The Steel Company of Canada

Iron Desulphurization Slag Fines

Safety Data Sheet (SDS)

Section 1 – Identification

1(a) Product Identifier Used on Label: Iron Desulphurization Slag Fines

1(b) Other Means of Identification: Desulphurization Slag Fines, Desulph Fines, C-Kish, Kish C-Waste

1(c) Recommended Use of the Chemical and Restrictions on Use:

1(d) Name, Address, and Telephone Number:

Stelco Inc.
386 Wilcox Street
Hamilton, ON L8L 8K5
Phone number: (905) 528-2511 (8:00 am to 5:00 pm)

1(e) Emergency Phone Number: 1-888-CAN-UTEC (226-8832) or 613-996-6666

Section 2 – Hazard(s) Identification

2(a) Classification of the Chemical: Iron Desulphurization Slag Fines is considered a hazardous material according to the criteria specified in REACH [REGULATION (EC) No 1907/2006], CLP [REGULATION (EC) No 1272/2008], OSHA 29 CFR 1910.1200 Hazard Communication Standard and the Canadian Hazardous Products Regulations. The categories of Health Hazards as defined in "GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS) have been evaluated and are listed below. Refer to Section 3, 8 and 11 for additional information.

2(b) Signal Word, Hazard Statement(s), Symbols and Precautionary Statement(s):

Hazard Symbol	Hazard Classification	Signal Word	Hazard Statement(s)	Precautionary Statement(s)
	Single Target Organ Toxicity (STOT) Repeated Exposure - 1	**Danger**	Causes damage to lungs through prolonged or repeated exposure. Causes serious eye damage. Causes skin irritation. Harmful if swallowed. May cause respiratory irritation.	Do not breathe dusts or fume. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Get medical advice/attention if you feel unwell. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center or doctor/physician if you feel unwell. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician. If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. If swallowed: Rinse mouth. Do **NOT** induce vomiting. Call a poison control center or doctor/physician if you feel unwell. Store locked up. Dispose of contents in accordance with federal, provincial, state and local regulations.
	Acute Toxicity-Oral 4 STOT Single Exposure - 3 Skin Irritation - 2			
	Eye Irritation - 1			

2(c) Hazards Not Otherwise Classified:

2(d) Unknown Acute Toxicity Statement (mixture):

Section 3 – Composition/Information on Ingredients

3(a-c) Chemical Name, Common Name (Synonyms), CAS Number and Other Identifiers, and Concentration:

Chemical Name	CAS Number	EC Number	% weight
Iron Oxides	1345-25-1 1309-37-1	215-721-8 215-168-2	27-46
Silica, Fused	60676-86-0	262-373-8	17-32
Calcium Oxide	1305-78-8	215-138-9	20-22
Magnesium Oxide	1309-48-4	215-171-9	7-8
Aluminum Oxide	1344-28-1	215-691-6	3-6
Manganese	7439-96-5	231-105-1	0.9-2
Carbon	7440-44-0	231-153-3	1-2
Sulphur	7740-34-9	231-722-6	0.6-1

EC- European Community **CAS**- Chemical Abstract Service

Iron Desulphurization Slag Fines contains small amounts of various constituents in addition to those listed. These small quantities are frequently referred to as "trace" or "residual" constituents that generally originate in the raw materials used. **Iron Desulphurization Slag Fines** may contain the following trace or residual constituents: Silica (Quartz), phosphorus, titanium dioxide, sodium oxide, chromium (III) oxide, lead, arsenic, zinc, and potassium oxide.

Section 4 – First-aid Measures

4(a) Description of Necessary Measures: Get medical attention if you feel unwell

- **Inhalation:** 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.
- **Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.
- **Skin Contact:** Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse.
- **Ingestion:** Call a poison center or doctor/physician if you feel unwell. Rinse mouth. Do NOT induce vomiting.

4(b) Most Important Symptoms/Effects, Acute and Delayed (Chronic):

Primary Entry Routes: Excessive total particulate exposure may cause irritation to the eyes, skin and respiratory tract. Operations which generate high dust concentrations may result in the following effects if exposures exceed recommended limits as listed in Section 8.

