Lubricants USA
400 Chisholm Place, Suite 418
Plano, Texas 75075
Telephone: (469)-241-0950 Telecopier: (469)-241-0956

MATERIAL SAFETY DATA SHEET

EMERGENCY OVERVIEW
This slippery liquid has a mild odor. No significant immediate hazards for emergency response are known.

NFPA RATING: HEALTH: 0 FLAMMABILITY: 1 REACTIVITY 0

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

GENERIC NAME: LUBRICATING OIL **ISSUE DATE:** October 19, 2004

THIS LUBRICANTS USA PRODUCT IS: **UNIVERSAL PLUS MOTOR OILS**

CAS NUMBER: Mixture
SYNONYMS / GENERAL NAMES: Motor oil
24 HOUR EMERGENCY TELEPHONE: (CHEMTREC) 1-800-424-9300
TECHNICAL INFORMATION: 1-800-442-5823

2. COMPOSITION / INFORMATION ON INGREDIENTS / HAZARDOUS INGREDIENTS

COMPONENTS	CAS NO.	%	HAZARD DATA
1) Highly-refined paraffinic petroleum oils *	64741-89-5 64741-88-4	85-95	*
2) Petroleum additives (proprietary)	Mixture	1-15	

*** Not limited to but include these CAS numbers. Hazard data on this petroleum oil is Oral LD 50 >5000, Dermal LD 50 >2000**

HAZARDOUS INGREDIENTS: NONE
HAZARDOUS PER 29 CFR 1916.1200: NO

3. HAZARDOUS IDENTIFICATION

ROUTES OF ENTRY:	Skin contact
TARGET ORGANS:	Skin
IRRITANCY:	This product can cause mild, transient, eye irritation with short-term contact with liquids or sprays.
REPRODUCTIVE EFFECTS:	N/A
CANCER INFORMATION:	This product does not contain any components at concentrations above 0.1% that are considered carcinogenic by OSHA, IARC, or NTP.

4. FIRST AID MEASURES

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EYES:	Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness or pain persists.
DERMAL:	Remove contaminated shoes and clothing, wipe off excess material. Wash exposed skin with soap and water. Seek medical attention if tissue appears damaged or if irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods.
INGESTION:	Do not induce vomiting unless directed to by a physician. Do not give anything to drink unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. Seek medical attention immediately.

INHALATION:	Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, a qualified individual should administer 100 percent humidified oxygen. Seek medical attention immediately. Keep the affected individual warm and at rest.
INJECTION:	Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention.

5. FIRE FIGHTING MEASURES

FLASH POINT, °C(°F): >182°C (360°F)
FLAMMABLE LIMITS (% BY VOLUME): **LOWER:** NO DATA **UPPER:** NO DATA
EXTINGUISHING MEDIA: Use dry chemical, foam, carbon dioxide or water fog.
SPECIAL FIRE FIGHTING PROCEDURES: N/A
AUTOIGNITION TEMPERATURE: N/A
EXPLOSION DATA: N/A
NFPA RATING: **HEALTH:** 0 **FLAMMABILITY:** 1 **REACTIVITY** 0

6. ACCIDENTAL RELEASE MEASURES

SPILL PROCEDURES: Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard—do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spills as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

Ecotoxicity Ecological effects testing has not been conducted on this material. Discharges are expected to cause only localized and non-persistent environmental damage.

Environmental fate An environmental fate analysis has not been conducted on this specific product. However, plants and animals may experience harmful or fatal effects when coated with petroleum-based products. Petroleum-based (mineral) lube oils will normally float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway can result in a loss of marine life or create an anaerobic environment. This material contains phosphorus, which is a controlled element for disposal in effluent waters in most sections of North America. Phosphorus is known to enhance the formation of algae. Severe algae growth can reduce oxygen content in the water possibly below levels necessary to support marine life.

7. HANDLING AND STORAGE

HANDLING & STORAGE PROCEDURES: Avoid water contamination and extreme temperatures to minimize product degradation. Keep container closed. Do not store with strong oxidizing agents. Do not store at temperatures above 120°F or in direct sunlight for extended periods of time.

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Empty containers may contain product resides that can ignite with explosive force. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:	Provide exhaust ventilation or other engineering controls to keep the airborne concentration of mists and/or vapors below the recommended exposure limits. An eye wash station and safety shower should be located near the workstation.
GLOVES PROTECTION:	Use gloves constructed of chemical resistant materials such as neoprene or heavy nitrile rubber if frequent or prolonged contact is expected. Use heat protective gloves when handling product at elevated temperatures.
EYE PROTECTION:	Safety glasses equipped with side shields should be adequate protection under most conditions of use. Wear goggles and/or face shield if splashing or spraying is likely, especially if material is heated above 125° F (or 51° C). Have suitable eye wash water available.
RESPIRATORY PROTECTION:	Vaporization or misting is not expected at ambient temperatures. Therefore, the need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).
CLOTHING RECOMMENDATION:	Avoid prolonged and/or repeated skin contact, especially after this product has been used in a crankcase. If splashing or spraying is expected chemical-resistant (Tyvek®, nitrile or neoprene) clothing should be worn. This might include long-sleeves, apron, slicker suit, boots and additional facial protection. If general contact occurs, promptly remove soaked clothing and take a shower.
OTHER COMMENTS:	Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners. Since standards/control limits have not been established for this product, the exposure limits shown below are suggested as minimum control guidelines.
Occupational exposure guidelines for highly-refined petroleum lubricant oils	Applicable workplace exposure levels TWA: 5 STEL; 10 (mg/M^3) from ACGIH (TLV) TWA: 5 (mg/M^3) from OSHA (PEL) TWA: 5 STEL; 10 (mg/M^3) from NIOSH

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Light to dark amber liquid
ODOR:	Mild petroleum odor
pH:	N/A
VAPOR PRESSURE, mm Hg (25°C):	<0.0001
VAPOR DENSITY:	<1 (Air =1)
MELTING POINT:	Not available
BOILING POINT, 760 mm Hg, °C:	Not available
SOLUBILITY IN WATER:	Insoluble in cold water.
SPECIFIC GRAVITY:	0.87-0.90 (Water = 1)
EVAPORATION RATE:	N/A
VISCOSITY 40°C (100°C)	60-160 cSt @ 40 C (4-22 cSt @ 100 C)
MOLECULAR WEIGHT:	N/A
PERCENT VOLATILE:	Negligible volatility

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10. STABILITY AND REACTIVITY

STABILITY:	Stable
INCOMPATIBILITY:	Strong oxidizers
POLYMERIZATION:	Not expected to occur
THERMAL DECOMPOSITION:	CO_2, CO, smoke, fumes, unburned hydrocarbons and trace oxides of sulfur, nitrogen, phosphorus and zinc.

11. TOXICOLOGICAL INFORMATION

EYE IRRITATION:	This product can cause mild, transient, eye irritation with short-term

	contact with liquid or sprays.
DERMAL IRRITATION:	This material can cause mild, transient skin irritation with short-term exposure.
INHALATION TOXICITY:	No significant adverse health effects are expected to occur upon short-term exposure to this product. Aspiration of liquid into the lungs can cause severe lung damage or death.
INGESTION IRRITATION:	If swallowed, no significant adverse health effects are anticipated. Ingestion can cause mild irritation to the digestive tract or cause a laxative effect.
INJECTION SENSITATION:	Injection under the skin, in muscle, or into the blood stream can cause irritation, inflammation, swelling, fever, and systemic effects and mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention.

