

Installation Instructions

for

Cembonit

&

Minerit

RECEIPT AND INSPECTION

It is the responsibility of the recipient to check that all goods received are free of damage and in accordance with the order submitted. Any deviations must be specified in writing on the delivery note immediately after receiving/receipt of the goods concerned. A copy of the delivery note with any remarks must be submitted to the driver. Goods may only be returned as per agreement.

STORAGE AND HANDLING

Flat panels/boards must be handled with care and protected against dirt and precipitation both during transport and at the building site.

The panels must be stacked on a dry and level surface with the edges of the panels lying directly above each other. The panels must always be stored under cover and covered with a protective material such as tarpaulin.

Flat panels that get wet on the pallet due to precipitation or condensation will have a tendency to precipitate calcium/efflorescence.

Flat panels must always be lifted and not dragged off the stack.

Secure stacking of flat panels: max. 5 pallets and max. 50 panels per pallet.

LAYOUT OF THE BUILDING SITE AND INSTALLATION PLANNING

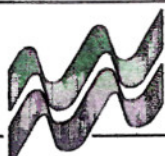
Access to the building site must be such that deliveries can be made by truck with or without a trailer. Delivery at the building site with a crane must be ordered in advance, and the products unloaded at the edge of the vehicle.

Extended storage of panels must take place in ventilated storage buildings.

Accessories/ancillary equipment must be stored so that it is not damaged, and protected against dirt and precipitation. Remember to cover all products for facade cladding at the end of the working day.

SAFETY

Before installing panels, the safety conditions in relation to the task at hand must be taken into account. If required, safety equipment such as scaffolding, gangways, boarding screens, safety nets and similar must be established in a proper and usable manner before work is commenced.



General Guideline for execution of exterior ventilated Fibre Cement cladding

Dansk Eternit Holding - DEH

Drawing no.: E_a

Page 1 of 4

Name: Execution_a

Date	04.10.29	EMJ
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VENTILATED CONSTRUCTION

Our facade cladding is executed as a ventilated construction, i.e. the outermost cladding is open in order to allow ventilation of an underlying cavity.

WIND BARRIER – IMPERVIOUSNESS

There is a wind barrier behind the facade cladding that is designed to make the structure impervious to the weather and the wind, as well as meeting the fire requirements with regards to the surface of the exterior wall.

As wind barrier the Minerit LW, is an excellent choice.

INSTALLATION IN GENERAL

In order to achieve a good result, it's important that the cladding is installed on a stiff, strong and flat construction. During installation the panels must be handled with care, and not dragged or pushed over each other so that the surface are damaged.

The stability of the walls must be ensured without help from our products. Our products must be able to move, in order not to crack when the climate changes.

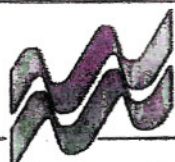
Always install cladding in dry weather.

CUTTING THE PANELS

The panels can also be cut from the front side by a handsaw with a finetoothed metal blade.

When sharp edges are desired and by large cutting jobs, a high-speed circular saw with diamond blade must be applied and an aspirator must be connected.

We recommend a diamond blade with a grain size of 36/44 and a cutting edge.



General Guideline for execution of exterior ventilated Fibre Cement cladding

Dansk Eternit Holding - DEH

Drawing no.: E_b
Page 2 of 4

Name: Execution_b

Date	04.10.29	EMJ
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DRILLING OF HOLES – always drill dry (without liquid)

The drilling of holes must be done from the front of the panel.

The drilling of fixed holes is best done using a Joran UNIplus universal drill and a drilling speed of 1500 rpm.

