

SDS ID No.: CLF-011

## Safety Data Sheet (SDS)

### Section 1 – Identification

**1(a) Product Identifier used on Label:** Electrical Grade Steel Sheet

**1(b) Other means of identification:** Refer to Section 16.0 for product synonyms

**1(c) Recommended use of the chemical and restrictions on use:** Electrical steel products are sold to various steel-consuming industries manufacturing next generation hyper-efficient transformers, generators, and motors. The main markets for these products are the electrical power grid and automotive hybrid and electric vehicles.

**1(d) Name, address, and telephone number:**

Cleveland-Cliffs Steel  
1 South Dearborn Street  
Chicago, IL 60603-9888


Phone number: 219-787-4901 or  
email at: [sdssupport@clevelandcliffs.com](mailto:sdssupport@clevelandcliffs.com)

**1(e) Emergency phone number:** 1-760-476-3962 (Versik 3E Company Code: 333211) or CHEMTREC (Day or Night): 1-800-424-9300

### Section 2 – Hazard(s) Identification

**2(a) Classification of the chemical:** Electrical Grade Steel Sheet is considered an article under Reach regulation (REACH REGULATION (EC) No 1907/2006) and is not subject to classification under CLP regulation (REGULATION (EC) No 1272/2008). However, **Electrical Grade Steel Sheet** is not exempt as an article under OSHA's Hazard Communication Standard (29 CFR 1910.1200) due to its downstream use, thus this product is considered a mixture and a hazardous material. Therefore, the categories of Health Hazards as defined in "GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS), Third revised edition ST/SG/AC.10/30/Rev. 3" United Nations, New York and Geneva, 2009 have been evaluated. 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)
	Oral Toxicity - Oral - 4 Single Target Organ Toxicity (STOT) Repeat Exposure - 3	WARNING	Harmful if swallowed. May cause respiratory irritation. Causes eye irritation.
NA	Eye Irritation - 2B		

**Precautionary Statement(s):**

Prevention	Response	Storage/Disposal
Avoid breathing dusts / fume / gas / mist / vapor / spray. Use only outdoors or in well-ventilated areas. Wash thoroughly after handling. Do not eat, drink or smoke when using this product.	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. If eye irritation persists: Get medical advice/attention. If swallowed: Call a poison center or doctor/physician if you feel unwell. Rinse mouth.	Dispose of contents in accordance with federal, state and local regulations.

**2(c) Hazards not otherwise classified:** None Known

**2(d) Unknown acute toxicity statement (mixture):** None Known

### 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
<b>Base Metal (Noncoated, Standard Surface Finish, Bare, C-0 per ASTM A 976)</b>			
Iron	7439-89-6	231-096-4	93 - 98
Silicon	7440-21-3	231-130-8	1.2 – 3.5
Chromium	7440-47-3	231-157-5	0 – 1.5

EC - European Community

CAS - Chemical Abstract Service

Commercial steel products contain small amounts of various elements in addition to those specified. These small quantities frequently referred to as "trace" or "residual" elements, generally originate in the raw materials used and/or are alloying metals. Individual trace elements vary in concentration by weight, and may include aluminum, boron, calcium, carbon, columbium (niobium), copper, manganese, molybdenum, nickel, phosphorus, sulfur, titanium, and vanadium.

Note: Product surfaces may be treated with small amounts (<1.0%) of coatings for electrical insulation and other purposes, applied at the customer's request. Refer to the coating manufacturer's SDS for hazards associated with coatings. Refer to the following table for additional information.

