

MAFTEC Co., Ltd.

Polycrystalline Alumina Fiber

**MAFTEC™**

High temperature refractory use / High temperature resilient material

/ High temperature sealing use / Reinforcement material



Key performance achieved from MAFTEC™ proprietary technology

**MAFTEC**

# MAFTEC™

MAFTEC™ Blanket is available in a range of densities and sizes for a wide variety of thermal applications up to 1600°C.

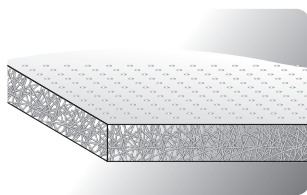
MAFTEC™ is manufactured on precisely-controlled, state of the art facilities to provide customers with highly consistent properties.



Key performance achieved from MAFTEC™ proprietary technology.



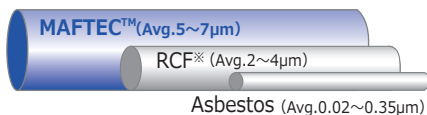
## Unique Stabilization Method : Self needling



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.



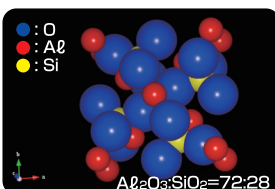
## Average fiber diameter



※RCF : Refractory Ceramic Fiber

## MAFTEC™ fiber diameter is 5 - 7 micrometers

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).

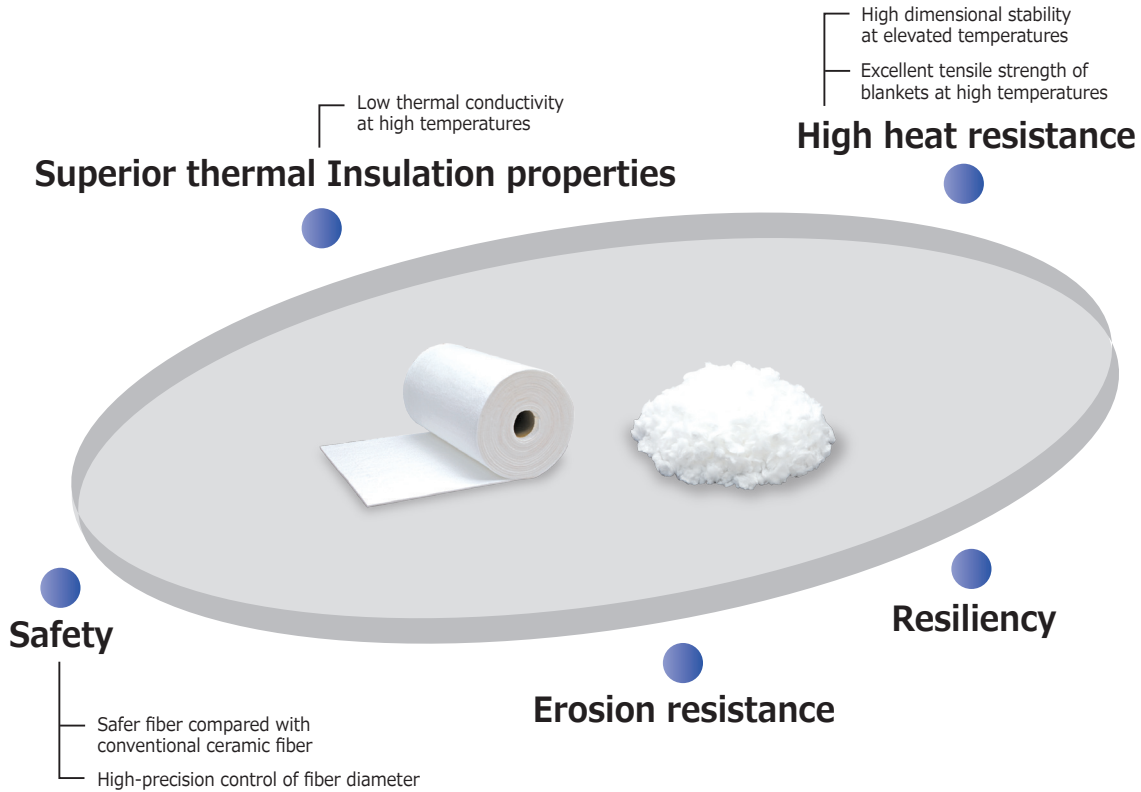


## MAFTEC™ has crystalline structure of mullite

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™

# MAFTEC™ Product Features



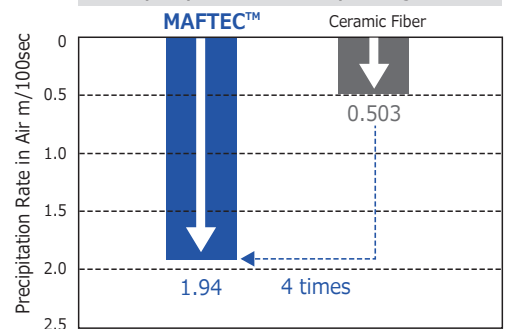
## Safety

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.

