SC Regulation 61-62.5 Standard 7) Dust collected in the Furnace Baghouse (BAG-1) shall be kept enclosed until it is removed from the facility's site. Fugitive or point emissions shall not exceed 10% opacity from any dust handling equipment or processing.</p> <p>Compliance with this requirement shall be demonstrated through compliance with the applicable requirements of New Source Performance Standards (NSPS), 40 CFR 60 Subpart AAa, Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 17, 1983.</p>																								
C.36	<p>Emission Unit ID: 04 Equipment ID: VDT Control Device ID: Flare-1 and Flare-2</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis for PM, VOC, SO₂, NO_x, CO, and CO_{2e}, the sources will adhere to applicable S.C. Regulation 61-62.5, Standard No. 3 – Waste Combustion and Reduction conditions as they pertain to Industrial Incinerators.</p>																								
C.37	<p>Emission Unit ID: 04 Equipment ID: DB2 Control Device ID: LNOX-DB2</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Pollutant</th><th>BACT Limit</th><th>Control Method</th></tr><tr><td>Filterable PM</td><td>1.9 lb/MMscf</td><td>Good Combustion Practices</td></tr><tr><td>Filterable PM₁₀ + Condensable</td><td>7.6 lb/MMscf</td><td>Good Combustion Practices</td></tr><tr><td>Filterable PM_{2.5} + Condensable</td><td>7.6 lb/MMscf</td><td>Good Combustion Practices</td></tr><tr><td>VOC</td><td>3.67 lb/MMscf</td><td>Good Combustion Practices</td></tr><tr><td>SO₂</td><td>0.6 lb/MMscf</td><td>Good Combustion Practices</td></tr><tr><td>NO_x</td><td>35 lb/MMscf</td><td>Use of Low NO_x Burners and Good Combustion Practices</td></tr><tr><td>CO</td><td>61 lb/MMscf</td><td>Good Combustion Practices</td></tr></table>	Pollutant	BACT Limit	Control Method	Filterable PM	1.9 lb/MMscf	Good Combustion Practices	Filterable PM ₁₀ + Condensable	7.6 lb/MMscf	Good Combustion Practices	Filterable PM _{2.5} + Condensable	7.6 lb/MMscf	Good Combustion Practices	VOC	3.67 lb/MMscf	Good Combustion Practices	SO ₂	0.6 lb/MMscf	Good Combustion Practices	NO _x	35 lb/MMscf	Use of Low NO _x Burners and Good Combustion Practices	CO	61 lb/MMscf	Good Combustion Practices
Pollutant	BACT Limit	Control Method																							
Filterable PM	1.9 lb/MMscf	Good Combustion Practices																							
Filterable PM ₁₀ + Condensable	7.6 lb/MMscf	Good Combustion Practices																							
Filterable PM _{2.5} + Condensable	7.6 lb/MMscf	Good Combustion Practices																							
VOC	3.67 lb/MMscf	Good Combustion Practices																							
SO ₂	0.6 lb/MMscf	Good Combustion Practices																							
NO _x	35 lb/MMscf	Use of Low NO _x Burners and Good Combustion Practices																							
CO	61 lb/MMscf	Good Combustion Practices																							

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions														
	CO ₂ e	26,028 tpy	Use of natural gas and efficient combustion technology through good combustion practices.												
	<p>The owner or operator has provided documentation to the Department supporting the vendor guaranteed NO_x, CO, and VOC emission factors.</p> <p>The facility shall adhere to the following good combustion practices: 1) Controlling fuel/air mixing in the combustion zone, except during startup; 2) Maintaining adequate temperature for complete combustion; 3) Allowing for sufficient gas residence time to complete combustion; 4) Burning pipeline quality natural gas only; 5) Implementing good operation and maintenance practices, including good burner maintenance and operation; and 6) Compliance with 40 CFR 63 Subpart DDDDD Tuning and Energy Assessment Requirements.</p> <p>The source is only permitted to burn natural gas as fuel. The use of any other substances as fuel is prohibited without prior approval from the Department.</p>														
C.38	<p>Emission Unit ID: 05 Equipment ID: TF-1 and TF-2 Control Device ID: LNOX-TF-1 and LNOX-TF-2</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table border="1"> <thead> <tr> <th>Equipment</th><th>Pollutant</th><th>BACT Limit</th><th>Control Method</th></tr> </thead> <tbody> <tr> <td>Tunnel Furnace No. 1</td><td>NO_x</td><td>23.8 lb/hr and 104 tpy</td><td>Utilize low-NO_x burners</td></tr> <tr> <td>Tunnel Furnace No. 2</td><td>NO_x</td><td>21.25 lb/hr and 93.08 tpy</td><td>Utilize low-NO_x burners</td></tr> </tbody> </table> <p>An initial source test has been completed indicating compliance with the limits. The owner/operator shall demonstrate continued compliance with the NO_x emission limits by conducting a source test every five (5) years.</p> <p>The owner or operator shall utilize low NO_x burners.</p> <p>This source is only permitted to burn natural gas as fuel. The use of any other substances as fuel is prohibited without prior approval from the Department.</p> <p>The owner/operator shall record and maintain records of the amounts of fuel combusted by these sources. The amount of fuel combusted shall be recorded monthly. These records shall be kept on-site and be made available to the Department upon request.</p>			Equipment	Pollutant	BACT Limit	Control Method	Tunnel Furnace No. 1	NO _x	23.8 lb/hr and 104 tpy	Utilize low-NO _x burners	Tunnel Furnace No. 2	NO _x	21.25 lb/hr and 93.08 tpy	Utilize low-NO _x burners
Equipment	Pollutant	BACT Limit	Control Method												
Tunnel Furnace No. 1	NO _x	23.8 lb/hr and 104 tpy	Utilize low-NO _x burners												
Tunnel Furnace No. 2	NO _x	21.25 lb/hr and 93.08 tpy	Utilize low-NO _x burners												

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions								
C.39	Emission Unit ID: 06 Equipment ID: RF Control Device ID: LNOX-RF								
	In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:								
	<table><tr><th>Equipment</th><th>Pollutant</th><th>BACT Limit</th><th>Control Method</th></tr><tr><td>Reheat Furnace</td><td>NO_x</td><td>27.75 lb/hr and 121.54 tpy</td><td>Utilize low-NO_x burners</td></tr></table>	Equipment	Pollutant	BACT Limit	Control Method	Reheat Furnace	NO _x	27.75 lb/hr and 121.54 tpy	Utilize low-NO _x burners
	Equipment	Pollutant	BACT Limit	Control Method					
	Reheat Furnace	NO _x	27.75 lb/hr and 121.54 tpy	Utilize low-NO _x burners					
An initial source test has been completed indicating compliance with the limits. The owner/operator shall demonstrate continued compliance with the NO _x emission limits by conducting a source test every five (5) years.									
The owner or operator shall utilize low NO _x burners.									
This source is only permitted to burn natural gas as fuel. The use of any other substances as fuel is prohibited without prior approval from the Department.									
The owner/operator shall record and maintain records of the amount of fuel combusted by this source. The amount of fuel combusted shall be recorded monthly. These records shall be kept on-site and be made available to the Department upon request.									
C.40	Emission Unit ID: 07 Equipment ID: PL-1 Control Device ID: SCB-1								
	In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:								
	<table><tr><th>Pollutant</th><th>BACT Limit (averaging period)</th><th>Control Method</th></tr><tr><td>Filterable PM</td><td>0.010 gr/dscf (3-hour block average) 0.77 lb/hr (3-hour block average)</td><td>Wet Scrubber and Mist Eliminator; Proper Operation and Maintenance Follow the Nucor Steel – Berkeley 40 CFR 63 Subpart CCC – NESHAP for Steel Pickling Operation and Maintenance Plan</td></tr></table>	Pollutant	BACT Limit (averaging period)	Control Method	Filterable PM	0.010 gr/dscf (3-hour block average) 0.77 lb/hr (3-hour block average)	Wet Scrubber and Mist Eliminator; Proper Operation and Maintenance Follow the Nucor Steel – Berkeley 40 CFR 63 Subpart CCC – NESHAP for Steel Pickling Operation and Maintenance Plan		
Pollutant	BACT Limit (averaging period)	Control Method							
Filterable PM	0.010 gr/dscf (3-hour block average) 0.77 lb/hr (3-hour block average)	Wet Scrubber and Mist Eliminator; Proper Operation and Maintenance Follow the Nucor Steel – Berkeley 40 CFR 63 Subpart CCC – NESHAP for Steel Pickling Operation and Maintenance Plan							

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions		
C.41	Filterable PM ₁₀	0.0055 gr/dscf (3-hour block average) 0.43 lb/hr (3-hour block average)	Wet Scrubber and Mist Eliminator; Proper Operation and Maintenance Follow the Nucor Steel – Berkeley 40 CFR 63 Subpart CCC – NESHAP for Steel Pickling Operation and Maintenance Plan
	A source test for filterable PM and filterable PM ₁₀ has been completed indicating compliance with the limits. The averaging period listed in the table above (3-hour block average) involves three (3) 1-hour test runs. The owner/operator shall demonstrate continued compliance with the emission limits by conducting a source test every two and a half (2 ½) years thereafter.		
	The owner or operator shall follow good operating and maintenance practices as defined in the facility's Pickle Line Operating and Maintenance Plan developed for compliance with NESHAP Subpart CCC along with daily differential pressure and water flow recordkeeping. The wet scrubber and mist eliminator (SCB-1) shall be in place and operational whenever processes controlled by the scrubber are running, except during periods of scrubber malfunction or mechanical failure.		
	Records shall be kept on-site to verify that proper operation and maintenance is being met. These records shall be made available to the Department upon request.		
C.41	Emission Unit ID: 08 Equipment ID: CRM-1 Control Device ID: CRM1ME1 and CRM1ME2		
	In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:		
	Pollutant	BACT Limit (averaging period)	Control Method
	Filterable PM	0.010 gr/dscf (3-hour block average) 7.20 lb/hr (3-hour block average)	Fan with Mist Eliminator; Proper Operation and Maintenance Daily monitoring of system fan amps and operation in accordance with manufacturer guidelines.

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions		
	Filterable PM ₁₀	0.0028 gr/dscf (3-hour block average) 2.0 lb/hr (3-hour block average)	Fan with Mist Eliminator; Proper Operation and Maintenance Daily monitoring of system fan amps and operation in accordance with manufacturer guidelines.
	VOC	1.16 lb/hr (3-hour block average)	Proper Operation and Maintenance which includes Minimized Use of Oils and/or Grease VOC Minimization Plan
<p>A source test for filterable PM, filterable PM₁₀, and VOC emissions has been completed indicating compliance with the limits. The averaging period listed in the table above (3-hour block average) involves three (3) 1-hour test runs. The owner/operator shall demonstrate continued compliance with the emission limits by conducting a source test every five (5) years thereafter.</p> <p>The owner or operator shall monitor the system fan amps daily and equipment shall be operated in accordance with manufacturer guidelines. The fan with mist eliminator (CRM1ME1) shall be in place and operational whenever processes controlled by the fan with mist eliminator are running, except during periods of control device malfunction or mechanical failure. Upon startup of the pollution control upgrade, that is part of PSD permit 0420-0060-DX, the owner or operator shall cease to operate CRM1ME1. The owner or operator shall install a control system (fan with mist eliminator, CRM1ME2) with a vendor guarantee for filterable PM emissions no greater than the grain loading or lb/hr PM BACT limits listed above. The total PM₁₀ and PM_{2.5} emissions for the control system, CRM1ME2 shall have a vendor guarantee no greater than 2.0 lb/hr. The new fan with mist eliminator (CRM1ME2) shall be in place and operational whenever processes controlled by CRM1ME2 are running, except during periods of control device malfunction or mechanical failure.</p> <p>The facility shall follow a VOC Minimization Plan that includes but is not limited to: 1) Tracking of all bulk and non-bulk oil and grease purchases and deliveries; 2) Tracking spent oil and grease recovery, disposal, and recycling; 3) Performance of periodic maintenance, in accordance with manufacturer recommendations, to minimize leaks of oil and grease from seals and bearings; 4) Implementation of standard operating procedures and operator training on proper management and handling of oil and grease and leak/spill prevention; 5) Planned periodic maintenance of caster spray vents, rolling</p>			

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions				
	<p>mill components, pickle line components, and ancillary equipment in accordance with manufacturing instructions; 6) Best management practices for use of parts washers including containment of waste solution, keeping parts covered while draining, and weekly inspection of parts washers for visible leaks; and 7) Continuation of the Management of Change Program which requires approval for any new oils or grease.</p> <p>Records shall be kept on-site to verify proper operation and maintenance and the VOC minimization plan are being met. These records shall be made available to the Department upon request.</p>				
C.42	<p>Emission Unit ID: 08 Equipment ID: CRM-2 Control Device ID: CRM2ME1 and CRM2ME2</p> <p>(S.C. Regulation 61-62.1, Section II.E) This facility established federally enforceable operating limitations to limit the potential to emit from this source to less than 3.2 lb/hr and 14 tpy of PM/PM₁₀ to avoid a PSD Significant Increase of 25 tpy and 15 tpy of PM and PM₁₀, respectively.</p> <p>The owner or operator shall operate and maintain fan amperage meters on the mist eliminators. The amperage shall be recorded daily, when a mist eliminator is in use, and maintained on site. The fan with mist eliminator controls (CRM2ME1 and CRM2ME2) shall be in place and operational whenever processes controlled by the fan with mist eliminator controls are running, except during periods of control device malfunction or mechanical failure. Operational ranges for the monitored parameters have been established and were derived from the initial source test, manufacturer recommendations, or operational observation. Records shall be kept on-site to verify that proper operation and maintenance is being met. These records shall be made available to the Department upon request.</p> <p>An initial source test for particulate matter emissions indicating compliance with the permit limits has been completed for the Cold Reversing Mill No. 2. The owner/operator shall demonstrate continued compliance with the permit limits by conducting a source test every five (5) years.</p>				
C.43	<p>Emission Unit ID: 05, 06, and 08 Equipment ID: HMMV, BMMV, and CMMV</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>ID</th><th>Pollutant</th><th>BACT Limit (averaging period)</th><th>Control Method</th></tr></table>	ID	Pollutant	BACT Limit (averaging period)	Control Method
ID	Pollutant	BACT Limit (averaging period)	Control Method		

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS (S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions			
	HMMV	Filterable PM	1.98E-04 gr/dscf (3-hour block average) 1.46 lb/hr (3-hour block average)	Proper Operation and Maintenance Weekly inspections, housekeeping practices, and operation in accordance with manufacturer guidelines.
	HMMV	VOC	6.88 lb/hr (3-hour block average)	Proper Operation and Maintenance VOC Minimization Plan
	CMMV	Filterable PM	1.81E-04 gr/dscf (3-hour block average) 2.79 lb/hr (3-hour block average)	Proper Operation and Maintenance Weekly inspections, housekeeping practices, and operation in accordance with manufacturer guidelines.
	CMMV	VOC	7.63 lb/hr (3-hour block average)	Proper Operation and Maintenance VOC Minimization Plan
	BMMV	Filterable PM	2.78E-04 gr/dscf (3-hour block average) 3.35 lb/hr (3-hour block average)	Proper Operation and Maintenance Weekly inspections, housekeeping practices, and operation in accordance with manufacturer guidelines.

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions			
	BMMV	Filterable PM ₁₀	2.62E-04 gr/dscf (3-hour block average) 3.15 lb/hr (3-hour block average)	Proper Operation and Maintenance Weekly inspections, housekeeping practices, and operation in accordance with manufacturer guidelines.
	BMMV	VOC	10.04 lb/hr (3-hour block average)	Proper Operation and Maintenance VOC Minimization Plan
<p>The owner or operator shall conduct weekly inspections on the rolling mill components and ancillary equipment which include water sprays, bearings, and rolls. Housekeeping practices that include minimization of dust shall be used and the equipment shall be operated in accordance with manufacturer guidelines.</p> <p>The facility shall follow a VOC Minimization Plan that includes but is not limited to: 1) Tracking of all bulk and non-bulk oil and grease purchases and deliveries; 2) Tracking spent oil and grease recovery, disposal, and recycling; 3) Performance of periodic maintenance, in accordance with manufacturer recommendations, to minimize leaks of oil and grease from seals and bearings; 4) Implementation of standard operating procedures and operator training on proper management and handling of oil and grease and leak/spill prevention; 5) Planned periodic maintenance of caster spray vents, rolling mill components, pickle line components, and ancillary equipment in accordance with manufacturing instructions; 6) Best management practices for use of parts washers including containment of waste solution, keeping parts covered while draining, and weekly inspection of parts washers for visible leaks; and 7) Continuation of the Management of Change Program which requires approval for any new oils or grease.</p> <p>Records shall be kept on-site to verify that good work practice standards, proper operation and maintenance, and the VOC minimization plan are being met. These records shall be made available to the Department upon request.</p>				
C.44	Emission Unit ID: 09 Equipment ID: GL-PF and GL-RF Control Device ID: NOX1			

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions								
	<p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Equipment</th><th>Pollutant</th><th>BACT Limit</th><th>Control Method</th></tr><tr><td>Galvanizing Line – Preheat (71.5 Million Btu/hr) and Galvanizing Line – Radiant (27.8 Million Btu/hr)</td><td>NO_x</td><td>6.44 lb/hr and 28 tpy (total)</td><td>SNCR/SCR Hybrid, preheat furnace uses SNCR and radiant tube furnace uses SCR</td></tr></table> <p>The owner or operator shall demonstrate compliance through the use of a Selective Non-catalytic Reduction/Selective Catalytic Reduction (SNCR/SCR) Hybrid control device where the preheat furnace uses SNCR and the radiant tube furnace uses SCR.</p> <p>The owner or operator shall continue to monitor the control temperatures for the SNCR/SCR Hybrid (NOX1) of the Galvanizing Line and use that temperature to control its operation. The control temperature is defined as the temperature used to automatically regulate injection times, as determined by a thermocouple located downstream of the injection point. The owner or operator shall continue to operate and maintain a temperature gauge on the SNCR/SCR Hybrid (NOX1). The control temperatures shall be recorded at least every fifteen (15) minutes, during periods of time when the SNCR/SCR Hybrid (NOX1) is operating and maintained on site. The SNCR/SCR Hybrid (NOX1) shall be in place and operational whenever processes controlled by the SNCR/SCR Hybrid (NOX1) are running, except during periods of control device malfunction or mechanical failure. The approved control temperature range, for the proper operation of the SNCR/SCR Hybrid (NOX1), shall be kept on-site and made available to the Department upon request.</p> <p>The facility shall perform the following operation and maintenance checks on an annual basis for the SNCR/SCR Hybrid control system:</p> <ol style="list-style-type: none">1) The catalyst on the SCR system will be checked for proper operation.2) The overall SNCR/SCR Hybrid control system shall be checked for proper operation. <p>These sources are only permitted to burn natural gas as fuel. The use of any other substances as fuel is prohibited without prior approval from the Department.</p>	Equipment	Pollutant	BACT Limit	Control Method	Galvanizing Line – Preheat (71.5 Million Btu/hr) and Galvanizing Line – Radiant (27.8 Million Btu/hr)	NO _x	6.44 lb/hr and 28 tpy (total)	SNCR/SCR Hybrid, preheat furnace uses SNCR and radiant tube furnace uses SCR
Equipment	Pollutant	BACT Limit	Control Method						
Galvanizing Line – Preheat (71.5 Million Btu/hr) and Galvanizing Line – Radiant (27.8 Million Btu/hr)	NO _x	6.44 lb/hr and 28 tpy (total)	SNCR/SCR Hybrid, preheat furnace uses SNCR and radiant tube furnace uses SCR						
C.45	<p>Emission Unit ID: 09 Equipment ID: GL-GF and GL-ALHT</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis for filterable PM and VOC, these sources are only permitted to burn natural gas as fuel. The use of any other substances as fuel is prohibited without prior approval from the Department.</p>								

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions											
C.46	<p>Emission Unit ID: 09 Equipment ID: GL-PF, GL-RF, GL-GF, and GL-ALHT Control Device ID: NOX1 and LNOX-GL-GF</p> <p>(S.C. Regulation 61-62.5, Standard No. 2 and S.C. Regulation 61-62.5, Standard No. 7)</p> <p>These sources are only permitted to burn natural gas as fuel. The use of any other substances as fuel is prohibited without prior approval from the Department.</p> <p>The owner/operator shall record and maintain records of the amounts of fuel combusted by these sources. The amount of fuel combusted shall be recorded monthly and maintained on site.</p>											
C.47	<p>Emission Unit ID: 11 Equipment ID: SDDS, SFS, STDS, SFCS-2, SFCS-3, SFCS-4, SGF, SC-1, SS-1, SS-2, SS-3, and SS-4 Control Device ID: WS</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Equipment</th><th>Pollutant</th><th>BACT Limit</th><th>Control Method</th></tr><tr><td>Slag Processing Equipment</td><td>PM</td><td>3.5 lb/hr and 15.3 tpy (total)</td><td rowspan="2">Maintaining adequate moisture content of the processed slag, using water sprays on material storage piles, limiting the drop height of transfer operations, applying dust suppressants to unpaved roads, and enforcing the posted speed limit of 10 MPH.</td></tr><tr><td>Slag Processing Equipment</td><td>Opacity</td><td>10%, each</td></tr></table> <p>The owner or operator shall maintain adequate moisture content of the processed slag, using water sprays on material storage piles, limiting the drop height of transfer operations, applying dust suppressants to unpaved roads, and enforcing the posted speed limit of 10 MPH. Details of dust suppression strategies shall be included in the Fugitive Dust Plan.</p> <p>The facility shall not process slag with a moisture content of less than 1.5% and shall analyze the unprocessed slag pile monthly for pile moisture content (%). If the moisture content is less than 1.5%, then the pile cannot be processed until the moisture content exceeds 1.5%. All test results shall be kept in a log and each log entry shall contain the test date, test time and test result. Each log entry</p>	Equipment	Pollutant	BACT Limit	Control Method	Slag Processing Equipment	PM	3.5 lb/hr and 15.3 tpy (total)	Maintaining adequate moisture content of the processed slag, using water sprays on material storage piles, limiting the drop height of transfer operations, applying dust suppressants to unpaved roads, and enforcing the posted speed limit of 10 MPH.	Slag Processing Equipment	Opacity	10%, each
Equipment	Pollutant	BACT Limit	Control Method									
Slag Processing Equipment	PM	3.5 lb/hr and 15.3 tpy (total)	Maintaining adequate moisture content of the processed slag, using water sprays on material storage piles, limiting the drop height of transfer operations, applying dust suppressants to unpaved roads, and enforcing the posted speed limit of 10 MPH.									
Slag Processing Equipment	Opacity	10%, each										

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions								
	<p>shall be kept on site for a calendar period of five (5) years from the entry date and made available to Department personnel upon request. The Department reserves the right to impose a more frequent testing schedule.</p> <p>The loading, transportation, and unloading or dumping of vehicles will be conducted so as to keep fugitive dust emissions to a minimum. This will include, but not be limited to, proper wetting of materials and operator care to minimize fugitive dust. All loading, transportation, and unloading or dumping processes of vehicles or other operations shall not exceed 10% opacity (Method 9).</p> <p>Visible emissions caused by raw material storage piles, product storage piles, and slag storage piles shall not exceed 10% opacity (Method 9).</p> <p>All paved roads within the facility shall use water sprays, street sweepers, and/or chemical suppression (submitted to and reviewed by SCDHEC Bureau of Water) for control of fugitive dust where necessary. All unpaved roads will use either water or chemical suppression (submitted to and reviewed by SCDHEC Bureau of Water) for control of fugitive dust where necessary. The excess accumulation of dirt or dust on all roadways will be minimized. Visible emissions caused by facility vehicular traffic shall not exceed 10% opacity (Method 9).</p> <p>Nucor shall conduct a semiannual Method 9 on the slag processing area for monitoring opacity limits during periods of source operation. The Method 9 readings shall be made in accordance with reference Method 9 in Appendix A of 40 CFR 60. The readings shall be maintained in permanent logs, along with any corrective actions taken and made available to Department representatives upon request.</p> <p>Semiannual reports of the Method 9 readings shall be submitted to the Manager of the Technical Management Section, postmarked no later than 30 calendar days after the end of the reporting period.</p>								
C.48	<p>Emission Unit ID: 13 Equipment ID: BARGE</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Process</th><th>Pollutant</th><th>BACT Limit</th><th>Control Method</th></tr><tr><td>Barge Unloading Operations</td><td>Opacity</td><td>10%</td><td>Include, but not limited to, proper wetting of materials and operator care to minimize fugitive dust.</td></tr></table>	Process	Pollutant	BACT Limit	Control Method	Barge Unloading Operations	Opacity	10%	Include, but not limited to, proper wetting of materials and operator care to minimize fugitive dust.
Process	Pollutant	BACT Limit	Control Method						
Barge Unloading Operations	Opacity	10%	Include, but not limited to, proper wetting of materials and operator care to minimize fugitive dust.						

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>Visible emissions caused by unloading of raw materials from barges shall not exceed 10% opacity (Method 9).</p> <p>Visible emissions caused by raw material storage piles shall not exceed 10% opacity (Method 9).</p> <p>The loading, transportation, and unloading or dumping of vehicles shall be conducted so as to keep fugitive dust emissions to a minimum. This shall include, but not be limited to, low drop heights and operator care to minimize fugitive dust.</p> <p>All paved roads within the facility shall use water sprays, street sweepers, and/or chemical suppression (submitted to and reviewed by SCDHEC Bureau of Water) for control of fugitive dust where necessary. All unpaved roads shall use either water or chemical suppression (submitted to and reviewed by SCDHEC Bureau of Water) for control of fugitive dust where necessary. The excess accumulation of dirt or dust on all roadways will be minimized. Visible emissions caused by facility vehicular traffic shall not exceed 10% opacity (Method 9).</p> <p>(SC Regulation 61 62.70.6(a)(3)(i)(B)) The facility shall conduct visual observations once per day during the unloading of the loaded barges using 40CFR60 Appendix A Method 9 during daylight hours. Should excess visible emissions occur as a result of a malfunction in equipment, operator error, etc. operations shall immediately cease and shall not resume until the problem(s) have been corrected. Records shall be kept of all visible emission observations. These records shall include the date, time of observation, the results of the Method 9 performed, the type of material being unloaded, the cause of any excess visible emissions, the duration of the excess visible emissions and the measures used to correct the occurrence. Records shall be kept on-site and shall be made available to the Department upon request. The owner/operator shall submit quarterly reports documenting that visible emissions observations were conducted in accordance with this condition. The report shall include records of abnormal emissions if any and corrective actions taken. If the unit did not operate during the inspection period, the report shall so state.</p> <p>The facility shall also maintain physical systems and procedures that minimize to the maximum extent possible the deposition of dust into the waterway. Best Management Practices (BMP) shall be followed in order to minimize air and water emission impacts.</p>
C.49	<p>Emission Unit ID: 14 Equipment ID: CT-1 and CT-1A</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p>

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions			
	Equipment ID	Pollutant	BACT Limit (averaging period)	Control Method
	CT-1	Filterable PM	0.66 lb/hr (3-hour block average)	Proper Equipment Design, Operation and Maintenance Limiting Total Dissolved Solids (TDS) (less than 3,000 ppm), utilize high efficiency drift eliminators (achieving drift rate of 0.001%), routine inspections on drift eliminator in accordance with vendor specifications, and monitor conductivity monthly.
	CT-1	Filterable PM ₁₀	0.33 lb/hr (3-hour block average)	Proper Equipment Design, Operation and Maintenance Limiting TDS (less than 3,000 ppm), utilize high efficiency drift eliminators (achieving drift rate of 0.001%), routine inspections on drift eliminator in accordance with vendor specifications, and monitor conductivity monthly.

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions			
	CT-1	Filterable PM _{2.5}	1.34E-03 lb/hr (3-hour block average)	Proper Equipment Design, Operation and Maintenance Limiting TDS (less than 3,000 ppm), utilize high efficiency drift eliminators (achieving drift rate of 0.001%), routine inspections on drift eliminator in accordance with vendor specifications, and monitor conductivity monthly.
	CT-1	VOC	0.23 tpy (12-month rolling average)	Proper Operation and Maintenance Implementation of a monitoring program, including monthly monitoring of conductivity, turbidity monitoring, and inspections for oily sheen

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions			
	CT-1A	Filterable PM	0.13 lb/hr (3-hour block average)	Proper Equipment Design, Operation and Maintenance Limiting TDS (less than 3,000 ppm), utilize high efficiency drift eliminators (achieving drift rate of 0.001%), routine inspections on drift eliminator in accordance with vendor specifications, and monitor conductivity monthly.
	CT-1A	Filterable PM ₁₀	0.06 lb/hr (3-hour block average)	Proper Equipment Design, Operation and Maintenance Limiting TDS (less than 3,000 ppm), utilize high efficiency drift eliminators (achieving drift rate of 0.001%), routine inspections on drift eliminator in accordance with vendor specifications, and monitor conductivity monthly.

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions			
	CT-1A	Filterable PM _{2.5}	2.52E-04 lb/hr (3-hour block average)	<p>Proper Equipment Design, Operation and Maintenance</p> <p>Limiting TDS (less than 3,000 ppm), utilize high efficiency drift eliminators (achieving drift rate of 0.001%), routine inspections on drift eliminator in accordance with vendor specifications, and monitor conductivity monthly.</p>
	CT-1A	VOC	0.044 tpy (12-month rolling average)	<p>Proper Operation and Maintenance</p> <p>Implementation of a monitoring program, including monthly monitoring of conductivity, turbidity monitoring, and inspections for oily sheen</p>
<p>For each cooling tower (CT-1 and CT-1A), the owner or operator shall follow proper operation and maintenance practices which include limiting the TDS to less than 3,000 ppm, utilizing high efficiency drift eliminators (achieving a drift rate of 0.001%), routine inspections on the drift eliminators in accordance with vendor specifications, and monthly monitoring of conductivity.</p> <p>For each cooling tower (CT-1 and CT-1A), the owner or operator shall implement a monitoring program that includes monthly monitoring of conductivity, turbidity, and monthly inspections for oily sheen.</p> <p>Records shall be kept on-site to verify that proper operation and maintenance practices and a monitoring program are being met. These records shall be made available to the Department upon request.</p>				
C.50	Emission Unit ID: 15			

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions																																																																														
	<p>Equipment ID: 807, 807F, 808, 808F, 809, 809F, 810/812, 810F/812F, 811, 811F, 817, 817F, 818, 818F, 819, 819F, 822, 822F, 824, 824F, 825/826, 825F/826F, 827, 827F, 828, 828F, 829, 829F, 830, 830F, 831, 831F, 832, 832F, 833, 833F, 834, 834F, 835, 835F, 836, 836F, 1B, 3B, and 8B</p> <p>Control Device ID: DRI-SH1, DRI-SH2, DRI-DC1, DRI-DC2, DRI-DC4, DRI-DC3, DRI-DC9, DRI-DC10, DRI-DC11, DRI-DC14, DRI-DC16, DRI-DC17, DRI-DC18, DRI-DC19, DRI-DC20, DRI-DC21, DRI-DC24, DRI-DC25, DRI-DC25, DRI-DC26, DRI-DC27, and DRI-DC28</p> <p>(S.C. Regulation 61-62.1, Section II.E) This facility is a potential major source for PM, PM₁₀, and PM_{2.5} emissions. The facility has agreed to federally enforceable operating limitations to limit its potential to emit. The DRI Handling Operations (Unit ID 15) is limited to a maximum throughput rate of 1,250,000 ton/yr.</p> <table><tr><th>Equipment</th><th>Annual Capacity (TPY)</th><th>Total Operating Hours (hrs/yr)</th></tr><tr><td>807 and 807F</td><td>497,625</td><td>2,500</td></tr><tr><td>808 and 808F</td><td>497,625</td><td>2,500</td></tr><tr><td>809 and 809F</td><td>497,625</td><td>2,500</td></tr><tr><td>810 and 810F</td><td>1,250,000</td><td>1,800</td></tr><tr><td>811 and 811F</td><td>497,625</td><td>2,500</td></tr><tr><td>812 and 812F</td><td>1,250,000</td><td>1,800</td></tr><tr><td>817 and 817F</td><td>995,250</td><td>2,500</td></tr><tr><td>818 and 818F</td><td>1,250,000</td><td>2,500</td></tr><tr><td>819 and 819F</td><td>254,750</td><td>582</td></tr><tr><td>822 and 822F</td><td>254,750</td><td>582</td></tr><tr><td>824 and 824F</td><td>1,250,000</td><td>1,800</td></tr><tr><td>825, 825F, 826, 826F</td><td>1,250,000</td><td>1,800</td></tr><tr><td>827 and 827F</td><td>333,333</td><td>8,760</td></tr><tr><td>828 and 828F</td><td>333,333</td><td>8,760</td></tr><tr><td>829 and 829F</td><td>333,333</td><td>8,760</td></tr><tr><td>830 and 830F</td><td>125,000</td><td>8,760</td></tr><tr><td>831 and 831F</td><td>125,000</td><td>8,760</td></tr><tr><td>832 and 832F</td><td>1,250,000</td><td>8,760</td></tr><tr><td>833 and 833F</td><td>625,000</td><td>8,760</td></tr><tr><td>834 and 834F</td><td>625,000</td><td>8,760</td></tr><tr><td>835 and 835F</td><td>625,000</td><td>8,760</td></tr><tr><td>836 and 836F</td><td>625,000</td><td>8,760</td></tr><tr><td>1B</td><td>254,750</td><td>2,572</td></tr><tr><td>3B</td><td>218,750</td><td>438</td></tr><tr><td>8B</td><td>218,750</td><td>438</td></tr></table>	Equipment	Annual Capacity (TPY)	Total Operating Hours (hrs/yr)	807 and 807F	497,625	2,500	808 and 808F	497,625	2,500	809 and 809F	497,625	2,500	810 and 810F	1,250,000	1,800	811 and 811F	497,625	2,500	812 and 812F	1,250,000	1,800	817 and 817F	995,250	2,500	818 and 818F	1,250,000	2,500	819 and 819F	254,750	582	822 and 822F	254,750	582	824 and 824F	1,250,000	1,800	825, 825F, 826, 826F	1,250,000	1,800	827 and 827F	333,333	8,760	828 and 828F	333,333	8,760	829 and 829F	333,333	8,760	830 and 830F	125,000	8,760	831 and 831F	125,000	8,760	832 and 832F	1,250,000	8,760	833 and 833F	625,000	8,760	834 and 834F	625,000	8,760	835 and 835F	625,000	8,760	836 and 836F	625,000	8,760	1B	254,750	2,572	3B	218,750	438	8B	218,750	438
Equipment	Annual Capacity (TPY)	Total Operating Hours (hrs/yr)																																																																													
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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions				
	<p>The owner/operator shall maintain all records necessary to determine DRI throughput. The actual DRI throughput rate shall be recorded monthly and a 12-month rolling sum shall be calculated. The 12-month rolling sum shall not exceed 1,250,000 tons.</p> <p>Reports of the calculated values and the 12-month rolling sum shall be submitted to the Manager of the Technical Management Section semiannually.</p>				
C.51	<p>Emission Unit ID: 15 Equipment ID: 807, 807F, 808, 808F, 809, 809F, 810/812, 810F/812F, 811, 811F, 817, 817F, 818, 818F, 819, 819F, 822, 822F, 824, 824F, 825/826, 825F/826F, 827, 827F, 828, 828F, 829, 829F, 830, 830F, 831, 831F, 832, 832F, 833, 833F, 834, 834F, 835, 835F, 836, 836F, 1B, 3B, and 8B Control Device ID: DRI-SH1, DRI-SH2, DRI-DC1, DRI-DC2, DRI-DC4, DRI-DC3, DRI-DC9, DRI-DC10, DRI-DC11, DRI-DC14, DRI-DC16, DRI-DC17, DRI-DC18, DRI-DC19, DRI-DC20, DRI-DC21, DRI-DC24, DRI-DC25, DRI-DC25, DRI-DC26, DRI-DC27, and DRI-DC28</p> <p>(S.C. Regulation 61-62.1, Section II.E) This facility established federally enforceable operating limitations to limit the total potential to emit from these sources to less than 25.0 tons per year for PM, 15.0 tons per year for PM₁₀, and 10.0 tons per year for PM_{2.5} to avoid PSD.</p> <p>The owner/operator shall maintain all records necessary to determine PM, PM₁₀, PM_{2.5} emissions. PM, PM₁₀, and PM_{2.5} emissions shall be calculated on a monthly basis, and a twelve-month rolling sum shall be calculated for total PM, PM₁₀, PM_{2.5} emissions. Emissions from malfunctions are required to be quantified and included in the calculations. The twelve-month rolling sum shall be less than 25.0 TPY PM, 15.0 TPY PM₁₀, and 10.0 TPY PM_{2.5}. Reports of the calculated values and the twelve-month rolling sum, calculated for each month in the reporting period, shall be submitted semiannually.</p> <p>An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.</p>				
C.52	<p>Emission Unit ID: 17 Equipment ID: 802, 803, 804, 805, and 601 – Coil Cutting Control Device ID: 802, 803, 804, 805, and 601</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Equipment</th><th>Pollutant</th><th>BACT Limit</th><th>Control Method</th></tr></table>	Equipment	Pollutant	BACT Limit	Control Method
Equipment	Pollutant	BACT Limit	Control Method		

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions											
	802/EAF Top Feed “new”	PM ₁₀	0.001 grain/dscf	Baghouse; Proper Operation and Maintenance								
	803/EAF Top Feed “old”	PM ₁₀	0.001 grain/dscf	Baghouse; Proper Operation and Maintenance								
	804/Alloy Grizzly Baghouse	PM ₁₀	0.001 grain/dscf	Baghouse; Proper Operation and Maintenance								
	805/Briquetter Baghouse	PM ₁₀	0.001 grain/dscf	Baghouse; Proper Operation and Maintenance								
	601/Coil Cutting Baghouse	PM ₁₀	0.001 grain/dscf	Baghouse; Proper Operation and Maintenance								
	<p>The facility shall continue to operate and maintain an overall pressure drop gauge on the EAF Top Feed “new” baghouse (Control Device ID 802). Pressure drop readings shall be recorded each shift during source operation and shall be made available to Department personnel upon request.</p> <p>Operation and maintenance checks shall be made on at least a weekly basis for baghouse cleaning systems, dust collection hoppers, and conveying systems for proper operation. The baghouses shall be in place and operational whenever processes controlled by it are running, except during periods of baghouse malfunction or mechanical failure.</p> <p>The owner/operator shall maintain a log of the operation and maintenance checks and make these records available to a Department representative upon request.</p>											
C.53	<p>Emission Unit ID: 17 Equipment ID: 601 – Coil Cutting Control Device ID: 601</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Equipment</th><th>Pollutant</th><th>BACT Limit</th><th>Control Method</th></tr><tr><td>601/Coil Cutting</td><td>NO_x</td><td>0.1 lb/10⁶ Btu</td><td>Natural gas combustion with good combustion practices.</td></tr></table>				Equipment	Pollutant	BACT Limit	Control Method	601/Coil Cutting	NO _x	0.1 lb/10 ⁶ Btu	Natural gas combustion with good combustion practices.
Equipment	Pollutant	BACT Limit	Control Method									
601/Coil Cutting	NO _x	0.1 lb/10 ⁶ Btu	Natural gas combustion with good combustion practices.									

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions							
	601/Coil Cutting	SO ₂	0.0006 lb/10 ⁶ Btu	Natural gas combustion with good combustion practices.				
	601/Coil Cutting	CO	0.084 lb/10 ⁶ Btu	Natural gas combustion with good combustion practices.				
	601/Coil Cutting	VOC	0.0055 lb/10 ⁶ Btu	Natural gas combustion with good combustion practices.				
The coil cutting torches are permitted to burn only natural gas as fuel and the owner/operator shall utilize good combustion practices per manufacturer's guidance. The use of any other substances as fuel is prohibited without prior approval from the Department.								
C.54	<p>Emission Unit ID: 17 Equipment ID: 804F, 804V – MS-Debris, 805F, and 806F</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis for filterable PM these sources are subject to good work practice standards and proper maintenance.</p> <p>The owner or operator shall use good work practice standards and proper maintenance consisting of following a fugitive dust plan that entails minimizing drop heights and having material loaded in a manner to prevent material from dropping, blowing or otherwise escaping.</p> <p>Records shall be kept on-site to verify that a fugitive dust plan is being followed. These records shall be made available to the Department upon request.</p>							
C.55	<p>Emission Unit ID: 18 Equipment ID: NCS3A</p> <p>In accordance with S.C. Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, the following BACT Limits and Control Methods have been established:</p> <table><tr><th>Equipment ID</th><th>Pollutant</th><th>BACT Limit (averaging period)</th><th>Control Method</th></tr></table>				Equipment ID	Pollutant	BACT Limit (averaging period)	Control Method
Equipment ID	Pollutant	BACT Limit (averaging period)	Control Method					

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions			
	NCS3A	Filterable PM	0.12 lb/hr (3-hour block average)	<p>Proper Equipment Design, Operation and Maintenance</p> <p>Limiting TDS (less than 3,900 ppm), utilize high efficiency drift eliminators (achieving drift rate of 0.001%), routine inspections on drift eliminator in accordance with vendor specifications, and monitor conductivity monthly.</p>
	NCS3A	Filterable PM ₁₀	0.05 lb/hr (3-hour block average)	<p>Proper Equipment Design, Operation and Maintenance</p> <p>Limiting TDS (less than 3,900 ppm), utilize high efficiency drift eliminators (achieving drift rate of 0.001%), routine inspections on drift eliminator in accordance with vendor specifications, and monitor conductivity monthly.</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions			
	NCS3A	Filterable PM _{2.5}	2.50E-04 lb/hr (3-hour block average)	<p>Proper Equipment Design, Operation and Maintenance</p> <p>Limiting TDS (less than 3,900 ppm), utilize high efficiency drift eliminators (achieving drift rate of 0.001%), routine inspections on drift eliminator in accordance with vendor specifications, and monitor conductivity monthly.</p>
	<p>The owner or operator shall follow proper operation and maintenance practices which include limiting the TDS to less than 3,900 ppm, utilizing high efficiency drift eliminators (achieving a drift rate of 0.001%), routine inspections on the drift eliminators in accordance with vendor specifications, and monthly monitoring of conductivity.</p> <p>The owner or operator shall implement a monitoring program that includes monthly monitoring of conductivity.</p> <p>Records shall be kept on-site to verify that proper operation and maintenance practices and a monitoring program are being met. These records shall be made available to the Department upon request.</p>			
C.56	<p>(SC Regulation 61-62.5 Standard No. 7) The Melt Shop shall have a rated production capacity of 500 tons of steel cast per hour averaged over a month (monthly average) and a maximum steel production rate of 650 tons of steel cast per hour at peak operation. The Melt Shop shall have a maximum production level of 4,380,000 tons of steel averaged per twelve-month period (annual rolling sum). The monthly production rate shall be calculated using the actual tons (which can be calculated from slab thickness and cast speed) by the three (3) casting operations, two (2) sheet type operations and the beam mill caster, during a calendar month and the actual number of operating hours during the calendar month. The maximum production level shall be tracked using a twelve (12) month rolling sum method. Records of the monthly production rate and twelve (12) month rolling sum shall be maintained on site and shall be made available to Department personnel upon request.</p>			
C.57	<p>(SC Regulation 61-62.5 Standard No. 7) The facility shall submit quarterly reports that include the following information:</p>			

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<ol style="list-style-type: none"> 1) The cumulative total tons of steel produced (cast) during each month in the reporting period. 2) The hours of operation for the Electric Arc Furnaces during each month in the reporting period. 3) The average hourly production rate during each month in the reporting period. 4) The tons of Electric Arc Furnace dust captured by the Furnace Baghouse and Canopy Baghouse during each month in the reporting period. 5) The total amount of natural gas (in cubic feet) used facility-wide during the reporting period. <p>Quarterly reports listing the items listed above shall be submitted to the Manager of the Technical Management Section, Bureau of Air Quality within 30 days of that quarter's end. This report will also include a 12 month rolling average for steel production and Melt Shop fuel use.</p>
C.58	<p>Emission Unit ID: 01 and 02 Equipment ID: EAF-1, EAF-2, LMS-1, LMS-2, CSP1, BMC, LP, TP, and TNP Control Device ID: BAG-1, BAG-1A, LNOX-EAF-1, LNOX-EAF-2, LNOX-LP, LNOX-TP, and LNOX-TNP</p> <p>(S.C. Regulation 61-62.5, Standard No. 7) The facility shall keep Operations and Maintenance (O&M) documentation (written or electronic) with the facility's air permit and made available for inspections. This O&M documentation shall be updated as required to reflect changes in operations, equipment, etc. Any additions or changes to the O&M documentation, the equipment, or operating procedures of the equipment shall be submitted annually to the Director of the Air Permitting Division. If no changes to the O&M documentation occurred during the reporting period, then a letter shall indicate such.</p> <p>The Operations and Maintenance (O&M) documentation should contain the following information:</p> <ol style="list-style-type: none"> 1) Monitoring parameters, calibration and inspection schedules for all permitted equipment and air pollution control devices at the facility. 2) Flow diagram which indicates all points connected to the Furnace Baghouse (BAG-1) and Canopy Baghouse (BAG-1A). Fan Amp ranges established during baseline testing should also be documented. 3) Procedures for start-up and shut-down, procedures for malfunction control, procedures for production curtailment during furnace baghouse and canopy baghouse malfunctions, and routine maintenance schedules for pollution control equipment. 4) There shall be one person (or staff position or the Plant Environmental Engineer) at the facility

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>designated to be responsible for environmental matters during each shift. This person (or position) will be the contact with the Department and the local Environmental Affairs Regional office when any complaint, plant malfunction, etc. has occurred. The procedure for contact will be included in the O&M documentation.</p> <p>5) An inventory of spare bags for the furnace baghouse and canopy baghouse (the equivalent of at least one compartment) will be maintained.</p> <p>6) The furnace baghouse and canopy baghouse fans will be operated and maintained in such a manner as to deliver full operating efficiency as demonstrated through the most recent re-establishment of fan amp baselines during source testing per NSPS AAa. Procedures for minimizing fan down time and a description of curtailment procedures will be included in the O&M documentation. Fan outages due to malfunction(s) which result in discharges of air contaminants lasting for one (1) hour or more and which are greater than those discharges described for normal operation in the permit application, shall be reported no later than the beginning of the next working day to the local Environmental Affairs Regional office following such events. Written notification of the incidence will include down times, items repaired, and other pertinent information.</p> <p>7) A protocol for monitoring of emissions and operations as required by 40 CFR §60.273a and 40 CFR §60.274a, shall be developed and included in the O&M documentation.</p> <p>8) The facility shall utilize a scrap management program to eliminate the purchase of heavily oiled scrap steel. A description of the scrap management program (Scrap Metal Management Plan) shall be included in the O&M documentation.</p>
C.59	<p>Emission Unit ID: 04, 07 Equipment ID: DB1, DB2, PLB-1, PLB-2, PLB-3, and PLB-4 Control Device ID: LNOX-DB1, LNOX-DB2, LNOX-PLB-1, LNOX-PLB-2, LNOX-PLB-3 and LNOX-PLB-4</p> <p>These sources are subject to New Source Performance Standards (NSPS), 40 CFR 60 Subpart A, General Provisions and Subpart Dc, Small Industrial-Commercial-Institutional Steam Generating Units and S.C. Regulation 61-62.60, Subparts A and Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, as applicable. Compliance with the regulation shall be demonstrated by burning only natural gas for fuel. The use of other fuels will subject this source to additional emission limitations and is prohibited without prior written approval from the Department.</p> <p>The owner/operator shall record and maintain records of the amounts of fuel combusted by these sources. The amount of fuel combusted shall be recorded monthly. As an alternative, the owner/operator may record and maintain records of the total amount of natural gas for each source delivered to the facility during each calendar month.</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
C.60	<p>(S.C. Regulation 61-62.5, Standard No. 4, Section X and S.C. Regulation 61-62.6) Fugitive particulate matter (PM) emissions from material handling, process equipment, control equipment, or storage piles will be minimized to the maximum extent possible. This will include proper maintenance of the control system such as scheduled inspections, replacement of damaged or worn parts, etc. Fugitive emissions from dust buildup will be controlled by proper housekeeping and/or wet suppression.</p> <p>In an effort to minimize fugitive emissions, the following shall be adhered to:</p> <ul style="list-style-type: none">(a) Fugitive Particulate (PM) emissions from material handling, process equipment, control equipment, or storage piles will be minimized to the maximum extent possible. This will include proper maintenance of the control system such as scheduled inspections, replacement of damaged or worn parts, etc. Fugitive emissions from dust buildup will be controlled by proper housekeeping.(b) A wind direction indicator shall be installed and maintained in a prominent place that is easily observable by facility personnel. Operations will cease when meteorological conditions cause fugitive emissions to leave the loading/off-loading areas and/or the plant site.(c) The owner/operator shall not allow the release of excessive fugitive emissions into the atmosphere that are generated from any emission source that handles material in a batch drop type bulk handling process, such as the use of a clam shell or skip pan, including but not limited to, the transportation, loading, unloading, and handling of materials. If excessive emissions are observed, then fugitive emissions shall be determined using the US Environmental Protection Agency (EPA) Method 22 visual determination. If fugitive emissions are in excess of 12 minutes during a one hour observation period, with the required breaks as outlined in Method 22, operations shall cease until the problem is corrected.(d) The loading, unloading, transportation, or dumping of bulk material and piling of material, using hoppers, conveyors, or any other continuous material handling process, shall be conducted so as to keep fugitive dust emissions to a minimum. This shall include but is not limited to minimizing the distance of drop of any material, prompt removal of dust generated in areas where these operations take place, and operator care to minimize fugitive dust. The owner or operator may have to take additional measures, as necessary, to maintain visible emissions at or below the maximum limit. <p>Records shall be kept of excessive fugitive emission occurrences. These records shall include, at a minimum, the results of any Method 22 performed, the cause of the excess fugitive emissions, the duration of the emissions, and the measures used to correct the occurrence. These records shall be maintained onsite for a period of five years from the date generated and shall be made available to a Department representative upon request.</p>
C.61	<p>Emission Unit ID: 01 and 03</p> <p>Equipment ID: EAF-1, EAF-2, EAF-1_FUG, EAF-2_FUG, and BDS</p> <p>Control Device ID: BAG-1 and BAG-1A</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>These sources are subject to New Source Performance Standards (NSPS), 40 CFR 60 Subpart A, General Provisions and Subpart AAa, Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 17, 1983, and S.C. Regulation 61-62.60 Subparts A and Subpart AAa, Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 17, 1983, as applicable. These sources shall comply with all applicable requirements of Subparts A and AAa.</p> <p>In accordance with 40 CFR 60 Subpart AAa, Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 17, 1983, §60.272a, Standard for particulate matter, (a) On and after the date of which the performance test required to be conducted by §60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from an EAF or an AOD vessel any gases which:</p> <p>(a)(1) Exit from a control device and contain particulate matter in excess of 12 mg/dscm (0.0052 gr/dscf);</p> <p>(a)(2) Exit from a control device and exhibit 3 percent opacity or greater; and</p> <p>(a)(3) Exit from a shop and, due solely to the operations of any affected EAF(s) or AOD vessel(s), exhibit 6 percent opacity or greater.</p> <p>(b) On and after the date on which the performance test required to be conducted by §60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from the dust-handling system any gases that exhibit 10 percent opacity or greater.</p> <p>In accordance with 40 CFR §60.273a - Emission Monitoring:</p> <p>(a) Except as provided under paragraphs (b) and (c) of this section, a continuous monitoring system for the measurement of the opacity of emissions discharged into the atmosphere from the control device(s) shall be installed, calibrated, maintained, and operated by the owner or operator subject to the provisions of this subpart.</p> <p>(b) No continuous monitoring system shall be required on any control device serving the dust-handling system.</p> <p>(c) A continuous monitoring system for the measurement of the opacity of emissions discharged into the atmosphere from the control device(s) is not required on any modular, multi-stack, negative-pressure or positive-pressure fabric filter if observations of the opacity of the visible emissions from</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>the control device are performed by a certified visible emission observer; or on any single-stack fabric filter if visible emissions from the control device are performed by a certified visible emission observer and the owner installs and continuously operates a bag leak detection system according to paragraph (e) of this section. Visible emission observations shall be conducted at least once per day for at least three 6-minute periods when the furnace is operating in the melting and refining period. All visible emissions observations shall be conducted in accordance with Method 9. If visible emissions occur from more than one point, the opacity shall be recorded for any points where visible emissions are observed. Where it is possible to determine that a number of visible emission sites relate to only one incident of the visible emission, only one set of three 6-minute observations will be required. In that case, the Method 9 observations must be made for the site of highest opacity that directly relates to the cause (or location) of visible emissions observed during a single incident. Records shall be maintained of any 6-minute average that is in excess of the emission limit specified in §60.272a(a).</p> <p>(d) A furnace static pressure monitoring device is not required on any EAF equipped with a DEC system if observations of shop opacity are performed by a certified visible emission observer as follows: Shop opacity observations shall be conducted at least once per day when the furnace is operating in the meltdown and refining period. Shop opacity shall be determined as the arithmetic average of 24 consecutive 15-second opacity observations of emissions from the shop taken in accordance with Method 9. Shop opacity shall be recorded for any point(s) where visible emissions are observed. Where it is possible to determine that a number of visible emission sites relate to only one incident of visible emissions, only one observation of shop opacity will be required. In this case, the shop opacity observations must be made for the site of highest opacity that directly relates to the cause (or location) of visible emissions observed during a single incident.</p> <p>(e) A bag leak detection system must be installed and continuously operated on all single-stack fabric filters if the owner or operator elects not to install and operate a continuous opacity monitoring system as provided for under paragraph (c) of this section. In addition, the owner or operator shall meet the visible emissions observation requirements in paragraph (c) of this section. The bag leak detection system must meet the specifications and requirements of paragraphs (e)(1) through (8) of this section.</p> <p>(e)(1) The bag leak detection system must be certified by the manufacturer to be capable of detecting particulate matter emissions at concentrations of 1 milligram per actual cubic meter (0.00044 grains per actual cubic foot) or less.</p> <p>(e)(2) The bag leak detection system sensor must provide output of relative particulate matter loadings and the owner or operator shall continuously record the output from the bag leak detection system using electronic or other means (e.g., using a strip chart recorder or a data logger.)</p>

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>(e)(3) The bag leak detection system must be equipped with an alarm system that will sound when an increase in relative particulate loading is detected over the alarm set point established according to paragraph (e)(4) of this section, and the alarm must be located such that it can be heard by the appropriate plant personnel.</p> <p>(e)(4) For each bag leak detection system required by paragraph (e) of this section, the owner or operator shall develop and submit to the Administrator or delegated authority, for approval, a site-specific monitoring plan that addresses the items identified in paragraphs (i) through (v) of this paragraph (e)(4). For each bag leak detection system that operates based on the triboelectric effect, the monitoring plan shall be consistent with the recommendations contained in the U.S. Environmental Protection Agency guidance document "Fabric Filter Bag Leak Detection Guidance" (EPA-454/R-98-015). The owner or operator shall operate and maintain the bag leak detection system according to the site-specific monitoring plan at all times. The plan shall describe the following:</p> <p>(e)(4)(i) Installation of the bag leak detection system;</p> <p>(e)(4)(ii) Initial and periodic adjustment of the bag leak detection system including how the alarm set-point will be established;</p> <p>(e)(4)(iii) Operation of the bag leak detection system including quality assurance procedures;</p> <p>(e)(4)(iv) How the bag leak detection system will be maintained including a routine maintenance schedule and spare parts inventory list; and</p> <p>(e)(4)(v) How the bag leak detection system output shall be recorded and stored.</p> <p>(e)(5) The initial adjustment of the system shall, at a minimum, consist of establishing the baseline output by adjusting the sensitivity (range) and the averaging period of the device, and establishing the alarm set points and the alarm delay time (if applicable).</p> <p>(e)(6) Following initial adjustment, the owner or operator shall not adjust the averaging period, alarm set point, or alarm delay time without approval from the Administrator or delegated authority except as provided for in paragraphs (e)(6)(i) and (ii) of this section.</p> <p>(e)(6)(i) Once per quarter, the owner or operator may adjust the sensitivity of the bag leak detection system to account for seasonal effects including temperature and humidity according to the procedures identified in the site-specific monitoring plan required under paragraphs (e)(4) of this section.</p> <p>(e)(6)(ii) If opacities greater than zero percent are observed over four consecutive 15-second</p>

C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>observations during the daily opacity observations required under paragraph (c) of this section and the alarm on the bag leak detection system does not sound, the owner or operator shall lower the alarm set point on the bag leak detection system to a point where the alarm would have sounded during the period when the opacity observations were made.</p> <p>(e)(7) For negative pressure, induced air baghouses, and positive pressure baghouses that are discharged to the atmosphere through a stack, the bag leak detection sensor must be installed downstream of the baghouse and upstream of any wet scrubber.</p> <p>(e)(8) Where multiple detectors are required, the system's instrumentation and alarm may be shared among detectors.</p> <p>(f) For each bag leak detection system installed according to paragraph (e) of this section, the owner or operator shall initiate procedures to determine the cause of all alarms within 1 hour of an alarm. Except as provided for under paragraph (g) of this section, the cause of the alarm must be alleviated within 3 hours of the time the alarm occurred by taking whatever corrective action(s) are necessary. Corrective actions may include, but are not limited to, the following:</p> <p>(f)(1) Inspecting the baghouse for air leaks, torn or broken bags or filter media, or any other condition that may cause an increase in particulate emissions;</p> <p>(f)(2) Sealing off defective bags or filter media;</p> <p>(f)(3) Replacing defective bags or filter media or otherwise repairing the control device;</p> <p>(f)(4) Sealing off a defective baghouse compartment;</p> <p>(f)(5) Cleaning the bag leak detection system probe or otherwise repairing the bag leak detection system; and</p> <p>(f)(6) Shutting down the process producing the particulate emissions.</p> <p>(g) In approving the site-specific monitoring plan required in paragraph (e)(4) of this section, the Administrator or delegated authority may allow owners or operators more than 3 hours to alleviate specific conditions that cause an alarm if the owner or operator identifies the condition that could lead to an alarm in the monitoring plan, adequately explains why it is not feasible to alleviate the condition within 3 hours of the time the alarm occurred, and demonstrates that the requested additional time will ensure alleviation of the condition as expeditiously as practicable.</p> <p>In accordance with 40 CFR §60.274a - Monitoring of Operations:</p>

C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>(a) The owner or operator subject to the provisions of this subpart shall maintain records of the following information:</p> <p>(a)(1) All data obtained under paragraph (b) of this section; and</p> <p>(a)(2) All monthly operational status inspections performed under paragraph (c) of this section.</p> <p>(b) Except as provided under paragraph (e) of this section, the owner or operator subject to the provisions of this subpart shall check and record on a once-per-shift basis the furnace static pressure (if DEC system is in use, and a furnace static pressure gauge is installed according to paragraph (f) of this section) and either: check and record the control system fan motor amperes and damper position on a once-per-shift basis; install, calibrate, and maintain a monitoring device that continuously records the volumetric flow rate through each separately ducted hood; or install, calibrate, and maintain a monitoring device that continuously records the volumetric flow rate at the control device inlet and check and record damper positions on a once-per-shift basis. The monitoring device(s) may be installed in any appropriate location in the exhaust duct such that reproducible flow rate monitoring will result. The flow rate monitoring device(s) shall have an accuracy of ± 10 percent over its normal operating range and shall be calibrated according to the manufacturer's instructions. The Administrator may require the owner or operator to demonstrate the accuracy of the monitoring device(s) relative to Methods 1 and 2 of appendix A of this part.</p> <p>(c) When the owner or operator of an affected facility is required to demonstrate compliance with the standards under §60.272a(a)(3) and at any other time that the Administrator may require (under section 114 of the CAA, as amended) either: the control system fan motor amperes and all damper positions, the volumetric flow rate through each separately ducted hood, or the volumetric flow rate at the control device inlet and all damper positions shall be determined during all periods in which a hood is operated for the purpose of capturing emissions from the affected facility subject to paragraph (b) of this section. The owner or operator may petition the Administrator for reestablishment of these parameters whenever the owner or operator can demonstrate to the Administrator's satisfaction that the affected facility operating conditions upon which the parameters were previously established are no longer applicable. The values of these parameters as determined during the most recent demonstration of compliance shall be maintained at the appropriate level for each applicable period. Operation at other than baseline values may be subject to the requirements of §60.276a(c).</p> <p>(d) Except as provided under paragraph (e) of this section, the owner or operator shall perform monthly operational status inspections of the equipment that is important to the performance of the total capture system (i.e., pressure sensors, dampers, and damper switches). This inspection shall include observations of the physical appearance of the equipment (e.g., presence of holes in</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion). Any deficiencies shall be noted and proper maintenance performed.</p> <p>(e) The owner or operator may petition the Administrator to approve any alternative to either the monitoring requirements specified in paragraph (b) of this section or the monthly operational status inspections specified in paragraph (d) of this section if the alternative will provide a continuous record of operation of each emission capture system.</p> <p>(f) Except as provided for under §60.273a(d), if emissions during any phase of the heat time are controlled by the use of a DEC system, the owner or operator shall install, calibrate, and maintain a monitoring device that allows the pressure in the free space inside the EAF to be monitored. The pressure shall be recorded as 15-minute integrated averages. The monitoring device may be installed in any appropriate location in the EAF or DEC duct prior to the introduction of ambient air such that reproducible results will be obtained. The pressure monitoring device shall have an accuracy of ± 5 mm of water gauge over its normal operating range and shall be calibrated according to the manufacturer's instructions.</p> <p>(g) Except as provided for under §60.273a(d), when the owner or operator of an EAF controlled by a DEC is required to demonstrate compliance with the standard under §60.272a(a)(3), and at any other time the Administrator may require (under section 114 of the Clean Air Act, as amended), the pressure in the free space inside the furnace shall be determined during the meltdown and refining period(s) using the monitoring device required under paragraph (f) of this section. The owner or operator may petition the Administrator for reestablishment of the pressure whenever the owner or operator can demonstrate to the Administrator's satisfaction that the EAF operating conditions upon which the pressures were previously established are no longer applicable. The pressure determined during the most recent demonstration of compliance shall be maintained at all times when the EAF is operating in a meltdown and refining period. Operation at higher pressures may be considered by the Administrator to be unacceptable operation and maintenance of the affected facility.</p> <p>(h) During any performance test required under §60.8, and for any report thereof required by §60.276a(f) of this subpart, or to determine compliance with §60.272a(a)(3) of this subpart, the owner or operator shall monitor the following information for all heats covered by the test:</p> <p>(h)(1) Charge weights and materials, and tap weights and materials;</p> <p>(h)(2) Heat times, including start and stop times, and a log of process operation, including periods of no operation during testing and the pressure inside an EAF when direct-shell evacuation control systems are used;</p> <p>(h)(3) Control device operation log; and</p>

