



### 3 - Composition / Information On Ingredients

#### 3.2 Mixture

These products in the form of boards or shapes are made of refractory ceramic fibres.

COMPONENT	% by weight	CAS No.	REACH Registration Number	Hazard Classification according to CLP
Refractory Ceramic Fibre (Alumino-silicate wools)	10-50	142844-00-6	01-2119458050-50	Carc 1B (H350i)
Alumino-Silicate	10-50	Not Applicable	Not yet available	Not classified as hazardous
Clay	10-30	1332-58-7	Not yet available	Not classified as hazardous
Cement	20-50	65997-16-2	01-2119989490-26	Eye Irrit 2 (H318)
Other inert material	<1	Not Applicable	Not yet available	Not classified as hazardous

Composition:

CAS definition: Chemical composition of Refractory Ceramic Fibres (RCF/ASW):

SiO<sub>2</sub>: 45-60 %, Al<sub>2</sub>O<sub>3</sub>: 28-55 %, ZrO<sub>2</sub> < 18%

None of the components are radioactive under the terms of European Directive Euratom 96/29.

### 4 - First-Aid measures

#### Skin

Handling of this material may generate mild mechanical temporary skin irritation. If this occurs, rinse affected areas with water and wash gently. Do not rub or scratch exposed skin.

#### Eyes

In case of eye contact flush abundantly with water; have eye bath available. Do not rub eyes. Seek medical attention if irritation persists.

#### Nose and Throat

If these become irritated move to a dust free area, drink water and blow nose. Seek medical attention if irritation persists.

If symptoms persist, seek medical advice.

#### 4.2 - Most important symptoms and effects, both acute and delayed

No symptoms or effects expected either acute or delayed

#### 4.3 - Indication of any immediate medical attention and special treatment required

No special treatment required, if exposure occurs wash exposed areas to avoid irritation.

### 5 - Fire-fighting measures

#### 5.1 - Extinguishing media

Use extinguishing agent suitable for surrounding combustible materials.

#### 5.2 - Special hazards arising from the substance or mixture

Non combustible products. However, virgin product binder may burn and produce gases and/or fumes.

#### 5.3 - Advice for firefighters

Packaging and surrounding materials may be combustible.

### 6 - Accidental Release Measures

#### 6.1 - Personal precautions, protective equipment and emergency procedures

Where abnormally high dust concentrations occur, provide workers with appropriate protective equipment as detailed in section 8.

Restrict access to the area to a minimum number of workers required.

Restore the situation to normal as quickly as possible.

#### 6.2 - Environmental precautions

Prevent further dust dispersion for example by damping the materials.

Do not flush spillage to drain and prevent from entering natural watercourses.

Check for local regulations, which may apply

#### 6.3 - Methods and materials for containment and clean up

Pick up large pieces and use a vacuum cleaner fitted with a high efficiency filter (HEPA)

If brushes are used, ensure that the area is wetted down first.

Do not use compressed air for clean up.

Do not allow to become windblown.

#### 6.4 - Reference to other sections

For further information, please refer to sections 7 and 8

## **7 - Handling and storage**

### **7.1 - Precautions for safe handling**

Handling can be a source of dust emission and therefore the processes should be designed to limit the amount of handling. Whenever possible, handling should be carried out under controlled conditions (i.e., using dust exhaust system).

Regular good housekeeping will minimise secondary dust dispersal.

### **7.2 - Conditions for safe storage**

Store in original packaging in a dry area.

Always use sealed and clearly labelled containers.

Avoid damaging containers.

Reduce dust emission during unpacking.

Emptied containers, which may contain debris, should be cleaned before disposal or recycling.

Recyclable cardboard and/or plastic films are recommended for packaging.

### **7.3 - Specific end use**

The main application of these products is as thermal insulation. Use of the products is restricted to professional users.

