Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet
Safety Data Sheet (SDS)

ALGOMA STEEL INC.

Section 1: Identification

1 (a) Product Identifier: Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet	
1 (b) Other means of Identification:	None
1 (c) Recommended use and restrictions on use:	None
1 (d) Manufacturer's Name & Address	
Algoma Steel Inc. 105 West Street Sault Ste. Marie Ontario, Canada P6A 7B4	
1 (e) Emergency Telephone Numbers: 1 (705) 945–4058 (Mon – Fri 8:00 AM – 4:00 PM); 1 (705) 945-2275 (After Hours)	

Section 2: Hazard Identification

2 (a) Classification of the substance or mixture:

Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet is considered a "manufactured article" under the Hazardous Products Act and is not hazardous in its manufactured form and normal conditions of use. However, individual processes (such as welding, sawing, brazing, grinding, abrasive blasting, and machining) may result in the formation of fumes, dust, and/or particulate that may present hazards. Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet is not classified as hazardous in its solid form according to 29 CFR 1910, 1915 or 1926. However, certain processes such as cutting, milling, grinding, welding, melting or similar processes may result in the emission of fumes and airborne particulate that may be hazardous. 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)
	Carcinogenicity -2 Toxic to Reproduction -2 Single Target Organ Toxicity (STOT) Repeat Exposure -1	Danger	Suspected of causing cancer. Suspected of damaging fertility or the unborn child. Causes damage to lungs through prolonged or repeated inhalation exposure. Harmful if swallowed. May cause an allergic skin reaction. May cause respiratory irritation. Causes eye irritation.
	Acute Toxicity – Oral 4 Skin Sensitization – 1 STOT Single Exposure -3		
N/A	Eye Irritation – 2B		

Section 2: Hazard Identification (continued)

Precautionary Statement(s):

Prevention	Response	Storage/Disposal
Do not breathe dusts / fume / gas / mist / vapor / spray. Wear protective gloves / protective clothing / eye protection / face protection. Contaminated work clothing must not be allowed out of the workplace. Use only outdoors or in well ventilated areas. Wash thoroughly after handling.	If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: Get medical advice/attention. 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.	Dispose of contents in accordance with federal, state and local regulations.

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not eat, drink or smoke when using this product.	If on skin: Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off and wash contaminated clothing before reuse. If swallowed: Call a poison center or doctor/physician if you feel unwell. Rinse mouth	

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, CAS Number and Other Identifiers, and Concentration:

Chemical Name	CAS Number	% By Weight
Iron	7439-89-6	96-99
Manganese	7439-96-5	0-2
Chromium	7440-47-3	0-1
Nickel	7440-02-0	0-1
Carbon	7440-44-0	0-0.6
Molybdenum	7439-98-7	0-0.6
Copper	7440-50-8	0-0.6
Silicon	7440-21-3	0-0.6
Phosphorus	7723-14-0	0-0.15
Vanadium	7440-62-2	0-0.15

CAS- Chemical Abstract Service

- The product may have a light coating of a mineral oil based rust inhibitor to prevent corrosion.
- 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, columbium (niobium), and titanium.

Section 4: First Aid Measures

4(a) Description of necessary measures: If exposed, concerned or feel unwell: Get medical advice/attention.

- Inhalation: Hot Rolled Plate, Slabs, Hot & Cold Rolled 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.
- Eye Contact: Hot Rolled Plate, Slabs, Hot & Cold Rolled 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.
- 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.
- Ingestion: Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as sold/shipped is not a likely form of exposure. However during further processing (welding, grinding, burning, etc.), if swallowed: Call a poison center or doctor/physician if you feel unwell. Rinse mouth.

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

- Inhalation: Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as sold/shipped is not likely to present an acute or chronic health effect.
- Eye: Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as sold/shipped is not likely to present an acute or chronic health effect.
- Skin: Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as sold/shipped is not likely to present an acute or chronic health effect.
- Ingestion: Hot Rolled Plate, Slabs, Hot & Cold Rolled 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 Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as sold/shipped. Use extinguishers appropriate for surrounding materials.

