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# HEAT INSULATING MATERIAL

# CERAMIC FIBER

## CERAMIC FIBER BLANKET

LONG KETER provides a comprehensive range of CERAMIC FIBER BLANKET,Ceramic Fiber Blanket adopts high pure raw materials without any binding agent,ensure the product own good reliability and stability in any environment. The function of the blanket isn't affected by water and oil, it will recover its thermal performance and physical property after drying.Needing blanket in different size and thickness provides users a wide range of material selection to gain the best heat insulation structure and energy saving effect.

## CERAMIC FIBER Product Data

Type	LKT1100	LKT1260	LKT1360	LKT1430	LKT1500	
Classification Temperature(°C)	1100	1260	1360	1430	1500	
Color	White	White	White	White	Blue/Green	
Density(kg/m <sup>3</sup> )	96、128、160					
Permanent Linear Shrinkage (Heat Preservation 24 Hour,128kg/m <sup>3</sup> )	≤-4 (1000°C)	≤-3 (1000°C)	≤-3 (1100°C)	≤-3 (1350°C)	≤-3 (1600°C)	
Thermal Conductivity(W/M.K)	0.09(400°C) 0.16(800°C)	0.09(400°C) 0.16(800°C)	0.12(400°C) 0.20(1000°C)	0.16(400°C) 0.20(1000°C)	0.16(400°C) 0.20(1000°C)	
Chemical Composition (%)	Al <sub>2</sub> O <sub>3</sub>	42-44	45-46	52-55	39-40	43
	SiO <sub>2</sub>	-	-	-	-	-
	Al <sub>2</sub> O <sub>3</sub> +SiO <sub>2</sub>	96	98	99	-	-
	Al <sub>2</sub> O <sub>3</sub> +SiO <sub>2</sub> +ZrO <sub>2</sub> (Cr <sub>2</sub> O <sub>3</sub> )	-	-	-	99	99
	ZrO <sub>2</sub>	-	-	-	15-17	-
	Cr <sub>2</sub> O <sub>3</sub>	-	-	-	-	2.5-3.0

## Key Features for CERAMIC FIBER BLANKET

- Low heat strong capacity, low thermal conductivity
  - Excellent thermal stability and shock resistance, resist
  - Excellent tearing resistant
  - Excellent insulating performance, fire prevention and sound absorption
  - Double-side needling operation produces tough, resilient and strong blankets, which resist tearing both before and after heating
  - Easy cutting and installation

The main application for CERAMIC FIBER BLANKET are listed below:

- All kinds of industrial kiln linings (hot surface and back lining)
  - Furnace body expansion joint, furnace door, top cap seals
  - High building fireproof and heat insulation
  - Thermal resistance component of auto industry
  - High temperature filter media
  - Insulation for field stress relieving of welds



## Key Features for CERAMIC FIBER BOARD

- Low thermal conductivity and low heat storage
  - High temperature stability and resistant to thermal shock
  - High crushing strength and good toughness
  - Allow machining and cutting, easy application
  - Resistant to airflow erosion
  - All kinds of industrial furnace hot face and back face insulation
  - Kiln liner of the High-temperature furnace, kiln cars, door damper, furnace temperature to separate plate
  - Deep processing products molding mould, Like craft glass etc.
  - Astronavigation, ship-building heat insulation, fireproofing, sound proofing, insulation

LONGKETER provides a comprehensive range of CERAMIC FIBER BOARD, All kinds of ceramic fiber boards adopt ceramic fiber which is in corresponding to temperature level as raw material, through the large automatic vacuum filter molding machine to shape them, and then they will be done after special baking.

The product with good toughness and strength appears flattening and the ceramic material distributes uniformity, it also has excellent thermal insulation performance. Heating is not inflated. For light, construction convenient, free shear and bending, it is the ideal energy-efficient insulation materials of a furnace, piping and other equipment.

#### ■ CERAMIC FIBER BOARD Product Data

Classification temperature (°C)	1100	1260	1360	1430	1500
Color	White	White	White	White	Light green
Density(kg/m <sup>3</sup> )	280	280	280	280	280
Linear shrinkage after firing% (°C*24H)	≤ 4 (1000°C)	≤ 4 (1200°C)	≤ 4 (1300°C)	≤ 4 (1400°C)	≤ 4 (1400°C)
Ignition lost (at1000°C*5hr)LOI%	5	5	5	5	5
Thermal conductivity(W/m.k)	0.132 (600°C)				
	0.15 (800°C)	0.19 (1000°C)	0.19 (1000°C)	0.19 (1000°C)	0.19 (1000°C)
Rupture strength (Mpa)	0.5	0.5	0.5	0.5	0.5



LONGKETER provides a comprehensive range of CERAMIC FIBER MODULE. LKT ceramic fiber module adopts high quality ceramic fiber blanket, which is made up to compression module after folding, compression, packing. Module can choose kinds combination of anchor and furnace body. Installation method is so simple that can quicken the speed of furnace lining construction largely. After installation, the bandaging is cut and the modules are to form an integrated insulating lining. The anchor system in remote from the module hot face maintains the metal components at a relatively low temperature.

