MATERIAL SAFETY DATA SHEET

(EUROPEAN)

MSDS NUMBER 400E Revision 14 **According to 2001/58/EC**

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1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

IDENTIFICATION OF THE SUBSTANCE

TRADE NAMES: ***Fiberfrax*** **DENOMINATION : REFRACTORY CERAMIC FIBRES (RCF)**

FIBERFRAX products contain synthetic vitreous alumino-silicate fibres.

IDENTIFICATION OF THE MANUFACTURER AND SALES CONTACTS

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2. COMPOSITION / INFORMATION OF INGREDIENTS

COMPONENT	EINECS NUMBER	CAS NUMBER	SYMBOL	R PHRASES
Alumino silicate fibres	266-046-0	142 844 –00 -6	T	R49, R38

COMPOSITION

Chemical composition of fiberfrax fibres : SiO_2 45-60% - Al_2O_3 40-55%

DESCRIPTION

FIBERFRAX products are available in a variety of forms: bulks, blankets, papers, felts, boards, shapes, modules, cements, textiles (braids, ropes, cloth), coatings, mixes, mastics.

Use of the product

Restricted to "professional users" for application as thermal insulation, heat shields, heat containment, gaskets and expansion joints at temperatures up to 1260◦C in industrial furnaces, ovens, kilns, boilers and other process equipment and in the aerospace, automotive and appliance industries, and as passive fire protection systems and fire stops. Should not be sold directly to the general public, restricted to professional users.

3. HAZARDS IDENTIFICATION

IRRITANT EFFECTS

Mild mechanical irritation to skin, eyes and upper respiratory system may result from exposure. These effects are usually temporary.

CHRONIC RESPIRATORY HEALTH EFFECTS

RCF's have been classified by the EU as a category 2 carcinogen ("substances which should be regarded as if they are carcinogenic to man")

The International Agency for Research on Cancer (IARC) reaffirmed that group 2B ("possibly carcinogenic to humans") remains the appropriate classification for RCF.

Pre-existing skin and respiratory conditions including dermatitis, asthma or chronic lung disease, might be aggravated by exposure

4. FIRST AID MEASURES

SKIN

In case of skin irritation 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.

NOSE AND THROAT:

If these become irritated move to a dust free area, drink water and blow nose.

If symptoms persist, seek medical advice.

5. FIRE-FIGHTING MEASURES

Non combustible products. Packaging and surrounding materials may be combustible.

Use extinguishing agent suitable for surrounding combustible materials

6. ACCIDENTAL RELEASE MEASURES

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.
Prevent further dust dispersion for example by damping the materials.

METHODS FOR CLEANING UP

Pick up large pieces and use a vacuum cleaner fitted with high efficiency filter (HEPA)
If brushing is used, ensure that the area is wetted down first.
Do not use compressed air for clean-up.
Do not allow to be wind blown.
Do not flush spillage to drain and prevent from entering natural watercourses.
Check for local regulations, which may apply.

7. HANDLING AND STORAGE

HANDLING / TECHNIQUES TO REDUCE DUST EMISSIONS DURING HANDLING

HANDLING
Handling can be a source of dust emission.
Process should be designed to limit the amount of handling. Whenever possible, handling should be carried out under controlled conditions (i.e., use dust exhaust system).
Using specially treated or packaged products will minimise dust release.
Regular good housekeeping will minimise secondary dust dispersal.

STORAGE

Store in original packaging in dry area whilst awaiting use
Always use sealed and visibly 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.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

HYGIENE STANDARDS AND CONTROL MEASURES

Hygiene standards and exposure limits may differ from country to country. Check those currently applying in your country and comply with local regulations.

Examples of exposure limits in January 2002 are given below:

Germany	0.5 f/ml	TRGS 900
France	0.6 f/ml	Circulaire DRT no 954 du 12/01/95
United Kingdom	2.0 f/ml	HSE EH40 Maximum Exposure Limit
Italy	0.2 f/ml	Circolare 15 Marzo 2000 n.4
Spain	0.5 f/ml	OM 11/09/98 – BOE No.223 –17/09/98

8-hr time weighted average concentrations of airborne respirable fibres measured using the conventional membrane filter method

ENGINEERING CONTROLS

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

Where practical, enclose dust sources and provide dust extraction at source.
Designate RCF work areas and restrict access to informed and trained workers.
Use operating procedures, which will limit dust production and exposure of workers.
Keep the workplace clean. Use a vacuum cleaner fitted with an HEPA filter; avoid using brooms and compressed air.
If necessary, consult an industrial hygienist to design workplace controls and practices.
Using 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 treated or packaged to minimise or avoid dust release during handling.
Consult your supplier for further details

PERSONAL PROTECTIVE EQUIPMENTS

SKIN PROTECTION

Wear gloves and work clothes, which are loose fitting at the neck and wrists. Soiled clothes should be cleaned to remove excess fibres 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 glass with side shields

RESPIRATORY PROTECTION

For dust concentrations below the exposure limit value, RPE is not required but FFP2 respirators may be used on a voluntary basis.

For short term operations where excursions are less than ten times the 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

INFORMATION AND TRAINING OF WORKERS

This should include:

The applications involving RCF-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.

ENVIRONMENTAL EXPOSURE CONTROLS

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

Physical State	Solid	Melting point	>1650°C
Flammability	None	Length weighted geometric diameter	2-3µm
Appearance	White	Explosive properties	None
Oxidising properties	None	Odour	None

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID N.A. **MATERIALS TO AVOID** **N.A.**

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

HUMAN DATA

IRRITANT PROPERTIES
RCF is negative when tested using approved methods (Directive 67/548/EC, Annex 5, Method B4). All man made mineral fibres, like some natural fibres, can produce a mild irritation resulting in itching or rarely, in some sensitive individuals, in slight reddening. Unlike other irritant reactions this is not the result of allergy or chemical skin damage but is caused by a temporary mechanical effect.

RESPIRATORY EFFECTS
There is no known disease associated with exposure to RCF even though these fibres have been used for more than 40 years. Pulmonary morbidity studies were carried out among production workers in Europe and the USA. A statistically significant association between RCF exposure and pleural plaques was reported in the US morbidity study, this was not seen in Europe. Plaques do not develop into disease

DATA FROM ANIMAL EXPERIMENTS
In order to prepare samples for testing in animals RCF wools must be ground and suitably sized fibres separated. This process and its potential impact on the experimental findings have not been fully understood until quite recently. As such, in early animal experiments tumours were produced in animals after intrapleural and intraperitonal injections although inhalation experiments were inconclusive. A series of experiments were designed to overcome the shortcomings of these early attempts and in these, the so-called RCC studies, RCFs produced fibrosis, and a significant numbers of tumours including some mesotheliomas.

However this was only at the highest exposures used. It is now known that, due to the method used to prepare the samples, these exposures included a large number of non-fibrous particles not typical of any human exposure and that the dose of particles and fibres achieved was sufficient to considerably reduce dust clearance from the lungs. This would now be regarded as exceeding the maximum tolerated dose and is a condition that, in animals, will result in lung inflammation and tumours.
This would now indicate that the results might have depended more on the method of sample preparation than any material properties of the fibre tested.

12. ECOLOGICAL INFORMATION

These products are inert materials, which remain stable overtime.
No adverse effects of this material on the environment are anticipated.

13. DISPOSAL CONSIDERATIONS

RCF is categorised as a stable non-reactive hazardous waste, which can generally be disposed of at landfill, which has been licensed for this purpose. Please refer to the European list (Decision no 2000/532/CE as modified) to identify your appropriate waste number, and insure national and or regional regulation are complied with. Taking into account any possible contamination during use, expert guidance should be sought.

Unless wetted, such a waste is normally dusty and so should be properly sealed in clearly labelled containers for disposal. At some authorised disposal sites, dusty waste may be treated differently in order to ensure they are dealt with promptly to avoid them being wind blown. Check for national and/or regional regulations, which may apply
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14. TRANSPORT INFORMATION

Not classified as dangerous goods under relevant international transport regulations (ADR, RID, IATA, IMDG Refer Section 16 “Definitions”).

Ensure that dust is not wind blown during transportation .

15. REGULATORY INFORMATION

Fibre type definition according to Directive 67/548/EEC

Regulatory status in the EU, comes from European Directive 67/548/EEC, on the classification, labelling and packaging of dangerous substances and preparations as modified by Directive 97/69/EEC and its implementations by the Member States.

According to Directive 67/548/EEC, the fibre contained in this product belongs to the group of “man made vitreous(silicate) fibres with random orientation with alkaline oxide and alkali earth oxide (Na_2O $+K_2O$+CaO+MgO+BaO) content less or equal to 18% by weight”.

Fibre type classification for substances and preparations according to annex I to Directive 67/548/EEC

Classification: Carcinogen Category 2 : Irritant

SYMBOL T (Skull and Crossbones -Toxic)

RISK PHRASES
R49 May cause cancer by inhalation
R38 Irritating to skin

SAFETY ADVICE PHRASES

S24/25 Avoid contact with skin and eyes
S36/37/39 Wear suitable loose fitting, long-sleeved clothing, gloves and eye protection
S38 Wear suitable respiratory equipment

Marketing and use of RCF is controlled by Directive 76/769/EEC and is restricted to professional use only.

The toxic label as detailed will be applied to bulk fibres and dry preparations as required under Directive 67/548/EC, all other products will be labelled with an attention label .

This applies for sales in the European Union

PROTECTION OF WORKERS
Shall be in accordance with several European Directives as amended and their implementations by the Member States:

Council Directive 89/391/EEC dated 12 June 1989 "on the introduction of measures to encourage improvement in the safety and health of workers at work (OJEC (Official Journal of the European Community) L 183 of 29 June 1989,p.1).

Council Directive 98/24/EC dated 7 April 1997 " on the protection of workers from the risks related to chemical agents at work" (OJEC L 131 of 5 May 1998,p.11).

Council Directive 90/394/EC of 28 June 1990 on the protection of workers from risks related to exposure to carcinogens at work (OJEC L 196 of 26 July 1990,p.1).

Member states are in charge of implementing European directives into their own national regulation within a period of time normally given in the directive. Member States may impose more stringent requirements. Please always refer to national regulations.

16. OTHER INFORMATION

USEFUL REFERENCES (the directives which are cited must be considered in their amended version)
Working with Refractory Ceramic Fibres ; *ECFIA Code of Practice (February 1998)*

Recognition and control of exposure to Refractory Ceramic Fibres (RCF) ; *ECFIA Industrial hygiene guide (November 1999)*

Hazard from the use of Refractory Ceramic Fibres. Health and Safety Executive ; *Information document HSE 267 (1998)- UK*

Council Directive 89/391/EEC dated 12 June 1989 "on the introduction of measures to encourage improvements in the safety and health of workers at work" *(OJEC L 183 of 29 June 1989,p.1)*
Council Directive 67/548/EEC on the "approximation of the laws, regulations and administrative provision relating to the classification, packaging and labelling of dangerous substances as modified and adapted to the technical progress" *(OJEC L 196 of 16 August 1967,p.1 and its modifications and adaptations to technical progress).*
Commission Directive 97/69/EC of 5 December 1997 "adapting to technical progress for the 23rd time Council

Directive 67/548/EEC ,(OJEC L 343 *Official Journal of the European Communities, 13/12/97 , p.19).*
Council Directive 90/394/EC "on the protection of workers from risks related to exposure to carcinogens at work"

Official journal of the European Communities, 26/07/90
Council Directive 98/24/EC of 7th April 1998 "on the protection of the health and safety of workers from risks related to chemical agents at work" (OJEC L131 of 5th May 1998, P.11)
TRGS 521 : Faserstaube 5/2002 - Germany
TRGS 619 - Germany
Maxime LD et al (1998), CARE – A European pro-gramme for monitoring and reducing refractory ceramic fibres dust at the workplace Initial results. Gefahrstoffe – Reinhaltung der Luft, 58-3, 97-103.
Refractory ceramic fibres : a substitute study, *RCFC document, March 1996.*
Circulaire DRT No 954 du 12/01/95- France
Circolare 15 marzo 2000, n.4 – Italy

DEFINITIONS
ADR – Transport by road, council directive 94/55/EC
IMDG – Regulations relating to transport by sea
RID – Transport by rail, Council Directive 96/49/EC
ICAO/IATA - Regulations relating to transport by air

Precautionary measures to be taken after service and upon removal

As produced, all RCF fibres are vitreous (glassy) materials which, if raised up to continued exposure to elevated temperatures (above 900◦C) might de-vitrify. The occurrence and extent of crystalline phase formation is

dependent on the duration and temperature of exposure, fibre chemistry and/or the presence of fluxing agents. The presence of crystalline phases can be confirmed only through laboratory analysis of the "hot-face" fibre.

Simulated after-service RCF, containing 27% of crystalline silica showed little, or no, activity where exposure was by inhalation or by intraperitoneal injection. After service RCF was not cytotoxic to machraphage-like cells.

High concentrations of fibres and other dusts may be generated when after-service products are mechanically disturbed during operations such as wrecking. These dusts may contain crystalline silica, which some authorities have classified as a carcinogen. Therefore ECFIA recommends:

- control measures are taken to reduce dust emissions.
- all personnel directly involved wear an appropriate respirator to minimise exposure and comply with local regulatory limits.

These procedures will ensure compliance with local regulatory exposure standards for free crystalline silica. And because de-vitrified fibres containing silica mixed with amorphous and other crystalline phases are far less biologically active than free crystalline silica dusts, these measures will provide a high degree of protection.

CARE PROGRAMME

The European Ceramic Fibres Industry Association (ECFIA) has undertaken an extensive industrial hygiene programme to provide assistance to the users of RCF products.

The objectives are twofold:

- to monitor workplace dust concentrations at both manufacturers' and customers' premises,
- to document manufacturing and use of RCF products from an industrial hygiene perspective in order to establish appropriate recommendations to reduce exposures.

If you wish to participate in the CARE programme, contact ECFIA or your supplier.

SPRAYING
ECFIA recommends that this fibre is not used for spraying

NOTE

The directives and subsequent regulations detailed in this Material Safety Data Sheet are only applicable to the

European Union (EU) Countries and not to countries outside of the EU.

Websites
The European Ceramic Fibres Industry Association (ECFIA): 3, Rue du Colonel Moll, 75017 Paris
Tel. +33 (0)1 44 05 54 84 - Fax +33 (0)1 44 05 54 94- www.ecfia.org

Or to Deutsche Keramikfaser-Gesellschaft e.V. web site: www.dkfg.de

PRODUCTS	Significant Ingredients (% by weight)	Hazard warning	Risk Phrase
Lubricated bulk	Organic lubricant (< 1%)	None assigned	None assigned
Non-lubricated bulk	None	None	None
Blankets Durablanket, Durablanket S, Durablanket H, Durablanket WR, Durablanket SF, Fiberfrax SP Mat, Durablanket AC	None	None	None
Papers and Felts Fiberfrax FT Paper, Fiberfrax DS Paper, Durafelt LD, Durafelt HD 880 paper, 882 paper,972 paper	Acrylic latex (< 15%)	None	None
Papers HSA- K	None	None	None
Papers XPE	Vermiculite (40-60%) Organic binder(5-15%)	None	None
Papers and Felts Fiberfrax P Paper, Fiberfrax Lo-Con Felt	Phenolic resin (<4%)	Xn	R21/22 R36/38 R42/43
Boards and Shapes Duraboard LD, Duraboard MD, Duraboard 1010, Duraboard KT, Duraboard 1500, Duraboard 1600	Amorphous Silica (5-40%)	None	None
Boards and Shapes Duraboard CT	Calcium Aluminate (<40%)	Xi	R36/38
Boards and shapes Fiberfrax Rigiform Shapes	Amorphous Silica (5-40%)	None	
Boards and Shapes Fiberfrax Flexiform Shapes	Acrylic Latex (<15%)	None	None
Fiberfrax Bonded-S Modules	None	None	
Fiberfrax Prismo-Block S Modules	None	None	
Speciality Products Fiberfrax Fraxform 90	Calcium Aluminate (<15%) Amorphous Silica (15-50%)	Xi None	R36/38

Speciality Products Fiberfrax Moist Pak, Fiberfrax Moist Pak HD, Fiberfrax GC50	Amorphous Silica (15-50%)	None	None
Speciality Products Fiberfrax Skidrail System	Acrylic Latex (<15%)	None	None
Speciality Products Fyreputty	Aluminium Hydroxide (<20%) Colloidal Silica (<40%), Ethylene Glycol (<10%)	None None Xn	None None R22
Speciality Products IG Tape Foil backed Insulfrax	Sodium silicate (6%) Sodium silicate (4%)	Xi Xi	R36/38 R36/38
Cements / Coatings Fiberfrax QF-180, Fiberfrax QF-150	Amorphous Silica (<20%) Ethylene Glycol (<5%)	None Xn	None R22
Mixes / Mastics Fiberfrax Fraxfil, Fraxfil H, LDS Moldable, Fiberfrax Mastic, HD Mastic	Amorphous Silica (5-50%) Ethylene Glycol (<10%)	None Xn	None R22
Mixes / Mastics Fiberfrax Variform B	Calcium Aluminate(>60%) Amorphous Silica (<10%)	Xi None	R36/38 None
Mixes / Mastics Fiberfrax KUB	Calcium Aluminate (<40%)	Xi	R36/38
Mixes/ Mastic K1210	Calcium Aluminate (,20%) Calcined clay (50-65%)	Xi	R36/38
Textiles	None	None	None

Substances as listed below are present in Unifrax products and are identified in the above tables. The risk of exposure to the hazards as presented would occur during the production of Unifrax products and not necessarily in the final product as supplied. It is however advisable to take the precautions as recommended by the manufacturer of these raw materials.:

Phenol - Harmful in contact with the skin and if swallowed R21/22, irritating to the eyes and skin R36/38. May cause sensitisation when inhaled or in contact with the skin R 42/43. When heated to decomposition can emit oxides of carbon and nitrogen. Avoid contact with skin and eyes. Avoid inhalation.

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Calcium Aluminate - Repeated contact can cause irritation to the skin and eyes -R36/38 avoid contact with skin

Ethylene glycol - Harmful if swallowed R22

Sodium silicate - Can cause severe irritation to the skin and eyes- R36/38 avoid contact with skin and eyes , wear appropriate PPE.

NOTICE:

The information presented here in 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 practice any patented invention without a 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.