## Section 1. Identification

<table>
<thead>
<tr>
<th>Product name</th>
<th>: Alumina hydrate - dried</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name</td>
<td>: aluminium hydroxide</td>
</tr>
<tr>
<td>Product code</td>
<td>: 219</td>
</tr>
<tr>
<td>Product type</td>
<td>: Powder</td>
</tr>
</tbody>
</table>

### Relevant identified uses of the substance or mixture and uses advised against

**Material uses**: Industrial applications: feedstock for the manufacture of aluminium oxide and other aluminium containing compounds, including aluminium fluoride, aluminium sulphate, PAC, zeolites, and sodium aluminate. Coatings for titania. Filler for plastics, resins, rubbers, paper, paints, as a flame retardant and smoke suppressant for polymers. Additive to glass and various ceramic and refractory formulations.

**Supplier's details**: Rio Tinto Aluminium

North America:
400-1190 Avenue des Canadiens-de-Montréal,
Montreal, Quebec H3B 0E3, Canada
Telephone: +1 514 848 8000

Europe-Middle East-Africa:
Tour Reflets CB16
17 place des Reflets
92097 Paris La-Défense Cedex, France
Telephone: +33 1 57 00 20 01

Asia Pacific:
123 Albert Street, Brisbane, 4000, Australia
Telephone: +61 7 3625 3000 (BH)

12 Marina Boulevard, #20-01
Marina Bay Financial Centre Tower 3
Singapore 018982
Telephone: +65 6679 9000

e-mail address of person responsible for this SDS: rta.msds@riotinto.com

**Emergency telephone number**: +1 215 207 0061 (Rio Tinto Aluminium)
For advice on chemical emergencies, spillages, fires or first aid.
Section 2. Hazard identification

Classification of the substance or mixture
: Not classified.

GHS label elements

Signal word
: No signal word.

Hazard statements
: No known significant effects or critical hazards.

Precautionary statements

Prevention
: Not applicable.

Response
: Not applicable.

Storage
: Not applicable.

Disposal
: Not applicable.

Other hazards which do not result in classification
: Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.

Section 3. Composition/information on ingredients

Substance/mixture
: Substance

Chemical name
: aluminium hydroxide

CAS number/other identifiers

CAS number
: 21645-51-2

Product code
: 219

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>% (w/w)</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>aluminium hydroxide</td>
<td>100</td>
<td>21645-51-2</td>
</tr>
</tbody>
</table>

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact
: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

Inhalation
: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Skin contact
: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

Ingestion
: Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact
: Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.

Inhalation
: Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.

Skin contact
: No known significant effects or critical hazards.

Ingestion
: No known significant effects or critical hazards.

Over-exposure signs/symptoms

Date of issue/Date of revision
: 12/06/2016

Version
: 1
**Section 4. First aid measures**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye contact</td>
<td>Adverse symptoms may include the following: irritation, redness</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Adverse symptoms may include the following: respiratory tract irritation, coughing</td>
</tr>
<tr>
<td>Skin contact</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

**Protection of first-aiders**

No action shall be taken involving any personal risk or without suitable training.

**Notes to physician**

Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments**

No specific treatment.

See toxicological information (Section 11)

**Section 5. Fire-fighting measures**

**Extinguishing media**

- Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media: None known.

**Specific hazards arising from the chemical**

- No specific fire or explosion hazard.
- Hazardous thermal decomposition products: None.

**Special protective actions for fire-fighters**

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters**

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

**Section 6. Accidental release measures**

**Environmental precautions**

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

- **Small spill**: Recycle, if possible. Waste must be disposed of according to applicable regulations.
- **Large spill**: Avoid creating dusty conditions and prevent wind dispersal. Note: see Section 1 for emergency contact information and Section 13 for waste disposal. Waste must be disposed of according to applicable regulations. Recycle, if possible.
Section 7. Handling and storage

Precautions for safe handling

Protective measures
Put on appropriate personal protective equipment (see Section 8). Avoid breathing dust.

Advice on general occupational hygiene
Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities
Store in accordance with local regulations. Store so as to avoid dust generation and dispersal.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>aluminium hydroxide</td>
<td>CA British Columbia Provincial (Canada, 5/2015). TWA: 1 mg/m³ 8 hours. Form: Respirable</td>
</tr>
<tr>
<td></td>
<td>CA Ontario Provincial (Canada, 7/2015). TWA: 1 mg/m³ 8 hours. Form: Respirable fraction</td>
</tr>
</tbody>
</table>

Appropriate engineering controls
Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls
Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures
Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection
Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields. If operating conditions cause high dust concentrations to be produced, use dust goggles.

