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JUN 11 2005

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# MATERIAL SAFETY DATA SHEET



## I. PRODUCT AND COMPANY IDENTIFICATION

**Product Names:** BLU-RAM® PC (PRAC 5037)      BLU-RAM® ST (PRAC 5657)  
BLU-RAM® PC QT (PRAC 5043)      BLU-RAM® TR (PRAC 5092)  
BLU-RAM® RM (PRAC 5035)      BLU-RAM® DPM QT (PRAC 5157)  
BLUORAM® HS (PRAC 5039)      BLU-RAM® GVM

**Category:** A Monolithic Refractory

**Technical Specification Nos.:** TS 15037      TS 15657      TS 15039  
TS 15043      TS 15092      TS 15041  
TS 15035      TS 15157

**Chemical Name:** Inorganic Oxide

**Company Name:**

**VESUVIUS USA**  
Research Center  
495 Emma Street  
Bettsville, OH 44815 USA

**FORMERLY PREMIER REFRACTORIES INTERNATIONAL**

**Technical Information: 1-419-986-5126 (USA)  
24hr. EMERGENCY ASSISTANCE, (CHEMTREC) 1-800-424-9300**



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MSDS NO. 1124

Phone: VESUVIUS RESEARCH: 1-419-986-5126

Date Prepared: 5/00

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This Revision: 3/01

SECTION 2. INGREDIENTS/COMPOSITION

Ingredient name:	CAS Number:	Percent:	IARC/NTP/OSHA:	Exposure Limits:
Aluminosilicate	1302-93-8	40-70	No	Nuisance Particulate OSHA PEL:TWA 15mg/m <sup>3</sup> ; respirable, 5mg/m <sup>3</sup> . ACGIH TLV:TWA total dust 10mg/m <sup>3</sup> .
Aluminum Oxide	1344-28-1	10-30	No	Nuisance Particulate
Silica, Fused	60676-86-0	5-30	No*	ACGIH TLV:TWA respirable 0.10mg/m <sup>3</sup> . ACGIH TLV:TWA respirable 0.05mg/m <sup>3</sup> . OSHA PEL:TWA respirable SiO <sub>2</sub> , 10mg/m <sup>3</sup> divided by 2(%SiO <sub>2</sub> +2).
Cristobalite (SiO <sub>2</sub> )	14464-46-1	0.1-5	Yes	Nuisance Particulate OSHA PEL:TWA 1.0mg/m <sup>3</sup> ; STEL 3.0mg/m <sup>3</sup> as mist. ACGIH TLV:TWA respirable quartz 0.05mg/m <sup>3</sup> . OSHA PEL:TWA respirable SiO <sub>2</sub> , 10mg/m <sup>3</sup> divided by (%SiO <sub>2</sub> +2).
Aluminum Phosphate	13530-50-2	1-5	No	Nuisance Particulate
Phosphoric Acid	7664-38-2	0-1	No	OSHA PEL:TWA 1.0mg/m <sup>3</sup> ; STEL 3.0mg/m <sup>3</sup> as mist. ACGIH TLV:TWA respirable quartz 0.05mg/m <sup>3</sup> . OSHA PEL:TWA respirable SiO <sub>2</sub> , 10mg/m <sup>3</sup> divided by (%SiO <sub>2</sub> +2).
Quartz (SiO <sub>2</sub> )	14808-60-7	0.1-5	Yes	None Established
Polypropylene Fiber	9003-07-0	<0.2	No	None Established

Quartz and cristobalite, polymorphs of crystalline silica, are listed by IARC as "known human carcinogens" Group 1. NTP lists respirable crystalline silica amongst substances which may "reasonably be anticipated to be carcinogens".

\*Silica, fused. ACGIH states this substance has been identified by sources other than IARC, NTP, or OSHA as a suspected or confirmed human carcinogen.

SECTION 3. HAZARDS IDENTIFICATION

HMS

HEALTH HAZARD	2 - MODERATE
FLAMMABILITY HAZARD	0 - MINIMAL
REACTIVITY HAZARD	0 - MINIMAL
PERSONAL PROTECTION	E - Glasses, Gloves

EMERGENCY OVERVIEW:

A damp blue, moldable, dust free material. Not a fire or spill hazard. A severe eye irritant. Prolonged skin contact may produce irritation/inflammation.

