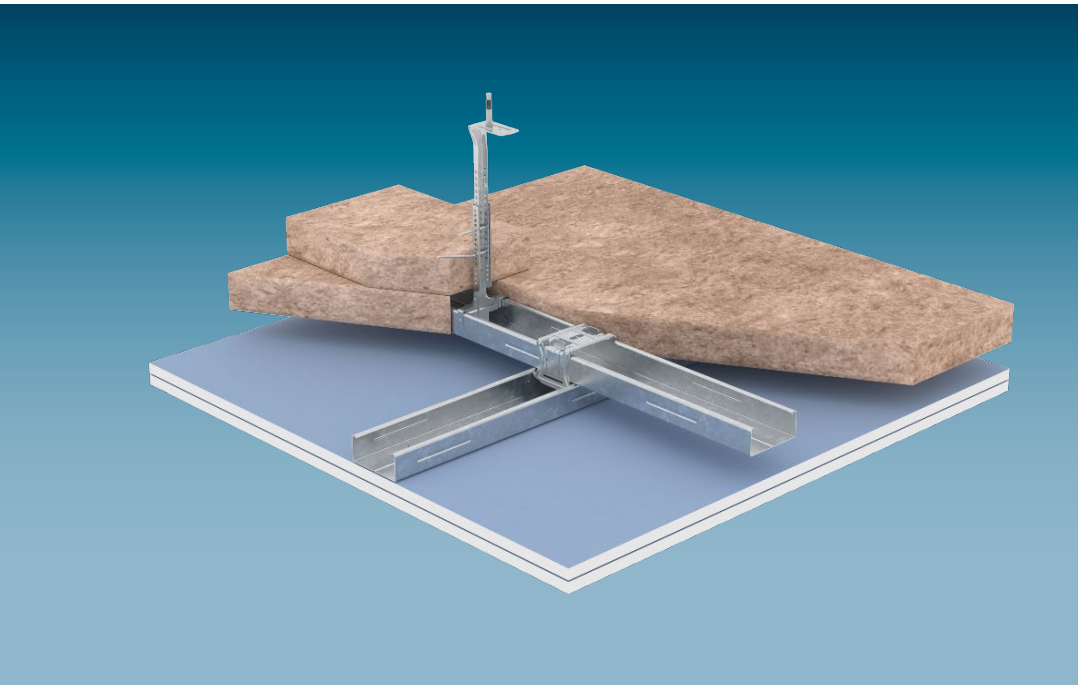

Drywall Systems

D11.de

System Data Sheet 2023-09

Knauf Board Ceiling

D111.de – Knauf Board ceiling with wood frame
D112.de – Knauf Board ceiling with metal grid
D113.de – Knauf Board ceiling with flush metal grid
D116.de – Knauf Board ceiling with large-span metal grid

Note on English translation / Hinweise zur englischen Fassung

This is a translation of the System Data Sheet valid in Germany.
All stated details and properties are in compliance with the regulations of the German standards and building regulations. They are only applicable for the specified products, system components, application rules, and construction details in connection with the specifications of the respective certificates and approvals.
Knauf Gips KG denies any liability for applications outside of Germany as this requires changes acc. to the respective national standards and building regulations.

Dies ist eine Übersetzung des in Deutschland gültigen Detailblattes. Alle angegebenen Werte und Eigenschaften entsprechen den in Deutschland gültigen Normen und bauaufsichtlichen Regelungen. Sie gelten nur bei Verwendung der angegebenen Produkte, Systemkomponenten, Anwendungsregeln und Konstruktionsdetails in Verbindung mit den Vorgaben der bauaufsichtlichen Nachweise.
Die Knauf Gips KG lehnt jegliche Haftung für Einsatz und Anwendung außerhalb Deutschlands ab, da in diesem Fall eine Anpassung an nationale Normen und bauaufsichtliche Regelungen notwendig ist.

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Notes on the document

Knauf system data sheets are the planning and application basis for the planners and professional installers in the application of Knauf systems. The contained information and specifications, constructions, details and stated products are based, unless otherwise stated, on the certificates of usability (e.g. National Technical Test Certificate (abP)) valid at the date they are published as well as on the applicable standards. Additionally, design and structural requirements and those relating to building physics (fire resistance and sound insulation) are considered.
The contained construction details are examples and can be used in a similar way for various cladding variants of the respective system. At the same time, the demands made on fire resistance and/or sound insulation as well as any necessary additional measures and/or limitations must be observed.

References to other documents

System data sheets

- Knauf Cleaneo Acoustic Board Ceilings D12.de
- Knauf Free-Spanning Ceilings D13.de
- Knauf Pre-fab Floor Screed F12.de
- Knauf Wood Joist Ceiling Systems D15.de
- Knauf Board Ceiling AQUAPANEL® D28.de

Technical Brochures

- Knauf Floor Systems – Construction and Application Technology F20.de.
- Knauf Jointing Competence Tro89.de

Folders

- Fire Resistance with Knauf BS1.de (German only)
- Sound insulation and room acoustics with Knauf (only sections in English)

Technical Information

- Fastening of Loads to Knauf Wall and Ceiling Systems VT03.de

Product data sheets

- Observe the product data sheets of the Knauf system components.

Symbols in the system data sheet

The following symbols are used in this document:

Insulation layers

G Mineral wool insulation layer acc. to EN 13162
non-combustible
(insulating material, e.g. from Knauf Insulation)

S Mineral wool insulation layer acc. to EN 13162
non-combustible
melting point ≥ 1000 °C acc. to DIN 4102-17
(insulating material, e.g. from Knauf Insulation)

Stud frame spacings

a Spacing of suspenders/anchors

b Axial spacing furring timber batten/furring channel/hat-shaped channel (cladding span width)

c Axial spacing carrying timber batten/carrying channel (spacing furring timber batten/furring channel)

Legend symbols

1 Legend number that will be explained when used

Intended use of Knauf Systems

Please observe the following:

Caution	Knauf systems may only be used for the application cases specified in the Knauf documentation. In case third-party products or components are used, they must be recommended or approved by Knauf. Flawless application of products / systems assumes proper transport, storage, assembly, installation and maintenance.

General notes on Knauf systems

Term definition

Knauf board ceilings can be applied as ceiling linings or suspended ceilings. The following definition applies acc. to DIN 18168:
Ceiling linings and suspended ceilings are: "… ceilings of even or other design with smooth, perforated or jointed surface consisting of a substructure and a surface layer forming the area. In the case of ceiling linings, the substructure is anchored directly to the load-bearing building component; in the case of suspended ceilings the substructure is suspended. …".

Field of application

The data specified in this system data sheet only applies for ceiling linings / suspended ceilings in interiors. For board ceilings in exteriors not directly exposed to the effects of weather, see system data sheet

.

Coatings and linings

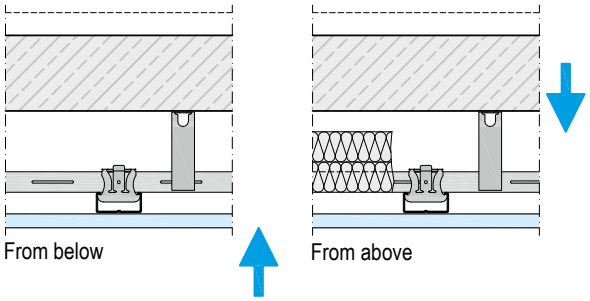
Notes	After wallpapering or after application of plasters, quick drying must be ensured through adequate airing. Other coatings or layers and vapour barriers up to about 0.5 mm thickness as well as claddings (with the exception of sheet steel), do not have any influence on the technical fire resistance classification of Knauf board ceilings

Notes on fire resistance

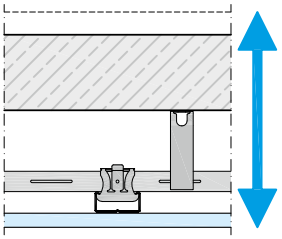
If the fire resistance effect from the classification of Knauf board ceiling is achieved without involvement or consideration of the basic ceiling, the fire resistance is referred to as *solely*.
This is relevant in particular when the plenum is to be protected against the exposure to fire from the room (fire resistance *solely from below*) or a protective effect for the room against fire exposure in the plenum (fire resistance *solely from above*) is the goal.
A combination of both requirements may be necessary depending on the requirements stipulated by the building inspectorate and/or fire resistance concept.
With respect to the fire resistance *solely*, Knauf board ceilings can be classified according to the interaction with the basic ceiling. If the type in question in involves solid ceilings, they are categorized as types I to III acc. to DIN 4102-4.
Wood joist ceilings are categorized as type IV and are not dealt with in this System Data Sheet.

