Building Insulation Solutions

Eco Engineering Solutions Ltd
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FIBERCEMENT SHEET APPLICATION GUIDE

Fibercement Sheet

Fibercement Siding

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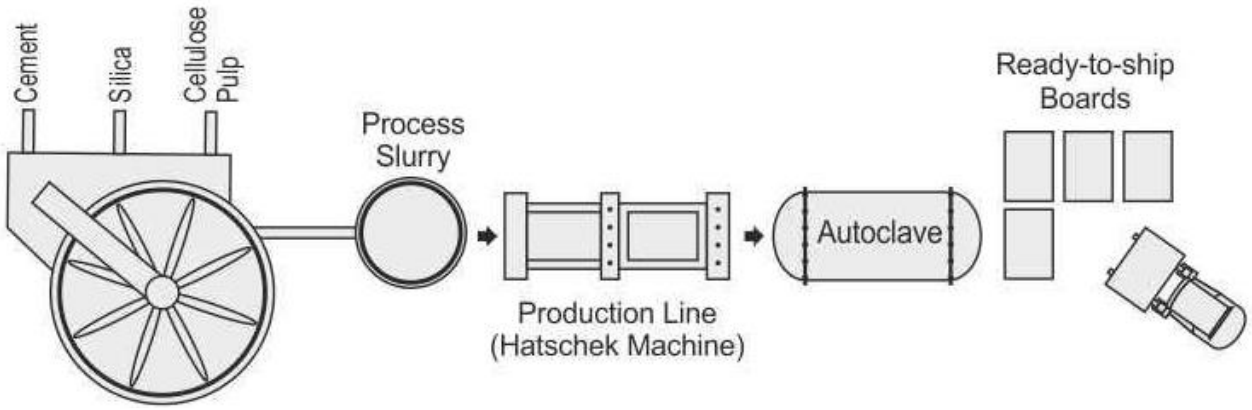
GENERAL

Fibercement is a term which defines in general the fiber reinforced cement products and used commonly all over the world. The common specification of the fibercement boards is the existence of any organic or inorganic fiber (or both) as reinforcement element and cement as binding element. Silica or other silica containing minerals can be used as auxiliary and filler elements. Depending on the application field, some additives may be used in the formulation to obtain enhancement at the heat and sound insulation, electrical resistance, lightness and resistance-to-fire properties. Fibercement board production can be realized by means of either air curing (natural curing) or autoclaving (curing under high pressure and temperature) methods.

MANUFACTURER has been producing fibercement boards using cellulose fiber 100% and autoclaving method. Whatever the fiber type or production method is preferred, all fibercement boards are evaluated within the context of EN 12467 as standard.

PRODUCTION

The first stage of fibercement board production is the preparation of a proper slurry made of the raw materials used in fixed proportions. Portland cement, micronized silica and cellulose pulp are mixed with water and build up the process slurry. The green boards (uncured board) are trimmed to demanded dimensions, kept in curing tunnels as stacked between the steel templates for pre-curing of the cement. The last stage of the production is to autoclave the boards which have completed the pre-curing phase in autoclaves under high pressure and temperature to make them gain the final properties to resist hard climatic conditions from coldest to hottest. After a reasonable storing time in the stock halls (necessary to eliminate the extra moisture due to steam curing) the products become ready for shipment.



FIBERCEMENT PRODUCTION STAGE

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ADVANTAGES OF FIBERCEMENT PRODUCTS

- Composition of all-natural materials, environment, nature and human friendly, Contains no asbestos or other harmful materials.
- Incombustible (A1 class Noncombustible material according to EN 13501-1), Contributes to extinguish the existing fire.
- No hazardous gas emission even when exposed to extreme temperatures.
- Water resistant, water absorption ratio is lower than 30%.
- Very low hygrical movement ratio (max. 0.5 mm/m).
- Resistant against sea water moisture, so it can be used safely as external wall of seaside buildings.
- Resistant against ultraviolet rays.
- Very good heat and sound insulation.
- Imperishable, long life (theoretically endless), easy maintenance.
- Not affected by insects harmful to woods, not inhabitable for insects.
- Can be painted with water based exterior and interior paints.
- Provides esthetic and economy with cedar, natural stone, stone masonry and brick laying surface appearances.
- Very good binding to cement-based adhesives, so can be used as underlying elements for ceramic tiles.
- Can be easily processed by proper tools, easy to install.
- Economical because they do not need plaster, Durable against strokes and beats.
- Light, can be easily handled (weight of 8 mm sheet is 11,2 kg/m2).
- Resistant against most chemical elements and animal waste.
- Can be safely used in hard climatic conditions due to the raw material content and autoclaving process.
- Resistant against frost and can be used in the coldest zones safely, breathing material, enables also the building to breathe.
- Can be used much more safely in any application, where similar covering materials used.
- Perfect binding to several insulation materials, so can be used as sandwich panel for multiple purposes.

