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5MS.009
Technic Composite Material Calcium Silicate

Applications

- Fire protection -building applications
- Electrical insulation
- Steel making for contact with non-ferrous liquid metal
- Thermal insulation - mechanical parts
- High-performance thermal insulation
- Protection against sparks
- Hot pipe/duct supports
- Support pads
- Heat band supports

Physical variables included in this documentation are provided by way of indication only and do not, under any circumstances, constitute a contractual undertaking. Please contact our technical service if you require any additional information.

Final Advanced Materials Sàrl
4 avenue de Strasbourg
68350 Didenheim – France
Tel : +33 (0) 3 67 78 78 78

Final Advanced Materials GmbH
Basler Strasse 115
79115 Freiburg – Deutschland
Tel: + 49 (0) 761 47 87 336

www.final-materials.com

info@final-materials.com

Overview

Calcium silicate is a powder with the formula Ca_2SiO_4. This product is primarily employed for its excellent high-temperature properties.

Calcium silicate is a low-density material, white in colour. It is odourless and poses no known health risks. Its derivatives are highly valued for their low thermal conductivity, their high resistance to heat and their limited dimensional shrinkage.

Main Characteristics:

- Low thermal conductivity
- Very good resistance to high temperatures
- Electrical insulation
- Low shrinkage
- Good resistance to compression
- Inflammable
- Inert material
- Easy-to-use

Implementation:

Calcium silicate composites can be sawn, bevelled, drilled, screwed and machined with traditional machines, tools and techniques.

For cutting and processing, tools with hard metal tips must be used. The cutting equipment must include a dust extraction system.

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LUX

LUX calcium silicate is a thermal insulation product with a very low conductivity. It is incombustible and fire-resistant and can be used in buildings to ensure fire resistance for up to 240 minutes.

The product contains no asbestos, is insensitive to corrosion and does not react with other materials. LUX calcium silicate contains no inorganic fibres.

Main Properties:

- Low thermal conductivity
- Resistant to fire up to 240 min
- Moisture-resistant
- Corrosion-resistant
- Solvent-resistant
- Easy-to-use
- Asbestos-free

Applications:

- Press insulation panel
- Furnaces and dryers
- Heat protection
- Thermal barrier mechanical parts
- Boiler separator

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DXP

Calcium silicate composite DXP is reinforced with fibreglass which enhances its mechanical performance. It is asbestos-free. It has very good thermal and electrical insulation, stable up to a temperature of 700 °C.

Main properties:

- Stable up to 700 °C (900 °C peak)
- High mechanical resistance
- Easy-to-use
- High-performance electrical insulation
- Dust-free
- Asbestos-free
- Strong
- Thermal insulation

Applications:

- Industrial furnace components: cast iron and heating
- Electrical insulation: arc protection (blow box)

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M1 and M1A

Calcium silicate products M1 and M1A are used in foundries, furnace construction and other industrial applications. These products are suitable for contact with liquid metals up to 850 °C (M1) or 1,000 °C (M1A) with very low shrinkage.

Main properties:

- It does not wet when in contact with melting metal*
- Insensitive to corrosion*
- No reaction to contact with graphite or boron nitride lubricants
- Low thermal conductivity
- Chemically stable in neutral and alkaline environments (reacts in acidic environments)
- High thermal and mechanical resistance
- Asbestos-free
- Easy-to-use

*non-ferrous metals and alloys (Al, Mg, Zn, Sn, Pb)

Applications:

- **Non-ferrous metal melting and casting equipment:** for transport, distribution and continuous or cyclic moulding.
- **Furnace construction:** loading plates, coatings in direct contact with metal, mechanical parts.
- **Chemical industry:** mechanical parts

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P1100S

P1100S is a stand-out product in the range, due to its superior thermal and mechanical properties. It provides solutions for applications which are normally unsuited to conventional calcium silicate products.

These large-scale insulating panels have a lightweight structure with a stable mineral matrix. This particular feature of production delivers a smaller and more easily controlled pore size. The incorporation of opacifying agents permits a further reduction in thermal conductivity.

Main properties:

- Extremely low thermal conductivity
- Low shrinkage
- Good mechanical resistance
- Very good thermal insulation
- Stable at high temperatures
- Light
- Easy-to-use

Applications:

- Petrochemical
- Furnaces
- Steel industry
- Food industry
- Glass industry
- Aluminium industry

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D1000CS HD

Calcium silicate composite D1000CS HD is abestos-free and does not contain any organic binder. It has very good thermal and electrical insulation properties and stays stable up to 1,000 °C. This product has a high dielectric strength and arc resistance.

Main properties:

- Thermal insulation
- Stable up to 1,000 °C
- High mechanical resistance
- High-performance electrical insulation
- Chemically stable in alkaline environments (reacts in acidic environments)
- Good arc resistance,
- High resistivity
- Dust-free
- Non-combustible
- No organic binders
- Asbestos-free
- Easy-to-use

Applications:

- Support parts for industrial furnaces
- Insulators for metal smelting
- Electrical insulation
- Electrical arc protection for connection equipment
- Thermal and electrical separators

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PRO-H

PRO-H is a non-combustible insulation board made from special calcium silicates reinforced with special fibres and fillers.

