

# Material Safety Data Sheet - MSDS

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product name:**



**Application:**

*Aluminium welding and brazing materials*

**Supplier:**

*Alumat d.o.o.  
Partizanska 38  
Slovenska Bistrica  
Slovenija*

## 2. PRODUCT TRADE NAME / PRODUCT CLASSIFICATION(S):

ER1070 (AI1070)

ER4043 (AI4043), ER4047 (AI4047)

ER5356 (AI5356), ER5554 (AI5554), ER5556 (AI5556), ER5183 (AI5183), ER5087 (AI5087)

## 3. HAZARDS IDENTIFICATION

HMIS Ratings: Health: 1 Fire: 1 Physical Hazard: 1

**Physical and Chemical Hazards:** Improper use of the product or inadequate preparation of the conductors, moulds or surroundings can result in aggressive reactions. Self-propagating high temperature reaction will occur if heated above ignition temperature. Generates molten metal in excess of 1370°C, slag and dense, dusty smoke.

**Human health:** Burns from contact with reaction or reaction products are possible. Inhalation of powder or fumes may cause metal fume fever.  
Exposure to reaction by-products: See section 8.

**Environment:** Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

## 4. COMPOSITION/INFORMATION ON INGREDIENTS

| Name                       | CAS #     | % by weight | UN number      |
|----------------------------|-----------|-------------|----------------|
| Aluminum                   | 7429-90-5 | 87 - 98     | UN1309         |
| Silicium Powder, Amorphous | 7440-21-3 | 4 - 13      | UN1346         |
| Copper Metal Powder        | 7440-50-8 | 0.1 - 6     | Not regulated. |
| Magnesium Metal Powder     | 7439-95-4 | 0.1 - 5     | UN2950         |
| Manganese                  | 7439-96-5 | <1.5        | Not regulated. |
| Chromium, Metal            | 7440-47-3 | <0.5        | Not regulated. |

**The fumes emitted by the electrodes, in use, are hazardous. This MSDS is written for workers using these electrodes.**

*See Section 8 for Exposure Limits of the oxides found in the welding fumes.*

## 5. FIRST-AID MEASURES

Molten product will cause skin burns and if in contact with eyes while in a molten state may cause serious damage. Burns (in contact with molten metal, slag or hot equipment): Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.

**Inhalation:** Inhalation of welding fumes: / Dust inhalation: Move into fresh air and keep at rest. In case of persistent throat irritation or coughing: Seek medical attention and take along these instructions.

**Skin contact:** Remove contaminated clothes and rinse skin thoroughly with water. If material is hot, treat for thermal burns and get immediate medical attention.

**Eye contact:** Dust in the eyes: Do not rub eye. Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyelids widely. If irritation persists: Seek medical attention and bring these instructions

# Material Safety Data Sheet - MSDS

**Ingestion:** Immediately rinse mouth and drink plenty of water. Keep person under observation. If person becomes uncomfortable seek hospital and bring these instructions.

## 6. FIRE-FIGHTING MEASURES

**Extinguishing media:** Extinguish with dry sand and/or flood with large amounts of water. Use fire-extinguishing media appropriate for surrounding materials. Extinguishing media which are not suitable: Hand water buckets or hand storage pumps. Molten metal contact with water can cause small pockets of superheated steam.

**Specific hazards:** During fire, health hazardous gases may be formed. Ignition temperature: > 950 °C  
Ignition of large quantities of exothermic materials may result in large volumes of dense smoke.

**Protective equipment for fire-fighters:** Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace

## 7. ACCIDENTAL RELEASE MEASURES

**Personal precautions** Follow precautions for safe handling described in this safety data sheet. Avoid inhalation of  
Dust. Do not breathe fumes. Avoid contact with skin and eyes. For personal protection, see  
Section 8.

