

In accordance with OSHA Standard 29 CFR 1910, 1200
MATERIAL SAFETY DATA SHEET
STEEL PRODUCTS

Revised: 8/18/08



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INFORMATION AND EMERGENCY

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I. IDENTIFICATION: PRODUCT NAME: HOT ROLLED BARS AND ROUNDS
COMMON NAME: ALLOY STEELS CAS. NO. : 12597-69-2

II. INGREDIENTS AND RECOMMENDED OCCUPATIONAL EXPOSURE LIMITS

Base Metal, Alloying Elements & Metallic Coating	% Weight	Exposure Limits	
		OSHA PEL	ACGIH TLV
Base Metal:			
Iron 7439-89-6	86-99	10 mg/m ³ (iron oxide fume)	5 mg/m ³ (iron oxide fume)
Alloying Elements:			
Carbon CAS #7440-440-0	0.01-1.10	- none established -	- none established -
Manganese CAS #7439-96-5	0.25-2.0	5 mg/m ³ (Mn compounds & fume) 5 mg/m ³ (Mn fume)	5 mg/m ³ (Mn dust & compounds)
Phosphorus CAS #7723-14-0	0.035 (max.)	- none established -	- none established -
Sulfur CAS #7704-34-9	0.001-0.15	13 mg/m ³ (as SO ₂)	5.2 mg/m ³ (as SO ₂)
Silicon CAS #7440-21-3	0.15-2.20	15 mg/m ³ (total dust) 5mg/m ³ (respirable fraction)	10 mg/m ³ (total dust)
Nickel CAS #7440-02-0	0.01-3.80	1 mg/m ³ (Ni metal & insol. compnds.)	1mg/m ³ (Ni metal & insol. compounds)
Chromium CAS #7440-47-3	0.01-13.00	1 mg/m ³ (Cr metal & insol. salts) 0.5 mg/m ³ (Cr-III & compnds.)	0.5 mg/m ³ (Cr metal & CRIII compnds.) 0.1 mg/m ³ (insol. CR-VI compnds.)
Molybdenum CAS #7439-98-7	0.01-1.10	15 mg/m ³ (insol. compnds. & total dust)	10 mg/m ³ (insol. compnds.)
Vanadium CAS #7440-62-2	0.01-0.50	0.5 mg/m ³ (V ₂ O ₅ dust) 0.1 mg/m ³ (V ₂ O ₅ fume)	0.05 mg/m ³ (respirable dust and fume)
Columbium CAS #7440-03-1	0.01-0.25	- none established -	5.0 mg/m ³
Aluminum CAS #7429-90-5	0.01-1.00	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)	10 mg/m ³ (Al metal dust) 5 mg/m ³ (Al welding fumes)
Bismuth CAS #7440-69-9	0.01-0.15	- none established -	- none established -

COMMENTS: IRAC (Suppl. 1, 29-30, 1979) has determined that there is sufficient evidence of increased lung cancer among workers in the chromate-producing industry and possibly chromium alloy workers. This determination is supported by sufficient evidence for carcinogenicity to animals and possible mutagenicity testing of Cr VI compounds. IRAC (11, 75-112, 1976) has determined that there is at least limited evidence that nickel and certain nickel compounds may be human carcinogens. Several nickel compounds are carcinogenic to laboratory animals by various routes of exposure. Exposure to high concentrations to nickel dusts can cause sensitization to dermatitis, respiratory irritation, asthma, pulmonary fibrosis and edema. Certain forms of nickel dust may cause nasal or lung cancer in humans (see Section IX). Repeated or prolonged exposure to hexavalent chromium compounds may cause respiratory irritation, nose bleed, ulceration and perforation of the nasal septum. Industrial exposures to certain forms of hexavalent chromium have been related to an increased incidence of lung cancer (see Section IX).

Note: All commercial metals contain small amounts of various elements in addition to those specified. These small quantities (<0.1%) are frequently referred to as “trace” or “residual” elements and generally originate in the raw materials used.

