Aestuver® Structural fire protection

PLANNING AND PROCESSING
FEBRUARY 2025

AESTUVER®

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Aestuver® is a brand of James Hardie

James Hardie Europe GmbH, under which the products of the Aestuver® brand are distributed, supports the various construction participants as a partner in the respective project phases. In addition to tailored products, we offer extensive services as part of our customer-oriented project support, as well as an interesting selection of other construction products.

JamesHardie™ fermacell® AESTUVER®

Aestuver® – Expertise in fire protection

Aestuver® is a leading brand in structural fire protection, offering economical and high-performance solutions for construction, tunnels, industry, and infrastructure. Aestuver® fire protection panels are ideal for structural fire protection, electrical installations and underground traffic systems. Their outstanding mechanical properties allow for versatile applications, from industrial installations to custom on-site constructions.

- Consulting, planning and project management by experienced fire protection experts
- All systems and components are certified (ETA, AbP, abZ, aBG)
- Aestuver® fire protection boards achieve the highest classification for weather, frost and water resistance (Type-X)

Fire protection boards withstand the effects of rain and snow. Even after many years, they provide the required structural fire protection in the event of a fire.

Intelligent fire protection solutions even for complex requirements

AESTUVER®

High-quality fire protection solutions

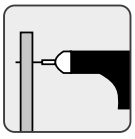
Weatherproof I Certified I Versatile

Aestuver® fire protection boards and products are characterised by excellent properties against the effect of weather. They undergo extensive tests to prove their resistance to UV radiation, moisture, temperature fluctuations, salt, dirt and other environmental influences.

Aestuver® Fire protection boards

Fire Protection up to 1 200 °C

With special additives



Easy processing with wood toos

Used for structural fire protection

Cement-bonded, glass fibre-reinforced lightweight concrete panels for structural fire protection

- Fire protection board for versatile use in high-quality fire protection
- No flammable components
- Weather, frost and water resistant.
- Use in wall/ceiling constructions
- Component in façades, ETICS, reinforcement elements and shaft walls
- Cladding for steel and timber constructions
- Filler and insulator for door, gate and window profiles and safety containers

Applications

The certified fire protection boards from Aestuver® are easy to process and are ideally suited for indoor and outdoor constuctions thanks to their weather resistance


Structural Fire Protection


Infrastructure


Electrical Instalations


Undergound & Metro


Industry & OEM

Categories of use for the Aestuver® fire protection boards

Indoor standard climate	Indoor wet room	Outdoor area Not directly weathered	Outdoor area directly weathered
			
Utilisation class 1 Category D Type Z2	Utilisation class 1 Category C Type Z1	Utilisation class 2 Category B Type Y	Utilisation class 3 Category A Type X

1.1 Aestuver® fire protection board

Cement-bonded, glass fibre-reinforced lightweight concrete panels for high-quality structural fire protection

- Weather, frost and water resistant
- No flammable components

Characteristics	
Density ρ_k (dry)	approx. 625 – ca. 965 kg/m³
Thermal conductivity λ_R according to EN 12667 [1)]	approx. 0,21 W/mK
Specific heat capacity c	approx. 0,9 kJ/kgK
Elongation / shrinkage when changing the relative humidity by 30 % (20 °C) according to EN 318	± 0,1 %
Equilibrium humidity at 65 % relative humidity and 20 °C air temperature according to EN ISO 12570	approx. 7%
Alkalinity (ph value)	approx. 12
Application category in relation to intended use according to EAD 350142-00-1106	Type 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Application category in relation to weathering according to EAD 350142-00-1106	Type Z1, Z2, Y, X

[1)] Value exemplary for 20 mm board | Data for other board thicknesses on request.

Dimensional tolerances for levelling moisture for standard panel formats	
Length, width	± 1 mm
Diagonal difference	≤ 2 mm
Thickness	± 1 mm

Certification	
European Technical Approval	ETA-11/0458
Building material classification EN 13501-1	Not flammable, A1
IMO FTPC part 1	Not flammable
Construction material classification	national/international

Characteristics depending on the board thickness									
Thickness in mm	10	15	20	25	30	35	40	50	60
Surface weight per m² in kg (at 7 % moisture)	≈ 10	≈ 12	≈ 15	≈ 18	≈ 22	≈ 25	≈ 28	≈ 34	≈ 41
Density ρ_k in kg per m³ (dry)	≈ 950	≈ 800	≈ 700	≈ 690	≈ 680	≈ 670	≈ 650	≈ 650	≈ 640
Flexural strength in N/mm² (According to EN 12467 ± 10 %)	5	3,5	3,5	3,3	2,8	2,8	2,8	2,8	2,8
Modulus of elasticity in N/mm² (According to EN 12467 ± 10 %)	4 300	3 450	3 000	2 750	2 400	2 300	2 250	1 900	1 450
Compressive strength in N/mm² (According to EN 789)	20	8,5	9	–*	6,5	6,5	6,5	–*	6
Water vapour diffusion resistance coefficient μ According to EN ISO 12572	36	25	54	–*	–*	–*	–*	–*	25
Airborne sound insulation R_w in dB According to DIN 52210	ca. 31	–*	ca. 31	–*	–*	ca. 35	ca. 36	–*	ca. 39

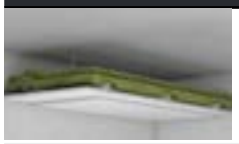
Format in mm **									
2 600 × 1 250	●	●	●	●	●	●	●	●	●

* no values determined | ** Other panel thicknesses, lengths (up to 3 000 mm), widths (up to 1 250 mm) and cuts on request.

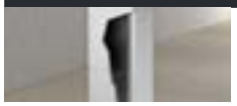
1.2 Construction overview

Walls & Ceilings

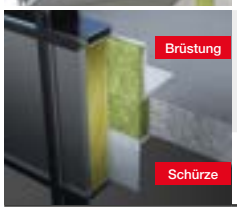
Assembly walls	Construction	Fire resistance	Boards [mm]	Substructure CW - UW	Mineral wool [mm] / [kg/m³]	Wall height [cm]	Page
	1 S 41 AE	EI 120	2×15 each side	50-06	40/30	500 Wall height	8
	1 S 43 AE	F 120-A	25 each side	Steel U-profile 100/50-6 and Aestuver panel strips d = 60 mm	without	549 Instal-lation height	10
	3 S 31 AE	EI 90	2×25	ohne	without	300 Instal-lation height	12
	3 S 32 AE 3 S 33 AE	EI 90 EI 90	2×25 2×30	50-06 75-06	without without	400 500 Instal-lation height	14 16

Ceilings	Construction	Fire resistance	Boards [mm]	Substructure CW - UW	Mineral wool [mm] / [kg/m³]	Span width [cm]	Page
	Self-supported suspended ceilings 2 S 31 AE ↑u ↓o	EI 90	2×20	CD60-06	2×40/30	625	18
	Self-supported suspended ceilings 2 S 32 AE ↑u	EI 90	2×25	CD60-06	without	625	20
	Bare ceiling Type I 2 S 35 AE ↑u	REI 90	25	CD60-06	55	625	22
	Bare ceiling Typ II, III 2 S 21 AE ↑u 2 S 36 AE ↑u	REI 60 R 90	15 20	CD60-06 CD60-06	195 195	625 625	22 22
	Corrugated sheet ceiling without mineral wool 2 ST 11 AE ↑u 2 ST 41 AE ↑u	REI 30 REI 120	2×15 2×25	Trapezoidal steel sheet t ≥ 0,75	without without	– –	24 27
	Corrugated sheet ceiling with mineral wool 2 ST 21 AE ↑u 2 ST 35 AE ↑u	REI 60 REI 90	2×15 2×20	Trapezoidal steel sheet t ≥ 0,75	without without	– –	25 26
	Self-supported with support profile 2 S 33 AE ↑u ↓o	EI 90	25 each side	2×UA 75-2	without	4400	28
	Self-supported with out support profile 2 S 34 AE ↑u ↓o	EI 90 (a≥) (a≤b)	2×30	without	without	1800	30

Steelwork, Concrete protection & fire flashove

Steel encasement	Component	Fire resistance	Critical temperature	Page
	Column	R 30 – R 180 ??	500°C 350 - 750°C	34 44
	Beam	R 30 – R 180 ??	500°C 350 - 750°C	36 46
	Solid timber components with steel components	F 30 - F 90 R 30 - R 90	250°C bzw. 500°C	38

Reinforced concrete protection	Component	Fire resistance	Critical temperature	Cladding [mm]	Page
	Walls/ceilings European	R 30 – R 180	500°C	15	40
	Columns/beams European	R 30 – R 120	500°C	15	40
	Strenghtening of carbon fibre slats	F 30 – F 120 F 30 – F 120	40 °C 90 °C	40–100 30–70	41

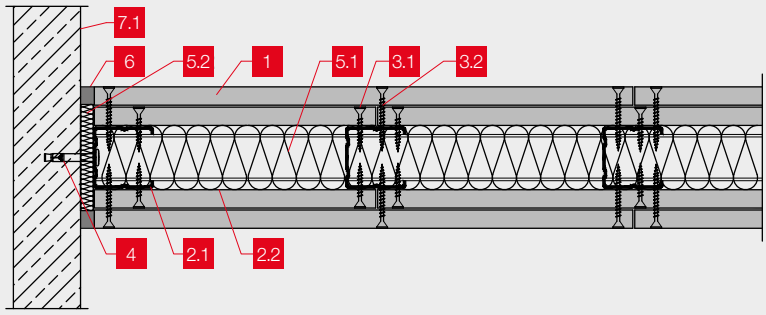
Flashover	Construction	Protection against fire flashover	Fire spread	Boards [mm]	Substruc-ture	Spacing Substructure [mm]	Page
	Flashover Eaves / verge Rafters Flat roofs	 90 Minutes 90 Minutes 90 Minutes	 – – –	 25 25 25	 CD 60-06 ohne ohne	 420 – –	42
	Fassaden	 E 90 EW 90 EI 90	Surface O ↔ I O → I O → I	 – – –	 – – –	 – – –	43
		EI 120	Edge sealing	–	–	–	43

2.1 Aestuver™ Assembly walls – EI 120

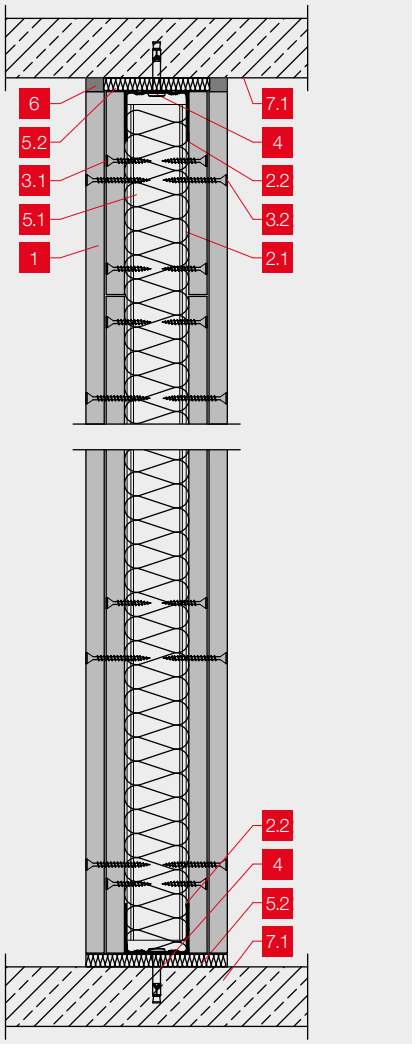
1 S 41 AE–fire protection from inside and outside

Fire protection	Boards	Sound insulation	Height	Wall thickness	Weight
F 120-A	each side 2 × 15mm	R_w = 60 dB ± 3dB	500 cm	≥ 110 mm	≥ 50 kg/m²

Wall construction - horizontal section



Wall construction - vertical section



Description

1	Aestuver® fire protection board - thickness d ≥ 15 mm
2.1	≥ CW50-06 - Centre distance a ≤ 625 mm
2.2	≥ UW50-06
2.3	Welded steel plate t ≥ 1 mm
3.1	3,9 × 30 mm fermacell™ Powerpanel screw- - a ≤ 400 mm
3.2	3,9 × 50 mm fermacell™ Powerpanel screw- - a ≤ 250 mm
4	Suitable fastener Ø ≥ 6 mm - a ≤ 500 mm
5.1	Mineral wool d ≥ 40 mm / ρ ≥ 30 kg/m³ (Melting point θ > 1 000 °C)
5.2	fermacell™ edge insulation strips
6	fermacell™ Powerpanel levelling compound
7.1	Solid component
7.2	Underlay according to proof of usability
7.3	Wet screed – Thickness d ≥ 50 mm
7.4	Dry screed according to proof of usability
7.5	Partition and shaft wall according to usability certificate
7.6	Cladded steel component according to usability certificate

Evidence

K-2100/868/15-MPA BS

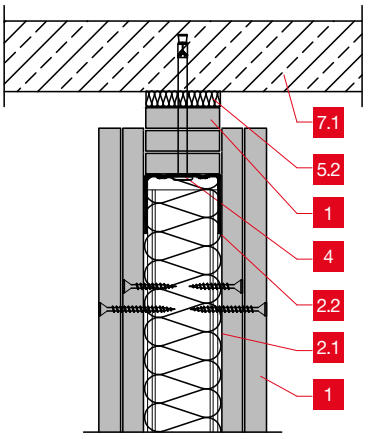
GA_2024_001

If the wall is constructed without insulation, the fire resistance class F90-A can be achieved. Adjoining components must have at least the same fire resistance class.

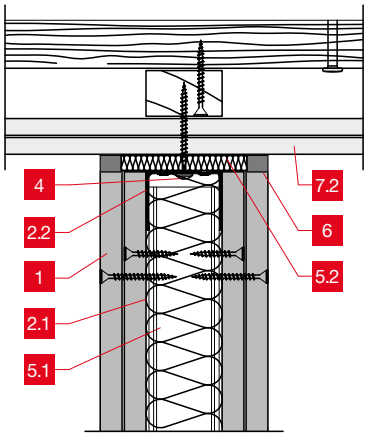
The construction can also be designed as a double stud wall. The installation of cavity wall boxes, fire protection boxes, bulkhead systems and inspection hatches is permitted. The relevant manufacturer specifications must be observed.

Construction details

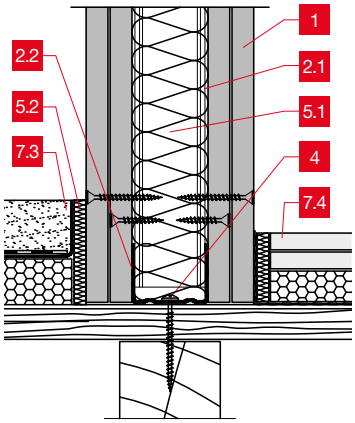
Sliding ceiling connection



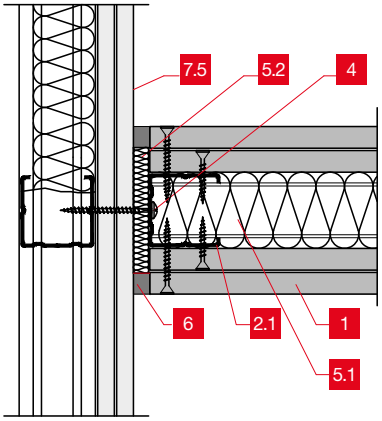
Connection to suspended ceiling



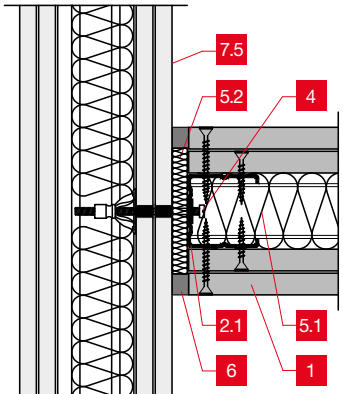
Connection to wooden beam ceiling



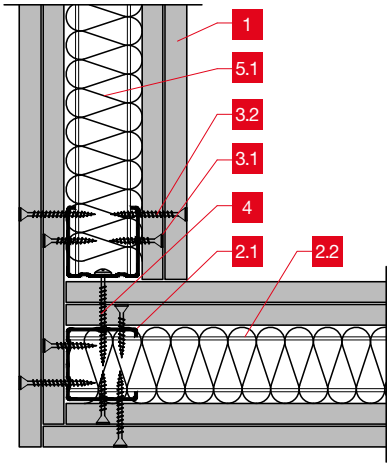
Partition wall connection in CW profile



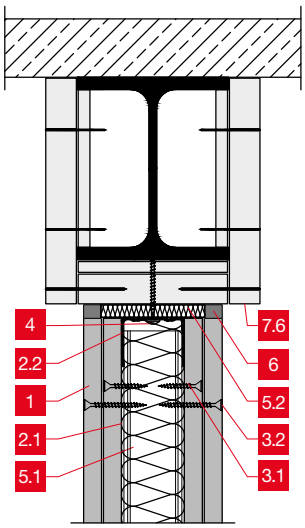
Partition wall connection in boards



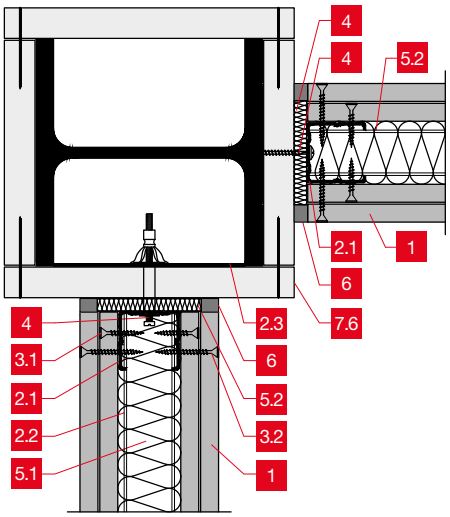
Corner design



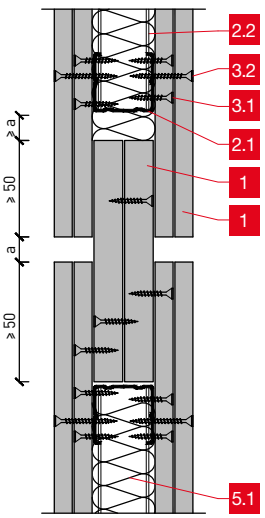
Connection to steel beams



Connection to steel column



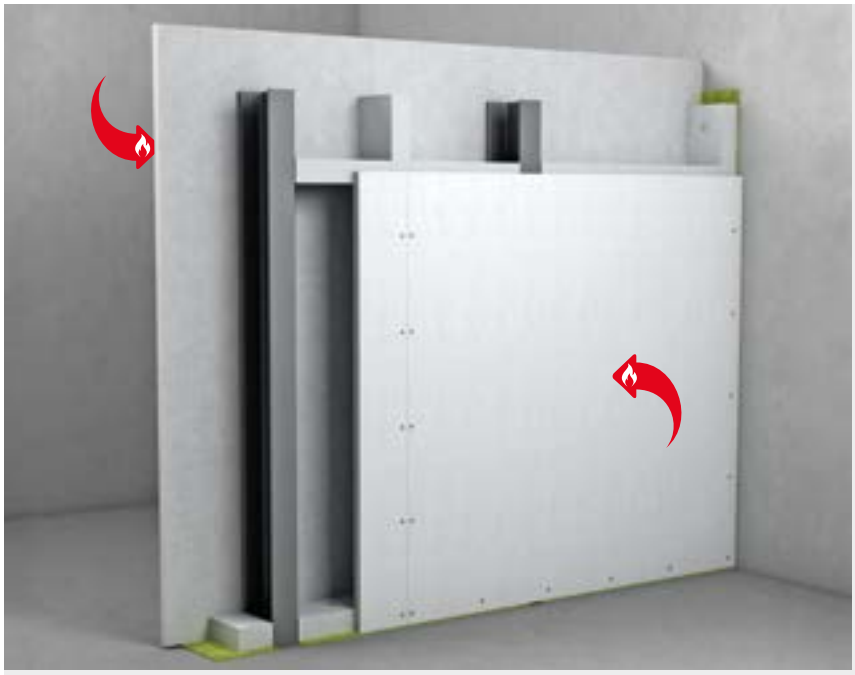
Expansion joint



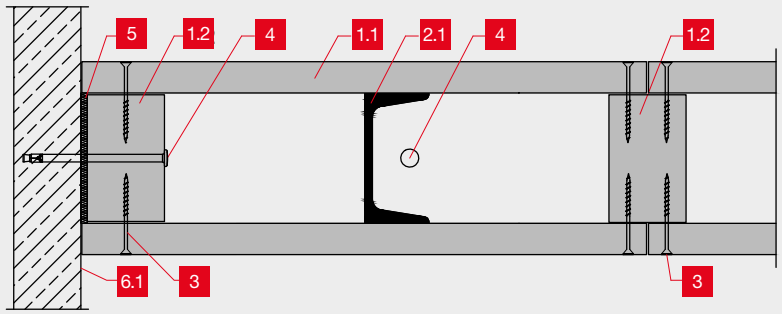
2.2 Aestuver™ Steel framework wall - F 120-A