#### Key Features for CERAMIC FIBER MODULE

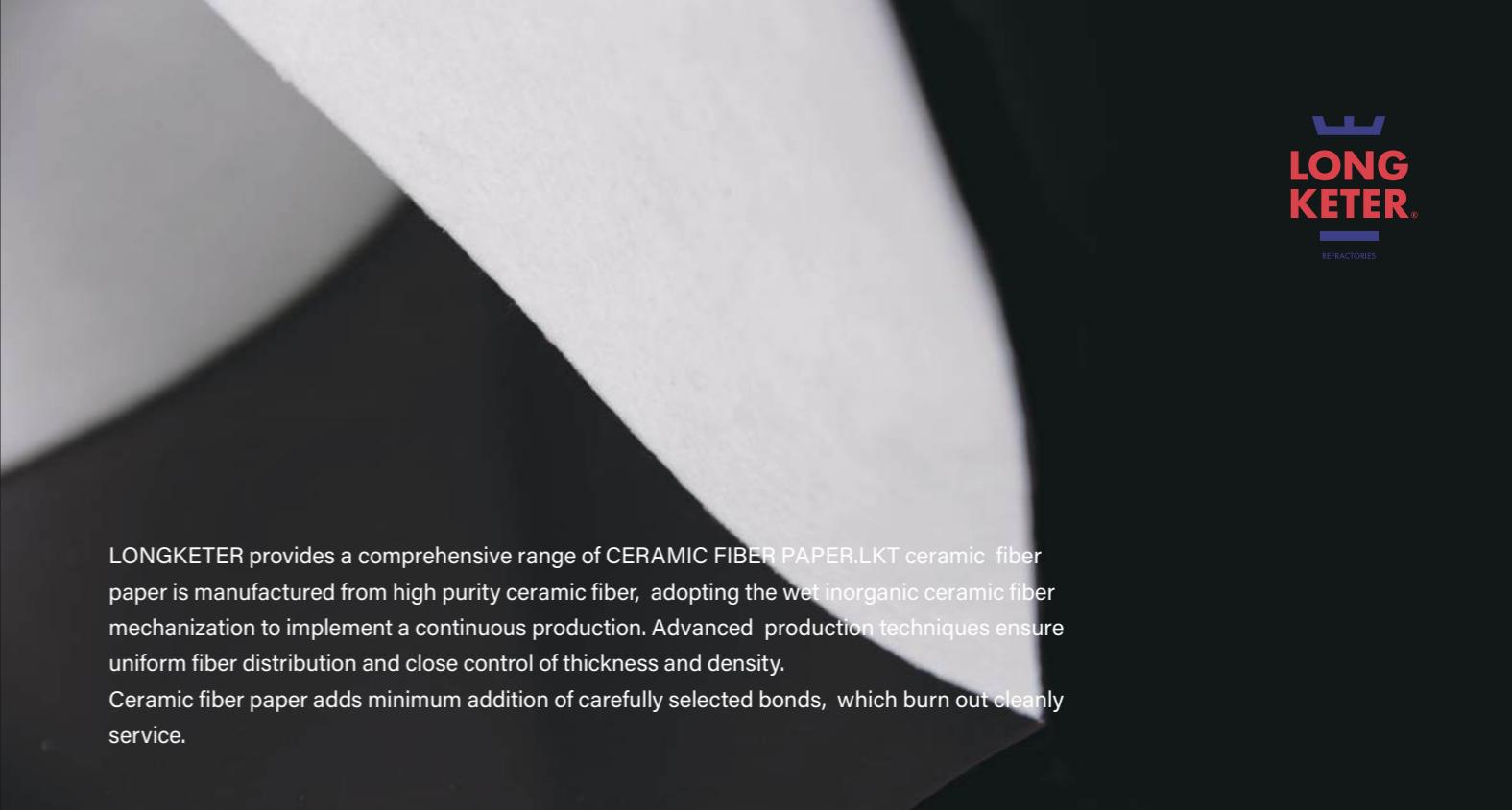
- The anchor on the back allows both in-line and parquet installation
- The decompression of the blanket folds give tightly sealed intermodular joints with both configurations
- The resilient blanket is resistant to mechanical damage
- Low thermal conductivity gives high thermal efficiency
- Total resistance to thermal shock
- No drying or curing required-so available for production operation immediately after installation
- The anchor is remote from the module hot face
- It can be cut to satisfy the requirement of different parts

The main application for CERAMIC FIBER MODULE are listed below:

Metallurgy, machinery, building materials, petrochemical industry, non-ferrous metal and other industries of all kinds of industrial furnace, heating furnace lining.

