



MATERIAL SAFETY DATA SHEET

I CHEMICAL PRODUCT AND IDENTIFICATION

Material/ Product Name(s): Fibratec* Bulk, Chopped, Blanket & Modules LT, RT, HP, HT,HTZ

CAS#: 142844-00-6

Chemical family: Inorganic amorphous glass fiber RCF (Refractory Ceramic Fiber)

General use: A high-temperature insulating material.

Manufacturer/Supplier: Nutec Fibratec, S.A. de C.V.
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II INGREDIENTS / COMPOSITION

Material or Component	CAS No.†	%	Hazard Data
Refractory Ceramic Fiber (RCF)	142844-00-6	98-	Respirable dust: 5 mg/m ³
Refractory Ceramic Fiber (RCF) (with zirconia) (Contains no asbestos)	142844-00-6	100	(NIOSH); Total Dust: 10 mg/m ³ (ACGIH TLV-TWA)

Chemical Abstract Service Number

Nutec Fibratec, S.A. de C.V. recommends an exposure limit of 0.5 fiber per cubic centimeter for respirable fiber as an 8-hour time weighted exposure. After service ceramic fiber may contain crystalline silica in the form of cristobalite; refer to Section 16. Fiber concentration is determined by time weighted air samples collected and analyzed using NIOSH Method 7400 ("B" counting rules).

III HAZARDS IDENTIFICATION

H M I S	HEALTH HAZARD	2- MODERATE
	FLAMMABILITY HAZARD	0 – MINIMAL
	REACTIVITY HAZARD	0 – MINIMAL
	PERSONAL PROTECTION	E – Glasses, Gloves, Dust Respirator

EMERGENCY OVERVIEW:

The fiber is a physical eye, skin and upper respiratory irritant. Dust generated from this product contains respirable fiber. Product is not a fire or spill hazard.

Medical conditions which may be aggravated by contact:

Dust from the product may aggravate existing chronic lung conditions such as, but not limited to, bronchitis, emphysema, and asthma.

Target organs:

Lungs, Eyes, Skin.



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Primary route(s) of entry:

Inhalation.

Acute effects:

Upper respiratory irritation, including irritation of throat. Irritation and inflammation to eyes on contact and to the skin on prolonged contact.

Chronic effects:

The international agency for research on Cancer (IARC) reviewed the carcinogenicity data on man-made vitreous fibers (including RCF) in 1987. IARC classified RCF as "possibly carcinogenic to humans" Group 2B. IARC's classification of RCF was based on sufficient evidence of carcinogenicity in experimental animals in the absence of data on the carcinogenicity of RCF to humans. Additionally, IARC classified cristobalite, which may be found in after-service RCF, and quartz, which may be found at low levels in some of the raw materials as "Known Human Carcinogens – Group 1. NTP lists the respirable polymorphs of crystalline silica (cristobalite and quartz) amongst substances which may "reasonably be anticipated to be carcinogens". The long-term, excessive inhalation of respirable RCF and/or dust particulate containing crystalline silica in the respirable size range, may contribute to the development of industrial bronchitis reduced breathing capacity, and lead to increased susceptibility to other lung disease.

Signs & symptoms of overexposure:**Eye contact:**

Fiber and/or particulate may contribute to the development of moderate eye irritation.

Skin Contact:

Abrasiveness of fiber may contribute to the development of skin irritation.

Inhalation:

Inhalation of airborne particulate can irritate upper respiratory system as well as the throat.

Ingestion:

An unlikely route of exposure. If ingested in sufficient quantity, may cause gastrointestinal disturbances. Symptoms will include irritation and may include nausea, vomiting and abdominal pain.

IV FIRST AID MEASURES

Eye contact:

Flush eyes, including under the eyelids, with large amounts of water. If irritation persists, seek medical attention.

Skin contact:

Wash affected areas with mild soap and water.

Inhalation:

Remove victims from adverse environment to fresh air.



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Ingestion:

Ingestion is an unlikely route of exposure. If ingested in sufficient quantity and victim is unconscious, 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.

