



U. S. STEEL GROUP
Material Safety Data Sheet
 P.O. Box 206, Pittsburgh, PA 15230-0206

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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.

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

PRODUCT INFORMATION

Product: Hot Rolled Carbon Steel — Structural Shapes & H Piling
Common Name: (Example: ASTM A36)
CAS No: 65997-19-5
USS Code No: 1C003
Original Issue Date: 8/1/85
Revised: 12/87, 1/90, 1/91
Reference: January, 1992

REGULATORY INFORMATION

U.S. OSHA R-T-K — Contains regulated material
Pennsylvania R-T-K — Contains regulated material
 E = Environmental Hazard
 F+ = 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
1991 NIOSH Registry of Toxic Effects of Chemical Substances Reference — 44891, 5557, 25416, 48152, 60758, 79351, 9104
Definitions:
PNOC Particulates not otherwise classified
PNOR Particulates not otherwise regulated
STEL Short Term Exposure Limit. A 15-minute Time-Weighted Average Value.

INGREDIENTS AND RECOMMENDED OCCUPATIONAL EXPOSURE LIMIT

Ingredient Name	CAS No.	% wt.	TDG Classification	WHMIS Classification	LD50 or LC50 Species/Route	OSHA PEL	ACGIH TLV
Base Metal Iron	1309-37-1	98/99	Not classified	D2B	5.4 gm/kg mouse/oral	Iron Oxide Fume - 10 mg/M ³ Total Dust - 15 mg/M ³ (PNOR) Respirable Fraction - 5 mg/M ³ (PNOR)	5 mg/M ³ (fume) (PNOC)
Alloying Elements Aluminum (E)	7429-90-5	.10 max.	Not classified	D2B	No information	Total Dust - 15 mg/M ³ Respirable Fraction & Welding Fume - 5 mg/M ³	10 mg/M ³ (dust) 5 mg/M ³ (welding fume)
Carbon	7440-44-0	.30 max.	Not classified	Not classified	No information	Total Dust - 15 mg/M ³ (PNOR) Respirable Fraction - 5 mg/M ³ (PNOR)	10 mg/M ³ (PNOC)
Manganese (E/E+)	7439-96-5	.25/1.20	Not classified	D2B	9 gm/kg rat/oral	Dust & Fume - 1 mg/M ³ 3 mg/M ³ (STEL)	5 mg/M ³ (dust) 1 mg/M ³ (fume) 3 mg/M ³ (STEL) (fume)
Phosphorus (E)	7723-14-0	.04 max.	Not classified	Not classified	No information	Total Dust - 15 mg/M ³ (PNOR) Respirable Fraction - 5 mg/M ³ (PNOR)	10 mg/M ³ (PNOC)
Silicon	7440-21-3	.35 max.	Not classified	Not classified	No information	Total Dust - 10 mg/M ³ Respirable Fraction - 5 mg/M ³	10 mg/M ³
Sulfur	7704-34-9	.001/.05	Not classified	Not classified	No information	Total Dust - 15 mg/M ³ (PNOR) Respirable Fraction - 5 mg/M ³ (PNOR)	10 mg/M ³ (PNOC)

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.

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.

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.

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.

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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CAS No.: 65997-19-5

USS Code No.: 1C003

Reference: January, 1992

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:

No ingredients of this product are listed by the NTP Annual Report on Carcinogens or have been found to be a potential carcinogen in the IARC Monographs or by OSHA.

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 311; CERCLA; SARA 302; DOT
S = SARA 302

Abbreviations

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
TDG Transportation of Dangerous Goods Act
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
TSCA Toxic Substances Control Act