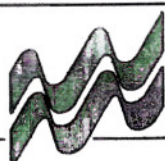
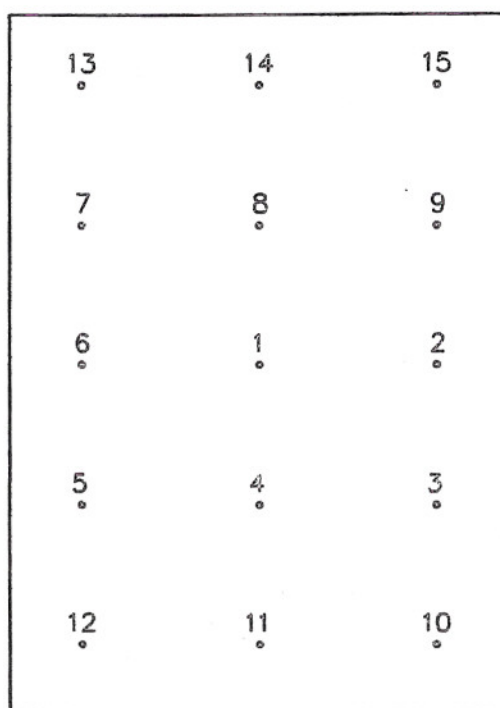
Larger holes, or cut-outs on the panel, can be made by a jig saw with a carbide blade or by drilling a series of holes 5 mm apart, after which the cut-out can be removed with the strike of a hammer.

The cut-out for a branch box etc. can be done by a turning saw (HHS bimetallic blade or diamond applied) or by a circle cutter.

INSTALLING OF ATTACHMENTS

The attaching is done in a spiral manner, see also the sketch below

Start attaching no. 1 (fixed point), afterwards the dilation points, starting with no. 2, then 3....



General Guideline for execution of exterior ventilated Fibre Cement cladding

Dansk Eternit Holding - DEH

Drawing no.: E_c

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Name: Execution_c

Date 04.10.29 EMJ

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MAX LENGTH OF NOT SUPPORTED BOARD/PANEL

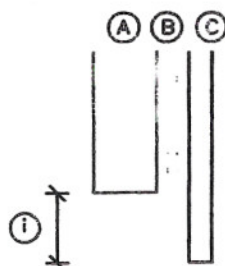
- ① Max. length of not supported (by stud) board/panel;

Wood: max. 45 mm, and min. distance to edge of wood: 25 mm

Steel: max. 55 mm, and min. distance to edge of steel: 15 mm

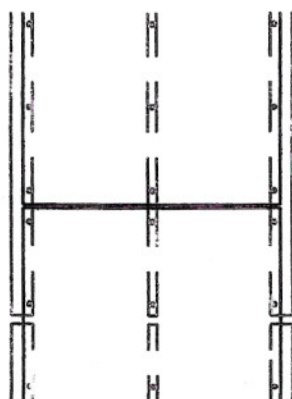
Alu.: max. 55 mm, and min. distance to edge of alu.: 15 mm

- Ⓐ Stud
Ⓑ Rubber
Ⓒ Board/Panel

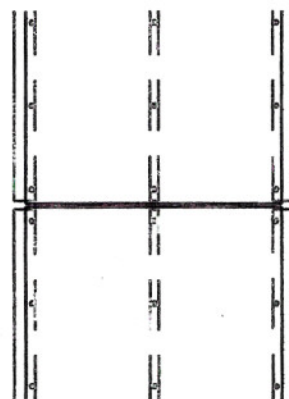


ATTACHMENT OF BOARD TO STUDS

Please remember that it's NOT allowed to attach one board to two studs, see the below sketches.



NOT ALLOWED

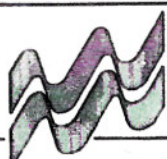


ALLOWED

COMPLETION OF WORK

Check that the facade cladding is clean and without damage, defects or omissions. Make sure that any waste is cleared up following completion of the work. Give the user's manual to the client and review it with him in detail.

The boards are moving with climate changes, therefore they might bend ± 6 mm.



