

# MATERIAL SAFETY DATA SHEET

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

## 7018 – AC – WELDING ELECTRODE

<b>RADNOR</b> WELDING PRODUCTS		Emergency Phone Number: 866-734-3438	
Date: April 30, 2006		Product Information Number: 888-838-0615	
<b>SECTION 1 – PRODUCT IDENTIFICATION</b>			
Product Name/Class	AWS E7018-AC Welding Electrode		
Product Number	004012		
Manufacturer	Radnor Welding Products 259 N. Radnor-Chester Road Suite 100 Radnor, PA 19087-5283		
<b>SECTION 2 – HAZARDOUS INGREDIENTS</b>			
<p><b>IMPORTANT!</b> 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.</p> <p>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.</p>			
Ingredients:	CAS No.	Weight %	TLV mg/m <sup>3</sup>
Iron	7439-89-6	15	10*
Titanium dioxides (as Ti)***	13463-67-7	10	10
Limestone and/or calcium carbonate	1317-65-3	5	10
Silicates and other binders	1344-09-8	<5	10*
Manganese and/or manganese alloys and compounds (as Mn)***	7439-96-5	<5	1.0(c)
Mineral silicates	1332-58-7	<5	5**
Aluminum oxide and/or Bauxite***	1344-28-1	<5	10
Fluorides (as F)	7789-75-5	1	2.5
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	1	10*
Titanium and/or titanium alloys (as Ti)	12719-90-3	0.5	10*
Aluminum and/or aluminum alloys (as Al)***	7429-90-5	<0.5	10
Lithium compounds (as Li)	554-13-2	<0.5	10*
Carbon steel core wire	7439-89-6	55	10*
<b>SECTION 3 – PHYSICAL CHARACTERISTICS</b>			
Boiling Point: N/A	Specific Gravity (H <sub>2</sub> O = 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
<b>SECTION 4 – FIRE and EXPLOSION HAZARD DATA</b>			
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.			
<b>SECTION 5 – REACTIVITY DATA</b>			
<p>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).</p> <p>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 and coating, etc. as noted above.</p> <p>Reasonably expected fume constituents of the product would include: Primarily iron; secondarily complex oxides of manganese, potassium, silicon, sodium, and titanium.</p> <p>Maximum fume exposure guideline and PEL for this product is 5.0 milligrams per cubic meter.</p> <p>Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.</p>			

<b>SECTION 5 – REACTIVITY DATA (continued)</b>			
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.			
<b>SECTION 6 – HEALTH HAZARD DATA</b>			
<p>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.</p> <p>Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC – (Not otherwise Classified) is 5 mg/m<sup>3</sup>. 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). 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. Arc Rays can injure eyes and burn skin. <i>Skin cancer has been reported.</i> 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.</p>			
HMIS Rating Health = 2 Flammability = 0 Reactivity = 0	HMIS Scale 4 = Severe Hazard 3 = Serious Hazard 2 = Moderate Hazard 1 = Slight Hazard 0 = Minimal Hazard	NFPA Rating Health = 1 Flammability = 0 Reactivity = 0 Other = N/A	NFPA Scale 4 = Severe Hazard 3 = Serious Hazard 2 = Moderate Hazard 1 = Slight Hazard 0 = Minimal Hazard
<b>SECTION 7 – PRECAUTIONS for SAFE HANDLING and USE</b>			
Read and understand the manufacturer's instructions 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.			
<b>SECTION 8 – CONTROL MEASURES</b>			
Respiratory Protection ( <i>Specify Type</i> ) 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. <i>Keep exposure as low as possible.</i>			
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.			
<b>OTHER INFORMATION REQUIRED BY STATE OR FEDERAL LAW</b>			
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. Titanium dioxides (as Ti); 4. Limestone and/or calcium carbonate; 5. Fluorides (as F).			
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.			