

# Material Safety Data Sheet

## Pursuant to Regulation (EC) No. 1907/2006

**Material:** Aluminium and Aluminium Alloys  
**Last updated:** 10/13/2017  
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### 1. Identification of the substance / preparation, name of company

#### Trade names

- Welding filler metals:  
MA-1070, MA-1450, MA-2319, MA-4018, MA-4043, MA-4047, MA-5087, MA-5183, MA-5356, MA-5754, MA-6063
- Universal wires: see EN 573-3  
Wrought aluminium materials and aluminium alloys; Nomenclature for alloys:  
Alloys are named with a standardized, four-digit, internationally recognized number, possibly with additional letters to describe the batch (according to EN 573-3; see reference 3)  
If necessary, a number designates the metallic state according to EN 515 (see reference 1), e.g. 5754 **H13**

#### Use of the substance / preparation

Thermal spray coating, vapour coating, welding, punching, rolling, forming, polishing, grinding, stripping, etching, glazing, anodizing

#### Manufacturer/supplier

MIGAL.CO GmbH

#### Street / post box

Wattstraße 2

#### Postal code / city / country

94405 Landau/Isar, Germany

#### Contact for technical information

Robert Lahnsteiner, Robert.lahnsteiner@migal.co

#### Phone / Facsimile / email

+49 9951 69059-0 / +49 9951 69059-3900 / info@migal.co

#### Emergency information desk

+49 9951 69059-3110

### 02. Hazards identification

#### Classification

No labelling requirement according to EC criteria

#### Other informations pertaining to special dangers for human and environment

##### Main hazards:

- If molten aluminium comes into contact with water or certain chemicals, in particular oxygen-rich chemicals, then a risk of splashing, explosion or fire exists.
- There is a risk of explosion, fire or splashing if fine aluminium particles, aluminium powder or aluminium turnings are produced and released while working.
- There is a risk of burns upon contact with hot or molten metal.
- There is a risk of abrasions and cuts upon contact with sharp edges of turnings, wire pieces, drawn wires, bars etc.
- There is a risk of eye injury during any kind of work that involves the production and release of fine aluminium particles, aluminium powder or aluminium turnings.
- There is a particular risk when welding aluminium products (see Chapter 8).
- There is a risk of electric shock when touched, since aluminium is a metal, and therefore a good electrical conductor.
- There are risks associated with the release of hydrogen, among other things during surface treatment in chemical and electrochemical processes (etching, glazing, anodizing etc.).
- There are risks when handling and storing large, heavy wire coils as well as bars and rods.

##### Specific hazards:

None

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### 03. Composition / information on ingredients

#### Chemical characterization

Metal in solid state

#### Hazard(ous) ingredient(s)

None

#### Substances with mandatory EC exposure limit values

None

Elements	CAS* No.	EINECS** No.	EU Index	Percent composition	V.M.E.***	
					Metal	Smoke
Aluminium (Al)	7429-90-5	231-072-3	013-001-00-6	Percentages vary depending on alloy, in accordance with standards of the Aluminium Association and of European Norm EN 573	10 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
Magnesium (Mg)	7439-95-4	231-104-6	012-001-00-3		10 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
Silicon (Si)	7440-21-3	231-130-8			10 mg/m <sup>3</sup>	
Iron (Fe)	7439-89-6	231-096-4			5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
Manganese (Mn)	7439-96-5	213-105-1			5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Zinc (Zn)	7440-90-5	231-175-3	030-001-00-1		5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
Magnesium oxide (MgO)	1309-48-4	215-171-9				
Aluminium oxide (Al <sub>2</sub> O <sub>3</sub> )	1344-28-1	215-691-6				
Copper (Cu)	7440-50-8	231-159-6				1 mg/m <sup>3</sup>
Chromium (Cr)	7440-47-3	231-157-5				0.5 mg/m <sup>3</sup>
Zinc oxide (ZnO)	1314-13-2	215-222-5				5 mg/m <sup>3</sup>
Titanium (Ti)	7440-32-6	231-142-3				
Zirconium (Zr)	7440-67-7	231-176-9	040-001-00-3			5 mg/m <sup>3</sup>
Vanadium (V)	7440-62-2	231-171-1				0.05 mg/m <sup>3</sup>

### 04. First-aid measures

#### General informations

None

#### In case of inhalation

(Powder / smoke): In the event of discomfort, remove the person concerned to fresh air. If symptoms persist, seek medical attention.

