# 7.2 CETRIS® Board Guardrail Panels, Terraces,Loggia, Balconies

For its high resistance to weather, fire and mechanical damage, the CETRIS® cement bonded particleboard is used as a cladding element for exterior applications. Apart from building cladding, the CETRIS® board can also be used as a panels of railings, staircases, balconies, terraces, loggias, etc.

To prevent injuries or material damage in the case of disintegration of these constructions, these thin walled and light constructions must be impact tested.

Security and usability of infill railings on balconies, terraces, and loggias is assessed according to the standard ČSN 74 3305 Guardrails. A critical examination verifies the reliability of the railings on the effects of impact load. In this test, the railing must resist the soft impact with energy impact according to the table.

This impact test is used to demonstrate the safety of railings against impact of a person. The test sample, which corresponds to the real execution of the railing, is exposed to the impact of the specimen with the desired incident energy, perpendicularly to the surface of the railing. The soft impact represents a bag filled with small glass balls of 3 mm diameter and the total weight of 50 kg.

The point of impact is directed to the places with the least resistance of the railing – mostly in the middle of the railing. After the impact the state of panel is assessed – among others, the impact must not create a hole through which a ball with a diameter of 76 mm can pass, or create a crack up to the edges of the panel.

| Utilisation category of the area according to EN1991-1-1 | Determination of use | Impact energy value (J) |
|---|---|---|
| A | Residential areas and areas for domestic activities | Min. 150 |
| B, C, D, E | Office areas<br>Areas where people may gather<br>Business areas | Min. 250 |

## Recommended and tested variants of solutions of CETRIS® board railing panels

1) CETRIS® board panel of thickness 14 mm fixed mechanically to the frame with screws or rivets.

In this variant, the panel – CETRIS® board of minimum thickness 14 mm – is fixed to the load-bearing construction with screws or rivets. The load-bearing frame is made of steel profiles 40 × 40 × 4 mm, maximum distance of vertical supports is 625 mm.

This mode of installation is subject to the same principles as apply to façade cladding. Due to thermal expansion of metal and contraction of CETRIS® boards caused by changes in humidity, we distinguish two principles for installation of CETRIS® boards according to the maximum length of the size used.

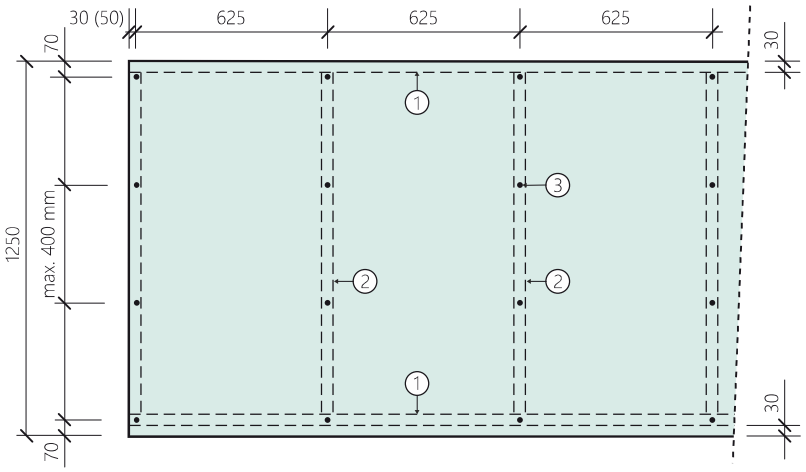
Length up to 1,670 mm:

- the boards are installed with a minimum gap of 5 mm
- the CETRIS® board has pre-drilled holes that are 5 mm larger than the diameter of the screw/bolt/rivet used whereby one of the pre-drilled holes (mostly at centre) always has the same diameter as the screw/bolt/rivet used and this is the, so-called, fixed point. Its position is chosen according to the size and orientation of the board
- screws with washers and sealing rubbers are used for anchoring – the recommended type is SFS SX 3/20 - 5.5 × 50 mm (clamping thickness 20 mm) or rivets – recommended types: ETANCO open Al/stainless steel rivet 4.8 × 24 mm (clamping length 20 mm), SFS AP 16-50210-S 5 × 21 mm (clamping thickness 18 mm)
- the position of the edge screw / rivet from the vertical edge is in the range 30 - 50 mm, and from the horizontal edge 70 - 100 mm, the maximum distance of the screws in the vertical direction of the supports is 400 mm.

