

## SAFETY DATA SHEET

This Safety Data Sheet (SDS) is for welding consumables and related products and may be used to comply with OSHA's Hazard Communication standard, 29 CFR 1910.1200, and Superfund Amendments and Reauthorization Act (SARA) of 1986 Public Law 99-499 and Canadian Workplace Hazardous Materials Information System (WHMIS) per Health Canada administrative policy. The OSHA standard must be consulted for specific requirements. This Safety Data Sheet complies with ISO 11014-1 and ANSI Z400.1. This document is translated in several languages and is available on our website at [www.hobartbrothers.com](http://www.hobartbrothers.com), from your sales representative or by calling customer service at 1 (937) 332-4000.

### SECTION 1 – IDENTIFICATION

#### Manufacturer/Supplier

**Name:** HOBART BROTHERS COMPANY  
**Address:** 101 TRADE SQUARE EAST, TROY, OH 45373  
**Website:** [www.hobartbrothers.com](http://www.hobartbrothers.com)  
Telephone No: +1 (937) 332-4000  
Emergency No: +1 (800) 424-9300

**Product Type:** SHIELDED METAL ARC WELDING (SMAW) ELECTRODES

**GROUP A: Product For:** CARBON STEEL  
**AWS Specification:** E6010, E6011, E6012, E6013, E6022, E7014, E7024-1

**GROUP B: Product For:** LOW HYDROGEN CARBON STEEL  
**AWS Specification:** E7016, E7018, E7018-1, E7018-M

**GROUP C: Product For:** LOW HYDROGEN, LOW ALLOY STEEL  
**AWS Specification:** E7018-A1, E7018-G, E8018-B2, E8018-B2L, E8018-B6, E8018-B8, E8018-C1, E8018-C2, E8018-C3, E8018-G, E9015-B9, E9018-B3, E9018-B3L, E9018-M, E10018-D2, E10018-M, E10518-M, E11018-M, E12018-M

**GROUP D: Product For:** HIGH STRENGTH CELLULOSE CARBON STEEL  
**AWS Specification:** E7010-P1, E8010-P1, E9010-G, E9010-P1

**Recommended Use:** SHIELDED METAL ARC WELDING (SMAW) ELECTRODES  
**Restrictions on Use:** Use only as indicated for welding operations

### SECTION 2 – IDENTIFICATION OF HAZARDS

**HAZARD CLASSIFICATION** – The products described in Section 1 are not classified as hazardous according to applicable GHS hazard classification criteria as required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

**LABEL ELEMENTS:** **Hazard Symbol** – No symbol required  
**Hazard Statement** – Not applicable

**Signal Word** – No signal word required  
**Precautionary Statement** – Not Applicable

#### HAZARDS NOT OTHERWISE CLASSIFIED

**WARNING!** - Avoid breathing welding fumes and gases, they may be dangerous to your health. Always use adequate ventilation. Always use appropriate personal protective equipment.

**PRIMARY ROUTES OF ENTRY:** Respiratory System, Eyes and/or Skin.

**ELECTRIC SHOCK:** Arc welding and associated processes can kill. See Section 8.

**ARC RAYS:** The welding arc can injure eyes and burn skin.

**FUMES AND GASES:** Can be dangerous to your health.

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures and electrodes used. Most fume ingredients are present as complex oxides and compounds and not as pure metals. When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation, plus those from the base metal and coating, etc., of the materials shown in Section 3 of this Safety Data Sheet. Monitor for the component materials identified in the list in Section 3.

Fumes from the use of this product may contain complex oxides or compounds of the following elements and molecules: amorphous silica fume, calcium oxide, chromium, fluorspar or fluorides, manganese, nickel, silica and strontium. Other reasonably expected constituents of the fume would also include complex oxides of iron, titanium, silicon and molybdenum. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1 and F1.3, available from the "American Welding Society", 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353.

### SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

#### HAZARDOUS INGREDIENTS

**IMPORTANT** - This section covers the hazardous materials from which this product is manufactured. This data has been classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) as required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The fumes and gases produced during welding with normal use of this product are addressed in Section 8.

