1. Identification

1.1. Product identifier

Product Code(s) 1036
Product Name DISPERSING ALUMINA M-ADS and M-ADW
Synonyms M-ADS Series, M-ADW Series

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

Recommended use Refractory; Construction material
Uses advised against No information available

1.3. Details of the supplier of the safety data sheet

Supplier 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 GB: +44 20 35147487
UK: 0 800 680 0425

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]
EUH210 - Safety data sheet available on request

2.3. Other hazards
May form combustible dust concentrations in air (during handling or processing).
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>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boric acid</td>
<td>233-139-2</td>
<td>10043-35-3</td>
<td>1-5</td>
<td>Repr. 1B (H360FD)</td>
<td>No data available</td>
</tr>
</tbody>
</table>

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

This product contains one or more candidate substance(s) of very high concern (Regulation (EC) No. 1907/2006 (REACH), Article 59)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS No</th>
<th>SVHC candidates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boric acid</td>
<td>10043-35-3</td>
<td>X</td>
</tr>
</tbody>
</table>

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.

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

Symptoms: Mild eye irritant. Mild skin irritant.

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. Do not breathe dust. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Take precautionary measures against static discharges.

**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**

Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

#### 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. Do not breathe dust. Avoid generation of dust. Do not eat, drink or smoke when using this product. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges.

**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 containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Protect from moisture.

#### 7.3. Specific end use(s)
Specific use(s)
Refractory; Construction material.

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

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>European Union</th>
<th>United Kingdom</th>
<th>France</th>
<th>Spain</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide 1344-28-1</td>
<td>-</td>
<td>TWA: 10 mg/m³ TWA: 4 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Boric acid 10043-35-3</td>
<td>-</td>
<td>-</td>
<td>TWA: 2 mg/m³ STEL: 6 mg/m³</td>
<td>-</td>
<td>TWA: 0.5 mg/m³</td>
</tr>
</tbody>
</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 1344-28-1</td>
<td>-</td>
<td>TWA: 10 mg/m³</td>
<td>-</td>
<td>-</td>
<td>TWA: 5 mg/m³ TWA: 2 mg/m³</td>
</tr>
<tr>
<td>Boric acid 10043-35-3</td>
<td>-</td>
<td>TWA: 2 mg/m³ STEL: 6 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</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 1344-28-1</td>
<td>TWA: 5 mg/m³ STEL 10 mg/m³</td>
<td>TWA: 3 mg/m³ STEL: 24 mg/m³</td>
<td>TWA: 2.5 mg/m³ TWA: 1.2 mg/m³</td>
<td>TWA: 10 mg/m³ STEL: 15 mg/m³</td>
<td>TWA: 10 mg/m³ TWA: 4 mg/m³ STEL: 30 mg/m³ STEL: 12 mg/m³</td>
</tr>
<tr>
<td>Boric acid 10043-35-3</td>
<td>-</td>
<td>TWA: 1.8 mg/m³ STEL: 1.8 mg/m³</td>
<td>-</td>
<td>-</td>
<td>TWA: 2 mg/m³ STEL: 6 mg/m³</td>
</tr>
</tbody>
</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 1344-28-1</td>
<td>-</td>
<td>60 µg/g creatinine - urine (Aluminum) - no restrictions</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  Wear safety glasses with side shields (or goggles). EN 166.

Hand protection  Wear suitable gloves. EN 374.

Skin and body protection  Wear fire/flame resistant/retardant clothing. EN 6529.