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PRODUCTS

The product range of A WALL Classified;

- ✓ Large boards- Smooth and Grooved.

A WALL BOARD

Fiber cement large sheets produced under the trademark of A-WALL BOARD are specifically used in prefabricated building sector as cladding material for internal and external walls, ceiling and floor covering sheets, backer boards for roofing materials and ceramic tiles. Sheets are produced in 1250 mm standard width and 2500 mm or 3000 mm length. Standard thicknesses are between 6 mm and 20 mm. Provided that they remain within the limits of the production line, any non-standard width or length may be produced upon demand.

The sheets are produced with various surface appearance such as smooth. Depending on the place of application they are grouped as interior or exterior sheets in accordance with EN 12467 standard. "A" category sheets are exterior sheets and are produced to endure hard climatic conditions. "C" category sheets are interior sheets and are used only for interior applications and are not expected heavy climatic conditions such as rain or frost. At Building Insulation Solutions, we are a specialist manufacturer and supplier of complete through wall solutions to the UK construction industry. We ensure the supply of building boards, Façades and Insulation which is also known as our Eco Bonus range of products. We work closely with architects, specifiers and contractors to ensure the correct fire protection products are used at all times and to the correct specification required by the client.

From planning to completion, we expertly guide our clients during their fire, blast, impact, sound or moisture protection project, ensuring a fit-for-purpose and accredited solution is both specified and delivered.

Our mission is to work with clients and save lives, protect buildings and ensure the maintenance of vital services.

All our products are independently tested by Exova Warrington or BRE and are CE compliant.

Although the general formulations are the same, the exterior sheets are reinforced by some chemical additives to reduce the thermal movement coefficient. The interior sheets are used as interior facade cladding materials, partition wall elements, suspending ceiling tiles, backer board for flooring and roofing materials or ceramic tiles in wet areas.

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APPLICATIONS

Fibercement boards can be used in the following applications successfully;

- Interior and exterior facade cladding of any kind of buildings.
- Sandwich panel wall element.
- Suspended ceiling element (6 mm).
- Backer board under roof tiles (instead of OSB).
- Underlying material for ceramic tiles in wet areas.
- Flooring material on elevated flooring systems.
- Cedar textured decorative interior applications.
- Concrete molds.
- Backer board on the billboards.
- Decorative shop window applications.
- Underlying elements in thermal sheathing applications, Wall elements in wet areas (as PP foil laminated).
- Trims, door and window framings.
- Supporting material in composite elements.
- Decorative element on garden walls.
- Supporting elements on curtain wall systems.
- Wall elements in prefabricated pools.

THEORETICAL BEARING LOADS (for information only)

Thickness (mm)	W (mm)	M., (Nmm)	M., (Nmm)	F, (kg)	F, (kg)	F. (kg)	F, (kg)
	b X h2 6	Wbx sl (longitudinal)	WbXS2 (transverse)	(longitudinal punctual load)	(transverse punctual load)	(longitudinal spreaded load)	(transverse spreaded load)
8	10.667	192.000	128000	115	77	230	154
10	16.667	300.000	200000	180	120	360	240
12	24.000	432.000	288.000	259	173	518	346
14	32.667	588.000	392000	353	235	706	470
16	42.667	768.000	512.000	461	307	922	614
18	54.000	972.000	648000	583	389	1166	778
20	66.667	1200.000	800000	720	480	1440	960

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DIMENSIONS & WEIGHTS TABLE (A-WALL BOARD)

