MINDELUN NEW MATERIALS

We offer you quality and service

Ceramic Fiber

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Ceramic Fiber is a thermal and fire proofing material includes long, flexible, and interwoven spun fibers produced for appliances operating at 650-1430°C. Ceramic fiber is obtained by mixing the raw materials of aluminum, silica and zirconium homogeneously, melting them at high temperatures, and beating the melt against disks rotating at high speed to create fibers.

Ceramic Fiber is used in the insulation of industrial ovens, boiler tubes and flues, and technical appliances, which operate at very high temperatures.

Ceramic Fiber is vapor and chemical resistant (with the exception of phosphoric and hydrofluoric acid, and strong alkaline materials, such as Na20 and K20). It maintains its thermal insulation properties and characteristics despite continuous wetting and drying.

CERAMIC FIBER BLANKET

Silica and alumina are melted into fibers at high temperatures and applied with pressure to create Ceramic Fiber blankets of various thickness and density levels.

Product Features
- High tensile strength and corrosion resistance
- Low thermal conductivity
- High thermal shocks resistance
- Good sound insulation and light weight
- High fexibility, facilitating cuts and installation
- Low heat storage
- Asbestos/asbestos free

Areas of Use
- Industrial oven insulation
- Ceramics and glass industry
- Iron and steel industry
- Casting industry
- Cement industry
- Industrial oven insulation
- Steel/fire doors

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Ceramic Fiber Blanket

Areas of Usage:

- *Furnace, kiln, reformer and boiler linings*
- *Investment casting mold wrappings*
- *Removable insulating blankets for stress relieving welds*
- *Reusable insulation for steam and gas turbines*
- *Flexible high-temperature pipe insulation*
- *Pressure and cryogenic vessel fire protection*
- *High-temperature kiln and furnace insulation*
- *Furnace door linings and seals*
- *Soaking pit seals •*
- *Furnace repairs*
- *Thermal reactor insulation*
- *Expansion joint seals*
- *Primary reformer header insulation •*
- *High-temperature gasketing*
- *Glass furnace crown insulation*
- *Incineration equipment and stack linings*
- *Annealing cover seals*
- *High-temperature filtration*
- *Nuclear insulation applications*
- *Atmosphere furnace lining*
- *Field steam generator lining*
- *Chemical process heaters*

Chemical and Physical Characters

1	Item	Unit	Test Result	Test Result	Test Result	Test Result	Test Result
2	Grade	/	Common	Standard	High purity	High alumina	Zirconia-alumina
3	Specification temp	(℃)	1050	1260	1260	1360	1360
4	Working temperature	(℃)	800	1050	1100	1150	1200
5	Color	/	White	Pure White	Pure White	Pure White	Pure White
6	Density	(kg/m^3)	128/96/80±15	128/96/80±15	128/96/80±15	160/128±15	160/128/96±15
7	Permanent shrinkage Rate of liner (24h, density 128kg/m^3)	(%)	-4	-3	-3	-3	-3
			(1000℃)	(1100℃)	(1000℃)	(1250℃)	(1250℃)
8	Thermal conductivity of each heat surface(density 128kg/m^3)	(W/m.k)	0.09(400℃)	0.09(400℃)	0.09(400℃)	0.12(600℃)	0.132(600℃)
			0.16（800℃）	0.16（800℃）	0.16（800℃） 0.20(1000℃)	0.20（1000℃）	0.22（1000℃）
9	Compression strength (density 128kg/m^3)	(Mpa)	≧0.04	≧0.04	≧0.04	≧0.06	≧0.06
10	Al_2O_3	(%)	≧40	≧42	≧47	≧45	≧45
11	$Al_2O_3+SiO_2$	(%)	96	97	99	99	-
12	$Al_2O_3+SiO_2+ZrO_2$	(%)	-	-	-	-	99
13	ZrO_2	(%)	-	-	-	-	-
14	Fe_2O_3	(%)	＜1.2	＜1.0	＜0.2	＜0.2	＜0.2
15	Na_2O+K_2O	(%)	＜0.5	＜0.5	＜0.2	＜0.2	＜0.2
16	Thickness	(mm)	12.5/25/50				
17	Width	(mm)	610/1220				
18	Length	(mm)	3600/7200/14400				

STORAGE

Product packages should be placed on at least one pallet which should not be in direct contact with the ground at storage area.
Product packages should be protected from water, moisture and sunlight in the storage area.
Appropriate work safety clothing and equipment must be used to protect the skin, eye and upper respiratory system during transport.
Products must be covered with a tarpaulin when shipped.
Do not leave any material on the products in such a way as to damage the package and the product.
Palletized products should not be stacked and stored on top of each other.
The opened packages must not be disposed of and must be disposed of in accordance with the regulations.

