SAFETY DATA SHEET

Product: 671
Revision Date: 6/01/2015

1. MATERIAL IDENTIFICATION

Product Name: Ceramabond 671
Product Description: White, Odorless Paste
Product Use: High Temperature Adhesive
Manufacturer: Aremco Products, Inc.
707-B Executive Blvd.
Valley Cottage, NY 10989
Telephone: 845-268-0039
Emergency Phone: 845-268-0039 or Infotrac (24/7) 800-535-5053

2. HAZARDS IDENTIFICATION

GHS Classification:
Eye Irritation Category 2A
Skin Irritation Category 2
Carcinogenicity* Category 1A
STOT RE, Respiratory* Category 2

* This product is a mixture and all powders are encapsulated. Carcinogenicity and respiratory referred to above only applies to dried liquid that may powder and become airborne.

GHS Signal Word: Warning

GHS Hazard Determining Components:
Silicate Solution
Aluminum Oxide
Alumina-Silica Refractory Ceramic Fiber

GHS Hazard Statements for Health Hazards:
H303 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H350 May Cause Cancer by Inhalation
H373 STOT RE, Respiratory

GHS Precautionary Statements - Prevention:
P202 Do not handle until all safety precautions have been read and understood
P260 Do not breathe dust/fume/gas/mist/vapors/spray
P264 Wash hands thoroughly after handling.
P280 Wear protective gloves and eye protection.
P281 Use personal protective equipment as required

GHS Precautionary Statements – Response:
P302+P352 IF ON SKIN: Wash with plenty of soap and water
P332+P313 If skin irritation occurs, get medical attention
P362 Take off contaminated clothing and wash before reuse
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do and continue rinsing
P313+P337 If eye irritation persists; get medical attention
P312 IF SWALLOWED: Call a poison center or doctor if you feel unwell
P308+P313 IF exposed or concerned: Get medical advice/attention
3. COMPOSITION

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>Concentration</th>
<th>GHS Product Identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicate Solution</td>
<td>1312-76-1</td>
<td>215-687-4</td>
<td>10.0-20.0%</td>
<td>H302 Acute Toxicity, Oral, Cat 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H315 Skin Corrosion/Irritation, Cat 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H319 Eye Damage/Eye Irritation, Cat 2A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H335 STOT, SE; Respiratory Tract Irritation, Cat 3</td>
</tr>
<tr>
<td>Alumino-Silicate Fiber</td>
<td>142844-00-6</td>
<td>604-314-4</td>
<td>1.0-5.0%</td>
<td>H315 Skin Corrosion/Irritation, Cat 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H319 Serious Eye Damage/Eye Irritation, Cat 2A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H350 May Cause Cancer by Inhalation, Cat 1B</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>1344-28-1</td>
<td>215-691-6</td>
<td>50.0-70.0%</td>
<td>None</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>N/A</td>
<td>25.0-35.0%</td>
<td>None</td>
</tr>
</tbody>
</table>

Note
This product is a mixture and all powders are encapsulated.

4. FIRST AID MEASURES

After eye contact: Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek immediate medical attention, preferably with an ophthalmologist.

After skin contact: Immediately wipe excess material off skin with a dry cloth then wash with soap and water for at least 5 minutes.

After inhalation: In case of inhalation due to spray mist, machining dust or dried particulate, remove source of exposure and assure that victim is breathing. If not breathing, administer cardio-pulmonary resuscitation (CPR).

After ingestion: If swallowed, do not induce vomiting. If victim is conscious and alert, give 1-2 glasses of water to drink. Do not give anything by mouth to an unconscious person. Seek medical attention immediately.

Medical Conditions Possibly Aggravated by Exposure:
Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

5. FIRE FIGHTING MEASURES

Flash Point: Not applicable
Flammable Limits: This material is non-combustible.
Extinguishing Media: This material is compatible with all extinguishing media.
Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA approved positive pressure breathing apparatus with full face-piece and full chemical resistant protective clothing. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazards: This material is non-combustible.