General Guideline for execution of exterior ventilated Fibre Cement cladding

Dansk Eternit Holding - DEH

Drawing no.: E_d

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Name: Execution_d

Date 04.10.29 EMJ

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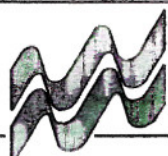
Technical Service Centre (TSC) is hereby giving the general guidelines/basic rules for fastening DEH external ventilated boards (item a) to the direct under laying studs (item b)

DEH external boards are:

- CEM: Cembonit
- MIN HD: Minerit HD
- MIN PC: Minerit Prisma Color

Consequently, it has to be stated that the following items have to be observed, as TSC isn't able to cover the specific laws and regulations in all countries:

- The specific static calculations have to be done in each country/region or each project according to the valid local laws and regulations.
- check if the country/region has specific rules regarding e.g. the use and type of pressure creosoted wood.
- The statics and fasteners to the structural facade/constructions (item c) must to be done in each country/region or each project according to applicable local laws and regulations.
- The middle point (fixed point) of steel or alu. studs has to be fixed to the structural facade, see item d. The other attachment points (dilatations points) of the studs to the structural facade have to be installed in accordance with item e.



General Guideline for fastening exterior ventilated Fibre Cement cladding

Dansk Eterni Holding - DEH

Drawing no.: F_a

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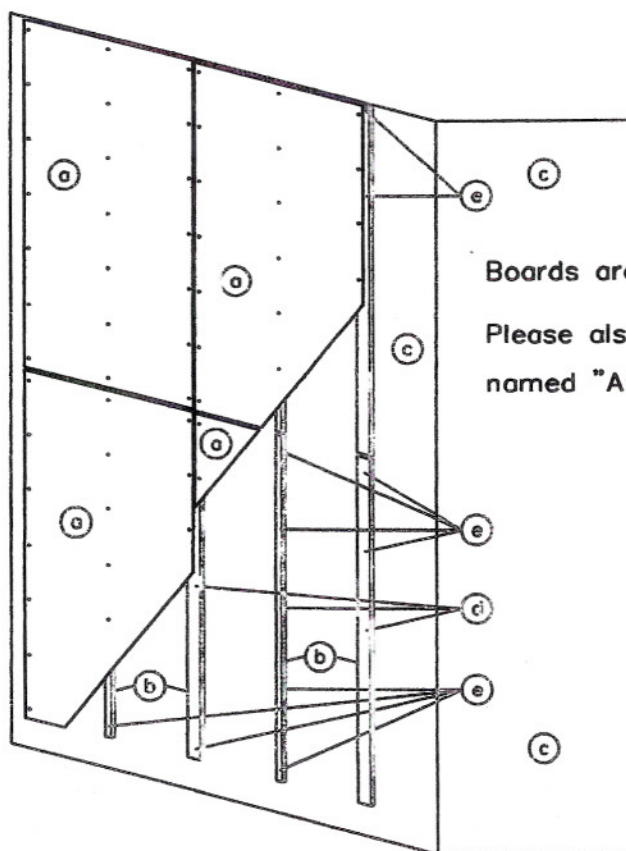
Name: Fastening_a

Date	03.05.14	EMJ
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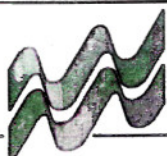
Revise 1	04.10.29	EMJ
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- (a) Board, Cembonit (CEM), Minerit HD (MIN HD) or Minerit Prisma Color (MIN PC)
- (b) Studs: Do NOT mix between wood, steel and alu. studs
- (c) Structural facade/Construction
- (d) The fixed points of STEEL or ALU. spacers must be attached to the structural facade in the same HORIZONTAL level (here shown in the middle), so that movements in the horizontal and vertical directions are eliminated.
- (e) The other attachments (dilatations points) of the STEEL or ALU. studs onto the structural facade have to allow movements in the vertical direction (but not in the horizontal direction).

Regarding wood, please see the Drawings named "Wood_Nails" or "Wood_Screws"



Boards are installed in the vertical plane.
Please also see all pages in the Drawing named "Attaching".



