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Aluminum - Rotary Kiln and Suspension Roaster

Rotary Kiln:

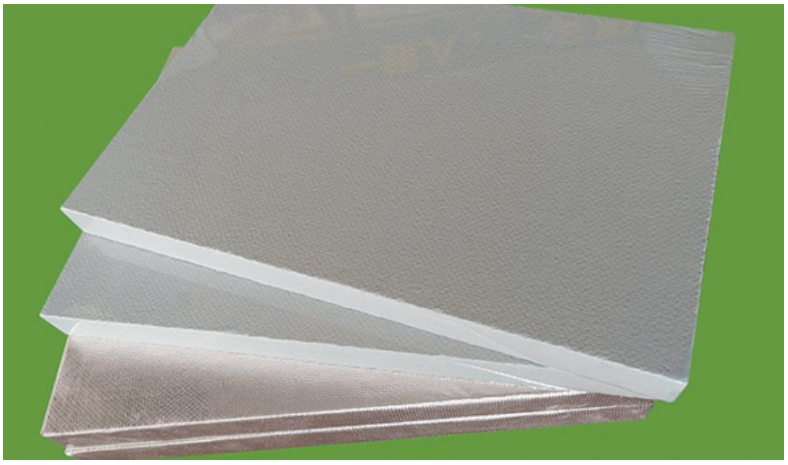
Rotary kilns are mainly used in the roasting of bauxite. In a high-temperature environment, bauxite is roasted in the rotary kiln to convert it into alumina. Rotary kilns have the advantages of large processing capacity and high thermal efficiency, but they also place high demands on refractory materials.

Suspension Roaster:

Suspension roasters are used for processing bauxite or alumina. The material is suspended in a hot gas stream and undergoes roasting reactions, characterized by fast processing speeds and high thermal efficiency.

Insulation Materials for Rotary Kilns and Suspension Roasters:

CCEWOOL® M60 Microporous Insulation Board



Temperature Grade: 600℃ (1112℉)

CCEWOOL® M60 Microporous Insulation Board is an efficient insulation product based on advanced microporous insulation technology. At low temperature, it has a lower thermal conductivity than still air. The thermal conductivity increases very little with the increase of temperature. At high temperature, its insulation effect is 3-4 times higher than traditional insulation materials. CCEWOOL® M60 Microporous Insulation Board has high compressive strength, covered with aluminum foil or glass fiber cloth. It is an excellent choice for the lightweight and energy-saving application of kiln.

Characteristics:

Good fit to curved surfaces

Low thermal conductivity

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Low heat storage

Non-combustibility

Application:

Typical Applications

Back-up insulation in high-temperature furnaces

Appliances insulation

Fire protection equipment

Electronic devices

Nonferrous Metal Furnace

Rotary & Shaft Kiln

Various Incinerator

Reheating Furnace

Permanent Lining For EAF Ladle

General Industrial Furnace etc.

TDS

CCEWOOL® M60 Microporous Insulation Board	
Description	M60 Board
Recommended Temperature of Use (℃)	600 (1112℉)
Density (kg/m³)	300/320
Modules of Rupture (MPa)	≥0.15
Compressive Strength (MPa, 10% relative deformation)	≥0.3
Permanent Linear Shrinkage (%)	600℃ x 24h ≤2.0
Thermal Conductivity (W/m·K)	
100℃	0.022
200℃	0.024
300℃	0.028
400℃	0.029
500℃	-