**Environmental precautions:** Precaution should be taken to prevent hot material and reaction byproducts from contact with  
Combustible materials in surrounding areas. Avoid spreading dust or contaminated materials.  
Avoid discharge to the aquatic environment. Contact local authorities in case of spillage to  
drain/aquatic environment

**Methods for cleaning up:** Sweep up spilled substance and remove to safe place. For waste disposal, see section 13

## 8. HANDLING AND STORAGE

**Handling :** Avoid breathing dusts, vapors or fumes from burning materials. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Do not ingest.  
Keep container closed. Wash thoroughly after handling.

**Storage :** unopened containers should be kept in a relatively dry storage area at temperatures between 15°C (60°F) and 30°C (80°F) and 50% maximum relative humidity.

## 9. Exposure Controls, Personal Protection

**Engineering controls:** Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Eyes :** Safety glasses with side shields. Face shield with radiation shielding. Body : Full suit. (Fire resistant.)

**Respiratory :** Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear a canister breathing apparatus (respirator) or a supplied-air respirator, when required, to weld in a confined space or when room

**Hands:** Gloves. (Fire resistant.)

**Feet:** Metal cap, safety boots.

# Material Safety Data Sheet - MSDS

| Occupational exposure limits         |                 | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       | Notations |
|--------------------------------------|-----------------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredient                           | List name       | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other |           |
| Aluminium powder (pyrophoric)        | US ACGIH 2/2010 | -             | 1                 | -     | -              | -                 | -     | -       | -                 | -     | [a]       |
|                                      | AB 4/2009       | -             | 10                | -     | -              | -                 | -     | -       | -                 | -     | [3] [b]   |
|                                      | BC 10/2009      | -             | 1                 | -     | -              | -                 | -     | -       | -                 | -     | [c]       |
|                                      | ON 7/2010       | -             | 1                 | -     | -              | -                 | -     | -       | -                 | -     | [a]       |
| Aluminium powder (pyrophoric), as Al | QC 6/2008       | -             | 10                | -     | -              | -                 | -     | -       | -                 | -     | [A]       |
| Silicon                              | BC 10/2009      | -             | 3                 | -     | -              | -                 | -     | -       | -                 | -     | [d]       |
|                                      | ON 7/2010       | -             | 10                | -     | -              | -                 | -     | -       | -                 | -     | [e]       |
|                                      | QC 6/2008       | -             | 10                | -     | -              | -                 | -     | -       | -                 | -     | [f]       |
|                                      | US ACGIH 2/2010 | -             | 0.2               | -     | -              | -                 | -     | -       | -                 | -     | [g][B]    |
| Copper                               | AB 4/2009       | -             | 1                 | -     | -              | -                 | -     | -       | -                 | -     | [C]       |
|                                      | BC 10/2009      | -             | 0.2               | -     | -              | -                 | -     | -       | -                 | -     | [h][C]    |
| Copper, as Cu                        | BC 10/2009      | -             | 1                 | -     | -              | -                 | -     | -       | -                 | -     | [g][C]    |
|                                      | ON 7/2010       | -             | 0.2               | -     | -              | -                 | -     | -       | -                 | -     | [i][C]    |
| Copper                               | QC 6/2008       | -             | 1                 | -     | -              | -                 | -     | -       | -                 | -     | [g][C]    |
|                                      | ON 7/2010       | -             | 0.2               | -     | -              | -                 | -     | -       | -                 | -     | [j]       |
| Copper, as Cu                        | QC 6/2008       | -             | 1                 | -     | -              | -                 | -     | -       | -                 | -     | [k][C]    |
|                                      | ON 7/2010       | -             | 0.2               | -     | -              | -                 | -     | -       | -                 | -     | [l][C]    |
| Manganese, as Mn                     | US ACGIH 2/2010 | -             | 0.2               | -     | -              | -                 | -     | -       | -                 | -     | [D]       |
|                                      | AB 4/2009       | -             | 0.2               | -     | -              | -                 | -     | -       | -                 | -     |           |
|                                      | BC 10/2009      | -             | 0.2               | -     | -              | -                 | -     | -       | -                 | -     | [D]       |
|                                      | ON 7/2010       | -             | 0.2               | -     | -              | -                 | -     | -       | -                 | -     |           |
| Chromium, measured as Cr             | QC 6/2008       | -             | 1                 | -     | -              | 3                 | -     | -       | -                 | -     | [l][D]    |
|                                      | US ACGIH 2/2010 | -             | 0.5               | -     | -              | -                 | -     | -       | -                 | -     | [m][E]    |
| Chromium, as Cr                      | AB 4/2009       | -             | 0.5               | -     | -              | -                 | -     | -       | -                 | -     | [3]       |
| Chromium                             | BC 10/2009      | -             | 0.5               | -     | -              | -                 | -     | -       | -                 | -     |           |
| Chromium, as Cr                      | ON 7/2010       | -             | 0.5               | -     | -              | -                 | -     | -       | -                 | -     |           |
| Chromium                             | QC 6/2008       | -             | 0.5               | -     | -              | -                 | -     | -       | -                 | -     |           |