5(b) Specific Hazards arising from the chemical: Not Applicable for Hot Rolled Plate, Slabs, Hot & Cold Rolled 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 Hot Rolled Plate, Slabs, Hot & Cold Rolled 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 Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as sold/shipped. 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.

Section 7: Handling and Storage

7(a) Precautions for safe handling: Not Applicable for Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as sold/shipped, however further processing (welding, burning, grinding, etc.) with the potential for generating high concentrations of airborne particulates 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): Hot Rolled Plate, Slabs, Hot & Cold Rolled 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 [1]	OHSA OEL [2]	ACGIH TLV – TWA [3]	IDLH [4]
Iron	10 mg/m³ (as iron oxide fume)	5 mg/m^3 (as iron oxide, respirable fraction[7])	5.0 mg/m³ (as iron oxide dust and fume)	2,500 mg Fe/m3
Manganese	(C) 5.0 mg/m³ (as Fume & Mn compounds)	0.2 mg/m^3 (as Mn, inorganic compounds)	0.02 mg/m³ (respirable fraction[7]) 0.1 mg/m³ (Inhalable fraction[5]) as elemental and inorganic compounds	500 mg Mn/m3
Chromium	0.5 mg/m³ (as Cr II & III, inorganic compounds) 1.0 mg/m³ (as Cr, metal) 0.005 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble) "AL" 0.0025 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble)	0.5 mg/m³ (as Cr III, inorganic compounds, and Cr Metal) 0.05 mg/m³ (water soluble Cr VI compounds) 0.01 mg/m³ (Insoluble Cr VI compounds)	0.5 mg/m³ (as Cr III, inorganic compounds) 0.5 mg/m³ (as Cr, metal) 0.05 mg/m³ (as Cr VI, inorganic compounds) 0.01 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble)	250 mg/m³ (as Cr II &metal) 25 mg/m³ (as Cr III) 15 mg/m³ (as Cr VI)
Nickel	1.0 mg/m³ (as Ni metal & insoluble compounds)	1 mg/m^3 (as inhalable fractions[5] Ni Metal) 0.2 mg/m^3 (as inhalable fractions[5] insoluble compounds, as Ni) 0.1 mg/m^3 (as inhalable fractions[5] insoluble compounds, as Ni)	1.5 mg/m³ (as inhalable fraction5[5] Ni metal) 0.2 mg/m³ (as inhalable fraction[5] Ni inorganic insoluble compounds) 0.1 mg/m³ (as inhalable fraction[5] Ni inorganic soluble compounds)	10 mg/m³ (as Ni)
Carbon				
Molybdenum	15 mg/m^3 (as total dust, PNOR[5]) 5.0 mg/m^3 (as respirable fraction PNOR)	0.5 mg/m^3 (respirable fraction[7], as Mo soluble compounds) 10 mg/m^3 (Inhalable fraction[5], metal and insoluble compounds) 3 mg/m^3 (respirable fraction[7],	0.5 mg/m^3 (respirable fraction[7], as Mo soluble compounds) 10 mg/m^3 (Inhalable fraction[5], metal and insoluble compounds) 3 mg/m^3 (respirable fraction[7],	5,000 Mo/m³ (insoluble compounds as Mo) 1,000 Mo/m³ (soluble compounds as Mo)

		metal and insoluble compounds)	metal and insoluble compounds)	
Copper	0.1 mg/m^3 (as fume, Cu) 1.0 mg/m^3 (as dusts & mists, Cu)	0.2 mg/m^3 (as fume) 1 mg/m^3 (as dusts and mists, as Cu)	0.2 mg/m^3 (as fume) 1 mg/m^3 (as dusts and mists, as Cu)	100 mg/m³
Silicon	15 mg/m³ (total dust, PNOR[6]) 5.0 mg/m³ (as respirable fraction, PNOR)			
Phosphorous	0.1 mg/m³	0.1 mg/m³	0.1 mg/m³	5.0 mg/m³
Vanadium	0.1 mg/m³ (as fume, as V2O5) 0.5 mg/m³ (respirable fraction[7] as V2O5)	0.05 mg/m³ (as V2O5)	0.05 mg/m³ (respirable dust/fume, as V205)	70 mg/m³