C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>(h)(4) Continuous opacity monitor or Method 9 data.</p> <p>In accordance with 40 CFR §60.275a - Test Methods and Procedures:</p> <p>(a) During performance tests required in §60.8, the owner or operator shall not add gaseous diluents to the effluent gas stream after the fabric in any pressurized fabric filter collector, unless the amount of dilution is separately determined and considered in the determination of emissions.</p> <p>(b) When emissions from any EAF(s) or AOD vessel(s) are combined with emissions from facilities not subject to the provisions of this subpart but controlled by a common capture system and control device, the owner or operator shall use either or both of the following procedures during a performance test (see also §60.276a(e)):</p> <p>(b)(1) Determine compliance using the combined emissions.</p> <p>(b)(2) Use a method that is acceptable to the Administrator and that compensates for the emissions from the facilities not subject to the provisions of this subpart.</p> <p>(c) When emission from any EAF(s) or AOD vessel(s) are combined with emissions from facilities not subject to the provisions of this subpart, the owner or operator shall demonstrate compliance with §60.272(a)(3) based on emissions from only the affected facility(ies).</p> <p>(d) In conducting the performance tests required in §60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in §60.8(b).</p> <p>(e) The owner or operator shall determine compliance with the particulate matter standards in §60.272a as follows:</p> <p>(e)(1) Method 5 shall be used for negative-pressure fabric filters and other types of control devices and Method 5D shall be used for positive-pressure fabric filters to determine the particulate matter concentration and volumetric flow rate of the effluent gas. The sampling time and sample volume for each run shall be at least 4 hours and 4.50 dscm (160 dscf) and, when a single EAF or AOD vessel is sampled, the sampling time shall include an integral number of heats.</p> <p>(e)(2) When more than one control device serves the EAF(s) being tested, the concentration of particulate matter shall be determined using the equation listed within 40 CFR §60.275a - Test Methods and Procedures.</p>

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>(e)(3) Method 9 and the procedures of §60.11 shall be used to determine opacity.</p> <p>(e)(4) To demonstrate compliance with §60.272a(a)(1), (2), and (3), the Method 9 test runs shall be conducted concurrently with the particulate matter test runs, unless inclement weather interferes.</p> <p>(f) To comply with §60.274a(c), (f), (g), and (h), the owner or operator shall obtain the information required in these paragraphs during the particulate matter runs.</p> <p>(g) Any control device subject to the provisions of the subpart shall be designed and constructed to allow measurement of emissions using applicable test methods and procedures.</p> <p>(h) Where emissions from any EAF(s) or AOD vessel(s) are combined with emissions from facilities not subject to the provisions of this subpart but controlled by a common capture system and control device, the owner or operator may use any of the following procedures during a performance test:</p> <p>(h)(1) Base compliance on control of the combined emissions;</p> <p>(h)(2) Utilize a method acceptable to the Administrator that compensates for the emissions from the facilities not subject to the provisions of this subpart, or;</p> <p>(h)(3) Any combination of the criteria of paragraphs (h)(1) and (h)(2) of this section.</p> <p>(i) Where emissions from any EAF(s) or AOD vessel(s) are combined with emissions from facilities not subject to the provisions of this subpart, determinations of compliance with §60.272a(a)(3) will only be based upon emissions originating from the affected facility(ies).</p> <p>(j) Unless the presence of inclement weather makes concurrent testing infeasible, the owner or operator shall conduct concurrently the performance tests required under §60.8 to demonstrate compliance with §60.272a(a)(1), (2), and (3) of this subpart.</p> <p>In accordance with 40 CFR §60.276a - Recordkeeping and Reporting Requirements:</p> <p>(a) Records of the measurements required in §60.274a must be retained for at least 2 years following the date of the measurement.</p> <p>(b) Each owner or operator shall submit a written report of exceedances of the control device opacity to the Administrator semi-annually. For the purposes of these reports, exceedances are defined as all 6-minute periods during which the average opacity is 3 percent or greater.</p> <p>(c) Operation at a furnace static pressure that exceeds the value established under §60.274a(g) and</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>either operation of control system fan motor amperes at values exceeding ± 15 percent of the value established under §60.274a(c) or operation at flow rates lower than those established under §60.274a(c) may be considered by the Administrator to be unacceptable operation and maintenance of the affected facility. Operation at such values shall be reported to the Administrator semiannually.</p> <p>(d) The requirements of this section remain in force until and unless EPA, in delegating enforcement authority to a State under section 111 (c) of the Act, approves reporting requirements or an alternative means of compliance surveillance adopted by such State. In that event, affected sources within the State will be relieved of the obligation to comply with this section, provided that they comply with the requirements established by the State.</p> <p>(e) When the owner or operator of an EAF or AOD is required to demonstrate compliance with the standard under §60.275(b)(2) or a combination of (b)(1) and (b)(2) the owner or operator shall obtain approval from the Administrator of the procedure(s) that will be used to determine compliance. Notification of the procedure(s) to be used must be postmarked at least 30 days prior to the performance test.</p> <p>(f) For the purpose of this subpart, the owner or operator shall conduct the demonstration of compliance with §60.272a(a) of this subpart and furnish the Administrator a written report of the results of the test. This report shall include the following information:</p> <p>(f)(1) Facility name and address;</p> <p>(f)(2) Plant representative;</p> <p>(f)(3) Make and model of process, control device, and continuous monitoring equipment;</p> <p>(f)(4) Flow diagram of process and emission capture equipment including other equipment or process(es) ducted to the same control device;</p> <p>(f)(5) Rated (design) capacity of process equipment;</p> <p>(f)(6) Those data required under §60.274a(h) of this subpart;</p> <p>(f)(6)(i) List of charge and tap weights and materials;</p> <p>(f)(6)(ii) Heat times and process log;</p> <p>(f)(6)(iii) Control device operation log; and</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>(f)(6)(iv) Continuous opacity monitor or Method 9 data.</p> <p>(f)(7) Test dates and test times;</p> <p>(f)(8) Test company;</p> <p>(f)(9) Test company representative;</p> <p>(f)(10) Test observers from outside agency;</p> <p>(f)(11) Description of test methodology used, including any deviation from standard reference methods;</p> <p>(f)(12) Schematic of sampling location;</p> <p>(f)(13) Number of sampling points;</p> <p>(f)(14) Description of sampling equipment;</p> <p>(f)(15) Listing of sampling equipment calibrations and procedures;</p> <p>(f)(16) Field and laboratory data sheets;</p> <p>(f)(17) Description of sample recovery procedures;</p> <p>(f)(18) Sampling equipment leak check results;</p> <p>(f)(19) Description of quality assurance procedures;</p> <p>(f)(20) Description of analytical procedures;</p> <p>(f)(21) Notation of sample blank corrections; and</p> <p>(f)(22) Sample emission calculations.</p> <p>(g) The owner or operator shall maintain records of all shop opacity observations made in accordance with §60.273a(d). All shop opacity observations in excess of the emission limit specified in §60.272a(a)(3) of this subpart shall indicate a period of excess emission, and shall be reported to the administrator semi-annually, according to §60.7(c).</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>(h) The owner or operator shall maintain the following records for each bag leak detection system required under §60.273a(e):</p> <p>(h)(1) Records of the bag leak detection system output;</p> <p>(h)(2) Records of bag leak detection system adjustments, including the date and time of the adjustment, the initial bag leak detection system settings, and the final bag leak detection system settings; and</p> <p>(h)(3) An identification of the date and time of all bag leak detection system alarms, the time that procedures to determine the cause of the alarm were initiated, if procedures were initiated within 1 hour of the alarm, the cause of the alarm, an explanation of the actions taken, the date and time the cause of the alarm was alleviated, and if the alarm was alleviated within 3 hours of the alarm.</p> <p><i>The Department has reviewed and approved (see letter dated February 23, 2010) alternative monitoring for the Electric Arc Furnace (EAF) emissions system. In lieu of the once-per-shift check of furnace static pressure and fan motor amperes and damper positions required pursuant to 40 CFR §60.274a(b). Nucor Steel – Berkeley will utilize an innovative electronic camera system to automatically monitor the amount of visible flame and control the damper positions. The damper position of the EAF canopy dampers will continue to be controlled via manual setpoints. The Department has approved the facility performing daily shop observations in lieu of pressure monitoring.</i></p>
C.62	<p>Emission Unit ID: 09 Equipment ID: GL-MC and GL-ST</p> <p>These sources are subject to New Source Performance Standards (NSPS), 40 CFR 60 Subpart A, General Conditions and Subpart TT, Standards of Performance for Metal Coil Surface Coating, and shall comply with all applicable provisions, in addition to those explicitly stated in this permit.</p> <p>In accordance with 40 CFR §60.462 - Standards for Volatile Organic Compounds:</p> <p>a) On and after the date on which §60.8 requires a performance test to be completed, each owner or operator subject to this subpart shall not cause to be discharged into the atmosphere more than:</p> <p>(a)(1) 0.28 kilogram VOC per liter (kg VOC/l) of coating solids applied for each calendar month for each affected facility that does not use an emission control device.</p> <p>In accordance with 40 CFR §60.463 - Performance Test and Compliance Provisions:</p> <p>b) The owner or operator of an affected facility shall conduct an initial performance test as required under §60.8(a) and thereafter a performance test for each calendar month for each affected facility according to the procedures in this section.</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>(c) The owner or operator shall use the procedures in 40 CFR §60.463 for determining monthly volume-weighted average emissions of VOC's in kg/l of coating solids applied.</p> <p>The facility shall comply with applicable test methods and procedures as specified in 40 CFR §60.466 Test Methods and Procedures.</p> <p>In accordance with 40 CFR §60.464 - Monitoring of Emissions and Operations:</p> <p>a) Where compliance with the numerical limit specified in §60.462(a)(1) or (2) is achieved through the use of low VOC-content coatings without the use of emission control devices or through the use of higher VOC-content coatings in conjunction with emission control devices, the owner or operator shall compute and record the average VOC content of coatings applied during each calendar month for each affected facility, according to the equations provided in §60.463.</p> <p>In accordance with 40 CFR §60.465 - Reporting and Recordkeeping Requirements:</p> <p>a) Where compliance with the numerical limit specified in §60.462(a)(1), (2), or (4) is achieved through the use of low VOC-content coatings without emission control devices or through the use of higher VOC-content coatings in conjunction with emission control devices, each owner or operator subject to the provisions of this subpart shall include in the initial compliance report required by §60.8 the weighted average of the VOC content of coatings used during a period of one calendar month for each affected facility.</p> <p>(c) Following the initial performance test, the owner or operator of an affected facility shall identify, record, and submit a written report to the Administrator every calendar quarter of each instance in which the volume-weighted average of the local mass of VOC's emitted to the atmosphere per volume of applied coating solids (N) is greater than the limit specified under §69.462. If no such instances have occurred during a particular quarter, a report stating this shall be submitted to the Administrator semiannually.</p> <p>(e) Each owner or operator subject to the provisions of this subpart shall maintain at the source, for a period of at least 2 years, records of all data and calculations used to determine monthly VOC emissions from each affected facility and to determine the monthly emission limit, where applicable.</p>
C.63	<p>Insignificant Activity Equipment ID: IA-EG8, IA-WP1, IA-WP2, IA-WP9, and IA-EG14</p> <p>These sources are subject to New Source Performance Standards (NSPS), 40 CFR 60 Subpart A (General Provisions) and Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines) and South Carolina Regulation 61-62.60 Subparts A and IIII, as applicable. These sources shall comply with all applicable requirements of these Subparts.</p>

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions																
C.64	<p>Insignificant Activity Equipment ID: IA-EG12</p> <p>This source is subject to New Source Performance Standards (NSPS), 40 CFR 60 Subpart A (General Provisions) and Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines) and South Carolina Regulation 61-62.60 Subparts A and JJJJ, as applicable. This source shall comply with all applicable requirements of these Subparts.</p>																
C.65	<p>It has been determined that this facility is subject to S.C. Regulation 61-62.68, Chemical Accident Prevention Provisions, due to in-process storage or use of a regulated substance in quantities above the specified threshold and that a Risk Management Plan (RMP) has already been submitted to the EPA; therefore, the following must be completed:</p> <ul style="list-style-type: none">• Submittal of subsequent revisions/corrections/updates of the RMP in accordance with S.C. Regulation 61-62.68.190 and 68.195.• For Program 1 processes, the owner/operator shall submit along with the RMP the certification statement provided in Section 68.12(b)(4). For all other covered processes, the owner/operator shall submit along with the RMP a single certification that, to the best of the signer's knowledge, information, and belief formed after reasonable inquiry, the information submitted is true, accurate, and complete. <p>If it is determined by the implementing agency (or other delegated authority) that additional relevant information is needed, this facility will be required to submit the information in a timely manner.</p>																
C.66	<p>Emission Unit ID: 01 Equipment ID: EAF-1, EAF-2, LMS-1, LMS-2, CC-1, and CC-2 Control Device ID: BAG-1 and BAG-1A</p> <p>These sources are subject to 40 CFR 64, Compliance Assurance Monitoring (CAM) and shall comply with all applicable provisions.</p> <p>The control device, pollutant, applicable regulation, and emission limits are as follows:</p> <table><tr><th>Control Device(s)</th><th>Pollutant</th><th>Applicable Regulation</th><th>Emission Limit(s)</th></tr><tr><td>Furnace Baghouse (BAG-1) and Canopy Baghouse (BAG-1A)</td><td>PM (filterable)</td><td>S.C. Regulation 61-62.5, Standard No. 4</td><td>72.15 lb/hr</td></tr><tr><td>Furnace Baghouse (BAG-1)</td><td>PM (filterable)</td><td>S.C. Regulation 61-62.5, Standard No. 7</td><td>0.0031 gr/dscf (12-hour block average) and 37.3 lb/hr (12-hour block average)</td></tr><tr><td>Canopy Baghouse (BAG-1A)</td><td>PM (filterable)</td><td>S.C. Regulation 61-62.5, Standard No. 7</td><td>0.0018 gr/dscf (12-hour block average) and 18.51 lb/hr (12-hour block average)</td></tr></table>	Control Device(s)	Pollutant	Applicable Regulation	Emission Limit(s)	Furnace Baghouse (BAG-1) and Canopy Baghouse (BAG-1A)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	72.15 lb/hr	Furnace Baghouse (BAG-1)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.0031 gr/dscf (12-hour block average) and 37.3 lb/hr (12-hour block average)	Canopy Baghouse (BAG-1A)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.0018 gr/dscf (12-hour block average) and 18.51 lb/hr (12-hour block average)
Control Device(s)	Pollutant	Applicable Regulation	Emission Limit(s)														
Furnace Baghouse (BAG-1) and Canopy Baghouse (BAG-1A)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	72.15 lb/hr														
Furnace Baghouse (BAG-1)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.0031 gr/dscf (12-hour block average) and 37.3 lb/hr (12-hour block average)														
Canopy Baghouse (BAG-1A)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.0018 gr/dscf (12-hour block average) and 18.51 lb/hr (12-hour block average)														

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Condition Number	Conditions																	
	Furnace Baghouse (BAG-1)	PM ₁₀ (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.0022 gr/dscf (12-hour block average) and 26.1 lb/hr (12-hour block average)														
	Canopy Baghouse (BAG-1A)	PM ₁₀ (filterable + condensable)	S.C. Regulation 61-62.5, Standard No. 7	0.0033 gr/dscf (12-hour block average) and 33.9 lb/hr (12-hour block average)														
	Canopy Baghouse (BAG-1A)	PM _{2.5} (filterable + condensable)	S.C. Regulation 61-62.5, Standard No. 7	0.0021 gr/dscf (12-hour block average) and 21.6 lb/hr (12-hour block average)														
	Furnace Baghouse (BAG-1) and Canopy Baghouse (BAG-1A)	Lead	S.C. Regulation 61-62.5, Standard No. 7	3.675E-4 lb/ton steel produced, 0.184 lb/hr, and 0.81 tpy														
	Furnace Baghouse (BAG-1)	Fluoride {does not include hydrogen fluoride (HF)}	S.C. Regulation 61-62.5, Standard No. 7	0.09 lb/hr, particulate (12-hour block average)														
<p>PM control is used as a surrogate for lead and particulate fluoride control, therefore CAM for PM is CAM for lead and fluoride.</p> <p>To meet the requirements of 40 CFR 64 the owner/operator shall continue to operate and maintain the indicators shown below as the measurement approach:</p>																		
<table> <tr> <th>Parameter</th><th>Indicator No. 1</th><th>Indicator No. 2</th><th>Indicator No. 3</th><th>Indicator No. 4</th></tr> <tr> <td rowspan="2">I. Indicator Measurement Approach</td><td>PM Concentration</td><td>Opacity</td><td>Pressure Drop</td><td>Inspection Program</td></tr> <tr> <td>Method 5 and Method 22</td><td> Method 9 visual observations. COMS installed at Furnace Baghouse (BAG-1) exhaust. BLDS installed at Canopy Baghouse (BAG-1A) exhaust. </td><td>Continuous pressure drop across the baghouses.</td><td>Visual inspection of baghouse cleaning systems, dust collection hoppers, and conveying systems.</td></tr> </table>					Parameter	Indicator No. 1	Indicator No. 2	Indicator No. 3	Indicator No. 4	I. Indicator Measurement Approach	PM Concentration	Opacity	Pressure Drop	Inspection Program	Method 5 and Method 22	Method 9 visual observations. COMS installed at Furnace Baghouse (BAG-1) exhaust. BLDS installed at Canopy Baghouse (BAG-1A) exhaust.	Continuous pressure drop across the baghouses.	Visual inspection of baghouse cleaning systems, dust collection hoppers, and conveying systems.
Parameter	Indicator No. 1	Indicator No. 2	Indicator No. 3	Indicator No. 4														
I. Indicator Measurement Approach	PM Concentration	Opacity	Pressure Drop	Inspection Program														
	Method 5 and Method 22	Method 9 visual observations. COMS installed at Furnace Baghouse (BAG-1) exhaust. BLDS installed at Canopy Baghouse (BAG-1A) exhaust.	Continuous pressure drop across the baghouses.	Visual inspection of baghouse cleaning systems, dust collection hoppers, and conveying systems.														

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions				
	II. Indicator Range	PM concentrations as outlined above.	<p>An excursion is defined as an opacity measurement exceeding 3% on a 6-minute average.</p> <p>BLDS – An excursion is defined as a triboelectric signal greater than 40 for both detectors for two minutes.</p>	<p>An excursion is defined as a pressure drop outside the range of 1 to 14 inches of water for the Furnace Baghouse (BAG-1) and 1 to 12 inches of water for the Canopy Baghouse (BAG-1A).</p>	<p>An excursion is defined as failure to perform the monthly inspection.</p>
	III. Performance Criteria				
	A. Data Representativeness	USEPA Reference Method 5 and 202	<p>COMS – 40 CFR Appendix B to Part 60</p> <p>BLDS – 40 CFR 60.273a(e)(4)</p>	Monthly operational status inspections of the equipment important to the total capture system.	Baghouses inspected visually for evidence of bag deterioration.
	B. Verification of Operational Status	Record baghouse flow rate during the stack test to establish a baseline for fan motor amps.	Operation in accordance with manufacturer's recommendations	Operation in accordance with manufacturer's recommendations	Confirmation of electronic records.
	C. QA/QC Practices and Criteria	USEPA Reference Method 5	<p>Use of a certified visible emission observer.</p> <p>COMS – EPA Procedure 3.</p> <p>BLDS – BLDS Plan as approved by DHEC</p>	Periodic calibration of pressure gauges.	Trained personnel perform inspections and maintenance.
	D. Monitoring Frequency	Once every two (2) years	<p>Daily VE (when EAF is operating unless inclement weather)</p> <p>Continuous (COMS and BLDS)</p>	Continuous (Recorded once every 15 minutes)	Monthly
	IV. Data Collection Procedures				

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions				
	Data Collection Procedures	USEPA reference Method 5 and Method 202	Logged electronically	Pressure drop for each compartment is logged electronically, once every 15 minutes.	Results of inspections and maintenance activities performed are logged electronically or in hardcopy format.
	Averaging Period	Average of 3 test runs each 4 hours long	Daily VE and COMS six-minute average.	Not Applicable	Not Applicable
<p>The indicators shown shall be used to provide assurance of compliance with each applicable requirement. The Furnace Baghouse (BAG-1) and Canopy Baghouse (BAG-1A) shall be in place and operational whenever processes controlled by them are running, except during periods of control device malfunction or mechanical failure.</p> <p>These operational ranges for the monitored parameters were derived from data, which demonstrate a reasonable assurance of compliance.</p> <p>QA/QC practices, etc. shall consist of USEPA Reference Method 5, use of a certified visible emission observer, COMS – EPA Procedure 3 for the Furnace Baghouse, DHEC approved BLDS Plan for the Canopy Baghouse, periodic calibration of pressure gauges, and trained personnel to perform inspections and maintenance.</p> <p>An excursion is defined as any operating condition where the indicator is outside of the approved range for the specified averaging period. Upon detecting an excursion, the owner/operator shall restore operation of the pollutant-specific emissions unit (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing any startup, shutdown, or malfunction period and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion (other than those caused by excused startup and shutdown conditions).</p> <p>The owner/operator shall develop, implement, and maintain a Quality Improvement Plan (QIP) as specified in §64.8, when a pollutant-specific emission unit has accumulated exceedances or excursions exceeding 5 percent duration of the unit's operating time for a reporting period, or when instructed to do so by the Department pursuant to §64.7(d)(2).</p> <p>A semiannual report for monitoring shall include, at a minimum, the information required under §</p>					

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions																
	<p>70.6(a)(3)(iii) and the following information as applicable:</p> <p>Summary information of the number, duration, and cause (including unknown cause, if applicable) of excursions, as applicable, and the corrective actions taken;</p> <p>Summary information on the number, duration, and cause (including unknown cause, if applicable) for monitor downtime incidents (other than downtime associated with zero and span or other daily calibration checks, if applicable);</p> <p>If applicable, a description of the actions taken to implement a Quality Improvement Plan (QIP) during the reporting period as specified in §64.8. Upon completion of a QIP, the owner/operator shall include in the next summary report documentation that the implementation of the plan has been completed and reduced the likelihood of similar levels of excursions occurring.</p> <p>The owner/operator shall maintain records of monitoring data, monitor performance data, corrective action, and quality improvement plans. The records shall include calculations of the percent duration of accumulated exceedances or excursions during the reporting period per pollutant-specific emission unit, updated monthly.</p>																
C.67	<p>Emission Unit ID: 07 Equipment ID: PL-1 and PL-2 Control Device ID: SCB-1 and SCB-2</p> <p>These sources are subject to 40 CFR 64, Compliance Assurance Monitoring (CAM) and shall comply with all applicable provisions.</p> <p>The control device, pollutant, applicable regulation, and emission limits are as follows:</p> <table><tr><th>Control Device(s)</th><th>Pollutant</th><th>Applicable Regulation</th><th>Emission Limit(s)</th></tr><tr><td>Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator (SCB-1) and Pickle Line No. 2 Wet Fume Scrubber/Mist Eliminator (SCB-2)</td><td>PM (filterable)</td><td>S.C. Regulation 61-62.5, Standard No. 4</td><td>68.96 lb/hr</td></tr><tr><td>Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator (SCB-1)</td><td>PM (filterable)</td><td>S.C. Regulation 61-62.5, Standard No. 7</td><td>0.010 gr/dscf (3-hour block average) and 0.77 lb/hr (3-hour block average)</td></tr><tr><td>Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator (SCB-1)</td><td>PM₁₀ (filterable)</td><td>S.C. Regulation 61-62.5, Standard No. 7</td><td>0.0055 gr/dscf (3-hour block average) and 0.43 lb/hr (3-hour block average)</td></tr></table> <p>To meet the requirements of 40 CFR 64 the owner/operator shall continue to operate and maintain</p>	Control Device(s)	Pollutant	Applicable Regulation	Emission Limit(s)	Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator (SCB-1) and Pickle Line No. 2 Wet Fume Scrubber/Mist Eliminator (SCB-2)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	68.96 lb/hr	Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator (SCB-1)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.010 gr/dscf (3-hour block average) and 0.77 lb/hr (3-hour block average)	Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator (SCB-1)	PM ₁₀ (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.0055 gr/dscf (3-hour block average) and 0.43 lb/hr (3-hour block average)
Control Device(s)	Pollutant	Applicable Regulation	Emission Limit(s)														
Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator (SCB-1) and Pickle Line No. 2 Wet Fume Scrubber/Mist Eliminator (SCB-2)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	68.96 lb/hr														
Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator (SCB-1)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.010 gr/dscf (3-hour block average) and 0.77 lb/hr (3-hour block average)														
Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator (SCB-1)	PM ₁₀ (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.0055 gr/dscf (3-hour block average) and 0.43 lb/hr (3-hour block average)														

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>differential pressure gauges and liquid flow gauges. Based on a 30-day operation period, the acceptable range for pressure drop (for each wet fume scrubber/mist eliminator) is between 10 and 20 inches of H₂O. Based on initial testing under NESHAP Subpart CCC, the acceptable range for scrubber liquid flow must be greater than 4.28 gallons per minute for Pickle Line No. 1 wet fume scrubber/mist eliminator (SCB-1). Based on initial testing under NESHAP Subpart CCC, the acceptable range for scrubber liquid flow must be greater than 4.82 gallons per minute for Pickle Line No. 2 wet fume scrubber/mist eliminator (SCB-2).</p> <p>The indicators (differential pressure gauges and liquid flow gauges) shall be used to provide assurance of compliance with each applicable requirement. The Pickle Line No. 1 Wet Fume Scrubber/Mist Eliminator (SCB-1) and Pickle Line No. 2 Wet Fume Scrubber/Mist Eliminator (SCB-2) shall be in place and operational whenever processes controlled by them are running, except during periods of control device malfunction or mechanical failure.</p> <p>These operational ranges for the monitored parameters were derived from data, which demonstrate a reasonable assurance of compliance.</p> <p>QA/QC practices, etc. shall consist of the differential pressure and liquid flow rate from each wet fume scrubber/mist eliminator being recorded daily, except when the wet fume scrubber/mist eliminator is not in use. The date and daily differential pressure and liquid flow rate shall be recorded in a log. Logs shall also be in place for periods for which a wet fume scrubber/mist eliminator is not in use, which includes wet fume scrubber identification, problems, corrective actions, and maintenance activities. Good operating and maintenance practices shall be followed as defined in the facility's Pickle Line Operating and Maintenance Plan developed for compliance with NESHAP Subpart CCC along with daily differential pressure and water flow recordkeeping.</p> <p>An excursion is defined as any operating condition where the indicator is outside of the approved range for the specified averaging period. Upon detecting an excursion, the owner/operator shall restore operation of the pollutant-specific emissions unit (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing any startup, shutdown, or malfunction period and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion (other than those caused by excused startup and shutdown conditions).</p> <p>The owner/operator shall develop, implement, and maintain a Quality Improvement Plan (QIP) as specified in §64.8, when a pollutant-specific emission unit has accumulated exceedances or excursions exceeding 5 percent duration of the unit's operating time for a reporting period, or when instructed to do so by the Department pursuant to §64.7(d)(2).</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions												
	<p>A semiannual report for monitoring shall include, at a minimum, the information required under § 70.6(a)(3)(iii) and the following information as applicable:</p> <p>Summary information of the number, duration, and cause (including unknown cause, if applicable) of excursions, as applicable, and the corrective actions taken;</p> <p>Summary information on the number, duration, and cause (including unknown cause, if applicable) for monitor downtime incidents (other than downtime associated with zero and span or other daily calibration checks, if applicable);</p> <p>If applicable, a description of the actions taken to implement a Quality Improvement Plan (QIP) during the reporting period as specified in §64.8. Upon completion of a QIP, the owner/operator shall include in the next summary report documentation that the implementation of the plan has been completed and reduced the likelihood of similar levels of excursions occurring.</p> <p>The owner/operator shall maintain records of monitoring data, monitor performance data, corrective action, and quality improvement plans. The records shall include calculations of the percent duration of accumulated exceedances or excursions during the reporting period per pollutant-specific emission unit, updated monthly.</p>												
C.68	<p>Emission Unit ID: 08 Equipment ID: CRM-1 and CRM-2 Control Device ID: CRM1ME1, CRM1ME2, CRM2ME1, and CRM2ME2</p> <p>These sources are subject to 40 CFR 64, Compliance Assurance Monitoring and shall comply with all applicable provisions.</p> <p>The control device, pollutant, applicable regulation, and emission limits are as follows:</p> <table><tr><th>Control Device(s)</th><th>Pollutant</th><th>Applicable Regulation</th><th>Emission Limit(s)</th></tr><tr><td>Mist Eliminator and Fume Exhaust System (CRM1ME1) Mist Eliminator and Fume Exhaust System (CRM1ME2) Mist Eliminator (CRM2ME1) Mist Eliminator (CRM2ME2)</td><td>PM (filterable)</td><td>S.C. Regulation 61-62.5, Standard No. 4</td><td>55.44 lb/hr</td></tr><tr><td>Mist Eliminator and Fume Exhaust System (CRM1ME1) Mist Eliminator and Fume Exhaust System (CRM1ME2)</td><td>PM (filterable)</td><td>S.C. Regulation 61-62.5, Standard No. 7</td><td>0.010 gr/dscf (3-hour block average) and 7.20 lb/hr (3-hour block average)</td></tr></table>	Control Device(s)	Pollutant	Applicable Regulation	Emission Limit(s)	Mist Eliminator and Fume Exhaust System (CRM1ME1) Mist Eliminator and Fume Exhaust System (CRM1ME2) Mist Eliminator (CRM2ME1) Mist Eliminator (CRM2ME2)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	55.44 lb/hr	Mist Eliminator and Fume Exhaust System (CRM1ME1) Mist Eliminator and Fume Exhaust System (CRM1ME2)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.010 gr/dscf (3-hour block average) and 7.20 lb/hr (3-hour block average)
Control Device(s)	Pollutant	Applicable Regulation	Emission Limit(s)										
Mist Eliminator and Fume Exhaust System (CRM1ME1) Mist Eliminator and Fume Exhaust System (CRM1ME2) Mist Eliminator (CRM2ME1) Mist Eliminator (CRM2ME2)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	55.44 lb/hr										
Mist Eliminator and Fume Exhaust System (CRM1ME1) Mist Eliminator and Fume Exhaust System (CRM1ME2)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.010 gr/dscf (3-hour block average) and 7.20 lb/hr (3-hour block average)										

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions			
	Mist Eliminator and Fume Exhaust System (CRM1ME1) Mist Eliminator and Fume Exhaust System (CRM1ME2)	PM ₁₀ (filterable)	S.C. Regulation 61-62.5, Standard No. 7	0.0063 gr/dscf (3-hour block average) and 4.54 lb/hr (3-hour block average)
	Mist Eliminator and Fume Exhaust System (CRM1ME1) Mist Eliminator and Fume Exhaust System (CRM1ME2)	PM _{2.5} (total)	S.C. Regulation 61-62.5, Standard No. 7	2.0 lb/hr
	Mist Eliminator (CRM2ME1) Mist Eliminator (CRM2ME2)	PM (filterable)	S.C. Regulation 61-62.1, Section II (E)	3.2 lb/hr and 14.0 tpy
	<p>To meet the requirements of 40 CFR 64 the owner/operator shall continue to operate and maintain fan amperage within a specified range. Based on a 30-day operation period, the fan amperage range was established between 40 – 58 amps for the Cold Reversing Mill No. 1 (CRM-1). Based on a 30-day operation period, the fan amperage range was established between 35 - 48 amps for the Cold Reversing Mill No. 2 (CRM-2). New fan amperage operating ranges will be established for CRM1ME2 upon startup and operation of the voluntary pollution control upgrade.</p> <p>The indicators (fan amperage) shall be used to provide assurance of compliance with each applicable requirement. The Mist Eliminator and Fume Exhaust System (CRM1ME1), Mist Eliminator and Fume Exhaust System (CRM1ME2), Mist Eliminator (CRM2ME1), and Mist Eliminator (CRM2ME2) shall be in place and operational whenever processes controlled by them are running, except during periods of control device malfunction or mechanical failure.</p> <p>These operational ranges for the monitored parameters were derived from data, which demonstrate a reasonable assurance of compliance.</p> <p>QA/QC practices, etc. shall consist of the meter fan amperage being recorded per shift in a log, for each control device, unless the mist eliminator is not in operation. The Cold Reversing Mill No. 1 and Cold Reversing Mill No. 2 shall undergo component inspections and maintenance in accordance with manufacturer's recommendations.</p> <p>An excursion is defined as any operating condition where the indicator is outside of the approved range for the specified averaging period. Upon detecting an excursion, the owner/operator shall restore operation of the pollutant-specific emissions unit (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing any startup, shutdown, or malfunction period and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion (other than those caused by excused startup and shutdown conditions).</p>			

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions								
	<p>The owner/operator shall develop, implement, and maintain a Quality Improvement Plan (QIP) as specified in §64.8, when a pollutant-specific emission unit has accumulated exceedances or excursions exceeding 5 percent duration of the unit's operating time for a reporting period, or when instructed to do so by the Department pursuant to §64.7(d)(2).</p> <p>A semiannual report for monitoring shall include, at a minimum, the information required under § 70.6(a)(3)(iii) and the following information as applicable:</p> <p>Summary information of the number, duration, and cause (including unknown cause, if applicable) of excursions, as applicable, and the corrective actions taken;</p> <p>Summary information on the number, duration, and cause (including unknown cause, if applicable) for monitor downtime incidents (other than downtime associated with zero and span or other daily calibration checks, if applicable);</p> <p>If applicable, a description of the actions taken to implement a Quality Improvement Plan (QIP) during the reporting period as specified in §64.8. Upon completion of a QIP, the owner/operator shall include in the next summary report documentation that the implementation of the plan has been completed and reduced the likelihood of similar levels of excursions occurring.</p> <p>The owner/operator shall maintain records of monitoring data, monitor performance data, corrective action, and quality improvement plans. The records shall include calculations of the percent duration of accumulated exceedances or excursions during the reporting period per pollutant-specific emission unit, updated monthly.</p>								
C.69	<p>Emission Unit ID: 09 Equipment ID: GL-PF and GL-RF Control Device ID: NOX1</p> <p>These sources are subject to 40 CFR 64, Compliance Assurance Monitoring and shall comply with all applicable provisions.</p> <p>The control device, pollutant, applicable regulation, and emission limit(s) are as follows:</p> <table><tr><th>Control Device</th><th>Pollutant</th><th>Applicable Regulation</th><th>Emission Limit(s)</th></tr><tr><td>SNCR/SCR Hybrid (NOX1)</td><td>NO_x</td><td>S.C. Regulation 61-62.5, Standard No. 7</td><td>6.44 lb/hr and 28.21 tpy</td></tr></table> <p>To meet the requirements of 40 CFR 64 the owner/operator shall continue to monitor the control temperatures for the SNCR/SCR Hybrid (NOX1) and natural gas flow rate to the furnaces. The control</p>	Control Device	Pollutant	Applicable Regulation	Emission Limit(s)	SNCR/SCR Hybrid (NOX1)	NO _x	S.C. Regulation 61-62.5, Standard No. 7	6.44 lb/hr and 28.21 tpy
Control Device	Pollutant	Applicable Regulation	Emission Limit(s)						
SNCR/SCR Hybrid (NOX1)	NO _x	S.C. Regulation 61-62.5, Standard No. 7	6.44 lb/hr and 28.21 tpy						

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>temperature is defined as the temperature range used to automatically regulate injection times, as determined by a thermocouple located downstream of the injection point. For the preheat furnace (GL-PF), the operating temperature range is greater than 1,250 °F. For the radiant tube furnace (GL-RF), the operating temperature range is greater than 550 °F. The natural gas flow rate is also monitored to automatically regulate injection rates. The injection control tables are set up for each furnace (radiant and preheat) as a percentage of that furnaces' natural gas total flow. At a minimum, natural gas flow of at least 60% leads to injection.</p> <p>The indicators (control temperatures and natural gas flow rate) shall be used to provide assurance of compliance with each applicable requirement. The SNCR/SCR Hybrid (NOX1) shall be in place and operational whenever processes controlled by it are running, except during periods of SNCR/SCR Hybrid (NOX1) malfunction or mechanical failure.</p> <p>These operational ranges for the monitored parameters were derived from data, which demonstrate a reasonable assurance of compliance.</p> <p>QA/QC practices, etc. shall consist of recording the control temperature for the preheat furnace and radiant tube furnace during periods of time when the SNCR/SCR Hybrid (NOX1) is operating at least every fifteen (15) minutes. All control temperatures and natural gas flow percentages shall be recorded in an electronic log. Inspections and maintenance shall be conducted according to manufacturer recommendations. During times of startup and at times when product demand does not generate sufficient heat to trigger injection, the owner or operator shall demonstrate compliance through the use of low-NO_x burners and good combustion practices.</p> <p>An excursion is defined as any operating condition where the indicator is outside of the approved range for the specified averaging period. Upon detecting an excursion, the owner/operator shall restore operation of the pollutant-specific emissions unit (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing any startup, shutdown, or malfunction period and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion (other than those caused by excused startup and shutdown conditions).</p> <p>The owner/operator shall develop, implement, and maintain a Quality Improvement Plan (QIP) as specified in §64.8, when a pollutant-specific emission unit has accumulated exceedances or excursions exceeding 5 percent duration of the unit's operating time for a reporting period, or when instructed to do so by the Department pursuant to §64.7(d)(2).</p> <p>A semiannual report for monitoring shall include, at a minimum, the information required under § 70.6(a)(3)(iii) and the following information as applicable:</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions								
	<p>Summary information of the number, duration, and cause (including unknown cause, if applicable) of excursions, as applicable, and the corrective actions taken;</p> <p>Summary information on the number, duration, and cause (including unknown cause, if applicable) for monitor downtime incidents (other than downtime associated with zero and span or other daily calibration checks, if applicable);</p> <p>If applicable, a description of the actions taken to implement a Quality Improvement Plan (QIP) during the reporting period as specified in §64.8. Upon completion of a QIP, the owner/operator shall include in the next summary report documentation that the implementation of the plan has been completed and reduced the likelihood of similar levels of excursions occurring.</p> <p>The owner/operator shall maintain records of monitoring data, monitor performance data, corrective action, and quality improvement plans. The records shall include calculations of the percent duration of accumulated exceedances or excursions during the reporting period per pollutant-specific emission unit, updated monthly.</p>								
C.70	<p>Emission Unit ID: 15</p> <p>Equipment ID: 807, 808, 809, 810/812, 811, 817, 818, 819, 822, 824, 825/826, 827, 828, 829, 830, 831, 832, 833, 834, 835, and 836</p> <p>Control Device ID: DRI-SH1, DRI-SH2, DRI-DC1, DRI-DC2, DRI-DC3, DRI-DC4, DRI-DC9, DRI-DC10, DRI-DC11, DRI-DC14, DRI-DC16, DRI-DC17, DRI-DC18, DRI-DC19, DRI-DC20, DRI-DC21, DRI-DC24, DRI-DC25, DRI-DC26, DRI-27, and DRI-DC28</p> <p>These sources are subject to 40 CFR 64, Compliance Assurance Monitoring and shall comply with all applicable provisions.</p> <p>The control device, pollutant, applicable regulation, and emission limits are as follows:</p> <table><tr><th>Control Device(s)</th><th>Pollutant</th><th>Applicable Regulation</th><th>Emission Limit(s)</th></tr><tr><td>Hopper Baghouse (DRI-SH1) Hopper Baghouse (DRI-SH2) Conveyor Transition Point Baghouse (DRI-DC1) Conveyor Baghouse (DRI-DC3) Conveyor Baghouse (DRI-DC11) Grizzly Baghouse (DRI-DC14)</td><td>PM (filterable)</td><td>S.C. Regulation 61-62.5, Standard No. 4</td><td>71.16 lb/hr, each</td></tr></table>	Control Device(s)	Pollutant	Applicable Regulation	Emission Limit(s)	Hopper Baghouse (DRI-SH1) Hopper Baghouse (DRI-SH2) Conveyor Transition Point Baghouse (DRI-DC1) Conveyor Baghouse (DRI-DC3) Conveyor Baghouse (DRI-DC11) Grizzly Baghouse (DRI-DC14)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	71.16 lb/hr, each
Control Device(s)	Pollutant	Applicable Regulation	Emission Limit(s)						
Hopper Baghouse (DRI-SH1) Hopper Baghouse (DRI-SH2) Conveyor Transition Point Baghouse (DRI-DC1) Conveyor Baghouse (DRI-DC3) Conveyor Baghouse (DRI-DC11) Grizzly Baghouse (DRI-DC14)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	71.16 lb/hr, each						

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Condition Number	Conditions			
	Conveyor Transition Point Baghouse (DRI-DC2, DRI-DC4) Conveyor Baghouse (DRI-DC9) Conveyor Baghouse (DRI-DC10) Conveyors Baghouse (DRI-DC16) Silos Baghouse (DRI-DC17, DRI-DC18)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	79.97 lb/hr, each
	Silos Baghouse (DRI-DC19, DRI-DC20, DRI-DC21) Conveyor/Day Bins Baghouse (DRI-DC24)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	64.76 lb/hr, each
	Conveyor Baghouse (DRI-DC25) Conveyor Baghouse (DRI-DC26) Conveyor Baghouse (DRI-DC27) Conveyor Baghouse (DRI-DC28)	PM (filterable)	S.C. Regulation 61-62.5, Standard No. 4	60.96 lb/hr, each
To meet the requirements of 40 CFR 64 the owner/operator shall continue to operate and maintain pressure drop gauges on each baghouse with the monitoring approach shown below:				
I. Indicator Measurement Approach				
Pressure Drop – Pressure drop across the baghouse is measured with a differential pressure gauge.				
II. Indicator Range				
An excursion is defined as a pressure drop outside of an established pressure drop range of 1 to 10 inches H ₂ O for each baghouse. Excursions trigger and inspection, corrective action, and a reporting requirement.				
III. Performance Criteria				
A. Data Representativeness		Pressure taps are located at the baghouse inlet and outlet. The gauges have a minimum accuracy as specified in the manufacturer’s specifications.		
B. Verification of Operational Status		Not Applicable		
C. QA/QC Practices and Criteria		The pressure gauge is periodically verified and calibrated or replaced as needed.		
D. Monitoring Frequency		Daily during source operation.		
IV. Data Collection Procedures				
Data Collection Procedures		Manually or electronically recorded daily.		
Averaging Period		Not Applicable		
The indicators shown shall be used to provide assurance of compliance with each applicable requirement. The baghouses shall be in place and operational whenever processes controlled by them are running, except during periods of control device malfunction or mechanical failure.				
These operational ranges for the monitored parameters were derived from data, which demonstrate a reasonable assurance of compliance.				
QA/QC practices, etc. shall consist of periodic calibration of pressure gauges and trained personnel				

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>to perform inspections and maintenance.</p> <p>An excursion is defined as any operating condition where the indicator is outside of the approved range for the specified averaging period. Upon detecting an excursion, the owner/operator shall restore operation of the pollutant-specific emissions unit (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing any startup, shutdown, or malfunction period and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion (other than those caused by excused startup and shutdown conditions).</p> <p>The owner/operator shall develop, implement, and maintain a Quality Improvement Plan (QIP) as specified in §64.8, when a pollutant-specific emission unit has accumulated exceedances or excursions exceeding 5 percent duration of the unit's operating time for a reporting period, or when instructed to do so by the Department pursuant to §64.7(d)(2).</p> <p>A semiannual report for monitoring shall include, at a minimum, the information required under § 70.6(a)(3)(iii) and the following information as applicable:</p> <p>Summary information of the number, duration, and cause (including unknown cause, if applicable) of excursions, as applicable, and the corrective actions taken;</p> <p>Summary information on the number, duration, and cause (including unknown cause, if applicable) for monitor downtime incidents (other than downtime associated with zero and span or other daily calibration checks, if applicable);</p> <p>If applicable, a description of the actions taken to implement a Quality Improvement Plan (QIP) during the reporting period as specified in §64.8. Upon completion of a QIP, the owner/operator shall include in the next summary report documentation that the implementation of the plan has been completed and reduced the likelihood of similar levels of excursions occurring.</p> <p>The owner/operator shall maintain records of monitoring data, monitor performance data, corrective action, and quality improvement plans. The records shall include calculations of the percent duration of accumulated exceedances or excursions during the reporting period per pollutant-specific emission unit, updated monthly.</p>
C.71	<p>This facility is under a Consent Decree Civil No.4-00-3945-24 with EPA and shall continue to comply with all applicable requirements of the Consent Decree.</p> <p>The facility is required to install and operate CEMS in accordance with Consent Decree Civil No.4-00-3945-24 with EPA.</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>(Consent Decree Civil No.4-00-3945-24 Attachment 7(A), 40CFR60 Appendix F Section 4.1, 40CFR60 Appendix F Section 4.2 and 40CFR60.13(d)(1)) After successful completion of the initial RATA for the Melt Shop Baghouse CEMS, the facility shall automatically check its zero (or low level value between 0 and 20% of span value) and span (50 to 100% of span value) calibration drifts at least once daily in accordance with a written procedure. The zero and span must, as a minimum, be adjusted whenever either the 24-hour zero drift or the 24-hour span drift exceeds two times the limit of the applicable performance specification in 40CFR60 Appendix B. The system must allow the amount of the excess zero and span drift to be recorded and quantified whenever specified. If Melt Shop Baghouse CEMS automatically adjusts the data to the corrected calibration values (e.g., microprocessor control) then it must be programmed to record the unadjusted concentration measured in the calibration drift prior to resetting the calibration, if performed, or record the amount of adjustment.</p> <p>(Consent Decree Civil No.4-00-3945-24 Attachment 7(A) and 40CFR60 Appendix F Section 4.3) If either the zero (or low-level) or high-level calibration drift result exceeds twice the applicable 40CFR60 Appendix B drift specification for five(5) consecutive daily periods, the Melt Shop Baghouse CEMS is out-of-control. If either the zero (or low-level) or high-level calibration drift result exceeds four (4) times the applicable 40CFR60 Appendix B drift specification during any calibration check, the Melt Shop Baghouse CEMS is out-of-control. If the Melt Shop Baghouse CEMS is out-of-control, then the necessary corrective action(s) shall be taken as specified in the Melt Shop Baghouse CEMS QC Program. Following the corrective action(s), the calibration drift checks shall be repeated.</p> <p>(Consent Decree Civil No.4-00-3945-24 Attachment 7(A) and 40CFR60 Appendix F Section 4.3.2) During periods that the Melt Shop Baghouse CEMS is out-of-control, the CEMS data may not be used in calculating emission compliance.</p> <p>(Consent Decree Civil No.4-00-3945-24 Attachment 7(A) and 40CFR60 Appendix F Section 4.3.1) The beginning of an out-of-control CEMS period is defined as the time corresponding to the completion of the fifth, consecutive, daily calibration drift check with a calibration drift in excess of two (2) times the allowable limit, or the time corresponding to the completion of the daily calibration drift check preceding the daily calibration drift check that results in a calibration drift in excess of four(4) times the allowable limit. The end of the out-of-control CEMS period is the time corresponding to the completion of the calibration drift check following corrective action that results in the calibration drift's at both the zero (or low-level) and high-level measurement points being within the corresponding allowable calibration drift limit (i.e., either two(2) times or four(4) times the allowable limit in 40CFR60 Appendix B).</p> <p>(Consent Decree Civil No.4-00-3945-24 Attachment 7(A) and 40CFR60 Appendix F Section 3) No later than 180 calendar days after the startup of the Melt Shop Baghouse CEMS, the facility shall have developed, implemented and be operating the CEMS according to a Melt Shop Baghouse QC</p>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	<p>program. At a minimum, the QC program shall include written procedures which should describe in detail, complete, step-by-step procedures and operations for each of the activities specified in paragraphs (e)(1) through (e)(6) of this condition. This QC program shall be kept on-site and made available to Department personnel upon request.</p> <p>(e)(1) Calibration of the Melt Shop Baghouse CEMS.</p> <p>(e)(2) Calibration drift determination and adjustment of the Melt Shop Baghouse CEMS.</p> <p>(e)(3) Preventive maintenance of the Melt Shop Baghouse CEMS (including spare parts inventory).</p> <p>(e)(4) Data recording, calculations and reporting.</p> <p>(e)(5) Accuracy audit procedures including sampling and analysis methods.</p> <p>(e)(6) Program of corrective action for Melt Shop Baghouse CEMS malfunctions.</p> <p>(Consent Decree Civil No.4-00-3945-24 Attachment 7(A) and 40CFR60 Appendix F Section 4.4) All measurements from the Melt Shop Baghouse CEMS shall be retained on file by the facility for five (5) calendar years. However, emission data obtained on each successive day while the CEMS is out-of-control may not be used in the calculation of reported emissions for that period.</p> <p>(Consent Decree Civil No.4-00-3945-24 Attachment 7(A)) The Melt Shop Baghouse CEMS shall be designed and installed to meet the performance specifications of 40CFR60 Appendix B.</p> <p>(Consent Decree Civil No.4-00-3945-24 Attachment 7(A), 40CFR60 Appendix F Section 5 and SC Regulation 61-62.5 Section IV) The Melt Shop Baghouse CEMS shall be audited according to 40CFR60 Appendix F Sections 5 and 6. The facility shall submit CEMS performance evaluation test plans, notifications and final reports to the Bureau of Air Quality's Source Test Evaluation section according to SC Regulation 61-62.1 Section IV and the applicable requirements of 40CFR60 Appendix F.</p>
C.72	<p>Nucor Steel – Berkeley (Permit number 0420-0060) is considered co-located with Steel Technologies. Aggregate emissions shall be considered when determining facility emissions.</p>
C.73	<p>Emission Unit ID: 02 Equipment ID: TP (new equipment only: TP-A, TP-B, TP-C, TP-D) Control Device ID: LNOX-TP</p> <p>The Tundish Preheaters are limited to operating 6,500 hours/yr in order to comply with S.C. Regulation 61-62.5, Standard No. 2. The owner/operator must record operating time daily. Any increase in allowable emission rate must be approved by the Department and may require re-modeling to demonstrate compliance with the above listed standard. Reports of the operating time</p>

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(S.C. Regulation 61-62.1, Section II; S.C. Regulation 61-62.70.6.a.3.i.B)

Condition Number	Conditions
	shall be submitted semiannually. This is a State Only requirement.

D. NESHAP PERIODIC REPORTING SCHEDULE SUMMARY

NESHAP Part	NESHAP Subpart	Compliance Monitoring Report Submittal Frequency	Reporting Period	Report Due Date
63	CCC	Semi-Annual	January 1 – June 30 July 1 – December 31	July 31 st January 31 st
63	SSSS	Semi-Annual	January 1 – June 30 July 1 – December 31	July 31 st January 31 st
63	ZZZZ (Emergency Engines see note 3 and 4)	N/A	N/A	N/A
63	DDDDD (5D)	Annual ⁵ , Biennial ⁶ , or Five-Year ⁶	January 1 – December 31 ⁵ Biennially ⁶ , or Five Years ⁶	Postmarked no later than January 31 following the end of the reporting period

1. This table summarizes only the periodic compliance reporting schedule. Additional reports may be required. See specific NESHAP Subpart for additional reporting requirements and associated schedule.
2. This reporting schedule does not supersede any other reporting requirements including but not limited to 40 CFR Part 60, 40 CFR Part 61, 40 CFR Part 63, and/or Title V. The MACT reporting schedule may be adjusted to coincide with the Title V reporting schedule with prior approval from the Department in accordance with 40 CFR 63.10(a)(5). This request may be made 1 year after the compliance date for the associated MACT standard.
3. Facilities with emergency engines are not required to submit reports. Only facilities with non-emergency engines are required to submit semiannual reports.
4. Facilities with emergency engines shall comply with the operations limits specified in 40 CFR 63.6640(f).
5. Reporting schedule for new affected sources.
6. Reporting schedule for existing affected sources.

N/A = Not Applicable

E. NESHAP – CONDITIONS

Condition Number	Conditions
E.1	All NESHAP notifications and reports shall be sent to the Manager of the Air Toxics Section, South Carolina Department of Health and Environmental Control - Bureau of Air Quality.

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Condition Number	Conditions
E.2	<p>All NESHAP notifications and the cover letter to periodic reports shall be sent to the United States Environmental Protection Agency (US EPA) at the following address or electronically as required by the specific subpart:</p> <p style="text-align: center;">US EPA, Region 4 Air, Pesticides and Toxics Management Division 61 Forsyth Street SW Atlanta, GA 30303</p>
E.3	<p>This facility has processes subject to the provisions of S.C. Regulation 61-62.63 and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants, Subparts A and Subpart CCC – National Emission Standards for Hazardous Air Pollutants for Steel Pickling-HCl Process Facilities and Hydrochloric Acid Regeneration Plants. Existing affected sources shall be in compliance with the requirements of these Subparts by the compliance date, unless otherwise noted. Any new affected sources shall comply with the requirements of these Subparts upon initial start-up unless otherwise noted.</p>
E.4	<p>This facility has processes subject to the provisions of S.C. Regulation 61-62.63 and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants, Subparts A and Subpart SSSS – National Emission Standards for Hazardous Air Pollutants: Surface Coating of Metal Coil. Existing affected sources shall be in compliance with the requirements of these Subparts by the compliance date, unless otherwise noted. Any new affected sources shall comply with the requirements of these Subparts upon initial start-up unless otherwise noted.</p>
E.5	<p>The facility has processes subject to the provisions of 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants (NESHAP), Subparts A (General Provisions) and ZZZZ (NESHAP for Stationary Reciprocating Internal Combustion Engines). Existing affected sources shall comply with the applicable provisions by the compliance date specified in Subpart ZZZZ. Any new affected sources shall comply with the requirements of these Subparts upon initial start-up unless otherwise noted.</p>
E.6	<p>Emergency engines less than or equal to 150 kilowatt (kW) rated capacity, emergency engines greater than 150 kW rated capacity designated for emergency use only and operated a total of 500 hours per year or less for testing and maintenance and have a method to record the actual hours of use, such as an hour meter, and diesel engine driven emergency fire pumps that are operated a total of 500 hours per year or less for testing and maintenance and have a method to record the actual hours of use, such as an hour meter, have been determined to be exempt from construction permitting requirements in accordance with South Carolina Regulation 61-62.1.</p> <p>If present, these sources shall still comply with the requirements of all applicable regulations, including but not limited to the following:</p> <p>New Source Performance Standards (NSPS) 40 CFR 60 Subpart A (General Provisions); NSPS 40 CFR 60 Subpart IIII (Stationary Compression Ignition Internal Combustion Engines);</p>

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Condition Number	Conditions
	NSPS 40 CFR 60 Subpart JJJJ (Stationary Spark Ignition Internal Combustion Engines); National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR 63 Subpart A (General Provisions); and NESHAP 40 CFR 63 Subpart ZZZZ (Stationary Reciprocating Internal Combustion Engines).
E.7	This facility has processes subject to the provisions of S.C. Regulation 61-62.63 and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants, Subparts A and Subpart DDDDD “National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.” Existing affected sources shall be in compliance with the requirements of these Subparts by the compliance date specified in Subpart DDDDD. Any new affected sources shall comply with the requirements of these Subparts upon initial start-up, unless otherwise noted.

F. COMPLIANCE SCHEDULE - RESERVED**G. PERMIT SHIELD**

Condition Number	Conditions
G.1	<p>(S.C. Regulation 61-62.70.6.f) A copy of the "applicability determination" submitted with the Part 70 permit application is included as Attachment – Applicable and Non-Applicable Federal and State Regulations. With the exception of those listed below, compliance with the terms and conditions of this permit shall be deemed compliance with the applicable requirements specified in Attachment – Applicable and Non-Applicable Federal and State Regulations as of the date of permit issuance provided that such applicable requirements are included and are specifically identified in the permit. Exceptions to this are stated below in the Permit Shield Exceptions Table. The owner or operator shall also be shielded from the non-applicable requirements specified in Attachment – Applicable and Non-Applicable Federal and State Regulations. Exceptions to this are stated below in the Permit Shield Exceptions Table.</p> <p>Nothing in the permit shield or in any Part 70 permit shall alter or affect the provisions of Section 303 of the Act, Emergency Orders, of the Clean Air Act; the liability of the owner or operator for any violation of applicable requirements prior to or at the time of permit issuance; the applicable requirements of the Acid Rain Program, consistent with Section 408.a of the Clean Air Act; or the ability of US EPA to obtain information from a source pursuant to Section 114 of the Clean Air Act. In addition, the permit shield shall not apply to emission units in noncompliance at the time of permit issuance, minor permit modifications (S.C. Regulation 61-62.70.7.e.2), group processing of minor permit modifications (S.C. Regulation 61-62.70.7.e.3), or operational flexibility (S.C. Regulation 61-62.70.7.e.5.i), except as specified in S.C. Regulation 61-62.70.7.e.5.iii.</p>

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Permit Shield Exceptions
40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
40 CFR 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines
40 CFR 63 Subpart CCC – National Emissions Standards for Hazardous Air Pollutants for Steel Pickling--HCl Process Facilities and Hydrochloric Acid Regeneration Plants
40 CFR 63 Subpart SSSS - Standards For Hazardous Air Pollutants: Surface Coating of Metal Coil
40 CFR 63 Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
40 CFR 63 Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters
SC Regulation 61-62.5, Standard No. 2 – Ambient Air Quality Standards
SC Regulation 61-62.5, Standard No. 5.2 – Control of Oxides of Nitrogen (NO _x)
SC Regulation 61-62.5, Standard No. 7 – Prevention of Significant Deterioration
SC Regulation 61-62.5, Standard No. 8 – Toxic Air Pollutants
SC Regulation 61-62.68, Chemical Accident Prevention Provisions
SC Regulation 61-62.6, Control of Fugitive Particulate Matter

H. PERMIT FLEXIBILITY

Condition Number	Conditions
H.1	The facility may install, remove, and modify insignificant activities as defined in S.C. Regulation 61-62.70.5.c and exempt sources as listed in S.C. Regulation 61-62.1, Section II.B, without revising or reopening the Title V Operating Permit. A list of insignificant activities/exempt sources must be maintained on site, along with any necessary documentation to support the determination that the activity is insignificant and/or exempt, and shall be made available to a Department representative upon request. The list shall be submitted with the next renewal application.

I. AMBIENT AIR STANDARDS REQUIREMENTS

Condition Number	Conditions
I.1	Air dispersion modeling (or other method) has demonstrated that this facility's operation will not interfere with the attainment and maintenance of any state or federal ambient air standard. Any changes in the parameters used in this demonstration may require a review by the facility to determine continuing compliance with these standards. These potential changes include any decrease in stack height, decrease in stack velocity, increase in stack diameter, decrease in stack exit temperature, increase in building height or building additions, increase in emission rates, decrease in distance between stack and property line, changes in vertical stack orientation, and installation of a rain cap that impedes vertical flow. Parameters that are not required in the determination will not invalidate the demonstration if they are modified. The emission rates used in the determination are

Nucor Steel - Berkeley**TV-0420-0060****Page 99 of 105****I. AMBIENT AIR STANDARDS REQUIREMENTS**

Condition Number	Conditions
	<p>listed in Attachment - Emission Rates for Ambient Air Standards of this permit. Higher emission rates may be administratively incorporated into Attachment - Emission Rates for Ambient Air Standards of this permit provided a demonstration using these higher emission rates shows the attainment and maintenance of any state or federal ambient air quality standard or with any other applicable requirement. Variations from the input parameters in the demonstration shall not constitute a violation unless the maximum allowable ambient concentrations identified in the standard are exceeded.</p> <p>The owner/operator shall maintain this facility at or below the emission rates as listed in Attachment - Emission Rates for Ambient Air Standards, not to exceed the pollutant limitations of this permit. Should the facility wish to increase the emission rates listed in Attachment - Emission Rates for Ambient Air Standards, not to exceed the pollutant limitations in the body of this permit, it may do so by the administrative process specified above. This is a State Only enforceable requirement.</p>

J. PERIODIC REPORTING SCHEDULE

Compliance Monitoring Report Submittal Frequency	Reporting Period (Begins on the effective date of the permit)	Report Due Date
Quarterly	January-March April-June July-September October-December	April 30 July 30 October 30 January 30
Semiannual	January-June April-September July-December October-March	July 30 October 30 January 30 April 30
Note: This reporting schedule does not supersede any federal reporting requirements including but not limited to 40 CFR Part 60, 40 CFR Part 61, and 40 CFR Part 63. All federal reports must meet the reporting time frames specified in the federal standard unless the Department or EPA approves a change.		

