

MATERIAL SAFETY DATA SHEET**Section 1 Chemical Product and Company Identification**

Product: STEEL PLATE, COIL, AND SLAB, Carbon or High Strength Low Alloy or Alloy

Organization MSDS #:

Manufacturer's Name: Oregon Steel Mills, Inc.

Emergency Phone Number: 503-286-9651 (Business hours M-F 8-5)
800-242-9300 CHEMTREC

Address: PO Box 2760
Portland, Oregon 97208

HMS Codes

Health: 1 Fire: 0 Reactivity: 0 Chronic Effects: 0 (Product)
Health: 1 Fire: 0 Reactivity: 0 Chronic Effects: 4 (Dust, fume)

Manufacturer's Code: None Established

Chemical name/Classification: Steel Plate, Coil or Slab

MSDS Revision Date: February, 2000

Replaces MSDS Issued: April 23, 1997

Section 2 Composition

Potentially Hazardous Components	CAS #	Percent	OSHA PEL ¹ (mg/m ³)	ACGIH TLV ¹ (mg/m ³)
Note: Elements are in the reduced state in the metal. Some elements have PELs or TLVs only for the oxidized form. These are listed since welding, heating, or other operations on the metal may produce oxides.				
Iron (as Fe ₂ O ₃)	7438-89-6	95+	10	5
Manganese (as Mn)	7439-96-5	<3	5 (C) ²	0.2
Chromium (as Cr)	7440-47-3	<2	1	0.5
Copper (as Cu)	7440-50-8	<2	1 ³ , 0.1 ⁴	1 ³ , 0.2 ⁴
Nickel (as Ni)	7440-02-0	<2	1	1.5 ⁵

- 1 PELs and TLVs are current as of 1999 and expressed as 8-hour time weighted average limits for total dust.
- 2 (C) = Ceiling limit
- 3 As a dust
- 4 As a fume
- 5 Inhalable fraction

NOTE: Coatings may be present. Refer to the coating MSDS for additional information.

Section 3 Hazards Identification

Emergency Overview: Solid product is odorless, and silver-gray in color. In the finished state, steel products are not expected to present inhalation, ingestion, or contact health hazards. Operations involving grinding, welding, cutting, machining, etc. may generate dusts or fumes which can pose the following hazards:

Chapel

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Section 3 Hazards Identification cont'd.

Primary Route of Entry: Inhalation of dust and fumes.

Eye: Dust and fumes may irritate the eyes.

Skin: Prolonged or extended contact with the dust or fume may irritate the skin. Chromium oxide (Cr+3) compounds reportedly produced sensitivity dermatitis. Nickel compounds are noted for producing "nickel itch", a sensitivity dermatitis.

Ingestion: None

Inhalation: Nickel dust or fumes may produce irritation in the upper respiratory system. Manganese and copper dusts and fumes are capable of producing metal fume fever. This temporary condition is delayed in onset after exposure and lasts for up to 48 hours. It is characterized by a dry cough, headache, chest tightness, shortness of breath, and flu-like fever. Acute effects may be additive for the metals.

Chronic Information: Iron oxide dust causes a pulmonary condition, siderosis. This is considered a benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis. Chronic overexposure to manganese has produced kidney damage, pneumonia, and a neurologic disorder similar to Parkinson's Disease. Symptoms include generalized muscle weakness, speech impairment, incoordination, and impotence. Advance manganese poisoning manifests a complete lack of facial expression, severe muscle rigidity, and gait disorders. Pulmonary disease has been reported in workers exposed to ferro chrome alloys; chromium metal, however, does not give rise to pulmonary fibrosis or pneumoconioses. Chronic nickel exposure has produced allergic asthma and pneumonitis.

Carcinogenicity: The International Agency for Research on Cancer (IARC) has classified nickel as possibly carcinogenic to humans (Group 2B). The National Toxicology Program identifies nickel and certain nickel compounds as ones that may reasonably be anticipated to be carcinogens.

Teratogenic/Mutagenic Information: No information was found for the steel plate or reported metal constituents.