#### CERAMIC FIBER MODULE Product Data

Type	LKT1100	LKT1260	LKT1360	LKT1430	LKT1500
Classification temperature (°C)	1100	1260	1360	1430	1500
Density(kg/m³)			160, 170, 190, 210		



LONGKETER provides a comprehensive range of CERAMIC FIBER PAPER. LKT ceramic fiber paper is manufactured from high purity ceramic fiber, adopting the wet inorganic ceramic fiber mechanization to implement a continuous production. Advanced production techniques ensure uniform fiber distribution and close control of thickness and density. Ceramic fiber paper adds minimum addition of carefully selected bonds, which burn out cleanly in service.

#### Key Features for CERAMIC FIBER PAPER

- Low thermal conductivity, low thermal capacity.
- Low shot content
- Good resistance to tearing, high flexibility
- Do not contain asbestos, resistance to corrosion, not react to liquid aluminum
- Good electrical insulation and sound insulation performance
- Excellent mechanical performance

The main application for CERAMIC FIBER PAPER are listed below:

- Industrial insulation, seal, protective materials
- Electric heat device insulation, heat insulation materials
- Molten metal gasket
- Instrument equipment, electric heating element of insulation and heat insulation materials
- Fire protection
- Thermal barriers for vehicles and spaceflight
- Fillers of expansion joints

#### CERAMIC FIBER PAPER Product Data

Classification temperature ( °C)	1260	1430		
Density (kg/m³)	200±15	200±15		
Organic content (%)	6-8	6-8		
Tensile strength (kpa)	1mm ≥300; 2mm-6mm ≥400			
Permanent linear shrinkage (°C*24h)	≤3.5(1000°C)	≤3.5(1200°C)		
Thermal conductivity (W/m.k)	400°C 600°C	0.115-0.121 0.165-0.175		
Dimension(mm)				
4000×1220×1	20000×1220×2	15000×1220×3	10000×1220×4	8000×1220×5
40000×610×1	20000×610×2	15000×610×3	10000×610×4	8000×610×5

## CERAMIC FIBER TEXTILES

LONG KETER provides a comprehensive range of CERAMIC FIBER TEXTILES. Industrial refractory fiber is made from ceramic fiber, E-Glass Fiber, vycor fiber, PANOF, etc..The products include yarn, cloth, tape, twisted rope, packing, tube, coated fabric and other kinds of tech textiles, which are widely used in heat insulation sealing etc.

### Key Features for CERAMIC FIBER TEXTILES

- Excellent high temperature resistant performance
- Thermal shock resistance
- Low thermal capacity
- Easy construction

### Product Data

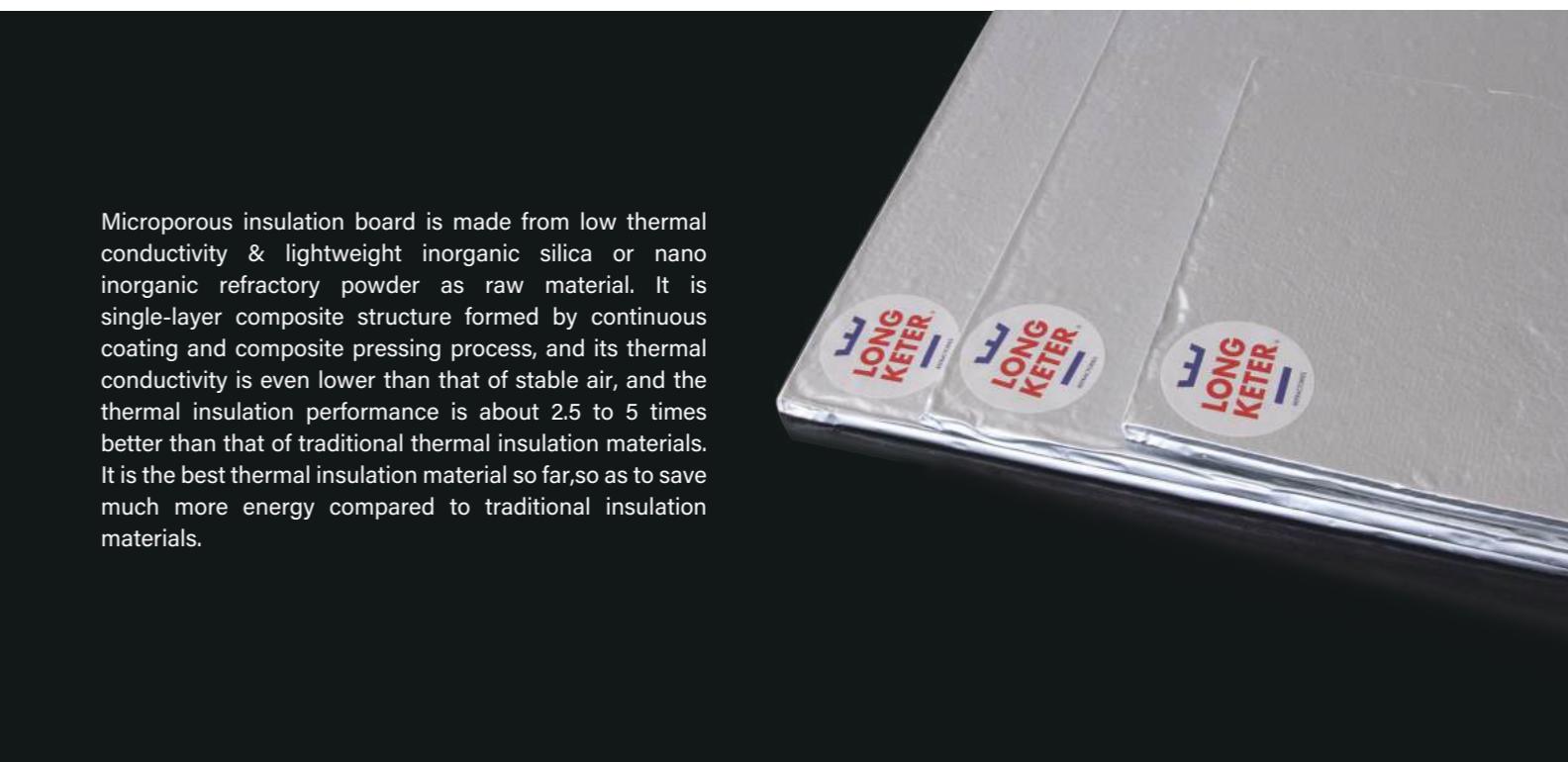
Tape	Thickness: 1.5,2.0,3.0	Width: 10, 15, 25, 50, 75, 100, 120, 150
Cloth	Thickness: 1.5,2.0,2.5,3.0,5.0	Width: 1000-1500
Coated Cloth	Thickness: 1.5,2.0,3.0	Width: 1000-1500
Twisted Rope	Diameter: 3, 4, 5, 6, 8, 10, 12, 13, 14, 16, 18, 20, 25, 30, 35, 40, 45, 50	
Twisted Tube		Inner Diameter: 12, 14, 15, 16, 18, 20, 25, 30, 50, 100