Skin protection

Hand protection
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection
Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection
Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.
Section 9. Physical and chemical properties

**Appearance**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical state</strong></td>
<td>Solid. [Powder.]</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>White. Pale color.</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>Odorless.</td>
</tr>
<tr>
<td><strong>Odor threshold</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Melting point</strong></td>
<td>2072°C (3761.6°F)</td>
</tr>
<tr>
<td><strong>Boiling point</strong></td>
<td>2977°C (5390.6°F)</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Evaporation rate</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>Non-flammable in the presence of the following materials or conditions: open flames, sparks and static discharge, heat, shocks and mechanical impacts, oxidizing materials, reducing materials, combustible materials, organic materials, metals, acids, alkalis and moisture.</td>
</tr>
<tr>
<td><strong>Lower and upper explosive (flammable) limits</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Vapor pressure</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Vapor density</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Bulk density</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Granulometry</strong></td>
<td>5 - 110 Microns</td>
</tr>
<tr>
<td><strong>Relative density</strong></td>
<td>2.4</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>Insoluble in the following materials: cold water and hot water.</td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Auto-ignition temperature</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>180°C (356°F)</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

**Reactivity**

No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability**

The product is stable.

**Possibility of hazardous reactions**

Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid**

No specific data.

**Incompatible materials**

Not applicable

**Hazardous decomposition products**

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

**Information on toxicological effects**

**Acute toxicity**

Conclusion/Summary: No known significant effects or critical hazards.

**Irritation/Corrosion**

**Skin**: No significant irritation expected other than possible mechanical irritation.

**Eyes**: May cause mild eye irritation.

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Version: 1
Section 11. Toxicological information

Respiratory Sensitization

Conclusion/Summary

Skin

Mutagenicity

Conclusion/Summary

Carcinogenicity

Conclusion/Summary

Reproductive toxicity

Conclusion/Summary

Teratogenicity

Conclusion/Summary

Specific target organ toxicity (single exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specific target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Aspiration hazard

Information on the likely routes of exposure

Potential acute health effects

Eye contact

Inhalation

Skin contact

Ingestion

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact

Inhalation

Skin contact

Ingestion

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects

Potential delayed effects

Long term exposure

Potential immediate effects

Potential delayed effects

<table>
<thead>
<tr>
<th>Date of issue/Date of revision</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/06/2016</td>
<td>1</td>
</tr>
</tbody>
</table>
Section 11. Toxicological information

Potential chronic health effects

Conclusion/Summary: No known significant effects or critical hazards.

General: Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

Carcinogenicity: No known significant effects or critical hazards.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>aluminium hydroxide</td>
<td>EC50 &gt;100 mg/l</td>
<td>Algae - Selenastrum capricornutum</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>EC50 &gt;100 mg/l</td>
<td>Daphnia - Daphnia magna</td>
<td>46 hours</td>
</tr>
<tr>
<td></td>
<td>EC50 &gt;100 mg/l</td>
<td>Fish - Salmo trutta</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

Conclusion/Summary: No known significant effects or critical hazards.

Persistence and degradability

Conclusion/Summary: Not readily biodegradable.

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Aquatic half-life</th>
<th>Photolysis</th>
<th>Biodegradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>aluminium hydroxide</td>
<td>-</td>
<td>-</td>
<td>Not readily</td>
</tr>
</tbody>
</table>

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogP&lt;sub&gt;ow&lt;/sub&gt;</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mobility in soil

| Soil/water partition coefficient (K<sub>oc</sub>) | Not available. |

Other adverse effects: No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Recycle, if possible.
Section 14. Transport information

<table>
<thead>
<tr>
<th>UN number</th>
<th>TDG Classification</th>
<th>DOT Classification</th>
<th>ADR/RID</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
</table>

| UN proper shipping name | - | - | - | - |
| Transport hazard class(es) | - | - | - | - |
| Packing group | - | - | - | - |
| Additional information | - | - | - | - |

Special precautions for user: Not applicable.

Transport in bulk according to Annex II of MARPOL and the IBC Code: Not applicable.

Section 15. Regulatory information

Canadian lists
- Canadian NPR: This material is not listed.
- CEPA Toxic substances: This material is not listed.
- Canada inventory: This material is listed or exempted.

International regulations
- UNECE Aarhus Protocol on POPs and Heavy Metals: Not listed.

International lists
- Australia inventory (AICS): This material is listed or exempted.
- China inventory (IECSC): This material is listed or exempted.
- Europe inventory: This material is listed or exempted.
- Japan inventory: Japan inventory (ENCS): This material is listed or exempted.
  Japan inventory (ISHL): This material is listed or exempted.
- Korea inventory: This material is listed or exempted.
- Malaysia Inventory (EHS Register): This material is listed or exempted.

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Section 15. Regulatory information

New Zealand Inventory of Chemicals (NZIoC) : This material is listed or exempted.
Philippines inventory (PICCS) : This material is listed or exempted.
Taiwan Chemical Substances Inventory (TCSI) : This material is listed or exempted.
Turkey : This material is listed or exempted.
United States : This material is listed or exempted.

Section 16. Other information

History
Date of issue/Date of revision : 06/12/2016
Date of previous issue : No previous validation
Version : 1
Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
IMSBC = International Maritime Solid Bulk Cargoes Code
LogPow = logarithm of the octanol/water partition coefficient
UN = United Nations

References : Not available.

Procedure used to derive the classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified.</td>
<td></td>
</tr>
</tbody>
</table>

Indicates information that has changed from previously issued version.

Canada / 4.7 / EN-US

Notice to reader
To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.