Please refer to section 8 and the relevant exposure scenario

## 8 - Risk Management Measures / Exposures Controls / Personal Protection

### 8.1 - Control parameters

Industrial hygiene standards and occupational exposure limits vary between countries and local jurisdictions. Check which exposure levels apply to your facility, and comply with local regulations. If no regulatory dust or other standards apply, a qualified industrial hygienist can assist with a specific workplace evaluation including recommendations for respiratory protection. Examples of exposure limits applying (in November 2014) in different countries are given below:

COUNTRY	RCF (fibre/ml)	Source
EU BOELV	0.3	Carcinogens and Mutagens Directive (DIRECTIVE 2004/37/EC)
Austria	0.5	Grenzwerteverordnung
Belgium	0.5	Valeurs limites d'exposition professionnelle – VLEP/ Grenswaarden voor beroepsmatige blootstelling – GWBB
Denmark	1	Grænseværdier for stoffer og materialer
Finland	0.2	Finnish Ministry of Social Affairs and Health
France	0.1	Institut National de Recherche et de Sécurité
Germany*	0.2*	TRGS 900
Hungary	1	<i>EUM-SZCSM rendelet</i>
Ireland	1	HAS – Ireland
Italy	0.2	Uses EU values
Luxembourg	0.5	Agents Chimiques, Cancérigènes Ou Mutagènes Au Travail
Netherlands	0.5	SER
Norway	0.1	Veiledning om administrative normer for forurensning i arbeidsatmosfære
Poland	0.5	Dziennik Ustaw 2010
Spain	0.5	INSHT
Sweden	0.2	AFS 2005:17
Switzerland	0.25	SUVA - Valeurs limites d'exposition aux postes de travail

#### 8.1.1 DNEL/DMEL (DERIVED NO-EFFECT LEVEL/DERIVED MINIMAL EFFECT LEVEL)

SCOEL (Scientific Committee on Occupational Exposure Limits) published a report in 2012 using all available data to set an OEL for RCF, because this substance is a fibre and its hazard is related to inhalation, this OEL is more appropriate than a modelled DNEL. The report concludes as follows:

Assuming a 45 years exposure the average cumulative exposures of 147.9 and 184.8 fmo/ml, respectively, result in an average fibre concentrations of 0.27 and 0.34 f/ml. Considering these values as no observed adverse effect levels SCOEL proposes an OEL of 0.3 f/ml.

#### Information on monitoring procedures

United Kingdom

MDHS 59 specific for MMVF: "Man-made mineral fibre - Airborne number concentration by phase-contrast light microscopy" and MDHS 14/4 "General methods for sampling and gravimetric analysis of respirable and inhalable dust"

MDHS 101 - "Crystalline silica in respirable airborne dusts"

NIOSH

NIOSH 0500 "Particulates not otherwise regulate, total"

NIOSH 0600 "Particulates not otherwise regulate, respirable"

NIOSH 7400 "Asbestos and other fibres by PCM"

NIOSH 7500 " Silica, Crystalline, by XRD (filter redeposition)"

### 8.2 - Exposure controls

#### 8.2.1 APPROPRIATE ENGINEERING CONTROLS

Review your application(s) and assess situations with the potential for dust release.

Where practical, enclose dust sources and provide dust extraction at source.

Designate work areas and restrict access to informed and trained workers.

Use operating procedures that will limit dust production and exposure of workers.

Keep the workplace clean. Use a vacuum cleaner fitted with a HEPA filter; avoid using brooms and never use compressed air for clean up.

If necessary, consult an industrial hygienist to design workplace controls and practices.

The use of products specially tailored to your application(s) will help to control dust. Some products can be delivered ready for use to avoid further cutting or machining. Some could be pre-treated or packaged to minimise or avoid dust release during handling.