Target Organs: Respiratory system, eyes, skin

Acute Effects:

- **Inhalation:** Excessive exposure to high concentrations of dust may cause irritation to the eyes, skin and mucous membranes of the upper respiratory tract. Excessive inhalation of fumes of freshly formed metal oxide particles sized below 1.5 microns and usually between 0.02-0.05 microns from many metals can produce an acute reaction known as "metal fume fever". Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), metallic taste in the mouth, dryness and irritation of the throat followed by weakness and muscle pain. The symptoms come on in a few hours after excessive exposures and usually last from 12 to 48 hours. Long-term effects from metal fume fever have not been noted. Excessive inhalation of calcium oxide dusts may cause severe irritation and burns of the respiratory tract.
- **Eye:** Particles of iron or iron compounds may become imbedded in the eye. Excessive exposure to high concentrations of dust may cause irritation to the eyes.
- **Skin:** Skin contact with dusts may cause irritation or sensitization, possibly leading to dermatitis. Skin contact with metallic fumes and dusts may cause physical abrasion.
- **Ingestion:** Ingestion of dust may cause nausea and/or vomiting.

Chronic Effects:

Long-term inhalation exposure to high concentrations (over-exposure) of agents that produce lung disorders may act synergistically with inhalation of oxides, vapors or dusts of this product to cause toxic effects.

Carcinogenicity: This product is not listed by IARC, NTP or OSHA as a carcinogen. IARC identifies welding fumes as a Group 1 carcinogen, a mixture that is carcinogenic to humans.

Medical Conditions Aggravated by Long-Term Exposure: Individuals with chronic respiratory disorders (i.e., asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by any airborne particulate matter exposure. Persons with pre-existing skin disorders may be more susceptible to dermatitis.

Section 5 – Fire-fighting Measures

5(a) Suitable (and unsuitable) Extinguishing Media: Steam, water fog, CO_2, foam, dry chemicals or sand. Small fires – Foam, CO_2, Dry Chemical, Water Spray. Large Fires – Water Spray, fog or foam.

5(b) Specific Hazards Arising from the Chemical: Incompatibility (materials to avoid) heat, and flames. When burned, toxic smoke and vapor may be emitted including, oxides of carbon, metal oxides and other toxic vapors. High concentrations of airborne metallic fines may present an explosion hazard.

5(c) Special Protective Equipment and Precautions for Fire-fighters: Wear a self-contained breathing apparatus (SCBA) with a full face-piece operated in pressure-demand or positive pressure mode and full protective clothing.

Section 6 - Accidental Release Measures

6(a) Personal Precautions, Protective Equipment and Emergency Procedures: For spills involving finely divided particles, clean-up personnel should be protected against contact with eyes and skin. If material is in a dry state, avoid inhalation of dust. Fine, dry material should be removed by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid using compressed air. Do not release into sewers or waterways. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, provincial, state, and local regulations.

6(b) Methods and Materials for Containment and Clean Up: Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, provincial, state, and local regulations. Follow applicable regulations (e.g. 29 CFR 1910.120) and all other pertinent federal, provincial, state, and local requirements.

Section 7 - Handling and Storage

7(a) Precautions for Safe Handling: Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Operations with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Practice good housekeeping. Avoid breathing metal fumes and/or dust.

7(b) Conditions for Safe Storage, Including any Incompatibilities: Store in a well-ventilated place. Store away from acids and incompatible materials. Whenever feasible, store locked up.

Section 8 - Exposure Controls/Personal Protection

8(a) Occupational Exposure Limits (OELs): The following exposure limits are offered as reference, for an experienced industrial hygienist to review.

Ingredients	Ontario TWA[1]	ACGIH TLV[2]	OSHA PEL[3]	NIOSH REL[4]	IDLH[5]
Iron Oxides	5.0 mg/m³ (as iron oxide, respirable fraction[6])	5.0 mg/m³ (as iron oxide, respirable fraction[6])	10 mg/m³ (as iron oxide fume)	5.0 mg/m³ (as iron oxide dust and fume)	2,500 mg Fe/m^3
Silica, Fused	0.1 mg/m^3 (as respirable fraction[6])	10 mg/m³ (as inhalable fraction[7], PNOS)[8] 3.0 mg/m³ (as respirable fraction,[6] PNOS)	0.05 mg/m^3 (respirable fraction[8], all forms) 0.025 mg/m^3 AL (respirable fraction[8], all forms)	0.05 mg/m³	NE
Calcium Oxide	2.0 mg/m³	2.0 mg/m³	5.0 mg/m³	2.0 mg/m³	25 mg/m³
Magnesium Oxide	10 mg/m³ (as inhalable fraction[7])	10 mg/m³ (as inhalable fraction[7])	15 mg/m³	NE	750 mg/m³
Aluminum Oxide	1.0 mg/m^3 (as respirable fraction[6])	10 mg/m³	15 mg/m³ (as total dust, PNOR)[9] 5.0 mg/m³ (as respirable fraction, PNOR)	NE	NE
Manganese	0.2 mg/m³	0.02 mg/m³ (as respirable fraction[6]) 0.1 mg/m^3 (as inhalable fraction[7])	"C" 5.0 mg/m³ (as Fume & Mn compounds)	1.0 mg/m³ (as Fume & Mn compounds) STEL 3.0 mg/m³	500 mg Mn/m^3
Carbon, Sulfur	10 mg/m³ (as inhalable fraction[7], PNOS[8]) 3.0 mg/m³ (as respirable fraction[8], PNOS)	10 mg/m³ (as inhalable fraction[6], PNOS[8]) 3.0 mg/m³ (as respirable fraction[8], PNOS)	15 mg/m³ (as total dust, PNOR)[9] 5.0 mg/m³ (as respirable fraction, PNOR)	NE	NE

