

---

## MATERIAL SAFETY DATA SHEET

Classified as Hazardous according to criteria of Worksafe Australia

---

### 1. IDENTIFICATION OF MATERIAL & SUPPLIER

---

**Product Name:** Variform

**Other Names:** Carbolane Variform  
Carbolane Varicast  
Variform A  
Variform B  
Variform V14  
Fiberfrax Variform

**UN Number:** None Allocated  
**DG Class:** None Allocated  
**Packaging Group:** None Allocated  
**Hazchem Code:** None Allocated  
**Poisons Schedule:** Not Scheduled  
**Product Use:** Refractory castable insulation

**Supplier:** Unifrax Australia Pty. Ltd.

**Contact:** See page 9

---

### 2. HAZARDS IDENTIFICATION

---

**Flammability**  
**Fire Hazards:** Non flammable

**Explosive Hazards:** Non explosive

**Health Hazards:** Irritating to eyes, skin, respiratory system and disturbances to gastro intestines.

---

## MATERIAL SAFETY DATA SHEET

Classified as Hazardous according to criteria of Worksafe Australia

---

### 3. COMPOSITION AND INFORMATION ON INGREDIENTS

---

| <u>Chemical Name</u>             | <u>CAS Number</u> | <u>Proportion</u> |
|----------------------------------|-------------------|-------------------|
| Calcium aluminate cement         | 65997-16-2        | >60 %             |
| Ceramic Fibre (alumino silicate) | 65997-17-3        | 10-<30 %          |
| Fumed silica                     | 69012-64-2        | 0-10 %            |
| Other non hazardous              |                   | 0-1 %             |

Contains no detectable crystalline silica

**Other Names:** contains SMF, MMMF, MMMF

---

### 4. FIRST AID MEASURES

---

|                          |   |
|--------------------------|---|
| <b>Ingestion:</b>        | Do not induce vomiting. Drink plenty of water..   |
| <b>Eye:</b>              | Flush immediately with large amount of water for at least 15 minutes. Eyelids should be held open away from the eyeball to ensure thorough rinsing. Do not rub eyes.  |
| <b>Skin:</b>             | If skin becomes irritated, remove contaminated clothing. Wash areas of contact with soap and water. Do not rub or scratch exposed skin. Using a skin cream or lotion after washing may be helpful in reducing irritation. |
| <b>Inhalation:</b>       | Remove exposed person/s from source of exposure to fresh air.   |
| <b>ADVICE TO DOCTOR:</b> | Acute effects are essential irritant in nature. Refer to 'OTHER INFORMATION' section for long term exposures.   |

---

## MATERIAL SAFETY DATA SHEET

Classified as Hazardous according to criteria of Worksafe Australia

---

### 5. FIRE FIGHTING MEASURES.

---

|  |                                    |
|--|------------------------------------|
| <b>Fire Explosion Hazard:</b>                          | Not Flammable and not explosive.   |
| <b>Hazardous Reactions/<br/>Decomposition Products</b> | Refer to SAFE HANDLING INFORMATION |
| <b>Hazchem Code:</b>                                   | None Allocated.                    |

---

### 6. ACCIDENTAL RELEASE MEASURES

---

|   |   |
|---|---|
| <b>Spills or Release<br/>To The Environment</b> | Pick up large pieces and place in containers. Where possible, use vacuum cleaner to clean up smaller spilled material. Refer to removal procedures in <b>Use and Handling</b> |
|---|---|

---

### 7. HANDLING & STORAGE

---

|                  |  |
|------------------|--|
| <b>Handling:</b> | <p>In the installation of <u>unbonded materials</u>, the following handling and installation procedures are recommended:</p> <ol style="list-style-type: none"><li>All installation practices should be designed to minimise the liberation of any airborne fibre or dust.</li><li>In large installations of several days/weeks duration, the installation area should be clearly designated and barriers erected to limit access.</li><li>The Ceramic Materials should be stored in sealed plastic bags or similar containers until installation is to proceed. These containers should only be opened within the designated work area when work is to start.</li><li>Where possible, materials should be delivered in sizes such that a minimum of handling is required. However when cutting or drilling is required, these should be done with hand tools fitted with local exhaust extraction. The exhaust from such extraction equipment should be fitted and positioned away from</li></ol> |
|------------------|--|

---

## MATERIAL SAFETY DATA SHEET

Classified as Hazardous according to criteria of Worksafe Australia

### 7. Handling & Storage cont'd:

other work areas.