CHRONIC EXPOSURE SYMPTOMS	Prolonged or repeated contact is toxic to lungs, digestive system, skin and eyes.
OTHER REMARKS	LD50 and LC 50 NOT AVAILABLE. Classified 3 (animal inadequate evidence) for mildly refined additive (<1%); classified 1 (proven for human) by IARC for severely refined additive <1%)

12. HEALTH INFORMATION

HMIS CODE: HEALTH: 0 FIRE: 1 REACTIVITY: 0

No	**HIGHLY TOXIC**	No	**SENSITIZER**
No	**TOXIC**	No	**REPRODUCTIVE EFFECTS**
No	**CORROSIVE**	No	**MUTAGEN**
No	**IRRITANT**		

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: It is the responsibility of the user to determine if the material is a hazardous waste at the time of disposal. Determine compliance status with all applicable requirements prior to disposal.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME:	Petroleum lubricating oil.
HAZARD CLASS:	Not a DOT controlled material (United States).
HAZARD IDENTIFICATION NUMBER:	N/A
DOT PLACARD:	N/A
COMPATIBILITY CATEGORY:	N/A

15. REGULATORY INFORMATION

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SARA SECTION 313 - TOXIC CHEMICALS:
This product does not contain toxic chemicals under SARA Section 313 and 40 CFR Part 372.

SARA SECTION 311 - HAZARD CATEGORIES:
This product may meet one or more of the criteria for the hazard categories defined in 40 CFR Part 370 as established be Sections 311 and 312 of SARA as indicated below:

NO	**IMMEDIATE (ACUTE) HEALTH HAZARD**	NO	**SUDDEN RELEASE OF PRESSURE HAZARD**
NO	**DELAYED (CHRONIC) HEALTH HAZARD**	NO	**REACTIVE HAZARD**
NO	**FIRE HAZARD**		

SARA SECTION 302 - EXTREMELY HAZARDOUS WASTE:
This product is not known to contain any components in concentrations greater than one percent that are

listed as Extremely Hazardous Substances in 40 CFR Part 355 pursuant to the requirements of Section 302(a) of SARA.

CLEAN WATER ACT (CWA):
Under the CWA, discharges of crude oil and petroleum products to surface water without proper Federal and State permits must be reported immediately to the National Response Center at (800) 424-8802.

CERCLA HAZARDOUS SUBSTANCES:
As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance.

U.S. TSCA INVENTORY
All components of this material are listed on the U.S. TSCA Inventory.

CALIFORNIA PROPOSITION 65
This product is not known to contain any components for which the State of California has found to cause cancer, birth defects or other reproductive harm.

NEW JERSEY RIGHT-TO-KNOW LABEL
Mineral oil.

ADDITIONAL REGULATORY REMARKS
None.

16. OTHER INFORMATION

The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product. This information was prepared for the guidance of plant engineering, operations and management and for persons working with or handling this product. Lubricants USA believes this information to be reliable and up to date as of the date of publication, but makes no warranty that it is.

NFPA HAZARD RATING	least - 0	slight - 1	moderate - 2	high - 3	extreme - 4
HMIS HEALTH RATING	least - 0	slight - 1	moderate - 2	high - 3	extreme - 4

AP = approximately EQ = equal > = greater than < = less than NA = not applicable
ND = no data NE = not established

ACGIH = American Conference of Governmental Industrial Hygienists
AIHA = American Industrial Hygiene Association
CERCLA = Comprehensive Environmental Response, Compensation and Liability Act (1980)
EPA = Environmental Protection Agency
HMIS = Hazardous Materials Information System
IARC = International Agency for Research on Cancer
NFPA = National Fire Protection Association
NIOSH = National Institute of Occupational Safety and Health
NLGI = National Lubricating Grease Institute
NPCA = National Paint and Coating Manufacturers Association
NTP = National Toxicology Program
OSHA = Occupational Safety and Health Administration
RQ = Reportable quantity
SARA = Superfund Amendments and Reauthorization Act (1986)
TSCA = Toxic Substance Control Act

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WD-40 Company
Material Safety Data Sheet

1 - Chemical Product and Company Identification

Manufacturer: WD-40 Company	**Chemical Name:** Organic Mixture
Address: 1061 Cudahy Place (92110) P.O. Box 80607 San Diego, California, USA 92138 –0607	**Trade Name:** WD-40 Aerosol **Product Use:** Cleaner, Lubricant, Penetrant
Telephone: 1-800-448-9340 **Emergency only:** 1-888-324-7596 (PROZAR) **Information:** 1-888-324-7596	**MSDS Date Of Preparation:** 5/16/07

2 – Hazards Identification

Emergency Overview:
DANGER! Harmful or fatal if swallowed. Flammable aerosol. Contents under pressure. Avoid eye contact. Use with adequate ventilation. Keep away from heat, sparks and all other sources of ignition.

Symptoms of Overexposure:
Inhalation: High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.
Skin Contact: Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.
Eye Contact: Contact may be mildly irritating to eyes. May cause redness and tearing.
Ingestion: This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. The liquid contents are an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis.
Chronic Effects: None expected.
Medical Conditions Aggravated by Exposure: Preexisting eye, skin and respiratory conditions may be aggravated by exposure.

Suspected Cancer Agent:
Yes No X

3 - Composition/Information on Ingredients

Ingredient	CAS #	Weight Percent
Aliphatic Hydrocarbon	64742-47-8 64742-48-9 64742-88-7	45-50
Petroleum Base Oil	64742-65-0	15-25
LVP Aliphatic Hydrocarbon	64742-47-8	12-18
Carbon Dioxide	124-38-9	2-3
Non-Hazardous Ingredients	Mixture	<10

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4 – First Aid Measures

Ingestion (Swallowed): Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7596 immediately.
Eye Contact: Flush thoroughly with water. Get medical attention if irritation persists.
Skin Contact: Wash with soap and water. If irritation develops and persists, get medical attention.

Inhalation (Breathing): If irritation is experienced, move to fresh air. Get medical attention if irritation or other symptoms develop and persist.

5 – Fire Fighting Measures

Extinguishing Media: Use water fog, dry chemical, carbon dioxide or foam. Do not use water jet or flooding amounts of water. Burning product will float on the surface and spread fire.
Special Fire Fighting Procedures: Firefighters should always wear positive pressure self-contained breathing apparatus and full protective clothing. Cool fire-exposed containers with water. Use shielding to protect against bursting containers.
Unusual Fire and Explosion Hazards: Contents under pressure. Aerosol containers may burst under fire conditions. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back.

6 – Accidental Release Measures

Wear appropriate protective clothing (see Section 8). Eliminate all sources of ignition and ventilate area. Leaking cans should be placed in a plastic bag or open pail until the pressure has dissipated. Contain and collect liquid with an inert absorbent and place in a container for disposal. Clean spill area thoroughly. Report spills to authorities as required.

7 – Handling and Storage

Handling: Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use with adequate ventilation. Keep away from heat, sparks, hot surfaces and open flames. Wash thoroughly with soap and water after handling. Do not puncture or incinerate containers. Keep can away from electrical current or battery terminals. Electrical arcing can cause burn-through (puncture) which may result in flash fire, causing serious injury. Keep out of the reach of children.
Storage: Do not store above 120°F or in direct sunlight. U.F.C (NFPA 30B) Level 3 Aerosol.

8 – Exposure Controls/Personal Protection

Chemical	Occupational Exposure Limits
Aliphatic Hydrocarbon	100 ppm TWA (ACGIH) 1200 mg/m3 TWA (manufacturer recommended)
Petroleum Base Oil	5 mg/m3 TWA (OSHA/ACGIH)
LVP Aliphatic Hydrocarbon	1200 mg/m3 TWA (manufacturer recommended)
Carbon Dioxide	5000 ppm TWA (OSHA/ACGIH), 30,000 ppm STEL (ACGIH)
Non-Hazardous Ingredients	None Established

The Following Controls are Recommended for Normal Consumer Use of this Product
Engineering Controls: Use in a well-ventilated area.
Personal Protection:
Eye Protection: Avoid eye contact. Safety glasses or goggles recommended.
Skin Protection: Avoid prolonged skin contact. Chemical resistant gloves recommended for operations where skin contact is likely.
Respiratory Protection: None needed for normal use with adequate ventilation.

For Bulk Processing or Workplace Use the Following Controls are Recommended
Engineering Controls: Use adequate general and local exhaust ventilation to maintain exposure levels below that occupational exposure limits.
Personal Protection:
Eye Protection: Safety goggles recommended where eye contact is possible.
Skin Protection: Wear chemical resistant gloves.
Respiratory Protection: None required if ventilation is adequate. If the occupational exposure limits are exceeded, wear a NIOSH approved respirator. Respirator selection and use should be

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based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.
Work/Hygiene Practices: Wash with soap and water after handling.