Representation of the fire resistance effect

- Suspended ceilings allocated solely to a single fire resistance class
  - Room-enclosing



- Suspended ceilings in conjunction with basic ceilings of types I to III
  - Room-enclosing
  - Structural stability in the event of a fire



Construction notes

Movement joints

Movement joints of the main structure should be integrated into the construction of the board ceiling. Movement joints are to be installed about every 15 m on continuous board ceilings, see also page 36.

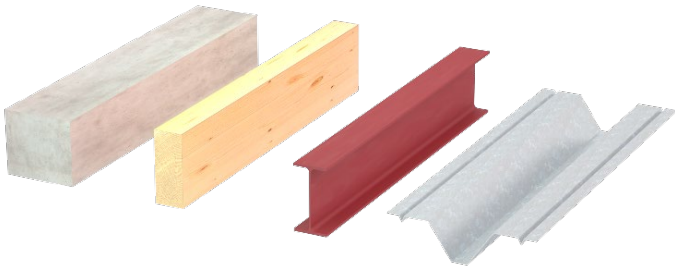
Notes on sound insulation

Requirements for the insulation layer:
(Insulation materials, e.g. from Knauf Insulation)
Mineral wool insulation layer acc. to EN 13162;
length-related flow resistance of 5 kPa·s/m^2 ≤ r ≤ 50 kPa·s/m^2

R_w	= Weighted sound reduction index in dB without sound transmission via flanking building components
$L_{n,w}$	= Weighted normalized impact sound level in dB without sound transmission via flanking building components
C alt. C_{tr}	= Spectrum adaptation term for airborne noise values in dB, that can be added to single number values, to consider features of determined sound spectra
C_I alt. $C_{I,50\text{-}2500}$	= Spectrum adaptation term for footfall sound pressure level values in dB, that can be added to single number values, to consider features of determined sound spectra

Fire protection of suspended ceilings allocated solely to a single fire resistance class

Knauf board ceilings without involvement or consideration of the basic ceiling (fire resistance *solely from below*) can be installed under all conventional load-bearing ceiling constructions.
e.g. wood joist ceilings, roof trusses, steel beams, wooden joists with steel beams lashed on the sides, trapezoid sheet metal or roofs.



Certificates of Usability

Knauf system	Fire resistance Suspended ceilings allocated solely to a single fire resistance class	Suspended ceilings in conjunction with Basic ceilings of type I to III	Sound insulation Airborne and impact sound (Knauf sound protection proofs)
D111.de	F30: AbP P-2100/199/15-MPA BS	–	–
D112.de	F30: AbP P-2100/199/15-MPA BS F60: AbP P-2100/347/17-MPA BS F90: AbP P-3400/4965-MPA BS	AbP P-3155/3992-MPA BS	**Diamant:** Floor T 007-06.10 Suspended ceiling T 008-10.10 Floor + suspended ceiling T 009-10.10 **Silentboard / Silentboard + Diamant:** Floor T 007-06.10 Suspended ceiling T 010-06.12 Floor + suspended ceiling T 011-06.12
D113.de	F30: AbP P-2100/199/15-MPA BS F60: AbP P-2100/347/17-MPA BS F90: AbP P-3400/4965-MPA BS	–	–
D116.de	F30: AbP P-2100/199/15-MPA BS F60: AbP P-2100/347/17-MPA BS F90: AbP P-3400/4965-MPA BS	AbP P-3155/3992-MPA BS	–

The stated constructional and structural properties, and characteristic building physics of Knauf systems can solely be ensured with the exclusive use of Knauf system components, or other products expressly recommended by Knauf. The validity and up-to-datedness of the stated proofs have to be considered.

Notes on fire resistance

The specifications marked with plus offer additional application options, which are not directly included in the Certificate of Usability. On the basis of our technical assessments, we assume that these marked design solutions can be assessed as a non-significant divergence. We can make the documentation on which this assessment is based, such as surveyors' reports or technical assessments, available to you together with the Certificate of Usability on request. We recommend that a non-significant divergence be coordinated and authorised in advance in consultation between the persons responsible for fire resistance and/or the relevant authorities.

plus Extension of the fire resistance Certificate of Usability

Prior consultation with respect to fire resistance notes recommended.

Knauf System	System-wide divergences
D111.de D112.de D113.de D116.de	■ In case of a configuration with a divergent grid type ■ In case of a configuration with divergent grid spacings ■ In case of a configuration with divergent grid components ■ In case of configuration of connections to lightweight partitions ■ Alternative connection backing and connections to lightweight partitions ■ In case of multi-level ceiling system design

Dimensioning principles

To read off the required spacings for the grid, it is first of all necessary to determine the load class taking into consideration the self-weight of the selected system variant including any existing or planned additional loads.

Example: D112.de– Board ceiling with metal grid with fire resistance

Step 1:

Determination of the rated weight

The rated weight is used for determining the necessary frame and does not include any safety values. The rated weight (cladding with grid) of the suspended ceiling/ceiling lining can be read off from the Knauf system tables in dependence on the selected cladding thickness (system variants).

Fire resistance class	Cladding: Diamant	Cladding: Silentboard	Cladding: Minimum thickness mm	Rated weight: Without insulation layer kg/m²	Furring channel: Max. axial clearances (b) mm	Insulation layer (Required for fire resistance): Minimum thickness mm	Insulation layer (Required for fire resistance): Min. density kg/m³
D112.de Board ceiling with metal grid							
F30	•		2x 12.5	28.3	500	None or Mineral wool (G)	
		•	2x 12.5	39.4	400		

Step 2:

Consideration of additional loads

Additional loads, e.g. consisting of fire resistance necessary and unnecessary insulation materials, as well as planned anchoring loads (see Technical Information - Fastening of loads to Knauf Wall and Ceiling Systems VT03.de) increase the total area weight of the ceiling lining / suspended ceiling and must be considered with the rating of the load class.
(Rated weight + weight of additional loads = total area weight)

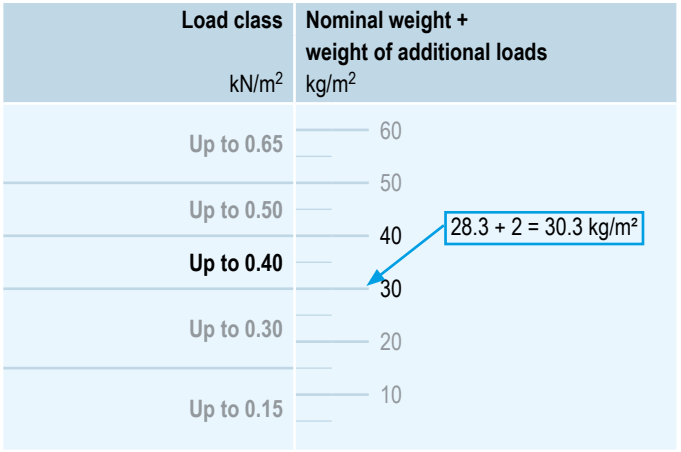
Example: Additional load 2 kg/m²

Step 3:

Determination of the load class

Based on the resulting total area load of the ceiling lining / suspended ceilings, the corresponding load class (kN/m²) can be determined from the load class diagram.

Determination of the load class



Notes	The load class up to 0.40 kN/m² is not listed for all system variants. Here also in case of loads > 0.30 kN/m² and ≤ 0.40 kN/m² the load class up to 0.50 kN/m² must be selected.

The self-weight of the ceiling may not exceed 0.50 kN/m². The load class up to 0.65 kN/m² may only be used in combination with additional loads, e.g. multi-level ceiling system. Rated acc. to DIN 18168-1.

Step 4:

Dimensioning of the grid

Using the determined load class, the maximum permissible spacings of the suspenders (a) as well as the profiles (b) and (c) can be read off in the tables “System variants” and “Maximum grid spacing” of the systems in dependence on the fire resistance requirements and selected grid.