V FIRE FIGHTING MEASURES

NFPA Code: Flammability: 0 Health: 0 Reactivity : 0 Special : 0

Flash point:

Product is not combustible.

Extinguishing Media:

Use extinguishing media appropriate to combustibles in area of fire.

Fire fighting instructions:

Firefighters should wear NIOSH-approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

VI ACCIDENTAL RELEASE MEASURES

Spill procedures:

Carefully, clean up and place material into a suitable covered container, being careful to avoid creating any airborne dust; Use EPA filtered vacuum equipment if available, if not, use a dust suppressant with sweeping; do not use compressed air. Clean-up personnel should wear approved respiratory protection, gloves, and goggles to prevent irritation from contact and/or inhalation.

VII HANDLING AND STORAGE

These products are stable under all conditions of storage. Store in original container in a dry area. Keep container closed when not in use. Avoid creating dust.

VIII EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering controls:

Pending results of long-term health effects studies, engineering controls (i.e. ventilation) and work practices to control levels of airborne fibers to the lowest level attainable. Provide sufficient ventilation, in both volume and airflow patterns, to control the fiber/dust concentrations below allowable exposure limits.

Personal protective equipment:

Goggles, gloves, respirators, long sleeve clothing and head covering.

Respiration protection:



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Nutec Fibrattec currently recommends an exposure limit of 0.5 fibers per cubic centimeter (0.5 f/cc) for respirable airborne ceramic fiber as an 8-hour time weighted average exposure. Provide workers with NIOSH/MSHA-approved respirators in accordance with requirements of 29

CFR 1910.134 when airborne concentrations of respirable fiber and/or cristobalite exceed the recommended limits.

The following are recommended respirator types for varying respirable airborne concentrations of ceramic fiber and/or cristobalite.

Fiber	Cristobalite	Respirator Type
< 1 f/cc	< 0.05 mg/m ³	Optional disposable respirator (example: 3M 9900)
1 – 5 f/cc	0.05 – 0.5 mg/m ³	Half-mask air-purifying respirator equipped with high-efficiency particulate air (HEPA) filtered cartridges (example: 3M 6340)
5 – 25 f/cc	0.5 – 2.5 mg/m ³	Full-facepiece air-purifying respirator equipped with high-efficiency particulate air (HEPA) filtered cartridges (example: 3M 7800 with 7255 filters) or powered air-purifying respirator (PAPR) with HEPA filtered cartridge.
> 25 f/cc	> 2.5 mg/m ³	Any supplied-air respirator operated in positive pressure mode (example: 3M 7800 with W9435 hose and W3196 regulator connected to clean air supply).

Airborne fiber and cristobalite concentrations are determined by time-weighted air samples collected and analyzed using NIOSH method 7400 (“B” counting rules) and 7500, respectively. Exposures are expressed as 8-hour time weighted averages.

IX PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point N/A	Melting Point >3200°F (1760°C)
Specific Gravity (g/cc) 2.5 – 2.7	Freezing Point N/A
Evaporation Rate N/A	Vapor Pressure N/A
% Volatile by Vol. 0	Solubility in H ₂ O 0
Appearance and Odor White, odorless, fibrous material	Bulk Weight (lbs/ft ³) 4-16
PH N/A	

X STABILITY AND REACTIVITY

Hazardous Polymerization: Will not occur.

Chemical Incompatibilities: Hydrofluoric acid, strong acid and alkali vapors.

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Hazardous Decomposition Products: None

XI TOXICOLOGICAL INFORMATION

Epidemiology:

Industry epidemiologic investigations of RCF production workers and surveillance of customer's employees using RCF is ongoing. Preliminary interim results¹, obtained from employees in RCF manufacturing facilities, is as follows:

1. - There is no evidence of any fibrotic lung disease (interstitial fibrosis) on x-ray.
2. - There is no evidence of any lung disease among those employees exposed to RCF that have never smoked.
3. - A statistical trend was observed in exposed population between the duration of exposure to RCF and a decrease in some measures of pulmonary function. These observations are clinically insignificant. In other words, if these observations were made on an individual employee, the results would be interrupted as being within the normal range.
4. - Pleural plaques (thickening along the chest wall) have been observed in a small number of employees who had a long duration of employment. There are several occupational and non-occupational causes for pleural plaques. It should be noted that plaques are not pre-cancer nor are they associated with any measurable effects on lung function.