1 S 43 AE - fire protection from inside and outside

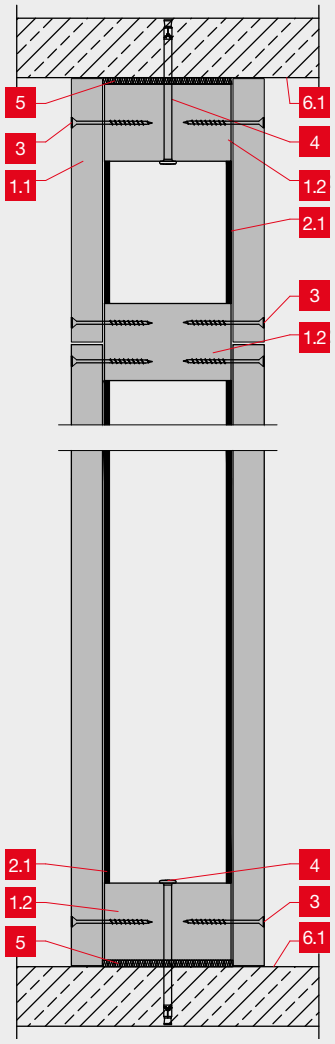
Fire protection	Boards	Sound insulation	Height	Wall thickness	Weight
F 120-A	each side 25 mm*	R_w = 44 dB ± 3dB****	up to 549 cm	≥ 150 mm***	45 kg/m²**



Wall construction – Horizontal section



Wandkonstruktion – Vertikalschnitt



Description	
1.1	Aestuver® Fire protection board - thickness d ≥ 25 mm*
1.2	Aestuver® Fire protection board - thickness d = 60 mm
2.1	Rolled profile acc. to structural calculations (load-bearing) – min. U-profile 100/50/5 - centre distance a ≤ 270 cm
2.2	Welded steel plate t ≥ 1 mm
3	4,5 × 70 mm Aestuver™ screw - a ≤ 250 mm Alternatively steel wire staple ≥ 60 × 11 × 1,5 mm - a ≤ 150 mm
4	Fasteners Ø ≥ 6 mm - a ≤ 700 mm
5	5 mm –10 mm edge insulation strips
6.1	Solid component
6.2	Suspended ceiling according to proof of usability
6.3	Wet screed – thickness d ≥ 50 mm
6.4	Dry screed according to proof of usability
6.5	Partition and shaft wall according to proof of usability
6.6	Cladded steel component according to proof of usability

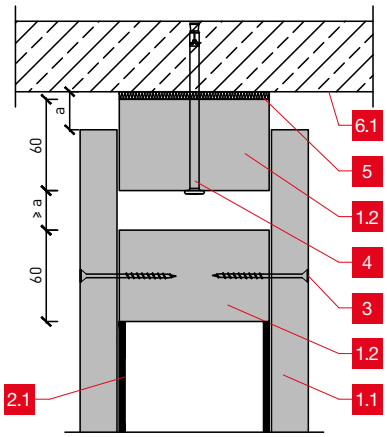
* F 60-A Plate thickness 20 mm
** F 60-A – 39 kg/m³
*** F 60-A – ≥ 140 mm
**** F 60-A – R_w = 42dB± 3dB

Evidence
P-3249/1399-MPA BS
GA_2024_003

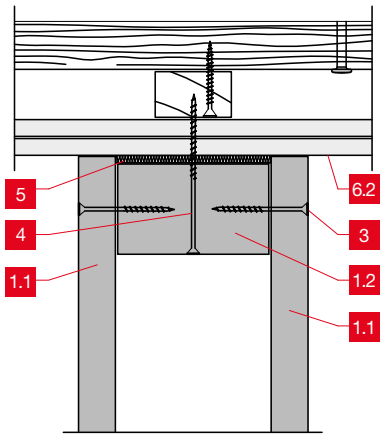
The wall structure can be designed with alternative support profiles (e.g. I-profiles/ hollow box profiles h × t ≥ 100 × 5 mm). Connecting components must have at least the same fire resistance class. The installation of hollow wall boxes, fire protection boxes, bulkhead systems and inspection hatches is permitted. The relevant manufacturer's specifications must be observed. The arrangement of additional, noncombustible insulation is possible.

Construction details

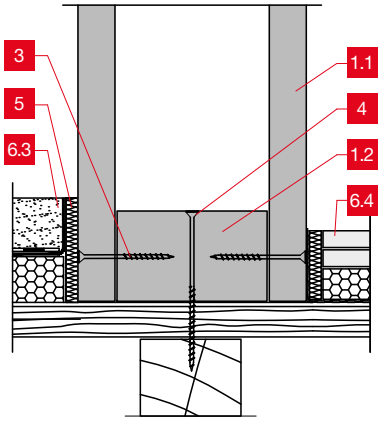
Sliding ceiling connection



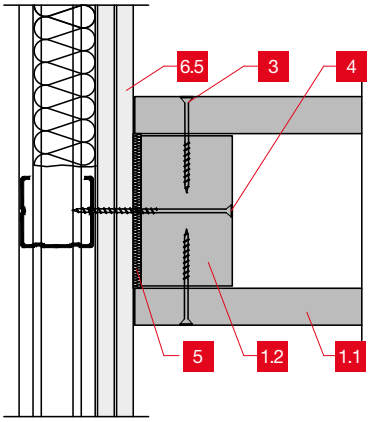
Connection to suspended ceiling



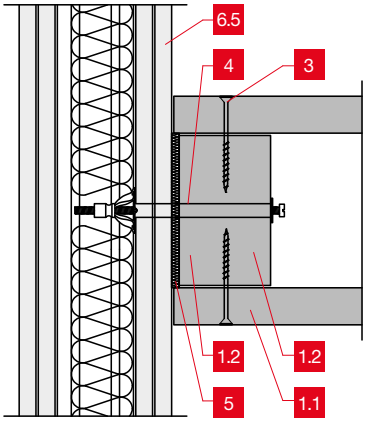
Connection to wooden beam ceiling



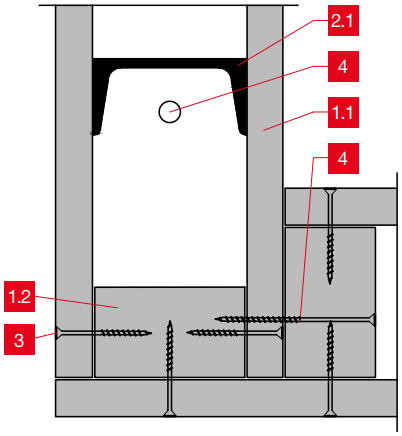
Partition wall connection in CW profile



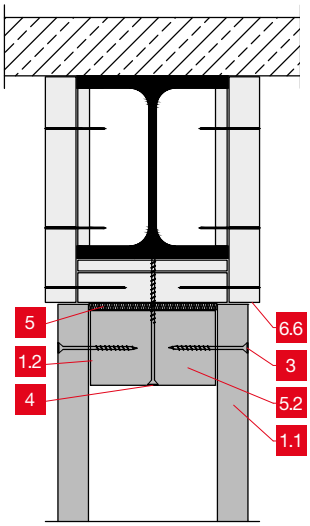
Partition wall connection in boards



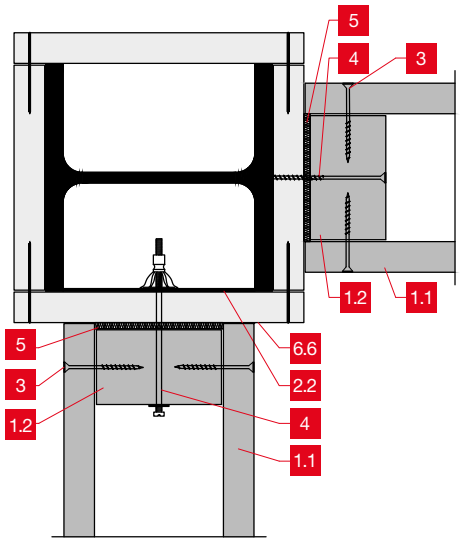
Corner design



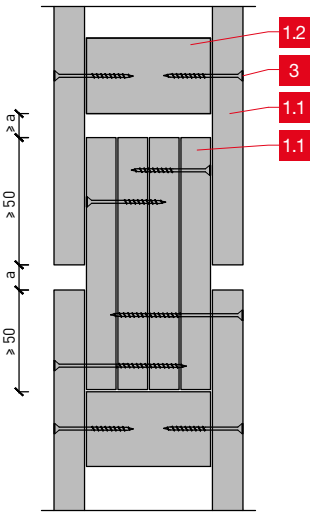
Connection to steel beams



Connection to steel column



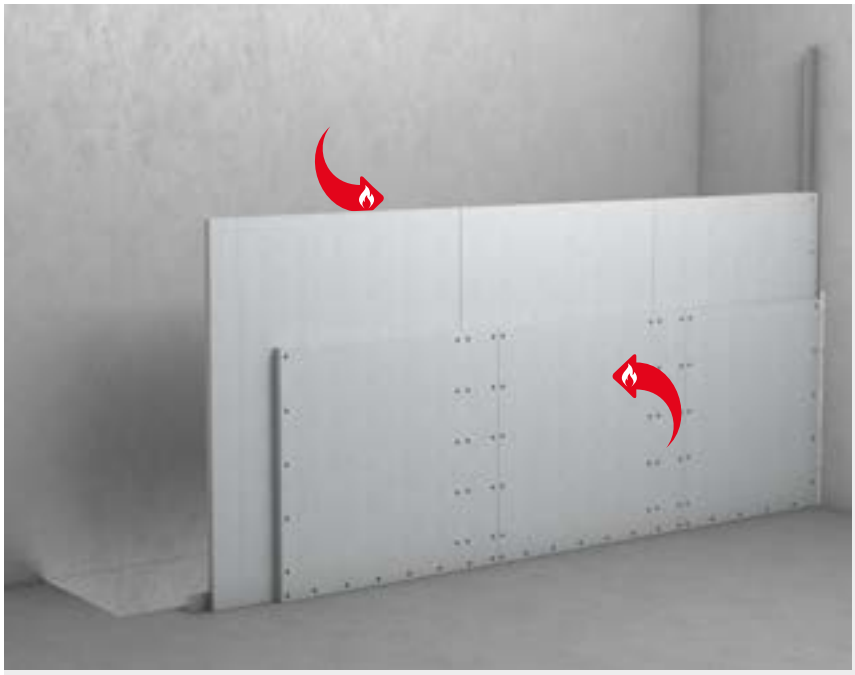
Expansion joint



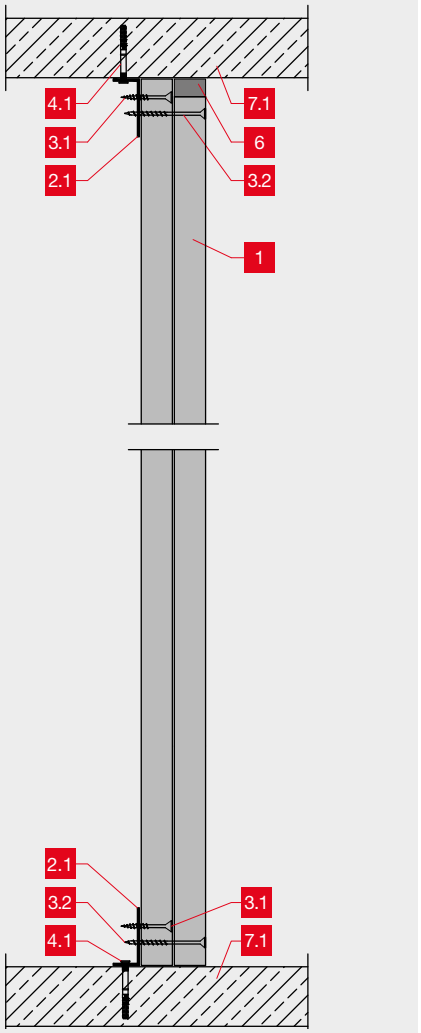
2.3 Aestuver™ Shaft wall - EI 90

3 S 31 AE - Fire exposure from inside and outside

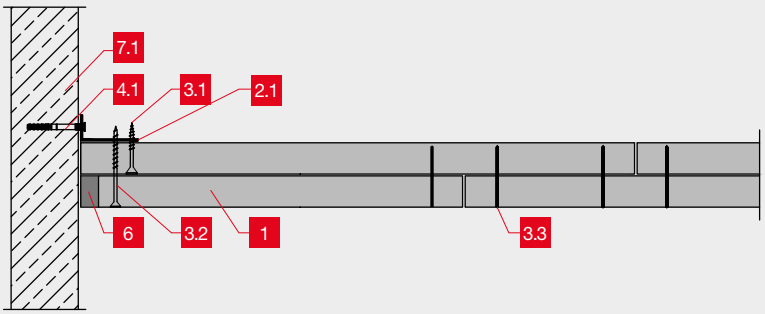
Fire protection	Boards	Sound insulation	Height	Wall thickness	Weight
EI 90	2 × 25 mm	R_w = 36 dB ± 3dB	300 cm	> 70 mm (50 mm Cladding)	37 kg/m²



Wall construction - vertical section



Wall construction – Horizontal section



Description

1	Aestuver® fire protection board - thickness d ≥ 25 mm
2.1	Metal angle bracket≥ ≥ 40 × 20 × 1 mm
2.2	Metal angle bracket≥ ≥ 40 × 40 × 1 mm
2.3	Welded steel plate t ≥ 1 mm
3.1	5,5 × 45 mm WÜRTH ZEBRA Wing-tip drilling screw with pias – a ≤ 500 mm
3.2	6,3 × 45 mm WÜRTH ZEBRA Wing-tip drilling screw with pias – a ≤ 250 mm
3.3	steel wire staple ≥ 45 × 11 × 1,5 mm - a ≤ 150 mm alternative suitable screws ≥ 3,9 × 45 mm - a ≤ 200 mm
4.1	Nail anchor Ø ≥ 6 mm - a ≤ 500 mm
4.2	Suitable fasteners Ø ≥ 6mm - a ≤ 500 mm
5	fermacell™ edge insulation strips
6	fermacell™ Powerpanel fine filler
7.1	Solid component
7.2	Separation and SHAFT WALL according to proof of usability Clad steel component according to proof of usability
7.3	Clad steel component according to proof of usability

Evidence

PK2-05-19-021-E-0 - Panel orientation vertical

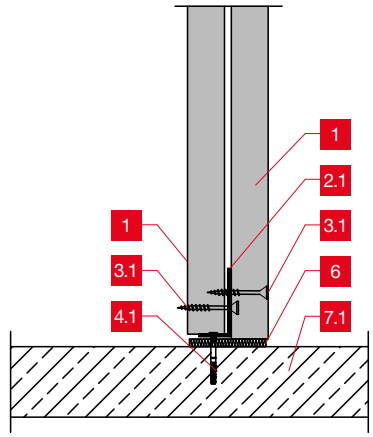
PK2-05-20-001-E-0 - Panel orientation horizontal

PK2-05-19-021-E-0

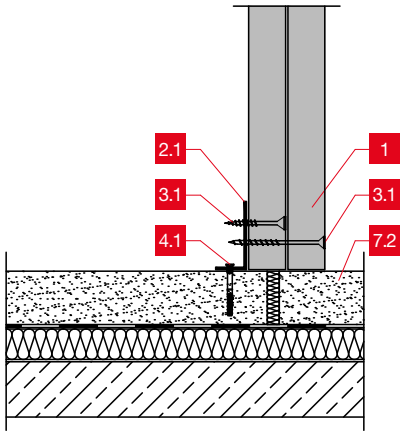
Joints must be stapled or screwed on both sides. Connecting components must have at least the same fire resistance class. Installation of cavity wall boxes, fire protection boxes and inspection flaps are permitted; the corresponding manufacturer's specifications must be observed. Installation of bulkhead systems on request.