	Thickness (mm)	Dimensions (mm x mm)	Board Area (m2)	Unit Weight (kg/m2)	Board Weight (kg)	Number of Boards per pallette	Number of Boards per m²
SMOOTH / TEXTURED BOARD	6	1250 x 2500	3,125	8,4	26,2	100	53,3
	8		3,125	11,2	35,0	75	40,0
	10		3,125	14,0	43,7	60	32,0
	12		3,125	16,8	52,5	50	26,7
	14		3,125	19,6	61,2	45	22,8
	16		3,125	22,4	70,0	40	20,0
	18		3,125	25,2	78,7	35	17,8
	20		3,125	28,0	87,5	30	16,0
SMOOTH / TEXTURED BOARD	6	1250 x 3000	3,75	8,4	31,5	80	44,4
	8		3,75	11,2	42,0	60	33,3
	10		3,75	14,0	52,5	50	26,7
	12		3,75	16,8	63,0	45	22,2
	14		3,75	19,6	73,5	40	19,0
	16		3,75	22,4	84,0	35	16,7
	18		3,75	25,2	94,5	30	14,8
	20		3,75	28,0	105,0	25	13,3

The weights on the table may vary depending on the environmental moisture of the storage area.

TECHNICAL SPECIFICATIONS

Standard Dimensions	: 1200 x 2400 mm or 1250 x 2500 mm or 1250 x 3000 mm
Tolerance on length	: ± 5mm
Tolerance on width	: ± 3,75mm
Tolerance on thickness	: ± 10 % e (smooth sheet) -10% e I +15% e- textured sheet (e: sheet thickness)
Squareness of edges	: ± 2 mm/m
Straightness of edges	: ± 0,1 % a (a: sheet length or width)
Surface appearance	: Smooth or textured
Apparent density	: 1350 +/-50 kg/m^3
Diffusion resistance number	: μ = 250
Porosity	: ~ 30%
Modulus of rupture (smooth) (min)	: ~ 14,0/Nmm2 (machine direction= longitudinal) : ~ 9,0 N/mm2 (transverse to machine direction)
Frost Resistance	: Frost resistant according to EN 12467
Water impermeability	: Impermeable according to EN 12467
Reaction to fire	: Incombustible (A1 Class incombustible material according to EN 13501-1)
Content of asbestos	: Non-asbestos
Release of other dangerous substance	: None
Thermal expansion coefficient	: αt = 0,005/mm/mK
Thermal conductivity coefficient	: Λ = 0,20 W/mK
Modulus of elasticity	: 8000 N/mm2 (machine direction) 6000 N/mm2 (transverse to machine direction)
Water absorption ratio	: < 30%
Moisture in storage	: < 10% (subject to ambient moisture)
Hygrical movement	: < 0,5 mm/m
Bending radius	: ~ 12 m

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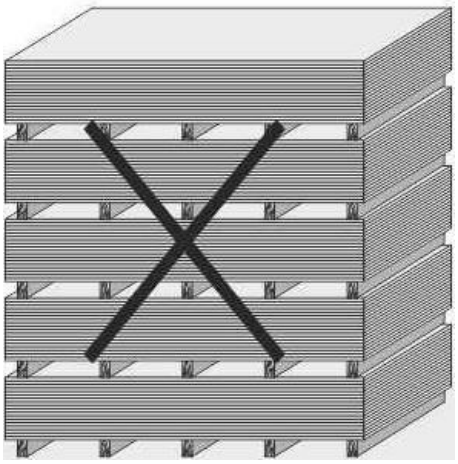
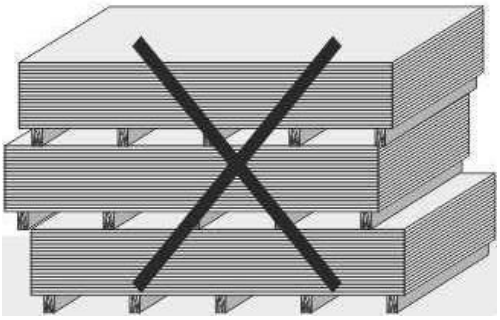
- The boards should be transported on perfect wooden pallets with at least 5 blocks.
- The drivers should be warned not to commit sudden brake or maneuver during the travel to the destination to avoid impact forces to affect the pallets.
- The pallets should be unloaded from the trucks under strict attention by means of proper devices and equipment and stacked on a smooth basement as one on the other in a position that all the blocks of the pallets shall remain in alignment.
- Total height of the pallets stacked one on the other should not exceed 3m.

