

# Material Safety Data Sheet

<b>Company:</b> Encore Group Ltd 5607-67 St. N.W Edmonton, AB T6B 3H5	<b>Issue Date:</b> August 26/08	<b>Identification:</b> Stainless Steels
<b>Trade Name (Common name or synonym):</b> Stainless Steels	<b>Emergency Phone Number:</b> 780-577-0526 or contact your nearest Encore Metals Branch	
<b>Chemical Name:</b> Steel (Examples: 304, 347, 17-4, 410)	<b>Form:</b> Bar, Sheet, Tubing, Structural, Forgings	

## I. INGREDIENTS

Material or Component	CAS Number	% Weight	Exposure Limits	
			OSHA PEL (mg/m <sup>3</sup> )	ACGIH TLV (mg/m <sup>3</sup> )
<b>Base Metal</b>				
Iron (Fe)	7439-89-6	39.0 – 81.0	10 (Fe <sub>2</sub> O <sub>3</sub> Fume)	5.0 (Fe <sub>2</sub> O <sub>3</sub> Fume)
<b>Alloying Elements</b>				
Aluminum (Al)	7429-90-5	0.0 – 2.0	None Listed	5.0 as welding fumes
Carbon (C)	7440-44-0	0.50 max	None Listed	None Listed
Chromium(Cr)	7440-47-3	10.0 – 27.0	1.0 as Chromium	0.5 as Chromium
Columbium(Cb)	7440-03-1			
Copper(Cu)	7440-50-8	0.04 – 4.0	0.2 as Copper	0.2 as Copper
Manganese(Mn)	7439-96-5	10.00 max	5.0 as Manganese	1.0 as Manganese
Molybdenum (Mo)	7439-98-7	0.0 – 4.0	5.0 as soluble compounds	5.0 as soluble compounds
Nickel (Ni)	7440-02-0	0.0 – 22.0	1.0 as Nickel	1.0 as Nickel
Phosphorous (P)	7723-14-0	0.001 - 0.20	0.1 as Phosphorous	0.1 as Phosphorous
Selenium (Si)	7782-49-2	0.0 – 0.35	0.2 as Selenium	0.2 as Selenium
Silicon(Si)	7440-21-3	2.0 max	None Listed	None Listed
Sulphur(S)	7704-34-9	0.001 – 0.35	13.0 SO <sub>2</sub>	5.0 SO <sub>2</sub>
Titanium(Ti)	7440-32-6	.70 Max	15.0 as TiO <sub>2</sub>	10.0 as total dust
Tantalum(Ta)	7440-25-7	10.0 as C%	5.0 as Tantalum	5.0 as Tantalum

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.

## II. PHYSICAL DATA

<b>Material is (under normal conditions):</b> <input type="checkbox"/> Liquid <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Gas <input type="checkbox"/> Other		<b>Appearance and Odor:</b> Gray – Black with metallic lustre/No odor		
<b>Acidity/Alkalinity:</b> Ph=NA	<b>Melting Point:</b> Approx. 2700° F	<b>Boiling Point:</b> NA	<b>Specific Gravity:</b> (H <sub>2</sub> O=1) Approx 8	<b>Solubility in Water (% by weight):</b> NA
<b>Vapor Pressure(mm Hg at 20° C):</b> NA				

## III. PERSONAL PROTECTIVE EQUIPMENT (PPE)

<b>Respiratory Protection:</b> NIOSH approved dust/mist/fume respirator should be used during welding or burning if OSHA PEL or TLV is exceeded.	<b>Hands, Arms and Body:</b> Use appropriate PPE such as welder's aprons and gloves when welding or burning. Check local codes.
<b>Eyes and Face:</b> Safety glasses or shield as appropriate.	<b>Other equipment or clothing:</b> As needed depending on the operation and safety codes.

## IV. EMERGENCY MEDICAL PROCEDURES

<b>Inhalation:</b> Remove to fresh air. If condition continues, consult a physician.	<b>Skin Contact:</b> Remove particles by washing with soap and water.
<b>Eye Contact:</b> Flush thoroughly with water. Get medical attention of the irritation persists.	<b>Ingestion:</b> If significant amounts are ingested, seek medical attention.

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## V. HEALTH AND SAFETY INFORMATION

<b>HEALTH</b>			
<p>Steel products in the natural state do not present an inhalation, ingestion or contact health hazard. However, operations such as welding, burning, sawing, brazing, grinding, and possibly machining, which results in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulates may present hazards. The above operations should be performed in well ventilated areas. The major exposure hazard is inhalation. The effects of overexposure are as follows:</p> <p><b>Acute:</b> Excessive inhalation of metallic fumes and dusts may result in irritation of eyes, nose and throat. Also high concentration of fumes and dusts of iron-oxide, manganese, copper and selenium may result in metal fume fever. Typical symptoms consist of a metallic taste in the mouth, dryness and irritation of the throat, chills and fever, and usually last from 12 to 48 hours.</p> <p><b>Chronic:</b> Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed opposite the element:            Iron (Iron Oxide): Pulmonary effects, siderosis.            Manganese: Bronchitis, pneumonitis, lack of coordination, central nervous system.            Chromium: Various forms of dermatitis, inflammation and or ulceration of the upper respiratory tract, and possible cancer of nasal passages and lungs. Based on available information, there does not appear to be any evidence that exposure to welding fume induces human cancer.            Nickel: Same as Chromium.            Selenium: Nasal and bronchial irritation, gastro intestinal disturbances, garlic odor of breath.            Copper: Pulmonary effects, nasal and Para nasal sinus, skin and liver.            Vanadium: May affect lungs. May affect blood pressure as vanadium pentoxide.            Cobalt: Inhalation of cobalt dust may cause asthma like disease with cough and dyspnea.            Molybdenum: Pain in joints, hands, knees and feet.</p> <p>Medical conditions generally aggravated by exposure would be dermatitis and pulmonary disease or disorders.</p> <p>Occupational Exposure Limits: See Section I. Chromium and Nickel have been identified by the Internal Agency for Research on Cancer (IARC) and the National Toxicology Program (NTP) as potential carcinogens.</p>			
<b>FIRE AND EXPLOSION</b>			
<b>Flash Point:</b> N/A °F	<b>Auto Ignition Temperature:</b> N/A °F	<b>Flammable Limits in Air:</b> Lower: N/A % Upper: N/A %	<b>Extinguishing Media:</b> N/A
<b>Fire and Explosion Hazards:</b> Steel products in their natural state do not present a fire or explosion hazard.			<b>Extinguishing Media NOT to be used:</b> N/A
<b>REACTIVITY</b>			
<b>Stability:</b> <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable	<b>Incompatibility (Materials to avoid):</b> Stable under normal conditions of use, storage and transport. Reacts with strong acids to form hydrogen gas. At temperatures above melting point, metallic oxide fumes may be liberated.		
<b>Conditions to Avoid:</b> Non-ventilated areas when cutting, welding, burning or brazing. Avoid generation of airborne dusts and fumes.			
<b>Hazardous Decomposition Products:</b> Metallic Oxides			

## VI. ENVIRONMENTAL

<b>Spill or Leak Procedures:</b> N/A Use good housekeeping practices to prevent accumulation of dust and to keep airborne dust to a minimum. Avoid breathing metal fumes or dust.	<b>Waste Disposal Method:</b> Follow the federal, state, provincial and local regulations regarding disposal.
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## VII. ADDITIONAL INFORMATION

<p><b>Disclaimer:</b>            The information in this MSDS was obtained from sources which we be to be reliable. However, the information is provided without any 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.</p>
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