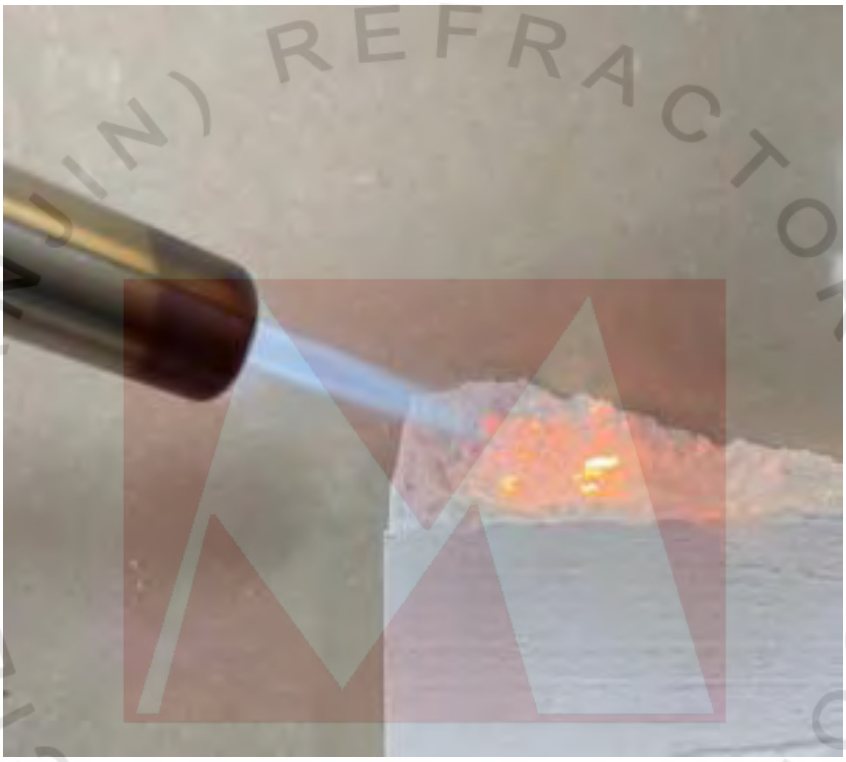
Ceramic Fiber Products



MAGSCIE REFRACTORIES

镁稀（天津）耐火材料有限公司

Magscie (Tianjin) Refractories Co., Ltd.

Ceramic Fiber Bulk

MWOOL: The product has light weight, high temperature resistance, good thermal stability, low thermal conductivity, low heat and mechanical shock resistance and other advantages, product than insulating brick with traditional casting materials such as refractory material and energy saving up to 10-30%.

MWOOL are chemically stable and resistant to most aggressive chemicals (except phosphoric acid, hydrofluoric acid and strong bases). Even if the product is soaked by oil, water or steam, its physical properties such as temperature resistance and heat insulation will not change.

MWOOL-1000,1260,1430: Ceramic fiber is a kind of melting method to produce amorphous (glass) of lightweight refractory fiber material, its production process is the different levels of Al-Si with raw material in electric arc furnace melting, after spun into different temperature of Al-Si ceramic fiber, product category temperature of 1000°C to 1430°C.

MWOOL-1600: Polycrystalline mullite fiber is the latest ultra-light high-temperature refractory fiber at domestic and abroad, classification of the temperature of 1600 °C and the melting point 1840 °C. It is a unique polycrystalline refractory fiber in the form of mullite crystal phase. MWOOL-1600 polycrystalline mullite fiber and glass fiber have completely different production process. it is produced by chemical "colloid method", and its chemically formulated according to the formation of single crystal mullite (Al_2O_3 72%+SiO_2 28%). The principle is to make soluble aluminum and silicon into a colloidal solution with a certain viscosity, and then spun into a fibrous embryo body, and then treatment with medium-high temperature and crystallization process to transformed into the main crystal phase of single mullite phase. The fiber diameter is 3-5um, and the length is 10-150mm. The fiber appearance is white, smooth, soft and elastic, like absorbent cotton.

Product Features:	Typical Applications:
➢No binding agent and other corrosive substances, no asbestos; ➢Low thermal conductivity, low heat capacity; ➢Excellent chemical stability, noncombustible; ➢Excellent thermal shock resistance; ➢Can still maintain good resilience under high temperature; ➢Excellent sound insulation performance; ➢High temperature shrinkage rate is small; ➢Low density.	➢Heat insulation and sealing in high temperature environment; ➢Materials of ceramic fiber secondary products such as board, paper, special-shaped products; ➢Materials of ceramic fiber textiles such as cloth, tape, rope; ➢Fiber reinforced materials for heat insulation castable and binders; ➢Heat insulation filling materials for small and complex Spaces and corners; ➢Filling material for refractory heat insulation bricks and castable expansion joints; ➢Reinforcement material for fiber composites, such as friction plates ➢Filler material for short term heat insulation repair.

