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 Section I - IDENTIFICATION  
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Eutectic Canada Inc.  
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 Vaudreuil-Dorion, Québec  
 J7V 5V5

Emergency Telephone: 514) 695-7500  
 Product Name: MC 71  
 Product Identifier: TUBULAR WELDING WIRE

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 Section II - HAZARDOUS INGREDIENTS  
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INGREDIENT	CAS No.	% WT.	ACGIH TLV	LD50/LC50
IRON	7439-89-6	60-100	10.0	LD5030 gm/kg (Oral, Rat)
FERROSILICON	8049-17-0	1-5	N.AV.	N.AV.
MAGNESIUM	7439-95-4	.1-1.0	N.AV.	N.AV.
TITANIUM DIOXIDE	13463-67-7	5-10	10.0	N.AV.
IRON OXIDE	1309-37-1	.5-1.5	5.0(as Fe2O3)	N.AV.

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 Section III - PHYSICAL / CHEMICAL CHARACTERISTICS  
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The following data should only be used in the context of the Material Safety Data Sheet.

Physical State: Solid  
 Appearance and Odour: Wire, no odour

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 Section IV - FIRE AND EXPLOSION DATA  
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Flammable: No

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 Section V - REACTIVITY  
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**STABLE:** YES

**INCOMPATIBILITY WITH OTHER SUBSTANCES:** AVOID CONTACT WITH ACIDS AND BASES.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

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. 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 vapours from cleaning and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II.

Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidization of the material shown in Section II, plus those from the base metal and coating, etc....

It is understood, however, that the elements and/or oxides to be mentioned are virtually always present as complex oxides and not as metals (Characterization of Arc Welding Fume: American Welding Society) the elements or oxides listed below correspond to the ACGIH categories located in (TLV Threshold Limit Values for Chemical Substances in the Work Environment).

Reasonable expected constituents of the fume would include: complex oxides of iron, manganese, silicon, and titanium. This product has fluorides present. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

SUBSTANCE	CAS No.	ACGIH TLV	EXPOSURE LIMITS
			LD50/LC50
IRON OXIDE	1309-37-1	5.0 (as Fe <sub>2</sub> O <sub>3</sub> )	N.AV.
SILICON OXIDE	7631-86-9	3.0	LD50 3160 mg/kg (Oral, Rat)
MANGANESE	7439-96-5	1,3 STEL * (FUME)	LD50 9.0 gm/kg (Oral,Rat)
TITANIUM OXIDE	13463-67-7	10.0	N.AV.
MAGNESIUM OXIDE	1309-48-4	10.0	N.AV.

\*STEL = SHORT TERM EXPOSURE LIMIT

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 Section VI - HEALTH HAZARD DATA  
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**POSSIBLE ROUTE OF ENTRY/EXPOSURE:** INHALATION (PRIMARY) - EYE - SKIN

The ACGIH recommended general limit for welding fume NOC (Not Otherwise Classified), is 5.0 mg/m<sup>3</sup>. The ACGIH TLVs, (1991-92) preface states these limits are not fine lines between safe and dangerous concentration and should not be used by anyone untrained in the discipline of industrial hygiene. See Section V for specific fume constituents which may modify this TLV.

SUBSTANCE	CAS No.	ACGIH TLV	EXPOSURE LIMITS
			LD50/LC50
WELDING FUMES	NOC*	5.0 mg/m <sup>3</sup>	N.AV.

\*NOC = NOT OTHERWISE CLASSIFIED

Electric arc welding may create one or more of the following health hazards:  
 Fumes and Gases can be dangerous to your health. Arc Rays can injure eyes and burn skin.

Electric shock can kill.

**CARCINOGENICITY:** Nickel and chromium must be considered as possible carcinogens under IARC Monographs, and are present in Group C and D electrodes.

**EFFECTS OF ACUTE OVEREXPOSURE:**

Welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat or eyes.

**NICKEL-NICKEL OXIDE (NiO)** metallic taste, nausea, tightness in chest, fever, allergic reactions.

**CHROMIUM (CrO<sub>3</sub>)** inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory system, damage to the lungs, and asthma like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dusts on the skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions likely in some people from chromium compounds.