General Guideline for fastening exterior ventilated Fibre Cement cladding

Dansk Eternit Holding - DEH

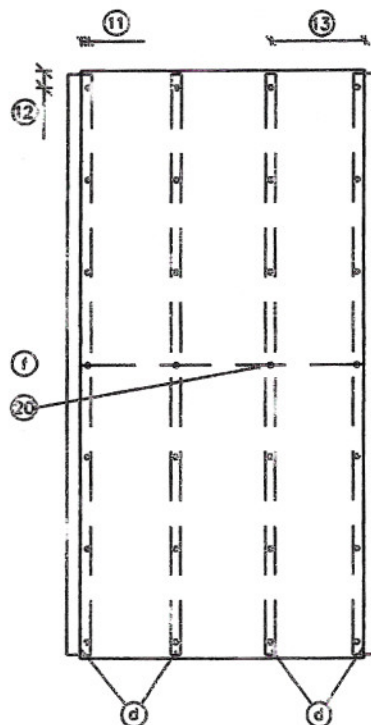
Drawing no.: F_b
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Name: Fastening_b

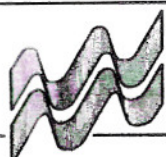
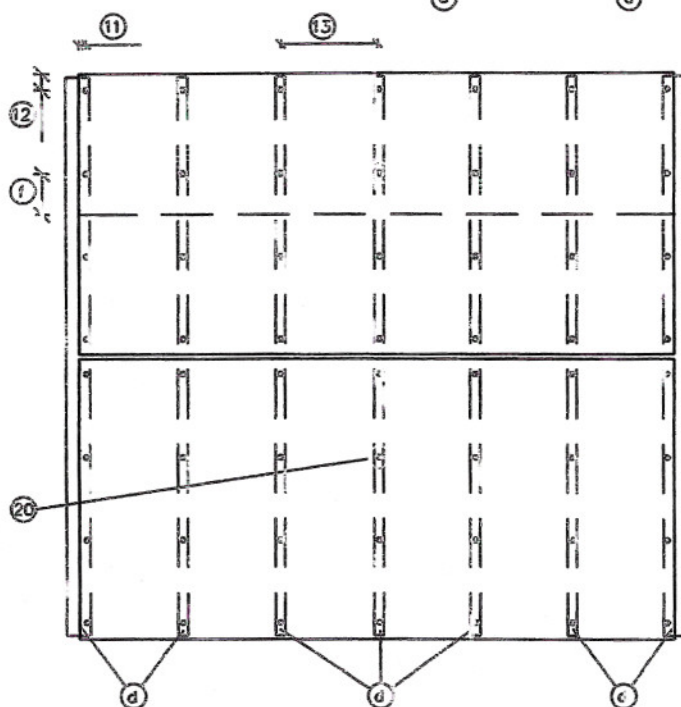
Date	03.05.14	EMJ
Revise 1	04.10.29	EMJ

Board thickness up to 6 mm, Vertical plane, Boards are here 1200x2500 mm.

- ⑪ Wood: 25 mm, Steel and alu.: 30 mm
- ⑫ 70 mm
- ⑬ Max. 425 mm
- ⑭ Fixed attachment on steel or alu.
- ⑮ Fixed attachment of steel or alu. studs to the structural facade, see also the Drawing named "Fastening"
- ⑯ The fixed attachment may here be max. 50 mm over/under the centre line of the board



- ⑰ The fixed attachment may here be max. 200 mm over/under the centerline of the board



General Guideline for attaching boards and studs on external ventilated FC cladding

Dansk Eternit Holding - DEH

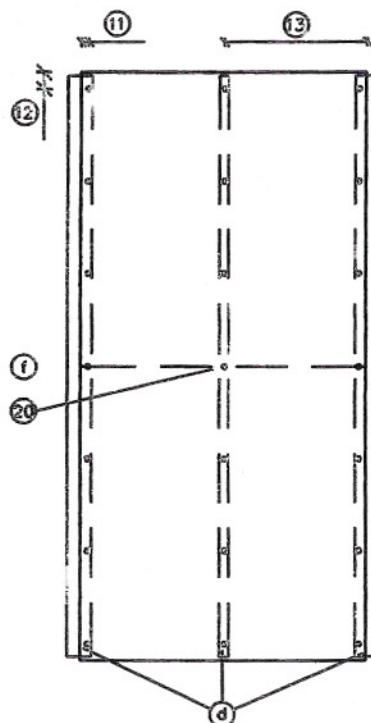
Drawing no.: ATT_a
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Name: Attaching_a

