

## Fastening of CETRIS® Cement Bonded Particleboards

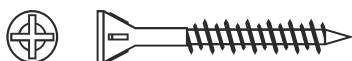
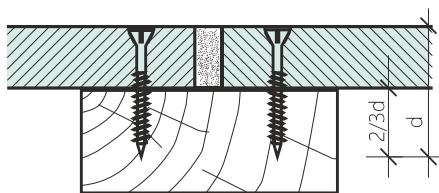
### 4.1 Interior Anchoring

CETRIS® boards can be fixed to the structures using screws, staples or nails. All types of fastening elements must be treated with an anti-corrosion agent; use of screws to fix plasterboard is not recommended. When using regular screws the screw holes should be pre-drilled to 1.2 multiple of the screw used. It is also recommended to prepare the countersinking for the sunken screw heads. For professional screwing it is recommended to use pneumatic or electrical screwdrivers with regulated revolutions.

The principles stated in this chapter (screwing to timber, sheet metal, stapling, nailing) also apply to exterior anchoring in cases where the board forms a base for a contact insulating system, or a composite roof system.

#### 4.1.1 Screwing to Timber

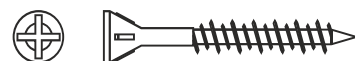
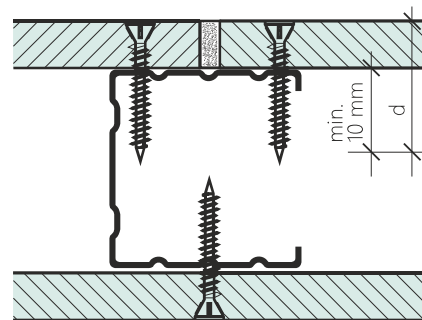
For correct fixation of CETRIS® boards to constructions it is necessary to keep the maximum spacing of the load-bearing construction and the fixation elements. The best fastening element for fixation of CETRIS® boards is a self-tapping screw with double thread, hardened tip and sunken head with blades for countersinking. This type of screw may be supplied as an auxiliary material with CETRIS® label, diameter 4.2 mm, lengths 35, 45, 55 mm for connecting of two CETRIS® boards in the floating floor system or for board fixation to horizontal and vertical timber constructions (floors, partition walls, ceiling panels, etc.). For anchoring purposes the screw should penetrate to the wooden construction with at least 2/3 of its length. For fixation of floor boards, a screw of the length exceeding the board thickness by 20 mm will suffice.



CETRIS self-tapping screw to timber

#### 4.1.2 Screwing to Sheet Metal

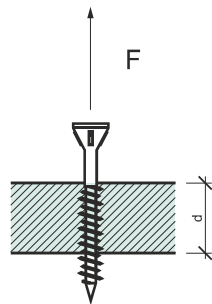
For fixation of CETRIS® boards to sheet metal profiles there is the self-tapping screw, CETRIS® 4.2 × 25 mm (this screw is threaded up to the head), or screws 4.2 × 35, 45, 55 mm (thread up to about 2/3 of the shank length). The most often used load-bearing constructions include zinc-coated CW and UW profiles. Horizontal UW profiles are anchored via sound absorbing inserts to the ceiling (floor) construction. Vertical CW profiles are inserted in the UW profiles, about 15 mm short of the room height. The CETRIS® board for wall cladding is only fixed to the vertical profiles (stands – CW). When anchoring to sheet metal profiles the screw should protrude by at least 10 mm through the thickness of the board. It is recommended to pre-drill the CETRIS® board. At the contact point – of the vertical joint and the vertical CW profile – first anchor the CETRIS® board closer to the stand of the CW profile. In the case of the opposite procedure (anchoring to the soft part of the CW profile) there is the risk of deformation of the profile and subsequently the cladding!