MAGSCIE BRAND		MWOOL -1000	MWOOL -1260	MWOOL -1430	MWOOL -1500	MWOOL -1600
Classification Temperature	°C	1000	1260	1430	1500	1600
Properties measure at ambient condition (23°C/50% RH)						
Color	-	White	White	White	Green	1600
Melting Point	°C	1700	1760	1760	1760	1840
Average Fiber Diameter	μm	2.6	2.6	2.8	2.65	3.10
Fiber Length	mm	~200	~250	~250	~150	~100
Average Gravity	Kg/m^3	2600	2600	2800	2650	3100
Thermal Conductivity at mean temperature at 128 kg/m^3						
400°C 600°C 800°C 1000°C	W/M.K W/M.K W/M.K W/M.K	0.15 0.22 0.31 -	0.13 0.19 0.25 -	- 0.13 0.20 0.29	- 0.13 0.19 0.26	- 0.06 0.10 0.14
Chemical Composition						
Al_2O_3	%	42-44	45-47	34-36	41-43	72
SiO_2	%	56-58	53-55	49-51	54-56	28
ZrO_2	%	-	-	14-17	-	
Cr_2O_3	%	-	-	-	2-3	

Packaging: Standard packaging 12kg/ box, other according to customer requirements.

Ceramic Fiber Blanket

MWOOL-BLANKET is made of special ceramic fiber through special reinforced double-side needling process. Magscie reinforced double-sided needling process greatly improves the fiber interweaving as well as delamination resistance of ceramic fiber and makes ceramic fiber blanket much stronger tensile strength without affecting its flexibility. Magscie ceramic fiber blanket without any binder and ensure the good reliability and stability no matter how high temperature and low temperature conditions.

MWOOL-BLANKET are chemically stable and resistant to most aggressive chemicals (except phosphoric acid, hydrofluoric acid and strong bases). Even if the product is soaked by oil, water or steam, its physical properties such as temperature resistance and heat insulation will not change.

MWOOL - BLANKET 1000 is a lightweight, flexible and cost-effective backed insulation fiber blanket made of kaolin clay.

MWOOL - BLANKET 1260 is a high-purity, light-weight, high-strength flexible double-sided needle-punched blanket. Its excellent tensile strength, airflow resistance, fire resistance and heat insulation properties make it widely used in different hot and cold surfaces. Warm and adiabatic.

MWOOL - BLANKET 1430 is made of high-purity alumina, silica and zircon sand after melting and spinning into ceramic fibers, and then made by double-sided needle punching. It has extremely low high temperature shrinkage characteristics and is widely used in chemical industry, metallurgy, ceramics, machinery and other thermal equipment industries.

MWOOL - BLANKET 1500 is made of high-purity alumina, silica, with a small amount of chromium oxide added. Due to the chemical stabilization of chromium oxide, the shrinkage at long-term high temperature is smaller, which effectively fills the gap between the use temperature of MWOOL-BLANKET 1425 and MWOOL-BLANKET 1600.

MWOOL - BLANKET 1600 is made of mullite crystal fibers, needle punched on both sides, without any binders or other ingredients. The long-term use temperature can reach 1600℃. It can still maintain its original toughness, strength and softness when it is subjected to high temperature for a long time in an oxidizing atmosphere, a neutral atmosphere or a weak reducing atmosphere.

More resistant to acid and alkali than ordinary ceramic fiber blankets. Because it does not contain shot, it has better thermal insulation properties.

Product Features:

- ➢Excellent chemical stability, non-flammable
- ➢Low thermal conductivity, excellent thermal insulation performance
- ➢Excellent thermal shock resistance
- ➢Excellent wind erosion resistance
- ➢Excellent sound insulation performance
- ➢High heat reflection coefficient
- ➢Low heat capacity
- ➢Excellent tensile strength and resilience

Typical Applications:

- ➢Industrial kiln lining
- ➢ Glass furnace roof insulation
- ➢ Internal and external thermal insulation of flue
- ➢ Coal mine survival chamber insulation layer
- ➢ Insulation of rail train equipment
- ➢ High temperature filter media
- ➢ Furnace door, manhole cover, high temperature flange connection seal
- ➢ Expansion joint filler
- ➢Insulation in nuclear power and aviation fields
- ➢Insulation of household appliances
- ➢Fireproof

