



A LINCOLN ELECTRIC COMPANY

# Aluminum Welding Wires/Rods

## Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations  
 Revision Date: 06/09/2015 Date of issue: 06/09/2015 Supersedes Date: 09/15/2014

Version: 1.0

### SECTION 1: IDENTIFICATION

#### Product Identifier

**Product Form:** Mixture

**Product Name:** Aluminum Welding and Brazing Wires/Rods

**Product Code:** 1100, 2319, 4043, 4047, 4145, 5087, 5183, 5356, 5554, 5556, 5754, 4043, 4047, **Albraze® 1070, Albraze® 4043**

#### Intended Use of the Product

Aluminum Welding Electrodes and Rods and Brazing Rods and Wire

#### Name, Address, and Telephone of the Responsible Party

##### Company

Harris Products Group  
 4501 Quality Place  
 Mason, OH 45040  
 T +1 (513) 234-2000  
[SDS@lincolnelectric.com](mailto:SDS@lincolnelectric.com)

#### Emergency Telephone Number

**Emergency Number :** CHEMTAS/Eu 60 Company Act (24 6) 783-3998 CHEMTAS/Canada/Mexico +1 (888) 609-1762

### SECTION 2: HAZARDS IDENTIFICATION

#### Classification of the Substance or Mixture

##### Classification (GHS-US)

Not classified

##### Label Elements

**GHS-US Labeling** No labeling applicable

##### Other Hazards

This product as shipped in its massive form, is inert and not hazardous to human health. Under normal conditions of use during welding, this product and its fumes pose separate hazards. These hazards under normal conditions of use are outlined in this document. Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Inhalation of dusts and fumes can cause metal fume fever. Symptoms can include a metallic or sweet taste in the mouth, sweating, shivering, headache, throat irritation, fever, chills, thirstiness, muscle aches, nausea, vomiting, weakness, fatigue, and shortness of breath. Overexposure to manganese fumes may affect the brain and central nervous system, resulting in poor coordination, difficulty speaking, and arm or leg tremor. This condition can be irreversible. Electric shock from welding equipment or electrodes may be fatal. Hot metal spatter and heat from electric arcs and welding flames may cause burns to the hands and body or may cause fire if it comes into contact with combustible materials. UV, IR and light radiation from an electric arc or welding flame process may cause damage to unprotected eyes. Fumes and gases generated during the welding process can be harmful to your health. If dust is generated, the dust may be flammable solid, water reactive, and self-heating. Take appropriate precautions if dust is generated and ensure proper engineering controls.

**Unknown Acute Toxicity (GHS-US)** Not available

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Aluminum	(CAS No) 7429-90-5	87 - 100	Comb. Dust Flam. Sol. 1, H228 Water-react. 2, H261
Silicon	(CAS No) 7440-21-3	5 - 13	Comb. Dust
Copper	(CAS No) 7440-50-8	<= 7	Comb. Dust Aquatic Acute 1, H400 Aquatic Chronic 2, H411
Magnesium	(CAS No) 7439-95-4	< 5	Comb. Dust Flam. Sol. 1, H228

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			Self-heat. 2, H252 Water-react. 2, H261
Manganese	(CAS No) 7439-96-5	< 1	Comb. Dust
Chromium	(CAS No) 7440-47-3	< 0.5	Comb. Dust
Zirconium	(CAS No) 7440-67-7	< 0.5	Comb. Dust Pyr. Sol. 1, H250 Self-heat. 1, H251 Water-react. 1, H260
Vanadium	(CAS No) 7440-62-2	< 0.5	Comb. Dust

Full text of H-phrases: see section 16

The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret [29 CFR 1910.1200].

More than one of the ranges of concentration prescribed by the Controlled Products Regulations has been used where necessary, due to varying composition.

### SECTION 4: FIRST AID MEASURES

#### Description of First Aid Measures

**General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).

**Inhalation:** Remove to fresh air and keep at rest in a position comfortable for breathing. Ventilate the area. Call a POISON CENTER/doctor/physician if you feel unwell.

**Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists. Wash contaminated clothing before reuse. In molten form: Cool skin rapidly with cold water after contact with molten product. Removal of solidified molten material from skin requires medical assistance.

**Eye Contact:** Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention. In molten form: . Removal of solidified molten material from the eyes requires medical assistance.

**Ingestion:** Do NOT induce vomiting. Rinse mouth. Call a physician or poison control center immediately.

#### Most Important Symptoms and Effects Both Acute and Delayed

**General:** Welding, cutting, or processing this material may release dust or fumes that are hazardous. During processing, inhalation of fumes may cause dizziness and/or irritation to the eyes, nose, and throat. Hot molten product will cause thermal burns to the skin.

**Inhalation:** The primary acute health hazard associated with this product would be the potential for exposure to fumes during metal processing operations. During processing, the most significant route of exposure is by the inhalation (breathing) of fumes. If fumes are inhaled, they can cause a condition commonly known as metal fume fever with symptoms which resemble influenza; Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea and prostration may also occur.

**Skin Contact:** Contact with hot, molten metal will cause thermal burns.

**Eye Contact:** Fumes from thermal decomposition may cause eye irritation. Risk of thermal burns on contact with molten product. Arc rays and sparks can burn eyes.

**Ingestion:** Ingestion is likely to be harmful or have adverse effects.

**Chronic Symptoms:** This product is intended for use in ARC welding. During this process UV rays irritate the superficial corneal epithelium, causing inhibition of mitosis, production of nuclear fragmentation, and loosening of the epithelial layer. Under experimental conditions in animals, phototoxic effects have been demonstrated at all levels of the cornea, including the stroma and endothelium. Aluminum: Inhalation of finely divided aluminum powder may cause pulmonary fibrosis. Silicon: Can cause chronic bronchitis and narrowing of the airways. Manganese: Chronic exposure can cause inflammation of the lung tissue, scarring the lungs (pulmonary fibrosis). Copper: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, lassitude); metallic or sweet taste; discoloration of skin and hair. Tissue damage of mucous membranes may follow chronic dust exposure. Chromium: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Increased incidences of respiratory cancer have been found in chromium (VI) workers. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion.

#### Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

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### SECTION 5: FIRE-FIGHTING MEASURES

#### Extinguishing Media

**Suitable Extinguishing Media:** Class D Extinguishing Agent (for metal powder fires). Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO<sub>2</sub>), dry sand.

**Unsuitable Extinguishing Media:** Do not use a high powered water stream. Use of a high powered stream may spread fire.

#### Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not considered flammable but will burn at high temperatures.

**Explosion Hazard:** Product is not explosive. Ensure proper welding procedures to avoid welding explosions.

**Reactivity:** Hazardous reactions will not occur under normal conditions. If dust are formed: Metallic dusts may ignite or explode.

#### Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers. Do not breathe fumes from fires or vapors from decomposition. Do not allow run-off from firefighting to enter drains or water sources. Avoid raising dust.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Hazardous Combustion Products:** Carbon oxides (CO, CO<sub>2</sub>). Metal oxides.

#### Reference to Other Sections

Refer to section 9 for flammability properties.

### SECTION 6: ACCIDENTAL RELEASE MEASURES

#### Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Do not breathe vapors from molten product. Avoid all contact with skin, eyes, or clothing. Avoid breathing (vapor, mist, gas).

#### For Non-Emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### For Emergency Personnel

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Evacuate unnecessary personnel. Eliminate ignition sources. Ventilate area.

#### Environmental Precautions

Prevent entry to sewers and public waters.

#### Methods and Material for Containment and Cleaning Up

**For Containment:** Where possible allow molten material to solidify naturally. Contain and collect as any solid.

**Methods for Cleaning Up:** Clean up spills immediately and dispose of waste safely. Avoid generation of dust during clean-up of spills. Ventilate area. Use explosion proof vacuum during cleanup, with appropriate filter. Do not mix with other materials. Use only non-sparking tools. Transfer spilled material to a suitable container for disposal.

#### Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. Concerning disposal elimination after cleaning, see item 13.

### SECTION 7: HANDLING AND STORAGE

#### Precautions for Safe Handling

**Additional Hazards When Processed:** Risk of electric shock when welding. Arc rays and sparks can burn skin. Fumes from welding, or processing of this material can be harmful if inhaled. See ANSI Z49.1-1967 Safety in Welding and Cutting published by the American Welding Society and OSHA Hazard Communication Standard 1910.1200 for additional details regarding the handling and storage of this material.

**Precautions for Safe Handling:** Avoid contact with skin and eyes. Do not breathe dust. Use appropriate personal protective equipment when handling and observe good personal hygiene measures after handling. Do not handle until all safety precautions have been read and understood.

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

#### Conditions for Safe Storage, Including Any Incompatibilities

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

**Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers. Halogens. Nitric oxide/nitrogen dioxide. Hydrogen peroxide. Phosphorus.