Consult your supplier for further details

Table of Uses and Risk Management Measures (RMM):

Intended use	RMM - Hierarchy of Controls

<p><b>Secondary use</b>– Conversion into wet and dry mixtures and articles.</p> <p>Process would include: Mixing forming operations, handling of RCF/ASW products, assembly of RCF/ASW containing products, machine and hand finishing of RCF/ASW products.</p> <p>Reference ES 2</p>	<ul style="list-style-type: none"> <li>• Where it is practical to do so, automatically feed RCF/ASW in to the process</li> <li>• Where practical to do so, segregate dry and wet processing</li> <li>• Enclose the process where practically possible.</li> <li>• Where practical to do so, segregate machine areas and restrict access to operators involved in the process.</li> <li>• Enclose Machines as far as practically possible.</li> <li>• Install LEV where possible, when machine finishing, handling, compressing and hand cutting to remove dust at source</li> <li>• Employ experienced personnel – trained in the correct use of fibrous products</li> <li>• PPE and RPE used for all dusty tasks</li> <li>• Provide vacuum cleaner connection point to central system where practical or use a portable HEPA vacuum</li> <li>• Regular clean up – using a wet scrubbing unit where practically possible and in general a HEPA vacuum should be used.</li> <li>• Dry brushing and use of compressed air should be prohibited</li> <li>• Waste materials to be contained at source, labelled and stored separately for disposal or recycling.</li> </ul>
<p><b>Intended use</b></p> <p>Tertiary use - maintenance and service life (Industrial or professional use)</p> <p>Process: Small scale repairs involving removal and installation of RCF/ASW products. Use of the product in an enclosed system, where there is occasional control access or no access.</p> <p>Reference ES 3</p>	<p><b>RMM - Hierarchy of Controls</b></p> <ul style="list-style-type: none"> <li>• Use pre-cut, pre-sized pieces where practically possible.</li> <li>• Allow access only to trained (authorised ) operators</li> <li>• Where practically possible, perform all hand cutting in a segregated area, on a down draft bench.</li> <li>• Clean up work area regularly during the shift using a HEPA equipped vacuum cleaner.</li> <li>• Prohibit use of dry brushing and compressed air cleaning.</li> <li>• Bag and seal waste immediately at source.</li> <li>• Use PPE and RPE appropriate to task.</li> <li>• Employ good hygiene practices.</li> </ul>
<p><b>Intended use</b></p> <p>Tertiary use - installation and removal (industrial or professional).</p> <p>Large scale removal and installation of RCF/ASW from Industrial processes.</p> <p>Large scale removal and installation by professionals.</p> <p>Reference ES 4</p>	<p><b>RMM - Hierarchy of Controls</b></p> <ul style="list-style-type: none"> <li>• Where practically possible enclose or segregate the work area.</li> <li>• Allow only authorised personnel.</li> <li>• Pre-wet insulation prior to removal where practically possible.</li> <li>• Where practically possible use a water lance for removal or vacuum-truck.</li> <li>• Use down draft bench for hand cutting products.</li> <li>• Cover pre-cut section during transport and storage to prevent secondary exposure.</li> <li>• Where practically possible provide multiple vacuum hoses for convenient cleanup of spillage or use portable HEPA filtered vacuums.</li> <li>• Bag waste materials immediately at source</li> <li>• Prohibit use of dry brushing and or compressed air cleaning.</li> <li>• Experienced personnel only</li> <li>• Use appropriate PPE and RPE appropriate to expected concentrations</li> </ul>

### 8.2.2 - Personal Protective Equipment

#### Skin Protection

Wear industrial leather gloves and work clothes, which are loose fitting at the neck and wrists. Soiled clothes should be cleaned to remove excess dust before being taken off (e.g. use vacuum cleaner, not compressed air). Each worker should be provided with two lockers in an appropriate changing and washing area. It is good hygiene practice to ensure work clothes are washed separately by the employer. Work clothes should not be taken home.

#### Eye Protection

As necessary, wear goggles or safety glasses with side shields

#### Respiratory Protection

For dust concentrations below the applicable exposure limit value, RPE is not required but FFP2 respirators should be provided for use on a voluntary basis.