MAGSCIE BRAND		MWOOL -BLANKET 1000	MWOOL -BLANKET 1260	MWOOL -BLANKET 1430	MWOOL -BLANKET 1500	MWOOL -BLANKET 1600
Classification Temperature	°C	1000	1260	1430	1500	1600
Properties measure at ambient condition (23°C/50% RH)						
Color	-	White	White	White	Green	White
Melting Point	°C	1700	1760	1700	1760	1840
Average Fiber Diameter	μm	2.6	2.6	2.8	2.65	3.10
Fiber Length	mm	~200	~250	~250	~150	~100
Average Gravity	Kg/m^3	2600	2600	2800	2650	3100
Shot Content (>212μm)	%	15	7	7	7	≤1
Permanent Linear Shrinkage 24h,128kg/m^3	%	≤2.0 900°C	≤2.0 1100°C	≤2.5 1300°C	≤3.5 1400°C	≤1.0 1600°C
Tensile Strength, Thickness 25mm,128kg/m^3.	KPa	40	80	80	80	103
Thermal Conductivity at mean temperature at 96 kg/m^3						
200°C	W/M.K	0.06	0.06	0.06	0.06	-
400°C	W/M.K	0.10	0.10	0.10	0.10	0.08
600°C	W/M.K	0.18	0.18	0.18	0.18	0.13
800°C	W/M.K	0.27	0.27	0.27	0.27	0.19
1000°C	W/M.K	-	0.36	0.36	0.36	0.27
1200°C	W/M.K	-	-	-	-	0.39
Thermal Conductivity at mean temperature at 128 kg/m^3						
200°C	W/M.K	0.05	0.05	0.05	0.05	-
400°C	W/M.K	0.09	0.09	0.09	0.09	0.08
600°C	W/M.K	0.15	0.15	0.15	0.15	0.12
800°C	W/M.K	0.23	0.23	0.23	0.23	0.17
1000°C	W/M.K	-	0.30	0.30	0.30	0.24
1200°C	W/M.K	-	-	-	-	0.33
Chemical Composition						
Al_2O_3	%	42-44	45-47	34-36	41-43	72
SiO_2	%	56-58	53-55	49-51	54-56	28
ZrO_2	%	-	-	14-17	-	-
Cr_2O_3	%	-	-	-	2-3	-

Standard Size:

Classification Temperature	Density kg/m^3	Length mm	Width mm	Thickness mm
1000 °C	96/128/160	3600/7200	610/1220	12.5/20/25/50
1260 °C	96/128/160	3600/7200	610/1220	6/12.5/20/25/50
1425 °C	128/160	3600/7200	610/1220	12.5/20/25/50
1500 °C	128	3600/7200	610/1220	25
1600 °C	100/130/150	3600/7200	610	12.5/25

Bio-soluble Fiber Blanket

Bio-soluble fiber blanket is made from a blend of CaO, SiO_2 and MgO. Bio-soluble fiber blanket is flexible and competent in treating with the refractory linings, thermal insulation and metals transfer, it has been proven superior and eco-friendly to traditional refractory ceramic fibers Reduce the damage to human body health.

Product Features:	**Typical Applications:**
➢ Low thermal conductivity	➢ Back-up insulation for dense refractory
➢ Good for health	➢ Furnace, kiln, and oven hot face linings
➢ High tensile strength	➢ Cryogenic insulation
➢ Thermal shock resistance	➢ Reusable steam / gas turbine insulation
➢ Excellent thermal insulating effect	➢ Fire protection
➢ Low shrinkage	➢ Food and building industry
➢ Light weight / Asbestos free	➢ Investment casting mold wrap

MAGSCIE BRAND		Bio-soluble Fiber Blanket
Classification Temperature	°C	1260
Properties measure at ambient condition (23°C/50% RH)		
Color	-	White
Melting Point	°C	1500
Average Fiber Diameter	μm	3.5
Fiber Length	mm	~250
Shot Content (>212μm)	%	18
Tensile Strength, Thickness 25mm,128kg/m^3.	KPa	40-50
Thermal Conductivity at mean temperature at 128 kg/m^3		
400°C 600°C 800°C	W/M.K W/M.K W/M.K	0.087 0.135 0.240
Chemical Composition		
Al_2O_3	%	≤1
SiO_2	%	55-65
CaO	%	23-35
MgO	%	5-10

Standard Size:

Classification Temperature	Density kg/m^3	Length mm	Width mm	Thickness mm
1260 °C	96/128	14640/7320/3660	610	12.5/25/50

Ceramic Fiber Board

MWOOL - BOARD is made of high-purity ceramic fibers with a small amount of binders, by vacuum forming, which can still maintain good mechanical strength in a hot state.

MWOOL - BOARD series have low thermal conductivity, good high temperature stability, uniform density, uniform thickness, excellent thermal shock resistance, rigidity and flexural strength, self-supporting, relatively low bulk density, and easy to cut or machine processing.

MWOOL - BOARD is chemically stable and resistant to most aggressive chemicals (except phosphoric acid, hydrofluoric acid and strong alkalis).

MWOOL - BOARD hydrophobic vacuum forming ceramic fiber board after special process treatment with good hydrophobic performance in the construction process and high moisture conditions.

MWOOL - BOARD can be used for self-supporting, thermal insulation and high temperature fields where certain mechanical strength is required.