### Section 3 – Composition/Information on Ingredients (concentration)

#### 3(a-c) Chemical name, common name (synonyms), CAS number and other identifiers, and concentration (concentration):

##### Coating (if applicable) <sup>1</sup>

Chemical Name	CAS Number	EC Number	% Weight <sup>2</sup>
<b>Mill – Anneal and Carlite 3 (Mill-Anneal C-2 per ASTM A 976)</b>			
Silicon Dioxide	7631-86-9	231-545-4	43
Magnesium Oxide	1309-48-4	215-171-9	57
<b>Carlite (C-5 per ASTM A 976)</b>			
Silicon Dioxide	7631-86-9	231-545-4	49
Phosphorus pentoxide	1314-56-3	215-236-1	34
Chromium Oxide	1308-38-9	215-160-9	9
Aluminum Oxide	1344-28-1	215-691-6	4
Magnesium Oxide	1309-48-4	215-171-9	4
<b>C-3</b>			
Phenolic Resin	NA	NA	100
<b>C-5</b>			
Styrene-Acrylic Resin	NA	NA	15-20
Aluminum Orthophosphate	7784-30-7	232-056-9	35-45
Kaolin	1332-58-7	265-064-6	20-25
Mica	12001-26-2	215-479-3	20-25
<b>C-5-A <sup>3</sup></b>			
Silicon Dioxide	7631-86-9	231-545-4	49
Phosphorus pentoxide	1314-56-3	215-236-1	34
Chromium Oxide	1308-38-9	215-160-9	9
Aluminum Oxide	1344-28-1	215-691-6	4
Magnesium Oxide	1309-48-4	215-171-9	4
<b>C-5-R</b>			
Aluminum Orthophosphate	7784-30-7	232-056-9	75
Silicon Dioxide	7631-86-9	231-545-4	25

1. Coatings represent less than 1% of total percent weight of product.

2. Percentages are expressed as typical ranges or maximum concentrations of elements in the coating, for the purpose of communicating the potential hazards of the finished product.

3. Coating may contain trace amounts of hexavalent chromium (Cr VI).

### Section 4 – First-aid Measures

#### 4(a) Description of necessary measures:

- **Inhalation: Electrical Grade Steel Sheet** as sold/shipped is not a likely form of exposure. However, during further processing (welding, grinding, burning, etc.), if inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: Get medical advice/attention.
- **Eye Contact: Electrical Grade Steel Sheet** as sold/shipped is not a likely form of exposure. However, during further processing (welding, grinding, burning, etc.), if in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue Rinsing. If eye irritation persists: Get medical advice attention. If exposed, concerned or feel unwell: Get medical advice/attention.
- **Skin Contact:** If on skin: Wash thoroughly after handling. Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off and wash contaminated clothing before reuse. If exposed, concerned or feel unwell: Get medical advice/attention.
- **Ingestion: Electrical Grade Steel Sheet** as sold/shipped is not a likely form of exposure. However, during further processing (welding, grinding, burning, etc.), if exposed, concerned or feel unwell: Get medical advice/attention.

#### 4(b) Most important symptoms/effects, acute and delayed (chronic):

- **Inhalation: Electrical Grade Steel Sheet** as sold/shipped is not likely to present an acute or chronic health effect.
- **Eye: Electrical Grade Steel Sheet** as sold/shipped is not likely to present an acute or chronic health effect.

#### 4(b) Most important symptoms/effects, acute and delayed (chronic):

- **Skin: Electrical Grade Steel Sheet** as sold/shipped is not likely to present an acute or chronic health effect.
- **Ingestion: Electrical Grade Steel Sheet** as sold/shipped is not likely to present an acute or chronic health effect.

However, during further processing (welding, grinding, burning, etc.) individual components may illicit an acute or chronic health effect. Refer to Section 11-Toxicological Information.

#### 4(c) Immediate Medical Attention and Special Treatment: None Known

### Section 5 – Fire-fighting Measures

**5(a) Suitable (and unsuitable) Extinguishing Media:** Not Applicable for **Electrical Grade Steel Sheet** as sold/shipped. Use extinguishers appropriate for surrounding materials.

**5(b) Specific Hazards arising from the chemical:** Not Applicable for **Electrical Grade Steel Sheet** as sold/shipped. When burned, toxic smoke, fume and vapor may be emitted.

**5(c) Special protective equipment and precautions for fire-fighters:** Self-contained NIOSH approved respiratory protection and full protective clothing should be worn when fumes and/or smoke from fire are present. Heat and flames cause emittance of acrid smoke and fumes. Do not release runoff from fire control methods to sewers or waterways. Firefighters should wear full face-piece self-contained breathing apparatus and chemical protective clothing with thermal protection. Direct water stream will scatter and spread flames and, therefore, should not be used.

