

8.2 Vertical Wall Constructions

8.2.1 Scope of Application

According to the background information provided here, the CETRIS® boards can be applied in the following types of vertical wall constructions:

- Non-load-bearing walls and partitions up to a height of 9.50 metres and a fire resistance in the range EI 15 – EI 180 minutes, with and without mineral filling (with an air gap).
- Shaft or separate advanced wall – with one-sided cladding of a wall construction with a fire resistance of EI 15 – EI 45.
- Wall on a wooden framework – as a load-bearing wall with a maximum height of 3 metres, and as non-load-bearing (filling) walls with a maximum height of 4 metres.

As stated in the protocols it is also necessary to comply with the technology of the wall assembly and all assembly procedures used and tested in the context of preparation of the samples. This means that the proposed connecting elements, their spacing and layout on the construction and other details are binding and must be complied with for the above attests to be applicable. In addition this variant solutions are recommended for applications and elements which cannot be tested because of the methodologies used or the spatial arrangement of the kilns. These solutions have also been professionally assessed and tested by expert assessments of PAVUS Praha or Fires Batizovce.

Important notice: The results of fire resistance tests and the tables following from them only assess the issue of the technical properties of the constructions in relation to their resistance to actual fire. For this reason, the axial distances and types of CW profiles / wooden pillars, which comply with the tests are stated. It is however necessary to consider them as the absolute minimum limit values. It is necessary to emphatically draw attention to the fact that when dimensioning the firewalls, the structural static requirements must also be assessed according to the real stress.

Assembly of fire constructions may only be carried out by trained staff – see Chap. 8.8. Training of assembly companies for CETRIS® board applications.

Description of the construction

The vertical fire partitions – walls and partition walls – with CETRIS® cement-bonded particleboard cladding can be designed on the basis of the fire resistance tests and extended applications of their results through theoretical calculations in several basic variants with different values of fire resistance pursuant to the following table.

Survey of wall constructions

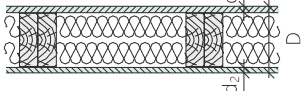
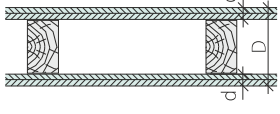
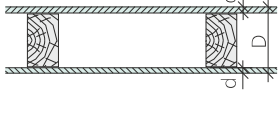
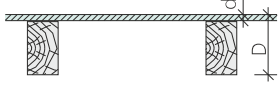
See table on the next page.



Type / Marking	Scheme	Size			Weight (kg/m ²)	Max. wall height (m)	Mineral wool		Fire Resistance	Thermal resistance (m ² K/W ^f)	Weighted sound transmission loss (dB)
		a (mm)	d (mm)	D (mm)			Thickness (mm)	Density (kg/m ³)			
WS 01		75	16	107	45	4,50			EI 30	0,15	44
WS 02		75	12	99	38	3,60	60	50	EI 45	1,61	52
		100		124		4,00			EI 45		
		2x75		174		7,80			EI 15		
WS 03		75	10+10	115	56	4,00			EI 45	0,19	-
WS 04		75	16	107	49	3,60	60	75	EI 60	1,65	
		100		132		4,00					
WS 05		75	12+12	123	67	4,00			EI 60	0,23	50
						5,50			EI 45		
						7,30			EI 30		
WS 06		75	12+12	123	72	4,00	60	75	EI 90	1,73	56
WS 07		75	16+18	143	95	4,00			EI 90	0,32	
WS 08		75	16+18	143	95	4,00	60	75	EI 120	1,80	
WS 09		2x75	18+12+12	234	118	4,00			EI 120	0,40	
WS 10		2x75	18+12+12	234	122	4,90	60	75	EI 180	1,90	61
						6,40			EI 120		
						9,50			EI 90		
WS 11		75	16	91	22	4,00			EI 15 ^b)	0,08	
WS 12		75	12+12	99	34	4,00			EI 30 ^b)	0,11	
WS 13		75	16+16	107	48	4,00	60	50	EI 45 ^b)	1,67	

Supplementary classification according to ČSN 73 0810: 2010 – all walls with steel load-bearing structures with DP 1 classification.

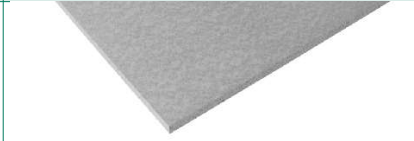
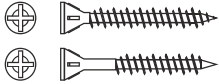
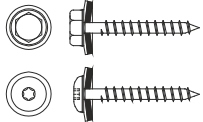
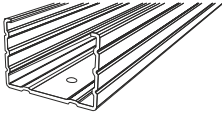
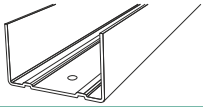



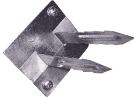
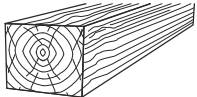






Type / Marking	Scheme	Size			Weight (kg/m ²)	Max. wall height (m)	Mineral wool		Fire Resistance	Thermal resistance (m ² K/W ¹)	Weighted sound transmission loss (dB)
		Supporting structure	d (mm)	D (mm)			Thickness (mm)	Density (kg/m ³)			
WW 01		wooden lath 120x100 mm axially 625 mm	d ₁ =14 CETRIS® BASIC d ₂ =12,5 Knauf RED	146,5	43	3,00	120	40	REI / REW 60 DP3	0,08	
						3,00			REI / REW 15 DP2		
						4,00			EI 60 DP3		
WW 02			12+12	148	74	3,00			REI 60 DP3	0,32	
						3,00			REI 45 DP2		
						4,00			EI 60 DP3		
WW 03		wooden lath 100x60 mm axially 625 mm	14	128	45	3,00			REI 30 DP3	0,15	
						3,00			REI 15 DP2		
						4,00			EI 30 DP3		
WW 04			14	114	27	3,00			REI 15 DP2	0,08	
						4,00			EI 15 DP2		

Notes to the table:

- 1) Informative thermal resistance value
- 2) Fire resistance value for exposition to fire on the CETRIS® board (full cladding) side as well as on the profile (hollow) side
- 3) The fire resistance value applies only to the fire stress on the CETRIS® boards

Materials for assembly of the firewall constructions – specifications

Description	Visualisation	Note
CETRIS® BASIC board Cement bonded particleboard, smooth surface, cement grey. Basic format 1,250x3,350 mm. Volume mass 1320±70 kgm ⁻³		Thickness according to the fire resistance requirements
Screw 4.2x25, 35, 45, 55 mm Counter-sunk, self-tapping screws		Screw type according to the thickness of cladding and type of load-bearing construction. Anchoring in the interior, or exterior under the warm cladding system (ETICS)
Screw 4.2 – 4.8 x 38, 45, 55 mm Stainless steel or galvanised screws with half-round or hex head with thrust water-tight washer		Screw type according to the thickness of the cladding and type of load-bearing construction. Anchoring on the exterior – it is necessary to pre-drill the board (hole diameter 8(10) mm)
CW profile 75, 100 (vertical) Galvanised sheet metal profile 75x50x0.6 mm 100x50x0.6 mm		Dimensions according to the fire resistance and wall height requirements. Alternatively, it is possible to use steel profiles with a cross-section area that minimally equivalent to the CW profiles.
UW profile 75, 100 (horizontal) Galvanised sheet metal profile 75x40x0.6 mm 100x40x0.6 mm		
Steel dowels For profile anchoring to masonry (concrete) walls		Dimensions (diameter and length) by weight of structure, type of substrate and anchored material
Fireproof sealant White matter for filling the joints and looping the screw heads		DEXAFLAMM-R putty (manufactured by Tora Spytihněv), or fire-resistant DenBraven (acrylic, silicone) putty
Heat-insulation Mineral or rock wool (Isover, Rock wool, Knauf Insulation ...)		It is necessary to keep the thickness and volume mass according to the specification in the composition. Reaction to fire class A1
Adhesive pins		For stabilisation of position of the insulation boards in the frame construction.
Wooden post Spruce timber of minimum class SII, max. Humidity 18%.		Alternatively glued timber may be used; cross-section according to the specifications in the composition
FIBERFRAX Durafelt Aluminium-silicon fibre mats/paper		For profile lining on the bottom side, interruption of thermal bridges, as insulation for temperatures up to 1,260° C
KNAUF GKF / RED board KNAUF plasterboard of thickness 12.5 mm. Basic size 1,250 × 2,000 (2,500) mm		Processing, anchoring, filler applications, surface finish of boards pursuant to the instructions of KNAUF Praha spol. s r.o.
KNAUF Uniflott Plasterboard joint filler.		Cannot be used for CETRIS® board joint filling!!!
Screw TN 35 Quick screw (4.0 × 35 mm) for plasterboard anchoring		Cannot be used for CETRIS® board anchoring!!!