Construction details

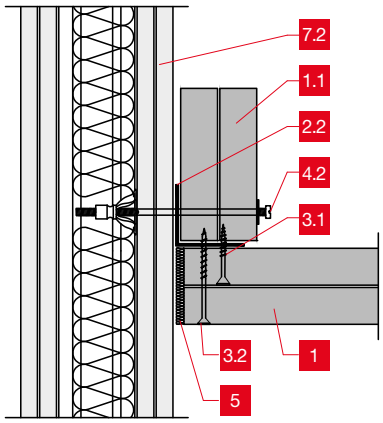
Alternative connection to slab



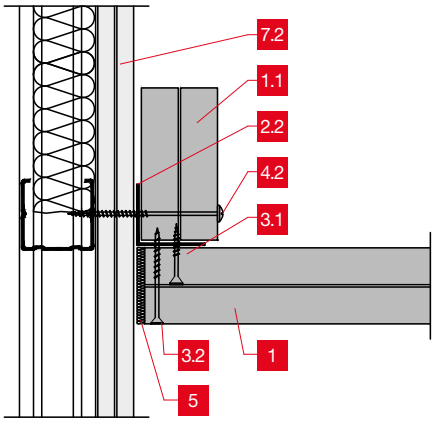
Wet screed connection



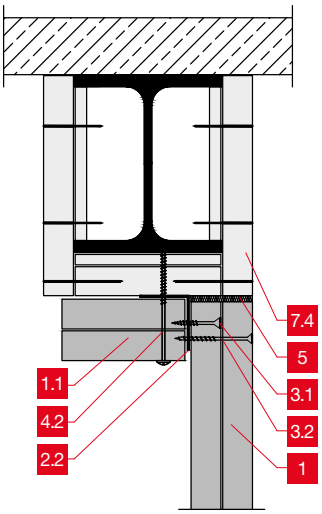
SHAFT WALL connection with boards



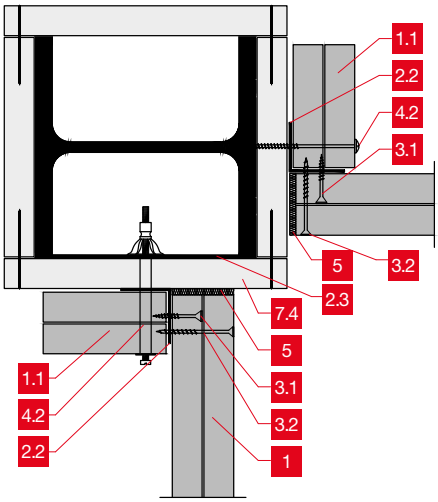
SHAFT WALL connection in CW-Profile



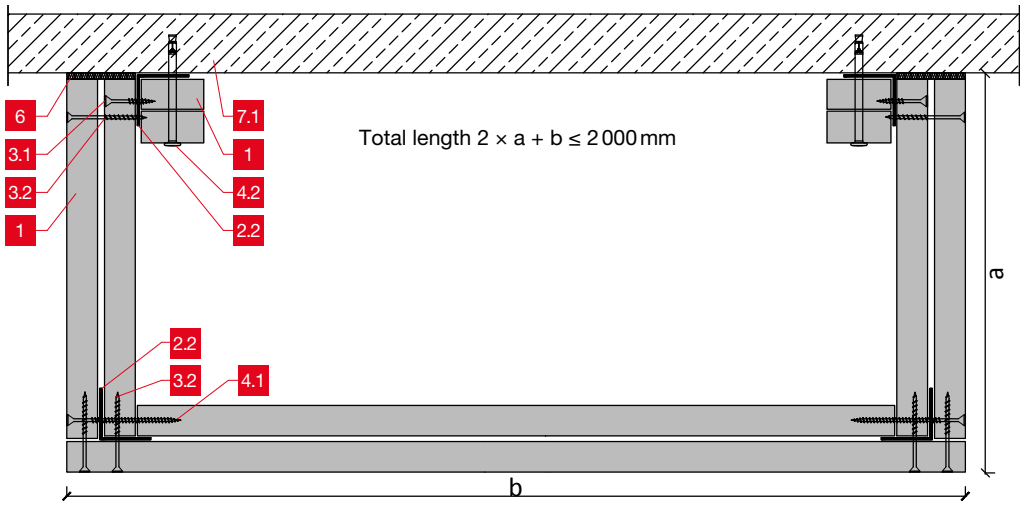
Connection to steel beam



Connection to steel column



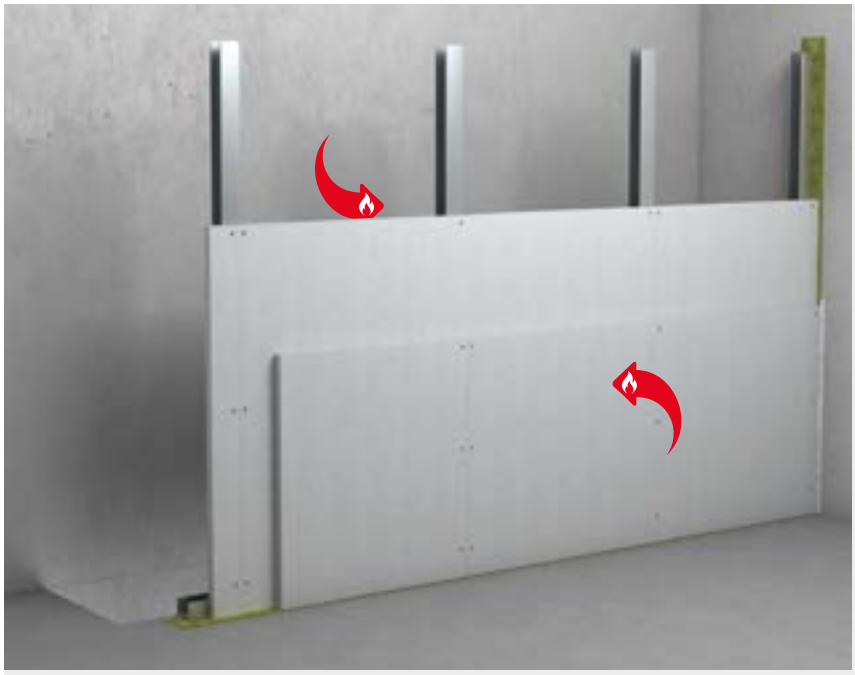
Three-sided design - horizontal section



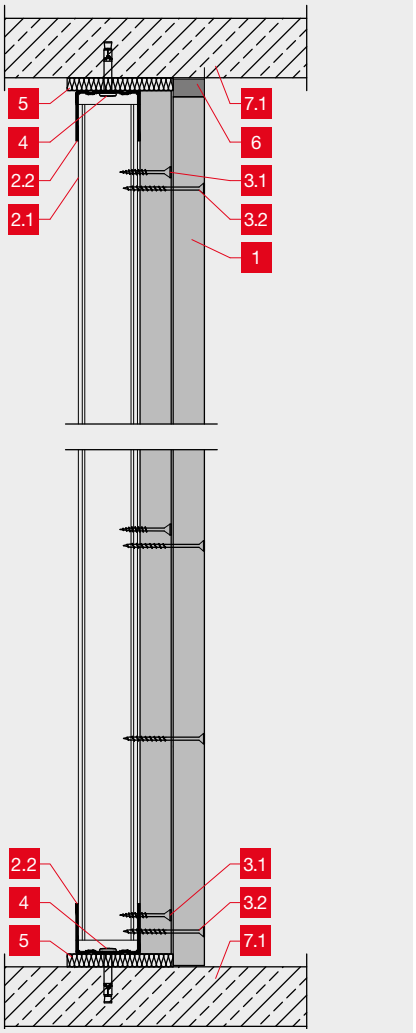
2.4 Aestuver™ Shaft wall - EI 120

3 S 32 AE - Fire exposure from inside and outside

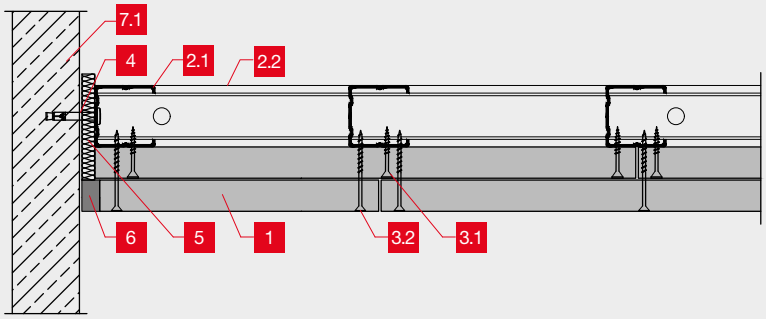
Fire protection	Boards	Sound insulation	Height	Wall thickness	Weight
EI 120	2×30 mm	R_w = 36 dB ± 3dB	400 cm	≥ 100 mm	51 kg/m²



Wall construction - vertical section



Wall construction – Horizontal section



Description

1	Aestuver® fire protection board - thickness d ≥ 25 mm
2.1	CW ≥ 50-06 - distance a ≤ 625 mm
2.2	≥ UW 50-06
3.1	3,9 × 50 mm fermacell™ Powerpanel H_20 screw a ≤ 400 mm
3.2	4,2 × 75 mm Aestuver™ drywall screw a ≤ 250 mm
4	Suitable fasteners Ø ≥ 6 mm - a ≤ 700 mm
5	fermacell™ edge insulation strips
6	fermacell™ Powerpanel fine filler
7.1	Solid component
7.2	Suspended ceiling according to proof of usability
7.3	Wet screed d ≥ 50 mm
7.4	Separation- and shaft wall according to proof of usability
7.5	Clad steel component according to proof of usability

Other variants

Fire rating	Boards
EI 90	2×25 mm
EI 45	2×20 mm

Evidence

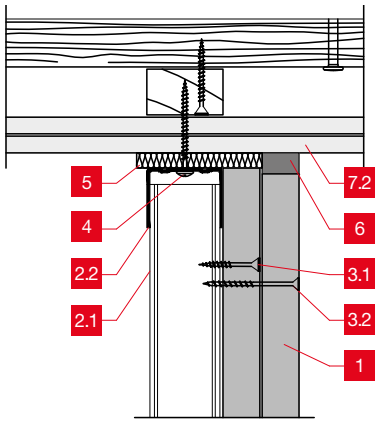
K-3584_484_14-MPA BS - EI 120 i-> <-a*
K-3618-518-14-MPA BS - EI 90 i-> <-a**
K-3681-581-14-MPA BS - EI 45 i->

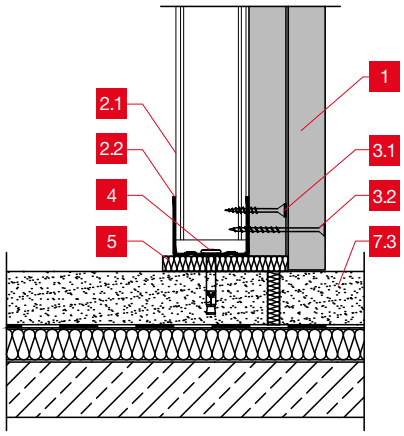
* Technical consultation
** with KB 3620-520-14 MPA BS
*** GA_2024_002 for "unfolded length"

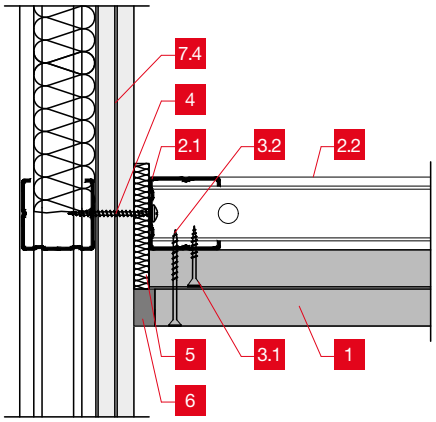
Connecting components must have at least the same fire resistance class. The installation of cavity wall boxes, fire protection boxes and inspection flaps is permitted; the corresponding manufacturer's specifications must be observed. Installation of penetration seals on request. The installation of mineral wool insulation leads to an improvement in the sound insulation value R_w.

Construction details

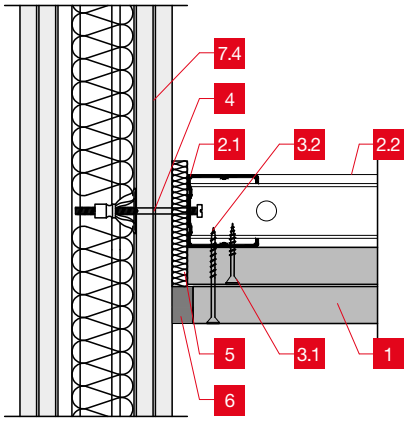
Ceiling connections



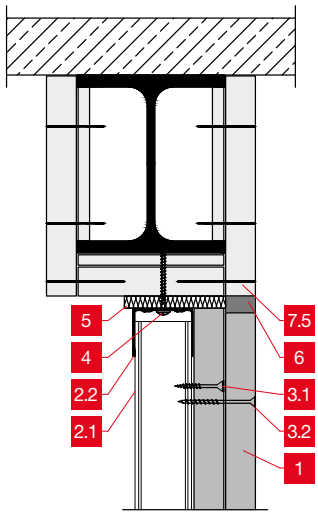




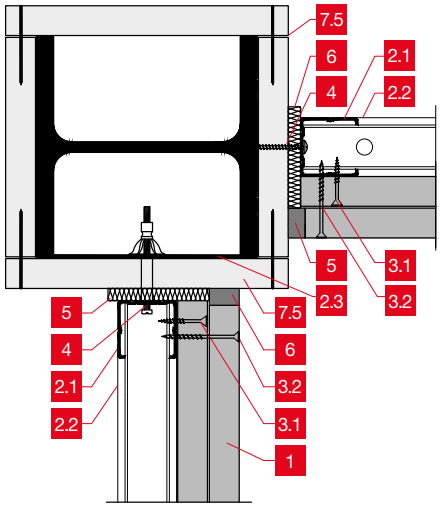
Shaft wall connection in panel



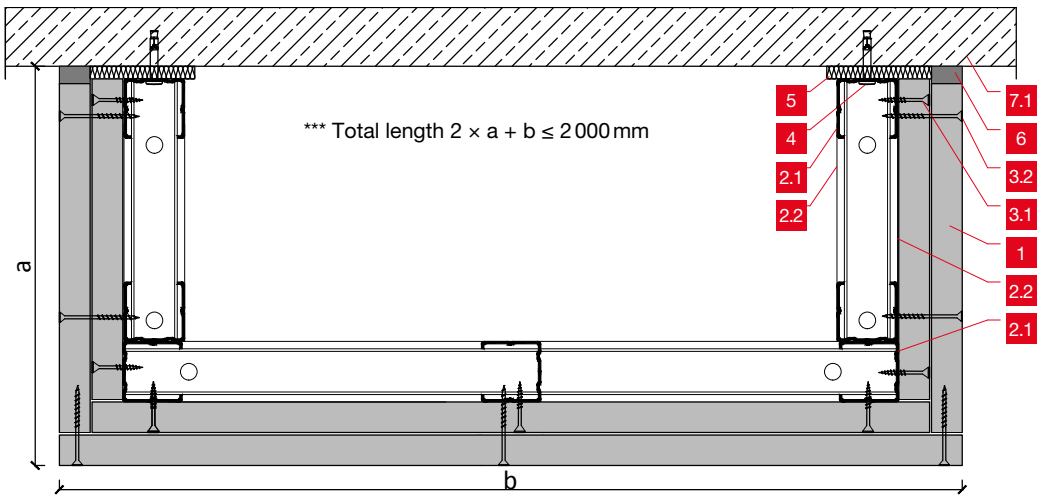
Connection to steel beams



Connection to steel columns



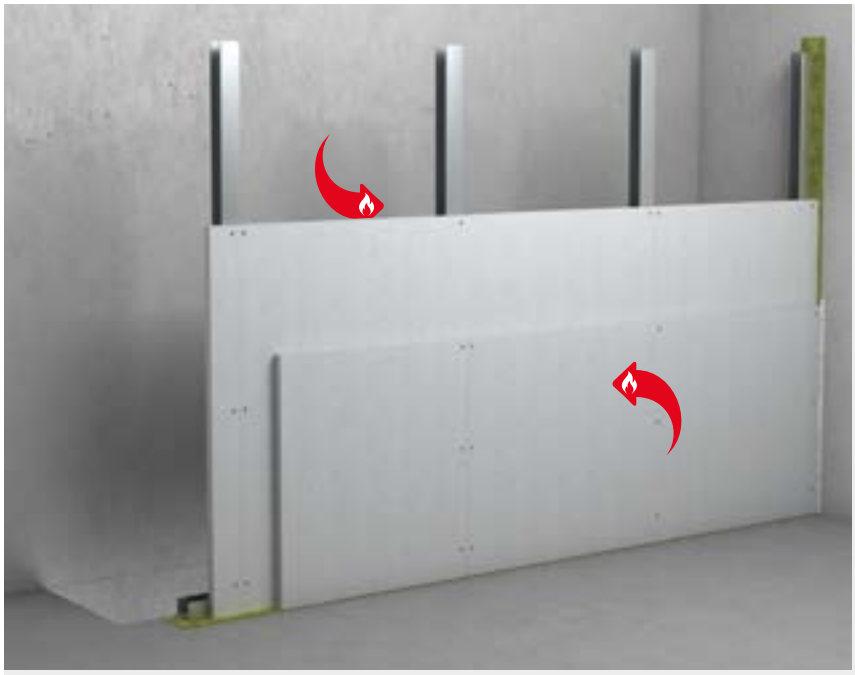
Three-sided design - horizontal section



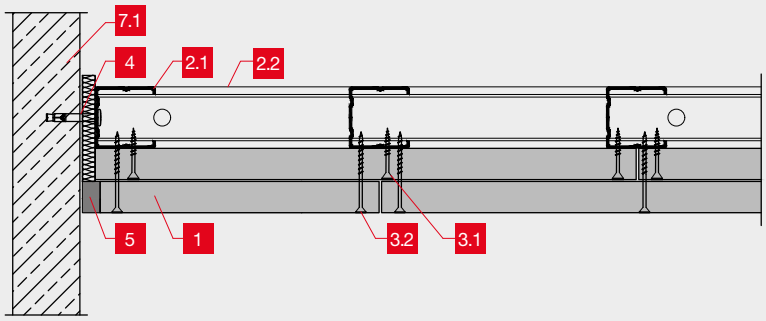
2.5 Aestuver™ Shaft wall - EI 90

3 S 33 AE - Fire exposure from inside and outside

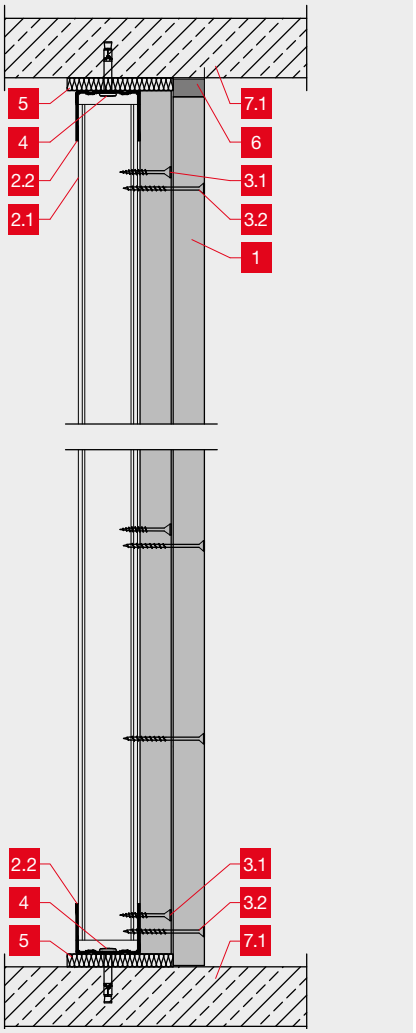
Fire protection	Boards	Sound insulation	Height	Wall thickness	Weight
EI 60 - EI 90	2 × 30 mm	R_w = 37 dB ± 3dB	500 cm	≥ 135 mm	61 kg/m²



Wall construction - horizontal section



Wall construction - vertical section



Description

1	Aestuver® fire protection board - thickness d ≥ 30 mm
2.1	CW ≥ 75-06 - distance a ≤ 625 mm
2.2	≥ UW 50-06
3.1	3,9 × 50 mm fermacell™ Powerpanel H_20 screw a ≤ 400 mm
3.2	4,2 × 75 mm Aestuver™ drywall screw a ≤ 250 mm
4	Suitable fasteners Ø ≥ 7,5 mm - a ≤ 500 mm
5	fermacell™ edge insulation strips
6	fermacell™ Powerpanel fine filler
7.1	Solid component
7.2	Suspended ceiling according to proof of usability
7.3	Wet screed d ≥ 50 mm
7.4	Separation- and shaft wall according to proof of usability
7.5	Clad steel component according to proof of usability

Evidence

PV 12 G 397 - EI 90
i-> <-a*

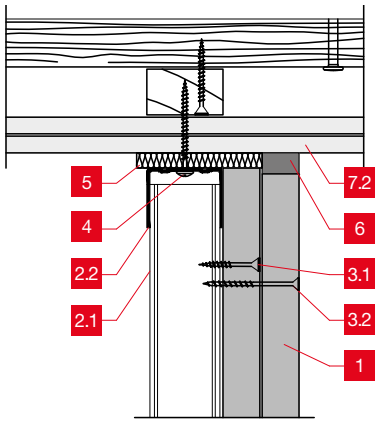
K-3296_518_14 - EI 60
i-> <-a*

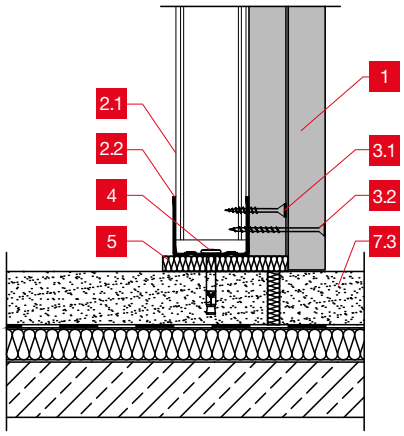
* Technical consultation
** GA_2024_002 for "unfolded length"

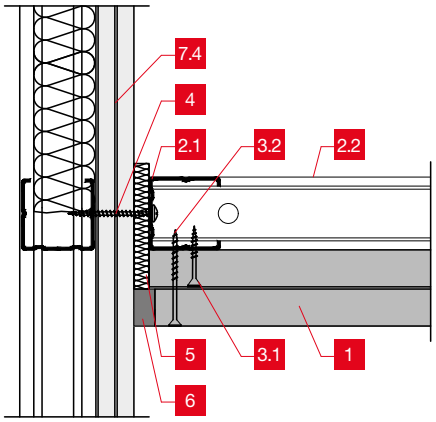
Connecting components must have at least the same fire resistance class. The installation of cavity wall boxes, fire protection boxes and inspection flaps is permitted; the corresponding manufacturer's specifications must be observed. Installation of penetration seals on request. The installation of mineral wool insulation leads to an improvement in the sound reduction index R_w.