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INGREDIENT	CAS NO.	EINECS <sup>r</sup>	GROUP AND %WEIGHT				GHS Classification(s)	GHS HAZARD STATEMENTS (See Section 16 for Complete Phrases)
			A	B	C	D		
ALUMINUM OXIDE	1344-28-1	215-691-6	<5	---	---	---	NONE	
CALCIUM CARBONATE	1317-65-3	215-279-6	<2	<2	---	---	NONE	
CELLULOSE	9004-34-6	232-674-9	<5	<1	<1	<5	NONE	
CHROMIUM (metal)	7440-47-3	231-157-5	---	---	<9	---	NONE	
FLUORSPAR	7789-75-5	232-188-7	---	1-12	4-15	---	NONE	
IRON	7439-89-6	231-096-4	70-90	70-90	60-90	70-90	NONE	
MAGNESIUM CARBONATE	546-93-0	208-915-9	<2	<5	<1	<1	NONE	
MANGANESE	7439-96-5	231-105-1	1-5	1-5	1-5	1-5	- Acute Tox. 4 (Inhalation) <sup>(1,7)</sup> - Acute Tox. 4 (Oral) <sup>(1)</sup> - STOT RE 1 <sup>(2)</sup>	H332 H302 H372
MICA	12001-26-2	None	<5	---	---	---	NONE	
MOLYBDENUM	7439-98-7	231-107-2	---	---	<2	<1	- STOT RE 2 <sup>(2)</sup> - Eye Irrit. 2 <sup>(3)</sup> - STOT SE 3 <sup>(4)</sup>	H373 H319 H335
NICKEL	7440-02-0	231-111-4	---	---	<5	<2	Powder/Element: - Carc. 2 <sup>(5)</sup> - Skin Sens. 1 <sup>(6)</sup> - STOT RE 1 <sup>(2)</sup> - Aquatic Chronic 3	H351 H317 H372 H412
POTASSIUM SILICATE	1312-76-1	215-199-1	<2	<2	<2	<2	NONE	
SILICA	14808-60-7	238-878-4	<7	<8	<7	<7	- STOT RE 2 <sup>(2)</sup> - Carc. 2 <sup>(5)</sup> - Acute Tox. 4 (Inhalation) <sup>(1)</sup>	H373 H351 H332
(Amorphous Silica Fume)	69012-64-2	273-761-1	---	---	---	---	NONE	
SILICON	7440-21-3	231-130-8	---	<2	<5	<2	NONE	
SODIUM SILICATE	1344-09-8	215-687-4	<2	<2	<2	<2	NONE	
STRONTIUM CARBONATE	1633-05-2	216-643-7	---	<2	<2	---	NONE	
TITANIUM DIOXIDE	13463-67-7	236-675-5	<14	<10	<5	<5	- Carc. 2 <sup>(5)</sup>	H351
HEXAVALENT CHROMIUM [CHROMIUM (VI) TRIOXIDE] (Fume constituent)	1333-82-0	215-607-8	Varies	Varies	Varies	Varies	- Ox. Sol. 1 <sup>(7)</sup> - Carc. 1A <sup>(5)</sup> - Muta. 1B <sup>(8)</sup> - Repr. Tox 2 <sup>(9)</sup> - Acute Tox. 2 (Inhalation) <sup>(1)</sup> - Acute Tox. 3 (Skin & Oral) <sup>(1)</sup> - STOT RE 1 <sup>(2)</sup> - Skin Corr. 1A <sup>(10)</sup> - Skin Sens. 1 <sup>(6)</sup> - Resp. Sens. 1 <sup>(11)</sup> - Aquatic Acute 1 - Aquatic Chronic 1	H271 H350 H340 H361f H330 H311, H301 H372 H314 H317 H334, H317 H400 H410

