

MARMON/KEYSTONE LLC

THE PIPE AND TUBING PEOPLE

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EMERGENCY PHONE NUMBER (724) 283-3000

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MATERIAL SAFETY DATA SHEET

TRADE NAME (Common Name or Synonym)

Carbon and Alloy Steels

CHEMICAL NAME

AISI/SAE Grades 10xx thru 93xx

I. INGREDIENTS

Material or Component	CAS Number	% Weight	EXPOSURE LIMITS	
			OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Base Metal				
Iron (Fe)	1309-37-1	98.5-99.5	10 Oxide Fume	5 Oxide Fume
Alloying Elements				
Aluminum (Al)	7429-90-5	<0.1-0.5	15 Dust	10 Dust/5 Fume
Bismuth (Bi)	7440-69-9	<0.2-0.5	Not Established	Not Established
Boron (B)	7440-42-8	<.01-1.0	15 Oxide Fume	10 Oxide Fume
Carbon (C)	7440-44-0	<.10-1.5	Not Established	3.5 AS Carbon Black
Chromium (Cr)	7440-47-3	<.40-10	1.0 Chrome Metal	0.5 Chrome Metal
Columbium (Cb)	7440-03-1	<.15-.35	Not Established	Not Established
Copper (Cu)	7440-50-8	<.30-1.90	1.0 Fume/1.0 Dust	0.2 Fume/1.0 Dust
Lead (Pb)	7439-92-1	<.01-.15	.05 Dust & Fume	.15 Dust & Fume
Manganese (Mn)	7439-96-5	<.04-0.7	5c Dust/5c Fume	5c Dust/1 Fume
Molybdenum (Mo)	7439-98-7	<.15-1.10	15 Insoluble Compounds	10 Insoluble Compounds
Nickel (Ni)	7440-02-0	<.01-10	1 Nickel Metal	1 Nickel Metal
Phosphorous (P)	7723-14-0	<.040-12	0.1 Phosphorous	0.1 Phosphorous
Silicon (Si)	7440-21-3	<.15-2.00	15 Dust	10 Total Dust
Sulfur (S)	7704-34-9	<.050-.35	13 Sulfur Dioxide	5 Sulfur Dioxide
Vanadium (V)	7440-62-2	<.01-0.15	0.5c Dust/0.1c Fume	0.05 Dust/0.05 Fume
Zinc Coating	1314-13-2	2 oz/ft ²	5 Oxide Fume	10 Dust/5 Fume
Aluminum Coating	7429-90-5	0.5 oz/ft ²	Not Established	10 Dust/5 Fume

Note: The above listing is a summary of elements used in alloying steel. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts. No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steel. Values shown are applicable to component elements.

II. PHYSICAL DATA

MATERIAL IS (At Normal Conditions) <input type="checkbox"/> LIQUID <input checked="" type="checkbox"/> SOLID <input type="checkbox"/> GAS <input type="checkbox"/> OTHER		APPEARANCE AND ODOR Grey-Black, Odorless	% VOLATILE BY VOLUME N/A	VAPOR DENSITY N/A
ACIDITY/ALKALINITY pH = N/A	Melting Point Approx. 2800 ° F Boiling Point N/A ° F	Specific Gravity (H ₂ O = 1) Approx. 7 Solubility in water (% by weight) N/A	VAPOR PRESSURE (mm Hg at 20° C) N/A	

III. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION Appropriate dust/mist/fume respirator should be used to avoid excessive inhalation of particulates. If exposure limits are reached or exceeded, use NIOSH approved equipment.	HANDS, ARMS AND BODY Protective gloves should be worn as required for welding, burning or handling operations.
EYES AND FACE Safety glasses should be worn when grinding or cutting. Face shields should be worn when welding or cutting.	OTHER CLOTHING AND EQUIPMENT As required depending on operations and safety codes.

IV. EMERGENCY MEDICAL PROCEDURES

INHALATION:	Remove to fresh air; if condition continues, consult a physician.
EYE CONTACT:	Flush thoroughly with running water to remove particulate; obtain medical attention.
SKIN CONTACT:	Remove particles by washing thoroughly with soap and water. Seek medical attention if condition persists.
INGESTION:	If significant amounts of metal are ingested, consult physician.

