



MATERIAL SAFETY DATA SHEET (EUROPE)

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material/Product Name(s): Nutec Fibratec Moldable S and PM.
Chemical family: Inorganic amorphous glass fiber (RCF) and binders.
General Uses: A high-temperature insulating material. This product is used to form troughs or liners for non ferrous metal transfer, gaskets and seals around Burner blocks, protection of metallic parts from heat, pump into voids in badly damaged back up insulation, gaskets and seals for chimneys and stacks, boiler doors, seals and thermal insulation and to fill voids and cracks in refractory surface.

Manufacturer/Supplier: Nutec Fibratec, S.A. de C.V.
Carretera Saltillo – Monterrey #100 (km 62.5)
66359 Santa Catarina N.L., México
Phone (MX): +52(81) 8151-4601
<http://www.nutecfibratec.com>

SECTION 2. COMPOSITION

Description: Nutec Fibratec Moldable S and PM is made of refractory ceramic fibres. Once dried out, this product may generate dust.

Material or Component	*CAS No.	%	Symbol	Phrases R
Refractory Ceramic Fibre (RCF) (Contains no asbestos)	142844-00-6	30-90	T, Xi	R49, R38
Aluminosilicate	1302-93-8	0-12	N.A.	N.A.
Silica, Colloidal	7631-86-9	5-60	N.A.	N.A.
Ethylene Glycol	203-473-3	0-3	Xn	R22
Organic Material	N.A.	0-10	N.A.	N.A.

*CAS, Chemical Abstract Service Number.

None of the components are radioactive under the terms of the European directive Eurotom 96/29.

SECTION 3. HAZARDS IDENTIFICATION

Irritation: Mild mechanical irritation may occur from exposure to skin, eyes and upper respiratory system may result from exposure to high dust concentration of dried product. These effects are usually temporary.

Pre – existing skin and respiratory conditions might be aggravated by exposure.



Chronic Respiratory Health Effects: Refractory Ceramic Fibres have been classified by de EU as a category 2 carcinogen (“substances which should be regarded as if they are carcinogenic to man”). The IARC (International Agency of Research on Cancer) reaffirmed that group 2B (“Possibly carcinogenic to humans”) remains the appropriate classification for RCF.

Chronic Respiratory Health Effects for Ethylene Glycol: NIOSH recently described evidence that ethylene glycol has potential reductive hazards by inhalation of ethylene glycol mist.

SECTION 4. FIRST AID MEASURES

Eye contact: In the case of eye contamination flush with water. Always have an eye bath within easy reach of personnel using insulation wool products and ensure that the bath is kept clean. Never rub the eye as this may cause damage. If in doubt seek medical advice.

Skin contact: In the case of skin irritation rinse affected areas with water and wash gently. Do not rub or scratch the affected area without water or this may increase the irritation.

Inhalation: Remove victim from adverse environment to fresh air and blown nose.

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

Nutec Fibrattec Moldable S and PM is a non combustible product. However, virgin product binder may burn and produce gases and/or fumes. Packaging and surrounding materials may be combustible. Use extinguishing agents prescribed for fire fighting such combustible packaging and surrounding materials. Wear self-contained breathing apparatus when entering smoke filled areas.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Use gloves, boots and rubber protection clothes when cleaning up. Avoid clean up procedure that could result in water pollution.

SECTION 7. HANDLING AND STORAGE

Handling: Do not handle wet product with bare hand. The process or processes should be designing to limit the amount of handle. Regular good house keeping will minimize secondary dispersal.

Storage: store in original packaging in a dry and cold area. Always use sealed and clearly labelled container. Avoid storage below + 5°C (risk of solidification) or above +40°C. Avoid damaging the packaging. . Keep container closed when not in use. Emptied containers, which may contain debris, should be cleaned before disposal or recycling.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Hygiene Standards And Exposure Limits: 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 for respirable dust (in January 2003) are given below:

COUNTRY	Exposure Limit*	SOURCE
France	0.6 f/ml	Circulaire DRT No. 95-4 du 10.01.95
U.K.	1f/ml a 5mg/m ³	HSE– EH40

**Time weighted average concentrations of airborne respirable ceramic fibres measured over eight hours by the conventional membrane filter method or the total inhalable dust using standard Gravimetric techniques.*

The long – term exposure limit (TWA 8 hours) for ethylene glycol in Germany and U.K. is respectively 26 mg/m³ and 60 mg/m³.

The long – term exposure limit (TWA 15 min) for ethylene glycol in USA and France is respectively 100 mg/m³ and 125 mg/m³.

ENGINEERING CONTROLS

Review your RCF applications in order to identify potential sources of dust exposure.