Toxicology:

The International Agency for Research on Cancer (IARC) reviewed the carcinogenicity data on man-made vitreous fibers (including ceramic fiber, glasswool, rockwool, and slagwool) and classified MMVF as a possible human carcinogen (Group 2B). IARC's 2B classification was based on sufficient evidence of carcinogenicity in the experimental animals and inadequate evidence (no data) of the carcinogenicity in the experimental of ceramic fiber to the humans.

A number of studies on the health effects of inhalation exposure of rats and hamster have recently been completed. In a lifetime nose-only inhalation study^{2,3}, rats exposed the Maximum Tolerated Dose of 30 mg/m³ (approximately 200 fibers /cc) developed progressive lung damage and cancers of the lung and of the pleura (lining of the chest wall and lung). In contrast, hamsters similarly exposed developed interstitial fibrosis and pleural cancer, but no lung cancer. Cancer of the pleura is called mesothelioma.

¹ Lockey, J.E., Lemasters, G.K., Rice, C.M., McKay, R.T., et al, (1994) Epidemiological Study Assessing Respiratory Effects of workers exposed to Ceramics Fibers, Department of Environmental Health, University of Cincinnati, College of Medicine.

² Mast, R.W., McConnell, E.E., Anderson, R., et al, (1993) Studies on the Chronic Toxicity (Inhalation) of four types of Refractory ceramic Fiber in Male Fisher 344 Rats. Submitted for publication.

³ Glass, L. E., Mast, R. W., Hesterberg, T. H., et al. Inhalation Oncogenicity of Refractory Ceramic Fiber (RCF) in Rats Final Results. (1992) The Toxicologist.



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In another lifetime nose-only inhalation study ^{4,5}, rats were exposed to three different concentrations of RCF (3,9, and 16 mg/m³ , approximately 25 , 75 and 115 fibers per cc respectively). The data from this study demonstrated a dose-response relationship in the

biological affects of RCF in rats. There is no RCF related increase in lung tumors at 3, 9, or 16 mg/m³ . A pleural fibrosis and mesothelioma were seen in single rat in the mid-dose (9 mg/m³) group. In addition, no consistently diagnosed fibrosis was seen below 9 mg/m³. Pulmonary fibrosis was observed at 9 and 16 mg/m³.

Toxicological information on other components contained in the product: The balances of the components contained in the product have no LD₅₀ or LC₅₀ found for oral, dermal, or inhalation routes of administration.

XII ECOLOGICAL INFORMATION.

No data available on any adverse ecological effects from this material.

XIII DISPOSAL INFORMATION.

Waste Management/ Disposal: This product does not exhibit any characteristics of a hazardous waste. It is a recommended that the product should be contained in bags or suitable closed containers to prevent creating any airborne dust during disposal. The product is suitable for landfill disposal. However, debris generated during installation, maintenance or tear-out procedures may be contaminated with other hazardous materials. Therefore, appropriate waste analysis may be necessary to determine proper disposal. Waste characterization and disposal/treatment methods should be determined by a qualified environmental professional in accordance with applicable federal, state and local regulations.

XIV TRANSPORT INFORMATION.

US Department of transportation:

Not regulated by DOT as a hazardous material. No hazard class, no label or placard required, no UN or NA number assigned.

Canadian TDG hazard Class & PIN: Not regulated.

XV REGULATORY INFORMATION.

SARA TITLE III:

These products do not contain any substances reportable under SARA Sections 302, 304, and 313. Sections 311 and 312 do apply. (Routine reporting and Chemical Inventories).

TSCA:

⁴ Mast, R.W., McConnell, Hesterberg, T. H., et al, (1993) A Multiple Dose Chronic Inhalation Toxicity of Size Selected Kaolin Refractory Ceramic Fiber (RCF) in Male Fisher 344 Rats. Submitted for publication.