### Section 6 - Accidental Release Measures

**6(a) Personal Precautions, Protective Equipment and Emergency Procedures:** Not Applicable for **Electrical Grade Steel Sheet** as sold/shipped. 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.

**6(b) Methods and materials for containment and clean up:** Not Applicable for **Electrical Grade Steel Sheet** as sold/shipped. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations. Follow applicable OSHA regulations (29 CFR 1910.120) and all other pertinent state and federal requirements.

### Section 7 - Handling and Storage

**7(a) Precautions for safe handling:** Not Applicable for **Electrical Grade Steel Sheet** as sold/shipped, however further processing, such as but not limited to, welding, burning, grinding, etc. may generate high concentrations of airborne particulates that should be evaluated and controlled as necessary. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoors or in well ventilated areas. Practice good housekeeping. Avoid breathing metal fumes and/or dust. Do not eat, drink or smoke when using this product. Cut resistant gloves and sleeves should be worn when working with steel products.

**7(b) Conditions for safe storage, including any incompatibilities:** Store away from acids and incompatible materials.

### Section 8 - Exposure Controls / Personal Protection

**8(a) Occupational Exposure Limits (OELs):** **Electrical Grade Steel Sheet** as sold/shipped in its physical form does not present an inhalation, ingestion or contact hazard, nor would any of the following exposure data apply. However, operations such as burning, welding (high temperature), sawing, brazing, machining, grinding, etc. may produce fumes and/or particulates. The following exposure limits are offered as reference for an experienced industrial hygienist to review.

Ingredients	OSHA PEL <sup>1</sup>	ACGIH TLV <sup>2</sup>	NIOSH REL <sup>3</sup>	IDLH <sup>4</sup>
Iron	10 mg/m <sup>3</sup> (iron oxide fume)	5.0 mg/m <sup>3</sup> (iron oxide, respirable fraction <sup>5</sup> )	5.0 mg/m <sup>3</sup> (iron oxide dust and fume)	2,500 mg/m <sup>3</sup> (as Fe)
Silicon	15 mg/m <sup>3</sup> (as total dust) 5.0 mg/m <sup>3</sup> (as respirable fraction)	NE	10 mg/m <sup>3</sup> (as total dust) 5.0 mg/m <sup>3</sup> (as respirable dust)	NE
Chromium	0.5 mg/m <sup>3</sup> (as Cr II & III, inorganic compounds) 1.0 mg/m <sup>3</sup> (as Cr, metal) 0.005 mg/m <sup>3</sup> (as Cr VI, inorganic compounds & certain water insoluble) “AL” 0.0025 mg/m <sup>3</sup> (as Cr VI, inorganic compounds & certain water insoluble)	0.003 mg/m <sup>3</sup> (as Cr III, inorganic compounds, inhalable fraction <sup>6</sup> ) “DSEN & RSEN” “water-soluble” compounds only 0.5 mg/m <sup>3</sup> (as Cr, metal, inhalable fraction) 0.0002 mg/m <sup>3</sup> (as Cr VI, inorganic compounds, water insoluble & insoluble) “STEL” 0.0005 mg/m <sup>3</sup> (as Cr VI, inorganic compounds, water insoluble & insoluble)	0.5 mg/m <sup>3</sup> (as Cr II & III, inorganic compounds & metal) 0.0002 mg/m <sup>3</sup> (as Cr VI, inorganic compounds, water insoluble & insoluble)	250 mg/m <sup>3</sup> (as Cr II & metal) 25 mg/m <sup>3</sup> (as Cr III) 15 mg/m <sup>3</sup> (as Cr VI)

NE - None Established

- 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. A Short Term Exposure Limit (STEL) is defined as a 15-minute exposure, which should not be exceeded at any time during a workday. 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.
- 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. DSEN – May cause dermal sensitization. This notation is used to indicate the potential for dermal sensitization resulting from the interaction of an absorbed agent and ultraviolet light (i.e. photosensitization). RSEN – May cause respiratory sensitization.
- 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 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.
- 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. Ca is designated as carcinogen.
- Respirable fraction. The concentration of respirable dust for the application of this limit is to be determined from the fraction passing a size-selector with the characteristics defined in ACGIH 2022 TLVs<sup>®</sup> and BEIs<sup>®</sup> Appendix D, paragraph C.
- 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 2022 TLVs<sup>®</sup> and BEIs<sup>®</sup> (Biological Exposure Indices) Appendix D, paragraph A.