3]Skin sensitization **Form:** [a]Respirable fraction; see Appendix C [b]Metal Dust [c]Respirable [d]Respirable dust [e]Total dust [f]Total dust. [g]Fume [h]Dusts and Mists [i]Dusts and mists [j]dust and mists [k]dusts & mists [l]fume [m]Inorganic **Notes:** [A]as Al [B]Substances for which the TLV is higher than the OSHA Permissible Exposure Limit (PEL) and/or the NIOSH Recommended Exposure Limit (REL). See CFR 58(124) :36338-33351, June 30, 1993, for revised OSHA PEL. Adopted Values enclosed are those for which changes are proposed. Consult the Notice of Intended Changes for current proposal. See Notice of Intended changes. [C]as Cu [D]as Mn [E]measured as Cr

# Material Safety Data Sheet - MSDS

## 10. Physical and Chemical Properties

|                               |  |
|-------------------------------|--|
| Physical state and Appearance | Solid.   |
| Color                         | Reddish-brown. Grayish-white.                                |
| Odor                          | Odorless.  |
| Melting/freezing point        | 1540 to 2030°C (2804 to 3686°F)                              |
| Specific gravity              | Not available.   |
| Solubility                    | Insoluble in the following materials: cold water, hot water. |

## 11. Stability and Reactivity

|                                  |   |
|----------------------------------|---|
| Stability and reactivity         | The product is stable.  |
| Hazardous decomposition products | Metallic oxides. Carbon oxides (CO, CO <sub>2</sub> ). Arc radiation can support the production of ozone and nitrogen oxides. |
| Hazardous polymerization         | Under normal conditions of storage and use, hazardous polymerization will not occur.  |

## 12. Toxicological Information

| Product/ingredient name | Result                | Species | Dose       | Exposure |
|-------------------------|-----------------------|---------|------------|----------|
| Silicon                 | LD <sub>50</sub> Oral | Rat     | 3160 mg/kg | -        |
| Manganese               | LD <sub>50</sub> Oral | Rat     | 9 g/kg     | -        |

**CARCINOGENIC EFFECTS:** See Section 2.  
 Contains material which causes damage to the following organs: blood, kidneys, lungs, liver, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

**Chronic effects and other toxic effects on humans**  
 Acute exposure to welding fumes may result in discomfort such as: dizziness, nausea or dryness of nose, throat or the eyes

| LD <sub>50</sub> or LC <sub>LO</sub> found for oral, dermal or inhalation routes of administration: |  |
|---|--|
| Nickel:   | oral rat LD <sub>50</sub> : 9000 mg/kg body weight                         |
| Silicon:  | oral rat LD <sub>50</sub> : 3160 mg/kg body weight                         |
| Manganese:  | oral rat LD <sub>50</sub> : 9000 mg/kg body weight                         |
| Iron:   | intraperitoneal rabbit LD <sub>LO</sub> : 20 mg/kg - no toxic effect noted |

