

Section 3 – Composition/Information on Ingredients (continued)**3(a-c) Chemical name, common name (synonyms), CAS number and other identifiers, and concentration (continued):**

Chemical Name	CAS Number	EC Number	% weight*
Silicon	7440-21-3	231-130-8	0.0-1.45
Chromium	7440-47-3	231-157-5	0.0-0.65
Nickel	7440-02-0	231-111-4	0.0-0.40
Copper	7440-50-8	231-159-6	0.0-0.40
Molybdenum	7439-98-7	231-107-2	0.0-0.35
Aluminum	7429-90-5	231-072-3	0.0-0.16

EC - European Community

CAS - Chemical Abstract Service

* Percentages are expressed as typical ranges or maximum concentrations of trace elements for the purpose of communicating the potential hazards of the finished product.

- Product surfaces may be treated with small amounts of corrosion-inhibiting oil that may contain mineral oil or petroleum distillates, or paints, epoxies, laminates, etc., generally applied at the customer's request. Refer to the coating manufacturer's SDS for hazards associated with coatings.

Section 4 – First-aid Measures**4(a) Description of necessary measures:**

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

5(b) Specific Hazards arising from the chemical: Not Applicable for **Hot Rolled or Cold Rolled Steel** 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 or Cold Rolled Steel** 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 or Cold Rolled Steel** 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 **Hot Rolled or Cold Rolled Steel** 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 or Cold Rolled Steel** as sold/shipped in its physical form does not present an inhalation, ingestion or contact hazard. 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	ACGIH TLV ²	NIOSH REL ³	IDLH ⁴
Iron	10 mg/m ³ (iron oxide fume)	5.0 mg/m ³ (iron oxide, respirable fraction ⁵)	5.0 mg/m ³ (iron oxide dust and fume)	2,500 mg/m ³ (as Fe)
Manganese	"C" 5.0 mg/m ³ (as fume & inorganic compounds, as Mn)	0.02 mg/m ³ (as fume & inorganic compounds, as Mn, respirable fraction) 0.1 mg/m ³ (as fume & inorganic compounds, as Mn, inhalable fraction ⁶)	1.0 mg/m ³ (as fume & inorganic compounds, as Mn) "STEL" 3.0 mg/m ³ (as fume & inorganic compounds, as Mn)	500 mg/m ³ (as Mn)
Nickel	1.0 mg/m ³ (metal, insoluble & soluble compounds, as Ni)	1.5 mg/m ³ (metal, as Ni, as inhalable fraction ⁷) 0.2 mg/m ³ (insoluble compounds, as Ni, inhalable fraction, inorganic only) 0.1 mg/m ³ (soluble compounds, as Ni, inhalable fraction, inorganic only)	0.015 mg/m ³ (metal & insoluble and soluble compounds, as Ni)	10 mg/m ³ (as Ni)
Copper	0.1 mg/m ³ (fume, as Cu) 1.0 mg/m ³ (dusts and mists, as Cu)	0.2 mg/m ³ (fume, as Cu) 1.0 mg/m ³ (dusts and mists, as Cu)	1.0 mg/m ³ (dusts and mists, as Cu)	100 mg/m ³ (as Cu)
Chromium	1.0 mg/m ³ (metal and insoluble salts (as Cr)	0.5 mg/m ³ (metal and Cr III compounds) 0.05 mg/m ³ (water-soluble Cr VI compounds) 0.01 mg/m ³ (Insoluble Cr VI compounds)	0.5 mg/m ³ (chromium metal and chromium(II) and chromium(III) compounds) 0.0002 mg (hexavalent chromium CrVI compounds)	250 mg/m ³ (as Cr)
Molybdenum	5 mg/m ³ (soluble compounds)	0.5 mg/m ³ (soluble compounds, respirable fraction, as Mo) 10 mg/m ³ (metal and insoluble compounds, inhalable fraction, as Mo) 3 mg/m ³ (metal and insoluble compounds, respirable fraction, as Mo)	5 mg/m ³ , soluble compounds, as Mo)	5000 mg/m ³ (as Mo)
Silicon	15 mg/m ³ (total dust, PNOR ⁷) 5.0 mg/m ³ (as respirable fraction, PNOR)	10 mg/m ³	10 mg/m ³ (as total dust) 5.0 mg/m ³ (as respirable dust)	NE
Aluminum	15 mg/m ³ (as total dust, PNOR) 5.0 mg/m ³ (as respirable fraction, PNOR)	10 mg/m ³ (as metal dust) 5.0 mg/m ³ (as welding fume)	10 mg/m ³ (as total dust) 5.0 mg/m ³ (as respirable dust)	NE