--- Dashes indicate the ingredient is not present within the group of products Γ – European Inventory of Existing Commercial Chemical Substance Number (1) Acute toxicity (Cat. 1, 2, 3 and 4) (2) Specific target organ toxicity (STOT) – repeated exposure (Cat. 1 and 2) (3) Serious eye damage/eye irritation (Cat. 1 and 2) (4) Specific target organ toxicity (STOT) – single exposure ((Cat. 1, 2) and Cat. 3 for narcotic effects and respiratory tract irritation, only) (5) Carcinogenicity (Cat. 1A, 1B and 2) (6) Skin sensitization (Cat. 1, Sub-cat. 1A and 1B) (7) Oxidizing solid (Cat. 1, 2 and 3) (8) Germ cell mutagenicity (Cat. 1A, 1B and 2) (9) Reproductive toxicity (Cat. 1A, 1B and 2) (10) Skin corrosion/irritation (Cat. 1, 1A, 1B, 1C and 2) (11) Respiratory sensitization (Cat. 1, Sub-cat. 1A and 1B)

### SECTION 4 – FIRST AID MEASURES

**INGESTION:** Not an expected route of exposure. Do not eat, drink, or smoke while welding; wash hands thoroughly before performing these activities. If symptoms develop, seek medical attention at once.

**INHALATION during welding:** If breathing is difficult, provide fresh air and contact physician. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

**SKIN CONTACT during welding:** Remove contaminated clothing and wash the skin thoroughly with soap and water. If symptoms develop, seek medical attention at once.

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**EYE CONTACT during welding:** Dust or fume from this product should be flushed from the eyes with copious amounts of clean, tepid water until victim is transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed. Obtain medical assistance at once. Arc rays can injure eyes. If exposed to arc rays, move victim to dark room, remove contact lenses as necessary for treatment, cover eyes with a padded dressing and rest. Obtain medical assistance if symptoms persist.

Section 11 of this SDS covers the acute effects of overexposure to the various ingredients within the welding consumable. Section 8 of this SDS lists the exposure limits and covers methods for protecting yourself and your co-workers.

### SECTION 5 – FIRE-FIGHTING MEASURES

**Fire Hazards:** Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, non-explosive and essentially nonhazardous until welded.

Welding arcs and sparks can ignite combustibles and flammable products. If there are flammable materials, including fuel or hydraulic lines, in the work area and the worker cannot move the work or the flammable material, a fire-resistant shield such as a piece of sheet metal or fire resistant blanket should be placed over the flammable material. If welding work is conducted within 35 feet or so of flammable materials, station a responsible person in the work zone to act as fire watcher to observe where sparks are flying and to grab an extinguisher or sound the alarm if needed.

Unused welding consumables may remain hot for a period of time after completion of a welding process. See American National Standard Institute (ANSI) Z49.1 for further general safety information on the use and handling of welding consumables and associated procedures.

**Suitable Extinguishing Media:** This product is essentially nonflammable until welded; therefore, use a suitable extinguishing agent for a surrounding fire.

**Unsuitable Extinguishing Media:** None known.

### SECTION 6 – ACCIDENTAL RELEASE MEASURES

In the case of a release of solid welding consumable products, solid objects can be picked up and placed into a disposal container. If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8. Wear proper personal protective equipment while handling. Do not discard as general trash.

### SECTION 7 – HANDLING AND STORAGE

**HANDLING:** No specific requirements in the form supplied. Handle with care to avoid cuts. Wear gloves when handling welding consumables. Avoid exposure to dust. Do not ingest. Some individuals can develop an allergic reaction to certain materials. Retain all warning and product labels.

**STORAGE:** Keep separate from acids and strong bases to prevent possible chemical reactions.

### SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

Read and understand the instructions and the labels on the packaging. Welding fumes do not have a specific OSHA PEL (Permissible Exposure Limit) or ACGIH TLV (Threshold Limit Value). The OSHA PEL for Particulates – Not Otherwise Regulated (PNOR) is 5 mg/m<sup>3</sup> – Respirable Fraction, 15 mg/m<sup>3</sup> – Total Dust. The ACGIH TLV for Particles – Not Otherwise Specified (PNOS) is 3 mg/m<sup>3</sup> – Respirable Particles, 10 mg/m<sup>3</sup> – Inhalable Particles. The individual complex compounds within the fume may have a lower OSHA PEL or ACGIH TLV than the OSHA PNOR and ACGIH PNOS. An Industrial Hygienist, the OSHA PELs for Air Contaminants (29 CFR 1910.1000), and the ACGIH TLVs should be consulted to determine the specific fume constituents present and their respective exposure limits. All exposure limits are in milligrams per cubic meter (mg/m<sup>3</sup>).

