MAFTEC™

MITSUBISHI CHEMICAL

Polycrystalline Alumina Fiber

MAFTEC™

High temperature refractory use ／ High temperature resilient material
／ High temperature sealing use ／ Reinforcement material

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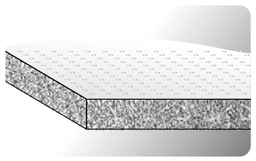
MAFTEC™

MAFTEC™ Blanket is available in a range of densities and sizes for a wide variety of thermal applications up to 1600℃. MAFTEC™ is manufactured on precisely-controlled, state of the art facilities to provide customers with highly consistent properties.

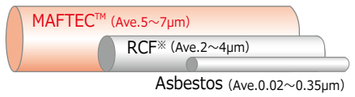
Key performance achieved from MAFTEC™ proprietary technology.



Unique Stabilization Method : Self needling

MAFTEC™ Blanket is punched by needles with burs, and it is stitched by MAFTEC™ fibers itself as result. MAFTEC™'s unique needle punch method provides superior erosion resistance that prevents exhaust gas leakage and provides long term substrate support as compared to other support mat products.

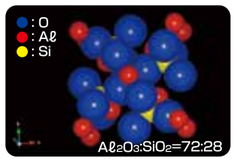
Average fiber diameter



※RCF : Refractory Ceramic Fiber

MAFTEC™ fiber diameter is 5-7micrometers

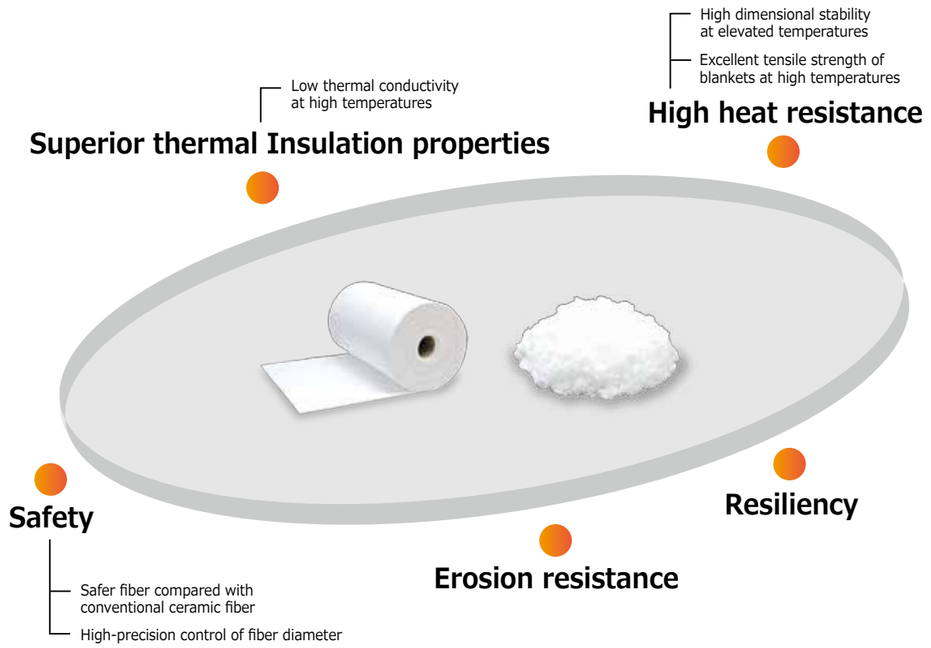
MAFTEC™'s average fiber diameter is controlled between from 5 to 7 micrometers. MAFTEC™ products contain little respirable fibers as defined by the World Health Organization(WHO).



MAFTEC™ has crystalline structure of mullite

The molecule of the MAFTEC™ fiber has a regular arrangement. MAFTEC™ has a stable crystalline mullite structure even to high temperatures giving MAFTEC™ excellent dimensional stability and resiliency.