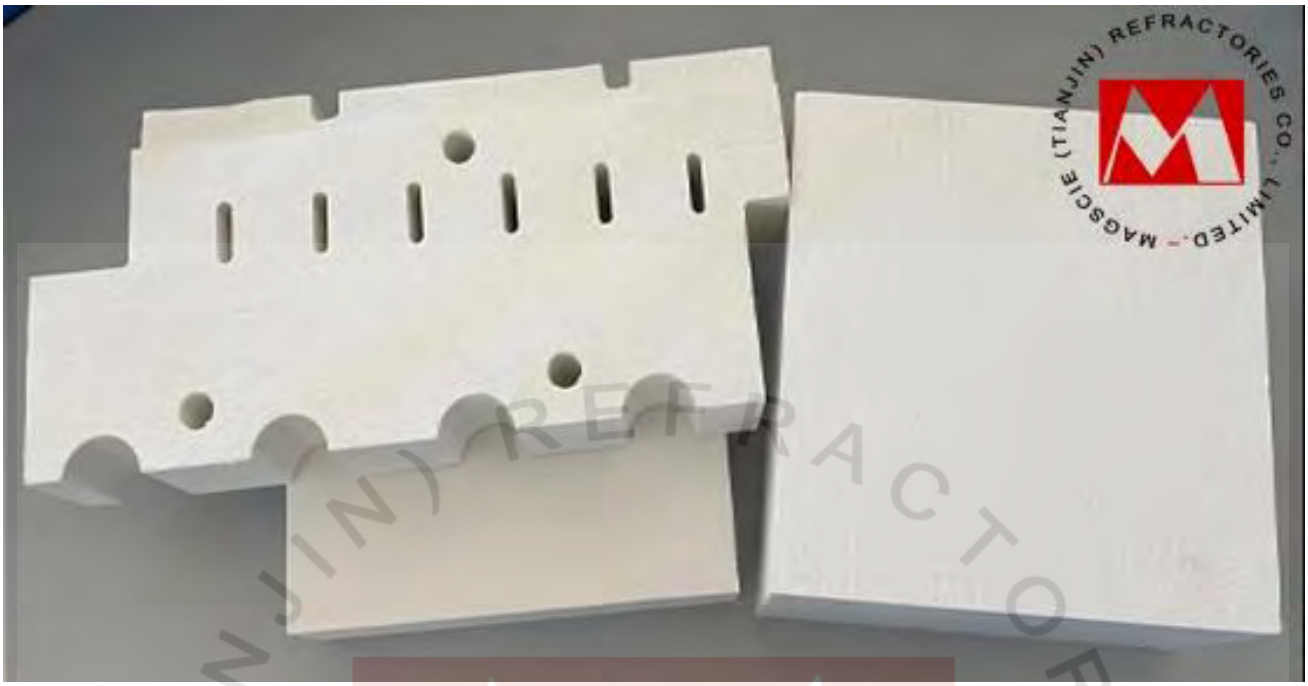
Product Features:	**Typical Applications:**
➢Asbestos free	➢Backing insulation of Glass tempering furnace, hot bending furnace, annealing furnace and molten pool
➢Uniform bulk density, uniform thickness and smooth surface	➢The lining and fire baffle of thermal equipment such as tunnel kiln, roller kiln and shuttle kiln in ceramic industry
➢Excellent high temperature strength and thermal stability	➢Electric furnace hot surface and backing insulation material
➢low thermal conductivity	➢Aluminum industry hot face and backing insulation material
➢low shrinkage	➢Insulation of thermal equipment in metallurgy, machinery, chemical industry, optoelectronics, environmental protection and other industries
➢low heat capacity	➢Other high temperature insulation
➢Excellent resistance to airflow erosion	
➢Direct contact with flame	
➢Easy to cut and install	

MAGSCIE BRAND		MWOOL -BOARD 1000	MWOOL -BOARD 1260	MWOOL -BOARD 1430	MWOOL -BOARD 1500	MWOOL -BOARD 1600	MWOOL -BOARD 1700	MWOOL -BOARD 1800
Classification temperature	°C	1000	1260	1430	1500	1600	1700	1800
Properties measure at ambient condition (23°C/50% RH)								
Bulk Density	Kg/m^3	250/280/300/350			350/400	350/400/500/550		
Linear Shrinkage	%	≤1.5 900°CX24h	≤2.0 1100°CX24h	≤3.0 1300°CX24h	≤1.0 140°CX24h	≤1.0 1500°CX24h	≤1.0 1600°CX24h	≤1.0 1700°CX24h
Modulus of Rupture	MPa	≥0.5			≥0.8			
Compressive Strength (10% relative deformation)	MPa	≥0.25			≥0.35			
Loss on Ignition	%	≤7			≤3			
Thermal Conductivity at mean temperature of								
-	-	280 kg/m^3			350 kg/m^3			
400°C	W/M.K	0.08	0.08	0.08	-	-	-	-
600 °C	W/M.K	0.11	0.11	0.11	0.13	0.13	0.13	0.13
800°C	W/M.K	0.15	0.15	0.15	0.16	0.16	0.16	0.16
1000°C	W/M.K	-	0.20	0.20	0.21	0.21	0.21	0.21
Chemical Composition								
Al_2O_3	%	42-44	45-46	34-36	65	72-75	75-88	78-90
$Al_2O_3+SiO_2$	%	52-54	51-52	48-50	34	25-28	12-25	10-22
ZrO_2	%	-	-	15-17	-	-	-	-

Standard Size:

Classification Temperature	Density kg/m^3	Length mm	Width mm	Thickness mm
1000 °C	250/280/300/350	1200/1000	1000/600	6、8、10、15、20、25、30、40、50、60、70、80、90、100、120
1260 °C				
1400 °C				
1500 °C	350/400/500/550			
1600 °C				
1700 °C				
1800 °C				

New Non-calcined Inorganic Ceramic Fiber Board



Production Technology:

Using high-purity ceramic fiber cotton as raw material, with patented formula, our self-develop environment-friendly production equipment was used to form the high quality inorganic board without secondary calcination.

