



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

\*\*Iron oxide is formed at temperatures above the melting point. The product is an alloy. At temperatures above the melting point steel products may liberate fumes containing oxides of iron and alloying elements.

#### 4. First-aid measures

**Inhalation** In case of inhalation of fumes from heated product: Move into fresh air and keep at rest. Get medical attention if symptoms persist. If breathing is difficult, give oxygen. If breathing stops, provide artificial respiration.

**Skin contact** Wash skin with soap and water. In case of burns with hot metal, rinse with plenty of cold water. If burns are severe, consult a physician. If skin irritation or an allergic skin reaction develops, get medical attention.

**Eye contact** Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. Get medical attention promptly if symptoms persist or occur after washing.

**Ingestion** Solid steel: Not applicable. Dust: Get medical attention if any discomfort continues.

**Most important symptoms/effects, acute and delayed** May dry the skin leading to discomfort and dermatitis. High concentrations of dust may irritate throat and respiratory system and cause coughing.

#### 5. Fire-fighting measures

**Suitable extinguishing media** Use fire-extinguishing media appropriate for surrounding materials.

**Unsuitable extinguishing media** Not applicable.

**Specific hazards arising from the chemical** No unusual fire or explosion hazards noted.

**Special protective equipment and precautions for firefighters** Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Fire fighting equipment/instructions** Use standard firefighting procedures and consider the hazards of other involved materials.

#### 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures** Cold solid metal: No special precautions are necessary beyond normal good hygiene practices. See Section 8 of the SDS for additional personal protection advice when handling this product. Hot metal: Avoid contact with hot material. Wear protective clothing as described in Section 8 of this safety data sheet.

**Methods and materials for containment and cleaning up** In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. Collect for recycling.

**Environmental precautions** No specific precautions.

#### 7. Handling and storage

**Precautions for safe handling** Avoid contact with sharp edges and hot surfaces. Use appropriate gloves and tools to ensure safe handling. Use work methods which minimize dust/fume production. Do not breathe fumes and dusts. The organic material(s) of the coating(s) may generate fumes or gases when heated or melted. Observe safety measures suited to the coating(s) when handling, cutting or melting. Follow the recommendations in ANSI Z49.1, Safety in welding and cutting (ANSI=American National Standard Institute).

**Conditions for safe storage, including any incompatibilities** Store in a dry place. Store away from: Strong oxidizing agents. Acids.

#### 8. Exposure controls/personal protection

##### Occupational exposure limits

##### US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Type	Value
Lead (CAS 7439-92-1)	TWA	0.05 mg/m <sup>3</sup>

##### US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
** Iron oxide (CAS 1309-37-1)	PEL	10 mg/m <sup>3</sup>	Fume.

**US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

Components	Type	Value	Form
Chromium (CAS 7440-47-3)	PEL	1 mg/m3	
Manganese (CAS 7439-96-5)	Ceiling	5 mg/m3	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	

**US. ACGIH Threshold Limit Values**

Components	Type	Value	Form
** Iron oxide (CAS 1309-37-1)	TWA	5 mg/m3	Respirable fraction.
Chromium (CAS 7440-47-3)	TWA	0.5 mg/m3	
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.

**US. NIOSH: Pocket Guide to Chemical Hazards**

Components	Type	Value	Form
** Iron oxide (CAS 1309-37-1)	TWA	5 mg/m3	Dust and fume.
Chromium (CAS 7440-47-3)	TWA	0.5 mg/m3	
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Manganese (CAS 7439-96-5)	STEL	3 mg/m3	Fume.
	TWA	1 mg/m3	Fume.
Nickel (CAS 7440-02-0)	TWA	0.015 mg/m3	

**Biological limit values**

**ACGIH Biological Exposure Indices**

Components	Value	Determinant	Specimen	Sampling Time
Lead (CAS 7439-92-1)	300 µg/l	Lead	Blood	*

\* - For sampling details, please see the source document.

**Exposure guidelines**

\*\*Iron oxide is formed at temperatures above the melting point.

**Appropriate engineering controls**

Adequate ventilation should be provided so that exposure limits are not exceeded. Use local exhaust when welding, burning, sawing, brazing, grinding or machining to prevent excessive dust or fume exposure.

**Individual protection measures, such as personal protective equipment**

**Eye/face protection**

Use of safety glasses or goggles is required for welding, burning, sawing, brazing, grinding or machining operations. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining.

**Skin protection**

**Hand protection**

Wear protective gloves. While handling product and/or steel packing material wear cut resistant gloves and sleeves for laceration protection.

**Other**

Wear suitable protective clothing.

**Respiratory protection**

Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

**Thermal hazards**

When material is heated, wear gloves to protect against thermal burns. Thermally protective apron and long sleeves are recommended when volume of hot material is significant.