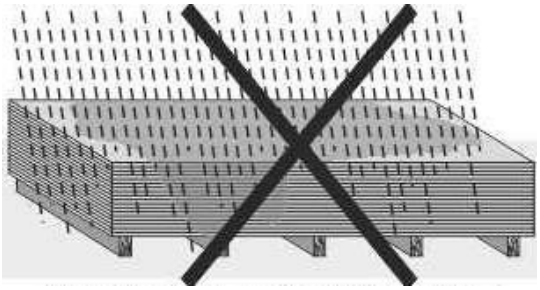


Over heighted stacking

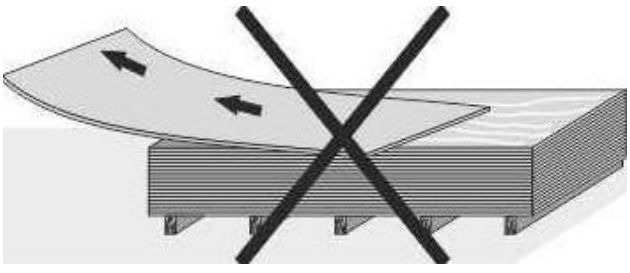


Non-aligned stacking

- Fibercement boards should be stored in the covered storage areas and protected against moisture and water.
- The protective coatings should not be removed when the boards are in storage. The unfolded pallets should be re-packed.
- The boards should be taken from the pallets without causing any scratch on the surface of next board.



Protect the boards against water



Do not scrape the boards

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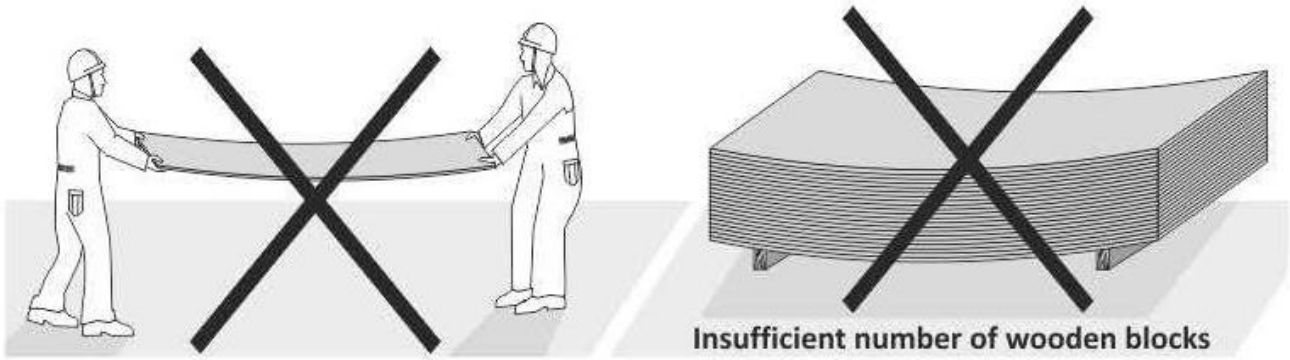
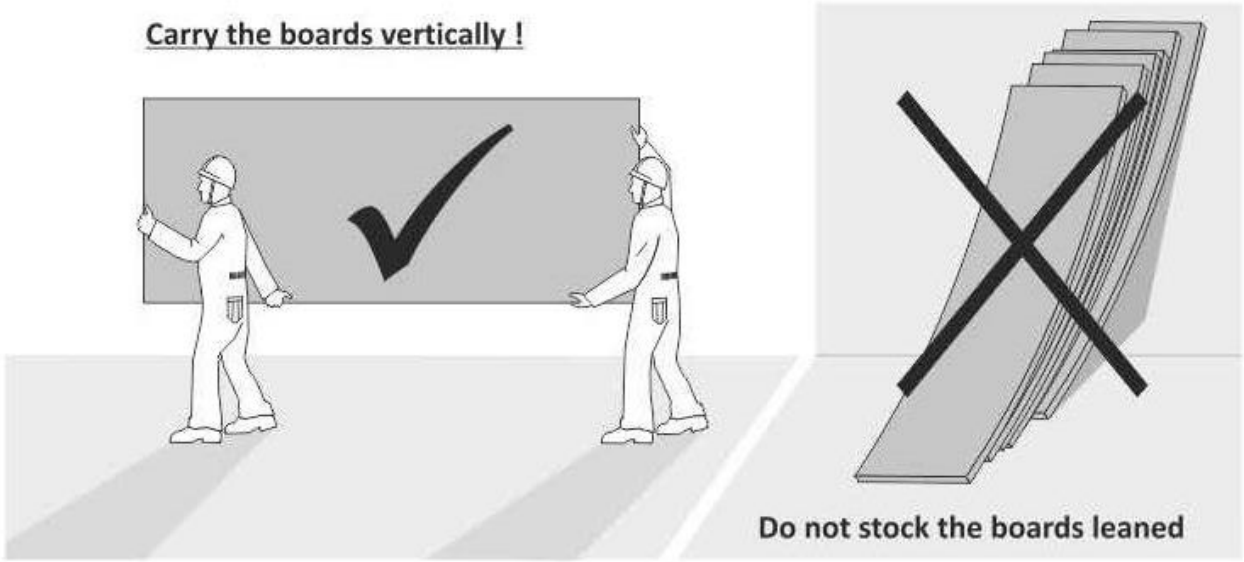
- The boards should be carried by two persons in vertical position in order to prevent cracking caused by flexing.
- The board edges and corners should be avoided to hit hard objects during handling and should not be laid down violently.





- The boards should be stored in the stock areas on pallets or wooden blocks. The basement of the stock area should be firm and smooth.
- The pallets should not be stored on the traffic route and the stock hall should be moisture free and good ventilated.
- The data labels on the pallets should be kept together with the other documents regarding the shipments to be referred to in the future complaints. The data on the labels shall be necessary in order to evaluate the complaints healthily.

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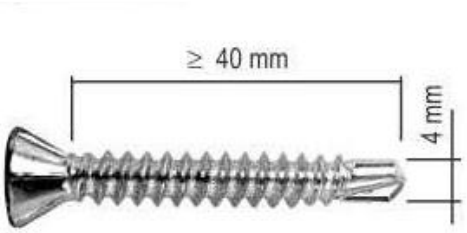
APPLICATION

FIXING MATERIAL

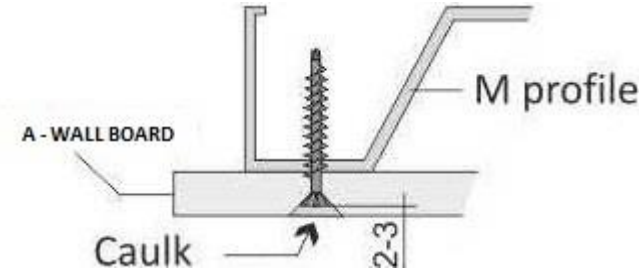


Fibercement Screw

Cordless Drill

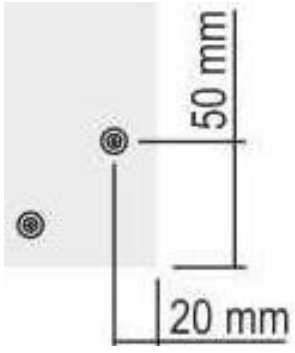
Use countersunk head, self-embedding and self-drilling fibercement screws for AWALL BOARD installation. In case of unavailability of these screws the screw hole and head countersink should be pre-drilled and then driven the screws. The below listed instructions should be respected for a correct installation;

- Use only recommended screw types
- Use sufficient number of fixing elements referring the screw distances shown on the sample installation drawing.
- Do not overdrive the screws to avoid any possible cracking at the screw head countersinks which may cause the board split completely,
- The screw should be driven so that the screw heads will be 2-3 mm deeper than the board surface level to provide a space enough for a proper caulking. It is recommended to countersink for the screw head with a proper drill-bit.
- Drive the screws perpendicular to the board
- The distances of the screws should be 20 mm minimum to the board edges and SO mm to the corners
- The screws should center the installation surfaces of them profiles



CORRECT APPLICATION

A WALL BOARD



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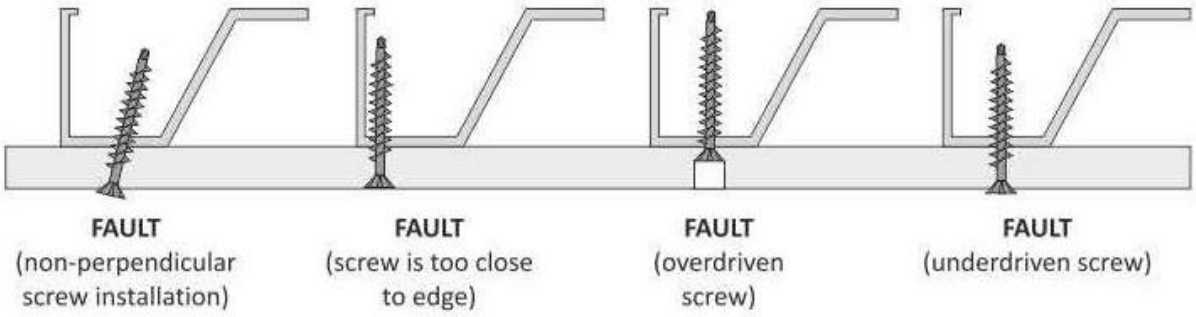
APPLICATION



