

# Material Safety Data Sheet

**Product:** Stainless Steel Tubing & Pipe- Austenitic

## 1. COMPONENT DATA

Material	% by Weight	CAS #	OSHA - PEL	
			TWA	ACGIH TLV
Iron	67-89	7439-89-6	10	5
Chromium*	10-27	7440-47-3	1	0.5
Nickel*	0-22	7440-02-0	1	1
Manganese*		7439-96-5		
Organic compounds fume	0-2		C5 C5	0.2 NE
Molybdenum	0-4	7439-98-7	10 (Total Dust) 5 (Respirable Fraction)	10
Copper*	0-4	7440-50-8	0.1 (Fume) 1 (Dust)	0.2 (Fume) 1 (Dust)
Silicon	0-2	7440-21-3	15 (Total Dust) 5 (Respirable Fraction)	10
Cobalt*	0-1	7440-48-7	0.01	0.02
Titanium	0-1	7440-32-6	15	10
% by Weight	-	Component % Varies by Grade		
C	-	Ceiling limit not to be exceeded		
*	-	Denotes SARA Title III, Section 313 toxic chemical		
STEL	-	Short Term Exposure Limit		

## 2. PHYSICAL DATA

Gray Solid with metallic luster, odorless	Boiling Point: N/A
Melting range: 2,500-2,800°F	Solubility in Water: N/A
Specific Gravity: ~ 8	Vapor Pressure: N/A
Vapor Density: N/A	pH: N/A
Evaporation Rate: N/A	

## 3. FIRE & EXPLOSION DATA

Flash Point: N/A

Extinguishing Media: N/A

## 4. REACTIVITY DATA

- Stability : Stable Conditions to avoid: N/A
- Incompatibility: Reacts with strong acids to form hydrogen gas
- Hazardous Polymerization: Will not occur
- Hazardous Decomposition Products: Metal fumes; Iron oxide, manganese, chromium, molybdenum, titanium dioxide and cobalt when burning or welding may occur.

## MSDS Stainless

Prepared By	Jerry Hemmerling	Issue Number	2
Approved By	Mike Aston	Issue Date:	04/13/11

## 5. HEALTH HAZARD DATA

Primary routes of exposure: Inhalation: Yes (Fumes from welding or burning, dusts from grinding or cutting)

Skin: No

Ingestion: No

Other: Eyes

## HEALTH HAZARDS (ACUTE and CHRONIC)

**ACUTE:** Excessive; inhalation of metallic fumes and dusts may be to respiratory passages. Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever" Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), a metallic taste in the mouth, dryness and irritation of the throat. The symptoms come on a few hours after excessive exposures and usually last from 12 to 48 hours. Long term effects from metal fever have not been noted. Iron oxide, manganese, and copper have been associated with causing metal fume fever.

High concentrations of metallic fumes and dusts can result in irritation of the eyes, skin, mucous membranes, and other forms of physical

**CHRONIC:** Chronic inhalation of high concentrations of metal fumes and dusts are associated with the following conditions:

Iron oxide:

Chronic inhalation of excessive concentrations of iron oxide fumes and dusts may result in development of a benign pneumoconiosis, called siderosis, which is observable as an X-ray change. No physical impairment of lung function has been associated with siderosis. Inhalation of excessive concentrations of ferric oxide may enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Manganese:

Chronic exposure to high concentrations of manganese fumes and dusts may increase the incidence of pneumonia and lung damage and may adversely affect the central nervous system with symptoms including languor, sleepiness, emotional disturbances, spastic gait, mask-like facial expression and, paralysis. Animal studies indicate that manganese exposure may increase susceptibility to bacterial and viral infections.

Nickel:

Nickel fumes are respiratory irritants and may cause pneumonitis. Skin contact may cause an allergic skin rash. Nickel itch is the dermatitis resulting from sensitization to nickel; the first symptom is usually itching, which occurs up to 7 days before skin eruption occurs. The primary skin eruption is erythematous, or follicular, which may be followed by skin ulceration. Nickel sensitivity, once acquired, is apparently not lost. All airborne nickel-contaminating dusts are regarded as carcinogens via inhalation.

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Chromium:

Grinding, polishing, abrasive blasting, hot rolling and hot forging dust, welding fumes, and thermal cutting fumes may contain Cr(VI) hexavalent chromium compounds. Studies have shown that some hexavalent chromium compounds can cause cancer.

Chromium as Cr(VI) hexavalent compound in fumes and dust is classified by NTP as "Known to be a human carcinogen" and by ACGIH as A1 "Confirmed Human carcinogen."

Chromium as metal or Cr(II) and Cr(III) oxides is not listed by NTP and is classified by ACGIH as A4 "Not classifiable as a human carcinogen." However, epidemiological studies amongst welders indicate no extra risk of cancer when welding stainless steels, compared to the slightly increased risk when welding steels that do not contain chromium.

