



**U. S. STEEL GROUP**  
**Material Safety Data Sheet**  
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This information is taken from sources or based upon data believed to be reliable; however, USX Corporation makes no warranty as to the absolute correctness or sufficiency of any of the following or that additional or other measures may not be required under particular conditions.

**PRODUCT INFORMATION**

**Product/Common Name:** Hot or Cold Rolled Carbon Steel Sheet/Strip and Hot Rolled Skelp  
**CAS No:** 65997-19-5  
**USS Code No:** 3C011  
**Original Issue Date:** 8/1/85  
**Reference:** January, 1994

**REGULATORY INFORMATION**

**U.S. OSHA R-T-K** — Contains regulated material  
**Pennsylvania R-T-K** — Contains regulated material  
 E = Environmental Hazard  
 E+ = Environmental Hazard any compound this substance  
 S = Special Hazard Substance  
**New Jersey R-T-K** — Contains regulated material  
 H = Special Health Hazard Substance  
**California Prop. 65** — This product contains a material known to the State of California to cause cancer.  
**SARA 313: MANGANESE**  
 The above materials are subject to SARA 313 reporting requirements. Please also note that if you prepackage or otherwise redistribute this product to industrial customers, SARA 313 requires that a notice be sent to those customers.  
**WHMIS: (Canadian): D-2B Product Classification**  
**1993 NIOSH Registry of Toxic Effects of Chemical Substances Reference** —  
 44891, 5557, 25416, 48152, 60758, 81466  
**Definitions:**  
 C Ceiling  
 PNOC Particulates not otherwise classified  
 PNOR Particulates not otherwise regulated  
 STEL Short Term Exposure Limit. A 15-minute Time-Weighted Average Value.

**PHYSICAL DATA:**

**Boiling Point:** Not Applicable  
**Freezing Point:** Not Applicable  
**Melting Point—Base Metal:** 2750°F  
**Melting Point—Metallic Coating:** Not Applicable  
**Specific Gravity:** 7.85  
**Vapor Pressure—at 20°C:** Not Applicable  
**Vapor Density (air = 1):** Not Applicable  
**Solubility in Water:** Not Soluble  
**% Volatiles:** Not Applicable  
**Evaporation Rate:** Not Applicable  
**pH:** Not Applicable  
**Oil/Water Dist. Coefficient:** Not Applicable  
**Odor Threshold Conc.:** Not Applicable  
**Appearance (Physical State and Color):** Metallic Gray Solid  
**Odor:** No Odor

**FIRE AND EXPLOSION HAZARDS:**

Not flammable or combustible. Steel products in the solid state present no fire or explosion hazard and do not contribute to the combustion of other materials.

**FIRE AND EXPLOSION DATA**

**Extinguishing Media:** Not Applicable  
**Special Fire Fighting Instructions:** None  
**Hazardous Combustion Products:** Stable under normal conditions of use, storage, and transport. Will react with strong acid to liberate hydrogen. At temperatures above the melting point, may liberate fumes containing oxides of iron and alloying elements.  
**Oxidizing Material:** Does Not Cause or Contribute to Combustion of Other Material by Yielding Oxidizer

**INGREDIENTS AND RECOMMENDED OCCUPATIONAL EXPOSURE LIMIT**

Ingredient Name	CAS No.	% wt.	TDG Class.	WHMIS Class.	LD50 Species/Route	OSHA PEL	ACGIH TLV
Base Metal Iron	1309-37-1	Balance	None	D2B	5500 mg/kg rat/intraperitoneal	Iron Oxide Fume - 10 mg/M <sup>3</sup> Total Dust — 15 mg/M <sup>3</sup> (PNOR) Respirable Fraction - 5 mg/M <sup>3</sup> (PNOR)	5 mg/M <sup>3</sup> (fume) (PNO)
Alloying Elements Aluminum (E)	7429-90-5	.10 max.	None	D2B	No information	Total Dust - 15 mg/M <sup>3</sup> Respirable Fraction & Welding Fume - 5 mg/M <sup>3</sup>	10 mg/M <sup>3</sup> (dust) 5 mg/M <sup>3</sup> (welding fume)
Carbon	7440-44-0	.005/.60	None	D2B	440 mg/kg mouse/intravenous	Total Dust - 15 mg/M <sup>3</sup> (PNOR) Respirable Fraction - 5 mg/M <sup>3</sup> (PNOR)	10 mg/M <sup>3</sup> (PNO)
Manganese (E/E+)	7439-96-5	.05/1.50	None	D2B	9 gm/kg rat/oral	Dust & Fume - 5 mg/M <sup>3</sup> (C)	5 mg/M <sup>3</sup> (dust) 1 mg/M <sup>3</sup> (fume) 3 mg/M <sup>3</sup> (STEL) (fume)
Phosphorus (E)	7723-14-0	.15 max.	4a	D2A	3030 ug/kg rat/oral	.1 mg/M <sup>3</sup>	.1 mg/M <sup>3</sup>
Sulfur	7704-34-9	.05 max.	None	None	> 8437 mg/kg rat/oral	Total Dust - 15 mg/M <sup>3</sup> (PNOR) Respirable Fraction - 5 mg/M <sup>3</sup> (PNOR)	10 mg/M <sup>3</sup> (PNO)

**NOTES:**

All commercial metals 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. Typical levels of commonly involved trace or residual elements that may be encountered in steel products are provided in Annex I so that their potential hazards may be considered. All exposure limits are based on 8-hour time-weighted average values unless stated otherwise. (STEL) denotes "Short-Term Exposure Limit", a 15-minute time-weighted average value.

