

Safety Data Sheet

Section 1: Identification

Product Identifier

AZ61A / AZ92A Magnesium Welding Filler Metal

Product Classifications

- **AWS A5.19:** R-AZ61A / R-AZ92A
- **AZ61A:** Magnesium alloy welding electrode/rod
- **AZ92A:** Magnesium alloy welding electrode/rod

Recommended Use

Welding and metalworking processes, including GTAW/TIG and other suitable welding processes using magnesium alloy filler metal.

Restrictions on Use

Use only for intended welding/metalworking applications. Avoid generation and inhalation of welding fumes, dust, chips, turnings, and grinding debris.

Manufacturer

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Section 2: Hazard(s) Identification

GHS Classification

For this welding/metalworking product, the hazard classification addresses hazards associated with handling and, particularly, processing/welding-generated fumes and

particulates. Comparable current magnesium AZ61A/AZ92A welding-filler SDSs classify the products as STOT SE 3, STOT RE 1, and Aquatic Acute 1 with a **Danger** signal word.

- **Specific Target Organ Toxicity — Single Exposure, Category 3**
 - H335 — May cause respiratory irritation.
 - H336 — May cause drowsiness or dizziness.
- **Specific Target Organ Toxicity — Repeated Exposure, Category 1**
 - H372 — Causes damage to organs through prolonged or repeated exposure.
- **Hazardous to the Aquatic Environment — Acute Category 1**
 - H400 — Very toxic to aquatic life.

GHS Hazard Pictograms



OSHA permits GHS pictograms to be represented by graphical reproductions or by the corresponding symbol name in an SDS.

Signal Word

DANGER

Precautionary Statements

P202 — Do not handle until all safety precautions have been read and understood.

P260 — Do not breathe dust/fume/gas/mist/vapors/spray.

P261 — Avoid breathing dust/fume/gas/mist/vapors/spray.

P264 — Wash thoroughly after handling.

P270 — Do not eat, drink or smoke when using this product.

P271 — Use only outdoors or in a well-ventilated area.

P273 — Avoid release to the environment.

P280 — Wear protective gloves/protective clothing/eye protection/face protection.

P304 + P340 — IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312 — Call a POISON CENTER/doctor if you feel unwell.

P314 — Get medical advice/attention if you feel unwell.

P391 — Collect spillage.

P403 + P233 — Store in a well-ventilated place. Keep container tightly closed.

P405 — Store locked up.

P501 — Dispose of contents/container in accordance with local, regional, national and international regulations.

Other Hazards Not Otherwise Classified

- Electric shock from welding equipment can cause serious injury or death.
- Welding arcs can cause severe eye injury and skin burns.
- Hot metal and sparks can ignite combustible materials.
- Welding fumes and gases may be hazardous when inhaled.
- Grinding, machining, cutting, or other operations that generate magnesium-containing dust, fines, chips, or turnings may create substantially greater fire/reactivity hazards than the solid filler metal.
- Finely divided magnesium-containing material may react with water and generate flammable hydrogen gas. Comparable magnesium alloy SDS information identifies increased reactivity in dust, fines and chips.

Section 3: Composition/Information On Ingredients

The two classifications are listed separately because their alloy chemistry differs. AWS A5.19 covers bare magnesium alloy welding electrodes and rods and classifies them according to chemical composition.

3.1 AZ61A — AWS A5.19 R-AZ61A

Chemical Component CAS Number Approximate Weight %

Magnesium (Mg)	7439-95-4	Balance
Aluminum (Al)	7429-90-5	5.8–7.2%
Zinc (Zn)	7440-66-6	0.40–1.50%
Manganese (Mn)	7439-96-5	0.15–0.50%
Beryllium (Be)	7440-41-7	0.0002–0.0008%
Copper (Cu)	7440-50-8	≤0.05%
Iron (Fe)	7439-89-6	≤0.005%
Nickel (Ni)	7440-02-0	≤0.005%
Silicon (Si)	7440-21-3	≤0.05%
Other elements	—	≤0.30%

