SAFETY DATA SHEET According to Commission Regulation (EU) 2020/878 of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006 (REACH)	**Version: 1.0**
	Issue date: 14.03.2023 Revision: -

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
Trade name: **Titanium Aluminum Carbide**
CAS no: 12537-81-4
EC no: 603-064-3
Index no: - (substance not included in table 3.1 annex VI to Commission Regulation (EU) 2020/878 of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006 (REACH))
REACH registration number: -
Molecular formula: Ti_2AlC

1.2 Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses: powder laboratory reagent, manufactured by powder metallurgy methods.
Uses advised against: all others not mentioned above.

1.3 Details of the supplier of the safety data sheet
E-mail address of the person responsible for the SDS:

1.4 Emergency telephone number
112 (European emergency call)

Section 2: Hazards identification

2.1 Classification of the substance or mixture
Caution! The substance has not been fully tested or due to the lack of data or the lack of technical possibility to obtain such data, the substance has not been classified in some hazard classes in accordance with in accordance with 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, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.
-
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements
Hazard pictogram(s): not applicable
Signal word: not applicable
Hazard statements: not applicable
Precautionary statements: not applicable
Supplemental Hazard Information: not applicable

2.3 Other hazards
The assessment of the criteria for PBT or vPvB in accordance with the Annex XIII of Regulation (EC) No 1907/2006 (REACH) as amended has not been carried out. Substance is not included in the list established in accordance with Article 59 for having endocrine disrupting properties, no data available on having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605. Caution! May form explosible dust-air mixture if dispersed.

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3.1 Substances

Name	Identifying numbers	Classification according to. regulation (EC) no 1272/2008	Concentration, %
Titanium Aluminum Carbide	CAS no: 12537-81-4 EC no: 603-064-3 Index no: - REACH registration no: -	-	100

Nanoform, characterization of particles: no data, no information about nanoform.

3.2. Mixtures – not applicable.

Section 4: First aid measures

4.1 Description of first aid measures

Ingestion: wash mouth with copious amounts of water. Do not give anything by mouth until consulting a physician. Get medical advice/attention if you feel unwell.
Eye contact: remove contact lenses, if present and easy to do. Wash with copious amounts of water. Continue rinsing for at least 15 minutes. If irritation occurs, get medical assistance.
Skin contact: wash with copious amounts of water. If irritation occurs, get medical assistance.
Inhalation: move of the exposed individual from the area to fresh air, place in the recovery position, get medical assistance. Get medical advice/attention if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed

Acute effects of exposure: because the substance has not been fully tested or due to the lack of data on the substance or the impossibility of technically obtaining such data, the effects of exposure to the substance are not known. May cause irritation of the respiratory system including coughing, scratchy feeling in the throat.
Repeated or prolonged exposure effects: occupational exposure by inhalation may lead to fibrotic changes in the lungs, alveolitis, bronchitis and chronic interstitial pneumonia.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Maintain vital functions.

Section 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: carbon dioxide, dry chemical.
Unsuitable extinguishing media: water jet.

5.2 Special hazards arising from the substance or mixture

May produce toxic fumes on combustion. Caution! Avoid generation of dusts. No data available on dust explosive properties.

5.3 Advice for the firefighters

Keep containers cool with water spray, use special protective equipment for firefighter.

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Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: restrict access by unauthorized persons. Protect against contact with water or moisture.

For emergency responders: use half mask or full mask with filter type 3, protective gloves made of nitrile, protective clothing cat. III made of polyethylene and protective goggles. Caution! Avoid generation of dusts. No data available on dust explosive properties.

6.2 Environmental precautions

Keep away from drains, surface and ground water.

6.3 Methods and material for containment and cleaning up

Take up mechanically. Avoid generation of dusts. Collect and place in a properly labeled waste container. Clean up affected area.

6.4 Reference to other sections

For personal protective equipment, see Section 8.

Disposal considerations, see Section 13.

Section 7: Handling and storage

7.1 Precautions for safe handling

Use personal protective equipment. Do not inhale. Avoid contact with skin and eyes. Ensure adequate ventilation at the workplace. Avoid generation of dusts. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Wash contaminated clothing before reuse.

7.2 Conditions for safe storage, including any incompatibilities

Store in tightly closed labeled container. Limit the access of unauthorised.

Conditions to avoid, see section 10.4

Incompatible materials, see section 10.5.

7.3 Specific end use(s)

See section 1.2.

Section 8: Exposure controls/personal protection

8.1 Control parameters

The maximum permissible concentrations at the workplace have not been set for the substance. Values for a similar substance are given below.

Titanium [CAS no: 7440-32-6]

Country	Limit value - Eight hours, mg/m3	Limit value – Short term, mg/m3
Latvia	10	
Poland	10	30
Romania	10	15

Aluminium [CAS no: 7429-90-5]

Country	Limit value - Eight hours, mg/m3	Limit value – Short term, mg/m3
Australia	5	
Canada - Québec	5	
Germany (DFG)	4 Inhalable fraction	
	1,5 Respirable fraction	
New Zealand	5	
Norway	5	
Poland	2,5 (fume, total dust)	

	1,2 (fume, respirable dust)	
South Africa Mining	5	
South Korea	5 (1)	

Source: https://limitvalue.ifa.dguv.de/

Commission Directive 2000/39/EC of 8 June 2000 establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

Commission Directive 2006/15/EC of 7 February 2006 establishing a second list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC.

Commission Directive 2009/161/EU of 17 December 2009 establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC.

Commission Directive (EU) 2017/164 of 31 January 2017 establishing a fourth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 91/322/EEC, 2000/39/EC and 2009/161/EU.

Commission Directive (EU) 2019/1831 of 24 October 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC and amending Commission Directive 2000/39/EC

Standard EN 689:2018 Workplace exposure. Measurement of exposure by inhalation to chemical agents. Strategy for testing compliance with occupational exposure limit values.

DNEL, PNEC

Lack of data.

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Ensure adequate ventilation at the workplace. Do not use in confined spaces without adequate ventilation.

8.2.2. Individual protection measures, such as personal protective equipment

a) Eye/face protection: goggles, EN166 Personal eye protection - specifications.

b) Skin protection

Hand protection: gloves, standard EN374 Protective gloves against dangerous chemicals and micro-organisms,

Material: nitrile

Category: III

Thickness: > 0,1 mm

Breakthrough time: not determined

The type and thickness of the gloves should be matched by the supplier of these personal protective equipment to ensure the appropriate level of protection.

Other: adjust according to the level of exposure. If exposure to body parts is possible and prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended of category III, type 5 EN 13982-1:2004 Protective clothing for use against solid particulates — Part 1: Performance requirements for chemical protective clothing providing protection to the full body against airborne solid particulates (type 5 clothing).

c) Respiratory protection: depending on the degree and time of exposure, use a protective mask/half-mask with filter P3 class (EN149 - Respiratory protective devices - Filtering half masks to protect against particles - Requirements, testing, marking) or powered respirator (EN12941 Respiratory protective devices. Powered filtering devices incorporating a helmet or a hood. Requirements, testing, marking) Classes TH2 or TH3. EN12942 - Respiratory protective devices. Power assisted filtering devices incorporating full face masks, half masks or quarter masks. Requirements, testing, marking).
d) Thermal hazards: not applicable. If necessary, use appropriate gloves for protection against thermal risks.

8.3 Environmental exposure controls

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions. Keep away from drains, surface and ground water.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state: powder
Colour: dark gray/black
Odour: none
Melting point/freezing point: data not available
Boiling point or initial boiling point and boiling range: data not available
Flammability: data not available
Lower and upper explosion limit: data not available
Flash point: data not available
Auto-ignition temperature: data not available
Decomposition temperature: data not available
pH: data not available
Kinematic viscosity: data not available
Solubility: data not available
Partition coefficient n-octanol/water (log value): data not available
Vapour pressure: data not available
Density and/or relative density: data not available
Relative vapour density: data not available
Particle characteristics: data not available

9.2 Other information

None.

Section 10: Stability and reactivity

10.1 Reactivity

Substance is stable under normal conditions of use.

10.2 Chemical stability

Substance is stable under normal conditions of use.

10.3 Possibility of hazardous reactions

Caution! Avoid generation of dusts. No data available on dust explosive properties.

10.4 Conditions to avoid

Caution! Avoid generation of dusts. No data available on dust explosive properties.

10.5 Incompatible materials

None known.

10.6 Hazardous decomposition products

May produce toxic fumes on combustion.

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Section 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

a) Acute toxicity

Due to lack of data, the substance has not been classified.

LD50, rat, ingestion = lack of data

LC50, rat, inhalation, 4h = lack of data

LD50, skin = lack of data

b) Skin corrosion/irritation

Due to lack of data, the substance has not been classified.

c) Serious eye damage/irritation

Due to lack of data, the substance has not been classified.

d) Respiratory or skin sensitization

Due to lack of data, the substance has not been classified.

e) Germ cell mutagenicity

The mixture does not contain substances classified in this hazard class. Based on available data, the classification criteria are not met.

f) Carcinogenicity

Due to lack of data, the substance has not been classified.

International Agency for Research on Cancer IARC classified chromium (III) and its compounds to group 3: not classifiable as to their carcinogenicity to humans.

g) Reproductive toxicity

Due to lack of data, the substance has not been classified.

h) Specific target organ toxicity-single exposure

Due to lack of data, the substance has not been classified.

i) Specific target organ toxicity-repeated exposure

Due to lack of data, the substance has not been classified.