CETRIS self-tapping screw to sheet metal

**A) Specification of resistance to the screw pulling out perpendicularly to the board plane:**

Test method: ČSN EN 320  
 Screw type: CETRIS 4,2 x 35 mm  
 (pre-drilled hole in the board with a diameter of 3.5 mm)



Board thickness d	Resistance
8 mm	597 N
10 mm	788 N
12 mm	1305 N

**Interior wall – no fire resistance requirement (or exterior cladding under contact thermal insulation systems)**

Board thickness (mm)	Screw spacing a (mm)	Beam spacing b (mm)	Distance of screws from vertical edge $c_1$ (mm)	Distance of screws from horizontal edge $c_2$ (mm)
8	< 200	< 420	> 25 < 50	> 50 < 100
10	< 250	< 500		
12, 14	< 250	< 625		
16, 18, 20	< 300	< 670		
22, 24, 26, 28, 30	< 350			
32, 34, 36, 38, 40	< 400			

**Interior ceiling – no fire resistance requirement (or exterior cladding under contact thermal insulation systems)**

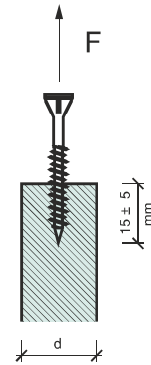
Board thickness (mm)	Screw spacing a (mm)	Beam spacing b (mm)	Distance of screws from vertical edge $c_1$ (mm)	Distance of screws from horizontal edge $c_2$ (mm)
8	< 200	< 420	> 25 < 50	> 50 < 100
10	< 250	< 500		
12	< 300	< 625		

**Interior ceiling – with fire resistance requirement (or exterior cladding under thermal insulation systems)**

Board thickness (mm)	Screw spacing a (mm)	Beam spacing b (mm)	Distance of screws from vertical edge $c_1$ (mm)	Distance of screws from horizontal edge $c_2$ (mm)
12	< 200	< 420	> 25 < 50	> 50 < 100

**B) Specification of resistance to the screw pulling out parallel to the board plane:**

Test method: ČSN EN 320  
 Screw type: CETRIS 4,2 x 35 mm  
 (pre-drilled hole in the board with a diameter of 3.5 mm)

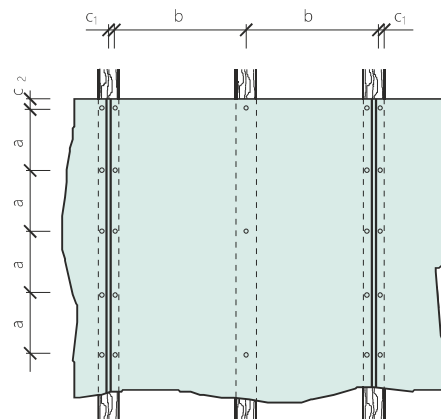


Board thickness d	Resistance
22 mm	1039 N

Note: informative values.

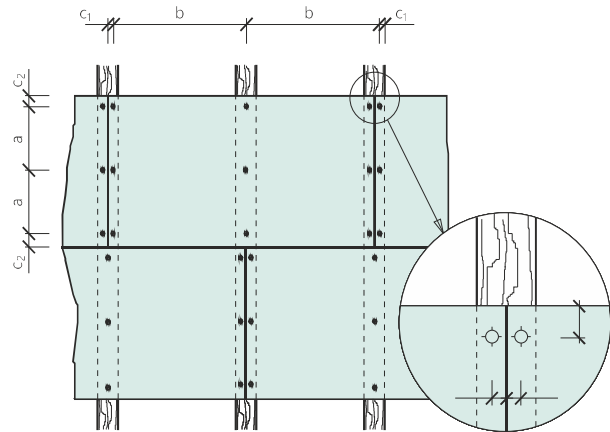
**Interior wall – with fire resistance requirement (or exterior cladding under thermal insulation systems)**

Board thickness (mm)	Screw spacing a (mm)	Beam spacing b (mm)	Distance of screws from vertical edge $c_1$ (mm)	Distance of screws from horizontal edge $c_2$ (mm)
10, 12, 14, 16, 18	< 200	< 625	> 25 < 50	> 50 < 100



**Flooring constructions – for details, see Chapters 6.6 and 6.7**

Board thickness (mm)	Screw spacing a (mm)	Beam spacing b (mm)	Distance of screws from vertical edge $c_1$ (mm)	Distance of screws from horizontal edge $c_2$ (mm)
12 (ZOCET, POLYCET floating floors)	Upper layer pre-drilled, max. 300 mm		>25 <50	50
16,18,20,22,24 CETRIS PD (PDB)	< 300	Pursuant to load tables		
26,28,30,32,34, 36,38 CETRIS PD (PDB)	< 400			



### 4.1.3 Stapling

Pneumatic staplers are used for fixation of the cement bonded particleboards (static load-bearing and non-load-bearing) to a wooden base (beam, column, KV prism, and the like). Various models are available according to the type and thickness of the board. The models differ in the type of staple used (wire diameter) and size of the body for higher impact force.