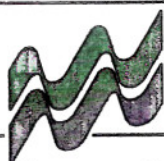
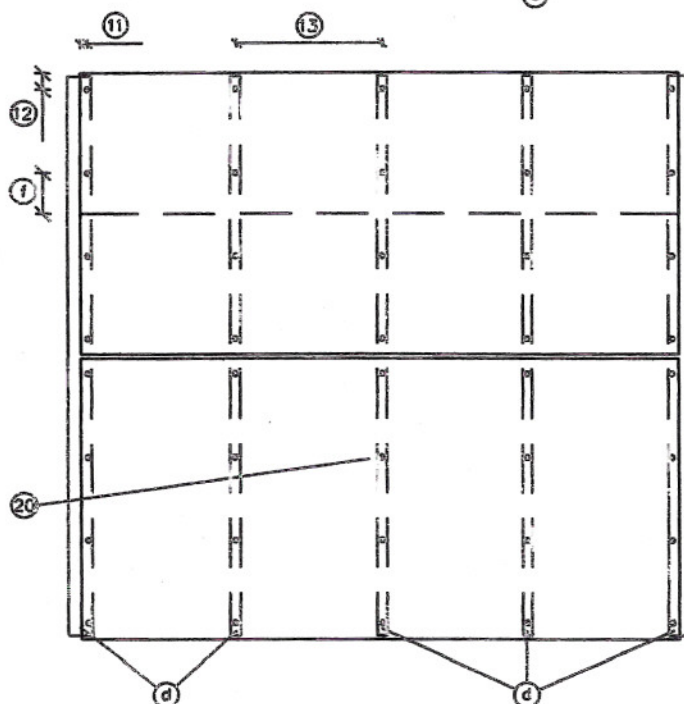
Date 04.10.29 EMJ

Board thickness over 6 mm, Vertical plane, Boards are here 1200x2500 mm.

- ⑪ Wood: 25 mm, Steel and alu.: 30 mm
- ⑫ 70 mm
- ⑬ Max. 625 mm
- ⑳ Fixed attachment on steel or alu.
- ㉑ Fixed attachment of steel or alu. studs to the structural facade, see also the Drawing named "Fastening"
- ㉒ The fixed attachment may here be max. 50 mm over/under the centre line of the board



- ㉓ The fixed attachment may here be max. 200 mm over/under the centre line of the board



General Guideline for attaching boards and studs on external ventilated FC cladding