Titanium Dioxide:

Titanium dioxide dust is a mild pulmonary irritant, eye and skin irritant and may be a potential carcinogen. Laboratory animals (rats) exposed to Titanium dioxide developed small focal areas of emphysema, which were attributable to large deposits of dust. Excessive exposure in humans may result in slight changes in the lungs.

Cobalt:

Cobalt in stainless steel is an alloy. None of the classifications of cobalt is valid for alloys. Cobalt dust may cause an asthma-like disease. Based on hard-metal workers, IARC has made a difference between cobalt metal with (2A) and without (2B) tungsten., NTP's 11<sup>th</sup> report on Carcinogens classified cobalt sulfate as "Reasonably anticipated to be carcinogen." ACGIH classifies cobalt as A3 Confirmed Animal Carcinogen with Unknown Relevance to Humans.

Silicon:

Elementary silicon is an inert material that appears to lack the properties of causing fibrosis in the lung tissue. However, slight pulmonary lesions have been reported in laboratory animals from intratracheal injections of silicon dust. Silicon dust has little adverse affect on lungs and does not appear to produce significant organic disease or toxic effects when exposures are kept under the TLV. Silicon may cause chronic respiratory effects.

Molybdenum:

Based on animal experiments, molybdenum and its compounds are highly toxic. Some evidence of liver dysfunction with hyperbilirubinemia have been reported in workmen chronically exposed in a Soviet Mo-Cu plant. In addition signs of gout have been found in factory workers and among inhabitants of Mo-rich areas of Armenia. The main features were joint pains in the knees, hands, feet, articular deformities, erythema, and edema of the joint areas.

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Copper:

Industrial exposure to copper fumes, dusts or mists results in metal fume fever with atrophic changes in nasal mucous membranes. Chronic poisoning results in Wilson's disease characterized by hepatic cirrhosis, brain damage, demyelination, renal disease and copper deposition in the cornea.

Stainless Steel as a mixture has not been determined to be carcinogenic. However, as listed in the above text individual components have been associated with carcinogenicity.

Stainless Steel:

NPT listed: No IARC Monographs: No OSHA listed: No.

## 6. EMERGENCY AND FIRST AID PROCEDURES

Inhalation: If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

Skin: If irritation develops, remove contaminated clothing immediately, and wash contaminated skin with soap or mild detergent and water for five minutes. Seek medical attention if necessary.

Eyes: In case of contact, immediately wash eyes with large amounts of water for fifteen minutes, occasionally lifting the lower and upper lids. Seek medical attention if necessary.

Ingestion: Seek medical attention if necessary.

## 7. SPECIAL PROTECTION INFORMATION

Ventilation: Ventilation, as described in the Industrial Ventilation Manual produced by the American Conference of Governmental Industrial Hygienists, shall be provided in areas where exposures are above the permissible exposure limits or threshold limit values (TLV) specified by OSHA or other local, state, and federal regulation.

Respiratory Protection: A properly fitted, NIOSH-approved, dust-fume respirator should be worn during welding, burning, grinding or cutting whenever dust or fumes exceed the Threshold Limit Value (TLV) or other recommended limits, in accordance with OSHA Respiratory Protection Standard (29 CFR 1910.134).

Skin Protection: Use appropriate clothing, such as welder's aprons and gloves when welding or burning.

Eye Protection: Wear ANSI Z87.1 approved safety glasses with side shield or goggles. Use appropriate eye protection, including welding helmets and/or face shields with protective filter lenses when welding.

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8. SPILL, LEAK, INFORMATION

Spill or Leak Procedures: N/A  
Waste Disposal Method: According to local, state, federal- regulations.

9. SPECIAL PRECAUTIONS/ADDITIONAL INFORMATION

Precautions to be taken for handling and Storage: None

Stainless steel products in the solid form are not classified as HAZMAT. No label is required during transport.

Additional Information: During welding, precautions should be taken for heat that may originate from the welding process or from components of the welding rod. Of special concern are silica or silicates, or both; fluorides, manganese, carbon monoxide, and nitrogen oxides. Arc and sparks generated when welding with product could be a source of ignition for combustible and flammable materials.

10. EPCRA / SARA SECTION 302, 304, 311/312 AND 313 TABLE

Component	CAS#	Sec 302 EHS	Sec 304 Spill	Sec 311/312 Hazard classes	Sec 312 SARA Tier II	Sec 313 Form R
			Reporting Quantity, lbs.		Threshold Planning Quantity, lbs.	By weight %
Chromium	7440-47-3	Not applicable	5,000	Chronic health hazard	10,000	10-27
Nickel	7440-02-0	Not applicable	100	Chronic health hazard	10,000	0-22
Manganese compounds	N450	Not applicable	No RQ established	Chronic health hazard	10,000	0-2.0

11. DISCLAIMER

While the information and recommendations set forth on this data sheet are believed to be accurate as of the present date, RathGibson Janesville, LLC makes no warranty with respect thereto and disclaims all liability from reliance thereon.

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