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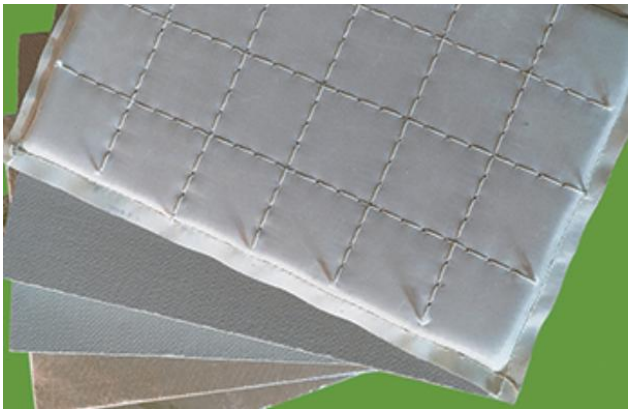
600℃	-
Covering Material	Aluminum Foil / PE Foil / Glass Fiber Cloth
Standard Size (mm)	600 x 400 x (10-50)
	1000 x 500 x (10-50)

CCEWOOL® M90 Microporous Insulation Board



Temperature Grade: 900℃ (1652℉)

CCEWOOL® M90 Microporous Insulation Board is an efficient insulation product based on advanced microporous insulation technology. It has a lower thermal conductivity than stagnant air, making it an ideal high-temperature insulation material. The surface of the board can be coated with aluminum foil or PE shrink film. The nano board can also be coated with high-temperature glass fiber materials on the surface of nano-microporous insulation materials using a special process, giving it low thermal conductivity while maintaining moderate flexibility, allowing for multidimensional bending to meet the requirements of special space applications.

Characteristics:

Good fit to curved surfaces
Excellent thermal shock resistance
Excellent thermal stability
Low thermal conductivity
Low heat storage
Non-combustibility

Application:

Typical Applications
Back-up insulation in high-temperature furnaces
Appliances insulation
Fire protection equipment
Electronic devices

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Nonferrous Metal Furnace

Rotary & Shaft Kiln

Various Incinerator

Reheating Furnace

Permanent Lining For EAF Ladle

General Industrial Furnace etc.

TDS

CCEWOOL® M90 Microporous Insulation Board	
Description	M90 Board
Recommended Temperature of Use (℃)	900(1652℉)
Density (kg/m³)	280/300
Modules of Rupture (MPa)	≥0.15
Compressive Strength (MPa, 10% relative deformation)	≥0.3
Permanent Linear Shrinkage (%)	900℃ x 24h ≤2.0
Thermal Conductivity (W/m·K)	
100℃	0.02
200℃	0.023
300℃	0.026
400℃	0.027
500℃	0.033
600℃	-
Covering Material	Aluminum Foil / PE Foil / Glass Fiber Cloth
	600 x 400 x (10-50)
Standard Size (mm)	1000 x 500 x (10-50)

CCEWOOL® M110 Microporous Insulation Board

Temperature Grade: 1100℃(2012℉)

CCEWOOL® M110 Microporous Insulation Board is a nanoscale microporous insulation material and is the best high-temperature solid insulation material with superior insulation performance to date. The surface can be covered with outer materials such as aluminum foil, glass

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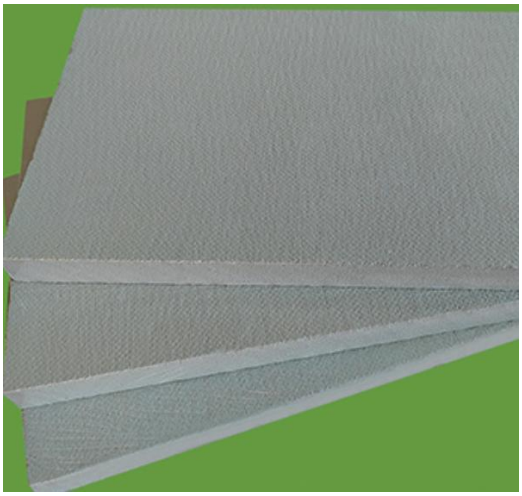
fiber cloth, etc., to reduce dust, decrease damage, increase strength, and prevent moisture damage. At low temperatures, the product has a lower thermal conductivity than stagnant air, with a slight increase in thermal conductivity as the temperature rises. It provides 3-4 times better insulation performance at high temperatures compared to traditional insulation materials. CCEWOOL® M110 Microporous Insulation Board is an ideal material for reducing heat loss and improving energy efficiency, making it an excellent choice for applications such as kilns and other lightweight and energy-saving applications.