NE - None Established

1. Time-Weighted Average (TWA) limits established by the Ontario Ministry of Labour are 8-hour TWA concentrations unless otherwise noted.
2. Threshold Limit Values (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH) are 8-hour TWA concentrations unless otherwise noted. ACGIH TLVs are for guideline purposes only and as such are not legal, regulatory limits for compliance purposes.
3. OSHA PELs (Permissible Exposure Limits) are 8-hour TWA (Time-Weighted Average) concentrations unless otherwise noted. A ("C") designation denotes a ceiling limit, which should not be exceeded during any part of the working exposure unless otherwise noted. An Action level (AL) is used by OSHA and NIOSH to express a health or physical hazard. They indicate the level of a harmful or toxic substance/activity, which requires medical surveillance, increased industrial hygiene monitoring, or biological monitoring. Action Levels are generally set at one half of the PEL but the actual level may vary from standard to standard. The intent is to identify a level at which the vast majority of randomly sampled exposures will be below the PEL.
4. The National Institute for Occupational Safety and Health Recommended Exposure Limits (NIOSH-REL) Compendium of Policy and Statements. NIOSH, Cincinnati, OH (1992). NIOSH is the U.S. federal agency designated to conduct research relative to occupational safety and health. As is the case with ACGIH TLVs, NIOSH RELs are for guideline purposes only and as such are not legal, regulatory limits for compliance purposes.
5. The "immediately dangerous to life or health air concentration values (IDLHs)" are used by NIOSH as part of the respirator selection criteria and were first developed in the mid-1970's by NIOSH. The Documentation for Immediately Dangerous to Life or Health Concentrations (IDLHs) is a compilation of the rationale and sources of information used by NIOSH during the original determination of 387 IDLHs and their subsequent review and revision in 1994.
6. Respirable fraction. The concentration of respirable particulate for the application of this TLV is to be determined from the fraction passing a size-selector with the characteristics defined in the ACGIH TLVs® and BEIs® based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices – as cited by Ministry of Labour (MOL) R.R.O. 833/90.
7. Inhalable fraction. The concentration of inhalable particulate for the application of this TLV is to be determined from the fraction passing a size-selector with the characteristics defined in the ACGIH TLVs® and BEIs® based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices – as cited by Ministry of Labour (MOL) R.R.O. 833/90.
8. PNOS. Particles (Insoluble or Poorly Soluble) Not Otherwise Specified defined in the ACGIH TLVs® and BEIs® based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices – as cited by Ministry of Labour (MOL) R.R.O. 833/90.
9. PNOR (Particulates Not Otherwise Regulated). All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by a limit which is the same as the inert or nuisance dust limit of 15 mg/m^3 for total dust and 5 mg/m^3 for the respirable fraction.

Section 8 - Exposure Controls/Personal Protection (continued)

8(b) Appropriate Engineering Controls: Local exhaust ventilation should be used to control the emission of air contaminants. General dilution ventilation may assist with the reduction of air contaminant concentrations. Emergency eye wash stations and deluge safety showers should be available in the work area.

8(c) Individual Protection Measures:

- **Respiratory Protection**: Seek professional advice prior to respirator selection and use. In the US, follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use only a NIOSH-approved respirator. In Ontario, follow CSA Standard Z94.4-11 "Selection Care and Use of Respirators" or the "NIOSH Guide to the Selection and Use of Particulate Respirators (1996)" for additional information. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. Concentration in air of the various contaminants determines the extent of respiratory protection needed. Half-face, negative-pressure, air-purifying respirator equipped with P100 filter is acceptable for concentrations up to 10 times the exposure limit. Full-face, negative-pressure, air-purifying respirator equipped with P100 filter is acceptable for concentrations up to 50 times the exposure limit. Protection by air-purifying negative-pressure and powered air respirators is limited. Use a positive-pressure-demand, full-face, supplied air respirator or self-contained breathing apparatus (SCBA) for concentrations above 50 times the exposure limit. If exposure is above the IDLH (Immediately dangerous to life or health) for any of the constituents, or there is a possibility of an uncontrolled release or exposure levels are unknown, then use a positive-demand, full-face, supplied air respirator with escape bottle or SCBA.