**General hygiene considerations**

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Observe any medical surveillance requirements.

**9. Physical and chemical properties**

**Appearance**

Solid metal Billets: 6 inches x 6 inches x 300 inches. Solid metal Bar Stock of various shapes and lengths.

**Physical state**

Solid.

<b>Form</b>	Solid.
<b>Color</b>	Metallic gray.
<b>Odor</b>	None.
<b>Odor threshold</b>	Not available.
<b>pH</b>	Not applicable.
<b>Melting point/freezing point</b>	2650 - 2750 °F (1454.44 - 1510 °C) / Not applicable.
<b>Initial boiling point and boiling range</b>	Not applicable.
<b>Flash point</b>	Not applicable.
<b>Evaporation rate</b>	Not applicable.
<b>Flammability (solid, gas)</b>	Non combustible.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	Not applicable.
<b>Flammability limit - upper (%)</b>	Not applicable.
<b>Explosive limit - lower (%)</b>	Not applicable.
<b>Explosive limit - upper (%)</b>	Not applicable.
<b>Vapor pressure</b>	Not applicable.
<b>Vapor density</b>	Not applicable.
<b>Relative density</b>	7.9
<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	Insoluble in water.
<b>Solubility (other)</b>	Not available.
<b>Partition coefficient (n-octanol/water)</b>	Not applicable.
<b>Auto-ignition temperature</b>	Not applicable.
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not applicable.

## 10. Stability and reactivity

<b>Reactivity</b>	Stable at normal conditions.
<b>Chemical stability</b>	This product is stable under expected conditions of use.
<b>Possibility of hazardous reactions</b>	Will not occur.
<b>Conditions to avoid</b>	Contact with incompatible materials. Avoid contact with acids and oxidizing substances.
<b>Incompatible materials</b>	Strong acids. Oxidizing agents.
<b>Hazardous decomposition products</b>	At elevated temperatures: Acid fumes. Metal oxides. Inorganic compounds. Strong Acid Contact: Hydrogen, Inorganic compounds.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Inhalation</b>	No inhalation hazard under normal conditions. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever.
<b>Skin contact</b>	Under normal conditions of intended use, this material does not pose a risk to health. Dust may irritate skin. Skin contact may aggravate an existing dermatitis. Contact with hot material can cause thermal burns which may result in permanent damage.
<b>Eye contact</b>	Under normal conditions of intended use, this material does not pose a risk to health. Contact with hot material can cause thermal burns which may result in permanent damage. Grinding and sanding this product may generate dust. Dust may irritate the eyes.
<b>Ingestion</b>	Solid steel: Not relevant, due to the form of the product. However, ingestion of dusts generated during working operations may cause nausea and vomiting.

**Symptoms related to the physical, chemical and toxicological characteristics**

Exposed individuals may experience eye tearing, redness, and discomfort. May dry the skin leading to discomfort and dermatitis. High concentrations of dust may irritate throat and respiratory system and cause coughing. Exposed individuals may experience eye tearing, redness, and discomfort.

**Information on toxicological effects****Acute toxicity**

Inhalation of dust (generated at high temperatures only) may cause mild irritation of the upper respiratory tract. Prolonged contact may cause redness, irritation and cracking. Welding, cutting and metalizing can generate ozone. Ozone can cause irritation of eyes, nose and respiratory tract.

**Skin corrosion/irritation**

Dust may irritate skin.

**Serious eye damage/eye irritation**

Dust may irritate the eyes.

**Respiratory or skin sensitization****Respiratory sensitization**

No data available.

**Skin sensitization**

Contains nickel: May cause an allergic skin reaction.

**Germ cell mutagenicity**

No data available.

**Carcinogenicity**

Nickel is listed by IARC (Group 2B) and NTP. A residual chrome VI compound from the surface coating is water soluble and is carcinogenic. Chromium VI compounds are regarded as human carcinogens by IARC, NTP, OSHA and ACGIH.

**IARC Monographs. Overall Evaluation of Carcinogenicity**

\*\* Iron oxide (CAS 1309-37-1)

3 Not classifiable as to carcinogenicity to humans.

Chromium (CAS 7440-47-3)

3 Not classifiable as to carcinogenicity to humans.

Lead (CAS 7439-92-1)

2B Possibly carcinogenic to humans.

Nickel (CAS 7440-02-0)

2B Possibly carcinogenic to humans.

**NTP Report on Carcinogens**

Nickel (CAS 7440-02-0)

Reasonably Anticipated to be a Human Carcinogen.

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**Reproductive toxicity**

No data available.

**Specific target organ toxicity - single exposure**

No data available.

**Specific target organ toxicity - repeated exposure**

No data available.

**Aspiration hazard**

Not relevant, due to the form of the product.