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Title V Compliance Certification Submittal Frequency	Reporting Period (Begins on the effective date of the permit)	Report Due Date
Annual	January-December April-March July-June October-September	February 14 May 15 August 14 November 14

L. TITLE V RECORD KEEPING AND REPORTING REQUIREMENTS

Condition Number	Conditions
L.1	Reporting required in this permit, shall be submitted in a timely manner as directed in the Title V Periodic Reporting Schedule and the Title V Compliance Certification Reporting Schedule of this permit. All required reports must be certified by a responsible official consistent with S.C. Regulation 61-62.70.5.d.
L.2	All reports and notifications required under this permit shall be submitted to the person indicated in the specific condition at the following address: 2600 Bull Street Columbia, SC 29201 The contact information for the local Environmental Affairs Regional office can be found at: http://www.scdhec.gov
L.3	Unless elsewhere specified within this permit, all reports required under this permit shall be submitted to the Manager of the Technical Management Section, Bureau of Air Quality.
L.4	All Title V Annual Compliance Certifications shall be sent to the US EPA, Region 4, Air Enforcement Branch and to the Manager of the Technical Management Section, Bureau of Air Quality. US EPA, Region 4 Air Enforcement Branch 61 Forsyth Street SW Atlanta, GA 30303
L.5	(S.C. Regulation 61-62.70.6.a.3.ii) The owner or operator shall comply, where applicable, with the following monitoring/support information collection and retention record keeping requirements: 1. Records of required monitoring information shall include the following: a. The date, place as defined in the permit, and time of sampling or measurements; b. The date(s) analyses were performed; c. The company or entity that performed the analyses; d. The analytical techniques or methods used; e. The results of such analyses; and f. The operating conditions as existing at the time of sampling or measurement; 2. Records of all required monitoring data and support information shall be retained for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all

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Condition Number	Conditions
	original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit.
L.6	<p>(S.C. Regulation 61-62.1, Section II.J.1.c) For sources not required to have continuous emission monitors, any malfunction of air pollution control equipment or system, process upset, or other equipment failure which results in discharges of air contaminants lasting for one (1) hour or more and which are greater than those discharges described for normal operation in the permit application, shall be reported to the Department within twenty-four (24) hours after the beginning of the occurrence and a written report shall be submitted to the Department within thirty (30) days. The written report shall include, at a minimum, the following:</p> <ol style="list-style-type: none">1. The identity of the stack and/or emission point where the excess emissions occurred;2. The magnitude of excess emissions expressed in the units of the applicable emission limitation and the operating data and calculations used in determining the excess emissions;3. The time and duration of excess emissions;4. The identity of the equipment causing the excess emissions;5. The nature and cause of such excess emissions;6. The steps taken to remedy the malfunction and the steps taken or planned to prevent the recurrence of such malfunction;7. The steps taken to limit the excess emissions; and,8. Documentation that the air pollution control equipment, process equipment, or processes were at all times maintained and operated, to the maximum extent practicable, in a manner consistent with good practice for minimizing emissions. <p>The initial twenty-four (24) hour notification should be made to the Department's local Environmental Affairs Regional office.</p> <p>The written report should be sent to the Manager of the Technical Management Section, Bureau of Air Quality and the local Environmental Affairs Regional office.</p>
L.7	<p>(S.C. Regulation 61-62.70.6.c.5.iii) The responsible official shall certify, annually, compliance with the conditions of this permit as required under S.C. Regulation 61-62.70.6.c. The compliance certification shall include the following:</p> <ol style="list-style-type: none">1. The identification of each term or condition of the permit that is the basis of the certification.2. The identification of the method(s) or means used by the owner or operator for determining the compliance status with each term and condition of the permit during the certification period.3. The status of compliance with the terms and conditions of the permit for the period covered by the certification, including whether compliance during the period was continuous or intermittent. The certification shall be based on the method or means designated in S.C. Regulation 61-62.70.6.c.5.iii.B. The certification shall identify each deviation and take it into account in the compliance certification.4. Such other facts as the Department may require to determine the compliance status of the

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Condition Number	Conditions
	source.
L.8	(S.C. Regulation 61-62.1, Section II.M) Within 30 days of the transfer of ownership/operation of a facility, the current permit holder and prospective new owner or operator shall submit to the Director of Air Permitting a written request for transfer of the source operating or construction permits. The written request for transfer of the source operating or construction permit shall include any changes pertaining to the facility name and mailing address; the name, mailing address, and telephone number of the owner or operator for the facility; and any proposed changes to the permitted activities of the source. Transfer of the operating or construction permits will be effective upon written approval by the Department.

M. GENERAL FACILITY WIDE

Condition Number	Conditions
M.1	The owner or operator shall comply with S.C. Regulation 61-62.2 "Prohibition of Open Burning."
M.2	The owner or operator shall comply with S.C. Regulation 61-62.3 "Air Pollution Episodes."
M.3	The owner or operator shall comply with S.C. Regulation 61-62.4 "Hazardous Air Pollution Conditions."
M.4	The owner or operator shall comply with S.C. Regulation 61-62.6 "Control of Fugitive Particulate Matter", Section III "Control of Fugitive Particulate Matter Statewide."
M.5	The owner or operator shall comply with the standards of performance for asbestos abatement operations pursuant to 40 CFR Part 61.145, including, but not limited to, requirements governing training, licensing, notification, work practice, cleanup, and disposal.
M.6	The owner or operator shall comply with the standards of performance for asbestos abatement operations pursuant to S.C. Regulation 61-86.1, including, but not limited to, requirements governing training, licensing, notification, work practice, cleanup, and disposal.
M.7	The owner or operator shall comply with the standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F, Protection of Stratospheric Ozone, Recycling and Emissions Reduction, except as provided for motor vehicle air conditioners (MVACs) in Subpart B. If the owner or operator performs a service on motor (fleet) vehicles that involves ozone-depleting substance refrigerant in MVACs, the owner or operator is subject to all applicable requirements of 40 CFR Part 82, Subpart B, Servicing of MVACs.
M.8	(S.C. Regulation 61-62.70.6.a.5) The provisions of this permit are severable, and if any provision of this permit, or application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.
M.9	(S.C. Regulation 61-62.70.6.a.6.i) The owner or operator must comply with all of the conditions of this permit. Any permit noncompliance constitutes a violation of the S.C. Pollution Control Act and/or the Federal Clean Air Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of permit renewal application.

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Condition Number	Conditions
M.10	(S.C. Regulation 61-62.70.6.a.6.ii) It shall not be a defense for an owner or operator in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
M.11	(S.C. Regulation 61-62.70.6.a.6.iii) The permit may be modified, revoked, reopened and reissued, or terminated for cause by the Department. The filing of a request by the owner or operator for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.
M.12	(S.C. Regulation 61-62.70.6.a.6.iv) The permit does not convey any property rights of any sort, or any exclusive privilege.
M.13	(S.C. Regulation 61-62.70.6.a.6.v) The owner or operator shall furnish to the Department, within a reasonable time, any information that the Department may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the owner or operator shall also furnish to the Department copies of records required to be kept by the permit or, for information claimed to be confidential, the owner or operator may furnish such records directly to the Administrator along with a claim of confidentiality. The Department may also request that the owner or operator furnish such records directly to the Administrator along with a claim of confidentiality.
M.14	(S.C. Regulation 61-62.70.6.a.8) No permit revision shall be required, under any approved economic incentives, marketable permits, emissions trading and other similar programs or processes for changes that are provided for in this permit.
M.15	(S.C. Regulation 61-62.70.6.c.2) Upon presentation of credentials and other documents as may be required by law, the owner or operator shall allow the Department or an authorized representative to perform the following: <ol style="list-style-type: none">1. Enter upon the owner or operator's premises where a Part 70 source is located or emissions-related activity is conducted, or where records must be kept under the conditions of the permit.2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit.3. Inspect any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit.4. As authorized by the Act and/or the S.C. Pollution Control Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit or applicable requirements.
M.16	(S.C. Regulation 61-62.70.6.g) In the case of an emergency, as defined in S.C. Regulation 61-62.70.6.g.1, the owner or operator shall demonstrate an affirmative defense of emergency through properly signed, contemporaneous operating logs, or other relevant evidence that: <ol style="list-style-type: none">1. An emergency occurred and that the owner or operator can identify the cause(s) of the emergency;2. The permitted facility was at the time being properly operated; and3. During the period of the emergency the owner or operator took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements

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M. GENERAL FACILITY WIDE

Condition Number	Conditions
	<p>in the permit; and</p> <p>4. The owner or operator shall submit verbal notification of the emergency to the Department within twenty-four (24) hours of the time when emission limitations were exceeded, followed by written notifications within thirty (30) days. This notice fulfills the requirement of S.C. Regulation 61-62.70.6.a.3.iii.B. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.</p> <p>This provision is in addition to any emergency or upset provision contained in any applicable requirement. In any enforcement proceeding, the owner or operator seeking to establish the occurrence of an emergency has the burden of proof.</p>
M.17	(S.C. Regulation 61-62.70.6.a.1.ii) Where an applicable requirement of the Act is more stringent than an applicable requirement of regulations promulgated under Title IV of the Act, both provisions shall be incorporated into the permit and shall be enforceable by the Administrator.
M.18	(S.C. Regulation 61-62.70.6.a.4) According to S.C. Regulation 61-62.70.6.a.4, the owner or operator is prohibited from emissions exceeding any allowances that the source lawfully holds under Title IV of the Act or the regulations promulgated thereunder. No permit revision shall be required for increases in emissions that are authorized by allowances acquired pursuant to the acid rain program, provided that such increases do not require a permit revision under any other applicable requirement. No limit shall be placed on the number of allowances held by a source. The source may not, however, use allowances as a defense to noncompliance with any other applicable requirement. Any such allowances shall be accounted for according to the procedures established in regulations promulgated under Title IV of the Act.
M.19	(S.C. Regulation 61-62.70.7.c.1.ii) Permit expiration terminates the source's right to operate unless a timely and complete renewal application has been submitted consistent with S.C. Regulation 61-62.70.5.a.1.iii, 62.70.5.a.2.iv, and 62.70.7.b. In this case, the permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the permit including any permit shield that may be granted pursuant to S.C. Regulation 61-62.70.6.f shall remain in effect until the renewal permit has been issued or denied.
M.20	Requests for permit modification and amendments shall be submitted on the appropriate Department approved Title V Modification Form(s).
M.21	(S.C. Regulation 61-62.70.6.a.7) The owners or operators of Part 70 sources shall pay fees to the Department consistent with the fee schedule approved pursuant to S.C. Regulation 61-62.70.9. Failure to pay applicable fee can be considered grounds for permit revocation.
M.22	<p>(S.C. Regulation 61-62.1, Section III) The owners or operators of Part 70 sources shall complete and submit a new updated emissions inventory consistent with the schedule approved pursuant to S.C. Regulation 61-62.1, Section III. These Emissions Inventory Reports shall be submitted to the Manager of the Emissions Inventory Section, Bureau of Air Quality.</p> <p>This requirement notwithstanding, an emissions inventory may be required at any time in order to determine the compliance status of any facility.</p>
M.23	This permit expressly incorporates insignificant activities. Emissions from these activities shall be included in the emissions inventory submittals as required by S.C. Regulation 61-62.1, Section

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M. GENERAL FACILITY WIDE

Condition Number	Conditions
	III.B.2.g.
M.24	(S.C. Regulation 61-62.1, Section II.J.1.a) No applicable law, regulation, or standard will be contravened.
M.25	(S.C. Regulation 61-62.1, Section II.J.1.e) Any owner or operator who constructs or operates a source or modification not in accordance with the application submitted pursuant to S.C. Regulation 61-62.1 or with the terms of any approval to construct, or who commences construction after the effective date of S.C. Regulation 61-62.1 without applying for and receiving approval hereunder, shall be subject to enforcement action.

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The emission rates listed herein are not considered enforceable limitations but are used to evaluate ambient air quality impact. Until the Department makes a determination that a facility is causing or contributing to an exceedance of a state or federal ambient air quality standard, increases to these emission rates are not in themselves considered violations of these ambient air quality standards (see Ambient Air Standards Requirements).

AMBIENT AIR QUALITY STANDARDS – STANDARD NO. 2					
Emission Point ID	Emission Rates (lbs/hr)				
	PM ₁₀ 24-hr	PM _{2.5} 24-hr	PM _{2.5} Annual	CO	Lead
100	59.44544	40.00067	40.00067	1404.3089	1.09E-01
100A	33.73073	21.58766	21.58767	494.59226	3.62E-02
101	1.65082	1.64288	1.32542	10.570	4.97E-05
102	0.16429	0.11746	0.11746	1.260	5.92E-06
105	0.29445	0.29445	0.29445	3.490	1.85E-05
200	0.55001	0.55001	0.55001	7.064	3.62E-05
201	0.13968	0.13968	0.13968	4.200	9.17E-06
202	0.57779	0.57779	0.57779	7.064	3.80E-05
204	1.38098	1.38098	1.38098	15.500	9.07E-05
205	0.10794	0.10794	0.10794	2.100	7.11E-06
206	0.10794	0.10794	0.10794	2.100	7.11E-06
300	2.44449	2.25401	2.25401	--	--
301A	0.11508	0.11508	0.11508	1.3015	7.55E-06
301B	0.11508	0.11508	0.11508	1.3015	7.55E-06
303	2.00003	2.00003	2.00003	--	--
304	--	--	--	10.100	--
305	0.73969	0.73969	0.73970	8.889	4.83E-03
306	1.29367	1.16669	1.16669	--	--
307A	0.11508	0.11508	0.11508	1.3015	7.55E-06
307B	0.11508	0.11508	0.11508	1.3015	7.55E-06
309	2.61116	2.18258	2.18258	--	--
310	0.17143	0.44604	0.44604	--	--
311	0.03722	0.03722	0.03722	--	2.45E-06
312	0.02048	0.02048	0.02048	--	1.35E-06
314	0.15953	0.15953	0.15953	--	1.05E-05
320	0.73573	0.73573	0.73573	8.12712	4.84E-05
321	0.16429	0.16429	0.16429	1.81194	1.08E-05
322A	0.05587	0.05587	0.05587	0.61763	3.68E-06

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Emission Point ID	Emission Rates (lbs/hr)				
	PM ₁₀ 24-hr	PM _{2.5} 24-hr	PM _{2.5} Annual	CO	Lead
322B	0.01492	0.01492	0.01492	0.16469	9.80E-07
323	0.18889	0.18889	0.18889	--	--
330A	0.11508	0.11508	0.11508	1.26828	7.55E-06
330B	0.11508	0.11508	0.11508	1.26828	7.55E-06
332	2.72227	2.50798	2.50798	--	--
600	2.34137	0.65356	0.50330	--	1.23E-06
601	0.85716	0.85716	0.85716	--	1.18E-06
602	0.10000	0.10000	0.03421	0.206	--
701a	0.48572	0.48572	0.48572	38.62932	3.53E-06
701b	0.04000	0.04000	0.04000	--	--
702	0.37382	0.37382	0.37382	6.127	2.46E-05
703	0.37382	0.37382	0.37382	3.00323	2.46E-05
802	0.48017	0.48017	0.48017	--	--
803	0.19683	0.19683	0.19683	--	--
804	0.25715	0.25715	0.25715	--	--
804F	0.00026	0.00004	0.00004	--	--
804V	0.03508	0.00531	0.00521	--	--
805	0.32540	0.32540	0.32540	--	--
805F	0.46826	0.07095	0.07095	--	--
806	0.12857	0.12857	0.12857	--	--
806F	0.00011	0.00002	0.00002	--	--
807	0.46271	0.46271	0.13175	--	--
807F	4.65087	0.70477	0.06667	--	--
808	0.32143	0.32143	0.09207	--	--
808F	4.65087	0.70477	0.06667	--	--
809	0.03857	0.03857	0.01103	--	--
809F	0.03897	0.01381	0.00131	--	--
810	0.02571	0.02571	0.00529	--	--
810F	0.15635	0.05524	0.00656	--	--
811	0.03857	0.03857	0.01103	--	--
811F	0.03897	0.01381	0.00131	--	--
817	0.03857	0.03857	0.01103	--	--
817F	0.07802	0.02762	0.00261	--	--

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Emission Point ID	Emission Rates (lbs/hr)				
	PM ₁₀ 24-hr	PM _{2.5} 24-hr	PM _{2.5} Annual	CO	Lead
818	0.03857	0.03857	0.01103	--	--
818F	0.15635	0.05524	0.00656	--	--
819	0.03857	0.03857	0.00256	--	--
819F	0.07802	0.02762	0.00134	--	--
822	0.77144	0.77144	0.05119	--	--
822F	2.32544	0.35239	0.01706	--	--
824	0.03857	0.03857	0.00793	--	--
824F	0.15635	0.05524	0.00656	--	--
825	0.03857	0.03857	0.00793	--	--
825826F	0.15635	0.05524	0.00656	--	--
827	0.02571	0.02571	0.02571	--	--
827F	0.04548	0.01611	0.00175	--	--
828	0.02571	0.02571	0.02571	--	--
828F	0.04548	0.01611	0.00175	--	--
829	0.02571	0.02571	0.02571	--	--
829F	0.04548	0.01611	0.00175	--	--
830	0.05143	0.05143	0.05143	--	--
830F	0.00186	0.00066	0.00066	--	--
831	0.05143	0.05143	0.05143	--	--
831F	0.00186	0.00066	0.00066	--	--
832	0.03857	0.03857	0.03857	--	--
832F	0.04548	0.01611	0.00656	--	--
833	0.02571	0.02571	0.02571	--	--
833F	0.03246	0.01151	0.00329	--	--
834	0.02571	0.02571	0.02571	--	--
834F	0.03246	0.01151	0.00329	--	--
835	0.02571	0.02571	0.02571	--	--
835F	0.03246	0.01151	0.00329	--	--
836	0.02571	0.02571	0.02571	--	--
836F	0.03246	0.01151	0.00329	--	--
ALLOYSTG	0.02895	0.01077	0.01077	--	--
BM	0.54683	0.06833	0.06833	--	--
BM1	1.09526	0.42778	0.42779	--	--

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	PM ₁₀ 24-hr	PM _{2.5} 24-hr	PM _{2.5} Annual	CO	Lead
BM2	1.09526	0.42778	0.42779	--	--
BM3	1.09526	0.42778	0.42779	--	--
CLSEC313	0.86509	0.86509	0.86509	--	--
CM1	1.03970	0.43890	0.43890	--	3.72E-06
CM2	1.56352	0.96827	0.95240	2.76830	3.82E-05
CM3	1.50796	0.90478	0.88890	2.76830	3.31E-05
CMSGEN	0.00002	0.00002	0.00002	--	--
CSP1	0.22937	0.02865	0.02865	--	--
CSP2	0.27540	0.03437	0.03437	--	--
CT14A	0.14127	0.00240	0.00054	--	--
CT14B	0.14127	0.00240	0.00054	--	--
CT4A	0.16588	0.00265	0.00066	--	--
CT4B	0.16588	0.00265	0.00066	--	--
CT4C	0.06000	0.00101	0.00101	--	--
CT5A	0.38334	0.00881	0.00110	--	--
CT5B	0.38334	0.00881	0.00110	--	--
DG	0.16349	0.00360	0.00050	--	--
DOOR11	0.11111	0.03937	0.03937	--	--
DOOR20	1.88098	1.65082	1.50003	2.15083	5.83E-04
EMGEN1	0.06429	0.06238	0.00857	--	--
EMGEN10	0.00006	0.00006	0.00002	--	--
EMGEN11	0.00006	0.00006	0.00002	--	--
EMGEN2	0.06429	0.06238	0.00857	--	--
EMGEN3	0.02492	0.02492	0.00683	--	--
EMGEN5	0.02064	0.02064	0.00565	--	--
EMGEN8	0.00507	0.00507	0.00139	--	--
EMWP3	0.00921	0.00921	0.00251	--	--
EMWP4	0.01833	0.01833	0.00502	--	--
EMWP5	0.07333	0.07333	0.02008	--	--
EMWP6	0.01833	0.01833	0.00502	--	--
EMWP7	0.03667	0.03667	0.01008	--	--
EMWP8	0.00733	0.00733	0.00201	--	--
EMWP9	0.00379	0.00379	0.00104	--	--

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	PM ₁₀ 24-hr	PM _{2.5} 24-hr	PM _{2.5} Annual	CO	Lead
FUG1B	0.03421	0.00984	0.00984	--	--
GEN12	0.00372	0.00372	0.00102	1.56510	--
GL1V	0.11508	0.11508	0.11508	--	--
GL2V	0.10873	0.10476	0.10476	--	--
HM1	0.56906	0.23096	0.22937	--	--
HM2	0.56906	0.23096	0.22937	--	--
HM3	0.56906	0.23096	0.22937	--	--
IA_SC	0.03524	0.03524	0.03524	--	--
ITGEN	0.00365	0.00365	0.00100	--	--
LIMESILO	0.02571	0.02571	0.00122	--	--
MH5	0.00335	0.00335	0.00112	--	2.21E-07
NCT1_1	0.63017	0.00984	0.00321	--	--
NCT1_2	0.63017	0.00984	0.00321	--	--
NCT1_3	0.63017	0.00984	0.00321	--	--
NCT1_4	0.63017	0.00984	0.00321	--	--
NCT13_1	0.67144	0.01048	0.00341	--	--
NCT13_2	0.67144	0.01048	0.00341	--	--
NCT3_1	0.27302	0.00427	0.00139	--	--
NCT3_2	0.27302	0.00427	0.00139	--	--
NCT3_3	0.27302	0.00427	0.00139	--	--
NCT3_4	0.27302	0.00427	0.00139	--	--
NCT3_5	0.05000	0.000767	0.000767	--	--
NCT6_1	0.13572	0.00395	0.00050	--	--
NCT6_2	0.13572	0.00395	0.00050	--	--
NCTGALV1	0.03524	0.00060	0.00013	--	--
NCTGALV2	0.03524	0.00060	0.00013	--	--
NCTGALV3	0.03524	0.00060	0.00013	--	--
NCTGALV4	0.03524	0.00060	0.00013	--	--
NCTGALV5	0.03524	0.00060	0.00013	--	--
NCTGALV6	0.03524	0.00060	0.00013	--	--
NCTGLUT1	0.02191	0.00064	0.00008	--	--
NCTGLUT2	0.02191	0.00064	0.00008	--	--
NCTGLUT3	0.02191	0.00064	0.00008	--	--

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	PM ₁₀ 24-hr	PM _{2.5} 24-hr	PM _{2.5} Annual	CO	Lead
NCTHMIN1	0.01532	0.00024	0.00008	--	--
NCTHMIN2	0.01532	0.00024	0.00008	--	--
NCTHMMIN	0.01921	0.00030	0.00010	--	--
NCTKILO1	0.07048	0.00120	0.00027	--	--
NCTKILO2	0.07048	0.00120	0.00027	--	--
NGALVCUT	0.74914	0.74914	0.74914	--	--
PLV1	0.00052	0.00048	0.00048	--	--
PLV10	0.00052	0.00048	0.00048	--	--
PLV11	0.00052	0.00048	0.00048	--	--
PLV12	0.00052	0.00048	0.00048	--	--
PLV13	0.00052	0.00048	0.00048	--	--
PLV14	0.00052	0.00048	0.00048	--	--
PLV15	0.00052	0.00048	0.00048	--	--
PLV16	0.00052	0.00048	0.00048	--	--
PLV17	0.00052	0.00048	0.00048	--	--
PLV18	0.00052	0.00048	0.00048	--	--
PLV19	0.00052	0.00048	0.00048	--	--
PLV2	0.00052	0.00048	0.00048	--	--
PLV21	0.03675	0.02746	0.02746	--	--
PLV22	0.03675	0.02746	0.02746	--	--
PLV23	0.03675	0.02746	0.02746	--	--
PLV24	0.03675	0.02746	0.02746	--	--
PLV25	0.03675	0.02746	0.02746	--	--
PLV26	0.03675	0.02746	0.02746	--	--
PLV3	0.00052	0.00048	0.00048	--	--
PLV4	0.00052	0.00048	0.00048	--	--
PLV5	0.00052	0.00048	0.00048	--	--
PLV6	0.00052	0.00048	0.00048	--	--
PLV7	0.00052	0.00048	0.00048	--	--
PLV8	0.00052	0.00048	0.00048	--	--
PLV9	0.00052	0.00048	0.00048	--	--
RMH_0001	0.00100	0.00029	0.00029	--	--
RMH_0002	0.00100	0.00029	0.00029	--	--

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	PM ₁₀ 24-hr	PM _{2.5} 24-hr	PM _{2.5} Annual	CO	Lead
RMH_0003	0.00100	0.00029	0.00029	--	--
RMH_0004	0.00100	0.00029	0.00029	--	--
RMH_0005	0.00100	0.00029	0.00029	--	--
RMH_0006	0.00100	0.00029	0.00029	--	--
RMH_0007	0.00100	0.00029	0.00029	--	--
RMH_0008	0.00100	0.00029	0.00029	--	--
RMH_0009	0.00100	0.00029	0.00029	--	--
RMH_0010	0.00100	0.00029	0.00029	--	--
RMH_0011	0.00100	0.00029	0.00029	--	--
RMH_0012	0.00100	0.00029	0.00029	--	--
RMH_0013	0.00100	0.00029	0.00029	--	--
RMH_0014	0.00100	0.00029	0.00029	--	--
RMH_0015	0.00100	0.00029	0.00029	--	--
RMH_0016	0.00100	0.00029	0.00029	--	--
RMH_0017	0.00100	0.00029	0.00029	--	--
RMH_0018	0.00100	0.00029	0.00029	--	--
RMH_0019	0.00100	0.00029	0.00029	--	--
RMH_0020	0.00100	0.00029	0.00029	--	--
RMH_0021	0.00100	0.00029	0.00029	--	--
RMH_0022	0.00100	0.00029	0.00029	--	--
RMH_0023	0.00100	0.00029	0.00029	--	--
RMH_0024	0.00100	0.00029	0.00029	--	--
RMH_0025	0.00100	0.00029	0.00029	--	--
RMH_0026	0.00100	0.00029	0.00029	--	--
RMH_0027	0.00100	0.00029	0.00029	--	--
RMH_0028	0.00100	0.00029	0.00029	--	--
RMH_0029	0.00100	0.00029	0.00029	--	--
RMH_0030	0.00100	0.00029	0.00029	--	--
RMH_0031	0.00100	0.00029	0.00029	--	--
RMH_0032	0.00100	0.00029	0.00029	--	--
RMH_0033	0.00100	0.00029	0.00029	--	--
RMH_0034	0.00100	0.00029	0.00029	--	--
RMH_0035	0.00100	0.00029	0.00029	--	--

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	PM ₁₀ 24-hr	PM _{2.5} 24-hr	PM _{2.5} Annual	CO	Lead
RMH_0036	0.00100	0.00029	0.00029	--	--
RMH_0037	0.00100	0.00029	0.00029	--	--
RMH_0038	0.00100	0.00029	0.00029	--	--
RMH_0039	0.00100	0.00029	0.00029	--	--
RMH_0040	0.00100	0.00029	0.00029	--	--
RMH_0041	0.00100	0.00029	0.00029	--	--
RMH_0042	0.00100	0.00029	0.00029	--	--
RMH_0043	0.00100	0.00029	0.00029	--	--
RMH_0044	0.00100	0.00029	0.00029	--	--
RMH_0045	0.00100	0.00029	0.00029	--	--
RMH_0046	0.00100	0.00029	0.00029	--	--
RMH_0047	0.00100	0.00029	0.00029	--	--
RMH_0048	0.00100	0.00029	0.00029	--	--
RMH_0049	0.00100	0.00029	0.00029	--	--
RMH_0050	0.00100	0.00029	0.00029	--	--
RMH_0051	0.00100	0.00029	0.00029	--	--
RMH_0052	0.00100	0.00029	0.00029	--	--
RMH_0053	0.00100	0.00029	0.00029	--	--
RMH_0054	0.00100	0.00029	0.00029	--	--
RMH_0055	0.00100	0.00029	0.00029	--	--
RMH_0056	0.00100	0.00029	0.00029	--	--
RMH_0057	0.00100	0.00029	0.00029	--	--
RMH_0058	0.00100	0.00029	0.00029	--	--
RMH_0059	0.00100	0.00029	0.00029	--	--
RMH_0060	0.00100	0.00029	0.00029	--	--
RMH_0061	0.00100	0.00029	0.00029	--	--
RMH_0062	0.00100	0.00029	0.00029	--	--
RMH_0063	0.00100	0.00029	0.00029	--	--
RMH_0064	0.00100	0.00029	0.00029	--	--
RMH_0065	0.00100	0.00029	0.00029	--	--
RMH_0066	0.00100	0.00029	0.00029	--	--
RMH_0067	0.00100	0.00029	0.00029	--	--
RMH_0068	0.00100	0.00029	0.00029	--	--

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AMBIENT AIR QUALITY STANDARDS – STANDARD NO. 2					
Emission Point ID	Emission Rates (lbs/hr)				
	PM ₁₀ 24-hr	PM _{2.5} 24-hr	PM _{2.5} Annual	CO	Lead
RMH_0069	0.00100	0.00029	0.00029	--	--
RMH_0070	0.00100	0.00029	0.00029	--	--
RMH_0071	0.00100	0.00029	0.00029	--	--
RMH_0072	0.00100	0.00029	0.00029	--	--
RMH_0073	0.00100	0.00029	0.00029	--	--
RMH_0074	0.00100	0.00029	0.00029	--	--
RMH_0075	0.00100	0.00029	0.00029	--	--
SNDBLST	0.63042	0.06304	0.06304	--	--
SPM	0.18889	0.18889	0.18889	--	--
SURGBIN	0.09834	0.03655	0.03655	--	--
WTLS1	0.05143	0.05143	0.10318	--	--
WTLS2	0.05143	0.05143	0.10318	--	--

AMBIENT AIR QUALITY STANDARDS – STANDARD NO. 2				
Emission Point ID	Emission Rates (lbs/hr)			
	SO ₂ Short-term	SO ₂ Annual	NO ₂ 1-hr	NO ₂ Annual
100	160.477725	160.477725	211.9083	162.7011
100A	39.76668	39.76668	14.84152	11.42876
101	0.076	0.076	6.23026	6.40487
102	0.009	0.009	0.74208	0.74208
105	0.025	0.025	2.4683	2.4683
200	0.051	0.051	14.04786	14.04786
201	0.03	0.03	3.55562	3.55562
202	0.051	0.051	13.17482	13.17482
204	0.111	0.111	27.77825	27.77825
205	0.015	0.015	2.75402	2.75402
206	0.015	0.015	2.4683	2.4683
301A	0.009	0.009	1.50796	1.50796
301B	0.009	0.009	1.50796	1.50796
304	0.072	0.072	--	--
305	0.063	0.063	6.43662	6.43662
307A	0.009	0.009	1.50796	1.50796

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AMBIENT AIR QUALITY STANDARDS – STANDARD NO. 2				
Emission Point ID	Emission Rates (lbs/hr)			
	SO ₂ Short-term	SO ₂ Annual	NO ₂ 1-hr	NO ₂ Annual
307B	0.009	0.009	1.50796	1.50796
311	--	--	0.49048	0.49048
312	--	--	0.26985	0.26985
314	--	--	1.04764	1.04764
320	0.05806	0.05806	7.50013	7.50013
321	0.01294	0.01294	1.07938	1.07938
322A	0.00441	0.00441	0.36747	0.36747
322B	0.00118	0.00118	0.09841	0.09841
330A	0.00906	0.00906	0.75478	0.75478
330B	0.00906	0.00906	0.75478	0.75478
600	--	--	0.24704	0.24704
601	0.002	0.002	0.23493	0.23493
602	--	--	2.37306	0.40556
701a	4.09062	4.09062	1.50003	1.50003
702	0.06	0.06	1.72225	1.72225
703	0.02954	0.02954	1.72225	1.72225
CM1	--	--	0.74446	0.74446
CM2	0.01977	0.01977	5.14294	5.17469
CM3	0.01977	0.01977	4.73024	4.76992
CMSGEN	--	--	--	0.00033
DOOR20	0.25659	0.25659	0.70001	0.70001
EMGEN1	--	--	--	0.36747
EMGEN10	--	--	--	0.00029
EMGEN11	--	--	--	0.00029
EMGEN2	--	--	--	0.36747
EMGEN3	--	--	--	0.09603
EMGEN5	--	--	--	0.07937
EMGEN8	--	--	--	0.02778
EMWP3	--	--	--	0.0354
EMWP4	--	--	--	0.0708
EMWP5	--	--	--	0.28334
EMWP6	--	--	--	0.0708
EMWP7	--	--	--	0.14127
EMWP8	--	--	--	0.02833

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AMBIENT AIR QUALITY STANDARDS – STANDARD NO. 2				
Emission Point ID	Emission Rates (lbs/hr)			
	SO ₂ Short-term	SO ₂ Annual	NO ₂ 1-hr	NO ₂ Annual
EMWP9	--	--	--	0.02079
GEN12	0.18588	0.00637	--	0.0204
GL1V	--	--	0.09841	0.09841
HM1	--	--	0.11746	0.12699
HM2	--	--	0.11746	0.12699
HM3	--	--	0.11746	0.12699
IA_SC	--	--	0.49604	0.49604
ITGEN	--	--	--	0.01302
MH5	--	--	0.01468	0.01468

STANDARD NO. 2 AND 7 – EXEMPTED AMBIENT AIR QUALITY STANDARDS EMISSION RATES (lbs/hr)						
Emission Point ID	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	Lead
313	0.86	0.86	--	--	--	--
IA-MH3c	0.06	0.06	0.06	0.75	0.63	--
IA-MH3d	0.02	0.02	0.0012	0.20	0.17	--

TOXIC AIR POLLUTANTS – STANDARD NO. 8				
Emission Point ID	Emission Rates (lbs/hr)			
	Acrolein	Antimony Compounds	Arsenic	Bromoform
	107-02-8	N/A	7440-38-2	75-25-2
101	--	--	1.99E-05	--
102	--	--	2.37E-06	--
105	--	--	7.41E-06	--
100	--	1.17E-01	1.11E-02	--
100A	--	3.89E-02	3.68E-03	--
303	4.80E-03	--	0.00E+00	--
305	--	--	1.40E-05	--
309	4.80E-03	--	0.00E+00	--
312	--	--	5.39E-07	--
320	--	--	1.40E-05	--
600	--	--	4.94E-07	--

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TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Emission Point ID	Emission Rates (lbs/hr)			
	Acrolein	Antimony Compounds	Arsenic	Bromoform
	107-02-8	N/A	7440-38-2	75-25-2
601	--	--	4.71E-07	--
701a	--	--	1.41E-06	--
BM1	4.82E-02	--	--	8.91E-03
BM2	4.82E-02	--	--	8.91E-03
BM3	4.82E-02	--	--	8.91E-03
CM1	3.66E-02	--	1.49E-06	6.78E-03
CM2	3.66E-02	--	1.49E-06	6.78E-03
CM3	3.66E-02	--	1.49E-06	6.78E-03
DOOR20	--	6.27E-04	5.94E-05	--
HM1	3.30E-02	--	2.35E-07	6.11E-03
HM2	3.30E-02	--	2.35E-07	6.11E-03
HM3	3.30E-02	--	2.35E-07	6.11E-03
MH5	--	--	8.84E-08	0.00E+00
PLV1	5.53E-04	--	--	1.02E-04
PLV2	5.53E-04	--	--	1.02E-04
PLV3	5.53E-04	--	--	1.02E-04
PLV4	5.53E-04	--	--	1.02E-04
PLV5	5.53E-04	--	--	1.02E-04
PLV6	5.53E-04	--	--	1.02E-04
PLV7	5.53E-04	--	--	1.02E-04
PLV8	5.53E-04	--	--	1.02E-04
PLV9	5.53E-04	--	--	1.02E-04
PLV10	5.53E-04	--	--	1.02E-04
PLV11	5.53E-04	--	--	1.02E-04
PLV12	5.53E-04	--	--	1.02E-04
PLV13	5.53E-04	--	--	1.02E-04
PLV14	5.53E-04	--	--	1.02E-04
PLV15	5.53E-04	--	--	1.02E-04
PLV16	5.53E-04	--	--	1.02E-04
PLV17	5.53E-04	--	--	1.02E-04
PLV18	5.53E-04	--	--	1.02E-04
PLV19	5.53E-04	--	--	1.02E-04
PLV21	8.76E-04	--	--	1.62E-04

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TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Emission Point ID	Emission Rates (lbs/hr)			
	Acrolein	Antimony Compounds	Arsenic	Bromoform
	107-02-8	N/A	7440-38-2	75-25-2
PLV22	8.76E-04	--	--	1.62E-04
PLV23	8.76E-04	--	--	1.62E-04
PLV24	8.76E-04	--	--	1.62E-04
PLV25	8.76E-04	--	--	1.62E-04
PLV26	8.76E-04	--	--	1.62E-04

TOXIC AIR POLLUTANTS EMISSION RATES - STANDARD NO. 8				
Emission Point ID	Emission Rates (lbs/hr)			
	Cadmium	Carbon Disulfide	Chlorine	Chromium (+6) Compounds
	7440-43-9	75-15-0	7782-50-5	N/A
101	1.09E-04	--	--	1.39E-04
102	1.30E-05	--	--	1.66E-05
105	4.07E-05	--	--	5.19E-05
100	1.90E-02	--	1.32E-01	3.78E-02
100A	6.31E-03	--	4.24E-02	1.25E-02
303	--	9.20E-02	--	--
305	7.71E-05	--	--	9.81E-05
309	--	9.20E-02	--	--
312	2.97E-06	--	--	3.77E-06
320	7.71E-05	--	--	9.81E-05
600	2.71E-06	--	--	3.45E-06
601	2.59E-06	--	--	3.29E-06
701a	7.76E-06	--	--	9.88E-06
BM1	--	5.96E-02	--	--
BM2	--	5.96E-02	--	--
BM3	--	5.96E-02	--	--
CM1	8.19E-06	4.53E-02	--	1.04E-05
CM2	8.19E-06	4.53E-02	--	1.04E-05
CM3	8.19E-06	4.53E-02	--	1.04E-05
CSP1	--	--	1.54E-01	--
CSP2	--	--	1.54E-01	--
CT14A	--	1.96E-04	--	--

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TOXIC AIR POLLUTANTS EMISSION RATES - STANDARD NO. 8				
Emission Point ID	Emission Rates (lbs/hr)			
	Cadmium	Carbon Disulfide	Chlorine	Chromium (+6) Compounds
	7440-43-9	75-15-0	7782-50-5	N/A
CT14B	--	1.96E-04	--	--
CT4A	--	1.09E-03	--	--
CT4B	--	1.09E-03	--	--
CT5A	--	1.76E-03	--	--
CT5B	--	1.76E-03	--	--
DOOR20	1.02E-04	--	--	2.02E-04
HM1	1.29E-06	4.08E-02	--	1.65E-06
HM2	1.29E-06	4.08E-02	--	1.65E-06
HM3	1.29E-06	4.08E-02	--	1.65E-06
MH5	4.86E-07	--	--	6.19E-07
PLV1	--	6.84E-04	--	--
PLV2	--	6.84E-04	--	--
PLV3	--	6.84E-04	--	--
PLV4	--	6.84E-04	--	--
PLV5	--	6.84E-04	--	--
PLV6	--	6.84E-04	--	--
PLV7	--	6.84E-04	--	--
PLV8	--	6.84E-04	--	--
PLV9	--	6.84E-04	--	--
PLV10	--	6.84E-04	--	--
PLV11	--	6.84E-04	--	--
PLV12	--	6.84E-04	--	--
PLV13	--	6.84E-04	--	--
PLV14	--	6.84E-04	--	--
PLV15	--	6.84E-04	--	--
PLV16	--	6.84E-04	--	--
PLV17	--	6.84E-04	--	--
PLV18	--	6.84E-04	--	--
PLV19	--	6.84E-04	--	--
PLV21	--	1.08E-03	--	--
PLV22	--	1.08E-03	--	--
PLV23	--	1.08E-03	--	--
PLV24	--	1.08E-03	--	--

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TOXIC AIR POLLUTANTS EMISSION RATES - STANDARD NO. 8				
Emission Point ID	Emission Rates (lbs/hr)			
	Cadmium	Carbon Disulfide	Chlorine	Chromium (+6) Compounds
	7440-43-9	75-15-0	7782-50-5	N/A
PLV25	--	1.08E-03	--	--
PLV26	--	1.08E-03	--	--

TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Emission Point ID	Emission Rates (lbs/hr)			
	Cobalt	Hexane	Hydrochloric Acid	Hydrogen Fluoride
	N/A	110-54-3	7647-01-0	7664-39-3
101	8.35E-06	1.79E-01	--	--
102	9.94E-07	2.13E-02	--	--
105	3.11E-06	6.67E-02	--	--
100	6.53E-02	--	--	5.76E-01
100A	2.16E-02	--	--	4.66E-02
303	--	1.86E-01	--	--
305	5.89E-06	1.26E-01	--	--
309	--	1.86E-01	--	--
312	2.26E-07	4.85E-03	--	--
320	5.89E-06	1.26E-01	--	--
600	2.07E-07	4.44E-03	--	--
601	1.98E-07	4.24E-03	--	--
701a	5.93E-07	2.54E-04	--	--
BM1	--	1.40E-01	--	--
BM2	--	1.40E-01	--	--
BM3	--	1.40E-01	--	--
CM1	6.25E-07	1.19E-01	--	--
CM2	6.25E-07	1.19E-01	--	--
CM3	6.25E-07	1.19E-01	--	--
CSP1	--	--	--	2.30E-02
CSP2	--	--	--	2.30E-02
CT14A	--	3.21E-04	--	--
CT14B	--	3.21E-04	--	--
CT4A	--	1.78E-03	--	--
CT4B	--	1.78E-03	--	--

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TOXIC AIR POLLUTANTS – STANDARD NO. 8				
Emission Point ID	Emission Rates (lbs/hr)			
	Cobalt	Hexane	Hydrochloric Acid	Hydrogen Fluoride
	N/A	110-54-3	7647-01-0	7664-39-3
CT5A	--	4.49E-03	--	--
CT5B	--	4.49E-03	--	--
DOOR20	3.49E-04	--	--	2.49E-03
HM1	9.88E-08	9.77E-02	--	--
HM2	9.88E-08	9.77E-02	--	--
HM3	9.88E-08	9.77E-02	--	--
MH5	3.71E-08	7.95E-04	--	--
PLV1	--	1.60E-03	3.69E-02	--
PLV2	--	1.60E-03	3.69E-02	--
PLV3	--	1.60E-03	3.69E-02	--
PLV4	--	1.60E-03	3.69E-02	--
PLV5	--	1.60E-03	3.69E-02	--
PLV6	--	1.60E-03	3.69E-02	--
PLV7	--	1.60E-03	3.69E-02	--
PLV8	--	1.60E-03	3.69E-02	--
PLV9	--	1.60E-03	3.69E-02	--
PLV10	--	1.60E-03	3.69E-02	--
PLV11	--	1.60E-03	3.69E-02	--
PLV12	--	1.60E-03	3.69E-02	--
PLV13	--	1.60E-03	3.69E-02	--
PLV14	--	1.60E-03	3.69E-02	--
PLV15	--	1.60E-03	3.69E-02	--
PLV16	--	1.60E-03	3.69E-02	--
PLV17	--	1.60E-03	3.69E-02	--
PLV18	--	1.60E-03	3.69E-02	--
PLV19	--	1.60E-03	3.69E-02	--
PLV21	--	2.53E-03	2.32E+00	--
PLV22	--	2.53E-03	2.32E+00	--
PLV23	--	2.53E-03	2.32E+00	--
PLV24	--	2.53E-03	2.32E+00	--
PLV25	--	2.53E-03	2.32E+00	--
PLV26	--	2.53E-03	2.32E+00	--

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TOXIC AIR POLLUTANTS EMISSION RATES - STANDARD NO. 8				
Emission Point ID	Emission Rates (lbs/hr)			
	Manganese Compounds	Mercury	Mineral Oil Mist	Nickel
	N/A	7439-97-6	8012-95-1	7440-02-0
101	3.78E-05	2.58E-05	0.00E+00	2.09E-04
102	4.50E-06	3.08E-06	0.00E+00	2.49E-05
105	1.41E-05	9.63E-06	0.00E+00	7.78E-05
100	3.31E-01	6.16E-02	0.00E+00	4.90E-02
100A	1.10E-01	2.04E-02	0.00E+00	1.63E-02
303	--	0.00E+00	0.00E+00	0.00E+00
305	2.66E-05	1.82E-05	0.00E+00	1.47E-04
309	--	0.00E+00	0.00E+00	0.00E+00
312	1.02E-06	7.01E-07	0.00E+00	5.66E-06
320	2.66E-05	1.82E-05	--	1.47E-04
600	9.38E-07	6.42E-07	--	5.18E-06
601	8.94E-07	6.12E-07	--	4.94E-06
701a	2.68E-06	1.84E-06	--	1.48E-05
CM1	2.83E-06	1.94E-06	--	1.56E-05
CM2	2.83E-06	1.94E-06	--	1.56E-05
CM3	2.83E-06	1.94E-06	--	1.56E-05
DOOR20	1.77E-03	3.29E-04	--	2.62E-04
GL2V	--	--	4.32E-02	--
HM1	4.47E-07	3.06E-07	--	2.47E-06
HM2	4.47E-07	3.06E-07	--	2.47E-06
HM3	4.47E-07	3.06E-07	--	2.47E-06
MH5	1.68E-07	1.15E-07	--	9.28E-07
PLV21	--	--	8.90E-02	--
PLV22	--	--	8.90E-02	--
PLV23	--	--	8.90E-02	--
PLV24	--	--	8.90E-02	--
PLV25	--	--	8.90E-02	--
PLV26	--	--	8.90E-02	--

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TOXIC AIR POLLUTANTS EMISSION RATES - STANDARD NO. 8				
Emission Point ID	Emission Rates (lbs/hr)			
	Phosphoric Acid	Selenium Compounds	Formaldehyde	Sodium Hydroxide
	7664-38-2	N/A	50-00-0	1310-73-2
101	--	2.38E-06	--	--
102	--	2.84E-07	--	--
105	--	8.89E-07	--	--
100	--	5.16E-01	--	--
100A	--	1.71E-01	--	--
305	--	1.68E-06	7.30E-03	0.93
312	--	6.47E-08	2.02E-04	0.45
320	--	1.68E-06	--	--
323	--	--	--	0.28
600	--	5.92E-08	--	--
601	--	5.65E-08	1.76E-04	--
701a	--	1.69E-07	1.06E-05	--
CM1	--	1.79E-07	--	--
CM2	1.14E+00	1.79E-07	--	--
CM3	--	1.79E-07	--	--
DOOR20	--	2.76E-03	--	--
GL2V	8.82E-01	--	--	--
HM1	--	2.82E-08	--	--
HM2	--	2.82E-08	--	--
HM3	--	2.82E-08	--	--
MH5	--	1.06E-08	--	--

DE MINIMIS TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Source ID	Emission Rates (lbs/hr)			
	Acetaldehyde	Acetonitrile	Benzene	Beryllium
	75-07-0	75-05-8	74-43-2	7440-41-7
303	--	--	2.40E-03	--
305	--	--	1.47E-04	8.41E-07
309	--	--	2.40E-03	--
312	--	--	5.66E-06	3.24E-08
320	--	--	1.47E-04	8.41E-07

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DE MINIMIS TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Source ID	Emission Rates (lbs/hr)			
	Acetaldehyde	Acetonitrile	Benzene	Beryllium
	75-07-0	75-05-8	74-43-2	7440-41-7
600	--	--	2.41E-07	1.38E-09
601	--	--	4.94E-06	2.82E-08
701a	--	--	2.96E-07	8.47E-08
BMMV	3.47E-01	2.24E-02	2.23E-02	--
CMMV	2.64E-01	1.70E-02	1.70E-02	--
HMMV	2.38E-01	1.53E-02	1.53E-02	--
IA-MH-1, IA-MH-2, IA-MH-4, IA-MH-5, IA-MH-6, IA-MH-7	--	--	4.78E-05	2.73E-07
IA-TC	--	--	2.06E-05	1.18E-07
PLV1-PLV19	2.52E-02	1.63E-03	1.62E-03	--
PLV21-PLV26	1.26E-02	8.13E-04	8.11E-04	--
Unit 02 LP	--	--	1.74E-04	9.95E-07
Unit 02 TNP	--	--	1.15E-05	6.59E-08
Unit 02 TP	--	--	1.17E-04	6.71E-07

DE MINIMIS TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Source ID	Emission Rates (lbs/hr)			
	1,3-Butadiene	Carbon Tetrachloride	Chloroform	p-Dichlorobenzene
	106-99-0	56-23-5	67-66-3	106-46-7
305	--	--	--	8.41E-05
312	--	--	--	3.24E-06
320	--	--	--	8.41E-05
600	--	--	--	1.38E-07
601	--	--	--	2.82E-06
701a	--	--	--	1.69E-07
BMMV	5.63E-03	1.42E-02	1.95E-02	--
CMMV	4.28E-03	1.08E-02	1.48E-02	--
CT4A, CT4B	--	--	2.35E-02	--
CT5A, CT5B	--	--	1.84E-02	--
CT14A, CT14B	--	--	4.25E-03	--
HMMV	3.86E-03	9.74E-03	1.33E-02	--

ATTACHMENT - Emission Rates for Ambient Air Standards

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DE MINIMIS TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Source ID	Emission Rates (lbs/hr)			
	1,3-Butadiene	Carbon Tetrachloride	Chloroform	p-Dichlorobenzene
	106-99-0	56-23-5	67-66-3	106-46-7
IA-MH-1, IA-MH-2, IA-MH-4, IA-MH-5, IA-MH-6, IA-MH-7	--	--	--	2.73E-05
IA-TC	--	--	--	1.18E-05
PLV1-PLV19	4.09E-04	1.03E-03	1.42E-03	--
PLV21-PLV26	2.05E-04	5.17E-04	7.08E-04	--
Unit 02 LP	--	--	--	9.95E-05
Unit 02 TNP	--	--	--	6.59E-06
Unit 02 TP	--	--	--	6.71E-05

DE MINIMIS TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Source ID	Emission Rates (lbs/hr)			
	1,4-Dioxane	Ethyl Benzene	Ethyl Chloride	Methanol
	123-91-1	100-41-4	75-00-3	67-56-1
303	3.60E-02	--	--	--
309	3.60E-02	--	--	--
BMMV	7.59E-03	1.31E-02	8.07E-03	1.98E-01
CMMV	5.77E-03	9.96E-03	6.13E-03	1.50E-01
HMMV	5.20E-03	8.98E-03	5.52E-03	1.35E-01
PLV1-PLV19	5.52E-04	9.52E-04	5.86E-04	1.44E-02
PLV21-PLV26	2.76E-04	4.76E-04	2.93E-04	7.18E-03

DE MINIMIS TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Source ID	Emission Rates (lbs/hr)			
	Methyl Chloride	Methyl-Isobutyl Ketone	Naphthalene	Polycyclic Organic Matter
	74-87-3	108-10-1	91-20-3	N/A
303	6.00E-04	--	--	--
305	--	--	4.28E-05	4.89E-05
309	6.00E-04	--	--	--
312	--	--	1.64E-06	1.88E-06
320	--	--	4.28E-05	4.89E-05
600	--	--	7.00E-08	8.01E-08

ATTACHMENT - Emission Rates for Ambient Air Standards

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DE MINIMIS TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Source ID	Emission Rates (lbs/hr)			
	Methyl Chloride	Methyl-Isobutyl Ketone	Naphthalene	Polycyclic Organic Matter
	74-87-3	108-10-1	91-20-3	N/A
601	--	--	1.44E-06	1.64E-06
701a	--	--	8.61E-08	9.85E-08
BMMV	2.52E-02	1.28E-02	1.29E-02	1.29E-02
CMMV	1.92E-02	9.71E-03	9.83E-03	9.83E-03
CT4A, CT4B	7.33E-04	--	--	--
CT14A, CT14B	1.32E-04	--	--	--
HMMV	1.73E-02	8.75E-03	8.85E-03	8.85E-03
IA-MH-1, IA-MH-2, IA-MH-4, IA-MH-5, IA-MH-6, IA-MH-7	--	--	1.39E-05	1.59E-05
IA-TC	--	--	5.98E-06	6.84E-06
PLV1-PLV19	1.83E-03	9.28E-04	9.39E-04	9.39E-04
PLV21-PLV26	9.16E-04	4.64E-04	4.70E-04	4.70E-04
Unit 02 LP	--	--	5.06E-05	5.79E-05
Unit 02 TNP	--	--	3.35E-06	3.83E-06
Unit 02 TP	--	--	3.41E-05	3.90E-05

DE MINIMIS TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Source ID	Emission Rates (lbs/hr)			
	Styrene	Toluene	Trichloroethylene	Xylenes
	100-42-5	108-88-3	79-01-6	108-38-3 (m-Xylene) 106-42-3 (p-Xylene)
303	--	6.00E-03	--	--
305	--	2.38E-04	--	--
309	--	6.00E-03	--	--
312	--	9.17E-06	--	--
320	--	2.38E-04	--	--
600	--	3.90E-07	--	--
601	--	8.00E-06	--	--
701a	--	4.80E-07	--	--
BMMV	9.65E-03	6.77E-02	1.22E-02	3.40E-02

ATTACHMENT - Emission Rates for Ambient Air Standards

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DE MINIMIS TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Source ID	Emission Rates (lbs/hr)			
	Styrene	Toluene	Trichloroethylene	Xylenes
	100-42-5	108-88-3	79-01-6	108-38-3 (m-Xylene) 106-42-3 (p-Xylene)
CMMV	7.33E-03	5.15E-02	9.24E-03	2.59E-02
CT4A, CT4B	--	1.25E-02	--	1.40E-03
CT5A, CT5B	--	6.55E-03	--	--
CT14A, CT14B	--	2.27E-03	--	2.53E-04
HMMV	6.61E-03	4.64E-02	8.32E-03	2.33E-02
IA-MH-1, IA-MH-2, IA-MH-4, IA-MH-5, IA-MH-6, IA-MH-7	--	7.74E-05	--	--
IA-TC	--	3.33E-05	--	--
PLV1-PLV19	7.01E-04	4.92E-03	8.83E-04	2.47E-03
PLV21-PLV26	3.50E-04	2.46E-03	4.42E-04	1.24E-03
Unit 02 LP	--	2.82E-04	--	--
Unit 02 TNP	--	1.87E-05	--	--
Unit 02 TP	--	1.90E-04	--	--

DE MINIMIS TOXIC AIR POLLUTANTS - STANDARD NO. 8				
Source ID	Emission Rates (lbs/hr)			
	o-Xylene	--	--	--
	95-47-6	--	--	--
BMMV	1.52E-02	--	--	--
CMMV	1.16E-02	--	--	--
HMMV	1.04E-02	--	--	--
PLV1-PLV19	1.11E-03	--	--	--
PLV21-PLV26	5.53E-04	--	--	--

ATTACHMENT – Applicable and Non-Applicable Federal and State Regulations

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The following contains the Federal and South Carolina air pollution regulations and their applicability, as specified in the Part 70 permit application.

Regulation Citation	Regulation Title	Applicable (Yes/No)
40 CFR 60	Subpart Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units	No
40 CFR 60	Subpart Dc - Standards of Performance for Small Industrial, Commercial, and Institutional Steam Generating Units	Yes
40 CFR 60	Subpart K - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978	No
40 CFR 60	Subpart Ka - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984	No
40 CFR 60	Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid storage vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984	No
40 CFR 60	Subpart TT - Standards of Performance for Metal Coil Surface Coating	Yes
40 CFR 60	Subpart AAa - Standards of Performance for Metal Coil Surface Coating Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed after August 17, 1983	Yes
40 CFR 60	Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	Yes
40 CFR 60	Subpart JJJJ - Standards Of Performance For Stationary Spark Ignition Internal Combustion Engines	Yes
40 CFR 63	Subpart CCC – National Emissions Standards for Hazardous Air Pollutants For Steel Pickling--HCl Process Facilities And Hydrochloric Acid Regeneration Plants	Yes
40 CFR 63	Subpart EEEE - Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)	No
40 CFR 63	Subpart MMMM - Surface Coating Of Miscellaneous Metal Parts And Products	No

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40 CFR 63	Subpart SSSS - Standards For Hazardous Air Pollutants: Surface Coating Of Metal Coil	Yes
40 CFR 63	Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	Yes
40 CFR 63	Subpart DDDDD - National Emissions Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers and Process Heaters	Yes
40 CFR 63	Subpart YYYYY - Standards For Hazardous Air Pollutants For Area Sources: Electric Arc Furnace Steelmaking Facilities	No
40 CFR 63	Subpart CCCCCC – Standards for Hazardous Air Pollutant for Gasoline Dispensing Facilities	No
40 CFR 63	Subpart WWWWWW – Standards for Hazardous Air Pollutants for Plating and Polishing	No
SC Regulation 61-62.5	Standard No. 1 – Emissions from Fuel Burning Operations	Yes
SC Regulation 61-62.5	Standard No. 2 – Ambient Air Quality Standards	Yes
SC Regulation 61-62.5	Standard No. 3 – Waste Combustion and Reduction	Yes
SC Regulation 61-62.5	Standard No. 3.1 – Hospital, Medical, Infections Waste Incinerators	No
SC Regulation 61-62.5	Standard No. 4 – Emissions from Process Industries	Yes
SC Regulation 61-62.5	Standard No. 5– Volatile Organic Compounds	No
SC Regulation 61-62.5	Standard No. 5.2 – Control of Oxides of Nitrogen (NO _x)	Yes
SC Regulation 61-62.5	Standard No. 7 – Prevention of Significant Deterioration	Yes
SC Regulation 61-62.5	Standard No. 8 – Toxic Air Pollutants	Yes
SC Regulation 61-62.68	Chemical Accident Prevention Provisions	Yes
SC Regulation 61-62.6	Control of Fugitive Particulate Matter	Yes

Attachment M
Welding Materials SDS

SAFETY DATA SHEET

This Safety Data Sheet (SDS) is for welding consumables and related products and may be used to comply with OSHA's Hazard Communication standard, 29 CFR 1910.1200, and Superfund Amendments and Reauthorization Act (SARA) of 1986 Public Law 99-499 and Canadian Workplace Hazardous Materials Information System (WHMIS) per Health Canada administrative policy. The OSHA standard must be consulted for specific requirements. This Safety Data Sheet complies with ISO 11014-1 and ANSI Z400.1. This document is translated in several languages and is available on our website at www.hobartbrothers.com, from your sales representative or by calling customer service at 1 (937) 332-4000.

SECTION 1 – IDENTIFICATION

Manufacturer/ Supplier Name:	HOBART BROTHERS LLC	Telephone No: +1 (937) 332-4000
Address:	101 TRADE SQUARE EAST, TROY, OH 45373	Emergency No: +1 (800) 424-9300
Canadian Address:	2570 NORTH TALBOT ROAD, OLDCASTLE, ONTARIO, CANADA N0R1L0	Canada: +1 (519) 737-3000
Website:	www.hobartbrothers.com	
Products Type:	TUBULAR ARC WELDING ELECTRODES	
GROUP A: Product For:	Gas Shielded Carbon and Low Alloy Steel	
Trade Name:	FABCO 37, 72, 73, 82HD, 85, 105D2, 711M, 791, 811A1, EXCEL-ARC 71, HORNET, RXR, RXR-XLS, SUPER-COR, TR70, TRIPLE-7, TRIPLE-8, XL-71; FABCOR 70, 71, 80D2, 80XLS, 86R, 702, F6; ULTIMET 716; SubCOR EM12K-S, EM13K-S, EM13K-S MOD; HOBART 71T, 71TM, 77TM, E71T-GS	
GROUP B: Product For:	Self-Shielded Carbon Steel	
Trade Name:	FABSHIELD 4, 21B, 23, 7027	
GROUP C: Product For:	Carbon and Low Alloy Steel	
Trade Name:	FABCO 70XHP, 71 HYD, 71 HYN, 80K2-C, 81B2, 81K2-C, 81N1, 85K2, 85XHP, 90K2, 91B3, 91K2-C, 95K2, 101, 101K3, 101M, 107G, 110, 110K3-M, 111-V, 115, 115K3, 125K4, 712C, 712M, 750C, 750M, 803, 811B2, 811N1, 811W, 812C, 812-Ni1M, 881K2, 910, 911B3, 911N2, 1101K3-C, MIL-101-TM, PREMIER 70, XLS25, XLS50; FABCOR 80B2, 80N1, 80N2, 90, 90B3, 100, 1100, 4130SR, CVN, EDGE, EDGE D2, EDGE MC, EDGE Ni1, EDGE XP, ELEVATE, HERCULES, MATRIX; FABCO XTREME 71, 85, 95, 101, 120, B2, B3; FABCO ELEMENT 70C, 70M, 71C, 71M, 71Ni1C, 71Ni1M, 71T1C, 71T1M, 81K2C, 81Ni2C, 81K2M; FABCOR ELEMENT 70C6, 80Ni1; FABSHIELD 71K6, 71K6-NP, 71T8, 81N1, 81N2, 91T8, 718, K54, XLNT-6, XLR-8, X80, X90, X100; TM- 770, 771, 811N3; MEGAFIL 810M, 710M, 713R, 350B, 731B, 235M, 825R, 735B 240M, 716R, 819R, 740B, 281 M, 281MCR, 781R, 781RCr, 281B, 741M, 610M, 940M, 742M, 1100M, 550R, 610R, 620R, 690R, 741B, 501B, 610B, 742B, 745, 807M, 807B, 236M, 237M, 836R, P36B, 736B, 737B; SubCOR SL 731, SL 840 HC, SL 735 1W, SL 735 2W, SL 735 3W, SL 735 4W, SL 735 5W, SL 741, SL 742, SL 745, SL 281 Cr, SL P1, SL P1 MOD, SL P11, SL P12 MOD, SL P36, SL P22, SL P24; SubCOR 92-S, F2-S, 100F3-S, 120-S, N1-S, W-S, B2-S, B3-S, 4130 SR	
GROUP D: Product For:	Corrosion Resisting Steel	
Trade Name:	FABCO 5055, B6, B9 FABCOR 409; FABLOY 409, 439; FABTUF 960; MEGAFIL P5M; SubCOR SL P5, SL P9, SL P91, SL P92	
AWS Specification:	Varies	
Recommended Use:	TUBULAR ARC WELDING ELECTRODES	
Restrictions on Use:	Use only as indicated for welding operations.	

SECTION 2 – IDENTIFICATION OF HAZARDS

HAZARD CLASSIFICATION – The products described in Section 1 are not classified as hazardous according to applicable GHS hazard classification criteria as required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200), Canada's Hazardous Products Regulations and Mexico's Harmonized System for Identification and Communication of Hazards and Risks from Hazardous Chemicals in the Workplace.

LABEL ELEMENTS: **Hazard Symbol** – No symbol required
Hazard Statement – Not applicable

Signal Word – No signal word required
Precautionary Statement – Not Applicable

HAZARDS NOT OTHERWISE CLASSIFIED

WARNING! - Avoid breathing welding fumes and gases, they may be dangerous to your health. Always use adequate ventilation. Always use appropriate personal protective equipment.

PRIMARY ROUTES OF ENTRY: Respiratory System, Eyes and/or Skin.

ARC RAYS: The welding arc can injure eyes and burn skin.

ELECTRIC SHOCK: Arc welding and associated processes can kill. See Section 8.

FUMES AND GASES: Can be dangerous to your health.

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures and electrodes used. Most fume ingredients are present as complex oxides and compounds and not as pure metals. When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation, plus those from the base metal and coating, etc., of the materials shown in Section 3 of this Safety Data Sheet. Monitor for the component materials identified in the list in Section 3.

Fumes from the use of this product may contain complex oxides or compounds of the following elements and molecules: amorphous silica fume, antimony trioxide, barium, calcium oxide, cerium oxide, chromium, cobalt, copper, fluor spar or fluorides, lithium, manganese, nickel, silica and strontium. Other reasonably expected constituents of the fume would also include complex oxides of iron, titanium, silicon and molybdenum. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1 and F1.3, available from the "American Welding Society", 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353.

SAFETY DATA SHEET

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS

IMPORTANT - This section covers the hazardous materials from which this product is manufactured. This data has been classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) as required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The fumes and gases produced during welding with normal use of this product are addressed in Section 8.

INGREDIENT	CAS NO.	EINECS ¹	GROUP AND %WEIGHT				GHS Classification(s)	GHS HAZARD STATEMENTS (See Section 16 for Complete Phrases)
			A	B	C	D		
ALUMINUM	7429-90-5	231-072-3	<2	<5	<3 ⁽¹⁾	---	Powder (pyrophoric): - Pyr. Sol. 1 ⁽²⁾ - Water-react. 2 ⁽³⁾ Powder (Stabilized): - Flam. Sol. 1 ⁽⁴⁾ - Water-react. 2 ⁽³⁾	H250 H261 H228 H261
ALUMINUM OXIDE	1344-28-1	215-691-6	---	---	<3	---	NONE	
ANTIMONY TRIOXIDE	1309-64-4	215-175-0	---	---	<1 ⁽⁵⁾	---	- Carc. 2 ⁽⁶⁾	H351
BARIUM CMPDS (as Ba)	7440-39-3	231-149-1	---	---	<2 ⁽⁷⁾	---	NONE	
BARIUM FLOURIDE	7787-32-8	232-108-0	---	<12 ⁽⁸⁾	<12 ⁽⁹⁾	---	NONE	
CALCIUM CARBONATE	1317-65-3	215-279-6	---	<2 ⁽¹⁰⁾	<2 ⁽¹⁰⁾	---	NONE	
CERIUM OXIDE	1306-38-3	215-150-4	---	---	<2 ⁽¹¹⁾	---	NONE	
CHROMIUM (metal)	7440-47-3	231-157-5	---	---	<3	5-20	NONE	
COBALT	7440-48-4	231-158-0	---	---	<1 ⁽¹²⁾	---	- Resp. Sens. 1 ⁽¹³⁾ - Skin Sens. 1 ⁽¹⁴⁾ - Aquatic Chronic 4	H334 H317 H413
COPPER	7440-50-8	231-159-6	<1 ⁽¹⁵⁾	---	<2 ⁽¹⁵⁾	<1 ⁽¹⁵⁾	NONE	
FLUORSPAR	7789-75-5	232-188-7	<5 ⁽¹⁶⁾	<10	<5	---	NONE	
IRON	7439-89-6	231-096-4	75-98	75-95	75-98	75-95	NONE	
IRON OXIDE	1309-37-1	215-168-2	---	---	<12	---	NONE	
LITHIUM CARBONATE	554-13-2	209-062-5	---	---	<2	---	- EUH014 ⁽¹⁷⁾ - Skin Corr. 1B ⁽¹⁸⁾	EUH014 H314
LITHIUM FLUORIDE	7789-24-4	232-152-0	---	<2 ⁽¹⁹⁾	<2 ⁽¹⁹⁾	---	- EUH014 ⁽¹⁷⁾ - Skin Corr. 1B ⁽¹⁸⁾	EUH014 H314
LITHIUM OXIDE	12057-24-8	235-019-5	---	---	<2	---	- EUH014 ⁽¹⁷⁾ - Skin Corr. 1B ⁽¹⁸⁾	EUH014 H314
MAGNESIUM	7439-95-4	231-104-6	---	<3	<2	---	Powder (pyrophoric): - Pyr. Sol. 1 ⁽²⁾ - Water-react. 1 ⁽³⁾ Powder or turnings: - Flam. Sol. 1 ⁽⁴⁾ - Self-heat. 1 ⁽²⁰⁾ - Water-react. 2 ⁽⁴⁾	H250 H260 H228 H252 H261
MAGNESIUM OXIDE	1309-48-4	215-171-9	---	<3	<2	---	NONE	
MANGANESE	7439-96-5	231-105-1	<5	<2	<4	<2	- Acute Tox. 4 (Inhalation) ⁽²¹⁾ - Acute Tox. 4 (Oral) ⁽²¹⁾ - STOT RE 1 ⁽²²⁾	H332 H302 H372
MANGANESE OXIDE	1344-43-0	215-171-9	---	---	<2	---	NONE	
MOLYBDENUM	7439-98-7	231-107-2	<1	---	<2	<2	- STOT RE 2 ⁽²²⁾ - Eye Irrit. 2 ⁽²³⁾ - STOT SE 3 ⁽²⁴⁾	H373 H319 H335

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INGREDIENT	CAS NO.	EINECS*	GROUP AND %WEIGHT				GHS Classification(s)	GHS HAZARD STATEMENTS (See Section 16 for Complete Phrases)
			A	B	C	D		
NICKEL	7440-02-0	231-111-4	---	---	<4	<1	Powder/Element: - Carc. 2 ⁽⁶⁾ - Skin Sens. 1 ⁽¹⁴⁾ - STOT RE 1 ⁽²²⁾ - Aquatic Chronic 3	H351 H317 H372 H412
SILICA	14808-60-7	238-878-4	<2	<2	<2	---	- STOT RE 2 ⁽²²⁾ - Carc. 2 ⁽⁶⁾ - Acute Tox. 4 (Inhalation) ⁽²¹⁾	H373 H351 H332
(Amorphous Silica Fume)	69012-64-2	273-761-1	---	---	---	---	NONE	
SILICON	7440-21-3	231-130-8	<4	---	<4	<2	NONE	
STRONTIUM FLUORIDE	7783-48-4	232-000-3	---	<2 ⁽²⁵⁾	---	---	NONE	
TITANIUM	7440-32-6	231-142-3	---	---	<2	<2	NONE	
TITANIUM DIOXIDE	13463-67-7	236-675-5	<10	---	<10	<2	- Carc. 2 ⁽⁶⁾	H351
ZIRCONIUM	7440-67-7	231-176-9	---	---	<1	---	- Pyr. Sol. 1 ⁽²⁾ - Water-react. 1 ⁽³⁾	H250 H260
HEXAVALENT CHROMIUM [CHROMIUM (VI) TRIOXIDE] (Fume constituent)	1333-82-0	215-607-8	Varies	Varies	Varies	Varies	- Ox. Sol. 1 ⁽²⁶⁾ - Carc. 1A ⁽⁶⁾ - Muta. 1B ⁽²⁷⁾ - Repr. Tox 2 ⁽²⁸⁾ - Acute Tox. 2 (Inhalation) ⁽²¹⁾ - Acute Tox. 3 (Skin & Oral) ⁽²¹⁾ - STOT RE 1 ⁽²²⁾ - Skin Corr. 1A ⁽¹⁸⁾ - Skin Sens. 1 ⁽¹⁴⁾ - Resp. Sens. 1 ⁽¹³⁾ - Aquatic Acute 1 - Aquatic Chronic 1	H271 H350 H340 H361f H330 H311, H301 H372 H314 H317 H334, H317 H400 H410

--- Dashes indicate the ingredient is not present within the group of products; Γ – European Inventory of Existing Commercial Chemical Substance Number (1) Present only in FABCO ELEMENT 70C, 70M and 71M; FABCO XTREME 71, 85, 95, 101, 120, B2, B3; FABSHIELD 71K6, 71K6-NP, 71T8, 81N1, 81N2, 91T8, 718, X80, X90, X100, XLNT-6 (2) Pyrophoric solid (Cat. 1) (3) Substance or mixture which in contact with water emits flammable gases (Cat. 1, 2 and 3) (4) Flammable solid (Cat. 1 and 2) (5) Present only in FABCOR 90, CVN, EDGE, EDGE D2, EDGE MC, EDGE Ni1, EDGE XP, ELEMENT 70C6, ELEMENT 80Ni1, ELEVATE, HERCULES, MATRIX; (6) Carcinogenicity (Cat. 1A, 1B and 2) (7) Present only in FABCO XTREME 71, 85, 95, 101, 120, B2, B3; FABSHIELD XLNT-6 (8) Present only in FABSHIELD 21B, 23; (9) Present only in FABCO XTREME 71, 85, 95, 101, 120, B2, B3; FABSHIELD 71K6, 71K6-NP, 71T8, 81N1, 81N1+, 81N2, 91T8, 718, XLNT-6, X80, X90, X100; (10) Present only in FABSHIELD 21B, 0.030" and 0.035" 23, 7027; (11) Present only in FABSHIELD 71K6, 71K6-NP, 71T8, 81N1, 81N1+, 81N2, 91T8, 718, E 71Ni, XLR-8, X80, X90, X100; FABCO XTREME 85, 95, 120 (12) Present only in FABSHIELD 71K6, 81N1, 81N2, X80, X90, X100 (13) Respiratory sensitization (Cat. 1, Sub-cat. 1A and 1B) (14) Skin sensitization (Cat. 1, Sub-cat. 1A and 1B) (15) Present only in ELEMENT 71T1C, 81Ni2C; FABCO 105D2, 110K3-M; SubCOR WS; all MEGAFIL and SubCOR SL products (16) Present only in FABCO 85, 105D2; SubCOR EM13K-S, EM13K-S MOD (17) See EUH-Statements in Section 16 (18) Skin corrosion/irritation (Cat. 1, 1A, 1B, 1C and 2) (19) Present only in FABCO 70XHP, 71 HYD, 101, 101M, 712C, 712M, 750C, 750M, 812C, 812-Ni1M, 91K2-C (0.052-in. only); ELEMENT 71T1C, 71T1M, 71Ni1C, 71Ni1M, 81K2C, 81K2M, 81Ni2C; FABSHIELD 71K6, 71K6-NP, 71T8, 81N1, 81N2, 91T8, 718, 7027, X80, X90, X100 (20) Self-heating substance or mixture (Cat. 1 and 2) (21) Acute toxicity (Cat. 1, 2, 3 and 4) (22) Specific target organ toxicity (STOT) – repeated exposure (Cat. 1 and 2) (23) Serious eye damage/eye irritation (Cat. 1 and 2) (24) Specific target organ toxicity (STOT) – single exposure ((Cat. 1, 2) and Cat. 3 for narcotic effects and respiratory tract irritation, only) (25) Present only in FABSHIELD 21B 0.045" – 3/32" (26) Oxidizing solid (Cat. 1, 2 and 3)(27) Germ cell mutagenicity (Cat. 1A, 1B and 2) (28) Reproductive toxicity (Cat. 1A, 1B and 2)

SECTION 4 – FIRST-AID MEASURES

INGESTION: Not an expected route of exposure. Do not eat, drink, or smoke while welding; wash hands thoroughly before performing these activities. If symptoms develop, seek medical attention at once.

INHALATION during welding: If breathing is difficult, provide fresh air and contact physician. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

SKIN CONTACT during welding: Remove contaminated clothing and wash the skin thoroughly with soap and water. If symptoms develop, seek medical attention at once. **EYE CONTACT during welding:** Dust or fume from this product should be flushed from the eyes with copious amounts of clean, tepid water until victim is transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed. Obtain medical assistance at once.

Arc rays can injure eyes. If exposed to arc rays, move victim to dark room, remove contact lenses as necessary for treatment, cover eyes with a padded dressing and rest. Obtain medical assistance if symptoms persist.

Section 11 of this SDS covers the acute effects of overexposure to the various ingredients within the welding consumable. Section 8 of this SDS lists the exposure limits and covers methods for protecting yourself and your co-workers.

SECTION 5 – FIRE-FIGHTING MEASURES

Fire Hazards: Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, non-explosive and essentially nonhazardous until welded.

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Welding arcs and sparks can ignite combustibles and flammable products. If there are flammable materials, including fuel or hydraulic lines, in the work area and the worker cannot move the work or the flammable material, a fire-resistant shield such as a piece of sheet metal or fire resistant blanket should be placed over the flammable material. If welding work is conducted within 35 feet or so of flammable materials, station a responsible person in the work zone to act as fire watcher to observe where sparks are flying and to grab an extinguisher or sound the alarm if needed.

Unused welding consumables may remain hot for a period of time after completion of a welding process. See American National Standard Institute (ANSI) Z49.1 for further general safety information on the use and handling of welding consumables and associated procedures.

Suitable Extinguishing Media: This product is essentially nonflammable until welded; therefore, use a suitable extinguishing agent for a surrounding fire.

Unsuitable Extinguishing Media: None known.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

In the case of a release of solid welding consumable products, solid objects can be picked up and placed into a disposal container. If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8. Wear proper personal protective equipment while handling. Do not discard as general trash.

SECTION 7 - HANDLING AND STORAGE

HANDLING: No specific requirements in the form supplied. Handle with care to avoid cuts. Wear gloves when handling welding consumables. Avoid exposure to dust. Do not ingest. Some individuals can develop an allergic reaction to certain materials. Retain all warning and product labels.

STORAGE: Keep separate from acids and strong bases to prevent possible chemical reactions.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Read and understand the instructions and the labels on the packaging. Welding fumes do not have a specific OSHA PEL (Permissible Exposure Limit) or ACGIH TLV (Threshold Limit Value). The OSHA PEL for Particulate – Not Otherwise Regulated (PNOR) is 5 mg/m³ – Respirable Fraction, 15 mg/m³ – Total Dust. The ACGIH TLV for Particles – Not Otherwise Specified (PNOS) is 3 mg/m³ – Respirable Particles, 10 mg/m³ – Inhalable Particles. The individual complex compounds within the fume may have a lower OSHA PEL or ACGIH TLV than the OSHA PNOR and ACGIH PNOS. An Industrial Hygienist, the OSHA PELs for Air Contaminants (29 CFR 1910.1000), and the ACGIH TLVs should be consulted to determine the specific fume constituents present and their respective exposure limits. All exposure limits are in milligrams per cubic meter (mg/m³).

INGREDIENT	CAS	EINECS	OSHA PEL	ACGIH TLV
ALUMINUM###	7429-90-5	231-072-3	5 R* (Dust), 15	1 R* {A4}
ALUMINUM OXIDE##	1344-28-1	215-691-6	5 R*	5 (Welding fumes, as Al)
ANTIMONY TRIOXIDE	1309-64-4	215-175-0	0.5 (as Sb)	1 R* {A4}
BARIUM CMPDS (as Ba)	7440-39-3	231-149-1	0.5 (as Ba)	10 (as Al, Tot particulate)
BARIUM FLOURIDE#	7787-32-8	232-108-0	0.5 (as Ba)	0.5 (as Sb) {A2}
CALCIUM CARBONATE	1317-65-3	215-279-6	5 R*, 5 (as CaO)	0.5 (as Ba) {A4}
CERIUM OXIDE	1306-38-3	215-150-4	5 R*, 15 (Dust)	0.5 (as Ba) {A4}
CHROMIUM#	7440-47-3	231-157-5	1 (Metal)	3 R*, 2 (as CaO)
			0.5 (Cr II & Cr III Cpnds)	3 R*, 10
			0.005 (Cr VI Cpnds, Calif. OSHA PEL)	0.5 (Metal)
COBALT (Metal, dust and fume, as Co)	7440-48-4	231-158-0	0.1 (Dust and Fume)	0.003 (Cr III Cpnds) {A4; DSEN; RSEN}
COPPER	7440-50-8	231-159-6	0.1 (Fume), 1 (Dust)	0.0002 (Cr VI Sol Cpnds) {A1; Skin; DSEN; RSEN}
FLUORSPAR	7789-75-5	232-188-7	2.5 (as F)	0.0005 (Cr VI STEL)
IRON+	7439-89-6	231-096-4	5 R*	0.02 {A3}
IRON OXIDE	1309-37-1	215-168-2	10 (Oxide Fume)	0.2 (Fume), 1 (Dust)
LITHIUM CARBONATE	554-13-2	209-062-5	5 R*, 15 (Dust)	2.5 (as F) {A4}
LITHIUM FLUORIDE	7789-24-4	232-152-0	2.5 (as F)	5 R* (Fe ₂ O ₃) {A4}
LITHIUM OXIDE	12057-24-8	235-019-5	1 ■ ■ ■	5 R* (Fe ₂ O ₃) {A4}
MAGNESIUM+	7439-95-4	231-104-6	5 R*	3 R*, 10 (Dust)
MAGNESIUM OXIDE	1309-48-4	215-171-9	15 (Fume, Total Part)	2.5 (as F) {A4}
MANGANESE#	7439-96-5	231-105-1	5 CL ** (Fume)	3 R*, 10 (Dust)
			1, 3 STEL *** ■	3 R*
MANGANESE OXIDE	1344-43-0	215-171-9	5 CL ** (Fume)	10 I* {A4}
			1, 3 STEL *** ■	0.1 I* {A4} ◆
MOLYBDENUM	7439-98-7	231-107-2	5 R*	0.02 R* ◆◆
NICKEL#	7440-02-0	231-111-4	1 (Metal)	0.1 I* {A4} ◆
			1 (Sol Cpnds)	0.02 R* ◆◆
			1 (Insol Cpnds)	3 R*, 10 I* (Ele and Insol)
SILICA++	14808-60-7	238-878-4	0.05 R*	0.5 R* (Sol Cpnds) {A3}
(Amorphous Silica Fume)	69012-64-2	273-761-1	0.8	1.5 I* (Ele) {A5}
SILICON+	7440-21-3	231-130-8	5 R*	0.1 I* (Sol Cpnds) {A4}
STRONTIUM FLUORIDE	7783-48-4	232-000-3	2.5 (as F)	0.2 I* (Insol Cpnds) {A1}
TITANIUM+	7440-32-6	231-142-3	5 R*	0.025 R* {A2}
TITANIUM DIOXIDE	13463-67-7	236-675-5	15 (Dust)	3 R*
ZIRCONIUM	7440-67-7	231-176-9	5 (Zr Cpnds)	3 R*
			5, 10 STEL *** ■ (Zr Cpnds)	2.5 (as F) {A4}

R* - Respirable Fraction I* - Inhalable Fraction ** - Ceiling Limit *** - Short Term Exposure Limit + - As a nuisance particulate covered under "Particulates Not Otherwise Regulated" by OSHA or "Particulates Not Otherwise Specified" by ACGIH ++ - Crystalline silica is bound within the product as it exists in the package. However, research indicates silica is present in welding fume in the amorphous (noncrystalline) form # - Reportable material under Section 313 of SARA ## - Reportable material under Section 313 of SARA only in fibrous form ### - Reportable material under Section 313 of SARA as dust or fume ■ - NIOSH REL TWA and STEL ■■ - AIHA Ceiling Limit of 1 mg/m³ ◆ - Limit of 0.1 mg/m³ is for Inhalable Mn in 20153 by ACGIH ◆◆ - Limit of 0.02 mg/m³ is for Respirable Mn in 2015 by ACGIH Ele - Element Sol - Soluble Insol - Insoluble Inorg - Inorganic Cpnds - Compounds NOS - Not Otherwise Specified {A1} - Confirmed Human Carcinogen per ACGIH {A2} - Suspected Human Carcinogen per ACGIH {A3} - Confirmed Animal Carcinogen with Unknown Relevance to Humans per ACGIH {A4} - Not Classifiable as a Human Carcinogen per ACGIH {A5} - Not Suspected as a Human Carcinogen per ACGIH (noncrystalline form) DSEN - Dermal Sensitization RSEN - Respiratory Sensitization EINECS - European Inventory of Existing Commercial Chemical Substance Number OSHA - U.S. Occupational Safety and Health Administration ACGIH - American Conference of Governmental Industrial Hygienists

VENTILATION: Use enough ventilation or local exhaust at the arc or both to keep the fumes and gases below the PEL/TLV in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

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RESPIRATORY PROTECTION: Use NIOSH-approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the regulatory limits.

EYE PROTECTION: Wear helmet or use face shield with filter lens for open arc welding processes. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others from the weld arc flash.

PROTECTIVE CLOTHING: Wear hand, head and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection as well as dark non-synthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable

SPECIAL PRECAUTIONS (IMPORTANT): When welding with electrodes that require special ventilation (such as stainless or hardfacing, or other products which require special ventilation, or on lead- or cadmium-plated steel and other metals or coatings like galvanized steel, which produce hazardous fumes) maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information: American National Standard Institute (ANSI) Z49.1; Safety in Welding and Cutting published by the American Welding Society, 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353; and OSHA Publication 2206 (29 CFR 1910), U.S. Government Printing Office, Washington, DC 20402.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, non-explosive and essentially nonhazardous until welded.

PHYSICAL STATE: Solid

APPEARANCE: Round, Cored Wire

COLOR: Gray or Copper (shiny metallic)

ODOR: Odorless

ODOR THRESHOLD: Not Applicable

pH: Not Applicable

MELTING POINT/FREEZING POINT: Not Available

INITIAL BOILING POINT AND BOILING RANGE: Not Available

FLASH POINT: Not Available

EVAPORATION RATE: Not Applicable

FLAMMABILITY (SOLID, GAS): Not Available

UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS: Not Available

VAPOR PRESSURE: Not Applicable

VAPOR DENSITY: Not Applicable

RELATIVE DENSITY: Not Available

SOLUBILITY(IES): Not Available

PARTITION COEFFICIENT: N-OCTANOL/WATER: Not Applicable

AUTO-IGNITION TEMPERATURE: Not Available

DECOMPOSITION TEMPERATURE: Not Available

VISCOSITY: Not Applicable

SECTION 10 – STABILITY AND REACTIVITY

GENERAL: Welding consumables applicable to this sheet are solid and nonvolatile as shipped. This product is only intended for use per the welding parameters it was designed for. When this product is used for welding, hazardous fumes may be created. Other factors to consider include the base metal, base metal preparation and base metal coatings. All of these factors can contribute to the fume and gases generated during welding. The amount of fume varies with the welding parameters.

STABILITY: This product is stable under normal conditions.

REACTIVITY: Contact with acids or strong bases may cause generation of gas.

SECTION 11 – TOXICOLOGICAL INFORMATION

SHORT-TERM (ACUTE) OVEREXPOSURE EFFECTS: **Welding Fumes** - May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes. **Aluminum Oxide** - Irritation of the respiratory system. **Antimony Compounds** - Irritation of nose, throat, eyes and skin. **Barium** - Aching eyes, rhinitis, frontal headache, wheezing, laryngeal spasms, salivation or anorexia. **Calcium Oxide** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Chromium** - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory tract, lung damage and asthma-like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dust on skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions may occur in some people. **Cobalt** - Pulmonary irritation, cough, dermatitis, weight loss. **Copper** - Metal fume fever characterized by metallic taste, tightness of chest and fever. Symptoms may last 24 to 48 hours following overexposure. **Fluorides** - Fluoride compounds evolved may cause skin and eye burns, pulmonary edema and bronchitis. **Iron, Iron Oxide** - None are known. Treat as nuisance dust or fume. **Lithium Compounds** - Overexposure may cause tremor and nausea. **Magnesium, Magnesium Oxide** - Overexposure to the oxide may cause metal fume fever characterized by metallic taste, tightness of chest and fever. Symptoms may last 24 to 48 hours following overexposure. **Manganese, Manganese Oxide** - Metal fume fever characterized by chills, fever, upset stomach, vomiting, irritation of the throat and aching of body. Recovery is generally complete within 48 hours of the overexposure. **Molybdenum, Cerium Oxide** - Irritation of the eyes, nose and throat. **Nickel, Nickel Compounds** - Metallic taste, nausea, tightness in chest, metal fume fever, allergic reaction. **Silica (Amorphous)** - Dust and fumes may cause irritation of the respiratory system, skin and eyes. **Strontium Compounds** - Strontium salts are generally non-toxic and are normally present in the human body. In large oral doses, they may cause gastrointestinal disorders, vomiting and diarrhea. **Titanium Dioxide** - Irritation of respiratory system. **Zirconium** - May cause irritation of the eyes, nose and throat due to mechanical effects.

LONG-TERM (CHRONIC) OVEREXPOSURE EFFECTS: **Welding Fumes** - Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis." Studies have concluded that there is sufficient evidence for ocular melanoma in welders. **Aluminum Oxide** - Pulmonary fibrosis and emphysema. **Antimony Compounds** - Metal fume fever, dermatitis, keratitis, conjunctivitis and ulceration and perforation of the nasal septum. Avoid conditions in which fresh hydrogen will react with antimony to form stibine which is extremely toxic. **Barium** - Long term overexposure to soluble barium compounds may cause nervous disorders and may have deleterious effects on the heart, circulatory system and musculature. **Calcium Oxide** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Chromium** - Ulceration and perforation of nasal septum. Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) compounds. **Cobalt** - Repeated overexposure to cobalt compounds can produce reduced pulmonary function, diffuse nodular fibrosis of lungs and respiratory hypersensitivity. **Copper** - Copper poisoning has been reported in the literature from exposure to high levels of copper. Liver damage can occur due to copper accumulating in the liver characterized by cell destruction and cirrhosis. High levels of copper may cause anemia and jaundice. High levels of copper may cause central nervous system damage characterized by nerve fiber separation and cerebral degeneration. **Fluorides** - Serious bone erosion (Osteoporosis) and mottling of teeth. **Iron, Iron Oxide Fumes** - Can cause siderosis (deposits of iron in lungs) which some researchers believe may affect pulmonary function. Lungs will clear in time when exposure to iron and its compounds ceases. Iron and magnetite (Fe₃O₄) are not regarded as fibrogenic materials. **Lithium Compounds** - May be considered as potentially teratogenic. **Magnesium, Magnesium Oxide** - No adverse long term health effects have been reported in the literature. **Manganese, Manganese Oxide** - Long-term overexposure to manganese compounds may affect the central nervous system. Symptoms may be similar to Parkinson's disease and can include slowness, changes in handwriting, gait impairment, muscle spasms and cramps and less commonly, tremor and behavioral changes. Employees who are overexposed to manganese compounds should be seen by a physician for early detection of neurologic problems. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait. **Molybdenum, Cerium Oxide** - Prolonged overexposure may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in breathing and anemia. **Nickel, Nickel Compounds** - Lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers. **Silica (Amorphous)** - Research indicates that silica is present in welding fume in the amorphous form. Long term overexposure may cause

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pneumoconiosis. Noncrystalline forms of silica (amorphous silica) are considered to have little fibrotic potential. **Strontium Compounds** - Strontium at high doses is known to concentrate in bone. Major signs of chronic toxicity, which involve the skeleton, have been labeled as "strontium rickets". **Titanium Dioxide** - Pulmonary irritation and slight fibrosis. **Zirconium** - May cause pulmonary fibrosis and pneumoconiosis.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with pre-existing impaired lung functions (asthma-like conditions). Persons with a pacemaker should not go near welding and cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device. Respirators are to be worn only after being medically cleared by your company-designated physician.

EMERGENCY AND FIRST AID PROCEDURES: Call for medical aid. Employ first aid techniques recommended by the American Red Cross. If irritation or flash burns develop after exposure, consult a physician.

CARCINOGENICITY: Chromium VI compounds, nickel compounds, silica (crystalline quartz), ultraviolet radiation and welding fumes are classified as IARC^E Group 1 and NTP^Z Group K carcinogens. Titanium dioxide, nickel metal/alloys, antimony trioxide and cobalt are classified as IARC Group 2B carcinogens.

CALIFORNIA PROPOSITION 65:

WARNING: These products can expose you to chemicals, including titanium dioxide and/or chromium and/or nickel, which are known to the State of California to cause cancer, and to carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to www.p65warnings.ca.gov.

INGREDIENT	CAS	IARC ^E	NTP ^Z	OSHA ^H	65 ^Θ
ALUMINUM	7429-90-5	---	---	---	---
ALUMINUM OXIDE	1344-28-1	---	---	---	---
ANTIMONY TRIOXIDE	1309-64-4	2B	---	---	X
BARIUM CMPDS (as Ba)	7440-39-3	---	---	---	---
BARIUM FLOURIDE	7787-32-8	---	---	---	---
CALCIUM CARBONATE	1317-65-3	---	---	---	---
CERIUM OXIDE	1306-38-3	---	---	---	---
CHROMIUM	7440-47-3	1 ^{ΣΣ} , 3 ^Σ	K ^{ΣΣ}	X ^{ΣΣ}	X ^{ΣΣ}
COBALT	7440-48-4	2B	---	X	X
COPPER	7440-50-8	---	---	---	---
FLUORSPAR	7789-75-5	---	---	---	---
IRON	7439-89-6	---	---	---	---
IRON OXIDE	1309-37-1	3	---	---	---
LITHIUM CARBONATE	554-13-2	---	---	---	X
LITHIUM FLUORIDE	7789-24-4	---	---	---	---
LITHIUM OXIDE	12057-24-8	---	---	---	---
MAGNESIUM	7439-95-4	---	---	---	---
MAGNESIUM OXIDE	1309-48-4	---	---	---	---
MANGANESE	7439-96-5	---	---	---	---
MANGANESE OXIDE	1344-43-0	---	---	---	---
MOLYBDENUM	7439-98-7	---	---	---	---
NICKEL	7440-02-0	2B ^β , 1 ^{ββ}	S ^β , K ^{ββ}	---	X ^β , X ^{ββ}
SILICA	14808-60-7	1 ^ψ	K	---	X
(Amorphous Silica Fume)	69012-64-2	3	---	---	---
SILICON	7440-21-3	---	---	---	---
STRONTIUM FLUORIDE	7783-48-4	---	---	---	---
TITANIUM	7440-32-6	---	---	---	---
TITANIUM DIOXIDE	13463-67-7	2B	---	---	X
Ultraviolet Radiation	---	1	---	---	---
Welding Fumes	---	1	---	---	---
ZIRCONIUM	7440-67-7	---	---	---	---

E – International Agency for Research on Cancer (1 – Carcinogenic to Humans, 2A – Probably Carcinogenic to Humans, 2B – Possibly Carcinogenic to Humans, 3 – Not Classifiable as to its Carcinogenicity to Humans, 4 Probably Not Carcinogenic to Humans) Z – US National Toxicology Program (K – Known Carcinogen, S – Suspected Carcinogen) H – OSHA Designated Carcinogen List Θ – California Proposition 65 (X – On Proposition 65 list) --- Dashes indicate the ingredient is not listed with the IARC, NTP, OSHA or 65 Σ – Chromium Metal and Chromium III Compounds ΣΣ – Chromium VI β – Nickel metal and alloys ββ – Nickel compounds ψ – Silica Crystalline α-Quartz --- Dashes indicate the ingredient is not listed with the IARC, NTP, OSHA or Proposition 65

SECTION 12 – ECOLOGICAL INFORMATION

Welding processes can release fumes directly to the environment. Welding wire can degrade if left outside and unprotected. Residues from welding consumables and processes could degrade and accumulate in the soil and groundwater.

SECTION 13 – DISPOSAL CONSIDERATIONS

Use recycling procedures if available. Discard any product, residue, packaging, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

SECTION 14 – TRANSPORT INFORMATION

No international regulations or restrictions are applicable. No special precautions are necessary.

SECTION 15 – REGULATORY INFORMATION

Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label and the safety data sheet. Observe all local and federal rules and regulations. Take all necessary precautions to protect yourself and others.

United States EPA Toxic Substance Control Act: All constituents of these products are on the TSCA inventory list or are excluded from listing.

CERCLA/SARA TITLE III: Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs):

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Ingredient name

Products on this SDS are a solid solution in the form of a solid article.

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to your Local Emergency Planning Committee.

Section 311 Hazard Class

As shipped: Immediate

RQ(lb)

--

TPQ (lb)

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In use: Immediate delayed

EPCRA/SARA TITLE III 313 TOXIC CHEMICALS: The following metallic components are listed as SARA 313 "Toxic Chemicals" and potentially subject to annual SARA 312 reporting: Aluminum, Antimony Trioxide, Barium Compounds, Barium Fluoride, Chromium, Cobalt, Copper, Lithium Carbonate, Manganese, Manganese Oxide, and Nickel. See Section 3 for weight percentage.**CANADIAN CONTROLLED PRODUCTS REGULATION:** This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all of the information required by the CPR.**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA):** All constituents of these products are on the Domestic Substance List (DSL).**SECTION 16 – OTHER INFORMATION**

The following Hazard Statements, provided in the OSHA Hazard Communication Standard (29 CFR Part 1910.1200) correspond to the columns labeled 'GHS Hazard Statements' within Section 3 of this safety data sheet. Take appropriate precautions and protective measures to eliminate or limit the associated hazard.

H228: Flammable solid
H250: Catches fire spontaneously if exposed to air
H252: Self-heating in large quantities; may catch fire
H260: In contact with water releases flammable gases which may ignite spontaneously
H261: In contact with water releases flammable gases
H271: May cause fire or explosion; strong oxidizer
H301: Toxic if swallowed
H302: Harmful if swallowed
H311: Toxic in contact with skin
H314: Causes severe skin burns and eye damage
H317: May cause an allergic skin reaction
H319: Causes serious eye irritation
H330: Fatal if inhaled
H332: Harmful if inhaled
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335: May cause respiratory irritation
H340: May cause genetic defects
H350: May cause cancer
H351: Suspected of causing cancer
H361f: Suspected of damaging fertility or the unborn child
H372: Causes damage to organs through prolonged or repeated exposure
H373: May cause damage to organs through prolonged or repeated exposure
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects
H412: Harmful to aquatic life with long lasting effects.

The following Supplemental Hazard Information (EUH-Statement) pertaining to Section 3 is also taken from the OSHA Hazard Communication Standard (29 CFR Part 1910.1200):
EUH014 - Reacts violently with water

For additional information please refer to the following sources:

USA: **American National Standard Institute (ANSI) Z49.1** "Safety in Welding and Cutting", **ANSI/American Welding Society (AWS) F1.5** "Methods for Sampling and Analyzing Gases from Welding and Allied Processes", **ANSI/AWS F1.1** "Method for Sampling Airborne Particles Generated by Welding and Allied Processes", **AWSF3.2M/F3.2** "Ventilation Guide for Weld Fume", American Welding Society, 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353. Safety and Health Fact Sheets available from AWS at www.aws.org.
OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954.
Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists (ACGIH), 6500 Glenway Ave., Cincinnati, Ohio 45211, USA.
NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work" published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.

Canada: **CSA Standard CAN/CSA-W117.2-01** "Safety in Welding, Cutting and Allied Processes".

Hobart Brothers LLC strongly recommends the users of this product study this SDS, the product label information and become aware of all hazards associated with welding. Hobart Brothers LLC believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Hobart Brothers LLC cannot make any expressed or implied warranty as to this information.

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Excalibur® 7018 MR®

Product Size: 7/32" (5.6 mm)

Other means of identification

SDS number: 200000000527

Recommended use and restriction on use

Recommended use: SMAW (Shielded Metal Arc Welding)

Restrictions on use: Not known. Read this SDS before using this product.

Manufacturer/Importer/Supplier/Distributor Information

Company Name: The Lincoln Electric Company
Address: 22801 Saint Clair Avenue
Cleveland, Ohio 44117
USA
Telephone: +1 (216) 481-8100
Contact Person: Safety Data Sheet Questions: www.lincolnelectric.com/sds
Arc Welding Safety Information: www.lincolnelectric.com/safety

Company Name: The Lincoln Electric Company of Canada LP
Address: 179 Wicksteed Avenue
Toronto, Ontario M4G 2B9
Canada
Telephone: +1 (416) 421-2600
Contact Person: Safety Data Sheet Questions: www.lincolnelectric.com/sds
Arc Welding Safety Information: www.lincolnelectric.com/safety

Emergency telephone number:

USA/Canada/Mexico +1 (888) 609-1762
Americas/Europe +1 (216) 383-8962
Asia Pacific +1 (216) 383-8966
Middle East/Africa +1 (216) 383-8969

3E Company Access Code: 333988

2. HAZARDS IDENTIFICATION

Classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), The United States Occupational Safety and Health Administration's Hazard Communication Standard (29 CFR 1910.1200), Canada's Hazardous Product Regulations and Mexico's Harmonized System for the Identification and Communication of Hazards and Risks from Hazardous Chemicals in the Workplace.

Hazard Classification Not classified as hazardous according to applicable GHS hazard classification criteria.

Label Elements

Hazard Symbol: No symbol
Signal Word: No signal word.
Hazard Statement: Not applicable
Precautionary Not applicable

Statements:
Other hazards which do not result in GHS classification:

Electrical Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with work piece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Arc rays can injure eyes and burn skin. Welding arc and sparks can ignite combustibles and flammable materials. Overexposure to welding fumes and gases can be hazardous. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product. Refer to Section 8.

Substance(s) formed under the conditions of use:

The welding fume produced from this welding electrode may contain the following constituent(s) and/or their complex metallic oxides as well as solid particles or other constituents from the consumables, base metal, or base metal coating not listed below.

Chemical Identity	CAS-No.
Carbon dioxide	124-38-9
Carbon monoxide	630-08-0
Nitrogen dioxide	10102-44-0
Ozone	10028-15-6
Manganese	7439-96-5
Fluorides (as F)	16984-48-8

3. COMPOSITION / INFORMATION ON INGREDIENTS
**Reportable Hazardous Ingredients
Mixtures**

Chemical Identity	CAS number	Content in percent (%)*
Iron	7439-89-6	50 - <100%
Calcium fluoride	7789-75-5	5 - <10%
Limestone	1317-65-3	5 - <10%
Titanium dioxide (naturally occurring)	13463-67-7	1 - <5%
Manganese	7439-96-5	1 - <5%
Sodium silicate	1344-09-8	1 - <5%
Potassium silicate	1312-76-1	1 - <5%
Silicon	7440-21-3	0.1 - <1%
Titanium dioxide (synthetic)	13463-67-7	0.1 - <1%
Zircon	14940-68-2	0.1 - <1%
Carboxymethyl cellulose, sodium salt	9004-32-4	0.1 - <1%
Magnesite	546-93-0	0.1 - <1%
Quartz	14808-60-7	0.1 - <1%
Silicon dioxide (amorphous)	7631-86-9	0.1 - <1%
Hydroxyethyl cellulose	9004-62-0	0.1 - <1%
Hectorite	12173-47-6	0.1 - <1%

Iron oxide	1309-37-1	0.1 - <1%
Aluminum oxide	1344-28-1	0.1 - <1%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition Comments:

The term "Hazardous Ingredients" should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a welding or allied process hazard. The product may contain additional non-hazardous ingredients or may form additional compounds under the condition of use. Refer to Sections 2 and 8 for more information.

4. FIRST AID MEASURES**Ingestion:**

Avoid hand, clothing, food, and drink contact with fluxes, metal fume or powder which can cause ingestion of particulate during hand to mouth activities such as drinking, eating, smoking, etc. If ingested, do not induce vomiting. Contact a poison control center. Unless the poison control center advises otherwise, wash out mouth thoroughly with water. If symptoms develop, seek medical attention at once.

Inhalation:

Move to fresh air if breathing is difficult. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

Skin Contact:

Remove contaminated clothing and wash the skin thoroughly with soap and water. For reddened or blistered skin, or thermal burns, obtain medical assistance at once.

Eye contact:

Dust or fume from this product should be flushed from the eyes with copious amounts of clean, tepid water until transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed. Obtain medical assistance at once.

Arc rays can injure eyes. If exposed to arc rays, move victim to dark room, remove contact lenses as necessary for treatment, cover eyes with a padded dressing and rest. Obtain medical assistance if symptoms persist.

Most important symptoms/effects, acute and delayed**Symptoms:**

Short-term (acute) overexposure to fumes and gases from welding and allied processes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from welding and allied processes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Refer to Section 11 for more information.

Hazards:

The hazards associated with welding and its allied processes such as soldering and brazing are complex and may include physical and health hazards such as but not limited to electric shock, physical strains, radiation burns (eye flash), thermal burns due to hot metal or spatter and potential health effects of overexposure to fumes, gases or dusts potentially generated during the use of this product. Refer to Section 11 for more information.

Indication of immediate medical attention and special treatment needed**Treatment:**

Treat symptomatically.

5. FIRE-FIGHTING MEASURES

General Fire Hazards: As shipped, this product is nonflammable. However, welding arc and sparks as well as open flames and hot surfaces associated with brazing and soldering can ignite combustible and flammable materials. Read and understand American National Standard Z49.1, "Safety in Welding, Cutting and Allied Processes" and National Fire Protection Association NFPA 51B, "Standard for Fire Prevention during Welding, Cutting and Other Hot Work" before using this product.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: As shipped, the product will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical: Welding arc and sparks can ignite combustibles and flammable products.

Special protective equipment and precautions for fire-fighters

Special fire-fighting procedures: Use standard firefighting procedures and consider the hazards of other involved materials.

Special protective equipment for fire-fighters: Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8.

Methods and material for containment and cleaning up: Absorb with sand or other inert absorbent. Stop the flow of material, if this is without risk. Clean up spills immediately, observing precautions in the personal protective equipment in Section 8. Avoid generating dust. Prevent product from entering any drains, sewers or water sources. Refer to Section 13 for proper disposal.

Environmental Precautions: Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water sources or sewer. Environmental manager must be informed of all major spillages.

7. HANDLING AND STORAGE

Precautions for safe handling: Prevent formation of dust. Provide appropriate exhaust ventilation at places where dust is formed.

Read and understand the manufacturer's instruction and the precautionary label on the product. Refer to Lincoln Safety Publications at www.lincolnelectric.com/safety. See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the American Welding Society, <http://pubs.aws.org> and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, www.gpo.gov.

Conditions for safe storage, including any incompatibilities: Store in closed original container in a dry place. Store in accordance with local/regional/national regulations. Store away from incompatible materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters

Occupational Exposure Limits: US

Chemical Identity	Type	Exposure Limit Values	Source
Calcium fluoride - as F	TWA	2.5 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
Calcium fluoride	IDLH	250 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
	IDLH	250 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Calcium fluoride - as F	PEL	2.5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Calcium fluoride - Dust.	TWA	2.5 mg/m3	US. OSHA Table Z-2 (29 CFR 1910.1000) (02 2006)
Limestone - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Limestone - Respirable fraction.	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Limestone - Respirable.	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Limestone - Total	REL	10 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Limestone - Inhalable particles.	TWA	10 mg/m3	US. ACGIH Threshold Limit Values (01 2021)
Limestone - Respirable particles.	TWA	3 mg/m3	US. ACGIH Threshold Limit Values (01 2021)
Limestone - Total dust.	TWA	50 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Limestone - Respirable fraction.	TWA	5 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Limestone - Total dust.	TWA	15 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Limestone - Respirable fraction.	TWA	15 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Titanium dioxide (naturally occurring)	TWA	10 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
	IDLH	5,000 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Titanium dioxide (naturally occurring) - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Titanium dioxide (naturally occurring) - Respirable fraction.	TWA	5 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Titanium dioxide (naturally occurring) - Total dust.	TWA	50 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Titanium dioxide (naturally occurring) - Respirable fraction.	TWA	15 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Titanium dioxide (naturally occurring) - Total dust.	TWA	15 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Manganese - Fume. - as Mn	Ceiling	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	STEL	3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	US. ACGIH Threshold Limit Values (03 2014)

Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Manganese	IDLH	500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Silicon - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Silicon - Respirable fraction.	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Silicon - Respirable.	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Silicon - Total	REL	10 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Silicon - Respirable particles.	TWA	3 mg/m3	US. ACGIH Threshold Limit Values (01 2021)
Silicon - Inhalable particles.	TWA	10 mg/m3	US. ACGIH Threshold Limit Values (01 2021)
Silicon - Respirable fraction.	TWA	5 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Silicon - Total dust.	TWA	50 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
	TWA	15 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Silicon - Respirable fraction.	TWA	15 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Titanium dioxide (synthetic)	TWA	10 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
	IDLH	5,000 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Titanium dioxide (synthetic) - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Titanium dioxide (synthetic) - Respirable fraction.	TWA	5 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Titanium dioxide (synthetic) - Total dust.	TWA	50 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Titanium dioxide (synthetic) - Respirable fraction.	TWA	15 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Titanium dioxide (synthetic) - Total dust.	TWA	15 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Zircon - as Zr	STEL	10 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
	TWA	5 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	STEL	10 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Zircon	IDLH	25 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Magnesite - Total	REL	10 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Magnesite - Respirable.	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Magnesite - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Magnesite - Respirable fraction.	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Magnesite - Respirable particles.	TWA	3 mg/m3	US. ACGIH Threshold Limit Values (01 2021)

Magnesite - Inhalable particles.	TWA	10 mg/m3	US. ACGIH Threshold Limit Values (01 2021)
Magnesite - Total dust.	TWA	15 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
	TWA	50 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Magnesite - Respirable fraction.	TWA	15 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
	TWA	5 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Quartz - Respirable.	TWA	2.4 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
	TWA	0.1 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
Quartz - Respirable dust.	REL	0.05 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Quartz - Respirable dust.	TWA	0.05 mg/m3	US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050) (03 2016)
	OSHA_ACT	0.025 mg/m3	US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050) (03 2016)
Quartz - Respirable dust.	PEL	0.05 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (03 2016)
Quartz	IDLH	50 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Quartz - Respirable fraction.	TWA	0.025 mg/m3	US. ACGIH Threshold Limit Values (02 2020)
Silicon dioxide (amorphous)	TWA	20 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
	TWA	0.8 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
	REL	6 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	IDLH	3,000 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Silicon dioxide (amorphous) - Inhalable particles.	TWA	10 mg/m3	US. ACGIH Threshold Limit Values (01 2021)
Silicon dioxide (amorphous) - Respirable particles.	TWA	3 mg/m3	US. ACGIH Threshold Limit Values (01 2021)
Silicon dioxide (amorphous) - Total dust.	TWA	50 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Silicon dioxide (amorphous) - Respirable fraction.	TWA	15 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
	TWA	5 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Silicon dioxide (amorphous) - Total dust.	TWA	15 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Iron oxide - Respirable fraction.	TWA	5 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
Iron oxide - Fume.	PEL	10 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Iron oxide - Dust and fume. - as Fe	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Iron oxide	IDLH	2,500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Aluminum oxide - Respirable fraction.	TWA	1 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Aluminum oxide - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air

			Contaminants (29 CFR 1910.1000) (02 2006)
Aluminum oxide - Respirable fraction.	TWA	15 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
	TWA	5 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Aluminum oxide - Total dust.	TWA	15 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
	TWA	50 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Aluminum oxide - Inhalable particles.	TWA	10 mg/m3	US. ACGIH Threshold Limit Values (01 2021)
Aluminum oxide - Respirable particles.	TWA	3 mg/m3	US. ACGIH Threshold Limit Values (01 2021)

Occupational Exposure Limits: Canada

Chemical Identity	Type	Exposure Limit Values	Source
Calcium fluoride - as F	TWA	2.5 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	2.5 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	2.5 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	2.5 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	2.5 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	2.5 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	5 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	2.5 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Limestone	TWA	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Limestone - Total dust.	STEL	20 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Limestone - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)

Limestone	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Limestone - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Limestone - Inhalable particles.	TWA	10 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
Limestone - Respirable particles.	TWA	3 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
Limestone - Inhalable fraction.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Limestone - Inhalable particles.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Limestone - Respirable particles.	TWA	3 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Limestone - Respirable fraction.	TWA	3 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Titanium dioxide (naturally occurring)	TWA	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Titanium dioxide (naturally occurring) - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Titanium dioxide (naturally occurring) - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Titanium dioxide (naturally occurring)	TWA	10 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Titanium dioxide (naturally occurring) - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	8 HR ACL	0.2 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	0.6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)

Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (06 2015)
Manganese - Fume, total dust. - as Mn	TWA	0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Manganese - Respirable. - as Mn	TWA	0.02 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)
Manganese - Total - as Mn	TWA	0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)
Silicon - Total dust.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
Silicon	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Silicon - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Silicon - Respirable particles.	TWA	3 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (01 2019)
Silicon - Total particulate.	TWA	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (01 2019)
Silicon - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (06 2020)
Silicon - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (06 2020)
Silicon - Inhalable particles.	TWA	10 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
Silicon - Respirable particles.	TWA	3 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
Silicon - Respirable fraction.	TWA	3 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Silicon - Inhalable fraction.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Silicon - Inhalable particles.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Silicon - Respirable particles.	TWA	3 mg/m3	Canada. Ontario OELs. (Control of

			Exposure to Biological or Chemical Agents), as amended (01 2020)
Titanium dioxide (synthetic)	TWA	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Titanium dioxide (synthetic) - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Titanium dioxide (synthetic) - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Titanium dioxide (synthetic)	TWA	10 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Titanium dioxide (synthetic) - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Zircon - as Zr	TWA	5 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	STEL	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	STEL	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	5 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	STEL	10 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	5 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	5 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	STEL	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	5 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)

	TWA	5 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
	STEL	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Magnesite - Total dust.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
Magnesite	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Magnesite - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Magnesite - Respirable particles.	TWA	3 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (01 2019)
Magnesite - Total particulate.	TWA	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (01 2019)
Magnesite - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (06 2020)
Magnesite - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (06 2020)
Magnesite - Respirable particles.	TWA	3 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
Magnesite - Inhalable particles.	TWA	10 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
Magnesite - Respirable particles.	TWA	3 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Magnesite - Respirable fraction.	TWA	3 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Magnesite - Inhalable particles.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Magnesite - Inhalable fraction.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Quartz - Respirable particles.	TWA	0.025 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Quartz - Respirable fraction.	8 HR ACL	0.05 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	0.10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (06 2015)
Quartz - Respirable dust.	TWA	0.1 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Quartz - Respirable fraction.	TWA	0.025 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for

			Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended (06 2020)
	TWA	0.025 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
Silicon dioxide (amorphous)	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
Silicon dioxide (amorphous) - Total particulate.	TWA	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (01 2019)
Silicon dioxide (amorphous) - Respirable particles.	TWA	3 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (01 2019)
Silicon dioxide (amorphous) - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (06 2020)
Silicon dioxide (amorphous) - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (06 2020)
Silicon dioxide (amorphous) - Respirable particles.	TWA	3 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
Silicon dioxide (amorphous) - Inhalable particles.	TWA	10 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
Silicon dioxide (amorphous) - Respirable fraction.	TWA	3 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Silicon dioxide (amorphous) - Inhalable particles.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Silicon dioxide (amorphous) - Inhalable fraction.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Silicon dioxide (amorphous) - Respirable particles.	TWA	3 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Silicon dioxide (amorphous) - Inhalable fraction.	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (06 2016)
Silicon dioxide (amorphous) - Respirable fraction.	15 MIN ACL	6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (06 2016)
	8 HR ACL	3 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (06 2016)
Silicon dioxide (amorphous) - Inhalable fraction.	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (06 2016)
Silicon dioxide (amorphous) - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (03 2020)
Iron oxide - Respirable.	TWA	5 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Iron oxide - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety

			Regulation 296/97, as amended) (07 2007)
Iron oxide - Dust. - as Fe	TWA	5 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Fume. - as Fe	STEL	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Fume. - as Fe	TWA	5 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Respirable fraction.	TWA	5 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	5 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
Iron oxide	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Iron oxide - Dust and fume. - as Fe	15 MIN ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	8 HR ACL	5 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	5 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Aluminum oxide	TWA	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Aluminum oxide - Respirable fraction.	TWA	1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	3 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (06 2015)
	TWA	1 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
Aluminum oxide - Inhalable fraction.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (06 2015)
Aluminum oxide	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety

			Regulations, 1996, Table 21), as amended (05 2009)
Aluminum oxide - Total dust. - as Al	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Aluminum oxide - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (06 2020)
Aluminum oxide - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (06 2020)
Aluminum oxide - Respirable.	TWA	1.0 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (06 2020)
Aluminum oxide - Inhalable particles.	TWA	10 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
Aluminum oxide - Respirable particles.	TWA	3 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (01 2021)
	TWA	3 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)
Aluminum oxide - Inhalable particles.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (01 2020)

Occupational Exposure Limits: Mexico

Chemical Identity	Type	Exposure Limit Values	Source
Iron - as Fe	VLE-PPT	1 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Calcium fluoride - as F	VLE-PPT	2.5 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Limestone - Inhalable fraction.	VLE-PPT	10 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Limestone - Respirable fraction.	VLE-PPT	3 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Titanium dioxide (naturally occurring)	VLE-PPT	10 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Manganese - as Mn	VLE-PPT	0.2 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Silicon - Inhalable fraction.	VLE-PPT	10 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Silicon - Respirable fraction.	VLE-PPT	3 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)

Titanium dioxide (synthetic)	VLE-PPT	10 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Zircon - as Zr	VLE-PPT	5 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
	VLE-CT	10 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Magnesite - Respirable fraction.	VLE-PPT	3 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Magnesite - Inhalable fraction.	VLE-PPT	10 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Quartz - Respirable fraction.	VLE-PPT	0.025 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Silicon dioxide (amorphous) - Inhalable fraction.	VLE-PPT	10 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Silicon dioxide (amorphous) - Respirable fraction.	VLE-PPT	3 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Iron oxide - Respirable fraction.	VLE-PPT	5 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Aluminum oxide	VLE-PPT	10 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)

Biological Limit Values: US

Chemical Identity	Exposure Limit Values	Source
Calcium fluoride (Fluoride: Sampling time: Prior to shift.)	2 mg/l (Urine)	ACGIH BEI (03 2013)
Calcium fluoride (Fluoride: Sampling time: End of shift.)	3 mg/l (Urine)	ACGIH BEI (03 2013)

Biological Limit Values: Mexico

Chemical Identity	Exposure Limit Values	Source
Calcium fluoride (fluorides: Sampling time: End of shift.)	10 mg/g (Creatinine in urine)	MX IBE (06 2012)
Calcium fluoride (fluorides: Sampling time: Prior to shift.)	3 mg/g (Creatinine in urine)	MX IBE (06 2012)

Additional exposure limits under the conditions of use: US

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	TWA	5,000 ppm	US. ACGIH Threshold Limit Values (12 2010)
	STEL	30,000 ppm	US. ACGIH Threshold Limit Values (12 2010)
	PEL	5,000 ppm 9,000 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	30,000 ppm 54,000 mg/m3	US. NIOSH: Pocket Guide to Chemical

			Hazards, as amended (2005)
	REL	5,000 ppm 9,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	IDLH	40,000 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Carbon monoxide	TWA	25 ppm	US. ACGIH Threshold Limit Values (12 2010)
	PEL	50 ppm 55 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	35 ppm 40 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	Ceil_Time	200 ppm 229 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	IDLH	1,200 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Nitrogen dioxide	TWA	0.2 ppm	US. ACGIH Threshold Limit Values (02 2012)
	Ceiling	5 ppm 9 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	1 ppm 1.8 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	IDLH	20 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
	IDLH	13 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Ozone	PEL	0.1 ppm 0.2 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Ceil_Time	0.1 ppm 0.2 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	TWA	0.05 ppm	US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.10 ppm	US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.08 ppm	US. ACGIH Threshold Limit Values (03 2014)
	IDLH	5 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
	TWA	0.20 ppm	US. ACGIH Threshold Limit Values (02 2020)
Manganese - Fume. - as Mn	Ceiling	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	STEL	3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Manganese	IDLH	500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Fluorides (as F) - as F	TWA	2.5 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
	PEL	2.5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Fluorides (as F) - Dust.	TWA	2.5 mg/m3	US. OSHA Table Z-2 (29 CFR 1910.1000) (02 2006)
Fluorides (as F)	IDLH	250 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)

Additional exposure limits under the conditions of use: Canada

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	STEL	30,000 ppm 54,000 mg/m3	Canada. Alberta OELs (Occupational

			Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	5,000 ppm 9,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	5,000 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	STEL	15,000 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	5,000 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	STEL	30,000 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	STEL	30,000 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	TWA	5,000 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	5,000 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	30,000 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	5,000 ppm 9,000 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
	STEL	30,000 ppm 54,000 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Carbon monoxide	TWA	25 ppm 29 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	25 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	STEL	100 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	25 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	25 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
	8 HR ACL	25 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	190 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)

	TWA	35 ppm	40 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
	STEL	200 ppm	230 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Nitrogen dioxide	STEL	5 ppm	9.4 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	3 ppm	5.6 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	CEILING	1 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.2 ppm		Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2012)
	STEL	5 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	TWA	3 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	3 ppm		Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	5 ppm		Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	3 ppm	5.6 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Ozone	STEL	0.3 ppm	0.6 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	0.1 ppm	0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	0.05 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.1 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.08 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.2 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.1 ppm	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
	STEL	0.3 ppm	0.6 mg/m3	Canada. Ontario OELs. (Control of

			Exposure to Biological or Chemical Agents), as amended (07 2010)
	15 MIN ACL	0.15 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	8 HR ACL	0.05 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	CEILING	0.1 ppm 0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (12 2008)
	TWA	0.05 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
	TWA	0.08 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
	TWA	0.10 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
	TWA	0.20 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (02 2020)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	8 HR ACL	0.2 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	0.6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (06 2015)
Manganese - Fume, total dust. - as Mn	TWA	0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)
Manganese - Respirable. - as Mn	TWA	0.02 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)
Manganese - Total - as Mn	TWA	0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)
Fluorides (as F) - as F	TWA	2.5 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	2.5 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	2.5 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Biological Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)

	TWA	2.5 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	2.5 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	2.5 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	5 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	2.5 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended (09 2017)

Additional exposure limits under the conditions of use: Mexico

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	VLE-CT	30,000 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
	VLE-PPT	5,000 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Carbon monoxide	VLE-PPT	25 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Nitrogen dioxide	VLE-PPT	0.2 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Ozone	VLE-P	0.1 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Manganese - as Mn	VLE-PPT	0.2 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Fluorides (as F) - as F	VLE-PPT	2.5 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)

Appropriate Engineering Controls

Ventilation: Use enough ventilation and local exhaust at the arc, flame or heat source to keep the fumes and gases from the worker's breathing zone and the general area. Train the operator to keep their head out of the fumes. **Keep exposure as low as possible.**

Individual protection measures, such as personal protective equipment
General information:

Exposure Guidelines: To reduce the potential for overexposure, use controls such as adequate ventilation and personal protective equipment (PPE). Overexposure refers to exceeding applicable local limits, the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) or the Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limits (PELs). Workplace exposure levels should be established by competent industrial hygiene assessments. Unless exposure levels are confirmed to be below the applicable local limit, TLV or PEL, whichever is lower, respirator use is required. Absent these controls, overexposure to one or more compound constituents, including those in the fume or airborne particles, may occur

resulting in potential health hazards. According to the ACGIH, TLVs and Biological Exposure Indices (BEIs) "represent conditions under which ACGIH believes that nearly all workers may be repeatedly exposed without adverse health effects." The ACGIH further states that the TLV-TWA should be used as a guide in the control of health hazards and should not be used to indicate a fine line between safe and dangerous exposures. See Section 10 for information on constituents which have some potential to present health hazards. Welding consumables and materials being joined may contain chromium as an unintended trace element. Materials that contain chromium may produce some amount of hexavalent chromium (CrVI) and other chromium compounds as a byproduct in the fume. In 2018, the American Conference of Governmental Industrial Hygienists (ACGIH) lowered the Threshold Limit Value (TLV) for hexavalent chromium from 50 micrograms per cubic meter of air (50 µg/m³) to 0.2 µg/m³. At these new limits, CrVI exposures at or above the TLV may be possible in cases where adequate ventilation is not provided. CrVI compounds are on the IARC and NTP lists as posing a lung cancer and sinus cancer risk. Workplace conditions are unique and welding fume exposures levels vary. Workplace exposure assessments must be conducted by a qualified professional, such as an industrial hygienist, to determine if exposures are below applicable limits and to make recommendations when necessary for preventing overexposures.

Eye/face protection:

Wear helmet or use face shield with filter lens shade number 12 or darker for open arc processes – or follow the recommendations as specified in ANSI Z49.1, Section 4, based on your process and settings. No specific lens shade recommendation for submerged arc or electroslag processes. Shield others by providing appropriate screens and flash goggles.

Skin Protection**Hand Protection:**

Wear protective gloves. Suitable gloves can be recommended by the glove supplier.

Other:

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, open flames, hot surfaces, sparks and electrical shock. See Z49.1. At a minimum, this includes welder's gloves and a protective face shield when welding, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing when welding, brazing and soldering. Wear dry gloves free of holes or split seams. Train the operator not to permit electrically live parts or electrodes from contacting the skin . . . or clothing or gloves if they are wet. Insulate yourself from the work piece and ground using dry plywood, rubber mats or other dry insulation.

Respiratory Protection:

Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are below applicable exposure limits.

Hygiene measures:

Do not eat, drink or smoke when using the product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, www.aws.org.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Steel rod with extruded flux coating.
Physical state:	Solid
Form:	Solid
Color:	No data available.
Odor:	No data available.
Odor threshold:	No data available.
pH:	No data available.
Melting point/freezing point:	No data available.
Initial boiling point and boiling range:	No data available.
Flash Point:	No data available.
Evaporation rate:	No data available.
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper:	No data available.
Explosive limit - lower:	No data available.
Vapor pressure:	No data available.
Vapor density:	No data available.
Density:	No data available.
Relative density:	No data available.
Solubility(ies)	
Solubility in water:	No data available.
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.

10. STABILITY AND REACTIVITY

Reactivity:	The product is non-reactive under normal conditions of use, storage and transport.
Chemical Stability:	Material is stable under normal conditions.
Possibility of hazardous reactions:	None under normal conditions.
Conditions to avoid:	Avoid heat or contamination.
Incompatible Materials:	Strong acids. Strong oxidizing substances. Strong bases.
Hazardous Decomposition Products:	Fumes and gases from welding and its allied processes such as brazing and soldering cannot be classified simply. The composition and quantity of both are dependent upon the metal to which the joining or hot work is applied, the process, procedure - and where applicable - the electrode or

consumable used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded or worked (such as paint, plating, or galvanizing), the number of operators and the volume of the work area, the quality and amount of ventilation, the position of the operator's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

In cases where an electrode or other applied material is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents produced during arc welding and brazing include the oxides of iron, manganese and other metals present in the welding consumable or base metal. Hexavalent chromium compounds may be in the welding or brazing fume of consumables or base metals which contain chromium. Gaseous and particulate fluoride may be in the fume of consumables or flux materials which contain fluoride. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc associated with welding.

11. TOXICOLOGICAL INFORMATION

General information:

The International Agency for Research on Cancer (IARC) has determined welding fumes and ultraviolet radiation from welding are carcinogenic to humans (Group 1). According to IARC, welding fumes cause cancer of the lung and positive associations have been observed with cancer of the kidney. Also according to IARC, ultraviolet radiation from welding causes ocular melanoma. IARC identifies gouging, brazing, carbon arc or plasma arc cutting, and soldering as processes closely related to welding. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.

Information on likely routes of exposure

Inhalation:

Potential chronic health hazards related to the use of welding consumables are most applicable to the inhalation route of exposure. Refer to Inhalation statements in Section 11.

Skin Contact:

Arc rays can burn skin. Skin cancer has been reported.

Eye contact:

Arc rays can injure eyes.

Ingestion:

Health injuries from ingestion are not known or expected under normal use.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation: Respiratory exposure to the crystalline silica present in this welding electrode is not anticipated during normal use. Respiratory overexposure to airborne crystalline silica is known to cause silicosis, a form of disabling pulmonary fibrosis which can be progressive and may lead to death. Crystalline silica is on the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program) lists as posing a cancer risk to humans. Note: All regional authorities do not use the same criteria for assigning carcinogenic classifications to chemicals. For example, the European Union (EU) CLP does not require classifying crystalline silica as a carcinogenic compound. Short-term (acute) overexposure to fumes and gases from welding and allied processes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from welding and allied processes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects.

Information on toxicological effects**Acute toxicity (list all possible routes of exposure)****Oral**

Product:	Not classified
Specified substance(s):	
Iron	LD 50 (Rat): 98.6 g/kg
Calcium fluoride	LD 50 (Rat): 4,250 mg/kg
Limestone	LD 50 (Rat): 6,450 mg/kg
Sodium silicate	LD 50 (Rat): 1.1 g/kg
Zircon	LD 50 (Rat): 3,200 mg/kg
Carboxymethyl cellulose, sodium salt	LD 50 (Rat): 2,700 mg/kg

Dermal

Product: Not classified

Inhalation

Product:	Not classified
Specified substance(s):	
Carboxymethyl cellulose, sodium salt	LC 50 (Rat, 4 h): 5,800 mg/m3

Repeated dose toxicity

Product: Not classified

Skin Corrosion/Irritation

Product: Not classified

Serious Eye Damage/Eye Irritation

Product: Not classified

Respiratory or Skin Sensitization

Product: Not classified

Carcinogenicity

Product: Arc rays: Skin cancer has been reported.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Titanium dioxide (naturally occurring)	Overall evaluation: 2B. Possibly carcinogenic to humans.
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Titanium dioxide (synthetic)	Overall evaluation: 2B. Possibly carcinogenic to humans.
Quartz	Overall evaluation: 1. Carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens:

Quartz	Known To Be Human Carcinogen.
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US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended:

Quartz	Cancer
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Germ Cell Mutagenicity**In vitro**

Product:	Not classified
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In vivo

Product:	Not classified
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Reproductive toxicity

Product:	Not classified
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Specific Target Organ Toxicity - Single Exposure

Product:	Not classified
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Specific Target Organ Toxicity - Repeated Exposure

Product:	Not classified
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Aspiration Hazard

Product:	Not classified
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Other effects:

Organic polymers may be used in the manufacture of various welding consumables. Overexposure to their decomposition byproducts may result in a condition known as polymer fume fever. Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually not lasting longer than 48 hours.

Symptoms related to the physical, chemical and toxicological characteristics under the condition of use**Inhalation:****Specified substance(s):**

Manganese	Overexposure to manganese fumes may affect the brain and central nervous system, resulting in poor coordination, difficulty speaking, and arm or leg tremor. This condition can be irreversible.
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Additional toxicological Information under the conditions of use:**Acute toxicity****Oral****Specified substance(s):**

Fluorides (as F)	LD 50 (Rat): 4,250 mg/kg
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Inhalation**Specified substance(s):**

Carbon dioxide	LC Lo (Human, 5 min): 90000 ppm
Carbon monoxide	LC 50 (Rat, 4 h): 1300 ppm
Nitrogen dioxide	LC 50 (Rat, 4 h): 88 ppm

Ozone LC Lo (Human, 30 min): 50 ppm

Other effects:**Specified substance(s):**

Carbon dioxide	Asphyxia
Carbon monoxide	Carboxyhemoglobinemia
Nitrogen dioxide	Lower respiratory tract irritation

12. ECOLOGICAL INFORMATION**Ecotoxicity****Acute hazards to the aquatic environment:****Fish**

Product: Not classified.

Specified substance(s):

Calcium fluoride	LC 50 (96 h): 340 mg/l
Sodium silicate	LC 50 (Western mosquitofish (<i>Gambusia affinis</i>), 96 h): 1,800 mg/l

Aquatic Invertebrates

Product: Not classified.

Specified substance(s):

Calcium fluoride	EC 50 (<i>Daphnia magna</i> ; <i>Daphnia</i> sp., 48 h): 270 mg/l
Manganese	EC 50 (Water flea (<i>Daphnia magna</i>), 48 h): 40 mg/l
Sodium silicate	EC 50 (Water flea (<i>Ceriodaphnia dubia</i>), 48 h): 22.94 - 49.01 mg/l
Carboxymethyl cellulose, sodium salt	EC 50 (Water flea (<i>Ceriodaphnia dubia</i>), 48 h): 46.04 - 165.37 mg/l

Chronic hazards to the aquatic environment:**Fish**

Product: Not classified.

Aquatic Invertebrates

Product: Not classified.

Toxicity to Aquatic Plants

Product: Not classified.

Persistence and Degradability**Biodegradation**

Product: No data available.

Bioaccumulative potential**Bioconcentration Factor (BCF)**

Product: No data available.

Mobility in soil:

No data available.

13. Disposal considerations**General information:**

The generation of waste should be avoided or minimized whenever possible. When practical, recycle in an environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements.

Disposal instructions:

Disposal of this product may be regulated as a Hazardous Waste. The welding consumable and/or by-product from the welding process (including,

but not limited to slag, dust, etc.) may contain levels of leachable heavy metals such as Barium or Chromium. Prior to disposal, a representative sample must be analyzed in accordance with US EPA's Toxicity Characteristic Leaching Procedure (TCLP) to determine if any constituents exist above regulated threshold levels. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner according to Federal, State and Local Regulations.

Contaminated Packaging:

Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

14. TRANSPORT INFORMATION**DOT**

UN number or ID number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No

IMDG

UN number or ID number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): –
EmS No.:
Packing Group: –
Marine Pollutant: No

IATA

UN number or ID number:
Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es):
Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No
Cargo aircraft only: Allowed.

TDG

UN number or ID number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No

15. REGULATORY INFORMATION**US Federal Regulations****TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended**Chemical Identity**

Quartz

OSHA hazard(s)kidney effects
lung effects
immune system effects
Cancer**CERCLA Hazardous Substance List (40 CFR 302.4):****Chemical Identity**

Manganese

Reportable quantity

Included in the regulation but with no data values. See regulation for further details.

Superfund Amendments and Reauthorization Act of 1986 (SARA)**Hazard categories**

Not classified

Not classified

SARA 302 Extremely Hazardous Substance

None present or none present in regulated quantities.

SARA 304 Emergency Release Notification

None present or none present in regulated quantities.

SARA 311/312 Hazardous Chemical**Chemical Identity****Threshold Planning Quantity****SARA 313 (TRI Reporting)****Chemical Identity**

Manganese

**Reporting threshold
for other users**

10000 lbs

**Reporting threshold for
manufacturing and processing**

25000 lbs.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

None present or none present in regulated quantities.

US State Regulations**US. California Proposition 65**

WARNING: This product can expose you to chemicals including, Titanium dioxide (naturally occurring), Titanium dioxide (synthetic), Quartz, which is [are] known to the State of California to cause cancer.

For more information go to www.P65Warnings.ca.gov.

WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq.)

WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov

US. New Jersey Worker and Community Right-to-Know Act**Chemical Identity****US. Massachusetts RTK - Substance List****Chemical Identity**

Quartz
Chromium and chromium alloys or compounds (as Cr)

US. Pennsylvania RTK - Hazardous Substances**Chemical Identity**

Calcium fluoride
Limestone
Titanium dioxide (naturally occurring)
Manganese

US. Rhode Island RTK

No ingredient regulated by RI Right-to-Know Law present.

Canada Federal Regulations**List of Toxic Substances (CEPA, Schedule 1)**

Not Regulated

Export Control List (CEPA 1999, Schedule 3)

Not Regulated

National Pollutant Release Inventory (NPRI)**Canada. National Pollutant Release Inventory (NPRI) Substances, Part 5, VOCs with Additional Reporting Requirements**

NPRI PT5 Not Regulated

Canada. National Pollutant Release Inventory (NPRI) (Schedule 1, Parts 1-4)

NPRI Not Regulated

Greenhouse Gases

Not Regulated

Controlled Drugs and Substances Act

CA CDSI Not Regulated

CA CDSII Not Regulated

CA CDSIII Not Regulated

CA CDSIV Not Regulated

CA CDSV Not Regulated

CA CDSVII Not Regulated

CA CDSVIII Not Regulated

Precursor Control Regulations

Not Regulated

Mexico. Substances subject to reporting for the pollutant release and transfer registry (PRTR): Not applicable

Inventory Status:

Canada DSL Inventory List:	One or more components are not listed or are exempt from listing.
EINECS, ELINCS or NLP:	One or more components are not listed or are exempt from listing.
Japan (ENCS) List:	One or more components are not listed or are exempt from listing.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Canada NDSL Inventory:	One or more components are not listed or are exempt from listing.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	One or more components are not listed or are exempt from listing.
New Zealand Inventory of Chemicals:	On or in compliance with the inventory

Japan ISHL Listing:	One or more components are not listed or are exempt from listing.
Japan Pharmacopoeia Listing:	One or more components are not listed or are exempt from listing.
Ontario Inventory:	One or more components are not listed or are exempt from listing.
Taiwan Chemical Substance Inventory:	On or in compliance with the inventory
Australia Industrial Chem. Act (AIC):	One or more components are not listed or are exempt from listing.
Korea Existing Chemicals Inv. (KECI):	One or more components are not listed or are exempt from listing.
Mexico INSQ:	One or more components are not listed or are exempt from listing.
Switzerland New Subs	
Notified/Registered:	One or more components are not listed or are exempt from listing.
Thailand Existing Chemical Inv. List:	One or more components are not listed or are exempt from listing.
Vietnam National Chemical Inventory:	One or more components are not listed or are exempt from listing.

16. OTHER INFORMATION

Definitions:

Revision Date: 05/19/2022

Further Information: Additional information is available by request.

Disclaimer: The Lincoln Electric Company urges each end user and recipient of this SDS to study it carefully. See also www.lincolnelectric.com/safety. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product. This information is believed to be accurate as of the revision date shown above. However, no warranty, expressed or implied, is given. Because the conditions or methods of use are beyond Lincoln Electric's control, we assume no liability resulting from the use of this product. Regulatory requirements are subject to change and may differ between various locations. Compliance with all applicable Federal, State, Provincial, and local laws and regulations remain the responsibility of the user.

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SAFETY DATA SHEET

MAY BE USED TO COMPLY WITH OSHA'S HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200 AND SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) OF 1986 PUBLIC LAW 99-499.
STANDARD SHOULD BE CONSULTED FOR SPECIFIC REQUIREMENTS.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

NAME OF CODE / PRODUCT: P12610 / Certanium 707 Electrode

**MANUFACTURER/
SUPPLIER:** LAWSON PRODUCTS
8770 WEST BRYN MAWR AVE. SUITE 900
CHICAGO, IL. 60631-3515 USA

TELEPHONE NUMBER: (773) 304-5050

EMERGENCY PHONE NUMBER: (888) 426-4851

PRODUCT CLASSIFICATION: Covered Electrode for Shielded Metal Arc Welding (SMAW)

SECTION 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Welding electrodes are not normally considered hazardous as shipped or when handled. Gloves should be worn when handling to prevent cuts. Avoid inhalation of dust from these products. Skin contact may cause possible allergic reactions. Persons with a pacemaker should not go near welding or cutting operations until they have consulted their doctor and obtained information from the manufacturer of the pacemaker device. When this product is used in a welding process the most important hazards are: heat, radiation, electric shock, and welding fumes.

ROUTES OF ENTRY:

Primary route of entry is the respiratory system. Other possible routes are eyes and/or skin contact.

POTENTIAL HEALTH EFFECTS:

EYES: RADIATION: Arc rays from welding can injure eyes. HEAT and MOLTEN METAL can severely damage eyes.

SKIN: HEAT: Spatter and molten metal can cause burn injuries
ELECTRICITY: **Electric shock can kill!**
RADIATION from the arc: Skin cancer has been reported.

INGESTION: Not an expected route of entry, but if ingested product could cause serious injury.

INHALATION: FUMES: Overexposure to welding fumes may result in symptoms like metal fume fever, dizziness, nausea, dryness of the nose, throat or eyes.

ACUTE HEALTH HAZARDS: See Section 11

CHRONIC HEALTH HAZARDS: See Section 11

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Nothing found.

WARNING: This product contains or produces a chemical known to the State of California to cause birth defects (or other reproductive harm) and cancer. (California Health & Safety Code 25249.5 *et seq.*)

WARNING: avoid breathing welding fumes and gases; they may dangerous to your health. Always use adequate ventilation and use appropriate personal protection equipment.

CARCINOGENICITY:

CHROMIUM - Chromium VI is listed as being carcinogenic to humans on *IARC* and *NTP* lists, and is listed by *NIOSH* as being a potential occupational carcinogen (with no further categorization).

NICKEL - is listed as being carcinogenic to humans on *IARC* and *NTP* lists, and is listed by *NIOSH* as being a potential occupational carcinogen (with no further categorization).

TITANIUM DIOXIDE is listed as being unclassifiable as to Carcinogenicity in humans by *IARC* and is listed by *NIOSH* as being a potential occupational carcinogen (with no further categorization).

MANGANESE is listed by *ACGIH* as Group A4: Not classifiable as a human carcinogen.

WELDING FUMES (not otherwise specified) are considered to be carcinogenic defined with no further categorization by *NIOSH* and *IARC*.

Package Labeling:

Although this product does not require a hazard warning label in all countries, we recommend that the safety advice should be observed:

Pictograms: GHS07- GHS08



Contains Nickel

R-Phrases:

Limited evidence of carcinogenic effect

May cause sensitization by skin contact

Toxic: danger of serious damage to health by prolonged exposure through inhalation

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Brazing/welding fumes and vapors may cause metal fume fever (headache, dizziness, dryness, cough, nausea, and fever) and these symptoms may appear 4-12 hours after exposure

May cause irritation by prolonged inhalation of brazing/welding fumes.

GHS:

Hazard categories:

Respiratory/skin sensitization: Skin Sens: 1

Carcinogenicity: Carc. 2

Specific target organ toxicity – repeated exposure: STOT RE 1

May cause an allergic skin reaction.

Suspected of causing cancer.

Causes damage to organs through prolonged or repeated exposure.

Hazard Statements:

H317 May cause an allergic skin reaction

H351 Suspected of causing cancer

H372 Causes damage to organs through prolonged or repeated exposure

Precautionary Statements:

P285 In case of inadequate ventilation wear respiratory protection

P314 Get medical advice if you do not feel well

P280 Wear protective gloves/protective clothing/eye protection/face protection

P202 Do not handle until all safety precautions have been read and understood

P260 Do not breathe dust/fume/gas/mist/vapors/spray

P501 Dispose of contents/container to waste treatment facility in accordance with local and national regulations

Before using this product, contact your doctor to determine if exposure to product or use of this product will aggravate your medical conditions.

ADDITIONAL LABELING INFORMATION

As an article the product does not need to be labeled in accordance with EC-directives or respective national laws. Metals in massive form, alloys, mixtures containing polymers and mixtures containing elastomers do not require a label according to this Annex (Annex I GHS), if they do not present a hazard to human health by inhalation, ingestion or contact with skin or to the aquatic environment in the form in which they are placed on the market, although classified as hazardous in accordance with the criteria of this Annex. Instead, the supplier shall provide the information to downstream users or distributors by means of the SDS.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

IMPORTANT: This section covers the materials from which these products are manufactured. The fumes and gases produced during normal use of these products are covered in Section 8. The chemicals or compounds subject to reporting under Title III, in Section 313, of the Superfund Amendments and Reauthorization Act (SARA) are marked by the symbol #.

INGREDIENTS	CAS NUMBER	Exposure Limit (mg/m ³)		Percent Ingredients (by weight)
		OSHA PEL	ACGIH-TLV	
Iron	7439-89-6	10 (as Fe)	5 (as Fe)	30 – 60
Chromium #	7440-47-3	1	0.5	15 – 40
Nickel #	7440-02-0	1	0.2	7 – 13
Titanium Dioxide	13463-67-7	15	10	7 – 13
Feldspar	68476-25-5	10	2	1 – 5
Calcium Carbonate	1317-65-3	5	10	1 – 5
Calcium Fluoride	7789-75-5	2.5 (as F)	2.5 (as F)	1 – 5
Sodium Silicate	1344-09-8	Not listed	Not listed	1 – 5
Potassium Silicate	1312-76-1	Not listed	Not listed	1 – 5
Lithium Aluminum Silicate (Al#)	12068-40-5	Not listed	5 (as Al fume)	1 – 5
Lithium Silicate	12627-14-4	Not listed	Not listed	1 – 5
Manganese #	7439-96-5	5 (ceiling)	0.1	1 – 5

CAS / EINECS NUMBER / HAZARD CLASSIFICATION FOR ABOVE INGREDIENTS

INGREDIENTS	CAS NUMBER	EINECS NUMBER	Hazard Classification per ECD 67/548/EEC
Iron	7439-89-6	231-096-4	No
Chromium #	7440-47-3	231-157-5	No
Nickel #	7440-02-0	231-111-4	Carc. Cat. 3; R40 - T; R48/23 - R43
Titanium Dioxide	13463-67-7	236-675-5	No
Feldspar	68476-25-5	270-666-7	No
Calcium Carbonate	1317-65-3	215-279-6	No
Calcium Fluoride	7789-75-5	232-188-7	No
Sodium Silicate	1344-09-8	215-687-4	No
Potassium Silicate	1312-76-1	215-199-1	No
Lithium Aluminum Silicate (Al#)	12068-40-5	235-098-6	No
Lithium Silicate	12627-14-4	235-730-0	No
Manganese #	7439-96-5	231-105-1	No

Exposure limits are subject to change. Contact ACGIH and OSHA for current values. See Section 16 for European Council Directive 67/548/EEC R-phrases and S-phrases if applicable.

SECTION 4: FIRST AID MEASURES

EMERGENCY & FIRST AID PROCEDURES: Call for medical aid. Employ first aid techniques recommended by The American Red Cross.

EYES: Flush with a large amount of fresh water for at least 15 minutes to remove dusts or fumes. Get medical attention. For radiation burns due to arc flash, see physician.

SKIN: Wash affected area with soap and water to remove dust or particles. If rash develops, see a physician. For skin burns from arc radiation, promptly flush with cold water. Get medical attention for burns or for irritations that persist.

INGESTION: Seek medical attention.

INHALATION: Remove to fresh air. If breathing is difficult administer oxygen. If breathing has stopped, begin artificial respiration and obtain medical assistance immediately.

ELECTRIC SHOCK: Disconnect and turn off the power. Use a nonconductive material to pull victim away from contact with live wire parts or wires. If breathing has stopped, begin artificial respiration and obtain medical assistance immediately. If no detectable pulse, begin Cardiopulmonary Resuscitation. (CPR) and immediately call for medical aid.

GENERAL: Move to fresh air and call for medical aid.

SECTION 5: FIRE FIGHTING MEASURES

Non-Flammable: Welding arc and sparks can ignite combustibles. Refer to American National Standard Z49.1 for fire prevention during welding. These products as shipped are non-hazardous, nonflammable, non-explosive, and non-reactive.

FLAMMABLE LIMITS IN AIR (% by volume): UPPER: N/A **LOWER:**N/A

FLASH POINT: N/A

AUTOIGNITION TEMPERATURE: N/A

NFPA HAZARD CLASSIFICATION:

Health: 2

Flammability: 0

Reactivity: 0

Other:

RATING UNDER NATIONAL FIRE PROTECTION 704:

Health: 2

Flammability: 0

Reactivity: 0

Protection:

EXTINGUISHING MEDIA: Use the extinguishing media recommended for the burning material and fire situation.

SPECIAL FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus as fume or vapors may be harmful.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

HAZARDOUS DECOMPOSITION PRODUCTS: Reasonably expected fume constituents of the fume could include complex oxides of iron, chromium, manganese and nickel.

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES: Solid objects may be picked up and placed in a container. Wear protective clothing and make sure that the solid objects are at room temperature before handling.

PERSONAL PRECAUTIONS: Gloves should be worn when handling to prevent cuts.

ENVIRONMENTAL PRECAUTIONS: Do not flush residue into waterways.

SECTION 7: HANDLING AND STORAGE

HANDLING: Handle with care to avoid cuts and to keep the wire from piercing the skin. Wear gloves when handling welding consumables. Avoid exposure to dust and do not ingest. Some individuals can develop an allergic reaction to certain materials. Keep all warning labels and identification labels on the product.

STORAGE: Keep material sealed and dry before use and do not remove product identification label or warning label. After using, keep remaining product sealed and dry and do not remove product identification label or warning label.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION



Read and understand the manufacturer's instructions and precautionary label on this product.

Always use adequate ventilation and wear appropriate personal protection. Do not breathe welding fumes and gases; they are dangerous to your health.

See American National Standard Z49.1, Safety in Welding and Cutting, published by the "American Welding Society," 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more detail on the following:

ENGINEERING CONTROLS: Proper ventilation must be maintained.

ARC RAYS and **SPARKS** can injure eyes and burn skin. **ELECTRIC SHOCK** can kill! Wear correct hand, eye, head, and body protection.

VENTILATION: Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below the TLV's in the workers breathing zone and the general area. Train the welder to keep their head out of the fumes. Monitor fume levels and do not exceed permissible exposure limits or values.

RESPIRATORY PROTECTION: Use respirable fume respirator or air supplied respirator when welding in a confined space or where local exhaust or ventilation does not keep exposure below the TLV's.

EYE PROTECTION: Wear a helmet or face shield with a filter lens of shade 12 or darker. Provide screens and flash goggles to shield others.

PROTECTIVE CLOTHING: Wear head, hand, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum, this includes welders' gloves and a protective face shield and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate themselves from work and ground, especially if clothing and gloves are wet.

WORK HYGIENIC PRACTICES: Do not eat or consume beverages in the work area.

EXPOSURE GUIDELINES: Use industrial hygiene monitoring equipment to ensure that exposure does not exceed applicable national exposure limits. When the electrode is consumed, fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. The fume and decomposition products, not the ingredients in the electrode, are important. Decomposition products include those originating from the volatilization, reaction, or oxidation of materials in Section 3, plus those from the base metal, etc., as noted above. These components are virtually always present as complex oxides and not as metals (Characterization of Arc Welding Fume: American Welding Society). Reasonably expected fume constituents of the fume could include complex oxides of iron, manganese, chromium and nickel.

The following limits can be used as guidance. Refer to Section 11 for more information about welding fumes.

<u>Substance</u>	<u>CAS NUMBER</u>	<u>Exposure Limit (mg/m³)</u>	
		<u>OSHA PEL</u>	<u>ACGIH-TLV</u>
Iron Oxide	1309-37-1	10 (as Fe)	5 (as Fe)
Nitric Oxide	10102-43-9	30	31
Chromium (VI)	not listed	0.005	0.05 (as Cr VI)
Nickel Oxide #	1313-99-1	1 (as Ni)	0.2 (as Ni)
Manganese fume #	7439-96-5	5	0.02

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may also be formed by radiation from the arc. The fume limit for Cr VI (5 micrograms/m³) may be reached before the ACGIH recommended general welding fume limit of 5 mg/m³ is reached. Monitor fume levels and Cr VI level. Train workers about the hazards of Cr (VI). **Read and comply with the OSHA permissible exposure limits for hexavalent chromium (CrVI), Fed. Reg. 71 – 10099 (specifically 29 CFR 1910.1026, 29 CFR 1915.1026, and 29 CFR 1926.1126).** For CrVI, OSHA requires: “The employer shall perform initial monitoring to determine the 8-hour TWA exposure for each employee on the basis of a sufficient number of personal breathing zone air samples to accurately characterize full shift exposure on each shift, for each job classification, in each work area”. Specialized equipment is required for monitoring Cr (VI) concentration in the workplace. OSHA Analytical Method Number ID-215 for area and breathing zone sampling and OSHA Analytical Method Number W4001 for wipe samples are listed on the OSHA website - www.osha.gov -as methods for measuring Cr(VI). This standard is complex and the employer should contact an occupational health professional for doing the Cr(VI) monitoring and all other fume monitoring.

Exposure limits are subject to change. Contact ACGIH, OSHA, NIOSH, and IARC for current values.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Solid appearance, non volatile, wire with a flux coating. No odor. Not soluble in water.

MELTING POINT: > 1800 °F (> 1000 °C)

SECTION 10: STABILITY AND REACTIVITY

GENERAL: These items are only intended for normal welding purposes.

STABILITY: Stable under normal conditions.

HAZARDOUS POLYMERIZATION: Will not occur

REACTIVITY: Contact with chemical substances like acids or strong bases could cause generation of gas.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may also be formed by radiation from the arc.

Refer to applicable national exposure limits for the fume compounds. Reasonably expected fume constituents of the fume could include complex oxides of iron, chromium, nickel and manganese. The employer should contact an occupational health professional for doing fume monitoring to determine fumes emitted and to ensure compliance to the applicable country limits.

Manganese also has a low exposure limit listed in the USA. Other country exposure limits may be different and the appropriate country standards should be used.

SECTION 11: TOXICOLOGICAL INFORMATION

Welding fumes cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure, and the electrode used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and the amount of ventilation, position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from

cleaning and degreasing activities). The International Agency for Research on Cancer has classified welding fumes as possibly carcinogenic to humans (group 2B).

EFFECTS OF OVEREXPOSURE - Electric arc welding may create one or more of the following health hazards:

FUMES AND GASES can be dangerous to your health.

PRIMARY ROUTES OF ENTRY are the respiratory system. Other possible routes are eyes and/or skin contact.

PREEXISTING respiratory or allergic conditions may be aggravated in some individuals (i.e. asthma, emphysema).

SHORT TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. **PRIMARY ROUTE OF ENTRY** is the respiratory system. **IRON, IRON OXIDE, MANGANESE** - Remove from overexposure and apply artificial respiration if needed. **CHROMIUM**- Inhalation of chromium can cause irritation of nasal membranes and skin. **FLUORIDES** - Fluoride compounds produced may cause eye and skin burns, and pulmonary edema bronchitis. Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. **NICKEL, NICKEL OXIDE** - May cause metallic taste, nausea, tightness in chest, fever, and allergic reactions.

LONG TERM (CHRONIC) OVEREXPOSURE may lead to siderosis (iron deposits in lungs) and is believed by some investigators to affect pulmonary functions. **PRIMARY ROUTE OF ENTRY** is the respiratory system. **IRON, IRON OXIDE** - Long term overexposure to iron fumes can cause deposits of iron in the lungs (siderosis). Lungs will clear in time when exposure to iron and its compounds cease. **MANGANESE** - Long term exposure may lead to "Manganism." Central nervous system is affected and symptoms include muscular weakness, impaired speech, impaired movement, and tremors. Exposed workers should get quarterly medical examinations for manganism. Bronchitis and some lung fibrosis have been reported. **FLUORIDES** - Overexposure to fluorides can cause serious bone erosion, excessive calcification of the bone and calcification of the ribs, pelvis and spinal column. May cause skin rash. **NICKEL, NICKEL OXIDE** - Long term overexposure to nickel products may cause lung fibrosis or pneumoconiosis. Long term overexposure to **HEXAVALENT CHROMIUM (CrVI)** is reported to cause lung cancer in humans.

Monitor fume levels and do not exceed permissible limits.

SECTION 12: ECOLOGICAL INFORMATION

MATERIAL: Welding consumables and materials can degrade into the components used to manufacture the product. Avoid exposure to conditions that could lead to accumulation in soils and groundwater.

CONTAMINATED PACKAGING: Empty containers should be taken for local recycling, recovery, or waste disposal. Metals may be recycled.

SECTION 13: DISPOSAL CONSIDERATION

WASTE DISPOSAL METHOD: Dispose of any grinding dust and waste residues in accordance with EPA or local regulations. Plastic materials, cardboard, and wire can be re-cycled.

U.S.A. RCRA: Some unused product may contain chromium which is considered hazardous waste if discarded, RCRA ID characteristic Toxic Hazardous Waste D007. Other ingredients in this product may be considered "hazardous material" in other countries and they may require special disposal methods. Contact your local municipality for the proper disposal method. Residues from welding consumables and processes could degrade and accumulate in groundwater. Welding slag from these products could typically contain the following components from the coating of the electrode: Ni, Fe, Cr, Mn, F, Na, Si, and Ca.

SECTION 14: TRANSPORTATION INFORMATION

DOMESTIC TRANSPORT REGULATIONS (USA): DOT - not regulated.

DOMESTIC TRANSPORT REGULATIONS (CANADA): TDG - not regulated.

DOMESTIC TRANSPORT REGULATIONS (MEXICO): MEX - not regulated.

INTERNATIONAL TRANSPORT REGULATIONS:

ICAO – not regulated

IATA – not regulated

IMDG / IMO – not regulated

OTHER AGENCIES: No international regulations or restrictions are applicable.

Handle with care to avoid damaging the product and keep product dry. Do not remove product identification label or warning label.

SECTION 15: REGULATORY INFORMATION

Read and understand the manufacturer's instructions and precautionary label on this product.

See American National Standard Z49.1, Safety in Welding and Cutting, published by the "American Welding Society," 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more information. Before using this product, understand and your employer's safety practices.

U.S. FEDERAL REGULATIONS: Under the OSHA Hazard Communication Standard these products are considered as hazardous.

U.S. EPA TSCA (TOXIC SUBSTANCE CONTROL ACT): All constituents of these products are on the TSCA inventory list or are excluded from listing.

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT)/SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT):

Reportable Quantities (RQ's) and/or Threshold Planning Quantities (TPQ's):

<u>Ingredient name:</u>	<u>RQ (lb)</u>	<u>TPQ(lb)</u>
Product is a solid solution in the form of a solid article	-	-

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to our Local Emergency Planning Committee.

EPCRA/SARA TITLE III 313 TOXIC CHEMICALS:

The following metallic components are listed as SARA 313 "TOXIC CHEMICALS" and are potentially subject to annual SARA 313 reporting. See Section 3 for percent and if the ingredient is present.

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>DISCLOSURE THRESHOLD</u>
Chromium & chromium compounds	7440-47-3	1.0 % de minimis concentration
Chromium VI	Not listed	0.1 % de minimis concentration
Barium compounds	Not listed	1.0 % de minimis concentration
Cobalt	7440-48-4	0.1 % de minimis concentration
Copper	7440-50-8	1.0 % de minimis concentration
Manganese	7439-96-5	1.0 % de minimis concentration
Nickel	7440-02-0	0.1 % de minimis concentration
Aluminum (fume or dust)	7429-90-5	1.0 % de minimis concentration
Silver	7440-22-4	1.0 % de minimis concentration

Package Labeling:

Additional advice on labeling

As a finished article the product does not need to be labeled in accordance with EC-directives or respective national laws.

International rules may vary and the appropriate regulations should be followed as defined by the country where the products are used.

SECTION 16: OTHER INFORMATION

This Safety Data Sheet has been revised due to modifications to several paragraphs and/or new format.

R-phrases

Nickel

R40: Limited evidence of a carcinogenic effect.

R43 : May cause sensitization by skin contact.

R48/23 : Toxic: danger of serious damage to health by prolonged exposure through inhalation.

S-phrases

Nickel

S2: Keep out of the reach of children

S36/37/39 : Wear suitable protective clothing, gloves and eye/face protection

S45 : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

S61: Avoid release to the environment. Refer to special instructions/Safety data sheet.

SUPPLEMENTAL INFORMATION – DEFINITIONS:

IARC: International Agency for the Research on Cancer

NIOSH: National Institute for Occupational Safety and Health

OSHA: U.S. Occupational Safety and Health Administration

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstracts Service Registry Number

EINECS: European Inventory of Existing Chemical Substances

PEL: Permissible Exposure Limit

NTP: National Toxicology Program

TLV: Threshold Limit Value

ECD: European Council Directive

GHS: Globally Harmonized System

The information in this SDS was obtained from sources we believe are reliable. However, this information is provided without any representation or warranty, expressed or implied, regarding accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons we do not assume responsibility and expressly disclaim liability of loss, damage, or expense arising from it or any way connected with the handling, storage, use, or disposal of the product.

9614

Issue date 04-Jun-2018

Revision date 04-Jun-2018

Revision Number 1

1. IDENTIFICATION

Product identification

Product identifier	Certanium® 889 Cast Iron Stick Rod Electrode
Other means of identification	P12003
Recommended use	Electrode
Restrictions on use	Covered electrode for Shielded Metal Arc Welding (SMAW). These items are only intended for normal welding purposes.

Supplier

Corporate Headquarters:
Cronatron, A Lawson Brand
Lawson Products, Inc.
8770 W.Bryn Mawr Ave.- Suite 900
Chicago, IL 60631
1-866-529-7664

Canadian Distribution Center:
Lawson Canada
7315 Rapistan Court
Mississauga, ON L5N 5Z4
(800) 323-5922

24 Hour Emergency Phone Number (888) 426-4851 (Prosar)

2. HAZARD(S) IDENTIFICATION

Hazard Classification This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Skin sensitization	Category 1
Carcinogenicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 1

Symbol



Signal word

WARNING

Hazard statements

H317 - May cause an allergic skin reaction
H351 - Suspected of causing cancer
H372 - Causes damage to organs through prolonged or repeated exposure

Precautionary statements

General	P101 - If medical advice is needed, have product container or label at hand P102 - Keep out of reach of children P103 - Read label before use.
Prevention	P285 - In case of inadequate ventilation wear respiratory protection P202 - Do not handle until all safety precautions have been read and understood P280 - Wear protective gloves/protective clothing and eye/face protection P260 - Do not breathe dust/fume/gas/mist/vapors/spray
Response	
General	P314 - Get medical advice/attention if you feel unwell.
Storage	Not available
Disposal	P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable
Hazard(s) Not Otherwise Classified (HNOC)	None known.
Physical Hazards Not Otherwise Classified (PHNOC)	When this product is used in a welding process the most important hazards are: heat, radiation, electric shock and welding fumes.
Unknown acute toxicity	None known

3. COMPOSITION/INFORMATION ON INGREDIENTS

Composition Mixture.

Chemical name	CAS-No	Weight %
Nickel	7440-02-0	30-60
Iron	7439-89-6	15-40
Strontium Carbonate	1633-05-2	5-10
Sodium Silicate	1344-09-8	1-5
Graphite	7782-42-5	1-5
Calcium Fluoride	7789-75-5	1-5
Calcium Carbonate	1317-65-3	1-5
Black Iron Oxide - Magnetite	1309-38-2	1-5
Aluminum	7429-90-5	1-5

4. FIRST-AID MEASURES

Necessary first-aid measures

General Information	Call for medical aid. Employ First Aid techniques recommended by the Red Cross.
Inhalation	Remove to fresh air. If breathing is difficult, give oxygen. Administer artificial respiration if not breathing. If breathing has stopped, contact emergency medical services immediately.
Ingestion	Seek medical attention.
Skin contact	Wash affected area with soap and water to remove dust or particles. If rash develops, see a physician. For skin burns from arc radiation, promptly flush with cold water. Get medical attention for burns or irritations that persist.

Eye contact	Flush with a large amount of fresh water for at least 15 minutes to remove dusts or fumes. For radiation burns due to arc flash, see physician.
Most important symptoms (acute)	Not available.
Most important symptoms (over-exposure)	Not available.
Indication of any immediate medical attention and special treatment needed	In case of ELECTRIC SHOCK: Disconnect and turn off the power. Use a nonconductive material to pull victim away from contact with live wire parts or wires. If breathing has stopped, begin artificial respiration and obtain medical assistance immediately. If no detectable pulse, begin Cardiopulmonary Resuscitation. (CPR) and immediately call for medical aid.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Use the extinguishing media recommended for the burning material and fire situation.
Unsuitable extinguishing media	Not available.
Specific hazards	Welding arc and sparks can ignite combustibles. Refer to American National Standard Z49.1 for fire prevention during welding. These products as shipped are non-hazardous, non-flammable, non-explosive, and non-reactive.
Special protective equipment for fire-fighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Reasonably expected fume constituents of the fume could include complex oxides of iron and nickel.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Solid objects may be picked up and placed in a container. Make sure the solid objects are at room temperature before handling. Gloves should be worn when handling to prevent cuts.
Methods and materials for containment and cleaning up	Do not flush residue into waterways.

7. HANDLING AND STORAGE

Precautions for safe handling	Before using this product, contact your doctor to determine if exposure to this product or use of this product will aggravate your medical conditions. Handle with care to avoid cuts and prevent the wire from piercing the skin. Wear gloves. Some individuals may develop an allergic reaction to certain materials. Keep all warning and identification labels on the product. Avoid exposure to dust and do not ingest. Gloves should be worn when handling to prevent cuts. Warn wearers of heart pacemakers or other medical electronic equipment vital to life that welding operations may impede the function of the medical device. Handle with care to avoid damaging the product and keep product dry.
Conditions for safe storage, including any incompatibilities	Keep material sealed and dry before use. After using, keep remaining product sealed and dry and do not remove product identification label or warning label. Do not remove product identification label or warning label.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical name	OSHA PEL (TWA)	ACGIH OEL (TWA)	NIOSH - TWA
Nickel	1 mg/m ³ TWA	1.5 mg/m ³ TWA	0.015 mg/m ³ TWA 0.015 mg/m ³ TWA
Iron	-	-	-
Strontium Carbonate	-	-	-
Sodium Silicate	-	-	-
Graphite	15 mg/m ³ TWA 5 mg/m ³ TWA	2 mg/m ³ TWA	2.5 mg/m ³ TWA
Calcium Fluoride	2.5 mg/m ³ TWA	2.5 mg/m ³ TWA	-
Calcium Carbonate	15 mg/m ³ TWA 5 mg/m ³ TWA	-	10 mg/m ³ TWA 5 mg/m ³ TWA
Black Iron Oxide - Magnetite	-	1 mg/m ³ TWA	1 mg/m ³ TWA
Aluminum	15 mg/m ³ TWA 5 mg/m ³ TWA	1 mg/m ³ TWA	10 mg/m ³ TWA 5 mg/m ³ TWA 5 mg/m ³ TWA 5 mg/m ³ TWA

Appropriate engineering controls

Adequate ventilation should be provided to keep exposure levels below current acceptable exposure limits. Read and understand the manufacturer's instructions and precautionary label on this product. Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below the TLV's in the workers breathing zone and the general area. Train welder to keep head out of fumes. Monitor fume levels and do not exceed permissible exposure limits or values. Wear head, hand and body protection which help prevent injury from radiation, sparks, heat, and electrical shock. See ANSI Z49.1. When the electrode is consumed, the fume and gas decomposition products are different in percent and form from the ingredients listed in Section 3. Fume and decomposition products, not the ingredients in the electrode, are important. Decomposition products include those originating from the volatilization, reaction or oxidation of the wire or rod plus those from the base metal and coating. These components are virtually always present as complex oxides and not as metals. Reasonably expected fume constituents of the fume could include complex oxides of iron and nickel.

Individual protection measures, such as personal protective equipment

Eye protection

Wear a helmet or face shield with a filter lens of shade 12 or darker. Provide screens and flash goggles to shield others.

Skin and body protection

Wear head, hand, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum, this includes welders' gloves and a protective face shield and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate themselves from work and ground, especially if clothing and gloves are wet.

Respiratory protection

Use respirable fume respirator or air supplied respirator when welding in a confined space or where local exhaust or ventilation does not keep exposure below the TLV's.

Hygiene measures

Do not eat, drink or smoke when using this product.

Canadian Province Occupational Exposure Limits

Chemical name	Alberta OEL	British Columbia OEL	Manitoba OEL	New Brunswick - OEL	Newfoundland and Labrador - OEL	Nova Scotia - OEL	Ontario OEL	Prince Edward Island - OEL	Quebec OEL	Saskatchewan - OEL
Nickel	1.5 mg/m ³ TWA	0.05 mg/m ³ TWA	1.5 mg/m ³ TWA	1 mg/m ³ TWA	1.5 mg/m ³ TWA	1.5 mg/m ³ TWA	1 mg/m ³ TWA	1.5 mg/m ³ TWA	1 mg/m ³ TWA EV	3 mg/m ³ STEL 1.5 mg/m ³ TWA

Chemical name	Alberta OEL	British Columbia OEL	Manitoba OEL	New Brunswick - OEL	Newfoundland and Labrador - OEL	Nova Scotia - OEL	Ontario OEL	Prince Edward Island - OEL	Quebec OEL	Saskatchewan - OEL
Iron	-	-	-	-	-	-	-	-	-	-
Strontium Carbonate	-	-	-	-	-	-	-	-	-	-
Sodium Silicate	-	-	-	-	-	-	-	-	-	-
Graphite	2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA	4 mg/m ³ STEL 2 mg/m ³ TWA
Calcium Fluoride	2.5 mg/m ³ TWA	2.5 mg/m ³ TWA	2.5 mg/m ³ TWA	2.5 mg/m ³ TWA	2.5 mg/m ³ TWA	2.5 mg/m ³ TWA	2.5 mg/m ³ TWA	2.5 mg/m ³ TWA	2.5 mg/m ³ TWA	5 mg/m ³ STEL 2.5 mg/m ³ TWA
Calcium Carbonate	10 mg/m ³ TWA	20 mg/m ³ STEL 10 mg/m ³ TWA 3 mg/m ³ TWA	-	10 mg/m ³ TWA	-	-	-	-	10 mg/m ³ TWA	20 mg/m ³ STEL 10 mg/m ³ TWA
Black Iron Oxide - Magnetite	1 mg/m ³ TWA	2 mg/m ³ STEL 1 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	1.0 mg/m ³ TWA	3 mg/m ³ STEL 1 mg/m ³ TWA
Aluminum	10 mg/m ³ TWA 5 mg/m ³ TWA	1.0 mg/m ³ TWA	1 mg/m ³ TWA	10 mg/m ³ TWA 5 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	10 mg/m ³ TWA 5 mg/m ³ TWA	20 mg/m ³ STEL 10 mg/m ³ STEL 10 mg/m ³ TWA 5 mg/m ³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Solid
Odor	None
Odor threshold	Not available
pH	Not applicable
Melting point/range °C	>1000
Melting point/range °F	>1800
Boiling point/range °C	Not available
Boiling point/range °F	Not available
Flash point °C / °F	Not available
Evaporation rate	Not available
Flammability (Solid, Gas)	Not available
Lower explosion limit	Not available
Upper explosion limit	Not available
Vapor pressure	Not applicable

Vapor density	Not available
Relative density	Not available
Solubility	Not available
Partition coefficient (n-octanol/water)	Not available
Autoignition temperature °C	Not available
Autoignition temperature °F	Not available
Decomposition temperature °C	Not available
Decomposition temperature °F	Not available
Viscosity	Not available

10. STABILITY AND REACTIVITY

Reactivity	Contact with chemical substances like acids or strong bases could cause generation of gas.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Not available.
Conditions to avoid	Not available.
Incompatible materials	Contact with chemical substances like acids or strong bases could cause generation of gas.
Hazardous decomposition products	Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may also be formed by radiation from the arc. Refer to applicable national exposure limits for the fume compounds. Reasonably expected fume constituents of the fume could include complex oxides of iron and nickel. The employer should contact an occupational health professional for doing fume monitoring to determine fumes emitted and to ensure compliance to the applicable country limits. Other country exposure limits may be different and the appropriate country standards should be used.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	Dermal. Inhalation. Eyes.
Symptoms	Welding fumes cannot be classified simply. Their composition and quantity are dependent upon the metal being welded, the process, procedures and electrodes being used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: Coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and the amount of ventilation, position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). The International Agency for Research on Cancer has classified welding fumes as possibly carcinogenic to humans (group 2B). Pre-existing respiratory or allergic conditions may be aggravated in some individuals (i.e. asthma, emphysema). Overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat or eyes. Primary route of entry is the respiratory system. Iron, iron oxide, manganese: remove from overexposure and apply artificial respiration if needed. Fluoride

compounds produced may cause eye and skin burns, and pulmonary edema bronchitis. Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. Nickel, Nickel oxide: May cause metallic taste, nausea, tightness in chest, fever, and allergic reactions. Ingestion not an expected route of entry, but if ingested product could cause serious injury. Arc Rays can injure eyes. Spatter and molten metal can cause burn injuries. Electric shock can kill. Skin cancer has been reported from arc radiation. May cause an allergic skin reaction. Warn wearers of heart pacemakers or other medical electronic equipment vital to life that welding operations may impede the function of the medical device.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Long term exposure may lead to siderosis (iron deposits in lungs) and is believed by some investigators to affect pulmonary functions. Primary route of entry is the respiratory system. Long term overexposure to iron fumes can cause deposits of iron in the lungs (siderosis). Lungs will clear in time when exposure to iron and its compounds cease. Overexposure to fluorides can cause serious bone erosion, excessive calcification of the bone and calcification of the ribs, pelvis, and spinal column. May cause skin rash. Long term overexposure to nickel compounds may cause lung fibrosis, edema or pneumoconiosis. May cause skin rash.

Numerical measures of toxicity

Chemical name	Inhalation LC50:	Dermal LD50:	Oral LD50:
Nickel	-	-	> 9000 mg/kg (Rat)
Iron	-	-	= 30 g/kg (Rat)
Strontium Carbonate	-	-	> 14 g/kg (Rat)
Sodium Silicate	-	> 4640 mg/kg (Rabbit)	= 1960 mg/kg (Rat)
Graphite	-	-	> 10000 mg/kg (Rat)
Calcium Fluoride	-	-	= 4250 mg/kg (Rat)
Calcium Carbonate	-	-	-
Black Iron Oxide - Magnetite	-	-	> 10000 mg/kg (Rat)
Aluminum	-	-	-

ATEmix (dermal) Not available

ATEmix (oral) Not available

ATEmix (inhalation-gas) Not available

ATEmix (inhalation-vapor) Not available

ATEmix (inhalation-dust/mist) Not available

Carcinogenicity

Chemical name	ACGIH OEL - Carcinogens	IARC	OSHA RTK Carcinogens	NTP
Nickel	-	Group 1 Group 2B	Listed	Known Reasonably Anticipated
Iron	-	-	-	-
Strontium Carbonate	-	-	-	-
Sodium Silicate	-	-	-	-
Graphite	-	-	-	-
Calcium Fluoride	A4	Group 3	-	-
Calcium Carbonate	-	-	-	-

Chemical name	ACGIH OEL - Carcinogens	IARC	OSHA RTK Carcinogens	NTP
Black Iron Oxide - Magnetite	-	-	-	-
Aluminum	A4	-	-	-

Canadian Province carcinogenicity limits

Chemical name	Alberta - Carcinogen	British Columbia - Carcinogen	Manitoba - Carcinogen	New Brunswick - Carcinogen	Nova Scotia - Carcinogen	Quebec - Carcinogen
Nickel	-	IARC 2B	ACGIH A5	-	ACGIH A5	-
Iron	-	-	-	-	-	-
Strontium Carbonate	-	-	-	-	-	-
Sodium Silicate	-	-	-	-	-	-
Graphite	-	-	-	-	-	-
Calcium Fluoride	-	-	ACGIH A4	ACGIH A4	ACGIH A4	-
Calcium Carbonate	-	-	-	-	-	-
Black Iron Oxide - Magnetite	-	-	-	-	-	-
Aluminum	-	-	ACGIH A4	-	ACGIH A4	-

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical name	Algae/aquatic plants	Fish
Nickel	0.18: 72 h Pseudokirchneriella subcapitata mg/L EC50 0.174 - 0.311: 96 h Pseudokirchneriella subcapitata mg/L EC50 static	1.3: 96 h Cyprinus carpio mg/L LC50 semi-static 100: 96 h Brachydanio rerio mg/L LC50 10.4: 96 h Cyprinus carpio mg/L LC50 static
Iron	-	13.6: 96 h Morone saxatilis mg/L LC50 static
Strontium Carbonate	-	-
Sodium Silicate	-	301 - 478: 96 h Lepomis macrochirus mg/L LC50 3185: 96 h Brachydanio rerio mg/L LC50 semi-static
Graphite	-	-
Calcium Fluoride	-	-
Calcium Carbonate	-	-
Black Iron Oxide - Magnetite	-	-
Aluminum	-	-

Persistence and degradability Not available.

Bioaccumulation

Chemical name	CAS-No	Partition coefficient (log Kow)
Nickel 7440-02-0	7440-02-0	-
Iron 7439-89-6	7439-89-6	-
Strontium Carbonate 1633-05-2	1633-05-2	-

Chemical name	CAS-No	Partition coefficient (log Kow)
Sodium Silicate 1344-09-8	1344-09-8	-
Graphite 7782-42-5	7782-42-5	-
Calcium Fluoride 7789-75-5	7789-75-5	-
Calcium Carbonate 1317-65-3	1317-65-3	-
Black Iron Oxide - Magnetite 1309-38-2	1309-38-2	-
Aluminum 7429-90-5	7429-90-5	-

Mobility in soil Not available.

Other adverse effects Welding consumables and materials can degrade into the components used to manufacture the product. Avoid exposure to conditions that could lead to accumulation in soils and groundwater.

13. DISPOSAL CONSIDERATIONS

Disposal information Dispose of any grinding dust and waste residues in accordance with EPA or local regulations. Plastic materials, cardboard, and wire can be recycled. Do not flush residue into waterways.

Contaminated packaging Empty containers should be taken for local recycling, recovery or waste disposal.

14. TRANSPORTATION INFORMATION

Shipping Descriptions

DOT
Proper shipping name Not regulated

TDG
Proper shipping name Not regulated

IATA
Proper shipping name Not regulated

IMDG/IMO
Proper shipping name Not regulated

Marine Pollutants

Chemical name	CAS-No	USDOT Marine Pollutant	Canada TDG Marine Pollutant	IMDG Marine Pollutant
Nickel	7440-02-0	-	-	-
Iron	7439-89-6	-	-	-
Strontium Carbonate	1633-05-2	-	-	-
Sodium Silicate	1344-09-8	-	-	-
Graphite	7782-42-5	-	-	-
Calcium Fluoride	7789-75-5	-	-	-
Calcium Carbonate	1317-65-3	-	-	-
Black Iron Oxide - Magnetite	1309-38-2	-	-	-
Aluminum	7429-90-5	-	-	-

15. REGULATORY INFORMATION

State regulations

U.S. state Right-to-Know regulations

Chemical name	CAS-No	Massachusetts - RTK	New Jersey - RTK	Pennsylvania - RTK
Nickel	7440-02-0	X	X	X
Iron	7439-89-6	-	-	-
Strontium Carbonate	1633-05-2	-	-	-
Sodium Silicate	1344-09-8	-	-	-
Graphite	7782-42-5	X	X	X
Calcium Fluoride	7789-75-5	-	X	-
Calcium Carbonate	1317-65-3	X	X	X
Black Iron Oxide - Magnetite	1309-38-2	-	-	-
Aluminum	7429-90-5	X	X	X

California Prop. 65

Chemical name	CAS-No	California Prop. 65
Nickel	7440-02-0	Carcinogen
Iron	7439-89-6	-
Strontium Carbonate	1633-05-2	-
Sodium Silicate	1344-09-8	-
Graphite	7782-42-5	-
Calcium Fluoride	7789-75-5	-
Calcium Carbonate	1317-65-3	-
Black Iron Oxide - Magnetite	1309-38-2	-
Aluminum	7429-90-5	-

California Proposition 65

Warning: This product contains or produces a chemical known to the State of California to cause birth defects (or other reproductive harm) and cancer

U.S. Federal Regulations

US EPA SARA 313

Chemical name	CAS-No	CERCLA/SARA Hazardous Substances RQ	SARA 313 - Threshold Values
Nickel	7440-02-0	100 lb 45.4 kg	0.1 %
Iron	7439-89-6	-	-
Strontium Carbonate	1633-05-2	-	-
Sodium Silicate	1344-09-8	-	-
Graphite	7782-42-5	-	-
Calcium Fluoride	7789-75-5	-	-
Calcium Carbonate	1317-65-3	-	-
Black Iron Oxide - Magnetite	1309-38-2	-	-
Aluminum	7429-90-5	-	1.0 %

**US EPA SARA 311/312
hazardous categorization**

Not available

International inventories

All components of this product are listed on the following inventories: U.S.A. (TSCA 8(b)), Canada (DSL/NDSL) or are exempt.

Chemical name	DSL/NDSL	Inventory - United States - Section 8(b) Inventory (TSCA)	U.S. - TSCA (Toxic Substances Control Act) - Section 12(b) - Export Notification
Nickel	X	X	-
Iron	X	X	-
Strontium Carbonate	X	X	-
Sodium Silicate	X	X	-
Graphite	X	X	-
Calcium Fluoride	X	X	-
Calcium Carbonate	X	X	-
Black Iron Oxide - Magnetite	X	X	-
Aluminum	X	X	-

Legend X - Listed

16. OTHER INFORMATION**NFPA**

Health	2
Flammability	0
Instability	0

HMIS

Health	2
Flammability	0
Physical hazards	0

Notice: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA).

Prepared by Regulatory Affairs**Issue date** 04-Jun-2018**Revision date** 04-Jun-2018**Revision note****Key to abbreviations**

ACGIH (American Conference of Governmental Industrial Hygienists)
 ATE (Average Toxicity Estimate)
 DSL/NDSL (Domestic Substance List/Non-Domestic Substance List)
 HMIS (Hazardous Materials Identification System)
 IARC (International Agency for Research on Cancer)
 IATA (International Air Transport Association)
 IMDG/IMO (International Maritime Dangerous Goods/International Maritime Organization)
 NFPA (National Fire Protection Association)
 NTP (National Toxicology Program)

OEL (Occupational Exposure Level)
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
PEL (Permissible Exposure Limit)
TSCA (Toxic Substance Control Act)
USEPA (United States Environmental Protection Agency)

Disclaimer

The information accumulated herein is believed to be accurate, but is not warranted to be, whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

End of Safety Data Sheet

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Radnor® ER70S-6

Product Size: .035" (0.9 mm)

Other means of identification

SDS number: 200000000798

Recommended use and restriction on use

Recommended use: GMAW (Gas Metal Arc Welding)

Restrictions on use: Not known. Read this SDS before using this product.

Manufacturer/Importer/Supplier/Distributor Information

Company Name: Radnor Welding Products

Address: P.O. Box 6675
Radnor, PA 19087
USA

Telephone: +1 (866) 924-7427

Emergency telephone number:

+1 (866) 734-3438

2. HAZARDS IDENTIFICATION

Classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), The United States Occupational Safety and Health Administration's Hazard Communication Standard (29 CFR 1910.1200), Canada's Hazardous Product Regulations and Mexico's Harmonized System for the Identification and Communication of Hazards and Risks from Hazardous Chemicals in the Workplace.

Hazard Classification Not classified as hazardous according to applicable GHS hazard classification criteria.

Label Elements

Hazard Symbol: No symbol

Signal Word: No signal word.

Hazard Statement: Not applicable

Precautionary Statements: Not applicable

Other hazards which do not result in GHS classification:

Electrical Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with work piece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Arc rays can injure eyes and burn skin. Welding arc and sparks can ignite combustibles and flammable materials. Overexposure to welding fumes and gases can be hazardous. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product. Refer to Section 8.

Substance(s) formed under the conditions of use:

The welding fume produced from this welding electrode may contain the following constituent(s) and/or their complex metallic oxides as well as solid particles or other constituents from the consumables, base metal, or base metal coating not listed below. Fume from this product may contain low levels of copper, typically less than 1% by weight. Overexposure to copper may cause metal fume fever, as well as skin, eye and respiratory tract irritation.

Chemical Identity	CAS-No.
Carbon dioxide	124-38-9
Carbon monoxide	630-08-0
Nitrogen dioxide	10102-44-0
Ozone	10028-15-6
Manganese	7439-96-5

3. COMPOSITION / INFORMATION ON INGREDIENTS
Reportable Hazardous Ingredients Mixtures

Chemical Identity	CAS number	Content in percent (%)*
Iron	7439-89-6	50 - <100%
Manganese	7439-96-5	1 - <5%
Silicon	7440-21-3	0.1 - <1%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition Comments:

The term "Hazardous Ingredients" should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a welding hazard. The product may contain additional non-hazardous ingredients or may form additional compounds under the condition of use. Refer to Sections 2 and 8 for more information.

4. FIRST AID MEASURES
Ingestion:

Avoid hand, clothing, food, and drink contact with fluxes, metal fume or powder which can cause ingestion of particulate during hand to mouth activities such as drinking, eating, smoking, etc. If ingested, do not induce vomiting. Contact a poison control center. Unless the poison control center advises otherwise, wash out mouth thoroughly with water. If symptoms develop, seek medical attention at once.

Inhalation:

Move to fresh air if breathing is difficult. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

Skin Contact:

Remove contaminated clothing and wash the skin thoroughly with soap and water. For reddened or blistered skin, or thermal burns, obtain medical assistance at once.

Eye contact:

Dust or fume from this product should be flushed from the eyes with copious amounts of clean, tepid water until transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed. Obtain medical assistance at once.

Arc rays can injure eyes. If exposed to arc rays, move victim to dark room,

remove contact lenses as necessary for treatment, cover eyes with a padded dressing and rest. Obtain medical assistance if symptoms persist.

Most important symptoms/effects, acute and delayed

Symptoms: Short-term (acute) overexposure to fumes and gases from welding and allied processes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from welding and allied processes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Refer to Section 11 for more information.

Hazards: The hazards associated with welding and its allied processes such as soldering and brazing are complex and may include physical and health hazards such as but not limited to electric shock, physical strains, radiation burns (eye flash), thermal burns due to hot metal or spatter and potential health effects of overexposure to fumes, gases or dusts potentially generated during the use of this product. Refer to Section 11 for more information.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

General Fire Hazards: As shipped, this product is nonflammable. However, welding arc and sparks as well as open flames and hot surfaces associated with brazing and soldering can ignite combustible and flammable materials. Read and understand American National Standard Z49.1, "Safety in Welding, Cutting and Allied Processes" and National Fire Protection Association NFPA 51B, "Standard for Fire Prevention during Welding, Cutting and Other Hot Work" before using this product.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: As shipped, the product will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical: Welding arc and sparks can ignite combustibles and flammable products.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Use standard firefighting procedures and consider the hazards of other involved materials.

Special protective equipment for fire-fighters: Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8.