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### Specific End Use(s)

Aluminum Electrodes and Rods

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government

Aluminum (7429-90-5)		
USA ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (respirable fraction)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	15 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable dust)
Alberta	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust)
British Columbia	OEL TWA (mg/m <sup>3</sup> )	1.0 mg/m <sup>3</sup> (respirable)
Manitoba	OEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (respirable fraction)
New Brunswick	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (metal dust)
Newfoundland & Labrador	OEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (respirable fraction)
Nova Scotia	OEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (respirable fraction)
Nunavut	OEL STEL (mg/m <sup>3</sup> )	20 mg/m <sup>3</sup>
Nunavut	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
Northwest Territories	OEL STEL (mg/m <sup>3</sup> )	20 mg/m <sup>3</sup>
Northwest Territories	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
Ontario	OEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (respirable)
Prince Edward Island	OEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (respirable fraction)
Québec	VEMP (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
Saskatchewan	OEL STEL (mg/m <sup>3</sup> )	20 mg/m <sup>3</sup> (dust)
Saskatchewan	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust)
Silicon (7440-21-3)		
USA OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	15 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable dust)
British Columbia	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (total dust) 3 mg/m <sup>3</sup> (respirable fraction)
New Brunswick	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
Nunavut	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (respirable mass) 10 mg/m <sup>3</sup> (total mass)
Northwest Territories	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (respirable mass) 10 mg/m <sup>3</sup> (total mass)
Ontario	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (total dust)
Québec	VEMP (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (containing no Asbestos and <1% Crystalline silica-total dust)
Saskatchewan	OEL STEL (mg/m <sup>3</sup> )	20 mg/m <sup>3</sup>
Saskatchewan	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
Yukon	OEL STEL (mg/m <sup>3</sup> )	20 mg/m <sup>3</sup>
Yukon	OEL TWA (mg/m <sup>3</sup> )	30 mppcf 10 mg/m <sup>3</sup>
Manganese (7439-96-5)		
USA ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	0.02 mg/m <sup>3</sup> (respirable fraction)

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		0.1 mg/m <sup>3</sup> (inhalable fraction)
<b>USA ACGIH</b>	ACGIH chemical category	Not Classifiable as a Human Carcinogen
<b>USA OSHA</b>	OSHA PEL (Ceiling) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (fume)
<b>USA NIOSH</b>	NIOSH REL (TWA) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (fume)
<b>USA NIOSH</b>	NIOSH REL (STEL) (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup>
<b>USA IDLH</b>	US IDLH (mg/m <sup>3</sup> )	500 mg/m <sup>3</sup>
<b>Alberta</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup>
<b>British Columbia</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup>
<b>Manitoba</b>	OEL TWA (mg/m <sup>3</sup> )	0.02 mg/m <sup>3</sup> (respirable fraction) 0.1 mg/m <sup>3</sup> (inhalable fraction)
<b>New Brunswick</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup>
<b>Newfoundland &amp; Labrador</b>	OEL TWA (mg/m <sup>3</sup> )	0.02 mg/m <sup>3</sup> (respirable fraction) 0.1 mg/m <sup>3</sup> (inhalable fraction)
<b>Nova Scotia</b>	OEL TWA (mg/m <sup>3</sup> )	0.02 mg/m <sup>3</sup> (respirable fraction) 0.1 mg/m <sup>3</sup> (inhalable fraction)
<b>Nunavut</b>	OEL Ceiling (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Nunavut</b>	OEL STEL (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup> (fume)
<b>Nunavut</b>	OEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (fume)
<b>Northwest Territories</b>	OEL Ceiling (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Northwest Territories</b>	OEL STEL (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup> (fume)
<b>Northwest Territories</b>	OEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (fume)
<b>Ontario</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup>
<b>Prince Edward Island</b>	OEL TWA (mg/m <sup>3</sup> )	0.02 mg/m <sup>3</sup> (respirable fraction) 0.1 mg/m <sup>3</sup> (inhalable fraction)
<b>Québec</b>	VEMP (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (total dust and fume)
<b>Saskatchewan</b>	OEL STEL (mg/m <sup>3</sup> )	0.6 mg/m <sup>3</sup>
<b>Saskatchewan</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup>
<b>Yukon</b>	OEL Ceiling (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Copper (7440-50-8)</b>		
<b>USA ACGIH</b>	ACGIH TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume)
<b>USA OSHA</b>	OSHA PEL (TWA) (mg/m <sup>3</sup> )	0.1 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
<b>USA NIOSH</b>	NIOSH REL (TWA) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (dust and mist) 0.1 mg/m <sup>3</sup> (fume)
<b>USA IDLH</b>	US IDLH (mg/m <sup>3</sup> )	100 mg/m <sup>3</sup> (dust, fume and mist)
<b>Alberta</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
<b>British Columbia</b>	OEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (dust and mist) 0.2 mg/m <sup>3</sup> (fume)
<b>Manitoba</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume)
<b>New Brunswick</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
<b>Newfoundland &amp; Labrador</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume)
<b>Nova Scotia</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume)
<b>Nunavut</b>	OEL STEL (mg/m <sup>3</sup> )	0.6 mg/m <sup>3</sup> (fume) 2 mg/m <sup>3</sup> (dust and mist)
<b>Nunavut</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
<b>Northwest Territories</b>	OEL STEL (mg/m <sup>3</sup> )	0.6 mg/m <sup>3</sup> (fume) 2 mg/m <sup>3</sup> (dust and mist)
<b>Northwest Territories</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)

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<b>Ontario</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
<b>Prince Edward Island</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume)
<b>Québec</b>	VEMP (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
<b>Saskatchewan</b>	OEL STEL (mg/m <sup>3</sup> )	0.6 mg/m <sup>3</sup> (fume) 3 mg/m <sup>3</sup> (dust and mist)
<b>Saskatchewan</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
<b>Yukon</b>	OEL STEL (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume) 2 mg/m <sup>3</sup> (dust and mist)
<b>Yukon</b>	OEL TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
<b>Chromium (7440-47-3)</b>		
<b>USA ACGIH</b>	ACGIH TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>USA ACGIH</b>	ACGIH chemical category	Not Classifiable as a Human Carcinogen
<b>USA OSHA</b>	OSHA PEL (TWA) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup>
<b>USA NIOSH</b>	NIOSH REL (TWA) (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>USA IDLH</b>	US IDLH (mg/m <sup>3</sup> )	250 mg/m <sup>3</sup>
<b>Alberta</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>British Columbia</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>Manitoba</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>New Brunswick</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>Newfoundland &amp; Labrador</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>Nova Scotia</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>Nunavut</b>	OEL STEL (mg/m <sup>3</sup> )	1.5 mg/m <sup>3</sup>
<b>Nunavut</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>Northwest Territories</b>	OEL STEL (mg/m <sup>3</sup> )	1.5 mg/m <sup>3</sup>
<b>Northwest Territories</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>Ontario</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>Prince Edward Island</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>Québec</b>	VEMP (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>Saskatchewan</b>	OEL STEL (mg/m <sup>3</sup> )	1.5 mg/m <sup>3</sup>
<b>Saskatchewan</b>	OEL TWA (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>
<b>Yukon</b>	OEL STEL (mg/m <sup>3</sup> )	3.0 mg/m <sup>3</sup>
<b>Yukon</b>	OEL TWA (mg/m <sup>3</sup> )	0.1 mg/m <sup>3</sup>
<b>Zirconium (7440-67-7)</b>		
<b>USA ACGIH</b>	ACGIH TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>USA ACGIH</b>	ACGIH STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>USA ACGIH</b>	ACGIH chemical category	Not Classifiable as a Human Carcinogen
<b>USA NIOSH</b>	NIOSH REL (TWA) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>USA NIOSH</b>	NIOSH REL (STEL) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>USA IDLH</b>	US IDLH (mg/m <sup>3</sup> )	50 mg/m <sup>3</sup>
<b>Alberta</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Alberta</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>British Columbia</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>British Columbia</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Manitoba</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Manitoba</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>New Brunswick</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>New Brunswick</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>

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<b>Newfoundland &amp; Labrador</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Newfoundland &amp; Labrador</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Nova Scotia</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Nova Scotia</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Ontario</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Ontario</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Prince Edward Island</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Prince Edward Island</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Québec</b>	VECD (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Québec</b>	VEMP (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Saskatchewan</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Saskatchewan</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Vanadium (7440-62-2)</b>		
<b>USA OSHA</b>	OSHA PEL (Ceiling) (mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup> (respirable dust) 0.1 mg/m <sup>3</sup> (fume)
<b>USA NIOSH</b>	NIOSH REL (TWA) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup>
<b>USA NIOSH</b>	NIOSH REL (STEL) (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup>
<b>Welding fumes (RR-00009-9)</b>		
<b>New Brunswick</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Nunavut</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (total particulate)
<b>Nunavut</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (total particulate)
<b>Northwest Territories</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (total particulate)
<b>Northwest Territories</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (total particulate)
<b>Québec</b>	VEMP (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (not otherwise classified)
<b>Saskatchewan</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Saskatchewan</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Yukon</b>	OEL STEL (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Yukon</b>	OEL TWA (mg/m <sup>3</sup> )	5.0 mg/m <sup>3</sup>
<b>Aluminum, welding fumes (RR-00020-4)</b>		
<b>USA NIOSH</b>	NIOSH REL (TWA) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>New Brunswick</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Nunavut</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Nunavut</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Northwest Territories</b>	OEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
<b>Northwest Territories</b>	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
<b>Québec</b>	VEMP (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>

### Exposure Controls

**Appropriate Engineering Controls:** Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. All equipment should comply with the National Electric Code. When cutting, grinding, crushing, or drilling, provide general or local ventilation systems, as needed, to maintain airborne dust concentrations below the regulatory limits. Local vacuum collection is preferred since it prevents release of contaminants into the work area by controlling it at the source. Other technologies that may aid in controlling airborne respirable dust include wet suppression, ventilation, process enclosure, and enclosed employee work stations. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Prevent dust accumulation (to minimize explosion hazard).