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-1970s 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 2018 TLVs[®] and BEIs[®] 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 2018 TLVs[®] and BEIs[®] (Biological Exposure Indices) Appendix D, paragraph A.
- 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 5.0 mg/m³ for the respirable fraction.

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.

8(c) Individual Protection Measures:

- **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.

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. Contact lenses should not be worn where industrial exposures to this material are likely.
- **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

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:** 7.85**9(n) Solubility(ies):** Water 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 **Hot or Cold Rolled Steel** 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			
Eye Damage/ Irritation (covers Categories 1, 2A and 2B)	NA*	2B ^c	No Pictogram	Warning	Causes eye irritation - Rating due to iron, chromium and copper particulates generated from further processing (welding, grinding, burning, etc.).
Skin/Dermal Sensitization (covers Category 1)	NA*	1 ^d		Warning	May cause an allergic skin reaction. – Nickel and chromium which are skin sensitizers.

Hot Rolled or Cold Rolled Steel

Section 11 - Toxicological Information (continued)

Carcinogenicity (covers Categories 1A, 1B and 2)	NA*	2 ^e		Warning	Suspected of causing cancer. - Rating due to nickel and chromium particulates or fumes that can enter the body generated when further processed (welding, grinding, burning, etc.).
Toxic Reproduction (covers Categories 1A, 1B and 2)	NA*	2 ^h		Warning	Suspected of damaging fertility or the unborn child. - Rating due to nickel and molybdenum particulate or fume that can enter the body generated when further processed (welding, grinding, burning, etc.).
Specific Target Organ Toxicity (STOT) Following Single Exposure (covers Categories 1-3)	NA*	3 ⁱ		Warning	May cause respiratory irritation. - Rating due to iron and copper and that can enter the body generated when further processed (welding, grinding, burning, etc.).
STOT following Repeated Exposure (covers Categories 1 and 2)	NA*	1 ^j		Danger	Causes damage to lungs and central nervous system through prolonged or repeated inhalation exposure. - Rating due to nickel, chromium, copper, molybdenum, manganese or aluminum particulate or fume that can enter the body generated when further processed (welding, grinding, burning, etc.).