Target organs: Skin, Upper Respiratory System

Primary route(s) of entry: Skin, Inhalation



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HAZARD IDENTIFICATION continued from page 2

**Acute effects:** Possibly corrosive to the eye on contact. Possible upper respiratory irritation. Possible irritation/inflammation to skin from frequent/prolonged contact.

**Chronic effects:** Dust that may be generated from dried product during installation and "after-service" tear-out may contain free/crystalline silica. The prolonged inhalation (usually years) of mineral dusts containing free/crystalline silica may result in the development of a disabling pulmonary fibrosis known as silicosis; a progressive, incapacitating and sometimes fatal lung disease. IARC has classified crystalline silica as a "known human carcinogen" Group 1. NTP lists respirable crystalline silica amongst substances which may "reasonably be anticipated to be carcinogens. See Section 16 for safe "Removal After Service Precautions".

**Signs & symptoms of overexposure:**

**Eye contact:** A corrosive and physical eye irritant.

**Skin contact:** Prolonged contact with bare skin may contribute to the development of a slight skin irritation, especially when product is wet.

**Inhalation:** Inhalation of excessive airborne particulates may irritate upper respiratory system.

**Ingestion:** An unlikely route of exposure. If ingested in sufficient quantity, may cause gastrointestinal disturbances. Symptoms will include irritation and may include nausea, vomiting and abdominal pain.

**SECTION 4. FIRST AID MEASURES**

**Eye contact:** Flush eyes, including under the eyelids, with large amounts of water. If irritation persists, seek medical attention.

**Skin contact:** Wash affected areas with mild soap and water.

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

**Ingestion:** Ingestion is an unlikely route of exposure. If ingested in sufficient quantity and victim is conscious, give 1-2 glasses of water or milk. Never give anything by mouth to an unconscious person. Leave decision to induce vomiting to qualified medical personnel, since particles may be aspirated into the lungs. Seek immediate medical attention.

**SECTION 5. FIRE FIGHTING MEASURES**

**NFPA code:** Flammability: 0, Health: 0, Reactivity: 0, Special: 0.

**Flash point:** NOT COMBUSTIBLE

**Extinguishing media:** Use extinguishing media appropriate to combustibles in area of fire.

**Firefighting instructions:** Firefighters should wear NIOSH-approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

**Spill procedures:** Carefully, cleanup and place material into a suitable container, being careful to avoid creating excessive dust. If conditions warrant, clean-up personnel should wear approved respiratory protection, gloves, and goggles to prevent irritation from contact and/or inhalation.

**SECTION 7. HANDLING AND STORAGE**

**Storage:** Provide cool, dry storage and store in original, unopened cartons. Keep cartons sealed when not in use.



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SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Engineering controls:** Provide sufficient ventilation, in both volume and air flow patterns, to control any mist/particulate emissions below allowable limits.

**Personal protective equipment:** The use of eye protection, gloves and long sleeve clothing is recommended.

**Respiration protection:** Provide workers with NIOSH approved respirators in accordance with requirements of 29 CFR 1910.13 for level of exposure incurred.

**Hygienic Practices:** Avoid contact with skin, eyes and clothing. After handling this product, wash hands before eating or drinking.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** A blue, moldable mixture of granular to fine materials; slight pungent odor. Packaged in 55 and 100 pound cartons.

**Boiling Point:** Not Applicable

**Melting Point:** >2900°F (1590°C)

**Water Solubility:** 2-5%

**pH (10% aqueous slurry):** 2.5 - 3.5

**Specific Gravity(g/cc):** Mixture

**Bulk Weight(lbs/ft<sup>3</sup>):** 160-180

**% Volatile by volume:** 0

**Evaporation rate:** Not applicable

SECTION 10. STABILITY AND REACTIVITY

**Hazardous Polymerization:** Will not occur

**Chemical Incompatibilities:** None

**Hazardous Decomposition Products:** None

SECTION 11. TOXICOLOGICAL INFORMATION

**Aluminum Silicates Toxic and Hazard Review (Sax):** an experimental tumorigen by implant.

**Toxicity Data:** ipl-rat TDLo:90 mg/kg:ETA

**Aluminum Oxide CAS#1344-28-1 Toxic and Hazard Review (Sax):** an experimental tumorigen and neoplastigen by implant. Inhalation of finely divided particles may cause lung damage (Shaver's disease). TOXICITY DATA: ipl-rat TDLo:90mg/kg:ETA;

imp-rat TDLo:200 mg/kg:NEO; imp-rat TD :200 mg/kg:ETA.