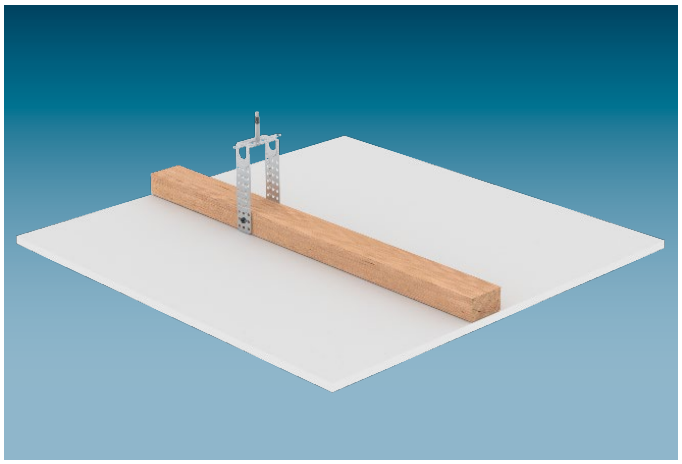
Dimensions in mm

Axial spacings furring channel (b)	Suspender spacings (a) Load class in kN/m² Up to 0.15	Up to 0.30	Up to 0.40	Up to 0.50	Up to 0.65
400	1400	1150	1050	1000	900
500	1300	1050	950	900	850
625	1200	1000	900	850	800

Knauf Board Ceilings

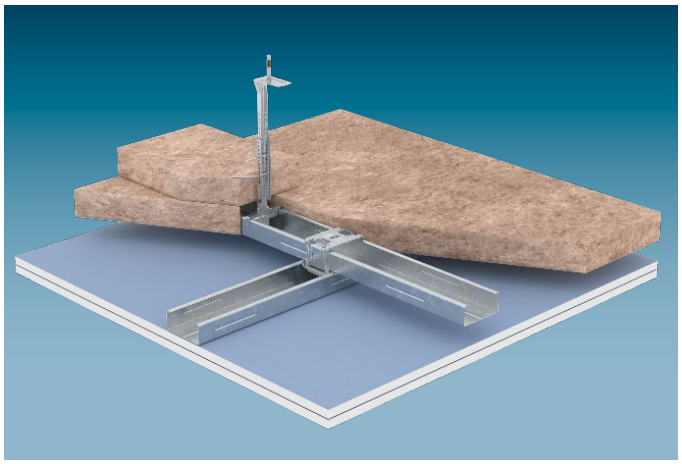
Knauf ceiling systems consist of a suspended or directly anchored grid that is clad using gypsum boards. The numerous requirements from the applications are covered by a large and diverse range of options.

D111.de Board ceiling with wood frame



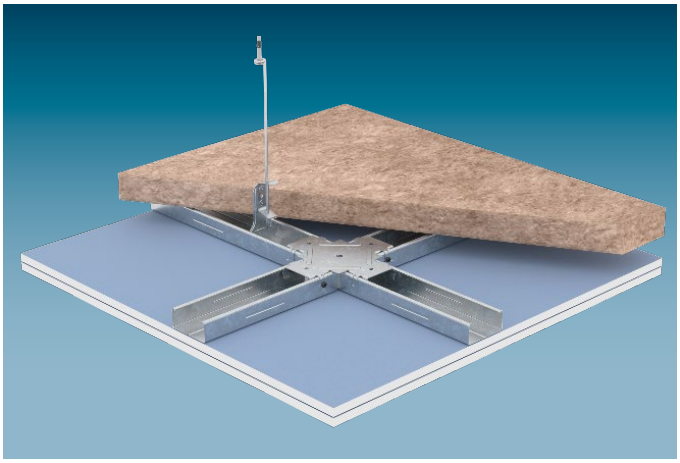
Knauf boards are fixed with screws to a wood frame made of carrying timber battens and furring timber battens (double batten frame) or just simple furring timber battens (single batten frame).
Anchoring of the grid is undertaken with suspenders on the basic ceiling.

D112.de Board ceiling with metal grid



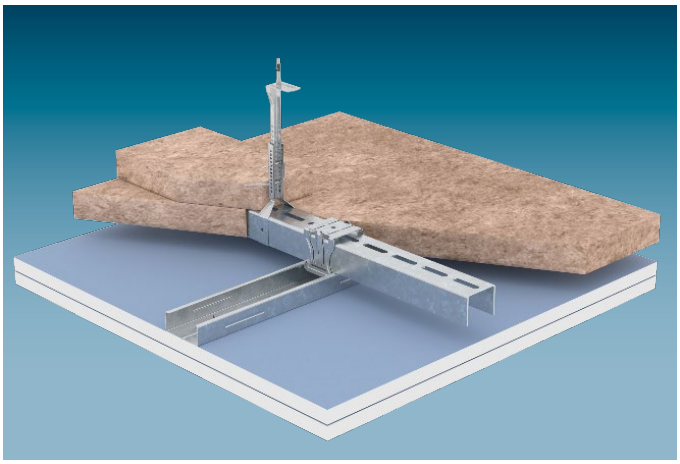
Knauf boards are fixed with screws to a metal grid made of carrying and furring channels (double-layer profile) or just furring channels (single-layer profile) made of sheet metal profiles CD 60/27.
Anchoring of the grid is undertaken with suspenders on the basic ceiling.

D113.de Board ceiling with flush metal grid



Knauf boards are fixed with screws to a metal grid of flush carrying and furring channels made of sheet metal profiles CD 60/27.
Anchoring of the grid is undertaken with suspenders on the basic ceiling.
Low construction heights can be implemented using this system.
Furthermore, the application of a necessary full surface insulation layer is easy to apply if required.

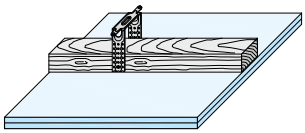
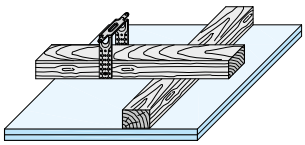
D116.de Board ceiling with large-span metal grid



Knauf boards are fixed with screws to a metal grid of carrying channels UA 50 and furring channels CD 60/27.
Anchoring of the grid is undertaken with suspenders on the basic ceiling.
This system facilitates particularly large suspender spacings, e.g. for equipment installations in the plenum or with larger spacings between beams.

System variants

Without fire resistance / fire resistance solely from below

Requirements on the basic ceiling for fire exposure	Fire resistance class		Lining (lateral application)								Rated weight	Furring timber batten	Insulation layer	
From below No fire resistance requirements for basic ceiling / roof construction **From above** (Plenum) Raw ceiling must have same fire resistance class as the suspended ceiling	For fire exposure												Required for fire resistance	
	From below	From above	Knauf Bauplatte wallboard	Knauf Piano fire-resistant board	Knauf Fire-Resistant Board	Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	Without insulation layer kg/m²	Max. axial clearances (b) mm	Minimum thickness mm	Minimum density kg/m³
D111.de Board ceiling with wood frame														
 Furring timber batten only	–	–	•							**12.5**	13.4	500	–	
							•			**12.5**	17.0	500		
								•		**12.5**	22.9	400		
			•							**2x 12.5**	22.8	500		
							•			**2x 12.5**	30.0	500		
 Carrying timber batten and furring timber batten							•	•		**12.5 + 12.5**	35.9	400		
	F30 plus	–		•						**2x 12.5**	26.0	500	None or Mineral wool (G)	
							•			**2x 12.5**	30.0	500		
								•		**2x 12.5**	41.3	400		
						•				**20**	21.6	625[1)]		

1) *Longitudinal cladding: Backing of the front edge joints of the cladding with timber battens ≥ 50 x 30 mm, profiles CD 60/27 or with ≥ 100 mm wide and ≥ 20 mm thick solid strips is necessary.*

- With combined cladding always use Diamant as a cover layer
- Possible suspenders in case of fire resistance requirements: Universal Bracket / Damping Universal Bracket