### Section 8 - Exposure Controls / Personal Protection (continued)

**8(b) Appropriate Engineering Controls:** Use controls as appropriate to minimize exposure to metal fumes and dusts during handling operations. Provide general or local exhaust ventilation systems to minimize airborne concentrations. Local exhaust is necessary for use in enclosed or confined spaces. Provide sufficient general/local exhaust ventilation in pattern/volume to control inhalation exposures below current exposure limits.

- **Respiratory Protection:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use only a NIOSH-approved respirator. 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 appropriate eye protection to prevent eye contact. For operations which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use safety glasses to prevent eye contact. Contact lenses should not be worn where industrial exposures to this material are likely. Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations.
- **Skin:** Wear appropriate personal protective clothing to prevent skin contact. Cut resistant gloves and sleeves should be worn when working with steel products. For operations which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use protective clothing, and gloves to prevent skin contact. Protective gloves should be worn as required for welding, burning or handling operations. Contaminated work clothing must 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.):** Solid, Metallic Gray  
(appearance may vary based on coating)

**9(b) Odor:** Odorless

**9(c) Odor Threshold:** NA

**9(d) pH:** NA

**9(e) Melting Point/Freezing Point:** ~2750 °F (~1510 C)

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

**9(g) Flash Point:** NA

**9(h) Evaporation Rate:** NA

**9(i) Flammability (solid, gas):** Non-flammable, non-combustible

NA - Not Applicable

ND - Not Determined for product as a whole

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

**9(k) Vapor Pressure:** NA

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

**9(m) Relative Density:** 7.60 – 7.75 g/cm<sup>3</sup>

**9(n) Solubility(ies):** Insoluble

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

**9(p) Auto-ignition Temperature:** NA

**9(q) Decomposition Temperature:** ND

**9(r) Viscosity:** NA

### Section 10 - Stability and Reactivity

**10(a) Reactivity:** Not Determined (ND) for product in a solid form. Do not use water on molten metal.

**10(b) Chemical Stability:** Steel products are stable under normal storage and handling conditions.

**10(c) Possibility of hazardous reaction:** None Known




**10(d) Conditions to Avoid:** Storage with strong acids or calcium hypochlorite.

**10(e) Incompatible Materials:** Will react with strong acids to form hydrogen. Iron oxide dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

**10(f) Hazardous Decomposition Products:** Thermal oxidative decomposition of steel products can produce fumes containing oxides of iron and manganese as well as other alloying elements.

## Section 11 - Toxicological Information

**11 Information on toxicological effects:** The following toxicity data has been determined for **Electrical Grade Steel Sheet** when further processed using the information available for its components applied to the guidance on the preparation of an SDS under the GHS requirements of OSHA and the EU CPL:

Hazard Classification	Hazard Category		Hazard Symbols	Signal Word	Hazard Statement
	EU	OSHA			
<b>Acute Toxicity Hazard</b> (covers Categories 1-4)	NA*	4 <sup>a</sup>		<b>Warning</b>	Harmful if swallowed.
<b>Eye Damage/ Irritation</b> (covers Categories 1, 2A and 2B)	NA*	2B <sup>c</sup>	No Pictogram	<b>Warning</b>	Causes eye irritation - Rating due to iron particulate generated from further processing (welding, grinding, burning, etc.).
<b>Specific Target Organ Toxicity (STOT) Following Single Exposure</b> (covers Categories 1-3)	NA*	3 <sup>i</sup>		<b>Warning</b>	May cause respiratory irritation. - Rating due to iron particulate or fume that can enter the body generated when further processed (welding, grinding, burning, etc.).
<b>STOT following Repeated Exposure</b> (covers Categories 1 and 2)	NA*	1 <sup>j</sup>		<b>Danger</b>	Causes damage to lungs and central nervous system through prolonged or repeated inhalation exposure. - Rating due particulate or fume that can enter the body generated when further processed (welding, grinding, burning, etc.).

