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Safety Data Sheet

Reference	ALUMINIUM TITANIUM ALLOY
Effective Date	1/1/2021
Revision	7

1.- IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND COMPANY

1.1 Product identifiers

- Trade Name: ALUMINIUM TITANIUM ALLOY (AlTi)
- Type of product: Preparation

1.2 Identified uses / Uses advised against

-1.2.1: Identified uses: Production of aluminium alloys

-1.2.2: Uses advised against: No data available

1.3 Identification of the Company

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1.4 Emergency call

National Institute of Toxicology.: +34 915620420 (24 h)

2.- HAZARDS IDENTIFICATION

2.1 Classification of the mixture (GHS Classification)

2.1.1 European regulation (EC) 1272/2008, as amended

Not Classified as hazardous according to the European regulation (EC) 1272/2008, as amended.

2.1.2 Hazard summary

Aluminium solid metal and aluminum alloys are not classified as hazardous. In the form in which it is marketed, the product causes no danger to health through inhalation. High temperatures or mechanical action may form dust and fume that can irritate the eyes, skin and respiratory tract.

2.2 Label elements

EC label-according to Regulation (EC) 1272/2008. as amended

There is therefore no obligation to label the product in accordance with regulation (EC) 1272/2008 (CLP, Annex I, 1.3.4).

2.3 Other hazards

- High temperatures or mechanical action may form dust and fume that can irritate the eyes, skin and respiratory tract.
- Fine particles from processing (grinding, cutting, polishing and welding) may be readily ignitable, and need to be controlled.

- Fine particles in contact with water or humidity in air may release flammable gases in hazardous quantities.
- For molten aluminium alloys there is a risk of explosions if in contact with water, and react violently in contact with oxides of some other metals or nitrates.
- The PBT and vPvB criteria of Annex XIII to the REACH Regulation (EC) No 1907/2006 do not apply to inorganic substances.

2.4 US Regulation NFPA

- Massive metal: H=0; F=0; R=0

3.- COMPOSITION / INFORMATION ABOUT COMPONENTS

3.1 Substance

- Not applicable

3.2 Mixture

Substance name	Concentration	CAS No	EINECS No
Aluminium REACH Registration N°: 01-2119529243-45-0149	95.5-89 %	7429-90-5	231-072-3
Titanium REACH Registration N°: 01-2119484878-14-0041	4.5-11 %	7440-32-6	231-142-3

3.2.1 Hazardous components-according to Regulation (EC) 1272/1008, as amended

Substance name	Hazard class	Hazard category	Route of exposure	H Phrases
Aluminium	Not Classified	-	-	-
Titanium	Not Classified	-	-	-

For the full text of the phrases mentioned in this Section, see Section 16.

4.- FIRST AID MEASURES

4.1 Description of necessary first-aid measures

4.1.1. If inhaled

- In case of dust or fume generation during some work operations and inhalation:
- Move to fresh air.
- In case of ongoing discomfort consult a physician.

4.1.2. In case of eye contact

- In case of dust contact, rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- If particles come into contact with eyes treatment for mechanical irritation or injury may be required.
- In case of ongoing discomfort consult a physician.
- In case of contact with liquid aluminium alloys, hospital treatment.

4.1.3. In case of skin contact

- In case of burns from hot/liquid aluminium alloys, rinse with plenty of water and contact physician.
- In case of liquid aluminium alloys splashes, remove affected clothing and shoes.

4.1.4. If swallowed

- Not applicable here.

4.2. Most important symptoms/effects, acute and delayed

4.2.1. Inhalation

- In the form in which it is marketed, the product causes no danger to health through inhalation.
- Fumes and dust generated during processing may cause respiratory tract irritation.
- Symptoms: Cough, sore throat.

4.2.2. Skin contact

- Fumes and dust generated during processing may cause slight irritation.

4.2.3. Eye contact

- Fumes and dust generated during processing may cause eye irritation.
- Symptoms: Redness, Lachrymation, Swelling of tissue.