Characteristics:

Extremely low thermal conductivity, significantly reduces insulation layer thickness and improves insulation efficiency.

Low heat dissipation and heat storage, increases heating and cooling rates.

Environmentally friendly, non-toxic, and harmless.

Durable material, capable of self-support.

Excellent thermal stability.

Superior resistance to rapid temperature changes.

Application:

Back-up insulation in high-temperature furnaces

Appliances insulation

Fire protection equipment

Electronic devices

Nonferrous Metal Furnace

Rotary & Shaft Kiln

Various Incinerator

Reheating Furnace

Permanent Lining For EAF Ladle

General Industrial Furnace etc.

TDS

CCEWOOL® M110 Microporous Insulation Board	
Description	M110 Board

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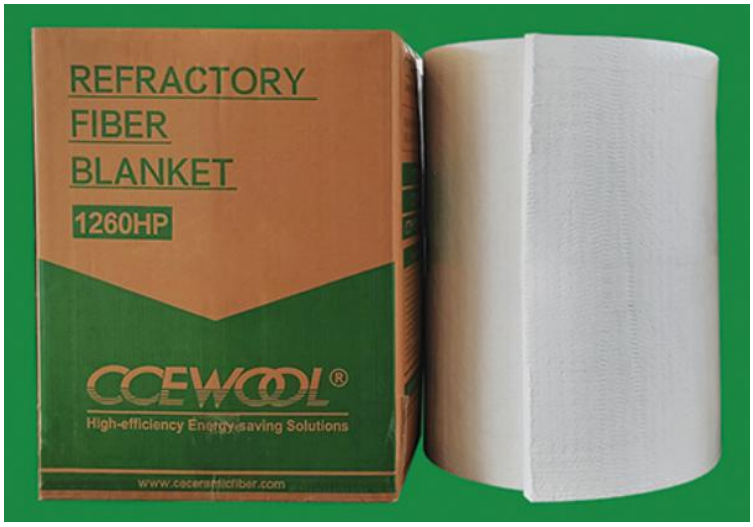
Recommended Temperature of Use (℃)	1100(2012℉)
Density (kg/m³)	320
Modules of Rupture (MPa)	≥0.15
Compressive Strength (MPa, 10% relative deformation)	≥0.3
Permanent Linear Shrinkage (%)	1050℃ x 24h ≤2.5
Thermal Conductivity (W/m·K)	
100℃	0.022
200℃	0.024
300℃	0.031
400℃	0.036
500℃	0.04
600℃	0.048
Covering Material	Aluminum Foil / PE Foil / Glass Fiber Cloth
	600 x 400 x (10-50)
Standard Size (mm)	1000 x 500 x (10-50)

CCEWOOL® Ceramic Fiber Blanket HPS



Temperature Grade 1260° C (2300° F) CCEWOOL® Ceramic Fiber Blanket HPS, purified from raw materials with fewer impurities, is made from high-purity refractory ceramic fiber spun fiber. Compared to RCF Blanket S, this product is whiter and has a lower thermal conductivity. It contains no organic binders. Manufactured through a unique internal needle punching process, with tensile strength exceeding 85KPa, providing higher performance and longer lifespan in applications involving heat flow or chemical corrosion. CCEWOOL® Ceramic Fiber Blanket HPS insulation material offers a variety of thickness, width, and density.

Characteristics:

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Excellent handling strength
Excellent hot strength
Low thermal conductivity
Low heat storage
Light weight
Resiliency
Thermal shock resistance
High heat reflectance
Excellent corrosion resistance
Excellent thermal stability

Application:

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.