Product Features:

The new inorganic ceramic fiber board contains very low organic matter. It will be smokeless, tasteless, and its strength and hardness can increase when exposed to naked fire and high temperature.

With the use of new equipment, production technology and formula, the new inorganic ceramic board has more accurate size, more delicate and smooth surface, extremely low shot content, low thermal conductivity and small thermal shrinkage.

It can be cut into corresponding size according to the use requirements. And can be processed by drilling and cutting. It is an ideal environmental protection high temperature resistant insulation panels for wall hanging furnace, electric furnace, oven, etc.

Typical Applications:

- Be thermal insulation and fire-retardant materials for metallurgy, petrochemical, glass, ceramics, non-ferrous metals and other industries.
- Use for environments with special requirements, such as required smokeless and fire-free in high temperature or naked flame.

Five significant advantages:

1. 5mm-200mm thickness, one-stage moulding

The size of traditional organic fiber board is 10mm-60mm, thinner one is fragile and has no strength, while thicker one is hard to dry and easy to moldy deformation as "cotton core".

Non calcined inorganic fiber board has excellent characteristics, such as high density and easy to dry, to make sure the high quality of fiber board while extremely thinner or thicker without deformation.

2. Extremely low organic content, <1.45%

The organic content of traditional organic fiber board is 7-9%, it can absorb moisture mildew easily, fire and smoke in higher temperature.

Non calcined inorganic fiber board make use of high quality inorganic glue to achieve extremely low organic content, while avoid the problem of fire and smoke when using fiber board.

3. No calcination, smokeless, tasteless and colorless in higher temperature

If the traditional organic fiber board want to be smokeless and tasteless in higher temperature, it must be calcined twice and dipped again after moulded, these stages may cause the organic content is still very high, while the internal strength of the fiber board can not be guaranteed.

Non calcined inorganic fiber board can be formed to one-stage moulding without secondary calcination by using high quality inorganic glue, which can be really smokeless, tasteless and colorless.

4. Higher strength, carving freely

Due to the characteristics of silica sol binder, the traditional organic fiber board can't form high-density fiber board with one-stage moulding. The internal strength of fiber board can't be guaranteed because it has to be dipped again after moulded.

Non calcined inorganic fiber board can be formed to one-stage moulding and achieve the density of 400 or above. It has the same strength in the internal and external, and can be carved into any desired shape freely.

5. No mildew, no waste water, environmental protection and energy saving

The traditional organic fiber board is easy to mildew because of starch using, and produce lots of poisonous waste water that inevitably polluting the environment.

Non calcined inorganic fiber board will not produce waste water, cyclic utilization, truly achieve environmental protection and energy saving, while contributing to the cause of human progress.

Ceramic Fiber Module

MWOOL-MODULE series of module products which are pre-folded or sliced and laminated with ceramic fiber blankets and processed by professional equipment. The modules have the advantages of precise size and smooth surface. They are specially designed for a variety of thermal processing equipment lining applications, with reliable quality, fast installation and excellent thermal insulation performance.

MWOOL-MODULE anchor system adopts reinforced anchors, the anchors have greater strength and are closer to the cold surface, and the anchors withstand lower temperatures to ensure their strength. The fixing rod is made of high-quality heat-resistant steel, and two circular fixing rods are embedded in the module system, which increases the load-bearing area and ensures the firmness of the anchor system.

MWOOL-MODULE are easy, fast and reliable to install.

- Pre-design the module and determine the position of the fixing bolts.
- Pre-weld the bolts and check the firmness of the welding.
- The steel plate inside the furnace shell can be coated with anti-corrosion materials, and the backing insulation can have multiple options such as: MWOOL-BOARD, MWOOL-BLANKET, metal aluminum foil composite backing.
- Fix the module on the furnace shell through the anchoring system inside the module.

MWOOL-MODULE 1500 fills the service temperature gap between MWOOL-MODULE 1430 and MWOOL-MODULE 1600.

MWOOL-MODULE 1600 is suitable for working temperature above 1500℃, and has good stability in oxidizing and reducing atmosphere.

MWOOL-MODULE 1430/1500 combined fiber modules combine high temperature performance with economy.

MWOOL-MODULE 1430/1600 combined fiber module has a working temperature above 1400 and has small shrinkage at high temperature, which effectively solves the problem of insufficient high temperature resistance of zirconium fiber and chromium-containing fiber modules, and at the same time, the cost is lower than that of 1600 fiber modules.