MAFTEC™ Product Features



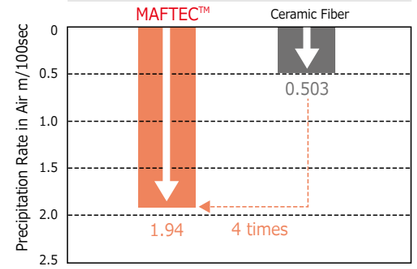
Safety

MAFTEC™ has a high level of safety for humans and the environment.

According to the WHO, fibers with diameter under 3 micrometers are respirable and can reach the lungs' alveoli. Respirable fibers are considered to have carcinogenic risks. MAFTEC™ contains practically no respirable fibers.

In addition, MAFTEC™, when scattered in air, will settle out quickly. MAFTEC™ improves the safety of your work place.

Faster precipitation and less spreading in the air



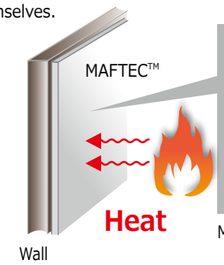
MAFTEC™ will precipitate four times faster than ceramic fibers.
(※) Values calculated by the Stokes equation.

Heat insulation property 1,600℃

MAFTEC™ is lightweight and has high heat insulative performance.

MAFTEC™ has the crystalline structure of mulllite. MAFTEC™ provides insulative performance due to both low thermal conductivity of the trapped air between fibers and high heat radiation shield performance of the fibers themselves.

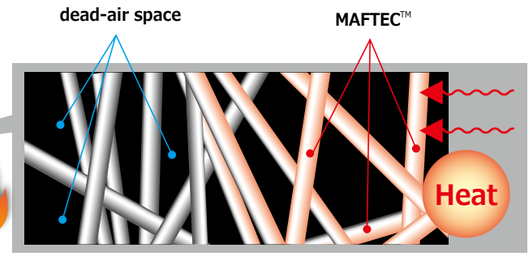
Alumina Fiber (SEM picture)



Wall

mechanism image (Heat blocked by trapped air and the fibers themselves)

Trapped air limits heat conduction + The fibers prevent radiant heat transmission



Mechanism image (Heat blocked by trapped air and the fibers themselves)

MAFTEC™ products

MAFTEC™ has 2-shaped items and can be used for various uses.

Reference chart

Grade	MLS	MLS-2
Mineral composition	mullite	mullite ・δ alumina
Product features	Emphasis on dimensional stability at high temperatures	Emphasis on flexibility, resiliency, and cushioning at high temperatures

MAFTEC™ Blanket

Grade / MLS MLS-2 (customer grade)

MAFTEC™ Blanket can be cut to necessary dimensions.

MAFTEC™ Blanket has various uses (automotive, steel industries, etc.) because it can be freely shaped into many forms.
MLS has superior dimensional stability at high temperatures.
MLS-2 has superior flexibility, resiliency, and cushioning.

Specification

Item (Grade)	Bulk density(kg/m³) 96(6pcf)	Bulk density(kg/m³) 128(8pcf)	Thickness (mm)	Width (mm)	Length (m)	Standard packaging (Pieces/carton)
Blanket (MLS)	○	○	6	610	3.6	12
					36	1
	○	○	12.5	610	3.6	6
					21.6	1
	○	–	25	610	3.6	3
					10.8	1
	–	○	25	610	3.6	3
					7.2	1

MAFTEC™ Bulk

Grade / MLS (customer grade) MLS-2 (customer grade)

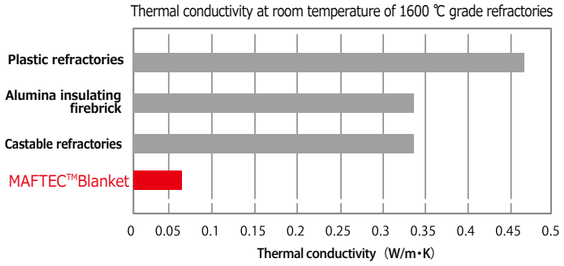
MAFTEC™ Bulk can be used for various industrial filling and process material applications.

