

# Calcium Silicate Products



**MAGSCIE**  
**REFRACTORIES**

镁稀（天津）耐火材料有限公司

Magscie (Tianjin) Refractories Co., Ltd.

## 1050°C Hydrophobic Non-asbestos Calcium Silicate Board



**INS-CS** the main component of high temperature calcium silicate is Xonotlite ( $6\text{CaO} \cdot 6\text{SiO}_2 \cdot \text{H}_2\text{O}$ ), which has higher temperature resistance than ordinary calcium silicate materials. Each xonotlite molecule contains only 1 crystal water, even if the temperature exceeds the limit, only a small amount of crystal water will be removed without causing serious damage to the system. Because of its excellent comprehensive properties, this material is widely used in field of high temperature and energy saving.

**INS-CS** calcium silicate boards are low density insulating board with excellent insulation value, high mechanical strength and good heat resistance. The boards are designed for maximum temperatures of 1050°C (1922°F) and are applicable as back up insulating lining in a wide variety of industries like Aluminum, Cement, Glass, Petrochemical & Chemical, furnaces, etc.

### Product Features:

- **Asbestos Free**  
Made from algaous fossil from hundreds of millions of years ago, the product is entirely asbestos-free and non-poisonous to human body.
- **Superior Strength**  
With similar density, the strength of this material is the highest among all the inorganic rigid insulation materials with better compressive performance and is not easy to bend.
- **Good Anti-corrosion**  
The super low chloride ion content and alkalescence have good protection for metal pipes, which greatly prolongs the service life of pipes and equipment and greatly reduces maintenance cost, bringing lasting protection and better durability.
- **Wonderful Non-combustibility**  
It also passed the test by National Center for Quality Supervision and Testing of Fire Building Materials which identifies it as Grade A1 incombustible material.
- **Good Stability**  
Long time soaking in water will not lead to pulverization. Various performance remains stable after drying.
- **Excellent Soundproofing Performance**  
Great soundproofing effectively reduces industrial noises.

### Typical Applications:

- It is widely used for heat insulation of the high temperature processing equipment and pipes in such industrial sectors as electricity, metallurgy, petroleum, glass and cement etc.

MAGSCIE BRAND		ASTM C533 TYPE-II	GB/T 10699-2015 TYPE-II	JIS A9510 NO.1-22	INS-CS220	INS-CS270	INS-CS300
Classification Temperature	°C	927	1000	1000	1050	1050	1050
Properties measure at ambient condition (23°C/50% RH)							
Color		White					
PH Value		8-9					
Bulk Density	Kg/m <sup>3</sup>	≤352	≤220, ≤270,	220	220	270	300
Cold Crushing Strength	MPa	0.688	0.5	0.45	0.65	1.0	3.20
Modulus of Rupture	MPa	0.344	0.3	0.30	0.35	0.6	1.30
Linear Shrinkage (To be free from cracks and warpage)	%	≤2 927°C*24hrs	≤2 1000°C*16hrs	≤2 1000°C*3hrs	≤2 1000°C*16hrs	≤2 1000°C*16hrs	≤2 1000°C*16hrs
Thermal Conductivity at mean temperature of							
93°C	W/M.K	0.078	-	-	-	-	0.065
100°C	W/M.K	-	0.065	0.065	0.065	0.078	-
200°C	W/M.K	-	0.075	0.077	0.075	0.088	-
204°C	W/M.K	0.088	-	-	-	-	0.077
300°C	W/M.K	-	0.087	0.088	0.081	0.087	-
316°C	W/M.K	0.097	-	-	-	-	0.086
400°C	W/M.K	-	0.100	0.106	0.100	0.100	-
427°C	W/M.K	0.108	-	-	-	-	0.098
500°C	W/M.K	-	0.115	0.127	0.110	0.115	-
538°C	W/M.K	0.111	-	-	-	-	-
600°C	W/M.K	-	-	-	0.122	0.130	-
Chemical Composition							
SiO <sub>2</sub>	%	-	-	-	45-49	45-49	45-49
CaO	%	-	-	-	38-42	38-42	38-42
Fe <sub>2</sub> O <sub>3</sub>	%	-	-	-	0.24	0.24	0.24
Al <sub>2</sub> O <sub>3</sub>	%	-	-	-	1.23	1.23	1.23
LOSS (Mainly H <sub>2</sub> O)	%	-	-	-	8-11	8-11	8-11