INGREDIENT	CAS	EINECS	OSHA PEL	ACGIH TLV
ALUMINUM OXIDE##	1344-28-1	215-691-6	5 R*	1 R* {A4} 10 (as Al, Tot particulate)
CALCIUM CARBONATE	1317-65-3	215-279-6	5 R*, 5 (as CaO)	3 R*, 2 (as CaO)
CELLULOSE	9004-34-6	232-674-9	5 R*	10 (Dust)
CHROMIUM#	7440-47-3	231-157-5	1 (Metal) 0.5 (Cr II & Cr III Cpnds) 0.005 (Cr VI Cpnds (Calif. OSHA PEL)	0.5 (Metal) {A4} 0.5 (Cr III Cpnds) {A4} 0.05 (Cr VI Sol Cpnds) {A1} 0.01 (Cr VI Insol Cpnds) {A1}
FLUORSPAR	7789-75-5	232-188-7	2.5 (as F)	2.5 (as F) {A4}
IRON+	7439-89-6	231-096-4	5 R*	5 R* (Fe <sub>2</sub> O <sub>3</sub> ) {A4}
IRON OXIDE	1309-37-1	215-168-2	10 (Oxide Fume)	5 R* (Fe <sub>2</sub> O <sub>3</sub> ) {A4}
MAGNESIUM CARBONATE	546-93-0	208-915-9	5 R*	3 R*
MANGANESE#	7439-96-5	231-105-1	5 CL ** (Fume) 1, 3 STEL*** ■	0.1 I* {A4} ◆ 0.02 R* ◆◆
MICA	12001-26-2	None	3 R* ■	3 R*
MOLYBDENUM	7439-98-7	231-107-2	5 R*	3 R*, 10 I* (Ele and Insol) 0.5 R* (Sol Cpnds) {A3}
NICKEL#	7440-02-0	231-111-4	1 (Metal) 1 (Sol Cpnds) 1 (Insol Cpnds)	1.5 I* (Ele) {A5} 0.1 I* (Sol Cpnds) {A4} 0.2 I* (Insol Cpnds) {A1}
POTASSIUM SILICATE	1312-76-1	215-199-1	Not established	Not established
SILICA++	14808-60-7	238-878-4	0.1 R*	0.025 R* {A2}
(Amorphous Silica Fume)	69012-64-2	273-761-1	0.8	2 R*
SILICON+	7440-21-3	231-130-8	5 R*	3 R*
SODIUM SILICATE	1344-09-8	215-687-4	Not established	Not established
STRONTIUM CARBONATE+	1633-05-2	216-643-7	5 R*	3 R*
TITANIUM DIOXIDE	13463-67-7	236-675-5	15 (Dust)	10 {A4}

R\* - Respirable Fraction I\* - Inhalable Fraction \*\* - Ceiling Limit \*\*\* - Short Term Exposure Limit + - As a nuisance particulate covered under "Particulates Not Otherwise Regulated" by OSHA or "Particulates Not Otherwise Classified" by ACGIH ++ - Crystalline silica is bound within the product as it exists in the package. However, research indicates silica is present in welding fume in the amorphous (noncrystalline) form # - Reportable material under Section 313 of SARA only in fibrous form ■ - NIOSH REL TWA and STEL ■■ - AIHA Ceiling Limit of 1 mg/m<sup>3</sup> ◆ - Limit of 0.1 mg/m<sup>3</sup> is for Inhalable Mn in 2015 by ACGIH ◆◆ - Limit of 0.02 mg/m<sup>3</sup> is for Respirable Mn in 2015 by ACGIH Ele - Element Sol - Soluble Insol - Insoluble Inorg - Inorganic Cpnds - Compounds NOS - Not Otherwise Specified {A1} - Confirmed Human Carcinogen per ACGIH {A2} - Suspected Human Carcinogen per ACGIH {A3} - Confirmed Animal Carcinogen with Unknown Relevance to Humans per ACGIH {A4} - Not Classifiable as a Human Carcinogen per ACGIH {A5} - Not Suspected as a Human Carcinogen per ACGIH (noncrystalline form) EINECS - European Inventory of Existing Commercial Chemical Substances OSHA - U.S. Occupational Safety and Health Administration ACGIH - American Conference of Governmental Industrial Hygienists

**VENTILATION:** Use enough ventilation or local exhaust at the arc or both to keep the fumes and gases below the PEL/TLV in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

**RESPIRATORY PROTECTION:** Use NIOSH-approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the regulatory limits.

**EYE PROTECTION:** Wear helmet or use face shield with filter lens for open arc welding processes. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others from the weld arc flash.