Samples for fault screwing

Cutting

- Fibercement products should be cut either tungsten carbide tipped fibercement blades or turbo diamond hard beton/granite saws.
  (Fibercement blades can be supplied from BIS)

Fibercement blade

Turbo diamond cutter (saw)

Cutting Table

Hand Saw

IMPORTANT WARNING: All personal protective equipment such as goggles, certificated dust mask and protective gloves should be worn during the cutting process. Repeated and prolonged inhalation of the dust containing high ratio of silica may cause acute or chronic diseases of the respiratory tract. Smoking may have a considerable promoting effect.

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APPLICATION

- The cutter tips of the fibercement blades should be protected from contacting hard objects. Small damages on the tips may cause an uneven and dusty cutting.
- The advancement speed of the cutter should not exceed 5 m/min for a smooth and dustless cutting. The excessive cutting speeds will cause the blades to be overheated and the tips to break away. The lack of one or more tips will decline the cutting performance of the blade.
- Cutting and drilling process should be carried out as dry. Dust residues should be cleaned with a soft brush or similar cleaning tool. The dust remaining on the surface will affect the quality of the finishing (painting).
- The back of the fibercement board should be supported with a wooden block during the cutting or drilling process.
- The environment where the cutting and drilling processes are carried out should be very well ventilated. The work place should not be swept or brushed but cleaned by means of a vacuum cleaner in order to prevent creating extra dust.

Installation Consideration

- Use only AWALL MBOARD EXTERIOR BOARDS of which the physical properties have been enhanced by mineral additives at the applications where the boards are expected to be exposed to heavy climatic conditions
- There should be a 20-30 mm clearance between the fibercement boards and the insulation material to enable a good ventilation at the back of the boards installed.
- The boards should be fixed on a proper steel construction (M profile, section iron etc.) with stainless or galvanized fibercement screws. If it is planned to build up a wall (exterior or separation) with fibercement boards, the sub-construction should be designed by a precise static calculation.
- First the horizontal sub-construction elements (iron section etc.) should be installed to the wall to build up a smooth installation surface for M profiles. The M profiles should be fixed after the placement of the insulation materials between the horizontal elements.
- The board edges should be flush at the butt joints.
- The screw heads should be caulked with acrylic based caulk after the installation without spreading the caulk to unnecessary areas. The caulks should be sanded by a sand block to provide a smooth base for painting.

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PAINTING

CAULK

Fibercement applications need caulking and retouching after the installation both to hide the screw heads and to obtain a good sealing at the butt joints. The points where there is a risk of water penetration also need to be sealed. **Silicone sealants are not suitable and cannot be used for caulking** since they are not suitable for water based paints. Best sealants for fibercement applications are polyurethane and acrylic caulks. The adherence performance of polyurethane sealants are much higher and should be preferred in caulking where a strong adherence is necessary. Hard acrylic sealants are used, since they are sand able, to hide the screw heads and to fill the gaps and holes occurred during the installation process. A clearance of 3-4 mm should be left between the boards for caulking considering the thermal or physical movements which may occur in the future. The polyurethane caulks should be applied as elevated from the board surface and the extra thereof should be trimmed after a firm dry-up

Polyurethane Caulk

Acrylic Caulk

NOTICE!

The sealants in paste form contain volatile substances to keep the mixture soft until the application. These volatile agents leave the mixture as soon as there is a contact with air and enables the caulk get hard. This causes a volumetric shrinkage of the caulk after application.

For a better result in painting, the excessively spreaded caulk application should be avoided. The unnecessary caulk spread may cause an uneven surface outlook since the painted areas will demonstrate different characteristics on primed fibercement and caulked areas.

