



MATERIAL SAFETY DATA SHEET (EUROPE)

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material/Product Name(s): Nutec Fibrattec Bulk, Blankets, Board and Modules LT, HP, HT, HTZ, MT
Chemical family: This product contains synthetic vitreous alumino-silicate fibers.
General Uses: Restricted to “professional users” , for application as thermal insulation, Heat shields and containment, gaskets and expansion joints at temperatures from 1000°C to 1425°C in industrial and domestic furnaces, kilns, boilers and other processes equipment. For application in aerospace, automotive, refining and petrochemical industries, steel industry and a passive Fire protection systems and Fire stops.

Manufacturer/Supplier: Nutec Fibrattec, S.A. de C.V.
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SECTION 2. COMPOSITION

Description: Nutec Fibrattec HT, HTZ, HP and LT fiber in the form of bulk, blanket and blanket modules are made of high temperature refractory ceramic fibers.

Component	CAS* Número	%	R Phrases
Refractory Ceramic Fiber (RFC)	142844-00-6	100	R49, R38
Refractory Ceramic Fiber (RFC) (with zircon)	142844-00-6		

Typical compositions by weight % are as follows: SiO₂ 47 – 56%, Al₂O₃ 33 – 50%, ZrO₂ <19%

*Chemical Abstract Service Number (CAS)

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. These effects are usually temporary.

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

Chronic respiratory health effects: Refractory ceramic fibers have been classified by the EU as a category 2 carcinogen (“substances with should be regarded as if they are carcinogenic to man”) the international Agency for Research on Cancer (IARC) reaffirmed that group 2B (“possibility carcinogenic to humans”) remains the appropriate classification for RCF.



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 fiber is a non combustible product. Packaging of bulk is plastic and blanket is cardboard therefore these are combustible. Use extinguishing agents prescribed for fire fighting such combustible packaging. Wear self-contained breathing apparatus when entering smoke filled areas.

SECTION 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.

Method for clean up of material:

- Pick up large pieces and use a vacuum cleaner fitter with high efficiency filter (HEPA).
- Ensure that the area is wetted down before sweeping.
- 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 water courses.

For wastes disposal refer to section 13.

SECTION 7. HANDLING AND STORAGE

Techniques to reduce dust emission during handling: Handling can be a source of dust emission. Wherever possible, handling should be carried out under ventilation. Technical or organizational control measures together with good house keeping practices will help to comply with exposure limits. Help with such methods is available on request.

Storage: Avoid damaging the packaging. We do not recommend the re-use of the packaging for products other than Nutec Fibrattec Fiber products as confusion may result. Reduce dust emission during unpacking. 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: Hygiene standards and exposure limits will differ from country to country. You should check those applicable to your country and comply with the regulations. If not regulatory dust or other standards apply, a qualified industrial hygienist can assist with specific work place evaluation including recommendations for respiratory protection.

Examples of exposure limits in January 2003 are given bellow:

U.K.	1 f/ml	HSE EH40 workplace exposure limit.
France	0.6 f/ml	Circulaire DRT No. 95-4 du 12/01/95

The exposure limit is a time weighted average numerical concentration of airborne respirable fibers measured by the conventional membrane filter method or gravimetric concentrations of inhalable dust.

Engineering controls: You should regularly review your applications and working practices in order to identify potential sources of dust exposure. Check local regulations applying to hygiene standards and exposure limits in your country. Always try to operate well within those limits. Introduce personal dust monitoring and record the results. Use technical and/or organizational means to comply with regulations. Technologies to control respirable dust such as local exhaust ventilation, point of generation dust collection, downdraft workstations, emission controlling tool designs and materials handling equipment are generally effective for minimizing exposures to respirable dust.

Keep the workplace clean. Use a vacuum cleaner fitted with 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 to use to avoid further cutting or machining. Some could be created or package to minimize or avoid dust emission during handling. Consult your supplier to further details.

Personal Protective Equipment:

Skin Protection: Wear gloves and loose fitting overalls at the neck and wrists. Clean cloths to remove excesses fibers before being taken off (use vacuum cleaning, not compressed air), cloths should be washed separately by employer and should not be taken home.

Eye Protection: Wear goggles or safety glasses with side shields to prevent eye contact.

Respiratory Protection: For dust concentrations below the exposure limit value, RPE is not required but FFP2 respirators may be use on a voluntary basis. For short term operations were excursions are less than 10 times the limit value use FFP3 respirators. In case of higher concentration or where the concentration is not known, please seek advice for 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: It is vital that all workers are advised of the health and safety aspects of materials they are using. Doing so safe guards their health and also corrects any misconceptions they may have about materials and their dangers.

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: white fiber/blanket

Odour: None

Boiling point: N.A.

Melting point: >1760 °C

Flash point: N.A.

Flammability: N.A.

Auto inflammability: N.A.

Explosive properties: N.A.

Oxidizing properties: N.A.

Vapour pressure: N.A.

Bulk density (Kg/m³): 64-160

Solubility: Slight

Partition coefficient: N.A.

Length weighted geometric mean diameter of fiber: 3.5µm

SECTION 10. STABILITY AND REACTIVITY

Conditions and materials to avoid: None

Decomposition products: As with much silica bearing refractories continuous use at above 900°C may lead to the formation of several crystalline phases. If crystalline silica is present you should follow corresponding hygiene regulations and standards applicable to you country.

For further information please refer to section 16.

SECTION 11. TOXICOLOGICAL INFORMATION

Irritant properties: Under directive 67/548/EEC annex 5, method B4, fibers referred to as RCF gave negative results. RCF along with many other man made mineral fibers can cause temporary mild irritation. This can result in itching and in rarely cases and in sensitive persons a rash. This is not a result of a chemical allergy but is caused by minor skin damage caused by the mechanical strength of the fibers.

Human data on respiratory effects: No known disease associate with exposure to RCF even though these fibers 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 fibers 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 were 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 known 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 fibers achieved in this process was sufficient to considerably reduce dose 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, tumours and mesotheliomas, probably by redirecting fibers to the pleura.

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 ensure 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

You should ensure that fibres are not able to be blown around during transport of new product or the disposal of used material. 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.
- Safety advise Phrases:
 - S24/25: avoid contact with skin and eyes.
 - Wear suitable loose fitting, long-sleeved clothing, gloves and eye protection.
 - Wear suitable respiratory equipment.

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 2004/37/EC dated 29 April 2004 "on the protection of workers from the risks related to exposure to carcinogens at work" (OJEC L 158 of 30 April 2008).

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, 58-3, 98-103.
- 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).
- 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 2004/37/EC dated 29 April 2004 “on the protection of workers from the risks related to exposure to carcinogens at work” (OJEC L 158 of 30 April 2008).
- TRGS 521: Faserstäube 5/2002 - Germany.
- TRGS 619 – Germany.
- TRGS 905 – 3/01.
- Refractory Ceramic Fibres: A substitute study, RCFC, March 1996.
- Circulaire DRT N° 954 du 12/01/95 – France.
- Circulaire 15 Marzo 2000, n. 4 – Italy.

Precautionary measures to be taken after service and upon removal:

As produced, all RCF fibers 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, 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 “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 are mechanically disturbed during operations such as wrecking. These dusts may contain crystalline Silica. ECFIA recommends:

- Control measures are taken to reduce emissions.
- All personnel 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.

Spraying:

ECFIA recommends that this fiber be 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 out side of the EU.

REFERENCES:

- The European Ceramic Fibres Industry Association (ECFIA), <http://www.ecfia.eu>
- Deutscher Verband der Hersteller und Verarbeiter von Hochtemperaturwolle e.V., <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
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