The main application for CERAMIC FIBER TEXTILES are listed below:

- Tape: Industrial heat insulation, pipe and cable coated bolted flange connection, friction reinforced materials
- Cloth: Large area industrial heat insulation, fire protection and coating cloth and base cloth, etc.
- Coated cloth: Fire smoke proof, adornment, Beirut cotton print, fire blanket, thermal insulation, etc.
- Twisted rope\tube: Coating high temperature resistant insulated wire,cable and high temperature tube, high temperature pipe heat insulation and seal, etc.

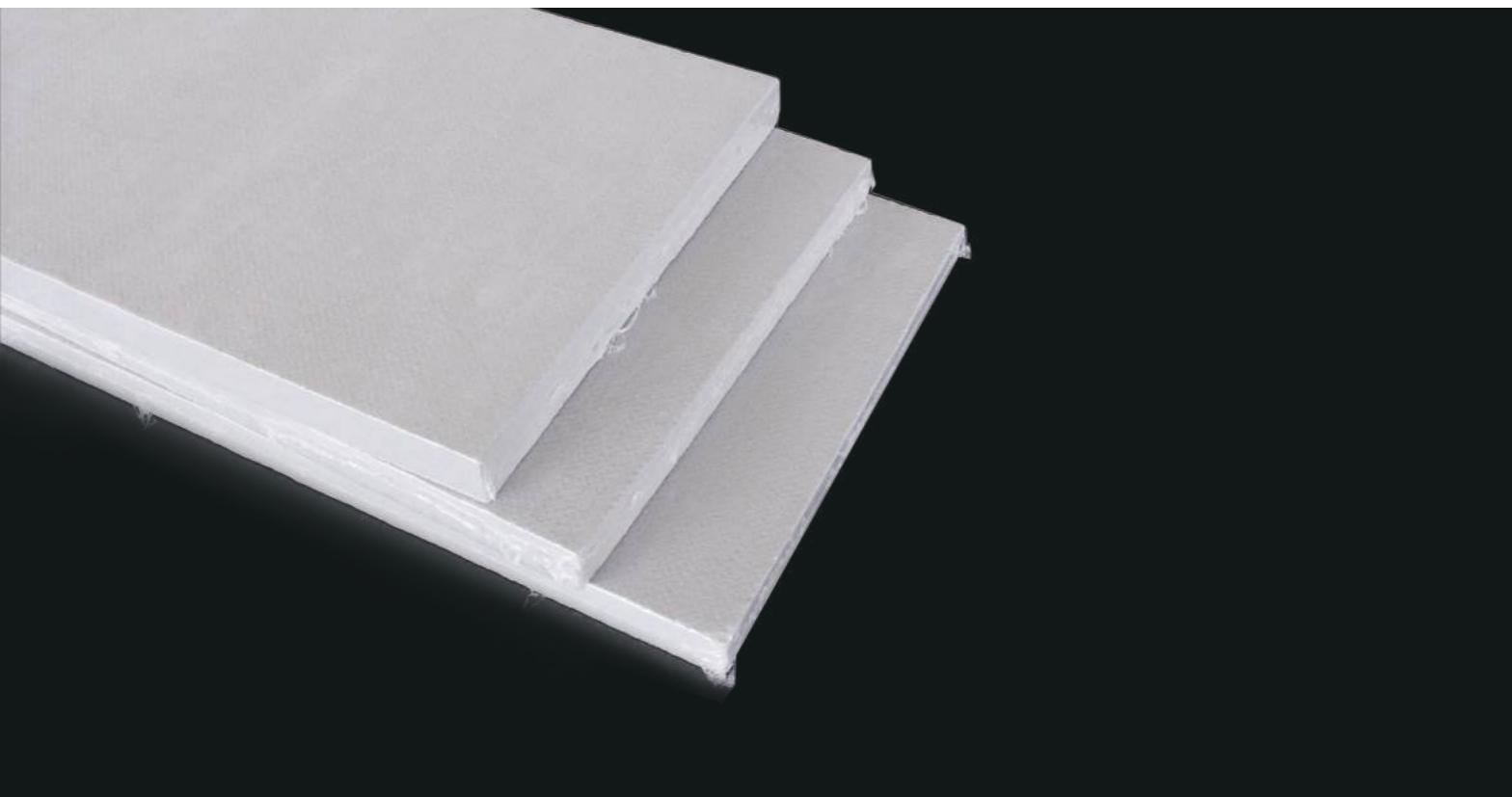
## MICROPOROUS INSULATION BOARD



Microporous insulation board is made from low thermal conductivity & lightweight inorganic silica or nano inorganic refractory powder as raw material. It is single-layer composite structure formed by continuous coating and composite pressing process, and its thermal conductivity is even lower than that of stable air, and the thermal insulation performance is about 2.5 to 5 times better than that of traditional thermal insulation materials. It is the best thermal insulation material so far, so as to save much more energy compared to traditional insulation materials.

### Features

- Very low thermal conductivity, thermal insulation performance is 2-10 times compared to traditional insulation materials
- Thermal conductivity doesn't increase much when temperature rises insulation materials
- Max service temperature could reach 1100°C
- A1 non-flame materials with low linear change and long service life insulation materials
- Environmental-friendly, no smoke or harmful smell when heating; Safe to skin



### ■ Microporous Insulation Board Product Data

Item code	UNIT	LKT950	LKT1000	LKT1200
Refractoriness	°C	≥1200	≥1200	≥1200
Max. Service temperature	°C	950	1000	1100
Bulk density(±10%)	kg/m3	280-350	550-650	550-650
Compressive strength	Mpa	0.5	0.8-1.2	0.8-1.2