3.2 AZ92A — AWS A5.19 R-AZ92A

Chemical Component CAS Number Approximate Weight %

Magnesium (Mg)	7439-95-4	Balance
Aluminum (Al)	7429-90-5	8.3–9.7%
Zinc (Zn)	7440-66-6	1.70–2.30%
Manganese (Mn)	7439-96-5	0.15–0.50%
Beryllium (Be)	7440-41-7	0.0002–0.0008%
Copper (Cu)	7440-50-8	≤0.05%
Iron (Fe)	7439-89-6	≤0.005%
Nickel (Ni)	7440-02-0	≤0.005%
Silicon (Si)	7440-21-3	≤0.05%

Chemical Component CAS Number Approximate Weight %

Other elements — ≤0.30%

Section 4: First-Aid Measures

Inhalation

Move person to fresh air. Keep comfortable for breathing. If breathing is difficult, obtain medical attention immediately. If symptoms persist or the person feels unwell, contact a physician or Poison Control Center.

Skin Contact

For normal solid-product contact, wash thoroughly with soap and water. For contact with hot/molten metal, immediately cool the affected area with clean water and obtain medical attention for burns. Do not remove adhered molten material from the skin.

Eye Contact

Immediately flush eyes with clean, lukewarm water for at least 15 minutes. Do not rub eyes. Obtain medical attention for persistent irritation or thermal injury.

Ingestion

Not an expected route of exposure for intact filler metal. Rinse mouth. Do not induce vomiting unless directed by medical personnel or Poison Control. Seek medical attention if symptoms occur.

Most Important Symptoms

Possible symptoms from welding fumes include respiratory irritation, coughing, headache, dizziness, nausea, metallic taste, fever/chills and flu-like symptoms. Repeated excessive exposure to certain metal fumes may produce serious chronic effects.

Medical Attention

Treat symptomatically. Medical personnel should be informed that exposure may involve welding fumes containing magnesium, aluminum, manganese, zinc and trace alloy constituents.

Section 5: Fire-Fighting Measures

Suitable Extinguishing Media

For burning magnesium, use a **Class D extinguishing agent specifically approved for magnesium fires**, such as an appropriate dry powder agent.

For surrounding fires, use extinguishing media appropriate to the surrounding combustible materials.

Unsuitable Extinguishing Media

Do not apply water directly to burning magnesium, magnesium fines, chips, or molten material.

Water can react with finely divided or molten magnesium and generate hydrogen gas and heat, potentially creating an explosion hazard.

Do not use inappropriate halogenated agents on burning magnesium fines.

Specific Hazards

Solid filler metal is substantially less reactive than finely divided material. Grinding, machining or other processes producing dust, powder, chips or turnings can increase fire and reaction hazards.

Hazardous Combustion Products

Metal oxides and other decomposition products may be generated. Welding may also produce carbon monoxide, carbon dioxide, ozone and nitrogen oxides depending on the welding process and base material.

Firefighter Protection

Wear full protective equipment and positive-pressure respiratory protection appropriate for the fire conditions.

Section 6: Accidental Release Measures

Personal Precautions

Avoid breathing dust or fumes. Keep unnecessary personnel away. Use appropriate PPE.

Environmental Precautions

Prevent material from entering drains, sewers, soil or waterways.

Cleanup

For solid filler metal, collect mechanically and place in a suitable container.

Avoid creating airborne dust. Do not use methods that disperse fine magnesium-containing particles into the air.

For machining/grinding fines, use appropriate equipment designed for combustible metal dust and follow the facility's combustible-dust procedures.

Do not mix magnesium-containing fines with incompatible materials.

Section 7: Handling And Storage

Handling

- Keep head out of welding-fume plume.
- Provide local exhaust ventilation at the welding arc.
- Avoid breathing welding fumes and dust.
- Wash thoroughly after handling.
- Do not eat, drink or smoke while using the product.
- Wear appropriate welding PPE.
- Keep filler metal dry.
- Prevent accumulation of grinding dust, chips and turnings.
- Use appropriate combustible-metal controls when machining or grinding.