It is off-white and its finish is smooth on one side and sanded on the other side. The board can be left uncoated or can be easily painted or lined.

It is resistant to moisture and does not deteriorate when used in potentially wet conditions. Its performance does not degrade with age or the presence of moisture.

Main properties:

- Moisture-resistant
- Performance does not degrade with age or the presence of moisture

Applications:

- Tunnel coating
- Protection of concrete walls and floors
- Service compartments
- Panels and access hatches
- Fire doors
- Protection of steel structures
- Ceiling membranes
- Steel duct covering
- Self-supporting ducts
- Utility shafts
- Partitions (EI)
- Concrete structure protection (R)
- Filling for fixed frames
- Glass partition frames (EI)

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FINAL ADVANCED MATERIALS

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Available Dimensions

Product	Item N°	Board Dimensions	Thickness	Tolerances
Pro-H	**080-0033**	1,250 x 2,500 mm 1,200 x 3,000 from 10 mm thickness	12.7 – 16 – 20- 25 – 30 – 40 – 50 – 60 mm	-
DXP	**080-0031**	1,200 x 900 mm	6, 8, 10, 12, 15, 20, 25 mm	Thickness: ± 1 mm Linear: ± 4 mm
LUX	**080-0032**	2,500 x 1,200 mmm	4, 6, 8, 10, 12, 15, 20, 25, 30, 40 mm	Width: ± 1 mm Length: ± 1 mm Thickness: ± 0,4 mm
M1	**080-0034**	2,500 x 1,250 mm and 1,250 x 1,200 mm	13.1 – 19.5 – 25.8 – 38.5 – 51.2 – 76.6 – 102 mm	Thickness: ± 0.4 mm Linear: ± 1 mm
M1A	**080-0035**	2,500 x 1,250 mm and 1,250 x 1,200 mm	13.1 – 19.5 – 25.8 – 38.5 – 51.2 – 76.6 – 102 mm	Thickness: ± 0,4 mm Linear: ± 1 mm
P1100 S	**080-0036**	2,500 x 1,250 mm	20, 25, 30, 40, 50, 60 mm	Tolerances: Thickness: ± 1.3 mm Length and Width: ± 1.5 mm
D1000C	**080-0037**	1,500 x 1,250 mm	10, 12, 15, 20, 25, 30, 40, 50, 75, 100 mm	Thickness: 0 / + 0.8 mm Length: ± 2 mm Width: 0 + 20 mm

Packing and Storage

Products must be dry-stored. Dry in steriliser before use if the product has been stored for a long time.

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Property		Unit	Pro-H	DXP	LUX	M1	M1A	P1100 S	D1000CS HD
Item N°			080-0033	080-0031	080-0032	080-0034	080-0035	080-0036	080-0039
Composition			Ca_2O_4Si	SiO_2 + CaO fiberglass	SiO_2 + CaO : 97 %	SiO_2 : 45 - 55 % CaO : 38 - 52 % Al_2O_3 : 1.4 % Fe_2O_3 : < 1.1 % LOI : < 5 %		SiO_2 + CaO	SiO_2 + CaO : 94 %
Density		**kg/m³**	870	1,800	950	850	970	300	1,300
			Thermal Properties						
Max. Temperature		**°C**	-	700 operating 900 peak	900 operating 1,000 peak	1,000	1,000	-	1,000
Thermal Conductivity	**20 °C**	**W.m⁻¹.K⁻¹**	0.175	-	-	-	-	-	-
	200 °C		-	0.38	0.26	0.24	0.25	0.07	0.31
	400 °C		-	0.34	0.25	0.25	0.26	0.08	0.33
	600 °C		-	0.32	0.25	0.25	0.27	0.09	0.35
	750 °C		-	-	0.25	0.26	0.27	0.10	-
Fire Classification (EN 13501 part 1)			fireproof	-	fireproof	-	-	-	0.38
Specific Heat Capacity		**J K⁻¹ kg⁻¹**	-	1.05	1.03	0.96	0.97	1.03	1-1.2
Thermal Expansion Coeff.		**10⁻⁶ K⁻¹**	-	6.6	7.3 (20 - 800 °C)	6 - 7 (20 - 750 °C)	6 - 7 (20 - 750 °C)	5.4 (20 - 400 °C)	5.6 ⊥ 5.8 //
			Mechanical Properties						
Compressive Strength at 200 °C		**MPa**	9.3	185	25	18	30	2.5 ⊥	43
Cold Flexural Strength		**MPa**	4.5	45	7	> 6	8	1.5 longit.	17
Hardness		**Shore D**				-	-	-	> 75
Shrinkage (Length / Wide)	**750 °C - 12 hr**	**%**	-	0.5	-	0.02	0.01	-	0.15 at 0.9
	1,000°C -12 hr		-	-	0.8 (24 h)	-	-	< 1.5	0.2 at 1.5
			Electrical Properties						
Dielectric Strength		**kV/mm**	-	1.8	-	-	-	-	4.5
Arc Resistance		**s**	-	> 420 (40 mA)	-	-	-	-	> 420
Water Content		**%**	-	-	< 5	-	-	-	-