MAFTEC™ Bulk's, quality is achieved by proprietary technology, and it can be widely used for various industrial filling, reinforcement and shaped products.

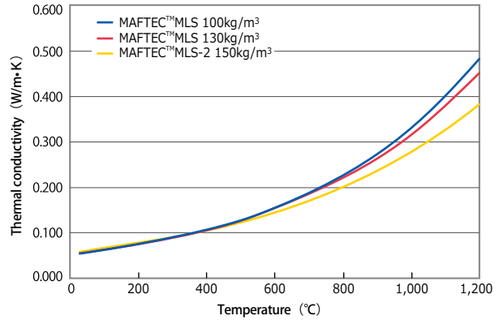
High thermal insulation properties

Thermal conductivity

The low thermal conductivity of MAFTEC™ performs well as a heat insulator at high temperatures.



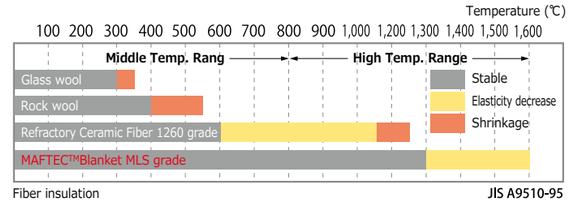
All grades of MAFTEC™, such as MLS,MLS-2 have low thermal conductivity.



High heat resistance

Thermal stability of insulation materials

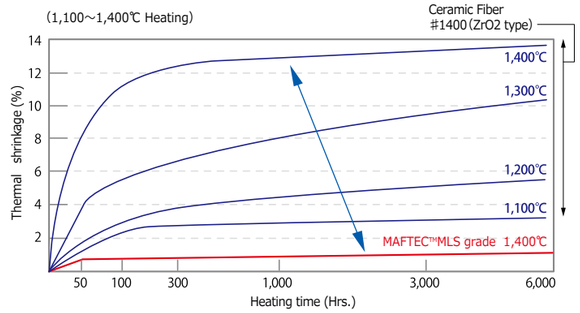
MAFTEC™ is very stable up to 1,600℃ and has excellent resiliency under 1,300℃.
MAFTEC™ is suitable for heat insulation at high temperatures.



High heat resistance

High dimensional stability at elevated temperatures

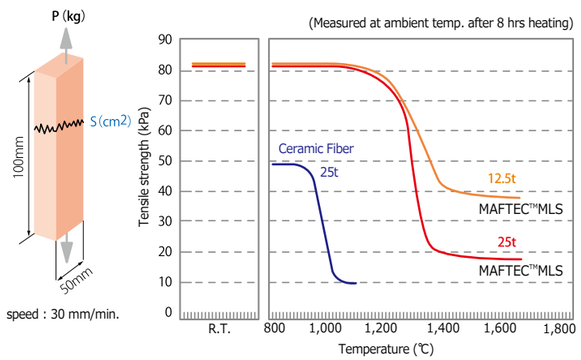
MAFTEC™ does not change dimension even after 6,000 hours. Dimensional stability is attributed to the stable crystal structure of pure mullite.



High heat resistance

Good tensile strength retention after heating

MAFTEC™ demonstrates better tensile strength than Refractory ceramic fiber even after high temperature exposure.