#### In case of skin contact

In the case of burns from hot or molten metal, cool the wound immediately and seek medical attention. In the case of cuts or abrasions, seek medical attention.

#### In case of eye contact

**(Wire, bars, rods, solid products):** In the case of an eye injury, seek medical attention.

**(Powder, smoke, turnings):** In the case of irritation, immediately flush the eyes with plenty of water. If irritation persists, seek medical attention.

#### In case of ingestion

None

#### Self protection of the first aider

No specific precautionary measures required

#### Suggestions for the medical practitioner

None

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### 05. Fire-fighting measures

#### **Suitable extinguishing media**

- The product as delivered is not combustible. A fire created from aluminium dust and turnings may only be extinguished with dry sand or Class D extinguishing agents approved for this purpose.
- If extinguishing burning powder, avoid stirring up particles.
- Since aluminium powder can burn for a long time, check to ensure no residual fire source exists after extinguishing.

#### **Extinguishing media which must not be used for safety reasons**

Do not use halogenated fire extinguishing agents or water.

#### **Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases**

Aluminium powder, dust and vapours present low risk upon inhalation. They are not irritating to skin and not toxic when ingested.

#### **Special protective equipment for fire fighting**

Protective clothing and breathing masks should be worn if necessary. The local fire brigade/department can inform you about risks, dangers and fire fighting.

#### **Additional information**

None

### 06. Accidental release measures

#### **Personal precautions**

Avoid contact with hot metals. Avoid breathing in fumes and smoke produced when metalworking and processing.

#### **Environmental precautions**

Do not allow liquid aluminium to contaminate drains or waterways. Do not throw turnings or powders down drains.

#### **Methods for cleaning up**

- Molten metal : Wait until the metal has solidified, then remove the metal
- Powder and turnings : Sweep up scattered substances with a broom or explosion-proof vacuum cleaner, without releasing dust into the environment.

#### **Additional information**

None

### 07. Handling and storage

#### **Advices on safe handling**

- **Risk of burns:** Hot aluminium is no different in colour from cold aluminium! Take precautions to ensure no accidents occur as a result of hot metals.
- **Risk of cuts:** All products can have hard or sharp edges, and are therefore present a danger of laceration. It is advisable to wear safety gloves.
- **Specific risk from bars, wire rods and drawn wires:** There is a risk of injuries to the face. Wear eye protection, such as safety glasses.
- **Specific risk from coiled products:** Make sure the wire cannot uncoil violently. It can cause injury. Wear eye protection and safety gloves.
- **Specific risk from stacked coils or bobbins:** There is a risk of violent uncoiling as soon as retaining straps are removed. Avoid lacerations from the retaining straps. It is advisable to wear safety gloves and eye protection.
- **Specific risk from wire coils:** Because the core of a wire coil or ring could be hidden by packaging, there is a risk of falling into the coil when walking on the goods.
- **Specific risk from finely dispersed metal:** There is a risk of explosion and eye injury. Wear eye protection, such as safety glasses. Only work in dry, well-ventilated rooms.

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### Precautions against fire and explosion

- In its solid form (bars, ingots, wire rods, drawn wires), the product is not flammable and typically presents no risk of fire or explosion.
- Aluminium powder can explode, especially when critical concentrations are reached in closed rooms or halls.
  - Avoid sparks and prevent the build-up of electrostatic charges.
  - Use suitable electronic equipment.
  - Do not smoke.
  - Remove any fine aluminium particles produced from processing or working with the metal (stripping, sawing, polishing, etc.) using a suitable ventilation system (see reference).
  - Prevent the uncontrolled production of particles and their dispersal.
  - Make sure equipment and premises are regularly cleaned.
  - Avoid contact with water, moisture and reactive gasses.
- Finely dispersed aluminium can produce hydrogen upon contact with air humidity. There is a risk of explosion. Therefore, avoid uncontrolled production of finely dispersed aluminium (powder, turnings, etc.) in closed areas with no ventilation or suitable extraction systems (suction line bends, filters, extraction containers, machine tool extractors).
- To remove dust, use suitable methods that reduce the proportion of finely dispersed particles in the environment to non-critical concentrations.