Dansk Eternit Holding - DEH

Drawing no.: ATT_b
Page 2 of 4

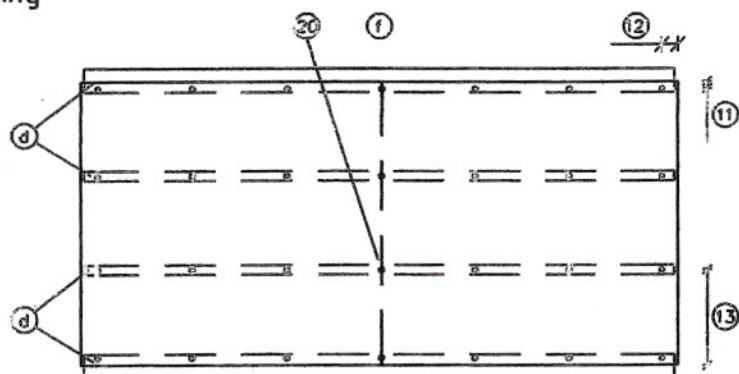
Name: Attaching_b

Date 04.10.29 EMJ

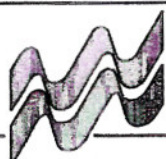
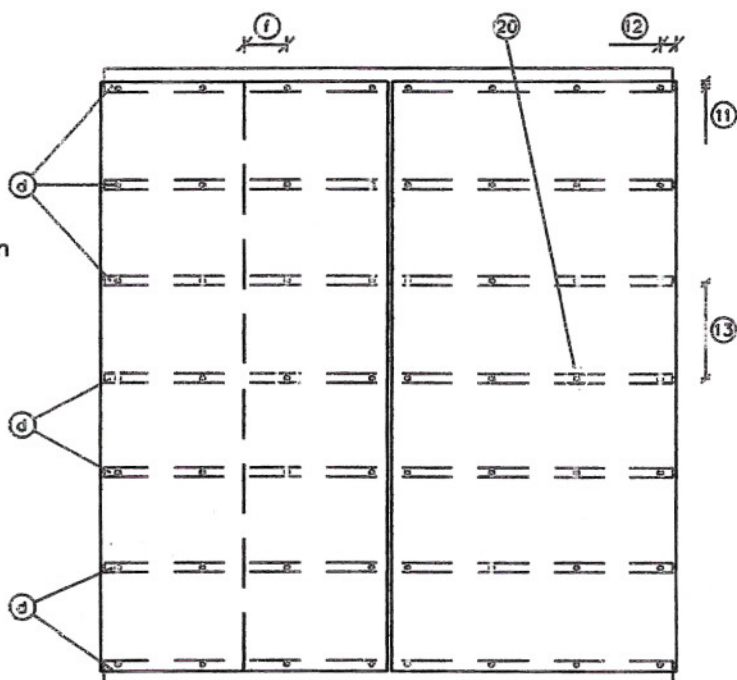
Board thickness up to 6 mm, Vertical plane, Boards are here 1200x2500 mm.

- ⑪ Wood: 25 mm, Steel and alu.: 30 mm
- ⑫ 70 mm
- ⑬ Max. 425 mm
- ⑭ Fixed attachment on steel or alu.
- ⑮ Fixed attachment of steel or alu. studs to the structural facade, see also the Drawing named "Fastening"

- ⑮ The fixed attachment may here be max. 50 mm over/under the centre line of the board



- ⑮ The fixed attachment may here be max. 200 mm over/under the centre line of the board



General Guideline for attaching boards and studs on external ventilated FC cladding

Dansk Eternit Holding - DEH

Drawing no.: ATT_c
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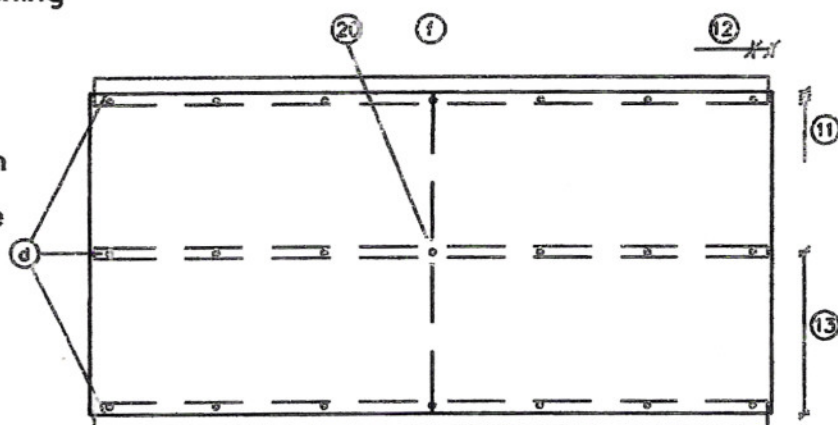
Name: Attaching_c

