1. Identification
Product identifier: UG1 Activated Alumina (ATS1100)
Other means of identification
  Synonyms: Actal * Aluminium oxide
Recommended use: Actal UG1 has a variety of uses. These include but are not limited to applications as a desiccant, catalyst or catalyst support
Recommended restrictions: None known.
Manufacturer/Importer/Supplier/Distributor information
Manufacturer
  Address: Accurate Thermal Systems
  4104 Sylon Blvd
  Hainesport, NJ 08036
  Telephone number: 609-326-3190
  e-mail address: info@accuthermal.com
Emergency number: CHEMTREC (US): (800) 424-9300
2. Hazard(s) identification
Physical hazards: Not classified.
Health hazards: Not classified.
Environmental hazards: Not classified.
OSHA defined hazards: Not classified.
Label elements
  Hazard symbol: None.
  Signal word: None.
  Hazard statement: The substance does not meet the criteria for classification.
  Precautionary statement: Prevention: Not available.
  Response: Not available.
  Storage: Not available.
  Disposal: Not available.
Hazard(s) not otherwise classified (HNOC): Material can be slippery when wet.
Supplemental information: None.
3. Composition/information on ingredients
Substances
  Chemical name: Aluminium oxide
  Common name and synonyms: 1344-28-1
  CAS number: 1344-28-1
  %: 100
*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.
Composition comments: Contains no hazardous ingredients according to GHS
4. First-aid measures
Inhalation: If dust from the material is inhaled, remove the affected person immediately to fresh air. Call a physician if symptoms develop or persist.
Skin contact: Wash off with soap and water. Get medical attention if irritation develops and persists. Take off contaminated clothing and wash before reuse.
Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.
Ingestion: Rinse mouth with water. Rinse mouth. Get medical attention if symptoms occur. If ingestion of a large amount does occur, seek medical attention.
Most important symptoms/effects, acute and delayed

Indication of immediate medical attention and special treatment needed

General information

5. Fire-fighting measures

Suitable extinguishing media
Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical
The product itself does not burn. No unusual fire or explosion hazards noted. Material can be slippery when wet.

Special protective equipment and precautions for firefighters
Wear self-contained breathing apparatus and protective clothing.

Fire fighting equipment/instructions
No unusual fire or explosion hazards noted.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
No unusual fire or explosion hazards noted. Non-combustible, substance itself does not burn.

Material can be slippery when wet

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Avoid inhalation of dust from the spilled material. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up
If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Collect dust using a vacuum cleaner equipped with HEPA filter. Minimize dust generation and accumulation. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water and sweep up or vacuum up spillage and collect in suitable container for disposal. For waste disposal, see section 13 of the SDS.

Environmental precautions
Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling
Provide appropriate exhaust ventilation at places where dust is formed. Do not breathe dust from this material. Avoid contact with skin and eyes. Avoid prolonged exposure. In case of insufficient ventilation, wear suitable respiratory equipment. Practice good housekeeping.

Conditions for safe storage, including any incompatibilities
Protect from moisture. Avoid dust formation. Keep container tightly closed. Store in a well-ventilated place. Guard against dust accumulation of this material. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium oxide</td>
<td>PEL</td>
<td>5 mg/m3</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td>(1344-28-1)</td>
<td></td>
<td>15 mg/m3</td>
<td>Total dust.</td>
</tr>
</tbody>
</table>

Biological limit values

Appropriate engineering controls

No biological exposure limits noted for the ingredient(s).

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear safety glasses with side shields. Use tight fitting goggles if dust is generated.
### Skin protection
- **Hand protection**
  
  Wear appropriate chemical resistant gloves. Use protective skin cream before handling the product. Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis.

- **Other**
  
  Wear suitable protective clothing. Normal work clothing (long sleeved shirts and long pants) is recommended.

- **Respiratory protection**
  
  Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

- **Thermal hazards**
  
  Not available.

### General hygiene considerations

Do not breathe dust. Avoid contact with eyes. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

### 9. Physical and chemical properties

#### Appearance
- **Physical state**
  
  Powder.

- **Form**
  
  Powder.

- **Color**
  
  Not available.

- **Odor**
  
  Not available.

- **Odor threshold**
  
  Not applicable

- **pH**
  
  10.0 , as a 10% suspension

- **Melting point/freezing point**
  
  Not applicable

- **Initial boiling point and boiling range**
  
  Not applicable

- **Flash point**
  
  Not applicable

- **Evaporation rate**
  
  Not applicable

- **Flammability (solid, gas)**
  
  Not applicable

#### Upper/lower flammability or explosive limits

- **Flammability limit - lower (%)**
  
  Not applicable

- **Flammability limit - upper (%)**
  
  Not applicable

- **Explosive limit - lower (%)**
  
  Not applicable

- **Explosive limit - upper (%)**
  
  Not applicable

- **Vapor pressure**
  
  Not applicable

- **Vapor density**
  
  Not applicable

- **Relative density**
  
  Not available.

#### Solubility(ies)

- **Solubility (water)**
  
  Not available.