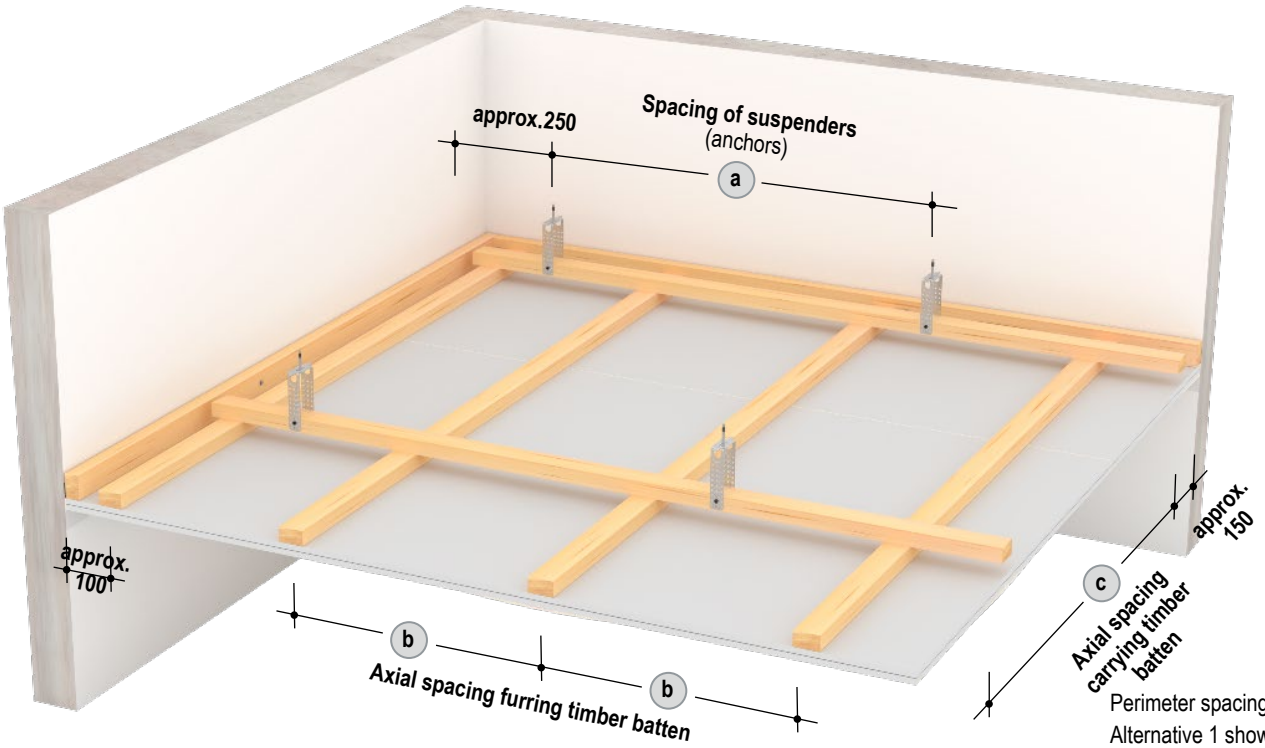
Determination of load class

Load class kN/m²	Nominal weight + weight of additional loads kg/m²
Up to 0.65	60
Up to 0.50	50
Up to 0.40	40
Up to 0.30	30
Up to 0.15	20
	10

Notes	
	plus Extension of the fire resistance Certificate of Usability, see page 6.
	Observe the notes on pages 4 to 6.

Maximum grid spacings

Dimensions in mm



Perimeter spacings:
Alternative 1 shown,
See also page 30

Without fire resistance/fire resistance solely from below –
Carrying timber batten and furring timber batten ≥ 50 x 30 mm

Axial spacings carrying timber batten (c)	Spacings of suspenders/anchors (a) Load class in kN/m²		
	Up to 0.15	Up to 0.30	Up to 0.50[1)]
500	1200	950	800
600	1150	900	750
700	1050	850	700[2)]
800	1050	800	–
900	1000	800[2)]	–
1000	950	–	–
1100	900	–	–
1200	900	–	–

Without fire resistance/fire resistance solely from below –
Only furring timber batten ≥ 50 x 30 mm

Axial spacings furring timber batten (b)	Spacings of suspenders/anchors (a) Load class in kN/m²		
	Up to 0.15	Up to 0.30	Up to 0.50[1)]
≤ 500	1200	950	800
625	–	900	750
800	–	800	700

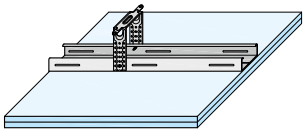
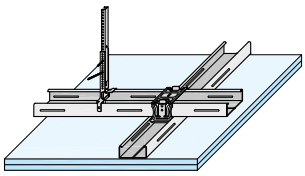
1) *Use suspenders of load carrying capacity class 0.40 kN*
2) *Not valid for furring batten spacing (b) 800 mm*

■ For axial spacings of furring timber batten also refer to pages 10 and 30

Note	Customized dimensioning of the ceiling substructure is possible on request, e.g. with different batten cross-sections.

System variants

Fire resistance solely from below (ire resistance in conjunction with the basic ceiling see pages 22 to 27)

Requirements on the basic ceiling for fire exposure **From below** No fire resistance requirements for basic ceiling / roof construction **From above** (Plenum) Raw ceiling must have same fire resistance class as the suspended ceiling	Fire resistance class For fire exposure From below	From above	Lining (lateral application) Knauf Bauplatte wallboard	Knauf Piano fire-resistant board	Knauf Fire-Resistant Board	Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	Rated weight Without insulation layer kg/m²	Furring channel Max. axial clearances b mm	Insulation layer Required for fire resistance Minimum thickness mm	Minimum density kg/m³
D112.de Board ceiling with metal grid														
 Furring channel only	–	–	•							**12.5**	11.7	500	–	
			•							**2x 12.5**	21.1			
	F30	–		•						**2x 12.5**	24.3	500	None or Mineral wool G	
							•			**2x 12.5**	28.3	500		
								•		**2x 12.5**	39.4	400		
						•				**20**	19.9	625[1)]		
 Carrying and furring channel	**F60**	–		•		•				**20 + 12.5**	30.9	500	None or Mineral wool G	
	F90	–			•	•				**25 + 18**	40.1	500	None or Mineral wool G	
						•				**2x 20**	37.5			
									•	**2x 20**	35.1			

1) Longitudinal cladding: Backing of the front edge joints of the cladding with profiles CD 60/27 or with ≥ 100 mm wide and ≥ 20 mm thick Solidboard strips is necessary.

Possible suspenders in case of fire resistance requirements:
Ankerfix Rapid Hanger CD / Universal brackets / Damping Universal Brackets / Nonius suspender / Nonius stirrup