### Further informations

None

### Technical measures and storage conditions

Cylindrical products that can roll (bars, coils, wire coils and wire bar bundles) must be sufficiently secured, e.g. using a chock or safety straps.

### Requirements for storage rooms and containers

- Aluminium scrap must be stored in a dry place to prevent the risk of explosions caused by humidity when remelting.
- Powders and fine aluminium particles must be stored in a well-ventilated, dry place / underground, away from heat and static electricity. Do not store next to inflammable products or reactive media (e.g. oxidants).

**Storage class VCI:** 13 Non-combustible solids

### Specific use(s)

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## 08. Exposure controls / personal protection

### Occupational exposure limits and/or biological limit values

#### *Arbeitsplatzgrenzwerte (AGW) Germany (workplace limit values)*

None

### Limiting and monitoring exposure

Technical measures and suitable work practices as described in Section 7 take priority over the use of personal protective equipment.

### Personal protective equipment

The type of personal protective equipment must be chosen to suit the typical duties at the specific workplace.

### Respiratory protection

A suitable ventilation system must be used in order to remove fine aluminium particles produced by processing the product (sawing, polishing etc.), by melting the metal or by welding.  
If there is a risk of maximum workplace concentration values being exceeded, then use suitable breathing protection.

### Hand protection

Always wear safety gloves if:

- You are handling molten metal, hot metal, turnings or powder.
- You are handling wire bars, drawn wire or any products with sharp edges or cut edges.
- You are handling packing straps.

### Eye protection

Use suitable eye protection (safety glasses, visor, etc.) in the following situations:

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- When working near or handling molten metal.
- When handling wire, wire rods and bars.
- When handling aluminium powder.
- During any work that produces fine aluminium particles (e.g. stripping, sawing, drilling, polishing, etc.).
- During any work that releases aluminium vapours (e.g. melting, welding, etc.).
- When welding aluminium products.
- When handling packing straps.

### Body protection / protective clothing

Welding work requires appropriate protective clothing, especially when it involves handling liquid metal.

### Information on work hygiene

Provide washing facilities at the workplace.

## 09. Physical and chemical properties

### Appearance

**Physical state:** Solid metal  
**Colour:** Grey to silvery grey  
**Odour:** Odourless

### Safety-relevant basic data

**Explosion hazard:** See Chapter 7  
**Lower Explosive Limit (LEL):** None  
**Upper Explosive Limit (UEL):** None  
**Vapour pressure:** None  
**Density:** 2.5 to 2.9 g/cm<sup>3</sup>  
**Flow time:** Not applicable  
**Water solubility:** Insoluble  
**pH-value:** None  
**Boiling point/range:** Around 2300 °C (Pure aluminium) under protective atmosphere  
**Melting point:** 543 °C to 660 °C (Depending on alloy)  
**Auto ignition temperature:** None

## 10. Stability and reactivity

### Conditions to avoid

Accumulation of powder and dust  
Solid aluminium is largely stable. However, fine aluminium particles can be highly reactive

### Materials to avoid

For molten aluminium and finely dispersed aluminium: water, mineral acids, halogenated products, bromides, iodides, sulphates, ammonium nitrate and their compounds

### Hazardous decomposition products

None known

### Other

**Caustic product:** No  
**Random polymerization:** Not possible  
**Corrosive product:** Not reactive  
**Dangerous segregation products:** None known

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### 11. Toxicological information

**Acute toxicity:** No acute toxicity  
(Ingestion, inhalation, skin contact)

**Chronic toxicity:** Aluminium powder and dust have little effect on the lungs, and are harmless and will not damage the body if maximum values are not exceeded. Vapours and smoke gases produced when melting or welding present only a slight risk to health, **providing the specific regulations and procedures for these processing methods are adhered to (see BGR 220)**

**Risk of cancer:** Aluminium is not on the list of carcinogenic substances of IARC (International Agency for Research on Cancer). There is no evidence of mutations or toxic effects on human genes.  
Welding fumes are classified by IARC as potentially carcinogenic for humans (Group 2B)

### 12. Ecological information

**Ecotoxicity**  
None

**Mobility**  
Aluminium does not move freely providing it does not come into contact with a humid environment at a pH below 5.5 or above 8.5.