11 Information on toxicological effects (continued):

* 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 LC₅₀ or LD₅₀ has been established for **Hot Rolled or Cold Rolled Steel**. 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)
 - **Aluminum:** Rat LD₅₀ > 15.9 g/kg (REACH)
 - **Nickel:** LD₅₀ >9000 mg/kg (Oral/Rat)
 - **Manganese:** Rat LD₅₀ > 2000 mg/kg (REACH)
Rat LD₅₀ > 9000 mg/kg (TOXNET)
 - **Chromium:** Rat LD₅₀ > 27.5 mg/kg (TOXNET)
 - **Molybdenum:** Rabbit LD₅₀ > 70 mg/kg (TOXNET)
- b. No Skin (Dermal) Irritation data available for **Hot Rolled or Cold Rolled Steel** as a mixture.
- c. No Eye Irritation data available for **Hot Rolled or Cold Rolled Steel** as a mixture. The following Eye Irritation information was found for the components:
 - **Iron:** Causes eye irritation.
 - **Chromium:** Causes eye irritation.
 - **Copper:** Causes eye irritation.
- d. No Skin (Dermal) Sensitization data available for **Hot Rolled or Cold Rolled Steel** as a mixture. The following Skin (Dermal) Sensitization information was found for the components:
 - **Nickel:** May cause allergic skin sensitization.
 - **Chromium:** May cause allergic skin sensitization.
- e. No Respiratory Sensitization data available for **Hot Rolled or Cold Rolled Steel** as a mixture or its components.
- f. No Germ Cell Mutagenicity data available for **Hot Rolled or Cold Rolled Steel** 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.
 - **Aluminum:** IUCLID; ATSDR have found this ingredient is not mutagenic *in vitro*; but has marginal effects *in vivo*.
- g. Carcinogenicity: IARC, NTP, and OSHA do not list **Hot Rolled or Cold Rolled Steel** as carcinogens. The following Carcinogenicity information was found for the components:
 - **Nickel and certain nickel compounds:** IARC-1 (compounds), carcinogen to humans; IARC-2B (elemental & alloys), possibly carcinogenic to humans; ACGIH TLV-A1 (insoluble compounds, as Ni), confirmed human carcinogen; TLV-A5 (elemental), not suspected as a human carcinogen; NTP-K, known to be a carcinogen; NIOSH-Ca, potential occupational carcinogen
 - **Iron Oxide (Fe₂O₃):** IARC-3, unclassifiable as to carcinogenicity in humans; ACGIH TLV-A4, not classifiable as a human carcinogen
 - **Manganese (inorganic compounds, as Mn):** ACGIH TLV-A4, not classifiable as a human carcinogen; EPA-D, not classifiable as to human carcinogenicity (CBD, cannot be determined).
 - **Manganese (fume, as Mn):** EPA-D, not classifiable as to human carcinogenicity (CBD, cannot be determined).
 - **Aluminum (metal and insoluble compounds):** IARC-1 (production), carcinogen to humans; ACGIH TLV-A4, not classifiable as a human carcinogen
 - **Chromium (metallic):** IARC-3, unclassifiable as to carcinogenicity in humans
 - **Molybdenum:** TLV-A3 (soluble compounds)
- h. No Toxic Reproduction data available for **Hot Rolled or Cold Rolled Steel** as a mixture. The following Toxic Reproductive information was found for the components:

Section 11 - Toxicological Information (continued)

- **Nickel:** Effects on fertility.
 - **Molybdenum:** Suspected of damaging fertility of the unborn child.
- i. No Specific Target Organ Toxicity (STOT) following a Single Exposure data available for **Hot Rolled or Cold Rolled Steel** as a mixture. The following STOT following a Single Exposure data was found for the components:
- **Iron:** Irritating to the Respiratory Tract
- j. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data was available for **Hot Rolled or Cold Rolled Steel** 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).
 - **Aluminum:** Repeated exposure associated with Asthma, fibrosis in lungs and encephalopathy in humans. Reviews have found 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.
 - **Chromium:** Repeated exposure systemic toxicity, skin and eyes, respiratory tract irritation.
 - **Copper:** Repeated exposure, target organs digestive system and respiratory tract irritation
 - **Molybdenum:** Repeated exposure, target organs eyes, respiratory system, liver, kidneys.

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 2018, 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), European Union Classification, Labeling and Packaging. (EU CPL), Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), International Uniform Chemical Information Database (IUCLID), 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.
- **Manganese and manganese oxides:** Manganese and Manganese oxide are harmful if swallowed.
- **Nickel and nickel oxides:** Nickel may cause allergic skin sensitization. Nickel oxide may cause an allergic skin.
- **Silicon and silicon oxides:** May be harmful if swallowed.
- **Aluminum and aluminum oxides:** Not Reported/ Not Classified
- **Chromium:** Inhalation of chromium compounds may cause shortness of breath, coughing, and wheezing.

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).
- **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.