Determination of load class

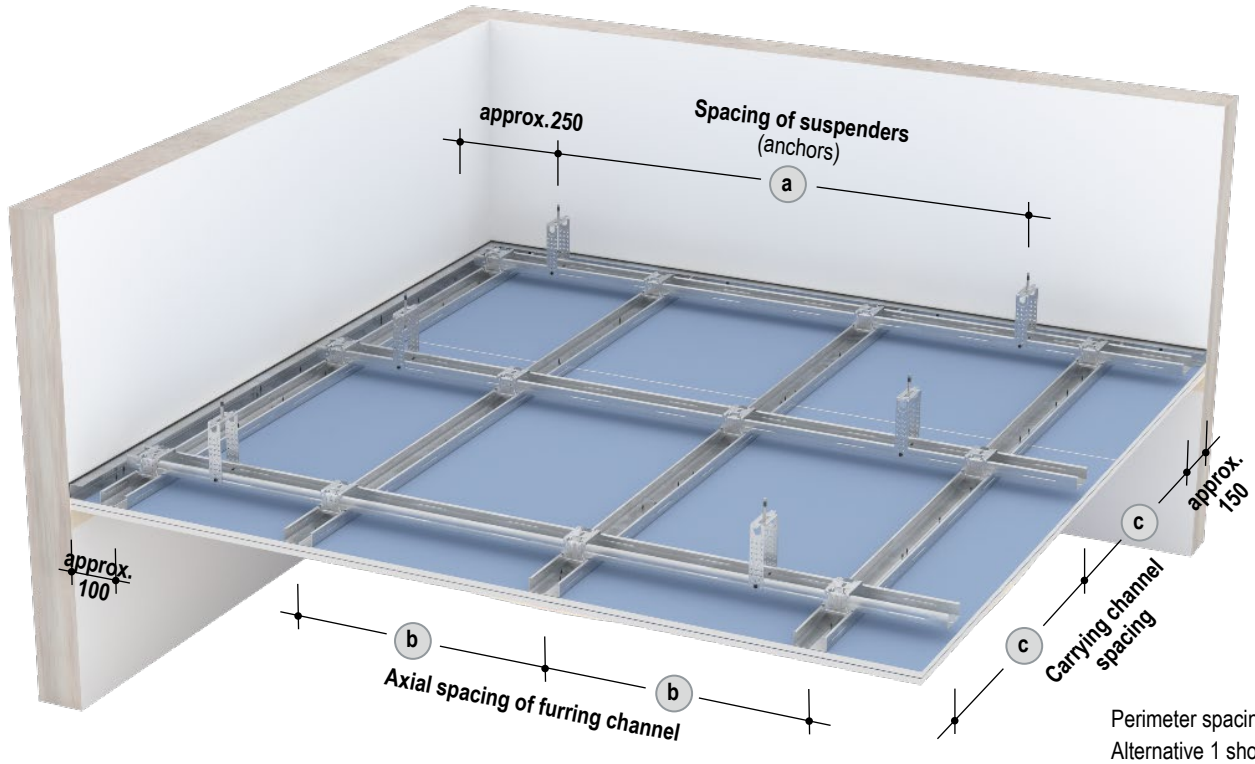
Load class kN/m²	Nominal weight + weight of additional loads kg/m²
Up to 0.65	60
Up to 0.50	50
Up to 0.40	40
Up to 0.30	30
Up to 0.15	20
	10

Notes

plus Extension of the fire resistance Certificate of Usability, see page 6.

Observe the notes on pages 4 to 6.

Maximum grid spacings



Perimeter spacings:
Alternative 1 shown,
See also page 30

Without fire resistance/fire resistance solely from below – carrying and furring channel

Axial spacings carrying channel (c)	Suspender spacings (a) Load class in kN/m²			
	Up to 0.15	Up to 0.30	Up to 0.50[1)]	Up to 0.65[1)]
500	1200	950	800	750
600	1150	900	750	700
700	1100	850	700[2)]	650
800	1050	800	700[2)]	–
900	1000	800	–	–
1000	950	750	–	–
1100	900	750[2)]	–	–
1200	900	–	–	–

Without fire resistance/fire resistance solely from below – Furring channel only

Axial spacings furring channel (b)	Suspender spacings (a) Load class in kN/m²				
	Up to 0.15	Up to 0.30	Up to 0.40[1)]	Up to 0.50[1)]	Up to 0.65[1)]
400	1400	1150	1050	1000	900
500	1300	1050	950	900	850
625	–	1000	900	850	800

Without fire resistance/fire resistance solely from below – Resilient Channel / Hat-Shaped Channel

Axial spacings Resilient Channels / Hat-Shaped Channel (b)	Spacings of suspenders / anchors (a) Load class in kN/m²				
	Up to 0.15	Up to 0.30	Up to 0.40[1)]	Up to 0.50[1)]	Up to 0.65[1)]
300	1400	1150	1050	1000	900
400	1300	1050	950	900	850
500	1200	1000	900	850	800

Notes

plus Extension of the fire resistance Certificate of Usability, see page 6.

Customized dimensioning of the ceiling substructure is possible on request.

It is recommended that the substructure is designed to accommodate a possible additional ceiling (≤ 0.15 kN/m²).

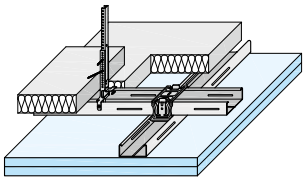
1) Use suspenders of load carrying capacity class 0.40 kN

2) Not valid for furring channel spacing (b) 800 mm

■ For axial spacings of furring channels also refer to pages 12 and 30

System variants

Fire resistance solely from below and/or from above (fire resistance in conjunction with the basic ceiling see pages 22 to 27)

Requirements on the basic ceiling for fire exposure **From below** No fire resistance requirements for basic ceiling / roof construction **From above** (Plenum) Raw ceiling must have same fire resistance class as the suspended ceiling	Fire resistance class For fire exposure From below	From above	Lining (lateral application) Knauf Bauplatte wallboard	Knauf Piano fire-resistant board	Knauf Fire-Resistant Board	Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	Rated weight Without insulation layer kg/m²	Furring channel Max. axial clearances (b) mm	Insulation layer Required for fire resistance Minimum thickness mm	Minimum density kg/m³
D112.de Board ceiling with metal grid														
	–	F30			•					15	15.5	500	Mineral wool (S) 40 40 + Mineral wool (S) 40 40 150 mm wide on carrying channel	
					•					15	17.9	500		
					•					18	18.1	625		
	F30	F30		•						2x 12.5	24.3	500		
							•			2x 12.5	28.3	500		
								•		2x 12.5	39.4	400		
									•	15	15.2	400	Mineral wool (S) 2x 40 40	
	F90	F90				•				25 + 18	40.1	500	Mineral wool (S) 40 40 + Mineral wool (S) 40 40 150 mm wide on carrying channel	
					•									
						•				2x 20	37.5			
									•	2x 20	35.1			

Possible suspenders in case of fire resistance requirements:
Universal Brackets / Damping Universal Brackets / Nonius suspender / Nonius stirrup

Determination of the load class

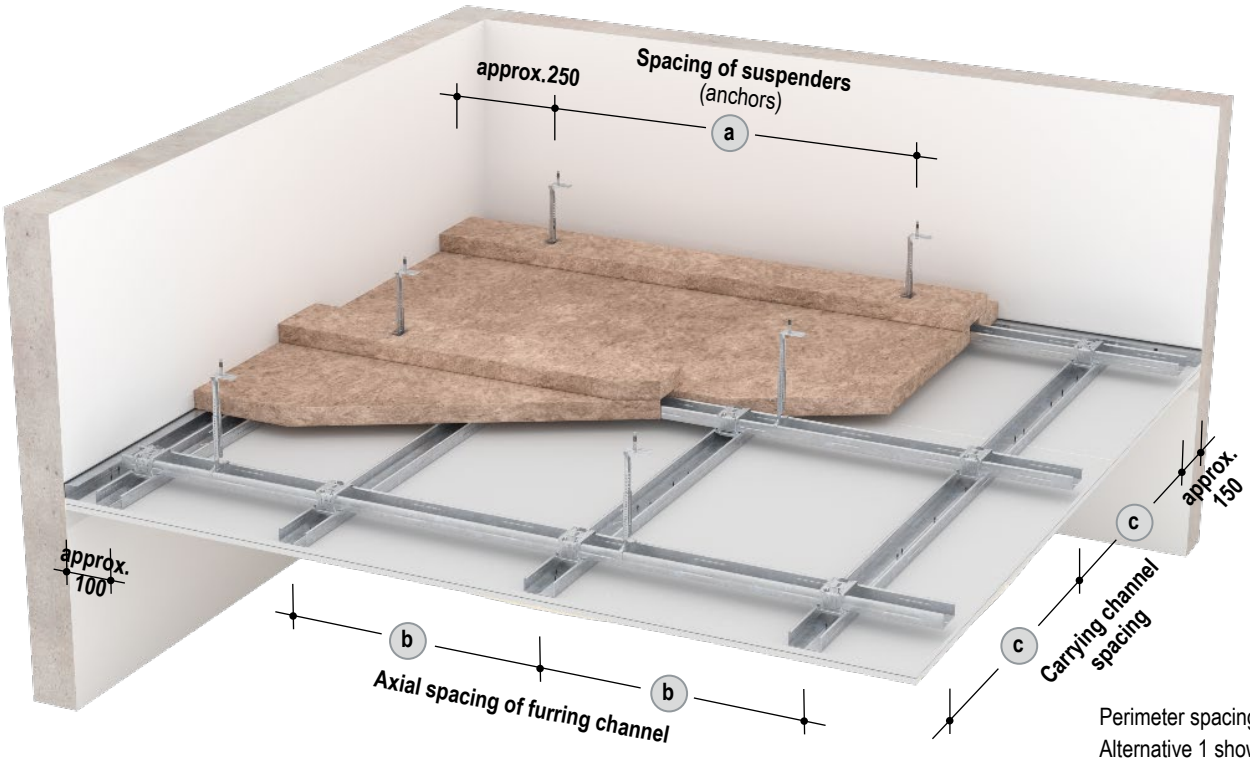
Load class kN/m²	Nominal weight + weight of additional loads kg/m²
Up to 0.65	60
Up to 0.50	50
Up to 0.40	40
Up to 0.30	30
Up to 0.15	20
	10

Notes

plus Extension of the fire resistance Certificate of Usability, see page 6.