Length over 1,670 mm:

- the boards are installed with a minimum gap of 10 mm
- the CETRIS® board has pre-drilled holes that are 7 mm larger than the diameter of the screw/bolt/rivet used whereby one of the pre-drilled holes (mostly at centre) always has the same diameter as the screw/bolt/rivet used and this is the, so-called, fixed point. Its position is chosen according to the size and orientation of the board
- screws with washers and sealing rubbers are used for anchoring – the recommended type is SFS SX 3/20 - 5.5 × 50 mm (clamping thickness 20 mm) or rivets – recommended types: ETANCO open Al/stainless steel rivet 4.8 × 24 mm (clamping length 20 mm), SFS AP 16-50210-S 5 × 21 mm (clamping thickness 18 mm)
- the position of the edge screw / rivet from the vertical edge is in the range 50 - 70 mm, and from the horizontal edge 70 - 100 mm, the maximum distance of the screws in the vertical direction of the supports is 400 mm. In cases where there is no possibility to comply with the required minimal edge distance, it is possible to glue the entire vertical edge of CETRIS® board to a vertical support (e.g. DenBraven Mamut Glue High Tack).

**Load-bearing construction and mechanical anchoring of railing fill – CETRIS® board 14 mm**



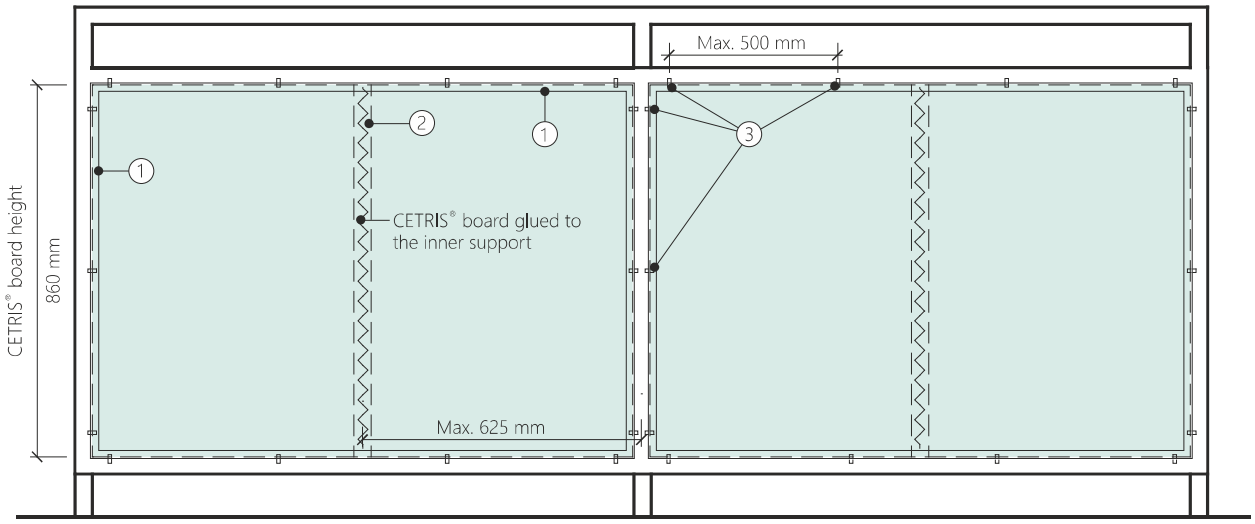

*1 Horizontal profile (axial distance max 1250 mm)*
*2 Vertical profile (axial distance max 625 mm)*
*3 Screw with washer and sealing rubber*

2) CETRIS® board panel of thickness 16 mm (or 10 mm) – fixed in the peripheral lath and glued to the inner braces

CETRIS® board, used for railing panel, is inserted in a F-shaped lath with edge dilation 3 – 5 mm. The adjusted board is installed in the peripheral frame with vertical braces. The F lath is riveted to the frame along the perimeter (maximum spacing 500 mm); it is fixed to the inner vertical brace of the CETRIS® board with DenBraven Mamut Glue High Tack glue. No anchoring element is visible from the visible side.