For short term operations where excursions are less than ten times the applicable limit value, use FFP3 respirators.

In case of higher concentrations or where the concentration is not known, please seek advice from your company and/or your supplier.

You may also refer to the ECFIA code of practice available on the ECFIA's web site: [www.ecfia.eu](http://www.ecfia.eu)

#### Information and Training of workers

This should include:

The applications involving RCF/ASW-containing products;

The potential risk to health resulting from the exposure to fibrous dust;

The requirements regarding smoking, eating and drinking at the workplace;

The requirements for protective equipment and clothing;

The good working practices to limit dust release;

The proper use of protective equipment.

### 8.2.3 - Environmental Exposure Controls

RCF/ASW is inorganic, inert and stable and it is not soluble in water (solubility <1mg/litre) and as such does not pose a detrimental effect on the environment.

Processes involving the manufacturing or use of RCF/ASW should be filtered to minimise fibre emissions to air

Waste RCF/ASW should be stored in closed containers and placed in to deep landfills, giving therefore little opportunity for release.

General good practice for spills and waste is to prevent products from being windblown, by covering and damping the waste materials. Contain spillages to prevent access to drain.

Refer to local, national or European applicable environmental standards for release to air water and soil.

For waste, refer to section13

## 9 - Physical and chemical properties

<b>Information on basic physical and chemical properties</b>	Not applicable
<b>State</b>	Grey powder with fibre
<b>Colour</b>	Grey
<b>Odour</b>	None
<b>Odour threshold</b>	Not Applicable
<b>pH</b>	Not applicable
<b>Melting point/freezing point</b>	> 1650°C
<b>Initial boiling point and boiling point range</b>	Not applicable
<b>Flash point</b>	Not applicable
<b>Evaporation rate</b>	Not Applicable
<b>Flammability (solid, gas)</b>	Not applicable
<b>Upper/lower flammability or explosive limits</b>	Not applicable
<b>Vapour pressure</b>	Not applicable
<b>Vapour density</b>	Not Applicable
<b>Relative density</b>	Not applicable
<b>Solubility(ies)</b>	Less than 1 mg/l
<b>Partition co-efficient: n-octanol/water</b>	Not applicable
<b>Auto-ignition temperature</b>	Not applicable
<b>Decomposition temperature</b>	Not Applicable
<b>Viscosity</b>	Not Applicable
<b>Other safety information</b>	Length Weighted Geometric Mean Diameter 1.4 - 3 µm
<b>Particle Characteristics</b>	Not applicable
<b>Explosive properties</b>	Not applicable
<b>Oxidising properties</b>	Not applicable

## 10 - Stability and Reactivity

### 10.1 - Reactivity

RCF/ASW is stable and non reactive.

### 10.2 - Chemical Stability

RCF/ASW is inorganic, stable and inert

### 10.3 - Possibility of Hazardous Reactions

None

### 10.4 - Conditions to Avoid

Please refer to handling and storage advice in Section 7

### 10.5 - Incompatible Materials

None

### 10.6 - Hazardous decomposition products

Upon heating above 900°C for sustained periods, this amorphous material begins to transform to mixtures of crystalline phases. For further information please refer to Section 16.

## 11 - Toxicological information

### Toxicokinetics, metabolism and distribution

#### 11.1.1 BASIC TOXICOKINETICS

Exposure is predominantly by inhalation or ingestion. Man made vitreous fibres of a similar size to RCF/ASW have not been shown to migrate from the lung and/or gut and do not become located in other organs of the body

#### 11.1.2 HUMAN TOXICOLOGICAL DATA

##### Epidemiology of RCF

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.A. 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 U.S.A. have demonstrated an absence of interstitial fibrosis. In the European study a reduction of lung capacity among smokers has been identified, however, based on the latest results in the U.S.A. study this reduction is no longer statistically significant.