Product Features:

- Embedded anchor system, good safety performance
- Low thermal conductivity, excellent thermal insulation performance
- Excellent mechanical strength
- Excellent thermal shock resistance
- Excellent wind erosion resistance
- Excellent sound insulation performance
- High reflection coefficient
- Low bulk density and small heat storage

Typical Applications:

- Steel industry: ladle cover, heating furnace, annealing furnace, annular furnace, bell furnace, coating furnace, hot air duct and flue, etc.
- Aluminum industry: crucible furnace, cell pit furnace and furnace cover and flue, etc.
- Petrochemical industry: cracking furnace, convector, coking furnace, heating furnace, atmospheric furnace, decompression furnace, flue, etc.
- Ceramic industry: tunnel kiln, shuttle kiln, roller kiln.
- Environmental protection industry: waste incinerator, RTO waste gas treatment furnace, etc.

MAGSCIE BRAND		MWOOL -MODULE 1260	MWOOL -MODULE 1430	MWOOL -MODULE 1500	MWOOL -MODULE 1600
Classification Temperature	°C	1260	1430	1500	1600
Properties measure at ambient condition (23°C/50% RH)					
Color	-	White	White	Green	White
Melting Point	°C	1760	1760	1760	1840
Average Fiber Diameter	μm	2.8	2.8	2.8	3.1
Shot Content (>212μm)	%	7	7	7	trace
Permanent Linear Shrinkage 24h,192kg/m^3	%	≤1.3 1100°C	≤1.5 1200°C	≤1.7 1300°C	≤1.1 1500°C
Thermal Conductivity at mean temperature at 160 kg/m^3					
400°C	W/M.K	0.09	0.09	0.09	-
600°C	W/M.K	0.14	0.14	0.14	0.14
800°C	W/M.K	0.20	0.20	0.20	0.20
1000°C	W/M.K	0.28	0.28	0.28	0.28
1200 °C	W/M.K	-	-	-	0.36
Thermal Conductivity at mean temperature at 192 kg/m^3					
400°C	W/M.K	0.08	0.08	0.08	-
600°C	W/M.K	0.13	0.13	0.13	0.13
800°C	W/M.K	0.18	0.18	0.18	0.18
1000°C	W/M.K	0.26	0.26	0.26	0.26
1200 °C	W/M.K	-	-	-	0.34
Chemical Composition					
Al_2O_3	%	44-48	34-36	43	72
SiO_2	%	52-56	48-50	54	28
ZrO_2	%	-	15-17	-	-
Cr_2O_3	%	-	-	2.8	-

Standard Size:

Classification Temperature	Density kg/m^3	Length mm	Width mm	Thickness mm
1260 °C	130/160/192/210	300 305	300 305	100-300
1425 °C				
1500 °C				
1600 °C				

Ceramic Fiber Vacuum Formed Shapes

MWOOL - SHAPED is made of high-purity ceramic fibers with a small amount of binders, by vacuum forming, which can still maintain good mechanical strength in a hot state.

MWOOL - SHAPED all ceramic fiber shaped series have low thermal conductivity, good high temperature stability, uniform density, uniform thickness, excellent thermal shock resistance, rigidity and flexural strength, self-supporting, relatively low bulk density, and easy to cut or machine processing.

MWOOL - SHAPED is chemically stable and resistant to most aggressive chemicals (except phosphoric acid, hydrofluoric acid and strong alkalis).

Product Features:	**Typical Application:**
➢ Can be made into multiple complex shapes	➢ Burner brick
➢ High dimensional accuracy	➢ Observation hole, manhole
➢ Excellent high temperature strength and thermal stability	➢ Electrical component carrier
➢ Low thermal conductivity	➢ Riser sleeve
➢ Low shrinkage	➢ Nozzle and tundish
➢ Low heat capacity	➢ Roll seal
➢ Excellent resistance to airflow erosion	➢ Catalytic Converter Insulation
➢ Direct contact with flame	➢ Pipe Insulation
	➢ Electric heating device carrier

MAGSCIE BRAND		MWOOL –SHAPED 1000	MWOOL –SHAPED 1260	MWOOL –SHAPED 1400	MWOOL –SHAPED 1500	MWOOL –SHAPED 1600	MWOOL – SHAPED 1700	MWOOL –SHAPED 1800
Classification Temperature	°C	1000	1260	1400	1500	1600	1700	1800
Properties measure at ambient condition (23°C/50% RH)								
Bulk Density	Kg/m^3	280/300/350				400/500		
Linear Shrinkage	%	≤1.5 900°CX24h	≤2.0 1100°CX24h	≤3.0 1300°CX24h	≤1.0 1400°CX24h	≤1.0 1500°CX24h	≤1.0 1600°CX24h	≤1.0 1700°CX24h
Modulus of Rupture	MPa	≥0.5				≥0.8		
Compressive Strength (10% relative deformation)	MPa	≥0.25				≥0.35		
Loss on Ignition	%	≤6				≤3		
Thermal Conductivity at mean temperature of								
-	-	250 kg/m^3				400 kg/m^3	400 kg/m^3	500 kg/m^3
400°C	W/M.K	0.08	0.07	0.07	0.07	0.12	0.12	0.18
600 °C	W/M.K	0.11	0.10	0.10	0.09	0.14	0.14	0.20
800°C	W/M.K	0.14	0.14	0.13	0.13	0.17	0.15	0.21
1000°C	W/M.K	0.19	0.19	0.19	0.18	0.21	0.19	0.23
1200°C	W/M.K	-	-	0.25	0.24	0.25	0.25	0.29
Chemical Composition								
Al_2O_3	%	42-44	45-46	34-36	65	72-75	75-88	78-90
$Al_2O_3+SiO_2$	%	52-54	51-52	48-50	34	25-28	12-25	10-22
ZrO_2	%	-	-	15-17	-	-	-	-