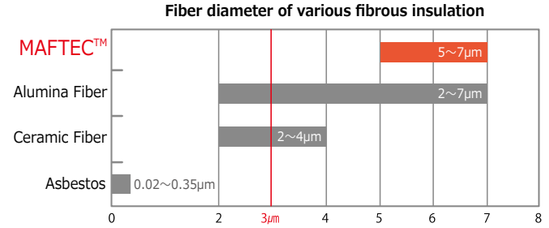


Safety

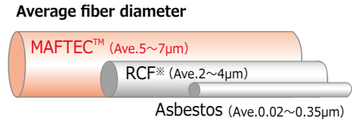
Better safety by well-controlled fiber diameter

Average fiber diameter of MAFTEC™ is controlled between 5 and 7 micrometers. Less than 3 micrometer diameter respirable fibers, which can reach the lung alveoli, increase the risk of diseases such as mesothelioma. MAFTEC™ contains practically no respirable fibers.

Fiber diameter of various fibrous insulation



Average fiber diameter



※RCF : Refractory Ceramic Fiber

*The values mentioned above are typical ones, not guaranteed ones.

MAFTEC™ properties

Typical Product Properties

Item	Test method	MAFTEC™Blanket			MAFTEC™Bulk	
		MLS		MLS-2	MLS	MLS-2
Application	–	Heat insulator Packing		Autowrap	Heat insulator Composite materials	Composite materials
Max.service Temperature (℃)	–	1,600		–	1,600	–
Chemical composition Al_2O_3 : SiO_2 (%)	ICP-AES	72 : 28				
LOI * (%)	–	≦0.1				
Mineral composition	XRD	Mullite		Mullite・δAlumina	Mullite	Mullite・δAlumina
Specific gravity (g/cm³)	–	3.1				
Average fiber diameter (μm)	–	5～7				
Shot content (%)	JIS R3311 (≧45μm)	0～2				
Specific heat (J/kg•K)	JIS R1672	1.1×10^3～1.2×10^3				
Thermal conductivity (W/m.K)	JIS R2251-1	**B.D.=100	**B.D.=130	**B.D.=150		
600℃		0.16	0.15	0.15	–	–
1,000℃		0.33	0.32	0.31	–	–
1,200℃		0.49	0.46	0.44	–	–
Heat shrinkage (%)	JIS R3311					
1,400℃×24h		≦1		≦1	–	–
1,600℃×24h		1		–	–	–

The values mentioned above are typical ones, not guaranteed ones.

*LOI : Loss of Ignition

**B.D. : Bulk Density (kg/m³)

Specification

MAFTEC™ Blanket MLS grade					
Bulk Density (kg/m³)		Thickness (mm)	Width (mm)	Length (m)	Standard packaging (pcs/ctn)
96(6pcf)	128(8pcf)				
○	○	6	610	3.6	12
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○	–	25	610	3.6	3
				10.8	1
–	○	25	610	3.6	3
				7.2	1

MAFTEC™ Instructions and directions for use

Cautions for storage and handling

Handling and storage

Handling precautions: Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Avoid skin contact. For industrial or professional use only.
Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below recommended exposure limits. If ventilation is not adequate, use respiratory protection equipment.
Storage requirements: Store under normal warehouse conditions.

First aid measures

Inhalation: Protect yourself with appropriate PPE, remove the person to fresh air. Decontaminate and begin rescue breathing if breathing has stopped and CPR if the heart has stopped. Seek prompt medical attention.
Eye contact: DO NOT allow victim to rub or keep eyes tightly shut. Gently lift eyelids and immediately flush eyes with large amounts of water. Continue to flush for at least 15 minutes, occasionally lifting the upper and lower lids. Seek prompt medical attention.
Skin contact: Quickly remove contaminated clothing. Immediately wash area with large amounts of water. Seek prompt medical attention for any reddened skin other than from washing.
Ingestion: Never give anything by mouth to an unconscious or convulsing person. Have the conscious and alert person drink 1 to 2 glasses of water to dilute. Induce vomiting only after recent ingestions due to the possibility of seizures. Seek prompt medical attention.

Disposal considerations

Disposal: Follow applicable local, state and federal regulations.

For detailed information, please refer to the MAFTEC™ SDS (Safety Data Sheet).