## 13. Ecological Information

| Product/ingredient name                | Result                               | Species  | Exposure |
|--|--------------------------------------|--|----------|
| Aluminum powder (pyrophoric)<br>Copper | Acute LC50 120 ug/L Fresh water      | Fish - Oncorhynchus mykiss - EMBRYO  | 96 hours |
|  | Acute EC50 4.1 ug/L Fresh water      | Crustaceans - Simocephalus vetulus Juvenile (Fledgling, Hatchling, Weanling) - <48 hours | 48 hours |
|  | Acute EC50 1 ug/L Fresh water        | Daphnia - Ceriodaphnia dubia - Juvenile (Fledgling, Hatchling, Weanling) - <24 hours     | 48 hours |
|  | Acute LC50 9.4 ug/L Fresh water      | Fish - Pimephales promelas - Juvenile (Fledgling, Hatchling, Weanling) - <1 months       | 96 hours |
| Manganese                              | Chronic NOEC 7.43 ug/L Fresh water   | Fish - Salmo trutta - IMMATURE - 14 cm 26.3 g  | 4 days   |
|  | Acute EC50 40000 ug/L Fresh water    | Daphnia - Daphnia magna  | 48 hours |
|  | Chronic NOEC 28000 ug/L Fresh water  | Daphnia - Daphnia magna  | 48 hours |
| Chromium                               | Acute LC50 50 to 65 ug/L Fresh water | Crustaceans - Simocephalus vetulus <24 hours   | 48 hours |
|  | Acute LC50 22 ug/L Fresh water       | Daphnia - Daphnia magna - <24 hours  | 48 hours |
| Production of Degradation              | Acute LC50 14.3 ppm Fresh water      | Fish - Cyprinus carpio   | 96 hours |
|  | Some metallic oxides.                |  |          |

# Material Safety Data Sheet - MSDS

## 14. Disposal Considerations

**Waste information** : Waste must be disposed of in accordance with federal, state and local environmental control regulations. Recycle, if possible.

## 15. Transport Information

No transport class is found applicable to this product.

- **Road ADR:** Not restricted
- **Railway RID:** Not restricted
- **Transport by see IMDG:** Not restricted
- **Air transport:** Not restricted

TRANSPORT INFORMATION include inter alia:

UN number: -

Product / good designation: -

Product / goods class: -

## 16. Regulatory Information

**EUROPEAN COMMUNITY:**

All components are listed on European Core inventory (ECOIN).

**U.S. FEDERAL:**

Regulations : Safety and Health standards, 29 CFR 1910, available from U.S. Government printing office, Washington, D.C. 20402-0001

## 17. Other Information

- RID = Regulations concerning the international carriage of dangerous good by rail.
- ADR = European agreement concerning the international carriage of dangerous goods by road.
- DoT49CFR = U.S. Department of transportation 49 code of Federal Regulations.
- ADNR = Regulations concerning the carriage of dangerous goods on the Rhine.
- IMDG code = International Maritime Dangerous Goods Code.
- ICAO -TI = International Civil Aviation Organization - Technical Instructions.
- IATA-DGR = International Air Transport Association - Dangerous Goods Regulations.
- ACGIH = American Conference of Governmental Industrial Hygienists.
- CAS = Chemical Abstract Service.
- CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act.
- CFR = Code of Federal Regulations.
- DSL = Domestic Substances List (Canada)

# Material Safety Data Sheet - MSDS

- EINECS = European Inventory of Existing Commercial Chemical Substances.
- EPA = Environmental Protection Administration.
- TCLP = Toxic Chemicals Leachate Program.
- IARC = International Agency for Research on Cancer.
- NIOSH = National Institute for Occupational Safety and Health.
- NTP = National Toxicology Program.
- OSHA = Occupational Safety and Health Administration.
- PEL = Permissible Exposure Limit.
- STEL = Short Term Exposure Limit.
- TLV = Threshold Limit Value.
- TSCA = Toxic Substances Control Act.