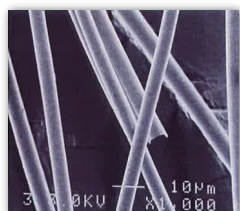
## Heat insulation property 1600°C

MAFTEC™ is lightweight and has high heat insulative performance.

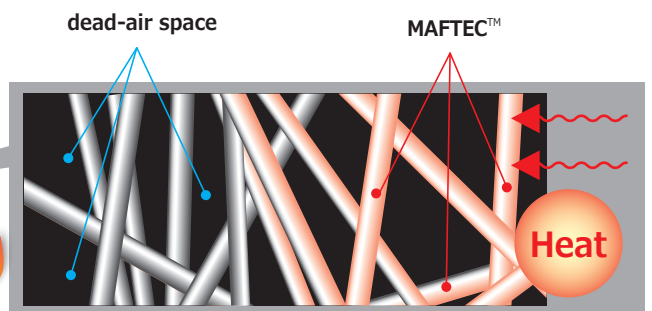
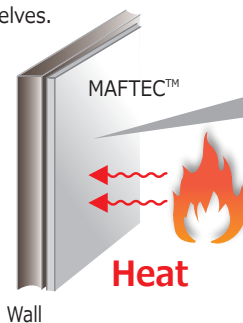
MAFTEC™ has the crystalline structure of mullite. MAFTEC™ provides insulative performance due to both low thermal conductivity of the trapped air between fibers and high heat radiation shield performance of the fibers themselves.

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

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



Alumina Fiber (SEM picture)



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	<b>MLS</b>	<b>MLS-2</b>
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/m <sup>3</sup> )		Thickness (mm)	Width (mm)	Length (m)	Standard packaging (Pieces/carton)
	96(6pcf)	128(8pcf)				
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.

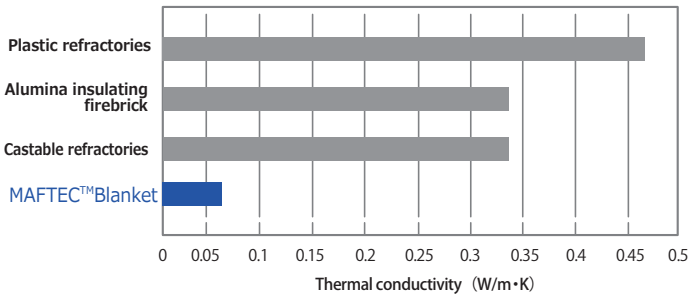
MAFTEC™ Bulk's, quality is achieved by proprietary technology, and it can be widely used for various industrial filling, reinforcement and shaped products.

High thermal insulation properties

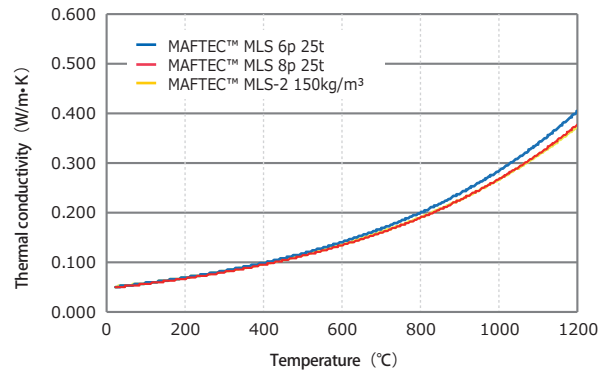
## Thermal conductivity

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

Thermal conductivity at room temperature of 1600°C grade refractories



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

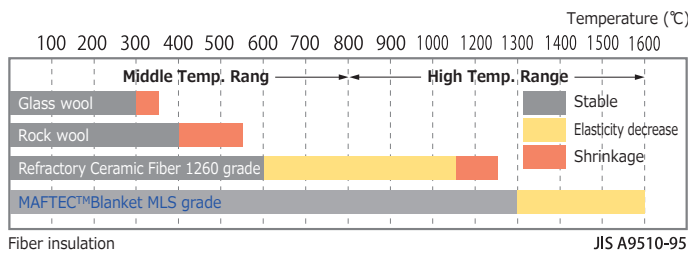


High heat resistance

## Thermal stability of insulation materials

MAFTEC™ is very stable up to 1600°C and has excellent resiliency under 1300°C.