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Ceramic Fiber Board

Areas of Usage:

- *Furnace, kiln, reformer and boiler linings*
- *Investment casting mold wrappings*
- *Removable insulating blankets for stress relieving welds*
- *Reusable insulation for steam and gas turbines*
- *Flexible high-temperature pipe insulation*
- *Pressure and cryogenic vessel fire protection*
- *High-temperature kiln and furnace insulation*
- *Furnace door linings and seals*
- *Soaking pit seals •*
- *Furnace repairs*
- *Thermal reactor insulation*
- *Expansion joint seals*
- *Primary reformer header insulation •*
- *High-temperature gasketing*
- *Glass furnace crown insulation*
- *Incineration equipment and stack linings*
- *Annealing cover seals*
- *High-temperature filtration*
- *Nuclear insulation applications*
- *Atmosphere furnace lining*
- *Field steam generator lining*
- *Chemical process heaters*

Chemical and Physical Characters

1	Item	Unit	Test Result	Test Result	Test Result	Test Result	Test Result
2	Grade	/	Common	Standard	High purity	High alumina	Zirconia-alumina
3	Specification temp	(°C)	1150	1260	1260	1360	1360
4	Working temperature	(°C)	1000	1050	1100	1150	1200
5	Color	/	White	Pure White	Pure White	Pure White	Pure White
6	Density	(kg/m^3)	260/280/300±15	260/280/300±15	260/280/300±15	260/280/300±15	260/280/300±15
7	Permanent shrinkage Rate of liner (24h, density 128kg/m^3)	(%)	-4	-3	-3	-3	-3
			(1000°C)	(1100°C)	(1000°C)	(1250°C)	(1250°C)
8	Thermal conductivity of each heat surface(density 128kg/m^3)	(W/m.k)	0.09(400°C)	0.09(400°C)	0.09(400°C)	0.12(600°C)	0.132(600°C)
			0.13（800°C）	0.13（800°C）	0.13（800°C） 0.18(1000°C)	0.18（1000°C）	0.22（1000°C）
9	Compression strength (density 128kg/m^3)	(Mpa)	≧0.5	≧0.5	≧0.5	≧0.5	≧0.5
10	Al_2O_3	(%)	≧40	≧42	≧47	≧45	≧45
11	$Al_2O_3+SiO_2$	(%)	96	97	99	99	-
12	$Al_2O_3+SiO_2+ZrO_2$	(%)	-	-	-	-	99
13	ZrO_2	(%)	-	-	-	-	-
14	Fe_2O_3	(%)	＜1.2	＜1.0	＜0.2	＜0.2	＜0.2
15	Na_2O+K_2O	(%)	＜0.5	＜0.5	＜0.2	＜0.2	＜0.2
16	Thickness	(mm)	25/50				
17	Width	(mm)	500/600				
18	Length	(mm)	900/1200				

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Ceramic Fiber Paper

Areas of Usage:

- *Furnace, kiln, reformer and boiler linings*
- *Investment casting mold wrappings*
- *Removable insulating blankets for stress relieving welds*
- *Reusable insulation for steam and gas turbines*
- *Flexible high-temperature pipe insulation*
- *Pressure and cryogenic vessel fire protection*
- *High-temperature kiln and furnace insulation*
- *Furnace door linings and seals*
- *Soaking pit seals •*
- *Furnace repairs*
- *Thermal reactor insulation*
- *Expansion joint seals*
- *Primary reformer header insulation •*
- *High-temperature gasketing*
- *Glass furnace crown insulation*
- *Incineration equipment and stack linings*
- *Annealing cover seals*
- *High-temperature filtration*
- *Nuclear insulation applications*
- *Atmosphere furnace lining*
- *Field steam generator lining*
- *Chemical process heaters*