6. ACCIDENTAL RELEASE MEASURES

Personal Protection: Wear chemical goggles, body-covering protective clothing, chemical resistant gloves, and rubber boots. Use NIOSH approved respirator where mist occurs.
Spill Cleanup: Mop up and neutralize liquid, then discharge to sewer in accordance with federal, state and local regulations or permits. Flush area with water to complete cleanup. Exercise caution during neutralization as heat may be generated.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin and clothing. Avoid breathing spray mist. Keep container closed. Promptly clean residue from closures with cloth dampened with water. Promptly clean up spills.
Storage: Store in an area that is cool, dry, well ventilated, away from combustible material, and away from ignition sources. Keep containers closed. Store in clean plastic or stainless steel containers.
### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>TLV (mg/m³)</th>
<th>PEL (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide</td>
<td>1344-28-1</td>
<td>215-691-6</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Alumino-Silicate, Fiber</td>
<td>142844-00-6</td>
<td>604-314-4</td>
<td>Not established</td>
<td>Not established</td>
</tr>
<tr>
<td>Silicate Solution</td>
<td>1344-09-8</td>
<td>215-687-4</td>
<td>No available information</td>
<td>No available information</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>N/A</td>
<td>No available information</td>
<td>No available information</td>
</tr>
</tbody>
</table>

**Engineering Controls:** Use with adequate ventilation. Keep containers closed. Safety shower and eyewash fountain should be within direct access.

**Respiratory Protection:** This product is not considered respirable in either the liquid or cured forms. However, if the cured product is polished, ground or chipped during processing, handling or use, powders may be released as airborne respirable particles. In these instances, appropriate personal protection equipment and local ventilation controls must be employed. If exposure limits are exceeded and local ventilation is unavailable, a supplied-air respirator or a self-contained NIOSH-approved dust and mist respirator is required.

**Skin Protection:** Wear body-covering protective clothing and gloves.

**Eye Protection:** Wear chemical goggles.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and chemical here represent typical properties of this product. Contact Technical Sales for exact specifications.

- **Appearance:** Paste
- **Color:** White
- **Odor:** Odorless
- **pH:** 11.0-11.5
- **Specific Gravity, g/cc:** 2.05-2.15
- **Water Solubility:** Soluble
- **Melting Point:** Not applicable
- **Boiling Point:** 100 °C
- **Vapor Pressure:** Not applicable
- **Vapor Density (air=1):** No data
- **VOC Content:** 0.00 lbs/gal
- **Viscosity:** 30,000-80,000 cP
- **Flash Point:** Not applicable
- **Auto-ignition Temperature:** Not applicable
- **Partition Coefficient:** No data
- **Decomposition Temperature:** 30,000-80,000 cP

### 10. STABILITY AND REACTIVITY

- **Chemical Stability:** This material is stable under all conditions of use and storage.
- **Conditions to Avoid:** Prolonged contact with aluminum, brass, copper, lead, and zinc may produce flammable hydrogen gas.
- **Materials to Avoid:** Gels and heats when mixed with acid. May react with ammonium salts resulting in evolution of ammonia gas.
- **Hazardous Decomposition Products:** None.
- **Hazardous Polymerization:** Will not occur.

### 11. TOXICOLOGICAL INFORMATION

**Acute Toxicity:** Component: CAS No. 1344-09-8, Silicate Solution
- LD₅₀ Oral, 1153 mg/kg (Rat)
- LD₅₀, Inhalation, No Data
- LD₅₀, Dermal, 4640 mg/kg (Rabbit)

