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Revision Number 1

1. Identification

1.1. Product identifier

Product Code(s) 154
Product Name TABULAR ALUMINA
Synonyms T60/64 CD and all sizes, T160, T162 all sizes, Filter Bed Alumina (FBA), Premix, Tabalox

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended use Refractory Aluminum filter Heat exchanger Inert bed support
Uses advised against No information available

1.3. Details of the supplier of the safety data sheet

Manufacturer

Almatis GmbH
Lyoner Str. 9
60528 Frankfurt
Germany
+ 49 69 9573410

For further information, please contact

E-mail address info@almatis.com

1.4. Emergency telephone number

Emergency Telephone +1 501-776-4677 3E Global Incident Response Hotline (Almatis access code: 334735)

Emergency Telephone - §45 - (EC)1272/2008

Europe 112

2. Hazard(s) identification

2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008

This mixture is classified as not hazardous according to regulation (EC) 1272/2008 [GHS]

2.2. Label elements

This mixture is classified as not hazardous according to regulation (EC) 1272/2008 [GHS]

Hazard statements

This mixture is classified as not hazardous according to regulation (EC) 1272/2008 [GHS]

2.3. Other hazards

No information available

3. Composition/information on ingredients

3.1 Substances

| Chemical name | EC No | CAS No | Weight-% | Classification according to Regulation (EC) No. 1272/2008 [CLP] | REACH registration number |
|----------------|-----------|-----------|----------|---|--|
| Aluminum oxide | 215-691-6 | 1344-28-1 | >99 | - | 01-2119529248-35-0024 01-2119529248-35-0125 01-2119529248-35-0086 01-2119529248-35-0087 |

Full text of H- and EUH-phrases: see section 16

4. First-aid measures

4.1. Description of first aid measures

| | |
|---|--|
| Inhalation | Remove to fresh air. |
| Eye contact | Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician. |
| Skin contact | Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician. |
| Ingestion | Clean mouth with water and drink afterwards plenty of water. |
| Self-protection of the first aider | Do not breathe dust. |

4.2. Most important symptoms and effects, both acute and delayed

| | |
|-----------------|--|
| Symptoms | Contact with dust can cause mechanical irritation or drying of the skin. |
|-----------------|--|

4.3. Indication of any immediate medical attention and special treatment needed

| | |
|---------------------------|------------------------|
| Note to physicians | Treat symptomatically. |
|---------------------------|------------------------|

5. Fire-fighting measures

5.1. Extinguishing media

| | |
|---------------------------------------|---|
| Suitable Extinguishing Media | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Unsuitable extinguishing media | No information available. |

5.2. Special hazards arising from the substance or mixture

| | |
|---|--|
| Specific hazards arising from the chemical | Avoid generation of dust. Fine dust dispersed in air may ignite. |
|---|--|

5.3. Advice for firefighters

Special protective equipment for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation. Avoid generation of dust. Avoid contact with eyes. Use personal protective equipment as required. Do not breathe dust.

Other information Refer to protective measures listed in Sections 7 and 8.

For emergency responders Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so. Prevent dust cloud.

Methods for cleaning up Take up with inert, damp, non-combustible material using clean non-sparking tools and place into loosely covered plastic containers for later disposal. Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections Advices on safe handling: See Section 7 for more information. Personal protective equipment [PPE]: See section 8 for more information. Disposal: See section 13 for more information.

7. Handling and storage

7.1. Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation. Avoid generation of dust. Do not breathe dust. Avoid contact with eyes.

General hygiene considerations Do not breathe dust.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed in a dry and well-ventilated place.

7.3. Specific end use(s)

Specific use(s)
No information available.

Risk Management Methods (RMM) The information required is contained in this Material Safety Data Sheet.

8. Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

| Chemical name | European Union | United Kingdom | France | Spain | Germany |
|-----------------------------|---|--|--|---|---|
| Aluminum oxide 1344-28-1 | - | TWA: 10 mg/m ³ TWA: 4 mg/m ³ | TWA: 10 mg/m ³ | TWA: 10 mg/m ³ | - |
| Chemical name | Italy | Portugal | Netherlands | Finland | Denmark |
| Aluminum oxide 1344-28-1 | - | TWA: 10 mg/m ³ | - | - | TWA: 5 mg/m ³ TWA: 2 mg/m ³ |
| Chemical name | Austria | Switzerland | Poland | Norway | Ireland |
| Aluminum oxide 1344-28-1 | TWA: 5 mg/m ³ STEL 10 mg/m ³ | TWA: 3 mg/m ³ STEL: 24 mg/m ³ | TWA: 2.5 mg/m ³ TWA: 1.2 mg/m ³ | TWA: 10 mg/m ³ STEL: 15 mg/m ³ | TWA: 10 mg/m ³ TWA: 4 mg/m ³ STEL: 30 mg/m ³ STEL: 12 mg/m ³ |