\* Not Applicable - Semi-formed steel products are considered articles under Reach regulation (REACH REGULATION (EC) No 1907/2006) and are not subject to classification under CLP regulation (REGULATION (EC) No 1272/2008).

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<sub>50</sub> or LD<sub>50</sub> has been established for **Electrical Grade Steel Sheet**. The following data has been determined for the components:

- **Iron:** Rat LD<sub>50</sub> = 98.6 g/kg (REACH)  
Rat LD<sub>50</sub> = 1060 mg/kg (IUCLID)  
Rat LD<sub>50</sub> = 984 mg/kg (IUCLID)  
Rabbit LD<sub>50</sub> = 890 mg/kg (IUCLID)  
Guinea Pig LD<sub>50</sub> = 20 g/kg (TOXNET)
- **Silicon:** LD<sub>50</sub> = 3160 mg/kg (Oral/Rat)

b. No Skin (Dermal) Irritation data available for **Electrical Grade Steel Sheet** as a mixture or its components.

c. No Eye Irritation data available for **Electrical Grade Steel Sheet** as a mixture. The following Eye Irritation information was found for the components:

- **Iron:** Causes eye irritation.
- **Silicon:** Slight eye irritation in rabbit protocol.

d. No Skin (Dermal) Sensitization data available for **Electrical Grade Steel Sheet** as a mixture or its components.

e. No Respiratory Sensitization data available for **Electrical Grade Steel Sheet** as a mixture or its components.

f. No Germ Cell Mutagenicity data available for **Electrical Grade Steel Sheet** as a mixture. The following Mutagenicity and Genotoxicity information was found for the components:

- **Iron:** IUCLID has found some positive and negative findings in vitro.

g. Carcinogenicity: IARC, NTP, and OSHA do not list **Electrical Grade Steel Sheet** as carcinogens. The following Carcinogenicity information was found for the components:

- **Iron Oxide (Fe<sub>2</sub>O<sub>3</sub>):** IARC-3, unclassifiable as to carcinogenicity in humans; ACGIH TLV-A4, not classifiable as a human carcinogen
- **Chromium (as metal):** IARC-3, unclassifiable as to carcinogenicity in humans; EPA-A, human carcinogen (inhalation), EPA-K, known human carcinogen (inhalation), EPA-D, not classifiable as a human carcinogen (oral), EPA-CBD, cannot be determined (oral)
- **Chromium (as trivalent chromium III, inorganic compounds):** IARC-3 (organic & inorganic compounds), unclassifiable as to carcinogenicity in humans; ACGIH TLV-A4, not classifiable as a human carcinogen; EPA-D, not classifiable as to human carcinogenicity (CBD, cannot be determined)
- **Chromium (hexavalent, VI, inorganic water-soluble & soluble compounds):** IARC-1, carcinogen to humans; ACGIH TLV-A1, confirmed human carcinogen; NIOSH-Ca, potential occupational carcinogen; NTP-K, known to be a carcinogen; EPA-A, human carcinogen (inhalation), EPA-K, known human carcinogen (inhalation), EPA-D, not classifiable as a human carcinogen (oral), EPA-CBD, cannot be determined (oral)
- **Welding Fumes** - IARC-1, carcinogen to humans; NIOSH-Ca, potential occupational carcinogen

h. No Toxic Reproduction data available for **Electrical Grade Steel Sheet** as a mixture or its components.

i. No Specific Target Organ Toxicity (STOT) following a Single Exposure data available for **Electrical Grade Steel Sheet** as a mixture. The following STOT following a Single Exposure data was found for the components:

- **Iron:** Irritating to Respiratory tract.

j. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data was available for **Electrical Grade Steel Sheet** as a mixture or its components.

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 2022, 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 ... (continued)



## Section 11 - Toxicological Information (continued)

### 11 Information on toxicological effects (continued):

... (continued) Toxic Substances and Disease Registry (ATSDR), Hazardous Substance Data Bank (HSDB), and International Programme on Chemical Safety (IPCS), European Union Classification, Labeling and Packaging, (EU CPL), Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), International Uniform Chemical Information Database (IUCILID), TOXicology Data NETwork (TOXNET), European Risk Assessment Reports (EU RAR).

