



Revision #1  
6-20-88

384-A  
603-A

MATERIAL SAFETY DATA SHEET FOR STEEL PRODUCTS

SECTION I - MANUFACTURER DATA:

MANUFACTURING FACILITY: Tri-Clover, Inc.  
CORPORATE ADDRESS: Alfa-Laval, 2115 Linwood Avenue,  
P.O. Box 1316, Ft. Lee, NJ 07024  
PHONE: (during normal business hours): 414-697-2401  
DATE OF PREPARATION: November 10, 1985  
CHEMICAL FAMILY: Steel  
PRODUCT NAME: Carbon Steel and Low Alloy

SECTION II - COMPONENT DATA:

<u>CHEMICAL COMPONENTS</u>	<u>C.A.S. NUMBER</u>	<u>% WT.</u>
<u>Base Metals:</u>		
Iron	7439-89-6	0-39.5%
Nickel	7440-02-0	0-1%
Chromium	7440-47-3	0-14%
Molybdenum	7439-98-7	0-5.5%
Silicon	7440-21-3	0-1.8%
Tungsten	7440-33-7	0-3.5%
Cobalt	7440-48-4	0-3.5%
Manganese	7439-96-5	0-1%

Coatings:

A thin coating of petroleum-based oil may be added to the surface as a corrosion inhibitor or preventative. A coating of paint may also be applied to this product, which will not exceed 1% of the total product weight. However, when using this product, ensure that employees are protected from air contaminants that may be generated from the vaporization of heavy metals in the coating.

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**SECTION III - PHYSICAL DATA:**

BOILING POINT (°F): Not Applicable (N/A)  
SPECIFIC GRAVITY (H<sub>2</sub>O=1): Approx. 8  
VAPOR PRESSURE (mmHg at 20°C): N/A  
PERCENT VOLATILE BY VOLUME: N/A  
VAPOR DENSITY (AIR=1): N/A  
EVAPORATE RATE (ETHYL ETHER=1): N/A  
SOLUBILITY IN WATER: N/A  
pH INFORMATION: N/A  
APPEARANCE AND ODOR: Odorless solid with metallic luster.

**SECTION IV - FIRE AND EXPLOSION HAZARD DATA:**

FLASH POINT (°F): N/A  
METHOD USED: N/A  
FLAMMABILITY LIMITS (% VOL):  
LEL: N/A UEL: N/A  
AUTO-IGNITION TEMPERATURE (°F): N/A  
EXTINGUISHING MEDIA: No fire or explosion hazards.  
SPECIAL FIRE-FIGHTING INSTRUCTIONS: N/A  
UNUSUAL FIRE AND EXPLOSION HAZARDS: N/A

**SECTION V - REACTIVITY DATA:**

STABILITY (CONDITIONS TO AVOID): Stable  
INCOMPATIBILITY (MATERIALS TO AVOID): None  
HAZARDOUS DECOMPOSITION PRODUCTS:

Metal fumes and certain noxious gases, such as Carbon monoxide, may be produced during welding or burning operations. See Section VI and X for additional information.

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**HAZARDOUS POLYMERIZATION:** Will not occur.

**SECTION VI - HEALTH HAZARD DATA:**

**PRIMARY ROUTE(S) OF ENTRY:** Inhalation, skin contact

**EFFECTS OF EXPOSURE:** No toxic effects would be expected from its inert solid form. Prolonged, repeated exposure to fume or dusts generated during heating, cutting, brazing or welding may cause adverse health effects associated with the following constituents:

**Inhalation:**

- Iron** - Siderosis, no fibrosis
- Nickel** - Respiratory irritation and pneumonitis; several nickel compounds, including nickel oxide are suspect lung and nasal carcinogens.
- Chromium** - Dusts of chromium metal are usually reported to be relatively nontoxic, although there are reports of a nodular type of pulmonary disease with impairment of lung function; some insoluble chromium compounds are suspect carcinogens.
- Molybdenum** - Irritation of the nose and throat, weight loss, and digestive disturbances in animals; no industrial poisoning has been reported.
- Silicon** - May produce x-ray changes in lungs without disability; categorized as nuisance dust.
- Tungsten** - Some evidence of pulmonary involvement, such as cough.
- Cobalt** - May cause interstitial pneumonitis and sensitization of the respiratory system; symptoms include cough, dyspnea, and decreased pulmonary function.
- Manganese** - May cause pneumonitis and CNS involvement.