**Chronic effects**

Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases. The product contains a small amount of sensitizing substance which may provoke an allergic reaction among sensitive individuals in contact with skin. The ingredients of the alloy are bound within the product and release is not expected under normal conditions.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to benign pneumoconiosis (siderosis). Inhalation of high concentrations of iron oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens. Exposure to manganese fume/dust can affect the central nervous system (apathy, drowsiness, weakness and other chronic symptoms such as postural tremors). Pre-existing skin and respiratory conditions including dermatitis, asthma and chronic lung disease might be aggravated by exposure.

**12. Ecological information****Ecotoxicity**

The environmental hazard of the product is considered to be limited.

**Components****Species****Test Results**

Lead (CAS 7439-92-1)

LC50

Rainbow trout, donaldson trout  
(Oncorhynchus mykiss)

1.17 mg/l, 96 Hours

Manganese (CAS 7439-96-5)

**Aquatic**

Algae

EC50

Desmodesmus subspicatus

> 2.8 mg/l, 72 hours

Crustacea

EC50

Daphnia magna

> 1.6 mg/l, 48 hours

Fish

LC50

Oncorhynchus mykiss

> 3.6 mg/l, 96 hours

**Persistence and degradability**

No data available.

**Bioaccumulative potential** No data available on bioaccumulation.  
**Mobility in soil** Not relevant, due to the form of the product.  
**Other adverse effects** None known.

### 13. Disposal considerations

**Disposal instructions** Dispose waste and residues in accordance with applicable federal, state, and local regulations.  
**Local disposal regulations** Dispose of in accordance with local regulations.  
**Hazardous waste code** Not regulated.  
**Waste from residues / unused products** Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal. Recover and recycle, if practical.  
**Contaminated packaging** Since emptied containers may retain product residue, follow label warnings even after container is emptied.

### 14. Transport information

**DOT**  
Not regulated as dangerous goods.  
**IATA**  
Not regulated as dangerous goods.  
**IMDG**  
Not regulated as dangerous goods.  
**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable.

### 15. Regulatory information

**US federal regulations** Under some use conditions, this material may be considered to be hazardous in accordance with OSHA 29 CFR 1910.1200.  
All components are on the U.S. EPA TSCA Inventory List.

#### TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

#### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Lead (CAS 7439-92-1)	Reproductive toxicity Central nervous system Kidney Blood Acute toxicity
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#### CERCLA Hazardous Substance List (40 CFR 302.4)

Chromium (CAS 7440-47-3)	LISTED
Lead (CAS 7439-92-1)	LISTED
Manganese (CAS 7439-96-5)	LISTED
Nickel (CAS 7440-02-0)	LISTED

#### Superfund Amendments and Reauthorization Act of 1986 (SARA)

**Hazard categories** Immediate Hazard - No  
Delayed Hazard - No  
Fire Hazard - No  
Pressure Hazard - No  
Reactivity Hazard - No

#### SARA 302 Extremely hazardous substance

Not listed.

**SARA 311/312 Hazardous chemical** No

#### SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Manganese	7439-96-5	0.47 - 1.35
Nickel	7440-02-0	0.03 - 0.21
Lead	7439-92-1	0.00 - 0.07

## Other federal regulations

### Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Chromium (CAS 7440-47-3)

Lead (CAS 7439-92-1)

Manganese (CAS 7439-96-5)

Nickel (CAS 7440-02-0)

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

Not regulated.

### Safe Drinking Water Act (SDWA)

Not regulated.

## US state regulations

### US. Massachusetts RTK - Substance List

\*\* Iron oxide (CAS 1309-37-1)

Chromium (CAS 7440-47-3)

Lead (CAS 7439-92-1)

Manganese (CAS 7439-96-5)

Nickel (CAS 7440-02-0)

### US. New Jersey Worker and Community Right-to-Know Act

\*\* Iron oxide (CAS 1309-37-1)

Chromium (CAS 7440-47-3)

Lead (CAS 7439-92-1)

Manganese (CAS 7439-96-5)

Nickel (CAS 7440-02-0)

### US. Pennsylvania Worker and Community Right-to-Know Law

\*\* Iron oxide (CAS 1309-37-1)

Chromium (CAS 7440-47-3)

Lead (CAS 7439-92-1)

Manganese (CAS 7439-96-5)

Nickel (CAS 7440-02-0)

### US. Rhode Island RTK

Chromium (CAS 7440-47-3)

Lead (CAS 7439-92-1)

Manganese (CAS 7439-96-5)

Nickel (CAS 7440-02-0)

### US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

### US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1)

Nickel (CAS 7440-02-0)

## International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

## 16. Other information, including date of preparation or last revision

**Issue date** 01-December-2014

**Revision date** -

**Version #** 01

**Disclaimer** Steel Dynamics, Inc. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.