Respiratory protection  When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

General hygiene considerations  Handle in accordance with good industrial hygiene and safety practice.
Environmental exposure controls  No information available.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Powder</td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td>white Powder</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>white</td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>None.</td>
<td></td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Property</strong></td>
<td><strong>Values</strong></td>
<td><strong>Remarks • Method</strong></td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Melting point / freezing point</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>No data available</td>
<td>None known</td>
</tr>
<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>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Upper flammability or explosive limits</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Lower flammability or explosive limits</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Water solubility</td>
<td>slightly soluble</td>
<td>None data available</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>Partly soluble</td>
<td></td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>-</td>
<td>Does not ignite</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
<td>None known</td>
</tr>
<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>
</tr>
<tr>
<td>Explosive properties</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Softening point</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Molecular weight</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>VOC Content (%)</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Liquid Density</td>
<td>3.9 g/cm³</td>
<td></td>
</tr>
<tr>
<td>Bulk density</td>
<td>900-1000 kg/m³</td>
<td></td>
</tr>
</tbody>
</table>

9.2. Other information

Softening point  No information available
Molecular weight  No information available
VOC Content (%)  No information available
Liquid Density  3.9 g/cm³
Bulk density  900-1000 kg/m³

10. Stability and reactivity

10.1. Reactivity

Reactivity  None under normal use conditions.

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  Avoid accumulation of airborne dust. Keep away from open flames, hot surfaces and sources of ignition.

10.5. Incompatible materials

Incompatible materials  None known based on information supplied.

10.6. Hazardous decomposition products

Hazardous decomposition products  Carbon monoxide. Carbon dioxide (CO2).

11. Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure

Product Information

- Inhalation  May cause irritation.
- Eye contact  Dust contact with the eyes can lead to mechanical irritation.
- Skin contact  Causes mild skin irritation.
- Ingestion  No known hazard by swallowing.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms  No information available.

Numerical measures of toxicity

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Oral LD50 (Rat)</th>
<th>Dermal LD50 (Rabbit)</th>
<th>Inhalation LC50 (Rat) 4 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>&gt; 5000 mg/kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boric acid</td>
<td>= 2660 mg/kg</td>
<td>&gt; 2000 mg/kg</td>
<td>&gt; 0.16 mg/L</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.
- 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.

The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as reproductive toxins.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>European Union</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boric acid</td>
<td>Repr. 1B</td>
</tr>
</tbody>
</table>

STOT - single exposure

No information available.

STOT - repeated exposure

No information available.

Aspiration hazard

No information available.

12. Ecological information

12.1. Toxicity

Ecotoxicity

Not considered to be harmful to aquatic life.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to microorganisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boric acid</td>
<td>-</td>
<td>LC50: (=1020\text{mg/L} \text{ (72h, Carassius auratus)})</td>
<td>-</td>
<td>EC50: 115 - 153\text{mg/L (48h, Daphnia magna)}</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

Persistance and degradability

Product is not biodegradable.

12.3. Bioaccumulative potential

Bioaccumulation

Does not bioaccumulate.

Component Information

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Partition coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boric acid</td>
<td>-0.757</td>
</tr>
</tbody>
</table>

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

<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>
<tr>
<td>Boric acid</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.

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 Catalog, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. 01 03 08.

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 contains one or more substance(s) subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Restricted substance per REACH Annex XVII</th>
<th>Substance subject to authorization per REACH Annex XIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boric acid - 10043-35-3</td>
<td>30.</td>
<td></td>
</tr>
</tbody>
</table>

Persistent Organic Pollutants
Not applicable

Dangerous substance category per Seveso Directive (2012/18/EU)
H2 - ACUTE TOXIC

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

International Inventories

<table>
<thead>
<tr>
<th>Inventory</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSCA</td>
<td>Does not comply</td>
</tr>
<tr>
<td>DSL/NDSL</td>
<td>Does not comply</td>
</tr>
<tr>
<td>EINECS/ELINCS</td>
<td>Does not comply</td>
</tr>
<tr>
<td>ENCS</td>
<td>Complies</td>
</tr>
<tr>
<td>IECSC</td>
<td>Complies</td>
</tr>
<tr>
<td>KECL</td>
<td>Complies</td>
</tr>
<tr>
<td>PICCS</td>
<td>Complies</td>
</tr>
<tr>
<td>AICS</td>
<td>Complies</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Control</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA</td>
<td>STEL</td>
</tr>
<tr>
<td>Ceiling</td>
<td>STEL</td>
</tr>
</tbody>
</table>

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) (AEL(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 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

Prepared By
Product Safety Department
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info@almatis.com

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Revision date
10-Jul-2019

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