Date 04.10.29 EMJ

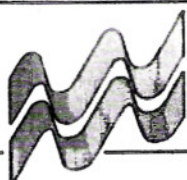
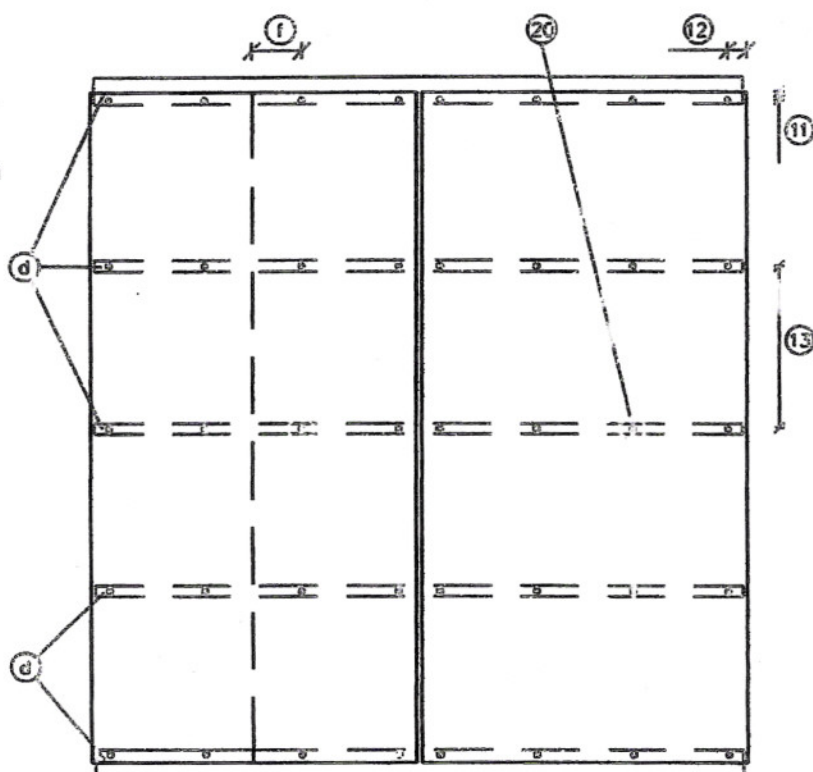
Board thickness over 6 mm, Vertical plane, Boards here 1200x2500 mm.

- ⑪ Wood: 25 mm, Steel and alu.: 30 mm
- ⑫ 70 mm
- ⑬ Max. 625 mm
- ⑭ Fixed attachment on steel or alu.
- ⑮ Fixed attachment of steel or alu. studs to the structural facade, see also the Drawing named "Fastening"

- ① The fixed attachment may here be max. 50 mm over/under the centre line of the board



- ① The fixed attachment may here be max. 200 mm over/under the centre line of the board



General Guideline for attaching boards and studs on external ventilated FC cladding

Dansk Eternit Holding - DEH

Drawing no.: ATT_d
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Name: Attaching_d

Date 04.10.29 EMJ

- ① Board, Cembonit (CEM) or Minerit Prisma Color (MIN PC)
- ② Dimension of steel Hat-stud: minimum 1.2x20/25/95/25/20 mm *)
- ④ EPT-rubber on steel stud, CEM board: 2 pieces of 30x3 mm
EPDM/TPE-rubber on steel stud, MIN PC board: 2 pieces of 36x1 mm
- ⑤ Stud joint (air gap) between two boards: 5–10 mm, see also page 2
- ⑥ Stud joint (air gap) between two steel studs: min. 10 mm
- ⑧ Dim. of steel Z-stud: min. 1.2x40/25/30 mm *)
- ⑩ EPT-rubber on the steel stud, CEM board: 30x3 mm
EPDM/TPE-rubber on the steel stud, MIN PC board: 36x1 mm
- ⑪ Screw distance from edge parallel to the steel stud: 30 mm
- ⑫ Screw distance from edge perpendicular to the steel stud: 70 mm
- ⑬ By Board installed in vertical plane (e.g. facade): *)

Board thickness	Stud c–c distance
up to 6 mm	max 425 mm
over 6 mm	max 625 mm

By Board installed in horizontal plane (e.g. ceiling and soffit): *)

Board thickness	Stud c–c distance
up to 6 mm	max 325 mm
over 6 mm	max 425 mm
- ⑭ By Board installed in vertical plane (e.g. facade): *)

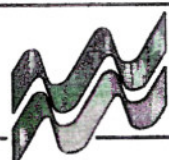
up to 8 floors	max 400 mm distance
over 8 floors	max 300 mm distance

By Board installed in horizontal plane (e.g. ceiling and soffit): max 300 mm *)
- ⑰ Predrilled hole (dilatation point) using self drilling screw for steel stud: Ø 8 mm
- ⑳ Predrilled hole for fixed (fix point) screw for steel stud: Ø 4.0 mm **)
- ㉑ Screw CEM board: DE-flex facade screw, stainless steel, S-TX25, 4.8x25 mm
Screw MIN PC board: stainless steel, wingscrew, 4.2x32 mm

*) To be sure that the laws and regulations of each country, region or project are followed, it is necessary to make specific static calculations.

