SAFETY DATA SHEET

Molsiv Adsorbents 13X APG 4x8
8944901

Version 2.0  Revision Date 05/22/2015  Print Date 04/08/2016

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Molsiv Adsorbents 13X APG 4x8
Number : 8944901
Product Use Description : Adsorbents
Manufacturer or supplier's details : UOP LLC
25 E. Algonquin Road
Des Plaines, IL 60017-5017
USA
Telephone : +1-847-391-2000
Telefax : +1-847-391-2253
In case of emergency call : Medical: 1-800-498-5701 or +1-303-389-1414
Transportation (CHEMTREC): 1-800-424-9300 or
+1-703-527-3887
(24 hours/day, 7 days/week)

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Form : Beads or pellets
Color : white to tan
Odor : none

Classification of the substance or mixture
Classification of the substance : Carcinogenicity, Category 1A, Inhalation or mixture

GHS Label elements, including precautionary statements
Symbol(s):  

Signal word: Danger

Hazard statements: May cause cancer by inhalation.

Precautionary statements:  
- Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required.
- Response: If exposed or concerned: Get medical advice/attention.
- Storage: Store locked up.
- Disposal: Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified: The product gets hot as it first adsorbs water.

Carcinogenicity

NTP: Quartz (SiO2) 14808-60-7  
Known carcinogen

IARC: Quartz (SiO2) 14808-60-7  
Group 1: Carcinogenic to humans

ACGIH: Quartz (SiO2) 14808-60-7  
A2: Suspected human carcinogen
SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Mixture

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zeolite, cuboidal, crystalline, synthetic, non-fibrous</td>
<td>1318-02-1</td>
<td>&gt;70.00 %</td>
</tr>
<tr>
<td>Mineral binder</td>
<td>-</td>
<td>&lt;30.00 %</td>
</tr>
<tr>
<td>Quartz (SiO2)</td>
<td>14808-60-7</td>
<td>&lt;5.00 %</td>
</tr>
</tbody>
</table>

Note : Composition as shown represents the chemical composition of the product and is not representing the composition for inventory purposes. See Section 15 for inventory information.

SECTION 4. FIRST AID MEASURES

Inhalation : Remove to fresh air. If symptoms persist, call a physician.

Skin contact : Wash off with soap and plenty of water. If skin irritation persists, call a physician.

Eye contact : Rinse immediately with plenty of water for at least 15 minutes. If eye irritation persists, consult a physician.

Ingestion : Drink at least 2 glasses of water. Obtain medical attention. Never give anything by mouth to an unconscious person.

Notes to physician

Treatment : This product is a desiccant and generates heat as it adsorbs water. The used product can contain material of a hazardous nature. Identify that material and treat symptomatically.
SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Not combustible.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific hazards during firefighting : The product itself does not burn.
The used product can retain material of a hazardous nature. Identify that material and inform the fire fighters.

Special protective equipment for firefighters : In the case of respirable dust and/or fumes, use self-contained breathing apparatus and dust impervious protective suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions : For personal protection see section 8.

Environmental precautions : No special environmental precautions required.

Methods for cleaning up : Sweep, shovel or vacuum spilled product into appropriate containers (do not use a vacuum if material has contacted a hydrocarbon material).
Pick up and arrange disposal without creating dust.
Never return spills in original containers for re-use.
Spilled product should be disposed of in accordance with all applicable government regulations.

SECTION 7. HANDLING AND STORAGE

Handling

Handling : Handle and open container with care.
Avoid dust formation.
Avoid contact with skin and eyes.
Provide an electrical ground connection during loading and transfer operations to avoid static discharge in an explosive atmosphere and to prevent persons handling the product from receiving static shocks.
A copy of UOP's booklet, "Precautions & Safe Practices for
Handling Zeolite Molecular Sieve Adsorbents in Process Units®, can be obtained from your UOP representative at no cost.