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:

- **Inhalation:** Excessive exposure to high concentrations of metal 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 micrometer and usually between 0.02-0.05 micrometers 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. Freshly formed oxide fumes of manganese have been associated with causing metal fume fever.
- **Eye:** Excessive exposure to high concentrations of metal dust may cause irritation to the eyes.
- **Skin:** Skin contact with metal dusts may cause irritation or sensitization, possibly leading to dermatitis. Skin contact with metallic fumes and dusts may cause physical abrasion.
- **Ingestion:** Ingestion of harmful amounts of this product as distributed is unlikely due to its solid insoluble form. Ingestion of metal dust may cause nausea or vomiting.

#### Acute Effects by component:

- **Iron and iron oxides:** Iron is harmful if swallowed, causes skin irritation, and causes eye irritation. Contact with iron oxide has been reported to cause skin irritation and serious eye damage. Particles of iron or iron compounds, which become imbedded in the eye, may cause rust stains unless removed fairly promptly.
- **Silicon and silicon oxides:** May be harmful if swallowed.
- **Chromium, chromium oxides and hexavalent chrome:** Hexavalent chrome causes damage to gastrointestinal tract, lung, severe skin burns and eye damage, serious eye damage, skin contact may cause an allergic skin reaction. Inhalation may cause allergic or asthmatic symptoms or breathing difficulties.

#### Delayed (chronic) Effects by component:

- **Iron and iron oxides:** Chronic inhalation of excessive concentrations of iron oxide fumes or dusts may result in the development of a benign pneumoconiosis, 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.
- **Silicon and silicon oxides:** 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.
- **Chromium, chromium oxides and hexavalent chromium:** The health hazards associated with exposure to chromium are dependent upon its oxidation state. The metal form (chromium as it exists in this product) is of very low toxicity. The hexavalent form is very toxic. Repeated or prolonged exposure to hexavalent chromium compounds may cause respiratory irritation, nosebleed, ulceration and perforation of the nasal septum. Industrial exposure to certain forms of hexavalent chromium has been related to an increased incidence of cancer. Hexavalent chromium may cause genetic defects and is suspected of damaging the unborn child. Developmental toxicity in the mouse, suspected of damaging fertility or the unborn child.

## Section 12 - Ecological Information

**12(a) Ecotoxicity (aquatic & terrestrial):** No Data Available for **Electrical Grade Steel Sheet** as sold/shipped. However, individual components of the product when processed 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<sub>50</sub>: >1000 mg/L; Fish 48 h-EC<sub>50</sub> > 100 mg/L (Currenta, 2008k); 96 h-LC<sub>0</sub> ≥ 50,000 mg/L Test substance: Bayferrox 130 red (95 – 97% Fe<sub>2</sub>O<sub>3</sub>; < 4% SiO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub>) (Bayer, 1989a).
- **Hexavalent Chrome:** EU RAR listed as category 1, found acute EC<sub>50</sub> and LD<sub>50</sub> to algae and invertebrates < 1 mg.

**12(b) Persistence & Degradability:** No Data Available for **Electrical Grade Steel Sheet** as sold/shipped or individual components.

**12(c) Bioaccumulative Potential:** No Data Available for **Electrical Grade Steel Sheet** as sold/shipped or individual components.

**12(d) Mobility (in soil):** No data available for **Electrical Grade Steel Sheet** as sold/shipped. However, individual components of the product have been found to be absorbed by plants from soil.

**12(e) Other adverse effects:** None Known

#### Additional Information:

**Hazard Category:** Not Reported

**Signal Word:** No Signal Word

**Hazard Symbol:** No Symbol

**Hazard Statement:** No Statement

## Section 13 - Disposal Considerations

**Disposal:** Steel scrap should be recycled whenever possible. Product dusts and fumes from processing operations should also be recycled or classified by a competent environmental professional and disposed of in accordance with applicable federal, state or local regulations.

### Section 13 - Disposal Considerations (continued)

**Container Cleaning and Disposal:** Follow applicable federal, state and local regulations. Observe safe handling precautions. European Waste Catalogue (EWC): 16-01-17 (ferrous metals), 12-01-99 (wastes not otherwise specified), 16-03-04 (off specification batches and unused products), or 15-01-04 (metallic packaging).

