

# 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*	0-2	7439-96-5	C5	C5 (dust & compound) 1 (Fume) 3 (Fume) STEL
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	10 (Total Dust) 5 (Respirable Fraction)	10
Cobalt*	0-1	7440-48-7	0.05	0.05
Titanium	0-1	13463-67-7	10 (Total Dust) 5 (Respirable Fraction)	10 (Total Nuisance Dust)
% 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: 2,600-2,800°F	Solubility in Water: N/A
Specific Gravity: $\approx$ 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.

### 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.

#### Chromium:

The health hazards associated with exposure to chromium are dependent on its oxidation state. The metal form (chromium as it exists in this product) is of very low toxicity. The hexavalent form is very toxic. Adverse effects of the hexavalent form on the skin may include ulcerations, dermatitis and allergic skin reactions. Inhalation of hexavalent chromium compounds can result in ulceration and perforation of the mucous membranes of the nasal septum, irritation of the pharynx and larynx, asthmatic bronchitis, bronchospasms, and edema. Respiratory symptoms may include coughing and wheezing, shortness of breath and nasal itch. Eye irritation or inflammation may also result. The international Agency for Research on Cancer (IARC) lists hexavalent chromium compounds as known human carcinogens. The American Conference of Governmental Industrial Hygienists (ACGIH) has reviewed the toxicity data and concluded that chromium metal is not carcinogenic to humans.

#### 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. The dusts of titanium dioxide can be placed in the nuisance category.

#### Cobalt:

Inhalation of cobalt metal fumes and dust causes irritation of the nose and throat. Cobalt dust may cause an asthma-like disease with symptoms ranging from cough, shortness of breath and dyspnea to decreased pulmonary function, nodular fibrosis, permanent disability and death. Exposure to cobalt may cause weight loss, dermatitis and respiratory hypersensitivity. Although, cobalt is not listed by IARC,

NPT or OSHA as a carcinogen, some data suggests that cobalt is an experimental carcinogen in laboratory animals.

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:

Molybdenum is not foreseen as a hazard in the present context. Though molybdenum has causes toxicity (anemia and poor growth) in farm animals, here is not data documenting toxicity to humans due to industrial exposure; however, molybdenum may cause lung disease and irritation.

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).

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

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

DOT Information:

Hazardous Material Proper Shipping

Name – N/A

Identification Number – N/A

Hazard Class – N/A

EPA Hazardous Waste Number – N/A

Additional Information: During welding, precautions should be taken for 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.

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