**Personal Protective Equipment:** Gloves. Protective clothing. Face shield. Insufficient ventilation: wear respiratory protection.



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**Materials for Protective Clothing:** With molten material wear thermally protective clothing.

**Hand Protection:** Leather gloves. Heat resistant gloves.

**Eye Protection:** Chemical goggles or safety glasses. Welders should wear goggles or safety glasses with side shields that comply with ANSI Z87.1 under welding helmets and always wear goggles or other suitable eye protection when gas welding or oxygen cutting.

**Skin and Body Protection:** Wear fire/flare resistant/retardant clothing.

**Respiratory Protection:** If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

**Thermal Hazard Protection:** Fire retardant clothing and gloves, as well as safety shoes are required for safe furnace work.

**Consumer Exposure Controls:** Do not eat, drink or smoke during use

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### Information on Basic Physical and Chemical Properties

Physical State	: Solid
Appearance	: Silver. Gray. Metallic.
Odor	: Not available
Odor Threshold	: Not available
pH	: Not available
Evaporation Rate	: Not available
Melting Point	: Not available
Freezing Point	: Not available
Boiling Point	: Not available
Flash Point	: Not available
Auto-ignition Temperature	: Not available
Decomposition Temperature	: Not available
Flammability (solid, gas)	: Not available
Lower Flammable Limit	: Not available
Upper Flammable Limit	: Not available
Vapor Pressure	: Not available
Relative Vapor Density at 20 °C	: Not available
Relative Density	: Not available
Specific Gravity	: Not available
Solubility	: Not available
Partition Coefficient: N-Octanol/Water	: Not available
Viscosity	: Not available
Explosion Data – Sensitivity to Mechanical Impact	: Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	: Not expected to present an explosion hazard due to static discharge.

## SECTION 10: STABILITY AND REACTIVITY

**Reactivity:** Hazardous reactions will not occur under normal conditions. If dust are formed: Metallic dusts may ignite or explode.

**Chemical Stability:** Stable under normal conditions.

**Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.

**Conditions to Avoid:** Incompatible materials.

**Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers. Halogens. Nitrogen oxides. Nitrogen dioxide. Hydrogen peroxide.

**Hazardous Decomposition Products:** Metal oxides. Oxides of aluminum. Oxides of magnesium. Oxides of manganese. Oxides of copper. Oxides of zirconium. Oxides of titanium. Chromium oxides. Silicon oxides. Vanadium oxides.

## SECTION 11: TOXICOLOGICAL INFORMATION

### Information on Toxicological Effects - Product

**Acute Toxicity:** Not classified

**LD50 and LC50 Data:** Not available

**Skin Corrosion/Irritation:** Not classified

**Serious Eye Damage/Irritation:** Not classified



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**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Teratogenicity:** Not available

**Carcinogenicity:** Not classified.

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified.

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** The primary acute health hazard associated with this product would be the potential for exposure to fumes during metal processing operations. During processing, the most significant route of exposure is by the inhalation (breathing) of fumes. If fumes are inhaled, they can cause a condition commonly known as metal fume fever with symptoms which resemble influenza; Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea and prostration may also occur.

**Symptoms/Injuries After Skin Contact:** Contact with hot, molten metal will cause thermal burns.

**Symptoms/Injuries After Eye Contact:** Fumes from thermal decomposition may cause eye irritation. Risk of thermal burns on contact with molten product. Arc rays and sparks can burn eyes.

**Symptoms/Injuries After Ingestion:** Ingestion is likely to be harmful or have adverse effects.

**Chronic Symptoms:** This product is intended for use in ARC welding. During this process UV rays irritate the superficial corneal epithelium, causing inhibition of mitosis, production of nuclear fragmentation, and loosening of the epithelial layer. Under experimental conditions in animals, phototoxic effects have been demonstrated at all levels of the cornea, including the stroma and endothelium. Aluminum: Inhalation of finely divided aluminum powder may cause pulmonary fibrosis. Silicon: Can cause chronic bronchitis and narrowing of the airways. Manganese: Chronic exposure can cause inflammation of the lung tissue, scarring the lungs (pulmonary fibrosis). Copper: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, lassitude); metallic or sweet taste; discoloration of skin and hair. Tissue damage of mucous membranes may follow chronic dust exposure. Chromium: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Increased incidences of respiratory cancer have been found in chromium (VI) workers. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion.

### Information on Toxicological Effects - Ingredient(s)

#### LD50 and LC50 Data:

<b>Silicon (7440-21-3)</b>	
LD50 Oral Rat	3160 mg/kg
<b>Manganese (7439-96-5)</b>	
LD50 Oral Rat	> 2000 mg/kg
<b>Chromium (7440-47-3)</b>	
LD50 Oral Rat	> 5000 mg/kg
<b>Chromium (7440-47-3)</b>	
IARC Group	3
<b>Welding fumes (RR-00009-9)</b>	
IARC Group	2B
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.

## SECTION 12: ECOLOGICAL INFORMATION

### Toxicity No additional information available

<b>Manganese (7439-96-5)</b>	
NOEC chronic fish	3.6 mg/l (Exposure time: 96h; Species: Oncorhynchus mykiss)
<b>Copper (7440-50-8)</b>	
LC50 Fish 1	<= 0.0068 (0.0068 - 0.0156) mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0.03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

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<b>EC50 Other Aquatic Organisms 1</b>	0.0426 (0.0426 - 0.0535) mg/l (Exposure time: 72 h - Species: Pseudokirchneriella subcapitata [static])
<b>LC 50 Fish 2</b>	0.3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
<b>EC50 Other Aquatic Organisms 2</b>	0.031 (0.031 - 0.054) mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata [static])

### Persistence and Degradability

<b>Copper (7440-50-8)</b>	
<b>Persistence and Degradability</b>	Not readily biodegradable.

**Bioaccumulative Potential** Not available

**Mobility in Soil** Not available

**Other Adverse Effects** Not available

## SECTION 13: DISPOSAL CONSIDERATIONS

**Sewage Disposal Recommendations:** Do not empty into drains; dispose of this material and its container in a safe way.

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

**Additional Information:** Recycle where possible and/or dispose of spent material such as metals & metal-bearing waste and submerged arc welding (SAW) flux/slag appropriately.

## SECTION 14: TRANSPORT INFORMATION

**In Accordance with DOT** Not regulated for transport

**In Accordance with IMDG** Not regulated for transport

**In Accordance with IATA** Not regulated for transport

**In Accordance with TDG** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### US Federal Regulations

<b>Aluminum (7429-90-5)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
<b>SARA Section 311/312 Hazard Classes</b>	Fire hazard Reactive hazard
<b>SARA Section 313 - Emission Reporting</b>	1.0 % (dust or fume only)
<b>Silicon (7440-21-3)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>Magnesium (7439-95-4)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>Manganese (7439-96-5)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
<b>SARA Section 313 - Emission Reporting</b>	1.0 %
<b>Copper (7440-50-8)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
<b>SARA Section 313 - Emission Reporting</b>	1.0 %
<b>Chromium (7440-47-3)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
<b>SARA Section 313 - Emission Reporting</b>	1.0 %
<b>Zirconium (7440-67-7)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

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### Vanadium (7440-62-2)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Listed on United States SARA Section 313

### SARA Section 313 - Emission Reporting

1.0 % (except when contained in an alloy)

### US State Regulations

#### Aluminum (7429-90-5)

U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)  
U.S. - Colorado - Primary Drinking Water Regulations - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)  
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)  
U.S. - Connecticut - Water Quality Standards - Acute Freshwater Aquatic Life Criteria  
U.S. - Connecticut - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria  
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities  
U.S. - Florida - Drinking Water Standards - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Georgia - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)  
U.S. - Massachusetts - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
RTK - U.S. - Massachusetts - Right To Know List  
U.S. - Massachusetts - Toxics Use Reduction Act  
U.S. - Michigan - Occupational Exposure Limits - TWAs  
U.S. - Minnesota - Hazardous Substance List  
U.S. - Minnesota - Permissible Exposure Limits - TWAs  
U.S. - Missouri - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Nevada - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - New Hampshire - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual  
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances  
U.S. - New Jersey - Environmental Hazardous Substances List  
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - New Jersey - Secondary Drinking Water Standards - Recommended Upper Limits (RULs)  
U.S. - New Jersey - Special Health Hazards Substances List  
U.S. - New Jersey - Water Quality - Ground Water Quality Criteria  
U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)  
U.S. - New Mexico - Water Quality - Standards for Ground Water of 10,000 mg/L TDS Concentration or Less  
U.S. - New York - Occupational Exposure Limits - TWAs  
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour  
U.S. - Oregon - Permissible Exposure Limits - TWAs  
U.S. - California - Safer Consumer Products - Initial List of Candidate Chemicals and Chemical Groups  
U.S. - Pennsylvania - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List  
RTK - U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Rhode Island - Water Quality Standards - Acute Freshwater Aquatic Life Criteria  
U.S. - Rhode Island - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria  
U.S. - South Carolina - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Tennessee - Occupational Exposure Limits - TWAs  
U.S. - Texas - Drinking Water Standards - Secondary Constituent Levels (SCLs)  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term  
U.S. - Utah - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Vermont - Permissible Exposure Limits - TWAs  
U.S. - Washington - Permissible Exposure Limits - STELS