**Storage**

Requirements for storage areas and containers: Store in original container. Keep in a dry place.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

- **Protective measures**: Handle in accordance with good industrial hygiene and safety practice.
- **Engineering measures**: Ensure adequate ventilation, especially in confined areas.
- **Eye protection**: Safety glasses, Safety goggles
- **Hand protection**: Protective gloves
- **Skin and body protection**: Work uniform and gloves to prevent prolonged contact.
- **Respiratory protection**: In case of insufficient ventilation, wear suitable respiratory equipment. Breathing apparatus with filter: NIOSH classification N-100 or if oil/liquid aerosols are present P-100 (42 CFR 84).

**Exposure Guidelines**

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zeolite, cuboidal, crystalline, synthetic, non-fibrous</td>
<td>1318-02-1</td>
<td>TWA: Time weighted average</td>
<td>1 mg/m³</td>
<td>2008</td>
<td>ACGIH:US. ACGIH Threshold Limit Values</td>
</tr>
<tr>
<td>Quartz (SiO₂)</td>
<td>14808-60-7</td>
<td>TWA: Time weighted average</td>
<td>0.025 mg/m³</td>
<td>2008</td>
<td>ACGIH:US. ACGIH Threshold Limit Values</td>
</tr>
</tbody>
</table>

Further information: Form of exposure: Respirable fraction.
<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quartz (SiO2)</strong></td>
<td>14808-60-7</td>
<td>REL: Recommended exposure limit (REL):</td>
<td>0.05 mg/m³</td>
<td>2005</td>
</tr>
<tr>
<td>Further information</td>
<td>Form of exposure: Respirable dust.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quartz (SiO2)</strong></td>
<td>14808-60-7</td>
<td>TWA: Time weighted average</td>
<td>0.1 mg/m³</td>
<td>1989</td>
</tr>
<tr>
<td>Further information</td>
<td>Form of exposure: Respirable dust.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quartz (SiO2)</strong></td>
<td>14808-60-7</td>
<td>TWA: Time weighted average</td>
<td>2.4 millions of particles per cubic foot of air The exposure limit is calculated from the equation, 250/((%SiO2+5) , using a value of 100% SiO2. Lower percentages of SiO2 will yield higher exposure limits.</td>
<td>2000</td>
</tr>
<tr>
<td>Further information</td>
<td>Form of exposure: Respirable.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### SAFETY DATA SHEET

**Molsiv Adsorbents 13X APG 4x8**

**8944901**

**Version 2.0**  
**Revision Date 05/22/2015**  
**Print Date 04/08/2016**

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS Number</th>
<th>TWA: Time weighted average</th>
<th>Exposure Limit</th>
<th>Z3: US. OSHA Table Z-3 (29 CFR 1910.1000)</th>
</tr>
</thead>
</table>
| Quartz (SiO2) | 14808-60-7 | 0.1 mg/m³  
The exposure limit is calculated from the equation, 10/(%SiO2+2), using a value of 100% SiO2. Lower percentages of SiO2 will yield higher exposure limits. | 2000 |  |
| Further information | Form of exposure: Respirable. | | | |

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS Number</th>
<th>TWA: Time weighted average</th>
<th>Exposure Limit</th>
<th>Z3: US. OSHA Table Z-3 (29 CFR 1910.1000)</th>
</tr>
</thead>
</table>
| Quartz (SiO2) | 14808-60-7 | 0.3 mg/m³  
The exposure limit is calculated from the equation, 30/(%SiO2+2), using a value of 100% SiO2. Lower values of % SiO2 will give higher exposure limits. | 2000 |  |
| Further information | Form of exposure: Total dust. | | | |

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- **Physical state**: Beads or pellets
- **Color**: white to tan
- **Odor**: none
- **pH**: Note: Not applicable
SAFETY DATA SHEET