8.2.2 Fire Partitions, Shaft Wall on Steel Framework

8.2.2.1 Load-bearing Construction

The load-bearing construction is a frame consisting of steel zinc-coated profiles CW (vertical posts) and UW (horizontal profiles). For specification of the CW profile dimension in relation to the height and total thickness of the wall, the ratio of the wall height h_s and thickness d should always be lower than 40. The $h_s/d > 40$ ratio represents slenderness ratio L/i circa 140.

The peripheral profiles are anchored into the frame (masonry) with steel dowels with a spacing of 625 mm, the joint between the profiles and the masonry is filled with fire-resistant filler. The axial distance of the vertical interior profiles does not exceed 625 mm.

8.2.2.2 Construction Composition

The construction is symmetrically or asymmetrically cladded on one or both sides with one or more layers of CETRIS® cement bonded particleboards. The thickness and the number of the CETRIS® boards, and the mineral wool insertion represent the decisive elements of fire resistance (see the dimension tables for the particular specified construction types). The horizontal displacement of the boards is min. 400 mm.

For multi-layer cladding, the gaps between the boards mutually overlap – in the vertical direction by the profile (625 mm), in the horizontal direction min. 400 mm.

For CETRIS® board anchoring to the sheet metal profiles self-tapping screws with sunken heads are used; the screw heads are equipped with blades for countersinking in the board and the screw size is 4.2 × 25 or 35, 45, 55 mm. The screw length must always be at least 10 mm longer than the thickness of the screwed board (in the case of multilayer coating at least 10 mm longer than the total thickness of all anchored layers). In the exterior (the boards form a visible cladding) anchoring must be done via the pre-drilled holes using the screws with a visible head and water-tight washer. Gaps of minimum width 5 mm are left between the boards. The joint fill, the wall perimeter filling and coverage of the screw heads is done using fire-resistant filler.

Dimensions of partition walls with heights up to 4 m (a steel framework of CW profiles, two-sided, clad with one- or a multi-layer coat of CETRIS® boards with or without interior heat insulation on mineral/rock wool basis)



Fire Resistance	Structure of the double-sided cladding made of CETRIS® boards						
	with an air gap			with thermal insulation (mineral or rock wool with resistance to fire class A1)			
	Cladding	Min. air gap thickness	Cladding	Cladding	Insulation thickness	Density	Cladding
EI 30	16	50	16	-	-	-	-
EI 45	10+10	50	10+10	12	60	50	12
EI 60	12+12	50	12+12	16	60	75	16
EI 90	18+16	50	18+16	12+12	60	75	12+12
EI 120	18+12+12	50	18+12+12	16+16	60	75	16+16
EI 180	-	-	-	18+12+12	60	75	18+12+12



Sizes of partition walls taller than 4 m

(a steel framework of CW profiles, two-sided, clad with one-or a multi-layer coat of CETRIS® boards with or without interior heat insulation on mineral/rock wool basis)

Fire resistance ¹⁾	Structure of the double-sided cladding made of CETRIS® boards				Maximum height (m)
	Cladding	Insulation thickness ²⁾	Density	Cladding	
EI 15	12	60	50	12	7,8
EI 30 ²⁴⁾⁵⁾	16	-	-	16	4,5
EI 30 ²⁴⁾	12+12	-	-	12+12	7,3
EI 45 ²⁴⁾	12+12	-	-	12+12	5,5
EI 90	18+12+12	60	75	18+12+12	9,5
EI 120					6,4
EI 180					4,9

Supplementary classification according to ČSN 73 0810: 2010 – all walls with steel load-bearing structures with DP 1 classification.

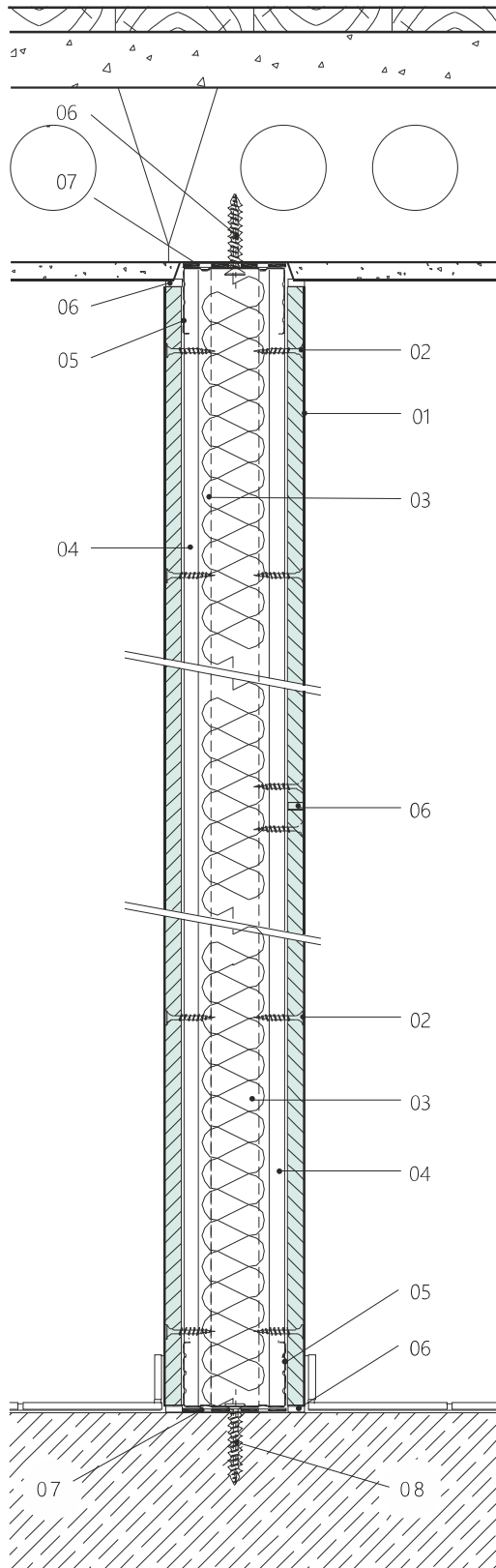
Notes to the table:

- 1) Classification of limit conditions of fire resistance is performed pursuant to EOTA TR 35
- 2) The air gap width is 75 mm
- 3) Mineral or rock wool insulation (e.g. Isover, Rock wool Knauf Insulation ...) with a prescribed density and thickness, reaction to fire class of min. A2. If we are not filling the entire joint, it is necessary to secure the position of the insulation – e.g. with adhesive pins.
- 4) For partitions with a height above 4 m, it is necessary to consider a higher weight of the construction and the higher the stress in the steel cross-section, which causes a drop in the critical temperature of the steel. For this reason, in the case of higher partitions, the steel framework needs better protection – unless filled with mineral wool in the points of contact between the steel CW profiles and the boards, the coating needs to be padded with a strip of CETRIS® board with the minimum thickness of 12 mm for the strip to overlap the width of the CW profile at least by 60 mm on each side.
- 5) The upper base U profile must have a minimum height of 100 mm at the point of the CW post.



8.2.2.3 Model Construction Designs – Partition Walls – Details of a Wall with Single-layer Cladding

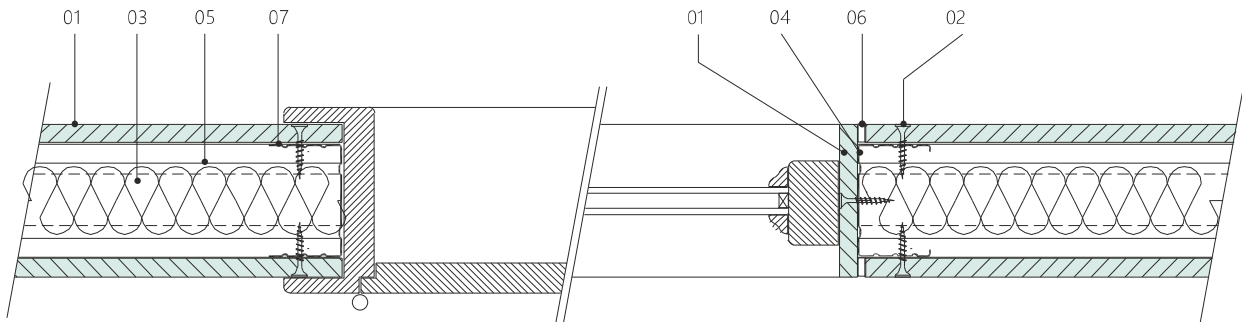
Vertical section



- 01 CETRIS® board
- 02 screw 4.2 × 35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile (steel beam I, U) – web
- 05 UW profile (steel beam I, U)
- 06 DEXAFLAMM-R filler
- 07 sealing of the profile underside (FIBERFRAX DURAFELT paper)
- 08 dowel