Heating linear shrinkage	800°C %	≤1.9	≤1.9	≤1.9
	200°C	0.016	/	/
Thermal conductivity	400°C W/m.K	0.021	0.043	0.047
	600°C	0.026	0.057	0.058
	800°C	0.035	0.063	0.069

#### Iron & Steel industry:

- Steel ladle, tundish, torpedo, converter, furnace door & roof, engine heat shield, power battery fire & heat insulation;

#### Industrial kiln:

- roller kiln, tunnel kiln, pit furnace, lithiumelectric kiln, rotary kiln;

#### Cement industry:

- decomposition furnace, grate cooler, tertiary air duct, flue gas chamber, etc.

#### Petrochemical:

- heat treatment furnace, cracking furnace;

#### Aluminum industry:

- aluminum melting furnace, aluminum electrolytic cell, aluminum holding furnace;



#### Package :

- Bare board/POF heat shrinkage film/Aluminum foil coated/glass fiber cloth coated etc.





## INSULATING FIREBRICKS

### INSULATING FIREBRICK

LONG KETER provides a comprehensive range of Insulating Firebrick. Insulating Firebrick are made from high-purity refractory clays; temperature of use ranging from 1100°C to 1700 °C and each grade is formulated to meet specific thermal and physical requirements. For higher temperature products, their addition of alumina are graduated. Each grade is added by classified organic filler. This organic filler burns out during manufacture process to give a uniform and controlled pore structure.

#### Key Features for Insulating Firebrick

- Low thermal conductive, low heat storage
- Purity
- Good thermal insulation, enable the use of thin-walled constructions
- The good alumina contents confer good refractoriness
- Low iron and alkali fluxcontent contributes to their stability to reducing atmosphere
- These can be machined to special shapes, incurring fewer sections and joints

Insulating Firebrick are classified to Clay Insulating Brick, High Alumina Insulating Brick and Mullite Insulating Brick.