Storage

Store in the original container in a **clean, dry, well-ventilated area**.

Protect from moisture and high humidity.

Keep away from:

- Strong acids
- Strong bases/alkalis

- Strong oxidizers
- Halogens
- Water when dealing with finely divided material
- Other incompatible materials

Comparable magnesium welding-filler SDS information identifies moisture, acids, alkalis and finely divided material as important reactivity considerations.

Section 8: Exposure Controls/Personal Protection

Exposure Limits

Exposure limits apply primarily to airborne dusts, fumes and decomposition products rather than the intact solid filler rod/wire.

Substance	CAS	OSHA PEL / Limit
Aluminum	7429-90-5	15 mg/m ³ total dust; 5 mg/m ³ respirable fraction
Magnesium oxide/fume	7439-95-4	15 mg/m ³ total particulate as oxide fume
Manganese	7439-96-5	5 mg/m ³ ceiling for fume
Zinc oxide	7440-66-6	5 mg/m ³ fume
Copper	7440-50-8	0.1 mg/m ³ fume; 1 mg/m ³ dust/mist
Nickel	7440-02-0	1 mg/m ³ metal/insoluble compounds
Beryllium	7440-41-7	0.2 µg/m³ 8-hr TWA; 2.0 µg/m³ 15-min STEL

The current OSHA beryllium standard establishes a 0.2 µg/m³ 8-hour TWA PEL and 2.0 µg/m³ 15-minute STEL.

Engineering Controls

Use local exhaust ventilation at the welding arc or point of fume generation.

Ventilation should maintain worker exposure below applicable occupational exposure limits.

Confined spaces require special ventilation and atmospheric controls.

Where combustible metal dust can be generated, dust-control and collection systems should be designed for the hazards of combustible metal dust.

Respiratory Protection

Keep the worker's head out of the fume plume.

Where engineering controls do not maintain exposures below applicable limits, use a NIOSH-approved respirator selected under a written respiratory protection program compliant with 29 CFR 1910.134.

Eye/Face Protection

Use an approved welding helmet or face shield with the appropriate filter shade. Use safety glasses with side protection as appropriate.

Skin Protection

Wear welding gloves and protective clothing suitable for heat, sparks, molten metal and ultraviolet radiation.

Hygiene

Wash hands and exposed skin thoroughly after handling and before eating, drinking or smoking.

Section 9: Physical And Chemical Properties

Property	Information
Physical State	Solid
Form	Wire/rod
Appearance	Silver/metallic
Odor	None
Odor Threshold	No data available
pH	Not applicable

Property	Information
Melting Point	Approximately 600°C / 1,112°F
Initial Boiling Point	Not applicable
Flash Point	Not applicable
Evaporation Rate	Not applicable
Flammability	Intact product not expected to readily burn; fines/dust may present combustible-metal hazards
Vapor Pressure	Not applicable
Vapor Density	Not applicable
Solubility in Water	Insoluble
Relative Density	Varies with alloy/product form
Partition Coefficient	Not applicable
Auto-Ignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	Not applicable

Comparable magnesium welding rods are described as silver-metallic solids with no odor and a melting point around 600°C.

Section 10: Stability And Reactivity

Reactivity

Stable under normal storage and handling conditions. Finely divided metal dust may be significantly more reactive.

Chemical Stability

Stable under normal conditions.

Possibility of Hazardous Reactions

Finely divided magnesium-containing material may react with water and generate hydrogen and heat. Acids and strong alkalis may also generate hydrogen gas.

Conditions to Avoid

- Excessive heat
- Ignition sources
- Moisture when fines/dust are present
- Accumulation of combustible dust
- Incompatible chemicals

Incompatible Materials

- Strong acids
- Strong bases/alkalis
- Strong oxidizers
- Halogens
- Certain halogenated hydrocarbons
- Water with finely divided or molten material

Hazardous Decomposition Products

Welding may produce complex oxides of magnesium, aluminum, manganese, silicon, copper and other alloy constituents, as well as carbon monoxide, carbon dioxide, ozone and nitrogen oxides. Actual fume composition depends on the welding process, base metal, coatings, ventilation and other conditions.