Molsiv Adsorbents 13X APG 4x8
8944901

Version 2.0Revision Date 05/22/2015Print Date 04/08/2016

<table>
<thead>
<tr>
<th>Property</th>
<th>Value/Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point/range</td>
<td>&gt; 400 °C</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>Note: Not applicable</td>
</tr>
<tr>
<td>Flash point</td>
<td>Note: Not applicable</td>
</tr>
<tr>
<td>Density</td>
<td>&gt; 2.0 g/cm³</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>&gt; 1.0</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Note: Insoluble</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>Note: Insoluble</td>
</tr>
<tr>
<td>Bulk density</td>
<td>Note: For further information, refer to the product technical data sheet.</td>
</tr>
</tbody>
</table>

SECTION 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value/Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical stability</td>
<td>Stable</td>
</tr>
<tr>
<td>Incompatible materials to avoid</td>
<td>Sudden contact with high concentrations of chemicals having high heats of adsorption such as olefins, HCl, etc. When first wetted, the product can heat up to the boiling point of water. Flood with water to cool material.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>No decomposition if used as directed. Hydrocarbons and other materials that contact the product during normal use can be retained on the product. It is reasonable to expect that decomposition products will</td>
</tr>
</tbody>
</table>
come from these retained materials of use.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity : LD50 Oral: > 32,000 mg/kg
Species: Rat

Acute inhalation toxicity : Note: no data available

Acute dermal toxicity : LD50 Dermal: > 2,000 mg/kg
Species: Rabbit

Skin irritation : Species: Rabbit
Classification: Not classified as a skin irritant in animal testing.

Eye irritation : Species: Rabbit
Result: mild transient effects

Further information : Note: The toxicological data has been taken from products of similar composition.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Toxicity to fish : Note: no data available

Toxicity to daphnia and other aquatic invertebrates : Note: no data available

Toxicity to algae : Note: no data available
Elimination information (persistence and degradability)

Bioaccumulation : Note: no data available

Mobility : Note: no data available

Biodegradability : Note: no data available

Further information on ecology

Additional ecological information : No information on ecology is available.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods : This product (in its fresh unused state) is not listed by generic name or trademark name in the U.S. EPA’s RCRA regulations and does not possess any of the four identifying characteristics of hazardous waste (ignitability, corrosivity, reactivity or toxicity). Materials of a hazardous nature that contact the product during normal use may be retained on this product. The user of the product must identify the hazards associated with the retained material in order to assess the waste disposal options.

SECTION 14. TRANSPORT INFORMATION

DOT Not dangerous goods

TDG Not dangerous goods

IATA Not dangerous goods

IMDG Not dangerous goods

SECTION 15. REGULATORY INFORMATION
Inventories

US. Toxic Substances Control Act : On the inventory, or in compliance with the inventory

Australia. Industrial Chemical (Notification and Assessment) Act : On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA), Domestic Substances List (DSL) : All components of this product are on the Canadian DSL.

Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory

Korea. Toxic Chemical Control Law (TCCL) List : On the inventory, or in compliance with the inventory

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act : On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances : On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand : On the inventory, or in compliance with the inventory

Note : Zeolites are considered Statutory Mixtures for Inventory purposes, for more information, contact SafetyDataSheet@honeywell.com.

National regulatory information

SARA 302 Components : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Quartz (SiO2) 14808-60-7

SARA 313 Components : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis)
reporting levels established by SARA Title III, Section 313.
- Quartz (SiO2) 14808-60-7

SARA 311/312 Hazards
- Chronic Health Hazard

California Prop. 65
- WARNING! This product contains a chemical known to the State of California to cause cancer.
  - Quartz (SiO2) 14808-60-7

Massachusetts RTK
- Quartz (SiO2) 14808-60-7

New Jersey RTK
- Quartz (SiO2) 14808-60-7

Pennsylvania RTK
- Quartz (SiO2) 14808-60-7

WHMIS Classification
- D2A: Very Toxic Material Causing Other Toxic Effects
  This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

SECTION 16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>Health hazard</th>
<th>HMIS III</th>
<th>NFPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>1*</td>
<td>1</td>
</tr>
<tr>
<td>Physical Hazard</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Instability</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* - Chronic health hazard

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

Further information
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. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.
Previous Issue Date: 02/07/2015
Prepared by Honeywell Performance Materials and Technologies Product Stewardship Group
SAFETY DATA SHEET
Aluminosilicate ..............