  Warning! Air-purifying respirators both negative-pressure, and powered-air do not protect workers in oxygen-deficient atmospheres.
- **Eyes:** Wear eye protection/face protection. A face shield should be used when appropriate to prevent contact with splashed materials. Chemical goggles, face shields or glasses should be worn to prevent eye contact. Contact lenses should not be worn where industrial exposure to this material is likely.
- **Skin:** Wear protective gloves. For operations, which in the generation of airborne particulates, use protective clothing to prevent skin contact. Take off contaminated clothing and wash before reuse. Contaminated work clothing should not be allowed out of the workplace.
- **Other Protective Equipment:** An eyewash fountain and deluge shower should be readily available in the work area.

Section 9 - Physical and Chemical Properties

9(a) Appearance (physical state, color, etc.): Gray/black solid

9(b) Odor: Odorless

9(c) Odor Threshold: ND

9(d) pH: ND

9(e) Melting Point/Freezing Point: ND

9(f) Initial Boiling Point and Boiling Range: ND

9(g) Flash Point: ND

9(h) Evaporation Rate: NA

9(i) Flammability (solid, gas): Not flammable

9(j) Upper/lower Flammability or Explosive Limits: ND

9(k) Vapor Pressure: NA

9(l) Vapor Density (Air = 1): NA

9(m) Relative Density: ND

9(n) Solubility(ies): ND

9(o) Partition Coefficient n-octanol/water: ND

9(p) Auto-ignition Temperature: ND

9(q) Decomposition Temperature: ND

9(r) Viscosity: ND

NA - Not Applicable

ND - Not Determined for product as a whole

Section 10 - Stability and Reactivity

10(a) Reactivity: Not Determined (ND) for product as a whole.

10(b) Chemical Stability: Iron Desulphurization Slag Fines is stable under normal storage and handling conditions.

10(c) Possibility of Hazardous Reaction: Not Known

10(d) Conditions to Avoid: Calcium oxide will react with water to form calcium hydroxide.

10(e) Incompatible Materials: Iron oxide dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

10(f) Hazardous Decomposition Products: Oxides of carbon, metal oxides and toxic vapors may be releases at elevated temperatures.

Section 11 - Toxicological Information

11(a-g) Information on Toxicological Effects: The following toxicity data have been determined for **Iron Desulphurization Slag Fines** using the information available for its components applied to the guidance on the preparation of an SDS under the requirements of the GHS:

Hazard Classifications	Hazard Category		Hazard Symbols	Signal Word	Hazard Statement
	EU	OSHA / WHMIS			
Acute Toxicity Hazard (covers Categories 1-5)	NA*	4[a]		**Warning**	Harmful if swallowed
Skin Irritation (covers Categories 1-3)	NA*	2[b]		**Warning**	Causes skin irritation
Eye Damage/Irritation (covers Categories 1, 2A, and 2B)	NA*	1[c]		**Danger**	Causes serious eye damage
Specific Target Organ Toxicity (STOT) Following Single Exposure (covers Categories 1-3)	NA*	3[f]		**Warning**	May cause respiratory irritation
STOT following Repeated Exposure (covers Categories 1 and 2)	NA*	1[g]		**Danger**	Causes damage to lungs through prolonged or repeated exposure.

* Not Applicable.

Toxicological data listed below are presented regardless to classification criteria. Individual hazard classification categories where the toxicological information has met or exceeded a classification criteria threshold are listed above.

a. No LC_{50} or LD_{50} has been established for **Iron Desulphurization Slag Fines** as a mixture. The following data has been determined for the components:

- **Iron Oxide:** LD_{50}= >10,000 mg/kg (Oral/ Rat)
- **Calcium Oxide:** LD_{50}= >500 mg/kg but < 2000 mg/kg (Oral/ Rat)
- **Aluminum Oxide:** LD_{50}= >5,000 mg/kg (Oral/ Rat)
- **Manganese:** Mn single oral exposures, LD_{50} ranged from 275 to 804 mg/kg body weight per day for manganese chloride in different rat strains
- **Sulfur:** LD_{50} = 2500 mg/kg (Oral/Rabbit)

b. No Skin Irritation data available for **Iron Desulphurization Slag Fines** as a mixture. The following Skin Irritation information was found for the components:

- **Iron Oxide:** Moderately irritating.
- **Calcium Oxide:** Causes human skin irritation with repeat exposures.
- **Magnesium Oxide:** Slight skin irritation noted in worker survey.

c. No Eye Irritation data available for **Iron Desulphurization Slag Fines** as a mixture. The following Eye Irritation information was found for the components:

- **Iron Oxide:** Severely irritating; may cause burns.
- **Calcium Oxide:** Risk of serious damage to eyes; human data.
- **Magnesium Oxide:** Slight eye irritation noted in worker survey.

d. No Germ Cell Mutagenicity data available for **Iron Desulphurization Slag Fines** as a mixture. The following Germ Cell Mutagenicity information was found for the components:

- **Iron Oxide:** Both positive and negative data.
- **Manganese:** Inconsistent results in genotoxicity tests.

e. No Carcinogenicity data available for **Iron Desulphurization Slag Fines** as a mixture. The following carcinogenicity information was found for the components:

- **Welding Fumes -** IARC Group 1 carcinogen, carcinogenic to humans.
- **Iron Oxide:** TLV-A4
- **Silica, Amorphous:** IARC 3

f. No Specific Target Organ Toxicity (STOT) Following Single Exposure data available for **Iron Desulphurization Slag Fines** as a mixture. The following STOT Following Single Exposure information was found for the components:

- **Calcium Oxide:** Respiratory irritation from breathing fine particles in human subjects.
- **Magnesium Oxide:** Slight respiratory tract irritation is expected with inhalation of powder.

g. No Specific Target Organ Toxicity (STOT) Following Repeated Exposure data available for **Iron Desulphurization Slag Fines** as a mixture. The following STOT Following Repeated Exposure information was found for the components:

- **Manganese:** Neurobehavioral alterations in worker populations with Mn including: speed and coordination of motor function are especially impaired.
- **Aluminum Oxide:** Chronic exposure to aluminum flake has been reported to cause pneumoconiosis in workers. Repeat oral exposure to aluminum results in decrements in neurobehavioral function and development.

Section 11 - Toxicological Information (continued)

11(a-g) Information on Toxicological Effects (continued):

The above toxicity information was determined from available scientific sources to illustrate the prevailing posture of the scientific community. The scientific resources includes: The American Conference of Governmental Industrial Hygienist (ACGIH) Documentation of the Threshold Limit Values (TLVs) and Biological Exposure indices (BEIs) with Other Worldwide Occupational Exposure Values 2017, The International Agency for Research on Cancer (IARC), The National Toxicology Program (NTP) updated documentation, the World Health Organization (WHO) and other available resources, the International Uniform Chemical Information Database (IUCLID), European Union Risk Assessment Report (EU-RAR), Concise International Chemical Assessment Documents (CICAD), European Union Scientific Committee for Occupational Exposure Limits (EU -SCOEL), Agency for Toxic Substances and Disease Registry (ATSDR), Hazardous Substance Data Bank (HSDB), and International Programme on Chemical Safety (IPCS).

The following health hazard information is provided regardless to classification criteria and is based on the individual component(s) and potential resultant components from further processing:

Acute Effects by component:

- **Iron Oxide:** Contact with iron oxide has been reported to cause skin irritation and serious eye damage.
- **Silica, Fused:** Not Reported/Not Classified
- **Calcium Oxide:** Calcium oxide is an eye and skin irritant.
- **Magnesium Oxide:** Headache, cough, sweating, nausea and fever may be caused by exposure to freshly formed fumes. The symptoms of metal fume fever do not become manifest until 4-12 hours after exposure.
- **Aluminum Oxide:** Inhalation may cause cough.
- **Manganese:** Manganese is harmful if swallowed.
- **Carbon:** Not Reported/ Not classified.
- **Sulfur:** Sulfur is harmful if swallowed, causes skin and eye irritation.

Delayed (chronic) Effects by Component: Individuals with chronic respiratory disorders (i.e., asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by any fume or airborne particulate matter exposure. Persons with pre-existing skin disorders may be more susceptible to dermatitis. Chronic inhalation of metallic fumes and dusts are associated with the following conditions:

- **Iron Oxide:** Chronic inhalation of excessive concentrations of iron oxide fumes or dusts may result in the development of a benign lung disease, called siderosis, which is observable as an X-ray change. No physical impairment of lung function has been associated with siderosis. Inhalation of excessive concentrations of ferric oxide may enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens. Iron oxide is listed as a Group 3 (not classifiable) carcinogen by the International Agency for Research on Cancer (IARC).
- **Silica, Fused:** Silicon dusts are a low health risk by inhalation and should be treated as a nuisance dust. Eye contact with pure material can cause particulate irritation. Skin contact with silicon dusts may cause physical abrasion.
- **Calcium:** Depending on the concentration and duration of exposure, repeated or prolonged inhalation may cause inflammation of the respiratory passages, ulcers of the mucous membranes, and possible perforation of the nasal septum. Repeated or prolonged skin contact may cause dermatitis.
- **Magnesium Oxide:** Irritation of eyes, nose, and throat. Symptoms may include dryness of nose and mouth, cough, feeling of weakness, tightness of chest, muscular pain, chills, fever, headache, nausea, and vomiting.
- **Aluminum Oxide:** Considered to be an inert or nuisance dust. Aluminum dusts/fines are a low health risk by inhalation and should be treated as a nuisance dust.
- **Manganese:** Chronic exposure to high concentrations of manganese fumes and dusts may adversely affect the central nervous system with symptoms including languor, sleepiness, weakness, emotional disturbances, spastic gait, mask-like facial expression and paralysis. Animal studies indicate that manganese exposure may increase susceptibility to bacterial and viral infections. Occupational overexposure (Manganese) is a progressive, disabling neurological syndrome that typically begins with relatively mild symptoms and evolves to include altered gait, fine tremor, and sometimes psychiatric disturbances. May cause damage to lungs with repeated or prolonged exposure. Worker populations exposed to MnO have had reports including: impairment of speed and coordination of motor function.
- **Carbon:** Chronic inhalation may lead to decreased lung function.
- **Sulfur:** Sulfur compounds, present in the fumes, may irritate the skin, eyes, lungs and gastrointestinal tract. May cause damage to the lung from prolonged or repeated exposure, Sulfur dioxide vapor is irritating to the respiratory tract and can cause lung damage with repeated or prolonged exposure.

Section 12 - Ecological Information

12(a) Ecotoxicity (aquatic & terrestrial): No data available for the product, **Iron Desulphurization Slag Fines** as a whole. However, individual components of the product have been found to be toxic to the environment. Metal dusts may migrate into soil and groundwater and be ingested by wildlife as follows:

- **Iron Oxide**: LC_{50}: >1000 mg/L; Fish
- **Calcium Oxide**: LC_{50}: 159 mg/L; invertebrates
- **Aluminum Oxide:** LC_{50}: >100 mg/L; Fish and algae

12(b) Persistence & Degradability: No Data Available

12(c) Bioaccumulative Potential: No Data Available

12(d) Mobility (in soil): No Data Available

12(e) Other Adverse Effects:

Note: The listing of regulations relating to a Stelco product may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.

Section 12 - Ecological Information (continued)

Additional Information:

Hazard Category: Not Reported

Signal Word: No Signal Word

Hazard Symbol: No Symbol

Hazard Statement: No Statement

Section 13 - Disposal Considerations

Disposal: Dispose of contents/containers in accordance with federal, provincial, state and local regulations.

Container Cleaning and Disposal: Follow applicable federal, provincial, state and local regulations. Observe safe handling precautions. European Waste Catalogue (EWC): 10-02-99 (wastes not otherwise specified), 16-03-04 (inorganic wastes other than those mentioned in 16-03-03).

Please note this information is for Iron Desulphurization Slag Fines in its original form. Any alterations can void this information.

Section 14 - Transport Information

14 (a-g) Transportation Information:

TDG/US Department of Transportation (DOT) under federal TDG and 49 CFR 172.101 does not regulate **Iron Desulphurization Slag Fines** as a hazardous material. All federal, provincial, state, and local laws and regulations that apply to the transport of this type of material must be adhered to.

Shipping Name: NA **Shipping Symbols:** NA **Hazard Class:** NA **UN No.:** NA **Packing Group:** NA **DOT/ IMO Label:** NA **Special Provisions (172.102):** NA	**Packaging Authorizations** **a) Exceptions:** NA **b) Non-bulk:** NA **c) Bulk:** NA	**Quantity Limitations** **a) Passenger, Aircraft, or Railcar:** NA **b) Cargo Aircraft Only:** NA **Vessel Stowage Requirements** **a) Vessel Stowage:** NA **b) Other:** NA **DOT Reportable Quantities**: NA

International Maritime Dangerous Goods (IMDG) and the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) classification, packaging and shipping requirements follow the US DOT Hazardous Materials Regulation.