Reproductive Information: No reproductive effects information was found for the steel plate. Human males exposed to manganese dust showed decreased fertility. Long term ingestion of nickel dust or salts caused degenerative changes in reproductive organs in animal studies.

Section 4 First Aid Measures

The following information is based on dusts or fumes which could be generated from the steel product.

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Section 4 First Aid Measures cont'd.

Eye Contact: Immediately flush with water for at least 15 minutes, carefully lifting eyelid to expose the eye to contact with the water. Remove contact lens, if present, and repeat with an additional 15 minute flush. If irritation develops or symptoms persist, get medical assistance.

Skin Contact: Wash thoroughly with soap and water after skin contact.

Inhalation: If affected, remove to fresh air. Give CPR/artificial respiration if not breathing. Provide oxygen if breathing is difficult. If irritation develops or symptoms persist, get medical assistance. Symptoms of metal fume fever may be delayed for several hours after exposure.

If Swallowed: Do not induce vomiting. If person is alert and not convulsing, administer 6 to 8 glasses of water to dilute the material. Then call poison control center. If spontaneous vomiting occurs, have person lean forward to avoid breathing in vomitus. Rinse mouth and administer more water.

Notes to Physician: Metal fume fever presents flu-like symptoms with fever, myalgia, and headache; leukocytosis is often present. Chest X-ray and arterial blood gases are normal, and the illness is self-limited to 24-48 hours.

Section 5 Fire Fighting Measures

Extinguishing Media: None required. This material is completely non-combustible. For fire in close proximity, use standard fire fighting practices.

Special Fire Fighting Methods: None required. Firefighters should use self-contained breathing apparatus and turnout gear consistent with standard practices.

Fire & Explosion Hazards: None known.

Section 6 Accidental Release Measures

Spill/Cleanup Procedure: Where dust is generated, promptly clean up material spills; use water to wet down and minimize dust during cleanup. Do not flush dusts or powders to sewers. See Section 8 for exposure control and personal protection information.

Section 7 Handling and Storage

All containers of this material must be labeled with the label supplied with this product. No special handling or storage required for product.

If used or handled in a manner which generates dust or fumes, see Section 8 for specific personal protection information.

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Section 8 Exposure Controls, Personal Protection

Respiratory Protection: Do not breathe dust or fumes generated from grinding, welding, cutting, machining, etc.

If dust or fume concentration is greater than the PEL, but less than 10 times PEL, use a NIOSH approved half-mask respirator with an N95 (class 95) filter.

For concentrations above 10 times PEL, but less than 50 times PEL use a NIOSH approved full-face respirator with N95 (class 95) filter.

Where airborne concentrations may exceed 50 times PEL, use a supplied-air respirator.

Ventilation: Use local exhaust ventilation to maintain airborne dust or fume concentrations below PEL. If ventilation fails to maintain concentrations below the PEL, respiratory protection is required by federal and/or state regulations; see respiratory protection information above. NOTE: Special attention should be given to exhaust ventilation and/or the use of supplied air respirators for work in confined spaces.

Recommended Gloves: Recommended glove material for product is leather or welders gloves to protect against cuts and abrasions.

Eye Protection: Use safety glasses when handling or using product as a general safe practice. For grinding, welding, and cutting of the product, use eye protection consistent with OSHA Standards and the American National Standards Institute (Z87.1-1989).

Section 9 Physical and Chemical Properties

Appearance: Metallic, silver-gray
Odor: None
Boiling Point: Not applicable
Vapor Pressure (mm Hg.): Not applicable
Specific Gravity: 7.8 (water = 1)
Percent Volatile: 0
Water Solubility: Not applicable
Melting Point: 2,780°F (approximate)
Boiling Point: 5,400°F (approximate)

Section 10 Stability and Reactivity

Stability: Stable

Incompatibility: None Known

Conditions to avoid: None Known

Hazardous Decomposition Products: Will not decompose. High temperature heating greater than 2,780°F may produce metal fumes.