Chemical and Physical Characters

1	Item	Unit	Test Result	Test Result	Test Result
2	Density	(kg/m^3)	200±15	200±15	200±15
3	Specification temp	(℃)	1260	1260	1260
4	Organic content	(%)	6--8	6--8	6--8
5	Color	/	White	Pure White	Pure White
6	Thermal conductivity of each heat surface(density 128kg/m^3)	(W/m.k)	0.075-0.085(200℃） 0.115-0.121（400℃） 0.165-0.175(600℃)		
7	Al_2O_3	(%)	45-46	≧42	≧47
8	Al_2O_3+SiO_2	(%)	96	97	99
9	Thickness	(mm)	2/3/4/5/6/10		
10	Width	(mm)	610/1220		
11	Length	(mm)	6000/10000/12000/15000/20000/30000		

STORAGE

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Ceramic Fiber Bulk

Areas of Usage:

- *Furnace, kiln, reformer and boiler linings*
- *Investment casting mold wrappings*
- *Removable insulating blankets for stress relieving welds*
- *Reusable insulation for steam and gas turbines*
- *Flexible high-temperature pipe insulation*
- *Pressure and cryogenic vessel fire protection*
- *High-temperature kiln and furnace insulation*
- *Furnace door linings and seals*
- *Soaking pit seals •*
- *Furnace repairs*
- *Thermal reactor insulation*
- *Expansion joint seals*
- *Primary reformer header insulation •*
- *High-temperature gasketing*
- *Glass furnace crown insulation*
- *Incineration equipment and stack linings*
- *Annealing cover seals*
- *High-temperature filtration*
- *Nuclear insulation applications*
- *Atmosphere furnace lining*
- *Field steam generator lining*
- *Chemical process heaters*

Chemical and Physical Characters

1	Item	Unit	Test Result	Test Result	Test Result	Test Result	Test Result
2	Grade	/	Common	Standard	High purity	High alumina	Zirconia-alumina
3	Specification temp	(℃)	1050	1260	1260	1360	1360
4	Working temperature	(℃)	800	1050	1100	1150	1200
5	Color	/	White	Pure White	Pure White	Pure White	Pure White
6	Fiber diameter	(um	2--3	2--3	2--3	2--3	2--3
			3--4.5	3--4.5	3--4.5	3--4.0	3--4.0
7	Al_2O_3	(%)	≧40	≧42	≧47	≧45	≧45
8	$Al_2O_3+SiO_2$	(%)	96	97	99	99	99
9	$Al_2O_3+SiO_2+ZrO_2$	(%)	-	-	-	-	-
10	ZrO_2	(%)	-	-	-	-	-
11	Fe_2O_3	(%)	＜1.2	＜1.0	＜0.2	＜0.2	＜0.2
12	Na_2O+K_2O	(%)	＜0. 5	＜0. 5	＜0.2	＜0. 2	＜0.2
13	Pacakge	(/)	20kg/bag				

STORAGE

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Ceramic Fiber Cloth

Areas of Usage:

- *Furnace, kiln, reformer and boiler linings*
- *Investment casting mold wrappings*
- *Removable insulating blankets for stress relieving welds*
- *Reusable insulation for steam and gas turbines*
- *Flexible high-temperature pipe insulation*
- *Pressure and cryogenic vessel fire protection*
- *High-temperature kiln and furnace insulation*
- *Furnace door linings and seals*
- *Soaking pit seals •*
- *Furnace repairs*
- *Thermal reactor insulation*
- *Expansion joint seals*
- *Primary reformer header insulation •*
- *High-temperature gasketing*
- *Glass furnace crown insulation*
- *Incineration equipment and stack linings*
- *Annealing cover seals*
- *High-temperature filtration*
- *Nuclear insulation applications*
- *Atmosphere furnace lining*
- *Field steam generator lining*
- *Chemical process heaters*