Methods and material for containment and cleaning up: Absorb with sand or other inert absorbent. Stop the flow of material, if this is without risk. Clean up spills immediately, observing precautions in the personal protective equipment in Section 8. Avoid generating dust. Prevent product from entering any drains, sewers or water sources. Refer to Section 13 for proper disposal.

Environmental Precautions: Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water sources or sewer. Environmental manager must be informed of all major spillages.

7. HANDLING AND STORAGE

Precautions for safe handling: Prevent formation of dust. Provide appropriate exhaust ventilation at places where dust is formed.

Read and understand the manufacturer's instruction and the precautionary label on the product. See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the American Welding Society, <http://pubs.aws.org> and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, www.gpo.gov.

Conditions for safe storage, including any incompatibilities: Store in closed original container in a dry place. Store in accordance with local/regional/national regulations. Store away from incompatible materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters

Occupational Exposure Limits: US

Chemical Identity	Type	Exposure Limit Values	Source
Manganese - Fume. - as Mn	Ceiling	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	STEL	3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Manganese	IDLH	500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Silicon - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Silicon - Respirable fraction.	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Silicon - Respirable.	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Silicon - Total	REL	10 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)

Occupational Exposure Limits: Canada

Chemical Identity	Type	Exposure Limit Values	Source
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for

			Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	8 HR ACL	0.2 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	15 MIN ACL	0.6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (06 2015)
Manganese - Fume, total dust. - as Mn	TWA	0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
Silicon - Total dust.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (07 2010)
Silicon	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
Silicon - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)

Occupational Exposure Limits: Mexico

Chemical Identity	Type	Exposure Limit Values	Source
Iron - as Fe	VLE-PPT	1 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)
Manganese - as Mn	VLE-PPT	0.2 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)

Additional exposure limits under the conditions of use: US

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	TWA	5,000 ppm	US. ACGIH Threshold Limit Values (12 2010)
	STEL	30,000 ppm	US. ACGIH Threshold Limit Values (12 2010)
	PEL	5,000 ppm 9,000 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	30,000 ppm 54,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	REL	5,000 ppm 9,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	IDLH	40,000 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Carbon monoxide	TWA	25 ppm	US. ACGIH Threshold Limit Values (12 2010)
	PEL	50 ppm 55 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	35 ppm 40 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	Ceil_Time	200 ppm 229 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)

	IDLH	1,200 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Nitrogen dioxide	TWA	0.2 ppm	US. ACGIH Threshold Limit Values (02 2012)
	Ceiling	5 ppm 9 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	1 ppm 1.8 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	IDLH	20 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
	IDLH	13 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Ozone	PEL	0.1 ppm 0.2 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Ceiling	0.1 ppm 0.2 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	TWA	0.05 ppm	US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.20 ppm	US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.10 ppm	US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.08 ppm	US. ACGIH Threshold Limit Values (03 2014)
	IDLH	5 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Manganese - Fume. - as Mn	Ceiling	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	STEL	3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Manganese	IDLH	500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)

Additional exposure limits under the conditions of use: Canada

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	STEL	30,000 ppm 54,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	5,000 ppm 9,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	5,000 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	STEL	15,000 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	5,000 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2011)
	STEL	30,000 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2011)
	STEL	30,000 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)

	TWA	5,000 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
	8 HR ACL	5,000 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	15 MIN ACL	30,000 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	TWA	5,000 ppm 9,000 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
	STEL	30,000 ppm 54,000 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
Carbon monoxide	TWA	25 ppm 29 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	25 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	STEL	100 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	25 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2011)
	TWA	25 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (07 2010)
	8 HR ACL	25 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	15 MIN ACL	190 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	TWA	35 ppm 40 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
	STEL	200 ppm 230 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
Nitrogen dioxide	STEL	5 ppm 9.4 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	3 ppm 5.6 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	CEILING	1 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.2 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2012)
	STEL	5 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
	TWA	3 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
	8 HR ACL	3 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	15 MIN ACL	5 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)

			Regulations, 1996, Table 21) (05 2009)
	TWA	3 ppm 5.6 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
Ozone	STEL	0.3 ppm 0.6 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	0.1 ppm 0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	0.05 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.1 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.08 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.2 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.1 ppm 0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (07 2010)
	STEL	0.3 ppm 0.6 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (07 2010)
	15 MIN ACL	0.15 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	8 HR ACL	0.05 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	CEILING	0.1 ppm 0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)
	TWA	0.20 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
	TWA	0.05 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
	TWA	0.08 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
	TWA	0.10 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	8 HR ACL	0.2 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	15 MIN ACL	0.6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)

Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (06 2015)
Manganese - Fume, total dust. - as Mn	TWA	0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)

Additional exposure limits under the conditions of use: Mexico

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	VLE-CT	30,000 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)
	VLE-PPT	5,000 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)
Carbon monoxide	VLE-PPT	25 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)
Nitrogen dioxide	VLE-PPT	0.2 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)
Ozone	VLE-P	0.1 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)
Manganese - as Mn	VLE-PPT	0.2 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)

Appropriate Engineering Controls

Ventilation: Use enough ventilation and local exhaust at the arc, flame or heat source to keep the fumes and gases from the worker's breathing zone and the general area. Train the operator to keep their head out of the fumes. **Keep exposure as low as possible.**

Individual protection measures, such as personal protective equipment
General information:

Exposure Guidelines: To reduce the potential for overexposure, use controls such as adequate ventilation and personal protective equipment (PPE). Overexposure refers to exceeding applicable local limits, the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) or the Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limits (PELs). Workplace exposure levels should be established by competent industrial hygiene assessments. Unless exposure levels are confirmed to be below the applicable local limit, TLV or PEL, whichever is lower, respirator use is required. Absent these controls, overexposure to one or more compound constituents, including those in the fume or airborne particles, may occur resulting in potential health hazards. According to the ACGIH, TLVs and Biological Exposure Indices (BEIs) "represent conditions under which ACGIH believes that nearly all workers may be repeatedly exposed without adverse health effects." The ACGIH further states that the TLV-TWA should be used as a guide in the control of health hazards and should not be used to indicate a fine line between safe and dangerous exposures. See Section 10 for information on constituents which have some potential to present health hazards. Welding consumables and materials being joined may contain chromium as an unintended trace element. Materials that contain chromium may produce some amount of hexavalent chromium (CrVI) and other chromium compounds as a byproduct in the fume. In 2018, the American Conference of Governmental Industrial Hygienists (ACGIH)

lowered the Threshold Limit Value (TLV) for hexavalent chromium from 50 micrograms per cubic meter of air (50 µg/m³) to 0.2 µg/m³. At these new limits, CrVI exposures at or above the TLV may be possible in cases where adequate ventilation is not provided. CrVI compounds are on the IARC and NTP lists as posing a lung cancer and sinus cancer risk. Workplace conditions are unique and welding fume exposures levels vary. Workplace exposure assessments must be conducted by a qualified professional, such as an industrial hygienist, to determine if exposures are below applicable limits and to make recommendations when necessary for preventing overexposures.

Eye/face protection:

Wear helmet or use face shield with filter lens shade number 12 or darker for open arc processes – or follow the recommendations as specified in ANSI Z49.1, Section 4, based on your process and settings. No specific lens shade recommendation for submerged arc or electroslag processes. Shield others by providing appropriate screens and flash goggles.

Skin Protection

Hand Protection:

Wear protective gloves. Suitable gloves can be recommended by the glove supplier.

Other:

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, open flames, hot surfaces, sparks and electrical shock. See Z49.1. At a minimum, this includes welder's gloves and a protective face shield when welding, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing when welding, brazing and soldering. Wear dry gloves free of holes or split seams. Train the operator not to permit electrically live parts or electrodes from contacting the skin . . . or clothing or gloves if they are wet. Insulate yourself from the work piece and ground using dry plywood, rubber mats or other dry insulation.

Respiratory Protection:

Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are below applicable exposure limits.

Hygiene measures:

Do not eat, drink or smoke when using the product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, www.aws.org.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Solid welding wire or rod.
Physical state:	Solid
Form:	Solid
Color:	No data available.
Odor:	No data available.
Odor threshold:	No data available.
pH:	No data available.

Melting point/freezing point:	No data available.
Initial boiling point and boiling range:	No data available.
Flash Point:	No data available.
Evaporation rate:	No data available.
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	No data available.
Vapor density:	No data available.
Density:	No data available.
Relative density:	No data available.
Solubility(ies)	
Solubility in water:	No data available.
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.

10. STABILITY AND REACTIVITY

Reactivity:	The product is non-reactive under normal conditions of use, storage and transport.
Chemical Stability:	Material is stable under normal conditions.
Possibility of hazardous reactions:	None under normal conditions.
Conditions to avoid:	Avoid heat or contamination.
Incompatible Materials:	Strong acids. Strong oxidizing substances. Strong bases.
Hazardous Decomposition Products:	<p>Fumes and gases from welding and its allied processes such as brazing and soldering cannot be classified simply. The composition and quantity of both are dependent upon the metal to which the joining or hot work is applied, the process, procedure - and where applicable - the electrode or consumable used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded or worked (such as paint, plating, or galvanizing), the number of operators and the volume of the work area, the quality and amount of ventilation, the position of the operator's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)</p> <p>In cases where an electrode or other applied material is consumed, the fume and gas decomposition products generated are different in percent</p>

and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents produced during arc welding and brazing include the oxides of iron, manganese and other metals present in the welding consumable or base metal. Hexavalent chromium compounds may be in the welding or brazing fume of consumables or base metals which contain chromium. Gaseous and particulate fluoride may be in the fume of consumables or flux materials which contain fluoride. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc associated with welding.

11. TOXICOLOGICAL INFORMATION

General information:

The International Agency for Research on Cancer (IARC) has determined welding fumes and ultraviolet radiation from welding are carcinogenic to humans (Group 1). According to IARC, welding fumes cause cancer of the lung and positive associations have been observed with cancer of the kidney. Also according to IARC, ultraviolet radiation from welding causes ocular melanoma. IARC identifies gouging, brazing, carbon arc or plasma arc cutting, and soldering as processes closely related to welding. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.

Information on likely routes of exposure

Inhalation:	Potential chronic health hazards related to the use of welding consumables are most applicable to the inhalation route of exposure. Refer to Inhalation statements in Section 11.
Skin Contact:	Arc rays can burn skin. Skin cancer has been reported.
Eye contact:	Arc rays can injure eyes.
Ingestion:	Health injuries from ingestion are not known or expected under normal use.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation:	Short-term (acute) overexposure to fumes and gases from welding and allied processes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from welding and allied processes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects.
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Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral	
Product:	Not classified
Specified substance(s):	
Iron	LD 50 (Rat): 98.6 g/kg

Dermal	
Product:	Not classified

Inhalation

Product:	Not classified
Repeated dose toxicity	
Product:	Not classified
Skin Corrosion/Irritation	
Product:	Not classified
Serious Eye Damage/Eye Irritation	
Product:	Not classified
Respiratory or Skin Sensitization	
Product:	Not classified
Carcinogenicity	
Product:	Arc rays: Skin cancer has been reported.
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:	
No carcinogenic components identified	
US. National Toxicology Program (NTP) Report on Carcinogens:	
No carcinogenic components identified	
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):	
No carcinogenic components identified	
Germ Cell Mutagenicity	
In vitro	
Product:	Not classified
In vivo	
Product:	Not classified
Reproductive toxicity	
Product:	Not classified
Specific Target Organ Toxicity - Single Exposure	
Product:	Not classified
Specific Target Organ Toxicity - Repeated Exposure	
Product:	Not classified
Aspiration Hazard	
Product:	Not classified
Other effects:	Organic polymers may be used in the manufacture of various welding consumables. Overexposure to their decomposition byproducts may result in a condition known as polymer fume fever. Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually not lasting longer than 48 hours.
Symptoms related to the physical, chemical and toxicological characteristics under the condition of use	
Inhalation:	
Specified substance(s):	

Manganese

Overexposure to manganese fumes may affect the brain and central nervous system, resulting in poor coordination, difficulty speaking, and arm or leg tremor. This condition can be irreversible.

Additional toxicological Information under the conditions of use:

Acute toxicity

Inhalation

Specified substance(s):

Carbon dioxide	LC Lo (Human, 5 min): 90000 ppm
Carbon monoxide	LC 50 (Rat, 4 h): 1300 ppm
Nitrogen dioxide	LC 50 (Rat, 4 h): 88 ppm
Ozone	LC Lo (Human, 30 min): 50 ppm

Other effects:

Specified substance(s):

Carbon dioxide	Asphyxia
Carbon monoxide	Carboxyhemoglobinemia
Nitrogen dioxide	Lower respiratory tract irritation

12. ECOLOGICAL INFORMATION

Ecotoxicity

Acute hazards to the aquatic environment:

Fish

Product:	Not classified
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Aquatic Invertebrates

Product:	Not classified
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Specified substance(s):

Manganese	EC 50 (Water flea (Daphnia magna), 48 h): 40 mg/l
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Chronic hazards to the aquatic environment:

Fish

Product:	Not classified
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Aquatic Invertebrates

Product:	Not classified
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Toxicity to Aquatic Plants

Product:	Not classified
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Persistence and Degradability

Biodegradation

Product:	No data available.
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Bioaccumulative potential

Bioconcentration Factor (BCF)

Product:	No data available.
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Mobility in soil:

No data available.

13. Disposal considerations

General information:

The generation of waste should be avoided or minimized whenever possible. When practical, recycle in an environmentally acceptable,

regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements.

Disposal instructions: Dispose of this material and its container to hazardous or special waste collection point.

Contaminated Packaging: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

14. TRANSPORT INFORMATION

DOT

UN Number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No

IMDG

UN Number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): –
EmS No.: –
Packing Group: –
Marine Pollutant: No

IATA

UN Number:
Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es):
Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No
Cargo aircraft only: Allowed.

TDG

UN Number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No

15. REGULATORY INFORMATION

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):
Chemical Identity

Manganese

Reportable quantity

Included in the regulation but with no data values. See regulation for further details.

Superfund Amendments and Reauthorization Act of 1986 (SARA)
Hazard categories

Not classified

Not classified

SARA 302 Extremely Hazardous Substance

None present or none present in regulated quantities.

SARA 304 Emergency Release Notification
Chemical Identity

Manganese

Reportable quantity

Included in the regulation but with no data values. See regulation for further details.

SARA 311/312 Hazardous Chemical
Chemical Identity

Iron

Manganese

Silicon

Threshold Planning Quantity

10000 lbs

10000 lbs

10000 lbs

SARA 313 (TRI Reporting)
Chemical Identity

Manganese

**Reporting threshold
for other users**

10000 lbs

**Reporting threshold for
manufacturing and processing**

25000 lbs.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

None present or none present in regulated quantities.

US State Regulations
US. California Proposition 65

No ingredient requiring a warning under CA Prop 65.

WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq.)

WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov

US. New Jersey Worker and Community Right-to-Know Act
Chemical Identity

Manganese

US. Massachusetts RTK - Substance List

No ingredient regulated by MA Right-to-Know Law present.

US. Pennsylvania RTK - Hazardous Substances
Chemical Identity

Manganese

US. Rhode Island RTK

No ingredient regulated by RI Right-to-Know Law present.

Canada Federal Regulations
List of Toxic Substances (CEPA, Schedule 1)

Not Regulated

Export Control List (CEPA 1999, Schedule 3)

Not Regulated

National Pollutant Release Inventory (NPRI)
Canada. National Pollutant Release Inventory (NPRI) Substances, Part 5, VOCs with Additional Reporting Requirements

NPRI PT5 Not Regulated

Canada. National Pollutant Release Inventory (NPRI) (Schedule 1, Parts 1-4)

NPRI Not Regulated

Greenhouse Gases

Not Regulated

Controlled Drugs and Substances Act

CA CDSI Not Regulated

CA CDSII Not Regulated

CA CDSIII Not Regulated

CA CDSIV Not Regulated

CA CDSV Not Regulated

CA CDSVII Not Regulated

CA CDSVIII Not Regulated

Precursor Control Regulations

Not Regulated

Mexico. Substances subject to reporting for the pollutant release and transfer registry (PRTR): Not applicable

Inventory Status:

Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	On or in compliance with the inventory
EINECS, ELINCS or NLP:	On or in compliance with the inventory
Japan (ENCS) List:	One or more components are not listed or are exempt from listing.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	One or more components are not listed or are exempt from listing.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Japan ISHL Listing:	One or more components are not listed or are exempt from listing.
Japan Pharmacopoeia Listing:	One or more components are not listed or are exempt from listing.
Mexico INSQ:	On or in compliance with the inventory
Ontario Inventory:	On or in compliance with the inventory
Taiwan Chemical Substance Inventory:	On or in compliance with the inventory

16. OTHER INFORMATION
Definitions:

Revision Date: 07/03/2019

Further Information: Additional information is available by request.

Disclaimer: This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 6010 Mild Steel Electrodes

Product Size: 1/8" (3.2 mm)

Other means of identification

SDS number: 200000006767

Recommended use and restriction on use

Recommended use: SMAW (Shielded Metal Arc Welding)

Restrictions on use: Not known. Read this SDS before using this product.

Manufacturer/Importer/Supplier/Distributor Information

Company Name: The Harris Products Group

Address: 4501 Quality Place
Mason, OH 45040-1971
USA

Telephone: +1 (513) 754-2000

Contact Person: Safety Data Sheet Questions: custservmason@jwharris.com

Company Name: The Lincoln Electric Company of Canada LP

Address: 179 Wicksteed Avenue
Toronto, Ontario M4G 2B9
Canada

Telephone: +1 (416) 421-2600

Contact Person: Safety Data Sheet Questions: www.lincolnelectric.com/sds
Arc Welding Safety Information: www.lincolnelectric.com/safety

Emergency telephone number:

USA/Canada/Mexico +1 (888) 609-1762

Americas/Europe +1 (216) 383-8962

Asia Pacific +1 (216) 383-8966

Middle East/Africa +1 (216) 383-8969

3E Company Access Code: 333988

2. HAZARDS IDENTIFICATION

Classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), The United States Occupational Safety and Health Administration's Hazard Communication Standard (29 CFR 1910.1200), Canada's Hazardous Product Regulations and Mexico's Harmonized System for the Identification and Communication of Hazards and Risks from Hazardous Chemicals in the Workplace.

Hazard Classification Not classified as hazardous according to applicable GHS hazard classification criteria.

Label Elements

Hazard Symbol: No symbol

Signal Word: No signal word.

Hazard Statement: Not applicable

Precautionary Statements: Not applicable

Other hazards which do not result in GHS classification:

Electrical Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with work piece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Arc rays can injure eyes and burn skin. Welding arc and sparks can ignite combustibles and flammable materials. Overexposure to welding fumes and gases can be hazardous. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product. Refer to Section 8.

Substance(s) formed under the conditions of use:

The welding fume produced from this welding electrode may contain the following constituent(s) and/or their complex metallic oxides as well as solid particles or other constituents from the consumables, base metal, or base metal coating not listed below.

Chemical Identity	CAS-No.
Carbon dioxide	124-38-9
Carbon monoxide	630-08-0
Nitrogen dioxide	10102-44-0
Ozone	10028-15-6
Manganese	7439-96-5

3. COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Ingredients Mixtures

Chemical Identity	CAS number	Content in percent (%)*
Iron	7439-89-6	50 - <100%
Cellulose, pulp	65996-61-4	1 - <5%
Sodium silicate	1344-09-8	1 - <5%
Titanium dioxide	13463-67-7	1 - <5%
Manganese	7439-96-5	0.1 - <1%
Chlorite	1318-59-8	0.1 - <1%
Iron oxide	1309-37-1	0.1 - <1%
Magnesite	546-93-0	0.1 - <1%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition Comments:

The term "Hazardous Ingredients" should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a welding hazard. The product may contain additional non-hazardous ingredients or may form additional compounds under the condition of use. Refer to Sections 2 and 8 for more information.

4. FIRST AID MEASURES

Ingestion:

Avoid hand, clothing, food, and drink contact with fluxes, metal fume or powder which can cause ingestion of particulate during hand to mouth

activities such as drinking, eating, smoking, etc. If ingested, do not induce vomiting. Contact a poison control center. Unless the poison control center advises otherwise, wash out mouth thoroughly with water. If symptoms develop, seek medical attention at once.

Inhalation: Move to fresh air if breathing is difficult. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

Skin Contact: Remove contaminated clothing and wash the skin thoroughly with soap and water. For reddened or blistered skin, or thermal burns, obtain medical assistance at once.

Eye contact: Dust or fume from this product should be flushed from the eyes with copious amounts of clean, tepid water until transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed. Obtain medical assistance at once.

Arc rays can injure eyes. If exposed to arc rays, move victim to dark room, remove contact lenses as necessary for treatment, cover eyes with a padded dressing and rest. Obtain medical assistance if symptoms persist.

Most important symptoms/effects, acute and delayed

Symptoms: Short-term (acute) overexposure to fumes and gases from welding and allied processes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from welding and allied processes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Refer to Section 11 for more information.

Hazards: The hazards associated with welding and its allied processes such as soldering and brazing are complex and may include physical and health hazards such as but not limited to electric shock, physical strains, radiation burns (eye flash), thermal burns due to hot metal or spatter and potential health effects of overexposure to fumes, gases or dusts potentially generated during the use of this product. Refer to Section 11 for more information.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

General Fire Hazards: As shipped, this product is nonflammable. However, welding arc and sparks as well as open flames and hot surfaces associated with brazing and soldering can ignite combustible and flammable materials. Read and understand American National Standard Z49.1, "Safety in Welding, Cutting and Allied Processes" and National Fire Protection Association NFPA 51B, "Standard for Fire Prevention during Welding, Cutting and Other Hot Work" before using this product.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: As shipped, the product will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical:

Welding arc and sparks can ignite combustibles and flammable products.

Special protective equipment and precautions for firefighters
Special fire fighting procedures:

Use standard firefighting procedures and consider the hazards of other involved materials.

Special protective equipment for fire-fighters:

Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8.

Methods and material for containment and cleaning up:

Absorb with sand or other inert absorbent. Stop the flow of material, if this is without risk. Clean up spills immediately, observing precautions in the personal protective equipment in Section 8. Avoid generating dust. Prevent product from entering any drains, sewers or water sources. Refer to Section 13 for proper disposal.

Environmental Precautions:

Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water sources or sewer. Environmental manager must be informed of all major spillages.

7. HANDLING AND STORAGE

Precautions for safe handling:

Prevent formation of dust. Provide appropriate exhaust ventilation at places where dust is formed.

Read and understand the manufacturer's instruction and the precautionary label on the product. Refer to Lincoln Safety Publications at www.lincolnelectric.com/safety. See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the American Welding Society, <http://pubs.aws.org> and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, www.gpo.gov.

Conditions for safe storage, including any incompatibilities:

Store in closed original container in a dry place. Store in accordance with local/regional/national regulations. Store away from incompatible materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters
Occupational Exposure Limits: US

Chemical Identity	Type	Exposure Limit Values	Source
Titanium dioxide	TWA	10 mg/m3	US. ACGIH Threshold Limit Values, as amended (12 2010)
Titanium dioxide - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Titanium dioxide	IDLH	5,000 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Manganese - Fume. - as Mn	Ceiling	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02

			2006)
	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	STEL	3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2014)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2014)
Manganese	IDLH	500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Iron oxide - Respirable fraction.	TWA	5 mg/m3	US. ACGIH Threshold Limit Values, as amended (12 2010)
Iron oxide - Fume.	PEL	10 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Iron oxide - Dust and fume. - as Fe	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Iron oxide	IDLH	2,500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Magnesite - Total	REL	10 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Magnesite - Respirable.	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Magnesite - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Magnesite - Respirable fraction.	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)

Occupational Exposure Limits: Canada

Chemical Identity	Type	Exposure Limit Values	Source
Titanium dioxide	TWA	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Titanium dioxide - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Titanium dioxide - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Titanium dioxide	TWA	10 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Titanium dioxide - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	8 HR ACL	0.2 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety

			Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	0.6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (06 2015)
Manganese - Fume, total dust. - as Mn	TWA	0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Manganese - Respirable. - as Mn	TWA	0.02 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)
Manganese - Total - as Mn	TWA	0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)
Iron oxide - Respirable.	TWA	5 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Iron oxide - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Dust. - as Fe	TWA	5 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Fume. - as Fe	STEL	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Fume. - as Fe	TWA	5 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Respirable fraction.	TWA	5 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	5 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
Iron oxide	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Iron oxide - Dust and fume. -	15 MIN	10 mg/m3	Canada. Saskatchewan OELs

as Fe	ACL		(Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	8 HR ACL	5 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Iron oxide - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Iron oxide - Dust and fume. - as Fe	TWA	5 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Magnesite - Total dust.	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
Magnesite	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Magnesite - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)

Occupational Exposure Limits: Mexico

Chemical Identity	Type	Exposure Limit Values	Source
Iron - as Fe	VLE-PPT	1 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Titanium dioxide	VLE-PPT	10 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Manganese - as Mn	VLE-PPT	0.2 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Iron oxide - Respirable fraction.	VLE-PPT	5 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)

Additional exposure limits under the conditions of use: US

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	TWA	5,000 ppm	US. ACGIH Threshold Limit Values, as amended (12 2010)
	STEL	30,000 ppm	US. ACGIH Threshold Limit Values, as amended (12 2010)
	PEL	5,000 ppm 9,000 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	30,000 ppm 54,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	REL	5,000 ppm 9,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	IDLH	40,000 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Carbon monoxide	TWA	25 ppm	US. ACGIH Threshold Limit Values, as amended (12 2010)

	PEL	50 ppm	55 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	35 ppm	40 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	Ceil_Time	200 ppm	229 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	IDLH	1,200 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Nitrogen dioxide	TWA	0.2 ppm		US. ACGIH Threshold Limit Values, as amended (02 2012)
	Ceiling	5 ppm	9 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	1 ppm	1.8 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	IDLH	20 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
	IDLH	13 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Ozone	PEL	0.1 ppm	0.2 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Ceil_Time	0.1 ppm	0.2 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	TWA	0.05 ppm		US. ACGIH Threshold Limit Values, as amended (03 2014)
	TWA	0.20 ppm		US. ACGIH Threshold Limit Values, as amended (03 2014)
	TWA	0.10 ppm		US. ACGIH Threshold Limit Values, as amended (03 2014)
	TWA	0.08 ppm		US. ACGIH Threshold Limit Values, as amended (03 2014)
	IDLH	5 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Manganese - Fume. - as Mn	Ceiling		5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL		1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	STEL		3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Manganese - Inhalable fraction. - as Mn	TWA		0.1 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2014)
Manganese - Respirable fraction. - as Mn	TWA		0.02 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2014)
Manganese	IDLH		500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)

Additional exposure limits under the conditions of use: Canada

Chemical Identity	Type	Exposure Limit Values		Source
Carbon dioxide	STEL	30,000 ppm	54,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	5,000 ppm	9,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	5,000 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	STEL	15,000 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	5,000 ppm		Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as

			amended (03 2011)
	STEL	30,000 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	STEL	30,000 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	TWA	5,000 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	5,000 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	30,000 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	5,000 ppm 9,000 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
	STEL	30,000 ppm 54,000 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Carbon monoxide	TWA	25 ppm 29 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	25 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	STEL	100 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	25 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	25 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
	8 HR ACL	25 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	190 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	35 ppm 40 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
	STEL	200 ppm 230 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Nitrogen dioxide	STEL	5 ppm 9.4 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	3 ppm 5.6 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	CEILING	1 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)

	TWA	0.2 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2012)
	STEL	5 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	TWA	3 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	3 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	5 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	3 ppm 5.6 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Ozone	STEL	0.3 ppm 0.6 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	0.1 ppm 0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	0.05 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.1 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.08 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.2 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.1 ppm 0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
	STEL	0.3 ppm 0.6 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
	15 MIN ACL	0.15 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	8 HR ACL	0.05 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	CEILING	0.1 ppm 0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (12 2008)
	TWA	0.20 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
	TWA	0.05 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
	TWA	0.08 ppm	Canada. Manitoba OELs (Reg. 217/2006,

			The Workplace Safety And Health Act), as amended (03 2014)
	TWA	0.10 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	8 HR ACL	0.2 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	0.6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (06 2015)
Manganese - Fume, total dust. - as Mn	TWA	0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Manganese - Respirable. - as Mn	TWA	0.02 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)
Manganese - Total - as Mn	TWA	0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)

Additional exposure limits under the conditions of use: Mexico

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	VLE-CT	30,000 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
	VLE-PPT	5,000 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Carbon monoxide	VLE-PPT	25 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Nitrogen dioxide	VLE-PPT	0.2 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Ozone	VLE-P	0.1 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Manganese - as Mn	VLE-PPT	0.2 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)

Appropriate Engineering Controls

Ventilation: Use enough ventilation and local exhaust at the arc, flame or heat source to keep the fumes and gases from the worker's breathing zone and the general area. Train the operator to keep their head out of the fumes. **Keep exposure as low as possible.**

Individual protection measures, such as personal protective equipment

General information:

Exposure Guidelines: To reduce the potential for overexposure, use controls such as adequate ventilation and personal protective equipment (PPE). Overexposure refers to exceeding applicable local limits, the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) or the Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limits (PELs). Workplace exposure levels should be established by competent industrial hygiene assessments. Unless exposure levels are confirmed to be below the applicable local limit, TLV or PEL, whichever is lower, respirator use is required. Absent these controls, overexposure to one or more compound constituents, including those in the fume or airborne particles, may occur resulting in potential health hazards. According to the ACGIH, TLVs and Biological Exposure Indices (BEIs) "represent conditions under which ACGIH believes that nearly all workers may be repeatedly exposed without adverse health effects." The ACGIH further states that the TLV-TWA should be used as a guide in the control of health hazards and should not be used to indicate a fine line between safe and dangerous exposures. See Section 10 for information on constituents which have some potential to present health hazards. Welding consumables and materials being joined may contain chromium as an unintended trace element. Materials that contain chromium may produce some amount of hexavalent chromium (CrVI) and other chromium compounds as a byproduct in the fume. In 2018, the American Conference of Governmental Industrial Hygienists (ACGIH) lowered the Threshold Limit Value (TLV) for hexavalent chromium from 50 micrograms per cubic meter of air (50 µg/m³) to 0.2 µg/m³. At these new limits, CrVI exposures at or above the TLV may be possible in cases where adequate ventilation is not provided. CrVI compounds are on the IARC and NTP lists as posing a lung cancer and sinus cancer risk. Workplace conditions are unique and welding fume exposures levels vary. Workplace exposure assessments must be conducted by a qualified professional, such as an industrial hygienist, to determine if exposures are below applicable limits and to make recommendations when necessary for preventing overexposures.

Eye/face protection:

Wear helmet or use face shield with filter lens shade number 12 or darker for open arc processes – or follow the recommendations as specified in ANSI Z49.1, Section 4, based on your process and settings. No specific lens shade recommendation for submerged arc or electroslag processes. Shield others by providing appropriate screens and flash goggles.

Skin Protection

Hand Protection:

Wear protective gloves. Suitable gloves can be recommended by the glove supplier.

Other:

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, open flames, hot surfaces, sparks and electrical shock. See Z49.1. At a minimum, this includes welder's gloves and a protective face shield when welding, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing when welding, brazing and soldering. Wear dry gloves free of holes or split seams. Train the operator not to permit electrically live parts or electrodes from contacting the skin . . . or clothing or gloves if they are wet. Insulate yourself from the work piece and ground using dry plywood, rubber mats or

other dry insulation.

Respiratory Protection:

Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are below applicable exposure limits.

Hygiene measures:

Do not eat, drink or smoke when using the product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, www.aws.org.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Steel rod with extruded flux coating.
Physical state:	Solid
Form:	Solid
Color:	No data available.
Odor:	No data available.
Odor threshold:	No data available.
pH:	No data available.
Melting point/freezing point:	No data available.
Initial boiling point and boiling range:	No data available.
Flash Point:	No data available.
Evaporation rate:	No data available.
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	No data available.
Vapor density:	No data available.
Density:	No data available.
Relative density:	No data available.
Solubility(ies)	
Solubility in water:	No data available.
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.

10. STABILITY AND REACTIVITY

Reactivity:	The product is non-reactive under normal conditions of use, storage and transport.
Chemical Stability:	Material is stable under normal conditions.
Possibility of hazardous reactions:	None under normal conditions.
Conditions to avoid:	Avoid heat or contamination.
Incompatible Materials:	Strong acids. Strong oxidizing substances. Strong bases.
Hazardous Decomposition Products:	<p>Fumes and gases from welding and its allied processes such as brazing and soldering cannot be classified simply. The composition and quantity of both are dependent upon the metal to which the joining or hot work is applied, the process, procedure - and where applicable - the electrode or consumable used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded or worked (such as paint, plating, or galvanizing), the number of operators and the volume of the work area, the quality and amount of ventilation, the position of the operator's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)</p> <p>In cases where an electrode or other applied material is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents produced during arc welding and brazing include the oxides of iron, manganese and other metals present in the welding consumable or base metal. Hexavalent chromium compounds may be in the welding or brazing fume of consumables or base metals which contain chromium. Gaseous and particulate fluoride may be in the fume of consumables or flux materials which contain fluoride. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc associated with welding.</p>

11. TOXICOLOGICAL INFORMATION

General information:	The International Agency for Research on Cancer (IARC) has determined welding fumes and ultraviolet radiation from welding are carcinogenic to humans (Group 1). According to IARC, welding fumes cause cancer of the lung and positive associations have been observed with cancer of the kidney. Also according to IARC, ultraviolet radiation from welding causes ocular melanoma. IARC identifies gouging, brazing, carbon arc or plasma arc cutting, and soldering as processes closely related to welding. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.
Information on likely routes of exposure	
Inhalation:	Potential chronic health hazards related to the use of welding consumables are most applicable to the inhalation route of exposure. Refer to Inhalation statements in Section 11.

Skin Contact: Arc rays can burn skin. Skin cancer has been reported.

Eye contact: Arc rays can injure eyes.

Ingestion: Health injuries from ingestion are not known or expected under normal use.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation: Short-term (acute) overexposure to fumes and gases from welding and allied processes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from welding and allied processes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product: Not classified

Specified substance(s):

Iron LD 50 (Rat): 98.6 g/kg

Sodium silicate LD 50 (Rat): 1.1 g/kg

Dermal

Product: Not classified

Inhalation

Product: Not classified

Repeated dose toxicity

Product: Not classified

Skin Corrosion/Irritation

Product: Not classified

Serious Eye Damage/Eye Irritation

Product: Not classified

Respiratory or Skin Sensitization

Product: Not classified

Carcinogenicity

Product: Arc rays: Skin cancer has been reported.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Titanium dioxide Overall evaluation: 2B. Possibly carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended:

No carcinogenic components identified

Germ Cell Mutagenicity

In vitro

Product: Not classified

In vivo
Product: Not classified

Reproductive toxicity
Product: Not classified

Specific Target Organ Toxicity - Single Exposure
Product: Not classified

Specific Target Organ Toxicity - Repeated Exposure
Product: Not classified

Aspiration Hazard

Product: Not classified

Other effects: Organic polymers may be used in the manufacture of various welding consumables. Overexposure to their decomposition byproducts may result in a condition known as polymer fume fever. Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually not lasting longer than 48 hours.

Symptoms related to the physical, chemical and toxicological characteristics under the condition of use

Inhalation:

Specified substance(s):

Manganese

Overexposure to manganese fumes may affect the brain and central nervous system, resulting in poor coordination, difficulty speaking, and arm or leg tremor. This condition can be irreversible.

Additional toxicological Information under the conditions of use:

Acute toxicity

Inhalation

Specified substance(s):

Carbon dioxide	LC Lo (Human, 5 min): 90000 ppm
Carbon monoxide	LC 50 (Rat, 4 h): 1300 ppm
Nitrogen dioxide	LC 50 (Rat, 4 h): 88 ppm
Ozone	LC Lo (Human, 30 min): 50 ppm

Other effects:

Specified substance(s):

Carbon dioxide	Asphyxia
Carbon monoxide	Carboxyhemoglobinemia
Nitrogen dioxide	Lower respiratory tract irritation

12. ECOLOGICAL INFORMATION

Ecotoxicity

Acute hazards to the aquatic environment:

Fish

Product: Not classified.

Specified substance(s):

Sodium silicate	LC 50 (Western mosquitofish (<i>Gambusia affinis</i>), 96 h): 1,800 mg/l
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Aquatic Invertebrates

Product: Not classified.

Specified substance(s):

Sodium silicate EC 50 (Water flea (Ceriodaphnia dubia), 48 h): 22.94 - 49.01 mg/l
Manganese EC 50 (Water flea (Daphnia magna), 48 h): 40 mg/l

Chronic hazards to the aquatic environment:

Fish

Product: Not classified.

Aquatic Invertebrates

Product: Not classified.

Toxicity to Aquatic Plants

Product: Not classified.

Persistence and Degradability

Biodegradation

Product: No data available.

Bioaccumulative potential

Bioconcentration Factor (BCF)

Product: No data available.

Mobility in soil:

No data available.

13. Disposal considerations

General information:

The generation of waste should be avoided or minimized whenever possible. When practical, recycle in an environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements.

Disposal instructions:

Dispose of this material and its container to hazardous or special waste collection point.

Contaminated Packaging:

Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

14. TRANSPORT INFORMATION

DOT

UN Number:

UN Proper Shipping Name:

NOT DG REGULATED

Transport Hazard Class(es)

Class:

NR

Label(s):

—

Packing Group:

—

Marine Pollutant:

No

IMDG

UN Number:

UN Proper Shipping Name:

NOT DG REGULATED

Transport Hazard Class(es)

Class:

NR

Label(s): —
 EmS No.: —
 Packing Group: —
 Marine Pollutant: No

IATA
 UN Number: —
 Proper Shipping Name: NOT DG REGULATED
 Transport Hazard Class(es): —
 Class: NR
 Label(s): —
 Packing Group: —
 Marine Pollutant: No
 Cargo aircraft only: Allowed.

TDG
 UN Number: —
 UN Proper Shipping Name: NOT DG REGULATED
 Transport Hazard Class(es): —
 Class: NR
 Label(s): —
 Packing Group: —
 Marine Pollutant: No

15. REGULATORY INFORMATION

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

Chemical Identity

Manganese

Reportable quantity

Included in the regulation but with no data values. See regulation for further details.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Not classified

Not classified

SARA 302 Extremely Hazardous Substance

None present or none present in regulated quantities.

SARA 304 Emergency Release Notification

Chemical Identity

Manganese

Reportable quantity

Included in the regulation but with no data values. See regulation for further details.

SARA 311/312 Hazardous Chemical

Chemical Identity

Iron

Cellulose, pulp

Sodium silicate

Titanium dioxide

Threshold Planning Quantity

10000 lbs

10000 lbs

10000 lbs

10000 lbs

Manganese	10000 lbs
Chlorite	10000 lbs
Iron oxide	10000 lbs
Magnesite	10000 lbs

SARA 313 (TRI Reporting)

None present or none present in regulated quantities.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65



WARNING

Cancer - www.P65Warnings.ca.gov

WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq.)

WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov

US. New Jersey Worker and Community Right-to-Know Act

Chemical Identity

Titanium dioxide

US. Massachusetts RTK - Substance List

Chemical Identity

Quartz

US. Pennsylvania RTK - Hazardous Substances

Chemical Identity

Titanium dioxide

US. Rhode Island RTK

No ingredient regulated by RI Right-to-Know Law present.

Canada Federal Regulations

List of Toxic Substances (CEPA, Schedule 1)

Chemical Identity

Titanium dioxide

Iron oxide

Export Control List (CEPA 1999, Schedule 3)

Not Regulated

National Pollutant Release Inventory (NPRI)

Canada. National Pollutant Release Inventory (NPRI) Substances, Part 5, VOCs with Additional Reporting Requirements

NPRI PT5

Not Regulated

Canada. National Pollutant Release Inventory (NPRI) (Schedule 1, Parts 1-4)

NPRI

Not Regulated

Greenhouse Gases

Not Regulated

Controlled Drugs and Substances Act

CA CDSI Not Regulated

CA CDSII Not Regulated

CA CDSIII Not Regulated

CA CDSIV Not Regulated

CA CDSV Not Regulated

CA CDSVII Not Regulated

CA CDSVIII Not Regulated

Precursor Control Regulations

Not Regulated

Mexico. Substances subject to reporting for the pollutant release and transfer registry (PRTR): Not applicable

Inventory Status:

Australia AICS:	One or more components are not listed or are exempt from listing.
Canada DSL Inventory List:	One or more components are not listed or are exempt from listing.
EINECS, ELINCS or NLP:	On or in compliance with the inventory
Japan (ENCS) List:	One or more components are not listed or are exempt from listing.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	One or more components are not listed or are exempt from listing.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	One or more components are not listed or are exempt from listing.
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Japan ISHL Listing:	One or more components are not listed or are exempt from listing.
Japan Pharmacopoeia Listing:	One or more components are not listed or are exempt from listing.
Mexico INSQ:	One or more components are not listed or are exempt from listing.
Ontario Inventory:	One or more components are not listed or are exempt from listing.
Taiwan Chemical Substance Inventory:	On or in compliance with the inventory

16. OTHER INFORMATION

Definitions:

Revision Date: 04/13/2020

Further Information: Additional information is available by request.

Disclaimer: The Lincoln Electric Company urges each end user and recipient of this SDS to study it carefully. See also www.lincolnelectric.com/safety. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product. This information is believed to be accurate as of the revision date shown above. However, no warranty, expressed or implied, is given. Because the conditions or methods of use are beyond Lincoln Electric's control, we assume no liability resulting from the use of this product. Regulatory requirements are subject to change and may differ between various locations. Compliance with all applicable Federal, State, Provincial, and local laws and regulations remain the responsibility of the user.

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SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 6011 Mild Steel Electrode

Product Size: 1/8" (3.2 mm)

Other means of identification

SDS number: 200000006769

Recommended use and restriction on use

Recommended use: SMAW (Shielded Metal Arc Welding)

Restrictions on use: Not known. Read this SDS before using this product.

Manufacturer/Importer/Supplier/Distributor Information

Company Name: The Harris Products Group

Address: 4501 Quality Place
Mason, OH 45040-1971
USA

Telephone: +1 (513) 754-2000

Contact Person: Safety Data Sheet Questions: custservmason@jwharris.com

Company Name: The Lincoln Electric Company of Canada LP

Address: 179 Wicksteed Avenue
Toronto, Ontario M4G 2B9
Canada

Telephone: +1 (416) 421-2600

Contact Person: Safety Data Sheet Questions: www.lincolnelectric.com/sds
Arc Welding Safety Information: www.lincolnelectric.com/safety

Emergency telephone number:

USA/Canada/Mexico +1 (888) 609-1762

Americas/Europe +1 (216) 383-8962

Asia Pacific +1 (216) 383-8966

Middle East/Africa +1 (216) 383-8969

3E Company Access Code: 333988

2. HAZARDS IDENTIFICATION

Classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), The United States Occupational Safety and Health Administration's Hazard Communication Standard (29 CFR 1910.1200), Canada's Hazardous Product Regulations and Mexico's Harmonized System for the Identification and Communication of Hazards and Risks from Hazardous Chemicals in the Workplace.

Hazard Classification Not classified as hazardous according to applicable GHS hazard classification criteria.

Label Elements

Hazard Symbol: No symbol

Signal Word: No signal word.

Hazard Statement: Not applicable

Precautionary Statements: Not applicable

Other hazards which do not result in GHS classification:

Electrical Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with work piece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Arc rays can injure eyes and burn skin. Welding arc and sparks can ignite combustibles and flammable materials. Overexposure to welding fumes and gases can be hazardous. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product. Refer to Section 8.

Substance(s) formed under the conditions of use:

The welding fume produced from this welding electrode may contain the following constituent(s) and/or their complex metallic oxides as well as solid particles or other constituents from the consumables, base metal, or base metal coating not listed below.

Chemical Identity	CAS-No.
Carbon dioxide	124-38-9
Carbon monoxide	630-08-0
Nitrogen dioxide	10102-44-0
Ozone	10028-15-6
Manganese	7439-96-5

3. COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Ingredients Mixtures

Chemical Identity	CAS number	Content in percent (%)*
Iron	7439-89-6	50 - <100%
Cellulose, pulp	65996-61-4	1 - <5%
Potassium silicate	1312-76-1	1 - <5%
Titanium dioxide	13463-67-7	1 - <5%
Manganese	7439-96-5	0.1 - <1%
Iron oxide	1309-37-1	0.1 - <1%
Limestone	1317-65-3	0.1 - <1%
Sodium silicate	1344-09-8	0.1 - <1%
Potassium carbonate	584-08-7	0.1 - <1%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition Comments:

The term "Hazardous Ingredients" should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a welding hazard. The product may contain additional non-hazardous ingredients or may form additional compounds under the condition of use. Refer to Sections 2 and 8 for more information.

4. FIRST AID MEASURES

Ingestion:

Avoid hand, clothing, food, and drink contact with fluxes, metal fume or

powder which can cause ingestion of particulate during hand to mouth activities such as drinking, eating, smoking, etc. If ingested, do not induce vomiting. Contact a poison control center. Unless the poison control center advises otherwise, wash out mouth thoroughly with water. If symptoms develop, seek medical attention at once.

Inhalation: Move to fresh air if breathing is difficult. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

Skin Contact: Remove contaminated clothing and wash the skin thoroughly with soap and water. For reddened or blistered skin, or thermal burns, obtain medical assistance at once.

Eye contact: Dust or fume from this product should be flushed from the eyes with copious amounts of clean, tepid water until transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed. Obtain medical assistance at once.

Arc rays can injure eyes. If exposed to arc rays, move victim to dark room, remove contact lenses as necessary for treatment, cover eyes with a padded dressing and rest. Obtain medical assistance if symptoms persist.

Most important symptoms/effects, acute and delayed

Symptoms: Short-term (acute) overexposure to fumes and gases from welding and allied processes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from welding and allied processes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Refer to Section 11 for more information.

Hazards: The hazards associated with welding and its allied processes such as soldering and brazing are complex and may include physical and health hazards such as but not limited to electric shock, physical strains, radiation burns (eye flash), thermal burns due to hot metal or spatter and potential health effects of overexposure to fumes, gases or dusts potentially generated during the use of this product. Refer to Section 11 for more information.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

General Fire Hazards: As shipped, this product is nonflammable. However, welding arc and sparks as well as open flames and hot surfaces associated with brazing and soldering can ignite combustible and flammable materials. Read and understand American National Standard Z49.1, "Safety in Welding, Cutting and Allied Processes" and National Fire Protection Association NFPA 51B, "Standard for Fire Prevention during Welding, Cutting and Other Hot Work" before using this product.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: As shipped, the product will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.

Unsuitable extinguishing Do not use water jet as an extinguisher, as this will spread the fire.

media:

Specific hazards arising from the chemical: Welding arc and sparks can ignite combustibles and flammable products.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Use standard firefighting procedures and consider the hazards of other involved materials.

Special protective equipment for fire-fighters: Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8.

Methods and material for containment and cleaning up: Absorb with sand or other inert absorbent. Stop the flow of material, if this is without risk. Clean up spills immediately, observing precautions in the personal protective equipment in Section 8. Avoid generating dust. Prevent product from entering any drains, sewers or water sources. Refer to Section 13 for proper disposal.

Environmental Precautions: Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water sources or sewer. Environmental manager must be informed of all major spillages.

7. HANDLING AND STORAGE

Precautions for safe handling: Prevent formation of dust. Provide appropriate exhaust ventilation at places where dust is formed.

Read and understand the manufacturer's instruction and the precautionary label on the product. Refer to Lincoln Safety Publications at www.lincolnelectric.com/safety. See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the American Welding Society, <http://pubs.aws.org> and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, www.gpo.gov.

Conditions for safe storage, including any incompatibilities: Store in closed original container in a dry place. Store in accordance with local/regional/national regulations. Store away from incompatible materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION
Control Parameters
Occupational Exposure Limits: US

Chemical Identity	Type	Exposure Limit Values	Source
Titanium dioxide	TWA	10 mg/m3	US. ACGIH Threshold Limit Values, as amended (12 2010)
Titanium dioxide - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Titanium dioxide	IDLH	5,000 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Manganese - Fume. - as Mn	Ceiling	5 mg/m3	US. OSHA Table Z-1 Limits for Air

			Contaminants (29 CFR 1910.1000) (02 2006)
	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	STEL	3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2014)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2014)
Manganese	IDLH	500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Iron oxide - Respirable fraction.	TWA	5 mg/m3	US. ACGIH Threshold Limit Values, as amended (12 2010)
Iron oxide - Fume.	PEL	10 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Iron oxide - Dust and fume. - as Fe	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Iron oxide	IDLH	2,500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Limestone - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Limestone - Respirable fraction.	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Limestone - Respirable.	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Limestone - Total	REL	10 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)

Occupational Exposure Limits: Canada

Chemical Identity	Type	Exposure Limit Values	Source
Titanium dioxide	TWA	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Titanium dioxide - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Titanium dioxide - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Titanium dioxide	TWA	10 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Titanium dioxide - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	8 HR ACL	0.2 mg/m3	Canada. Saskatchewan OELs

			(Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	0.6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (06 2015)
Manganese - Fume, total dust. - as Mn	TWA	0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Manganese - Respirable. - as Mn	TWA	0.02 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)
Manganese - Total - as Mn	TWA	0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)
Iron oxide - Respirable.	TWA	5 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Iron oxide - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Dust. - as Fe	TWA	5 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Fume. - as Fe	STEL	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Fume. - as Fe	TWA	5 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Iron oxide - Respirable fraction.	TWA	5 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	5 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
Iron oxide	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)

Iron oxide - Dust and fume. - as Fe	15 MIN ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	8 HR ACL	5 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Iron oxide - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Iron oxide - Dust and fume. - as Fe	TWA	5 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Limestone	TWA	10 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
Limestone - Total dust.	STEL	20 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Limestone - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Limestone	8 HR ACL	10 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	20 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Limestone - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)

Occupational Exposure Limits: Mexico

Chemical Identity	Type	Exposure Limit Values	Source
Iron - as Fe	VLE-PPT	1 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Titanium dioxide	VLE-PPT	10 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Manganese - as Mn	VLE-PPT	0.2 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Iron oxide - Respirable fraction.	VLE-PPT	5 mg/m3	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)

Additional exposure limits under the conditions of use: US

Chemical Identity	Type	Exposure Limit Values	Source
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Carbon dioxide	TWA	5,000 ppm	US. ACGIH Threshold Limit Values, as amended (12 2010)
	STEL	30,000 ppm	US. ACGIH Threshold Limit Values, as amended (12 2010)
	PEL	5,000 ppm 9,000 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	30,000 ppm 54,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	REL	5,000 ppm 9,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	IDLH	40,000 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Carbon monoxide	TWA	25 ppm	US. ACGIH Threshold Limit Values, as amended (12 2010)
	PEL	50 ppm 55 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	35 ppm 40 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	Ceil_Time	200 ppm 229 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	IDLH	1,200 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Nitrogen dioxide	TWA	0.2 ppm	US. ACGIH Threshold Limit Values, as amended (02 2012)
	Ceiling	5 ppm 9 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	1 ppm 1.8 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	IDLH	20 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
	IDLH	13 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Ozone	PEL	0.1 ppm 0.2 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Ceil_Time	0.1 ppm 0.2 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	TWA	0.05 ppm	US. ACGIH Threshold Limit Values, as amended (03 2014)
	TWA	0.20 ppm	US. ACGIH Threshold Limit Values, as amended (03 2014)
	TWA	0.10 ppm	US. ACGIH Threshold Limit Values, as amended (03 2014)
	TWA	0.08 ppm	US. ACGIH Threshold Limit Values, as amended (03 2014)
	IDLH	5 ppm	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)
Manganese - Fume. - as Mn	Ceiling	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
	STEL	3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2005)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2014)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2014)
Manganese	IDLH	500 mg/m3	US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values (10 2017)

Additional exposure limits under the conditions of use: Canada

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	STEL	30,000 ppm 54,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table

			2), as amended (07 2009)
	TWA	5,000 ppm 9,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	5,000 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	STEL	15,000 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	5,000 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	STEL	30,000 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	STEL	30,000 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	TWA	5,000 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	5,000 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	30,000 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	5,000 ppm 9,000 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
	STEL	30,000 ppm 54,000 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Carbon monoxide	TWA	25 ppm 29 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	25 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	STEL	100 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	25 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2011)
	TWA	25 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
	8 HR ACL	25 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	190 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	35 ppm 40 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09

			2017)
	STEL	200 ppm 230 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Nitrogen dioxide	STEL	5 ppm 9.4 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	3 ppm 5.6 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	CEILING	1 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.2 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2012)
	STEL	5 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	TWA	3 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (11 2010)
	8 HR ACL	3 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	5 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	TWA	3 ppm 5.6 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Ozone	STEL	0.3 ppm 0.6 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	0.1 ppm 0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	TWA	0.05 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.1 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.08 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.2 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	0.1 ppm 0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
	STEL	0.3 ppm 0.6 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (07 2010)
	15 MIN ACL	0.15 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as

			amended (05 2009)
	8 HR ACL	0.05 ppm	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	CEILING	0.1 ppm 0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (12 2008)
	TWA	0.20 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
	TWA	0.05 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
	TWA	0.08 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
	TWA	0.10 ppm	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended (07 2009)
	8 HR ACL	0.2 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
	15 MIN ACL	0.6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21), as amended (05 2009)
Manganese - Respirable fraction. - as Mn	TWA	0.02 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - Inhalable fraction. - as Mn	TWA	0.1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act), as amended (03 2014)
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended (06 2015)
Manganese - Fume, total dust. - as Mn	TWA	0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended (09 2017)
Manganese - Respirable. - as Mn	TWA	0.02 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)
Manganese - Total - as Mn	TWA	0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2018)

Additional exposure limits under the conditions of use: Mexico

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	VLE-CT	30,000 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
	VLE-PPT	5,000 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Carbon monoxide	VLE-PPT	25 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended

			(04 2014)
Nitrogen dioxide	VLE-PPT	0.2 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Ozone	VLE-P	0.1 ppm	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)
Manganese - as Mn	VLE-PPT	0.2 mg/m ³	Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control), as amended (04 2014)

Appropriate Engineering Controls

Ventilation: Use enough ventilation and local exhaust at the arc, flame or heat source to keep the fumes and gases from the worker's breathing zone and the general area. Train the operator to keep their head out of the fumes. **Keep exposure as low as possible.**

Individual protection measures, such as personal protective equipment

General information:

Exposure Guidelines: To reduce the potential for overexposure, use controls such as adequate ventilation and personal protective equipment (PPE). Overexposure refers to exceeding applicable local limits, the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) or the Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limits (PELs). Workplace exposure levels should be established by competent industrial hygiene assessments. Unless exposure levels are confirmed to be below the applicable local limit, TLV or PEL, whichever is lower, respirator use is required. Absent these controls, overexposure to one or more compound constituents, including those in the fume or airborne particles, may occur resulting in potential health hazards. According to the ACGIH, TLVs and Biological Exposure Indices (BEIs) "represent conditions under which ACGIH believes that nearly all workers may be repeatedly exposed without adverse health effects." The ACGIH further states that the TLV-TWA should be used as a guide in the control of health hazards and should not be used to indicate a fine line between safe and dangerous exposures. See Section 10 for information on constituents which have some potential to present health hazards. Welding consumables and materials being joined may contain chromium as an unintended trace element. Materials that contain chromium may produce some amount of hexavalent chromium (CrVI) and other chromium compounds as a byproduct in the fume. In 2018, the American Conference of Governmental Industrial Hygienists (ACGIH) lowered the Threshold Limit Value (TLV) for hexavalent chromium from 50 micrograms per cubic meter of air (50 µg/m³) to 0.2 µg/m³. At these new limits, CrVI exposures at or above the TLV may be possible in cases where adequate ventilation is not provided. CrVI compounds are on the IARC and NTP lists as posing a lung cancer and sinus cancer risk. Workplace conditions are unique and welding fume exposures levels vary. Workplace exposure assessments must be conducted by a qualified professional, such as an industrial hygienist, to determine if exposures are below applicable limits and to make recommendations when necessary for preventing overexposures.

Eye/face protection:

Wear helmet or use face shield with filter lens shade number 12 or darker for open arc processes – or follow the recommendations as specified in ANSI Z49.1, Section 4, based on your process and settings. No specific lens shade recommendation for submerged arc or electroslag processes. Shield others by providing appropriate screens and flash goggles.

Skin Protection

Hand Protection:	Wear protective gloves. Suitable gloves can be recommended by the glove supplier.
Other:	Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, open flames, hot surfaces, sparks and electrical shock. See Z49.1. At a minimum, this includes welder's gloves and a protective face shield when welding, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing when welding, brazing and soldering. Wear dry gloves free of holes or split seams. Train the operator not to permit electrically live parts or electrodes from contacting the skin . . . or clothing or gloves if they are wet. Insulate yourself from the work piece and ground using dry plywood, rubber mats or other dry insulation.
Respiratory Protection:	Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are below applicable exposure limits.
Hygiene measures:	Do not eat, drink or smoke when using the product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, www.aws.org .

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Steel rod with extruded flux coating.
Physical state:	Solid
Form:	Solid
Color:	No data available.
Odor:	No data available.
Odor threshold:	No data available.
pH:	No data available.
Melting point/freezing point:	No data available.
Initial boiling point and boiling range:	No data available.
Flash Point:	No data available.
Evaporation rate:	No data available.
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	No data available.
Vapor density:	No data available.
Density:	No data available.
Relative density:	No data available.

Solubility(ies)

Solubility in water:	No data available.
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.

10. STABILITY AND REACTIVITY

Reactivity:	The product is non-reactive under normal conditions of use, storage and transport.
Chemical Stability:	Material is stable under normal conditions.
Possibility of hazardous reactions:	None under normal conditions.
Conditions to avoid:	Avoid heat or contamination.
Incompatible Materials:	Strong acids. Strong oxidizing substances. Strong bases.
Hazardous Decomposition Products:	<p>Fumes and gases from welding and its allied processes such as brazing and soldering cannot be classified simply. The composition and quantity of both are dependent upon the metal to which the joining or hot work is applied, the process, procedure - and where applicable - the electrode or consumable used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded or worked (such as paint, plating, or galvanizing), the number of operators and the volume of the work area, the quality and amount of ventilation, the position of the operator's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)</p> <p>In cases where an electrode or other applied material is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents produced during arc welding and brazing include the oxides of iron, manganese and other metals present in the welding consumable or base metal. Hexavalent chromium compounds may be in the welding or brazing fume of consumables or base metals which contain chromium. Gaseous and particulate fluoride may be in the fume of consumables or flux materials which contain fluoride. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc associated with welding.</p>

11. TOXICOLOGICAL INFORMATION

General information:

The International Agency for Research on Cancer (IARC) has determined welding fumes and ultraviolet radiation from welding are carcinogenic to humans (Group 1). According to IARC, welding fumes cause cancer of the lung and positive associations have been observed with cancer of the kidney. Also according to IARC, ultraviolet radiation from welding causes ocular melanoma. IARC identifies gouging, brazing, carbon arc or plasma arc cutting, and soldering as processes closely related to welding. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.

Information on likely routes of exposure

- Inhalation:** Potential chronic health hazards related to the use of welding consumables are most applicable to the inhalation route of exposure. Refer to Inhalation statements in Section 11.
- Skin Contact:** Arc rays can burn skin. Skin cancer has been reported.
- Eye contact:** Arc rays can injure eyes.
- Ingestion:** Health injuries from ingestion are not known or expected under normal use.

Symptoms related to the physical, chemical and toxicological characteristics

- Inhalation:** Short-term (acute) overexposure to fumes and gases from welding and allied processes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from welding and allied processes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

- Product:** Not classified
- Specified substance(s):**
- | | |
|---------------------|--------------------------|
| Iron | LD 50 (Rat): 98.6 g/kg |
| Limestone | LD 50 (Rat): 6,450 mg/kg |
| Sodium silicate | LD 50 (Rat): 1.1 g/kg |
| Potassium carbonate | LD 50 (Rat): 1,870 mg/kg |

Dermal

- Product:** Not classified
- Specified substance(s):**
- | | |
|---------------------|-------------------------------|
| Potassium carbonate | LD 50 (Rabbit): > 2,000 mg/kg |
|---------------------|-------------------------------|

Inhalation

- Product:** Not classified

Repeated dose toxicity

- Product:** Not classified

Skin Corrosion/Irritation

- Product:** Not classified

Serious Eye Damage/Eye Irritation

- Product:** Not classified

Respiratory or Skin Sensitization

Product: Not classified

Carcinogenicity

Product: Arc rays: Skin cancer has been reported.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Titanium dioxide Overall evaluation: 2B. Possibly carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended:

No carcinogenic components identified

Germ Cell Mutagenicity

In vitro

Product: Not classified

In vivo

Product: Not classified

Reproductive toxicity

Product: Not classified

Specific Target Organ Toxicity - Single Exposure

Product: Not classified

Specific Target Organ Toxicity - Repeated Exposure

Product: Not classified

Aspiration Hazard

Product: Not classified

Other effects:

Organic polymers may be used in the manufacture of various welding consumables. Overexposure to their decomposition byproducts may result in a condition known as polymer fume fever. Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually not lasting longer than 48 hours.

Symptoms related to the physical, chemical and toxicological characteristics under the condition of use

Inhalation:

Specified substance(s):

Manganese

Overexposure to manganese fumes may affect the brain and central nervous system, resulting in poor coordination, difficulty speaking, and arm or leg tremor. This condition can be irreversible.