**Skin Contact:**

-Dermatitis due to sensitization may occur in some individuals from exposure to nickel or chromium fumes.

**Eye Contact:**

May cause irritation.

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Ingestion:

May cause irritation of mouth and throat.

NOTE: Some constituents pose more potential hazards than others depending on their inherent toxicity and degree of exposure

EXPOSURE LIMITS:

<u>CHEMICAL COMPONENTS</u>	<u>OSHA PEL (mg/M<sup>3</sup>)</u>	<u>ACGIH TLV (mg/M<sup>3</sup>)</u>	<u>NTP LISTED</u>	<u>IARC LISTED</u>
Iron	10 (As Fe <sub>2</sub> O <sub>3</sub> fume)	5 (As Fe <sub>2</sub> O <sub>3</sub> fume)	No	No
Nickel	1.0	0.1	No	Yes
Chromium	1.0	0.5	Yes	Yes
Molybdenum	5 (Soluble compound)	5 (Soluble compound)	No	No
Silicon	None	10	No	No
Tungsten	None	1 (Soluble Compound)	No	No
Cobalt	0.1 (As metal fume and dust)	0.1 (As fume and dust)	No	No
Manganese	5	1.0 (As fume)	No	No

SECTION VII - EMERGENCY AND FIRST-AID PROCEDURES:

**INHALATION:** In case of overexposure, immediately move person from contaminated area to fresh air at once. Give artificial respiration if breathing has stopped, or oxygen, if necessary. Get medical attention, if necessary.

**SKIN:** If irritation develops, remove contaminated clothing immediately, and wash contaminated skin with soap or mild detergent and water for five minutes. If irritation persists, seek medical attention.

**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.

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**SECTION VIII - SPECIAL HANDLING INFORMATION:**

**VENTILATION:** Ventilation, as described in the Industrial Ventilation Manual produced by the American Conference of Governmental Industrial Hygienists, should be used to maintain concentration of air contaminants below established air contaminant standards.

**RESPIRATORY PROTECTION:** A properly fitted, NIOSH-approved, dust-fume respirator should be worn during welding or burning when air contaminant levels exceed OSHA permissible exposure levels (PEL's) or ACGIH threshold limit values (TLV's). Respiratory protection should be selected and used in accordance with the OSHA Respiratory Protection Standard (29CFR1910.134) and other applicable regulations.

**PROTECTIVE CLOTHING:** Use appropriate protective clothing, such as welder's aprons and gloves, when welding or burning.

**EYE PROTECTION:** Use face shield (8" minimum) and/or safety goggles when welding, burning, grinding, or machining.

**SECTION IX - SPILL, LEAK AND DISPOSAL PROCEDURES:**

**ACTION TO TAKE FOR SPILLS (USE APPROPRIATE SAFETY EQUIPMENT):** N/A

**WASTE DISPOSAL METHOD:** N/A

**SECTION X - SPECIAL PRECAUTIONS/ADDITIONAL INFORMATION:**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** None

**DOT INFORMATION:**

**Hazardous Material Proper Shipping Name:** N/A

**Hazard Class:** N/A

**Identification Number:** N/A

**EPA HAZARDOUS WASTE NUMBER:** N/A

**ADDITIONAL INFORMATION:** During welding, precautions should be taken for airborne contaminants and noxious gases that may originate from components of the welding rod. Of special concern are silica or silicates, or both; fluorides; copper; manganese; carbon monoxide and nitrogen oxides. Arc and sparks generated when welding with this product could be a source of ignition for combustible and flammable materials.

9/6/88

TRI-CLOVER, INC.  
9201 Wilmot Road  
Kenosha, WI 53141

- W A R N I N G -

Metal products contain various constituents in the base metal and coatings of varying toxicity. During metal-working activities such as welding, burning, heating, grinding, or machining, metal fumes, gases and dusts may be dangerous to your health. CAUTION: Processing that produces fumes and dust may cause respiratory disease, particularly those alloys that contain chromium and nickel. Ventilation or respirators may be required to maintain contaminants below the OSHA Permissible Exposure Level.

If workers develop symptoms of exposures to fumes and gases, move persons to fresh air at once. Give artificial respiration or oxygen as necessary. Get medical attention, if necessary.

For further information, refer to appropriate Material Safety Data Sheet for this product.