Where practical enclosed dust sources and provide dust extraction at source. If exposure can not be avoided, local exhaust ventilation can be used which collect dust at source. For example downdraft tables, emission controlling tools and materials handling equipment. Delimit 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 a HEPA filter; avoid brushing and compressed air. If necessary consult an industrial hygienist to design proper workplace controls.

Using products specially tailored to your application(s) will help controlling dust. Some products can be delivered ready for use to avoid further cutting or machining. Some could be treated or packaged to minimize or avoid dust emission during handling.

PERSONAL PROTECTIVE EQUIPMENT

Skin protection: Use of gloves and work clothes is recommended, which are loose fitting at the neck and wrists. Soiled clothes should be cleaned before being taken off (e.g. use vacuum cleaning, not compressed air). Each worker should be provided with two lockers in an appropriate changing and washing area. Work clothes should be washed separately by employer and should not be taken home.

Eye protection: Wear safety glasses with side shields or wear goggles as necessary.

Respiratory protection: For dust concentrations below the exposure limit value, RPE is not required but FFP2 respirators may be used on 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 local Nutec Fibratec's supplier. You may also refer to the ECFIA code of practice available on the ECFIA's website.



INFORMATION AND TRAINING OF WORKERS

Workers should be informed about:

- The applications involving fiber-containing products.
- The potential risk to health resulting from exposure to fibrous dust.
- The requirements concerning smoking, eating and drinking in the workplace.
- The requirements for protective equipment and clothing.
- Good housekeeping and working practices in order to reduce dust emissions.
- The correct use of protective equipment.

ENVIRONMENTAL EXPOSURE CONTROLS

Refer to local, national or European applicable environmental permitted standards for air, water and soil. For waste, refer to Section 13.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: off white

Odour: None

Boiling point: N.A.

Melting point: >1590°C

Flash point: N.A.

Flammability: N.A.

Auto inflammability: N.A.

Explosive properties: N.A.

Oxidizing properties: N.A.

Vapour pressure: N.A.

Relative density (g/cm³): 2.5 - 2.7

Solubility: Slight

Partition coefficient: N.A.

SECTION 10. STABILITY AND REACTIVITY

Conditions and materials to avoid: None

Decomposition products: Continuous use at above 900°C for sustained periods, may lead to the formation of several crystalline phases. If crystalline silica is present you should follow corresponding hygiene regulations and standards applicable to your country.

For further information please refer to section 16.

Fumes: During first heating, oxidation products from the organic binder might be emitted in a temperature range from 180°C to 600°C. It is recommended to ventilate the room until all gases and fumes have disappeared. Avoid exposure to high concentrations of gas or fumes.



SECTION 11. TOXICOLOGICAL INFORMATION

Respiratory health effects: No known disease associate with exposure to RCF even though these fibres have been used for more than 40 years. Pulmonary morbidity studies were carried out among the production workers in Europe and the USA. In the American study pleural plaques where reported in 2.9% of workers examined. Plaques do not cause any symptoms and do not develop into disease.

Other animal studies: In order to prepare samples for testing in animals RCF wools must be ground and suitably sized fibres separate. This processes and its potential impact on the experimental findings have not been fully understood until quite recently. As such, in early animal experiments tumours where produced after intrapleural and intraperitoneal 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 significant numbers of tumours including some mesotheliomas.

However this was only found at the highest exposure used. It is now know that due to the method used to prepare the samples, these exposures included a large number of non-fibrous particles at not typical of any human exposure and that the dose of particles and fibres achieved in this processes was sufficient to considerably reduce dose clearance from the lungs. This would now be regarded as a exceeding the maximum tolerate dose and is a condition that in animals, will result in lung inflammation, tumours and mesotheliomas, probably by redirecting fibres to the pleura.

Experimental studies for Ethylene Glycol: Ethylene glycol toxicity by ingestion includes kidney effects with oxalate crystal deposition and liver damage. By inhalation exposure, lung changes and irritation of mucosal surfaces occurred in rats. A slight effect on reproduction was seen in mice administered 2000 mg/kg/day in their drinking water. During the studies with pregnant animals where high doses of ethylene glycol have been administered, foetal and maternal toxicity was observed.

SECTION 12. ECOLOGICAL INFORMATION

These products are inert materials, which remain stable over time.

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

SECTION 13. DISPOSAL INFORMATION

Waste containing more than 0.1% of RCF is categorized as a hazardous waste, which can generally be disposed of at a landfill, which can be licensed for this purpose. Please refer to the European List (Decision N° 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 labeled containers for disposal. At some authorized disposal sites, dusty waste may be treated differently in order to ensure they are dealt with promptly to avoid the being wind blown.

Check for national and/or regional regulation which may apply.



