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Material Safety Data Sheet

Steel



SECTION 1 – Product Identification

Distributor: Joseph T. Ryerson & Son, Inc.

Address: 2621 W. 15th Place
Chicago, Illinois 60608

Chemical Name and Synonyms: STEEL

Chemical Family: Metals

Formula: Not Applicable

Emergency Telephone: 312-762-2121

SECTION 2 – Product Description and Hazardous Ingredients/Identity Information

See Chart Inside For Listing

SECTION 3 – Physical Data

Melting Point F (C): Greater Than 2800 (1540)

Vapor Pressure: Not Applicable

Vapor Density (Air = 1): Not Applicable

Solubility in Water: Negligible

Appearance and Odor: Grayish to silvery odorless sheet, strip, plate, bar, structural shapes, pipe and tubing.

Specific Gravity (H₂O = 1): Greater Than 7

% Volatile by Volume (%): Not Applicable

Evaporation Rate: Not Applicable

SECTION 4 – Fire and Explosion Hazard Data

Flash Point F (C): Not Applicable

Extinguishing Media: Use methods applicable to surrounding area.

Special Fire Fighting Procedures: Use self-contained breathing apparatus for protection against degradation products and fire fighting technique or agent(s) applicable to surrounding materials.

Flammable Limits: Not Applicable

Unusual Fire and Explosion Hazards: None

DISCLAIMER

RYERSON MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct, but no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material or the results to be obtained from the use thereof. User assumes all risk and liability of any use, processing or handling of any material. Variations in methods; conditions; equipment used to store, handle or process the material; and hazards in connection with the use of the material are solely the responsibility of the user and remain at its sole discretion.

As sold, the product described in this MSDS is considered by Ryerson to be an "article" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910. 1200 *et seq.* This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. It is not intended to preempt, replace or expand the terms contained in Ryerson Conditions of Sale. Compliance with all applicable federal, state and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are required.

* Steel products may be coated with petroleum oils to meet customer specifications. Information relative to specific coatings may be obtained from Ryerson.

SECTION 5 – Health Hazard Data

Applicable Statutory or Recommended Occupational Exposure Limits: No Threshold Limit Value (TLV) or Permissible Exposure Limit (PEL) exists for steel. Steel products in the natural state do not present an inhalation, ingestion or contact hazard. However, operations such as burning, welding, sawing, brazing, and grinding may result in the following effects if exposures exceed permissible limits as listed in Section 2 of the individual constituents.

Effects of Overexposure:

Acute – Dust or fume may cause irritation to the eyes, nose, or throat; leave a metallic taste in the mouth; result in metal fume fever; or produce flu-like symptoms.

Chronic	Aluminum	- Physical irritation	Nickel	- Lung damage, skin sensitizer, some compounds may cause cancer. Listed NTPARC and IARC Monograph
	Bismuth	- Physical irritation		
	Boron	- Physical irritation		
	Cobalt	- Blood, heart, bone marrow, thyroid, lung and pancreatic damage	Phosphorous	- Lower jaw bone damage
			Sulfur	- Affects lung
	Chromium	- Skin, nasal tissue damage, cancer, possible mutations	Selenium	- Nasal and lung irritation, stomach or bowel disturbance, garlic odor of breath
	Copper	- Physical irritation	Tellurium	- Garlic breath and perspiration, metallic taste, dry mouth, nausea, reduced sweating, loss of appetite
	Iron	- Lung damage		
	Lead	- Metallic taste, weakness, constipation, nausea, nervous disorder, blood and urinary damage, reproductive and possible cancer hazard	Titanium	- Physical irritation
			Vanadium	- Lung damage
	Manganese	- Lung damage, lack of coordination	Zinc	- Affects blood cells
	Molybdenum	- Affects liver, kidney, spleen, blood, causes diarrhea, bone deformation, and growth retardation	* Coating oils	- Steel coated with an oil may result in a mild skin irritation upon prolonged and repeated contact. Wear gloves and/or wash skin following contact to prevent skin irritation.

Usual Route(s) of Entry: Inhalation

Emergency and First Aid Procedures:

In the event of acute exposure, remove to fresh air, administer oxygen, and seek a physician's assistance.