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**PROTECTIVE CLOTHING:** Wear hand, head and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection as well as dark non-synthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

**PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS:** Not applicable

**SPECIAL PRECAUTIONS (IMPORTANT):** When welding with electrodes that require special ventilation (such as stainless or hardfacing, or other products which require special ventilation, or on lead- or cadmium-plated steel and other metals or coatings like galvanized steel, which produce hazardous fumes) maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information: American National Standard Institute (ANSI) Z49.1; Safety in Welding and Cutting published by the American Welding Society, 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353; and OSHA Publication 2206 (29 CFR 1910), U.S. Government Printing Office, Washington, DC 20402.

### SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, non-explosive and essentially nonhazardous until welded.

**PHYSICAL STATE:** Solid

**APPEARANCE:** Cored Wire/Coated Rod

**COLOR:** Gray

**ODOR:** Not Applicable

**ODOR THRESHOLD:** Not Applicable

**pH:** Not Applicable

**MELTING POINT/FREEZING POINT:** Not Available

**INITIAL BOILING POINT AND BOILING RANGE:** Not Available

**FLASH POINT:** Not Available

**EVAPORATION RATE:** Not Applicable

**FLAMMABILITY (SOLID, GAS):** Not Available

**UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS:** Not Available

**VAPOR PRESSURE:** Not Applicable

**VAPOR DENSITY:** Not Applicable

**RELATIVE DENSITY:** Not Available

**SOLUBILITY(IES):** Not Available

**PARTITION COEFFICIENT: N-OCTANOL/WATER:** Not Applicable

**AUTO-IGNITION TEMPERATURE:** Not Available

**DECOMPOSITION TEMPERATURE:** Not Available

**VISCOSITY:** Not Applicable

### SECTION 10 – STABILITY AND REACTIVITY

**GENERAL:** Welding consumables applicable to this sheet are solid and nonvolatile as shipped. This product is only intended for use per the welding parameters it was designed for. When this product is used for welding, hazardous fumes may be created. Other factors to consider include the base metal, base metal preparation and base metal coatings. All of these factors can contribute to the fume and gases generated during welding. The amount of fume varies with the welding parameters.

**STABILITY:** This product is stable under normal conditions.

**REACTIVITY:** Contact with acids or strong bases may cause generation of gas.

### SECTION 11 – TOXICOLOGICAL INFORMATION

**SHORT-TERM (ACUTE) OVEREXPOSURE EFFECTS:** **Welding Fumes** - May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes. **Aluminum Oxide** - Irritation of the respiratory system. **Calcium Oxide** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Chromium** - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory tract, lung damage and asthma-like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dust on skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions may occur in some people. **Fluorides** - Fluoride compounds evolved may cause skin and eye burns, pulmonary edema and bronchitis. **Iron, Iron Oxide** - None are known. Treat as nuisance dust or fume. **Magnesium, Magnesium Oxide** - Overexposure to the oxide may cause metal fume fever characterized by metallic taste, tightness of chest and fever. Symptoms may last 24 to 48 hours following overexposure. **Manganese** - Metal fume fever characterized by chills, fever, upset stomach, vomiting, irritation of the throat and aching of body. Recovery is generally complete within 48 hours of the overexposure. **Mica** - Dust may cause irritation of the respiratory system, skin and eyes. **Molybdenum** - Irritation of the eyes, nose and throat. **Nickel, Nickel Compounds** - Metallic taste, nausea, tightness in chest, metal fume fever, allergic reaction. **Potassium Silicate** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Silica (Amorphous)** - Dust and fumes may cause irritation of the respiratory system, skin and eyes. **Sodium Silicate** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Strontium Compounds** - Strontium salts are generally non-toxic and are normally present in the human body. In large oral doses, they may cause gastrointestinal disorders, vomiting and diarrhea. **Titanium Dioxide** - Irritation of respiratory system.