4.2.4. Ingestion

- Not applicable here.

4.3. Indication of inmediate medical attention and special treatment needed, if necessary

- Not applicable here.

5.- FIRE FIGHTING MEASURES

5.1 Extinguishing media

This product does not present fire or explosion hazards as shipped. Small chips, dust and fines may be ignitable.

5.1.1. Suitable extinguishing media

- Use class D extinguishing agents on dust, fines or molten metal.

5.1.2. Unsuitable extinguishing media

- Do not use water with liquid aluminium alloys.
- Do not use water, foam or halogenated extinguishing agents.

5.2. Specific hazards arising from the chemical

- The product as such is not flammable.
- Fine particles in contact with water may generate flammable gases in hazardous quantities.
- Use fire fighting extinguishing methods suitable to surrounding conditions.
- Fine dispersed particles (dust, powder) may form explosive mixtures in contact with air.
- Molten aluminium alloys may explode on contact with water or moisture.

- Sudden violent release of steam and gases or explosion can ocurr when water is trapped under molten aluminium alloys.
- Molten aluminium alloys may react violently with rust, certain metal oxides and nitrates.
- Contaminated waste resulting from fire fighting operations must be disposed of in accordance with official regulations.

5.3. Special protective actions for fire-fighters

- Wear approved positive pressure, self-contained breathing apparatus when appropriate.
- Use personal full heat protective clothing when appropriate.

6.- ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1. Advice for non-emergency personnel

- Stop the metal flow by using dry sand as a dyke.
- Do not use shovels or hand tools to detain the metal flow.
- Use only preheated or specially coated and rust free tools in contact with molten aluminium alloys.
- Let molten metal solidify and cool down to room temperature before picking up.

6.1.2. Advice for emergency responders

- See protection measures listed in section 8.

6.2. Environmental precautions

- Prevent spills.
- Collect scrap for recycling.

6.3. Methods and materials for containment and cleaning up

- Pick up mechanically.
- Let molten metal solidify and cool down to room temperature before picking up.

6.4. Reference to other sections

- Refer to protection measures listed in sections 7 and 8.
- Refer to disposal considerations listed in sections 13.

7.- HANDLING AND STORAGE

7.1 Precautions for safe handling

- Ensure good ventilation / local exhaust at the workplace in the case of operations generating dust, like cutting, grinding, polishing
- Fine dispersed aluminium (dust, powder) may form explosive mixtures in contact with air and in contact with water may release highly flammable gases in hazardous quantities.
- Remelt ingots needs to be kept dry and preheated before charging into molten metal.
- The movement of molten aluminium alloys should be carried out using suitable and approved refractory lined containers.
- Recently cast products may still be hot, avoid touching metal in casting areas.

- Be careful to use only preheated or specially coated and rust free tools in contact with molten aluminium alloys.
- Product intended for remelting must be stored in dry area, carefully inspected and preheated before charging into molten metal.
- Avoid dust formation.
- Eating is prohibited at work place.
- Use protection measures listed in section 8.

7.2. Conditions for storage, including incompatibilities

7.2.1. Storage

- Product should be kept dry.
- Pay attention to stack stability.
- Keep in a well-ventilated, dry place.
- Keep away from Incompatible products.
- Suitable storage areas should be clearly marked.

7.2.2. Packaging material

7.2.2.1. Suitable material

- PE, wood, paper.