**MANGANESE-MANGANESE DIOXIDE (MnO<sub>2</sub>)** intoxication can include typical metal fume effects of dry throat, coughing, tight chest, low back pain, vomiting, fatigue and headache.

**IRON-IRON OXIDE** probably none, except as nuisance dust.

**FLUORIDE** - Fluoride compounds evolved may cause skin and eye burns; pulmonary edema bronchitis.

**EFFECTS OF CHRONIC OVEREXPOSURE:**

Welding fumes may lead to siderosis (iron deposits in lungs) and is believed by some investigators to affect pulmonary functions.

**NICKEL-NICKEL OXIDE (NiO)** long term overexposure to nickel compounds may cause lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicate a higher incidence of lung and nasal cancers.

**CHROMIUM (CrO3)** - studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are regulated by OSHA to be considered carcinogenic. 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) materials.

**MANGANESE-MANGANESE DIOXIDE (MnO2)** long term overexposure to manganese compounds may affect the central nervous system. Symptoms include muscular weakness, tremors similar to Parkinson's Disease. Behavioural changes and changes in handwriting may also appear.

**FLUORIDE** - repeated overexposure to fluorides can cause bone erosion although the effect is minimized in combination with iron.

**IRON-IRON OXIDE** long term overexposure to iron fumes can cause deposits of iron in the lung. This condition is called "Siderosis". 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.

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Section VII - EMERGENCY FIRST AID  
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**INHALATION, EYE, & SKIN:**

Remove from exposure and seek medical aid. Employ first aid techniques such as recommended by St. John's Ambulance. Wash skin and eyes with water, to remove dust. If irritation persists after exposure, consult a physician.

**GENERAL ADVICE:**

Read and understand the manufacture's instructions and the precautionary label on the product.

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Section VIII - PREVENTIVE MEASURES  
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**ENGINEERING CONTROLS:**

Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. (Refer to Section 10.0 of CAN/CSA W117.2-M87).

**PERSONAL PROTECTIVE CLOTHING:**

Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. 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 substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

**RESPIRATORY PROTECTION:**

Use approved fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV.

**EYE PROTECTION:**

Wear helmet or use face shield with filter lens. As a rule of thumb begin with shade number 14. Adjust if needed by selecting the next lighter and/or darker shade number or refer to W117.2-M87 Tables 7. Provide protective screens and flash goggles, if necessary, to shield others.

**SPECIAL PRECAUTIONS:**

Read and understand the manufacture's product data sheet. Maintain exposure below the TLV. Use industrial hygiene monitoring to ensure that your use of this product does not create exposure which exceed TLV. Always use exhaust ventilation. Refer to Section XI for additional information.

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Section IX - STORAGE AND HANDLING  
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**STORAGE REQUIREMENTS:** Dry at room temperature. Humidity should be below 70% and temperature within the limits 5 to 50°C.

**HANDLING PROCEDURES AND EQUIPMENT:** REFER TO SECTION VIII - PREVENTIVE MEASURES

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Section X - CLEAN-UP AND WASTE DISPOSAL  
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**CLEAN-UP:** N.AP.

**WASTE DISPOSAL:**

Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, provincial, and local regulations.

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Section XI - PREPARATION DATE OF MATERIAL SAFETY DATA SHEET  
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**SPECIAL SHIPPING INFORMATION:** N.AP.

**REFERENCES AND SOURCES USED:**

ACGIH-TLVs, "THRESHOLD LIMIT VALUES AND BIOLOGICAL EXPOSURE INDICES FOR 1991-1992"

CCOHS INFODISK, A2(91-2) "CANADIAN CENTRE FOR OCCUPATIONAL HEALTH AND SAFETY" CAN/CSA W117.2-M87, "SAFETY IN WELDING, CUTTING, & ALLIED PROCESSES"

ANSI/ASC Z49.1-88, "SAFETY IN WELDING & CUTTING"

OSHA (29CFR1910), "HAZARD COMMUNICATION STANDARD"

SAX, IRVING N., "DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS", SIXTH EDITION, VAN NOSTRAND REINHOLD, 1984

ANDERSON, ROY S., "HEALTH HAZARDS DETERMINATIONS, HEALTH EFFECTS FROM USE OF WELDING ELECTRODES:", 1985

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