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U.S. - Washington - Permissible Exposure Limits - TWAs  
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Fresh Water  
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Fresh Water

### Silicon (7440-21-3)

U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)  
U.S. - Idaho - Occupational Exposure Limits - TWAs  
RTK - U.S. - Massachusetts - Right To Know List  
U.S. - Michigan - Occupational Exposure Limits - TWAs  
U.S. - Minnesota - Hazardous Substance List  
U.S. - Minnesota - Permissible Exposure Limits - TWAs  
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - New Jersey - Special Health Hazards Substances List  
U.S. - New York - Occupational Exposure Limits - TWAs  
U.S. - Oregon - Permissible Exposure Limits - TWAs  
RTK - U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Tennessee - Occupational Exposure Limits - TWAs  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term  
U.S. - Vermont - Permissible Exposure Limits - TWAs  
U.S. - Washington - Permissible Exposure Limits - STELs  
U.S. - Washington - Permissible Exposure Limits - TWAs

### Magnesium (7439-95-4)

U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity  
RTK - U.S. - Massachusetts - Right To Know List  
U.S. - Nevada - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List  
RTK - U.S. - Pennsylvania - RTK (Right to Know) List

### Manganese (7439-96-5)

U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Chronic  
U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)  
U.S. - Colorado - Primary Drinking Water Regulations - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)  
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)  
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities  
U.S. - Florida - Drinking Water Standards - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Georgia - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)  
U.S. - Idaho - Occupational Exposure Limits - Ceilings  
U.S. - Illinois - Toxic Air Contaminant Carcinogens  
U.S. - Illinois - Toxic Air Contaminants  
U.S. - Louisiana - Reportable Quantity List for Pollutants  
U.S. - Maine - Air Pollutants - Hazardous Air Pollutants  
U.S. - Massachusetts - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Massachusetts - Drinking Water Guidelines  
RTK - U.S. - Massachusetts - Right To Know List  
U.S. - Massachusetts - Toxics Use Reduction Act  
U.S. - Michigan - Occupational Exposure Limits - STELs  
U.S. - Michigan - Occupational Exposure Limits - TWAs  
U.S. - Minnesota - Chemicals of High Concern  
U.S. - Minnesota - Groundwater Health Risk Limits  
U.S. - Minnesota - Hazardous Substance List

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U.S. - Minnesota - Permissible Exposure Limits - STELS  
U.S. - Minnesota - Permissible Exposure Limits - TWAs  
U.S. - Missouri - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Nevada - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - New Hampshire - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual  
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances  
U.S. - New Jersey - Environmental Hazardous Substances List  
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - New Jersey - Secondary Drinking Water Standards - Recommended Upper Limits (RULs)  
U.S. - New Jersey - Special Health Hazards Substances List  
U.S. - New Jersey - Water Quality - Ground Water Quality Criteria  
U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)  
U.S. - New Mexico - Water Quality - Standards for Ground Water of 10,000 mg/L TDS Concentration or Less  
U.S. - New York - Occupational Exposure Limits - TWAs  
U.S. - North Carolina - Control of Toxic Air Pollutants  
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour  
U.S. - Oregon - Permissible Exposure Limits - Ceilings  
U.S. - California - Safer Consumer Products - Initial List of Candidate Chemicals and Chemical Groups  
U.S. - Pennsylvania - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List  
RTK - U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 24-Hour  
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - Annual  
U.S. - South Carolina - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Tennessee - Occupational Exposure Limits - STELS  
U.S. - Tennessee - Occupational Exposure Limits - TWAs  
U.S. - Texas - Drinking Water Standards - Secondary Constituent Levels (SCLs)  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term  
U.S. - Utah - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Vermont - Permissible Exposure Limits - Ceilings  
U.S. - Vermont - Permissible Exposure Limits - STELS  
U.S. - Vermont - Permissible Exposure Limits - TWAs  
U.S. - Virginia - Water Quality Standards - Public Water Supply Effluent Limits  
U.S. - Washington - Permissible Exposure Limits - Ceilings  
U.S. - Washington - Permissible Exposure Limits - STELS  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet

### **Copper (7440-50-8)**

U.S. - California - Priority Toxic Pollutants - Freshwater Criteria  
U.S. - California - Priority Toxic Pollutants - Human Health Criteria  
U.S. - California - Priority Toxic Pollutants - Saltwater Criteria  
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Acute  
U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)  
U.S. - Colorado - Primary Drinking Water Regulations - Maximum Contaminant Level Goals (MCLGs)  
U.S. - Colorado - Primary Drinking Water Regulations - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Connecticut - Drinking Water Quality Standards - Groundwater Sources  
U.S. - Connecticut - Drinking Water Quality Standards - Maximum Contaminant Levels  
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)

# Aluminum Welding Wires/Rods

## Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)  
U.S. - Connecticut - Water Quality Standards - Acute Freshwater Aquatic Life Criteria  
U.S. - Connecticut - Water Quality Standards - Acute Saltwater Aquatic Life Criteria  
U.S. - Connecticut - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria  
U.S. - Connecticut - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria  
U.S. - Connecticut - Water Quality Standards - Consumption of Water and Organisms  
U.S. - Connecticut - Water Quality Standards - Health Designations  
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities  
U.S. - Florida - Drinking Water Standards - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Georgia - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)  
U.S. - Idaho - Occupational Exposure Limits - TWAs  
U.S. - Illinois - Toxic Air Contaminants  
U.S. - Louisiana - Reportable Quantity List for Pollutants  
U.S. - Maryland - Surface Water Quality Standards - Acute Freshwater Aquatic Life  
U.S. - Maryland - Surface Water Quality Standards - Acute Saltwater Aquatic Life Criteria  
U.S. - Maryland - Surface Water Quality Standards - Chronic Freshwater Aquatic Life  
U.S. - Maryland - Surface Water Quality Standards - Chronic Saltwater Aquatic Life Criteria  
U.S. - Maryland - Surface Water Quality Standards - Consumption of Water and Organisms  
U.S. - Massachusetts - Allowable Ambient Limits (AALs)  
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)  
U.S. - Massachusetts - Drinking Water - Maximum Contaminant Levels (MCLs)  
U.S. - Massachusetts - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1  
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2  
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity  
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1  
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2  
RTK - U.S. - Massachusetts - Right To Know List  
U.S. - Massachusetts - Threshold Effects Exposure Limits (TELs)  
U.S. - Massachusetts - Toxics Use Reduction Act  
U.S. - Michigan - Occupational Exposure Limits - TWAs  
U.S. - Michigan - Polluting Materials List  
U.S. - Minnesota - Hazardous Substance List  
U.S. - Minnesota - Permissible Exposure Limits - TWAs  
U.S. - Missouri - Drinking Water - Maximum Contaminant Levels (MCLs)  
U.S. - Missouri - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Nevada - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - New Hampshire - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual  
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances  
U.S. - New Jersey - Environmental Hazardous Substances List  
U.S. - New Jersey - Primary Drinking Water Standards - Action Levels - ALs  
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - New Jersey - Water Quality - Ground Water Quality Criteria  
U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)  
U.S. - New Mexico - Water Quality - Standards for Ground Water of 10,000 mg/L TDS Concentration or Less  
U.S. - New York - Occupational Exposure Limits - TWAs  
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances  
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour  
U.S. - North Dakota - Water Quality Standards - Aquatic Life Acute Value for Classes I, IA, II, III  
U.S. - North Dakota - Water Quality Standards - Aquatic Life Chronic Value for Classes I, IA, II, III