**LONG-TERM (CHRONIC) OVEREXPOSURE EFFECTS:** **Welding Fumes** - Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis." Studies have concluded that there is sufficient evidence for ocular melanoma in welders. **Aluminum Oxide** - Pulmonary fibrosis and emphysema. **Calcium Oxide** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Chromium** - Ulceration and perforation of nasal septum. Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) compounds. **Fluorides** - Serious bone erosion (Osteoporosis) and mottling of teeth. **Iron, Iron Oxide Fumes** - Can cause siderosis (deposits of iron in lungs) which some researchers believe may affect pulmonary function. Lungs will clear in time when exposure to iron and its compounds ceases. Iron and magnetite (Fe<sub>3</sub>O<sub>4</sub>) are not regarded as fibrogenic materials. **Magnesium, Magnesium Oxide** - No adverse long term health effects have been reported in the literature. **Manganese** - Long-term overexposure to manganese compounds may affect the central nervous system. Symptoms may be similar to Parkinson's disease and can include slowness, changes in handwriting, gait impairment, muscle spasms and cramps and less commonly, tremor and behavioral changes. Employees who are overexposed to manganese compounds should be seen by a physician for early detection of neurologic problems. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait. **Mica** - Prolonged overexposure may cause scarring of the lungs and pneumoconiosis characterized by cough, shortness of breath, weakness and weight loss. **Molybdenum** - Prolonged overexposure may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in breathing and anemia. **Nickel, Nickel Compounds** - Lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers. **Potassium Silicate** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Silica (Amorphous)** - Research indicates that silica is present in welding fume in the amorphous form. Long term overexposure may cause pneumoconiosis. Noncrystalline forms of silica (amorphous silica) are considered to have little fibrotic potential. **Sodium Silicate** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Strontium Compounds** - Strontium at high doses is known to concentrate in bone. Major signs of chronic toxicity, which involve the skeleton, have been labeled as "strontium rickets". **Titanium Dioxide** - Pulmonary irritation and slight fibrosis.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Persons with pre-existing impaired lung functions (asthma-like conditions). Persons with a pacemaker should not go near welding and cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device. Respirators are to be worn only after being medically cleared by your company-designated physician.



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H330: Fatal if inhaled  
H332: Harmful if inhaled  
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled  
H335: May cause respiratory irritation  
H340: May cause genetic defects  
H350: May cause cancer  
H351: Suspected of causing cancer  
H361f: Suspected of damaging fertility or the unborn child  
H372: Causes damage to organs through prolonged or repeated exposure  
H373: May cause damage to organs through prolonged or repeated exposure  
H400: Very toxic to aquatic life.  
H410: Very toxic to aquatic life with long lasting effects  
H412: Harmful to aquatic life with long lasting effects.

For additional information please refer to the following sources:

**USA:** **American National Standard Institute (ANSI) Z49.1** "Safety in Welding and Cutting", **ANSI/American Welding Society (AWS) F1.5** "Methods for Sampling and Analyzing Gases from Welding and Allied Processes", **ANSI/AWS F1.1** "Method for Sampling Airborne Particles Generated by Welding and Allied Processes", **AWSF3.2M/F3.2** "Ventilation Guide for Weld Fume", American Welding Society, 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353. Safety and Health Fact Sheets available from AWS at [www.aws.org](http://www.aws.org).  
**OSHA Publication 2206 (29 C.F.R. 1910)**, U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954.  
**Threshold Limit Values and Biological Exposure Indices**, American Conference of Governmental Industrial Hygienists (ACGIH), 6500 Glenway Ave., Cincinnati, Ohio 45211, USA.  
**NFPA 51B** "Standard for Fire Prevention During Welding, Cutting and Other Hot Work" published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.

**Canada:** **CSA Standard CAN/CSA-W117.2-01** "Safety in Welding, Cutting and Allied Processes".

Hobart Brothers Company strongly recommends the users of this product study this SDS, the product label information and become aware of all hazards associated with welding. Hobart Brothers Company believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Hobart Brothers Company cannot make any expressed or implied warranty as to this information.