Additional toxicological information under the conditions of use:

Acute toxicity

Inhalation

Specified substance(s):

Carbon dioxide	LC Lo (Human, 5 min): 90000 ppm
Carbon monoxide	LC 50 (Rat, 4 h): 1300 ppm
Nitrogen dioxide	LC 50 (Rat, 4 h): 88 ppm

Ozone

LC Lo (Human, 30 min): 50 ppm

Other effects:
Specified substance(s):

Carbon dioxide	Asphyxia
Carbon monoxide	Carboxyhemoglobinemia
Nitrogen dioxide	Lower respiratory tract irritation

12. ECOLOGICAL INFORMATION

Ecotoxicity
Acute hazards to the aquatic environment:
Fish
Product: Not classified.

Specified substance(s):

Sodium silicate	LC 50 (Western mosquitofish (<i>Gambusia affinis</i>), 96 h): 1,800 mg/l
Potassium carbonate	LC 50 (Fathead minnow (<i>Pimephales promelas</i>), 96 h): < 750 mg/l

Aquatic Invertebrates
Product: Not classified.

Specified substance(s):

Manganese	EC 50 (Water flea (<i>Daphnia magna</i>), 48 h): 40 mg/l
Sodium silicate	EC 50 (Water flea (<i>Ceriodaphnia dubia</i>), 48 h): 22.94 - 49.01 mg/l
Potassium carbonate	LC 50 (Water flea (<i>Ceriodaphnia dubia</i>), 48 h): 580 - 670 mg/l

Chronic hazards to the aquatic environment:
Fish
Product: Not classified.

Aquatic Invertebrates
Product: Not classified.

Toxicity to Aquatic Plants
Product: Not classified.

Persistence and Degradability
Biodegradation
Product: No data available.

Bioaccumulative potential
Bioconcentration Factor (BCF)
Product: No data available.

Mobility in soil:

No data available.

13. Disposal considerations

General information:

The generation of waste should be avoided or minimized whenever possible. When practical, recycle in an environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements.

Disposal instructions:

Dispose of this material and its container to hazardous or special waste collection point.

Contaminated Packaging:

Dispose of contents/container to an appropriate treatment and disposal



facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

14. TRANSPORT INFORMATION

DOT

UN Number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No

IMDG

UN Number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): –
EmS No.:
Packing Group: –
Marine Pollutant: No

IATA

UN Number:
Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es):
Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No
Cargo aircraft only: Allowed.

TDG

UN Number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No

15. REGULATORY INFORMATION

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

Chemical Identity

Manganese

Reportable quantity

Included in the regulation but with no data values. See regulation for further details.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Not classified

Not classified

SARA 302 Extremely Hazardous Substance

None present or none present in regulated quantities.

SARA 304 Emergency Release Notification

Chemical Identity

Manganese

Reportable quantity

Included in the regulation but with no data values. See regulation for further details.

SARA 311/312 Hazardous Chemical

Chemical Identity

Iron

Cellulose, pulp

Potassium silicate

Titanium dioxide

Manganese

Iron oxide

Limestone

Sodium silicate

Potassium carbonate

Threshold Planning Quantity

10000 lbs

10000 lbs

10000 lbs

10000 lbs

10000 lbs

10000 lbs

10000 lbs

10000 lbs

10000 lbs

SARA 313 (TRI Reporting)

None present or none present in regulated quantities.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65



WARNING

Cancer - www.P65Warnings.ca.gov

WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq.)

WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov

US. New Jersey Worker and Community Right-to-Know Act

Chemical Identity

Titanium dioxide

US. Massachusetts RTK - Substance List

No ingredient regulated by MA Right-to-Know Law present.

US. Pennsylvania RTK - Hazardous Substances

Chemical Identity

Titanium dioxide

US. Rhode Island RTK

No ingredient regulated by RI Right-to-Know Law present.

Canada Federal Regulations

List of Toxic Substances (CEPA, Schedule 1)

Chemical Identity

Titanium dioxide

Iron oxide

Export Control List (CEPA 1999, Schedule 3)

Not Regulated

National Pollutant Release Inventory (NPRI)

Canada. National Pollutant Release Inventory (NPRI) Substances, Part 5, VOCs with Additional Reporting Requirements

NPRI PT5 Not Regulated

Canada. National Pollutant Release Inventory (NPRI) (Schedule 1, Parts 1-4)

NPRI Not Regulated

Greenhouse Gases

Not Regulated

Controlled Drugs and Substances Act

CA CDSI Not Regulated

CA CDSII Not Regulated

CA CDSIII Not Regulated

CA CDSIV Not Regulated

CA CDSV Not Regulated

CA CDSVII Not Regulated

CA CDSVIII Not Regulated

Precursor Control Regulations

Not Regulated

Mexico. Substances subject to reporting for the pollutant release and transfer registry (PRTR): Not applicable

Inventory Status:

Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	One or more components are not listed or are exempt from listing.
EINECS, ELINCS or NLP:	On or in compliance with the inventory
Japan (ENCS) List:	One or more components are not listed or are exempt from listing.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	One or more components are not listed or are exempt from listing.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Japan ISHL Listing:	One or more components are not listed or are exempt from listing.
Japan Pharmacopoeia Listing:	One or more components are not listed or are exempt from listing.
Mexico INSQ:	One or more components are not listed or are exempt from listing.
Ontario Inventory:	On or in compliance with the inventory
Taiwan Chemical Substance Inventory:	On or in compliance with the inventory

16. OTHER INFORMATION

Definitions:

Revision Date: 04/13/2020

Further Information: Additional information is available by request.

Disclaimer: The Lincoln Electric Company urges each end user and recipient of this SDS to study it carefully. See also www.lincolnelectric.com/safety. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product. This information is believed to be accurate as of the revision date shown above. However, no warranty, expressed or implied, is given. Because the conditions or methods of use are beyond Lincoln Electric's control, we assume no liability resulting from the use of this product. Regulatory requirements are subject to change and may differ between various locations. Compliance with all applicable Federal, State, Provincial, and local laws and regulations remain the responsibility of the user.

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Attachment N
Slag Oxidizer SDS



SDS DATE: 08/20/2020
ORIGINAL: 08/29/2017

SAFETY DATA SHEET

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements of the Global Harmonizing System.
THIS SDS COMPLIES WITH 29 CFR 1910.1200 (HAZARD COMMUNICATION STANDARD)
IMPORTANT: Read this SDS before handling & disposing of this product.
Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: HYDROGEN PEROXIDE (TECH GRADE) 35%
SYNONYMS: Hydrogen peroxide (aqueous); Hydroperoxide; Peroxide
PRODUCT USES: Oxidizer, chemical bleaching
RESTRICTIONS: Not for human consumption
COMPANY IDENTITY: Cascade Columbia Distribution Company
COMPANY ADDRESS: 6900 Fox Avenue S.
COMPANY CITY: Seattle, WA 98108
COMPANY PHONE: 1-206-763-2351
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)

SECTION 2. HAZARDS IDENTIFICATION

2.1 HAZARD STATEMENTS: (CAT = Hazard Category)

GHS SIGNAL WORD: DANGER!!!

HAZARD CLASS (CAT=CATEGORY):

OXIDIZING LIQUID (CAT: 2)

CORROSIVE TO METALS (CAT: 1)

ACUTE TOXICITY, ORAL (CAT: 4)

ACUTE TOXICITY, INHALATION (CAT: 4)

TARGET ORGAN TOXICITY, SINGLE EXPOSURE (CAT: 3)

SKIN CORROSION/IRRITATION (CAT: 1)

SERIOUS EYE DAMAGE/EYE IRRITATION (CAT:1)

GHS HAZARD STATEMENTS:

H273 MAY INTENSIFY FIRE; OXIDIZER.

H290 MAY BE CORROSIVE TO METALS

H302 HARMFUL IF SWALLOWED.

H315 CAUSES SKIN IRRITATION

H318 CAUSES SERIOUS EYE DAMAGE

H332 HARMFUL IF INHALED.

H335 MAY CAUSE RESPIRATORY IRRITATION.

H336 MAY CAUSE DROWSINESS OR DIZZINESS.

GHS PRECAUTIONARY STATEMENTS:

EXPOSURE PREVENTION:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P210 Keep away from heat/sparks/open flames/hot surfaces. -- No Smoking.

P220 Keep/Store away from clothing/organic material/combustible materials.

P221 Take any precaution to avoid mixing with combustibles.

P234 Keep only in original container.

P260 Do not breathe dust/fume/gas/mist/vapors/spray.

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash with soap & water thoroughly after handling.

P270 Do not eat, drink, or smoke when using this product.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P283 Wear fire/flame resistant/retardant clothing.

P301+330+331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303+361+353 IF ON SKIN (OR HAIR): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+340 IF INHALED: Remove victim to fresh air & keep at rest in a position comfortable for breathing.

P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do - Continue rinsing.

P306+360 IF ON CLOTHING: Rinse immediately contaminated CLOTHING and SKIN with plenty before removing clothes.

P310 Immediately call a POISON CENTER or doctor/physician.

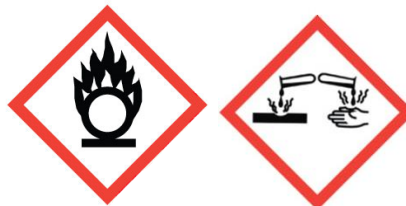
P312 Call a POISON CENTER or doctor/physician if you feel unwell.

P332+313 IF SKIN irritation occurs: Get medical advice/attention.

P337+313 IF EYE irritation persists: Get medical advice/attention.

P352 Wash with plenty of soap and water.

P363 Wash contaminated clothing before reuse.



P370+378 In case of fire: Use water fog, dry chemical, carbon dioxide or regular foam.
P371+380+375 In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.
P390 Absorb spillage to prevent material damage.
P404 Store in a closed container.
P405 Store locked up.
P406 Store in corrosive resistant container with resistant inner liner.
P500 Dispose of contents/container following local/regional/federal regulations.

2.2 HAZARDS NOT OTHERWISE CLASSIFIED: Toxic to aquatic life
SEE SECTIONS 8, 11 & 12 FOR TOXICOLOGICAL INFORMATION.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 MIXTURE OR SUBSTANCE: MIXTURE

CHEMICAL NAME	CAS#	EINCES #	% WT
WATER	7732-18-5	231-791-2	65
HYDROGEN PEROXIDE	7722-84-1	231-765-0	35

TRACE COMPONENTS: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SECTION 4. FIRST AID MEASURES

4.1 MOST IMPORTANT SYMPTOMS/EFFECTS, ACUTE & CHRONIC:

Skin irritation and eye damage. See Section 11 for symptoms/effects, acute & chronic.

4.2 GENERAL ADVICE:

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists, refer to Section 8 for specific personal protective equipment.

4.3 EYE CONTACT:

If this product enters the eyes, check for and remove any contact lenses. Open eyes while under gently running water. Use sufficient force to open eyelids. "Roll" eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

4.4 SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard contaminated shoes.

4.5 INHALATION:

After high vapor exposure, remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, trained personnel should immediately begin artificial respiration. If the heart has stopped, trained personnel should immediately begin cardiopulmonary resuscitation (CPR). Seek immediate medical attention.

4.6 SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

4.7 RESCUERS: Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of label and SDS to physician or health professional with victim.

4.8 NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis should not be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after

endotracheal intubation).

SECTION 5. FIRE FIGHTING MEASURES

5.1 FIRE & EXPLOSION PREVENTIVE MEASURES:

Isolate from all reducers, combustibles, heat, & open flame.

5.2 SUITABLE (& UNSUITABLE) EXTINGUISHING MEDIA:

Use water fog or spray. Do not use water jet.

5.3 SPECIAL PROTECTIVE EQUIPMENT & PRECAUTIONS FOR FIRE FIGHTERS:

Water spray may be ineffective on fire but can protect fire-fighters & cool closed containers. Use fog nozzles if water is used. Do not enter confined fire-space without full bunker gear. (Helmet with face shield, bunker coats, gloves & rubber boots).

5.4 SPECIFIC HAZARDS OF CHEMICAL & HAZARDOUS COMBUSTION PRODUCTS:

Isolate from oxidizers, heat, & open flame. Closed containers may explode if exposed to extreme heat. Applying to hot surfaces requires special precautions. Continue all label precautions!

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, EMERGENCY PROCEDURES:

The proper personal protective equipment for incidental releases (such as: 1 Liter of the product released in a well-ventilated area), use impermeable gloves, they should be Level B: triple-gloves (rubber gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard-hat, and Self-Contained Breathing Apparatus specific for the material handled, goggles, face shield, and appropriate body protection. In the event of a large release, use impermeable gloves, specific for the material handled, chemically resistant suit and boots, and hard hat. Self-Contained Breathing Apparatus or respirator may be required where engineering controls are not adequate or conditions for potential exposure exist. When respirators are required, select NIOSH/MSHA approved based on actual or potential airborne concentrations in accordance with latest OSHA and/or ANSI recommendations.

6.2 ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container. Keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

6.3 METHODS AND MATERIAL FOR CONTAINMENT & CLEAN-UP:

Absorb spilled liquid with polypads or other suitable absorbent materials. If necessary, neutralize using suitable buffering material, (acid with soda ash or base with phosphoric acid), and test area with litmus paper to confirm neutralization. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13 - Disposal Considerations).

6.4 Notification Procedures:

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting release of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800) 424-8802.

SECTION 7. HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING:

Isolate from all reducers, combustibles, heat, & open flame. Use only with adequate ventilation. Wear OSHA Standard goggles or face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse. Avoid free fall of liquid. Ground containers when transferring. Do not flame cut, braze, or weld. Continue all label precautions!

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES:

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage and moisture. Isolate from any source of heat or ignition. Avoid storage on wood floors. Separate from incompatibles, combustibles, organic, or other readily oxidizable materials. Containers of this material may be hazardous when empty since they may retain product residues (dust, solids); observe all warnings and precautions listed for this product.

7.3 NONBULK: CONTAINERS:

Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Empty containers should be handled with care. Never store food, feed, or drinking water in containers which held this product.

7.4 BULK CONTAINERS:

All tanks and pipelines which contain this material must be labeled. Perform routine maintenance on tanks or pipelines which contain this product. Report all leaks immediately to the proper personnel.

7.5 TANK CAR SHIPMENTS:

Tank cars carrying this product should be loaded and unloaded in strict accordance with tank-car manufacturer's recommendation and all established on-site safety procedures. Appropriate personal protective equipment must be used (see Section 8, Engineering Controls and Personal Protective Equipment.). All loading and unloading equipment must be inspected, prior to each use. Loading and unloading operations must be attended, at all times. Tank cars must be level, brakes must be set or wheels must be locked or blocked prior to loading or unloading. Tank car (for loading) or storage tanks (for unloading) must be verified to be correct for receiving this product and be properly prepared, prior to starting the transfer operations. Hoses must be verified to be in the correct positions, before starting transfer operations. A sample (if required) must be taken and verified (if required) prior to starting transfer operations. All lines must be blown-down and purged before disconnecting them from the tank car or vessel.

7.6 PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:

Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Collect all rinsates and dispose of according to applicable Federal, State, Provincial, or local procedures.

7.7 EMPTY CONTAINER WARNING:

Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. **DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY BURST AND CAUSE INJURY OR DEATH.**

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 EXPOSURE LIMITS:

CHEMICAL NAME	SYNONYMS	OSHA PEL	NIOSH REL	ACGIH TLV	IDLH
Hydrogen Peroxide (7722-84-1)	Hydrogen peroxide (aqueous); Hydroperoxide; Peroxide	TWA: 1 ppm (1.4 mg/m3)	TWA: 1 ppm (1.4 mg/m3)	TWA: 1 ppm [1990]	75 ppm

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

8.2 APPROPRIATE ENGINEERING CONTROLS:

RESPIRATORY EXPOSURE CONTROLS

Airborne concentrations should be kept to lowest levels possible. If vapor, dust or mist is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air-supplied respirator authorized in 29 CFR 1910.134, European Standard EN 149, or applicable State regulations, after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown. Maintain airborne contaminant concentrations below exposure limits. If adequate ventilation is not available or there is potential for airborne exposure above the exposure limits, a respirator may be worn up to the respirator exposure limitations, check with respirator equipment manufacturer's recommendations/limitations. For particulates, a particulate respirator (NIOSH Type N95 or better filters) may be worn. If oil particles (such as: lubricants, cutting fluids, glycerine, and so on) are present, use a NIOSH Type R or P filter. For a higher level of protection, use positive pressure supplied air respiration protection or Self-Contained Breathing Apparatus or if oxygen levels are below 19.5% or are unknown.

COMPANY IDENTITY: Cascade Columbia Distribution Company
PRODUCT IDENTITY: HYDROGEN PEROXIDE (TECH GRADE) 35%

SDS DATE: 08/20/2020
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EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS

Positive pressure, full-face piece Self-Contained Breathing Apparatus; or positive pressure, full-face piece Self-Contained Breathing Apparatus with an auxiliary positive pressure Self-Contained Breathing Apparatus.

VENTILATION

LOCAL EXHAUST: Necessary MECHANICAL (GENERAL): Necessary
SPECIAL: None OTHER: None
Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

8.3 INDIVIDUAL PROTECTION MEASURES, SUCH AS PERSONAL PROTECTIVE EQUIPMENT:

EYE PROTECTION:

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, chemical splash goggles should be worn, when a higher degree of protection is necessary, use splash goggles or safety glasses. Face-shields are recommended when the operation can generate splashes, sprays or mists.

HAND PROTECTION:

Use gloves chemically resistant to this material. Preferred examples: Butyl rubber, Chlorinated Polyethylene, Polyethylene, Ethyl vinyl alcohol laminate ("EVAL"), Polyvinyl alcohol ("PVA"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"), Neoprene, Nitrile/butadiene rubber ("nitril") or ("NBR"), Polyvinyl chloride ("PVC") or "vinyl", Viton. Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

BODY PROTECTION:

Use body protection appropriate for task. Cover-all, rubber aprons, or chemical protective clothing made from impervious materials are generally acceptable, depending on the task.

WORK & HYGIENIC PRACTICES:

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using toilet facilities and at the end of the working period. Provide readily accessible eye wash stations & safety showers. Remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE:	Liquid, Water-White
ODOR:	Pungent
ODOR THRESHOLD:	Not Available
pH (Neutrality):	2.50 ± 0.40
FREEZING POINT:	-33°C/-27°F (35% H2O2)
BOILING POINT:	108°C/ 226°F (35% H2O2)
FLASH POINT (TEST METHOD):	Not Applicable
EVAPORATION RATE (n-Butyl Acetate=1):	Not Available
FLAMMABILITY CLASSIFICATION:	Not Applicable
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
VAPOR PRESSURE (mm of Hg)@30°C:	0.75 (50% H2O2)
VAPOR DENSITY (air=1):	1.0 (50% H2O2)
DENSITY:	1.108
SPECIFIC GRAVITY (Water=1):	1.110
POUNDS/GALLON:	9.246
WATER SOLUBILITY:	Complete
PARTITION COEFFICIENT (n-Octane/Water):	Not Available
AUTO IGNITION TEMPERATURE:	Not Applicable
DECOMPOSITION TEMPERATURE:	> 60°C/>140°F (Slow decomposition at 35% H2O2)
TOTAL VOC'S (TVOC)*:	0.0 Vol% /0.0 g/L / 0.000 Lbs/Gal
NONEXEMPT VOC'S (CVOC)*:	0.0 Vol% /0.0 g/L / 0.000 Lbs/Gal
HAZARDOUS AIR POLLUTANTS (HAPS):	0.0 Wt% /0.0 g/L / 0.000 Lbs/Gal
NONEXEMPT VOC PARTIAL PRESSURE (mm of Hg @ 20 C)	0.0
VISCOSITY @ 20°C (Dynamic):	1.17 mPa.s (50% H2O2)

SECTION 10. STABILITY & REACTIVITY

10.1 REACTIVITY & CHEMICAL STABILITY:

Stable under normal conditions, no hazardous reactions when kept from incompatibles.

10.2 POSSIBILITY OF HAZARDOUS REACTIONS & CONDITIONS TO AVOID:

Isolate from flammables, heat, & open flame.

10.3 INCOMPATIBLE MATERIALS:

Isolate from all reducers, combustibles, heat, & open flame.

10.4 HAZARDOUS DECOMPOSITION PRODUCTS:

Oxygen.

10.5 HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 ACUTE HAZARDS

COMMON ROUTES OF EXPOSURE: Inhalation and Absorption

11.11 EYE & SKIN CONTACT:

Corrosive to skin, causes defatting, dermatitis.

Corrosive to eyes, causes redness, tearing, blurred vision, blindness.

11.12 INHALATION:

Corrosive to respiratory tract. Acute overexposure can cause serious nervous system depression.

Vapor harmful.

11.13 SWALLOWING:

Corrosive to cause abdominal contact, causes nausea, vomiting & diarrhea.

11.2 SUBCHRONIC HAZARDS/CONDITIONS AGGRAVATED

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Pre-existing disorders of any target organs mentioned in this Document can be aggravated by over-exposure by routes of entry to components of this product. Persons with these disorders should avoid use of this product.

11.3 CHRONIC HAZARDS

11.31 CANCER, REPRODUCTIVE & OTHER CHRONIC HAZARDS:

There are reports of limited evidence of carcinogenicity of hydrogen peroxide to mice administered high concentrations in their drinking water (IARC Monograph 36, 1985). However, the International Agency for Research on Cancer concluded that hydrogen peroxide could not be classified as to its carcinogenicity to humans (Group III).

11.32 TARGET ORGANS: May cause damage to target organs, based on animal data.

11.33 IRRITANCY: Irritating to contaminated tissue.

11.34 SENSITIZATION: No component is known as a sensitizer.

11.35 MUTAGENICITY: No known reports of mutagenic effects in humans.

11.36 EMBRYOTOXICITY: No known reports of embryotoxic effects in humans.

11.37 TERATOGENICITY: No known reports of teratogenic effects in humans.

11.38 REPRODUCTIVE TOXICITY: No known reports of reproductive effects in humans.

A MUTAGEN is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate across generational lines. An EMBRYOTOXIN is a chemical which causes damage to a developing embryo (such as: within the first 8 weeks of pregnancy in humans), but the damage does not propagate across generational lines. A TERATOGEN is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A REPRODUCTIVE TOXIN is any substance which interferes in any way with the reproductive process.

11.4 MAMMALIAN TOXICITY INFORMATION

Chemical	Route of Exposure	Animal	Dosage	Toxicity Effect
Hydrogen Peroxide	Oral	Rat (male & female)	431 mg/kg	Unpublished reports
	Inhalation (vapor)	Rat	LC50 > 0.17 mg/L/4 hr	No mortality observed @ 50% H2O2
	Dermal	Rabbit	6,440 mg/kg	Unpublished reports

STOT (Repeated Exposure) – The solution is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.

SECTION 12. ECOLOGICAL INFORMATION

12.1 ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

12.2 EFFECT OF MATERIAL ON PLANTS AND ANIMALS:

This product may be harmful or fatal to plant and animal life if released into the environment. Ecotoxicity assessment indicates toxicity to aquatic life (acute) and harmful to aquatic life With long lasting effects (chronic).

12.3 EFFECT OF MATERIAL ON AQUATIC LIFE:

Chemical	Species	Ecotoxicity	Effect
Hydrogen Peroxide	Pimephales promelas (fathead minnow)	LC50 - 16.4 mg/L/96 hr	Harmful to fish (Acute)
	Daphnia pulex (water flea)	EC50 - 2.4mg/L/48 hr	Toxic to aquatic invertebrates (Acute)
	Skeletonema costatum (marine diatom)	ErC50 2.62 mg/L/72 hr	Toxic to algae (Acute)
	Activated sludge	EC50 - 466 mg/L/0.5 hr	Unpublished reports (Acute)
	Daphnia magna (Water flea)	NOEC - 0.63 mg/L/ 21 days	Harmful to aquatic invertebrates with long lasting effects

12.4 MOBILITY IN SOIL

This material is mobile in soil.
 Koc: 1.58
 Log Koc: 0.2

12.5 DEGRADABILITY

This product is completely biodegradable.

12.6 BIOACCUMULATION

This product does not accumulate or biomagnify in the environment.

SECTION 13. DISPOSAL CONSIDERATIONS

The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers and liners may retain some product residues. Vapor from some product residues may create a highly flammable or explosive atmosphere inside the container. **DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE USED CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY BURST AND CAUSE INJURY OR DEATH.** Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Processing, use or contamination may change the waste disposal requirements. Do not dispose of on land, in surface waters, or in storm drains. Waste should be recycled or disposed of in accordance with regulations. Large amounts should be collected for reuse or consigned to licensed hazardous waste haulers for disposal. **ALL DISPOSAL MUST BE IN ACCORDANCE WITH ALL FEDERAL, STATE, PROVINCIAL, AND LOCAL REGULATIONS. IF IN DOUBT, CONTACT PROPER AGENCIES.**

COMPANY IDENTITY: Cascade Columbia Distribution Company
PRODUCT IDENTITY: HYDROGEN PEROXIDE (TECH GRADE) 35%

SDS DATE: 08/20/2020
SDS DATE: 08/29/2017

SECTION 14. TRANSPORT INFORMATION

MARINE POLLUTANT: No
DOT/TDG SHIP NAME: UN2014, Hydrogen Peroxide, Aqueous Solutions, 5.1 (8), PG-II
DRUM LABEL: Oxidizer (5.1), Corrosive (8)
IATA / ICAO: UN2014, Hydrogen Peroxide, Aqueous Solutions, 5.1 (8), PG-II
IMO / IMDG: UN2014, Hydrogen Peroxide, Aqueous Solutions, 5.1 (8), PG-II
EMERGENCY RESPONSE GUIDEBOOK NUMBER: 140

SECTION 15. REGULATORY INFORMATION

15.1 STANDARD REGULATIONS:

SARA SECTION 311/312 HAZARDS: Acute Health, Reactive
TSCA (Toxic Substances Control Act): All components of this product are on the TSCA list.
CERCLA - Hazardous Substance list (40 CFR 302.4) - Reportable quantity: None
Section 211 Hazardous Substances (40 CFR 117.3) - Reportable quantity: None
Section 302 (TPQ) - Reportable Quantity: None
Section 304- Reportable Quantity: None
Section 313 (Specific Toxic Chemical Listings): This material contains no known products restricted under SARA Title III, Section 313 in amounts greater or equal to 1%.

15.2 STATE REGULATIONS:

CALIFORNIA SAFE DRINKING WATER & TOXIC ENFORCEMENT ACT (PROPOSITION 65):
This product contains no chemicals known to the State of California to cause cancer, reproductive toxicity, or developmental toxicity.

15.3 INTERNATIONAL REGULATIONS

The identified components of this product are listed on the chemical inventories of the following countries:
Australia (AICS), Canada (DSL or NDSL), China (IECSC), Europe (EINECS, ELINCS), Japan (METI/CSCL, MHLW/ISHL), South Korea (KECI), New Zealand (NZIOc), Philippines (PICCS), Switzerland (SWISS), Taiwan (NECSI), USA (TSCA).

15.4 CANADA: WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

C: Oxidizer
D2B: Irritating to skin / eyes.

This product was classified using the hazard criteria of the Controlled Products Regulations (CPR). This Document contains all information required by the CPR.

SECTION 16. OTHER INFORMATION

16.1 HAZARD RATINGS:

NFPA:
HEALTH 2
FIRE 0
REACTIVITY 2
SPECIFIC HAZARDS OX

HMIS:
HEALTH 2
FLAMMABILITY 0
PHYSICAL HAZARDS 2
PERSONAL PROTECTION *

(*Personal Protection Rating to be supplied by user based on use conditions.)

This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating systems.

16.2 EMPLOYEE TRAINING

See Section 2 for Risk & Safety Statements. Employees should be made aware of all hazards of this material (as stated in this SDS) before handling it.

16.3 SDS DATE: 08/20/2020

NOTICE

The supplier disclaims all expressed or implied warranties of merchantability or fitness for a specific use, with respect to the product or the information provided herein, except for conformation to contracted specifications. All information appearing herein is based upon data obtained from manufacturers and/or recognized technical sources. While the information is believed to be accurate, we make no representations as to its accuracy or sufficiency. Conditions of use are beyond our control, and therefore users are responsible for verifying the data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their handling, and disposal of the product. Users also assume all risks in regards to the publication or use of, or reliance upon information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or process.

Attachment O
Cooling Tower SDS



**CASCADE
COLUMBIA
DISTRIBUTION
COMPANY**

COMPANY IDENTITY: Cascade Columbia Distribution Company
PRODUCT IDENTITY: SODIUM HYPOCHLORITE 12.5%

SDS DATE: 05/26/2015
ORIGINAL: 05/26/2015

SAFETY DATA SHEET

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.

THIS SDS COMPLIES WITH 29 CFR 1910.1200 (HAZARD COMMUNICATION STANDARD)

IMPORTANT: Read this SDS before handling & disposing of this product.

Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: SODIUM HYPOCHLORITE 12.5%
SYNONYMS: Bleach, Hypo, Hypochlorite, Liquid Chlorine Solution
PRODUCT USES: Laundry

COMPANY IDENTITY: Cascade Columbia Distribution Company
COMPANY ADDRESS: 6900 Fox Avenue S.
COMPANY CITY: Seattle, WA 98108
COMPANY PHONE: 1-206-761-2351
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-611-996-6666 (CANADA)

SECTION 2. HAZARDS IDENTIFICATION DANGER!!

2.1 HAZARD STATEMENTS: (CAT = Hazard Category)

(H200s) PHYSICAL: Corrosive To Metals(CAT:1)

H290 MAY BE CORROSIVE TO METALS.

(H300s) HEALTH: Acute Toxicity, Oral(CAT:4)

H314 CAUSES SEVERE SKIN BURNS AND EYE DAMAGE.

(H300s) HEALTH: Serious eye damage/eye irritation (CAT:1)

H318 CAUSES SERIOUS EYE DAMAGE

(H300s) HEALTH: Specific target organ toxicity, single exposure (CAT:3)(respiratory tract irritation)

H335 MAY CAUSE RESPIRATORY IRRITATION



2.2 PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P234 Keep only in original container.

P261 Avoid breathing dust/fume/gas/mist/vapors/spray.

P264 Wash with soap & water thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P301+331+330+312 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Call a Poison Center/doctor if you feel unwell.

P303+361+353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+340+312 IF INHALED: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a POISON CENTER or doctor/physician.

P363 Wash contaminated clothing before reuse.

P390 Absorb spillage to prevent material damage.

P403+233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

P406 Store in corrosive resistant container with resistant inner liner.

P500 Dispose of contents/container following local/regional/federal regulations.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#	EINECS#	WT %
Sodium hypochlorite	7681-52-9	231-668-3	12.5
Sodium Hydroxide	1310-73-2	215-185-5	0.2%

The specific chemical component identities and/or the exact component percentages of this material may be withheld as trade secrets. This information is made available to health professionals, employees, and designated representatives in accordance with the applicable provisions of 29 CFR 1910.1200 (I)(1).

TRACE COMPONENTS: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).
SEE SECTIONS 8, 11 & 12 FOR TOXICOLOGICAL INFORMATION.

SECTION 4. FIRST AID MEASURES

4.1 GENERAL ADVICE:

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists, refer to Section 8 for specific personal protective equipment.

4.2 EYE CONTACT:

Immediately flush eyes while under gently running water. Use sufficient force to open eyelids. "Roll" eyes to expose more surface. Minimum flushing is for 15 minutes. Seek medical attention immediately.

4.3 SKIN CONTACT:

Immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Seek medical attention immediately. Wash contaminated clothing before reuse, discard contaminated shoes.

4.4 INHALATION:

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, trained personnel should immediately provide artificial respiration. DO NOT use mouth-to-mouth method if victim inhaled substance. Induce artificial respiration with aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Seek immediate medical attention.

4.5 SWALLOWING:

If swallowed, CALL PHYSICIAN POISON CONTROL CENTER IMMEDIATELY. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth resuscitation (see 4.4). Never give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

4.6 NOTES TO PHYSICIAN:

Probable mucosal damage may contraindicate the use of gastric lavage.

SECTION 5. FIRE FIGHTING MEASURES

5.1 FIRE & EXPLOSION PREVENTIVE MEASURES

Isolate from acids, oxidizers, extreme heat and open flame.

5.2 EXTINGUISHING MEDIA

Use water fog, foam, dry chemical powder, carbon dioxide.

5.3 SPECIAL FIRE FIGHTING PROCEDURES

Cool closed containers. Use fog nozzles if water is used.

Do not enter confined fire-space without full bunker gear.

(Helmet with face shield, bunker coats, gloves & rubber boots). Wear Self-Contained Breathing Apparatus. No skin surface should be exposed.

5.4 UNUSUAL EXPLOSION AND FIRE PROCEDURES

May decompose, generating irritating chlorine gas.

Do not use Mono Ammonium Phosphate (MAP) fire extinguishers. Such use may cause explosion with release of toxic gases.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PROTECTIVE MEASURES:

Keep unprotected personnel away.

Wear appropriate personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

6.2 ENVIRONMENTAL PRECAUTIONS:

Keep from entering storm sewers and ditches which lead to waterways.

6.3 CONTAINMENT AND CLEAN-UP MEASURES:

Stop spill at source. Dike and contain. Sweep spilled material into dry, sealable containers. Wash away remainder with plenty of water. Clean surface thoroughly to remove residual contamination. This material is alkaline and may raise the pH of surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

SECTION 7. HANDLING AND STORAGE

7.1 HANDLING

Use caution when combining with water. DO NOT add water to caustic. ALWAYS add caustic to water while stirring to minimize heat generation.

Put on appropriate personal protective equipment (See Section 8). Eating, drinking, and smoking should be prohibited in areas where this material is handled, stored, and processed. Workers should wash hands and face before eating, drinking, smoking and using the toilet facilities. Do not breathe vapor or mist. Do not swallow. Avoid contact with eyes, skin and clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Do not reuse container. Isolate from oxidizers, heat, & open flame. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse. Mixing this product with ammonia, acids, detergents, etc. or with organic materials, e.g. feces, urine, etc. will release chlorine gas, which is irritating to eyes, lungs, and mucous membranes.

7.2 STORAGE

Store in original container protected from direct sunlight to maintain hypochlorite strength. Store in a dry, cool and well-ventilated area, away from incompatible materials (See Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Keep containers upright to prevent leakage. Do not allow to freeze. If closed containers become heated, vent to release decomposition products (mainly oxygen under normal decomposition).

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)
Sodium hypochlorite	7681-52-9	231-668-3		
Sodium Hydroxide	1310-58-3	215-181-3	None Known	None Known

MATERIAL	CAS#	EINECS#	CEILING	STEL(OSHA/ACGIH)	HAP
Sodium hypochlorite	7681-52-9	231-668-3		None Known	
Sodium Hydroxide	1310-58-3	215-181-3	2 ppm	None Known	No

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

8.1 RESPIRATORY EXPOSURE CONTROLS

Avoid breathing vapor or mist. Maintain airborne contaminant concentrations below exposure limits given above. Use Local exhaust ventilation to maintain these levels. When airborne exposure limits are exceeded, use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Full facepiece equipment is recommended. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus.

8.2 EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS

Positive pressure, full-face piece Self-Contained Breathing Apparatus; or positive pressure, full-face piece Self-Contained Breathing Apparatus with an auxiliary positive pressure Self-Contained Breathing Apparatus.

8.3 VENTILATION

LOCAL EXHAUST:	Necessary	MECHANICAL (GENERAL):	Necessary
SPECIAL:	None	OTHER:	None

Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

8.4 EYE PROTECTION:

Splash goggles or safety glasses. Face-shields are recommended when the operation can generate splashes, sprays or mists.

8.5 HAND PROTECTION:

Use gloves chemically resistant to this material. Preferred examples: Butyl rubber, Neoprene, or Nitrile.

8.6 BODY PROTECTION:

Use body protection appropriate for task. Cover-all, rubber aprons, or chemical protective clothing made from impervious materials when splashing may occur. Rinse immediately if skin is contaminated. Remove contaminated clothing promptly and wash before reuse. Clean protective equipment before reuse.

8.7 WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash at end of each shift & before eating, smoking or using the toilet. Remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE:	Greenish yellow liquid
ODOR:	Pungent
ODOR THRESHOLD:	0.9 mg/m ³
pH (Neutrality):	11.2-11.4 (1% solution)
MELTING POINT/FREEZING POINT:	-23.3 C / -10 F
BOILING RANGE (IBP, Dry Point):	Decomposes at 110 C / 230 F
FLASH POINT (TEST METHOD):	Not Applicable
EVAPORATION RATE (n-Butyl Acetate=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C (68 F)	12.1
VAPOR DENSITY (air=1):	2.61
GRAVITY @ 68/68 F / 20/20 C:	
DENSITY:	1.2 g/mL or 10 lb/gal @20 C (68 F)
SPECIFIC GRAVITY (Water=1):	1.2 g/mL or 10 lb/gal @20 C (68 F)
POUNDS/GALLON:	10 lbs/gal
WATER SOLUBILITY:	Complete
PARTITION COEFFICIENT (n-Octane/Water):	Not Available
AUTO IGNITION TEMPERATURE:	Not Applicable
DECOMPOSITION TEMPERATURE:	110 C / 230 F
VOCs (>0.044 Lbs/Sq In) :	0.0 Vol% / 0.0 g/L / 0.000 Lbs/Gal
TOTAL VOC'S (TVOC)*:	0.0 Vol% / 0.0 g/L / 0.000 Lbs/Gal
NONEXEMPT VOC'S (CVOC)*:	0.0 Vol% / 0.0 g/L / 0.000 Lbs/Gal
HAZARDOUS AIR POLLUTANTS (HAPS):	0.0 Wt% / 0.0 g/L / 0.000 Lbs/Gal
NONEXEMPT VOC PARTIAL PRESSURE (mm of Hg @ 20 C)	0.0
VISCOSITY @ 20 C (ASTM D445):	1.75 - 2.50 centipoises (varies with T)
* Using CARB (California Air Resources Board Rules).	

SECTION 10. STABILITY & REACTIVITY

10.1 STABILITY

Stable under normal conditions.

All bleach decomposition is dependent on temperature. For any given temperature, the higher the strength, the faster it decomposes. In summary, for every 10 C increase in storage temperature, the sodium hypochlorite will decompose at an increased rate factor of approximately 3.5.

Condition of instability include high heat, ultraviolet light.

10.2 CONDITIONS TO AVOID

High heat, direct sunlight.

10.3 MATERIALS TO AVOID

Oxidizing agents, acids, nitrogen-containing organics, metals, iron, copper, nickel, cobalt, organic materials, and ammonia.

10.4 HAZARDOUS DECOMPOSITION PRODUCTS

Rate of decomposition increases with heat. May develop chlorine gas if mixed with acidic solutions.

10.5 HAZARDOUS POLYMERIZATION

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 ACUTE HAZARDS

11.1.0 TOXICITY:

When in solution, this material will affect all tissues with which it comes in contact. The severity of the tissue damage is a function of its concentration, the length of tissue contact time, and local tissue conditions. After exposure there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucous membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact.

11.1.1 EYE & SKIN CONTACT:

Severe burns to skin, defatting, dermatitis.
Severe burns to eyes, redness, tearing, blurred vision.
Permanent eye damage including blindness could result.

11.1.2 INHALATION:

Severe respiratory tract irritation may occur.

11.1.3 SWALLOWING:

Harmful or fatal if swallowed.

11.2 SUBCHRONIC HAZARDS/CONDITIONS AGGRAVATED

CONDITIONS AGGRAVATED:

None Known.

11.3 CHRONIC HAZARDS

11.3.1 CANCER, REPRODUCTIVE & OTHER CHRONIC HAZARDS:

This product has no carcinogens listed by IARC, NTP, NIOSH, OSHA or ACGIH, as of this date, greater or equal to 0.1%.

11.3.2 TARGET ORGANS: May cause damage to skin, eye, and respiratory system, based on animal data.

11.3.3 IRRITANCY OF PRODUCT: This product is irritating to contaminated tissue.

11.3.4 SENSITIZATION TO THE PRODUCT: No component of this product is known as a sensitizer.

11.3.5 MUTAGENICITY: No known reports of mutagenic effects in humans.

11.3.6 EMBRYOTOXICITY: No known reports of embryotoxic effects in humans.

11.3.7 TERATOGENICITY: No known reports of teratogenic effects in humans.

11.3.8 REPRODUCTIVE TOXICITY: No known reports of reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical which causes damage to a developing embryo (such as: within the eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

11.4 MAMMALIAN TOXICITY INFORMATION

Oral --- LD50 - Rat - 3-5 g/kg
Dermal - LD50 - Rabbit -- >2 g/kg

COMPANY IDENTITY: Cascade Columbia Distribution Company
PRODUCT IDENTITY: SODIUM HYPOCHLORITE 12.5%

SDS DATE: 05/26/2015
ORIGINAL: 05/26/2015

SECTION 12. ECOLOGICAL INFORMATION

12.1 ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

12.2 EFFECT OF MATERIAL ON PLANTS AND ANIMALS:

Sodium hypochlorite is low in toxicity to avian wildlife, but is highly toxic to freshwater fish and invertebrates.

12.3 EFFECT OF MATERIAL ON AQUATIC LIFE:

Atlantic Herring (*Clupea harengus*): LC50 = 0.033 - 0.097 mg/l/96 hr, flow through bioassay (pH:8)
Water Flea (*Ceriodaphnia* sp. 0) LC50 = 0.006 mg/l/24 hr

12.4 MOBILITY IN SOIL

Mobility of this material has not been determined.

12.5 DEGRADABILITY

This product is completely biodegradable.

12.6 BIOACCUMULATION

In fresh water, sodium hypochlorite breaks down rapidly into non-toxic compounds when exposed to sunlight. In seawater, chlorine levels decline rapidly; however hypobromite (which is acutely toxic to aquatic organisms) is formed.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste disposal requirements. Do not dispose of on land, in surface waters, or in storm drains. Waste should be recycled or disposed of in accordance with regulations. Large amounts should be collected for reuse or consigned to licensed hazardous waste haulers for disposal. Empty containers may contain residues. Follow all label warnings even after container is emptied.
ALL DISPOSAL MUST BE IN ACCORDANCE WITH ALL FEDERAL, STATE, PROVINCIAL, AND LOCAL REGULATIONS. IF IN DOUBT, CONTACT PROPER AGENCIES.

SECTION 14. TRANSPORT INFORMATION

MARINE POLLUTANT: No
DOT/TDG SHIP NAME: UN1791, Hypochlorite solutions, 8, PG-III
DRUM LABEL: (CORROSIVE)
IATA / ICAO: UN1791, Hypochlorite solutions, 8, PG-III
IMO / IMDG: UN1791, Hypochlorite solution, 8, PG-III
EMERGENCY RESPONSE GUIDEBOOK NUMBER: 154

SECTION 15. REGULATORY INFORMATION

15.1 EPA REGULATION:

SARA SECTION 311/312 HAZARDS: Acute Health

All components of this product are on the TSCA list.

This material contains no known products restricted under SARA Title III, Section 313 in amounts greater or equal to 1%.

SARA TITLE III INGREDIENTS	CAS#	EINECS#	WT%	(REG.SECTION)	RQ(LBS)
Sodium hypochlorite	1310-73-2	215-185-5	25-50	(311,312)	100

SECTION 15. REGULATORY INFORMATION (CONTINUED)

Any release equal to or exceeding the RQ must be reported to the National Response Center (800-424-8802) and appropriate state and local regulatory agencies as described in 40 CFR 302.6 and 40 CFR 355.40 respectively. Failure to report may result in substantial civil and criminal penalties. State & local regulations may be more restrictive than federal regulations.

15.2 STATE REGULATIONS:

CALIFORNIA SAFE DRINKING WATER & TOXIC ENFORCEMENT ACT (PROPOSITION 65):

This product is not listed, but it may contain impurities/trace elements (in amounts of less than 0.1%) which are known to the State of California to cause cancer or reproductive toxicity under Proposition 65, State Drinking Water and Toxic Enforcement Act.

15.21 U.S. STATE REGULATED COMPONENTS: (HAZARDOUS SUBSTANCE LISTS):

COMPONENT	AK	CA	FL	IL	KS	MA	MI	MN
Sodium Hypochlorite		No				Yes	Yes	
Sodium Hydroxide	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

COMPONENT	MO	NJ	ND	PA	RI	TX	WV	WI
Sodium Hypochlorite		Yes		Yes				
Sodium Hydroxide	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

NOTE: Absence of a state from this list does not mean the material is not regulated.

15.3 INTERNATIONAL REGULATIONS

The identified components of this product are listed on the chemical inventories of the following countries:

Australia (AICS), Canada (DSL or NDSL), China (IECSC), Europe (EINECS, ELINCS), Japan (METI/CSCL, MHLW/ISHL), South Korea (KECI), New Zealand (NZIoC), Philippines (PICCS), Switzerland (SWISS), Taiwan (NECSI), USA (TSCA).

15.4 CANADA: WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

Health effects criteria met by this chemical:

E- Corrosive to skin

E - TDG class 8 - corrosive substance

E: Corrosive Material.

Ingredient Disclosure List: Included for disclosure at 1% or greater.

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all information required by the CPR.

SECTION 16. OTHER INFORMATION

16.1 HAZARD RATINGS:

HEALTH (NFPA): 2, HEALTH (HMIS): 2, FLAMMABILITY: 0, PHYSICAL HAZARD: 1
(Personal Protection Rating to be supplied by user based on use conditions.)
This information is intended solely for the use of individuals
trained in the NFPA & HMIS hazard rating systems.

16.2 EMPLOYEE TRAINING

See Section 2 for Risk & Safety Statements. Employees should be made aware
of all hazards of this material (as stated in this SDS) before handling it.

16.3 SDS DATE: 05/26/2015

NOTICE

The supplier disclaims all expressed or implied warranties of merchantability or fitness
for a specific use, with respect to the product or the information provided herein,
except for conformation to contracted specifications. All information appearing herein
is based upon data obtained from manufacturers and/or recognized technical sources.
While the information is believed to be accurate, we make no representations as to its
accuracy or sufficiency.

Conditions of use are beyond our control, and therefore users are responsible for
verifying the data under their own operating conditions to determine whether the product
is suitable for their particular purposes and they assume all risks of their handling,
and disposal of the product. Users also assume all risks in regards to the publication
or use of, or reliance upon information contained herein.

This information relates only to the product designated herein, and does not relate to
its use in combination with any other material or process.

SAFETY DATA SHEET



COMPANY IDENTITY: CCI
PRODUCT IDENTITY: CCI RO-80

SDS DATE: 05/02/2019
REPLACES: 09/28/2018

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.

THIS SDS COMPLIES WITH CFR 1910.1200 (HAZARD COMMUNICATIONS STANDARD)

IMPORTANT: Read this SDS before handling & disposing of this product.

Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: CCI RO-80
SDS NUMBER: CR4571
COMPANY IDENTITY: CCI CHEMICAL
COMPANY ADDRESS: 3540 EAST 26TH STREET, VERNON, CALIFORNIA 90058
COMPANY PHONE: 800-767-9112
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (CANADA)



SECTION 2. HAZARDS IDENTIFICATION

HAZARD STATEMENTS:

H100s = General, H200s = Physical, H300 = Health, H400s = Environmental

H315 May cause skin irritation.
H320 Causes eye irritation.
H335 Inhalation of mist may cause mucous membrane and respiratory irritation.

PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do – Continue rinsing.
P309+311 If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.
P405+102 Store locked up. Keep out of reach of children.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#
Water	7732-18-5
Aluminum Chlorhydrate	12042-91-0
Proprietary Compound	-----

Trace components: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant Additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SECTION 4. FIRST AID MEASURES**EYE CONTACT:**

If this product enters the eyes, open eyes while under gently running water. Use sufficient force to open eyelids. Roll eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard contaminated shoes.

INHALATION:

Move person to fresh air, if effects occur, consult a physician.

SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis Should be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after endotracheal intubation). Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of the label and SDS to physician or health professional with victim.

SECTION 5. FIRE FIGHTING MEASURES

FIRE & EXPLOSIONS PREVENTIVE MEASURES:

None.

EXTINGUISHING MEDIA:

Use media appropriate for surrounding fire. Cool fire exposed containers and structures with water.

SPECIAL FIRE FIGHTING PROCEDURES: None.

UNUSUAL EXPLOSION AND FIRE PROCEDURES: None.

FLASH POINT: None.

AUTOIGNITION TEMPERATURE: None.

SECTION 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

PERSONAL PRECAUTIONS:

Spilled material may cause a slipping hazard. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment.

ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container, keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

CONTAINMENT AND CLEAN-UP MEASURES:

Absorb spilled liquid with poly pads or other suitable absorbent materials. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. Dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13- Disposal Considerations).

SECTION 7. HANDLING AND STORAGE

HANDLING:

Product shipped/handled hot can cause thermal burns. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling.

STORAGE:

Store in a cool, dry, well-ventilated area away from heat and incompatible materials. Protect from physical damage.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	TWA (OSHA)	TLV (ACGIH)	
Water	7732-18-15	None Known	None Known	
Aluminum Chlorhydrate	12042-91-0	2 mg/m ³	2 mg/m ³	
Proprietary Compound	-----	None Known	None Known	

MATERIAL	CAS#	CEILING	STEL (OSHA/ACGIH)	HAP
Aluminum Chlorhydrate	12042-91-0	N/A	None Known	No

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

RESPIRATORY EXPOSURE CONTROLS:

A respiratory protective program that meets OSHA CFR 1910.134 and ANSI Z86.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

VENTILATION:

LOCAL EXHAUST: None

MECHANICAL (General): None

SPECIAL: None

OTHER: None

Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

PERSONAL PROTECTION:

Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse.

WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash at the end of each work shift & before eating, smoking or using the toilet. Promptly remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES:

APPEARANCE:	Clear to straw colored liquid.
ODOR:	Odorless
ODOR THRESHOLD:	Not Available
pH (Neutrality):	3.5-4.5
MELTING POINT/FREEZING POINT:	-16°C
BOILING RANGE (IBP, 50%, Dry Point):	101°C (212°F)
FLASH POINT (TEST METHOD):	None
EVAPORATION RATE (n-BUTYL ACETATE=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C:	Not Available
VAPOR DENSITY (air = 1):	Not Available
SPECIFIC GRAVITY (Water = 1):	1.33-1.36
POUNDS/GALLON:	11.259
WATER SOLUBILITY:	Complete
VISCOSITY (mPa.s):	N/A
AUTO IGNITION TEMPERATURE:	None
DECOMPOSITION TEMPERAURE:	Not Available

SECTION 10. STABILITY & REACTIVITY

STABILITY:

Stable under most conditions.

CONDITIONS TO AVOID:

Isolate from extreme heat, and open flame.

MATERIALS TO AVOID:

Oxidizing materials can cause a reaction. Caustics will precipitate aluminum hydroxide.

HAZARDOUS DECOMPOSITION PRODUCTS:

Chlorine compounds, metal oxides.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

No Data Available

CONDITIONS AGGRAVATED:

None Known.

CHRONIC HAZARDS

CHRONIC TOXICITY:

In animals, effects have been reported on the following organs after ingestions: Gastrointestinal tract, heart, and kidney. Does levels producing these effects were many times a strong association between elevated blood pressure and prolonged dietary overuse. Related effects could occur in the kidneys.

CARCINOGENICITY:

This product is not classified as a carcinogen by NTP, IARC or OSHA.

MUTAGENIC DATA:

In vitro genetic toxicity studies were negative.

DEVELOPMENTAL TOXICITY:

Did not cause birth defects or any other fetal effects in laboratory animals.

SECTION 12. ECOLOGICAL INFORMATION

PIMELPHALES PROMELAS:

LC50/HRS: 1056 mg/L 24 hrs. 832 mg/L 48 hrs. 684 mg/L 72 hrs. 609 mg/L 96 hrs.

DAPHNIA MAGNA:

LC50/HRS: 642 mg/L 24 hrs. 397 mg/L 48 hrs.

BIOACCUMULATION:

Does not bioaccumulate.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste management options. Recycle / dispose of observing national, regional, state, provincial and local health, safety & pollution laws. If in doubt, contact appropriate agencies.

SECTION 14. TRANSPORT INFORMATION

UN/NA: N/A

Classification: NON REGULATED

Proper Shipping Name: LIQUID NON REGULATED

D.O.T Hazard Name (49CFR 172.101): NONE

D.O.T. ID Number (49CFR 172.101): NONE

D.O.T. Hazard Class (49CFR 172.101): Non D.O.T. Regulated

RCRA Hazard Class (40cfr261) (If discarded): NONE

E.P.A. Priority pollutants (40CFR 122.53): NONE

HAZARD RATINGS:

HEALTH (NFPA): 1, HEALTH (HMIS): 1, FLAMMABILITY: 0, PHYSICAL HAZARD: 0

(Personal Protection Rating to be supplied by user based on use conditions.)

This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating system.

SECTION 15. REGULATORY INFORMATION:

TSCA Chemical Substances Inventory:

All components of this product are either listed on the inventory or exempt from listing.

California Proposition 65 Information:

This product contains no listed substances known to the state of California to cause cancer, birth defects or other reproductive harm.

NOTICE

All information, recommendations, and suggestions appearing herein concerning this product are based upon data obtained from the manufacturer and/or recognized technical sources; however, C.C.I. makes no warranty, representation or guaranty as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of the product. Additional product literature may be available upon request. Since actual use by others is beyond our control, no warranty, express or implied is made by C.C.I. as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does C.C.I. assume any liability arising out of use by others of this product.

SAFETY DATA SHEET

COMPANY IDENTITY: CCI
PRODUCT IDENTITY: CWT-1100 PB

SDS DATE: 05/09/2019
REPLACES: 03/25/2019

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.

THIS SDS COMPLIES WITH CFR 1910.1200 (HAZARD COMMUNICATIONS STANDARD)

IMPORTANT: Read this SDS before handling & disposing of this product.

Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: CWT-1100 PB
SDS NUMBER: CR7045
COMPANY IDENTITY: CCI CHEMICAL
COMPANY ADDRESS: 3540 EAST 26TH STREET, VERNON, CALIFORNIA 90058
COMPANY PHONE: 800-767-9112
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (CANADA)



SECTION 2. HAZARDS IDENTIFICATION

HAZARD STATEMENTS:

H100s = General, H200s = Physical, H300 = Health, H400s = Environmental

H317 May cause allergic skin reaction.
H320 Causes eye irritation.
H303 May be harmful if swallowed.

PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do – Continue rinsing.
P309+311 If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#	EINECS#
Water	7732-18-5	231-791-2
Potassium Hydroxide	1310-58-3	-----

Trace components: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant Additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SECTION 4. FIRST AID MEASURES

EYE CONTACT:

If this product enters the eyes, open eyes while under gently running water. Use sufficient force to open eyelids. Roll eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard contaminated shoes.

INHALATION:

Move person to fresh air, if effects occur, consult a physician.

SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis Should be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after endotracheal intubation). Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of the label and SDS to physician or health professional with victim.

SECTION 5. FIRE FIGHTING MEASURES

FIRE & EXPLOSIONS PREVENTIVE MEASURES:

Isolate from extreme heat and open flame.

EXTINGUISHING MEDIA:

Water, Water spray, foam, carbon dioxide (CO2). Dry powder.

SPECIAL FIRE FIGHTING PROCEDURES: None.

UNUSUAL EXPLOSION AND FIRE PROCEDURES: None.

FLASH POINT: N/A

AUTOIGNITION TEMPERATURE: N/A

SECTION 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

PERSONAL PRECAUTIONS:

Spilled material may cause a slipping hazard. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment.

ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container, keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

CONTAINMENT AND CLEAN-UP MEASURES:

Absorb spilled liquid with poly pads or other suitable absorbent materials. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. Dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13- Disposal Considerations).

SECTION 7. HANDLING AND STORAGE

HANDLING:

Product shipped/handled hot can cause thermal burns. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling.

STORAGE:

Freezing will affect the physical condition and may damage the material. Keep in a dry cool place (0-30°C). Keep away from heat and sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)
Water	7732-18-15	231-791-2	None Known	None Known
Potassium Hydroxide	1310-58-3	-----	2 mg/m3	2 mg/m3

MATERIAL	CAS#	EIENECS#	CEILING	STEL (OSHA/ACGIH)	HAP
Potassium Hydroxide	1310-58-3	-----	Not listed	None Known	No

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

RESPIRATORY EXPOSURE CONTROLS:

A respiratory protective program that meets OSHA CFR 1910.134 and ANSI Z86.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

VENTILATION:

LOCAL EXHAUST: Recommended MECHANICAL (General): Recommended

SPECIAL: None OTHER: None

Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

PERSONAL PROTECTION:

Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse.

WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash at the end of each work shift & before eating, smoking or using the toilet. Promptly remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES:

APPEARANCE:	Clear Amber Liquid
ODOR:	Negligible
ODOR THRESHOLD:	Not Available
pH (1%):	11-12
MELTING POINT/FREEZING POINT:	N/A
BOILING RANGE (IBP, 50%, Dry Point):	> 212°F
FLASH POINT (TEST METHOD):	N/A
EVAPORATION RATE (n-BUTYL ACETATE=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C:	Not Available
VAPOR DENSITY (air = 1):	Not Available
SPECIFIC GRAVITY (Water = 1):	1.22-1.24
POUNDS/GALLON:	10.26
WATER SOLUBILITY:	Complete
VISCOSITY (mPa.s):	N/A
AUTO IGNITION TEMPERATURE:	N/A
DECOMPOSITION TEMPERAURE:	Not Available

SECTION 10. STABILITY & REACTIVITY**STABILITY:**

Stable under most conditions.

CONDITIONS TO AVOID:

Isolate from extreme heat, and open flame.

MATERIALS TO AVOID:

Reactive metals and strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS:

Elevated temperatures may produce Phosphines, Nox, Carbon Monoxide, and Carbon Dioxide.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

LD50 Oral: LD50/oral/rat > 2000 mg/kg (estimated)

LD50 Dermal LD50/oral/rat > 2000 mg/kg (estimated)

LD50 Inhalation The product is not expected to be toxic by inhalation.

CONDITIONS AGGRAVATED:

None Known.

CHRONIC HAZARDS

CHRONIC TOXICITY:

In animals, effects have been reported on the following organs after ingestions: Gastrointestinal tract, heart, and kidney. Does levels producing these effects were many times a strong association between elevated blood pressure and prolonged dietary overuse. Related effects could occur in the kidneys.

CARCINOGENICITY:

This product is not classified as a carcinogen by NTP, IARC or OSHA.

MUTAGENIC DATA:

In vitro genetic toxicity studies were negative.

DEVELOPMENTAL TOXICITY:

Did not cause birth defects or any other fetal effects in laboratory animals.

SECTION 12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY:

The effects of this product on aquatic organisms are rapidly and significantly mitigated by the presence of dissolved organic carbon in the aquatic environment.

FRESH FISH TOXICITY:

LC50, Danio rerio/96 hr > 10 mg/l (OECD 203)

ALGAE TOXICITY:

Algal inhibition test are not appropriate. The flocculating characteristics of the product interfere directly in the test medium preventing homogenous distribution which invalidates the test.

DAPHNIA:

EC50/Daphnia magna/48 hr > 10 mg/l (OECD 202)

BIOACCUMULATION:

Does not bioaccumulate.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste management options. Recycle / dispose of observing national, regional, state, provincial and local health, safety & pollution laws. If in doubt, contact appropriate agencies.

SECTION 14. TRANSPORT INFORMATION

UN/NA: N/A

Classification: NON D.O.T REGULATED

Proper Shipping Name: INDUSTRIAL WATER TREATMENT COMPOUND, NON D.O.T. REGULATED

D.O.T Hazard Name (49CFR 172.101): NONE

D.O.T. ID Number (49CFR 172.101): NONE

D.O.T. Hazard Class (49CFR 172.101): NONE

RCRA Hazard Class (40cfr261) (If discarded): NONE

E.P.A. Priority pollutants (40CFR 122.53): NONE

SECTION 15. REGULATORY INFORMATION:

TSCA Chemical Substances Inventory:

All components of this product are either listed on the inventory or exempt from listing.

California Proposition 65 Information:

This product contains no listed substances known to the state of California to cause cancer, birth defects or other reproductive harm.

SECTION 16. OTHER INFORMATION:

HAZARD RATINGS:

HEALTH (NFPA): 2, HEALTH (HMIS): 2, FLAMMABILITY: 0, PHYSICAL HAZARD: 1

(Personal Protection Rating to be supplied by user based on use conditions.)

This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating system.

NOTICE

All information, recommendations, and suggestions appearing herein concerning this product are based upon data obtained from the manufacturer and/or recognized technical sources; however, C.C.I. makes no warranty, representation or guaranty as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of the product. Additional product literature may be available upon request. Since actual use by others is beyond our control, no warranty, express or implied is made by C.C.I. as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does C.C.I. assume any liability arising out of use by others of this product.

SAFETY DATA SHEET

COMPANY IDENTITY: CCI
PRODUCT IDENTITY: CWT-CI

SDS DATE: 10/18/2018
REPLACES: 07/29/2014

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.

THIS SDS COMPLIES WITH CFR 1910.1200 (HAZARD COMMUNICATIONS STANDARD)

IMPORTANT: Read this SDS before handling & disposing of this product.

Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: CWT-CI
SDS NUMBER: CR3916
COMPANY IDENTITY: CCI CHEMICAL
COMPANY ADDRESS: 3540 EAST 26TH STREET, VERNON, CALIFORNIA 90058
COMPANY PHONE: 800-767-9112
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (CANADA)

SECTION 2. HAZARDS IDENTIFICATION

DANGER!!



EXPOSURE PREVENTION:

HAZARD STATEMENTS:

H100s = General, H200s = Physical, H300 = Health, H400s = Environmental

H301 Toxic if swallowed.
H314 Causes severe skin burns and eye damage.

PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do – Continue rinsing.
P309+311 If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.
P405+102 Store locked up. Keep out of reach of children.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#	EINECS#
Sodium Hydroxide	1310-73-2	215-185-5
Water	7732-18-5	231-791-2
Sodium Tolytriazole	64665-57-2	-----

Trace components: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant Additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SECTION 4. FIRST AID MEASURES

EYE CONTACT:

If this product enters the eyes, open eyes while under gently running water. Use sufficient force to open eyelids. Roll eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard Contaminated shoes.

INHALATION:

After high vapor exposure, remove to fresh air. If it is suspected that the fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest, breathing is difficult, give oxygen. If breathing has stopped, trained personnel should immediately begin artificial respiration. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. If the heart has stopped, trained personnel should immediately begin cardiopulmonary resuscitation (CPR). Seek immediate medical attention. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis Should be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after endotracheal intubation). Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of the label and SDS to physician or health professional with victim.

SECTION 5. FIRE FIGHTING MEASURES

FIRE & EXPLOSIONS PREVENTIVE MEASURES:

Isolate from extreme heat and open flame.

EXTINGUISHING MEDIA:

In case of fire in surroundings, all extinguishing agents allowed.

SPECIAL FIRE FIGHTING PROCEDURES:

Water spray may be ineffective on fire but can protect fire-fighters & cool closed containers. Use fog nozzles if water is used. Do not enter confined fire-space without full bunker gear. (Helmet with face shield, bunker coats, gloves & rubber boots). Use NIOSH approved positive-pressure self-contained breathing apparatus.

UNUSUAL EXPLOSION AND FIRE PROCEDURES:

Noncombustible.

Isolate from acids.

Closed containers may explode if exposed to extreme heat.

Applying to hot surfaces requires special precautions.

SECTION 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

PERSONAL PROTECTIVE EQUIPMENT:

The proper protective equipment for incidental releases (such as: 1 Litter of the product released in a well-ventilated area), use impermeable gloves (triple-gloves, rubber gloves and nitrile gloves, over latex gloves), goggles, face shield, and appropriate body protection. In the event of a large release, use impermeable gloves, specific for the material handled, chemically resistant suit and boots, and hard hat. Self-Contained Breathing Apparatus or respirator may be required where engineering controls are not adequate or conditions for potential exposure exist. When respirators are required, select NIOSH/MSHA approved based on actual or potential airborne concentrations in accordance with latest OSHA and/or ANSI recommendations.

ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container, keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

CONTAINMENT AND CLEAN-UP MEASURES:

Absorb spilled liquid with poly pads or other suitable absorbent materials. If necessary, neutralize using suitable buffering material, (acid with soda ash or base with phosphoric acid), and test area with litmus paper to confirm neutralization. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. Dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13- Disposal Considerations).

SECTION 7. HANDLING AND STORAGE

HANDLING:

Use only with adequate ventilation. Do not get in eyes, on skin or clothing. Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse.

STORAGE:

Keep separated from strong oxidants, strong acids, metals, food & feedstuffs. Keep dry. Do not store above 49 C/120 F. Keep container tightly closed & upright when not in use to prevent leakage. Wear full face shield, gloves & full protective clothing when opening or handling. When empty, drain completely, replace bungs securely.

NONBULK: CONTAINERS:

Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in a secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see section 10, Stability and Reactivity). Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Empty containers should be handle with care. Never store food, feed. Or drinking water in containers which held this product.

BULK CONTAINERS:

All tanks and pipelines which contain this material must be labeled. Perform routine maintenance on tanks or pipelines which contain this product. Report all leaks immediately to the proper personnel.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:

Follow practices indicated in section 6 (Accidental Release Measures). Make sure certain application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilations is provided. Collect all rinsates and dispose of according to applicable Federal, State, Provincial, or local procedures.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)
Sodium hydroxide	1310-73-2	215-185-5	None Known	None Known
Water	7732-18-15	231-791-2	None Known	None Known
Sodium Tolytriazole	64665-57-2	-----	None Known	None Known

MATERIAL	CAS#	EIENECS#	CEILING	STEL (OSHA/ACGIH)	HAP
Sodium Hydroxide	1310-73-2	215-185-5	2 ppm	None Known	No

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

RESPIRATORY EXPOSURE CONTROLS:

A respiratory protective program that meets OSHA CFR 1910.134 and ANSI Z86.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

VENTILATION:

LOCAL EXHAUST: Recommended MECHANICAL (General): Recommended

SPECIAL: None OTHER: None

Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

PERSONAL PROTECTION:

Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse.

WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash at the end of each work shift & before eating, smoking or using the toilet. Promptly remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES:

APPEARANCE:	Clear amber to yellow solution
ODOR:	Characteristic odor
ODOR THRESHOLD:	Not Available
pH (Neutrality):	13-14
MELTING POINT/FREEZING POINT:	Not Available
BOILING RANGE (IBP, 50%, Dry Point):	Not Applicable
FLASH POINT (TEST METHOD):	Not Applicable
EVAPORATION RATE (n-BUTYL ACETATE=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C:	N/A
VAPOR DENSITY (air = 1):	N/A
SPECIFIC GRAVITY (Water = 1):	1.18-1.20
POUNDS/GALLON:	9.236
WATER SOLUBILITY:	Complete
PARTITION COEFFICIENT (n-Octane/Water):	Not Available
AUTO IGNITION TEMPERATURE:	Not Applicable
DECOMPOSITION TEMPERAURE:	Not Available

SECTION 10. STABILITY & REACTIVITY**STABILITY:**

Stable under most conditions.

CONDITIONS TO AVOID:

Isolate from extreme heat, and open flame.

MATERIALS TO AVOID:

Strong oxidizing agents, strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS:

Carbon dioxide, Carbon monoxide, Nitrogen oxides.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

ACUTE HAZARDS

EYE & SKIN CONTACT:

Severe burns to skin, defatting, dermatitis.

Severe burns to eyes, redness, tearing, and blurred vision.

Liquid can cause severe skin & eye burns. Wash thoroughly after handling.

INHALATION:

Severe respiratory tract irritation may occur. Vapor harmful.

The applicable occupational exposure limit value should not be exceeded during any part of working exposure.

SWALLOWING:

Harmful or fatal if swallowed.

SUBCHRONIC HAZARDS/CONDITIONS AGGRAVATED

CONDITIONS AGGRAVATED:

None Known.

CHRONIC HAZARDS

CANCER, REPRODUCTIVE & OTHER CHRONIC HAZARDS:

This product has no carcinogens listed by IARC, NTP, NIOSH, OSHA or ACGIH, as of this date

Greater or equal to 0.1%.

IRRITANCY OF PRODUCT: This product is irritating to contaminated tissue.

SENSITIZATION TO THE PRODUCT: No component of this product is known to be a sensitizer.

MUTAGENICITY: This product is not reported to produce mutagenic effects in humans.

EMBRYOTOXICITY: This product is not reported to produce embryotoxic effects in humans.

TERATOGENICITY: This product is not reported to produce teratogenic effects in humans.

REPRODUCTIVE TOXICITY: This product is not reported to cause reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical which causes damage to developing embryo (such as: within the eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MAMMALIAN TOXICITY INFORMATION

TOXICITY DATA: Toxicology information for components > 1% concentration is given below:

SODIUM HYDROXIDE:

Eye irritancy (monkey):	1%, 24 hours (severe)
Eye irritancy (rabbit):	500 ml, 24 hours (severe)
Eye irritancy (rabbit):	1% solution (severe)
Eye irritancy (rabbit):	1 mg, 24 hours (severe)
Cytogenic analysis system	(grasshopper parenteral): 20 mg
LD50 (interperoneal, mouse):	40 mg/kg
LDLO (oral, rabbit):	500 mg/kg

LD50 – Dose that is lethal to 50% of a given species by a given route of exposure.

LC50 – Air concentration that is lethal to 50% of a given species in a given period of time.

LDLO –Lowest lethal dose in a given species by a given route of exposure.

SECTION 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

EFFECT OF MATERIAL ON PLANTS AND ANIMALS:

This product may be harmful or fatal to plant and animal life if released into the environment.

Refer to section 11 (Toxicological Information) for further data on the effects of this product's components on test animals.

EFFECT OF MATERIAL ON AQUATIC LIFE:

SODIUM HYDROXIDE:

LC100 (Cyprimus carpio):	180 ppm/24 hours 25 C
TLm (mosquito fish):	125 ppm/96 hour (fresh water)
TLm (bluegill):	99 mg/L/48 hour (tap water)

MOBILITY IN SOIL:

Mobility of this material has not been determined.

DEGRADABILITY:

This product is completely biodegradable.

ACCUMULATION:

Bioaccumulation of this product has not been determined.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste management options. Recycle / dispose of observing national, regional, state, provincial and local health, safety & pollution laws. If in doubt, contact appropriate agencies.

SECTION 14. TRANSPORT INFORMATION

DOT/TDG SHIP NAME: UN1719 Caustic Alkali Liquids, N.O.S., (Contains Sodium Hydroxide), 8, PGIII
 DRUM LABEL: (CORROSIVE)
 IATA / ICAO: UN1719, Caustic Alkali liquid, N.O.S., (Contains Sodium Hydroxide) 8, PG-III
 IMO / IMDG: UN1719, Caustic Alkali liquid, N.O.S., (Contains Sodium Hydroxide) 8, PG-III
 EMERGENCY RESPONSE GUIDEBOOK NUMBER 154



SECTION 15. REGULATORY INFORMATION

EPA REGULATIONS:

SARA SECTION 311/312 HAZARDS: Acute Health

ALL components of this product are on the TSCA list.

SARA Title III Section 313 Supplier Notification

This product contains the indicated < * > toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning & Community Right-To-Know Act of 1986 & of 40 CFR 372.

This information must be included in all MSDSs that are copied and distributed for this material.

SARA TITLE III INGREDIENTS

Sodium Hydroxide

CAS#

1310-73-2

EINECS#

215-185-5

Any release equal to or exceeding the RQ must be reported to the National Response Center (800-424-8802) and appropriate state and local regulatory agencies as described in 40 CFR 302.6 and 40 CFR 355.40 respectively.

Failure to report may result in substantial civil and criminal penalties. State & local regulations may be more restrictive than federal regulations.

STATE REGULATIONS:

CALIFORNIA SAFE DRINKING WATER & TOXIC ENFORCEMENT ACT (PROPOSITION 65):

This product contains no chemicals known to the State of California to cause cancer or reproductive toxicity.

INTERNATIONAL REGULATIONS:

The components of this product are listed on the chemical inventories of the following countries:

Australia (AICS), Canada (DSL, NDSL), China (IECSC), Europe (EINECS, ELINCS), Japan (METI/CSCL, MHLW/ISHL), South Korea (KECI), New Zealand (NZIOC), Philippines (PICCS), Switzerland (SWISS), Taiwan (NECSI), USA (TSCA).

CANADA: WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

D2B: Irritating to skin / eyes.

E: Corrosive Material.

SECTION 16. OTHER INFORMATION

HAZARD RATINGS:

HEALTH (NFPA): 1, HEALTH (HMIS): 1, FLAMMABILITY: 0, PHYSICAL HAZARD: 0

(Personal Protection Rating to be supplied by user based on use conditions.)

This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating system.

NOTICE

All information, recommendations, and suggestions appearing herein concerning this product are based upon data obtained from the manufacturer and/or recognized technical sources; however, C.C.I. makes no warranty, representation or guaranty as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of the product. Additional product literature may be available upon request. Since actual use by others is beyond our control, no warranty, express or implied is made by C.C.I. as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does C.C.I. assume any liability arising out of use by others of this product.

SAFETY DATA SHEET

COMPANY IDENTITY: CCI
PRODUCT IDENTITY: CWT-SI-008

SDS DATE: 10/19/2018
REPLACES: 11/27/2017

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.

THIS SDS COMPLIES WITH CFR 1910.1200 (HAZARD COMMUNICATIONS STANDARD)

IMPORTANT: Read this SDS before handling & disposing of this product.

Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: CWT-SI-008
SDS NUMBER: CR3157
COMPANY IDENTITY: CCI CHEMICAL
COMPANY ADDRESS: 3540 EAST 26TH STREET, VERNON, CALIFORNIA 90058
COMPANY PHONE: 800-767-9112
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (CANADA)

SECTION 2. HAZARDS IDENTIFICATION

HAZARD STATEMENTS:

H100s = General, H200s = Physical, H300 = Health, H400s = Environmental

H317 May cause allergic skin reaction.
H320 Causes eye irritation.
H303 May be harmful if swallowed.

PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do – Continue rinsing.
P309+311 If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#	EINECS#
Water	7732-18-5	231-791-2
Sodium Hydroxide	1310-73-2	-----

Trace components: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant Additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SECTION 4. FIRST AID MEASURES

EYE CONTACT:

If this product enters the eyes, open eyes while under gently running water. Use sufficient force to open eyelids. Roll eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard contaminated shoes.

INHALATION:

Move person to fresh air, if effects occur, consult a physician.

SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis should be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after endotracheal intubation). Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of the label and SDS to physician or health professional with victim.

SECTION 5. FIRE FIGHTING MEASURES

FIRE & EXPLOSIONS PREVENTIVE MEASURES:

Isolate from extreme heat and open flame.

EXTINGUISHING MEDIA:

Water, Water spray, foam, carbon dioxide (CO₂). Dry powder.

SPECIAL FIRE FIGHTING PROCEDURES:

None.

UNUSUAL EXPLOSION AND FIRE PROCEDURES:

None.

FLASH POINT: N/A

AUTOIGNITION TEMPERATURE: N/A

SECTION 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

PERSONAL PRECAUTIONS:

Spilled material may cause a slipping hazard. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment.

ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container, keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

CONTAINMENT AND CLEAN-UP MEASURES:

Absorb spilled liquid with poly pads or other suitable absorbent materials. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. Dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13- Disposal Considerations).

SECTION 7. HANDLING AND STORAGE

HANDLING:

Product shipped/handled hot can cause thermal burns. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling.

STORAGE:

Freezing will affect the physical condition and may damage the material. Keep in a dry cool place (0-30°C). Keep away from heat and sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)
Water	7732-18-15	231-791-2	None Known	None Known
Sodium Hydroxide	1310-73-3	-----	2 mg/m3	2 mg/m3

MATERIAL	CAS#	EIENECS#	CEILING	STEL (OSHA/ACGIH)	HAP
Sodium Hydroxide	1310-73-3	-----	Not listed	None Known	No

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

RESPIRATORY EXPOSURE CONTROLS:

A respiratory protective program that meets OSHA CFR 1910.134 and ANSI Z86.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

VENTILATION:

LOCAL EXHAUST: Recommended MECHANICAL (General): Recommended

SPECIAL: None OTHER: None

Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

PERSONAL PROTECTION:

Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse.

WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash at the end of each work shift & before eating, smoking or using the toilet. Promptly remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES:

APPEARANCE:	Clear Amber Liquid
ODOR:	Negligible
ODOR THRESHOLD:	Not Available
pH (1% Solution):	9-10
MELTING POINT/FREEZING POINT:	N/A
BOILING RANGE (IBP, 50%, Dry Point):	> 212°F
FLASH POINT (TEST METHOD):	N/A
EVAPORATION RATE (n-BUTYL ACETATE=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C:	Not Available
VAPOR DENSITY (air = 1):	Not Available
SPECIFIC GRAVITY (Water = 1):	1.17-1.19
POUNDS/GALLON:	9.84
WATER SOLUBILITY:	Complete
VISCOSITY (mPa.s):	N/A
AUTO IGNITION TEMPERATURE:	N/A
DECOMPOSITION TEMPERAURE:	Not Available

SECTION 10. STABILITY & REACTIVITY**STABILITY:**

Stable under most conditions.

CONDITIONS TO AVOID:

Isolate from extreme heat, and open flame.

MATERIALS TO AVOID:

Reactive metals and strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS:

Elevated temperatures may produce Phosphines, Nox, Carbon Monoxide, and Carbon Dioxide.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

LD50 Oral: LD50/oral/rat > 2000 mg/kg (estimated)

LD50 Dermal LD50/oral/rat > 2000 mg/kg (estimated)

LD50 Inhalation The product is not expected to be toxic by inhalation.

CONDITIONS AGGRAVATED:

None Known.

CHRONIC HAZARDS

CHRONIC TOXICITY:

In animals, effects have been reported on the following organs after ingestions: Gastrointestinal tract, heart, and kidney. Does levels producing these effects were many times a strong association between elevated blood pressure and prolonged dietary overuse. Related effects could occur in the kidneys.

CARCINOGENICITY:

This product is not classified as a carcinogen by NTP, IARC or OSHA.

MUTAGENIC DATA:

In vitro genetic toxicity studies were negative.

DEVELOPMENTAL TOXICITY:

Did not cause birth defects or any other fetal effects in laboratory animals.

SECTION 12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY:

The effects of this product on aquatic organisms are rapidly and significantly mitigated by the presence of dissolved organic carbon in the aquatic environment.

FRESH FISH TOXICITY:

LC50, Danio rerio/96 hr > 10 mg/l (OECD 203)

ALGAE TOXICITY:

Algal inhibition test are not appropriate. The flocculating characteristics of the product interfere directly in the test medium preventing homogenous distribution which invalidates the test.

DAPHNIA:

EC50/Daphnia magna/48 hr > 10 mg/l (OECD 202)

BIOACCUMULATION:

Does not bioaccumulate.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste management options. Recycle / dispose of observing national, regional, state, provincial and local health, safety & pollution laws. If in doubt, contact appropriate agencies.

SECTION 14. TRANSPORT INFORMATION

UN/NA: N/A

Classification: NON D.O.T REGULATED

Proper Shipping Name: INDUSTRIAL WATER TREATMENT COMPOUND, NON D.O.T. REGULATED

D.O.T Hazard Name (49CFR 172.101): NONE

D.O.T. ID Number (49CFR 172.101): NONE

D.O.T. Hazard Class (49CFR 172.101): NONE

RCRA Hazard Class (40cfr261) (If discarded): NONE

E.P.A. Priority pollutants (40CFR 122.53): NONE

HAZARD RATINGS:

HEALTH (NFPA): 2, HEALTH (HMIS): 2, FLAMMABILITY: 0, PHYSICAL HAZARD: 1

(Personal Protection Rating to be supplied by user based on use conditions.)

This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating system.

SECTION 15. REGULATORY INFORMATION:

TSCA Chemical Substances Inventory:

All components of this product are either listed on the inventory or exempt from listing.

California Proposition 65 Information:

This product contains no listed substances known to the state of California to cause cancer, birth defects or other reproductive harm.

NOTICE

All information, recommendations, and suggestions appearing herein concerning this product are based upon data obtained from the manufacturer and/or recognized technical sources; however, C.C.I. makes no warranty, representation or guaranty as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of the product. Additional product literature may be available upon request. Since actual use by others is beyond our control, no warranty, express or implied is made by C.C.I. as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does C.C.I. assume any liability arising out of use by others of this product.

SAFETY DATA SHEET

SDS DATE: 09/13/2016

COMPANY IDENTITY: CCI
PRODUCT IDENTITY: HYDROGEN PEROXIDE 10%

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.
THIS SDS COMPLIES WITH CFR 1910.1200 (HAZARD COMMUNICATIONS STANDARD)
IMPORTANT: Read this SDS before handling & disposing of this product.
Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: HYDROGEN PEROXIDE 10%
SDS NUMBER: CR23
COMPANY IDENTITY: CCI CHEMICAL
COMPANY ADDRESS: 3540 EAST 26TH STREET, VERNON, CALIFORNIA 90058
COMPANY PHONE: 800-767-9112
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (CANADA)

SECTION 2. HAZARDS IDENTIFICATION



DANGER!!

EXPOSURE PREVENTION: AVOID ALL CONTACT!

HAZARD STATEMENTS:

H100s = General, H200s = Physical, H300 = Health, H400s = Environmental
H272 May intensify fire, oxidizer explosive when mixed with combustible material.
H303 May be harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H335 May cause respiratory irritation.

PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal
P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do – Continue rinsing.
P309+311 If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.
P405+102 Store locked up. Keep out of reach of children.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#	EINECS#	WT %
Hydrogen Peroxide	7722-84-1	231-765-0	10
Water	7732-18-5	231-791-2	90

Trace components: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant Additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SECTION 4. FIRST AID MEASURES**EYE CONTACT:**

If this product enters the eyes, open eyes while under gently running water. Use sufficient force to open eyelids. Roll eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard contaminated shoes.

INHALATION:

After high vapor exposure, remove to fresh air. If it is suspected that the fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest, breathing is difficult, give oxygen. If breathing has stopped, trained personnel should immediately begin artificial respiration. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. If the heart has stopped, trained personnel should immediately begin cardiopulmonary resuscitation (CPR). Seek immediate medical attention. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis Should be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after endotracheal intubation).

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of the label and SDS to physician or health professional with victim.

SECTION 5. FIRE FIGHTING MEASURES

FIRE & EXPLOSIONS PREVENTIVE MEASURES:

Isolate from extreme heat, combustibles, alkalies, and reducing agents.

EXTINGUISHING MEDIA:

Use appropriate extinguishing media.

SPECIAL FIRE FIGHTING PROCEDURES:

Water spray may be ineffective on fire but can protect fire-fighters & cool closed containers. Use fog nozzles if water is used. Do not enter confined fire-space without full bunker gear. (Helmet with face shield, bunker coats, gloves & rubber boots). Use NIOSH approved positive-pressure self-contained breathing apparatus.

UNUSUAL EXPLOSION AND FIRE PROCEDURES:

Isolate from oxidizers, heat, & open flame.
Closed containers may explode if exposed to extreme heat.
Applying to hot surfaces requires special precautions.

SECTION 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

PERSONAL PROTECTIVE EQUIPMENT:

The proper protective equipment for incidental releases (such as: 1 Litter of the product released in a well-ventilated area), use impermeable gloves (triple-gloves, rubber gloves and nitrile gloves, over latex gloves), goggles, face shield, and appropriate body protection. In the event of a large release, use impermeable gloves, specific for the material handled, chemically resistant suit and boots, and hard hat. Self-Contained Breathing Apparatus or respirator may be required where engineering controls are not adequate or conditions for potential exposure exist. When respirators are required, select NIOSH/MSHA approved based on actual or potential airborne concentrations in accordance with latest OSHA and/or ANSI recommendations.

ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container, keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

CONTAINMENT AND CLEAN-UP MEASURES:

Absorb spilled liquid with poly pads or other suitable absorbent materials. If necessary, neutralize using suitable buffering material, (acid with soda ash or base with phosphoric acid), and test area with litmus paper to confirm neutralization. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. Dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13- Disposal Considerations).

SECTION 7. HANDLING AND STORAGE

HANDLING:

Use only with adequate ventilation. Do not get in eyes, on skin or clothing. Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse. To minimize static discharge when transferring, ensure electrical continuity by bonding and grounding all equipment. Use an inlet line diameter of at least 3.5 inches with a maximum flow rate of 1 meter/second.

STORAGE:

Keep separated from strong oxidants, strong acids, metals, food & feedstuffs. Keep dry. Do not store above 49 C/120 F. Keep container tightly closed & upright when not in use to prevent leakage. Wear full face shield, gloves & full protective clothing when opening or handling. When empty, drain completely, replace bungs securely.

NONBULK: CONTAINERS:

Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in a secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see section 10, Stability and Reactivity). Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Empty containers should be handle with care. Never store food, feed. Or drinking water in containers which held this product.

BULK CONTAINERS:

All tanks and pipelines which contain this material must be labeled. Perform routine maintenance on tanks or pipelines which contain this product. Report all leaks immediately to the proper personnel.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:

Follow practices indicated in section 6 (Accidental Release Measures). Make sure certain application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilations is provided. Collect all rinsates and dispose of according to applicable Federal, State, Provincial, or local procedures.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)
Hydrogen Peroxide	7722-84-1	231-765-0	1 ppm	1 ppm
Water	7732-18-15	231-791-2	None Known	None Known

MATERIAL	CAS#	EIENECS#	CEILING	STEL (OSHA/ACGIH)	HAP
Hydrogen Peroxide	231-765-0	231-765-0	1 ppm	None Known	No

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

RESPIRATORY EXPOSURE CONTROLS:

A respiratory protective program that meets OSHA CFR 1910.134 and ANSI Z86.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

VENTILATION:

LOCAL EXHAUST: Necessary MECHANICAL (General): Necessary

SPECIAL: None OTHER: None

Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

PERSONAL PROTECTION:

Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse.

WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash at the end of each work shift & before eating, smoking or using the toilet. Promptly remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES:

APPEARANCE:	Liquid, water-white
ODOR:	None
ODOR THRESHOLD:	Not Available
Ph (1% Neutrality):	6.5-7.5
MELTING POINT/FREEZING POINT:	NA
BOILING RANGE (IBP, 50%, Dry Point):	N/A
FLASH POINT (TEST METHOD):	Not Applicable
EVAPORATION RATE (n-BUTYL ACETATE=1):	N/A
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C:	N/A
VAPOR DENSITY (air = 1):	ND
GRAVITY @ 68/68F / 20/20C:	
SPECIFIC GRAVITY (Water = 1):	1.04-1.06
POUNDS/GALLON:	8.757
WATER SOLUBILITY:	Complete
PARTITION COEFFICIENT (n-Octane/Water):	Not Available
AUTO IGNITION TEMPERATURE:	Not Applicable
DECOMPOSITION TEMPERAURE:	Not Available

SECTION 10. STABILITY & REACTIVITY**STABILITY:**

Stable under most conditions.

CONDITIONS TO AVOID:

Isolate from extreme heat, and open flame.

MATERIALS TO AVOID:

Isolate from dirt, cyanides, combustibles, oxidizer, reducers, alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS:

None.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

ACUTE HAZARDS

EYE & SKIN CONTACT:

Primary irritation to skin, defatting, dermatitis.
Primary irritation to eyes, redness, tearing, blurred vision.
Liquid can cause severe skin & eye burns. Wash thoroughly after handling.

INHALATION:

Anesthetic. Irritates respiratory tract. Acute overexposure can cause serious nervous system depression. Vapor harmful.

SWALLOWING:

Harmful or fatal if swallowed.

SUBCHRONIC HAZARDS/CONDITIONS AGGRAVATED

CONDITIONS AGGRAVATED:

Persons with severe skin, liver or kidney problems should avoid use.

CHRONIC HAZARDS

CANCER, REPRODUCTIVE & OTHER CHRONIC HAZARDS:

This product has no carcinogens listed by IARC, NTP, NIOSH, OSHA or ACGIH, as of this date
Greater or equal to 0.1%.

IRRITANCY OF PRODUCT: This product is irritating to contaminated tissue.

SENSITIZATION TO THE PRODUCT: No component of this product is known to be a sensitizer.

MUTAGENICITY: This product is not reported to produce mutagenic effects in humans.

EMBRYOTOXICITY: This product is not reported to produce embryotoxic effects in humans.

TERATOGENICITY: This product is not reported to produce teratogenic effects in humans.

REPRODUCTIVE TOXICITY: This product is not reported to cause reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical which causes damage to developing embryo (such as: within the eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MAMMALIAN TOXICITY INFORMATION

No mammal information is available on this product.

SECTION 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

AQUATIC ANIMAL INFORMATION:

No aquatic environmental information is available on this product.

MOBILITY IN SOIL:

Mobility of this material has not been determined.

DEGRADABILITY:

This product is completely biodegradable.

ACCUMULATION:

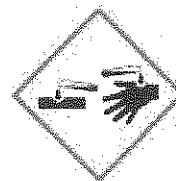
Bioaccumulation of this product has not been determined.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste management options. Recycle / dispose of observing national, regional, state, provincial and local health, safety & pollution laws. If in doubt, contact appropriate agencies.

SECTION 14. TRANSPORT INFORMATION

DOT/TDG SHIP NAME: UN2014, Hydrogen Peroxide, Aqueous Solutions, 5.1, (8), PG II
DRUM LABEL: (OXIDIZER) (CORROSIVE)
IATA / ICAO: UN2014, Hydrogen Peroxide, Aqueous Solution, 5.1, (8) PG-II
IMO / IMDG: UN2014, Hydrogen Peroxide, Aqueous Solution, 5.1, (8) PG-II
EMERGENCY RESPONSE GUIDEBOOK NUMBER 140



SECTION 15. REGULATORY INFORMATION



EPA REGULATIONS:

SARA SECTION 311/312 HAZARDS: Acute Health

ALL components of this product are on the TSCA list.

SARA Title III Section 313 Supplier Notification

This product contains the indicated < * > toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning & Community Right-To-Know Act of 1986 & of 40 CFR 372.

This information must be included in all MSDSs that are copied and distributed for this material.

STATE REGULATIONS:

CALIFORNIA SAFE DRINKING WATER & TOXIC ENFORCEMENT ACT (PROPOSITION 65):

This product contains no chemicals known to the State of California to cause cancer or reproductive toxicity.

INTERNATIONAL REGULATIONS:

The components of this product are listed on the chemical inventories of the following countries:

Australia (AICS), Canada (DSL,NDSL), China (IECSC), Europe (EINECS,ELINCS), Japan (METI/CSCL, MHLW/ISHL), South Korea (KECI), New Zealand (NZIOC), Philippines (PICCS), Switzerland (SWISS), Taiwan (NECSI), USA (TSCA).

CANADA: WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

D2B: Irritating to skin / eyes.

E: Corrosive Material.

SECTION 16. OTHER INFORMATION

HAZARD RATINGS:

HEALTH (NFPA): 2, HEALTH (HMIS): 2, FLAMMABILITY: 0, PHYSICAL HAZARD: 2

(Personal Protection Rating to be supplied by user based on use conditions.)

This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating system.

EMPLOYEE TRAINING:

See Section 2 for Risk & Safety Statements. Employees should be made aware of all hazards of this material (as stated in this SDS) before handling it.

NOTICE

All information, recommendations, and suggestions appearing herein concerning this product are based upon data obtained from the manufacturer and/or recognized technical sources; however, C.C.I. makes no warranty, representation or guaranty as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of the product. Additional product literature may be available upon request. Since actual use by others is beyond our control, no warranty, express or implied is made by C.C.I. as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does C.C.I. assume any liability arising out of use by others of this product.

SAFETY DATA SHEET

COMPANY IDENTITY: CCI
PRODUCT IDENTITY: RO-291

SDS DATE: 11/28/2018
REPLACES: 03/07/2017

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.

THIS SDS COMPLIES WITH CFR 1910.1200 (HAZARD COMMUNICATIONS STANDARD)

IMPORTANT: Read this SDS before handling & disposing of this product.

Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: RO-291
SDS NUMBER: CR3467
COMPANY IDENTITY: CCI CHEMICAL
COMPANY ADDRESS: 3540 EAST 26TH STREET, VERNON, CALIFORNIA 90058
COMPANY PHONE: 800-767-9112
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (CANADA)

SECTION 2. HAZARDS IDENTIFICATION

HAZARD STATEMENTS:

H100s = General, H200s = Physical, H300 = Health, H400s = Environmental

H412 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P262 Do not get in eyes, on skin, or on clothing.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do – Continue rinsing.

P309+311 If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.

P405+102 Store locked up. Keep out of reach of children.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#	EINECS#
Water	7732-18-5	231-791-2
Polyquaternary Amine	42751-79-1	-----

Trace components: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant Additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SECTION 4. FIRST AID MEASURES

EYE CONTACT:

If this product enters the eyes, open eyes while under gently running water. Use sufficient force to open eyelids. Roll eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard contaminated shoes.

INHALATION:

Move person to fresh air, if effects occur, consult a physician.

SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis should be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after endotracheal intubation). Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of the label and SDS to physician or health professional with victim.

SECTION 5. FIRE FIGHTING MEASURES

FIRE & EXPLOSIONS PREVENTIVE MEASURES:

Isolate from extreme heat and open flame.

EXTINGUISHING MEDIA:

Water, Water spray, foam, carbon dioxide (CO₂). Dry powder.

SPECIAL FIRE FIGHTING PROCEDURES:

None.

UNUSUAL EXPLOSION AND FIRE PROCEDURES:

None.

FLASH POINT: N/A

AUTOIGNITION TEMPERATURE: N/A

SECTION 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

PERSONAL PRECAUTIONS:

Spilled material may cause a slipping hazard. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment.

ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container, keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

CONTAINMENT AND CLEAN-UP MEASURES:

Absorb spilled liquid with poly pads or other suitable absorbent materials. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. Dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13- Disposal Considerations).

SECTION 7. HANDLING AND STORAGE

HANDLING:

Product shipped/handled hot can cause thermal burns. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling.

STORAGE:

Freezing will affect the physical condition and may damage the material. Keep in a dry cool place (0-30°C). Keep away from heat and sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)
Water	7732-18-15	231-791-2	None Known	None Known
Polyquaternary Amine	42751-79-1	-----	None Known	None Known

MATERIAL	CAS#	EIENECS#	CEILING	STEL (OSHA/ACGIH)	HAP
Polyquaternary Amine	42751-79-1	-----	-----	None Known	No

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

RESPIRATORY EXPOSURE CONTROLS:

A respiratory protective program that meets OSHA CFR 1910.134 and ANSI Z86.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

VENTILATION:

LOCAL EXHAUST: Recommended MECHANICAL (General): Recommended

SPECIAL: None OTHER: None

Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

PERSONAL PROTECTION:

Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse.

WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash at the end of each work shift & before eating, smoking or using the toilet. Promptly remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES:

APPEARANCE:	Clear Amber Liquid
ODOR:	Negligible
ODOR THRESHOLD:	Not Available
pH (Neutrality):	5.0-9.0
MELTING POINT/FREEZING POINT:	(C°): -3
BOILING RANGE (IBP, 50%, Dry Point):	Not Applicable
FLASH POINT (TEST METHOD):	N/A
EVAPORATION RATE (n-BUTYL ACETATE=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C:	Not Available
VAPOR DENSITY (air = 1):	Not Available
SPECIFIC GRAVITY (Water = 1):	1.06-1.08
POUNDS/GALLON:	8.92
WATER SOLUBILITY:	Complete
VISCOSITY (mPa.s):	N/A
AUTO IGNITION TEMPERATURE:	N/A
DECOMPOSITION TEMPERAURE:	Not Available

SECTION 10. STABILITY & REACTIVITY**STABILITY:**

Stable under most conditions.

CONDITIONS TO AVOID:

Isolate from extreme heat, and open flame.

MATERIALS TO AVOID:

Oxidizing agents may cause exothermic reactions.

HAZARDOUS DECOMPOSITION PRODUCTS:

No decomposition if stored and applied as directed. Burning of the dried material can produce hydrogen chloride gas, nitrogen oxides (NO_x), carbon oxide.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION**ACUTE TOXICITY:**

LD50 Oral: LD50/oral/rat > 2000 mg/kg (estimated)

LD50 Dermal LD50/oral/rat > 2000 mg/kg (estimated)

LD50 Inhalation The product is not expected to be toxic by inhalation.

CONDITIONS AGGRAVATED:

None Known.

CHRONIC HAZARDS**CHRONIC TOXICITY:**

In animals, effects have been reported on the following organs after ingestions: Gastrointestinal tract, heart, and kidney. Does levels producing these effects were many times a strong association between elevated blood pressure and prolonged dietary overuse. Related effects could occur in the kidneys.

CARCINOGENICITY:

This product is not classified as a carcinogen by NTP, IARC or OSHA.

MUTAGENIC DATA:

In vitro genetic toxicity studies were negative.

DEVELOPMENTAL TOXICITY:

Did not cause birth defects or any other fetal effects in laboratory animals.

SECTION 12. ECOLOGICAL INFORMATION**AQUATIC TOXICITY:**

The effects of this product on aquatic organisms are rapidly and significantly mitigated by the presence of dissolved organic carbon in the aquatic environment.

FRESH FISH TOXICITY:

LC50, Danio rerio/96 hr > 10 mg/l (OECD 203)

ALGAE TOXICITY:

Algal inhibition test are not appropriate. The flocculating characteristics of the product interfere directly in the test medium preventing homogenous distribution which invalidates the test.

DAPHNIA:

EC50/Daphnia magna/48 hr > 10 mg/l (OECD 202)

BIOACCUMULATION:

Does not bioaccumulate.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste management options. Recycle / dispose of observing national, regional, state, provincial and local health, safety & pollution laws. If in doubt, contact appropriate agencies.

SECTION 14. TRANSPORT INFORMATION

UN/NA: N/A

Classification: NON D.O.T REGULATED

Proper Shipping Name: WASTE WATER COMPOUND, NON D.O.T. REGULATED

D.O.T Hazard Name (49CFR 172.101): NONE

D.O.T. ID Number (49CFR 172.101): NONE

D.O.T. Hazard Class (49CFR 172.101): NONE

RCRA Hazard Class (40cfr261) (If discarded): NONE

E.P.A. Priority pollutants (40CFR 122.53): NONE

HAZARD RATINGS:

HEALTH (NFPA): 2, HEALTH (HMIS): 2, FLAMMABILITY: 0, PHYSICAL HAZARD: 0

(Personal Protection Rating to be supplied by user based on use conditions.)

This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating system.

SECTION 15. REGULATORY INFORMATION:**TSCA Chemical Substances Inventory:**

All components of this product are either listed on the inventory or exempt from listing.

California Proposition 65 Information:

WARNING! This product contains a chemical known to the State of California to cause Cancer and birth defects or other Reproductive harm, Epichlorohydrin, 1,3-Dichloro-2 propanol (1,3-DCP), 3-Monochloropropane-1,2-diol (3-MCPD)

NOTICE

All information, recommendations, and suggestions appearing herein concerning this product are based upon data obtained from the manufacturer and/or recognized technical sources; however, C.C.I. makes no warranty, representation or guaranty as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of the product. Additional product literature may be available upon request. Since actual use by others is beyond our control, no warranty, express or implied is made by C.C.I. as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does C.C.I. assume any liability arising out of use by others of this product.

SAFETY DATA SHEET

COMPANY IDENTITY: CCI
PRODUCT IDENTITY: RO-3900

SDS DATE: 10/18/2019

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.

THIS SDS COMPLIES WITH CFR 1910.1200 (HAZARD COMMUNICATIONS STANDARD)

IMPORTANT: Read this SDS before handling & disposing of this product.

Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: RO-3900
SDS NUMBER: CR4290
COMPANY IDENTITY: CCI CHEMICAL
COMPANY ADDRESS: 3540 EAST 26TH STREET, VERNON, CALIFORNIA 90058
COMPANY PHONE: 800-767-9112
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (CANADA)

SECTION 2. HAZARDS IDENTIFICATION

HAZARD STATEMENTS:

H100s = General, H200s = Physical, H300 = Health, H400s = Environmental

H412 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P262 Do not get in eyes, on skin, or on clothing.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do – Continue rinsing.

P309+311 If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.

P405+102 Store locked up. Keep out of reach of children.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#	EINECS#
Water	7732-18-5	231-791-2
Petroleum Distillate	64742-47-8	-----

Trace components: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant Additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SECTION 4. FIRST AID MEASURES

EYE CONTACT:

If this product enters the eyes, open eyes while under gently running water. Use sufficient force to open eyelids. Roll eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard contaminated shoes.

INHALATION:

Move person to fresh air, if effects occur, consult a physician.

SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis should be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after endotracheal intubation). Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of the label and SDS to physician or health professional with victim.

SECTION 5. FIRE FIGHTING MEASURES

FIRE & EXPLOSIONS PREVENTIVE MEASURES:

Isolate from extreme heat and open flame.

EXTINGUISHING MEDIA:

Water, Water spray, foam, carbon dioxide (CO₂). Dry powder.

SPECIAL FIRE FIGHTING PROCEDURES:

None.

UNUSUAL EXPLOSION AND FIRE PROCEDURES:

None.

FLASH POINT: Does not flash

AUTOIGNITION TEMPERATURE: No data available

SECTION 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

PERSONAL PRECAUTIONS:

Spilled material may cause a slipping hazard. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment.

ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container, keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

CONTAINMENT AND CLEAN-UP MEASURES:

Absorb spilled liquid with poly pads or other suitable absorbent materials. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. Dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13- Disposal Considerations).

SECTION 7. HANDLING AND STORAGE

HANDLING:

Product shipped/handled hot can cause thermal burns. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling.

STORAGE:

Freezing will affect the physical condition and may damage the material. Keep in a dry cool place (0-30°C). Keep away from heat and sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)
Water	7732-18-15	231-791-2	None Known	None Known
Petroleum Distillate	64742-47-8	-----	None Known	None Known

MATERIAL	CAS#	EIENECS#	CEILING	STEL (OSHA/ACGIH)	HAP
Petroleum Distillate	64742-47-8	-----	-----	None Known	No

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

RESPIRATORY EXPOSURE CONTROLS:

A respiratory protective program that meets OSHA CFR 1910.134 and ANSI Z86.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

VENTILATION:

LOCAL EXHAUST: Necessary MECHANICAL (General): Necessary

SPECIAL: None OTHER: None

Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

PERSONAL PROTECTION:

Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse.

WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash at the end of each work shift & before eating, smoking or using the toilet. Promptly remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES:

APPEARANCE:	White, viscous, opaque liquid
ODOR:	Aliphatic
pH (Neutrality):	5-8 @ 5 g/L
MELTING POINT/FREEZING POINT:	<5 °C
BOILING RANGE (IBP, 50%, Dry Point) :	>100°C
FLASH POINT (TEST METHOD):	Does not flash
EVAPORATION RATE (n-BUTYL ACETATE=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE:	2.3 kPa @ 20°C
VAPOR DENSITY (air = 1):	Not Available
SPECIFIC GRAVITY (Water = 1):	1.01
POUNDS/GALLON:	8.4
WATER SOLUBILITY:	Appreciable
VISCOSITY (mPa.s):	>20.5 mm ² /s @ 40°C
AUTO IGNITION TEMPERATURE:	No data available
DECOMPOSITION TEMPERAURE:	> 150°C

SECTION 10. STABILITY & REACTIVITY**STABILITY:**

Stable under most conditions.

CONDITIONS TO AVOID:

Isolate from extreme heat, and open flame.

MATERIALS TO AVOID:

Oxidizing agents may cause exothermic reactions.

HAZARDOUS DECOMPOSITION PRODUCTS:

No decomposition if stored and applied as directed. Burning of the dried material can produce hydrogen chloride gas, nitrogen oxides (NO_x), carbon oxide.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

LD50 Oral: LD50/oral/rat > 5000 mg/kg (estimated)
LD50 Dermal The product is not expected to be toxic to skin.
LD50 Inhalation The product is not expected to be toxic by inhalation.

CONDITIONS AGGRAVATED:

None Known.

CHRONIC HAZARDS

CHRONIC TOXICITY:

In animals, effects have been reported on the following organs after ingestions: Gastrointestinal tract, heart, and kidney. Does levels producing these effects were many times a strong association between elevated blood pressure and prolonged dietary overuse. Related effects could occur in the kidneys.

CARCINOGENICITY:

This product is not classified as a carcinogen by NTP, IARC or OSHA.

MUTAGENIC DATA:

In vitro genetic toxicity studies were negative.

DEVELOPMENTAL TOXICITY:

Did not cause birth defects or any other fetal effects in laboratory animals.

SECTION 12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY:

The effects of this product on aquatic organisms are rapidly and significantly mitigated by the presence of dissolved organic carbon in the aquatic environment.

FRESH FISH TOXICITY:

LC50, Danio rerio/96 hr > 1000 mg/l

ALGAE TOXICITY:

Algal inhibition test are not appropriate. The flocculating characteristics of the product interfere directly in the test medium preventing homogenous distribution which invalidates the test.

DAPHNIA:

LC50/Daphnia magna/48 hr / Chaetogammus marinus = 15 mg/l

BIOACCUMULATION:

Does not bioaccumulate.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste management options. Recycle / dispose of observing national, regional, state, provincial and local health, safety & pollution laws. If in doubt, contact appropriate agencies.

SECTION 14. TRANSPORT INFORMATION

UN/NA: N/A

Classification: NON D.O.T REGULATED

Proper Shipping Name: WASTE WATER COMPOUND, NON D.O.T. REGULATED

D.O.T Hazard Name (49CFR 172.101): NONE

D.O.T. ID Number (49CFR 172.101): NONE

D.O.T. Hazard Class (49CFR 172.101): NONE

RCRA Hazard Class (40cfr261) (If discarded): NONE

E.P.A. Priority pollutants (40CFR 122.53): NONE

HAZARD RATINGS:

HEALTH (NFPA): 0, HEALTH (HMIS): 0, FLAMMABILITY: 1, PHYSICAL HAZARD: 0

(Personal Protection Rating to be supplied by user based on use conditions.)

This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating system.

PPE Code: B

SECTION 15. REGULATORY INFORMATION**TSCA Chemical Substances Inventory:**

All components of this product are either listed on the inventory or exempt from listing.

US SARA Reporting Requirements:

SARA (Section 311/312) hazard class:

Not concerned.

RCRA Status:

Not RCRA hazardous.

California Proposition 65 Information:

WARNING! This product contains a chemical known to the state of California to cause cancer and birth defects or other reproductive harm, Acrylamide.

NOTICE

All information, recommendations, and suggestions appearing herein concerning this product are based upon data obtained from the manufacturer and/or recognized technical sources; however, C.C.I. makes no warranty, representation or guaranty as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of the product. Additional product literature may be available upon request. Since actual use by others is beyond our control, no warranty, express or implied is made by C.C.I. as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does C.C.I. assume any liability arising out of use by others of this product.

SAFETY DATA SHEET

COMPANY IDENTITY: CCI
PRODUCT IDENTITY: WW-252S

SDS DATE: 04/04/2019

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.

THIS SDS COMPLIES WITH CFR 1910.1200 (HAZARD COMMUNICATIONS STANDARD)

IMPORTANT: Read this SDS before handling & disposing of this product.

Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: WW-252S
SDS NUMBER: CR6997
COMPANY IDENTITY: CCI CHEMICAL
COMPANY ADDRESS: 3540 EAST 26TH STREET, VERNON, CALIFORNIA 90058
COMPANY PHONE: 800-767-9112
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (CANADA)

SECTION 2. HAZARDS IDENTIFICATION

HAZARD STATEMENTS:

H100s = General, H200s = Physical, H300 = Health, H400s = Environmental

H412 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P262 Do not get in eyes, on skin, or on clothing.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do – Continue rinsing.

P309+311 If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.

P405+102 Store locked up. Keep out of reach of children.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#	EINECS#
Water	7732-18-5	231-791-2
Polyquaternary Amine	42751-79-1	-----

Trace components: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant Additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SECTION 4. FIRST AID MEASURES

EYE CONTACT:

If this product enters the eyes, open eyes while under gently running water. Use sufficient force to open eyelids. Roll eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard contaminated shoes.

INHALATION:

Move person to fresh air, if effects occur, consult a physician.

SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis should be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after endotracheal intubation).

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of the label and SDS to physician or health professional with victim.

SECTION 5. FIRE FIGHTING MEASURES

FIRE & EXPLOSIONS PREVENTIVE MEASURES:

Isolate from extreme heat and open flame.

EXTINGUISHING MEDIA:

Water, Water spray, foam, carbon dioxide (CO₂). Dry powder.

SPECIAL FIRE FIGHTING PROCEDURES:

None.

UNUSUAL EXPLOSION AND FIRE PROCEDURES:

None.

FLASH POINT: >100

AUTOIGNITION TEMPERATURE: (°C) >200

SECTION 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

PERSONAL PRECAUTIONS:

Spilled material may cause a slipping hazard. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment.

ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container, keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

CONTAINMENT AND CLEAN-UP MEASURES:

Absorb spilled liquid with poly pads or other suitable absorbent materials. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. Dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13- Disposal Considerations).

SECTION 7. HANDLING AND STORAGE

HANDLING:

Product shipped/handled hot can cause thermal burns. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling.

STORAGE:

Freezing will affect the physical condition and may damage the material. Keep in a dry cool place (0-30°C). Keep away from heat and sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)
Water	7732-18-15	231-791-2	None Known	None Known
Polyquaternary Amine	42751-79-1	-----	None Known	None Known

MATERIAL	CAS#	EIENECS#	CEILING	STEL (OSHA/ACGIH)	HAP
Polyquaternary Amine	42751-79-1	-----	-----	None Known	No

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

RESPIRATORY EXPOSURE CONTROLS:

A respiratory protective program that meets OSHA CFR 1910.134 and ANSI Z86.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

VENTILATION:

LOCAL EXHAUST: Recommended MECHANICAL (General): Recommended

SPECIAL: None OTHER: None

Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

PERSONAL PROTECTION:

Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse.

WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash at the end of each work shift & before eating, smoking or using the toilet. Promptly remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES:

APPEARANCE:	Clear Straw Colored Liquid
ODOR:	Negligible
ODOR THRESHOLD:	Not Available
pH (Neutrality):	6-8
MELTING POINT/FREEZING POINT:	(C°): -3
BOILING RANGE (IBP, 50%, Dry Point):	Not Applicable
FLASH POINT (TEST METHOD) :	>100
EVAPORATION RATE (n-BUTYL ACETATE=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C:	Not Available
VAPOR DENSITY (air = 1):	Not Available
SPECIFIC GRAVITY (Water = 1):	1.04-1.06
POUNDS/GALLON:	8.757
WATER SOLUBILITY:	Complete
VISCOSITY (mPa.s):	N/A
AUTO IGNITION TEMPERATURE:	(C°): >200
DECOMPOSITION TEMPERAURE:	Not Available

SECTION 10. STABILITY & REACTIVITY**STABILITY:**

Stable under most conditions.

CONDITIONS TO AVOID:

Isolate from extreme heat, and open flame.

MATERIALS TO AVOID:

Oxidizing agents may cause exothermic reactions.

HAZARDOUS DECOMPOSITION PRODUCTS:

No decomposition if stored and applied as directed. Burning of the dried material can produce hydrogen chloride gas, nitrogen oxides (NOx), carbon oxide.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

LD50 Oral: LD50/oral/rat > 2000 mg/kg (estimated)

LD50 Dermal LD50/oral/rat > 2000 mg/kg (estimated)

LD50 Inhalation The product is not expected to be toxic by inhalation.

CONDITIONS AGGRAVATED:

None Known.

CHRONIC HAZARDS

CHRONIC TOXICITY:

In animals, effects have been reported on the following organs after ingestions: Gastrointestinal tract, heart, and kidney. Does levels producing these effects were many times a strong association between elevated blood pressure and prolonged dietary overuse. Related effects could occur in the kidneys.

CARCINOGENICITY:

This product is not classified as a carcinogen by NTP, IARC or OSHA.

MUTAGENIC DATA:

In vitro genetic toxicity studies were negative.

DEVELOPMENTAL TOXICITY:

Did not cause birth defects or any other fetal effects in laboratory animals.

SECTION 12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY:

The effects of this product on aquatic organisms are rapidly and significantly mitigated by the presence of dissolved organic carbon in the aquatic environment.

FRESH FISH TOXICITY:

LC50, Danio rerio/96 hr > 10 mg/l (OECD 203)

ALGAE TOXICITY:

Algal inhibition test are not appropriate. The flocculating characteristics of the product interfere directly in the test medium preventing homogenous distribution which invalidates the test.

DAPHNIA:

EC50/Daphnia magna/48 hr > 10 mg/l (OECD 202)

BIOACCUMULATION:

Does not bioaccumulate.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste management options. Recycle / dispose of observing national, regional, state, provincial and local health, safety & pollution laws. If in doubt, contact appropriate agencies.

SECTION 14. TRANSPORT INFORMATION

UN/NA: N/A

Classification: LIQUID NON REGULATED

Proper Shipping Name: LIQUID NON REGULATED

D.O.T Hazard Name (49CFR 172.101): NONE

D.O.T. ID Number (49CFR 172.101): NONE

D.O.T. Hazard Class (49CFR 172.101): NONE

RCRA Hazard Class (40cfr261) (If discarded): NONE

E.P.A. Priority pollutants (40CFR 122.53): NONE

HAZARD RATINGS:

HEALTH (NFPA): 1, HEALTH (HMIS): 1, FLAMMABILITY: 0, PHYSICAL HAZARD: 0

(Personal Protection Rating to be supplied by user based on use conditions.)

This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating system.

SECTION 15. REGULATORY INFORMATION:

TSCA Chemical Substances Inventory:

All components of this product are either listed on the inventory or exempt from listing.

California Proposition 65 Information:

WARNING! This product contains a chemical known to the State of California to cause Cancer and birth defects or other Reproductive harm, Epichlorohydrin, 1,3-Dichloro-2 propanol (1,3-DCP), 3-Monochloropropane-1,2-diol (3-MCPD)

NOTICE

All information, recommendations, and suggestions appearing herein concerning this product are based upon data obtained from the manufacturer and/or recognized technical sources; however, C.C.I. makes no warranty, representation or guaranty as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of the product. Additional product literature may be available upon request. Since actual use by others is beyond our control, no warranty, express or implied is made by C.C.I. as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does C.C.I. assume any liability arising out of use by others of this product.

Attachment P
Slag Analytical Report for Fluorides



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Friday, June 30, 2023

John Browning
Bridgewater Group
7100 SW Hampton St. Suite 235
Tigard, OR 97223

RE: A3F1607 - CSRM Dusting Sampling - [none]CSRM-007

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A3F1607, which was received by the laboratory on 6/26/2023 at 11:09:00AM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Default Cooler 3.1 degC



DRAFT REPORT

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Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Bridgewater Group

7100 SW Hampton St. Suite 235
Tigard, OR 97223

Project: CSRM Dusting Sampling

Project Number: [none]CSRM-007

Project Manager: John Browning

Report ID:

A3F1607 - 06 30 23 1050

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EAF/LMF Slag Dust - 062123	A3F1607-02	Solid	06/21/23 12:01	06/26/23 11:09

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Project: CSRM Dusting Sampling

Project Number: [none]CSRM-007

Project Manager: John Browning

Report ID:

A3F1607 - 06 30 23 1050

ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EAF/LMF Slag Dust - 062123 (A3F1607-02)				Matrix: Solid				
Batch: 23F1109								
Fluoride	33.2	---	9.89	mg/kg	1	06/29/23 15:43	EPA 9056A	PRO

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DRAFT REPORT, DATA SUBJECT TO CHANGE



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Bridgewater Group**7100 SW Hampton St. Suite 235
Tigard, OR 97223Project: **CSRM Dusting Sampling**

Project Number: [none]CSRM-007

Project Manager: John Browning

Report ID:

A3F1607 - 06 30 23 1050

QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23F1109 - DI Leach						Solid						
Blank (23F1109-BLK1)			Prepared: 06/29/23 12:09 Analyzed: 06/29/23 13:55									
<u>EPA 9056A</u>												
Fluoride	ND	---	10.0	mg/kg	1	---	---	---	---	---	---	
LCS (23F1109-BS1)			Prepared: 06/29/23 12:09 Analyzed: 06/29/23 14:16									
<u>EPA 9056A</u>												
Fluoride	79.9	---	10.0	mg/kg	1	80.0	---	100	90-110%	---	---	
Duplicate (23F1109-DUP1)			Prepared: 06/29/23 12:09 Analyzed: 06/29/23 15:00									
<u>QC Source Sample: Non-SDG (A3F1606-02)</u>												
Fluoride	66.2	---	9.97	mg/kg	1	---	57.3	---	---	15	15%	PRO
Matrix Spike (23F1109-MS1)			Prepared: 06/29/23 12:09 Analyzed: 06/29/23 15:21									
<u>QC Source Sample: Non-SDG (A3F1606-02)</u>												
<u>EPA 9056A</u>												
Fluoride	83.3	---	9.88	mg/kg	1	79.0	57.3	33	80-120%	---	---	PRO,Q-02

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Tigard, OR 97223

Project: **CSRM Dusting Sampling**

Project Number: [none]CSRM-007

Project Manager: **John Browning**

Report ID:

A3F1607 - 06 30 23 1050

SAMPLE PREPARATION INFORMATION

Anions by Ion Chromatography

Prep: DI Leach

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 23F1109</u>							
A3F1607-02	Solid	EPA 9056A	06/21/23 12:01	06/29/23 12:09	5.0556g/50mL	5g/50mL	0.99

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Tigard, OR 97223

Project: CSRM Dusting Sampling

Project Number: [none]CSRM-007

Project Manager: John Browning

Report ID:

A3F1607 - 06 30 23 1050

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

- PRO** Sample has undergone sample processing prior to extraction and analysis.
- Q-02** Spike recovery is outside of established control limits due to matrix interference.

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Project: **CSRM Dusting Sampling**

Project Number: [none]CSRM-007
Project Manager: **John Browning**

Report ID:

A3F1607 - 06 30 23 1050

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.
ND Analyte NOT DETECTED at or above the detection or reporting limit.
NR Result Not Reported
RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ("-----"), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.

The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

Results for Volatiles analyses on soils and sediments that are reported on a "dry weight" basis include the water miscible solvent (WMS) correction referenced in the EPA 8000 Method guidance documents. Solid and Liquid samples reported on an "As Received" basis do not have the WMS correction applied, as dry weight was not performed.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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Project Number: [none]CSRM-007

Project Manager: **John Browning**

Report ID:

A3F1607 - 06 30 23 1050

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).

-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.

-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.

For further details, please request a copy of this document.

-Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level, if results are not reported to the MDL.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

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Project: **CSRM Dusting Sampling**

Project Number: [none]CSRM-007

Project Manager: **John Browning**

Report ID:

A3F1607 - 06 30 23 1050

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -

EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
<u>All reported analytes are included in Apex Laboratories' current ORELAP scope.</u>					

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

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DRAFT REPORT, DATA SUBJECT TO CHANGE

Page 9 of 11



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Bridgewater Group

7100 SW Hampton St. Suite 235

Tigard, OR 97223

Project: CSRМ Dusting Sampling

Project Number: [none]CSRМ-007

Project Manager: John Browning

Report ID:

A3F1607 - 06 30 23 1050

APEX LABS
6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

CHAIN OF CUSTODY

A3F1607
Lab # **A3F1577**
DJS 6-28
COC 1 of 1

Company:	Bridgewater Group	Project Mgr:	John Browning	Project Name:	CSRМ	Dust Sampling	Project #:	CSRМ-007
Address:	7100 SW Hampton, Suite 235, Tigard Oregon							PO #
Sampled by:	Justin Pounds							Phone:
Site Location:	OR WA CA AK ID							Email:
LAB ID #	6/21/23							12:01
DATE	6/21/23							12:01
TIME	MATRIX							# OF CONTAINERS
SAMPLE ID	EAFILMF Slag Dust - 082123							1
ANALYSIS REQUEST								
RCRA Metals (8)								
8081 Pest								
8082 PCBs								
8270 Semi-Vols Full List								
8270 SIM PAHs								
8260 VOCs Full List								
8260 Halo VOCs								
8260 RBDM VOCs								
8260 BTEX								
NWTPH-Gx								
NWTPH-Dx								
NWTPH-HCID								
TCLP Metals (8)								
TOTAL DISS. TCLP								
Al, Si, As, Ba, Be, Cd, Ca, Cr, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Ti, V, Zn								
See attached metal analytical								
Flouride - Method 9056								
Hexavalent Chromium (Cr VI)								
Sieve to < 30 microns								
Archive								

SPECIAL INSTRUCTIONS:
Confidential: Subject to Attorney/Client Privilege & Attorney Work Product
Results to only be sent to Geoff Tichenor at Steel Rivers LLP: geoffrey.tichenor@steel.com
Total metals to be analyzed: and less than 30 microns
Metals: As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, P, Se, Sb, Ag, Ti, Zn, Sb, V, Al

TAT Requested (circle)
1 Day 2 Day 3 Day
4 DAY 5 DAY Other: _____

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY:	RECEIVED BY:
Signature: <i>[Signature]</i>	Signature: <i>[Signature]</i>
Date: 6/21/23	Date: 6/21/23
Printed Name: Justin Pounds	Printed Name: Shawn Thompson
Company: Bridgewater Group	Company: Apex Labs

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Tigard, OR 97223

Project: **CSRM Dusting Sampling**

Project Number: [none]CSRM-007

Project Manager: John Browning

Report ID:

A3F1607 - 06 30 23 1050

APEX LABS COOLER RECEIPT FORMClient: Bridgewater Group Element WO#: A3 F1607
F1531
06 30 23Project/Project #: CSRM Dust Sampling CSRM-007**Delivery Info:**Date/time received: 6/26/23 @ 1109 By: SATDelivered by: Apex ☒ Client ☐ ESS ☐ FedEx ☐ UPS ☐ Radio ☐ Morgan ☐ SDS ☐ Evergreen ☐ Other ☐**Cooler Inspection** Date/time inspected: 6/26/23 @ 1230 By: SATChain of Custody included? Yes ☒ No ☐Signed/dated by client? Yes ☒ No ☐

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>3.1</u>						
Custody seals? (Y/N)	<u>N</u>						
Received on ice? (Y/N)	<u>Y</u>						
Temp. blanks? (Y/N)	<u>Y</u>						
Ice type: (Gel/Real/Other)	<u>Gel</u>						
Condition (In/Out):	<u>IN</u>						

Cooler out of temp? (Y/N) N Possible reason why: _____Green dots applied to out of temperature samples? Yes ☒ No ☐Out of temperature samples form initiated? Yes ☒ No ☐**Sample Inspection:** Date/time inspected: 6-26-23 @ 1229 By: DSSAll samples intact? Yes ☒ No ☐ Comments: _____Bottle labels/COCs agree? Yes ☒ No ☐ Comments: _____COC/container discrepancies form initiated? Yes ☐ No ☒Containers/volumes received appropriate for analysis? Yes ☒ No ☐ Comments: _____Do VOA vials have visible headspace? Yes ☐ No ☐ NA ☒

Comments: _____

Water samples: pH checked: Yes ☐ No ☐ NA ☒ pH appropriate? Yes ☐ No ☐ NA ☒

Comments: _____

Additional information:Labeled by: DSSWitness: [Signature]Cooler Inspected by: [Signature]

Form Y-003 R-00

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