1. OSHA Permissible Exposure Limits (PELs) 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 Peak is defined as the acceptable maximum peak for a maximum duration above the ceiling concentration for an eight-hour shift. A skin notation refers to the potential significant contribution to the overall exposure by the cutaneous route, either by contact with vapors or, of probable greater significance, by direct skin contact with the substance. 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.
2. OEL's listed under the *Occupational Health and Safety Act* are 8-hour TWA (time-weighted average) concentrations, unless otherwise noted, as listed under section 4 of Ontario Regulation 833, Control of Exposure to Biological or Chemical Agents.
3. Threshold Limit Values (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH) are 8-hour TWA concentrations unless otherwise noted. A Short Term Exposure Limit (STEL) is defined as the maximum concentration to which workers can be exposed for a short period of time (15 minutes) for only four times throughout the day with at least one hour between exposures. A "skin" notation refers to the potential significant contribution to the overall exposure by the cutaneous route, either by contact with vapors or, of probable greater significance, by direct skin contact with the substance. ACGIH-TLVs are only recommended guidelines based upon consensus agreement of the membership of the ACGIH. As such, the ACGIH TLVs are for guideline use purposes and are not legal regulatory standards for compliance purposes. The TLVs are designed for use by individuals trained in the discipline of industrial hygiene relative to the evaluation of exposure to various chemical or biological substances and physical agents that may be found in the workplace.
4. 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.
5. 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 2014 TLVs ® and BEIs ® (Biological Exposure Indices) Appendix D, paragraph A.
6. 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/m3 for total dust and 5 mg/m3 for the respirable fraction.
7. 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 the ACGIH 2015 TLVs ® and BEIs ® (Biological Exposure Indices) Appendix D.

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 during milling, grinding, melting and welding operations. 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.

8(c) Individual Protection Measures:

- Respiratory Protection: If concentrations exceed established limits when welding or grinding, 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. Fullface, 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): Metallic Gray, Soild	9 (j) Upper and Lower Flammability or Explosive Limits: NA
9 (b) Odor: Odorless	9 (k) Vapor Pressure: NA
9 (c) Odor Threshold: NA	9 (l) Vapor Density (Air = 1): NA
9 (d) pH: NA	9 (m) Relative Density: >1.0 SG
9 (e) Melting Point/Freezing Point: ~ 2750°F (~ 1510°C)	9 (n) Solubility: Water Insoluble
9 (f) Initial Boiling Point and Boiling Range: ND	9 (o) Partition Coefficient n-octanol/water: ND
9 (g) Flash Point: NA	9 (p) Auto-ignition Temperature: NA
9 (h) Evaporation Rate: NA	9 (q) Decomposition Temperature: ND
9 (i) Flammability (solid, gas): Non-flammable, non-combustible	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(a-e) Information on toxicological effects: The following toxicity data has been determined for Hot Rolled Plate, Slabs, Hot & Cold Rolled 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 WHMIS, OSHA and the EU CPL:

Hazard Classification	Hazard Category	Hazard Symbols	Signal Word	Hazard Statement
Acute Toxicity Hazard (covers Categories 1-4)	4[a]		Warning	Harmful if swallowed
Eye Damage/ Irritation (covers Categories 1, 2A and 2B)	2B[c]	No Pictogram	Warning	Causes eye irritation
Skin/Dermal Sensitization (covers Category 1)	1[d]		Warning	May cause an allergic skin reaction
Carcinogenicity (covers Categories 1A, 1B and 2)	2[g]		Warning	Suspected of causing cancer
Toxic Reproduction (covers Categories 1A, 1B and 2)	2[h]		Warning	Suspected of damaging fertility or the unborn child
Specific Target Organ Toxicity (STOT) Following Single Exposure (covers Categories 1-3)	3[i]		Warning	May cause respiratory irritation
STOT following Repeated Exposure (covers Categories 1 and 2)	1[j]		Warning	Causes damage to lungs and central nervous system through prolonged or repeated inhalation exposure

* 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.

1. No LC50 or LD50 has been established for Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet. The following data has been determined for the components:

- Iron: Rat LD50 =98.6 g/kg (REACH)
  Rat LD50 =1060 mg/kg (IUCLID)
  Rat LD50 =984 mg/kg (IUCLID)
  Rabbit LD50 =890 mg/kg (IUCLID)
  Guinea Pig LD50 =20 g/kg (TOXNET)
- Nickel: LD50 >9000 mg/kg (Oral/Rat)
- Silicon: LD50 = 3160 mg/kg (Oral/Rat)
- Manganese: Rat LD50 > 2000 mg/kg (REACH)
  Rat LD50 > 9000 mg/kg (NLM Toxnet)
- Carbon: Mouse-iv: 440 mg/kg
- Copper: mouse-ip: 3500 ug/kg

- Vanadium: rabbit-sub cutaneous: 59 mg/kg

2. No Skin (Dermal) Irritation data available for Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as a as a mixture or its individual components.

3. No Eye Irritation data available for Hot Rolled Plate, Slabs, Hot & Cold Rolled 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.
   - Nickel: Slight eye irritation from particulate abrasion only.

4. No Skin (Dermal) Sensitization data available for Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as a mixture. The following Skin (Dermal) Sensitization information was found for the components:
   - Nickel: May cause allergic skin sensitization.
   - No Respiratory Sensitization data available for Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as a mixture or its components.

5. No Germ Cell Mutagenicity data available for Hot Rolled Plate, Slabs, Hot & Cold Rolled 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.
   - Nickel: EU RAR has found positive results in vitro and in vivo but insufficient data for classification.

6. Carcinogenicity: IARC, and NTP do not list Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as carcinogens. The following Carcinogenicity information was found for the components:
   - Welding Fumes - IARC Group 2B carcinogen, a mixture that is possibly carcinogenic to humans.
   - Chromium (as metal and trivalent chromium compounds) – IARC Group 3 carcinogens, not classifiable as to their human carcinogenicity.
   - Nickel and certain nickel compounds – Group 2B - metallic nickel Group 1 - nickel compounds ACGIH confirmed human carcinogen. Nickel – EURAR Insufficient evidence to conclude carcinogenic potential in animals or humans; suspect carcinogen classification Category 2 Suspected of causing cancer.

7. No Toxic Reproduction data available for Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as a mixture. The following Toxic Reproductive information was found for the components:
   - Nickel: Effects on fertility.

8. No Specific Target Organ Toxicity (STOT) following a Single Exposure data available for Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as a mixture. The following STOT following a Single Exposure data was found for the components:
   - Iron: Irritating to Respiratory tract.

9. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data was available for Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as a whole. The following STOT following Repeated Exposure data was found for the components:
   - Nickel: Rat 4 wk inhalation LOEL 4 mg/m3 Lung and Lymph node histopathology. Rat 2 yr inhalation LOEL 0.1 mg/ m3 Pigment in kidney, effects on hematopoiesis spleen and bone marrow and adrenal tumor. Rat 13 Week Inhalation LOAEC 1.0 mg/m3 Lung weights, and Alveolar histopathology.
   - Manganese: Inhalation of metal fumes - Degenerative changes in human Brain; Behavioral: Changes in motor activity and muscle weakness (Whitlock *et al.,* 1966).

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 2009, 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 Program 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:

- 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 and copper 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.
- 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.

- Manganese and manganese oxides: Manganese and Manganese oxide is harmful if swallowed.
- Nickel and nickel oxides: Nickel may cause allergic skin sensitization. Nickel oxide may cause an allergic skin reaction.
- Silicon and silicon oxides: May be harmful if swallowed.
- Vanadium: Can cause inflammation of respiratory passages, asthma, cardiac palpitations, gastrointestinal discomfort, renal damage, nervous depression.

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. Iron oxide is listed as a Group 3 (not classifiable) carcinogen by the International Agency for Research on Cancer (IARC).
- 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. NTP (The National Toxicology Program) Fourth Annual report on Carcinogens cites “certain Chromium compounds” as human carcinogens. ACGIH has reviewed the toxicity data and concluded that chromium metal is not classifiable as a human carcinogen. 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.
- Manganese and manganese oxides: 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. Neurobehavioral alterations in worker populations exposed to manganese oxides include: speed and coordination of motor function are especially impaired.
- Nickel and nickel oxides: Exposure to nickel dusts and fumes can cause sensitization dermatitis, respiratory irritation, asthma, pulmonary fibrosis, edema, and may cause nasal or lung cancer in humans. Nickel causes damage to lungs through prolonged or repeated inhalation exposure. IARC lists nickel and certain nickel compounds as Group 2B carcinogens (sufficient animal data). ACGIH 2013 TLVs® and BEIs® lists insoluble nickel compounds as confirmed human carcinogens. Nickel is suspected of damaging the unborn child.
- 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.

Section 12: Ecological Information

12(a) Ecotoxicity (aquatic & terrestrial): No Data Available for Hot Rolled Plate, Slabs, Hot & Cold Rolled 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: LC50: >1000 mg/L; Fish 48 h-EC50 > 100 mg/L (Currenta, 2008k); 96 h-LC0 ≥ 50,000 mg/L. Test substance: Bayferrox 130 red (95 –97% Fe_2O_3; < 4% SiO_2 and Al_2O_3) (Bayer, 1989a).
- Hexavalent Chrome: EU RAR listed as category 1, found acute EC50 and LD50 to algae and invertebrates < 1 mg.
- Nickel Oxide: IUCLID found LC50 in fish, invertebrates and algae > 100 mg/l.

12(b) Persistence & Degradability: No Data Available for Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as sold/shipped or individual components.
12(c) Bioaccumulative Potential: No Data Available for Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as sold/shipped or individual components.
12(d) Mobility (in soil): No data available for Hot Rolled Plate, Slabs, Hot & Cold Rolled 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
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.

Container Cleaning and Disposal: Follow applicable provincial, federal and state 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 Hot and Cold Rolled Steel Sheet in its original form. Any alterations can void this information.

Section 14: Transport Information

14 (a-g) Transportation Information: All provincial, federal, and state laws and regulations that apply to the transport of this type of material must be adhered to.

Transport Canada, *Transportation of Dangerous Goods (*TDG)

Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet does not have a TDG classification.

US Department of Transportation (DOT)

Under 49 CFR 172.101 does not regulate Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as a hazardous material.

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

International Air Transport Association (IATA)

Does not regulate Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as a hazardous material.

Regulations Concerning the International Carriage of Dangerous Goods by Road (ADR)

Does not regulate Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet as a hazardous material.

Section 15: Regulatory Information

Regulatory Information: *The following listing of regulations relating to an Algoma product may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.*

OSHA Regulations: Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-2, Z-3): The product, Hot Rolled Plate, Slabs, Hot & Cold Rolled 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, Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet is not listed as a whole. However, individual components of the product are listed:

Components	Regulations
Chromium	CERCLA, CWA, SARA 313, RCRA, SDWA
Manganese	CAA, SARA 313, SDWA
Nickel	CAA, CERCLA, CWA, SARA 313

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

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])

Section 313 Supplier Notification: The product, Hot Rolled Plate, Slabs, Hot & Cold Rolled Sheet contains 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:

Chemical Name	Percent by Weight
Chromium	1
Manganese	2.5
Nickel	1
Copper	1

This is a list of some of the regulations to be followed and may not be complete. Ensure you verify compliance with all applicable Provincial, Federal, State and Local l Laws and Regulations

Section 16: Other Information

Prepared By: Algoma Steel Inc.
Revised Date: 11/30/2018

Disclaimer

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