SAFETY DATA SHEET
This safety data sheet was created pursuant to the requirements of:

Issuing Date 19-Feb-2020
Revision date 13-Sep-2021
Revision Number 5

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

1.1. Product identifier
Product Code(s) 1000
Product Name Reactive Alumina Spinel
Synonyms CTC55, E-SY 2000

1.2. Relevant identified uses of the substance or mixture and uses advised against
Recommended use Refractory
Uses advised against No information available

1.3. Details of the supplier of the safety data sheet
Manufacturer Almatis GmbH
Giulinistrasse 2
67065 Ludwigshafen
Germany
Telephone: +49-621-5707-0

For further information, please contact
E-mail address info@almatis.com

1.4. Emergency telephone number
Emergency Telephone GB: +44 20 35147487
UK: 0 800 680 0425

Emergency Telephone - §45 - (EC)1272/2008
Not applicable

SECTION 2: Hazards 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 [CLP]

2.2. Label elements
This mixture is classified as not hazardous according to regulation (EC) 1272/2008 [CLP]
Signal word
None

Hazard statements
This mixture is classified as not hazardous according to regulation (EC) 1272/2008 [CLP]
EUH210 - Safety data sheet available on request
Precautionary Statements - EU (§28, 1272/2008)
P403 + P235 - Store in a well-ventilated place. Keep cool

2.3. Other hazards
No information available

SECTION 3: Composition/information on ingredients

3.1 Substances
Not applicable

3.2 Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>EC No</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>Classification according to Regulation (EC) No. 1272/2008 [CLP]</th>
<th>REACH registration number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>215-691-6</td>
<td>1344-28-1</td>
<td>40-60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

SECTION 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 doctor.
Skin contact Wash skin with soap and water. In the case of skin irritation or allergic reactions see a doctor.
Ingestion Clean mouth with water and drink afterwards plenty of water.

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 doctors Treat symptomatically.

SECTION 5: Firefighting 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.

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.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Personal precautions
Ensure adequate ventilation.

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

Methods for cleaning up
Sweep up and shovel into suitable containers for disposal. Pick up and transfer to properly labelled 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.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Advice on safe handling
Ensure adequate ventilation. Avoid generation of dust. Do not breathe dust. Wash thoroughly after handling.

General hygiene considerations
Handle in accordance with good industrial hygiene and safety practice.

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)
Refractory.

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

SECTION 8: Exposure controls/personal protection
8.1. Control parameters

Exposure Limits

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>United Kingdom</th>
<th>France</th>
<th>Germany</th>
<th>Spain</th>
<th>European Union</th>
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</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 4 mg/m³</td>
<td>TWA: 10 mg/m³</td>
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<tr>
<td>1344-28-1</td>
<td>TWA: 4 mg/m³</td>
<td>TWA: 1.5 mg/m³</td>
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</table>

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Italy</th>
<th>Portugal</th>
<th>Netherlands</th>
<th>Finland</th>
<th>Denmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td></td>
<td>TWA: 10 mg/m³</td>
<td>-</td>
<td>-</td>
<td>TWA: 5 mg/m³</td>
</tr>
<tr>
<td>1344-28-1</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>TWA: 2 mg/m³</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Austria</th>
<th>Switzerland</th>
<th>Poland</th>
<th>Norway</th>
<th>Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 3 mg/m³</td>
<td>TWA: 2.5 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³</td>
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<tr>
<td>1344-28-1</td>
<td>STEL: 10 mg/m³</td>
<td>STEL: 24 mg/m³</td>
<td>STEL: 15 mg/m³</td>
<td>TWA: 4 mg/m³</td>
<td>TWA: 10 mg/m³</td>
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<table>
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<td>TWA: 4 mg/m³</td>
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</table>

Biological occupational exposure limits

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Austria</th>
<th>Switzerland</th>
<th>Poland</th>
<th>Norway</th>
<th>Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>-</td>
<td>60 µg/g creatinine - urine (Aluminum) - no restrictions</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1344-28-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Derived No Effect Level (DNEL) No information available.

Predicted No Effect Concentration (PNEC) No information available

8.2. Exposure controls

Personal protective equipment

Eye/face protection No special protective equipment required.

Eye protection must conform to standard EN 166.

Hand protection Wear suitable gloves.

Gloves must conform to standard EN 374.

Skin and body protection No special protective equipment required.