⁵ Mast, R.W., McConnell, E.E., Glass, L. R., al. A Multiple Dose Chronic Inhalation Toxicity Study of Kaoline in Refractory Ceramic Fiber (RCF) in Male Fisher 344 Rats. (1993). The Toxicologist.



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All substances in this product are listed in the chemical substance inventory [(sections 8(b)]. Refractory, fiber aluminosilicate (RCF) CAS# 142844-00-6 is substance to the TSCA Export Notification Requirements [Section 12(b)] or TSCA.

OSHA:

Comply with Hazard Communication Standard 29 CFR 1910.134 and 29 CFR 1926.103.

CALIFORNIA:

Listed as "Ceramic Fibers (airborne particles of respirable size)" Proposition 65 and the Safe Drinking Water and Toxic Enforcement Act of 1986.

XVI OTHER INFORMATION.

Special Precautions:

Product which has been in service above 1800°F (982°C) may undergo partial conversion to cristobalite, a form of crystalline silica which presents a health hazard if inhaled over long periods of time. Cristobalite is classified by IARC as a "Known Human Carcinogen – Group A". NTP lists cristobalite amongst substances which may "reasonably be anticipated to be carcinogens"

AFTER-SERVICE RCF REMOVAL PRECAUTIONS:

1. -Employees should be apprised of the hazards and proper conditions and precautions for safe use or exposure.
2. – NIOSH -approved respirators, in accordance with requirements of 29 CFR 1910.134 Should be used according to the above guideline for dust levels above the OSHA PEL (8-hours TWA) of 0.05 mg/m³ for cristobalite.
3. - Dust generations should be minimized by the use of dust control equipment or water spray when feasible.
4. - Wear protective clothing and vacuum clean prior to removing clothing
5. - Where there is a possibility of exposure to dust containing crystalline silica, the following warning should be posted: FREE SILICA WORK AREA - AVOID BREATHING DUST – DUST MAY CAUSE DELAYED LUNG INJURY (SILICOSIS).

Acronyms and References Used in Preparation of MSDS:

ACGIH:	American Conference of Governmental Industrial Hygienists
CAS#:	CAS Re Number is assigned number to identify a material. CAS stands for Chemical Abstracts Service.
F/cc:	Fibers per cubic centimeter.
HMIS:	Hazardous Materials Identification system (National Paint & Coatings Association).
IARC:	International Agency for Research on Cancer.
MSHA:	Mine Safety and Health Administration.
Mg/m ³ :	Milligrams per cubic meter.
NIOSH:	National Institute for Occupational Safety and Health.
NFPA:	National Fire Protection Association.
NTP:	National toxicology program.
OSHA:	Occupational Safety and Health Administration.
PEL:	Permissible Exposure Limit (OSHA).
RCF:	Refractory Ceramic Fiber.



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REL: Recommended Exposure Limit (NIOSH).
RTECS: Registry of Toxic Effects of Chemical Substances.
SARA: Superfund Amendments and Reauthorization Act.
TITLE III: Emergency Planning and Community Right To Know Act
Section 302: Extremely Hazardous Substance.
Section 304: Emergency Release.
Section 311 & 312 Community right-to-know, MSDSs, Chemical Inventory.
Section 313: Toxic Chemical.
TLV: Threshold Limit Values (ACGIH):
TWA: Time weighted Average.
29CFR1910.134: OSHA Respiratory Protection Standard.

References:

Sax, N. Irving: Dangerous Properties Of Industrial Materials, Seventh Edition, Van Nostrand

Reinhold Co., Inc., 1989.

Kirk, R. and Othmer, D., Encyclopedia of Chemical Technology, Third Edition, Wiley-Interscience, New York, NY 1980.

Clansky, K.B., Suspect Chemical Sourcebook, 1992-2 Edition, Roytech Publications, Bethesda, Maryland.

Sax N, Irving and Lewis, R. J. Hawley's Condensed Chemical Directory, Eleventh Ed., Van Nostand Reinhold Co, Inc., NY.

Manufacturers / Suppliers, Material Safety Data Sheets on Raw Materials Used.

Prepared / revised by: F. Miranda
May, 2007.

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