SECTION 14. TRANSPORT INFORMATION

Not classified as dangerous goods under relevant international transport regulations (ADR, RID, IATA, IMDG).

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: Regulation relating to transport by air.

SECTION 15. REGULATORY INFORMATION

FIBRE DEFINITION ACCORDING TO DIRECTIVE 67/548/EEC:

Regulatory status comes from European Directive 67/548/EEC on the classification, labeling and packaging of dangerous substances and preparations as modified by Directive 97/69/EC and its implementations by the member states.

According to Directive 67/548/EEC, the fiber contained in this product is a mineral wool belonging to the group of man made vitreous (Silicate) Fibers with random orientation with alkali oxide and alkali earth oxide ($\text{Na}_2\text{O} + \text{K}_2\text{O} + \text{CaO} + \text{MgO} + \text{BaO}$) content less or equal to 18% by weight.

Fiber type classification 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.

Marketing and use of RCF is controlled by Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations as modified (21st amending, Directive 2001/41/EC, 19 June 2001) and is restricted to professional use only.

This applies only in the European Union.

PROTECTION OF WORKERS:

Protection measures shall be in accordance with several European Directives as amended and their implementation by member states.

- Protection measures shall also be in accordance with 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 (official Journal of the European Community) L 183 of 29 June 1989, p. 1).
- Council Directive 98/24/EC dated 7 April 1998 "on the protection of workers from the risks related to chemical agents at work" (OJEC L 131 of 5 May 1998, page 11).
- Council Directive 90/394/EC dated 28 June 1990 "on the protection of workers from the risks related to exposure to carcinogens at work" (OJEC L 196 of 26 July 1990, page 1).

OTHER POSSIBLE REGULATIONS:

Member states are in charge of implementing European Directives into their own national regulations within a period of time normally specified in the directive.

Member states may impose more stringent requirements. Please always refer to any applicable regulations.

SECTION 16. OTHER INFORMATION

Useful references (the Directives which are cited must be considered in their amended version)

- Hazards from the use of Refractory Ceramic Fibre. Health and Safety executive: Information document, HSE 267 (1998).- UK
- Working with refractory ceramic fibres; ECFIA; code of practice (February 1998).
- Maxim LD et al (1998). CARE – a European programme for monitoring and reducing refractory ceramic fibre dust at the work place initial results. Gefahrstoffe-Reinhaltung der Luft, 58-3, 97-103.
- Recognition and control of exposure to RCF, ECFIA, November 1999.
- 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, page 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 substance as modified and adapted to the technical progress" (OJEC L 196 of 16 August 1967, page 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 of 13 December 1997)
- Council Directive 98/24/EC dated 7 April 1998 "on the protection of workers from the risks related to chemical agents at work" (OJEC L 131 of 5 May 1998, page 11).
- Council Directive 90/394/EC dated 28 June 1990 "on the protection of workers from the risks related to exposure to carcinogens at work" (OJEC L 196 of 26 July 1990, page 1).
- TRGS 521: Faserstäube 5/2002 - Germany.
- Refractory Ceramic Fibres: A substitute study, RCFC, March 1996.

Precautionary measures to be taken after service and upon removal:

As produced, all RCF fibres are Vitreous (Glassy) materials which, if raised up to continue 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.

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 "in making the overall evaluation, the working group noted that carcinogenicity in humans was not detected in all industrial circumstances studied".

In most Jurisdictions there are specific occupational exposure limits for crystalline silica (quartz, cristobalite) which may vary between countries and local jurisdictions. Check which exposure levels apply to your facility and comply with local regulation.

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 macrophage-like cells.

High concentrations of fiber and other dusts may be generated when after service products and mechanically disturbed during operations such as wrecking. These dusts may contain crystalline Silica. ECFIA recommends:

- Control measures are taken to reduce emissions.
- All personal directly involved wear an appropriate respirator to minimize exposure and comply with local regulatory limits.



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

CARE PROGRAMME (Controlled and Reduced Exposure)

The European Ceramic Fibres Industrial Association (ECFIA) has undertaken an extensive industrial Hygiene programme for High Temperature insulation Wool (HTIW). The objectives are twofold:

- To monitor workplace dust concentration at both manufacturers' and costumers' premises
- To document manufacturing and use of HTIW products from an industrial hygiene perspective in order to establish appropriate recommendation to reduce exposures.

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

REFERENCES:

- The European Ceramic Fibres Industry Association (ECFIA), <http://www.ecfia.eu>
- Deutschen Verbands der Hersteller und Verarbeiter von Hochtemperaturwolle eV., <http://www.dkfg.de>

NOTICE:

Although reasonable care has been taken in the preparation of the information contained herein, Nutec extends no warranties, makes no representation and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

Revised by: F. Miranda
August 2009