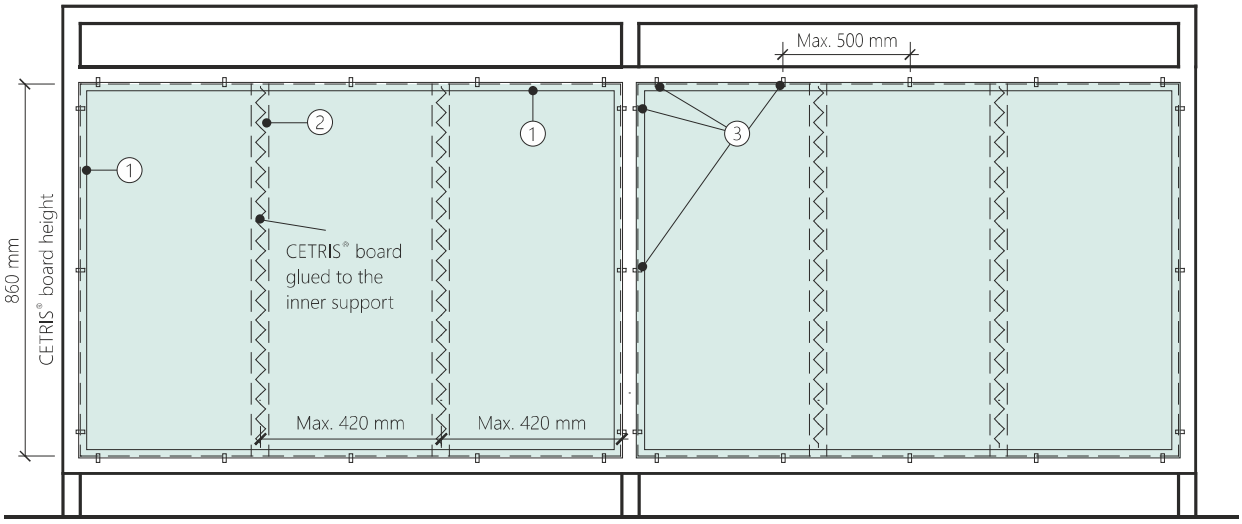
When using a CETRIS® board of thickness 16 mm, the maximum available spacing of the inner vertical reinforcements is 625 mm. A suitable type of the peripheral lath is the F profile PROAL 74009.

*1 Aluminium F-profile PROAL 74009 – for board thickness 16 mm)*
*2 Vertical brace 40×25×4 mm*
*3 Rivets – joining of the F-profile to the frame*



When using a CETRIS® board of thickness 10 mm, the maximum possible spacing of the inner vertical reinforcements is 420 mm. A suitable type of the peripheral lath is the F profile PROAL 74008.

*1 Aluminium F-profile PROAL 74008 – for board thickness 10 mm*
*2 Vertical brace 40×25×4 mm*
*3 Rivets – joining of the F-profile with the frame*




250 J All these variants have been successfully certified for higher impact energy – i.e. 250 J, they are therefore suitable for all application classes.

# 7.3 Suspended Ceilings - Cladding of Roof Overhangs using CETRIS® Boards

CETRIS® cement bonded particleboards are also widely used for horizontal or oblique cladding of roof construction overlaps. The conditions for anchoring of the boards and their types differ for various environments and appearances.

Board type selection

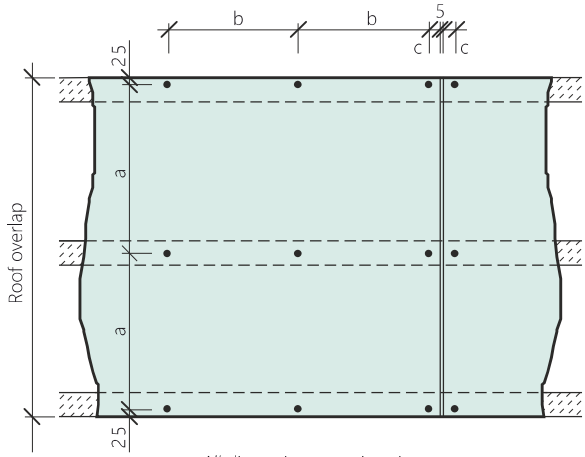
Cladding of the exterior of constructions may be done using basic CETRIS® BASIC, PROFIL, INCOL boards without surface treatment whose surfaces can be treated prior to installation, or some CETRIS® boards with surface treatment– FINISH, PROFIL FINISH, LASUR, PROFIL LASUR, DEKOR boards. The basic CETRIS® BASIC board or the CETRIS® PLUS board with acrylic primer is used for cladding constructions in the interior and exterior under the contact thermal insulation system.

Type of support

- Single-direction wooden lath grid with a minimum width of 50 mm. If the lath lies at the joint of two boards, its minimum width must be at least 80 mm, or two laths of width 50 mm must be used side by side)
- CD galvanised profiles. If the profile lies at the joint of two boards, then two profiles must be used side by side

Choice of board thickness, distance of the supports

These two parameters are mutually related, the same principles apply to the cladding and the façade system, only the maximum distance of the screws is reduced to 1/2 the support span due to the horizontal position. Due to the weight of the cladding boards, CETRIS® boards with thicknesses of 8-10-12 mm may be used.




*All dimensions are given in mm.*