

Safety Data Sheet

1. Supplier and product

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Product: MAGNESIUM ALLOYS AZ31, AZ61, AZ80, AZ91, AZ92, WE43, ZE41 and ZK60

Form: Rod, Wire, Plate, Sheet, Bar

Product size: Variable

Product Use(s): Alloys for welding and other metallurgical processes.

2. Hazards identification

Classification(s)

GHS Classified: STOT SE 3 (H336, H335), STOT SE 3 (H372), Aquatic Acute 1 (H400)

GHS Label Symbol(s): Health, Exclamation, Environment



GHS Label Signal Word(s): Danger

GHS Label Hazard Statement(s): May cause respiratory irritation. May cause drowsiness or dizziness. Causes damage to organs through prolonged or repeated exposure. Very toxic to aquatic life.

GHS Precautionary statements: Do not breathe dust/fume/gas/mist/vapors/spray. Avoid breathing dust/fume/gas/mist/vapor/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. Get medical advice and attention if you feel unwell.

Collect spillage. Store in a well-ventilated place; Keep container tightly closed. Store locked up. Dispose of contents/container in accordance with local/ regional/ national/ international regulations.

Label Precautionary Statement(s):

WARNING: PROTECT yourself and others. Read and understand this information.

FUMES AND GASES can be hazardous to your health.

ARC RAYS can injure your eyes and burn skin.

- Before Use, read and understand the manufacturer's instructions. Safety Data Sheets (SDS), and your employer's safety policies.
- Keep your head out of the fumes.
- Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area.
- Wear correct eye, ear, and body protection.
- Do not touch live electrical parts.

Other Hazards: This product as shipped in 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, 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 (component) 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.

3. Composition/information on ingredients

Ingredient	CAS Number	% wt.	GHS note
Aluminum	7429-90-5	5-10	
Magnesium	7439-95-4	>87	
Manganese	7439-96-5	0-0.5	
Silicon	7440-21-3	0-0.05	
Zinc	7440-66-6	0-2.5	

Note: The percentage by weight values for the ingredients in this product represent approximate formulation values.

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 and this SDS 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: 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: 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 unless directed by medical personnel. Rinse mouth with water if conscious. Call a physician or poison control center immediately.

Note to Physician: Treat symptoms and eliminate overexposure.

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. Beryllium: may cause irritation and cancer. 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/SDS at hand.

5 Fire-fighting measures

Products as shipped are non-hazardous, nonflammable, non-explosive, and nonreactive.

Extinguishing Media

Suitable Extinguishing Media: Use fire-extinguishing agents appropriate for surrounding materials.

Unsuitable Extinguishing Media: Do not use water on molten metal.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not considered flammable. Will burn at high temperatures. (Welding arcs and sparks can ignite combustible and flammable materials.)

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

Reactivity: None under normal conditions. Metallic dusts may ignite or explode.

Advice for Firefighters

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

Firefighting Instructions: 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: Use proper protective equipment, including respiratory protection. Hazardous Combustion Products: Metal oxides. Aluminum (component) can react with many alcohols or sodium hydroxide and produce flammable hydrogen gas. Finely divided forms (dust) of product may be reactive and combustible.

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 response and 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.

7 Handling and storage

Precautions for Safe Handling

Use proper ventilation and respiration apparatus; eye, hand, and body protection as necessary.

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 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 oxidizers. Halogens. Mineral Acids. Halogens.

8 Exposure controls/personal protection

Ingredients – Exposure Limits

Ingredient	CAS #	ACGIH TLV (mg/m3)	OSHA PEL (mg/m3)	Carc.
Aluminum	7429-90-5	1 (resp)	15 (total dust), 5 (resp)	A4
Magnesium	7439-95-4	10	15	
Manganese	7439-96-5	0.02 (resp)	5 (fume ceiling)	
Silicon	7440-21-3	10 (total dust)	15 (total dust), 5 (resp)	
Zinc (as oxide)	7440-66-6	2 (fume)	15 (total dust), 5 (resp)	

Exposure controls:

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity. 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. Dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product should contain explosion relief vents, 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.

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/flammable resistant/retardant clothing appropriate for task.

Respiratory Protection: Wear approved respiratory apparatus appropriate for task.

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.