Observe the notes on pages 4 to 6.

Maximum grid spacings



Perimeter spacings:
Alternative 1 shown,
See also page 30

Fire protection solely (from below and) from above – carrying and furring channel

Axial spacings carrying channel (c)	Suspender spacings (a) Load class in kN/m²			
	Up to 0.30	Up to 0.40[1)]	Up to 0.50[1)]	Up to 0.65[1)]
500	950	850	800	700
600	900	800	700	700
700	850	750	700[2)]	650[2)]
800	800	–	–	–

Fire protection solely (from below and) from above – Furring channel only

Axial spacings furring channel (b)	Suspender spacings (a) Load class in kN/m²			
	Up to 0.30	Up to 0.40[1)]	Up to 0.50[1)]	Up to 0.65[1)]
400	1150	1050	1000	900
500	1050	950	900	850
625	1000	900	850	800

Notes

plus Extension of the fire resistance Certificate of Usability, see page 6.

Observe additional constructional measures with fire resistance *solely from below* acc. to page 57.

Customized dimensioning of the ceiling substructure is possible on request.

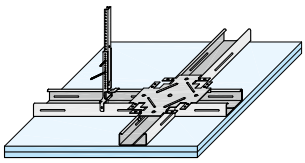
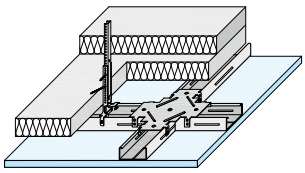
It is recommended that the substructure is designed to accommodate a possible additional ceiling (≤ 0.15 kN/m²).

1) *Use suspenders of load carrying capacity class 0.40 kN*
2) *Only permissible for furring channel spacing (b) max. 500 mm*

■ For axial spacings of furring channels also refer to pages 14 and 30

System variants

Fire resistance solely from below and/or from above (fire resistance in conjunction with the basic ceiling see pages 22 to 27)

Requirements on the basic ceiling for fire exposure **From below** No fire resistance requirements for basic ceiling / roof construction **From above** (Plenum) Raw ceiling must have same fire resistance class as the suspended ceiling	**Fire resistance class** For fire exposure **From below**	**From above**	**Lining** (lateral application) Knauf Bauplatte wallboard	Knauf Piano fire-resistant board	Knauf Fire-Resistant Board	Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	**Rated weight** Without insulation layer kg/m²	**Furring channel** Max. axial clearances (b) mm	**Insulation layer** required for fire resistance Minimum thickness mm	Minimum density kg/m³
D113.de Board ceiling with flush metal grid														
	–	–	•							**12.5**	11.7	500	–	
			•							**2x 12.5**	21.1			
	F30	–		•						**2x 12.5**	24.3	500	None or Mineral wool (G)	
							•			**2x 12.5**	28.3	500		
								•		**2x 12.5**	39.4	400		
	F60	–		•		•				**20 + 12.5**	30.9	500	None or Mineral wool (G)	
	–	**F30**			•					**15**	15.5	500	Mineral wool (S)	
							•			**15**	17.9		40	40
	F30	**F30**		•						**2x 12.5**	24.3	500	None or Mineral wool (G)	
							•			**2x 12.5**	28.3	500		
								•		**2x 12.5**	39.4	400		
									•	**15**	15.2	400	Mineral wool (S)	
													2x 40	40

- Universal connector as profile connection also possible
- Possible suspenders in case of fire resistance requirements:
  - Solely from below: Ankerfix Rapid Hanger CD / Universal Bracket / Damping Universal Bracket / Nonius suspender
  - Solely (from below and) from above: Universal Bracket / Damping Universal Bracket / Nonius suspender

Determination of the load class

Load class kN/m²	**Nominal weight + weight of additional loads** kg/m²
Up to 0.65	60
Up to 0.50	50
Up to 0.40	40
Up to 0.30	30
Up to 0.15	20
	10

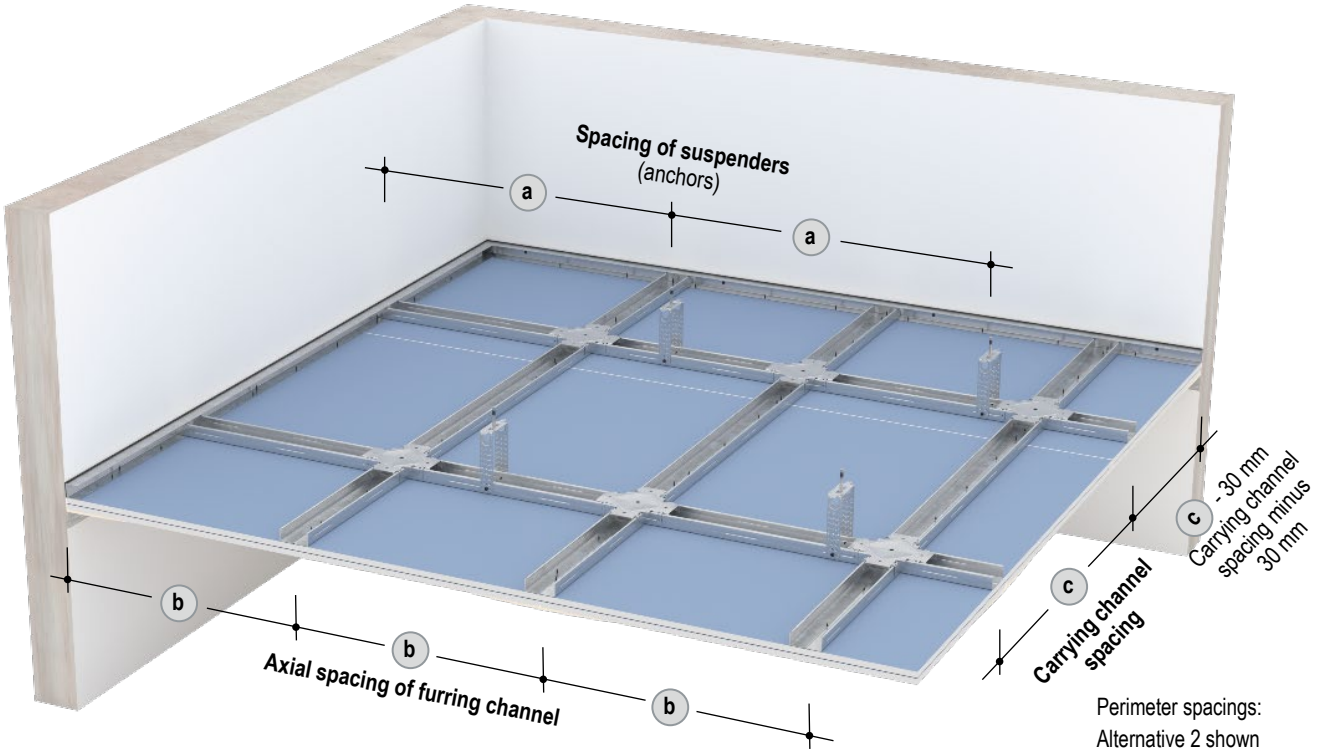
Notes

plus Extension of the fire resistance Certificate of Usability, see page 6.

Observe the notes on pages 4 to 6.