- e) Empty storage bags should be folded and stored in a waste container along with any waste material.
- f) Upon completion of the job, all excess materials should be sealed in bags prior to removal from the designated work area. The work area should be vacuumed using an industrial vacuum cleaner. Wet mopping and wiping can be utilised if an industrial vacuum cleaner is not available.

For removal of Ceramic Fiber materials the following handling procedures are recommended:

- a) All installation practices should be designed to minimise the liberation of any airborne fibre or dust.
- b) In large installations of several days/weeks duration, the installation area should be clearly designated and barriers erected to prevent access.
- c) Upon completion of the job, all excess materials should be sealed in bags prior to removal from the designated work area. The work area should be vacuumed using an industrial vacuum cleaner. Wet mopping and wiping can be utilised if an industrial vacuum cleaner is not available.

For removal of embrittled Ceramic Fiber materials the following procedures, in particular, the selection of respirator protection should be implemented during the removal of such materials.

- a) The removal area should be signposted and contained, where workable, to minimize the transfer of dust to other work areas.
- b) Separate change areas should be provided to minimize the transfer of dust to general work areas.
- c) Where workable, the spent material should be wetted to suppress dust generation.
- d) Waste shall be placed in containers, plastic bags or other methods which prevent Fiber and/or dust

---

## MATERIAL SAFETY DATA SHEET

Classified as Hazardous according to criteria of Worksafe Australia

### 7. Handling & Storage cont'd:

- emission, and disposed of in accordance with local waste disposal authority requirements.
- e) The removal area should then be cleaned using an Industrial vacuum cleaner and:-
  - f) Once visible dust has been cleaned up, containment material should be removed in a manner that minimizes the liberation of any trapped dust.

**Storage Precautions:** No special storage requirements.

---

### 8. EXPOSURE CONTROLS & PERSONAL PROTECTION

---

|                            |                          |   |
|----------------------------|--------------------------|---|
| <b>Exposure Standards:</b> | Ceramic fibre            | 0.5 fibre/mL for SMF (NOHSC 1995)                               |
|                            | Fumed silica             | 2 mg/m <sup>3</sup> (NOHSC 1995)                                |
|                            | Calcium aluminate cement | 10 mg/m <sup>3</sup> dust not otherwise classified (NOHSC 1995) |

**Engineering Controls:** Where possible when using the dry product use local exhaust ventilation.

**Personal Protection Equipment:** (For handling of the dry product)

The National Code of Practice for the Safe Use of Synthetic Mineral Fibres (NOHSC 1990) advises the use of the following PPE that for installation and removal of both bonded and unbonded ceramic fibre material.

- a) Disposable coveralls or long sleeve, loose fitting clothing and gloves (launderable clothing should be washed separately from other clothing).
- b) Where overhead work is involved, goggles and head covering should be worn; and
- c) A half-face (P1 or P2) respirator should be worn during work in enclosed or poorly ventilated spaces, or where evidence suggests that respirable fibre levels may exceed 0.5 f/mL.

For removal of embrittled or heat effected ceramic materials the following personal protective equipment should be used by all personnel directly involved in the removal work.

- a) Disposable coveralls or long sleeve, loose fitting clothing and gloves (launderable clothing should be washed separately from other clothing).