Construction details

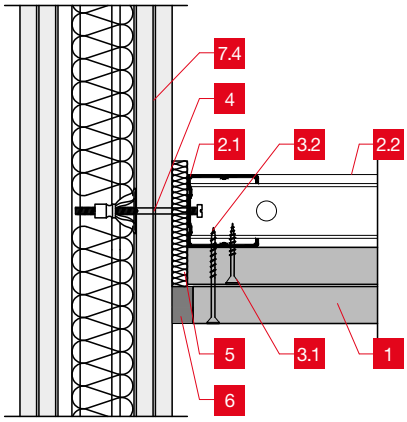
Ceiling connections



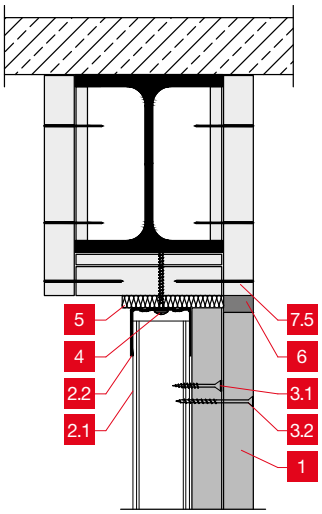




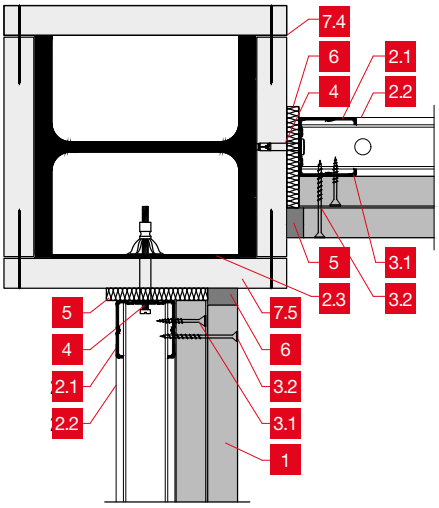
Shaft wall connection in panel



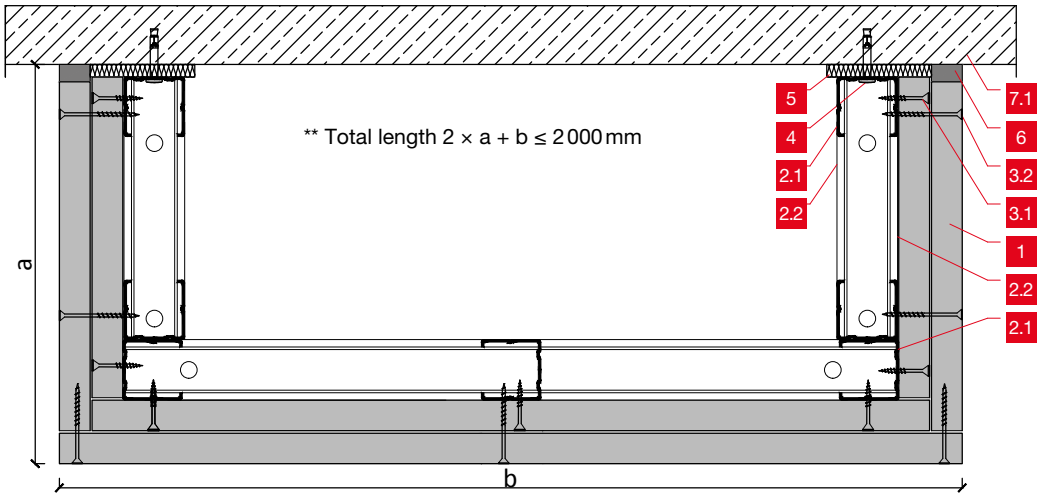
Connection to steel beams



Connection to steel columns



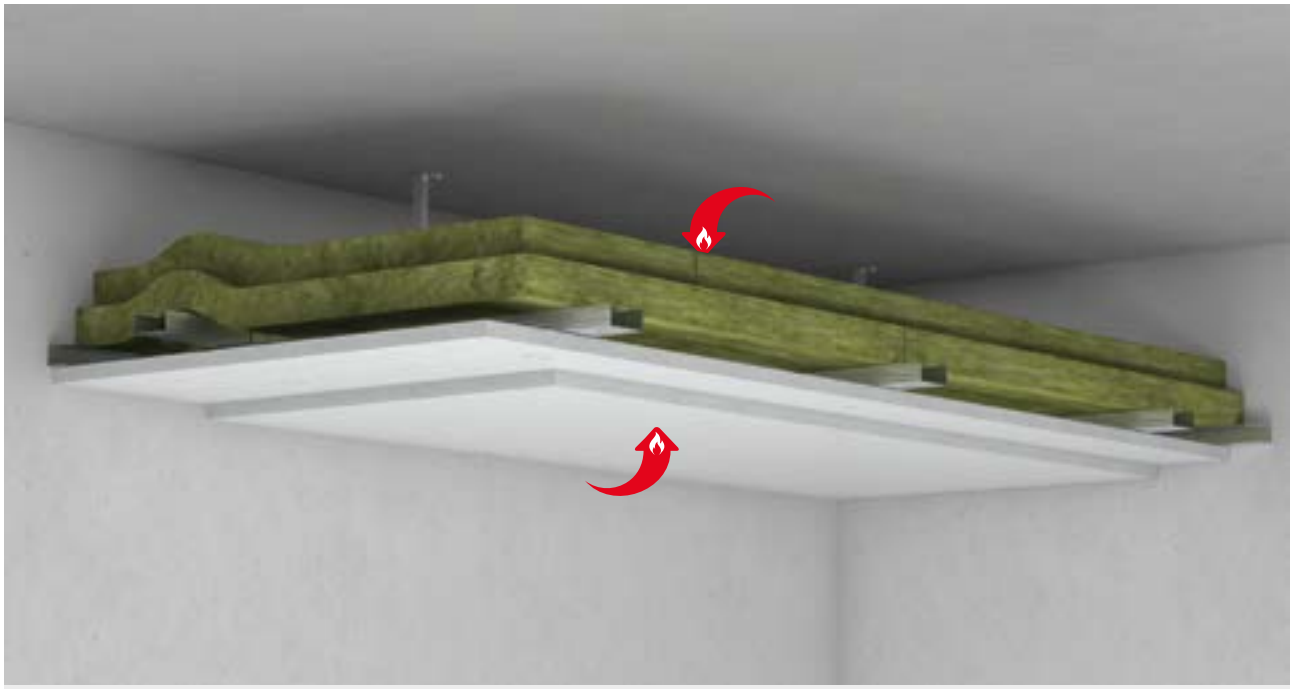
Three-sided design - horizontal section



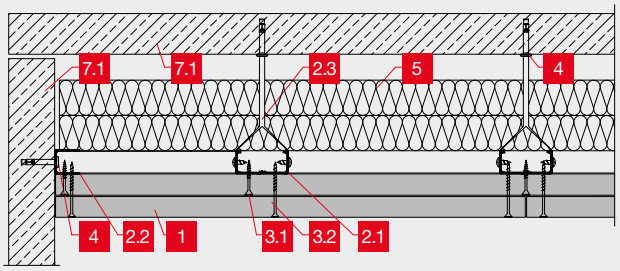
3.1 Aestuver™ Independent suspended ceiling - EI 90

2 S 31 AE - Fire exposure from above and below

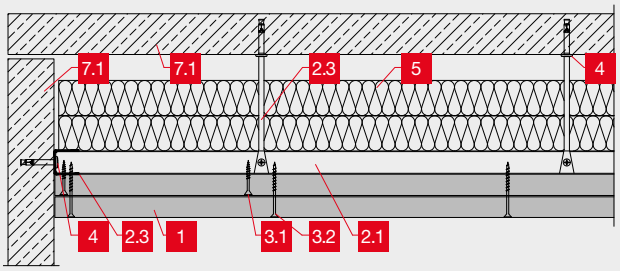
Fire protection	Boards	Hanger length	Height	Weight
F 90-A (↑u ↓o)	2 × 20 mm	Beliebig (↑u) / ≤ 175 cm (↓o)	≥ 147 mm	37 kg/m²



Wall connection - cross section



Wall connection - longitudinal section



Description	
1	Aestuver® fire protection board - thickness d ≥ 20 mm
2.1	CD60-06 Supporting profile spacing a ≤ 625 mm I Edge distance ≤ 500 mm
2.2	Connection profile UD27-06
2.3	CD- hanger spacing a ≤ 750 mm and according to structural calculations
3.1	3,9 × 35 mm fermacell™ Powerpanel screw a ≤ 200 mm
3.2	3,9 × 50 mm fermacell™ Powerpanel screw a ≤ 200 mm
4	Nail anchor Ø ≥ 6 mm– spacing a ≤ 500 mm (Connection wall component)
5	Mineral wool 40 mm 30 kg/m³ (Melting point > 1 000 °C)
7.1	Solid component*
7.2	Separating and SHAFT WALL according to usability certificate
7.3	Aestuver™ symmetrical partition wall 1 S 41 AE according to P-2101/076/16

*In case of fire from below: Unfinished ceiling without fire resistance class

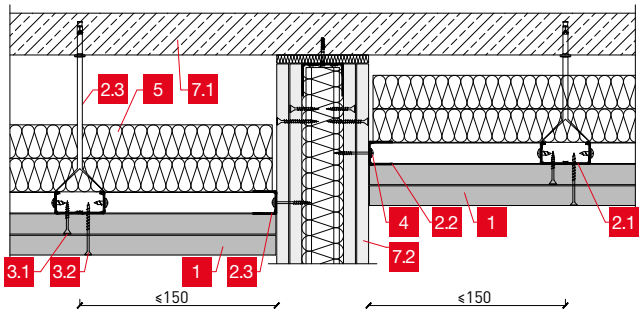
Evidence

KB-210007475_V2018-10-12

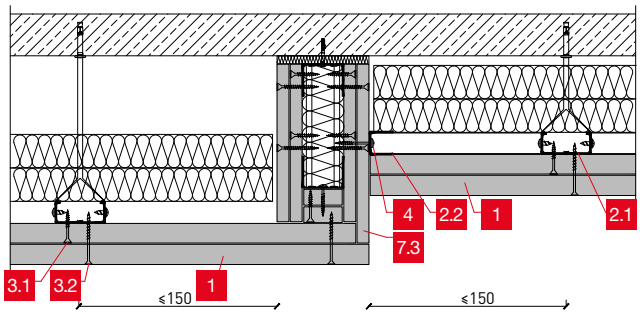
Connecting components must have at least the same fire resistance class. The substructure can be constructed at the same level or as base and supporting battens.

Construction details

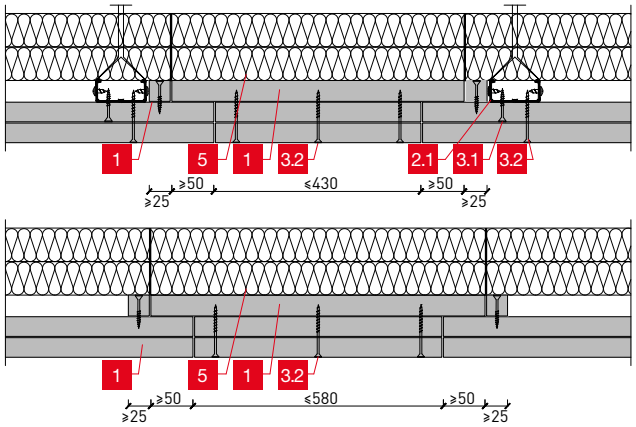
Connection to drywall



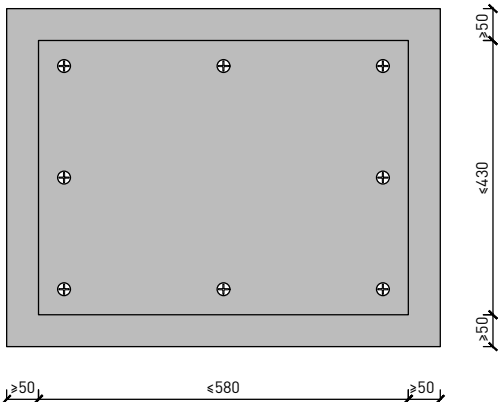
Height offset



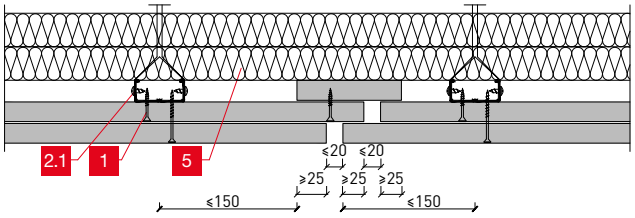
Inspection opening



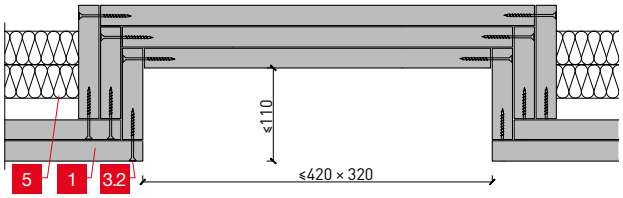
Bottom view with screw connection diagram



Movement joint



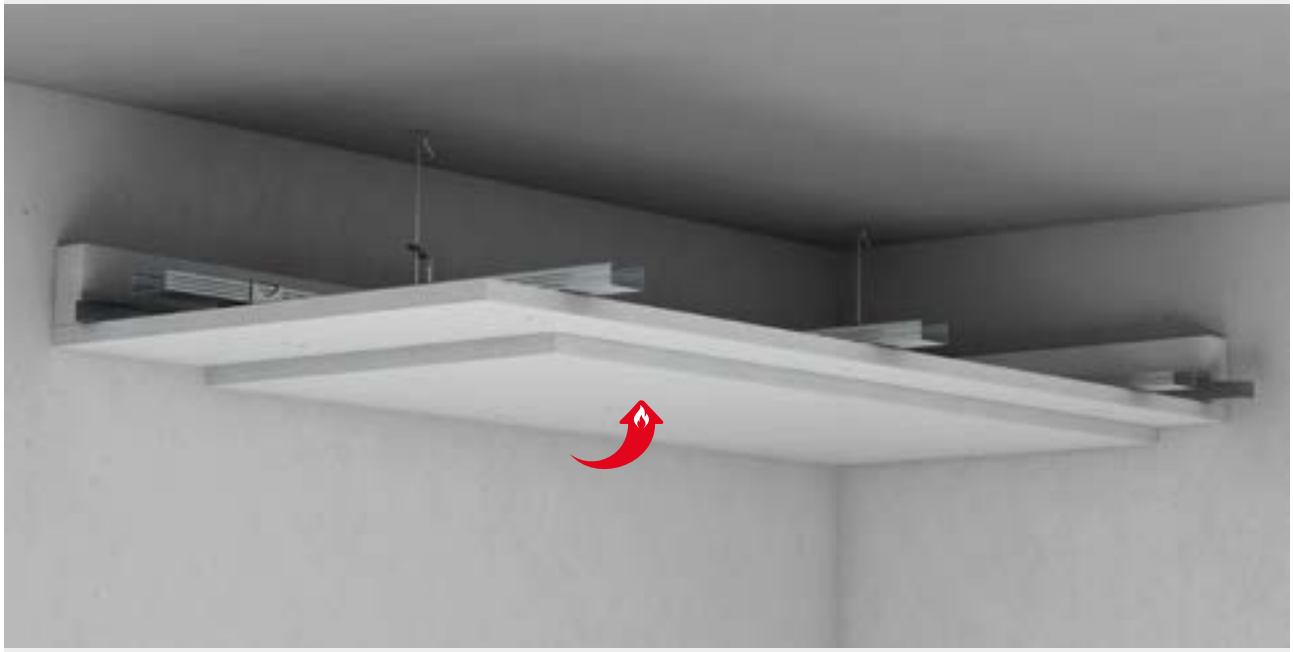
Lamp box



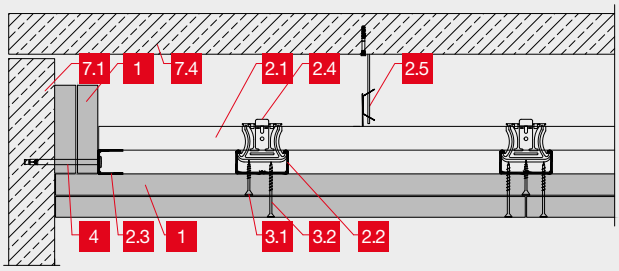
3.2 Aestuver™ Independent suspended ceiling - EI 90

2 S 32 AE - Fire exposure from below

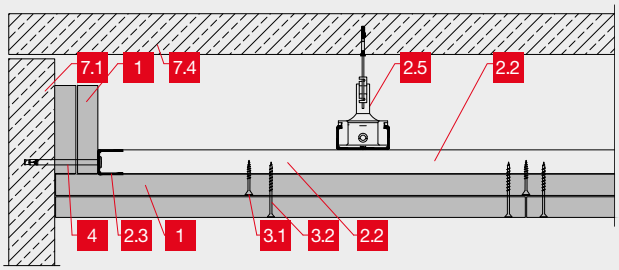
Fire protection	Boards	Hanger length	Height	Weight
EI 90 (↑u)	2×25 mm	Any	≥105 mm	≥40 kg/m²
EI 120 (↑u)	2×30 mm	Any	≥115 mm	≥50 kg/m²



Wall connection - cross section



Wall connection - longitudinal section



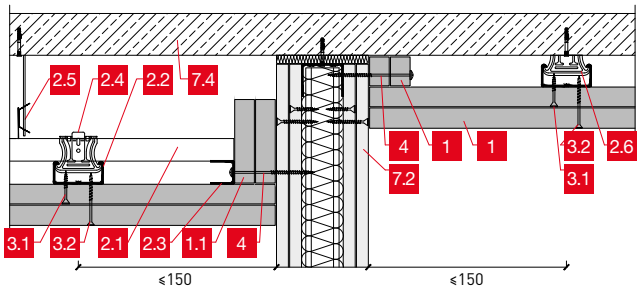
Description	
1	Aestuver® fire protection board - thickness d ≥25 mm
2.1	CD60-06 27 mm Basic profile spacing a ≤750 mm I Edge distance r=500 mm
2.2	CD60-06 27 mm Support profile spacing a ≤625 mm I Edge distance r=250 mm
2.3	Connection profile UD27-06
2.4	Cross-connection
2.5	CD- Hanger distance a ≤1 000 mm and according to structural calculations
2.6	CD- Direct mounting distance a ≤1 000 mm and according to structural calcs
2.7	C ceiling profile connector
3.1	3,9×35 mm fermacell™ Powerpanel screw a≤400 mm
3.2	4,2×75 mm Aestuver™ Drywall screw a≤200 mm
4	Fasteners Ø≥6 mm - a≤500mm
7.1	Solid component
7.2	Separating and SHAFT WALL according to usability certificate
7.3	Aestuver™ symmetrical partition wall 1 S 41 AE
7.4	Unfinished ceiling without fire resistance class

Evidence
K_2100_866_15_MPA BS
K_2100_867_15_MPA BS
PK2-07-20-001-E-0

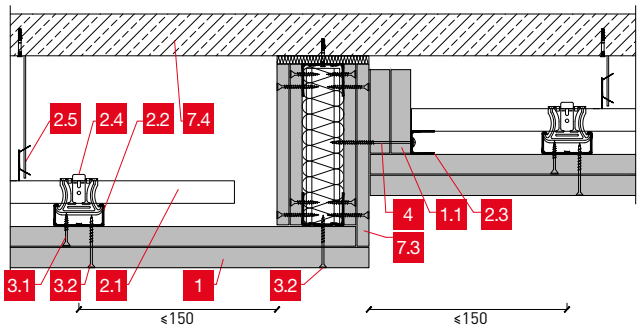
Adjacent wall components must have at least the same fire resistance class. The installation of additional, non-combustible insulation is possible. Combustible cable insulation in the ceiling cavity must be limited to a fire load of 7 kWh/m².

Construction details

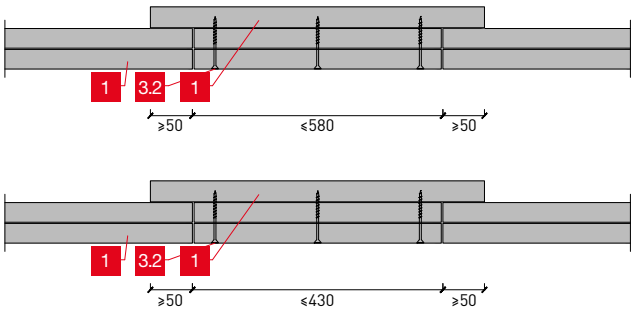
Connection to drywall



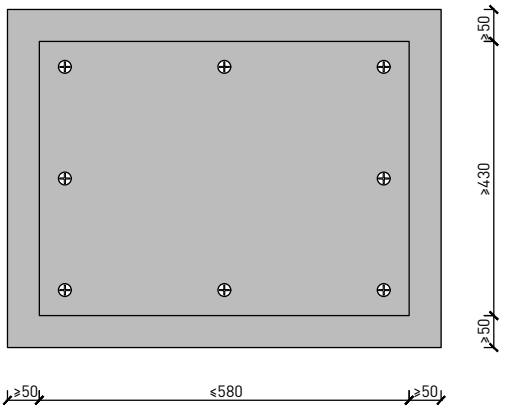
Height offset



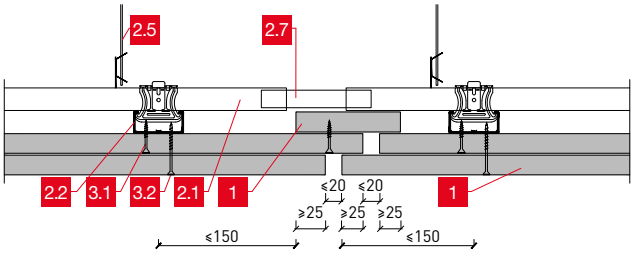
Inspection opening



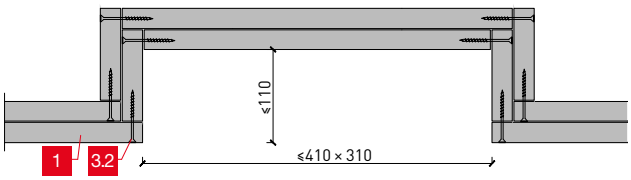
Bottom view with screw connection diagram



Movement joint



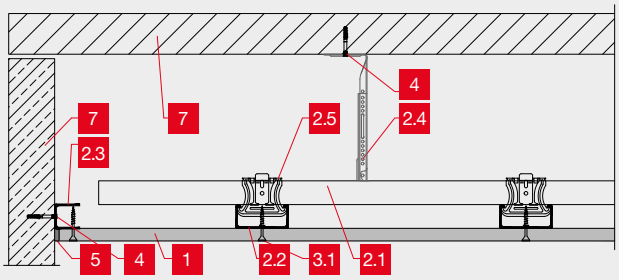
Lamp box



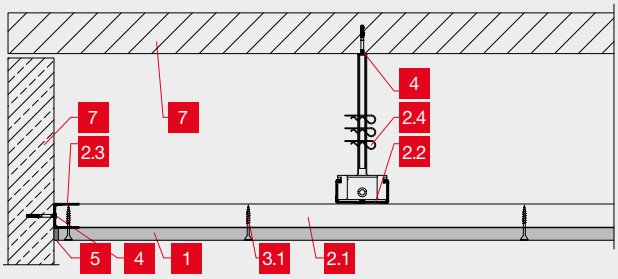
3.3 Aestuver® Ceilings in connection with bare ceiling (Type I, II, III) - EI 60–EI 90 2 S 35 AE, 2 S 21 AE, 2 S 36 AE

Fire protection	Boards	Hanger length	Height	Weight
EI 60–EI 90	≥15 mm	≥0 mm	≥65 mm	≥16 kg/m²

Wall connection - cross section



Wall connection - longitudinal section



Description	
1	Aestuver® fire protection board - thickness d ≥15 mm
2.1	CD60-06 27 mm Basic profile centre distance a ≤1 000 mm
2.2	CD60-06 27 mm Supporting profile distance a ≤625 mm
2.3	UD profile 27-06
2.4	CD-Hanger a ≤750 mm and according to structural calculations
2.5	Cross-connection
3.1	3,9×35 mm fermacell™ Powerpanel screw a ≤200 mm
4	Nail anchor Ø ≥6 mm - a ≤500 mm
5	fermacell™ Powerpanel fine filler
7	Solid component

Evidence
15 mm K_2101_387_18 REI 60
20 mm KB-2101/714/19-MPA_BS
25 mm K_2102_334_19

Single-layer ceiling construction in which the fire resistance class is achieved in conjunction with the bare ceiling. Connecting wall components must have at least the same fire resistance class.