9 – Physical and Chemical Properties

Boiling Point:	323°F (minimum)	Specific Gravity:	0.817 @ 72°F
Solubility in Water:	Insoluble	pH:	Not Applicable
Vapor Pressure:	110 PSI @ 70°F	Vapor Density:	Greater than 1
Percent Volatile:	74%	VOC:	412 grams/liter (49.5%)
Coefficient of Water/Oil Distribution:	Not Determined	Appearance/Odor	Light amber liquid/mild odor
Flash Point:	131°F (concentrate) Tag Closed Cup	Flammable Limits: (Solvent Portion)	LEL: 1.1% UE:: 8.9%

10 – Stability and Reactivity

Stability: Stable
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Avoid heat, sparks, flames and other sources of ignition. Do not puncture or incinerate containers.
Incompatibilities: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

11 – Toxicological Information

The oral toxicity of this product is estimated to be greater than 5,000 mg/kg based on an assessment of the ingredients. This product is not classified as toxic by established criteria. It is an aspiration hazard.
None of the components of this product is listed as a carcinogen or suspected carcinogen or is considered a reproductive hazard.

12 – Ecological Information

No data is currently available.

13 - Disposal Considerations

If this product becomes a waste, it would be expected to meet the criteria of a RCRA ignitable hazardous waste (D001). However, it is the responsibility of the generator to determine at the time of disposal the proper classification and method of disposal. Dispose in accordance with federal, state, and local regulations.

14 – Transportation Information

DOT Surface Shipping Description: Consumer Commodity, ORM-D
IMDG Shipping Description: Aerosols, 2, UN1950

15 – Regulatory Information

U.S. Federal Regulations:
CERCLA 103 Reportable Quantity: This product is not subject to CERCLA reporting requirements, however, oil spills are reportable to the National Response Center under the Clean Water Act and many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.
SARA TITLE III:
Hazard Category For Section 311/312: Acute Health, Fire Hazard, Sudden Release of Pressure

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Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements: None
Section 302 Extremely Hazardous Substances (TPQ): None
EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on the TSCA inventory
Canadian Environmental Protection Act: All of the ingredients are listed on the Canadian Domestic Substances List or exempt from notification
Canadian WHMIS Classification: Class B-5 (Flammable Aerosol)
This MSDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the MSDS contains all of the information required by the CPR.

16 – Other Information:

HMIS Hazard Rating:
Health – 1 (slight hazard), Fire Hazard – 4 (severe hazard), Reactivity – 0 (minimal hazard)

SIGNATURE: Peter P. Lee TITLE: Director of Global Quality Assurance

REVISION DATE: Revision Date: May 2007 SUPERSEDES: December 2004

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MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet (MSDS) complies with the requirements of OSHA's Hazard Communication Standard.

6011 WELDING ELECTRODE

RADNOR

Emergency Phone Number:
866-734-3438

Date: April 30, 2006

Product Information Number: 888-838-0615

SECTION 1 – PRODUCT IDENTIFICATION

Product Name/Class	AWS E6011 Welding Electrode
Product Number	004008
Manufacturer	Radnor Welding Products 259 N. Radnor-Chester Road Suite 100 Radnor, PA 19087-5283

SECTION 2 – HAZARDOUS INGREDIENTS

IMPORTANT! This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Sections 5 through 8. See these sections for industrial hygiene information.

CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.

The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

Ingredients:	CAS No.	Weight %	TLV mg/m^3	PEL mg/m^3	Supplemental Information:
Cellulose and other carbohydrates	65996-61-4	5	10*	10*	* Not listed. Nuisance value maximum is 10 mg/m^3. PEL value for iron oxide is 10 mg/m^3. TLV value for iron oxide is 5 mg/m^3. ** As respirable dust. *** Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 370 and 372. (#) Crystalline silica (quartz) is on the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program) lists as posing a carcinogenic risk to humans. (c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter
Silicates and other binders	1344-09-8	<5	10*	10*	
Iron	7439-89-6	<5	10*	10*	
Titanium dioxides (as Ti)***	13463-67-7	<5	10	10	
Magnesite	1309-48-4	<5	10	15	
Manganese and/or manganese alloys and compounds (as Mn)***	7439-96-5	<5	1.0(c)	1.0(c)	
Limestone and/or calcium carbonate	1317-65-3	1	10	15	
Mineral silicates	1332-58-7	0.5	5**	5**	
Quartz	14808-60-7	<0.5	#0.1**	#0.1**	
Carbon steel core wire	7439-89-6	75	10*	10*	

SECTION 3 – PHYSICAL CHARACTERISTICS

Boiling Point: N/A	Specific Gravity (H_2O = 1): N/A	Solubility in Water : N/A
Vapor Pressure (mm Hg.) N/A	Melting Point N/A	%Volatile: N/A
Vapor Density (Air = 1) N/A	Evaporation Rate (Butyl Acetate =1) N/A	Appearance and Odor: N/A

SECTION 4 – FIRE and EXPLOSION HAZARD DATA

Non Flammable. Welding arc and sparks can ignite combustibles and flammables. Refer to American National Standard Z49.1 for fire prevention during the use of welding and allied procedures.

SECTION 5 – REACTIVITY DATA

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, procedure 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 worker 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).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc. as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide and fluorides; secondarily complex oxides of manganese, potassium, silicon, sodium, and zinc.

Maximum fume exposure guideline for this product (based on manganese content) is 4.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

SECTION 5 – REACTIVITY DATA (continued)

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.4, and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION 6 – HEALTH HAZARD DATA

Carcinogenicity: The composition of welding or brazing fumes may contain carcinogens, depending on several factors that are unknown and unknowable to the product manufacturer (see Section 5). Always assume that welding or brazing fumes may contain toxic and/or carcinogenic materials, and follow sound Work/Hygiene practices as recommended by ANSI Z49.1.

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC – (Not otherwise Classified) is 5 mg/m^3. ACGIH-1987-88 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section 5 for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air. Effects of Overexposure: Electric arc welding may create one or more of the following health hazards: Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion. Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. May cause skin rash. Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.* Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control. Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross. IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques. IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases, call a physician.

HMIS Rating	HMIS Scale	NFPA Rating	NFPA Scale
Health = 2	4 = Severe Hazard	Health = 1	4 = Severe Hazard
Flammability = 0	3 = Serious Hazard	Flammability = 0	3 = Serious Hazard
Reactivity = 0	2 = Moderate Hazard	Reactivity = 0	2 = Moderate Hazard
	1 = Slight Hazard	Other = N/A	1 = Slight Hazard
	0 = Minimal Hazard		0 = Minimal Hazard

SECTION 7 – PRECAUTIONS for SAFE HANDLING and USE

Read and understand the manufacturer's instruction and the precautionary label on the product. See American National Standard Z49.1, "Safety in Welding and Cutting", published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more details on many of the following:

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

SECTION 8 – CONTROL MEASURES

Respiratory Protection *(Specify Type)* Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Other Protective Clothing or Equipment: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See 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 substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin or clothing or gloves if they are wet. Insulate from work and ground.

OTHER INFORMATION REQUIRED BY STATE OR FEDERAL LAW

California Proposition 65 Information: Warning: This product contains a chemical known to the State of California to cause cancer.

New Jersey Right-To-Know Information: 5 most predominant ingredients/hazardous and non-hazardous)
1. Carbon steel; 2. Cellulose and other carbohydrates; 3. Limestone and/or calcium carbonate; 4. Mineral silicates; 5. Manganese and/or manganese alloys and compounds (as Mn).

SARA Title III Notification Information: All chemical compounds marked with an asterisk (*) are toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Super Fund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Disclaimer of Expressed and Implied Warranties: The information in this document is believed to be correct as of the date issued. However, no warranty of merchantability, fitness for any particular purpose, or any other warranty is expressed or is to be implied regarding the accuracy or completeness of this information, the results to be obtained from the use of this information or the product, the safety of this product, or the hazards related to its use.

MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet (MSDS) complies with the requirements of OSHA's Hazard Communication Standard.

7018 WELDING ELECTRODE

RADNOR

Emergency Phone Number: 866-734-3438

Date: April 30, 2006

Product Information Number: 888-838-0615

SECTION 1 – PRODUCT IDENTIFICATION

Product Name/Class	AWS E7018 Welding Electrode
Product Number	004011
Manufacturer	Radnor Welding Products 259 N. Radnor-Chester Road Suite 100 Radnor, PA 19087-5283

SECTION 2 – HAZARDOUS INGREDIENTS

IMPORTANT! This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Sections 5 through 8. See these sections for industrial hygiene information.

CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.

The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

Ingredients:	CAS No.	Weight %	TLV mg/m³	PEL mg/m³	Supplemental Information:
Iron	7439-89-6	15	10*	10*	* Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 mg/m³. TLV value for iron oxide is 5 milligrams per cubic meter. ** As respirable dust. *** Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 370 and 372. (@) As V_2O_5 fume or dust. (c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter
Limestone and/or calcium carbonate	1317-65-3	10	10	15	
Fluorides (as F)	7789-75-5	5	2.5	2.5	
Silicates and other binders	1344-09-8	<5	10*	10*	
Titanium dioxides (as Ti)***	13463-67-7	<5	10	10	
Manganese and/or manganese alloys and compounds (as Mn)***	7439-96-5	<5	0.2	1.0(c)	
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	1	10*	10*	
Aluminum oxide and/or Bauxite***	1344-28-1	<0.5	10	10	
Zinc and/or zinc oxides***	1314-13-2	<0.5	10	10	
Mineral silicates	1332-58-7	<0.5	5**	5**	
Vanadium alloys (as V)	7440-62-2	<0.5	.05(@)	.05(@)	
Carbon steel core wire	7439-89-6	60	10*	10*	

SECTION 3 – PHYSICAL CHARACTERISTICS

Boiling Point: N/A	Specific Gravity (H_2O = 1): N/A	Solubility in Water : N/A
Vapor Pressure (mm Hg.) N/A	Melting Point N/A	%Volatile: N/A
Vapor Density (Air = 1) N/A	Evaporation Rate (Butyl Acetate =1) N/A	Appearance and Odor: N/A

SECTION 4 – FIRE and EXPLOSION HAZARD DATA

Non Flammable. Welding arc and sparks can ignite combustibles and flammables. Refer to American National Standard Z49.1 for fire prevention during the use of welding and allied procedures.

SECTION 5 – REACTIVITY DATA

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, procedure 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 worker 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).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc. as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide and fluorides; secondarily complex oxides of manganese, potassium, silicon, sodium, and zinc.

Maximum fume exposure guideline for this product (based on manganese content) is 4.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

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SECTION 5 – REACTIVITY DATA (continued)

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.4, and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION 6 – HEALTH HAZARD DATA

Carcinogenicity: The composition of welding or brazing fumes may contain carcinogens, depending on several factors that are unknown and unknowable to the product manufacturer (see Section 5). Always assume that welding or brazing fumes may contain toxic and/or carcinogenic materials, and follow sound Work/Hygiene practices as recommended by ANSI Z49.1.

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC – (Not otherwise Classified) is 5 mg/m³. ACGIH-1987-88 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section 5 for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air. Effects of Overexposure: Electric arc welding may create one or more of the following health hazards: Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion. Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. May cause skin rash. Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.* Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control. Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross. IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques. IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases, call a physician.

HMIS Rating	HMIS Scale	NFPA Rating	NFPA Scale
Health = 2 Flammability = 0 Reactivity = 0	4 = Severe Hazard 3 = Serious Hazard 2 = Moderate Hazard 1 = Slight Hazard 0 = Minimal Hazard	Health = 1 Flammability = 0 Reactivity = 0 Other = N/A	4 = Severe Hazard 3 = Serious Hazard 2 = Moderate Hazard 1 = Slight Hazard 0 = Minimal Hazard

SECTION 7 – PRECAUTIONS for SAFE HANDLING and USE

Read and understand the manufacturer's instruction and the precautionary label on the product. See American National Standard Z49.1, "Safety in Welding and Cutting", published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more details on many of the following:

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

SECTION 8 – CONTROL MEASURES

Respiratory Protection *(Specify Type)* Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Other Protective Clothing or Equipment: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See 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 substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin or clothing or gloves if they are wet. Insulate from work and ground.

OTHER INFORMATION REQUIRED BY STATE OR FEDERAL LAW

California Proposition 65 Information: Warning: This product contains a chemical known to the State of California to cause cancer.

New Jersey Right-To-Know Information: 5 most predominant ingredients/hazardous and non-hazardous)
1. Carbon steel; 2. Iron; 3. Limestone and/or calcium carbonate; 4. Flourides (as F); 5. Silicon and/or silicon alloys and compounds (as Si).

SARA Title III Notification Information: All chemical compounds marked with an asterisk (*) are toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Super Fund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Disclaimer of Expressed and Implied Warranties: The information in this document is believed to be correct as of the date issued. However, no warranty of merchantability, fitness for any particular purpose, or any other warranty is expressed or is to be implied regarding the accuracy or completeness of this information, the results to be obtained from the use of this information or the product, the safety of this product, or the hazards related to its use.

Date:	9/1/04	MSDS No.:	US-M675A
Trade Name:	Easy Arc 7024 WELDING ELECTRODE		
Sizes:	All		
Supersedes:	12/1/01		

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Covered Electrode

Classification: AWS E7024

SECTION II - HAZARDOUS MATERIAL (1)

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.
(1) The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard. All materials are listed on the TSCA inventory.

Ingredients:	CAS No.	Wt.%	TLV mg/m^3	PEL mg/m^3
Iron	7439-89-6	25	10*	10*
Titanium dioxides (as Ti)*****	13463-67-7	5	10	15
Silicates and other binders	1344-09-8	< 5	10*	10*
Manganese and/or manganese alloys and compounds (as Mn)*****	7439-96-5	< 5	0.2	1.0(c)
Mineral silicates	1332-58-7	< 5	5**	5**
Quartz	14808-60-7	< 5	#0.05**	#0.1**
Cellulose and other carbohydrates	65996-61-4	< 5	10*	10*
Aluminum oxide and/or Bauxite*****	1344-28-1	1	10	10
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	0.5	10*	10*
Magnesite	1309-48-4	0.5	10	15
Limestone and/or calcium carbonate	1317-65-3	0.5	10	15
Zinc and/or zinc oxides*****	1314-13-2	< 0.5	5(d)	5(d)
Carbon steel core wire	7439-89-6	45	10*	10*

Supplemental Information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 milligrams per cubic meter. TLV value for iron oxide is 5 milligrams per cubic meter.

(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

(d) Values are for zinc oxide fume. The ACGIH TLV has a STEL (Short Term Exposure Limit) of 10 milligrams per cubic meter.

(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter. Values are those proposed by OSHA in 1989. Present PEL is 5.0 milligrams per cubic meter (ceiling value).

(#) Crystalline silica (quartz) is on the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program) lists as posing a carcinogenic risk to humans.

(**) As respirable dust.

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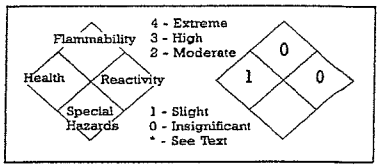
SECTION III - HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI. Product is inert, no special handling or spill procedures required. Not regulated by DOT.

(CONTINUED ON SIDE TWO)

Product:	Easy Arc 7024
Date:	9/1/04



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOS - (Not Otherwise Specified) is 5 mg/m^3. ACGIH-1999 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq).

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

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, procedure 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 worker 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.)

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 oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide; secondarily complex oxides of calcium, magnesium, manganese, potassium, silicon, sodium, titanium and zinc.

Maximum fume exposure guideline for this product (based on manganese content) is 3.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII

CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, 'Safety In Welding, Cutting and Allied Processes' published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See 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 substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted. No applicable ecological information available.

