

MARMON/KEYSTONE CORPORATION

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THE PIPE AND TUBING PEOPLE

P.O. BOX 992, Butler, PA 16003-0992
EMERGENCY PHONE NUMBER (724) 283-3000

ISSUE DATE:
JANUARY 1, 1999

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	86.5-99.5	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 thresholds 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>Stainless 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 melt 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 style="margin-left: 20px;">Aluminum: Irritation of the eyes, nose and throat. Chromium: Lesions of the skin and mucous membranes, possibly cancer of the nose or lungs-bronchogenic carcinoma Cobalt: Respiratory tract irritation, skin rash Copper: Irritation of the eyes, nose and throat, metal fume fever Iron: Pulmonary effects, siderosis 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 Selenium: Nasal and bronchial irritation, gastrointestinal disturbances, garlic breath odor Sulfur: (As sulfur dioxide) Edema of the lungs Titanium: No chronic debilitating symptoms indicated Columbium/Tantalum: No chronic debilitating symptoms indicated</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	FLASH POINT N/A ° F	AUTO IGNITION TEMPERATURE N/A	FLAMMABLE LIMITS IN AIR Lower N / % Upper A %
	<p>FIRE AND EXPLOSION HAZARDS Stainless 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>			
Reactivity	STABILITY <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable		INCOMPATIBILITY (MATERIALS TO AVOID) Reacts with strong acids to form hydrogen gas.	
	<p>CONDITIONS TO AVOID: Stainless steel at temperatures above the melting point may liberate fumes containing oxides of iron and alloying elements.</p>			
	<p>HAZARDOUS DECOMPOSITION PRODUCTS: 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

The information in this MSDS was obtained from sources which we believe are reliable, however, the information is provided without a representation or warranty, express or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

NAME AND C.A.S. NO.

Aluminum 7429-90-5	Chromium 7440-47-3	Cobalt 7440-48-4	Copper 7440-50-8	Manganese 7439-96-5	Nickel 7440-02-0	Lead 7439-92-1	Vanadium 7440-62-2	Phosphorus 7723-14-0	Selenium 7782-49-9
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PERCENT BY WEIGHT CONTAINED

PRODUCT NAME	Aluminum 7429-90-5	Chromium 7440-47-3	Cobalt 7440-48-4	Copper 7440-50-8	Manganese 7439-96-5	Nickel 7440-02-0	Lead 7439-92-1	Vanadium 7440-62-2	Phosphorus 7723-14-0	Selenium 7782-49-9
Nickel Based Alloy Steel Alloy 200 Alloy 400 Alloy 600 Alloy 800	0	<2	0	0	<5	95-99	0	0	0	0
	<5	<1	0	27-68	<5	31-67	0	0	0	0
	<5	15-48	0-13	0	<5	39-80	0	0	0	0
	<5	.1-30	0-15	<2	<1	.1-42	0	0	0	0
Aluminum Alloy	90-99.7	<0.01-0.4	0	<0.05-6.0	<0.02-1.5	0	<0.40-0.7	0	0	0
Chrome Plated Carbon Steel	<2	Metallic Coating >98 CR & Insol. Salts <1	0	<1	<2	<1	0	<1	<1	0
Carbon and Alloy Steels	0.1-0.5	<.40-10	0	<.30-1.90	<.04-0.7	<.01-10	<.01-0.15	<.01-0.15	<.040-.12	0
Stainless Steels	.01-0.5	<10-27	<.01-.75	<.18-4.5	<2-10	<.12-34	0	0	<.01-.06	<.01-0.3

LABELS

ELECTROLYTIC CHROMIUM PLATED STEEL

CANCER HAZARD (Contains chromium and nickel). Exposure may create cancer risk.

WARNING!! Particulates may be harmful if inhaled or ingested. Avoid breathing fumes or dust. Adequate ventilation required in welding, burning, sawing, brazing, grinding or machining operations.

FIRST AID: For overexposure to airborne dust and fumes, remove exposed person to fresh air. If breathing is difficult or has stopped, administer artificial respiration or oxygen as indicated. Seek medical attention promptly.

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ALUMINUM ALLOY

WARNING!! This product is not a physical or health hazard in bulk form. Welding or machining aluminum may generate dusts and fumes which may cause eye, nose and throat irritation. Ozone may be emitted as a by-product during welding or plasma arc cutting. Prolonged exposure to ozone may result in nausea, headache and lung damage. Suspended aluminum dust, allowed to accumulate in a confined area, may be explosive. Molten metal can explode--If remelted, make certain no water or moisture is present in cavities or on external surfaces. For further information, refer to Material Safety Data Sheet.

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NICKEL ALLOY STEEL

WARNING!!

Particulates may be harmful if inhaled or ingested. This product contains chromium and nickel. Exposure may create cancer risk. Avoid breathing fumes or dust. Adequate ventilation required in welding, sawing, brazing, grinding or machining operations.

FIRST AID: For exposure to airborne dust and fumes, remove exposed person to fresh air. If breathing is difficult or has stopped, administer artificial respiration or oxygen as indicated and seek medical attention promptly.

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CARBON AND/OR ALLOY STEEL TUBING

WARNING!!

Particulates may be harmful if inhaled or ingested. If steel grade contains chromium or nickel, exposure may create cancer risk. Avoid breathing fumes or dust. Adequate ventilation required in welding, sawing, brazing, grinding or machining operations.

FIRST AID: For exposure to airborne dust and fumes, remove exposed person to fresh air. If breathing is difficult or has stopped, administer artificial respiration or oxygen as indicated and seek medical attention promptly.

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STAINLESS STEEL

WARNING!!

Particulates may be harmful if inhaled or ingested. This product contains chromium and nickel. Exposure may create cancer risk. Avoid breathing fumes or dust. Adequate ventilation required in welding, shaving, brazing, grinding or machining operations.

FIRST AID: For exposure to airborne dust and fumes, remove exposed person to fresh air. If breathing is difficult or has stopped, administer artificial respiration or oxygen as indicated and seek medical attention promptly.

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