# Aluminum Welding Wires/Rods

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U.S. - North Dakota - Water Quality Standards - Human Health Value for Classes I, IA, II  
U.S. - Oregon - Permissible Exposure Limits - TWAs  
U.S. - Pennsylvania - Beneficial Use of Sewage Sludge by Land Application - Pollutant Ceiling Limits  
U.S. - Pennsylvania - Drinking Water - Maximum Contaminant Levels (MCLs)  
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List  
RTK - U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 1-Hour  
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - Annual  
U.S. - Rhode Island - Water Quality Standards - Acute Freshwater Aquatic Life Criteria  
U.S. - Rhode Island - Water Quality Standards - Acute Saltwater Aquatic Life Criteria  
U.S. - Rhode Island - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria  
U.S. - Rhode Island - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria  
U.S. - Rhode Island - Water Quality Standards - Human Health Criteria for Consumption of Water and Aquatic Organisms  
U.S. - South Carolina - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Tennessee - Occupational Exposure Limits - TWAs  
U.S. - Texas - Drinking Water Standards - Secondary Constituent Levels (SCLs)  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term  
U.S. - Utah - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)  
U.S. - Vermont - Permissible Exposure Limits - TWAs  
U.S. - Virginia - Water Quality Standards - Acute Freshwater Aquatic Life  
U.S. - Virginia - Water Quality Standards - Acute Saltwater Aquatic Life  
U.S. - Virginia - Water Quality Standards - Chronic Freshwater Aquatic Life  
U.S. - Virginia - Water Quality Standards - Chronic Saltwater Aquatic Life  
U.S. - Virginia - Water Quality Standards - Public Water Supply Effluent Limits  
U.S. - Washington - Permissible Exposure Limits - STELS  
U.S. - Washington - Permissible Exposure Limits - TWAs  
U.S. - West Virginia - Water Quality - Groundwater Standards - Ceiling Concentrations  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet  
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Fresh Water  
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Fresh Water  
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Marine Water  
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Marine Water  
U.S. - Arkansas - Surface Water Quality Standards - Chronic Aquatic Life Criteria  
U.S. - Arkansas - Surface Water Quality Standards - Acute Aquatic Life Criteria

### Chromium (7440-47-3)

U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)  
U.S. - Colorado - Hazardous Wastes - Maximum Concentration for the Toxicity Characteristics  
U.S. - Colorado - Primary Drinking Water Regulations - Maximum Contaminant Level Goals (MCLGs)  
U.S. - Colorado - Primary Drinking Water Regulations - Maximum Contaminant Levels (MCLs)  
U.S. - Connecticut - Drinking Water Quality Standards - Groundwater Sources  
U.S. - Connecticut - Drinking Water Quality Standards - Maximum Contaminant Levels  
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)  
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)  
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities  
U.S. - Florida - Drinking Water Standards - Inorganic Contaminants - Maximum Contaminant Levels (MCLs)  
U.S. - Georgia - Drinking Water - Maximum Contaminant Levels (MCLs)  
U.S. - Idaho - Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)

# Aluminum Welding Wires/Rods

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U.S. - Idaho - Occupational Exposure Limits - TWAs  
U.S. - Illinois - Toxic Air Contaminants  
U.S. - Louisiana - Reportable Quantity List for Pollutants  
U.S. - Maine - Air Pollutants - Hazardous Air Pollutants  
U.S. - Maryland - Surface Water Quality Standards - Consumption of Water and Organisms  
U.S. - Massachusetts - Allowable Ambient Limits (AALs)  
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)  
U.S. - Massachusetts - Drinking Water - Maximum Contaminant Levels (MCLs)  
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1  
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2  
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity  
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1  
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2  
RTK - U.S. - Massachusetts - Right To Know List  
U.S. - Massachusetts - Threshold Effects Exposure Limits (TEELs)  
U.S. - Massachusetts - Toxics Use Reduction Act  
U.S. - Michigan - Occupational Exposure Limits - TWAs  
U.S. - Michigan - Polluting Materials List  
U.S. - Minnesota - Hazardous Substance List  
U.S. - Minnesota - Permissible Exposure Limits - TWAs  
U.S. - Missouri - Drinking Water - Maximum Contaminant Levels (MCLs)  
U.S. - Nebraska - Drinking Water - Maximum Contaminant Levels (MCLs)  
U.S. - Nebraska - Maximum Concentration of Contaminants for the Toxicity Characteristic  
U.S. - New Hampshire - Drinking Water - Maximum Contaminant Levels (MCLs)  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual  
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances  
U.S. - New Jersey - Environmental Hazardous Substances List  
U.S. - New Jersey - Primary Drinking Water Standards - Maximum Contaminant Levels - MCLs  
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - New Jersey - Special Health Hazards Substances List  
U.S. - New Jersey - Water Quality - Ground Water Quality Criteria  
U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)  
U.S. - New Mexico - Water Quality - Standards for Ground Water of 10,000 mg/L TDS Concentration or Less  
U.S. - New York - Occupational Exposure Limits - TWAs  
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances  
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour  
U.S. - North Dakota - Hazardous Wastes - Maximum Concentration for the Toxicity Characteristic  
U.S. - Oregon - Permissible Exposure Limits - TWAs  
U.S. - Pennsylvania - Drinking Water - Maximum Contaminant Levels (MCLs)  
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List  
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances  
RTK - U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - South Carolina - Maximum Contaminant Levels (MCLs)  
U.S. - Tennessee - Occupational Exposure Limits - TWAs  
U.S. - Texas - Drinking Water Standards - Maximum Contaminant Levels (MCLs)  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term  
U.S. - Utah - Drinking Water - Maximum Contaminant Levels (MCLs)  
U.S. - Vermont - Hazardous Waste - Hazardous Constituents  
U.S. - Vermont - Hazardous Waste - Maximum Contaminant Concentration for Toxicity  
U.S. - Vermont - Permissible Exposure Limits - TWAs  
U.S. - Washington - Dangerous Waste - Dangerous Waste Constituents List  
U.S. - Washington - Permissible Exposure Limits - TWAs



# Aluminum Welding Wires/Rods

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U.S. - West Virginia - Water Quality - Groundwater Standards - Ceiling Concentrations  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet

### Zirconium (7440-67-7)

U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)  
U.S. - Idaho - Occupational Exposure Limits - TWAs  
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1  
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2  
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity  
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1  
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2  
RTK - U.S. - Massachusetts - Right To Know List  
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - New Jersey - Special Health Hazards Substances List  
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 1-Hour  
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour  
U.S. - Oregon - Permissible Exposure Limits - TWAs  
RTK - U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater  
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet

### Vanadium (7440-62-2)

U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations  
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)  
U.S. - Massachusetts - Allowable Ambient Limits (AALs)  
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)  
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1  
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2  
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity  
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1  
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2  
RTK - U.S. - Massachusetts - Right To Know List  
U.S. - Massachusetts - Threshold Effects Exposure Limits (TEELs)  
U.S. - Massachusetts - Toxics Use Reduction Act  
U.S. - Minnesota - Groundwater Health Risk Limits  
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances  
U.S. - New Jersey - Environmental Hazardous Substances List  
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List  
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List  
RTK - U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 1-Hour  
U.S. - Tennessee - Occupational Exposure Limits - TWAs  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

### Welding fumes (RR-00009-9)

U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)  
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)  
U.S. - Illinois - Toxic Air Contaminant Carcinogens

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U.S. - Illinois - Toxic Air Contaminants  
U.S. - Michigan - Occupational Exposure Limits - TWAs  
U.S. - Minnesota - Hazardous Substance List  
U.S. - Minnesota - Permissible Exposure Limits - TWAs  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual  
U.S. - New York - Occupational Exposure Limits - TWAs  
RTK - U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Tennessee - Occupational Exposure Limits - TWAs  
U.S. - Vermont - Permissible Exposure Limits - TWAs  
U.S. - Washington - Permissible Exposure Limits - STELs  
U.S. - Washington - Permissible Exposure Limits - TWAs

### Aluminum, welding fumes (RR-00020-4)

U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)  
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)  
U.S. - Michigan - Occupational Exposure Limits - TWAs  
U.S. - Minnesota - Hazardous Substance List  
U.S. - Minnesota - Permissible Exposure Limits - TWAs  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour  
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual  
U.S. - New York - Occupational Exposure Limits - TWAs  
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances  
RTK - U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Tennessee - Occupational Exposure Limits - TWAs  
U.S. - Washington - Permissible Exposure Limits - STELs  
U.S. - Washington - Permissible Exposure Limits - TWAs

### Canadian Regulations

#### Aluminum (7429-90-5)

Listed on the Canadian DSL (Domestic Substances List)

Listed on the Canadian IDL (Ingredient Disclosure List)

IDL Concentration 1 %

WHMIS Classification	Class B Division 6 - Reactive Flammable Material Class B Division 4 - Flammable Solid
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#### Silicon (7440-21-3)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
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#### Magnesium (7439-95-4)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification	Class B Division 4 - Flammable Solid Class B Division 6 - Reactive Flammable Material
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#### Manganese (7439-96-5)

Listed on the Canadian DSL (Domestic Substances List)

Listed on the Canadian IDL (Ingredient Disclosure List)

IDL Concentration 1 %

WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
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#### Copper (7440-50-8)

Listed on the Canadian DSL (Domestic Substances List)

Listed on the Canadian IDL (Ingredient Disclosure List)

IDL Concentration 1 %

WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
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# Aluminum Welding Wires/Rods

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<b>Chromium (7440-47-3)</b>	
Listed on the Canadian DSL (Domestic Substances List)	
Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 0.1 %	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
<b>Zirconium (7440-67-7)</b>	
Listed on the Canadian DSL (Domestic Substances List)	
Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class B Division 4 - Flammable Solid
<b>Vanadium (7440-62-2)</b>	
Listed on the Canadian DSL (Domestic Substances List)	
Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