---

## MATERIAL SAFETY DATA SHEET

Classified as Hazardous according to criteria of Worksafe Australia

b) Where overhead work is involved, goggles and head covering should be worn. Eye protection would be provided as an integral component of a full-face respirator.

c) A P2 respirator provides the necessary protection factor for this task. However, in some circumstances where excessive levels of dust are created, the limitations of filter loading capacity and facial seal may necessitate the use of:

- a full-face P3 cartridge respirator, or
- a full-face P3 powered air-purifying respirator or
- a full-faced positive pressure demand airline respirator

All respiratory devices should be tested for compliance with AS/NZS 1715 & AS/NZS 1716.

---

### 9. PHYSICAL & CHEMICAL PROPERTIES

|                        |                 |                             |           |
|------------------------|-----------------|-----------------------------|-----------|
| <b>Appearance:</b>     | Tan fibrous mix | <b>Specific Gravity:</b>    | 2.5 - 2.7 |
| <b>Melting Point:</b>  | >1800°C         | <b>Flash Point:</b>         | N/A       |
| <b>Boiling Point:</b>  | N/A             | <b>Flammability Limits:</b> | N/A       |
| <b>Vapor Pressure:</b> | N/A             | <b>Solubility in Water:</b> | Insoluble |

---

### 10. STABILITY & REACTIVITY

**Stability:** Stable under normal conditions of use.

**Hazardous Reactions** Refer to SAFE HANDLING INFORMATION  
**Decomposition Products**

---

### 11. TOXICOLOGICAL INFORMATION

The potential for SMF fibres to produce health effects has been the subject of extensive investigations over a number of decades. The Australian Refractory Ceramic Fibre Industry Association (ARCFIA) is continuing to support the necessary investigations and will make all data available to interested parties. Information will be updated as studies are completed and reviewed.

The following is a review of the results to date:

---

## MATERIAL SAFETY DATA SHEET

Classified as Hazardous according to criteria of Worksafe Australia

### 11. Toxicological Information cont'd:

**EPIDEMIOLOGY:** Extensive investigations of ceramic fibre production workers have been ongoing for more than 10 years. The preliminary evidence is as follows;

1. There is no evidence of any fibrotic lung disease (interstitial fibrosis) whatsoever on X-ray.
2. There is no evidence of any lung disease among those employees exposed to ceramic fibres that have never smoked.
3. A statistical "trend" was observed in smokers between slight decreases in measures of pulmonary function and the duration of exposure to ceramic fibre however this trend is similar to that observed in smokers who work in other industries.
4. Pleural plaques (thickening along the chest wall) have been observed in a small number of employees in overseas plants who have had long duration of employment. A repeat study found inconsistencies in detecting such pleural plaques. No pleural plaques have been found in the Australian manufacturing workforce. There are several occupational and non-occupational causes for pleural plaques and it is generally considered that they are not indications of "pre-cancer" nor are they associated with any measurable effect on lung function.

**TOXICOLOGY:** A number of studies have been conducted on the health effects of inhalation exposure of rats and hamsters. In a lifetime (6 hours per day, 5 days a week for 24 months) nose only inhalations study, rats exposed to Maximum Tolerated Dose (30 mg/M<sup>3</sup>, 200 fibres/mL) developed progressive lung damage (interstitial fibrosis) and cancer of the lung and mesothelioma. In contrast, hamsters similarly exposed developed interstitial fibrosis and mesothelioma but no lung cancers. A multiple dose study (3, 9, 16 mg/M<sup>3</sup>; 25, 75, and 150 fibres/mL) found a dose related parenchymal fibrosis however in the lowest exposed group (25 fibres/mL) no irreversible effects were found that could be attributed to ceramic fibre exposure. There was no statistical excess of lung tumors at any dose. One rat developed a mesothelioma in the 75 fibre/mL exposure group.

In 1997 the International Agency for Research on Cancer (IARC) reviewed the epidemiological and animal toxicology data on SMF (including ceramic fibre, glasswool, rockwool, and slagwool) and classified the group as possible human carcinogens (IARC Group 2B).