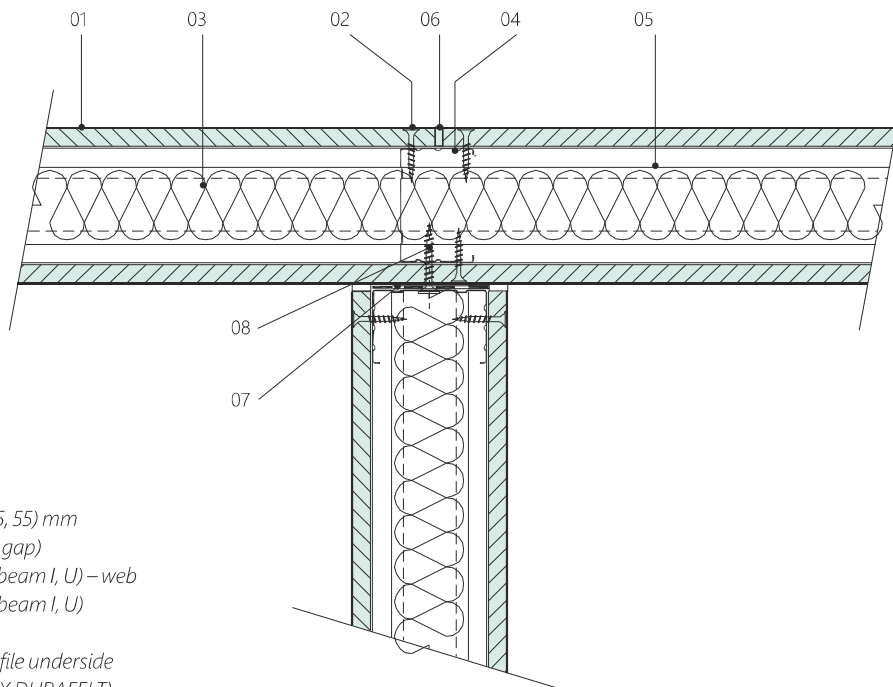


Hole in the wall - Horizontal section



- 01 CETRIS® board
- 02 screw 4,2 × 35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile (steel beam I, U) – web
- 05 UW profile (steel beam I, U)
- 06 fire resistant filler
- 07 UA profile

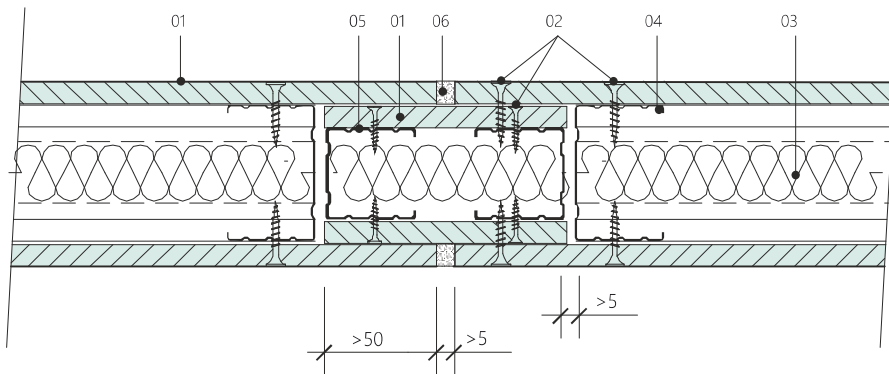
T-joint - Horizontal section



- 01 CETRIS® board
- 02 screw 4,2 × 35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile (steel beam I, U) – web
- 05 UW profile (steel beam I, U)
- 06 fire resistant filler
- 07 sealing of the profile underside
(paper FIBERFRAX DURAFELT)
- 08 dowel

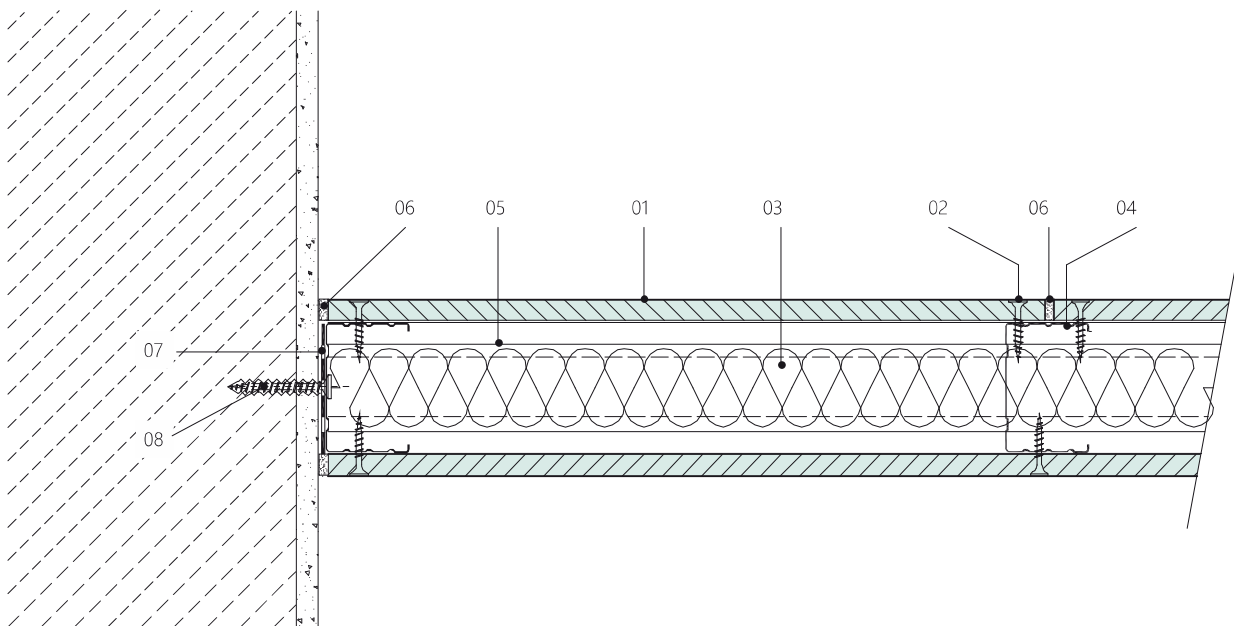


Joint detail – EI > 60 min - Horizontal section



- 01 CETRIS® board
- 02 screw 4.2 × 35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile 75
- 05 UW profile 50
- 06 fire resistant filler.

Connection at the wall - Horizontal section

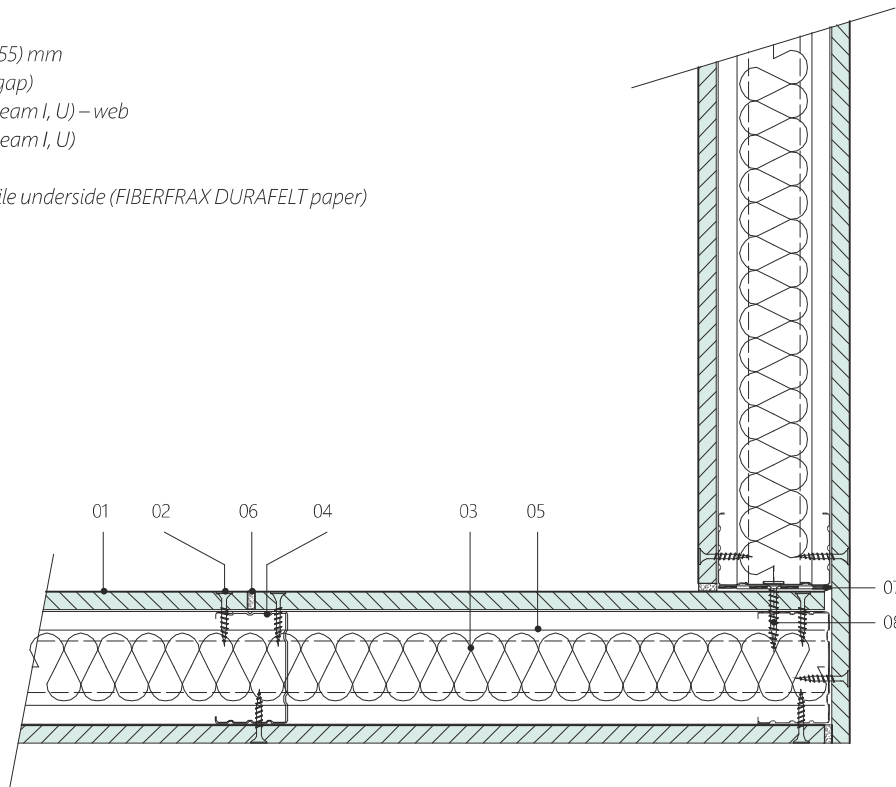


- 01 CETRIS® board
- 02 screw 4.2 × 35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile (steel beam I, U) – web
- 05 UW profile (steel beam I, U)
- 06 fire resistant filler
- 07 sealing of the profile underside (FIBERFRAX DURAFELT paper)
- 08 dowel