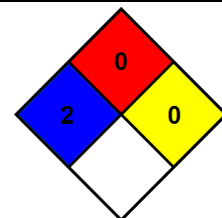
### SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

**Revision Date** : 06/09/2015  
**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

#### GHS Full Text Phrases:

Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Comb. Dust	Combustible Dust
Flam. Sol. 1	Flammable solids Category 1
Pyr. Sol. 1	Pyrophoric solids Category 1
Self-heat. 1	Self-heating substances and mixtures Category 1
Self-heat. 2	Self-heating substances and mixtures Category 2
Water-react. 1	Substances and mixtures which in contact with water emit flammable gases Category 1
Water-react. 2	Substances and mixtures which in contact with water emit flammable gases Category 2
H228	Flammable solid
H232	May form combustible dust concentrations in air
H250	Catches fire spontaneously if exposed to air
H251	Self-heating: may catch fire
H252	Self-heating in large quantities; may catch fire
H260	In contact with water releases flammable gases which may ignite spontaneously
H261	In contact with water releases flammable gases
H400	Very toxic to aquatic life
H411	Toxic to aquatic life with long lasting effects

**NFPA Health Hazard** : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.  
**NFPA Fire Hazard** : 0 - Materials that will not burn.  
**NFPA Reactivity** : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



#### HMIS III Rating

**Health** : 1 Slight Hazard - Irritation or minor reversible injury possible  
**Flammability** : 0 Minimal Hazard

# Aluminum Welding Wires/Rods

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**Physical** : 0 Minimal Hazard

**Party Responsible for the Preparation of This Document**

Harris Products Group T 513.234.9127

**Disclaimer** Harris Products Group cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for use, handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available. No warranty, expressed, or implied, is given.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

North America GHS US 2012 & WHMIS 2



## Safety Data Sheet

acc. to OSHA GHS (29 CFR 1910.1200)

Printing date 09/09/2015

Reviewed on 09/09/2015

### 1 Identification

- **Product identifier**
- **Trade name:** Albraze™EC Aluminum Brazing Flux (Flux component in Albraze™1070 kits)
- **Other means of identification**
- **SDS Number:** 0133
- **Recommended use and restriction on use**
- **Recommended use:** Metal Brazing
- **Restrictions on use:** No relevant information available.
- **Manufacturer/Importer/Supplier/Distributor information**
- **Manufacturer/Supplier:**  
Harris Products Group  
4501 Quality Place  
Mason, Ohio 45040 US  
513-754-2000
- **Safety Data Sheet Questions:** [salesinfo@jwharris.com](mailto:salesinfo@jwharris.com)
- **Arc Welding Safety Information:** [www.lincolnelectric.com/safety](http://www.lincolnelectric.com/safety)
- **24-Hour Emergency Response Telephone Numbers:**  
1-866-519-4752 (USA, Canada, Mexico only)
- (+) 1-760-476-3962
- **3E Company Access Code:** 333895

### 2 Hazard(s) identification

Classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), OSHA Hazard Communication Standard (29 CFR 1910.1200) and the Canadian Controlled Products Regulations.

- **Classification of the substance or mixture**



GHS08 Health hazard

STOT RE 1 H372 Causes damage to the respiratory system through prolonged or repeated exposure.  
Route of exposure: Inhalation.



GHS05 Corrosion

Eye Dam. 1 H318 Causes serious eye damage.

(Cont'd. on page 2)

# Safety Data Sheet

acc. to OSHA GHS (29 CFR 1910.1200)

Printing date 09/09/2015

Reviewed on 09/09/2015

**Trade name: Albraze™ EC Aluminum Brazing Flux (Flux component in Albraze™ 1070 kits)**

(Cont'd. of page 1)



GHS07

Acute Tox. 4 H302 Harmful if swallowed.  
 Skin Irrit. 2 H315 Causes skin irritation.

Lact. H362 May cause harm to breast-fed children.

· **Additional information:**

0 % of the mixture consists of component(s) of unknown toxicity.  
 There are no other hazards not otherwise classified that have been identified.

· **Label elements**

· **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms:**



GHS05 GHS07 GHS08

· **Signal word:** Danger

· **Hazard-determining components of labeling:**

lithium chloride  
 potassium fluoride  
 zinc chloride  
 aluminum potassium fluoride  
 lithium fluoride  
 zinc fluoride  
 sodium fluoride  
 zinc oxide

· **Hazard statements:**

H302 Harmful if swallowed.  
 H315 Causes skin irritation.  
 H318 Causes serious eye damage.  
 H362 May cause harm to breast-fed children.  
 H372 Causes damage to the respiratory system through prolonged or repeated exposure. Route of exposure: Inhalation.

· **Precautionary statements:**

P201 Obtain special instructions before use.  
 P263 Avoid contact during pregnancy/while nursing.  
 P260 Do not breathe dust.  
 P264 Wash thoroughly after handling.  
 P280 Wear protective gloves/protective clothing/eye protection.  
 P270 Do not eat, drink or smoke when using this product.  
 P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P302+P352 IF ON SKIN: Wash with plenty of water.  
 P330 Rinse mouth.

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P308+P313 IF exposed or concerned: Get medical advice/attention.  
 P362+P364 Take off contaminated clothing and wash it before reuse.  
 P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Additional information:**

· **Other hazards which do not result in GHS classification:**

Heat rays (infrared radiation) from flame or hot metal can injure eyes. Overexposure to brazing fumes and gases can be hazardous. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.

### 3 Composition/information on ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture: consisting of the following components.

· **Dangerous components:**

7447-41-8	lithium chloride	10-30%
7783-49-5	zinc fluoride	1-5%
60304-36-1	aluminum potassium fluoride	1-5%
7789-23-3	potassium fluoride	1-5%
13775-52-5	tripotassium hexafluoroaluminate	1-5%
7646-85-7	zinc chloride	1-5%
7789-24-4	lithium fluoride	1-5%
13775-53-6	trisodium hexafluoroaluminate	<1.0%
7681-49-4	sodium fluoride	<1.0%
1314-13-2	zinc oxide	<1.0%

· **Additional information:**

For the listed ingredient(s), the identity and exact percentage(s) are being withheld as a trade secret.

· **Composition comments:**

The term "Dangerous components" should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a hazard. The product may contain additional nonhazardous ingredients or may form additional compounds under the condition of use. Refer to Sections 2 and 8 for more information.

### 4 First-aid measures

· **Description of first aid measures**

· **General information:** No special measures required.

· **After inhalation:**

Move to fresh air if breathing is difficult. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

· **After skin contact:**

Remove contaminated clothing and wash the skin thoroughly with soap and water. For reddened or blistered skin, or thermal burns, obtain medical assistance at once.

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- **After eye contact:**  
Dust or fume from this product should be flushed from the eyes with copious amounts of clean, tepid water until transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed. Obtain medical assistance at once.
- **After swallowing:**  
Rinse out mouth and then drink plenty of water.  
Do not induce vomiting; immediately call for medical help.
- **Information for doctor**
- **Most important symptoms and effects, both acute and delayed:**  
Gastric or intestinal disorders when ingested.  
Breathing difficulty  
Coughing
- **Danger:**  
Brazing hazards are complex and may include physical and health hazards such as but not limited to infrared radiation from flame or hot metal, physical strains, thermal burns due to hot metal or spatter and potential health effects of overexposure to brazing fume or dust. Refer to Section 11 for more information.
- **Indication of any immediate medical attention and special treatment needed:** Treat symptomatically.

## 5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**  
As shipped, the product will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.
- **For safety reasons unsuitable extinguishing agents:** For metal fires: Use specific agents only.
- **Special hazards arising from the substance or mixture**  
Infrared radiation from flame or hot metal can ignite combustibles and flammable products.
- **Advice for firefighters**
- **Special fire fighting procedures:**  
Use standard firefighting procedures and consider the hazards of other involved materials.
- **Protective equipment:**  
Wear self-contained respiratory protective device.  
Wear fully protective suit.
- **Additional information:**  
Read and understand American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" and National Fire Protection Association NFPA 51B, "Standard for Fire Prevention During Welding, Cutting and Other Hot Work" before using this product.

## 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures:**  
If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8.
- **Environmental precautions:**  
Avoid release to the environment.  
Damp down dust with water spray.  
Prevent further leakage or spillage if safe to do so.

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- **Methods and material for containment and cleaning up:**

Clean up spills immediately, observing precautions in the personal protective equipment in Section 8. Avoid generating dust. Prevent product from entering any drains, sewers or water sources.

Pick up mechanically.

Send for recovery or disposal in suitable receptacles.

Dispose contaminated material as waste according to item 13.

- **Reference to other sections:**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

### 7 Handling and storage

- **Handling**

- **Precautions for safe handling:**

Avoid breathing dust.

Ensure good ventilation/exhaustion at the workplace.

Any deposit of dust which cannot be avoided must be regularly removed.