**): The screw in the centre of the board is to be fixed, so the movement of the board relative to the steel stud is halved.

PS: It is very important to remove dust from drilling and cutting immediately to avoid the dust from "burning" permanently to the board.



General Guideline for installing exterior ventilated FC cladding on steel using screws

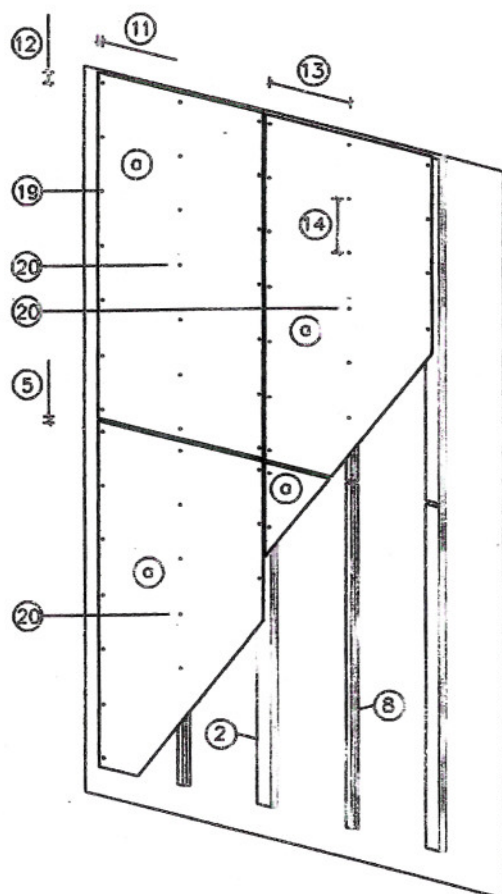
Dansk Eternit Holding - DEH

Drawing no.: S_S_a
Page 1 of 2

Name: Steel_Screws_a

Date	03.05.14	EMJ
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Regarding General guideline for fastening to the structural facade/
construction, please see all pages in the Drawing named "Fastening".



Stud/steel quality: min. S250GD

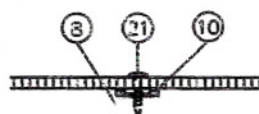
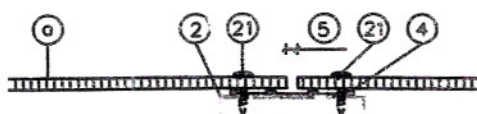
(250 N/mm²)

Stud/steel coating: min. Zinc 275 g/m²

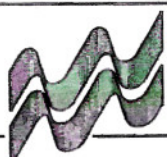
There has to be a running air gap of min.
10 mm at each floor (maximum 3.05 m) in
order to ventilate the boards/construction.

The screws are to be tightened with about 4
Nm – but test the torque before setting the
Nm; otherwise you may destroy the board,
because it will not have the possibility to move

Please also see all pages in the drawings
named "Attaching" and "Execution".



- 20 The screw (DE-flex S-TX25) in the centre of the board is to be fixed, therefore
you HERE predrill the board with Ø 4.0 mm. If you have an equal number of
spacers, you just fix ONE of the two studs in the middle. The fixed screw in the
centre has to be installed first – afterwards the rest of the screws are installed
in a spiral. If you are using MIN PC boards, you also use the DE-flex here
because the MIN screw is with wings.



General Guideline for installing external
ventilated FC cladding on steel using screws

Dansk Eternit Holding - DEH

Drawing no.: S_S_b
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Steel_Screws_b

Date	03.05.14	EMJ
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