V. HEALTH/SAFETY INFORMATION

Health	<p>Steel products in their solid state present no inhalation, ingestion, or contact health hazard. Operations such as burning, welding, sawing, brazing, grinding, and machining, 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 hazards. The major exposure hazard is inhalation. Effects of overexposure to fume and dust are as follows:</p> <p>ACUTE: Excessive inhalation of metallic fumes and dust may result in irritation of eyes, nose and throat. High concentrations of fumes and dust of iron-oxide, manganese, copper, zinc and lead may result in metal fume fever. Typical symptoms last from 12 to 48 hours and consist of a metallic taste in the mouth, dryness and irritation of the throat, chills and fever.</p> <p>CHRONIC: Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed opposite the element:</p> <p>Aluminum: May initiate fibrotic changes to lung tissue Bismuth: No chronic debilitating symptoms indicated Boron: No chronic debilitating symptoms indicated Chromium: Lesions of the skin and mucous membranes, possibly cancer of the nose or lungs-bronchogenic carcinoma Copper: No chronic debilitating symptoms indicated Iron: Siderosis, pulmonary effects. No chronic debilitating symptoms indicated Lead: Anemia, urinary dysfunction, weakness, constipation, nausea, nervous disorder Manganese: Bronchitis, pneumonitis, lack of coordination Molybdenum: Respiratory tract irritation, possible liver and kidney damage, bone deformity Nickel: Lesions of the skin and mucous membranes, possibly cancer of the nose or lungs-bronchogenic carcinoma Phosphorous: Necrosis of the mandible Sulfur: (As sulfur dioxide) Edema of the lungs Vanadium: (As vanadium pentoxide) Emphysema, pneumonia Zinc: Gastrointestinal inflammation reported in animal studies</p> <p>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.</p> <p>OCCUPATIONAL EXPOSURE LIMITS: See Products Ingredients Section I. Chromium and Nickel have been identified by the International Agency for Research on Cancer (IARC) and/or the National Toxicology Program (NTP) as potential cancer causing agents.</p>										
	Fire and Explosion	<p>FLASH POINT</p> <p>N/A ° F</p>	<p>AUTO IGNITION TEMPERATURE</p> <p>N/A</p>	<p>FLAMMABLE LIMITS IN AIR</p> <table border="1"> <tr> <td>Lower</td> <td>N</td> <td>%</td> </tr> <tr> <td>Upper</td> <td>A</td> <td>%</td> </tr> </table>	Lower	N	%	Upper	A	%	<p>EXTINGUISHING MEDIA</p> <p>For molten metal use dry power or sand.</p>
		Lower	N	%							
Upper	A	%									
<p>FIRE AND EXPLOSION HAZARDS</p> <p>Steel tubular products do not present fire or explosion hazards under normal conditions. Fine metal particles such as produced in grinding or sawing can burn. High concentrations of metallic fines in the air may present an explosion hazard.</p>			<p>EXTINGUISHING MEDIA NOT TO BE USED</p> <p>Do not use water on molten metal.</p>								
Reactivity	<p>STABILITY</p> <p><input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable</p>		<p>INCOMPATIBILITY (MATERIALS TO AVOID)</p> <p>Reacts with strong acids to form hydrogen gas.</p>								
	<p>CONDITIONS TO AVOID: Steel at temperatures above the melting point may liberate fume containing oxides of iron and alloying elements. Avoid generation of airborne fume and dust.</p>										
	<p>HAZARDOUS DECOMPOSITION PRODUCTS:</p> <p>Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1.</p>										

VI. ENVIRONMENTAL

SPILL OR LEAK PROCEDURES

Fine turnings and small chips should be swept or vacuumed. Scrap metal can be reclaimed for re-use.

WASTE DISPOSAL METHOD*

Used or unused product should be disposed of in accordance with Federal, State or Local Laws and Regulations.
 *Disposer must comply with Federal, State and Local disposal or discharge laws.

VII. ADDITIONAL INFORMATION

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod. Arc or spark generated when welding or burning could be a source of ignition for combustion and flammable materials.

DISCLAIMER

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