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PAINTING

Paint

All water based acrylic paints {interior or exterior) can be used safely in painting the fibercement products. Flexible paints should be preferred and the below listed facts should be strictly respected:

- Never use oil based paints on fibercement products.
- Do not start the primering and top painting unless the sheets and sidings dry up,
- Clean all dust and residue arising from the cutting or drilling process,
- Sand all caulked points gently for a better base for painting,
- Primer all the surface before painting for a better appearance and adherence,
- A good ventilation should exist at the back of the boards for longer paint life,
- Use only sand able hard acrylic caulks for retouching jobs,
- Refer to the technical staff of BIS for further information

IMPORTANT NOTICE

Durability and life of the paints in fibercement applications depend not only on the quality of the material and workmanship but on the quality of the primer and top paint as well. Some paint manufacturers give long guarantee terms for their products on color fastness and paint durability. For specific fibercement applications please consult either paint manufacturer or BISI to avoid any complication.

Primer Shield

Sand Block

Finished Coat

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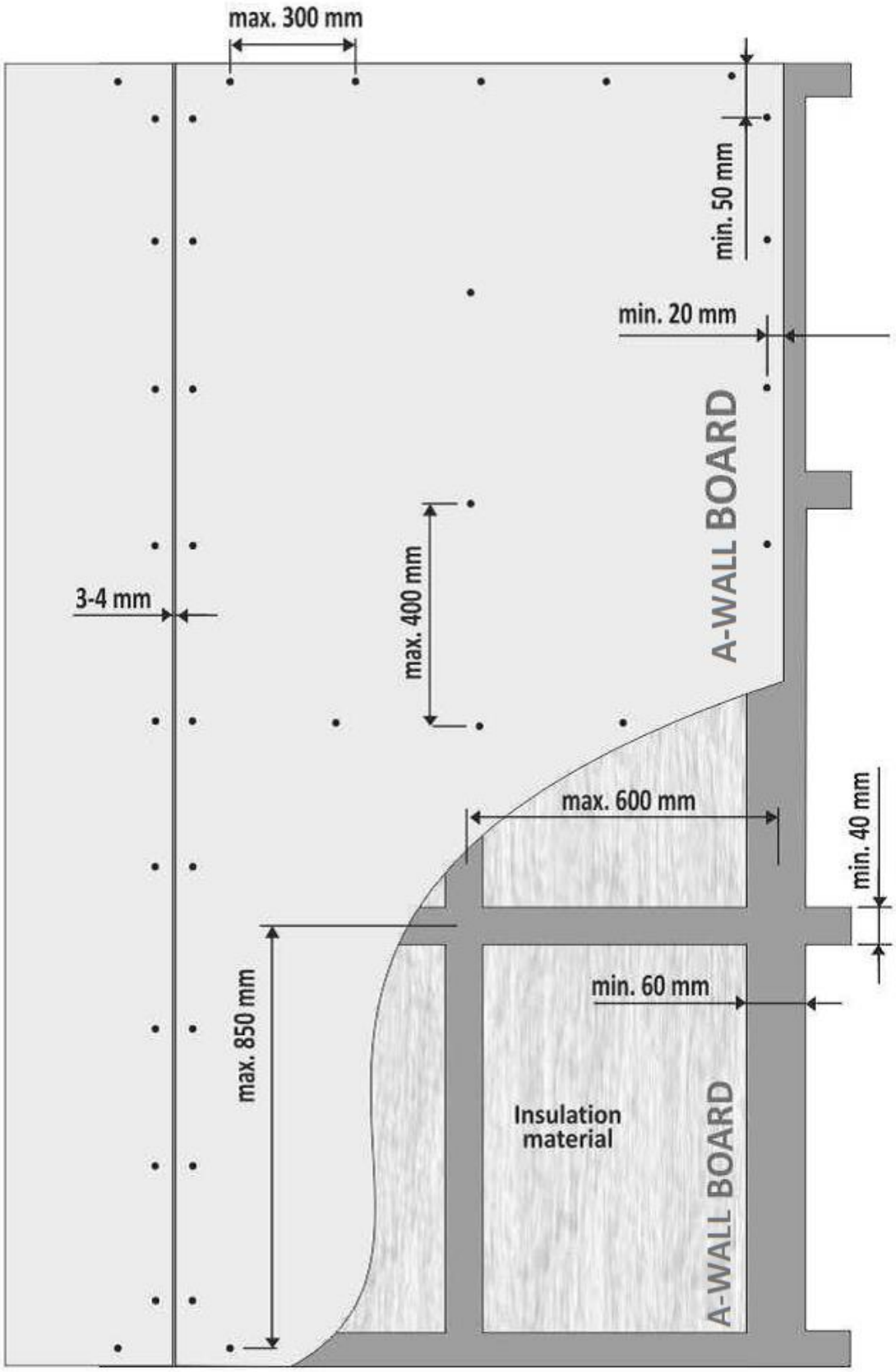
APPLICATION (A-WALL BOARD)



