

DO A 061522
CONFIDENTIAL

SECTION VI REACTIVITY DATA

STABILITY: UNSTABLE: NO CONDITIONS TO AVOID: NONE, UNLESS OTHERWISE SPECIFIED

STABLE: YES

CONDITIONS TO AVOID: NONE, UNLESS OTHERWISE SPECIFIED

INCOMPATIBILITY (MATERIALS TO AVOID): NONE

HAZARDOUS DECOMPOSITION PRODUCTS: The composition and quality of welding fumes and gases are dependent upon the metal being welded, the process, procedure, and electrodes used. Other conditions which also influence 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. Fume and gas decomposition products, and not the ingredients in the electrode, are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration in the electrode. Also, new compounds not in the electrode may form. 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 these products could include primarily oxides of iron; secondarily complex oxides of manganese, silicon, nickel, chromium, molybdenum and vanadium. The present OSHA permissible exposure limits for hexavalent chromium is 0.05 mg/M³ and for nickel 1 mg/M³, which will result in a significant reduction from the 5 mg/M³ general fume level.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc, in addition to the shielding gases like argon and helium whenever they are employed. Chromium compounds are required to be considered carcinogenic by OSHA.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample from inside the welder's helmet if worn or in the worker's breathing zone. See AWS F1.1 and AWS F1.2-1985, available from the American Welding Society.

SEE AWS PUBLICATION: "FUMES AND GASES IN THE WELDING ENVIRONMENT"

HAZARDOUS POLYMERIZATION: NOT APPLICABLE.

SECTION VII SPILL OR LEAK PROCEDURES NOT APPLICABLE

WASTE DISPOSAL METHOD: Prevent waste from contaminating surrounding environment. Discard any product residue, disposable container or liner in an environmentally acceptable manner, in full compliance with Federal, State and Local regulations.

SECTION VIII SPECIAL PROTECTION INFORMATION (See Note)

"Read and understand the manufacturer's instructions and the precautionary label on the product. *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. *Respiratory Protection* - Use respirable fume respirator, or air supplied respirator when welding in a confined space or where local exhaust or ventilation does not keep exposure below the recommended exposure limit. *Eye Protection* - Wear helmet or use face shield with filter lens. Provide protective screens and flash goggles, if necessary, to shield others. As a rule of thumb start with a shade that is too dark to see the weld zone. Then go to the next lighter shade which gives sufficient view of the weld zone. *Protective Clothing* - Wear hand, head and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground."

SECTION IX SPECIAL PRECAUTIONS (See Note)

OTHER PRECAUTIONS: Use exhaust system to clear welding fumes. Make sure that inhaled air does not contain fume constituents above permissible exposure levels.

NOTE: Other precautions for additional safety information on welding and cutting, see American Standard Z49.1-1967, Safety in Welding and Cutting, and the Welding Handbook, Vol. 1, Chapter 9, Safe Practices in Welding and Cutting. Both are available from American Welding Society, Inc., 550 N.W. 10th Ave. Road, P.O. Box 350, Miami, FL 33109. Tel. 305-371-0000.

DO A 061523
CONFIDENTIAL

ALLOY RODS CORPORATION
MATERIAL SAFETY DATA SHEET (MSDS)
For Welding Consumables and Related Products
Complies with OSHA Hazard Communication Standard 29 C.F.R. 1910.1200

SECTION I - IDENTIFICATION

Product Name: ATOM ARC COVERED LOW HYDROGEN ELECTRODES

Manufacturer's Name: ALLOY RODS CORPORATION

Emergency Telephone No. - 717/637-8911

Address: P. O. Box 817, Wilson Avenue, Hanover, PA 17331

Telephone No. for Information - 717/637-8911

Product Trade Name(s):

ATOM ARC 7018, 7018-1, 7018LC, 7018-M, 7018 ALPHA
7018M, 8018, 8018-C1, 8018-CH,
018-B2L, 8018H, 8018HM,
018, 8018CH, 10018
0018M, 12018, T, 8018H, 8018-B3L
0018M1, 12018-M2
13018, 4130, 4140, 4340

Product Classification(s):

AWS A5.1, E7018; E7018-1; E7018; E7018; E7018
AWS A5.5, E7018-A1; E8018-C3; E8018-C1; E8018-B2;
E8018-B2L; E8018-C2; E8018-HM;
E8018H; E8018-B3; E10018-M
E10018-D2, E12018-M, E11018-M, E8018-W, E9018-B3L
MIL-E-0022200/10A, MIL 10018-M1, MIL 12018-M2
NOT CLASSIFIED (4130LN, 4130, 4140, 4340)

SECTION II - HAZARDOUS INGREDIENTS

WARNING: THIS SECTION COVERS THE MATERIALS FROM WHICH THE PRODUCT IS MANUFACTURED. THE FUMES AND GASES PRODUCED DURING WELDING WITH NORMAL USE OF THIS PRODUCT ARE COVERED IN SECTION V.