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

PRODUCT NAME
Aluminosilicate ..............

SYNONYMS, TRADE NAMES
Sylosiv....................., Crystalline Aluminosilicate, , Molecular Sieve..............Z3-01, Z3-02, Z3-03, Z3-03M, Z3-03EP, Z3-04, 3A-8KM, 3A-9KM, Sylobead MS C.........512, 514, 518, 522, 542, 544, 548, 562, 564, , Zeochem.........

SUPPLIER
UNIVAR LTD
46 Peckover Street
BRADFORD
West Yorkshire
United Kingdom
BD1 5BD
Tel: +44 1274 377000
Fax: +44 1274 377001
sds@univareurope.com

SDS No.
S908

Emergency Contact Number (Office Hours) +44 1274 377070

2 HAZARDS IDENTIFICATION

CLASSIFICATION -

3 COMPOSITION/INFORMATION ON INGREDIENTS

EC (EINECS) NO. 215-283-8
CAS-N0. 1318-02-1

4 FIRST-AID MEASURES

INHALATION
Move the exposed person to fresh air at once. Rinse nose and mouth with water. Get medical attention if any discomfort continues.

INGESTION
Immediately rinse mouth and provide fresh air. Get medical attention if any discomfort continues. Do not induce vomiting.

SKIN CONTACT
Remove affected person from source of contamination. Remove contaminated clothing. Wash the skin immediately with soap and water. Get medical attention if any discomfort continues.

EYE CONTACT
Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA
This product is not flammable. Use fire-extinguishing media appropriate for surrounding materials.

PROTECTIVE MEASURES IN FIRE
Wear full protective clothing.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS
Wear protective clothing as described in Section 8 of this safety data sheet.
ENVIROMENTAL PRECAUTIONS
Do not discharge onto the ground or into water courses.

SPILL CLEAN UP METHODS
Avoid generation and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS
Avoid spilling, skin and eye contact. Avoid handling which leads to dust formation.

STORAGE PRECAUTIONS
Store in tightly closed original container in a dry, cool and well-ventilated place. Keep in original container.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

PROTECTIVE EQUIPMENT

ENGINEERING MEASURES
Provide adequate ventilation. Observe Workplace Exposure Limits and minimise the risk of inhalation of dust.

RESPIRATORY EQUIPMENT
No specific recommendation made, but protection against nuisance dust must be used when the general level exceeds 10 mg/m3.

HAND PROTECTION
Use suitable protective gloves if risk of skin contact.

EYE PROTECTION
Wear approved safety goggles.

HYGIENE MEASURES
DO NOT SMOKE IN WORK AREA! Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes contaminated. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE
Powder, dust Solid Pellets

COLOUR
White Beige.

ODOUR
Odourless

SOLUBILITY
Insoluble in water

pH-VALUE, CONC. SOLUTION
9.0 - 11.5

10 STABILITY AND REACTIVITY

STABILITY
Stable under normal temperature conditions.

CONDITIONS TO AVOID
Avoid excessive heat for prolonged periods of time.

11 TOXICOLOGICAL INFORMATION

TOXIC DOSE 1 - LD 50 >10000 mg/kg (oral rat)

INHALATION
Dust in high concentrations may irritate the respiratory system.