7.2.2.2. Unsuitable material

- no data available

7.3. Specific use(s)

- For further information, please contact: Supplier

8.- EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

8.1.1. Exposure Limit Values

Spain: Workplace Exposure Limits in Spain 2016 (INSHT):

Substance	CAS N°	VLA-ED	Form
Aluminium	7429-90-5	10 mg/m^3 10 mg/m^3	Metal dust Alumium oxide dust
Titanium	7440-32-6	10 mg/m^3	Titanium oxide dust

United States: OHSA:

Substance	CAS N°	TWA	Form
Aluminium	7429-90-5	15 mg/m^3 5 mg/m^3	Total dust Respirable fraction
Titanium	7440-32-6	15 mg/m^3	Titanium oxide total dust

Germany:

Substance	CAS N°	TWA	Form
Aluminium	7429-90-5	10 mg/m^3 3 mg/m^3	Inhalable dust Respirable dust

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UK: EH40 Workplace Exposure Limits 2007 (WELs):

Substance	CAS N°	TWA	Form
Aluminium	7429-90-5	10 mg/m^3 4 mg/m^3	Inhalable total dust Respirable dust
Titanium	7440-32-6	10 mg/m^3 4 mg/m^3	Titanium oxide total inhalable dust Titanium oxide respirable dust

Some additional EU countries:

Substance	CAS N°	TWA	Form
Aluminium	7429-90-5	10 mg/m^3 5mg/ m^3	Total dust Aluminium Welding fumes

TLV-ACGIH:

Substance	CAS N°	VLA-ED	Form
Aluminium	7429-90-5	10 mg/m^3	Metal dust

8.1.2. Recommended control procedures

Follow the standard monitoring methods.

8.1.3. Other information on limit values

8.1.3.1. Biological tolerable limit

Germany: 200 µg Aluminium/L urine at end of shift

8.1.3.2. Predicted No Effect Concentration. (PNEC)

Aluminium:

- Fresh water: No data, aquatic toxicity unlikely
- Marine water: No data, aquatic toxicity unlikely
- Sewage treatment plants, 20 mg/l
- Fresh water sediment: No or insufficient data available at present
- Marine sediment: No or insufficient data available at present
- Soil: No or insufficient data available at present

8.1.2.3. Derived No Effect Level (DNEL)/ Derived minimal effect level

Aluminium:

- Workers, Inhalation, Long-term exposure - local effects: 3.72 mg/m^3
- General population, Oral, Long-term exposure - systemic effects: 3.95 mg/kg bw/day

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- Provide appropriate exhaust ventilation at places where dust is formed.
- Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing or polishing operations, in order to eliminate explosion hazards.
- Apply technical measures to comply with the occupational exposure

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limits.

8.2.2. Individual protection measures

8.2.2.1. Respiratory protection

- Not required under recommended conditions of use.
- In case dust or fumes are released, personal protective equipment required if exposure limits are exceed.
- If during production process, dust is generated, and if ventilation is inadequate, wear respirator type FFP2 (EN 149:2001) is advisable.

8.2.2.2. Hand protection

- Protective gloves
- For handling of molten metal, the use of protective gloves to prevent skin contact is required.

8.2.2.3. Eye protection

- Safety glasses with side shields.
- During production process where excessive dust is generated, e.g. material transfer, cutting or polishing; the use of safety goggles is advisable.
- For handling of molten metal, the use of safety glasses or face shields to prevent eye contact is required. Contact lenses should not be worn where industrial exposures to this material are likely.

8.2.2.4. Skin and body protection

- Use recommended work clothes.
- For handling of molten metal, the use of protective clothing (flame retardant-EN certified for molten metal handling) to prevent skin contact is required. No synthetics fabrics even as undergarments.

8.2.2.5. Hygiene measures

- Eye wash bottles or eye wash stations in compliance with applicable standards. Must be available in areas handling molten metal for use in case of burns.
- When using do not eat, drink or smoke.
- Handle in accordance with good industrial hygiene and safety practice.

8.2.3. Environmental exposure controls

- Take into account the requirements of national and international legislation on emissions.