**Aluminosilicates (Clay) Toxic and Hazard Review Chemical Toxicology (Hodge Et al.)**

Clay see silica. Toxicity Rating: 1. Chemically and biologically inert when ingested in any of its many physical forms, such as crystalline quartz, amorphous siliceous earth or colloidal silica gels.

**Fused silica CAS#60676-86-0 Toxic and Hazard Review (Sax):** Poison by

intraperitoneal, intravenous and intratracheal routes. IARC Cancer Review: Animal sufficient Evidence. ACGIH states (3/93) that this substance has been identified by other sources as a suspected or confirmed human carcinogen. No LD<sub>50</sub> in RTECS.

Other species toxicity data (NIOSH RTECS 1992): intraperitoneal-rat

LDLo: 400 mg/kg; intratracheal-rat LDLo 120 mg/kg, intraperitoneal-mouse LDLo:

40 mg/kg, intravenous-cat LDLo 15 mg/kg.

**Cristobalite CAS#14464-46-1 Toxic and Hazard Review (Sax):** Poison by

intratracheal route. An experimental carcinogen and tumorigen. Human systemic effects by inhalation: cough, dyspnea, fibrosis. Listed by IARC as a "known human carcinogen", Group 1. Listed by NTP. No LD<sub>50</sub> in RTECS. Inhalation-human TCLo:

400 particles per cubic centimeter per 4 years- intermittent; Pulmonary system

effects. Other species toxicity data (NIOSH RTECS 1992): intratracheal-rat LDLo 200

mg/kg; intrapleural-rat TDLo: 90 mg/kg; carcinogenic effects; intrapleural-rat TD:

100 mg/kg; equivocal tumorigenic agent; intratracheal-rat LDLo: 200 mg/kg.

**Quartz CAS# 14808-60-7. Toxic and Hazard Review (Sax):** Experimental poison by

intratracheal and intravenous routes. An experimental carcinogen, tumorigen, and

neoplastigen. Human systemic effects by inhalation: cough, dyspnea, liver effects.

Listed by IARC as a "known human carcinogen" Group 1. Listed by NTP. No LD<sub>50</sub> in

RTECS. Inhalation human: TCLo 16 million particles per cubic centimeter per 8 hours

per 17.9 Years-Intermittent; Pulmonary system effects; Inhalation-human LCLo: 300



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TOXICOLOGICAL INFORMATION continued from page 4

micrograms/m<sup>3</sup> per 10 years-intermittent: liver. Other species toxicity data (NIOSH RTECS): intravenous-rat LDLo: 90 mg/kg; intraperitoneal-rat LDLo: 200 mg/kg; intravenous-mouse LDLo: 40 mg/kg; intravenous-dog LDLo: 20 mg/kg.  
Phosphoric Acid CAS#7664-38-2. Toxic and Hazard Review (Sax): Moderately toxic by ingestion and skin contact. A corrosive irritant to eyes, skin and mucous membranes and a systemic irritant by inhalation. Toxicity data: unx-man LDLo:220 mg/kg; skn-rbt LD<sub>50</sub>:2740 mg/kg; eye-rbt:119 mg SEV; orl-rat LD<sub>50</sub>:1530 mg/kg.  
Balance of Ingredients: No LD<sub>50</sub> or LC<sub>50</sub> found for oral, dermal, or inhalation routes of administration.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicological/Chemical Fate Information:

No data available on any adverse effects of this material on the environment.

