MATERIAL SAFETY DATA SHEET

Revision Date: 1994/09/21

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Alumina Hydrate

PRODUCT NUMBER: (REFER TO SECTION 16)

SECTION 1 MANUFACTURERS INFO

MANUFACTURER: THE R.J. MARSHALL CO.  
ADDRESS: 26776 W. Twelve Mile  
CITY: Southfield  
STATE: MI  ZIP: 48034-7807

EMERGENCY PHONE: (800)424-9300  
INFORMATION PHONE: (810)353-4100  
DATE PREPARED: 1994/06/02  
PREPARER: George J. Michaels

SYNONYMS: Trihydrate d' alumine, Alumina Trihydrate, ATH, Hydrate d' alumine, Gibbsite, Product Hydrate, Hydroxide d' aluminium, Aluminium Hydroxide, Alumine hydratee, Hydrated Alumina, Trioxys de' aluminium, Aluminium Trihydroxide.

APPEARANCE AND ODOUR: White or cream powder, odourless

USES:
Refractory material
Abrasive
Fire retardant and smoke suppressant for plastics
Ceramic materials, aluminum fluoride, aluminum sulfate production

2. COMPOSITION / INFORMATION ON INGREDIENTS

EXPOSURE LIMITS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>% by Weight</th>
<th>Typical - Max.</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Hydrate</td>
<td>21645-31-2</td>
<td>64.5 - 67.0</td>
<td>10</td>
<td></td>
<td>15.5 (respirable)</td>
</tr>
<tr>
<td>Loss on ignition (water)</td>
<td></td>
<td>34.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Not hazardous.
4. FIRST AID MEASURES

Inhalation: If overcome by high dust concentrations, remove to a ventilated area. Skin contact: Wash skin thoroughly with soap and water. Eye contact: Flush eyes thoroughly with water, taking care to rinse under eyelids. If irritation persists, continue flushing for 15 minutes, rinsing from time to time under eyelids. If discomfort continues, consult a physician. Do not scrub, since the abrasion may cause irritation. If irritation persists, consult a physician. Ingestion: Not applicable.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Non combustible.
HAZARDOUS COMBUSTION PRODUCTS: Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Collect solids. Recycle if possible.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS: Avoid generating dust during handling.
STORAGE CONDITIONS: Not applicable

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Provide general and local ventilation to maintain concentrations of air contaminants below recommended standards. Wear eye and respiratory protection (goggles and mask), or a full-face respirator if necessary.

EXPOSURE LIMITS:
(ACGIH=American Conference of Governmental Industrial Hygienists; TLV=Threshold Limit Value, OSHA=Occupational Safety and Health Administration (USA); PEL=Permissible Exposure Limit, TWA=Time Weighted Average; STEL=Short Term Exposure Limit; Ceiling= Ceiling value).

<table>
<thead>
<tr>
<th></th>
<th>ACGIH (TLV)</th>
<th>OSHA (PEL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TWA</td>
<td>STEL</td>
</tr>
<tr>
<td>Aluminum oxide (total dust)</td>
<td>10 mg/m</td>
<td>None</td>
</tr>
<tr>
<td>-Respirable dust</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
9. PHYSICAL AND CHEMICAL PROPERTIES

Ph: Not applicable.
boiling point: Not applicable.
melting point: 2030 degrees C
vapour pressure: Not applicable
vapour density (air=1): N/A
evaporation rate: Not applicable
relative density (water=1): 2.4
water solubility: Insoluble
flashpoint: Not applicable.
autoignition temp.: Not applicable.
lower flammable limit: Not applicable.
higher flammable limit: Not applicable.
explosive properties: Not applicable.
odour threshold: Not determined
oxidizing properties: Not applicable.
partition coefficient (n-octanol/water): N/A.

SUPPLEMENTARY INFORMATION: Mixing hydrated alumina with water, the result is that the slurry may be slightly acidic or basic. See below the resulting Ph for each grades.

GRADES
Hydrate grade UF-15,25,35 (Solution 5% p/v) 10-11
Hydrate grade UF-E',15,25,35 (Solution 5% p/v) 5-6
Hydrate grade FRF (Solution 20% p/v) 9-10
Hydrate grade Superfine (Solution 5% p/v) 10
Alumina trihydrate "Filtercake" (Solution 1% p/v) 9-10

10. STABILITY AND REACTIVITY

STABLE (yes/no): Yes
CONDITIONS AND MATERIAL TO AVOID: Not applicable.
HAZARDOUS DECOMPOSITION PRODUCTS: Not applicable.

11. TOXICOLOGICAL INFORMATION

ROUTES OF EXPOSURE: Inhalation: Yes Ingestion: No
Eye contact: NO Skin contact: No Skin absorption: No

ACUTE EFFECTS:
Inhalation: Inhalation of high concentrations of these inert nuisance particulates can result in mild irritation of the respiratory tract.
Skin contact: May cause irritation through mechanical abrasion.
Eye contact: May cause irritation through mechanical abrasion.
Ingestion: Not applicable.

CHRONIC EFFECTS:
Medical conditions aggravated by exposure to the product: Not applicable.