Ceramic Fiber Textiles

MWOOL-TEXTILES are made from MWOOL produced by the melting of very pure raw materials with glasses fiber or refractory steel line as strengthening stuff, followed by fiber span thread with different weaving process and equipment, and woven into textiles such as cloth, belt, rope etc. with Characteristics of stable chemical performance, resistance to most of the erosion of the chemicals.

MWOOL -TEXTILES are chemically stable and resistant to most aggressive chemicals (except phosphoric acid, hydrofluoric acid and strong bases). Even if the product is soaked by oil, water or steam, its physical properties such as temperature resistance and heat insulation will not change.

Product Features:

- Asbestos free
- Excellent thermal insulation properties
- Excellent mechanical strength
- Excellent thermal shock resistance
- Excellent corrosion resistance to acid, oil and water vapor

Typical Applications:

- MWOOL - Cloth
  - High temperature resistant fire curtain, special operation labor insurance clothing material
  - Protection of cables or fuel pipes
  - Insulation of high temperature pipes and containers
  - Thermal radiation barrier
  - Sealing of high temperature pipeline flanges and fans
- MWOOL - Belt
  - High temperature furnace door curtain
  - Thermal radiation barrier
  - Flange connection and furnace door seal
  - Cable thermal insulation
  - Pipe thermal insulation
- MWOOL - Rope
  - Furnace door seals for industrial furnaces and ovens
  - High temperature pipeline connection sealing
  - Flexible expansion joint connection
  - Heat exchanger, kiln car seal
  - Insulation and sealing of industrial furnace flues and air ducts
- MWOOL - Yarn
  - Sewing ceramic fiber cloth
- MWOOL - Fiberglass Cloth
  - Flexible Sealed Composites
  - Fire and high temperature insulation curtains
  - High temperature pipeline insulation and sealing
  - Insulated wire, cable, electronic equipment wrapping

MAGSCIE BRAND		Glass Fiber Reinforced	Stainless Steel Wire Reinforcement
Work Temperature	°C	650	1050
Melt Temperature	°C	1760	1760
Bulk Density	Kg/m^3	350-600	350-600
Thermal Conductivity at mean temperature of			
800°C	W/M.K	0.17	0.17
Loss on Ignition	%	10-18	10-18

SIZE:

Ceramic Fiber Cloth	Width：1000mm；Thickness：2,3,4,5,6 mm
Ceramic Fiber Tape	Width：10~150mm; Thickness：2,3,4,5,6 mm
Ceramic Fiber Twist Rope	Outside Diameter：5,6,8,10,12,14,15,16,18,20,25,30,35,40 mm
Ceramic Fiber Round Braid	Outside Diameter：5,6,8,10,12,14,15,16,18,20,25,30,35,40,50 mm
Ceramic Fiber Square Braid	5x5,6x6,8x8,10x10,12x12,14x14,15x15,16x16mm 18x18,20x20,25x25,30x30,35x35,40x40,45x45,50x50,60x60mm
Ceramic Fiber Yarn	Tex (Weight in grams of 1000m long yarn at a given moisture regain): 330,420,525,630,700,830,1000,2000,2500 mm

Ceramic Fiber Paper

MWOOL-PAPER ceramic fiber paper made of MWOOL by wet forming process with uniform thickness, flat surface, good flexibility can be cut or punched to further produce products of various sizes and specifications.

MWOOL-PAPER ceramic fiber paper is chemically stable and resistance to most aggressive chemicals (except phosphoric acid, hydrofluoric acid and strong bases). Even if this series of products are wetted by oil, water or steam, their physical properties such as temperature resistance and heat insulation will not change after drying. In addition, MWOOL-PAPER ceramic fiber paper has excellent dielectric strength.

Product Features:	Typical Applications:
➢ Asbestos free	➢ Soldering Heat Barriers
➢ low thermal conductivity	➢ Wrap Investment Castings
➢ Very low slag content	➢ Wrap catalytic converters in power plants
➢ light weight	➢ Protect thermocouple tubes
➢ Excellent corrosion resistance	➢ Furnace door seal
➢ Excellent thermal stability and thermal shock resistance	➢ Thermal Insulation Gasket
➢ good dielectric strength	➢ Industrial furnace masonry expansion joints
➢ Easy to wrap, shape or cut	➢ Thermal insulation materials for household appliances
➢ Excellent elasticity and flexibility	➢ High temperature filter material
➢ Low heat capacity, high heat reflection coefficient	➢ Insulation material in metallurgy, glass industry