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MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet (MSDS) complies with the requirements of OSHA's Hazard Communication Standard.

E71T-1 FLUX-CORED WELDING WIRE

RADNOR.

Emergency Phone Number: 866-734-3438

Date: April 30, 2006

Product Information Number: 888-838-0615

SECTION 1 – PRODUCT IDENTIFICATION

Product Name/Class	AWS 5.20, E71T-1 Flux-Cored Welding Wire
Product Number	004021
Manufacturer	Radnor Welding Products 259 N. Radnor-Chester Road Suite 100 Radnor, PA 19087-5283

SECTION 2 – HAZARDOUS INGREDIENTS

The term "Hazardous Materials" should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

The following chemicals are subject to reporting under Title III of the Super Fund Amendments and Reauthorization Act (SARA) of 1986: aluminum (fume or dust) and compounds of barium, and manganese.

Ingredients	CAS No.	ACGIH TLV (1998) TWA (mg/m^3)		OSHA-PEL (1993) TWA (mg/m^3)	STEL (mg/m^3)
Aluminum	7429-90-5	5 (Welding Fume)		5 (Welding Fume)	-
Iron	7439-89-6	5 (Oxide Fume)		10 (Total Particulate)	-
Magnesium	1309-48-4	10 (Oxide Fume)		15 (Fume, Total Particulate)	-
Manganese	7439-96-5	0.2 (Fume)	C5 (STEL)	1 (Fume)	3
Mineral Silicates (Use Quartz Formula)	14808-60-7	0.1		0.1 (Respirable Dust)	-
Silicon	7440-21-3	10 (Dust)		5 (Respirable)	-
Sodium Fluoride	7681-49-4	2.5 (as F)		2.5 (as F)	-
Titanium Dioxide	13463-67-7	10 (Dust)		5 (Respirable)	-

SECTION 3 – PHYSICAL CHARACTERISTICS

Boiling Point: N/A	Specific Gravity (H_2O = 1): N/A	Solubility in Water: N/A
Vapor Pressure (mm Hg.): N/A	Melting Point: N/A	%Volatile: N/A
Vapor Density (Air = 1): N/A	Evaporation Rate (Butyl Acetate =1): N/A	Appearance and Odor: N/A

SECTION 4 – FIRE and EXPLOSION HAZARD DATA

Non Flammable: Welding arc and sparks can ignite combustibles. See Z49.1 referenced in Section 7.

Flash Point (Method Used): N/A	Flammable Limits:	LEL: N/A
		UEL: N/A

Extinguishing Media: N/A

Special Fire Fighting Procedures: Non Flammable. Welding arc and sparks can ignite combustibles and flammables. Refer to American National Standard Z49.1 for fire prevention during the use of welding and allied procedures.

Unusual Fire and Explosion Hazards: N/A

SECTION 5 – REACTIVITY DATA

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 vapors 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 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above. 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 and Physical Agents in the Workroom Environment). Reasonably expected constituents of the fume would include: complex oxides of iron, manganese, silicon, aluminum, magnesium, calcium, and barium. Fluorides will also be present.

Stability	Unstable ☐	Conditions to Avoid: Avoid breathing fumes created by the welding process.
	Stable ☒	

Incompatibility (Materials to Avoid): Avoid welding on painted, galvanized or plated surfaces.

Hazardous Decomposition or Byproducts: Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. 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, available from the "American Welding Society," P.O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment – A Sampling Strategy Guide", which gives additional advice on sampling). At a minimum, materials listed in this section should be analyzed.

Hazardous Polymerization	May Occur ☐	Conditions to Avoid: N/A
	Will Not Occur ☒	

SECTION 6 – HEALTH HAZARD DATA

Threshold Limit Value: The exposure level for welding fume has been established at 5 mg/m^3 with OSHA's PEL and ACGIH's TLV. TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and excessive concentrations. Effects of Overexposure: Electric arc welding may create one or more of the following health hazards: Fumes and Gases can be dangerous to your health. Primary Routes of Entry are the respiratory system, eyes and/or skin. Short-Term (Acute) Overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat or eyes. Manganese – Manganese Dioxide (MnO_2) Remove from overexposure and apply artificial respiration, if needed. Wash eyes or skin with water to remove dusts. Fluoride – Fluoride compounds evolved may cause skin and eye burns; pulmonary edema bronchitis. Long-Term (Chronic) Overexposure may lead to siderosis (iron deposits in lungs) and is believed by some investigators to affect pulmonary functions. Manganese – Manganese Dioxide (MnO_2) Long term overexposure to manganese compounds may affect the central nervous system. Symptoms include muscular weakness, tremors similar to Parkinson's disease. Behavioral changes and changes in handwriting may also appear. Employees overexposed to manganese compounds should get quarterly examinations for early detection of manganism. Fluoride – Repeated overexposure to fluorides can cause serious bone erosion although the effect is minimized in combination with iron. Arc Rays can injure eyes and burn skin. Electric Shock can kill. Emergency and First Aid Procedures Call for medical aid. Employ first aid techniques recommended by the American Red Cross. Eyes & Skin: If irritation or flash burns develop after exposure, consult a physician. Carcinogenicity: The composition of welding fumes may contain carcinogens, depending on several factors that are unknown and unknowable to the product manufacturer (see Section 5). Always assume that welding fumes may contain toxic and/or carcinogenic materials, and follow sound Work/Hygenic practices as recommended by ANSI Z49.1.

HMIS Rating	HMIS Scale	NFPA Rating	NFPA Scale
Health = 2	4 = Severe Hazard	Health = 1	4 = Severe Hazard
Flammability = 0	3 = Serious Hazard	Flammability = 0	3 = Serious Hazard
Reactivity = 0	2 = Moderate Hazard	Reactivity = 0	2 = Moderate Hazard
	1 = Slight Hazard	Other = N/A	1 = Slight Hazard
	0 = Minimal Hazard		0 = Minimal Hazard

SECTION 7 – PRECAUTIONS for SAFE HANDLING and USE

Read and understand the manufacturer's instructions and precautionary label on the product. See American National Standard Z49.1, "Safety in Welding and Cutting", published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more details on many of the following:

Steps to Be Taken in Case Material Is Released or Spilled: Product is non-hazardous. No special precautions are required for spills of bulk material. Scrap metal can be reclaimed for reuse. Follow federal, state, and local regulations regarding disposal.

Waste Disposal Method: Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

SECTION 8 – CONTROL MEASURES

Respiratory Protection *(Specify Type)* 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 TLV.

Ventilation: 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.

Protective Gloves: Wear welding gloves made of leather or other heat-resistant resistant materials.

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. Provide protective screens and flash goggles, if necessary, to shield others.

Other Protective Clothing or Equipment: 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 nonsynthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

Work/Hygienic Practices: 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. ANSI Z49.1 The American Welding Society, P.O. Box 351040, Miami, FL 33135 – OSHA (29CFR1910) U.S. Dept. of Labor, Washington, D.C. 20210.

OTHER INFORMATION REQUIRED BY STATE OR FEDERAL LAW

California Proposition 65 Information: Warning: This product contains a chemical known to the State of California to cause cancer.

New Jersey Right-To-Know Information: 5 most predominant ingredients/hazardous and non-hazardous) 1. Iron; 2. Aluminum; 3. Manganese; 4. Magnesium; 5. Silicon

SARA Title III Notification Information: All chemical compounds marked with an asterisk (*) are toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Super Fund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet (MSDS) complies with the requirements of OSHA's Hazard Communication Standard.