Section 11: Toxicological Information

Likely Routes of Exposure

- Inhalation

- Eye contact
- Skin contact
- Ingestion of deposited dust/particulate

Acute Effects

Welding fumes may cause:

- Respiratory irritation
- Coughing
- Headache
- Dizziness
- Nausea
- Metal-fume-fever-like symptoms
- Eye and upper respiratory irritation

Chronic Effects

Repeated or excessive exposure to welding fumes and constituent metals may cause respiratory and/or systemic effects. Manganese exposure is of particular concern because excessive chronic exposure can affect the central nervous system.

Sensitization

Trace alloy constituents such as nickel and beryllium may present sensitization hazards.

Carcinogenicity

Beryllium is recognized by IARC as carcinogenic to humans. Nickel compounds/metals have also been evaluated by IARC. The presence of these constituents in the alloy is at the low concentrations specified by the applicable filler-metal classification, but welding fumes may concentrate or transform constituents during use.

Specific Target Organ Toxicity — Single Exposure

May cause respiratory irritation and may cause drowsiness or dizziness.

Specific Target Organ Toxicity — Repeated Exposure

Causes damage to organs through prolonged or repeated exposure.

Aspiration Hazard

Not expected to be an aspiration hazard in the solid filler-metal form.

Section 12: Ecological Information

Ecotoxicity

The product contains metals, including zinc and copper, that may be harmful to aquatic organisms. The comparable magnesium-alloy SDS classification identifies the product as **Aquatic Acute 1, H400 — Very toxic to aquatic life.**

Persistence and Degradability

Not applicable to inorganic metallic constituents. No product-specific biodegradation data available.

Bioaccumulative Potential

No product-specific data available.

Mobility in Soil

No product-specific data available.

Other Adverse Effects

Avoid uncontrolled release to the environment.

Section 13: Disposal Considerations

Collect unused filler metal for recycling whenever practical.

Metal-containing waste should be handled in accordance with applicable federal, state and local regulations.

Do not discharge metal dust, chips, turnings or residues to drains or waterways.

Combustible magnesium-containing fines should be managed according to applicable combustible-metal waste procedures.

Section 14: Transport Information

U.S. DOT

Not regulated as a dangerous good when shipped as intact welding filler metal in normal solid form, subject to the actual quantity, packaging, physical condition and shipping configuration.

UN Number

Not applicable.

UN Proper Shipping Name

Not applicable.

Transport Hazard Class

Not applicable.

Packing Group

Not applicable.

Marine Pollutant

Not determined/not applicable for the intact product.

Special Precautions

Prevent damage to packaging and prevent contamination with water or incompatible materials, particularly where metal fines or dust are present.

Comparable magnesium welding-rod SDS information identifies intact product as not regulated as a dangerous good under common transport regulations.

Section 15: Regulatory Information

OSHA

This SDS is prepared in the 16-section format required by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. OSHA requires Sections 1–11 and 16 and specifies Sections 12–15 in the standardized sequence.

OSHA Beryllium Standard

Because the alloy specifications contain trace beryllium, applicable requirements of **29 CFR 1910.1024** should be evaluated when workers may be exposed to airborne beryllium during welding, grinding, machining or other operations. The OSHA PEL is $0.2 \mu\text{g}/\text{m}^3$ as an 8-hour TWA and the STEL is $2.0 \mu\text{g}/\text{m}^3$ over 15 minutes.

TSCA

Components are subject to applicable requirements of the Toxic Substances Control Act.

SARA 313

Certain metallic constituents may be subject to SARA Section 313 reporting requirements depending on concentration, form and applicable regulatory thresholds.

State Regulations

Certain constituents, including beryllium and nickel, may be subject to state Right-to-Know and other state-specific requirements.

California Proposition 65

Beryllium and nickel are among constituents that may trigger California Proposition 65 requirements when applicable. Product-specific labeling should be reviewed before distribution into California.

Section 16: Other Information

SDS Preparation Date

September 25, 2026