Biological occupational exposure limits

| Chemical name | Austria | Switzerland | Poland | Norway | Ireland |
|-----------------------------|---------|---|--------|--------|---------|
| Aluminum oxide 1344-28-1 | - | 60 µg/g creatinine - urine (Aluminum) - no restrictions | - | - | - |

Derived No Effect Level (DNEL) No information available.

Predicted No Effect Concentration (PNEC) No information available.

8.2. Exposure controls

Engineering controls Apply technical measures to comply with the occupational exposure limits. Showers. Eyewash stations. Ventilation systems.

Personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Hand protection Wear suitable gloves.

Skin and body protection If there is a risk of contact: Wear suitable protective clothing.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

General hygiene considerations Do not breathe dust.

Environmental exposure controls Avoid release to the environment. Avoid creating dust.

9. Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Physical state Solid Powder granules Balls
Appearance white Powder granules Balls
Color white
Odor None.
Odor threshold No information available

| <u>Property</u> | <u>Values</u> | <u>Remarks • Method</u> |
|--|----------------------------|--------------------------|
| pH | No data available | |
| Melting point / freezing point | 2053 °C | |
| Boiling point / boiling range | No data available | None known |
| Flash point | No data available | None known |
| Evaporation rate | No data available | None known |
| Flammability (solid, gas) | No data available | No information available |
| Flammability Limit in Air | | None known |
| Upper flammability or explosive limits | No data available | |
| Lower flammability or explosive limits | No data available | |
| Vapor pressure | No data available | No information available |
| Vapor density | No data available | No information available |
| Relative density | No data available | None known |
| Water solubility | insoluble | |
| Solubility(ies) | insoluble | |
| Partition coefficient | No data available | None known |
| Autoignition temperature | No data available | Does not ignite |
| Decomposition temperature | No data available | No information available |
| Kinematic viscosity | No data available | No information available |
| Dynamic viscosity | No data available | No information available |
| Explosive properties | No information available | |
| Oxidizing properties | No information available | |
| 9.2. Other information | | |
| Softening point | No information available | |
| Molecular weight | No information available | |
| VOC Content (%) | No information available | |
| Liquid Density | 3.5-3.7 g/cm ³ | |
| Bulk density | 800-2800 kg/m ³ | |

10. Stability and reactivity

10.1. Reactivity

| | |
|------------|-------------------------------|
| Reactivity | No information available. |
| Remarks | None under normal processing. |

10.2. Chemical stability

| | |
|-----------|---------------------------------|
| Stability | Stable under normal conditions. |
|-----------|---------------------------------|

Explosion data

| | |
|----------------------------------|-------|
| Sensitivity to mechanical impact | None. |
| Sensitivity to static discharge | None. |

10.3. Possibility of hazardous reactions

| | |
|------------------------------------|-------------------------------|
| Possibility of hazardous reactions | None under normal processing. |
| Hazardous polymerization | None under normal processing. |

10.4. Conditions to avoid

| | |
|---------------------|-----------------------|
| Conditions to avoid | Avoid dust formation. |
|---------------------|-----------------------|

10.5. Incompatible materials

| | |
|------------------------|---|
| Incompatible materials | None known based on information supplied. |
|------------------------|---|

10.6. Hazardous decomposition products

Hazardous decomposition products None under normal processing.

11. Toxicological information**11.1. Information on toxicological effects****Information on likely routes of exposure****Product Information**

| | |
|---------------------|---|
| Inhalation | Specific test data for the substance or mixture is not available. May cause irritation of respiratory tract. |
| Eye contact | Specific test data for the substance or mixture is not available. Dust contact with the eyes can lead to mechanical irritation. |
| Skin contact | Specific test data for the substance or mixture is not available. May cause irritation. |
| Ingestion | Specific test data for the substance or mixture is not available. |

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms No information available.