Aluminum toxicity most often affects the central nervous system, the skeletal system, the hematopoietic system, the urinary tract and the respiratory system. An increased effect of active forms of oxygen can stimulate the formation of amyloid deposits. The clinical image of aluminum smelters was dominated by ataxia, memory impairment, impaired abstract thinking and depressive states. Aluminum compounds have a detrimental effect not only on the psychic but also motor skills.

Source: Łukasz B, Rybakowska IM, Krakowiak A, Sein Anand J. The health effects of environmental and occupational exposure to aluminum. Medycyna Pracy. 2020;71(1):79-88. doi:10.13075/mp.5893.00887.

j) Aspiration hazard

Based on available data, the classification criteria are not met.

Information on likely routes of exposure

Inhalation, ingestion, eye and skin contact.

Symptoms related to the physical, chemical and toxicological characteristics. Delayed and immediate effects as well as chronic effects from short and long-term exposure

Acute effects of exposure: because the substance has not been fully tested or due to the lack of data on the substance or the impossibility of technically obtaining such data, the effects of exposure to the substance are not known. May cause irritation of the respiratory system including coughing, scratchy feeling in the throat.

Repeated or prolonged exposure effects: occupational exposure by inhalation may lead to fibrotic changes in the lungs, alveolitis, bronchitis and chronic interstitial pneumonia.

11.2 Information on other hazards

None known.

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Section 12: Ecological information

12.1 Toxicity
Due to lack of data, the substance has not been classified.
12.2 Persistence and degradability
No data available.
12.3 Bioaccumulative potential
No data available.
12.4 Mobility in soil
No data available.
12.5 Results of PBT and vPvB assessment
The assessment of the criteria for PBT or vPvB in accordance with the Annex XIII of Regulation (EC) No 1907/2006 (REACH) as amended has not been carried out.
12.6 Endocrine disrupting properties
Substance is not included in the list established in accordance with Article 59 for having endocrine disrupting properties, no data available on having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.
12.7 Other adverse effects
None known.

Section 13: Disposal considerations

13.1 Waste treatment methods
Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal. Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.
Waste code: waste producers need to assess the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code(s).
REGULATION (EC) No 2150/2002 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 November 2002 on waste statistics (OJ L 332, 9.12.2002, p.1)

Section 14: Transport information

14.1 UN number or ID number: not applicable
14.2 UN proper shipping name: not applicable
14.3 Transport hazard class(es): not applicable
14.4 Packing group: not applicable
14.5 Environmental hazards: not applicable
14.6 Special precautions for user: not applicable
14.7 Maritime transport in bulk according to IMO instruments: not applicable

Section 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
1. 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), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

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2. 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, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.
3. Commission Regulation (EU) 2020/878 of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Substances subject to the authorization procedure - Annex XIV to Reg. (EC) No. 1907/2006 (REACH): substance is not listed.

Substances of Very High Concern (SVHC) - Candidate List: substance is not listed.

Restrictions on the production, placing on the market and use of certain hazardous substances, mixtures and articles - Annex XVII to Regulation (EC) No. 1907/2006 (REACH): substance is not listed.

15.2 Chemical safety assessment

A chemical safety assessment has not been carried out.

Section 16: Other information

Full text of hazard statements::

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Abbreviations and acronyms used in the safety data sheet:

CAS no - unique identification number assigned by the Chemical Abstracts Service (CAS).
EC no - unique seven-digit identifier that was assigned to substances for regulatory purposes within the European Union by the European Commission.
Index no - number identifying the substance from Annex VI to Regulation (EC) No 1272/2008 (CLP) with a harmonized classification.
PBT - Persistent, bioaccumulative and toxic chemicals.
vPvB - Very persistent and very bioaccumulative.
PNEC - Predicted no effect concentration.
DNEL - Derived no-effect level.
LD50 - Lethal dose for 50%.
LC50 - Lethal concentration for 50%.

Advice on any training appropriate for workers to ensure protection of human health and the environment:

Training course should include hazard Information, personal protective equipment and safe handling.

Key literature references and sources for data:

1. https://limitvalue.ifa.dguv.de/
2. Łukasz B, Rybakowska IM, Krakowiak A, Sein Anand J. The health effects of environmental and occupational exposure to aluminum.Medycyna Pracy. 2020;71(1):79-88 doi:10.13075/mp.5893.00887.
3. Riihimäki V, Aitio A. Occupational exposure to aluminum and its biomonitoring in perspective. Crit Rev Toxicol. 2012 Nov;42(10):827-53. doi: 10.3109/10408444.2012.725027. Epub 2012 Sep 27. PMID: 23013241, Abstract.