**Skin Corrosion/Irritation:** Irritating to skin

**Serious Eye Damage/Irritation:** Irritating to eyes

**Sensitization:** Not sensitizing

**Mutagenicity:** No data

**Carcinogenicity:** This product is not listed by IARC, NTP, OSHA, or ACGIH as a known or suspected carcinogen.

**Reproductive Toxicity:** No data
**Acute Toxicity:**

**Component:** CAS No. 142844-00-6, Alumina-Silica Refractory Ceramic Fiber (RCF)

**Toxicokinetics, Metabolism & Distribution:**

**Basic Toxicokinetics**

Exposure is predominantly by inhalation or ingestion. Man made vitreous fibers of a similar size to RCF have not been shown to migrate from the lung and/or gut and do not become located in other parts of the body. When compared to many naturally occurring minerals, RCF has a low ability to persist and accumulate in the body (half-life of long fibers (> 20- microns) in 3 week rat inhalation test is approximately 60 days.)

**Human Toxicological Data**

In order to determine possible human health effects following RCF exposure, the University of Cincinnati has been conducting medical surveillance studies on RCF workers in the U.S. The Institute of Occupational Medicine (IOM) has conducted medical surveillance studies on RCF workers in European manufacturing facilities.

Pulmonary morbidity studies among production workers in Europe and USA have demonstrated an absence of interstitial fibrosis and no decrements in lung function associated with current exposures, but have indicated a reduction of lung capacity among smokers.

A statistically significant correlation between pleural plaques and cumulative RCF exposure was evidenced in the USA longitudinal study.

The USA mortality study did not show evidence of increased lung tumor development either in the lung parenchyma or in the pleura.

**Information on Toxicological Effects:**

**Acute Toxicity: Short Term Inhalation**

No data available: Short term tests have been undertaken to determine fiber (bio) solubility rather than toxicity; repeat dose inhalation tests have been undertaken to determine chronic toxicity and carcinogenicity.

**Acute Toxicity: Oral**

No data available: Repeated dose studies have been carried out using gavage. No effect was found.

**Skin Corrosion/Irritation:**

Not possible to obtain acute toxicity information due to the nature of the substance

**Serious Eye Damage/Irritation:**

Not possible to obtain acute toxicity information due to the nature of the substance

**Respiratory or Skin Sensitization:**

No evidence from human epidemiological studies of any respiratory or skin sensitization potential

**Germ Cell Mutagenicity:**

- **Method:** In vitro micronucleus test
- **Species:** Hamster (CHO)
- **Dose:** 1-35 mg/ml
- **Routes of Admin:** In suspension
- **Results:** Negative

**Carcinogenicity:**

- **Method:** Inhalation. Multi-dose.
- **Species:** Rat
- **Dose:** 3, 9 and 16 mg/m³
- **Routes of Admin:** Nose only inhalation
- **Results:** Fibrosis just reached significant levels at 16 and 9 mg/m³ but not at 3 mg/m³. None of the parenchymal tumor incidences were higher than the historical control values for this strain of animal.

**Carcinogenicity:**

- **Method:** Inhalation. Single dose.
- **Species:** Rat
- **Dose:** 30 mg/m³
- **Routes of Admin:** Nose only inhalation
- **Results:** This study was designed to test the chronic toxicity and Carcinogenicity of RCF at extreme exposures. Tumor incidence (incl. Mesothelioma) was raised at this dose level. The presence of overload conditions (only detected after the experiment was completed), whereby the delivered dose exceeded the clearance capability of the lung, makes meaningful conclusions in terms of hazard and risk assessment difficult.
Carcinogenicity:
Species: Hamster
Dose: $30 \text{ mg/m}^3$
Routes of Admin: Nose only inhalation
Results: This low quality study in hamsters produced mesothelial lesions of uncertain significance. Subsequent studies in hamsters with glass fibers indicated that the lung burdens of RCF in this experiment were between 5 and 10 times more than that need to produce overload, and the results are therefore difficult to interpret.

There are reports of injection studies with some similar materials. While some intraperitoneal injection studies reported the development of tumors in rats, the relationship of these results to classification remains controversial.