Numerical measures of toxicity

Oral LD50 > 5000 mg/kg (rat)

Component Information

| Chemical name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|----------------|----------------------|-------------|-----------------|
| Aluminum oxide | > 5000 mg/kg (Rat) | | |

Delayed and immediate effects as well as chronic effects from short and long-term exposure

| | |
|--|---------------------------|
| Skin corrosion/irritation | No information available. |
| Serious eye damage/eye irritation | No information available. |
| Respiratory or skin sensitization | No information available. |
| Germ cell mutagenicity | No information available. |
| Carcinogenicity | No information available. |
| Reproductive toxicity | No information available. |
| STOT - single exposure | No information available. |
| STOT - repeated exposure | No information available. |
| Aspiration hazard | No information available. |

12. Ecological information

12.1. Toxicity

Ecotoxicity Aquatic toxicity is unlikely due to low solubility. Not considered to be harmful to aquatic life.

12.2. Persistence and degradability

Persistence and degradability Not readily biodegradable.

12.3. Bioaccumulative potential

Bioaccumulation Does not bioaccumulate.

12.4. Mobility in soil

Mobility in soil No information available.

Mobility No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment .

| Chemical name | PBT and vPvB assessment |
|----------------|---|
| Aluminum oxide | The substance is not PBT / vPvB PBT assessment does not apply |

12.6. Other adverse effects

Other adverse effects None.

13. Disposal considerations**13.1. Waste treatment methods**

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. Transport information**IMDG**

14.1 UN number Not regulated
 14.2 UN proper shipping name Not regulated
 14.3 Transport hazard class(es) Not regulated
 14.4 Packing group Not regulated
 14.5 Marine pollutant Not applicable
 14.6 Special Provisions None
 14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code No information available

RID

14.1 UN number Not regulated
 14.2 UN proper shipping name Not regulated

| | |
|---------------------------------|----------------|
| 14.3 Transport hazard class(es) | Not regulated |
| 14.4 Packing group | Not regulated |
| 14.5 Environmental hazards | Not applicable |
| 14.6 Special Provisions | None |

ADR

| | |
|---------------------------------|----------------|
| 14.1 UN number | Not regulated |
| 14.2 UN proper shipping name | Not regulated |
| 14.3 Transport hazard class(es) | Not regulated |
| 14.4 Packing group | Not regulated |
| 14.5 Environmental hazards | Not applicable |
| 14.6 Special Provisions | None |

IATA

| | |
|---------------------------------|----------------|
| 14.1 UN number | Not regulated |
| 14.2 UN proper shipping name | Not regulated |
| 14.3 Transport hazard class(es) | Not regulated |
| 14.4 Packing group | Not regulated |
| 14.5 Environmental hazards | Not applicable |
| 14.6 Special Provisions | None |

15. Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****European Union**

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Authorizations and/or restrictions on use:

This product does not contain substances subject to authorization (Regulation (EC) No. 1907/2006 (REACH), Annex XIV) This product does not contain substances subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII)

Persistent Organic Pollutants

Not applicable

Ozone-depleting substances (ODS) regulation (EC) 1005/2009 Not applicable

International Inventories

| | |
|---------------|----------|
| TSCA | Complies |
| DSL/NDSL | Complies |
| EINECS/ELINCS | Complies |
| ENCS | Complies |
| IECSC | Complies |
| KECL | Complies |
| PICCS | Complies |
| AICS | Complies |

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

15.2. Chemical safety assessment

Chemical Safety Report No information available

16. Other information

Key or legend to abbreviations and acronyms used in the safety data sheet

Legend

SVHC: Substances of Very High Concern for Authorization:

Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

| | | | |
|---------|-----------------------------|------|----------------------------------|
| TWA | TWA (time-weighted average) | STEL | STEL (Short Term Exposure Limit) |
| Ceiling | Maximum limit value | * | Skin designation |

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)

U.S. Environmental Protection Agency ChemView Database

European Food Safety Authority (EFSA)

EPA (Environmental Protection Agency)

Acute Exposure Guideline Level(s) (AEGl(s))

U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act

U.S. Environmental Protection Agency High Production Volume Chemicals

Food Research Journal

Hazardous Substance Database

International Uniform Chemical Information Database (IUCLID)

Japan GHS Classification

Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)

NIOSH (National Institute for Occupational Safety and Health)

National Library of Medicine's ChemID Plus (NLM CIP)

National Library of Medicine's PubMed database (NLM PUBMED)

National Toxicology Program (NTP)

New Zealand's Chemical Classification and Information Database (CCID)

Organization for Economic Co-operation and Development Environment, Health, and Safety Publications

Organization for Economic Co-operation and Development High Production Volume Chemicals Program

Organization for Economic Co-operation and Development Screening Information Data Set

RTECS (Registry of Toxic Effects of Chemical Substances)

World Health Organization

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This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer

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relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet