

Safety Data Sheet

SECTION 1 - MATERIAL IDENTIFICATION

Trade Name and Synonyms: Plicast Tuff Mix KK

Product Number: 14027

 Al_2O_3 - 44.3 % SiO_2 - 38.1 %

Manufacturers Code I.D. : L - 1969

Chemical Name and Synonyms: High Temperature Cement

Chemical/Mineral Family: Alumino Silicate

Recommended Use: Refractory/Construction/maintenance/repair material

Supplier: Plibrico Company, LLC - 1935 Techny Road - Unit 16, Northbrook, IL 60062
 Phone 312-337-9000, Fax 312-337-9003, www.plibrico.com

Manufacturer: Plibrico Company, LLC - 1935 Techny Road, Unit 16, Northbrook, IL 60062
 Phone 312-337-9000, Fax 312-337-9003, www.plibrico.com

Contact Person: Chris Smith, csmith@plibrico.com
 EMERGENCY PHONE: 312-337-9000, After 4:30PM weekdays, Weekends, and Holidays: 740-604-1033

SECTION 2- HAZARDOUS IDENTIFICATION


Signal Word: Danger

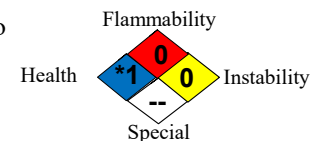
Hazard statement: H315: Causes skin irritation, H320: Causes eye irritation
 H335: May cause respiratory irritation H351: Suspected of causing cancer
 H373: May cause damage to lung through prolonged or repeated inhalation.

HMIS Rating

| | | |
|---------------------|---|---|
| Health | * | 1 |
| Flammability | | 0 |
| Physical Hazard | | 0 |
| Personal Protection | | E |

This product contains crystalline silica, a substance that has been listed by:

- 1. IARC: sufficient evidence for the carcinogenicity of crystalline silica to humans. (Group 1)
- 2. Canadian WHMIS : D2A - Materials Causing Other Toxic Effects
- 3. ACGIH: A2-Suspected Human Carcinogen.
- 4. NTP: a substance known to be a human carcinogen.
- Special Notes: *** Greater amounts of Quartz and Cristobalite may be formed after firing. Major portion of the crystalline silica present in the product as manufactured is not fine enough to normally be considered respirable.

NFPA Rating scale 0-4

Precautionary Statements:

- P260+P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
- P280 - Wear eye protection/face protection
- P285 - Wear respiratory protection
- P305+P351+P338 - If in eyes: Rinse cautiously with water.
- P302+P352 - If on skin: Wash with plenty of soap and water.
- P501- Dispose of material in accordance with local regulation.

Primary Route of Entry: Inhalation, Ingestion, Skin Contact

Target Organs: respiratory tract (nose & throat), eyes, skin

Potential Health Effects:
Eyes: May cause irritation. Abrasive action of dust can damage eye.

Skin: May cause irritation

Ingestion: May cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting, abdominal pain and diarrhea.

Inhalation: Effects of overexposure:

1. Acute: Exposure to nuisance dust may cause temporary irritation or discomfort to skin, eyes, nose, throat or lungs and may aggravate bronchial disorders.
2. Chronic: Long term inhalation of respirable quartz, cristobalite, fused silica and/or amorphous silica may cause silicosis (delayed lung injury) and other respiratory disorders. In addition there is sufficient evidence for the carcinogenicity of crystalline silica to humans.

SECTION 3- HAZARDOUS INGREDIENTS

| Ingredients (checked) | C.A.S. No. | Weight % | TLV ACGIH mg/m ³ | OSHA PEL mg/m ³ | EINECS |
|--|------------|------------|--------------------------------|---|-----------|
| <input checked="" type="checkbox"/> Quartz*** | 14808-60-7 | 8.77 | 0.025(resp.dust) | 0.05 mg/m ³ TWA | 238-878-4 |
| <input checked="" type="checkbox"/> Cristobalite*** | 14464-46-1 | 8.77 | 0.025(resp.dust) | 0.05 mg/m ³ TWA | 238-455-4 |
| <input type="checkbox"/> Amorphous Silica*** | 69012-64-2 | | 0.025(resp.dust) | 15(total), 5(resp.) | 273-761-1 |
| <input type="checkbox"/> Fused Silica*** | 60676-86-0 | | 0.025(resp. dust) | 80 mg/m ³ /%SiO ₂ | 262-373-8 |
| <input type="checkbox"/> Zirconium Silicate*** | 14940-68-2 | | 10 | 15(total), 5(resp.) | 239-019-6 |
| <input type="checkbox"/> Aluminum Phosphate | 13530-50-2 | - | 2 mg/m ³ TWA(as Al) | 2 mg/m ³ TWA(as Al) | 236-875-2 |
| <input type="checkbox"/> Alumina | 1344-28-1 | - | 1(resp.dust) | 15(total), 5(resp.) | 215-691-6 |
| <input checked="" type="checkbox"/> Aluminosilicate(Mullite) | 1302-93-8 | 65. - 75. | 2(resp.dust) | 15(total), 5(resp.) | 215-113-2 |
| <input type="checkbox"/> Aluminosilicate(Kyanite) | 1302-76-7 | - | 2(resp.dust) | 15(total), 5(resp.) | 215-106-4 |
| <input type="checkbox"/> Bauxite | 1318-16-7 | - | 10 | 15(total), 5(resp.) | ----- |
| <input type="checkbox"/> Silicon Carbide | 409-21-2 | - | 10 | 15(total), 5(resp.) | 206-991-8 |
| <input type="checkbox"/> Pyrophyllite | 12269-78-2 | - | 10 | 15(total), 5(resp.) | ----- |
| <input type="checkbox"/> Spinel | 1302-67-6 | - | 10 | 15(total), 5(resp.) | 215-105-9 |
| <input type="checkbox"/> Andalusite | 12183-80-1 | - | 10 | 15(total), 5(resp.) | 235-352-6 |
| <input type="checkbox"/> Zirconiumdioxide | 1314-23-4 | - | 10 | 15(total), 5(resp.) | 215-227-2 |
| <input checked="" type="checkbox"/> Calcium Aluminate Cement | 65997-16-2 | 24. - 34. | 10 | 15(total), 5(resp.) | 266-045-5 |
| <input type="checkbox"/> Calcium Silicate Cement | 65997-15-1 | - | 10 | 15(total), 5(resp.) | 266-043-4 |
| <input type="checkbox"/> Clay | 1332-58-7 | - | 2(resp.dust) | 15(total), 5(resp.) | 265-064-6 |
| <input type="checkbox"/> Aluminum Sulfate | 10043-01-3 | - | 2(resp.dust) | 15(total), 5(resp.) | 233-135-0 |
| <input type="checkbox"/> Barium Sulfate | 772-74-37 | - | 10 | 10(total), 5(resp.) | 231-784-4 |
| <input type="checkbox"/> Bentonite | 1302-78-9 | - | 10 | 15(total), 5(resp.) | 215-108-5 |
| <input type="checkbox"/> Perlite | 93763-70-3 | - | 10 | 15(total), 5(resp.) | 310-127-6 |
| <input type="checkbox"/> Sodium Silicate | 1344-09-8 | - | 10 | 15(total), 5(resp.) | 215-687-4 |
| <input checked="" type="checkbox"/> Titanium Oxide | 13463-67-7 | 2.0 | 10 | 15(total), 5(resp.) | 215-280-1 |
| <input type="checkbox"/> Calcium Fluoride | 7789-75-5 | 1 - 5 | 2.5 as F | 2.5 as F | 232-188-7 |
| <input type="checkbox"/> Organic Fiber | 9003-07-0 | 0.05 - 0.5 | 10(total), 3(resp.) | 15(total), 5(resp.) | ----- |
| <input type="checkbox"/> Sodium Hydroxide | 1310-73-2 | < 1 | 2 (Ceiling) | 2 TWA | 215-185-5 |
| <input type="checkbox"/> polyphosphoric acids, sodium salts | 68915-31-1 | < 5 | 3 (resp. dust) | 15(total), 5(resp.) | 272-808-3 |

SECTION 4- FIRST AID MEASURES

Eyes: Immediately flush eyes with plenty of water and get medical attention.

Skin: Wash with soap and water. Get medical attention if irritation develops or persists.

Ingestion: If swallowed, seek medical attention.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. Get immediate attention.

If symptoms persist, seek medical attention.

SECTION 5- FIRE FIGHTING MEASURES

Unusual Fire and Explosive Hazards: The product will not burn. Improper mixing and bake-out of materials may result in steam spalling during initial heating. Refer to mixing instructions and bake-out schedules for proper procedures.

Fire Fighting Equipment: Fire fighters should wear full protective gear and self-contained breathing apparatus-SCBA.

SECTION 6- ACCIDENTAL RELEASE MEASURES

Steps to be taken in case material is released or spilled: Wear protective clothing as described in Section 8 of this sheet. Use routine housekeeping procedures, avoid dusting, collect material in closed containers or bags.

Waste Disposal Method: According to the EPA (40CFR 261.3) wastes are not hazardous wastes. Wastes may be disposed of in a landfill, however, in accordance with federal, state, and local regulations.

SECTION 7 - HANDLING AND STORAGE

To ensure product quality, store material in a dry place. Minimize dust generation and avoid inhalation and contact with refractory dusts during processing, installation, maintenance and tear-out. After handling of refractory dusts from processing, installation, maintenance or tear-out, wash exposed skin areas thoroughly. Wash clothing contaminated with dusts.

SECTION 8 - EXPOSURE CONTROL/PERSONAL PROTECTION

Ventilation: Local and Mechanical: follow OSHA STD 29 CFR 1910.94.

Respiratory Protection: Good ventilation should be provided if dust is created when working with materials. Used material, which is being removed, should be dampened to reduce dust. In addition, when dust is present, workers should employ respirator protection. Recommended: NIOSH approved respirator for dusts and mists, including silica, in compliance with OSHA STD 29.CFR1910.134.

Protection Gloves: Protective gloves recommended.

Eye Protection: Safety glasses/goggles.

Other Protective Equipment: As required to meet applicable OSHA standards.

Note: See Section 3 for occupational exposure limit values.



SECTION 9- PHYSICAL AND CHEMICAL PROPERTIES

Appearance, Color & Odour: Granular aggregate & fine solid mix, brown or grey in color, earthy smell

Solubility in Water: Negligible

pH: Alkaline

Vapor Pressure: Not applicable

Boiling Point (o): N/A

Vapor Density: Not applicable

Melting Point (o): 2500F / 1371C

Evaporation Rate: Not applicable

Specific Gravity: 2.9

% Volatile by Weight: Not applicable

SECTION 10- STABILITY AND REACTIVITY DATA

Stability: Stable

Hazardous Polymerization: May not occur

Incompatibility: Materials to avoid: N/A

Hazardous Decomposition: N/A

SECTION 11 - TOXICOLOGICAL INFORMATION

Effects of overexposure:

- 1. Acute: Exposure to nuisance dust may cause temporary irritation or discomfort to skin, eyes, nose, throat or lungs and may aggravate bronchial disorders.
- 2. Chronic: Long term inhalation of respirable quartz, cristobalite, fused silica and/or amorphous silica may cause silicosis (delayed lung injury) and other respiratory disorders.
- 3. Prolonged contact with skin may cause irritation.

For crystalline silica (quartz /cristobalite):

CARCINOGENICITY: Product contains crystalline silica which may cause delayed respiratory disease (silicosis) if inhaled over a prolonged period of time. IARC concludes that "there is a sufficient evidence for the carcinogenicity of crystalline silica to humans." (Group 1).

For aluminum silicate: Aluminum silicate minerals have been found to cause lung fibrosis in the absence of crystalline silica.

SECTION 12 - ECOLOGICAL INFORMATION

No ecological concerns have been identified.

Not applicable for as-manufactured refractory product. Dusts of as-manufactured refractory product have a low order of aquatic toxicity (rating TLM96: over 1000 ppm), are insoluble, and are not very mobile. Based upon this information, it is not believed to be a significant threat to the environment if accidentally released on land or into water. However, dusts generated during maintenance and tear-out operations may be contaminated with other hazardous substances (e.g. metal). Evaluation of dusts from specific processes should be performed by a qualified environmental professional to determine if an environmental threat exists in the case

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste Disposal Method: According to the EPA (40CFR261.3) wastes are not hazardous wastes. Wastes may be disposed of in a landfill, however, in accordance with federal, state, and local regulations. However, dusts generated during maintenance and tear-out operations may be contaminated with other hazardous substances (e.g. metals). Therefore, appropriate waste analysis may be necessary to determine proper disposal. Waste characterization and disposal/treatment methods should be determined by a qualified environmental professional in accordance with applicable federal, state and local regulations.

SECTION 14 - TRANSPORT INFORMATION

Canadian Transportation of Dangerous Goods Regulation: Hazard Class & PIN: Not Regulated

| | |
|--|----------------|
| DOT Proper Shipping Name (29 CFR 172.101): | Not regulated |
| DOT Hazard Class (29 CFR 172.101): | Not regulated |
| UN/NA Code (49 CFR 172.101): | Not applicable |
| DOT Labels Required (49 CFR 172.101): | Not applicable |
| DOT Placards Required (49 CFR 172.504): | Not applicable |
| Land Transport ADR/RID (cross-border): | Not regulated |
| Maritime Transport IMDG : | Not regulated |
| Air Transport ICAO-TI and IATA-DGR: | Not regulated |

SECTION 15 - REGULATORY INFORMATION

CANADIAN WHMIS: D2A

CANADIAN EPA: Components of this product are listed on the Domestic Substance List (DSL).

U.S. FEDERAL REGULATIONS:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

SARA TITLE III: EPCRA Section 302 (EHSs):

This product does not contain ingredients subject to reporting requirements of 40 CFR Part 355, Appendices A and B (Extremely Hazardous Substances).

CERCLA Section 304:

This product does not contain ingredients subject to state and local reporting under Section 304 of SARA Title III as listed in 40 CFR Part 302, Table 302.4

SECTION 311/312 HAZARD CATEGORIES:

Product (airborne particulates) is categorized as an immediate (acute) health hazard and a delayed (chronic) health hazard as defined by SARA Title III Section 311/312 (40 CFR 370).

SECTION 313 TOXIC CHEMICALS: None

TSCA: Components of this product are listed on the TSCA Inventory.

SECTION 16 - OTHER INFORMATION

Only Trained personel should use this material.

Abbreviations:

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstracts Service

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act

DOT: Department of Transportation

EPA: Environmental Protection Agency

IARC: International Agency for Research on Cancer

NFPA: National Fire Protection Association

NIOSH: National Institute for Occupational Safety and Health

NTP: National Toxicology Program

OSHA: Occupational Safety and Health Administration

SARA: Superfund Amendment and Reauthorization Act

WHMIS: Workplace Hazardous Materials Information System (Canada)

DISCLAIMER

The information presented herein is presented in good faith and believed to be accurate as of the effective date of this Safety Data Sheet. Occupational exposure limits are under constant review and may be changed at any time. Employers may use this SDS to supplement other information gathered by them in their efforts to assure the health and safety of their employees and the proper use of this product. This summary of the relevant data reflects professional judgment. Employers should note that information perceived to be less relevant has not been included in this SDS. Therefore, given the summary nature of this document, Plibrico Company, LLC, does not extend any warranty (expressed or implied), assume any responsibility or make any representation regarding the completeness of this information or its suitability for the purposes envisioned by the user. No warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use. In addition, Plibrico Company, LLC, shall not be liable for injury arising by either misuse of materials, or failure to follow safety procedures as outlined in the safety data sheet.

PLIBRICO COMPANY, LLC

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