Carcinogenicity / Mutagenicity / Reproductive toxicity: Does not contain any carcinogens or potential carcinogens (IARC, NTP, OSHA). (IARC-International Agency for Research on Cancer. NTP = National Toxicology Program (USA); OSHA = Occupational Safety and Health Administration (USA).
12. ECOLOGICAL INFORMATION

No information available.

13. DISPOSAL CONSIDERATIONS

Recycle if possible. This substance is inert and does not require special disposal methods. Dispose of waste in accordance with federal, state, or local regulations.

14. TRANSPORT INFORMATION

This product is not classified as dangerous under the Transport Regulations, for road, rail, sea or air transport (no UN number).

15. REGULATORY INFORMATION

NEMIS CLASSIFICATION (Canada): Not controlled

EEC CLASSIFICATION (Europe):
  Warning symbol: Not applicable.
  Warning word: Not applicable.
  Risk phrases: Not applicable.
  Safety phrases: Not applicable.

USA FEDERAL REGULATIONS:
Section 313 Supplier Notification
This product contains no chemicals in concentrations subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (Title III or SARA) and of 40 CFR 372.


TSCA, DSL
This substance or all the ingredients of this product are on the Domestic Substance List (DSL [Canada]) as well as on the Chemical Substances Inventory of the Toxic Substances Control Act (TSCA Inventory [USA]). (Please note that this product is not subject to any legal reporting requirements under these acts).

SARA STATUS:
This product is regulated by SARA Sections 311, 312, solely because it is regulated by OSHA Hazard Communication Standard (29 CFR 1910.1200) However, none of the five Hazard Categories (SARA 311, 312) are appropriate for this product. For purposes of SARA III reporting, this substance contains no ingredients listed on the Extremely Hazardous or Section 313 lists.
INTERNATIONAL REGULATIONS:
CANADIAN DOMESTIC SUBSTANCES LIST: Components of this product are listed on the Canadian DSL.

EUROPEAN COMMUNITY: Components of this product are listed on ECOIN, the European core inventory (EC) market.

16. OTHER INFORMATION

National Fire Protection Agency (NFPA) codes (Health, Flammability, Reactivity): 0,0,0

Hazardous Material Information System (HMIS) codes (Health, Flammability, Reactivity): 0,0,0.

Product grades available from The R.J. Marshall Company: (This list may be incomplete).

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grade</th>
<th>Grade</th>
<th>Grade</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-104</td>
<td>A-202</td>
<td>A-4555</td>
<td>DF-40</td>
<td>HYFILL 133</td>
</tr>
<tr>
<td>A-203</td>
<td></td>
<td></td>
<td></td>
<td>HYFILL 136</td>
</tr>
<tr>
<td>A-105</td>
<td>A-204</td>
<td>RC-802</td>
<td>DF-45</td>
<td></td>
</tr>
<tr>
<td>A-106</td>
<td>A-205</td>
<td>RC-802/A-208</td>
<td>DF-64</td>
<td>HYFILL 136</td>
</tr>
<tr>
<td>A-108</td>
<td>A-206</td>
<td></td>
<td>DF-74</td>
<td>H-490</td>
</tr>
<tr>
<td>A-112</td>
<td>A-208</td>
<td></td>
<td>DF-85</td>
<td>H-550</td>
</tr>
<tr>
<td>A-145</td>
<td>A-210</td>
<td>AH-170</td>
<td></td>
<td>H-636</td>
</tr>
<tr>
<td>A-212</td>
<td>AH-270</td>
<td></td>
<td></td>
<td>H-705</td>
</tr>
<tr>
<td>A-245</td>
<td>AH-290</td>
<td>AH-310</td>
<td>AH-331</td>
<td>CW-308</td>
</tr>
<tr>
<td>ONYX FILL I</td>
<td>AH-610</td>
<td>AH-330</td>
<td>C-31-C</td>
<td>H-710B</td>
</tr>
<tr>
<td>ONYX FILL I-C</td>
<td>AH-690</td>
<td>AH-331</td>
<td>C-33</td>
<td>C-826</td>
</tr>
<tr>
<td>ONYX FILL III</td>
<td>C-333</td>
<td>C-331</td>
<td></td>
<td>H-910</td>
</tr>
<tr>
<td>ONYX FILL V</td>
<td>RLV-1</td>
<td></td>
<td></td>
<td>C-431</td>
</tr>
<tr>
<td>ONYX ROYALE 150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations:
CAS# = Chemical Abstracts Service Registry Number,  EC = European Community
LD = Lethal dose 50%;   LC = Lethal concentration 50%;
LCL = lowest published lethal concentration.

*Although the information in this MSDS was obtained from sources which we believe to be reliable, it cannot be guaranteed. In addition, this information may be used in a manner beyond our knowledge or control. The information is therefore provided for advice purposes only, without any representation or warranty express or implied.*

Date of the previous revision: 1994/01/01

Reason for modification: Standardization according to ISO 11014 and European Directive 91/155/EEC; Information added on inclusion on different lists (TSCA-DSL-NDSL, section 15); Addition of NFPA and HMIS codes (section 16); Modification