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

The U.S.A. mortality study did not show evidence of increased lung tumour development either in the lung parenchyma or in the pleura.

##### Epidemiology of crystalline Silica

Prolonged/repeated inhalation of respirable crystalline silica dust may cause delayed lung injury (silicosis).

In evaluating crystalline silica as a cancer risk, the International Agency for Research on Cancer (IARC) reviewed several studies from different industries and concluded that crystalline silica from occupational sources inhaled in the form of quartz or cristobalite is carcinogenic to humans (Group 1) [IARC Monograph; vol.68; June 1997].

However, in reaching its conclusion, IARC stated that the carcinogenicity in humans could not be found in all industries reviewed and that carcinogenicity might be dependent on inherent characteristics of crystalline silica or on external factors affecting biological activity (e.g., cigarette smoking) or distribution of its polymorphs.

### 11.1 - Information on hazard classes as defined in Regulation (EC) No 1272/2008

#### Experimental studies of RCF

##### • Acute toxicity: short term inhalation

No data available: Short term tests have been undertaken to determine fibre (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 a chemical irritant according to test method OECD no. 404

##### • Serious eye damage/irritation:

Not possible to obtain acute toxicity information due to the morphology and chemical inertness of the substance

##### • Respiratory or skin sensitisation

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

##### • Germ cell mutagenicity;

Method: In vitro micronucleus test

Species: Hamster (CHO)

Dose: 1-35 mg/ml

o Routes of administration: In suspension

o Results: Negative

##### • Carcinogenicity;

Method: Inhalation. Multi-dose

Species: Rat,

Dose: 3 mg/m<sup>3</sup>, 9 mg/m<sup>3</sup> and 16 mg/m<sup>3</sup>

Routes of administration: Nose only inhalation

Results: Fibrosis just reached significant levels at 16 and 9 mg/m<sup>3</sup> but not at 3 mg/m<sup>3</sup>. None of the parenchymal tumour incidences were higher than the historical control values for this strain of animal.

Method: Inhalation. Single dose

Species: Rat

Dose: 30 mg/m<sup>3</sup>

Routes of administration: Nose only inhalation

Results: Rats were exposed to a single concentration of 200 WHO fibres/ml specially prepared RCF for 24 months. High incidence of exposure-related pulmonary neoplasms (bronchoalveolar adenomas and carcinomas) were observed. A small number of mesotheliomas were observed in each of the fibre exposure groups (Mast et al 1995a).

Method: Inhalation. Single dose

Species: Hamster

Dose: 30 mg/m<sup>3</sup>

Routes of administration: Nose only inhalation

Results: Hamsters were exposed to a single concentration of 260 WHO fibres/ml specially prepared RCF for 18 months and developed lung fibrosis, a significant number of pleural mesotheliomas (42/102) but no primary lung tumours (McConnell et al 1995).

Method: Inhalation. Single dose

Species: Rat

Dose: RCF1: 130 F/ml and 50 mg/m<sup>3</sup> (25% of non fibrous particles)

RCF1a: 125 F/ml and 26 mg/m<sup>3</sup> (2% of non fibrous particles)

Routes of administration: Nose only inhalation

Results: Rats were exposed to RCF1 and RCF1a for 3 weeks. The objective of the study was to compare lung retention and biological effects of the original RCF1 compared to RCF1a. The main difference of these 2 samples was the non fibrous particle content of respectively 25% versus 2%. The post treatment observation was 12 months. Alveolar clearance was barely retarded after RCF1A exposure. After RCF1 exposure, however, a severe retardation of clearance was observed. (Bellmann et al 2001) (Source: publication)

After intraperitoneal injection of ceramic fibres into rats in three experiments (Smith et al 1987, Pott et al 1987, Davis et al 1984), mesotheliomas were found in the abdominal cavity in two studies, while the third report (Pott et al 1987) had incomplete histopathology. Only a few mesotheliomas were found in the abdominal cavity of hamsters after intraperitoneal injection in one experiment (Smith et al 1987). However, the ceramic fibres tested were of relatively large diameter. When rats and hamsters were exposed via intraperitoneal injection, tumour incidence was related to fibre length and dose (Smith et al 1987, Pott et al 1987, Miller et al 1999, Pott et al 1989). (From SCOEL publication (EU Scientific Committee on Occupational Exposure Limits) publication SCOEL/SUM/165, October 2010)

##### • Reproductive toxicity;

Method: Gavage

Species: Rat

Dose: 250mg/kg/day

Routes of administration: Oral

Results: No effects were seen in an OECD 421 screening study. There are no reports of any reproductive toxic effects of mineral fibres. Exposure to these fibres is via inhalation and effects seen are in the lung. Clearance of fibres is via the gut and the faeces, so exposure of the reproductive organs is extremely unlikely.

##### • STOT-Single exposure: Not applicable

##### • STOT-Repeated exposure: Not applicable

##### • Aspiration hazard: Not applicable

Experimental studies for crystalline silica

Animals exposed to very high concentrations of crystalline silica, artificially or by inhalation, have reported fibrosis and tumours (IARC Monographs 42 and 68). Inhalation and intratracheal installation of crystalline silica in rats caused lung cancer. However, studies in other species such as mice and hamsters caused no lung cancer. Crystalline silica also caused fibrosis in rats and hamsters in several inhalation and intratracheal installation studies.

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 manufacturers' plants in the UK has failed to show any human cases of skin conditions related to fibre exposure.

## 12 - Ecological information

### 12.1 - Toxicity

These products are insoluble materials that remain stable overtime and are chemically identical to inorganic compounds found in the soil and sediment; they remain inert in the natural environment.

No adverse effects of this material on the environment are anticipated.

### 12.2 - Persistence and degradability

Not established

### 12.3 - Bioaccumulative potential

Not established

### 12.4 - Mobility in soil

No information available

### 12.5 - Results of PBT and vPvB assessment

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).

This mixture contains no substance considered to be very persistent and very bioaccumulative (vPvB).

### 12.6 - Endocrine Disrupting Properties

No additional information available

### 12.7 - Other adverse effects

## 13 - Disposal Considerations

### 13.1 - Disposal Considerations

## 14 - Transport information

### 14.1 - Transport information

#### 14.1. UN number

Not Applicable

#### 14.2. UN proper shipping name

Not Applicable

#### 14.3. Transport hazard class(es)

Not Applicable

#### 14.4. Packing group

Not Applicable

#### 14.5. Environmental hazards

Not Applicable

#### 14.6. Special precautions for user

Not Applicable

#### 14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

## 15 - Regulatory information

### 15.1 - Regulatory information

This SDS has been prepared in accordance with WHO GHS rev. 6 requirements. Where applicable, local regulations have been followed.

## 16 - Other Information

### 16.1 - ADDITIONAL INFORMATION AND PRECAUTIONS TO BE CONSIDERED UPON REMOVAL OF AFTER SERVICE MATERIAL

### 16.2 - uses advised against

### 16.3 - NOTE

This Safety Data Sheet was originally produced in English and has subsequently been translated in to other languages; whilst every effort has been made to make this an accurate translation, please be aware that technical terms do not always translate correctly. The English version should always be considered as the reference version.

### 16.4 - Further Information

#### FURTHER INFORMATION

Further information can be found on

<http://www.morganthermalceramics.com/>

<http://www.ecfia.eu/>

<http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/workplace-exposure-standards-airborne-contaminants>

### 16.5 - Technical Datasheets

#### TECHNICAL DATA SHEETS

For more information on individual products please see the technical data sheet section at [www.morganthermalceramics.com](http://www.morganthermalceramics.com)

### 16.6 - Revision Summary

Content checked and revision date updated

### 16.7 - NOTICE