INGESTION
May cause discomfort if swallowed.
**Aluminosilicate**

**SKIN CONTACT**
Powder may irritate skin.

**EYE CONTACT**
Particles in the eyes may cause irritation and smarting.

### 12 ECOLOGICAL INFORMATION

**ECOTOXICITY**
Not regarded as dangerous for the environment.

- **LC 50, 96 Hrs, FISH mg/l**
  - 1800 - 3200

- **EC 50, 48 Hrs, DAPHNIA, mg/l**
  - 1000 - 1800

**MOBILITY**
The product is insoluble in water.

### 13 DISPOSAL CONSIDERATIONS

**DISPOSAL METHODS**
Dispose of waste and residues in accordance with local authority requirements.

### 14 TRANSPORT INFORMATION

**ROAD TRANSPORT NOTES**
Not Classified

**RAIL TRANSPORT NOTES**
Not Classified.

**SEA TRANSPORT NOTES**
Not Classified.

**AIR TRANSPORT NOTES**
Not Classified.

### 15 REGULATORY INFORMATION

**RISK PHRASES**
- NC Not classified.

**STATUTORY INSTRUMENTS**
Chemicals (Hazard Information and Packaging) Regulations.

**APPROVED CODE OF PRACTICE**
Classification and Labelling of Substances and Preparations Dangerous for Supply. Safety Data Sheets for Substances and Preparations.

**GUIDANCE NOTES**
Workplace Exposure Limits EH40. CHIP for everyone HSG(108).

### 16 OTHER INFORMATION

- **ISSUED BY**
  - Univar Ltd
- **REV. NO./REPL. SDS GENERATED**
  - 03
- **SDS NO.**
  - S908
- **SAFETY DATA SHEET STATUS**
  - Approved.
- **DATE**
  - 24th January 2007
- **SIGNATURE**
  - Jitendra Panchal
SAFETY DATA SHEET

(REACH regulation (EC) n° 1907/2006 - n° 453/2010)

SECTION 1 : IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier
   Product name : A.A. GRADE D
   Product code : 11599

1.2. Relevant identified uses of the substance or mixture and uses advised against
   Adsorbent for gas and liquid treatment. (For further information, refer to the product technical data sheet).
   Active Alumina

1.3. Details of the supplier of the safety data sheet
   Registered company name : Axens.
   Address : 89, Boulevard FRANKLIN ROOSEVELT.92508.RUEIL-MALMAISON.FRANCE.
   Telephone : +33 (0)1 47 14 21 00.     Fax : +33 (0)1 47 51 87 95.
   fds@axens.net
   http://www.axens.net

1.4. Emergency telephone number : +33.(0)1.45.42.59.59.
   Other emergency numbers
   International Emergency Telephone Number (CARECHEM) :
   +44(0) 1235 239 670 : (Europe, Americas, Middle East, Africa, Israel (Europe and English Language speaking countries)
   +44(0) 1235 239 671 : Middle East/Africa (Arabic speaking countries)
   Asia-Pacific region (excluding China) : +65 3158 1074
   China : +86 10 5100 3039
   USA/Canada : +1 215 207 0061

SECTION 2 : HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture
   In compliance with EC regulation No. 1272/2008 and its amendments.
   This mixture does not present a physical hazard. Refer to the recommendations regarding the other products present on the site.
   This mixture does not present a health hazard with the exception of possible occupational exposure thresholds (see paragraphs 3 and 8).
   This mixture does not present an environmental hazard. No known or foreseeable environmental damage under standard conditions of use.

2.2. Label elements
   No labelling requirements for this mixture.
   Safety phrase :
   S 22 Do not breathe dust.

2.3. Other hazards
   The mixture does not contain any substances classified as ‘Substances of Very High Concern’ (SVHC) by the European Chemicals Agency

Made under licence of European Label System, Software of INFODYNE (http://www.infodyne.fr)
The mixture satisfies neither the PBT nor the vPvB criteria for mixtures in accordance with annexe XIII of the REACH regulations EC 1907/2006. Avoid the formation or spread of dust in the atmosphere.

SECTION 3 : COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

<table>
<thead>
<tr>
<th>Identification</th>
<th>(EC) 1272/2008</th>
<th>67/548/EEC</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDEX: 1344_28_1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS: 1344-28-1</td>
<td></td>
<td></td>
<td>[1]</td>
</tr>
<tr>
<td>EC: 215-691-6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REACH: 01-2119529248-35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALUMINIUM OXIDE</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: [1] Substance for which maximum workplace exposure limits are available.

SECTION 4 : FIRST AID MEASURES

As a general rule, in case of doubt or if symptoms persist, always call a doctor. NEVER induce swallowing by an unconscious person.