Read and understand the manufacturer's instruction and the precautionary label on the product. Refer to Lincoln Safety Publications at [www.lincolnelectric.com/safety](http://www.lincolnelectric.com/safety). See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the American Welding Society, <http://pubs.aws.org> and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, [www.gpo.gov](http://www.gpo.gov).

- **Information about protection against explosions and fires:** No special measures required.

- **Conditions for safe storage, including any incompatibilities**

- **Storage**

- **Requirements to be met by storerooms and receptacles:**

Store in closed original container in a dry place. Store away from incompatible materials. Store in accordance with local/regional/national regulations.

- **Information about storage in one common storage facility:** No special requirements.

- **Further information about storage conditions:** No special requirements.

- **Specific end use(s):** No relevant information available.

### 8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.

- **Control parameters**

- **Exposure Guidelines:**

Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) are values published by the American Conference of Government Industrial Hygienists (ACGIH). ACGIH Statement of Positions Regarding the TLVs® and BEIs® states that the TLV-TWA should be used as a guide in the control of health hazards and should not be used to indicate a fine line between safe and dangerous exposures. See Sections 2, 3, 8, 10, and 11 for information on potential fume constituents of health interest. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists.

- **Components with limit values that require monitoring at the workplace:**

These components may be present

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**7783-49-5 zinc fluoride**

PEL (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F
REL (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F
TLV (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F, BEI
EL (Canada)	Long-term value: 2.5 mg/m <sup>3</sup> as F
LMPE (Mexico)	Long-term value: 2.5 mg/m <sup>3</sup> A4, IBE; como F

**7789-23-3 potassium fluoride**

PEL (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F
REL (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F
TLV (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F, BEI
EL (Canada)	Long-term value: 2.5 mg/m <sup>3</sup> as F
LMPE (Mexico)	Long-term value: 2.5 mg/m <sup>3</sup> A4, IBE; como F

**7646-85-7 zinc chloride**

PEL (USA)	Long-term value: 1 mg/m <sup>3</sup> Fume
REL (USA)	Short-term value: 2 mg/m <sup>3</sup> Long-term value: 1 mg/m <sup>3</sup>
TLV (USA)	Short-term value: 2 mg/m <sup>3</sup> Long-term value: 1 mg/m <sup>3</sup> fume
EL (Canada)	Short-term value: 2 mg/m <sup>3</sup> Long-term value: 1 mg/m <sup>3</sup> fume
EV (Canada)	Short-term value: 2 mg/m <sup>3</sup> Long-term value: 1 mg/m <sup>3</sup> fume
LMPE (Mexico)	Short-term value: 2 mg/m <sup>3</sup> Long-term value: 1 mg/m <sup>3</sup>

**7789-24-4 lithium fluoride**

PEL (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F
REL (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F

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TLV (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F, BEI
EL (Canada)	Long-term value: 2.5 mg/m <sup>3</sup> as F
LMPE (Mexico)	Long-term value: 2.5 mg/m <sup>3</sup> A4, IBE; como F

**13775-53-6 trisodium hexafluoroaluminate**

PEL (USA)	Long-term value: 2.5 (as Fluoride) mg/m <sup>3</sup>
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**7681-49-4 sodium fluoride**

PEL (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F
REL (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F
TLV (USA)	Long-term value: 2.5 mg/m <sup>3</sup> as F, BEI
EL (Canada)	Long-term value: 2.5 mg/m <sup>3</sup> as F
LMPE (Mexico)	Long-term value: 2.5 mg/m <sup>3</sup> A4, IBE; como F

**1314-13-2 zinc oxide**

PEL (USA)	Long-term value: 15* 5** mg/m <sup>3</sup> *total dust **respirable fraction and fume
REL (USA)	Short-term value: 10** mg/m <sup>3</sup> Long-term value: 5* 5** mg/m <sup>3</sup> Ceiling limit value: 15* mg/m <sup>3</sup> *dust only **fume
TLV (USA)	Short-term value: 10* mg/m <sup>3</sup> Long-term value: 2* mg/m <sup>3</sup> *as respirable fraction
EL (Canada)	Short-term value: 10 mg/m <sup>3</sup> Long-term value: 2 mg/m <sup>3</sup>
EV (Canada)	Short-term value: 10 mg/m <sup>3</sup> Long-term value: 2 mg/m <sup>3</sup> respirable
LMPE (Mexico)	Short-term value: 10* mg/m <sup>3</sup> Long-term value: 2* mg/m <sup>3</sup> *fracción respirable

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· **Ingredients with biological limit values:**

**7783-49-5 zinc fluoride**

BEI (USA) 2 mg/L  
 Medium: urine  
 Time: prior to shift  
 Parameter: Fluoride (background, nonspecific)

3 mg/L  
 Medium: urine  
 Time: end of shift  
 Parameter: Fluoride (background, nonspecific)

**7789-23-3 potassium fluoride**

BEI (USA) 2 mg/L  
 Medium: urine  
 Time: prior to shift  
 Parameter: Fluoride (background, nonspecific)

3 mg/L  
 Medium: urine  
 Time: end of shift  
 Parameter: Fluoride (background, nonspecific)

**7789-24-4 lithium fluoride**

BEI (USA) 2 mg/L  
 Medium: urine  
 Time: prior to shift  
 Parameter: Fluoride (background, nonspecific)

3 mg/L  
 Medium: urine  
 Time: end of shift  
 Parameter: Fluoride (background, nonspecific)

**7681-49-4 sodium fluoride**

BEI (USA) 2 mg/L  
 Medium: urine  
 Time: prior to shift  
 Parameter: Fluoride (background, nonspecific)

3 mg/L  
 Medium: urine  
 Time: end of shift  
 Parameter: Fluoride (background, nonspecific)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**

· **Personal protective equipment:**

· **General protective and hygienic measures:**

The usual precautionary measures for handling chemicals should be followed.

Do not eat, drink or smoke when using the product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash

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work clothing and protective equipment to remove contaminants.

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, [www.aws.org](http://www.aws.org).

Keep away from foodstuffs, beverages and feed.

Pregnant women should strictly avoid inhalation or skin contact.

· **Engineering controls:** No relevant information available.

· **Ventilation**

Use enough ventilation, local exhaust at the the flame or heat source, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the operator to keep his head out of the fumes. Keep exposure as low as possible.

· **Breathing equipment:**

Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are below applicable exposure limits.

Particulate mask should filter at least 99% of airborne particles.

· **Protection of hands:**



Thermally-protective gloves.

Suitable gloves can be recommended by the glove supplier.

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

· **Eye protection:**



Wear glasses or face shield with appropriate shading for brazing operations.

· **Body protection:** Protective work clothing

· **Limitation and supervision of exposure into the environment** No special requirements.

· **Risk management measures** No special requirements.

### 9 Physical and chemical properties

· **Information on basic physical and chemical properties**

· **General information**

· **Appearance:**

· <b>Form:</b>	Powder
· <b>Color:</b>	Silver-colored
· <b>Odor:</b>	Nearly odorless
· <b>Odor threshold:</b>	Not determined.

· <b>pH-value:</b>	Not applicable.
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· <b>Change in condition:</b>	
<b>Melting point/Melting range:</b>	515 - 630 °C (959 - 1166 °F)
<b>Boiling point/Boiling range:</b>	Not determined.
· <b>Flash point:</b>	Not applicable.
· <b>Flammability (solid, gaseous):</b>	Not determined.
· <b>Auto-ignition temperature:</b>	Not determined.
· <b>Decomposition temperature:</b>	Not determined.
· <b>Auto igniting:</b>	Product is not self-igniting.
· <b>Danger of explosion:</b>	Product does not present an explosion hazard.
· <b>Explosion limits:</b>	
<b>Lower:</b>	Not determined.
<b>Upper:</b>	Not determined.
· <b>Vapor pressure:</b>	Not applicable.
· <b>Density:</b>	
<b>Relative density:</b>	Not determined.
<b>Bulk density at 20 °C (68 °F)</b>	1200 kg/m <sup>3</sup>
<b>Vapor density:</b>	Not applicable.
<b>Evaporation rate:</b>	Not applicable.
· <b>Solubility in / Miscibility with:</b>	
<b>Water:</b>	Partly soluble.
· <b>Partition coefficient (n-octanol/water):</b>	Not determined.
· <b>Viscosity:</b>	
<b>Dynamic:</b>	Not applicable.
<b>Kinematic:</b>	Not applicable.
· <b>Other information</b>	No relevant information available.

### 10 Stability and reactivity

- **Reactivity:** The product is non-reactive under normal conditions of use, storage and transport.
- **Chemical stability:** Stable under normal temperatures and pressures.
- **Thermal decomposition / conditions to be avoided:**  
No decomposition if used and stored according to specifications.
- **Possibility of hazardous reactions:**  
Reacts with strong acids and alkali.  
Reacts with strong oxidizing agents.  
As the product is supplied it is not capable of dust explosion; however enrichment with fine dust causes risk of dust explosion.
- **Conditions to avoid:** No relevant information available.
- **Incompatible materials:** No relevant information available.