**TABLE A
TYPICAL LEVELS OF TRACE OR RESIDUAL ELEMENTS IN STEELS**

ELEMENTS		% WEIGHT	ELEMENT		% WEIGHT
Aluminum	Al	0.002-0.01	Molybdenum	Mo	<0.004-0.04
Arsenic	As	0.005-0.008	Nickel	Ni	0.011-0.04
Boron	B	0.0005-0.00030	Niobium	Nb	0.002-0.005
Calcium	Ca	0.0002	Silicon	Si	<0.004-0.02
Chromium	Cr	0.02-0.08	Tin	Sn	<0.004-0.02
Cobalt	Co	<0.005-0.009	Titanium	Ti	0.001-0.004
Copper	Cu	0.009-0.18	Vanadium	V	0.001-0.003
Lead	Pb	<0.001	Zirconium	Zr	0.002

III. PHYSICAL DATA

MELTING POINT – Based Metal 2650 - 2750° F, APPEARANCE AND ODOR – Metallic Gray, No odor.

IV. FIRE AND EXPLOSION HAZARD DAT

Steel, products in the solid state present no fire or explosion hazard.

V. STORAGE AND HANDLING PRECAUTIONS

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.

VI. SPILL AND RELEASE INFORMATION-STEPS TO BE TAKEN IN THE EVENT MATERIAL IS RELEASED

Not applicable to steel in the solid state. WASTE DISPOSAL INFORMATION- Material must be disposed of in accordance with all applicable Federal, State, and Local regulations. Waste material may be land-filled at an approved facility (TLCP testing for metals may be required). Material should be recycled if possible.

VII. HEALTH HAZARD DATA

NOTE: Steel products under normal conditions do not present an inhalation, ingestion or contact health hazard. However, operations, such as burning, welding, sawing, brazing, grinding and possibly machining, etc., which result in evaluating the temperature of the product to or above its melting point or result in the generation of airborne particulates, may present health hazards. **EFFECTS OF OVEREXPOSURE: MAJOR EXPOSURE HAZARD-INHALATION.** Chronic inhalation of high concentrations of iron oxide fumes or dusts may be lead to 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 Zinc in the respirable particle size range can cause in influenza-like 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. **EMERGENCY AND FIRST AID PROCEDURES:** For overexposure to airborne fumes and particles, remove exposed person to fresh air. If breathing is difficult or it has stopped, administer artificial respiration or oxygen as indicated. Seek medical attention promptly. Treat metal fume fever by bed rest, and administer a pain and fever reducing medication.

VIII. REACTIVITY DATA

Stable under normal conditions of use, storage, and transport. Will react with strong acid to liberate fumes containing oxides of iron and alloying elements.

IX. PERSONAL PROTECTIVE EQUIPMENT

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. **EYE:** 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.

X. REGULATORY INFORMATION AND ADDITIONAL COMMENTS

Component Name (CAS number)	SARA EHS ³		SARA 313 ⁴	CERCLA ⁵
	RQ	TPQ	Chemical (YES/NO)	RQ (lbs.)
Chromium (7440-47-3)	NA	NA	YES	5,000
Nickel (7440-02-0)	NA	NA	YES	100
Manganese (7439-96-5)	NA	NA	YES	NA
Aluminum, <i>fume or dust</i> (7429-90-5)	NA	NA	YES	NA

ADDITIONAL COMMENTS

The International Agency for Research on Cancer (IARC) – *Monographs on the Evaluation of Carcinogenic Risks to Humans* (1987) lists chromium as a Group 3 carcinogen: Not classifiable as a human carcinogen: inadequate human evidence, inadequate animal evidence. The National Toxicology Program (NTP) – *7th Annual Report on Carcinogens* (1994) has listed chromium & certain chromium & certain chromium compounds as known carcinogens: Evidence from human studies indicates that there is a casual relationship between exposure to the substance and human cancer.

The International Agency for Research on Cancer (IARC) – *Monographs on the Evaluation of Carcinogenic Risks to Humans* (1987) list nickel as a Group 1 carcinogen: sufficient human evidence, sufficient animal evidence.

The National Toxicology Program (NTP) – *7th Annual Report on Carcinogens* (1994) has listed nickel & certain nickel compounds as anticipated carcinogens: There exists limited evidence of carcinogenicity in humans or sufficient evidence of carcinogenicity in experimental animals.

³Section 302 Extremely Hazardous Substances (EHSs) Reportable Quantities (RQs) and Threshold Planning Quantities (TPQs) as listed in 40 CFR 355 (App. A & B).

⁴Section 313 Toxic Chemicals as listed in 40 CFR 372.

⁵Reportable Quantities of CERCLA Hazardous Substances as listed in 40 CFR 302 (Table 302.4).

This information is taken from courses or based upon data believed to be reliable. However, Gerdau MacSteel makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional or other measures may not be required under particular conditions.