ER 70S-2, ER 70S-3, ER70S-6 WELDING WIRE

RADNOR

Emergency Phone Number: 866-734-3438

Date: April 30, 2006

Product Information Number: 888-838-0615

SECTION 1 – PRODUCT IDENTIFICATION

Product Name/Class	AWS A5.18, ER 70S-2, ER 70S-3, ER 70S-6 Welding Wire
Product Number	004023
Manufacturer	Radnor Welding Products 259 N. Radnor-Chester Road Suite 100 Radnor, PA 19087-5283

SECTION 2 – HAZARDOUS INGREDIENTS

Material	CAS Number	% By Weight	ACGIH TLV	SARA Section 313
Carbon	1333-86-4	<.50	3.5 MG/M^3 Carbon	N/A
Manganese	7439-96-5	<2.50	C 5MG/M^3 Mn & Mn	Yes
Silicon	7440-21-3	<1.50	10 MG/M^3 Total	N/A
Copper	7440-50-8	<.50	.2 MG/M^3	Yes
Molybdenum	7439-98-7	<.75	5 MG/M^3	N/A
Aluminum	7429-90-5	<.50	15 MG/M^3 as Weld	Yes
Titanium	7440-32-6	<.50	10 MG/M^3 TiO AS	N/A
Zirconium	7440-67-7	<.50	5 MG/M^3 AS Zr	N/A
Iron	7439-89-6	Balance	5 MG/M^3 Fe203 Fe	N/A

SECTION 3 – PHYSICAL CHARACTERISTICS

Boiling Point: N/A	Specific Gravity (H_2O = 1): N/A	Solubility in Water: N/A
Vapor Pressure (mm Hg): N/A	Melting Point: N/A	%Volatile: N/A
Vapor Density (Air = 1): N/A	Evaporation Rate (Butyl Acetate=1): N/A	Appearance and Odor: Solid Wire or Rod.

SECTION 4 – FIRE and EXPLOSION HAZARD DATA

Flash Point (Method Used): N/A	Flammable Limits:	LEL: N/A
		UEL: N/A

Extinguishing Media: N/A

Special Fire Fighting Procedures: Non Flammable. Welding arc and sparks can ignite combustibles and flammables. Refer to American National Standard Z49.1 for fire prevention during the use of welding and allied procedures.

Unusual Fire and Explosion Hazards: N/A

SECTION 5 – REACTIVITY DATA

Stability	Unstable ☐	Conditions to Avoid: N/A
	Stable ☒	

Incompatibility (Materials to Avoid): None

Hazardous Decomposition or Byproducts: The composition and quality of welding fumes and gases are dependent upon metal being welded, process, and electrode being used. Other factors include coatings on the metal being welded (paint, plating or galvanizing), number of welders and volume of work area as presence of contaminants in atmosphere. When electrode is consumed fume and gas decomposition products generated are different in percent and form from ingredients listed in Section 2. Fume and gas decomposition products, and not ingredients in electrode, are important. The concentration of given fume or gas component may decrease or increase by many times original concentration in electrode. New compounds not in electrode may form decomposition products of normal operation include those originating from volatilization, reaction, oxidation of materials in Section 2, plus those from base metal and coating.

Reasonably expected fume constituents of product could include primarily oxides of iron; secondarily complex oxides of manganese & silicon & aluminum. Gaseous reaction products – carbon monoxide, carbon dioxide. Ozone and nitrogen oxides may be formed by radiation from arc, and shielding gases when employed. One recommended way to determine composition and quantity of fumes and gases to which workers are exposed is to take air sample from inside welders helmet or in working zone. See AWS F1.1 and AWS F1.2-1985, available from American Welding Society. See AWS publication: "Fumes and Gases in the Welding Environment".

Hazardous Polymerization	May Occur ☐	Conditions to Avoid: N/A
	Will Not Occur ☒	

W WELD ER 70

SECTION 6 – HEALTH HAZARD DATA

Carcinogenicity: The composition of welding or brazing fumes may contain carcinogens, depending on several factors that are unknown and unknowable to the product manufacturer (see Section 5). Always assume that welding or brazing fumes may contain toxic and/or carcinogenic materials, and follow sound Work/Hygiene practices as recommended by ANSI Z49.1.

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC – (Not otherwise Classified) is 5 mg/m^3. ACGIH-1987-88 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section 5 for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air. Effects of Overexposure: Electric arc welding may create one or more of the following health hazards: Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion. Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. May cause skin rash. Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.* Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control. Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross. IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques. IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases, call a physician.

HMIS Rating	HMIS Scale	NFPA Rating	NFPA Scale
Health = 2	4 = Severe Hazard	Health = 1	4 = Severe Hazard
Flammability = 0	3 = Serious Hazard	Flammability = 0	3 = Serious Hazard
Reactivity = 0	2 = Moderate Hazard	Reactivity = 0	2 = Moderate Hazard
	1 = Slight Hazard	Other = 0	1 = Slight Hazard
	0 = Minimal Hazard		0 = Minimal Hazard

SECTION 7 – PRECAUTIONS for SAFE HANDLING and USE

Steps to Be Taken in Case Material Is Released or Spilled: N/A

Waste Disposal Method: Prevent waste from contaminating surrounding environment. Discard product residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations.

Precautions to Be Taken In Handling and Storing: N/A

Other Precautions: N/A

SECTION 8 – CONTROL MEASURES

Respiratory Protection *(Specify Type)*: Make sure inhaled air does not contain fume constituents above permissible exposure levels.

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Protective Gloves: Leather welding gloves. | Eye Protection: Safety glasses with shaded lenses.

Other Protective Clothing or Equipment: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock or burns. See Z49.1. At a minimum this includes welder's gloves and a protective face shield or goggles, and may include arm protectors, aprons, hats, shoulder protection, as well as heat-resistant clothing.

Work/Hygienic Practices: For maximum safety: Be certified for, and wear a respirator at all times when welding or brazing.

OTHER INFORMATION REQUIRED BY STATE OR FEDERAL LAW

California Proposition 65 Information: Warning: This product contains a chemical known to the State of California to cause cancer.

New Jersey Right-To-Know Information: 5 most predominant ingredients/hazardous and non-hazardous)

1. Iron; 2. Manganese; 3. Silicon; 4. Molybdenum; 5. Copper.

SARA Title III Notification Information: All chemical compounds marked with an asterisk (*) are toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Super Fund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Disclaimer of Expressed and Implied Warranties: The information in this document is believed to be correct as of the date issued. However, no warranty of merchantability, fitness for any particular purpose, or any other warranty is expressed or is to be implied regarding the accuracy or completeness of this information, the results to be obtained from the use of this information or the product, the safety of this product, or the hazards related to its use.

LINCOLN® ELECTRIC

Date:	12/13/2007	MSDS No.:	US-M235
Trade Name:	Fleetweld 22	WELDING ELECTRODE	
Sizes:	All		
Supersedes:	12/1/01		

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Covered Electrode

Classification: AWS E6022

SECTION II - HAZARDOUS MATERIAL (1)

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.
(1) The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard. All materials are listed on the TSCA inventory.

Ingredients:	CAS No.	Wt.%	TLV mg/m^3	PEL mg/m^3
Iron oxides	65996-74-9	10	5	10
Manganese and/or manganese alloys and compounds (as Mn)*****	7439-96-5	5	0.2	5 (c)
Cellulose and other carbohydrates	65996-61-4	< 5	10*	10*
Silicates and other binders	1344-09-8	< 5	10*	10*
Magnesite	1309-48-4	< 5	10	15
Iron	7439-89-6	1	10*	10*
Aluminum oxide and/or Bauxite	1344-28-1	0.5	10	15
Carbon black	1333-86-4	< 0.5	3.5	3.5
Limestone and/or calcium carbonate	1317-65-3	< 0.5	10	15
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	< 0.5	10*	10*
Carbon steel core wire	7439-89-6	70	10*	10*

Supplemental Information:

(*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 milligrams per cubic meter. TLV value for iron oxide is 5 milligrams per cubic meter.

(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

(c) Value is for manganese fume. Present PEL is 5 milligrams per cubic meter (ceiling value). Values proposed by OSHA in 1989 were 1.0 milligrams per cubic meter TWA and 3.0 milligrams per cubic meter STEL (Short Term Exposure Limit).

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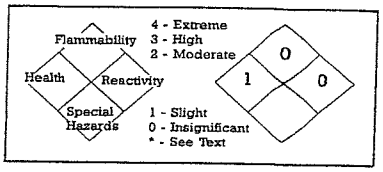
SECTION III - HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI. Product is inert, no special handling or spill procedures required. Not regulated by DOT.