Please note this information is for Electrical Grade Steel Sheet in its original form. Any alterations can void this information.

### Section 14 - Transport Information

#### 14 (a-g) Transportation Information:

**US Department of Transportation (DOT)** under 49 CFR 172.101 may regulate **Electrical Grade Steel Sheet** as a hazardous material under certain circumstances. All Local, State, Federal and international regulations that apply to the transport of this type of material must be adhered to.

### Section 15 - Regulatory Information

**Regulatory Information:** The following listing of regulations relating to a Cleveland-Cliffs Steel 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, **Electrical Grade Steel Sheet** 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:** The product, **Electrical Grade Steel Sheet** is not listed as a whole. However, individual components of the product may be listed depending on the coating applied.

**SARA 311/312 Potential Hazard Categories:** Immediate Acute Health Hazard; Delayed Chronic Health Hazard


**Section 313 Supplier Notification:** The product, **Electrical Grade Steel Sheet** does not contain the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act and 40 CFR part 372:

#### Regulations Key:

CAA	Clean Air Act (42 USC Sec. 7412; 40 CFR Part 61 [As of: 8/18/06])
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])

**State Regulations:** The product, **Electrical Grade Steel Sheet** 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: May contain regulated material, depending on coating applied.

California Prop. 65:  **WARNING:** This product, **Electrical Grade Steel Sheet** can expose you to chemicals including chromium (hexavalent chromium compounds) which is known to the State of California to cause cancer; and chromium (hexavalent chromium compounds) which is known to the State of California to cause reproductive toxicity. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

New Jersey: May contain regulated material, depending on coating applied.

Minnesota: May contain regulated material, depending on coating applied.

Massachusetts: May contain regulated material, depending on coating applied.

#### Other Regulations:

**WHMIS Classification (Canadian):** The product, **Electrical Grade Steel Sheet** is not listed as a whole. However individual components are listed.

Ingredients	WHMIS Classification
Iron	Combustible dusts - Category 1 (may form combustible dust concentrations in air)
Silicon	Flammable solids - Category 2 (The classification "Flammable solids" refers to the amorphous form of silicon powder); Combustible dusts *
Chromium	Combustible dusts**

\* This product belongs to the hazard class "Combustible dust" if 5% or more by weight of its composition has a particle size < 500 µm.

\*\*This product belongs to the hazard class "Combustible dust" if 5% or more by weight of its composition has a particle size < 500 µm.

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

### Section 16 - Other Information

**Prepared By:** Cleveland-Cliffs Steel

**Original Issue Date:** 10/05/2002

**Revised Date:** 3/24/2023

## Section 16 - Other Information (continued)

**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 HAZARD= 0, Materials that are normally stable, even under fire conditions, and 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.

FLAMMABILITY = 0, Materials that will not burn.

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

**ABBREVIATIONS/ACRONYMS:**

<b>ACGIH</b>	American Conference of Governmental Industrial Hygienists	<b>NIF</b>	No Information Found
<b>BEIs</b>	Biological Exposure Indices	<b>NIOSH</b>	National Institute for Occupational Safety and Health
<b>CAS</b>	Chemical Abstracts Service	<b>NTP</b>	National Toxicology Program
<b>CERCLA</b>	Comprehensive Environmental Response, Compensation, and Liability Act	<b>ORC</b>	Organization Resources Counselors
<b>CLP</b>	Classification, Labelling and Packaging	<b>OSHA</b>	Occupational Safety and Health Administration
<b>CFR</b>	Code of Federal Regulations	<b>PEL</b>	Permissible Exposure Limit
<b>CNS</b>	Central Nervous System	<b>PNOR</b>	Particulate Not Otherwise Regulated
<b>GI, GIT</b>	Gastro-Intestinal, Gastro-Intestinal Tract	<b>PNOC</b>	Particulate Not Otherwise Classified
<b>HMIS</b>	Hazardous Materials Identification System	<b>PPE</b>	Personal Protective Equipment
<b>IARC</b>	International Agency for Research on Cancer	<b>ppm</b>	parts per million
<b>LC50</b>	Median Lethal Concentration	<b>RCRA</b>	Resource Conservation and Recovery Act
<b>LD50</b>	Median Lethal Dose	<b>REACH</b>	Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals
<b>LD<sub>Lo</sub></b>	Lowest Dose to have killed animals or humans	<b>RTECS</b>	Registry of Toxic Effects of Chemical Substances
<b>LEL</b>	Lower Explosive Limit	<b>SARA</b>	Superfund Amendment and Reauthorization Act
<b>LOEL</b>	Lowest Observed Effect Level	<b>SCBA</b>	Self-contained Breathing Apparatus
<b>LOAEC</b>	Lowest Observable Adverse Effect Concentration	<b>SDS</b>	Safety Data Sheet
<b>µg/m<sup>3</sup></b>	microgram per cubic meter of air	<b>STEL</b>	Short-term Exposure Limit
<b>mg/m<sup>3</sup></b>	milligram per cubic meter of air	<b>TLV</b>	Threshold Limit Value
<b>Mppcf</b>	million particles per cubic foot	<b>TWA</b>	Time-weighted Average
<b>MSHA</b>	Mine Safety and Health Administration	<b>UEL</b>	Upper Explosive Limit
<b>NFPA</b>	National Fire Protection Association		