MAGSCIE BRAND		MWOOL-PAPER 1000	MWOOL-PAPER 1260	MWOOL-PAPER 1400
Classification Temperature	℃	1000	1260	1400
Properties measure at ambient condition (23°C/50% RH)				
Color	-	White	White	White
Bulk Density	kg/m^3	210	210	210
Tensile Strength	MPa	0.50	0.65	0.65
Organic Content	%	⩽10	⩽8	⩽8
Linear Shrinkage Rate	%	⩽3.5 1000x24hrs	⩽3.5 1100x24hrs	⩽3.5 1200x24hrs
Thermal Conductivity at mean temperature of				
200°C	w/m.k	0.05	0.05	0.05
400°C	w/m.k	0.09	0.09	0.09
600°C	w/m.k	0.13	0.13	0.13
800°C	w/m.k	0.20	0.20	0.20
1000°C	w/m.k	-	-	0.28
Chemical Composition				
Al_2O_3	%	42	45	35
SiO_2	%	54	54	48
ZrO_2	%	-	-	17

Aerogel is currently known as a light solid material because of its nano porous structure (1-100nm), low density (1~500kg/m³), low dielectric constant (1.1~2.5), and low thermal conductivity (0.013). ～0.025W/(m · K)), high porosity (80~99.8%), high specific surface area (200~1000m³/g) and other characteristics, showing unique properties in mechanics, acoustics, heat, optics and other aspects, It has broad and huge application prospects in many fields such as aerospace, military, transportation, communications, medical, building materials, electric power, metallurgy, etc., and is called "the magical material that changes the world".

Silica Aerogel is a material with good thermal insulation performance so far. Its pore size is lower than the mean free path of air molecules under normal pressure. Therefore, the air molecules in the aerogel pores are approximately static, thus avoiding the convective heat transfer of air. The extremely low volume density of aerogels and the curved path of the nano-network structure also prevent gas and solid heat conduction, and the "infinitely many" void walls can reduce heat radiation. These three aspects work together to block almost all the ways of heat transfer, so that aerogel can achieve a thermal insulation effect those other materials can't match, even far lower than the thermal conductivity of static air at room temperature of 0.025W/m·K, reaching 0.013W /m·K or less.

Product Features:

- **Super Thermal Insulation Performance**
  The thermal conductivity is only 1/3~1/5 that of traditional materials, which effectively reduces heat loss, has high space utilization, and has more significant performance advantages at high temperatures.
- **Long Lasting Heat Resistance**
  The unique three-dimensional network structure of aerogel avoids the phenomenon that other heat-preserving materials suffer from sintering deformation due to long-term high temperature or vibration, and the phenomenon that the heat-preserving performance of particles is drastically reduced.
- **Fireproof and Waterproof**
  Aerogel can reach the national A-level non-combustible standard for building materials, and the water repellency rate can reach more than 99%, which can avoid the material's settlement failure caused by water ingress.
- **Tensile and Crack Resistance**
  It has good flexibility and tensile strength, and can resist the internal stress caused by the stretching during construction and the linear shrinkage when alternating cold and heat.
- **Environmental Protection**
  The product is composed of inorganic materials, does not contain harmful substances to the human body, the content of soluble chloride ions is very small, and it is non-corrosive to equipment and pipelines.
- **Sound Resistance and Impact Resistance**
  While keeping the equipment warm, it also has the functions of sound absorption, noise reduction, and vibration buffering, which improves the environmental quality and protects the equipment.
- **Easy To Install**
  The product density is less than 200kg/m³, light and convenient, easy to cut, and high construction efficiency.

Typical Applications:

- Industrial pipelines, steam turbines, boilers, heat exchangers, high-temperature reaction and heating equipment, flues, industrial furnace bodies, power plant heating networks, direct-buried pipelines, and high-temperature steam pipelines.
- Application areas: Building energy saving, petrochemical industry, power heating network, solar thermal energy, chemical and pharmaceutical industry, industrial equipment.

Product Specifications	**Thickness**	3/6/10mm		
	Length	Customizable		
	Width	1500mm		
	Color	Beige		
	Recommended Use Temperature	-50~650℃		
	Note: The specific size can be customized according to customer requirements			
Performance Parameter	**Thermal Conductivity (Average Temperature)**	25℃	0.021W/（m·k）	GB/T 10295
		300℃	0.036W/（m·k）	GB/T 10294
	Burning Level	Class A		GB 8624
	Heating Permanent Line Change	≥-2.0%		GB/T 17911
	Vibration Mass Loss Rate	≤1%		GB/T 34336 Appendix B
	Bulk Density	210±20kg/m³		GB/T 5480
	Compression Rebound Rate	≥90%		GB/T 34336 Appendix C
	Tensile Strength	≥500kPa		GB/T 17911
	Mass Moisture Absorption Rate	≤5%		GB/T 5480
	Volumetric Water Absorption	≤1%		GB/T 5480
	Hydrophobic Rate	≥99%		GB/T 10299
	Compressive Strength (25%)	≥80kPa		GB/T 13480
	Cover Austenitic Stainless Steel	Pass		GB/T 17393
	Cover Aluminum, Copper, Steel	Pass		GB/T 11835 Appendix F