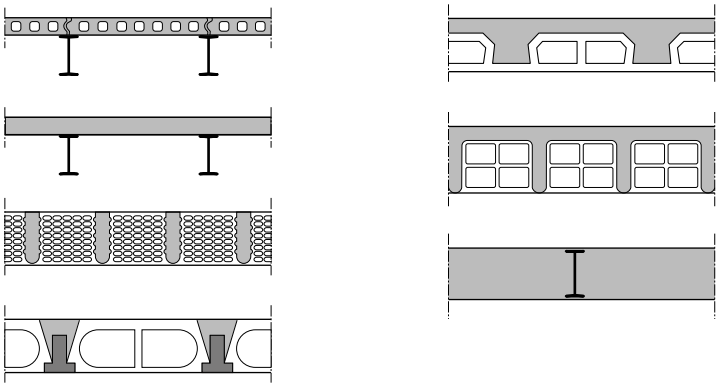
Flammable cable insulation in the ceiling cavity must be limited to a fire load of 7 kWh/m².

Construction	Ceiling type	Fire resistance	Board thickness [mm]	Hanger spacing [mm]	Drop height [mm]	Weight [kg/m²]
2 S 35 AE	Typ I	F 90-A	25	≤750	≥ 55	22
2 S 21 AE	Typ II, III	REI 60	15	≤750	≥195	16
2 S 36 AE	Typ II, III	F 90-A	20	≤750	≥195	19

Ceiling types

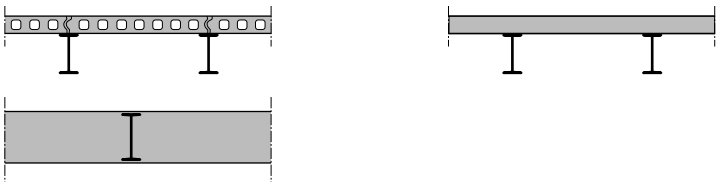
Type I ceilings are:

1. Ceilings with exposed steel beams in the intermediate ceiling area with a U/A value < 300 m-1 u and an upper finish of hollow pumice concrete blocks in accordance with DIN 4028 or aerated concrete panels in accordance with DIN 4223.
2. Reinforced concrete beam ceilings according to DIN 1045 with intermediate components made of lightweight concrete according to DIN 4158 or bricks according to DIN 4159 and DIN 4160.
3. Reinforced concrete ribbed slabs in accordance with DIN 1045 with intermediate components made of lightweight concrete in accordance with DIN 4158 or bricks in accordance with DIN 4159 and DIN 4160.
4. Reinforced concrete floors in conjunction with steel beams embedded in concrete.



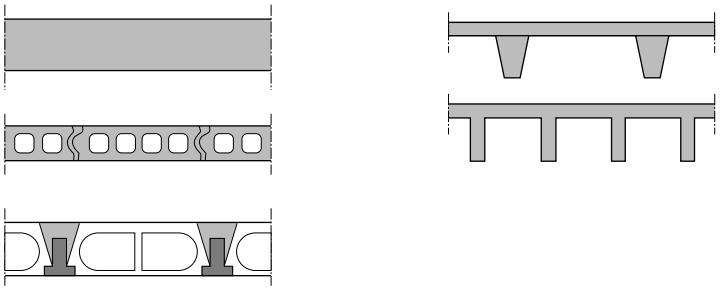
Type II ceilings are:

Ceilings with exposed steel beams in the intermediate ceiling area with a U/A value $<300\,m^{-1}$ and an upper cover made of in-situ concrete in accordance with DIN 1045 or prefabricated slabs with a statically contributing in-situ concrete layer in accordance with DIN 1045 or prefabricated parts as hollow planks made of reinforced or prestressed concrete.



Type III ceilings are:

Ceilings made of reinforced concrete or prestressed concrete slabs made of normal concrete, but not with components or intermediate components made of lightweight concrete or bricks. These are ceilings with the following designations: Reinforced concrete or prestressed concrete slabs according to DIN 1045 made of normal concrete Reinforced concrete or prestressed concrete hollow core slabs according to DIN 1045 or DIN 4227 made of normal concrete Reinforced concrete beam ceilings with beams and intermediate components according to DIN 1045 made of normal concrete Reinforced concrete ribbed ceilings to DIN 1045 without intermediate components or with intermediate components made of normal concrete Mushroom slabs and coffered ceilings according to DIN 1045 made of normal concrete.



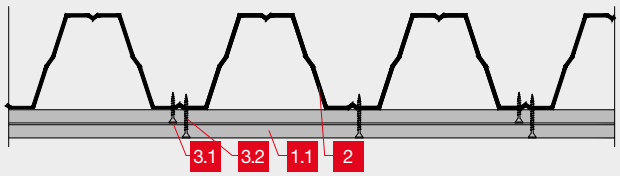
NOTE:
For claypot ceilings fire protection please contact our customer service centre.

3.4 Aestuver™ Trapezoidal steel sheet ceiling - REI 30

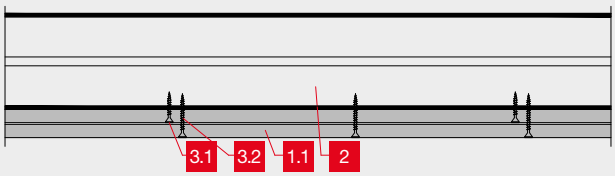
2 ST 11 AE - Fire protection from below

Fire protection	Boards	Unsupported	Height	Weight
REI 30 (↑u)	2 × 15 mm	According to structural calcs	≥ 30 mm	≥ 35 kg/m²

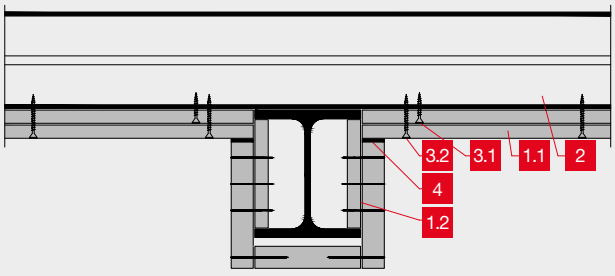
Across the clamping direction



In clamping direction



In clamping direction (Integrated steel beam cladding



Description	
1.1	Aestuver® fire protection board - thickness d ≥ 15 mm
1.2	Aestuver® fire protection board – thickness as per U/A factor (see section 5.1)
2	Trapezoidal sheet t ≥ 0,75 (Structural calc in case of fire as per usability certificate
3.1	3,9 × 35 mm fermacell™ Powerpanel screw a ≤ 600 mm
3.2	3,9 × 50 mm fermacell™ Powerpanel screw a ≤ 300 mm
4	Aestuver™ tape DSB – d = 1,5 mm

Evidence
KB 3.2/14-043-6
ETA-11-0458

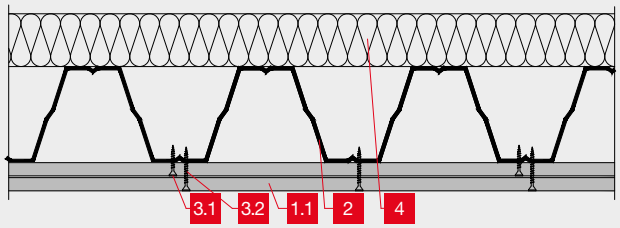
Direct fixing of the fire protection boards in the deep beads. Fire resistance without additional insulation layer. Spans of the trapezoidal steel sheeting can be freely selected, taking into account the deflection limit of l/300 and in accordance with the structural analysis.

3.5 Aestuver™ Trapezoidal steel sheet ceiling - REI 60

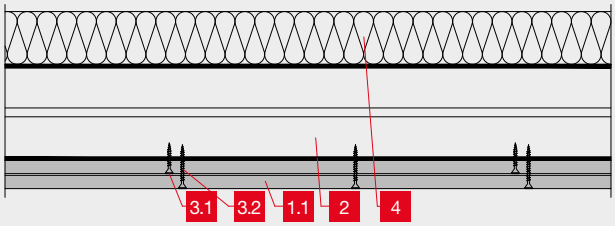
2 ST 21 AE - Fire protection from below

Fire protection	Boards	Unsupported	Height	Weight
REI 60 (↑u)	2 × 15 mm	According to structural calcs	≥ 90 mm	≥ 44 kg/m²

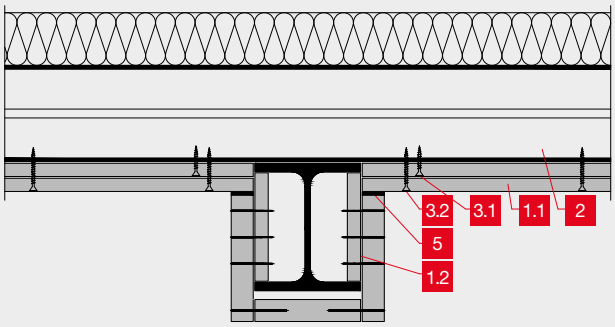
Across the clamping direction



In clamping direction



In clamping direction



Description	
1.1	Aestuver® fire protection board - thickness d ≥ 15 mm
1.2	Aestuver® fire protection board – thickness as per U/A factor (see section 5.1)
2	Trapezoidal sheet t ≥ 0,75 (Structural calc in case of fire as per usability certificate
3.1	3,9 × 35 mm fermacell™ Powerpanel screw a ≤ 600 mm
3.2	3,9 × 50 mm fermacell™ Powerpanel screw a ≤ 300 mm
4	Mineral wool d ≥ 60 mm / ρ ≥ 150 kg/m³ (Melting point θ > 1 000 °C)
5	Aestuver™ tape DSB – d = 1,5 mm

Evidence

KB 3.2/14-043-5

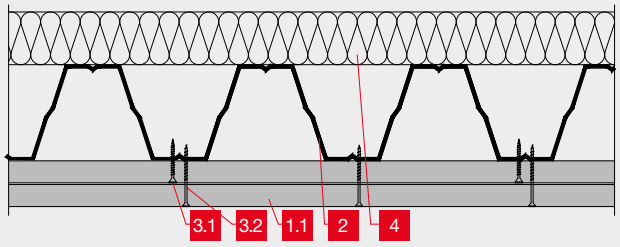
Direct fastening of the fire protection panels in the deep corrugations. Spans of the steel trapezoidal sheeting can be freely selected, taking into account the deflection limit of l/300 and according to structural calculations.

3.6 Aestuver™ Trapezoidal steel sheet ceiling - REI 90

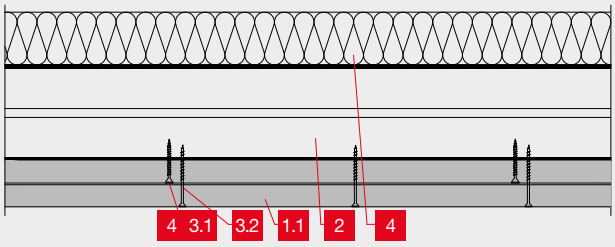
2 ST 35 AE - Fire protection from below

Fire protection	Boards	Unsupported	Height	Weight
REI 90 (↑u)	2×20 mm	According to structural calcs	≥100 mm	≥50 kg/m²

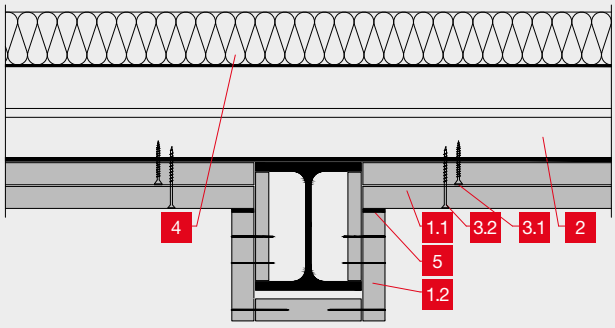
Across the clamping direction



In clamping direction



In clamping direction



Description	
1.1	Aestuver® fire protection board - thickness d ≥20 mm
1.2	Aestuver® fire protection board – thickness as per U/A factor (see section 5.1)
2	Trapezoidal sheet t ≥0,75 (Structural calc in case of fire as per usability certificate
3.1	3,9×35 mm fermacell™ Powerpanel screw a≤600 mm
3.2	4,2×75 mm Aestuver™ drywall screw a≤300 mm
4	Mineral wool d≥60 mm / ρ≥150 kg/m³ (Melting point θ>1 000 °C)
5	Aestuver™ tape DSB – d=1,5 mm

Evidence

KB 3.2/14-043-5

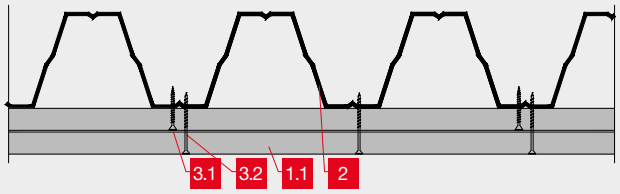
Direct fixing of the fire protection boards in the deep beads. Project-specific design without overlying insulation possible on request. Spans of the trapezoidal steel sheet can be freely selected, taking into account the deflection limit of l/300 and in accordance with the structural analysis.

3.7 Aestuver™ Trapezoidal steel sheet ceiling - REI 120

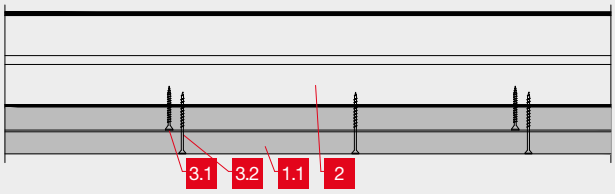
2 ST 41 AE - Fire protection from below

Fire protection	Boards	Unsupported	Height	Weight
REI 120 (↑u)	2 × 25 mm	According to structural calcs	≥ 50 mm	≥ 47 kg/m²

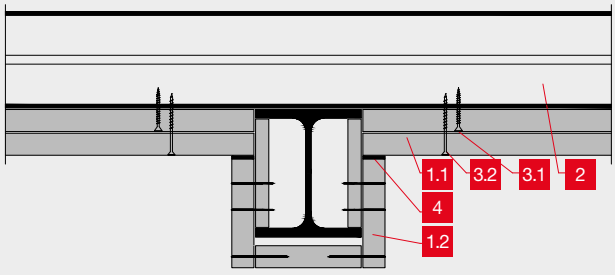
Across the clamping direction



In clamping direction



In clamping direction



Description	
1.1	Aestuver® fire protection board - thickness d ≥ 25 mm
1.2	Aestuver® fire protection board – thickness as per U/A factor (see section 5.1)
2	Trapezoidal sheet t ≥ 0,75 (Structural calc in case of fire as per usability certificate
3.1	3,9 × 50 mm fermacell™ Powerpanel screw a ≤ 600 mm
3.2	4,2 × 75 mm Aestuver™ drywall screw a ≤ 300 mm
4	Aestuver™ tape DSB – d = 1,5 mm

Evidence

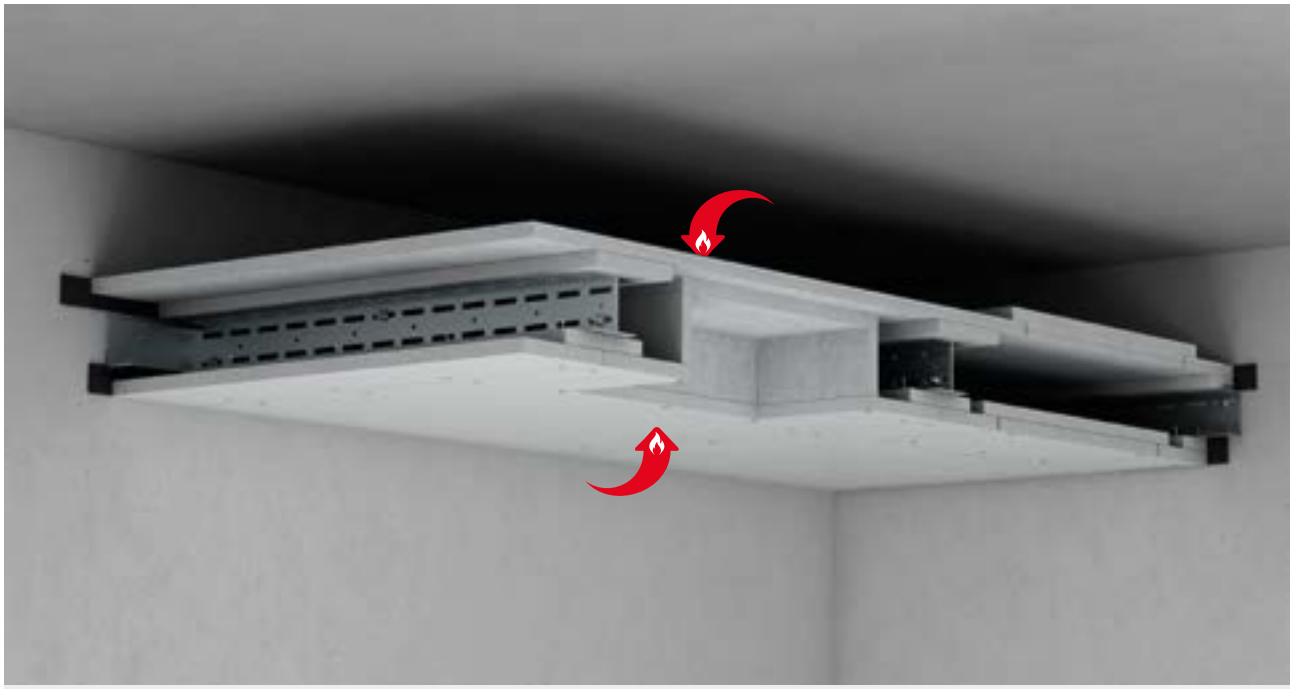
KB 3.2/14-043-6

Direct fastening of the fire protection boards in the deep beads. Fire resistance without additional insulation layer. Spans of the trapezoidal steel sheeting can be freely selected, taking into account the deflection limit of l/300 and in accordance with the structural analysis.