AN INSULATED WALL APPLICATION DETAIL WITH A-WALL BOARD

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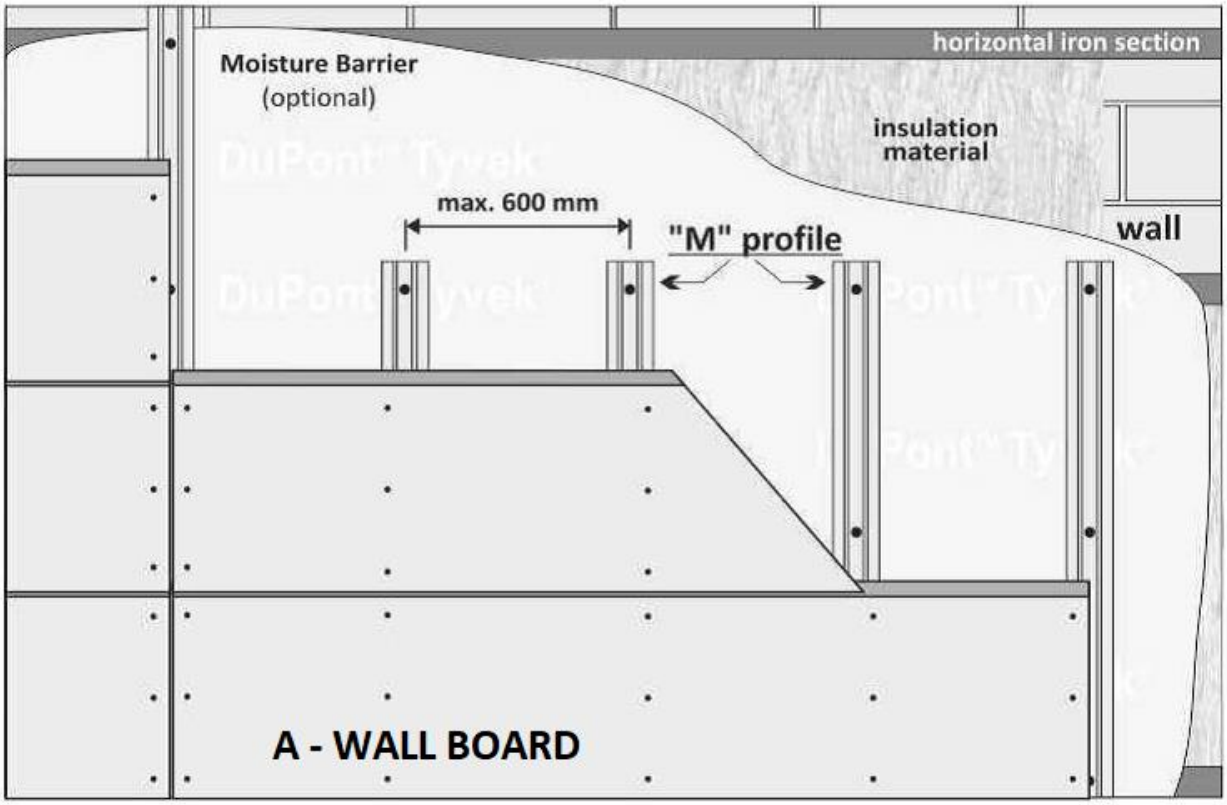
APPLICATION (A-WALL BOARD)



Grooved A-Wall Board Application Detail

- 18 mm A-WALL BOARD should be used for basement (floor) applications. The distances between the studs should be minimum 400 mm at board width and 600 mm at length.
- For wall applications, minimum 8 mm A-WALL BOARD should be used. 10 mm or 12 mm boards are recommended for exterior wall claddings.

		6mm	5mm	10mm	12mm	14mm	16mm	18mm	20mm
Ceiling	Width	600							
	Length	1200							
Wall	Width		400	400	600	600			
	Length		600	800	800	800			
Basement	Width						400	400	600
	Length						400	600	800

Recommended stud distances depending on the thickness of the board and the place of application

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PRODUCT

A – WALL BOARD

SMOOTH BOARD

The top face has a smooth appearance and Board thickness varies from 6 to 20mm.
Sizes: 1200 x 2400mm, 1250 x 1250mm, 1250 x 3000mm

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