9.- PHYSICAL AND CHEMICAL PROPERTIES

9.1 Physical and chemical properties

9.1.1. General Information

- Physical state: solid at 20 °C.
- Appearance: metal alloy in massive form
- Colour: silvery or silver grey (also when hot)
- Odour: odourless

9.1.2. Important health safety and environmental information

pH	Not applicable
Melting point/freezing	Approx. 660 °C

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point	
Boiling point/boiling range	Approx. 2467 °C
Flash point	Not applicable
Evaporation rate	Not applicable
Flammability	The product is not flammable.
Explosive properties	Not applicable
Vapour pressure	Not data available
Vapour density	Not applicable
Relative density	Approx. 2.5-2.8 g/cm^3, at 20 °C
Bulk density	Not applicable
Solubility(in water 20°C)	Almost insoluble
Solubility/qualitative	Not data available
Partition coefficient: n-octanol/water	The methods for determining biodegradability are not applicable to inorganic substances
Autoignition temperature	Not data available
Decomposition temperature	Not data available
Viscosity	Not data available
Oxidizing properties	Not data available

9.2. Other information

- no data available

10 .- ESTABILITY AND REACTIVITY

10.1 Reactivity

- This alloy is not reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

- Stable under normal conditions of use, storage and transport.

10.3. Posibility of hazardous reactions

- None under normal processing.

10.4. Conditions to avoid

- Molten alloy may react violently in contact with certain metal oxides and nitrates none.
- Molten alloy may cause explosions in contact with water or wet surfaces.
- In areas with very high dust concentrations, aluminium dust may form an explosive atmosphere.
- Finely divided powder may be flammable at high temperature.

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10.4. Incompatible materials

- None.

10.5. Hazardous decomposition products

- None.

11.- TOXICOLOGICAL INFORMATION

All data are given for aluminium as the main constituent

11.1 Information on toxicological effects

Aluminium:

Oral uptake < 0.1%, nearly insoluble in lung fluids. Most absorbed aluminium is rapidly excreted through urine. Main deposit in body is in bone structure.

11.1.1. Acute toxicity

Aluminium-Titanium: no data available

Aluminium: No acute effects

Aluminium:

LD50 (oral):	> 5000mg/kg bwt (rats)
LD50 (dermal):	No effect
LD50 (inhalative):	> 2,350 mg/l (rats)

Titanium:

LD50 (oral, TiO_2):	> 5000mg/kg bwt (rats)

Specific symptoms in animal tests:

Aluminium:

After swallowing:	None
After skin contact:	None
After inhalation:	None

11.1.2. Skin corrosion/irritation

- Aluminium: No effects.

11.1.3. Serious eye damage/eye irritation

- Aluminium: No effects. Aluminium particles may produce irritation due to mechanical abrasion.

11.1.4. Respiratory or skin sensitization

Aluminium:

- After skin contact:	None
- After inhalation:	None

11.1.5. CMR-effects (carcinogenic, mutagenic and reproductive effects)

Aluminium:

- Carcinogenicity:	None
- Mutagenicity:	None
- Reproductive toxicity:	None
- Assessment of CMR properties:	Not classified for CMR

11.1.6. Repeated dose toxicity

Aluminium:

- Sub acute oral Toxicity: None. Calculated DNEL 3,95 mg/kg bwt/day
- Sub acute inhalative Toxicity: None. See occupational exposure limits. Calculated DNEL 3,7 mg/m^3 respirable.

11.2 Other information

Practical experience, observations relevant for classification: none

12.- ECOLOGICAL INFORMATION

All data are given for aluminium as the main constituent

12.1 Toxicity

Aluminium-Titanium: No data available

Product	test	result	Species	Exposure
Aluminium metal shavings	Fish - OECD TG 203	>100 mg/l	Salmo trutta	pH 8
Aluminium metal shavings	Daphnia - OECD TG 202	>100 mg/l	Daphnia Magna	pH 8
Aluminium metal shavings	Algae - OECD TG 201	>100 mg/l	Selenastrum Capricornutum	pH 8

12.2. Persistence and degradability

Not applicable

12.3. Bioaccumulative potential

Bioaccumulative potencial:

Aluminium-Titanium: no data available

Aluminium: not bioaccumulative

Partition coefficient n-octanol/water: not applicable

Titanium: not potencial for bioaccumulation

12.4. Mobility

Aluminium: not mobile normal environmental conditions: may be leached from the ground at low pH (<5.5) or high pH (>8.5).