### Clay Insulating Bricks Product Data

Type	NG-1.5	NG-1.3a	NG-1.3b	NG-1.0	NG-0.9	NG-0.8	NG-0.7	NG-0.6	NG-0.5	NG-0.4
Density (g/cm³)	1.5	1.3	1.3	1.0	0.9	0.8	0.7	0.6	0.5	0.4
Cold Crushing Strength(Mpa)	5.9	4.4	3.9	2.9	2.5	2.5	2.0	1.5	1.2	1.0
Experimental Temperature of 2% Change of Reheating Line	1400	1400	1350	1350	1300	1250	1250	1200	1150	1150
Thermal Conductivity (W/m.K) 350±25°C	0.70	0.60	0.60	0.50	0.40	0.35	0.35	0.25	0.25	0.20

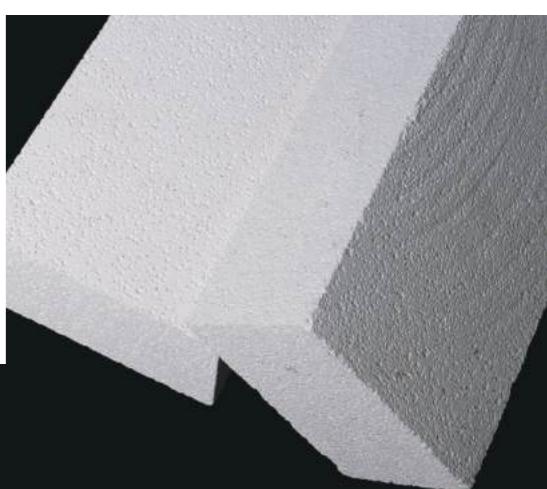
### High Alumina Insulating Bricks Product Data

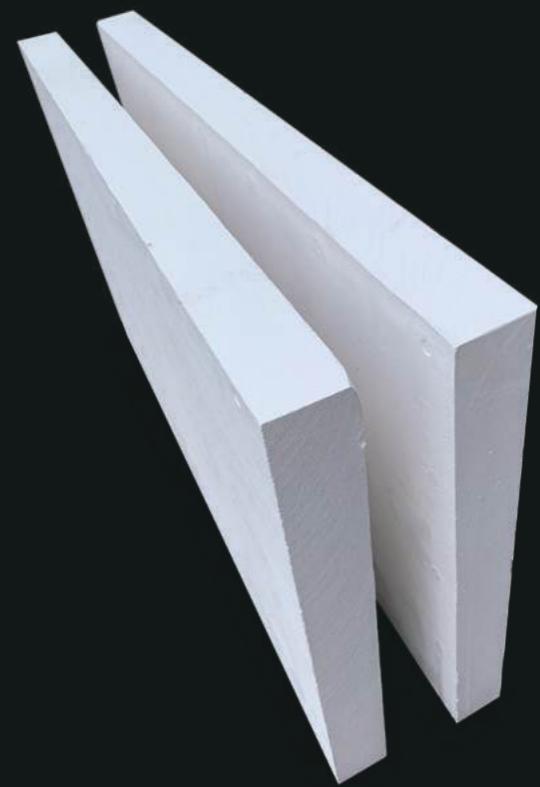
Type	LG-1.0	LG-0.9	LG-0.8	LG-0.7	LG-0.6	LG-0.5	LG-0.4
Density(g/cm³)	1.0	0.9	0.8	0.7	0.6	0.5	0.4
Cold Crushing Strength (Mpa)	≥4.0	≥3.5	≥3.0	≥2.5	≥2.0	≥1.5	≥0.8
Experimental Temperature of 2% Change of Reheating Line (°C)	1400	1400	1400	1350	1350	1250	1250
Thermal Conductivity (W/m.K)350±25°C	≤0.50	≤0.45	≤0.35	≤0.35	≤0.30	≤0.25	≤0.20
Al <sub>2</sub> O <sub>3</sub>					≥48		
Fe <sub>2</sub> O <sub>3</sub>					≤2		



### Mullite Insulating Bricks Product Data

Type	JM23	JM26	JM28	JM30	
Classification Temperature(°C)	1260	1430	1540	1600	
Density(kg/m³ )	500	800	900	1100	
Compressive Strength(Mpa)	1.0	2.0	2.5	3.0	
Rupture Strength(Mpa)	0.7	1.5	1.8	2.0	
Thermal Conductivity( W/m.K)	0.22(600°C) 0.27(800°C)	0.39(800°C) 0.43(1000°C)	0.37(800°C) 0.41(1000 °C)	0.43(800°C) 0.45(1000 °C)	
Chemical Composition (%)	Al <sub>2</sub> O <sub>3</sub> SiO <sub>2</sub> Fe <sub>2</sub> O <sub>3</sub>	45 48 1.0	55 41 0.9	64 32 0.7	73 25 0.6





# CALCIUM SILICATE BOARD

## INTRODUCTION

LKTHERMO-C is a non-combustible matrix engineered mineral board reinforced with selected fibres and fillers. It is formulated without the use of formaldehyde.

LKTHERMO-C is resistant to the effects of moisture and will not physically deteriorate when used in damp or humid conditions. Performance characteristics are not degraded by age or moisture.

## Advantages

Resistance to the effects of moisture is not physically deteriorate when used in damp or humid conditions.

Performance characteristics are not degraded by age or moisture.