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 Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls No information available.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Solid</th>
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</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>white Powder</td>
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<tr>
<td>Colour</td>
<td>white</td>
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<tr>
<td>Odour</td>
<td>None.</td>
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</table>
Odour threshold

No information available

<table>
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<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
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<tbody>
<tr>
<td>pH</td>
<td>9.00</td>
<td>aqueous solution</td>
</tr>
<tr>
<td>Melting point / freezing point</td>
<td>1900 - 2135 °C</td>
<td></td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>-</td>
<td>Estimated</td>
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<tr>
<td>Flash point</td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Flammability Limit in Air</td>
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<td>None known</td>
</tr>
<tr>
<td>Upper flammability or explosive</td>
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<td></td>
</tr>
<tr>
<td>limits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower flammability or explosive</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>limits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapour pressure</td>
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<td>None known</td>
</tr>
<tr>
<td>Vapour density</td>
<td>No data available</td>
<td>None known</td>
</tr>
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<td>Relative density</td>
<td>No data available</td>
<td>None known</td>
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<tr>
<td>Water solubility</td>
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</tr>
<tr>
<td>Solubility (es)</td>
<td>Insoluble</td>
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<td>Partition coefficient</td>
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<td>Autoignition temperature</td>
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<td>Does not ignite</td>
</tr>
<tr>
<td>Hyphen</td>
<td>No data available</td>
<td>None known</td>
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<tr>
<td>Kinematic viscosity</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Dynamic viscosity</td>
<td>No data available</td>
<td>None known</td>
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<tr>
<td>Explosive properties</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>No information available</td>
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</tbody>
</table>

9.2. Other information

Softening point

No information available

Molecular weight

No information available

VOC Content (%)

No information available

Liquid Density

=3.2 g/cm³

Bulk density

Not determined

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity

No information available.

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.

10.4. Conditions to avoid

Conditions to avoid

dust formation.

10.5. Incompatible materials

Incompatible materials

None known based on information supplied.

10.6. Hazardous decomposition products
Hazardous decomposition products Not applicable.

SECTION 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.
Eye contact Specific test data for the substance or mixture is not available.
Skin contact Specific test data for the substance or mixture is not available.
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

Product Information

Component Information

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>&gt; 5000 mg/kg (Rat)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Skin corrosion/irritation No information available.

Product Information

Serious eye damage/eye irritation No information available.

Product Information

Respiratory or skin sensitisation No information available.

Product Information

Germ cell mutagenicity No information available.

Product Information

Carcinogenicity No information available.

Product Information

Reproductive toxicity No information available.

Product Information

STOT - single exposure No information available.

Product Information

STOT - repeated exposure No information available.
1000 - REACTIVE ALUMINA SPINEL

Revision date 13-Sep-2021

Product Information

Aspiration hazard
No information available.

SECTION 12: Ecological information

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

Product Information

12.2. Persistence and degradability
Persistence and degradability
No information available.

12.3. Bioaccumulative potential
Bioaccumulation
No information available.

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
The product does not contain any substance(s) classified as PBT or vPvB.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>PBT and vPvB assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>The substance is not PBT / vPvB PBT assessment does not apply</td>
</tr>
</tbody>
</table>

12.6. Other adverse effects
Other adverse effects
No information available.

SECTION 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.

Waste codes / waste designations according to EWC / AVV
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific: 01 03 08.

SECTION 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 Not regulated
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

SECTION 15: Regulatory information

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

Water hazard class (WGK) non-hazardous to water (nwg)

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

Authorisations and/or restrictions on use:
This product does not contain substances subject to authorisation (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 Not Listed
EINECS/ELINCS Complies
ENCS  Complies
IECSC  Not Listed
KECL  Complies
PICCS  Not Listed
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

SECTION 16: Other information

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

Legend
SVHC: Substances of Very High Concern for Authorisation:

Legend  Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION
TWA  TWA (time-weighted average)  STEL  STEL (Short Term Exposure Limit)*  Skin designation
Ceiling  Maximum limit value

Classification procedure
Classification according to Regulation (EC) No. 1272/2008 [CLP]  Method Used
Acute oral toxicity  Calculation method
Acute dermal toxicity  Calculation method
Acute inhalation toxicity - gas  Calculation method
Acute inhalation toxicity - Vapour  Calculation method
Acute inhalation toxicity - dust/mist  Calculation method
Skin corrosion/irritation  Calculation method
Serious eye damage/eye irritation  Calculation method
Respiratory sensitisation  Calculation method
Skin sensitisation  Calculation method
Mutagenicity  Calculation method
Carcinogenicity  Calculation method
Reproductive toxicity  Calculation method
STOT - single exposure  Calculation method
STOT - repeated exposure  Calculation method
Acute aquatic toxicity  Calculation method
Chronic aquatic toxicity  Calculation method
Aspiration hazard  Calculation method
Ozone  Calculation method

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
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus database (NLM CIP)
National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
Organisation 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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14-Sep-2021

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

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information 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