Section 11 - Toxicological Information (continued)

- **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.
- **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 2018 TLVs® and BEIs® lists insoluble nickel compounds as confirmed human carcinogens. Nickel is suspected of damaging the unborn child.
- **Aluminum and aluminum oxides:** Chronic inhalation of finely divided powder has been reported to cause pulmonary fibrosis and emphysema. Repeated skin contact has been associated with bleeding into the tissue, delayed hypersensitivity and granulomas. 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.
- **Chromium and chromium compounds:** Welding, cutting, grinding and other processes involving high temperatures can result in the formation of hexavalent chromium (Cr(VI)) compounds. All hexavalent chromium compounds are toxic and carcinogenic (IARC Group 1) especially when airborne and inhaled. Inhalation of Cr(VI) compounds is associated with lung cancer as well as cancers of the nose and nasal sinuses.

Section 12 - Ecological Information

12(a) Ecotoxicity (aquatic & terrestrial): No Data Available for **Hot Rolled or Cold Rolled Steel** 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% Fe₂O₃; < 4% SiO₂ and Al₂O₃) (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 or Cold Rolled Steel** as sold/shipped or individual components.

12(c) Bioaccumulative Potential: No Data Available for **Hot Rolled or Cold Rolled Steel** as sold/shipped or individual components.

12(d) Mobility (in soil): No data available for **Hot Rolled or Cold Rolled Steel** 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.

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 **Hot Rolled or Cold Rolled Steel** 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 does not regulate **Hot Rolled or Cold Rolled Steel** as a hazardous material. All federal, state, and local laws and regulations that apply to the transport of this type of material must be adhered to.

Shipping Name: Not Applicable (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) **Group:** NA

c) **Authorization:** 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 Hot Rolled or Cold Rolled Steel as a hazardous material.

Hot Rolled or Cold Rolled Steel



SDS ID No.: AMNS-0005

Revision: 03/15/2021

Section 14 - Transport Information (continued)

Shipping Name: Not Applicable (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
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International Air Transport Association (IATA) does not regulate Hot Rolled or Cold Rolled Steel as a hazardous material.

Shipping Name: Not Applicable (NA) Class/Division: NA Hazard Label (s): NA UN No.: NA Packing Group: NA Excepted Quantities (EQ): NA	Passenger & Cargo Aircraft		Cargo Aircraft Only: Pkg Inst: NA Max Net Qty/Pkg: NA	Special Provisions: NA ERG Code: NA
	Limited Quantity (EQ)			
	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: Hot Rolled or Cold Rolled Steel does not have a TDG classification.

Section 15 - Regulatory Information

Regulatory Information: *The following listing of regulations relating to an AM/NS Calvert LLC 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, **Hot Rolled or Cold Rolled Steel** 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 or Cold Rolled Steel** is not listed as a whole. However, individual components of the product are listed:

Components	Regulations
Manganese	CAA, SARA 313, SDWA, CERCLA
Nickel	CAA, CERCLA, CWA, SARA 313
Aluminum	SARA 313, SWDA
Chromium	CAA, CWA, SARA 313, SDWA, CERCLA, RCRA
Copper	CWA, CERCLA, SDWA, SARA 313
Molybdenum	SDWA

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

Section 313 Supplier Notification: The product, **Hot Rolled or Cold Rolled Steel** 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:

CAS #	Chemical Name	Percent by Weight
7439-96-5	Manganese	2.50 max
7440-02-0	Nickel	0.40 max
7429-90-5	Aluminum	0.16 max
7440-47-3	Chromium	0.65 max
7440-50-8	Copper	0.40 max

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, **Hot Rolled or Cold Rolled Steel** as a whole is not listed in any state regulations. However, individual components of the product are listed in various state regulations:

Hot Rolled or Cold Rolled Steel

Section 15 - Regulatory Information (continued)

Pennsylvania Right to Know: Contains regulated material in the following categories:

- Hazardous Substances: Aluminum, Manganese, Nickel, Silicon
- Environmental Hazards: Aluminum, Manganese, Nickel
- Special Hazardous Substance: Nickel

California  This product can expose you to chemicals including nickel (metallic) which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov.

New Jersey: Contains regulated material in the following categories:

- Hazardous Substance: Aluminum, Manganese, Molybdenum, Silicon, Nickel, Chromium, Copper, Molybdenum
- Environmental Hazards: Manganese, Nickel, Chromium, Copper
- Special Hazardous Substance: Aluminum, Manganese, Silicon, Chromium

Minnesota: Manganese, Nickel, Copper, Chromium, Molybdenum

Massachusetts: Aluminum, Manganese, Silicon, Nickel

Other Regulations:

WHMIS Classification (Canadian): The product, **Hot Rolled or Cold Rolled Steel** 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)
Manganese	Reproductive toxicity - Category 2; Specific target organ toxicity - repeated exposure - Category 1; Combustible dusts*
Nickel	Skin sensitization – Category 1; Carcinogenicity – Category 2; Specific target organ toxicity – repeated exposure - Category 1
Silicon	Flammable solids - Category 2; Combustible dusts**

*This product could belong to the hazard class "Combustible dust", based on various factors related to the combustibility and explosiveness of its dust, including composition, shape and size of the particles.

**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: AM/NS Calvert LLC

Original Issue Date: 8/26/2002

Revised Date: 3/15/2021

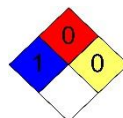
Additional Information:

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:

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
CLP	Classification, Labelling and Packaging	OSHA	Occupational Safety and Health Administration
CFR	Code of Federal Regulations	PEL	Permissible Exposure Limit
CNS	Central Nervous System	PNOR	Particulate Not Otherwise Regulated
GI, GIT	Gastro-Intestinal, Gastro-Intestinal Tract	PNOC	Particulate Not Otherwise Classified
HMIS	Hazardous Materials Identification System	PPE	Personal Protective Equipment
IARC	International Agency for Research on Cancer	ppm	parts per million
LC50	Median Lethal Concentration	RCRA	Resource Conservation and Recovery Act
LD50	Median Lethal Dose	REACH	Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals
LD_{Lo}	Lowest Dose to have killed animals or humans	RTECS	Registry of Toxic Effects of Chemical Substances

Hot Rolled or Cold Rolled Steel



SDS ID No.: AMNS-0005

Revision: 03/15/2021

Section 16 - Other Information (continued)

LEL	Lower Explosive Limit		SARA	Superfund Amendment and Reauthorization Act
LOEL	Lowest Observed Effect Level		SCBA	Self-contained Breathing Apparatus
LOAEC	Lowest Observable Adverse Effect Concentration		SDS	Safety Data Sheet
µg/m³	microgram per cubic meter of air		STEL	Short-term Exposure Limit
mg/m³	milligram per cubic meter of air		TLV	Threshold Limit Value
mppcf	million particles per cubic foot		TWA	Time-weighted Average
MSHA	Mine Safety and Health Administration		UEL	Upper Explosive Limit
NFPA	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. AM/NS Calvert LLC 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 AM/NS CALVERT LLC 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 Hot Rolled or Cold Rolled Steel include:

Cold Rolled Steel	Cold Rolled Full Hard Steel
Cold Rolled HSLA Steel	Cold Rolled Carbon Steel
Hot Rolled Carbon Steel	Advanced High Strength Steel (AHSS)/TRIP
Hot Rolled HSLA Steel	High Strength Low Alloy (HSLA)
Bake Hard	Ultra High Strength (UHSS)
Low Carbon	Advanced High Strength (AHSS)
Ultra Low Carbon (ULC)	Structural

Hot Rolled or Cold Rolled Steel

Signal Word: **DANGER**

Symbols:



HAZARD STATEMENTS:

Causes eye irritation.
May cause an allergic skin reaction.
Suspected of causing cancer.
Suspected of damaging fertility or the unborn child.
May cause respiratory irritation.
Causes damage to lungs and central nervous system through prolonged or repeated inhalation exposure.

PRECAUTIONARY STATEMENTS

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.
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 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 on skin: Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off and wash contaminated clothing before reuse.
Call a poison center/doctor if you feel unwell.
Dispose of contents in accordance with federal, state and local regulations.

SDS ID No.: AMNS-0005

AM/NS Calvert LLC
P.O. Box 456
Calvert, AL 36513

General Information: Phone: 251-289-3000

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

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

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