SECTION 13. DISPOSAL INFORMATION

Waste Management/Disposal: This product, as manufactured, does not exhibit any characteristics of a hazardous waste. It is suitable for landfill disposal. However, debris generated during installation, maintenance or tear-out procedures may be contaminated with other hazardous materials. 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

US Department of Transportation: Not regulated by DOT as a hazardous material. No hazard class, no label or placard required, no UN or NA number assigned.  
Canadian TDG Hazard Class & PIN: Not regulated

SECTION 15. REGULATORY INFORMATION

SARA TITLE III: This product does not contain any substances reportable under Sections 302, 304 or 313. Sections 311 and 312 do apply. (Routine Reporting and Chemical Inventories)

The product contains 0-1% phosphoric acid CAS#7664-38-2. EPA/CERCLA RQ is 5000 lb; EPCRA section 313 de minimis concentration is 1.0%. Therefore, the phosphoric acid contained in this product is excluded from reporting requirements.

TSCA: All substances in this product are listed in the Chemical Substance Inventory of the Toxic Substances Control Act.

California Proposition 65: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive toxins.

SECTION 16. OTHER INFORMATION

Removal After Service/Tear-Out Precautions:

Because of the possible presence of crystalline silica in used refractory debris, particular care should be exercised during tear-out to minimize the generation of dust. Adherence to proper methods of dust suppression and control is imperative. The following precautions should be taken during tear-out.

1. Employees should be apprised of the hazards and proper conditions and precautions for safe use or exposure.
2. Approved respirators, in accordance with requirements of 29 CFR 1910.134, should be used for dust levels above 0.05mg/m<sup>3</sup> respirable crystalline silica.
3. Dust generation should be minimized by the use of dust control equipment or water spray.
4. Wear protective clothing and vacuum clean prior to removing clothing.



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REMOVAL AFTER SERVICE INFORMATION continued from page 5

5. Where there is a possibility of exposure to dust containing respirable crystalline silica, the following warning should be posted.

FREE SILICA WORK AREA	AVOID BREATHING DUST
DUST MAY CAUSE DELAYED LUNG INJURY ( SILICOSIS)	

**ACRONYMS AND REFERENCES USED IN PREPARATION OF MSDS':**

ACGIH: American Conference of Governmental Industrial Hygienists  
 CAS#: CAS Registration Number is an assigned number to identify a material. CAS stands for Chemical Abstracts Service.  
 CERCLA: Comprehensive Environmental Response, Compensation & Liability Act  
 EPCRA: Emergency Planning and Community Right-to-Know Act of 1986  
 HMIS<sup>TM</sup>: Hazardous Materials Identification System (National Paint & Coatings Association)  
 IARC: International Agency for Research on Cancer  
 MSHA: Mine Safety and Health Administration  
 mg/m<sup>3</sup>: Milligrams per cubic meter  
 NIOSH: National Institute for Occupational Safety and Health  
 NFPA: National Fire Protection Association  
 NTP: National Toxicology Program  
 OSHA: Occupational Safety and Health Administration  
 PEL: Permissible Exposure Limit (OSHA)  
 REL: Recommended Exposure Limit (NIOSH)  
 SARA: Superfund Amendments and Reauthorization Act  
 TITLE III: Emergency Planning and Community Right To Know Act  
 Section 302: Extremely Hazardous Substances  
 Section 304: Emergency Release  
 Section 311: Community Right-to-Know, MSDSs or List of Chemicals  
 Section 312: Community Right-to-Know, Inventories and Locations, (Tier I/II)  
 Section 313: Toxic Chemicals, Toxic Chemical Release Reporting, Form R  
 TLV: Threshold Limit Values (ACGIH)  
 TWA: Time Weighted Average  
 29CFR1910.134: OSHA Respiratory Protection Standard

**REFERENCES:**

Sax, N. Irving: Dangerous Properties of Industrial Materials, Seventh Edition, Van Nostrand Reinhold Co., Inc., 1989.  
 Kirk, R. and Othmer, D., Encyclopedia of Chemical Technology, Third Edition, Wiley-Interscience, New York, NY 1982.  
 Clansky, K.B., Suspect Chemicals Sourcebook, 1992-2 Edition, Roytech Publications, Bethesda, Maryland.  
 Sax, N. Irving and Lewis, R.J. Hawley's Condensed Chemical Dictionary, Eleventh Ed., Van Nostrand Reinhold Co., Inc., NY  
 Manufacturers/Suppliers, Material Safety Data Sheets on Raw Materials Used

Prepared/revised: J.E. ROWELL  
 March 8, 2001

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