(CONTINUED ON SIDE TWO)

Product:	**Fleetweld 22**
Date:	**12/13/2007**



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOS - (Not Otherwise Specified) is 5 mg/m^3. ACGIH-1999 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq).

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with work piece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

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, procedure 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 worker 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.)

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 oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide; secondarily complex oxides of magnesium, manganese, silicon and sodium.

Maximum fume exposure guideline for this product (based on manganese content) is 2.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII
CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 (both available for free download at http://www.lincolnelectric.com/community/safety/) and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See 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 substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted. No applicable ecological information available.

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ZEP Manufacturing Company
Acuity Specialty Products Group, Inc.
P.O. Box 2015
Atlanta, GA 30301
1-877-I-BUY-ZEP (428-9937)
www.zep.com

Material Safety Data Sheet
and Safe Handling and Disposal Information

Section 1. Chemical Product and Company Identification

Product name Zep 45 NC Liquid
Product Use Lubricant & Penetrant
Product Code 0562
Date of issue 05/03/06 **Supersedes** 07/19/04

Emergency Telephone Numbers

For MSDS Information:
Acuity Specialty Products Group, Inc.
Compliance Services 1-877-I-BUY-ZEP (428-9937)

For Medical Emergency
INFOTRAC:
(877) 541-2016 Toll Free - All Calls Recorded

For a Transportation Emergency
CHEMTREC:
(800) 424-9300 - All Calls Recorded
In the District of Columbia (202) 483-7616

Printing date: 05/03/06

Prepared by Compliance Services Group
Acuity Specialty Products Group
1420 Seaboard Industrial Blvd.
Atlanta, GA 30318

Section 2. Composition, Information on Ingredients

Name of Hazardous Ingredients	CAS #	% by Weight	Exposure Limits
LIGHT ALIPHATIC NAPHTHA; solvent naphtha (petroleum), medium aliphatics; formerly: light aromatic naphtha	64742-88-7	30-40	**ACGIH TLV (United States).** STEL: 200 ppm 8 hour(s). **OSHA PEL (United States).** TWA: 500 ppm 8 hour(s).
PARAFFIN OIL; blend of heavy and light naphthenic petroleum distillate	64742-52-5	10-20	**ACGIH TLV (United States).** TWA: 100 ppm 8 hour(s). **OSHA PEL (United States).** : 5 mg/m³ 8 hour(s). Form: Mist
Proprietary Blended Salts of Oxygenated and Sulfonated Hydrocarbons	Proprietary	10-20	**ACGIH TLV (United States).** : 5 mg/m³ 8 hour(s). Form: Mist
HYDROTREATED LIGHT PETROLEUM DISTILLATES; paraffinic, naphthenic solvent	64742-47-8	1-10	**ACGIH TLV (United States).** : 5 mg/m³ Not established
MINERAL SEAL OIL; mineral oil; petrolatum	64741-77-1	1-10	**OSHA PEL (United States).** : 5 mg/m³ 8 hour(s). Form: Mist
BLEND OF AMYL ACETATE; 3-METHYL BUTYL ACETATE; 2-METHYL BUTYL ACETATE	628-63-7; 123-92-2; 624-41-9	1-10	**ACGIH TLV (United States).** : 5 ppm 8 hour(s). Form: Mist **OSHA PEL (United States).** TWA: 100 ppm 8 hour(s).
2-ETHYL HEXYL ALCOHOL; 2-ethyl-1-hexanol; 2-ethylhexanol	104-76-7	1-10	**ACGIH TLV (United States).** TWA: 50 ppm 8 hour(s). STEL: 100 ppm 15 minute(s). Not established

Section 3. Hazards Identification

Acute Effects

Routes of Entry Dermal contact. Eye contact. Inhalation.

Skin Direct contact may cause irritation and redness. Prolonged or repeated contact may dry skin and cause irritation.

Eyes Causes eye irritation. Inflammation of the eye is characterized by redness, watering, and itching.

Inhalation Over-exposure by inhalation may cause respiratory irritation. Can cause central nervous system depression.

Ingestion Harmful if swallowed. Aspiration hazard if swallowed- can enter lungs and cause damage.

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Health	2
Fire Hazard	2
Reactivity	0
Personal Protection	B

NOTE: MSDS data pertains to the product as delivered in the original shipping container(s). Risk of adverse health effects are lessened by following all prescribed safety precautions, including use of proper personal protective equipment.

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ZEP 45

Carcinogenic Effects Ingredients: Not listed as carcinogen by OSHA, NTP or IARC.

Chronic Effects Repeated or prolonged exposure to the substance can produce damage to liver, kidneys, blood, thymus, central nervous system. Prolonged or repeated contact may dry skin and cause irritation.

See Toxicological Information (section 11)

Section 4. First Aid Measures

Eye Contact Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Get medical attention.

Skin Contact Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion Aspiration hazard if swallowed- can enter lungs and cause damage. Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flash Point Closed cup: 43.33°C (110°F). **Flammable Limits** Not available.

Flammability Combustible liquid.

Fire Hazard Combustible liquid and vapor. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back.

Fire-Fighting Procedures Use dry chemical or CO_2. Cool closed containers exposed to fire with water. Wear special protective clothing and positive pressure, self-contained breathing apparatus. Do not release runoff from fire to sewers or waterways.

Section 6. Accidental Release Measures

Spill Clean up Put on appropriate personal protective equipment (see Section 8). Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Section 7. Handling and Storage

Handling Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Avoid breathing vapors or spray mists. Use only with adequate ventilation. Do not reuse container. Wash thoroughly after handling.

Storage Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Do not store above 49°C (120.2°F). Do not contaminate water by cleaning of equipment or disposal of wastes. Keep out of the reach of children.

Section 8. Exposure Controls, Personal Protection

Personal Protection

Eyes Safety glasses.

Body For prolonged or repeated handling, use gloves. Recommended: Neoprene gloves. Nitrile gloves. Rubber gloves.

Respiratory Use with adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Wear appropriate respirator when ventilation is inadequate.

Protective Clothing (Pictograms)

Section 9. Physical and Chemical Properties

Physical State Liquid.

pH Not applicable.

Boiling Point 179.44°C (355°F)

Specific Gravity 0.83 (Water = 1)

Solubility Insoluble in cold water, hot water.

Color Amber.

Odor Sweetish. Solvent-like.

Vapor Pressure Not determined.

Vapor Density Not determined.

Evaporation Rate <1 compared to water

VOC (Consumer) 413 (g/l). 49.2% 3.44 lb/gal

Section 10. Stability and Reactivity

Stability and Reactivity The product is stable.

Incompatibility Avoid contact with strong oxidizers, excessive heat, sparks or open flame.

Hazardous Polymerization Will not occur.

Hazardous Decomposition Products Carbon Dioxide, Carbon Monoxide and other organic materials.

Section 11. Toxicological Information

Toxicity to Animals Not applicable.

Section 12. Ecological Information

Ecotoxicity Not available.

Biodegradable/OECD Not available.

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ZEP45

Section 13. Disposal Considerations

Waste Information Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Waste Stream Code: D001
Classification: Hazardous Waste

Consult your local or regional authorities.

Section 14. Transport Information

Proper shipping name None.

DOT Classification Not a DOT controlled material (United States).

UN number Not regulated.

NOTE: DOT classification applies to most package sizes. For specific container size classifications or for size exceptions, refer to the Bill of Lading with your shipment.

Section 15. Regulatory Information

U.S. Federal Regulations

SARA 313 toxic chemical notification and release reporting:
No products were found.

Clean Water Act (CWA) 311: Blend of amyl acetate, 3-methyl butyl acetate, & 2-methyl butyl acetate

Clean air act (CAA) 112 regulated toxic substances: No products were found.

All Components of this product are listed or exempt from listing on TSCA inventory.