Staple types KG 700 CNK geh / DIN 1052 /, wire diameter 1.53 mm  
 KG 700 CDNK geh, for joint / board on board /  
 KG 745 CNK geh for board of max. th. 10 mm to wood.  
 KG 722 CDNK geh for joining of the board to a board of thickness 12x12 mm.  
 KG 718 CDNK geh for joining of the board to a board of thickness 10x12 mm.  
 Recommended staplers: PN 755 XI/Kontakt, PN 755 XI/Automat

- staple length up to 55 mm
- the Automat version has a rate of up to 300 staples /min

### 4.1.4 Nailing

Nailing may be used to anchor CETRIS® cement bonded particleboards of thickness 8 - 22 mm. Recommended board nailing principles:

- nail diameter  $d_n = 2,1-2,5$  mm.
- minimum nail length = board thickness + 30 mm (min)
- nails must not be embedded lower than 2 mm.

HD 7900 CNK geh /DIN 1052/, wire diameter 1.83 mm  
 SD 9100 CNK geh /DIN 1052/, wire diameter 2.00 mm  
 Stapler PN 9180 XII/ Kontakt

- staple length up to 75(80) mm
- model XII with high impact force

Recommended board stapling principles

- minimum staple distance from board edge 20 mm
- minimum staple spacing 30 mm (36 mm for the HD7900 staples and SD9100), max. 75 mm (around the perimeter), max. 150 mm inside the board area
- staples obliquely to the board edge, at least under an angle of 30°

Recommended staple length (HD 7900 CNK geh, SD 9100 CNK geh)						
Board thickness (mm)	12	14	16	18	20	22
Staple length (mm)	45	50	60	70	70	70

- nailer types Duo Fast CNP 50.1, CNP 65.1, Haubold RNC 50M, RNC 65 S/WII, recommended working pressure 6 - 8 bar (max. 8 bar).
- minimum nail spacing in boards on a wooden base, the minimum nail spacing from the non-stressed edge of the board is 5.  $d_n$ , the minimum nail spacing from the stressed edge of the board is 7.  $d_n$ .
- the mutual spacing of the nails in the boards is minimum 20.  $d_n$ , maximum 75 mm (edge support), 150 mm (inner reinforcements).



## 5.4 Exterior Plasters

Application of plasters is surface finishing with an invisible joint. The CETRIS® boards continuously expand and shrink as a result of humidity dilatation movements. To prevent damage of the façade plaster by hair-thin cracks caused by these movements, it is necessary to cover the CETRIS® board with an insulation board (polystyrene, mineral wool) with the minimum thickness of 30 mm. When using a CETRIS® cement bonded particleboard of max. format 1,250 x 1,250 mm, an insulation board thickness of 20 mm suffices. The insulation will create a separation layer to which other layers are applied, like in the case of the contact thermal insulating systems – filling compound, bandage, noble plaster. The CETRIS® boards must be treated with a penetration agent, the joints need not be filled in this case. Polystyrene and mineral wool are glued with cement glue or low-expansion foam to cover the joints between the CETRIS® cement bonded particleboards.

Mechanical anchoring of insulation boards to CETRIS® boards is implemented with disc dowels (self-tapping screw with disc head of high-quality polyethylene). The number of anchoring elements are specified by the manufacturers of the insulation boards, or the manufacturer of the discs shall be minimum 4 pieces/m<sup>2</sup>

Recommended products for anchoring the insulation:

- EJOT SBH-T 65/25, screw diameter 4.8 mm, anchoring length 20–40 mm. Used in combination with the self-tapping screws EJOT® Climadur-Dabo SW 8 R.
- Subsequently a trowel-on coating is applied on the full surface and the glass-fibre bandaging material is embedded in it. After the smoothing layer, the filling compound is re-applied and is followed by the final finish.

- 1 CETRIS® cement bonded particleboard
- 2 primer
- 3 insulation board
- 4 filling compound
- 5 bandage fabric
- 6 priming
- 7 plaster
- 8 dilatation joint

