

SAFETY DATA SHEET

[Product Group] ISOWOOL Shaped Forms RF

1. IDENTIFICATION OF SUBSTANCE / PREPARATION AND OF THE COMPANY

[Trade Names] ISOWOOL 1000 Board RF, ISOWOOL 1260 Board RF,
ISOWOOL 1260 D3Board RF, ISOWOOL 1400 Board RF,
ISOWOOL 1260 SI-Board RF, ISOWOOL 1400 SI-Board RF,
ISOWOOL 1000 Shaped Form RF, ISOWOOL 1260 Shaped Form RF,
ISOWOOL 1260 D3 Shaped Form RF, ISOWOOL 1400 Shaped Form RF,
ISOWOOL Panel Heater (its fiber section)

[Generic Terms] Refractory Ceramic Fiber (RCF), Alumino silicate Wool (ASW),
Alumina Silica Ceramic Fiber, Amorphous Ceramic Fiber

[Brief Description of Product]

This product is made by molding the compound of refractory ceramic fiber and inorganic/ organic binder, and formed in various shapes. Then, after having impregnated colloidal inorganic binder to this product, this product is fired.

[Manufacturer/Supplier]

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2. HAZARDS IDENTIFICATION

GHS Classification

	Item	Evaluation	Remarks
Physical Hazards	Explosives	Not applicable	
	Flammable gases	Not applicable	
	Flammable aerosol	Not applicable	
	Oxidizing gases	Not applicable	
	Gases under pressure	Not applicable	
	Flammable liquids	Not applicable	
	Flammable solids	Not classified	Noncombustible
	Self-reactive substance and mixtures	Not applicable	
	Pyrophoric liquids	Not applicable	
	Pyrophoric solids	Not classified	Noncombustible
	Self-heating substance and mixtures	Not classified	Noncombustible

	Substance and mixtures ,witch in contact with water ,emit flammable gases	Not classified	Noncombustible
	Oxidizing liquids	Not applicable	
	Oxidizing solids	Not classified	Nonreactive
	Organic peroxides	Not applicable	
	Corrosive to metals	Not classified	No data available
Health Hazards	Acute toxicity (oral, dermal, inhalation)	Classification not possible	No data available
	Skin corrosion/irritation	Not classified	Transient stimulation
	Serious eye damage/eye irritation	Classification not possible	No data available
	Respiratory /skin sensitizer	Classification not possible	No data available
	Germ cell mutagenicity	Classification not possible	No data available
	Carcinogenicity	Category 2	IARC 2B
	Toxic to reproduction	Classification not possible	No data available
	Specific target organ/systemic toxicity (Single Exposure)	Classification not possible	No sufficient data
	Specific target organ/systemic toxicity (Repeated Exposure)	Not classified	No epidemiological data
	Aspiration hazard	Classification not possible	No data available
Environmental Hazards	Hazard to Aquatic Environment (Acute)	Classification not possible	No data available
	Hazard to Aquatic Environment (Chronicity)	Classification not possible	No data available
	Hazard to Ozone layer	Classification not possible	No data available

Pictogram or Symbol :



Signal word : “Warning”

Hazard Statement :

- . Suspected of causing cancer.
- . Direct contact with the material may cause transient stimulation to eyes and skin.
- . Causes damage to respiratory system through prolonged or repeated exposure.

Precautionary statements

Prevention

- . Do not handle until all precautionary statements have been read and fully understood.
- . Do not eat, drink or smoke when handling this product.
- . Minimize the dust inhalation while handling the material.
- . Wear protective gloves.
- . Use personal protective gears.
- . Wash hands thoroughly when handling this product.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substance/Mixture : Mixture

	CAS No.	Content (%)	EC No.
Refractory ceramic fiber	142844-00-6	70-80	—
Inorganic binder	7631-86-9	20-30	231-545-4

4. FIRST AID MEASURES

If in eye : Flush with running water until the foreign-body sensation disappears.

Do not rub eyes.

If on skin : Wash area of contact thoroughly with water or lukewarm water.

After that, wash well with soap and water. If irritation or other symptoms remain, seek medical advice.

5. FIRE FIGHTING MEASURES

Material is unflammable. Therefore, no particular measures are established.

6. ACCIDENTAL RELEASE MEASURES

Product is in a shaped form so that particular measure is not established.

7. HANDLING & STORAGE**[Handling Instructions]**

- . When handling the material, wear protective mask. Where necessary, install local exhaust ventilation and/or arrester.
- . Wear working cloth with long sleeves and protective gloves. Where necessary, wear protective safety glasses.
- . Adhesion to working cloth must be removed by vacuum with high efficiency air filter (HEPA) or adhesive tape not creating dust in the air.
- . Prohibit smoking at working place
- . Handle the material at a limited section/place only in order not to spread the dust to other areas.
- . Always gargle the throat and wash hands after handling.
- . As the products contain organic binder, they will generate odor and smoke at the initial heating. Therefore, provide a measure for ventilation.