State Regulations

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute : Benzene

Section 16. Other Information

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

MATERIAL SAFETY DATA SHEET

REISSUE DATE March 1, 1996

SECTION I (GENERAL INFORMATION)

NAME: ZINC COATED STEEL = HOT DIP GALVANIZE

MANUFACTURER: Industrial Galvanizers America, Inc.
Southeastern Galvanizing Div.
P.O. Box 1367
Mango, FL 33550-1367

CHEMICAL FAMILY: NA Emergency Phone: (813) 621-8990

DISCLAIMER:

AS THE CONDITIONS OR METHODS OF USE ARE BEYOND OUR CONTROL, WE DO NOT ASSUME ANY RESPONSIBILITY AND EXPRESSLY DISCLAIM ANY LIABILITY FOR ANY USE OF THIS MATERIAL. INFORMATION CONTAINED HEREIN IS BELIEVED TO BE TRUE AND ACCURATE BUT ALL STATEMENTS OR SUGGESTIONS ARE MADE WITHOUT AND WARRANTY, EXPRESS OR IMPLIED, REGARDING ACCURACY OF THE INFORMATION, THE HAZARDS CONNECTED WITH THE USE OF THIS MATERIAL OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

SECTION II HAZARDOUS INGREDIENTS - ZINC COATING ONLY

MATERIAL	%	PEL	TLV	CAS NO.
ZINC	99.0-99.99	5mg/M3(fume)	10mg/M3	7440-66-6
LEAD (1)	0.1 max	0.05mg/M3	0.15mg/M3	7439-92-1
CADMIUM (1)	0.002 max	0.2mg/M3(dust)	0.05mg/M3	7440-43-9
ALUMINUM	0.002 max	15mg/M3*	10mg/M3	7429-90-5
COPPER (1)	0.02 max	0.1mg/M3(fume)	0.1mg/M3	7440-50-8

*(5mgM3 Respirable)

NOTE: GALVANIZED PRODUCTS UNDER NORMAL CONDITIONS DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

(1) Subject to reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372).

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ZINC

SECTION III - ZINC COATING ONLY

BOILING POINT(760 MM HG): 1665 F

MELTING POINT: 788 F

SPECIFIC GRAVITY: 7.12

EVAPORATION RATE(=1): N/A

VAPOR DENSITY (AIR = 1): N/A

SOLUBILITY IN WATER: NEGLIGIBLE

PERCENT VOLATILE BY VOLUME (%) : N/A

VAPOR PRESSURE AT 909 F: 0.13kPa

APPEARANCE AND ODOR: SILVER-WHITE, BLUISH-WHITE METAL

SECTION IV - FIRE AND EXPLOSION HAZARD DATA - ZINC COATING ONLY

FLASH POINT (METHOD USED): N/A

FLAMMABLE LIMITS:
LEL: N/A
UEL: N/A

NFPA FIRE RATING

HEALTH -0
FLAMMABILITY -0
REACTIVITY -0

EXTINGUISHING MEDIA: DRY CHEMICAL, DRY POWDER, OR CARBON DIOXIDE EXTINGUISHER. DO NOT USE WATER.

SPECIAL FIRE FIGHTING PROCEDURES: USE NIOSH/MSHA APPROVED SELF-CONTAINED BREATHING APPARATUS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: HEATING OF METAL BEYOND BOILING POINT RESULTS IN EVOLUTION OF ZINC VAPOR, WHICH IMMEDIATELY REACTS WITH AIR TO FORM ZINC OXIDE FUME.

SECTION V HEALTH HAZARD DATA - ZINC COATING ONLY

THRESHOLD LIMIT VALUE: 10mg/M3 (NUISANCE DUST)

PERMISSIBLE EXPOSURE LIMIT: 15 mg/M3 (NUISANCE DUST)

ROUTES OF ENTRY: INHALATION OF ZINC FUME IF MATERIAL HAS BEEN HEATED ABOVE THE BOILING POINT.

EFFECTS OF OVEREXPOSURE: PROLONGED INHALATION OF HIGH LEVELS OF ZINC FUME MAY RESULT IN TIGHTNESS OF CHEST, METALLIC TASTE, COUGH, DIZZINESS, FEVER, CHILLS HEADACHE, NAUSEA, AND DRY THROAT. OVEREXPOSURE TO ZINC VAPOR MAY PRODUCE SYMPTOMS KNOWN AS METAL FUME FEVER OR "ZINC SHAKES", AN ACUTE, SELF-LIMITING CONDITION WITHOUT RECOGNIZED COMPLICATIONS.

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ZINC

OVEREXPOSURE TO HIGH LEVELS OF AIRBORNE OR INGESTED LEAD CAN RESULT IN NAUSEA, WEAKNESS, PAIN IN JOINTS, AND IRRITABILITY. CHRONIC EXPOSURE TO LEAD CAN RESULT IN LEAD POISONING.

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SECTION V - HEALTH HAZARD DATA (continued) PAGE 3

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: ZINC VAPOR MAY BE AN IRRITANT TO PRE-EXISTING RESPIRATORY CONDITIONS. DISEASES OF THE BLOOD AND BLOOD -FORMING ORGANS KIDNEYS, NERVOUS AND POSSIBLY REPRODUCTIVE SYSTEMS MAY BE AGGRAVATED BY OVEREXPOSURE TO LEAD. EXPOSURE TO LEAD MAY RESULT IN INJURY TO A DEVELOPING FETUS.

EMERGENCY AND FIRST AID PROCEDURES: SYMPTOMS RESULTING FROM INHALATION OVEREXPOSURE USUALLY DISAPPEAR WITHIN 24 HOURS. SYMPTOMATIC TREATMENT, SUCH AS BED REST, POSSIBLY ASPIRIN, TO AFFORD RELIEF FROM FEVER AND CHILLS. IN ALL CASES, CONSULT PHYSICIAN FOR MEDICAL ATTENTION.

CARCINOGENIC ASSESSSMENT:
NTP? NO IRAC MONOGRAPH? NO OSHA? NO

SECTION VI - REACTIVITY DATA - ZINC COATING ONLY

STABILITY: ( ) UNSTABLE
(X) STABLE
CONDITIONS TO AVOID: NONE
INCOMPATIBILITY (MATERIALS TO AVOID): AVOID CONTACT WITH ACIDS AND ALKALIS.

HAZARDOUS DECOMPOSITION PRODUCTS: ZINC AND LEAD BOIL OFF AS METAL FUMES AT ELEVATED TEMPERATURES.

HAZARDOUS POLYMERIZATION: ( ) MAY OCCUR
(X) WILL NOT OCCUR

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: MATERIAL SHOULD BE CONTAINED FOR RECYCLING.

WASTE DISPOSAL METHOD:
MATERIAL MAY BE RECYCLED OR DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS. THIS MATERIAL MAY BE REGULATED UNDER CERCLA, TSCA, SARA, AND RCRA REGULATIONS.

SECTION VIII - SPECIAL PROTECTION INFORMATION - ZINC COATING ONLY

RESPIRATORY PROTECTION (SPECITY TYPE):USE NIOSH/MSHA APPROVED TYPE RESPIRATOR FOR PROTECTION AGAINST ZINC FUME.

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ZINC

VENTILATION: LOCAL EXHAUST OR OTHER VENTILATION THAT WILL REDUCE DUST CONCENTRATIONS TO LESS THAN PERMISSIBLE EXPOSURE LIMITS.

PROTECTIVE GLOVES: RECOMMENDED TO PREVENT SKIN IRRITATION IN HYPERSENSITIVE INDIVIDUALS.

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SECTION VIII SPECIAL PROTECTION INFORMATION - ZINC COATING CON'T. PAGE 4

EYE PROTECTION: USE SAFETY EYEWEAR FOR PROTECTION AGAINST AIRBORNE PARTICULATE MATTER.

OTHER PROTECTIVE EQUIPMENT: TO PREVENT BURNS FROM CONTACT WITH MOLTEN METAL, APPROPRIATE PROTECTIVE GARMENTS SHOULD BE WORN. SUCH GARMENTS MAY INCLUDE APRONS, FACE SHIELDS, LEGGINGS, ETC., DEPENDING ON CONDITIONS OF USE.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: STORE IN A LOCATION SEPARATE FROM ACIDS AND ALKALIS.

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