Maximum grid spacings

Dimensions in mm



Perimeter spacings:
Alternative 2 shown
Bearing UD runner at entire perimeter, see also page 30

Without fire resistance/fire resistance solely from below – carrying and furring channel

Axial spacings carrying channel (c)	Suspender spacings (a) Load class in kN/m²				
	Up to 0.15	Up to 0.30	Up to 0.40[1)]	Up to 0.50[1)]	Up to 0.65[1)]
500	1200	950	850	800	750
600	1150	900	800	750	700
700	1100	850	750	700	650[2)]
800	1050	800	750	700	–
900	1000	800	700	–	–
1000	950	750	700	–	–
1100	900	750	–	–	–
1200	900	700	–	–	–
1250	900 (1100)	650 (1000)	–	–	–

Fire protection solely (from below and) from above – carrying and furring channel

Axial spacings carrying channel (c)	Suspender spacings (a) Load class in kN/m²			
	Up to 0.30	Up to 0.40[1)]	Up to 0.50[1)]	Up to 0.65[1)]
500	850	750	700	600
600	800	700	650	550
700	750	650	600	500
800	700	650	600	–
900	700	600	–	–
1000	650	600	–	–
1100	650	–	–	–
1200	600	–	–	–
1250	600 (850)	–	–	–

1) *Use suspenders of load carrying capacity class 0.40 kN*
2) *Only permissible for furring channel spacing (b) max. 500 mm*

Values in brackets () only apply when the cladding is screw fastened to the carrying channel

■ For axial spacings of furring channels also refer to pages 16 and 30

Notes

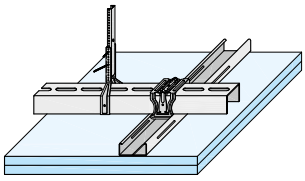
plus Extension of the fire resistance Certificate of Usability, see page 6.

Observe additional constructional measures with fire resistance *solely from below* acc. to page 57.

Customized dimensioning of the ceiling substructure is possible on request.

System variants

Fire resistance solely from below (ire resistance in conjunction with the basic ceiling see pages 22 to 27)

Requirements on the basic ceiling for fire exposure **From below** No fire resistance requirements for basic ceiling / roof construction **From above** (Plenum) Raw ceiling must have same fire resistance class as the suspended ceiling	Fire resistance class For fire exposure From below	From above	Lining (lateral application) Knauf Bauplatte wallboard	Knauf Piano fire-resistant board	Knauf Fire-Resistant Board	Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	Rated weight Without insulation layer kg/m²	Furring channel Max. axial clearances (b) mm	Insulation layer Required for fire resistance Minimum thickness mm	Minimum density kg/m³
D116.de Board ceiling with large-span metal grid														
	–	–	•							**12.5**	14.5	500	–	
			•							**2x 12.5**	23.9			
	F30	–		•						**2x 12.5**	27.1	500	None or Mineral wool (G)	
							•			**2x 12.5**	31.1	500		
								•		**2x 12.5**	42.2	400		
						•				**20**	22.7	625[1)]		
	F60	–		•		•				**20 + 12.5**	33.7	500	None or Mineral wool (G)	
	F90	–				•				**25 + 18**	43.0	500	None or Mineral wool (G)	
					•									
						•				**2x 20**	40.3			
									•	**2x 20**	37.9			

1) Longitudinal cladding: Backing of the front edge joints of the cladding with profiles CD 60/27 or with ≥ 100 mm wide and ≥ 20 mm thick Solidboard strips is necessary.

Possible suspenders in case of fire resistance requirements:
Universal Bracket / Damping Universal Bracket / Nonius stirrup

Determination of the load class

Load class kN/m²	Nominal weight + weight of additional loads kg/m²
Up to 0.65	60
Up to 0.50	50
Up to 0.40	40
Up to 0.30	30
Up to 0.15	20
	10

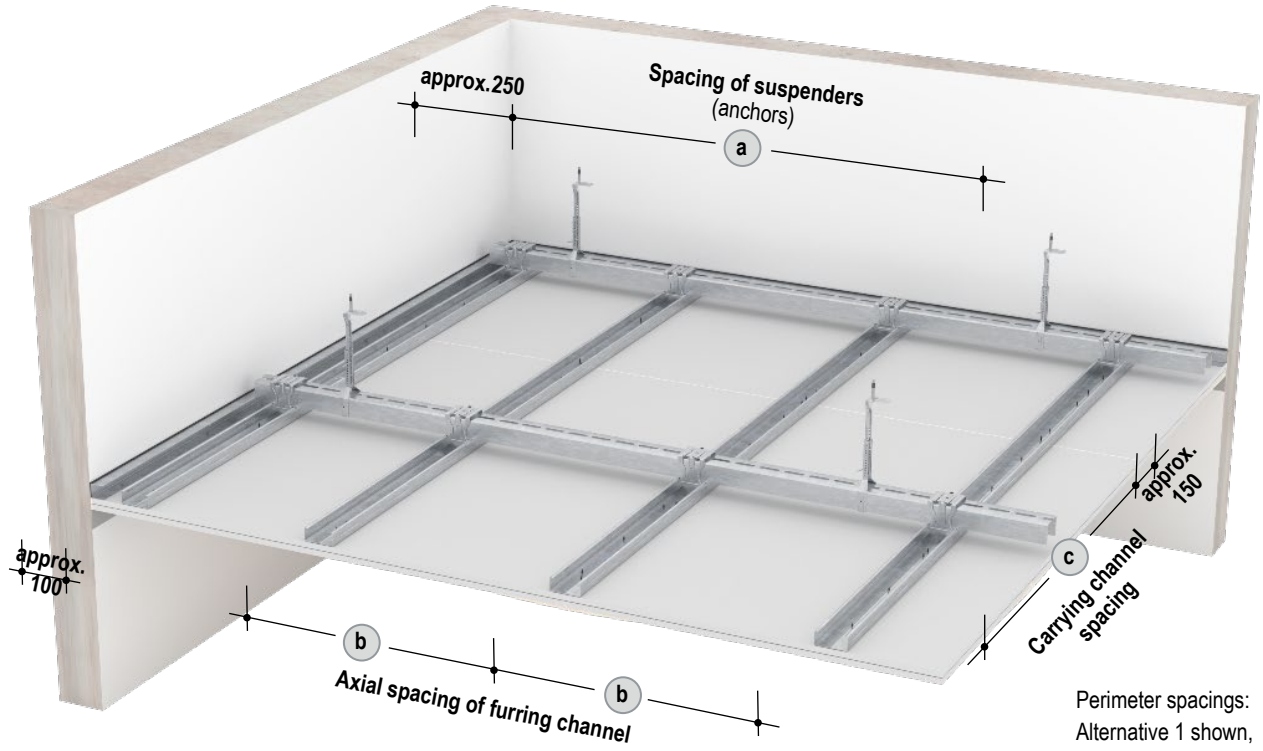
Notes

plus Extension of the fire resistance Certificate of Usability, see page 6.

Observe the notes on pages 4 to 6.

Maximum grid spacings

Dimensions in mm



Perimeter spacings: Alternative 1 shown, see also page 30

Without fire resistance/fire resistance solely from below – carrying and furring channel

Axial spacings carrying channel (c)	Suspender spacings (a) Load class in kN/m² Up to 0.15	Up to 0.30	Up to 0.50	Up to 0.65
Suspenders load bearing capacity class 0.40 kN				
500	2600	2050	1600	1200
600	2450	1950	1300	1000
700	2300	1850	1100[1)]	850
800	2200	1650	1000[1)]	–
900	2150	1450	–	–
1000	2050	1300	–	–
1100	2000	1200[1)]	–	–
1200	1950	–	–	–
1300	1900	–	–	–
1400	1850	–	–	–
1500	1750	–	–	–

1) Not valid for furring channel spacing (b) 500 mm

■ For axial spacings of furring channels also refer to pages 18 and 30

Notes

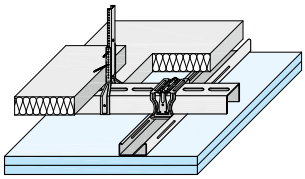
plus Extension of the fire resistance Certificate of Usability, see page 6.

Customized dimensioning of the ceiling substructure is possible on request.

It is recommended that the substructure is designed to accommodate a possible additional ceiling (≤ 0.15 kN/m²).