#### DIMENSIONAL TOLERANCES:

ITEM	INS-CS	GB/T10699-1998 TYPE-II	ASTM C533-2007 TYPE-II
LENGTH	±2mm	±4mm	±3mm
WIDTH	±2mm	±4mm	±3mm
THICKNESS	±2mm	+3mm -1.5mm	±3mm

#### STANDARD SIZE:

Length mm	Width mm	Thickness mm
400	250	25-120
500	500	25-120
600	300	25-120
1000	500	25-120
1080	950	50-120
1220	900	50-120

Packed in standard export cartons with plastic bags inside used for waterproofing.

Carton Size: 580(L)\*320(W)\*620(H)mm

40HQ: 560BOXES, 20HQ: 252BOXES.

Pallets can be made according to customers' requirements.

## 650℃ Hydrophobic Non-asbestos Calcium Silicate Board/Pipe



It is the microcellular structured inorganic rigid and super-light heat insulation material mainly composed of inorganic siliceous and calcium and made by special technology such as the hydrothermal reaction under high temperature and high pressure etc. It can still maintain the high insulating effect at 650℃ and is advantageous in the stability of coping with temperature changes. With super-low chloride ion content, it can provide very nice protection on pipelines, and is prefabricated to shape up, greatly extending the service life.

### Product Features:

- Outstanding Waterproofing Performance  
No oil and water absorption reduces the safety hazard caused by medium leakage.
- Asbestos Free  
Made from algaous fossil from hundreds of millions of years ago, the product is entirely asbestos-free and non-poisonous to human body.
- Superior Strength  
With similar density, the strength of this material is the highest among all the inorganic rigid insulation materials with better compressive performance and is not easy to bend.
- Good Anti-corrosion  
The super low chloride ion content and alkalescence have good protection for metal pipes, which greatly prolongs the service life of pipes and equipment and greatly reduces maintenance cost, bringing lasting protection and better durability.
- Wonderful Non-combustibility  
It passed the test by National Center for Quality Supervision and Testing of Fire Building Materials which identifies it as Grade A1 incombustible material.
- Good Stability  
Long time soaking in water will not lead to pulverization. Various performance remains stable after drying.
- Excellent Soundproofing Performance  
Great soundproofing effectively reduces industrial noises.

### Typical Applications:

- It's the preferred product for equipment pipelines and heat supply pipeline network systems in industrial fields such as electricity, petrochemical industry, metallurgy, construction, vessel, etc. It can also be used as the backing material for firebricks in various furnaces.

MAGSCIE BRAND		ASTM C533 TYPE I	JIS A9510 NO.1-22	INS-CS230L	INS-CS250L
Classification Temperature	°C	650	650	650	650
<b>Properties measure at ambient condition (23°C/50% RH)</b>					
Bulk Density	Kg/m <sup>3</sup>	≤250	≤220	230±10%	250±10%
Cold Crushing Strength	MPa	≥0.689	≥0.45	≥0.50	≥0.60
Modulus of Rupture	MPa	≥0.344	≥0.30	≥0.30	≥0.45
Linear Shrinkage (To be free from cracks and warpage)	%	≤2	≤2	≤2	≤2
<b>Thermal Conductivity at mean temperature of</b>					
50°C	W/M.K	0.060	-	-	-
93°C	W/M.K	0.065	0.065	-	-
100°C	W/M.K	-	-	0.060	0.062
149°C	W/M.K	0.072	-	-	-
200°C	W/M.K	0.079	0.077	0.073	0.075
260°C	W/M.K	0.087	-	-	-
300°C	W/M.K	-	0.088	0.085	0.087
371°C	W/M.K	0.102	-	-	-
400°C	W/M.K	-	0.106	0.102	0.104
500°C	W/M.K	-	0.127	-	-
538°C	W/M.K	0.111	-	-	-
<b>Chemical Composition</b>					
SiO <sub>2</sub>	%	-	-	37-42	37-42
CaO	%	-	-	29-34	29-34
Fe <sub>2</sub> O <sub>3</sub>	%	-	-	3-4	3-4
Al <sub>2</sub> O <sub>3</sub>	%	-	-	10-12	10-12
LOSS (Mainly H <sub>2</sub> O)	%	-	-	12-17	12-17