. [Storage instructions]

- . Avoid exposure to water.
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8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Exposure Limits**ACGIH's recommendation : Refractory ceramic fiber ...0.2f/cm³

Protective equipment : Restrict, separate and close up tight the area where the dust of refractory ceramic fiber is to be originated and/or install local exhaust ventilation and/or dust arrestor. If those measures are not applicable, use protective devices such as below:

Protective Gear : Respiratory protection :

It is advisable to select the most suitable device based on the degree of concentration of refractory ceramic fiber and follow RCFC's recommendation shown in the table below.

Using government approved filter-replacement type mask, always check fitness to the face and check and replace the filter frequently.

Degree of ceramic fiber concentration 8hours TLV-TWA*	Kind of respiratory protection Gear
~5 pieces/ cm ³	Half-faced replacement type dust protective mask . (RL2, RS2)* - over 95.0% of particle trapping efficiency . (RL3, RS3)* - over 99.9% of particle trapping efficiency
5~25 pieces/ cm ³	Full-faced replacement type dust protective mask . (RL3, RS3) - over 99.9% of particle trapping efficiency
Over 25 pieces/ cm ³	. Full-faced pressure-demand air-flow respirator . Full-body or hood type respirator with electric fan and blower

Note: * TLV (threshold limit value), TWA (time-weighted average)

** (RL2, RS2) and (RL3, RS3) indicate grade of mask.

R : Replacement-type

S : Used solid sodium chloride as test particle.

L : Used liquid DOP as test particle.

Eye protection : Wear proper eye protection to suit the work and environment such as chemical goggles, safety glasses with side shields.

Skin protection : Wear gloves and long-sleeve work clothes to prevent a direct contact.

9. PHYSICAL & CHEMICAL PROPERTIES

Physical Form : In various shaped forms

Color : White

Average fiber diameter : 2~4 μ m

Ignition point : Non flammable

Explosion point : Nothing

Explosive range : Nothing

Max. service temperature : 1,000~1,400°C

Absolute specific gravity : 2~3

Solubility : Insoluble in water nor organic solvent solution

10. STABILITY & REACTIVITY

Stable

11. TOXICOLOGICAL INFORMATION

Acute action : If entered in eye or adhered to skin, may cause physical irritation in the eye or irritation or puffiness on the skin. These effects are considered to be temporary and not chronic.

Chronic action : As the dust contains inhalant fibrous dust, if inhaled in sufficient quantity for prolonged periods, it may cause respiratory systems impairment. However, there has been no report of actual impairment caused by handling refractory ceramic fiber.

Carcinogenicity : There are no useful references regarding the carcinogenicity of refractory ceramic fibers to humans in the International Agency for Research on Cancer (IARC) but IARC classified refractory ceramic fibers into Group 2B (possible carcinogenicity) based upon the animal tests shown below. NTP (National Toxicology Program in the U.S.A.) also classified ceramic fibers into B2 (sufficient evidence of carcinogenicity based on animal tests where increased rate of occurrence of malignant tumor was recognized). EU classified refractory ceramic fiber into Category 1B (possible carcinogenic).

< Results of animal tests >

Results of experiments vary depending on kinds of experimental animals, size, amount, way of exposure etc. of fibers to those experimental animals. Therefore, continued experiments are necessary.

- ① There is a report that increase of lung tumor has been observed in rats inhaled 8.4mg/m³ of refractory ceramic fiber into their lungs for twelve months.
- ② There is a report that pleural sarcoma has been frequently observed in the rats put in refractory ceramic fiber into their pleural cavity, especially when fiber diameters were less than 0.25 μ m and lengths were more than 8 μ m.
- ③ There is a report that pleural mesothelioma has been observed in the 3 rats out of 36 rats put in 20mg refractory ceramic fiber into their pleura.
- ④ There is a report that one (1) % of interstitial fibrosis has been observed in

hamsters inhaled 12mg/m³ RCF with 1.8 μ m refractory ceramic fiber diameter for 24 months (6 hours per day, 5 days per week) but not in rats. Also there is a report that peritoneal interstitial fibrous has been observed in hamsters and rats put in 25mg/m³ into their pleural cavity.

- ⑤ There is a report that tumor has been observed in 2.6~14.5% of rats inhaled 3~30mg/m³ refractory ceramic fiber based on kaolin for 24 months (6 hours per day, 5 days per week).

1 2. ECOLOGICAL INFORMATION

No information on environmental hazards.

