



MATERIAL SAFETY DATA SHEET (EUROPE)

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material/Product Name(s):	Nutec Fibrattec Boards and Special Shapes LD, HD, MD.
Chemical family:	This product contains: Refractory Ceramic Fibre (RCF) (Alumino Silicate Glass wools for high temperature use), fillers and binders.
General Uses:	Restricted to "professional users" , for application as thermal insulation, Heat shields and containment, gaskets and expansion joints, in walls, floor and sealing at temperatures from 1150°C to 1650°C in industrial and domestic furnaces, kilns, boilers and other processes equipment. For application in aerospace, automotive, refining and petrochemical industries, steel, aluminum and non ferrous metals industry and a passive Fire protection systems and Fire stops.
Manufacturer/Supplier:	Nutec Fibrattec, 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.nutecfibrattec.com

SECTION 2. COMPOSITION

Description: Nutec Fibrattec Boards and special shapes, are made of high temperature refractory ceramic fibers.

Material or Component	*CAS No.	%	Symbol	Phrases R
Refractory Ceramic Fiber (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.
Starch	9005-25-8	2-10	N.A.	N.A.

Typical compositions by weight % are as follows: SiO₂ 27 – 54%, Al₂O₃ 39 – 73%, 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 boards and shapes are non combustible products. However, 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

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 done 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: Store in original packaging in a dry are, 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 and 5mg/m ³	HSEEH40
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. Delimit RCF work areas and restrict access to informed and trained workers.

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 used on a voluntary basis. For short term operations where 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 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: It is vital that all workers are advised of the health and safety aspects of materials they are using. Doing so safeguards 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/beige

Odour: None

Boiling point: N.A.

Melting point: >1732 °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 (Kg/m³): 256-480

Solubility: Slight

Partition coefficient: N.A.

Length weighted geometric mean diameter of fiber: 2-4 µm

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 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 may be emitted in a temperature range from 180-600°C. It is recommended to ventilate the room until all gases and fumes have disappeared. Avoid exposure to high concentration of gas or fumes.

SECTION 11. TOXICOLOGICAL INFORMATION

HUMAN DATA

Irritant properties: Under directive 67/548/EEC annex 5, method B4, fibres referred to as RCF gave negative results. RCF along with many other man made mineral fibres 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 allergy or chemical skin damage but is caused by minor skin damage caused by the mechanical strength of the fibres.

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.

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 categorised as a hazardous waste, which can generally be disposed of at a landfill, which has been 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 disposed of in sealed plastic bags or containers. At some authorized 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.



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 fibre contained in this product is a mineral wool belonging to the group of man made vitreous (Silicate) Fibres 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 greater than 18% by weight.

FIBRE TYPE CLASSIFICATION ACCORDING TO ANNEXE 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.

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 2004).

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 Fibres. Health and Safety Executive: Information document, HSE 267 (1998).
- 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 workplace 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 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 2004).
- TRGS 521: Faserstäube 5/2002 - Germany.

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 devitrify. 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.



High concentrations of fibre 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 fibres 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 Industry 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
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