**DIMENSIONAL TOLERANCES:**

ITEM	INS-CS	GB/T10699-1998 TYPE-II	ASTM C533-2007 TYPE-II
LENGTH	±2mm	±4mm	±3mm
WIDTH	±2mm	±4mm	±3mm
THICKNESS	±2mm	+3mm -1.5mm	±3mm

**STANDARD SIZE:**

Item	Slab	Curved	Pipe
Length (mm)	600	600	600
Width (mm)	300/150	150/100	0.5"-60" (inside diameter)
Thickness (mm)	25-100	25-100	25-100

Packed in standard export cartons with plastic bags inside used for waterproofing.

Carton Size: 580(L)\*320(W)\*620(H)mm

40HQ: 560BOXES, 20HQ: 252BOXES.

Pallets can be made according to customers' requirements.



## High Density (intensity) Calcium Silicate Insulation Board



**INS-CS850** is a xonolite-based calcium silicate board excellent in heat resistance and 100% asbestos-free. It is excellent in machinability and is most suitable as thermal insulation material for transfer, casting and holding processes where the insulation material is in direct contact with molten aluminum alloy such as launders, spouts, floats, hot top ring headers and the holding furnace for die-casting.

**INS-CS850** range of products are technical ceramic parts made from special high density calcium silicate with a density of  $\geq 850 \text{ kg / m}^3$  and are suitable for direct contact with a large number of liquid noniron metals up to  $1000^\circ\text{C}$ . It has excellent machinability and is ideal as a heat insulating material for transfer, casting, and holding systems such as launders, spouts, floats, header materials for hot top rings and holding furnaces for die casting that come into direct contact with molten aluminum.

It does not react with lubricants (e.g., boron nitride and graphite).

It is physiologically harmless.

The products can be easily processed (turning, milling, drilling, grinding, sawing) with appropriate tools for precise moldings.

It is engineered calcium silicate insulation parts for among others, aluminum casting.

### Typical Applications:

- **Non-ferrous metals:** Floats, Dip tubes, Spouts, Distribution boxes, Heat resistant splash guards, Dams, ...
- **Furnaces:** Hot face linings for dosing/holding furnaces for aluminum casting, Load bearing housings, Insulation where high thermal and/or mechanical load is required
- **Oil & Gas:** Collars, gaskets and pipe support rings, Spacers and bushes

**INS-CS 850CFR** is a kind of "technical ceramic" made from calcium silicate reinforced with carbon fibers.

### Typical Applications:

- **Non-ferrous metals:**
  - Transition plates, hot top rings for billet casting
  - Spouts, Stoppers, Dip tubes, Nozzles
  - Distribution boxes, Flow gates, Header boxes
  - Launder Linings, Dams, Heat breaks, etc.

MAGSCIE BRAND		INS-CS850 (Glass Fiber Reinforced)	INS-CS 850CFR (Carbon Fiber Reinforced)
Classification Temperature	°C	1100	1100
<b>Properties measure at ambient condition (23°C/50% RH)</b>			
Bulk Density	Kg/m <sup>3</sup>	850-950	850-950
Cold Crushing Strength (5%)	MPa	15.5	17.0
Modulus of Rupture	Mpa	6.5	8.0
Linear Shrinkage	%	≤2 1000°C*3hrs	≤2 1000°C*3hrs
<b>Thermal Conductivity at mean temperature of</b>			
200°C,	W/M.K	≤0.207	≤0.207
400°C,	W/M.K	≤0.221	≤0.221
600°C,	W/M.K	≤0.227	≤0.227
<b>Chemical Composition</b>			
SiO <sub>2</sub>	%	49-52	49-52
CaO	%	39-42	39-42
Fe <sub>2</sub> O <sub>3</sub>	%	0.3-0.4	0.3-0.4
Al <sub>2</sub> O <sub>3</sub>	%	0.4-0.5	0.4-0.5
Na <sub>2</sub> O+K <sub>2</sub> O	%	0.09-0.1	0.09-0.1
LOSS (Mainly H <sub>2</sub> O)	%	5.0-9.0	5.0-9.0

Packed in standard export cartons with plastic bags inside used for waterproofing.