TERM "HAZARDOUS" IN "HAZARDOUS MATERIALS" SHOULD BE INTERPRETED AS A TERM REQUIRED AND DEFINED IN OSHA HAZARD COMMUNICATION STANDARD (29 C.F.R. 1910.1200) AND IT DOES NOT NECESSARILY IMPLY THE EXISTENCE OF HAZARD.

Ingredient	(CAS No.)	Exposure Limit mg/M3	Source	Ingredient	(CAS No.)	Exposure Limit mg/M3	Source
(A)	(7439-84-6)	10-5	(1) (2)	Manganese	(7439-98-5)	5 cl	(1) (2)
mium [Cr]	(7440-47-3)	1-0.5	(1) (2)	Nickel (B)	(7440-02-0)	1	(1) (2)
leum	(7440-21-3)	10	(2)	Molybdenum (C)	(7439-98-7)	5	(1) (2)
er (D)	(7440-50-8)	1 (Dust)	(1) (2)	Potassium Silicate	(1312-76-1)	(M/A)	(3)
um Silicate	(6834-92-0)	(M/A)	(3)	Calcium Fluoride	(7784-75-5)	2.5 as F	(1) (2)
ium Carbonate	(1317-65-3)	10	(2)	Potassium Feldspar (E)	(68476-25-5)	(M/A)	(3)
mium Dioxide	(13463-67-7)	10	(2)	Zirconium Silicate (F)	(7440-67-2)	5	(1) (2)

Occupational Safety and Health Administration, 29 C.F.R. 1910.1000 Permissible Exposure Limit (PEL).
American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV(R)).
Not known; nuisance particulate concentration per OSHA 1910.1000, Table 2-3, is 5 mg/M³ respirable dust,
and per ACGIH is 10 mg/M³.

In 8018CH, 8018CH, 12018, "T", 8018H, 8018-B3L, 8018-B2L, 4130LN, 4130, 4140, 4340.

In 8018, 8018C1, 8018H, 8018HM, 8018, 12018, "T", 8018H, 10018, 10018-M1, 12018-M2, 4130LN, 4130,
4140, and 4340.

In 7018M, 8018CH, 8018HM, 8018, 8018CH, 10018M, 12018, "T", 8018-B3L, 8018-B2L, 10018-M1, 12018-M2,
4130LN, 4130, 4140, 4340.

In 8018H.

Not in 7018 Alpha.

SECTION III - PHYSICAL AND CHEMICAL DATA

Products as shipped are nonhazardous, nonflammable, nonexplosive, and nonreactive.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Remarks: Welding arc and sparks can ignite combustibles. See 2-49 for information on fire and explosion hazards.

SECTION V - REACTIVITY DATA

ADDS DECOMPOSITION PRODUCTS:

Welding fumes cannot be classified simply. Their composition and quantity 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), number of welds and volume of work area, quality and amount of ventilation, position of 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). The primary route of entry of welding fumes and gases is by inhalation.

When the electrode is consumed, the fume and gas decomposition products are different in percent and form from the ingredients listed in Section II. Decomposition products include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II plus those from base metal, coating, etc. as noted above. These components are virtually always present as complex compounds and not as metals (Characterization of Arc Welding Fumes: American Welding Society).

Reasonably expected fume constituents from these products would include fluorides and complex oxides of iron, manganese, silicon, and, when present, nickel, chromium, molybdenum, and copper. 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.

SECTION VI - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for welding fume MOC (Not Otherwise Classified) is 5 mg/M³. The ACGIH 1984-85 preface states: "The TLV-TWA should be used as guides in the control of health hazards and should not be used as firm lines between safe and dangerous concentrations." See Section V for specific fume constituents which may modify this TLV.

Effects of Overexposure: FUMES AND GASES can be dangerous to your health. Aggravation of preexisting respiratory or allergic conditions may occur in some workers. SHORT-TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as: dizziness, nausea, or dryness or irritation of nose, throat, or eyes. LONG TERM (CHRONIC) OVEREXPOSURE may lead to siderosis (iron deposits in the lung) and is believed by some investigators to affect pulmonary function. ARC RAYS can injure eyes and burn skin. ELECTRIC SHOCK can kill. See Section VII.

Emergency & First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.

CARCINOGENICITY	NIOSH	ARC Monographs	OSHA Required
When Present	CF, HI	CF, HI	CF

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE/APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and the precautionary label on this product. See American National Standard Z-49.1, Safety in Welding and Cutting, published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29 C.F.R. 1910), U. S. Government Printing Office, Washington, D.C. 20402 for more detail on many of the following:

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

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

Eye Protection: Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade which is too dark to see the weld zone. Then go to the next lighter shade which gives sufficient view of the weld zone. Provide protective screens and flash goggles, if necessary, to shield others.

Protective Clothing: Wear head, hand and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. 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 touch live electrical parts and to insulate himself from work and ground.

Procedure for Cleanup of Spills or Leaks: NOT APPLICABLE

Spill Disposal Method: Prevent waste from contaminating surrounding environment. Store in properly labeled, leak-proof container or place in an official waste receptacle manner, in full compliance with local, state and federal regulations.