12.5. PBT and vPvB assessment

The PBT and vPvB criteria of Annex XIII to the REACH Regulation (EC) No 1907/2006 do not apply to inorganic substances. Therefore a PBT/vPvB assessment was not performed.

12.6. Other adverse effects

Aluminium-Titanium: no data available

Aluminium: No.

12.7. Final Assessment

Aluminium: No acute or chronic classification is appropriate for Al metal massive based on non toxic results below the Ecotoxicity Reference Value (ERV) of tests with aluminium metal, oxide and hydroxide at loadings of 100 mg/L at pH 8-8.5 (maximum solubility of Al expected). All aluminium in soil or the aquatic environment comes from natural sources. Local sources have an insignificant contribution and impact on environment.

13.- DISPOSAL CONSIDERATIONS

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13.1 Waste disposal methods

- Aluminium alloys are subject of recycling.
- If recycling is not practicable, dispose of in compliance with local regulations.

13.2. Contaminated packaging

- Not applicable.

14.- TRANSPORT INFORMATION

14.1. International transport regulations

In accordance with ADR, RID, IMDG, IATA, AND:

- Not applicable.

15.- REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1 EU-Regulations

- 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), as amended.
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, as amended
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work, as amended.
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste.
- Regarding labeling, point 1.3.4 of Annex I to CLP provides the metals in the massive form, as well as alloys, do not require a label if they do not present a hazard to human health by inhalation, ingestion or contact with skin or to the aquatic environment in the form in which are placed on the market.
- No REACH Annex XVII restrictions.

15.1.2 National Regulations

- Límites de Exposición Profesional para Agentes Químicos en España 2016.

15.2. Chemical Safety Assessment

- A Chemical Safety Report has not been carried out for this alloy.
- A Chemical Safety Report has been carried out for aluminium (>95%).

15.3 US Regulation NFPA

- Massive metal: H=0; F=0; R=0

16.- OTHER INFORMATION

16.1. Full Text of H-statements referred to under sections 2 and 3

Not applicable.

16.2. Revision Statement

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This revision updates section **1,3, 12, 14, 15** of the Material Safety Data Sheet.

16.3. Abbreviations and acronyms

- GHS: Global Harmonized System.
- CAS: Chemical Abstracts Service.
- EC50: Effective Concentration 50%.
- DNEL: Derived no-effect level
- INSHT: Instituto Nacional de Seguridad e Higiene en el Trabajo.
- LC50: Lethal Concentration 50%.
- LD50: Lethal Dose 50%.
- vPvB: very Persistent and very Bioaccumulative.
- NOAEC: No observed Adverse Effect Concentration.
- NOAEL: No observed Adverse Effect Level.
- PBT: Persistent, Bioaccumulative and Toxic.
- PE: Polystyrene.
- TWA: Time weighted average.
- VLA-ED: Valor límite ambiental de exposición diaria.
- WELs: Workplace Exposure Limits.
- Bwt: Bodyweight

16.4. Source of key data to compile the datasheet

- Chemical Safety Report of metal aluminium.
- EH40/2005. Workplace Exposure Limits, as amended through 1,10, 2007 (WELs) Published by the Health and Safety Executive (HSE). Issued under the Control of Substances Hazardous to Health Regulations - as amended.
- Límites de Exposición Profesional para Agentes Químicos en España 2016. Published by the INSHT (Spain).
- European Chemicals Agency
- The Sigma Aldrich Library of Chemical Safety Data.

16.5. Other information

It is recommended to provide periodical training to the workers related to handling of hazardous substances for health and/or environment.

The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product which conforms to the specification, unless otherwise stated. In this case of combinations and mixtures one must make sure that no new dangers can arise. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and the environment.

PREPARED	APPROVED
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