MATERIAL SAFETY DATA SHEET (MSDS)

FIBERFRAX PRODUCTS

MSDS Number 400 E
According to 91/155/EEC

Date of Issue : 26 June 1998
Date of last revision : 11 January 2002

1. Identification of the products and of the company

FIBERFRAX products contain synthetic vitreous alumino-silicate fibres.
Common name : **REFRACTORY CERAMIC FIBRES (RCF)**

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

UNIFRAX CORPORATION

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Germany	**+49 (0)2 11 87746 0**	**+49 (0)2 11 87746 115**
Belgium	**+32 (0)2 761 23 12**	**+32 (0)2 761 23 13**
Italy	**+39 02 967 01 808**	**+39 02 962 57 21**
Spain	**+34 91 395 22 79**	**+34 91 395 21 24**

OCCUPATIONAL HYGIENE DEPARTMENT

UK	**+44 (0)17 44 88 7603**	**+44 (0)17 44 88 61 73**

2. Composition / Information on ingredients

Chemical composition of ***FIBERFRAX*** fibres :
SiO_2 45-60% - Al_2O_3 40-55%
CAS n° 142 844-00-6
T (Toxic),
R49 "May cause cancer by inhalation",
R38 "irritating to skin"

According to product form, other ingredients may be present *(see appended table)*.

3. Hazard identification

RCF has been classified under Directive 97/69/EC among category 2 carcinogens (« substances which should be regarded as if they are carcinogenic to man »). In October 2001 the International Agency for Research on Cancer (IARC) re-affirmed that category 2B (possibly carcinogenic to humans) remains the appropriate IARC classification for RCF.
Mild mechanical irritation to skin, eyes and upper respiratory system may result from exposure.

4. First aid measures

In case of skin irritation, rinse affected areas with water and wash gently.
In case of serious eye contact, flush abundantly with water, have an eye bath available.

5. Fire fighting measures

The wool and the products without organic binder are not combustible.
In case of surrounding fire, the presence of *FIBERFRAX* does not call for special measures.

6. Accidental release measures

PERSONAL PROTECTION IN CASE OF ACCIDENTAL RELEASE OR SPILLAGE LIKELY TO RESULT IN AN ABNORMALLY HIGH DUST CONCENTRATION

Provide the workers with appropriate personal protective equipment as detailed in section 8.
Restrict access to the area to a minimum number of workers.
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 first and finish with a vacuum cleaner fitted with high efficiency filter (HEPA).
If sweeping is used, ensure that the area is wetted down first.
Do not use compressed air for clean up.
For waste disposal refer to section 13.

ENVIRONMENTAL PROTECTION

Do not allow to be wind blown.
Do not flush spillage to drain and prevent from entering natural water courses.
Check for local regulations which may apply.

7. Handling and storage

HANDLING

Handling can be a source of dust exposure.
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.

See next section 8 for personal protection.

STORAGE

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 cardboards and/or plastic films are recommended for packaging.

8. Exposure control / Personal protection

HOW TO REDUCE DUST EXPOSURE TO A MINIMUM

Review your RCF application(s) and assess situations with the potential for dust release.
Where practical, enclose dust sources and provide dust extraction.
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 properly.
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.

HYGIENE STANDARDS AND EXPOSURE LIMITS

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

Examples of exposure limits (in January 2000) are given below :

Country	Exposure Limits*	Source
Germany	**0.5 f/ml**	**TRGS 900**
France	**0.6 f/ml**	**Circulaire DRT n° 954 du 12/01/95**
UK	**2.0 f/ml**	**HSE EH40 Maximum Exposure Limit (proposal to reduce to 1.0 f/ml)**

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

SKIN AND EYE PROTECTION

Wear gloves and overalls which are loose fitting at the neck and wrists.
Wear goggles or safety glasses with side shields in case of overhead working.
After handling rinse exposed skin with water.
Wash work clothing separately.

RESPIRATORY PROTECTION

Use appropriate respiratory protective equipment (RPE) against excessive concentrations of fibrous dust or other possible contaminant which could have been introduced.
For dust concentrations significantly below the exposure limit, RPE is not required but FFP2 masks may be used on a voluntary basis.
For short term operations where excursions above the exposure limit are less than a factor of ten, use FFP3 respirators.
In case of higher concentrations, please contact your supplier for advice.

INFORMATION AND TRAINING OF WORKERS

Workers should be informed on :

- 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.

Workers should be trained on :

- the good working practices to limit dust release ;
- the proper use of protective equipment.

FURTHER RECOMMENDATION

Please refer to the code of practice and industrial hygiene guide issued by the European Ceramic Fibres Industry Association (ECFIA).

9. Physical and chemical properties

Oxidising properties	None
Odour	None
Melting point	>1650°C
Flammability	None
Explosive properties	None
Length weighted geometric diameter	2.5 - 3µm

10. Stability and reactivity

CONDITIONS OR MATERIALS TO AVOID

Avoid contact with hydrofluoric acid, phosphoric acid and strong alkalis.

DECOMPOSITION PRODUCTS

Upon heating above 900°C for sustained periods, several crystalline phases – including crystalline silica – may form within the vitreous matrix.

Fibrous and other dusts may be generated when after-service products are mechanically disturbed. Under such circumstances it is recommended that a) control measures be taken to reduce dust and b) all personnel directly involved wear an adapted respirator to minimise exposure and comply with exposure limits.

11. Toxicological information

IRRITANT PROPERTIES

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

HUMAN DATA ON PULMONARY EFFECTS

Pulmonary morbidity studies were carried out among production workers in Europe and the USA. The only noticeable finding was an incidence of 2.9% pleural plaques among the American workers examined. The relationship between RCF exposure and pleural plaques was not found in the two European studies.

A mortality study has not been conducted among RCF workers. No case report of disease attributed to RCF was ever published in the medical literature.

INHALATION TOXICOLOGY DATA IN ANIMALS

In earlier studies, RCF together with other man-made fibres were regarded as inert. In the 70's and 80's tumours were produced in animals after intrapleural or intraperitoneal injections but the several inhalation experiments conducted at that time were inconclusive.
In 1990, chronic inhalation studies known as the "RCC" studies, were conducted with size-selected fibres. Fibrosis, lung tumours and mesotheliomas were produced in animals exposed to very high concentrations for 24 months. It was then discovered that the size selection process led to a serious contamination of the test samples by non-fibrous particles. These particles may have modified the behaviour of fibres leading to a condition sometimes referred to as pulmonary overload.

Experts are still analysing the significance of the RCC results. In further tests, uncontaminated RCF samples have proved to be largely less biologically active.

IARC REVIEW

In October 2001 a scientific working group of 19 experts from 11 countries convened by the International Agency for Research on Cancer (IARC) concluded on re-evaluation of the carcinogenic risk of airborne Man Made Vitreous Fibres. After detailed examination of all available data the IARC working party confirmed that category 2b (possible carcinogen to humans) remains the appropriate IARC classification for RCF.

12. Ecological information

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

13. Disposal considerations

In the UK, some types of RCF waste are considered as "special". Check with local authorities if the "special" waste classification applies to you and follow "special" rules for disposal.
Unless wetted, such a waste is normally dusty and so should be properly sealed in clearly and visibly labelled containers for disposal. Special precautions should be taken to avoid damaging the containers during transportation, storage and field disposal.
In case of contamination by products classified as hazardous waste, expert guidance should be sought.
Always check for local regulations which may apply.

14. Transport information

Not classified as dangerous goods under relevant international transport regulations.
Ensure that dust is not wind blown during transportation.

15. Regulatory information

Regulatory status comes from European Directive 97/69/EC and its implementation by the Member States.

HAZARD CLASSIFICATION

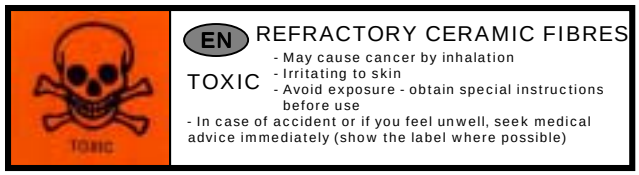
According to Directive, these fibres belong to the group of "man-made vitreous (silicate) fibres with random

orientation with alkaline oxide and alkali earth oxide ($Na_2O+K_2O+CaO+MgO+BaO$) content less or equal to 18% by weight" . Fibres in this group are classified as :

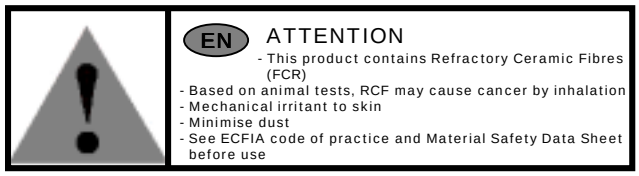
Carc. Cat. 2
T
R49 "May cause cancer by inhalation"
Xi
R38 "Irritating to skin"

LABELLING

The skull and cross-bones label depicted below will appear on bulk fibre and dry cements products:



All other products will carry the « Attention » label depicted below :



PROTECTION OF WORKERS

Shall be in accordance with Council Directive 90/394/EEC "on the protection of workers from the risks related to exposure to carcinogens at work" and its national implementations (COSHH requirements). Comply with hygiene standards and any applicable regulation-see HSE guidance notes).

OTHER POSSIBLE REGULATIONS

Member States are in charge of implementing European Directives into their own national regulation within a period normally given in the Directive. Member States may impose more stringent requirements. Please always refer to any applicable regulation.

16. Other information

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
Site Web : www.ecfia.org

USEFUL REFERENCES

- 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)*
- Requirements of COSHH, control of substances hazardous to health.
- COSHH essentials ; easy steps to control chemicals, *HSE books, HSG 193.*
- Requirements of CHIP; Chemical hazard information and packaging of substances and preparations dangerous for supply.
- 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*
- Commission Directive 97/69/EC of 5 December 1997 "adapting to technical progress for the 23rd time Council Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances" , *Official Journal of the European Communities, 13/12/97.*
- Maxime LD et al (1998), CARE – A European programme 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.*

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 :

(i) to monitor workplace dust concentrations at both manufacturers' and customers' premises,

(ii) 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 you supplier.

SPRAYING

ECFIA recommends that this fibre is not used for spraying.

Notice

Printed on : 11/01/2002

Labels (Attention or Skulls) and significant ingredients for Fiberfrax products

PRODUCTS	LABEL	Significant Ingredients (% by weight)
Lubricated bulk B20, B32, B802, B804, B805, B806, B807, B808, B811, B812, B813, B815, B816, B818, B819, B820, B902, S20, S801, S900	S	Organic lubricant (< 1%)
Non-lubricated bulk B10, B12, B102, B103, B104, B106, B126, B800, B814, B817, B821, B900, B901, B903, B904, B905, B906, B907, B908, B909, B910, B911, B912, S104, S800, X50/b X50s	S	None
Blankets Durablanket, Durablanket S, Durablanket H, Durablanket WR, Durablanket SF, Fiberfrax SP Mat, Durablanket AC	A	None
Papers and Felts Fiberfrax FT Paper, Fiberfrax DS Paper, Durafelt LD, Durafelt HD	A	Acrylic latex (< 15%)
Papers and Felts Fiberfrax P Paper, Fiberfrax Lo-Con Felt	A	Phenolic resin (<4%)
Boards and Shapes Duraboard LD, Duraboard MD, Duraboard 1010, Duraboard KT, Duraboard 1500, Duraboard 1600	A	Amorphous Silica (5-40%)
Boards and Shapes Duraboard CT	A	Calcium Aluminate (<40%)
Boards and shapes Fiberfrax Rigiform Shapes	A	Amorphous Silica (5-40%)
Boards and Shapes Fiberfrax Flexiform Shapes	A	Acrylic Latex (<15%)
Fiberfrax Bonded-S Modules	A	None
Fiberfrax Prismo-Block S Modules	A	Aucun
Speciality Products Fiberfrax Fraxform 90	A	Calcium Aluminate (<15%) Amorphous Silica (15-50%)
Speciality Products Fiberfrax Moist Pak, Fiberfrax Moist Pak HD, Fiberfrax GC50	A	Amorphous Silica (15-50%)
Speciality Products Fiberfrax Skidrail System	A	Acrylic Latex (<15%)
Speciality Products Fyreputty	A	Aluminium Tripolyphosphate (<20%) Colloidal Silica (<40%), Ethylene Glycol (<10%)
Speciality Products IG Tape	A	None
Cements / Coatings Fiberfrax QF-180, Fiberfrax QF-150	A	Amorphous Silica (<20%) Ethylene Glycol (<5%)
Mixes / Mastics Fiberfrax Fraxfil, Fraxfil H, LDS Moldable, Fiberfrax Mastic, HD Mastic	A	Amorphous Silica (5-50%) Ethylene Glycol (<10%)
Mixes / Mastics Fiberfrax Variform B	S	Calcium Aluminate(>60%) Amorphous Silica (<10%)
Mixes / Mastics Fiberfrax KUB	S	Calcium Aluminate (<40%)
Textiles	A	None