4.1. Description of first aid measures

In the event of exposure by inhalation:
Move the affected person away from the contaminated area and into the fresh air.

In the event of splashes or contact with eyes:
Wash thoroughly with soft, clean water for 15 minutes holding the eyelids open. If there is any redness, pain or visual impairment, consult an ophthalmologist.

In the event of splashes or contact with skin:
Watch out for any remaining product between skin and clothing, watches, shoes, etc. Rinse with plenty of water.

In the event of swallowing:
Seek medical attention, showing the label. Rinse mouth out with water.

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

The main symptoms and effects known are described in the label (§ 2) and / or in section 11.

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

Symptomatic treatment.

SECTION 5 : FIREFIGHTING MEASURES

Non-flammable.

5.1. Extinguishing media

Suitable methods of extinction
All extinguishing agents can be used.

Unsuitable methods of extinction
None to our knowledge. If there is a fire close by, use suitable extinguishing agents.

5.2. Special hazards arising from the substance or mixture

A fire will often produce a thick black smoke. Exposure to decomposition products may be hazardous to health. Do not breathe in smoke.

In the event of a fire, the following may be formed:
- carbon dioxide (CO2)

5.3. Advice for firefighters

No data available.

SECTION 6 : ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Consult the safety measures listed under headings 7 and 8.
Since the product is in the form of balls, it can cause the floor to be very slippery. For fire-fighters

Fire-fighters will be equipped with suitable personal protective equipment (See section 8).

6.2. Environmental precautions

Prevent any material from entering drains or waterways.

6.3. Methods and material for containment and cleaning up

Retrieve the product by mechanical means (sweeping/vacuuming). If necessary, wash with water following recovery.

6.4. Reference to other sections

No data available.

SECTION 7 : HANDLING AND STORAGE

Requirements relating to storage premises apply to all facilities where the mixture is handled.

7.1. Precautions for safe handling

Always wash hands after handling.

Does not require any specific or particular measures.

Avoid the formation or spread of dust in the atmosphere.

Ventilation.

Fire prevention:

Prevent access by unauthorised personnel.

Recommended equipment and procedures:

For personal protection, see section 8.

Observe precautions stated on label and also industrial safety regulations.

Prohibited equipment and procedures:

No smoking, eating or drinking in areas where the mixture is used.

7.2. Conditions for safe storage, including any incompatibilities

No data available.

Storage

Keep away from incompatible materials.

Keep the container tightly closed in a cool, well ventilated place.

To guarantee the quality and properties of the product keep:

- protected from humidity and bad weather conditions.

Packaging

Always keep in packaging made of an identical material to the original.

7.3. Specific end use(s)

No data available.

SECTION 8 : EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Occupational exposure limits:

- ACGIH TLV (American Conference of Governmental Industrial Hygienists, Threshold Limit Values, 2010):

<table>
<thead>
<tr>
<th>CAS</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
<th>Definition</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1344-28-1</td>
<td>10 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- Australia (NOHSC: 3008, 1995):

<table>
<thead>
<tr>
<th>CAS</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
<th>Definition</th>
<th>Criteria</th>
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</thead>
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<td>-</td>
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<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- Belgium (Order of 19/05/2009, 2010):

<table>
<thead>
<tr>
<th>CAS</th>
<th>TWA</th>
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<th>Ceiling</th>
<th>Definition</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
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<td>10 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- Canada / Alberta (Occupational health and safety code, 2009):

<table>
<thead>
<tr>
<th>CAS</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
<th>Definition</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1344-28-1</td>
<td>10 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- Canada / British Colombia (2009):

<table>
<thead>
<tr>
<th>CAS</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
<th>Definition</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1344-28-1</td>
<td>10 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- Canada / Quebec (Regulations on occupational health and safety):

<table>
<thead>
<tr>
<th>CAS</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
<th>Definition</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1344-28-1</td>
<td>10 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>T</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
<th>Definition</th>
<th>Criteria</th>
</tr>
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<td>10 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>T</td>
</tr>
</tbody>
</table>