9. Physical and chemical properties

Physical state: Solid	Appearance: silver-metallic rod/wire
Odor: None	Odor threshold: n/a
PH: n/a	Evaporation rate: n/a
Melting point: 600 C (1112 F)	Freezing point: n/a
Boiling point (@ 24 mm Hg): n/a	Flash point: n/a
Auto-ignition temperature: n/a	Decomposition temperature: n/a
Flammability (solid, gas): n/a	Lower flammable limit: n/a
Upper flammable limit: n/a	Vapor pressure (mm Hg @ 1284C): n/a
Relative vapor density at 20C: n/a	Relative density (flux-cored rod): n/a
Specific gravity @ 20C (water = 1): n/a	Solubility in water: Insoluble
Partition coefficient (N-octanol/water): n/a	Viscosity: n/a
Explosion - sensitivity to mechanical impact: not expected to present an explosion hazard due to mechanical impact	Explosion - sensitivity to static discharge: not expected to present an explosion hazard due to static discharge

10. Stability and reactivity

Products as shipped are non-hazardous, nonflammable, non-explosive, and nonreactive.

Reactivity: None under normal conditions. If dust are formed: Metallic dusts may ignite or explode.

Chemical Stability: Stable under normal conditions.

Possibility of Hazardous Reactions: Will not occur.

Conditions to Avoid: Incompatible materials. Uncontrolled exposure to extreme temperatures.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers. Halogens. Nitrogen oxides. Nitrogen dioxide. Hydrogen peroxide. Alcohols. Halogenated hydrocarbons.

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. (From flux: fluorides).

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
Page 5 of 7 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. Fumes, inhaled, 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).

Information on Toxicological Effects - Ingredient(s)

Silicon	LD50 oral rat 3160 mg/kg
Manganese	LD50 oral rat > 2000 mg/kg g/m ³ ; BRN, central nervous system effects TCLo (inhalation human) = 2300 US EPA-D (Not classifiable as to human carcinogenicity)
Zinc	TCLo (inhalation human) = 124 mg/m ³ /50 mins.; pulmonary system effects, skin Skin irritancy (human) = 300 mg/3 days/intermittent; mild US EPA-D (Not classifiable as to human carcinogenicity)
Welding fumes	IARC Group 2B; OSHA Hazard Communication Carcinogen listed

12. Ecological information

Toxicity: Very toxic to aquatic life.

Manganese	NOEC chronic fish: 3.6 mg/L (96h - Oncorhynchus mykiss)
Zinc	LC50 Fish 1: 2.16 - 3.05 mg/L (96h - Pimephales promelas) EC50 Daphnia 1: 0.139 - 0.908 mg/L (48h - Daphnia magna) EC50 other aquatic organisms 1: 0.11 - 0.271 mg/L (96h - Pseudokirchneriella subcapitata) LC50 Fish 2: 0.211 - 0.269 mg/L (96h - Pimephales promelas) EC50 other aquatic organisms 2: 0.09 - 0.125 mg/L (72h - Pseudokirchneriella subcapitata)

Persistence and Degradability: Copper: Not readily biodegradable.

Environmental Stability: Components of product will react with water and air to form a variety of metal oxides.

Bioaccumulative: Potential Not available

Mobility in Soil: Not available

Other Adverse Effects: Not available

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.

EPA Waste Number: D007 Chromium (5.0 mg/L regulated level)

14. Transport information

Transport is not regulated in accordance with: USDOT, TDG (Canada), IATA, or IMDG.

15. Regulatory information

	US Federal Regulations	Canadian
Aluminum	Listed on the United States TSCA (Toxic Substances Control Act) inventory; Listed on United States SARA Section 313 SARA Section 311/312 Hazard Classes: Fire hazard Reactive hazard SARA Section 313 - Emission Reporting: 1.0% (dust or fume only)	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
Silicon	Listed on the United States TSCA (Toxic Substances Control Act) inventory	Listed on the Canadian DSL (Domestic Substances List) WHMIS Classification: Uncontrolled product according to WHMIS classification criteria
Magnesium	Listed on the United States TSCA (Toxic Substances Control Act) inventory	Listed on the Canadian DSL (Domestic Substances List) WHMIS Classification: Class B Division 4 - Flammable Solid; Class B Division 6 - Reactive Flammable Material
Manganese	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%	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

State Regulatory Information:

Some components are listed in some US states.

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

WARNING: This product may contain chemicals, and when used for welding or brazing may produce fumes or gases containing chemicals known to the state of California to cause cancer, and/or birth defects (or other reproductive harm).

Proposition 65 (California):

- Chemicals known to cause reproductive toxicity for females: none
- Chemicals known to cause reproductive toxicity for males: none
- Chemicals known to cause developmental toxicity: none

16. Other information including information on preparation and revision of the SDS

NFPA Health Hazard: 1 - Exposure could cause irritation but only minor residual injury even if no treatment 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: 2 Moderate Hazard - Temporary or minor injury may occur Flammability: 0 Minimal Hazard Physical: 0 Minimal Hazard
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