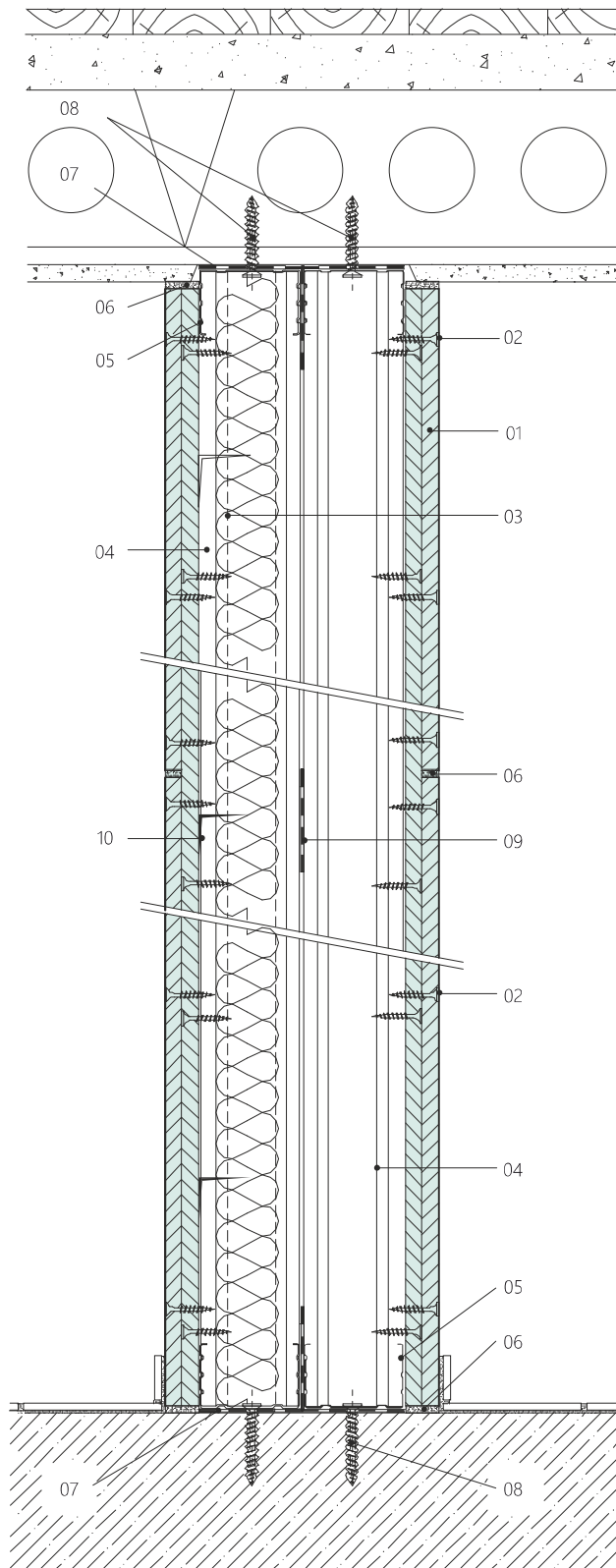
L-joint - Horizontal section

- 01 CETRIS® board
- 02 screw 4.2×35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile (steel beam I, U) – web
- 05 UW profile (steel beam I, U)
- 06 fire resistant filler
- 07 sealing of the profile underside (FIBERFRAX DURAFELT paper)
- 08 dowel



8.2.2.4 Model Construction Designs – Partition Walls – Details of a Wall with Multi-layer Cladding

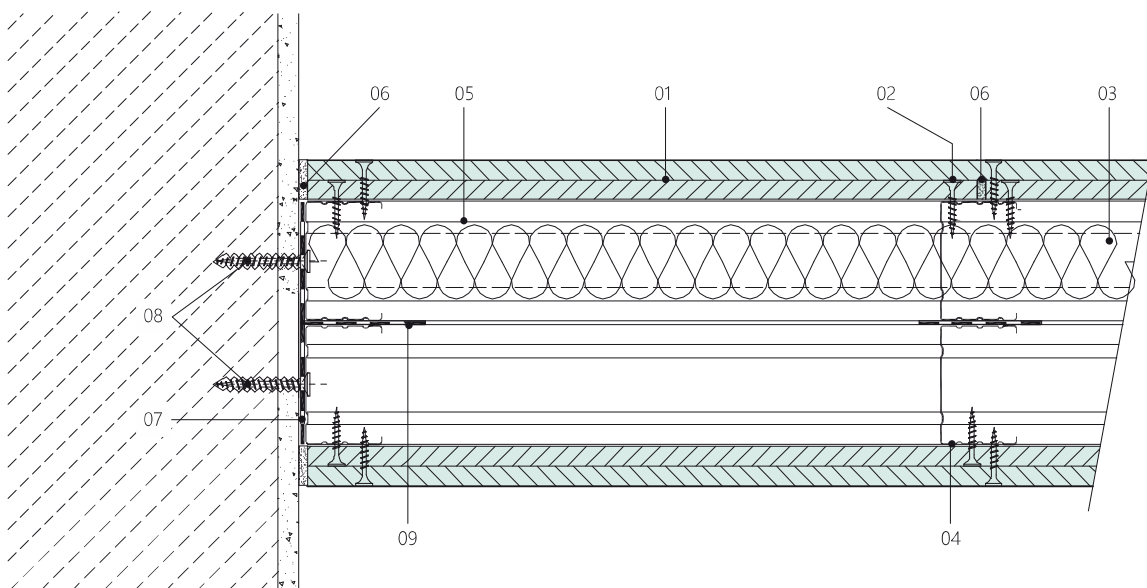
Vertical section



- 01 CETRIS® board
- 02 screw 4.2 × 35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile (steel beam I, U) – web
- 05 UW profile (steel beam I, U)
- 06 fire resistant filler
- 07 sealing of the profile underside (FIBERFRAX DURAFELT paper)
- 08 dowel
- 09 sealing tape
- 10 adhesive pins

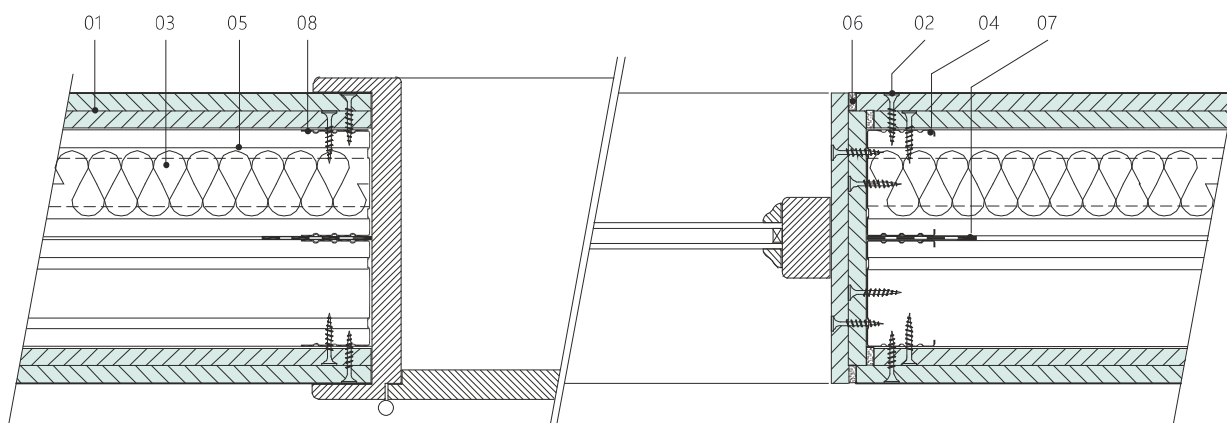


Connection at the wall Horizontal section



- 01 CETRIS® board
- 02 screw 4.2 × 35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile (steel beam I, U) – web
- 05 UW profile (steel beam I, U)
- 06 fire resistant filler
- 07 sealing of the profile underside (FIBERFRAX DURAFELT paper)
- 08 dowel
- 09 sealing tape