---

## MATERIAL SAFETY DATA SHEET

Classified as Hazardous according to criteria of Worksafe Australia

---

### 12. ECOLOGICAL INFORMATION

---

Not available

---

### 13. DISPOSAL CONSIDERATIONS

---

**Waste Disposal:** Waste should be placed in containers, plastic bags or other methods which prevent fibre or dust emission, and disposed of in accordance with the local waste disposal authority requirements. There may be specific regulations at the Local, State or Federal level that pertain to this material.

---

### 14. TRANSPORT INFORMATION

---

No special transport requirements are necessary.

|                         |                |
|-------------------------|----------------|
| <b>UN Number</b>        | None Allocated |
| <b>Shipping Name</b>    | None Allocated |
| <b>DG Class</b>         | None Allocated |
| <b>Packaging Group</b>  | None Allocated |
| <b>Hazchem Code</b>     | None Allocated |
| <b>Poisons Schedule</b> | Not Scheduled  |

---

### 15. REGULATORY INFORMATION

---

**Risk Statement:** R40 (3) Possible risk of irreversible effects. R36/37/38 Irritating to eyes, respiratory system and skin.

**Safety Statement:** S22 Do not breathe dust. S52 Avoid contact with eyes. S38 In insufficient ventilation, wear suitable respiratory equipment. S40 To clean floor and all objects contaminated by this Material, use AS approved HEPA fitted vacuum cleaner. S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

**Hazard Category:** Harmful, irritant.

**Poisons Schedule:** Not scheduled.

---

---

## MATERIAL SAFETY DATA SHEET

Classified as Hazardous according to criteria of Worksafe Australia

---

### 16. OTHER INFORMATION

---

#### RCF DEVITRIFICATION

As produced, all RCG fibers are vitreous (glassy) materials which do not contain crystalline silica. Continued exposure to elevated temperatures may cause these fibers to devitrify (become crystalline). The first crystalline formation (mullite) begins to occur at approximately 985° C (1805° F). Crystalline phase silica may begin to form at temperatures of approximately 1200° C (2192° F). The occurrence and extent of crystalline phase formation is dependent on the duration and temperature of exposure, fiber chemistry and/or the presence of fluxing agents. The presence of crystalline phases can be confirmed only through laboratory analysis of the "hot face" fiber.

IARC's evaluation of crystalline silica states "Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)" and additionally notes "carcinogenicity in humans was not detected in all industrial circumstances studied" (IARC Monograph Vol. 68, 1997). NTP lists all polymorphs of crystalline silica amongst substances which may "reasonably be anticipated to be carcinogens".

IARC and NTP did not evaluate after-service RCF, which may contain various crystalline phases. However, an analysis of after-service RCF samples obtained pursuant to an exposure monitoring agreement with the USEPA, found that in the furnace conditions sampled, most did not contain detectable levels of crystalline silica. Other relevant RCF studies found that (1) simulated after-service RCF showed little, or no, activity where exposure was by inhalation or by intraperitoneal injection; and (2) after-service RCF was not cytotoxic to macrophage-like cells at concentrations up to 320 g/cm<sup>2</sup> - by comparison, pure quartz or cristobalite were significantly active at much lower levels (circa 20 g/cm<sup>2</sup>).

#### CONTACT DETAILS:

**Contact:** During Business Hours Ph: +61 3 9463 7100

**Emergency / After Hours Contact:** Alan Smith  
Ph: 0409 288 916

Unifrax Australia Pty. Ltd.

326 Settlement Road  
Thomastown, VIC 3074

ACN 093 625 757

Ph: (03) 9463 7100 Fax: (03) 9464 5472



**FIBERFRAX® VARIFORM**

---

## **MATERIAL SAFETY DATA SHEET**

**Classified as Hazardous according to criteria of Worksafe Australia**

**References:** Replaces MSDS dated 27 March 2007.

**NOTICE:** *The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorisation given or implied to practise any patented invention without licence. In addition, no responsibility can be assumed by the vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.*

... End Of Report ...

---

Authorised by: Alan Smith  
Version: 1.3  
Control Status: Controlled Document  
Created on: 01/05/10