## HEALTH DATA

**Primary Routes of Entry:**  
Inhalation, and skin, if coated.

### Effects of Overexposure:

Chronic inhalation of high concentrations of iron oxide fumes or dusts may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

The inhalation of high concentrations of freshly formed oxide fumes and dusts of Manganese, Copper, Lead and/or Zinc in the respirable particle size range can cause an influenza-like illness termed metal fume fever. Typical symptoms last 12 to 48 hours and are characterized by metallic taste in mouth, dryness and irritation of the throat, followed by weakness, muscle pain, fever and chills. Continuous exposures to high concentrations of manganese can cause central nervous system disorders and "manganese pneumonia". Fibrosis of lung tissue from manganese exposures has also been reported for products containing manganese only.

Inhalation of phosphorus oxides may cause respiratory irritation and painful burns upon skin contact.

Sulfur compounds, present in the fumes, may irritate the skin, eyes, lungs and gastrointestinal tract.

Longterm inhalation exposure to high concentrations (overexposure) to pneumoconiotic agents may act synergistically with inhalation of oxides, fumes or dusts of this product to cause toxic effects.

**OIL COATING MAY BE USED:** Prolonged or repeated contact with unprotected skin may result in skin irritation. Torchng or burning operations on steel products with oil coating may produce emissions which can be irritating to the eyes and respiratory tract.

### Emergency and First Aid Procedures:

**Respiratory:** For overexposure to airborne fumes and particulates, remove exposed person to fresh air. If breathing is difficult or has stopped, administer artificial respiration or oxygen as indicated. Seek medical attention promptly. Metal fume fever may be treated by bed rest, and administering a pain and fever reducing medication. Seek medical attention.

**Skin:** If thermal burn has occurred, flush area with cold water. Seek medical attention. For mechanical abrasions, seek medical attention.

**Eyes:** Flush eyes with large amounts of water to remove particles. Seek medical attention.

### Special Protection Information:

**Respiratory:** NIOSH/MSHA-approved dust and fume respirators should be used to avoid excessive inhalation of particulates. Appropriate respirator selection depends on the magnitude of exposure.

**Skin:** Protective gloves should be worn as required for welding, burning or handling operations. Oil coating may be used: Wear gloves when handling; do not continue to use gloves or work clothing that has become saturated or soaked through with oil coating. Wash hands, and any area of skin after contact, with soap and water or waterless hand cleaner.

**Eyes:** Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations.

**Ventilation:** Local exhaust ventilation should be provided when welding, burning, sawing, brazing, grinding or machining to prevent excessive dust or fume exposure.

**Other Protective Equipment:** Depending upon the conditions of use and specific work situations, additional protective equipment and/or clothing may be required to control exposures.

**Precautions in Handling and Storage:** Operations with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Avoid breathing metal fumes and/or dusts.

**Spill or Leak Procedures:** Not applicable to steel in solid state. Dispose in accordance with state and local regulation.

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A Division of USX Corporation  
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### PRODUCT INFORMATION

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**USS Code No.:** 3C011

**Reference:** January, 1994

### Health Hazard Data

**NOTE:** Steel products under normal conditions do not present an inhalation, ingestion, contact health or environmental hazard. However, operations such as burning, welding, sawing, brazing, grinding, and possibly machining, etc., which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, may present health hazards.

**Medical Conditions Aggravated by Exposure:** Individuals with chronic respiratory disorders (i.e., asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by any fume or airborne particulate matter exposure.

**SARA Potential Hazard Categories are:**

- Immediate Acute Health Hazard
- Delayed Chronic Health Hazard

### Carcinogen Information:

IARC identifies welding fumes as a Group 2B carcinogen, a mixture which is probably carcinogenic to humans. (Lists of IARC Evaluations, May, 1993)

### Regulatory Information Components

**NOTE:** The listing of regulations relating to a USS product may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.

#### Components: Regulation

Al = SARA 313 if > 1.0%; SDWA; RCRA; DOT

Mn = SARA 313 if > 1.0%

P = SARA 313 if > 1.0%; CWA; CERCLA; SARA 302; DOT

S = DOT

### Abbreviations

ACGIH American Conference of Governmental Industrial Hygienists

CAA Clean Air Act

CERCLA Comprehensive Environmental Response, Compensation and Liability Act

CWA Clean Water Act

DOT Department of Transportation

IARC International Agency for Research on Cancer

NIOSH National Institute of Occupational Safety and Health

NTP National Toxicology Program

OSHA Occupational Safety and Health Administration

RCRA Resource Conservation Recovery Act

SARA Superfund Amendments and Reauthorization Act of 1986

SDWA Safe Drinking Water Act

TDG Transportation of Dangerous Goods Act

TSCA Toxic Substances Control Act

WHMIS Workplace Hazardous Materials Information System