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STD:

CCEWOOL® Ceramic Fiber Blanket HPS	
Classification temperature	1260 (2300℉)
Operation Temp(℃)(℉)	1100 (2012℉)
Density (kg/m3)	64/ 96/ 128/160(4,6,8,10lb/ft3)
Shot Content(%)	≤15
Color	White
Chemical Composition of refractory ceramic blanket (%)	
Al2O3	≥44
SiO2	≥55
ZrO2	-
Permanent Change on Heating (%), EN1094-1 After 24 hours	
®950℃ (1742℉)	-
®1000℃ (1832℉)	1.5
®1100℃ (2012℉)	2.2
®1200℃ (2192℉)	3
®1300℃ (2372℉)	-
®1400℃ (2552℉)	-
Tensile Strength(Kg/m3), EN1094-1 KPa	
64kg/m3(4lb/ft3)	45
96kg/m3(6lb/ft3)	65
128kg/m3(8lb/ft3)	85
160kg/m3(10lb/ft3)	125
Heat Conductive Co-efficient W/(m·k)(128kg/m3)	
200℃ (392℉)	0.07
400℃ (752℉)	0.12
600℃ (1112 ℉)	0.2
800℃ (1472℉)	0.3

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1000℃ (1832℉)	0.4

Thickness	Density kg/m3				Length	Width
mm	64	96	128	160	mm	mm
6	-	-	○	○	7200	610, 1220
13	-	√	√	○	14640	
19	-	√	√	○	9760	
25	○	√	√	√	7320	
38	○	√	√	√	4880	
50	○	√	√	-	3660	

Note: (√) is standard size, Custom size are available

CCEWOOL® Ceramic Fiber Module

Temperature Grades: 1100℃ (2012℉), 1260℃ (2300℉), 1400℃ (2550℉), 1430℃ (2600℉)

CCEWOOL® Ceramic Fiber Module is made from spun refractory ceramic fiber blanket, mechanically processed, and produced according to customer drawings. The product is pure white in color, with uniform dimensions, and can be directly fastened to the steel plate anchor pins on the industrial kiln shell, providing excellent fire resistance and insulation, thereby improving the overall refractory insulation of the kiln. We can design and manufacture modules and shaped modules of corresponding specifications for customers based on the kiln type and specifications, and we can also produce modules of various specifications based on customer-provided drawings.

Characteristics:

Excellent chemical stability and thermal stability;

Low thermal conductivity, low thermal capacity;

Supporting both soldiers-march-based arrangement and assembly-based arrangement with the help of anchor in various forms in the back of the module;

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Module will squeeze with each another in different directions after unbinding, to produce no gap;
Elastic fiber blanket resists to external mechanical forces;
Fiber blanket's elasticity can compensate for the deformation of furnace shell, so that no gap is generated between modules;
Light weight, and absorbing less heat as insulation materials;
Low thermal conductivity brings strong energy-saving effects;
Able to withstand any thermal shock;
Lining need no drying or curing, ready to use immediately after installation;
Anchoring system is far away from hot surface of component, to allow metal anchor member to be in a relatively low temperature.

Application:

All kinds of industrial furnace and heating device linings for metallurgy, machinery;
construction materials, petrochemicals, non-ferrous metal industries;
Low mass kiln cars;
Roller hearth furnace linings;
Gas Turbine exhaust ducts;
Duct linings;
Furnace hearths;
Boiler insulation;
Furnace lining insulation for high-temperature applications.

TDS

CCEWOOL® Ceramic Fiber Module					
Item	1100	1260S	1260HPS	1400	1430HZ
Operation Temp	950℃ (1742℉)	1050℃ (1922℉)	1100℃ (2012℉)	1200℃ (2192℉)	1350℃ (2462℉)
Density	160-220 kg/m3				
Linear Shrinkage EN1094-1 （%）					
®950℃, 24hrs	1.5	-	-	-	-
®1000℃,24hrs	2	1.5	1.5	-	-
®1100℃,24hrs	3	2.5	2	1.5	-
®1200℃,24hrs	-	3	3	2	1
®1300℃,24hrs	-	-	-	3	2
®1400℃,24hrs	-	-	-	-	3