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· **Hazardous decomposition products:**

Brazing fumes and gases cannot be classified simply. The composition and products: quantity of both are dependent upon the metal being joined, the process, procedure and filler metals and flux 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 joined (such as paint, plating, or galvanizing), the number of operators and the volume of the worker area, the quality and amount of ventilation, the position of the operator's head with respect to the fume and fumes from chemical fluxes used in some brazing operations.

### 11 Toxicological information

· **Information on likely routes of exposure**

· **Ingestion:** Unlikely route of exposure.

· **Inhalation:**

Potential chronic health hazards related to the use of welding consumables are most applicable to the inhalation route of exposure.

· **Skin Contact:** Heat rays can burn skin.

· **Eye Contact:** Heat rays (infrared radiation from flame) or hot metal can injure eyes.

· **Information on toxicological effects**

· **Inhalation**

Short-term (acute) overexposure to brazing 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 brazing fumes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects.

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

**7447-41-8 lithium chloride**

Oral	LD50	526 mg/kg (rat)
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**7789-23-3 potassium fluoride**

Oral	LD50	245 mg/kg (rat)
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**7646-85-7 zinc chloride**

Oral	LD50	350 mg/kg (rat)
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**7681-49-4 sodium fluoride**

Oral	LD50	52 mg/kg (rat)
------	------	----------------

**1314-13-2 zinc oxide**

Oral	LD50	> 5000 mg/kg (rat)
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· **Primary irritant effect:**

· **on the skin:** Irritant to skin and mucous membranes.

· **on the eye:** Strong irritant with the danger of severe eye injury.

· **Sensitization:** No sensitizing effects known.

· **Additional toxicological information:**

Organic polymers may be used in the manufacture of various welding consumables. Overexposure to their decomposition byproducts may result in a condition known as polymer fume fever. Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually not lasting

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longer than 48 hours.

- **Carcinogenic categories**

- **IARC (International Agency for Research on Cancer)**

None of the ingredients are listed.

- **NTP (National Toxicology Program):**

None of the ingredients are listed.

- **OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

- **Other information relevant to carcinogenicity**

Cancerous lesions have been reported in persons exposed to arc rays.

- **Acute effects (acute toxicity, irritation and corrosivity):**

Harmful if swallowed.

Causes serious eye damage.

Irritating to skin.

- **Repeated dose toxicity:** Danger of very serious irreversible effects.

- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**

Lact.

- **Germ cell mutagenicity:** Based on available data, the classification criteria are not met.

- **Carcinogenicity:** Based on available data, the classification criteria are not met.

- **Reproductive toxicity:** May cause harm to breast-fed children.

- **STOT-single exposure:** Based on available data, the classification criteria are not met.

- **STOT-repeated exposure:**

Causes damage to the respiratory system through prolonged or repeated exposure. Route of exposure: Inhalation.

- **Aspiration hazard:** Based on available data, the classification criteria are not met.

### 12 Ecological information

- **Persistence and degradability:** No relevant information available.

- **Behavior in environmental systems**

- **Bioaccumulative potential:** No relevant information available.

- **Mobility in soil:** No relevant information available.

- **Additional ecological information**

- **General notes:**

Negative ecological effects are, according to the current state of knowledge, not expected.

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- **Results of PBT and vPvB assessment**

- **PBT:** Not applicable.

- **vPvB:** Not applicable.

- **Other adverse effects:** No relevant information available.

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## 13 Disposal considerations

- **Waste treatment methods**

- **Recommendation:**

The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes.

- **Uncleaned packagings**

- **Recommendation:** Disposal in accordance with official regulations.

## 14 Transport information

- **UN-Number**

- **DOT, ADR, IMDG, IATA** Not Regulated.

- **UN proper shipping name**

- **DOT, ADR, IMDG, IATA** Not Regulated.

- **Transport hazard class(es)**

- **DOT, ADR, ADN, IMDG, IATA**

- **Class** Not Regulated.

- **Packing group**

- **DOT, ADR, IMDG, IATA** Not Regulated.

- **Environmental hazards**

- **Marine pollutant:** No

- **Special precautions for user**

Not applicable.

- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**

Not applicable.

- **UN "Model Regulation"**

Not Regulated.

## 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**

- **US Federal Regulations**

None of the ingredients are listed.

- **SARA**

- **Section 302 (extremely hazardous substances):**

None of the ingredients are listed.

- **Section 304 (emergency release notification):**

None of the ingredients are listed.

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· **Sections 311/312 (hazardous chemical threshold planning quantity in pounds):**

None of the ingredients are listed.

· **Section 313 (TRI reporting)**

7783-49-5 zinc fluoride

7646-85-7 zinc chloride

· **Section 355 (extremely hazardous substances):**

None of the ingredients are listed.

· **CERCLA Hazardous Substance List (40 CFR 302.4):**

7783-49-5 zinc fluoride

7646-85-7 zinc chloride

· **TSCA (Toxic Substances Control Act)**

All ingredients are listed.

· **Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)**

None present or none present in regulated quantities.

· **Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):**

None present or none present in regulated quantities.

· **Proposition 65 (California)**

· **Chemicals known to cause cancer:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients are listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients are listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency):**

7783-49-5 zinc fluoride D, I, II

7646-85-7 zinc chloride D, I, II

1314-13-2 zinc oxide D, I, II

· **TLV (Threshold Limit Value established by ACGIH):**

7783-49-5 zinc fluoride A4

7789-23-3 potassium fluoride A4

7789-24-4 lithium fluoride A4

7681-49-4 sodium fluoride A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health):**

None of the ingredients are listed.

· **State Right to Know Listings**

· **US. New Jersey Worker and Community Right-to-Know Act**

zinc fluoride

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## Safety Data Sheet

acc. to OSHA GHS (29 CFR 1910.1200)

Printing date 09/09/2015

Reviewed on 09/09/2015

**Trade name: Albraze™EC Aluminum Brazing Flux (Flux component in Albraze™1070 kits)**

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potassium fluoride

sodium fluoride

zinc oxide

zinc chloride

· **US. Massachusetts RTK - Substance List**

zinc fluoride

potassium fluoride

sodium fluoride

zinc oxide

zinc chloride

· **US. Pennsylvania RTK - Hazardous Substances**

zinc fluoride

potassium fluoride

sodium fluoride

zinc oxide

zinc chloride

· **US. Rhode Island RTK**

zinc fluoride

potassium fluoride

sodium fluoride

zinc oxide

zinc chloride

· **Canada**

· **Canadian substance listings**

· **Canadian Domestic Substances List (DSL):**

All ingredients are listed.

· **Canada Non-Domestic Substances List (NDSL)**

None of the ingredients are listed.

· **Canadian Ingredient Disclosure list (limit 0.1%):**

None of the ingredients are listed.

· **Canadian Ingredient Disclosure list (limit 1%):**

7783-49-5 | zinc fluoride

7646-85-7 | zinc chloride

7789-24-4 | lithium fluoride

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### 16 Other information

· **Date of preparation / last revision** 09/09/2015 / -

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## Safety Data Sheet

**acc. to OSHA GHS (29 CFR 1910.1200)**

Printing date 09/09/2015

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**Trade name: Albraze™ EC Aluminum Brazing Flux (Flux component in Albraze™ 1070 kits)**

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· **Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)  
 IMDG: International Maritime Code for Dangerous Goods  
 DOT: US Department of Transportation  
 IATA: International Air Transport Association  
 ACGIH: American Conference of Governmental Industrial Hygienists  
 EINECS: European Inventory of Existing Commercial Chemical Substances  
 ELINCS: European List of Notified Chemical Substances  
 CAS: Chemical Abstracts Service (division of the American Chemical Society)  
 DNEL: Derived No-Effect Level (REACH)  
 PNEC: Predicted No-Effect Concentration (REACH)  
 LC50: Lethal concentration, 50 percent  
 LD50: Lethal dose, 50 percent  
 PBT: Persistent, Bioaccumulative and Toxic  
 vPvB: very Persistent and very Bioaccumulative  
 Acute Tox. 4: Acute toxicity, Hazard Category 4  
 Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2  
 Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1  
 Lact.: Reproductive toxicity, Additional category, Effects on or via lactation  
 STOT RE 1: Specific target organ toxicity - Repeated exposure, Hazard Category 1

· **Sources**

Website, European Chemicals Agency ([http://http://echa.europa.eu/](http://echa.europa.eu/))  
 Website, US EPA Substance Registry Services ([http://http://ofmpub.epa.gov/sorinternet/registry/substreg/home/overview/home.do](http://ofmpub.epa.gov/sorinternet/registry/substreg/home/overview/home.do))  
 Website, Chemical Abstracts Registry, American Chemical Society (<https://www.cas.org>)  
 Patty's Industrial Hygiene, 6th ed., Rose, Vernon, ed. ISBN: 978-0-470-07488-6  
 Casarett and Doull's Toxicology: The Basic Science of Poisons, 8th Ed., Klaassen, Curtis D., ed., ISBN: 978-0-07-176923-5.  
 Safety Data Sheets, Individual Manufacturers  
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· **Disclaimer:**

We urge each end user and recipient of this SDS to study it carefully. If necessary consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product.

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