## Applications

- Tunnel lining, concrete floor and wall upgrading
- M&E services enclosure
- Access panels and hatches, firedoors
- Structural steel prote
- Membrane ceilings
- Cladding to steel ducts, self-sup porting ducts

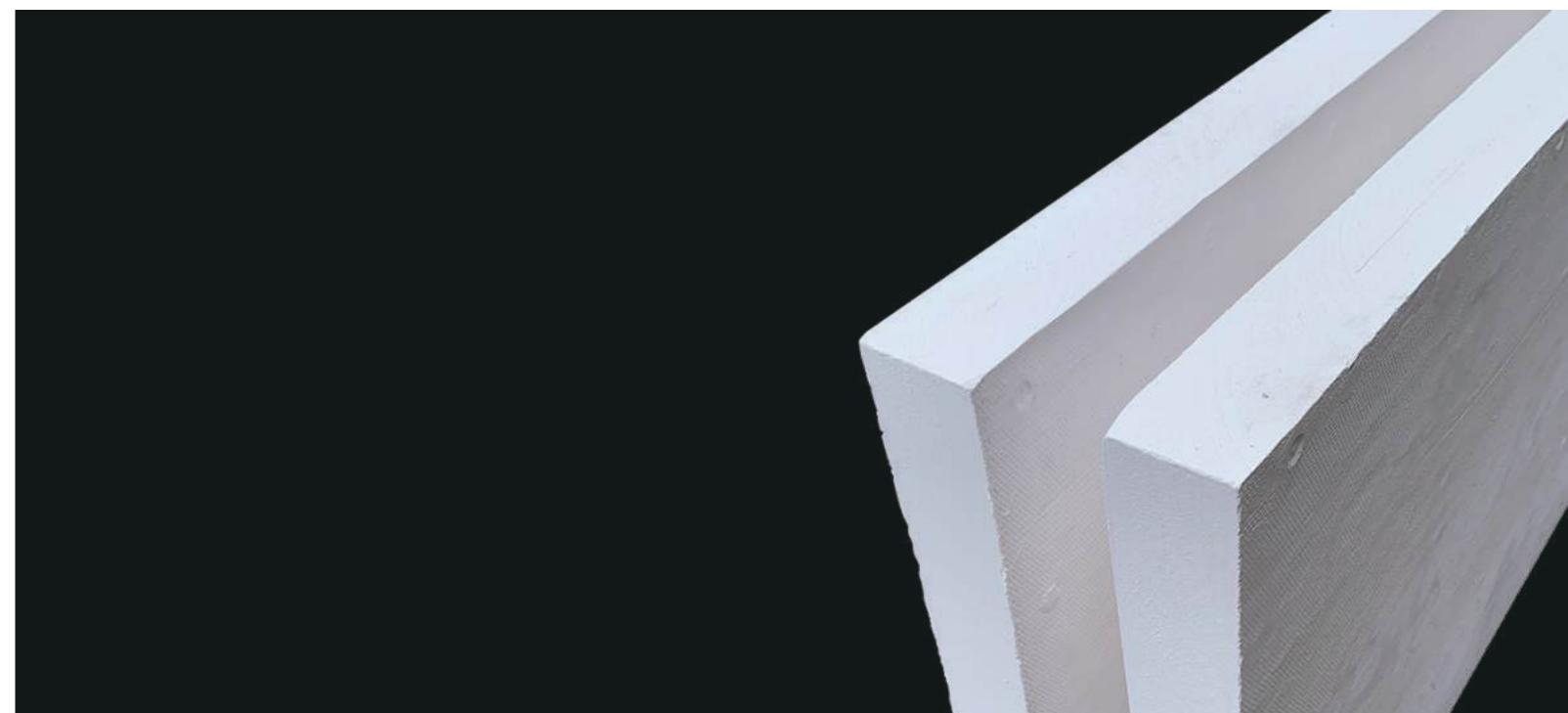
## ■ Specification of the calcium silicate board

Chemical analysis	SiO <sub>2</sub>	%	47.2
	CaO	%	45.1
	Fe <sub>2</sub> O <sub>3</sub>	%	0.26
	Al <sub>2</sub> O <sub>3</sub>	%	1.03
	Loss	Kg/m <sup>3</sup>	6.41
Bulk density		MPa	230±10%
Pressure Strength		MPa	≥0.65
Flexural Strength			≥0.45
Thermal conductivity	100°C 200°C 400°C 600°C	W/(M.K.)	≤0.052 ≤0.065 ≤0.091 ≤0.112
Temp. Limit		°C	1050
Linear Shrinkage		%	≤2

## ■ Dimension and tolerance for calcium silicate board

Length mm (±4 mm)	Width mm (±3 mm)	Thickness mm (+3, -1.5 mm)
400	250	25-120
500	500	25-120
600	300	25-120
100	500	25-120
1200	600	25-120
1200	1200	25-120

Special dimension could be customized.