- **Auto-ignition temperature**
  
  Not applicable

- **Decomposition temperature**
  
  Not applicable

- **Viscosity**
  
  Not applicable

- **Other information**
  
  **Bulk density**
  
  1000.00 kg/m³

  **Percent volatile**
  
  0 % estimated

### 10. Stability and reactivity

#### Reactivity

The product is stable and non-reactive under normal conditions of use, storage and transport.

#### Chemical stability

Material is stable under normal conditions.

#### Possibility of hazardous reactions

No dangerous reaction known under conditions of normal use. Hazardous polymerization does not occur.

#### Conditions to avoid

Avoid spread of dust. Contact with incompatible materials. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air).

#### Incompatible materials

None known.

#### Hazardous decomposition products

No dangerous reaction known under conditions of normal use. No hazardous decomposition products are known.
11. Toxicological information

Information on likely routes of exposure

**Inhalation**
Inhalation of dusts may cause respiratory irritation. Prolonged inhalation may be harmful.

**Skin contact**
No adverse effects due to skin contact are expected.

**Eye contact**
Dust in the eyes will cause irritation.

**Ingestion**
Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics

**Irritation of eyes and mucous membranes. Skin irritation.**

Information on toxicological effects

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated Alumina</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>INHALATION</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>2.3 mg/l estimated</td>
</tr>
<tr>
<td><strong>ORAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>10000 mg/kg estimated</td>
</tr>
</tbody>
</table>

**Components**

<table>
<thead>
<tr>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium oxide (CAS 1344-28-1)</td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
</tr>
<tr>
<td><em>INHALATION</em></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td>&gt; 2.3 mg/l</td>
</tr>
<tr>
<td><strong>ORAL</strong></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td>&gt; 10000 mg/kg</td>
</tr>
</tbody>
</table>

* Estimates for product may be based on additional component data not shown.

**Skin corrosion/irritation**
Prolonged skin contact may cause temporary irritation.

**Serious eye damage/eye irritation**
Dust in the eyes will cause irritation.

**Respiratory or skin sensitization**

**Respiratory sensitization**
Not available.

**Skin sensitization**
This product is not expected to cause skin sensitization.

**Germ cell mutagenicity**
No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

**Carcinogenicity**
This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

Not listed.

**Reproductive toxicity**
This product is not expected to cause reproductive or developmental effects.

**Specific target organ toxicity - single exposure**
Not classified.

**Specific target organ toxicity - repeated exposure**
Not classified.

**Aspiration hazard**
Not available.

**Chronic effects**
Prolonged inhalation may be harmful.

12. Ecological information

**Ecotoxicity**
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium oxide (CAS 1344-28-1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>&gt; 218.6 mg/l, 96 hours as Al</td>
</tr>
<tr>
<td></td>
<td>NOEC</td>
<td>37.2 mg/l, 96 hours as Al</td>
</tr>
</tbody>
</table>

* Estimates for product may be based on additional component data not shown.
Persistence and degradability: No data is available on the degradability of this product.

Bioaccumulative potential: No data available.

Mobility in soil: No data available.

Other adverse effects: No other adverse environmental effects (e.g., ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions: Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations: Dispose in accordance with all applicable regulations.

Hazardous waste code: The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products: Material should be recycled if possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Dispose of in accordance with local regulations. Can be landfilled, when in compliance with local regulations.

Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT: Not regulated as dangerous goods.

IATA: Not regulated as dangerous goods.

IMDG: Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

15. Regulatory information

US federal regulations: All components are on the U.S. EPA TSCA Inventory List. This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.


SARA 304 Emergency release notification: Not regulated.


Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories: Immediate Hazard - No, Delayed Hazard - No, Fire Hazard - No, Pressure Hazard - No, Reactivity Hazard - No.

SARA 302 Extremely hazardous substance: Not listed.

SARA 311/312 Hazardous chemical: No.

SARA 313 (TRI reporting)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>% by wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium oxide</td>
<td>1344-28-1</td>
<td>100</td>
</tr>
</tbody>
</table>

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List: Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130): Not regulated.

US state regulations

US - Massachusetts RTK - Substance: Listed substance
   Aluminium oxide (CAS 1344-28-1)

US - Rhode Island RTK - Hazardous Substances: Listed substance
   Aluminium oxide (CAS 1344-28-1)

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)
   Not listed.

US. New Jersey Worker and Community Right-to-Know Act
   Aluminium oxide (CAS 1344-28-1)

US. Pennsylvania Worker and Community Right-to-Know Law
   Aluminium oxide (CAS 1344-28-1)

US. California Proposition 65
   California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of New and Existing Chemicals (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date: Feb-16-2015
Revision date: Feb-16-2015
Version #: 07

Disclaimer:
The information in the sheet was written based on the best knowledge and experience currently available.

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Revision Information
Product and Company Identification: Synonyms
Composition / Information on Ingredients: Ingredients
Physical & Chemical Properties: Multiple Properties
Regulatory Information: Risk Phrases - Class.
REACH: Registration Substance