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Tensile Strength （Mpa）					
Density-64kg/m3	0.039	0.039	0.039	0.039	0.039
Density-96kg/m3	0.078	0.078	0.078	0.078	0.078
Density-128kg/m3	0.103	0.103	0.103	0.103	0.103
Density-160kg/m3	0.127	0.127	0.127	0.127	0.127
Thermal Conductivity W/(m·k) 128kg/m3-1000℃	0.45	0.43	0.4	0.35	0.3
Chemical Composition（%）					
Al2O3	≥43	≥44	≥44	≥52	≥35
SiO2	≥52	≥52	≥55	≥47	≥49
ZrO2	-	-	-	-	≥15
Al2O3+SiO2+ZrO2	-	-	-	-	≥99
Fe2O3	≤1.0	≤0.8	≤0.2	≤0.2	≤0.2
Na2O+K2O	≤0.4	≤0.3	≤0.2	≤0.2	≤0.2
CaO+MgO	≤0.3	≤0.1	≤0.1	≤0.1	≤0.1
Specification （mm）	L*W: 300*300;450*300;600*300				
	H: 100;150;200;250;300				
Package	Carton Box or Pallet				

CCEWOOL® Ceramic Fiber Board LD

Temperature Grade
1260℃(2300℉)
CCEWOOL® Ceramic Fiber Board LD is made from high-purity alumina-silicate fibers with a certain proportion of binders added. It is manufactured through

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processes such as pressing, curing, shaping, longitudinal and transverse cutting, and vacuum molding. It features a uniform structure, excellent thermal and acoustic insulation properties, low thermal conductivity, low heat capacity, high compressive strength, precise dimensions, good flatness, ease of mechanical processing, and installation. These characteristics make it ideal for use as a core material or sandwich material in the manufacturing of components where aesthetics, quality, uniformity, and performance are crucial. CCEWOOL® Ceramic Fiber Board LD is produced through a fully automatic vacuum molding process, operating continuously for 24 hours, resulting in improved compressive strength. The surface of CCEWOOL® Ceramic Fiber Board LD is flat, and it is available in various standard thicknesses for selection.

Characteristics:

Low heat capacity, low thermal conductivity;
Non-brittle material, good elasticity;
High compressive strength;
Excellent wind-erosion resistance, long service life;
Excellent thermal stability and thermal shock resistance;
Continuous production, even fiber distribution and stable performance;
Good sound insulation;
Good anti-stripping properties;
Easily molded or cut, easy to install;
Accurate sizes and good flatness.

Application:

refractory lining;
Insulating backup to dense refractory materials;
Insulating backup to brick & castable;
Furnace hot face lining in ceramic kiln, box furnace & petrochemical furnace;
Use in industrial heat processing equipment;
Rigid high-temperature gaskets & seals;
High-temperature baffles & muffles;
Flue & chimney linings in furnaces & kilns;
Molten metal trough covers;
Hot gas duct linings;
Expansion joints;
Industrial heat shields & thermal barriers;

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Industrial combustion chamber construction;

Domestic appliance & light-duty industrial combustion chamber construction.

TDS

CCEWOOL® Ceramic Fiber Board LD	
Classification Temperature (℃)(℉)	1260℃(2300℉)
Operation Temp(℃)(℉)	1050℃(1922℉)
Color	white
Permanent Linear Change on Heating (%)	
®950C,24hrs	-
®1200C,24hrs	3
®1300C,24hrs	-
®1350C,24hrs	-
Thermal Conductivity (w/m.k)	
600℃	-
800℃	0.13
1000℃	0.19
Rupture Strength (Mpa)	
Thickness≤25mm	0.5
Thickness＞25mm	0.2
Chemical Composition (%)	
Al2O3	≥44
SiO2	≥52
ZrO2	-
Package	Carton box or pallet

CCEWOOL® Ceramic Fiber Board LD	
Thickness (mm)	20.25.50.80.100
Size (mm)	1200*1000 or customized size