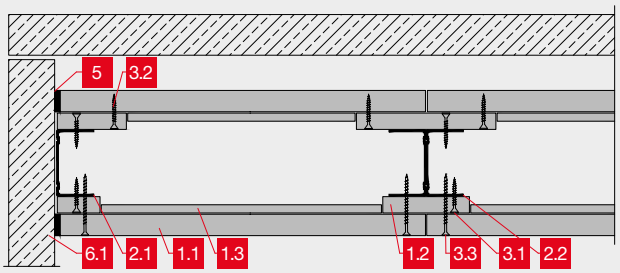
3.8 Aestuver™ Self-supporting wide-span ceiling - EI 90

2 S 33 AE - Fire exposure from above and below

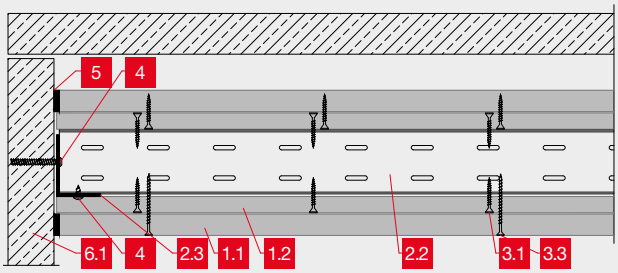
Fire protection	Boards	Span	Height	Weight
EI 90 (↑u ↓o)	Each side 25 mm	440 cm (self-supporting)	≥ 165 mm	≥ 58 kg/m²



Wall connection - cross section



Wall connection - longitudinal section



Description	
1.1	Aestuver® fire protection board - thickness d ≥ 25 mm
1.2	Aestuver® fire protection board - thickness d ≥ 20 mm – b ≥ 180 mm
1.3	Aestuver® fire protection board - thickness d ≥ 10 mm – b ≥ 100 mm
2.1	UA-Profile 75-20
2.2	UA-Profile 75-20 (coupled) – centre distance a ≤ 625 mm
2.3	Support angle 70 × 50 × 3 mm
3.1	3,9 × 40 mm fermacell™ Powerpanel screw with drill point a ≤ 400 mm
3.2	3,9 × 40 mm fermacell™ Drywall screw a ≤ 400 mm
3.3	6,3 × 65 mm WÜRTH Zebra wing sliders a ≤ 200 mm
4	Concrete screws Ø ≥ 7,5 mm - l ≥ 132 mm - a ≤ 500 mm
5	Aestuver™ Tape DSB b = 20 mm - d = 1,5 mm
6.1	Solid component*
6.2	Separating and SHAFT WALL according to usability certificate

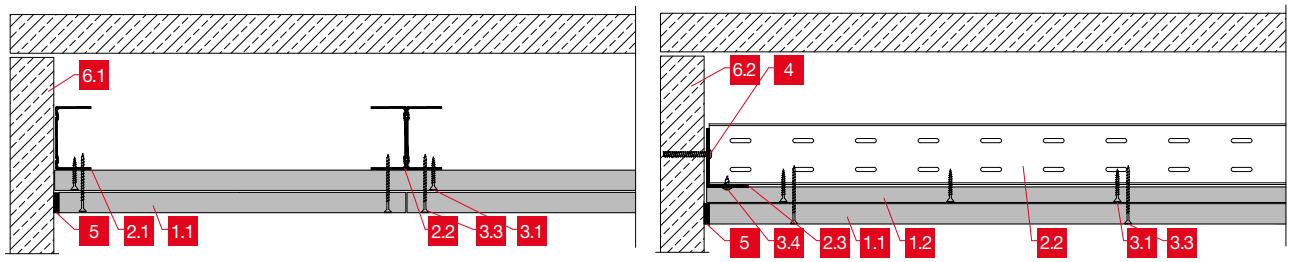
*For fire from below: Unfinished ceiling without fire resistance class permissible

Evidence
3.2_17-354-1
GA-2024/018

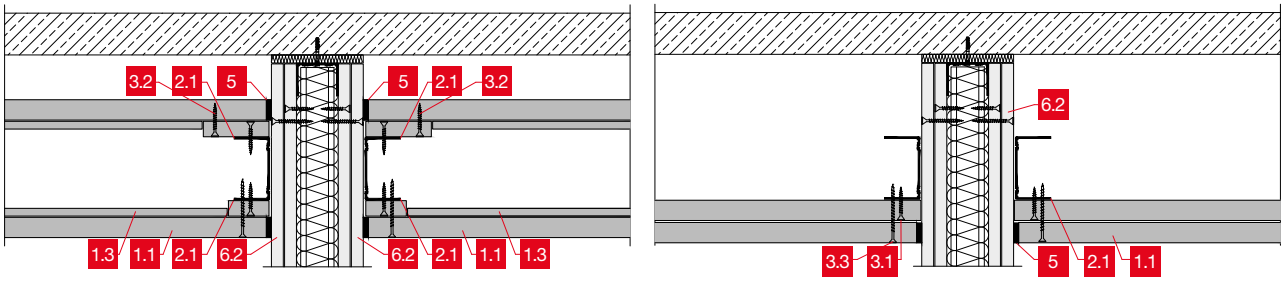
Connecting components must have at least the same fire resistance class. Unsupported ceiling construction up to 440 cm span. Larger spans and other support profiles possible on request. Test report 3.2-09-432.

Construction details

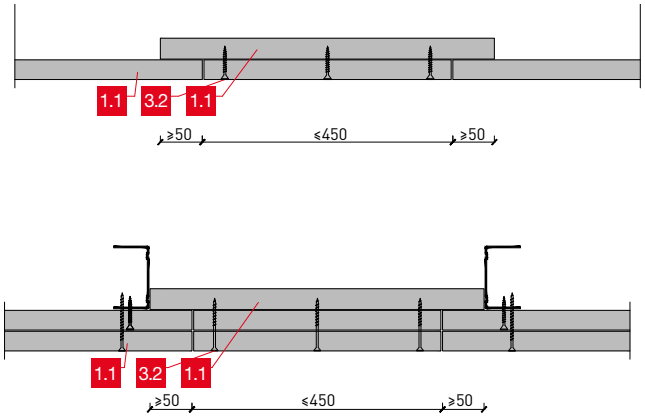
Alternatively, version F 90-A (↑u) (for exclusive use with fire protection from below)



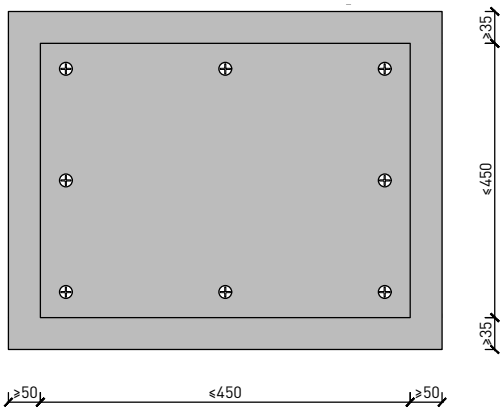
Wall connections



Inspection hatch



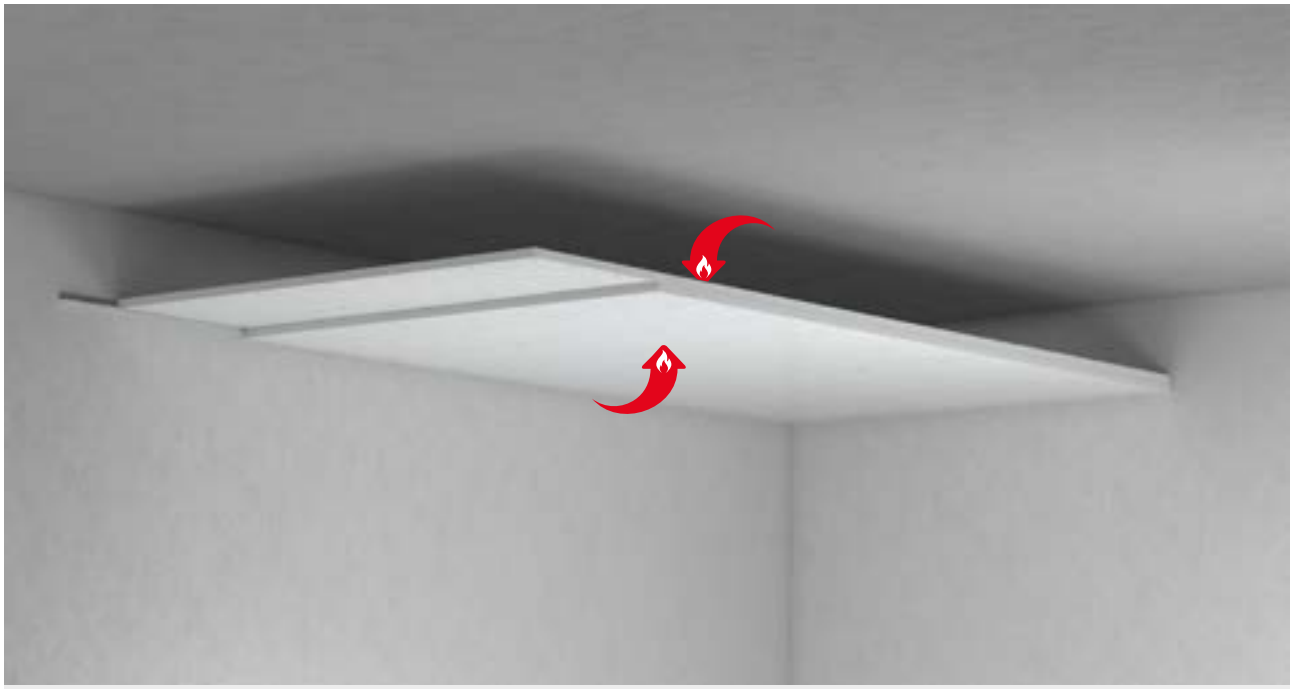
Bottom view with screw connection diagram



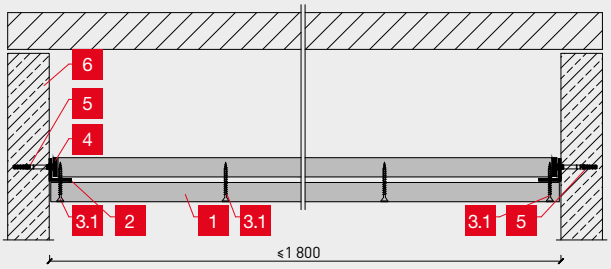
3.9 Aestuver™ self-supporting false ceiling - EI 90

2 S 34 AE - Fire exposure from above and below

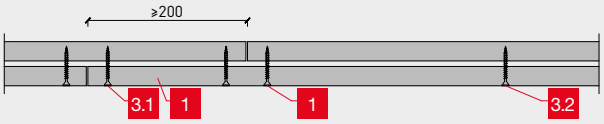
Fire protection	Boards	Unsupported	Height	Weight
EI 90-A (↑u ↓o)	2 × 30 mm	≤ 180 cm	≥ 60 mm	≥ 44 kg/m²



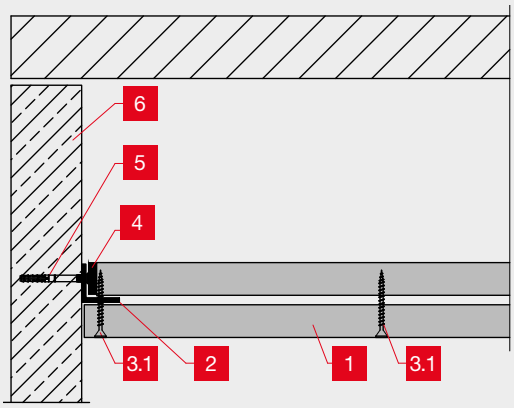
Cross section



Longitudinal section - joint overlap



Wall connection



Description

1	Aestuver® fire protection board - thickness d ≥ 30 mm
2	Steel angle ≥ 28 × 28 × 0,6 mm
3.1	3,9 × 50 mm fermacell™ Powerpanel screw – a ≤ 300 mm
3.2	3,9 × 50 mm fermacell™ Powerpanel screw – $a_{längs}$ ≤ 300 mm/ a_{quer} ≤ 600 mm
4	Aestuver™ Tape DSB – b = 30 mm
5	Nail anchor Ø ≥ 6 mm - a ≤ 500 mm
6	Solid component*

*For fire from below: Unfinished ceiling without fire resistance class permissible

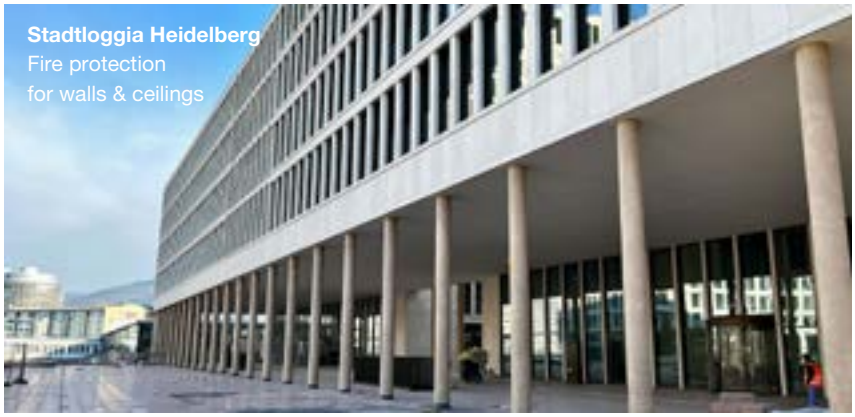
Evidence

K_2101_438_20 & K_2101_444_20

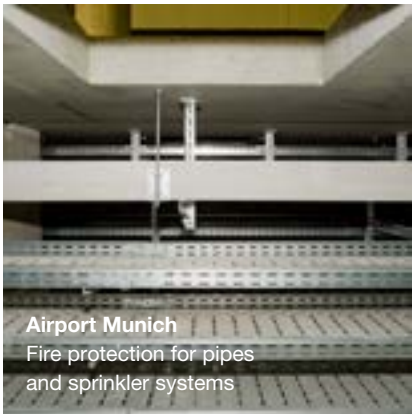
Connecting components must have at least the same fire resistance class. Selfsupporting ceiling construction without substructure with a very slim construction height of only 60 mm. Installation of inspection openings possible on request.

Reference projects with Aestuver fire protection boards

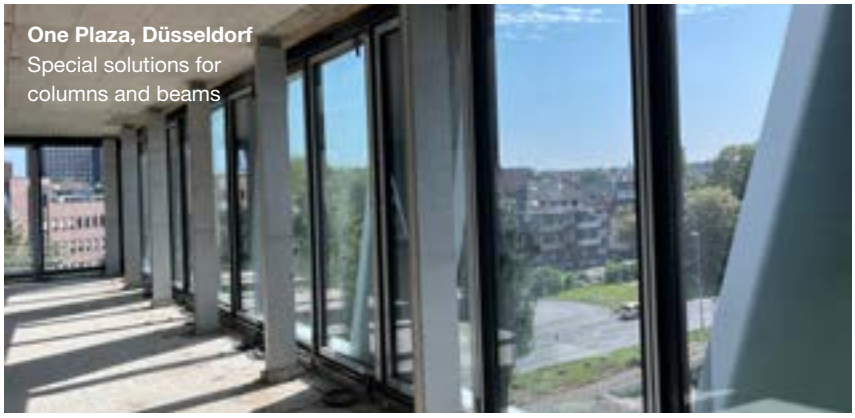
Weatherproof constructions for indoor and outdoor use



Stadtloggia Heidelberg
Fire protection
for walls & ceilings



Airport Munich
Fire protection for pipes
and sprinkler systems



One Plaza, Düsseldorf
Special solutions for
columns and beams

Schoolbuidlding, Magdeburg
Fire protection cladding for
complex components

4.1 A/V (Ap/V) profile factor

The geometry of the steel profile is defined by the A/V value according to DIN 4102 Part 4 or the Ap/V value according to EN 1993-1-2.

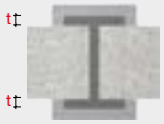
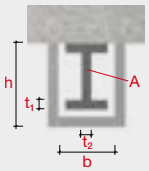
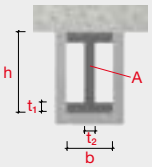
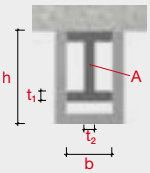
Both values describe the ratio of the surface exposed to fire to the volume of the steel component.

For components with a constant crosssection along the length, the two values are identical.

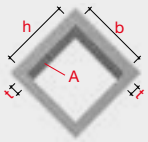
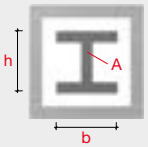
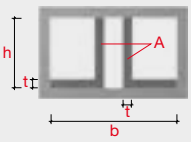
Consequently, it can be said that the larger the profile factor, the faster the steel component heats up and thus the required cladding thickness increases depending on the fire resistance period.

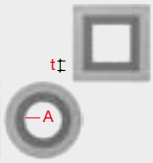
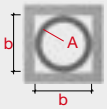
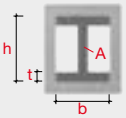
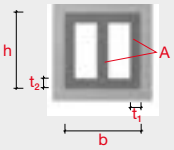
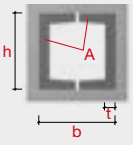
On these pages you will find calculation formulas for various steel profiles as well as the values already calculated for selected standard profiles (IPE, IPN, HE-A, HE-B, HE-M).

Three-sided fire exposure

Profile factor				
	Flange	Beam	Beam	Beam
A/V or. Ap/V	$\frac{100}{t}$	$\frac{2h+b}{A} \times 10^2$	$\frac{2h+b}{A} \times 10^2$	$\frac{2h+b}{A} \times 10^2$
Design features b, h and t in cm; Area A in cm²				

Four-sided fire exposure

Profile factor					
	Flat steel	Structural Tees	Angle	Beam or column	Double angle
A/V or. Ap/V	$\frac{200}{t}$	$\frac{200}{t}$	$\frac{2b+2h}{A} \times 10^2$	$\frac{2b+2h}{A} \times 10^2$	$\frac{2b+2h}{A} \times 10^2$
Design features b, h and t in cm; Area A in cm²					

Profile factor					
	Hollow section beams	Hollow section beams	Beam or column	Beam or column	Beam or column
A/V or. Ap/V	$\frac{100}{t}$	$\frac{4b}{A} \times 10^2$	$\frac{2b+2h}{A} \times 10^2$	$\frac{2b+2h}{A} \times 10^2$	$\frac{2b+2h}{A} \times 10^2$
Design features b, h and t in cm; Area A in cm²					

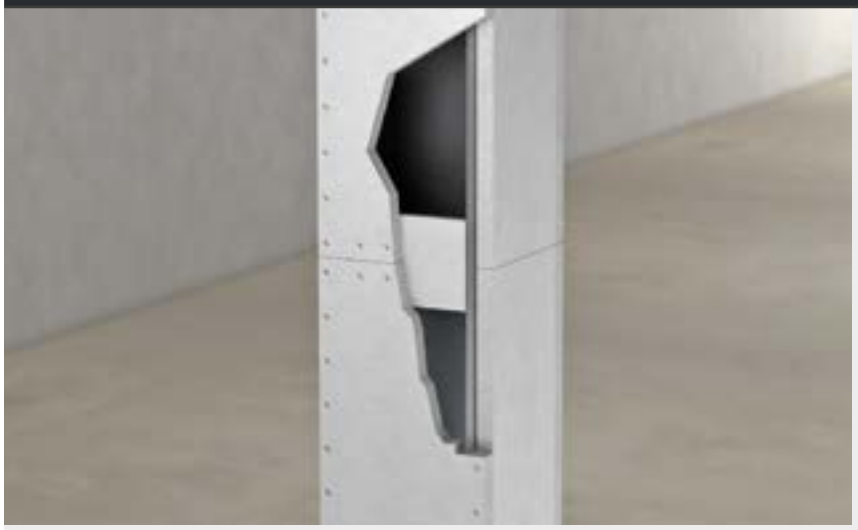
Profile type	A/V Profile factor																	
IPE																		
	IPE 80	IPE 100	IPE 120	IPE 140	IPE 160	IPE 180	IPE 200	IPE 220	IPE 240	IPE 270	IPE 300	IPE 330	IPE 360	IPE 400	IPE 450	IPE 500	IPE 550	IPE 600
 Four-sided	330	300	279	259	241	226	211	198	184	176	167	157	146	137	130	121	113	105
 Dreiseitig	270	247	230	215	200	188	176	165	153	147	139	131	122	116	110	104	97	91
IPN																		
	IPN 80	IPN 100	IPN 120	IPN 140	IPN 160	IPN 180	IPN 200	IPN 220	IPN 240	IPN 260	IPN 280	IPN 300	IPN 320	IPN 340	IPN 360	IPN 380	IPN 400	IPN 450	IPN 500	IPN 550	IPN 600
 Four-sided	322	283	251	225	205	188	174	161	150	140	131	123	116	110	104	99	94	84	77	71	64
 Three-sided	266	236	210	189	173	158	147	136	127	119	111	105	99	94	89	85	81	73	66	61	56
HE-A																		
	HE-A 100	HE-A 120	HE-A 140	HE-A 160	HE-A 180	HE-A 200	HE-A 220	HE-A 240	HE-A 260	HE-A 280	HE-A 300	HE-A 320	HE-A 340	HE-A 360	HE-A 400	HE-A 450	HE-A 500	HE-A 550	HE-A 600	HE-A 650	HE-A 700	HE-A 800	HE-A 900	HE-A 1000
 Four-sided	185	185	174	161	155	145	134	122	117	113	105	98	94	91	87	83	80	79	79	78	76	76	74	74
 Three-sided	138	137	129	120	115	108	99	91	88	84	78	74	72	70	68	66	65	65	65	65	64	66	65	66
HE-B																		
	HE-B 100	HE-B 120	HE-B 140	HE-B 160	HE-B 180	HE-B 200	HE-B 220	HE-B 240	HE-B 260	HE-B 280	HE-B 300	HE-B 320	HE-B 340	HE-B 360	HE-B 400	HE-B 450	HE-B 500	HE-B 550	HE-B 600	HE-B 650	HE-B 700	HE-B 800	HE-B 900	HE-B 1000
 Four-sided	154	141	130	118	110	102	97	91	88	85	80	77	75	73	71	69	67	67	67	66	65	66	65	65
 Three-sided	115	106	98	88	83	77	72	68	66	64	60	58	57	56	56	55	54	55	56	56	55	57	57	57
HE-M																		
	HE-M 100	HE-M 120	HE-M 140	HE-M 160	HE-M 180	HE-M 200	HE-M 220	HE-M 240	HE-M 260	HE-M 280	HE-M 300	HE-M 320	HE-M 340	HE-M 360	HE-M 400	HE-M 450	HE-M 500	HE-M 550	HE-M 600	HE-M 650	HE-M 700	HE-M 800	HE-M 900	HE-M 1000
 Four-sided	85	80	76	71	68	65	62	52	51	50	43	43	43	44	45	47	48	50	51	52	53	55	57	59
 Three-sided	65	61	58	54	52	49	47	39	39	38	33	33	34	34	36	38	39	41	42	44	45	48	50	52