ALLOY RODS CORPORATION
MATERIAL SAFETY DATA SHEET (MSDS)
For Welding Consumables and Related Products
Complies with OSHA Hazard Communication Standard 29 C.F.R. 1910.1200

SECTION I - IDENTIFICATION

Identity: REFRACTORY BACKING TAPE FOR WELDING	
Manufacturer's Name: ALLOY RODS CORPORATION	Emergency Telephone No. - 717/637-8911
Address: P. O. Box 517, Wilson Avenue, Hanover, PA 17331	Telephone No. for Information - 717/637-8911
Product Trade Name(s): REFRAC-T-BACK	Product Classification(s): NOT CLASSIFIED

SECTION II - HAZARDOUS INGREDIENTS

IMPORTANT: THIS SECTION COVERS THE MATERIALS FROM WHICH THE PRODUCT IS MANUFACTURED. THE FUMES AND GASES PRODUCED DURING WELDING WITH NORMAL USE OF THIS PRODUCT ARE COVERED IN SECTION V.

THE TERM "HAZARDOUS" IN "HAZARDOUS MATERIALS" SHOULD BE INTERPRETED AS A TERM REQUIRED AND DEFINED IN OSHA HAZARD COMMUNICATION STANDARD (29 C.F.R. 1910.1200) AND IT DOES NOT NECESSARILY IMPLY THE EXISTENCE OF ANY HAZARD.

<u>Ingredient</u>	<u>(CAS No.)</u>	<u>Exposure Limit</u> <u>mg/H3</u>	<u>Source</u>	<u>Ingredient</u>	<u>(CAS No.)</u>	<u>Exposure Limit</u> <u>mg/H3</u>	<u>Source</u>
Ceramic Tiles	(66402-68-4)	(N/A)	(3)	Aluminum	(7429-90-5)	10	(2)
Cordierite				Acrylic Adhesive	(9003-01-4)	(N/A)	(3)
(fused Magnesium							
Aluminum Silicate)							

1. Occupational Safety and Health Administration, 29 C.F.R. 1910.1000 Permissible Exposure Limit (PEL).
2. American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV[R]).
3. Not known; nuisance particulate concentration per OSHA 1910.1000, Table Z-3, is 5 mg/M³ respirable dust, and per ACGIH is 10 mg/M³.

SECTION III - PHYSICAL AND CHEMICAL DATA

These products as shipped are nonhazardous, nonflammable, nonexplosive, and nonreactive.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Nonflammable: Welding arc and sparks can ignite combustibles. See Z-49.1 referenced in Section VII.

HAZARDOUS DECOMPOSITION PRODUCTS:

Welding fumes cannot be classified simply. Their composition and quantity 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), number of welds and volume of work area, quality and amount of ventilation, position of 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). The primary route of entry of welding fumes and gases is by inhalation.

When the electrode is consumed, the fume and gas decomposition products are different in percent and form from the ingredients listed in Section II. Decomposition products include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II plus those from base metal, coating, etc. as noted above. These components are virtually always present as complex compounds and not as metals (Characterization of Arc Welding Fume: American Welding Society).

Reasonably expected fume constituents for Refrac-T-Back consist of vapors from the acrylic adhesive. No decomposition of the cordierite tiles or aluminum tape will occur. The principal source of fumes will be the welding consumable employed. See the MSDS for the consumable which you are using for detailed information concerning this fume. 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.

SECTION VI - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for welding fume NOC (Not Otherwise Classified) is 5 mg/M3. The ACGIH 1984-85 preface states: "The TLV-TWA should be used as guides in the control of health hazards and should not be used as firm lines between safe and dangerous concentrations." See Section V for specific fume constituents which may modify this TLV.

Effects of Overexposure: FUMES AND GASES can be dangerous to your health. Aggravation of preexisting respiratory or allergic conditions may occur in some workers. SHORT-TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as: dizziness, nausea, or dryness or irritation of nose, throat, or eyes. LONG TERM (CHRONIC) OVEREXPOSURE may lead to siderosis (iron deposits in the lung) and is believed by some investigators to affect pulmonary function. ARC RAYS can injure eyes and burn skin. ELECTRIC SHOCK can kill. See Section VII.

Emergency & First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.

CARCINOGENICITY

NTP?

IARC Monographs?

OSHA Regulated?

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE/APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and the precautionary label on this product. See American National Standard Z-49.1, Safety in Welding and Cutting, published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29 C.F.R. 1910), U. S. Government Printing Office, Washington, D.C. 20402 for more detail on many of the following:

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

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

Eye Protection: Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade which is too dark to see the weld zone. Then go to the next lighter shade which gives sufficient view of the weld zone. Provide protective screens and flash goggles, if necessary, to shield others.

Protective Clothing: Wear head, hand and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. 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 touch live electrical parts and to insulate himself from work and ground.

Procedure for Cleanup of Spills or Leaks: NOT APPLICABLE

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