SECTION 6 – Reactivity Data

Stability: Considered Stable

Incompatibility: Not incompatible with materials

Hazardous Polymerization: Not Applicable

Hazardous Decomposition Products: Not Applicable

Conditions to Avoid: May liberate metal fumes, metal oxides, or other oxides if exposed to elevated temperatures.

SECTION 7 – Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled: Not Applicable

Waste Disposal Method: This material may be reclaimed for reuse.

SECTION 8 – Special Protection Information

If operations are such that atmospheric levels of contaminants exceed prescribed limits, provide local-exhaust ventilation and/or adequate respiratory protection. Consult your regional codes or code of Federal Regulations, Title 29, Part 1910.252, Welding, Cutting and Brazing, 1910.134, Respiratory Protection, and 1910-Subpart Z, Toxic and Hazardous Substances.

SECTION 9 – Special Precautions

Precautions to be Taken in Handling and Storing: Not Applicable

Other Precautions: Not Applicable

SECTION 10 – Superfund Amendments and Reauthorization Act of 1986 (S.A.R.A.)

SARA Title III Section 313 and 40 CFR Part 372: The chemicals identified by (*) in Section 2 denote a toxic chemical or chemicals subject to reporting requirements of section 313 of Title III, and 40 CFR Part 372.

SECTION 11 – California Proposition 65

One or more of the alloys listed on this sheet contains a material known to the state of California to cause cancer or reproductive Toxicity. These are:

<u>Material</u>	<u>Listed Effect</u>
Nickel	Cancer
Lead	Reproductive Toxicity

PRODUCT DESCRIPTION	AISI GRADE/TRADE NAME	METAL CAS NUMBER: 7439-89-6	METALLIC COATINGS		
			*Zinc	Iron	*Aluminum
Nonresulfurized Carbon Steel	1005-1095	>95			
Nonresulfurized Carbon Steel: Vanadium Bearing	1005-1095	>95			
Nonresulfurized Carbon Steel: Lead Bearing	10L05-10L95	>95			
Nonresulfurized Carbon Steel: Titanium Bearing	1006	>95			
Nonresulfurized Carbon Steel: Bismuth Bearing	1016	>95			
Nonresulfurized Carbon Steel: Tellurium Bearing	1016	>95			
Nonresulfurized Carbon Steel: Bismuth Bearing	1045	>95			
Nonresulfurized Carbon Steel: Boron Treated	10B38	>95			
Nonresulfurized Carbon Steel: Boron Treated	10B42	>95			
Resulfurized Carbon Steel	1106	>95			
Resulfurized Carbon Steel	1110-1151	>95			
Resulfurized Carbon Steel: Bismuth Bearing	1110-1151	>95			
Resulfurized Carbon Steel: Tellurium Bearing	1110-1151	>95			
Resulfurized Carbon Steel: Vanadium Bearing	1110-1151	>95			
Rephosphorized and Resulfurized Carbon Steel: Lead Bearing	11L10-11L51	>95			
Resulfurized Carbon Steel: Lead Bearing	11L10-11L51	>95			
Resulfurized Carbon Steel: Lead and Tellurium Bearing	11L10-11L51	>95			
Rephosphorized and Resulfurized Carbon Steel: Bismuth Bearing	1211-1215	>95			
Rephosphorized and Resulfurized Carbon Steel: Tellurium Bearing	1211-1215	>95			
Rephosphorized and Resulfurized Carbon Steel	1211-1215	>95			
Rephosphorized and Resulfurized Carbon Steel: Lead Bearing	12L11-12L15	>95			
Nonresulfurized Carbon Steel	1513-1566	>95			
Nonresulfurized Carbon Steel: Vanadium Bearing	1513-1566	>95			
Nonresulfurized Carbon Steel: Vanadium, Titanium and Boron	15B13-15B36	>95			
Standard Alloy Steel: Manganese	1330-1345	>95			
Standard Alloy Steel: Molybdenum Bearing	4023-4047	>95			
Standard Alloy Steel: Molybdenum and Chromium	4118-4161	>95			
Standard Alloy Steel: Tellurium Bearing	4118-4161	>95			
Standard Alloy Steel: Boron Treated	41B18-41B61	>95			
Standard Alloy Steel: Vanadium, Titanium and Boron	41B18-41B61	>95			
Standard Alloy Steel: Molybdenum, Chromium and Lead	41L18-41L61	>95			
Standard Alloy Steel: Molybdenum, Chromium and Nickel	4320-4340	>95			
Standard Alloy Steel: Molybdenum and Nickel	4617-4626	>95			
Standard Alloy Steel: Boron Treated	50B40-50B60	>95			
Standard Alloy Steel: Chromium Bearing	5115-5160	>95			
Standard Alloy Steel: Boron Treated	51B60	>95			
Standard Alloy Steel: Chromium	50100	>95			
Standard Alloy Steel: Chromium	51100	>95			
Standard Alloy Steel: Chromium	52100	>95			
Standard Alloy Steel: Chromium & Vanadium	6118-6150	>95			
Standard Alloy Steel: Molybdenum, Chromium and Nickel	8615-8822	>95			
Standard Alloy Steel: Molybdenum, Chromium Nickel and Lead	86L15-86L55	>95			
Standard Alloy Steel: Nickel, Chrome & Molybdenum	9310	>92			
Standard Alloy Steel: Boron Treated	94B15-94B30	>93			>98
Inland ALUMA-TI	ALUMA-TI	>95			>98
ALUMINIZED STEEL	ALUMINIZED STEEL	>95			
Inland CAL DI-FORM	CAL DI-FORM	>95			
Inland CAL HI-FORM	CAL HI-FORM	>97			
Inland CORTEN A	CORTEN A	>95			
Inland CORTEN B	CORTEN B	>95			
Inland CORTEN C	CORTEN C	>95			
Inland CORTEN W	CORTEN W	>95			
Inland DECOR	DECOR	>95	>98		
Inland EZ CUT	EZ CUT	>95			
Inland 4-WAY	4-WAY	>95			
Inland HI-FORM	HI-FORM	>95			
Inland INAMEL	INAMEL	>95			
Inland INCUT	INCUT	>95			
Inland INX	INX	>95			
Inland INX BISMUTH	INX BISMUTH	>95			
Inland INX LEDLOY	INX LEDLOY	>95			
Inland LEDLOY	LEDLOY	>95			
Inland LEDLOY A	LEDLOY A	>95			
Inland LEDLOY AN	LEDLOY AN	>95			
Inland LEDLOY AX	LEDLOY AX	>95			
Inland MartInsite	MartInsite	>95			>89
PAINT-TITE	PAINT-TITE	>95			>10
Inland TI-CO Galvanized	TI-CO	>95			>98
Inland TI-NAMEL	TI-NAMEL	>95			
Inland TRI-STEEL	TRI-STEEL	>95			
Nonresulfurized Carbon Steel	ASTM A36	>95			
Standard Alloy Steel: Chromium Molybdenum	ASTM A182	>87			
Standard Alloy Steel: Chromium Molybdenum	ASTM A182 GR F11	>93			
Nonresulfurized Carbon Steel	ASTM A283	>95			
Nonresulfurized Carbon Steel	ASTM A285	>95			
Standard Alloy Steel: Chromium Molybdenum	ASTM A387 GR 11	>94			
Standard Alloy Steel: Chromium Molybdenum	ASTM A387 GR 22	>93			
Nonresulfurized Carbon Steel	ASTM A455	>95			
Standard Alloy Steel: Nickel Chromium, Boron	ASTM A514	>94			
Nonresulfurized Carbon Steel	ASTM A515	>95			
Standard Alloy Steel: Nickel Chromium, Boron	ASTM A517	>94			

Contaminant and Exposure Limits (mg/m ³)	*Aluminum	Bismuth	Boron	Carbon	*Chromium	Vanadium	*Zinc
	As Welding Fume PEL TLV Values are time-weighted averages, except "c" indicates a ceiling or short-term exposure limit	5	Not Listed	As Boron Oxide 15 10	Not Listed	Metals 1 0.5 Chromium II and III cpds 0.5 0.5 Chromic Acid and Chromates 0.1c 0.05 as CrO ₃ as Cr	As Vanadium Pentoxide Dust 0.05 resp. PEL 0.05 resp. TLV As Vanadium Pentoxide Fume 0.05 0.05