Made under licence of European Label System, Software of INFODYNE (http://www.infodyne.fr)
### Derived no effect level (DNEL) or derived minimum effect level (DMEL):

**ALUMINA/BOEHMITE**: DNEL: 3000 µg/m³ (in Al₂O₃)

### Predicted no effect concentration (PNEC):

**ALUMINIUM OXIDE (CAS: 1344-28-1)**

<table>
<thead>
<tr>
<th>Environmental compartment:</th>
<th>Fresh water.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNEC</td>
<td>0.0749 mg/l</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental compartment:</th>
<th>Waste water treatment plant.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNEC</td>
<td>20 mg/l</td>
</tr>
</tbody>
</table>

### 8.2. Exposure controls

**Personal protection measures, such as personal protective equipment**

Pictogram(s) indicating the obligation of wearing personal protective equipment (PPE):

[Image]

- **Eye / face protection**
  - Avoid contact with eyes.
  - Before handling powders or dust emission, wear mask goggles in accordance with standard EN166.
  - Safety spectacles with side shields.

- **Hand protection**
  - Wear suitable protective gloves in the event of prolonged or repeated skin contact.
  - Type of gloves recommended:
- Natural latex
- Nitrile rubber (butadiene-acrylonitrile copolymer rubber (NBR))
- Neoprene® (Polychloroprene)
- PVC (polyvinyl chloride)
Recommended properties:
- Impervious gloves in accordance with standard EN374

- Body protection
Work clothing worn by personnel shall be laundered regularly.
After contact with the product, all parts of the body that have been soiled must be washed.
Protective clothing with elasticated cuffs and closed neck.

- Respiratory protection
Avoid breathing dust.
Type of FFP mask:
Wear a disposable half-mask dust filter in accordance with standard EN149.
Category:
- FFP1
- P1 (White)

SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Solid in granules.</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>Flash point interval</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>Vapour pressure (50°C)</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>Density</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Insoluble.</td>
</tr>
<tr>
<td>Melting point/melting range</td>
<td>2000 °C.</td>
</tr>
<tr>
<td>Self-ignition temperature</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>Decomposition point/decomposition range</td>
<td>Not relevant.</td>
</tr>
</tbody>
</table>

9.2. Other information
No data available.

SECTION 10 : STABILITY AND REACTIVITY

10.1. Reactivity
No data available.

10.2. Chemical stability
This mixture is stable under the recommended handling and storage conditions in section 7.

10.3. Possibility of hazardous reactions
No data available.

10.4. Conditions to avoid
Avoid:
- formation of dusts

10.5. Incompatible materials
Keep away from:
- strong acids
- strong bases
- strong oxidising agents

10.6. Hazardous decomposition products
The thermal decomposition may release/form:
- carbon monoxide (CO)
- carbon dioxide (CO2)

SECTION 11 : TOXICOLOGICAL INFORMATION
11.1. Information on toxicological effects

No data available.

11.1.1. Substances

Acute toxicity :

ALUMINIUM OXIDE (CAS: 1344-28-1)

Oral route :  
LD<sub>50</sub> > 2000 mg/kg  
Species : Rat  
OCDE Ligne directrice 401 (Toxicité aiguë par voie orale)

Inhalation route :  
LC<sub>50</sub> > 2.3 mg/l  
Species : Rat  
OCDE Ligne directrice 403 (Toxicité aiguë par inhalation)

11.1.2. Mixture

The product has not been tested. The indication is based on the properties of the different components.

Acute toxicity :

negative

Skin corrosion/skin irritation :

Prolonged or repeated exposure may cause skin irritation and dermatitis due to the defatting properties of the product.

Serious damage to eyes/eye irritation :

May cause irritation to eyes due to the presence of a foreign body.

Respiratory or skin sensitisation :

negative

Germ cell mutagenicity :

negative

Carcinogenicity :

negative

Reproductive toxicant :

negative

Specific target organ systemic toxicity - single exposure :

negative

Specific target organ systemic toxicity - repeated exposure :

negative

Symptoms related to the physical, chemical and toxicological characteristics

no data

SECTION 12 : ECOLOGICAL INFORMATION

12.1. Toxicity

Not harmful to aquatic life.