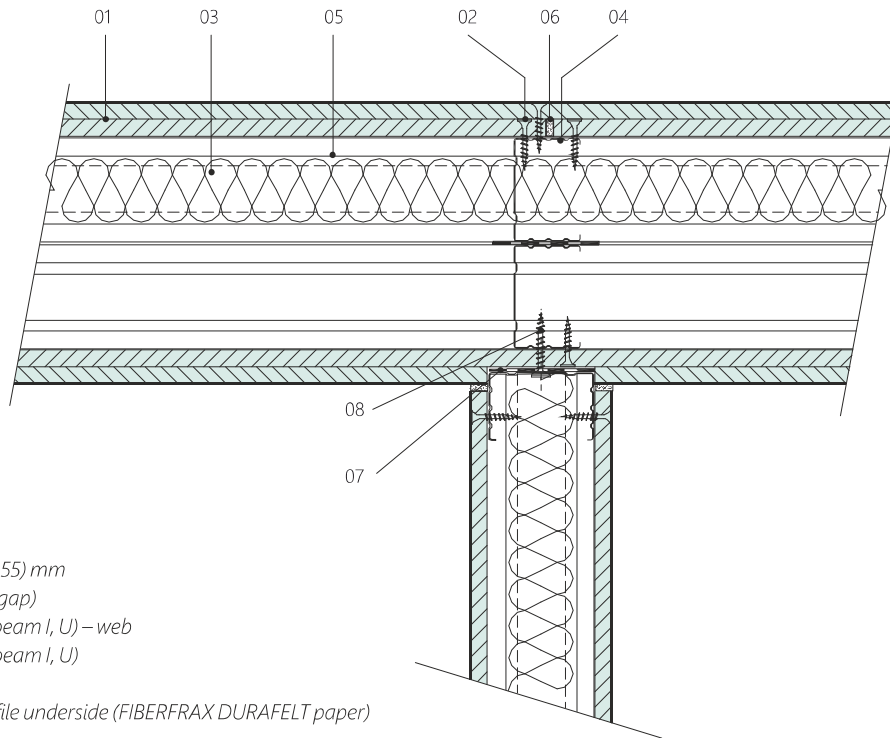
Hole in the wall Horizontal section



- 01 CETRIS® board
- 02 screw 4.2 × 35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile (steel beam I, U) – web
- 05 UW profile (steel beam I, U)
- 06 fire resistant filler
- 07 sealing tape
- 08 UA profile (opening jamb)



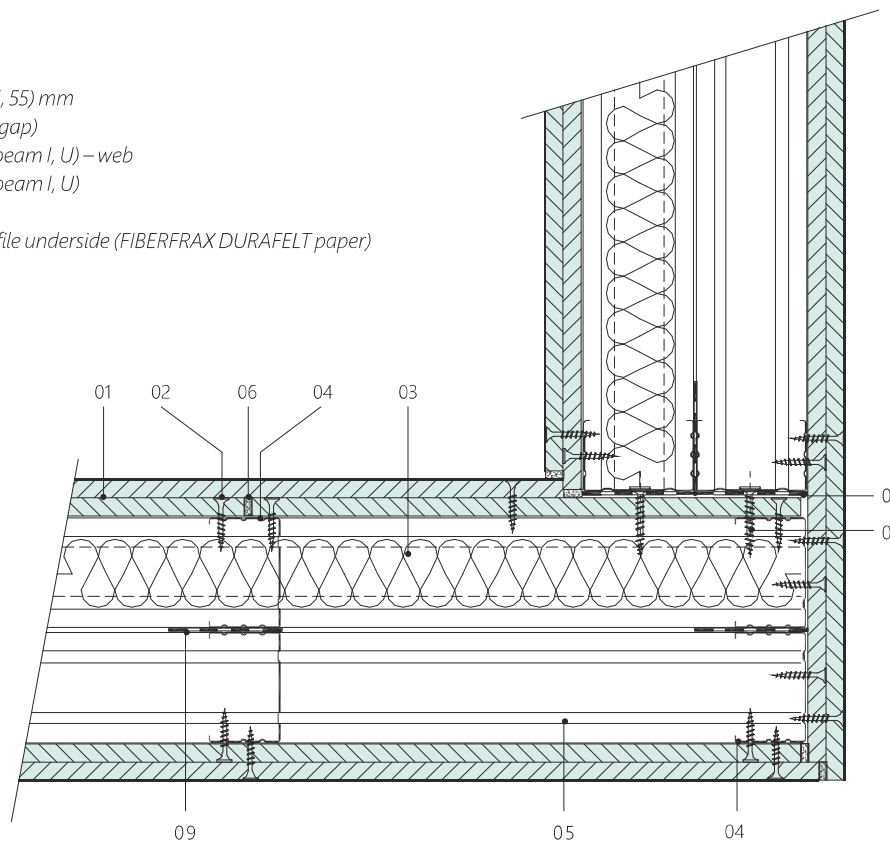
T-joint - Horizontal section



- 01 CETRIS® board
- 02 screw 4.2×35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile (steel beam I, U) – web
- 05 UW profile (steel beam I, U)
- 06 fire resistant filler
- 07 sealing of the profile underside (FIBERFRAX DURAFELT paper)
- 08 dowel

L-joint - Horizontal section

- 01 CETRIS® board
- 02 screw 4.2 × 35 (45, 55) mm
- 03 mineral wool (air gap)
- 04 CW profile (steel beam I, U) – web
- 05 UW profile (steel beam I, U)
- 06 fire resistant filler
- 07 sealing of the profile underside (FIBERFRAX DURAFELT paper)
- 08 dowel
- 09 sealing tape



8.2.3 Shaft (Advanced) Firewalls

Shaft (advanced) firewalls are wall constructions clad only with single-layer CETRIS® cement-bonded particleboards, which ensure the stipulated fire resistance.

They can be used as separate shaft walls as well as advanced walls - to increase the fire resistance of the existing constructions. In this case, it is not required for the existing constructions to exhibit any fire resistance. The maximum separate height of these constructions is 4 m. In the case of cladding of lift shafts in multi-storey buildings, use at a higher height is conditional:

- the load-bearing constructions of the cladding are anchored to the load-bearing wall of the building, or other load-bearing constructions with a maximum spacing of 4,000 mm using steel dowels,
- the load-bearing construction to which the shaft wall is fixed must have a fire resistance that is higher than that of the shaft wall itself,
- all the joints (also between the lift shaft and the load-bearing construction) must be filled fire-resistant filler.

The mechanical requirements of the lift shaft cladding are described in ČSN EN 81-20 Safety rules for the construction and installation of lifts – Lifts for the transport of persons and goods – Part 20: Passenger and goods lifts. For safe operation of the lift, the shaft wall must have such a mechanical strength that withstands the action of 1,000 N (100 kg) perpendicular to the wall from one or the other side at an arbitrary point, proportionately to the circular or square area of 300 x 300 mm:

- without permanent deformation
- with elastic deformation up to 15 mm.

This parameter was verified by the Strojirenský a zkušební ústav Brno. The CETRIS® cement bonded particleboard of thickness 12 mm in one layer anchored to the frame construction was chosen.

During the repeated test, neither permanent deformation occurred nor was the prescribed elastic deformation limit exceeded.

Overview of shaft (advanced) firewalls

Fire resistance	One-sided cladding with CETRIS® boards	Insulation thickness	Density	Fire stress
EI 15	16	-	-	only on the cladding side – CETRIS® boards
EI 30	12+12	-	-	on the cladding side – CETRIS® boards also on the side of the gap (profiles)
EI 45	16+16	60	50	only on the cladding side – CETRIS® boards

Supplementary classification according to ČSN 73 0810: 2010 – DP1.

8.2.3.1 Load-bearing Construction of Advanced Walls

The load-bearing construction is a frame consisting of steel zinc-coated CW profiles CW 75 x 50 x 0.6 mm. The peripheral profiles are anchored into the existing masonry construction with steel dowels with a spacing of 625 mm, the joint between the profiles and the masonry is filled with fire-resistant filler. The axial distance of the vertical profiles does not exceed 625 mm.