Chemical and Physical Characters

1	Item	Unit	Test Result	Test Result
2	Color	/	White	White
3	Specification temp	(℃)	1000(Glass fiber)	1260(Stainless Steel fiber)
4	Using Temp	(℃)	650	1000
5	Fiber diameter	(um)	44200	44200
6	Shot content	(%)	≤8.5	≤8.5
7	Thermal conductivity of average temperature	（W/m.k)	0.13-0.19(538℃,8pcf）	0.13-0.19(538℃,8pcf）
		(%)	0.075-0.085(1232℃*24h）	0.075-0.085(1232℃*24h）
8	$A_{l2}O_3$	(%)	≧45-46	≧45-46
9	SiO_2	(%)	51-52	51-52
10	Fe_2O_3	(%)	＜0. 43	＜0. 43
11	Na_2O+K_2O	(%)	0. 7-1. 2	0. 7-1. 2
12	Thickness	(mm)	2/3/4/5	
13	Width	(mm)	1000	
14	Length	(mm)	20000	

STORAGE

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Ceramic Fiber Thread

Areas of Usage:

- *Furnace, kiln, reformer and boiler linings*
- *Investment casting mold wrappings*
- *Removable insulating blankets for stress relieving welds*
- *Reusable insulation for steam and gas turbines*
- *Flexible high-temperature pipe insulation*
- *Pressure and cryogenic vessel fire protection*
- *High-temperature kiln and furnace insulation*
- *Furnace door linings and seals*
- *Soaking pit seals •*
- *Furnace repairs*
- *Thermal reactor insulation*
- *Expansion joint seals*
- *Primary reformer header insulation •*
- *High-temperature gasketing*
- *Glass furnace crown insulation*
- *Incineration equipment and stack linings*
- *Annealing cover seals*
- *High-temperature filtration*
- *Nuclear insulation applications*
- *Atmosphere furnace lining*
- *Field steam generator lining*
- *Chemical process heaters*

Chemical and Physical Characters

1	Item	Unit	Test Result	Test Result
2	Color	/	White	White
3	Specification Temp	(℃)	1000	1260
4	Using temp	(℃)	650	1000
5	Basic materials	/	CF fiber+Glass fiber	CF fiber+Stainless steel fiber
6	Fiber diameter	(mm)	2,3	2,3
7	Thread weight/roll	(kg)	2±02	2±02
	Moisture content	(%)	≤1	≤1
8	LOI	(%)	≤15	≤15
9	Tex	(g/km)	525	525
	Number of twist	(Strand)	2	2

Tex (g/km)	Fiber Diameter
525	2.0mm
620	2.5mm
1000	3.0mm
2000	3.0mm
2250	3.5mm

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Ceramic Fiber Blanket 1430 °C ZIRC

Areas of Usage:

- Ceramic kilns (abrasives, sanitary ware, electrical insulators, etc.)
- Billet/slab reheat furnaces
- Seals, gaskets, batten strips
- Forge furnaces
- Refractory kilns
- BOF door/shields
- Soaking pit seals
- High-temperature kilns and furnaces
- Boiler linings
- Furnace door linings and seals
- Glass furnace crown insulation
- Incineration equipment
- Skid pipe insulation
- Chemical process heaters
- Reformers

Chemical Composition (Weight / %)

SiO2	45-47
Al2O3	25-28
ZrO2	20-24
Na+K	≤ 0,3
Fe2O3	≤0,25

Physical Properties

Colour	White		
Classification temperature(C°)	1430 C°		
Shot Content %	≤ 1		
Fiber diameter(micron)	3-3,5		
Usage temperature(C°)	1350 C°		
Linear Shrinkage After Heating(%)	1350 C °24 hour/≤2,5		
Density (kg/m³)	110-128	96-128	96-128
Tensile Strength(MPa)	90	100	100
Thickness (mm)	13	25	50
Length (mm)	14400	7200	3600
Width (mm)	610		

Thermal Conductivity (W/mK) / Thermal Resistance (m²K/W)

Density (kg/m³)	110		96		96	
C°	(W/mK)	(m²K/W)	(W/mK)	(m²K/W)	(W/mK)	(m²K/W)
400 C°	0,25	0,05	0,25	0,10	0,25	0,20
600 C°	0,34	0,04	0,34	0,07	0,34	0,15
800 C°	0,44	0,03	0,44	0,06	0,44	0,11
Density (kg/m³)	128					
400 C°	0,18	0,07	0,18	0,14	0,18	0,28
600 C°	0,28	0,05	0,28	0,09	0,28	0,18
800 C°	0,36	0,04	0,36	0,07	0,36	0,14

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