Hazardous Polymerization: No

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Section 11 Toxicology Information**Toxicity Data:**

	LD50
Iron:	20gm/kg (oral - guinea pig)
Manganese:	9gm/kg (oral - rat)
Chromium:	27.5mg/kg (unreported route - rat)
Copper:	3.5mg/kg (intraperitoneal - mouse)
Nickel:	250mg/kg (intraperitoneal - rat)

See Section 3 for other toxicological information.

Section 12 Ecological Information

Solid steel products and articles produced from products are not an ecological hazard. Released dusts may be hazardous to fish, animals, plants, and the environment based on components. The degree of hazard depends on the particle size and quantity released. In addition, if particles are small enough, materials may be ingested by wildlife, with possible toxic effects. The solid products are not expected to migrate easily into soil or groundwater based on its insoluble form. Dusts from products can become mobile in water and contaminate soil and groundwater. These dusts may persist in the environment for long periods, based upon corrosion resistance, insolubility, and non-biodegradable properties.

Section 13 Disposal Considerations

EPA Waste Codes: Not applicable for product.
Waste generated from product processing should be classified by a competent environmental professional and disposed, processed, or recycled in accordance with federal and local regulations. Product dusts from processing may be classified as a hazardous waste, depending on various properties of the dust (e.g. toxicity, solubility, flammability). Possibly more restrictive state and local regulations may apply.

Section 14 Transportation Information

DOT Number: Not established for product
DOT Hazard Class/Hazard Label: Not applicable based on 49 CFR 173.
Hazardous Materials Description/Proper Shipping Name: Not applicable for solid formed product.
Hazard Class: Not applicable for solid formed product.
Product Identification No.: Not applicable for solid formed product.

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Section 15 Regulatory Information

OSHA Hazard Communication Rule, 29 CFR 1910.1200: Not considered hazardous in product form. See components listed in Section 2 with accompanying notes.
 Sara/Title III: This material is considered under applicable definitions to meet the following categories:

Acute: Yes Chronic: Yes Fire: No Pressure: No Reacting: No
 Sara 313: This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40 CFR §372).

CAS #	Chemical Name	Percent By Weight
7439-96-5	Manganese	≤3
7440-47-3	Chromium	≤2
7440-50-8	Copper	≤2
7440-02-0	Nickel	≤2

Users should comply with applicable OSHA and RCRA and other state and federal regulations including (but not limited to) 29 CFR 1910.1000 (air contaminants), 29 CFR 1910.1200 (hazard communication), and 40 CFR 262 et al. (hazardous waste).

CERCLA RQ (pounds)*: Copper: 5,000; Nickel: 100; Chromium: 5,000
 * Reporting required only if diameter of particles released is less than 100 micrometers.

California Prop 65: Listed elements known by the state to cause cancer – Nickel.
 Listed possible trace elements (less than 0.1% wgt.) known by the state to cause cancer (C), and/or reproductive toxicity (R) – Arsenic (C,R), Cobalt (C), and Lead (C,R)

Manganese, chromium, copper, and nickel are listed on Canada's Ingredient Disclosure List. The nickel content of the steel make it a controlled product falling in a WHMIS Class D, Division 2, Subdivision A category. (Suspected carcinogen, skin sensitizer.)

MSDS Prepared by: Paul Carlson Associates, Inc.
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Oregon Steel Mills has prepared this information based on its reasonable review of available information, which underlying information was not created or prepared by Oregon Steel Mills. Although Oregon Steel Mills provides this information as a public service, it does not represent or warrant the accuracy, completeness or applicability of the information contained herein. Oregon Steel Mills does not warrant the fitness of the product for any particular use and has not evaluated the hazards associated with any particular uses of the product. All employers using the product should perform all review and testing and take all precautions required to protect their employees from any hazards associated with their use of the product.

Y = Yes, UN = Unknown, NA = Not Applicable, NRG = Not Regulated, NE = Not Established, NG = Not Given, NR = Not Required

TO Gary Gilbert

2 pages to follow

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