**Workers qualifying:** Safety at Work Certificate

**Recommended use and possible restrictions:** Metallurgical products

**Instructions:** Technical instructions by producer

**Sources:**

- Official gazette of Republic Slovenia, Nr. 73/1999,
- Official gazette of Republic Slovenia, Nr. 101/2002.

The content and format of this MSDS is in accordance with:

- Commission Directive 2001/58/EC of July 2001, amending for the second time Commission Directive 91/155/EC;
- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH);
- Directive 1999/45/EC or. 67/584/EEC of the classification, packaging and labelling of dangerous substances;
- Directive 1998/24/EC on protection of the health and safety of workers from the risk related to chemical agents at work;
- EN 573-3 (2007): Aluminium and aluminium alloys - Chemical composition and form of wrought products;
- EN 18273-3 (2016): Aluminium and aluminium alloys - Chemical composition and form of wrought products;
- Directive 2002/95/EG (RoHS) dated 27.1.2003 - "Directive of the European Parliament and Council of 27. January 2003, on the restriction of the use of certain hazardous substances in electrical and electronic equipment";
- Directive 2000/53/EC (ELV) dated 18.9.2000 - "Directive of the European Parliament and of the Council of 18. September 2000, on end-of life vehicles";

The data based on the present state of knowledge and experience. The Safety Data Sheet serves to describe the product only with regard to the safety requirements. These data do not constitute a specification. The existing regulations are to be observed by customers at their own responsibility

# Material Safety Data Sheet - MSDS

## LEGEND:

|         |   |        |                                      |
|---------|---|--------|--------------------------------------|
| ACGIH   | American Conference of Governmental Industrial Hygienists           | atm    | atmosphere                           |
| AICS    | Australian Inventory of Chemical Substances                         | cm     | centimeter gram                      |
| CAS     | Chemical Abstract Services  | g      | inch kilogram                        |
| CERCLA  | Comprehensive Environmental Response, Compensation, & Liability Act | in     | pound meter                          |
| CFR DOT | Code of Federal Regulations   | kg     | milligram                            |
| DSL     | Department of Transportation  | lb.    | millimeter                           |
| ECOIN   | Domestic Substances List  | m      | not otherwise specified parts        |
| EPA     | (Canada) European Core  | mg     | per billion                          |
| IARC    | Inventory Environmental   | mm     |                                      |
| LC50    | Protection Agency   | n.o.s. |                                      |
|         | International Agency for Research on Cancer                         | ppb    |                                      |
|         | Lethal Concentration (50 percent kill)                              |        |                                      |
| LCL     | Lowest published lethal   | ppm    | parts per million pounds/square inch |
| o       | concentration Lethal dose (50                                       | psia   | absolute microgram                   |
| LD5     | percent kill)   | ug     |                                      |
| 0       | Lowest published lethal   |        |                                      |
| LDL     | dose Metal Inert Gas  |        |                                      |
| o       |   |        |                                      |
| MIG     |   |        |                                      |
| NFPA    | National Fire Protection Association                                |        |                                      |
| NIOSH   | National Institute for Occupational Safety and Health               |        |                                      |
| NTP     | National Toxicology Program   |        |                                      |
| OSHA    | Occupational Safety and Health Administration                       |        |                                      |
| PEL     | Permissible Exposure Limit  |        |                                      |
| PIN     | Product Identification Number                                       |        |                                      |
| RCA     | Resource Conservation and Recovery Act                              |        |                                      |
| SARA    | Superfund Amendments and Reauthorization Act                        |        |                                      |
| STEL    | Short Term Exposure Limit   |        |                                      |
| TCLP    | Toxic Chemicals Leachate Program                                    |        |                                      |
| TDG     | Transportation of Dangerous Goods                                   |        |                                      |
| TIG     | Tungsten Inert Gas  |        |                                      |
| TLV     | Threshold Limit Value   |        |                                      |
| TSCA    | Toxic Substances Control Act  |        |                                      |
| TWA     | Time weighted Average   |        |                                      |