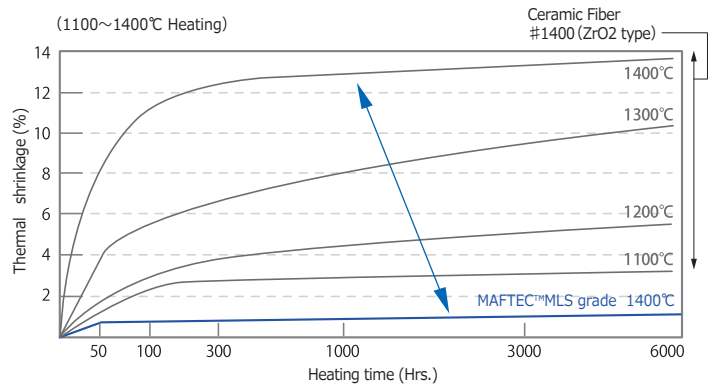
MAFTEC™ is suitable for heat insulation at high temperatures.



High heat resistance

## High dimensional stability at elevated temperatures

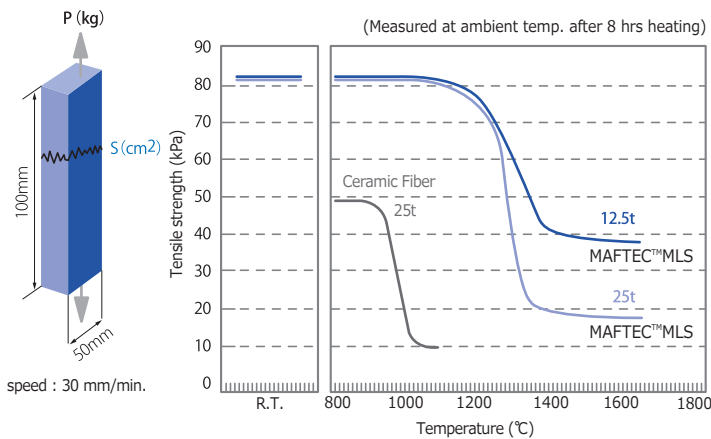
MAFTEC™ does not change dimension even after 6000 hours. Dimensional stability is attributed to the stable crystal structure of pure mullite.



High heat resistance

## Good tensile strength retention after heating

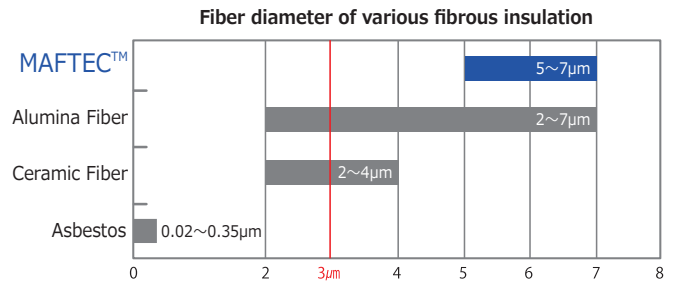
MAFTEC™ demonstrates better tensile strength than Refractory ceramic fiber even after high temperature exposure.



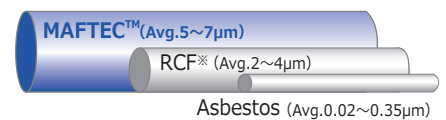
Safety

## 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.





Average fiber diameter



\*RCF : Refractory Ceramic Fiber

# 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 (°C)	—	1600	—	1600	—	
Chemical composition Al <sub>2</sub> O <sub>3</sub> :SiO <sub>2</sub> (%)	ICP-AES	72 : 28				
LOI* (%)	—	≤0.1				
Mineral composition	XRD	Mullite	Mullite · δAlumina	Mullite	Mullite · δAlumina	
Specific gravity (g/cm <sup>3</sup> )	—	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 <sup>3</sup> ~1.2×10 <sup>3</sup>				
Thermal conductivity (W/m·K)	JIS R2251-1	6p 25t	8p 25t	**B.D.= 150	—	—
600°C		0.15	0.14	0.15	—	—
1000°C		0.29	0.28	0.27	—	—
1200°C		0.41	0.39	0.38	—	—
Heat shrinkage (%)	JIS R3311	≤1		≤1	—	—
1400°C×24h		1		—	—	—

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

\*LOI : Loss of Ignition

\*\*B.D. : Bulk Density (kg/m<sup>3</sup>)

## Specification

MAFTEC™ Blanket MLS grade					
Bulk Density (kg/m <sup>3</sup> )		Thickness (mm)	Width (mm)	Length (m)	Standard packaging (pcs/ctn)
96 (6pcf)	128 (8pcf)				
○	○	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

## 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).

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### Agents

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<https://www.maftec.co.jp>

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