4.2 Aestuver® Steel column cladding R 30 - R 180

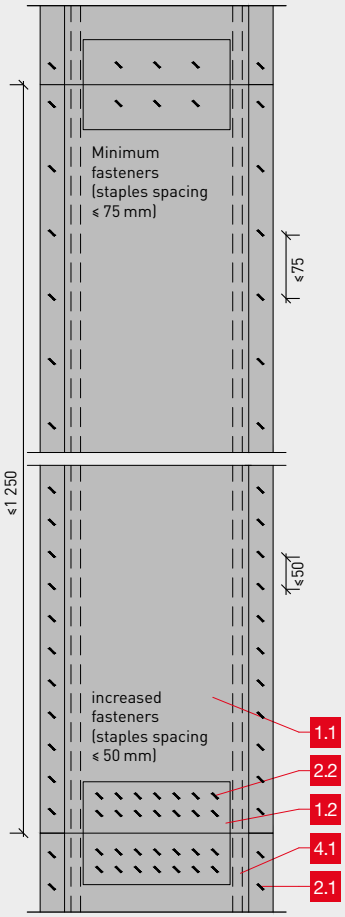
according to European approval

Fire protection	Application	Cladding	Temperature	Approval
R 30 - R 180	vertical	Single layer	350–750 °C	ETA 11/0458

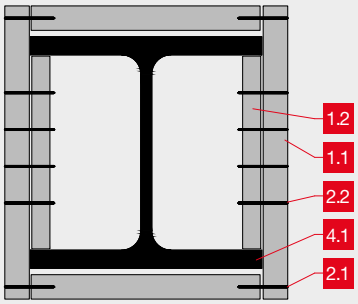
Detail 4-sided column



Träger Längsschnitt



Detail 4-sided column



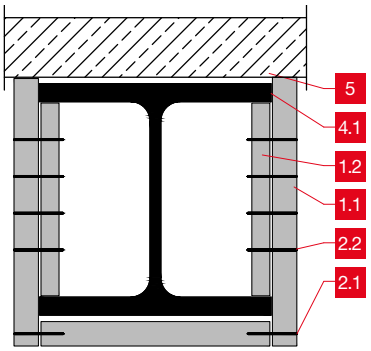
Description	
1.1	Aestuver® fire protection board (cladding) – thickness according to table
1.2	Aestuver® fire protection board (noggins) b ≥ 150 mm – thickness according to table
2.1	Board fastening in board edge according to table
2.2	Board fastening in noggins according to table
3	Suitable fasteners a ≤ 500 mm
4.1	Steel element
4.2	Steel angle ≥ 40 × 20 × 0,7 mm
5	Solid component

Evidence
ETA-11/0458
GA-2020/084

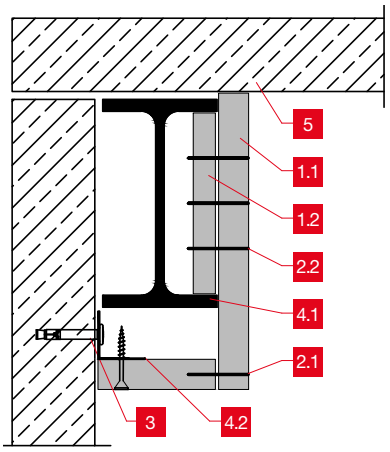
Single-layer support cladding. Fastening panel to panel with staples or screws. Also available for alternative support profiles (e.g. hollow box profiles). Filling of the panel joints and bonding agents is not required for fire protection purposes. ETA 11/0458 can be used in conjunction with EN 1993-1-2.

Construction details

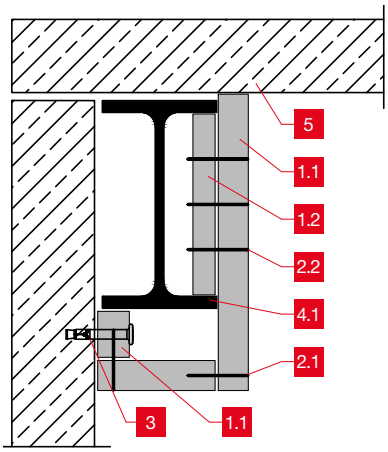
Three-sided design



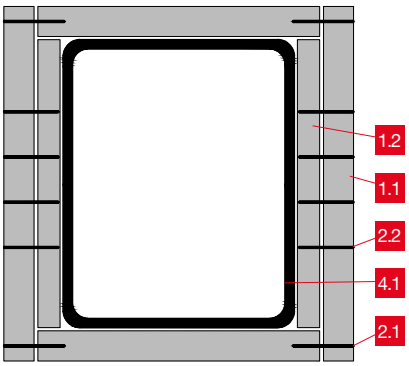
Two-sided application with L-bracket



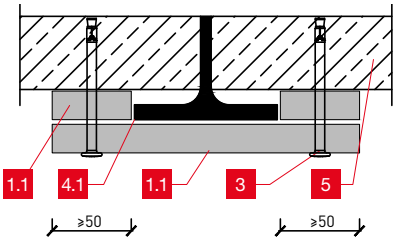
Two-sided application with panel strips

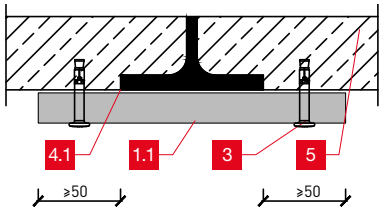


Hollow section 4-sided



Flange cladding





Cladding thickness according to profile factor and staples spacing ≤75 mm for critical steel temperature θ=500 °C

Fire protection class	Min. cladding thickness [mm]							
	15	20	25	30	35	40	45	50
R 30	≤240	≤380	≤380	≤380	≤380	≤380	≤380	≤380
R 60	≤70	≤100	≤140	≤200	≤330	≤380	≤380	≤380
R 90	–	≤50	≤70	≤80	≤110	≤140	≤180	≤250
R 120	–	–	≤45	≤50	≤60	≤70	≤90	≤110

Fasteners with staple spacing ≤75 mm critical steel temperature θ=500 °C

Board [mm]	Board fixings in board edge [mm]				Noggins [mm]	Fixings for noggins [mm]			
	Dimension	Spacing	Screws	Spacing		Staples	Spacing	Screws	Spacing
15	≥40×11×1,5	a ≤75	3,5×35	a ≤150	15	≥30×11×1,5	a ≤50	–	–
20	≥45×11×1,5	a ≤75	3,5×35	a ≤150	20	≥40×11×1,5	a ≤50	–	–
25	≥50×11×1,5	a ≤75	4,0×55	a ≤150	20	≥45×11×1,5	a ≤50	≥3,5×50	a ≤50
30	≥60×11×1,5	a ≤75	4,5×70	a ≤150	20	≥50×11×1,5	a ≤50	≥3,5×60	a ≤50
40	≥80×11×2	a ≤75	4,5×80	a ≤150	20	≥60×11×1,5	a ≤50	≥3,5×80	a ≤50
50	≥80×11×2	a ≤75	4,5×80	a ≤150	20	≥70×11×1,5	a ≤50	≥3,5×80	a ≤50

Cladding thickness according to profile factor and staples spacing ≤50 mm for critical steel temperature θ=500 °C

Fire protection class	Min. cladding thickness [mm]							
	15	20	25	30	35	40		50
R 30	≤280	≤380	≤380	≤380	≤380	≤380	≤380	≤380
R 60	≤80	≤120	≤180	≤300	≤380	≤380	≤380	≤380
R 90	≤50	≤60	≤80	≤100	≤140	≤200	≤300	≤380
R 120	–	–	≤50	≤60	≤80	≤100	≤120	≤160
R 180	–	–	–	–	–	≤50	≤60	≤60

Fasteners with staple spacing ≤50 mm critical steel temperature θ=500 °C

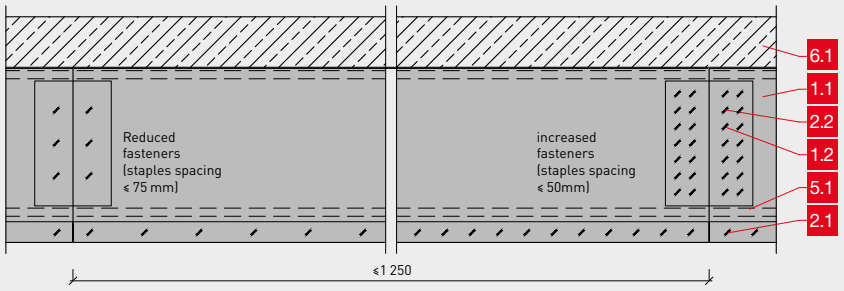
Board [mm]	Board fixings in board edge [mm]				Noggins [mm]	Fixings for noggins [mm]			
	Dimension	Spacing	Screws	Spacing		Staples	Spacing	Screws	Spacing
15	≥40×11×1,5	a ≤50	3,5×35	a ≤100	2×15	≥40×11×1,5	a ≤50	–	–
20	≥45×11×1,5	a ≤50	4,0×55	a ≤100	2×20	≥45×11×1,5	a ≤50	–	–
25	≥50×11×1,5	a ≤50	4,0×55	a ≤100	2×20	≥50×11×1,5	a ≤50	≥3,5×50	a ≤50
30	≥60×11×1,5	a ≤50	4,5×70	a ≤100	2×20	≥60×11×1,5	a ≤50	≥3,5×60	a ≤50
40	≥80×11×2	a ≤50	4,5×80	a ≤100	2×20	≥70×11×2	a ≤50	≥3,5×80	a ≤50
50	≥80×11×2	a ≤50	4,5×80	a ≤100	2×20	≥80×11×2	a ≤50	≥3,5×80	a ≤50

4.3 Aestuver® Steel beam cladding R 30 - R 240

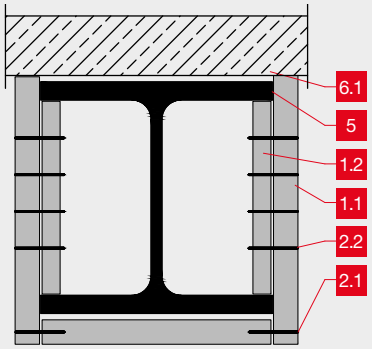
according to European approval

Fire protection	Orientation	Cladding	Temperature	Application
R 30 - R 240	horizontal	Single layer	350–750 °C	ETA 11/0458

Longitudinal section



Detail Beam 3-sided



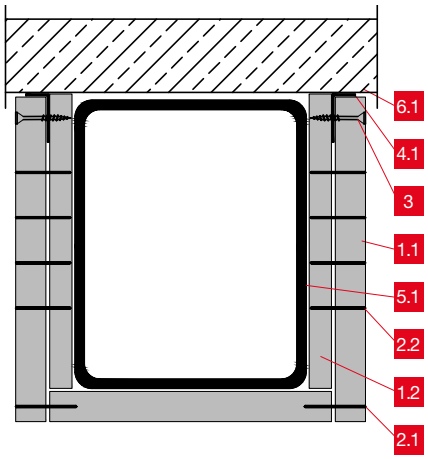
Description	
1.1	Aestuver® fire protection board (cladding) – thickness according to table
1.2	Aestuver® fire protection board (noggins) b ≥ 150 mm – thickness as per the table
2.1	Fixing board in board edge according to table
2.2	Fixing board in noggins according to table
3	Suitable fastener
4	Aestuver™ assembly mortar
5.1	Steel element
5.2	Steel angle ≥ 40 × 20 × 0,7 mm
6.1	Slab
6.2	Historical canopy ceiling

Evidence
ETA-11/0458
GA-2020/084

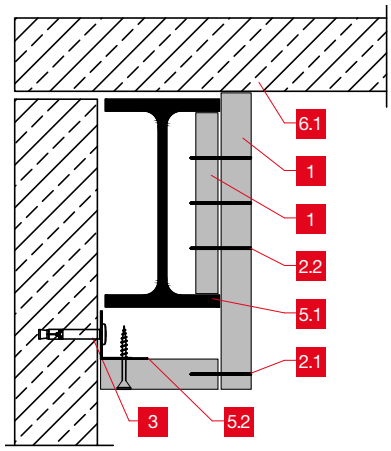
The panel thicknesses of beams clad on four sides are to be selected analogously to the steel columns in accordance with ETA-11/0458. Can be used in conjunction with EN 1993-1-2. Joint backing at the flange is not required. Filling the panel joints and fasteners is not required for fire protection purposes.

Construction details

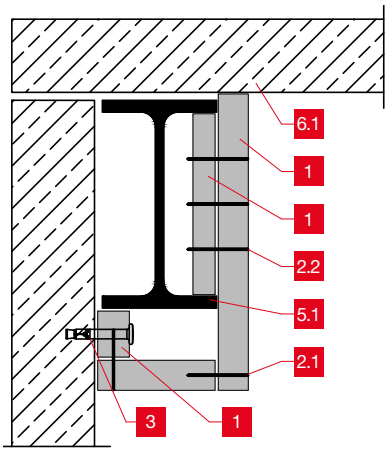
Hollow section profile 3-sided



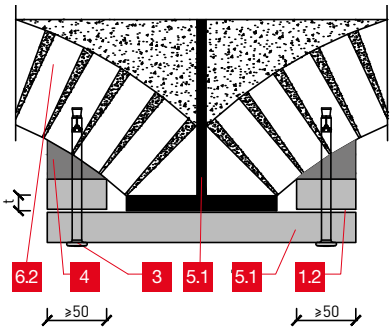
Two-sided application with L-bracket



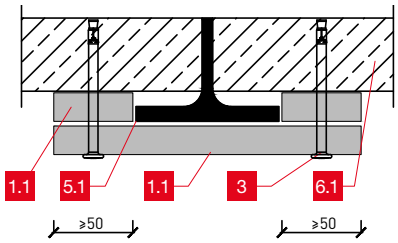
Two-sided application with panel strips

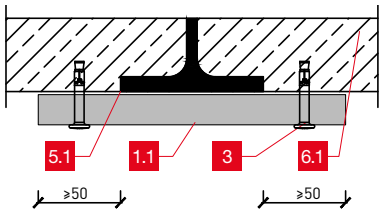


Canopy ceiling



Flange cladding





Cladding thickness according to profile factor and staples spacing ≤75 mm for critical steel temperature θ=500 °C

Fire protection class	Min. cladding thickness [mm]							
	15	20	25	30	35	40	45	50
R 30	≤278	≤278	≤278	≤278	≤278	≤278	≤278	≤278
R 60	≤130	≤278	≤278	≤278	≤278	≤278	≤278	≤278
R 90	–	≤70	≤100	≤160	≤270	≤278	≤278	≤278
R 120	–	–	–	≤62	≤90	≤120	≤160	≤240

Fasteners with staple spacing ≤75 mm critical steel temperature θ=500 °C

Board [mm]	Board fixings in board edge [mm]				Noggins [mm]	Fixings for noggins [mm]			
	Dimension	Spacing	Screws	Spacing		Staples	Spacing	Screws	Spacing
15	≥40×10×1,5	a ≤75	3,5×35	a ≤150	15	≥30×11×1,5	a ≤50	–	–
20	≥45×10×1,5	a ≤75	3,5×35	a ≤150	20	≥40×11×1,5	a ≤50	–	–
25	≥50×11×1,5	a ≤75	4,0×55	a ≤150	20	≥45×11×1,5	a ≤50	≥3,5×50	a ≤50
30	≥60×11×1,5	a ≤75	4,5×70	a ≤150	20	≥50×11×1,5	a ≤50	≥3,5×60	a ≤50
40	≥80×11×2	a ≤75	4,5×80	a ≤150	20	≥60×11×1,5	a ≤50	≥3,5×80	a ≤50
50	≥80×11×2	a ≤75	4,5×80	a ≤150	20	≥70×11×1,5	a ≤50	≥3,5×80	a ≤50

Cladding thickness according to profile factor and staples spacing ≤50 mm for critical steel temperature θ=500 °C

Fire protection class	Min. cladding thickness [mm]							
	15	20	25	30	35	40		50
R 30	≤278	≤278	≤278	≤278	≤278	≤278	≤278	≤278
R 60	≤140	≤278	≤278	≤278	≤278	≤278	≤278	≤278
R 90	–	≤80	≤130	≤260	≤278	≤278	≤278	≤278
R 120	–	–	≤62	≤90	≤130	≤200	≤278	≤278
R 180	–	–	–	–	–	–	≤70	≤90

Fasteners with staple spacing ≤50 mm critical steel temperature θ=500 °C

Board [mm]	Board fixings in board edge [mm]				Noggins [mm]	Fixings for noggins [mm]			
	Dimension	Spacing	Screws	Spacing		Staples	Spacing	Screws	Spacing
15	≥40×11×1,5	a ≤50	3,5×35	a ≤100	2×15	≥40×11×1,5	a ≤50	–	–
20	≥45×11×1,5	a ≤50	3,5×35	a ≤100	2×20	≥45×11×1,5	a ≤50	–	–
25	≥50×11×1,5	a ≤50	4,0×55	a ≤100	2×20	≥50×11×1,5	a ≤50	≥3,5×50	a ≤50
30	≥60×11×1,5	a ≤50	4,5×70	a ≤100	2×20	≥60×11×1,5	a ≤50	≥3,5×60	a ≤50
40	≥80×11×2	a ≤50	4,5×80	a ≤100	2×20	≥70×11×2	a ≤50	≥3,5×80	a ≤50
50	≥80×11×2	a ≤50	4,5×80	a ≤100	2×20	≥80×11×2	a ≤50	≥3,5×80	a ≤50

5.1 Aestuver™ Steel fire protection in timber construction

Description	
1.1	Aestuver® fire protection board (cladding)
1.2	Aestuver® fire protection board (board strips)
2	Suitable fastener
3.1	Steel profile
3.2	Steel angle
4	Aestuver™ FPM mastic
5	Solid wood wall/ceiling according to usability certificate or DIN EN 1995-1-2

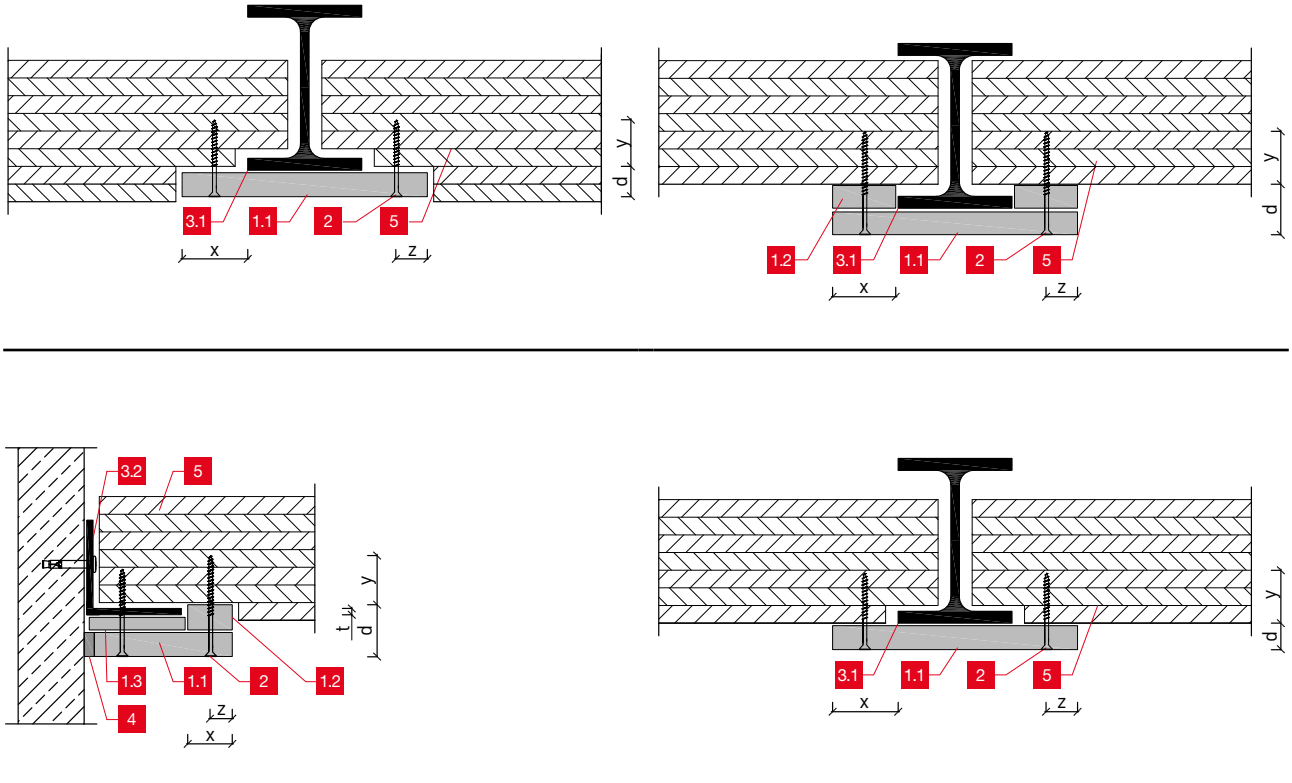
Evidence
ETA-11/0458
P-3248/1389
GA-2020/084

Fire protection cladding of load-bearing steel components with adjoining solid wood components. Butt joint backing at the flange not necessary for panel thicknesses according to profile factor in accordance with ETA-11/0458.