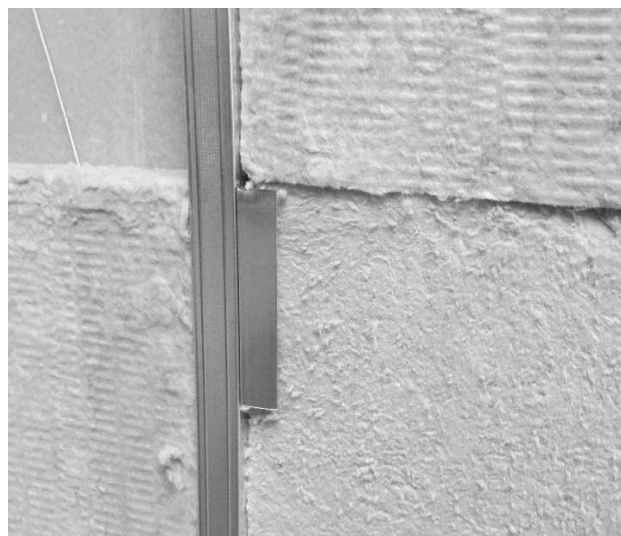
8.2.3.2 Construction Composition

The shaft (advanced) wall has one-sided cladding with one or more layers of CETRIS® cement bonded particleboards with the option to insert thermal insulation between the vertical profiles. The horizontal overlap of the boards is min. 400 mm. For multi-layer cladding, the gaps between the boards mutually overlap – in the vertical direction by the profile (625 mm), in the horizontal direction min. 400 mm. In the case of the composition with a fire resistance of EI 45 (cladding with two layers of CETRIS® cement bonded particleboards of thickness 16 mm), it is necessary:

- mineral wool (of thickness 60 mm, minimum weight 50 kg/m³) and secure it against failure of the UW steel profiles of approximate

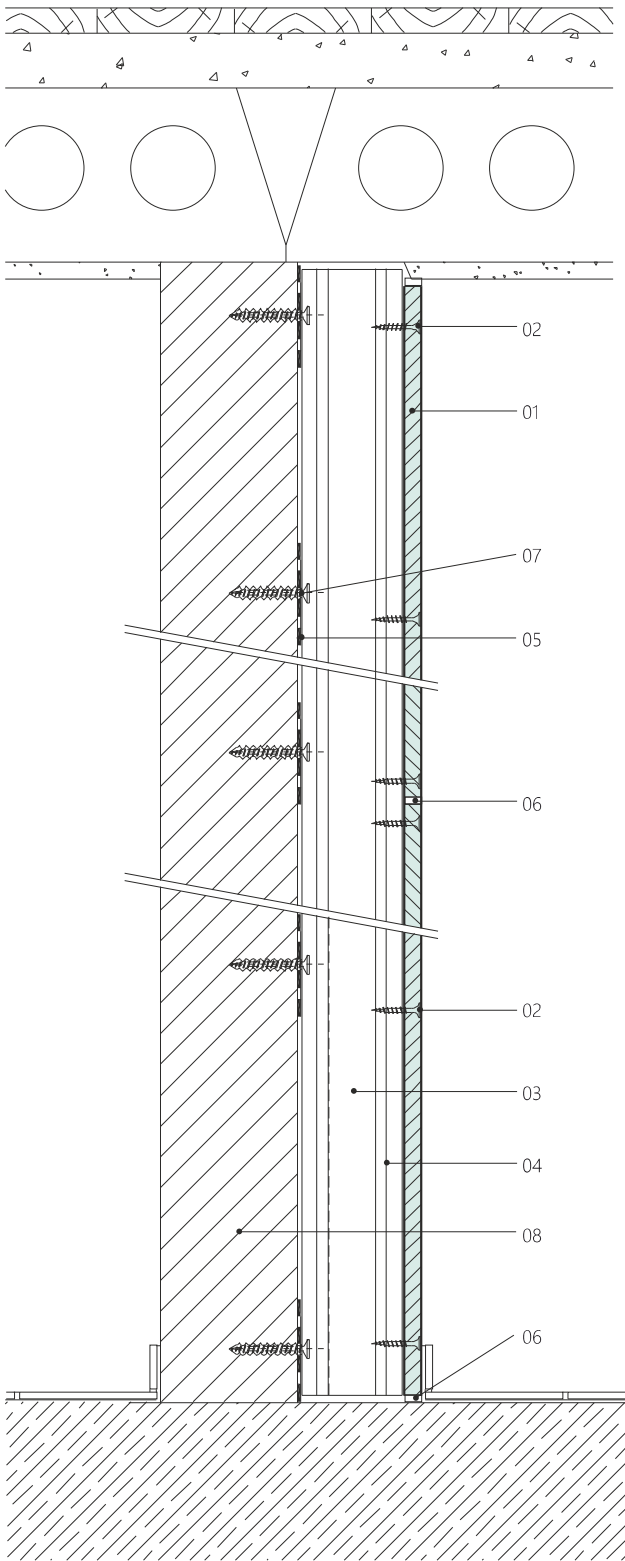
length 100 mm. These profiles are located at the point of the vertical joints of the mineral wool boards (inserted insulation) and are fixed to the vertical CW post.

- apply fire-resistant filler to the contact surface of the CW steel posts with the CETRIS® boards, e.g. DEXAFLAMM-R, Den Braven acrylic fire-resistant filler.



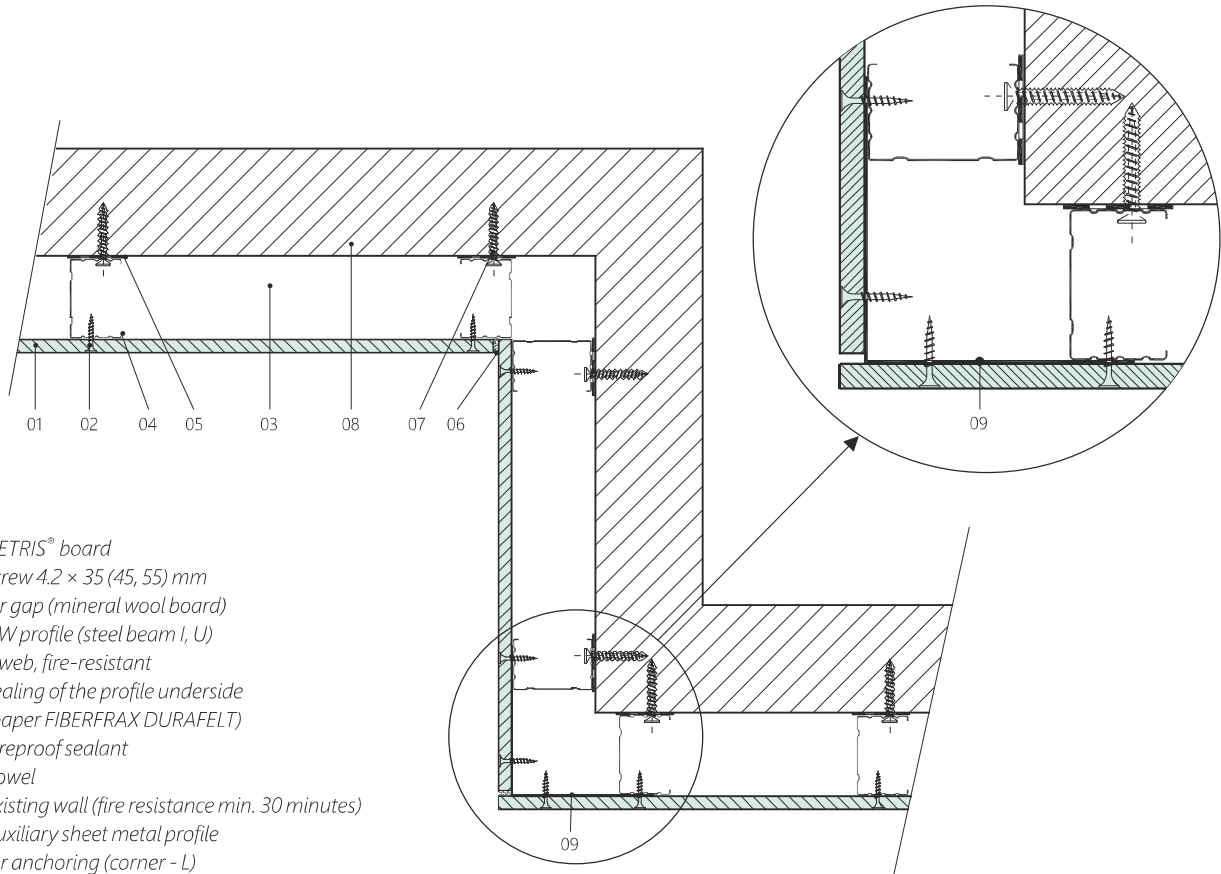
8.2.3.3 Model Construction Solutions – Details of Advanced Walls

Vertical section



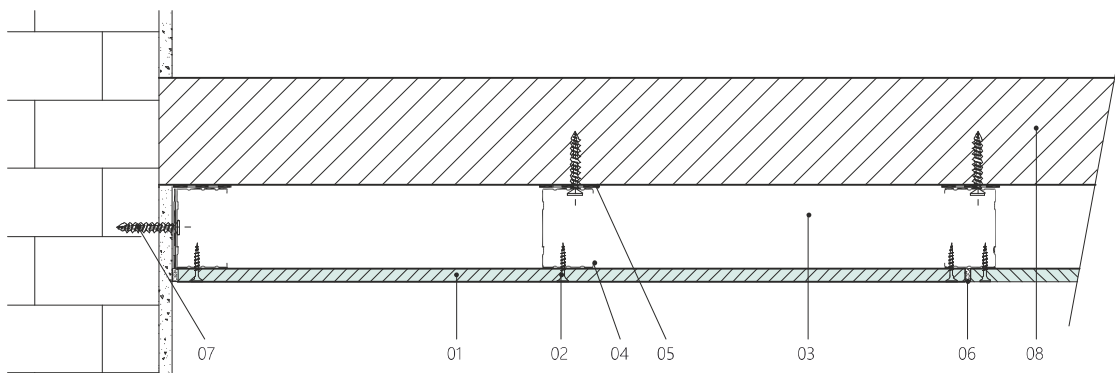
- 01 CETRIS® board
- 02 screw 4.2 × 35 (45, 55) mm
- 03 air gap (mineral wool board)
- 04 CW profile (steel beam I, U) – web
- 05 sealing of the profile underside (FIBERFRAX DURAFELT paper)
- 06 fire resistant filler
- 07 dowel
- 08 existing wall