# ROCK WOOL BOARD

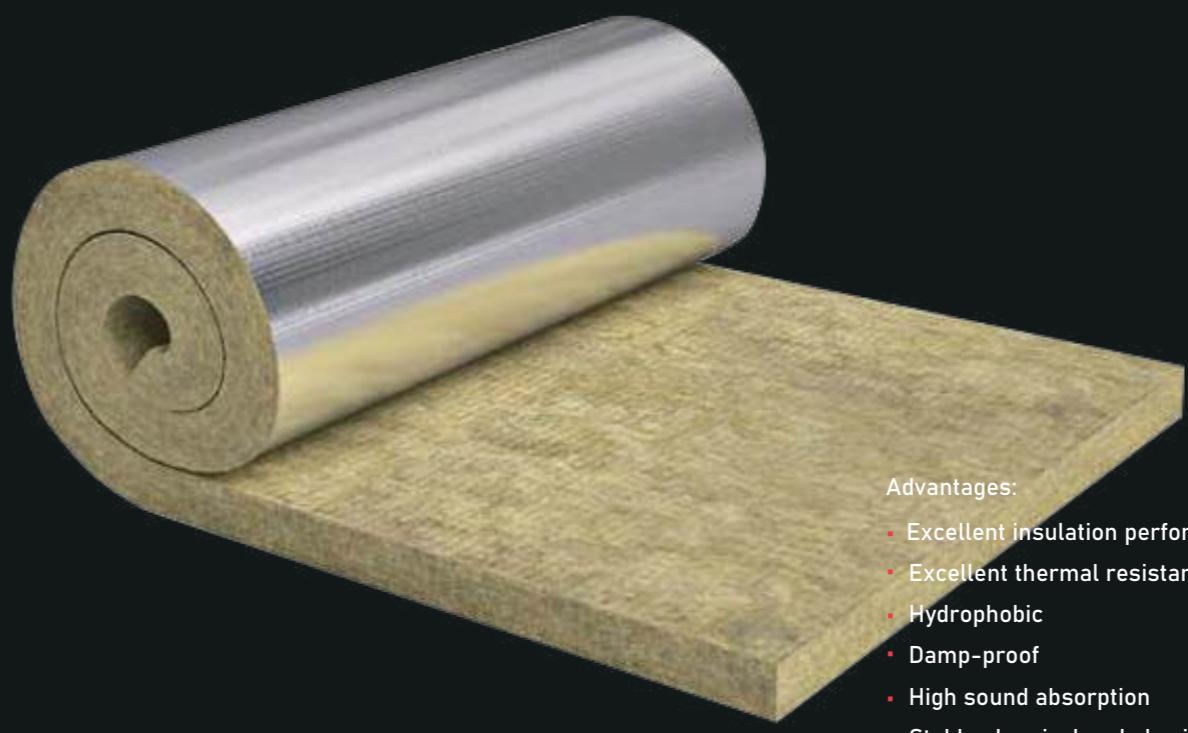
Rock Wool Board is made from molten basalt and binding agent. It's a grade A non-combustible rock wool product suitable for fire prevention, heat insulation, sound absorption, noise reduction and other propose in construction, industrial and mechanical equipment, etc..

It can be made into different bulk density and thickness.

Rock wool Board is packed in heat-shrinkage PE-film or OEM.

## ■ Technical Parameters

Item	Density
	40/60/80/100/120/140/160
Thickness (mm)	30-150
Size (mm)	1200x600
Average fiber diameter ( $\mu\text{m}$ )	4-7
Slag Content (%)	$\leq 0.3$
Combustion performance	Class A Non-Combustion
Hydrophobic rate (%)	$\geq 98.0$
Melt temperature( $^{\circ}\text{C}$ )	$>1000$
Moisture absorption rate (%)	$\leq 5.0$
Thermal conductivity (average 25 $^{\circ}\text{C}$ ) (W(m.k))	$\leq 0.040$



### Advantages:

- Excellent insulation performance
- Excellent thermal resistance
- Hydrophobic
- Damp-proof
- High sound absorption
- Stable chemical and physical properties
- Easy handling and installation

Rock Wool Blanket is made from molten basalt and binding agent. It's a grade A non-combustible rock wool product suitable for fire prevention, heat insulation, sound absorption, noise reduction and other propose in construction, industrial and mechanical equipment, etc..

It can be made into different bulk density and thickness.

Rock Wool Blanket is packed in heat-shrinkage PE-film or OEM.

- Advantages :**
- Excellent insulation performance
  - Excellent thermal resistance
  - Hydrophobic
  - Damp-proof
  - High sound absorption
  - Stable chemical and physical properties
  - Easy handling and installation



## ■ Technical Parameters

Item	Index
Density( $\text{kg}/\text{m}^3$ )	60-200
Thickness	30-100mm
Width	600mm
Length	3-10m
Average fiber diameter ( $\mu\text{m}$ )	4-7
Slag Content (%)	$\leq 0.3$
Combustion performance	Class A Non-Combustion
Hydrophobic rate (%)	$\geq 98.0$
Melt temperature( $^{\circ}\text{C}$ )	$>1000$
Moisture absorption rate (%)	$\leq 5.0$
Thermal conductivity (average 25 $^{\circ}\text{C}$ ) (W(m.k))	$\leq 0.040$



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