Regulations Concerning the International Carriage of Dangerous Goods by Road (ADR) does not regulate **Iron Desulphurization Slag Fines** as a hazardous material.

Shipping Name: NA **Classification Code:** NA **UN No.:** NA **Packing Group:** NA **ADR Label:** NA **Special Provisions:** NA **Limited Quantities:** NA	**Packaging** **a) Packing Instructions:** NA **b) Special Packing Provisions:** NA **c) Mixed Packing Provisions:** NA	**Portable Tanks & Bulk Containers** **a) Instructions:** NA **b) Special Provisions:** NA

International Air Transport Association (IATA) considers does not regulate **Iron Desulphurization Slag Fines** as a hazardous material.

Shipping Name: NA **Class/Division:** NA **Hazard Label (s):** NA **UN No.:** NA **Packing Group:** NA **Excepted Quantities (EQ):** NA	**Passenger & Cargo Aircraft Limited Quantity (EQ)**		**Cargo Aircraft Only** **Pkg Inst:** NA **Max Net Qty/Pkg:** NA	**Special Provisions:** NA **ERG Code:** NA
	Pkg Inst: NA **Max Net Qty/Pkg:** NA	**Pkg Inst:** NA **Max Net Qty/Pkg:** NA		

Pkg Inst – Packing Instructions Max Net Qty/Pkg – Maximum Net Quantity per Package ERG – Emergency Response Drill Code

Transport Dangerous Goods (TDG) Classification: Iron Desulphurization Slag Fines does not have a TDG classification.

Section 15 - Regulatory Information

Regulatory Information: *The following listing of regulations relating to a Stelco product may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.* This product and/or its constituents are subject to the following regulations:

OSHA Regulations: Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-2, Z-3): The product, **Iron Desulphurization Slag Fines** as a whole is not listed. However, individual components of the product are listed: Refer to Section 8, Exposure Controls and Personal Protection.

EPA Regulations: Iron Desulphurization Slag Fines is listed as a whole on the TSCA Inventory. In addition, individual components of the product are listed:

Components	Regulations
Manganese	CAA, CERCLA, SARA 313

Regulations Key:

CAA Clean Air Act (42 USC Sec. 7412; 40 CFR Part 61 [As of: 8/18/06]), No ingredients are listed.

CERCLA Comprehensive Environmental Response, Compensation and Liability Act (42 USC secs. 9601(14), 9603(a); 40 CFR Sec. 302.4, Table 302.4, Table 302.4 and App. A)

CWA Clean Water Act (33 USC secs. 1311; 1314(b), (c), (e), (g); 136(b), (c); 137(b), (c) [as of 8/2/06])

RCRA Resource Conservation Recovery Act (42 USC Sec. 6921; 40 CFR Part 261 App VIII)

SARA Superfund Amendments and Reauthorization Act of 1986 Title III Section 302 Extremely Hazardous Substances (42 USC secs. 11023, 13106; 40 CFR Sec. 372.65) and Section 313 Toxic Chemicals (42 USC secs. 11023, 13106; 40 CFR sec. 372.65 [as of 6/30/05])

TSCA Toxic Substance Control Act (15 U.S.C. s/s 2601 et seq. [1976])

SDWA Safe Drinking Water Act (42 U.S.C. s/s 300f et seq. [1974])

SARA Potential Hazard Categories: Immediate Acute Health Hazard; Delayed Chronic Health Hazard

Section 313 Supplier Notification: This product, **Iron Desulphurization Slag Fines,** contains the following toxic chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372:

CAS #	Chemical Name	Percent by Weight
7439-96-5	Manganese	2 max

State Regulations: The product, **Iron Desulphurization Slag Fines,** as a whole is not listed in any state regulations. However, individual components of the product are listed in various state regulations:

Pennsylvania Right to Know: The product, **Iron Desulphurization Slag Fines,** contains regulated material in the following categories:

- **Hazardous Substances:** Iron Oxide, Calcium Oxide, Magnesium Oxide, and Sulfur
- **Environmental Hazards:** Manganese, Aluminum Oxide

California Prop. 65: The product, **Iron Desulphurization Slag Fines,** does not contain metallic elements known to the State of California to cause cancer or reproductive toxicity.