Inner corner, outer corner Horizontal cross-section



- 01 CETRIS® board
- 02 screw 4.2 × 35 (45, 55) mm
- 03 air gap (mineral wool board)
- 04 CW profile (steel beam I, U)
–web, fire-resistant
- 05 sealing of the profile underside
(paper FIBERFRAX DURAFELT)
- 06 Fireproof sealant
- 07 dowel
- 08 existing wall (fire resistance min. 30 minutes)
- 09 auxiliary sheet metal profile
for anchoring (corner - L)

Connection at the wall Horizontal cross-section



- 01 CETRIS® board
- 02 screw 4.2 × 35 (45, 55) mm
- 03 air gap (mineral wool board)
- 04 CW profile (steel beam I, U) –web
- 05 sealing of the profile underside (FIBERFRAX DURAFELT paper)
- 06 fire resistant filler
- 07 dowel
- 08 existing wall



8.2.3.5 General Principles of Assembly of Fire Walls on a Steel Frame

All building constructions to which the non-load-bearing fire partitions and walls of CETRIS® boards are fixed in any manner, or by which they are supported and which might threaten their stability, must have at least the same fire resistance as the CETRIS® partition itself. If these constructions are structurally stressed then their potential deformations must not interfere with the integrity of the wall of CETRIS® boards. This requirement does not apply if the supporting and load-bearing construction cannot be exposed to thermal stress by fire even under the least favourable conditions for the period of the prescribed fire resistance.

- Maximum spacing of the screws anchoring the CETRIS® boards to the CW profiles must not exceed 200 mm (screws by the edges), or 400 mm (across the surface) and the distance from the board edges must not be less than 25 mm in the case of fire walls. In the case of multilayer cladding the screw spacing may be doubled.
- Maximum spacing of screws on CETRIS® strips or assembly inserts must be 100 mm, or less.
- Screws used for anchoring CETRIS® boards to CW profiles must be at least 10 mm longer than the thickness of the anchored board.
- If the CETRIS® board is used as visible coating of an exterior fire construction it must be anchored as façade cladding – i.e. with pre-drilled holes (8 or 10 mm) and screws with visible heads and sealing washers (see chapter 7.1.6.2).
- Maximum spacing of dowels for anchoring CW and UW profiles must not exceed 625 mm.
- CETRIS® assembly inserts or strips must always be at least 12 mm thick and their thickness must be equal to the thickness of the wall cladding.
- The CETRIS® strip at the joints of the CETRIS® boards must overlap on both sides by at least 60 mm, unless otherwise specified in the detail drawing.
- Maximum spacing of CW assembly profiles must not exceed 625 mm, and at the same time must be based on the board thickness and the respective structural assessment. The length of CW profiles is about 15 mm shorter than the room height. For walls with a height greater than 4 m, the CW profile must be shorter by 20 mm – the dilatation in the lower and upper mounting of the base (U) profile must be min. 10 mm. In case of wall height > 4 mm, it is necessary to observe the principles given in the table on page 146 + points 4 and 5.
- Dilatation joints and all contacts with the wall and the corner joints must be filled with fire resistant filler (e.g. DEXAFLAMM-R, Den Braven acrylic fire resistant filler). The filler must be driven in to a minimum depth of 5 mm.
- The surfaces of the CW or UW profiles adjacent to the floor and the ceiling or wall must be covered with fire resistant filler; if the fire resistance of the wall is greater than 60 minutes, we recommend lining with FIBERFRAX DURAFELT paper. This paper is also suitable for partial insulation of potential thermal bridges in the construction.
- The boards of multilayer cladding must be placed with an overlap of at least 400 mm and always without any cross joint.
- Joints of single-layer coats must always be supported with a CW profile under the joint or (in the places where this is impossible for construction reasons) with a CETRIS® strip; in exposed cases – in the case of higher demand for fire resistance – both methods may be used. In the case of multilayer coating even the inside joints of the bottom layers must be filled with filler.
- All dilatation joints in fire partitions with fire resistance above 60 minutes must always be supported with CETRIS® board strips under the joints of the same thickness as the thickness of the coat pursuant to the figure on page 153.
- For fire resistances of constructions above 60 minutes, it is recommended to insulate the insides of the CW and UW profiles adjacent to the load-bearing walls and ceilings with cut mineral felt.
- The position of mineral wool in an air gap of higher thickness than the thickness of the mineral wool strip should be fixed with adhesive pins.
- All openings in CETRIS® fire partitions must be sealed with inserts or in other ways pursuant to the project specifications. Installations inside the partition walls (water distribution lines, electrical wiring, etc.) must be protected against fire with mineral wool, otherwise the fire resistance of the wall could be reduced.
- In the case of cladding of large wall constructions (longer or higher than 6 m) dilatations in the load-bearing construction must be designed and made visible in the cladding of CETRIS® boards as well.
- Surface treatment and filling of CETRIS® boards can be done only after acclimatization of boards in installed condition

8.2.3.6 Assembly Procedure

- Measure the locations of the UW profiles in the horizontal planes and apply fire resistant filler to the floor and ceiling, or underline it as necessary with FIBERFRAX DURAFELT paper.
- Fix the profiles to the floor, ceiling or to the walls, as the case may be, with steel dowels. The maximum spacing of the dowels with regard to the weight of the boards has been specified as 625 mm.
- Install the CW profiles in the construction with the spacing as per the structural assessment and board thickness, but with a max. spacing of 625 mm. The length of the CW profiles must be about 15 mm shorter than the height of the room.
- Insert cut mineral felt between the profiles if required.
- Screw in the CETRIS® boards on the prepared construction leaving a gap of at least 10 mm between the floor and the ceiling and the bottom and top edges of the boards. Fix the CETRIS® boards with the screws to the CW profiles only.
- In the case of double or multilayer cladding the boards are laid with an overlap of minimum 400 mm.
Note: In the case of three-layer coats the joints of the bottom and the top coat must not be in the same places.
- The following applies to anchoring CETRIS® boards to the construction: The maximum axial distances of the screws from each other is 200 mm, only in the case of double or multilayer cladding the spacing can be increased in the first layer up to a maximum of 400 mm.



8.2.4 Fire Walls with a Wooden Supporting Structure Clad with a CETRIS® Cement Bonded Particleboard

Based on the new fire resistance tests of wall constructions, we have significantly extended the offer of wall compositions with wooden supporting structure clad with CETRIS® cement bonded particleboards. The list of structures includes compositions of bearing walls (wall height up to 3 m) and non-load-bearing walls (height up to 4 m) is given in table 6. fire resistance is determined according to EN 13 501-2 with sorting of construction components (DP2/ D. P3) in accordance with ČSN 73 0810, article 3.2.

8.2.4.1 Load-bearing Construction

The load-bearing construction consists of a frame of wooden vertical and horizontal beams mutually connected with screws.

The cross-section of the vertical wooden beams depends on the composition of the construction – it is necessary to keep the cross section mentioned in the table with a list of compositions. The beams can be made of dry spruce lumber (moisture content 18 % compactness class min. S II), alternatively glued lumber can be used.

The wooden prisms are anchored into the frame (masonry) with steel dowels with a spacing of 625 mm, the joint between the profiles and the masonry is filled with fire-resistant filler (e.g. DEXAFLAMM-R, Den Braven acrylic fire resistant filler). The axial distance of the vertical internal wooden posts must not exceed 625 mm.

8.2.4.2 General Principles of Assembly of Fire Walls on a Wooden Frame

The following principles apply to the implementation of the load-bearing wooden frame and for anchoring of CETRIS® boards.