Fire resistance class	Protrusion of panel cladding x	Fastener embedment depth y	Edge distance of the fastening z	Minimum cladding thickness d In the connection area to wooden components
F 30 (R 30)	≥ 50 mm	≥ 40 mm	≥ 25 mm	≥ 20 mm
F 60 (R 60)	≥ 60 mm	≥ 50 mm	≥ 30 mm	≥ 30 mm
F 90 (R 90)	≥ 80 mm	≥ 70 mm	≥ 40 mm	≥ 40 mm

Construction details

Clad steel beams of fire resistance class R 30 - R 90 in accordance with ETA-11/0458 - Steel beams in combination with solid wood ceilings



Planning support and project management

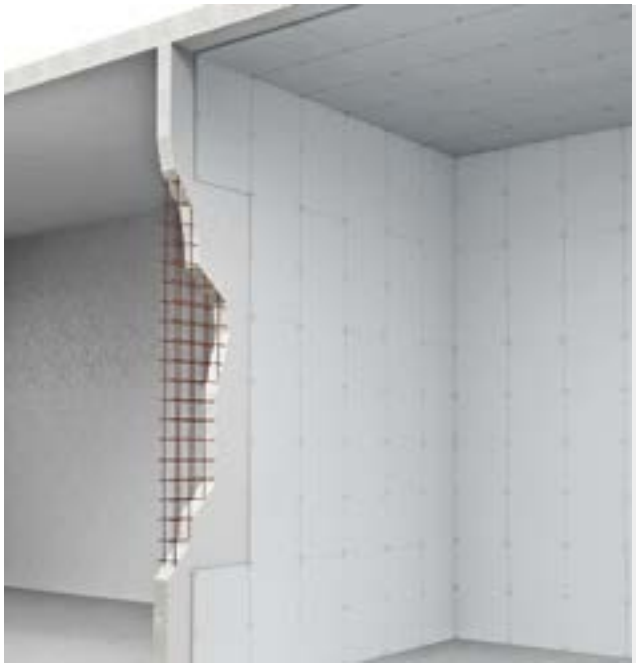
Project-specific solutions can be developed in cooperation with our fire protection experts.

Further information can also be found in our brochure Aestuver® in timber construction.

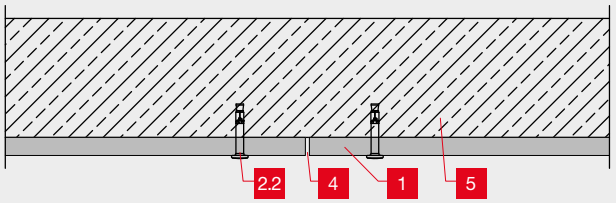
6.1 Aestuver® Reinforced concrete upgrading

Fire protection cladding of reinforced concrete components to replace missing concrete covering

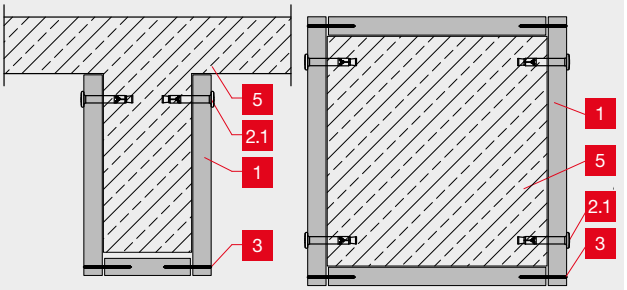
Fire protection	Cladding	Components	Load-bearing elements
R 30 – R 180	15 mm (10/20 mm)	Wall and ceiling	Columns and beams



Cross section wall/ceiling



Cross section downstand beam | **Cross section column**



Description	
1	Aestuver® fire protection board (d ≥ 15 mm) board format l × b ≤ 2 600 × 625 mm
2.1	Steel anchor Ø 6 × 30 mm Spacing a ≤ 400 mm
2.2	Steel anchor Ø 6 × 30 mm Spacing a ≤ 500 mm
3	Staples ≥ 40 × 11 × 15 mm Spacing a ≤ 100 mm
4	Butt-jointed joints - cross joints possible
5	Reinforced concrete part

*bei Stahlbetonwänden/-decken Plattendicke entsprechend Auswahl nachfolgende Tabelle

Evidence

ETA-11/0458

The European Technical Approval (ETA) is valid in Germany as proof of usability for the reinforcement of reinforced concrete. ETA 11/0458 can be used in conjunction with EN 1992-1-2.

Reinforced concrete wall/ceiling critical reinforcement steel temperature θ = 500 °C*

Fire resistance class	Existing concrete cover [mm]								
	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	≥ 50
	cladding thickness Aestuver® fire protection board [mm]								
R 30	**	**	**	**	**	**	**	**	**
R 60	10/15/20	10/15/20	10/15/20	**	**	**	**	**	**
R 90	15/20	15/20	15/20	15/20	**	**	**	**	**
R 120	15/20	15/20	15/20	15/20	15/20	15/20	**	**	**
R 180	20	20	20	20	20	20	20	20	**

Reinforced concrete column/beam critical reinforcement steel temperature von θ = 500 °C

Fire resistance class	Existing concrete cover [mm]												
	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74
	cladding thickness Aestuver® fire protection board [mm]												
R 30	15	15	15	**	**	**	**	**	**	**	**	**	**
R 60	15	15	15	15	15	15	**	**	**	**	**	**	**
R 90	15	15	15	15	15	15	15	15	15	15	**	**	**
R 120	15	15	15	15	15	15	15	15	15	15	15	15	15

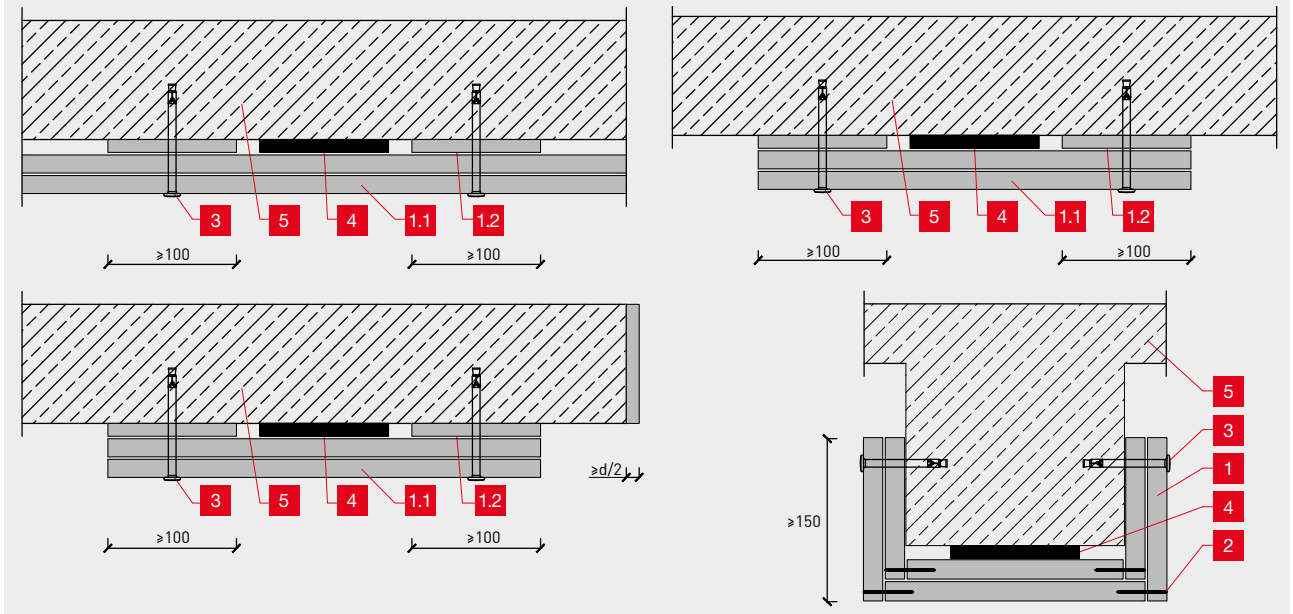
* Further design temperatures on request ** existing concrete cover sufficient according to DIN EN 1992-2

6.2 Aestuver® Strengthening of CFRP slats

Fire protection cladding of adhesive reinforcements made of carbon fibre reinforced plastic

Fire protection	Cladding thickness	Design temperature	Joints
F 30-A–F 120-A	2×15 mm up to 2×50 mm	40 °C to 90 °C	butt-jointed

Examples of project solutions



Description

1.1	Aestuver® fire protection board – thickness according to table
1.2	Aestuver® fire protection board – thickness d≥10 mm
2	Steel wire staples ≥40×11×15 mm spacing a≤100 mm
3	Steel anchor Ø≥6mm - spacing a≤500 mm
4	CFRP slat
5	Solid element

Joint offset longitudinal joint ≥50 mm - transverse joint ≥100 mm

Expert opinion

GS 3.2 /14-084-1

Fire resistance class	Minimum cladding thickness [mm]			
Critical temperature	F 30	F 60	F 90	F 120
40 °C	2×20	2×35	35+50	2×50
50 °C	2×20	25+40	2×40	2×50
75 °C	20+15	25+30	30+40	2×40
90 °C	2×15	20+25	2×30	30+40

7.1 Fire protection upgrading of roof overhangs

Fire resistance	Areas of application		
90 Minutes	Fascia/Eaves	Flat roofs	Cornice boxes

Description	
1	Aestuver® fire protection board format d ≥ 25 mm Board joints in the field must be backed with Aestuver™ board strips Board strip width b ≥ 100 mm
2	Roof covering
3	Eaves plank with sheet metal profile at the front
4	Rafter dimension b × h ≥ 60 × 160 mm – Rafter Spacing a ≤ 800 mm
5	Roof battens
6	Basic slat dimension b × h ≥ 40 × 80 mm
7	Substructure dimensions b × h ≥ 40 × 80 mm
8	Metal subframe – spacing a ≤ 420 mm
9	4,5 × 80 mm Aestuver™ Drywall screw a ≤ 150 mm Alternative: Clamp (galvanized/resinated) ≥ 70 × 10 × 1,5 mm – Spacing a ≤ 150 mm
10	4,0 × 55 mm Aestuver™ Drywall screw – spacing a ≤ 150 mm
11	3,9 × 50 mm fermacell™ Powerpanel H_20 screw – Spacing a ≤ 150 mm The sum of the partial lengths must be at least 1 500 mm – A + B + C ≥ 1 500 mm

Expert opinion

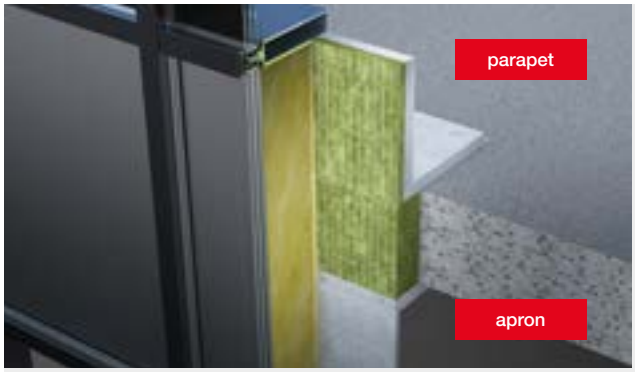
GS3.2/13-248

90-minute protection against fire flashover at the eaves or fascia.

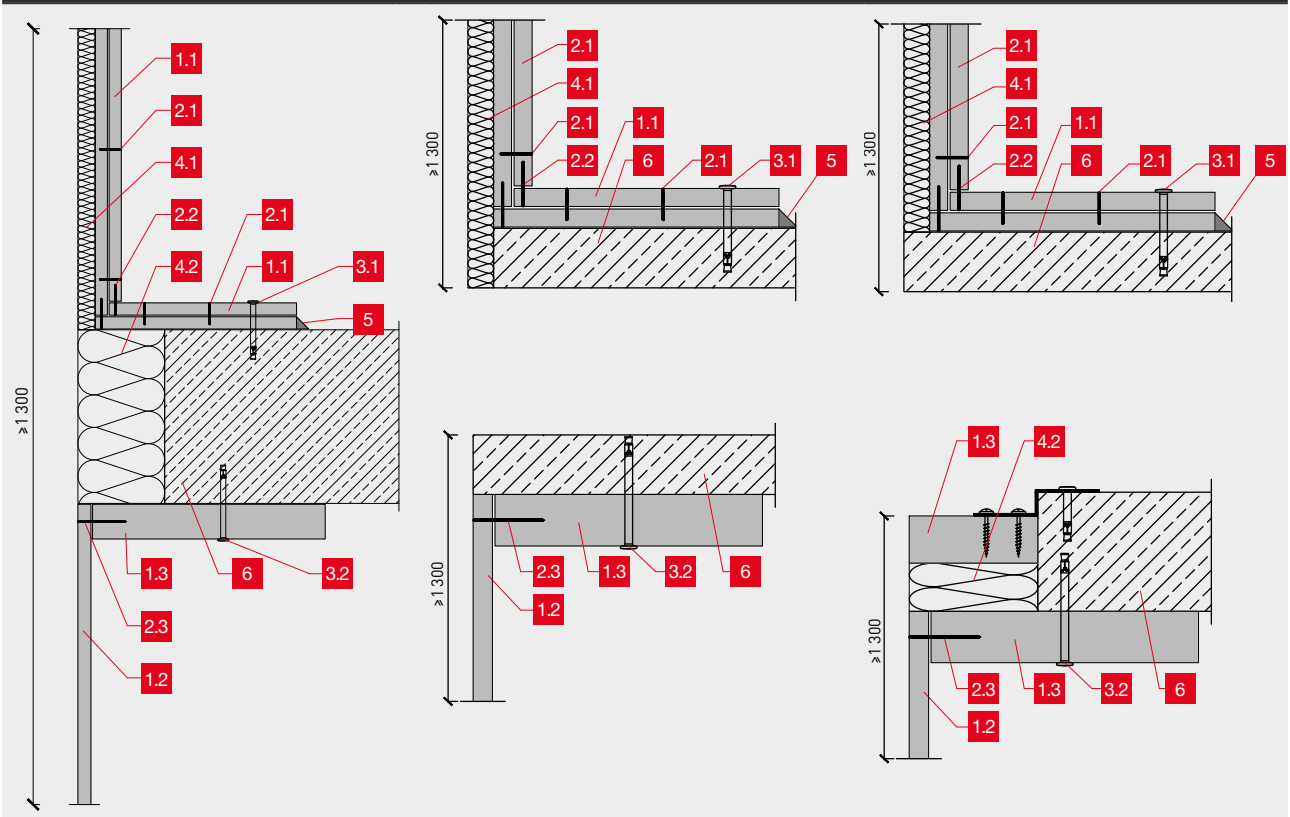
7.2 Aestuver™ spandrel area fire protection

To prevent the spread of fire from curtain walls

Surface			Perimeter sealing
E 90 (e EI 90 (e → i)	EW 90 (e → i)	EI 90 (e → i)	EI 120



Examples of solutions



Description

1.1	Aestuver® fire protection boards d ≥ 2 × 15 mm*/ Board width b ≤ 1 250 mm/Joint offset ≥ 200 mm
1.2	Aestuver® fire protection board d ≥ 15 mm*
1.3	Aestuver® fire protection board d ≥ 40 mm*
2.1	Steel staples 25 × 11 × 1,5 mm – Spacing a ≤ 150 mm
2.2	Steel staples 35 × 11 × 1,5 mm – Spacing a ≤ 150 mm
2.3	Steel staples 45 × 11 × 1,5 mm – Spacing a ≤ 100 mm
3.1	Fischer nail anchor FNA II 6 × 30/30 A4 + washer Ø 24 mm – Spacing a ≤ 600 mm
3.2	Fischer nail anchor FNA II 6 × 30/50 A4 + washer Ø 24 mm – Spacing a ≤ 335 mm
4.1	Mineral wool d ≥ 20 mm/ρ ≥ 80 kg/m³ (Melting point θ ≥ 1 000 °C)
4.2	Mineral wool d ≥ 200 mm/ρ ≥ 40 kg/m³ (Melting point θ ≥ 1 000 °C)
5	Aestuver™ Fire protection compound
6	Slab (Fire resistance ≥ F 90) – Thickness d ≥ 200 mm

* Full-surface bonding to each other and corner bonding with Aestuver™ fire protection

Classification

KB-C06-01-de-01

Project-related solutions are possible in various designs. Can be used in conjunction with a type A fall-protection curtain wall. For curtain walls (partial design without fire protection effect) in accordance with DIN EN 1364-4, the façade element classified in accordance with 13501-2 takes over the fire protection. The curtain wall in combination with the Aestuver façade element can be CEmarked in accordance with the hEN product standard DIN EN 13830.

8.1 Service & Quality

Consulting, planning & project management

Our experienced fire protection experts will support you right from the start and work with you to find the right solution. For simple projects, we provide you with free planning assistance and for complex requirements, we offer customised system solutions for your individual construction project.

Certification & quality assurance

Our systems and components are certified (ETA, AbP, abZ, aBG). The processes during production are constantly monitored. And we carry out regular quality tests in our in-house laboratories. Thanks to an intelligent labelling system, all products can be traced even years later.

Technical customer service on the construction site

Whether you need help with processing, planning or implemen-tation, we will be there. Our experienced fire protection experts will help you solve your problems. In addition to installation tips, we also offer on-site training to optimise the processing of our boards.

Customised component production

The proven fire protection and moisture resistance properties make Aestuver® panel materials a favoured product for industrial processing. The fire protection requirements to be met, the geometry of the components and the production-specific requirements of our industrial and OEM customers determine the shape, processing and packaging of the products used.products used.

More brochures on fire protection for tunnels, infrastructure and industry can be found on our website.

At **https://www.aestuver.com/en/downloads** you will find our brochures with all the details.

8.2 Weather resistance

The effects of weathering play a decisive role in the planning, construction and durability of buildings. Weather resistance determines how well a material is able to retain its physical and aesthetic properties over time under the influence of weather conditions.

Materials that are considered weather-resistant undergo extensive tests to assess their resistance to UV radiation, moisture, temperature fluctuations, salt, dirt and other environmental influences. The most significant influences are wind, rain, sunshine, temperature changes and frost. Weather influences play a decisive role in the planning, execution and durability of structures.

In EAD 350142-00-1106, utilisation categories are defined in relation to weather influences. These utilisation categories are based on the assessment rules of Regulation 305/2011. Products that fulfil the requirements for type X also fulfil the requirements for all other categories.

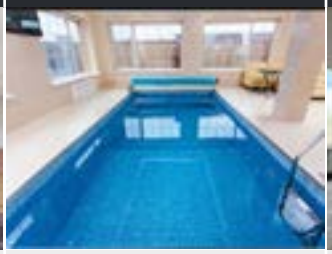
Typ X
Nutzungskategorie, Ganz der Witterung ausgesetzt
EAD
350142-00-1106

Aestuver® fire protection boards achieve the highest classification with type X.

Use categories for weather influences

- **Type X:** Products and kits made of fire protection boards and mats for all types of use (indoors or partially or fully exposed to the weather)
- **Type Z2:** Products and kits made of fire protection boards and mats for indoor use only
- **Type Y:** Products and kits made of fire protection boards and mats for use indoors or partially exposed to the weather
- **Type Z1:** Products and kits made of fire protection boards and mats only for use indoors with high humidity

Categories of use for the Aestuver® fire protection boards

Indoor standard climate	Indoor wet room	Outdoor area Not directly weathered	Outdoor area directly weathered
			
Utilisation class 1 Category D Type Z2	**Utilisation class 1 Category C Type Z1**	**Utilisation class 2 Category B Type Y**	**Utilisation class 3 Category A Type X**

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As at 02/2025

The respective current edition applies. If you are missing any information in this document, please contact our customer information!

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