New Jersey: The product, **Iron Desulphurization Slag Fines,** contains regulated material in the following categories:

- **Hazardous Substance:** Iron Oxide, Calcium oxide, Silica(Fused), Manganese

Minnesota: Calcium Oxide, Magnesium Oxide, Manganese, and Aluminum Oxide

Massachusetts: Iron Oxide, Calcium Oxide, Silica(Fused), Manganese, Aluminum Oxide, and Sulfur

Other regulations: The product, **Iron Desulphurization Slag Fines,** as a whole may not be listed in other regulations. However, individual components of the product may be listed, check appropriate regulations for further regulatory compliance.

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations and the SDS contains all the information required by the Hazardous Products Regulations.

Section 16 - Other Information

Prepared By: Stelco Inc.

Revision History:

06/30/2017 – Update to Stelco

05/10/2011 – Update of content and format to comply with GHS

Additional Information:

Hazardous Material Identification System (HMIS) Classification

Health Hazard	1
Fire Hazard	0
Physical Hazard	0

HEALTH= **1**, * Denotes possible chronic hazard if airborne dusts or fumes are generated Irritation or minor reversible injury possible.

FIRE= **0**, Materials that will not burn.

PHYSICAL HAZARDS = **0**, Materials that are normally stable, even under fire conditions, will not react with water, polymerize, decompose, condense, or self-react. Non-explosives.

National Fire Protection Association (NFPA)

HEALTH = **1**, Exposure could cause irritation but only minor residual injury even if no treatment is given.

FIRE = **0,** Materials that will not burn.

INSTABILITY = **0**, Normally stable, even under fire exposure conditions, and are not and reactive with water.

Section 16 - Other Information (continued)

ABBREVIATIONS/ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	**NIF**	No Information Found
BEIs	Biological Exposure Indices	**NIOSH**	National Institute for Occupational Safety and Health
CAS	Chemical Abstracts Service	**NTP**	National Toxicology Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	**ORC**	Organization Resources Counselors
CFR	Code of Federal Regulations	**OSHA**	Occupational Safety and Health Administration
CNS	Central Nervous System	**PEL**	Permissible Exposure Limit
GI, GIT	Gastro-Intestinal, Gastro-Intestinal Tract	**PNOR**	Particulate Not Otherwise Regulated
HMIS	Hazardous Materials Identification System	**PNOC**	Particulate Not Otherwise Classified
IARC	International Agency for Research on Cancer	**PPE**	Personal Protective Equipment
LC50	Median Lethal Concentration	**ppm**	parts per million
LD50	Median Lethal Dose	**RCRA**	Resource Conservation and Recovery Act
LD_{Lo}	Lowest Dose to have killed animals or humans	**RTECS**	Registry of Toxic Effects of Chemical Substances
LEL	Lower Explosive Limit	**SARA**	Superfund Amendment and Reauthorization Act
$\mu g/m^3$	microgram per cubic meter of air	**SCBA**	Self-contained Breathing Apparatus
mg/m^3	milligram per cubic meter of air	**STEL**	Short-term Exposure Limit
mppcf	million particles per cubic foot	**TLV**	Threshold Limit Value
SDS	Safety Data Sheet	**TWA**	Time-weighted Average
MSHA	Mine Safety and Health Administration	**UEL**	Upper Explosive Limit
MOL	Ontario Ministry of Labour	**WHMIS**	Workplace Hazardous Materials Information System
NFPA	National Fire Protection Association		

Disclaimer: This information is taken from sources or based upon data believed to be reliable. However, Stelco Inc. makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional or other measures may not be required under particular conditions.

Iron Desulphurization Slag Fines

Signal Word: DANGER

Symbols:

HAZARD STATEMENTS:

Causes damage to lungs through prolonged or repeated exposure.

Causes serious eye damage.

Causes skin irritation.

Harmful if swallowed.

May cause respiratory irritation.

PRECAUTIONARY STATEMENTS

Do not breathe dusts or fume.

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

Wash thoroughly after handling.

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

Use only outdoors or in a well-ventilated area. Get medical advice/attention if you feel unwell.

If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

If swallowed: Rinse mouth. Do **NOT** induce vomiting. Call a poison control center or doctor/physician if you feel unwell.

Store locked up.

Dispose of contents in accordance with federal, provincial, state and local regulations.

Stelco Inc.
386 Wilcox Street
Hamilton, ON L8L 8K5
Phone Number : (905) 528-2511 (8:00 am to 5:00 pm)
Emergency Contact: 1-888-226-8832 (CANUTEC)

Original Issue Date: 05/10/2011
Revised: 06/30/2017