- Maximum spacing of the screws anchoring the CETRIS® boards to the wooden posts must not exceed 200 mm (screws by the edges), or 400 mm (across the surface) and the distance from the board vertical edges must not be less than 25 mm in the case of fire walls.
- When installing CETRIS® boards it is necessary to keep joints with a minimum width of 5 mm, the joints must be filled with filler (DEXAFLAMM-R, Den Braven acrylic fire resistant filler).
- In case of two layers of CETRIS® boards, it is necessary to overlay the joints – in horizontal direction by 625 mm of the post distance, in the vertical direction by min. 400 mm. The joints must be filled with fire resistant filler.
- A horizontal joint created when cladding CETRIS® boards on a wall must be supported with wooden beam of minimum width 60 mm.
- Maximum spacing of dowels for anchoring the wooden beams must not exceed 625 mm.
- The maximum spacing of the dowels for anchoring the wooden posts should not be more than 625 mm.
- Dilation joints and all contact surfaces with the wall and the corner joints must be filled with fire resistant filler. The filler must be driven in to a minimum depth of 5 mm.
- The surfaces of the wooden prisms in contact with the floor and the ceiling or masonry must be treated with fire resistant filler.
- The position of cut mineral felt in an air gap of higher thickness than the thickness of the cut mineral felt must be fixed with adhesive pins.
- If there is an underlay tape prescribed on the wooden posts in the composition, it is necessary to use a minimum board width 200 mm. The underlay tape is fixed to the wooden posts with screws with countersunk head and the screw spacing is max. 300 mm.

Fire resistance	Composition of CETRIS® board double-sided cladding				Maximum height (m)
	Exterior cladding	Insulation thickness	Density	Interior cladding	
EI 15 DP2	14	-	-	-	3
REI 15 DP2					4
REI 30 DP3	14	-	-	14	3
REI 15 DP2					3
EI 30 DP3					4
REI 60 DP3					3
REI 45 DP2	12+12	-	-	12+12	3
EI 60 DP3					4
REI/REW 60 DP3	12	120	40	Knauf plaster-board GKF 12,5	3
REI/REW 15 DP2					3
EI 60 DP3					4

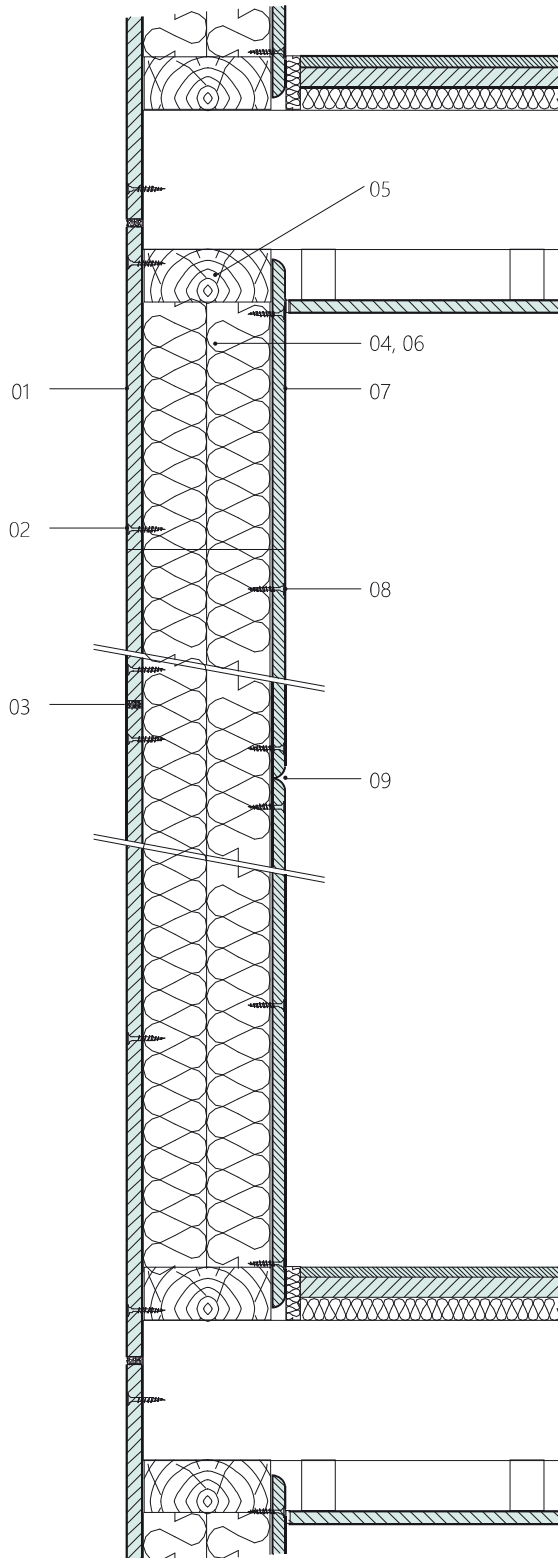
- All openings in the peripheral firewall must be sealed with fire packing or in some other way according to the project specifications. Installations inside the partition walls (water distribution lines, electrical wiring, etc.) must be protected against fire with cut mineral felt otherwise the fire resistance of the wall could be reduced.

Note: Anchoring of KNAUF Red boards, joint filling and surface finish must be done in compliance with the manufacturer's recommendations.



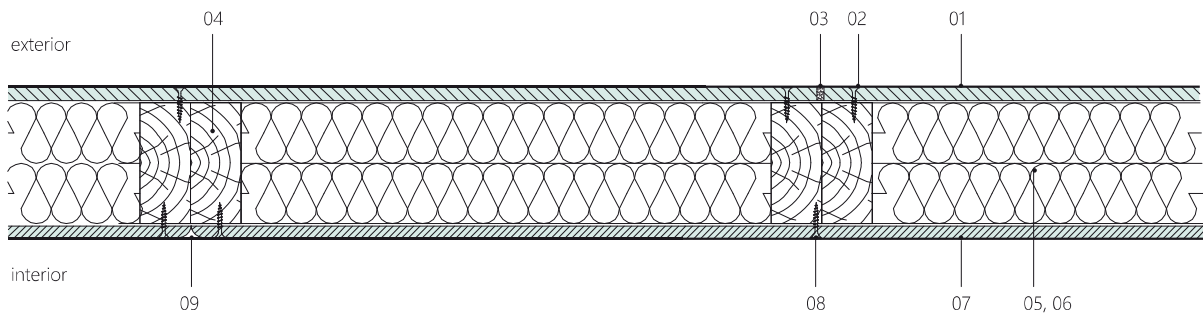
8.2.4.3 Model Construction Solutions – Peripheral Load-bearing Wall on a Wooden Construction – DETAILS

Vertical cross-section



- 01 CETRIS® board of thickness 14 mm
- 02 screw 4.2×35 mm
- 03 fire resistant filler
- 04 vertical wooden pillar (axial spacing max. 625 mm)
- 05 wooden prism
- 06 cut mineral felt (Orsil Uni) - 2× thickness 60 mm
- 07 Knauf GKF board - thickness 12.5 mm
- 08 screw TN 3.5×35 mm
- 09 gap filler – Knauf Uniflott

Horizontal cross-section



- 01 CETRIS® board of thickness 14 mm
- 02 screw 4.2 × 35 mm
- 03 fire resistant filler
- 04 vertical wooden pillar (axial spacing max. 625 mm)
- 05 wooden prism
- 06 mineral wool (Orsil Uni) - 2 × thickness 60 mm
- 07 Knauf GKF board - thickness 12.5 mm
- 08 screw TN3.5 × 35 mm
- 09 joint filler – Knauf Uniflott

8.3 Horizontal Constructions – Suspended Ceilings (Fire from Below)

8.3.1 Scope of Application

Based on the test results provided here, the CETRIS® boards can be applied in the following types of fire resistant horizontal wall constructions:

- Separate fire ceiling panel, heat (fire) exposure from underneath. In this case, the fire resistance is specified directly by the result of the fire resistance test.
- horizontal protective membrane (ceiling) sub-floor (roof) constructions, exposure to heat (fire) from below. The fire resistance is for the entire assembled construction.

As stated in the protocols it is also necessary to comply with the technology of the ceiling assembly and all assembly procedures used and tested in the context of preparation of the samples. The ceiling constructions may be of any size on the condition that the spacing between the suspensions will not increase and that the dilatation measures will be adequately implemented. The test results apply to cavities of any height. In the final analysis, this means that the proposed connecting elements, their spacing and layout on the construction and other details are binding and must be complied with for the above attests to be applicable.

Important notice:

- All the data applies to the conditions and stress of horizontal constructions during fire pursuant to the valid text of ČSN EN 1364-2 and ČSN 13 381-1. The results of fire resistance tests and implementation principles from them only assess the issue of the technical properties of the constructions in relation to their resistance to actual fire. For this reason, the axial distances and types of CD profiles and other elements, which comply with the tests are stated. These, however, must be considered the minimum limits that must not be exceeded. It is necessary to note that when dimensioning fire ceiling panels, it is also necessary to consider the structural requirements for the construction and modify it according to real stress in relation to the weight of the CETRIS® boards.
- Assembly of fire constructions may only be carried out by trained staff – see Chap. 8.8. Training of assembly companies in applications with CTD CETRIS® boards.