Reproductive Toxicity:
Method: Gavage.
Species: Rat
Dose: $250 \text{ mg/kg/day}$
Routes of Admin: Oral
Results: No effects were seen in an OECD 421 screening study. There are no reports of any reproductive toxic effects of mineral fibers. Exposure to these fibers is via inhalation and effects seen are in the lung. Clearance of fibers is via the gut and the feces, so exposure of the reproductive organs is extremely unlikely.

STOT SE: Not Applicable
STOT RE: Not Applicable
Aspiration Haz: Not Applicable
Irritant: Negative results have been obtained in animal studies (EU method B 4) for skin irritation. Inhalation exposures using the nose only route produce simultaneous heavy exposures to the eyes, but no reports of excess eye irritation exist. Animals exposed by inhalation similarly show no evidence of respiratory tract irritation. Human data confirm that only mechanical irritation, resulting in itching, occurs in humans. Screening at manufacturer's plants has failed to sow any human cases of skin conditions related to fiber exposure.

12. ECOLOGICAL INFORMATION
Ecotoxicity: This material is believed to be practically non-toxic to aquatic life.
Biodegradation: This material is inorganic and not subject to biodegradation.
Persistence: This material is believed to persist in the environment.
Bioconcentration: This material is not expected to bioconcentrate in organisms.
Physical/Chemical: Sinks and mixes with water. Only water will evaporate from this material.

13. DISPOSAL CONSIDERATIONS
Disposal Method: Dispose in accordance with federal, state and local regulations and permits.

14. TRANSPORTATION INFORMATION
DOT UN Status: The material is not a regulated hazardous material for transportation.

15. REGULATORY INFORMATION
U.S. Federal Regulations
CERCLA: No CERCLA reportable quantity has been established for this material.
TSCA: All ingredients of this material are listed on the TSCA inventory.
SARA Title III
Sections 302, 304, 313: This product does not contain any substances reportable under these sections.
Sections 311, 312:

<table>
<thead>
<tr>
<th>Hazard Classes</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Reactivity Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Pressure Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Immediate Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Delayed Hazard</td>
<td>No</td>
</tr>
</tbody>
</table>

International Inventory Status

- Canada (DSL)     Yes
- Europe (EINECS/ELINCS) Yes
- Australia (AICS) Yes
- Japan (MITI) Yes
- South Korea (KECL) Yes

16. OTHER INFORMATION

| NFPA Ratings (scale 0 – 4) | Health, 1  |
|                           | Flammability, 0 |
|                           | Reactivity, 0 |
|                           | Personal Protection, C |

| HMIS Ratings (scale 0 – 4) | Health, 1  |
|                           | Flammability, 0 |
|                           | Reactivity, 0 |
|                           | Personal Protection, C |

Key Legend Information

- ACGIH: American Conference of Governmental Industrial Hygienists
- ARD: International Agency for Research on Cancer
- CAS: Chemical Abstract Service
- CERCLA: Comprehensive Environmental Response, Compensation & Liability Act
- DSL: Domestic Substance List
- EC: European Commission
- HMIS: Hazardous Materials Identification System
- IARC: International Agency for Research on Cancer
- ND: Not Determined
- NE: Not Established
- NFPA: National Fire Protection Association
- NIOSH: National Institute for Occupational Safety & Health
- NTP: National Toxicology Program
- OSHA: Occupational Safety and Health Administration
- PEL: Permissible Exposure Limit
- RE: Repeat Exposure
- SARA: Superfund Amendments & Reauthorization Act
- SARA Title III: Emergency Planning & Community Right to Know Act
- SARA Section 302: Extremely Hazardous Substances
- SARA Section 304: Emergency Release
- SARA Section 311: MSDS/List of Chemicals & Hazardous Inventory
- SARA Section 312: Emergency & Hazardous Inventory
- SARA Section 313: Toxic Chemicals & Release Reporting
- SE: Single Exposure
- STEL: Short Term Exposure Limit
- STOT: Specific Target Organ Toxicity
- TLV: Threshold Limit Value
- TWA: Time Weighted Average

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