Carton Size: 580(L)\*320(W)\*620(H)mm,

40HQ: 560BOXES, 20HQ: 252BOXES.

Pallets can be made according to customers' requirements.



**INS-CS850** range of products are technical ceramic parts made from special high density calcium silicate with a weight of  $\geq 850 \text{ kg/m}^3$  and are suitable for direct contact with a large number of liquid noniron metals up to  $1000^\circ\text{C}$ . Typical fields of application are in foundries for the distribution and flow control of liquid aluminum, as well as in melting, holding and heat treatment furnaces. They are formulated without the use of asbestos fibers, and are thermally insulating, non-wetting, fracture tough materials with low shrinkage characteristics.

**INS-CS850** is the standard product for use in aluminum casting operations and is also used in the furnace industry and other process industries. The outstanding thermal shock resistance and high dimensional stability contribute effectively to the long service life and thus to economic efficiency in the respective application area.

**INS-CS850** engineered calcium silicate parts have excellent thermal shock resistance, low thermal conductivity, low thermal capacity and thermal expansion, good thermal insulation, high compressive and bending strength, good edge stability and stable in neutral and basic media.

**INS-CS850** does not react with lubricants (e.g., boron nitride and graphite).

**INS-CS850** is physiologically harmless.

**INS-CS850** products can be easily processed (turning, milling, drilling, grinding, sawing) with appropriate tools for precise moldings.

**INS-CS850** are engineered calcium silicate insulation parts for among others, aluminum casting.

#### Typical Applications:

- Non-ferrous metals: Floats, Dip tubes, Spouts, Distribution boxes, Heat resistant splash guards, Dams, ...
- Furnaces: Hotface linings for dosing/holding furnaces for aluminium casting, Load bearing housings, Insulation where high thermal and/or mechanical load is required
- Oil & Gas: Collars, gaskets and pipe support rings, Spacers and bushes

**INS-CS 850CFR** is a "technical ceramic" made from calcium silicate reinforced with carbon fibers.

#### Typical Applications:

- Non-ferrous metals:
  - Transition plates, hot top rings for billet casting
  - Spouts, Stoppers, Dip tubes, Nozzles
  - Distribution boxes, Flow gates, Header boxes
  - Launder Linings, Dams, Heat breaks, etc.



MAGSCIE BRAND		INS-CS850 (Glass Fiber Reinforced)	INS-CS 850CFR (Carbon Fiber Reinforced)
Classification Temperature	°C	1100	1100
<b>Properties measure at ambient condition (23°C/50% RH)</b>			
Bulk Density	Kg/m <sup>3</sup>	850-950	850-950
Cold Crushing Strength (5%)	MPa	15.5	17.0
Modulus of Rupture	Mpa	6.5	8.0
Linear Shrinkage	%	≤2 1000°C*3hrs	≤2 1000°C*3hrs
<b>Thermal Conductivity at mean temperature of</b>			
200°C, 400°C, 600°C,	W/M.K W/M.K W/M.K	≤0.207 ≤0.221 ≤0.227	≤0.207 ≤0.221 ≤0.227
<b>Chemical Composition</b>			
SiO <sub>2</sub>	%	49-52	49-52
CaO	%	39-42	39-42
Fe <sub>2</sub> O <sub>3</sub>	%	0.3-0.4	0.3-0.4
Al <sub>2</sub> O <sub>3</sub>	%	0.4-0.5	0.4-0.5
Na <sub>2</sub> O+K <sub>2</sub> O	%	0.09-0.1	0.09-0.1
LOSS (Mainly H <sub>2</sub> O)	%	5.0-9.0	5.0-9.0