12.1.1. Substances

ALUMINIUM OXIDE (CAS: 1344-28-1)

Fish toxicity :

LC<sub>50</sub> > 100 mg/l  
Species : Salmo trutta  
Duration of exposure : 96 h  
OCDE Ligne directrice 203 (Poisson, essai de toxicité aiguë)

Crustacean toxicity :

EC<sub>50</sub> > 100 mg/l  
Species : Daphnia magna  
Duration of exposure : 48 h  
OCDE Ligne directrice 202 (Daphnia sp., essai d'immobilisation immédiate)

Algae toxicity :

EC<sub>50</sub> > 100 mg/l  
Species : Selenastrum capricornutum  
Duration of exposure : 72 h  
OCDE Ligne directrice 201 (Algues, Essai d'inhibition de la croissance)

12.1.2. Mixtures

The product has not been tested. The indication is based on the properties of the different components.
12.2. Persistence and degradability
Inert mineral product. Not degradable.

12.2.1. Substances
ALUMINIUM OXIDE (CAS: 1344-28-1)
Biodegradability: no degradability data is available, the substance is considered as not degrading quickly.

12.3. Bioaccumulative potential
Slightly bioaccumulative.

12.4. Mobility in soil
Slightly soluble product, readily forms deposits.

12.5. Results of PBT and vPvB assessment
Complies with annexe XIII of regulation CE 1907/2006 (REACH): not applicable to inorganic substances.

12.6. Other adverse effects
No data available.

SECTION 13 : DISPOSAL CONSIDERATIONS
Proper waste management of the mixture and/or its container must be determined in accordance with Directive 2008/98/EC.
Unused material may be incinerated or landfilled in facilities meeting local regulations.

13.1. Waste treatment methods
Do not pour into drains or waterways.

Waste:
Waste management is carried out without endangering human health, without harming the environment and, in particular without risk to water, air, soil, plants or animals.
Recycle or dispose of waste in compliance with current legislation, preferably via a certified collector or company.
Do not contaminate the ground or water with waste, do not dispose of waste into the environment.
The exhausted catalysts may have different risks and properties compared to the original product. This safety data sheet is not applicable to exhausted catalysts.

Soiled packaging:
Empty container completely. Keep label(s) on container.
Empty containers should be taken to local recyclers for disposal. Refer to local regulations.

06 03 16 metallic oxides other than those mentioned in 06 03 15

SECTION 14 : TRANSPORT INFORMATION
Exempt from transport classification and labelling.

SECTION 15 : REGULATORY INFORMATION
15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
- Classification and labelling information included in section 2:
The following regulations have been used:
- Directive 1999/45/EC and its adaptations
- Regulation EC 1272/2008 modified by regulation EC 618/2012
- EU Regulation No. 1272/2008 amended by EU Regulation No. 758/2013.

- Container information:
No data available.

- Particular provisions:
No data available.

15.2. Chemical safety assessment
No data available.

SECTION 16 : OTHER INFORMATION
Since the user's working conditions are not known by us, the information supplied on this safety data sheet is based on our current level of
knowledge and on national and community regulations. The mixture must not be used for other uses than those specified in section 1 without having first obtained written handling instructions. It is at all times the responsibility of the user to take all necessary measures to comply with legal requirements and local regulations. The information in this safety data sheet must be regarded as a description of the safety requirements relating to the mixture and not as a guarantee of the properties thereof.

Abbreviations:

- PNEC: Predicted No-Effect Concentration
- ADR: European agreement concerning the international carriage of dangerous goods by Road.
- IATA: International Air Transport Association.
- ICAO: International Civil Aviation Organisation
- RID: Regulations concerning the International carriage of Dangerous goods by rail.
- WGK: Wassergefährdungsklasse (Water Hazard Class).
- PROC: Process Category
- ERC: Environmental Release Category
- PC: Market sector by type of Chemical Product
- SU: Sector of end Use