1 3. DISPOSAL CONSIDERATIONS

Waste must be disposed of in accordance with national and or regional environmental control regulations. Waste must be sent to an approved incinerator or disposed in an approved waste facility.

1 4. TRANSPORT INFORMATION

No hazard, but avoid generation of dust in the air by the breakage of package during the transportation.

United Nations (UN) Classification : Not Applicable

United Nations (UN) Number : Not Applicable

1 5. REGULATORY INFORMATION.

No Information

1 6. OTHER INFORMATION

[EU Information]

On January 13, 2010 the European Chemicals Agency has added refractory ceramic fiber to the Candidate List of Substances of Very High Concern(SVHC) for authorization.

As a consequence, EU (European Union) or EEA (European Economical Area) suppliers of articles which Contain Refractory ceramic fiber (RCF) in a concentration above 0.1 wt% have to provide sufficient information, available to them, to their customers or upon requests to a consumer within 45 days of the receipt of the request. This information must ensure safe use of the article and as minimum contains the name of the substance.

[Revision information]

Date of Revision	Description
Mar. 15, 2005	Chemical ingredients were reexamined.
	Latest recommendation by the Japan Society for Occupational Health and ACGIH on the acceptable concentration was examined by ourselves. The new standard of concentration becoming effective on 04/01/05, our standard of concentration was changed from 2.9mg/m ³ to 3.0mg/m ³ .
	EU now controls the content rate of heavy metal for the disposal of home

	appliances and automobiles. Therefore, we put the level of heavy metal of this product is well under level of the regulation (only negligible amount).
	Added calculation formula for the standard of concentration of cristobalite.
Oct. 1, 2006	Added GHS classification, RCFC recommendation, and HSE's set value.
	Identified the kind of respiratory protection device based on the degree of ceramic fiber concentration
	Regulatory information was modified based upon the latest occupational health information.
Jan. 15, 2008	Changed our address in accordance the municipal merger with neighboring towns taken place.
Jul. 1, 2009	The calculating formula of the management density was corrected by the management density revision of dust.
Mar. 10, 2010	Upon the regulation amendment of chemical substances, we reviewed our MSDS but didn't recognized the necessity of changing the content.
	In the clause of 15. Regulatory Information, we added the rule changes of the Industrial Safety and Hygiene and the REACH.
Dec. 15, 2010	GHS Classification was added on. Changed EU classification of carcinogenicity. Added on information of EU REACH regulation
Apr. 1,2011	Department name change.
Apr. 1,2013	Title changed "Safety Data Sheet". [Manufacturer/Supplier] Changed Person in charge Signal words, based on the review RCFA guidance. Added notification object: Occupational Safety and Health Act.
Apr. 20,2016	Added Trade Names : ISOWOOL 1260 SI-Board RF, ISOWOOL 1400 SI-Board RF, ISOWOOL 1260D3 Board RF, ISOWOOL 1260 D3 Shaped Form RF Changed :Manufacturer/Supplier. Added Environmental Hazards Item. Changed References 6 & 7 & 8
Sep.1,2017	3.Changed (Silica)
Mar.01,2018	2. HAZARDS IDENTIFICATION Changed. 3. COMPOSITION / INFORMATION ON INGREDIENTS Changed. 7.HANDLING & STORAGE Changed. 8.EXPOSURE CONTROLS / PERSONAL PROTECTION Changed. 12.ECOLOGICAL INFORMATION Changed. 13.DISPOSAL CONSIDERATIONS Changed. 15.REGULATORY INFORMATION Changed. 16.OTHER INFORMATION Changed.

[References]

1. IARC : Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans
Vol. 81 (2002) ,“Man-made Vitreous fibers”
2. GFA, RCFA, RWA : “Manual for Concentration Measuring of Man-made Mineral Fiber
(MMMMF)” (1992)
3. ECFIA : Code of Practice Working with Aluminum Silicate Wools (ASW), also called
Refractory Ceramic Fibers (ASW／RCF) (2010)
4. RCFC : Work Practice Guide for Refractory Ceramic Fiber Products (2010)
5. ILO : “Code of Practice on Safety in the Use of Synthetic Vitreous Fiber Insulation Wools
(glass wool, rock wool, slag wool)” (2000)
6. ACGIH : Recommendation on the Acceptable Concentration (2015)
7. National Institute of Technology and Evaluation (NITE) : Data base of “Total Information
Service System on Chemical Substances”
8. CEN : prEN1094-1
9. 1272/2008/EC : Regulation on Classification, Labeling and Packaging of Substances and
Mixture

Information given above will be revised whenever additional information becomes available. The information concerning content and physical and chemical properties described above doesn't mean to indicate the guaranteed value of those. Evaluation of risk and hazard was made basing upon information and data available at present but not basing upon all of them.