**Bioaccumulation potential**  
No data available

**Results of assessment of PBT properties**  
No data available

**Other harmful effects**  
No data available

### 13. Disposal considerations

**Material / preparation**  
Aluminium waste and residues

**Recommendations**

- Metallic aluminium can be recycled by remelting.
- The presence of organic coatings could necessitate special treatments before remelting.
- Fine aluminium particles can be highly reactive: special precautions must therefore be taken before disposing of them. No other incompatible waste must be present.
- Metal scrap to be remelted must be stored in a dry place (see Chapter 7 on trapped humidity in aluminium parts).

**European Waste Catalogue Code**  
12 01

**Packaging**  
**Contaminated packaging**  
Packing can be sent for recycling.  
Metallic aluminium and aluminium alloys leave no contamination in the packing that must be removed.

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### 14. Transport information

#### Land transport ADR/RID and GGVSE

**Classification**

**Class:** Not classified  
**UN-Number:** Not classified

**Hazard number:** Not hazardous material  
**Classification code:** Not hazardous material

#### Sea transport IMDG/GGVSee

**Classification**

**IMDG Code:** Not classified  
**UN-Number:** Not classified

**EmS:** Not hazardous material  
**Marine pollutant:** No

#### Air transport ICAO-TI and IATA-DGR

**Classification**

**Class:** Not classified  
**UN-Number:** Not classified

#### Other information

**All modes of transport involve the following risks:**

- Risks involved in handling (see Chapter 7).
- Risks resulting from improperly secured goods when transporting or handling: if the entire load or part of it can move about, then it could possibly cause traffic accidents or severe injuries to unloading personnel.
- Risks resulting from improperly chocked goods: e.g. when transporting cargo by ship. Given these risks, it is recommended that appropriate means be chosen for transporting heavy products (coils) (e.g. special trailers for land transport).

**Comment:**

Do not forget that products destined for remelting must be kept dry. Therefore, when transport, loading, unloading and storing make sure to prevent the ingress of water or snow.

### 15. Regulatory information

#### Chemical Safety Assessment (CSA)

Chemical safety assessments have not been performed.

#### Labelling according to EC directives

Aluminium and aluminium alloys are **exempt from the labelling requirements of EC directives / Gefahrstoffverordnung (Ordinance on Hazardous Substances, Germany).**

#### Code letter/s and hazard warning/s on the product

None

#### Hazardous component/s to be indicated on label

**Contains:**

**R phrases**

None

**S phrases**

None

#### EU Regulations

Aluminium is not affected by DIRECTIVE 2004/37/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 April 2004 regarding the protection of workers from the risks related to exposure to carcinogens or mutagens at work.

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### National German Regulations

**Wassergefährdungsklasse, WGK (Water Pollution Class)**

Class: Not hazardous to waters

**Technische Anleitung Luft, TA-Luft (Technical Instructions on Air Quality)**

None

**Störfallverordnung, 12. BimSchV (statutory order on hazardous incidents)**

None

**Lösemittelverordnung, 31. BimSchV (Solvent Ordinance)**

None

### 16. Other information

**Other applicable EC directives**

Technische Regeln für Gefahrstoffe (Technical Rules for Hazardous Materials)  
TRGS-528 Schweißtechnische Arbeiten (Welding)

**Restrictions on use recommended by the manufacturer**

None

**R phrases referred to in Sections 2 and 3**

None

**Other notices**

This material safety data sheet must not be construed as a replacement for existing technical manuals, merely as a complement to them. The information in this data sheet is based on our knowledge and the product at the given point in time. It aims to describe the product and its relationship to health, safety and spatial conditions. This data sheet contains no guarantee as to specific product properties. It also aims to highlight the risks of failing to treat the product or parts thereof as required.

This data sheet was produced in accordance with ISO 11014-1 and Directive (EC) No. 1907/2006. It does not absolve the consumer of his obligations and the statutory regulations. The consumer is solely liable for taking safety precautions relating to this product.

All of the guidelines mentioned above, particularly those in Chapter 15, are designed to assist the consumer in fulfilling his role in using and/or processing the product dealt with in this data sheet.

This data sheet should not be construed as exhaustive, and does not absolve the reader from the obligation to check whether there are any further statutory regulations that affect him but are not mentioned in this data sheet. The consumer is personally responsible for ownership, handling, processing and working in accordance with the prevailing regulations.

**Revisions since last issue**

1.0: Revised in all areas and adapted to EC regulation REACH

**Department issuing this data sheet**

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