**Disclaimer:** This information is taken from sources or based upon data believed to be reliable. Our objective in sending this information is to help you protect the health and safety of your personnel and to comply with the OSHA Hazard Communication Standard and Title III of the Emergency Planning and Community Right-to-Know Act. Cleveland-Cliffs Steel makes no warranty as to the absolute correctness, completeness, or sufficiency of any of the foregoing, or any additional, or other measures that may not be required under particular conditions.

THIS CLEVELAND-CLIFFS STEEL SDS MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY IMPLIED WARRANTIES OTHERWISE ARISING FROM COURSE OF DEALING OR TRADE.

**Products covered for Electrical Grade Steel Sheet (all grades):**

Product Identifier	Other Means of Identification
Noncoated Electrical Steel	Standard Surface Finish, Bare, C-0 per ASTM A 976
Mill-Anneal Surface Insulation Grain-Oriented Electrical Steel Products	Glass Film, Condition NF (C-2 per ASTM A 876), C-2 per ASTM A 976
CARLITE®3 Insulation Grain-Oriented Electrical Steel Products	CARLITE®3 (Condition F5: C5 over C2 per ASTM A 876), LITE CARLITE® (Condition F2: C5 over C2 per ASTM A 876)
C-3 Insulated Non-Oriented Electrical Steel Products	No 3 Core Plate, No 3A Core Plate, C-3 per ASTM A 976
C-5 Insulated Non-Oriented Electrical Steel Products	C-5 Phosphate, C-5 per ASTM A 976
C-5-A Insulation Non-Oriented Electrical Steel Products	C4, Condition PQ per ASTM A 876, ANTI-STICK™, CARLITE® ANTI-STICK™, C-5-A per ASTM A 976
Chromium-Free C-5-R Insulation Non-Oriented Electrical Steel Products	C-5 Rembrandtin, C-5 per ASTM A 976



# Electrical Grade Steel Sheet

**Signal Word: WARNING**

**Symbols:**



## HAZARD STATEMENTS:

Causes eye irritation.  
May cause respiratory irritation.  
Harmful if swallowed.

## PRECAUTIONARY STATEMENTS

Avoid breathing dusts / fume / gas / mist / vapor / spray.  
Use only outdoors or in well-ventilated areas.  
Wash thoroughly after handling.  
Do not eat, drink or smoke when using this product.  
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. If eye irritation persists: Get medical advice/attention.  
If swallowed: Call a poison center or doctor/physician if you feel unwell. Rinse mouth. Dispose of contents in accordance with federal, state and local regulations.

### SDS ID No.: CLF-011

Cleveland-Cliffs Steel  
1 South Dearborn Street  
Chicago, IL 60603-9888

**General Information: Phone:** 219-787-4901 or email at: [sdssupport@clevelandcliffs.com](mailto:sdssupport@clevelandcliffs.com)

**CHEMTREC (Day or Night): 1-800-424-9300**

**Emergency Contact: 1-760-476-3962, (Versik 3E Company Code: 333211)**

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