System variants

Fire resistance solely from below and/or from above (fire resistance in conjunction with the basic ceiling see pages 22 to 27)

Requirements on the basic ceiling for fire exposure **From below** No fire resistance requirements for basic ceiling / roof construction **From above** (Plenum) Raw ceiling must have same fire resistance class as the suspended ceiling	Fire resistance class For fire exposure From below	From above	Lining (lateral application) Knauf Bauplatte wallboard	Knauf Piano fire-resistant board	Knauf Fire-Resistant Board	Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	Rated weight Without insulation layer kg/m²	Furring channel Max. axial clearances (b) mm	Insulation layer Required for fire resistance Minimum thickness mm	Minimum density kg/m³
D116.de Board ceiling with large-span metal grid														
	–	F30			•					**15**	18.3	500	Mineral wool (S) 60 50 + Mineral wool (S) 60 50 100 mm wide on carrying channel	
							•			**15**	20.7			
					•					**18**	20.9	625		
	F30	F30		•						**2x 12.5**	27.1	500	Mineral wool (S) 40 40 + Mineral wool (S) 40 40 150 mm wide on carrying channel	
							•			**2x 12.5**	31.1	500		
								•		**2x 12.5**	42.2	400		
									•	**15**	18.0	400	Mineral wool (S) 2x 40 40	
	F90	F90			•	•				**25 + 18**	43.0	500	Mineral wool (S) 40 40 + Mineral wool (S) 40 40 150 mm wide on carrying channel	
						•				**2x 20**	40.3			
									•	**2x 20**	37.9			

Possible suspenders in case of fire resistance requirements:
Universal Bracket / Damping Universal Bracket / Nonius stirrup

Determination of the load class

Load class kN/m²	Nominal weight + weight of additional loads kg/m²
Up to 0.65	60
Up to 0.50	50
Up to 0.40	40
Up to 0.30	30
Up to 0.15	20
	10

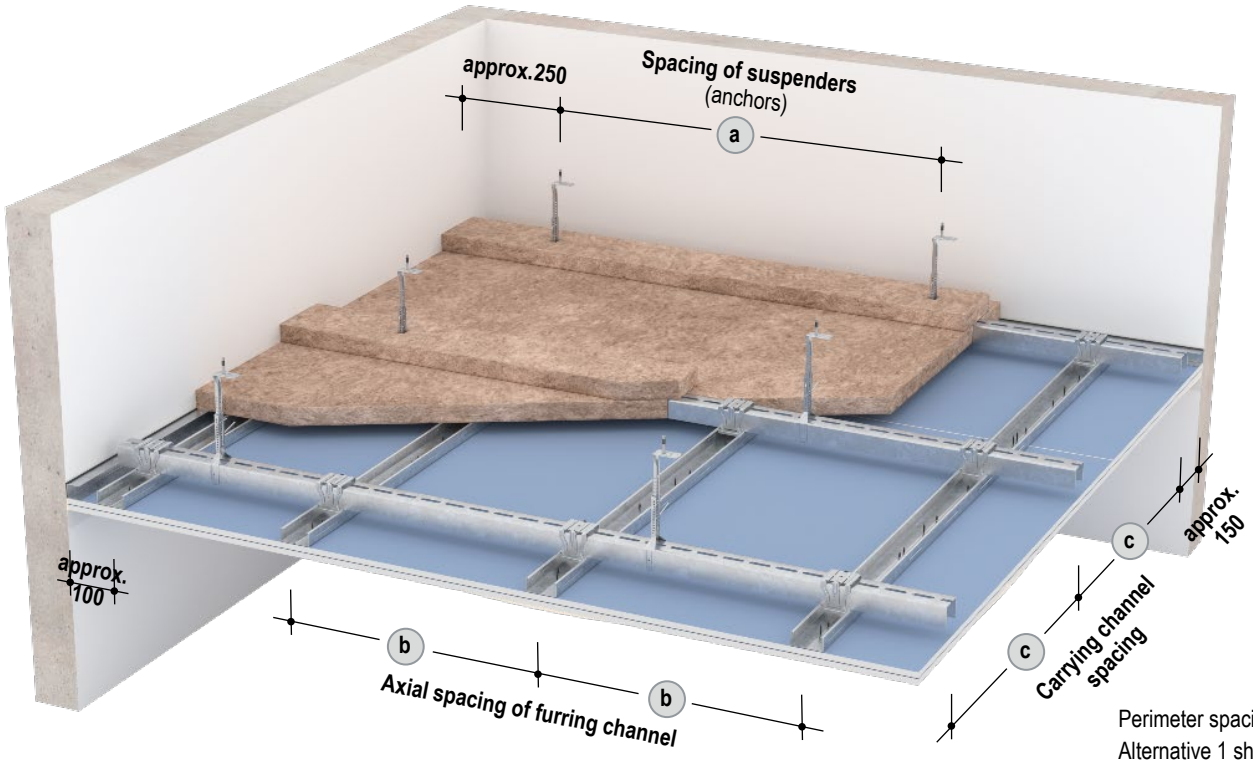
Notes

plus Extension of the fire resistance Certificate of Usability, see page 6.

Observe the notes on pages 4 to 6.

Maximum grid spacings

Dimensions in mm



Perimeter spacings: Alternative 1 shown, see also page 30

Fire protection solely (from below and) from above – carrying and furring channel

Axial spacings carrying channel (c)	Suspender spacings (a) Load class in kN/m² Up to 0.30	Up to 0.40	Up to 0.50	Up to 0.65
Nonius stirrup 0.40 kN				
500	1150	1000	950	850
600	1050	950	900	800
700	1000	900	850	750
800	950	850	800	–
900	900	800	–	–
1000	900[1)]	–	–	–
Threaded rod M8				
500	1700	1500	1400	1300
600	1600	1400	1300	1200
700	1500	1350	1250	1100[1)]
800	1400	1300	1200	–
900	1400	1250[1)]	–	–
1000	1300[1)]	1200[1)]	–	–

1) Only permissible for furring channel spacing (b) max. 500 mm

■ For axial spacings of furring channels also refer to pages 20 and 30

Notes

plus Extension of the fire resistance Certificate of Usability, see page 6.

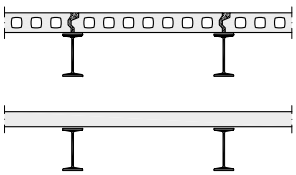
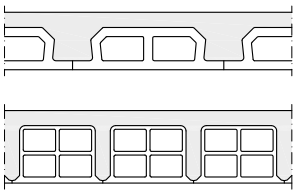
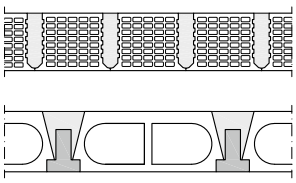
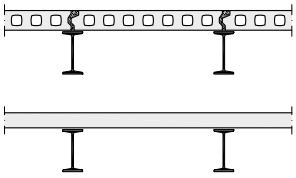
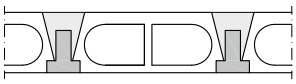
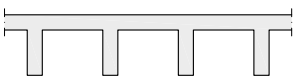
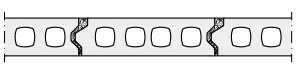
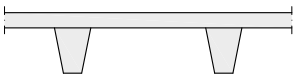
Observe additional constructional measures with fire resistance *solely from below* acc. to page 57.

Customized dimensioning of the ceiling substructure is possible on request.

It is recommended that the substructure is designed to accommodate a possible additional ceiling (≤ 0.15 kN/m²).

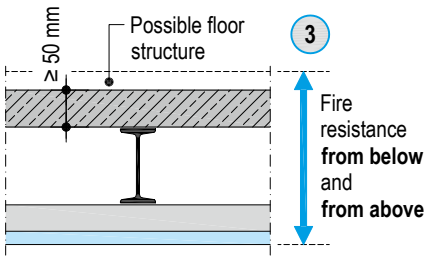
D111.de
D112.de
D113.de
D116.de

Basic ceilings of type I to III

(2) Basic ceilings	System selection
Ceiling type I	
	Ceilings with exposed steel beams in the plenum area with an A_P/V ratio ≤ 300 m^{-1} and an upper cover of pumice concrete hollow core planks or aerated concrete slabs
	Ribbed concrete cover with filler joists made of light concrete or bricks
	Reinforced concrete joist ceilings with filler joists made of light concrete or bricks
	Reinforced concrete ceiling in conjunction with steel beams embedded in concrete
Ceiling type II	
	Ceilings with exposed steel beams in the plenum area with an A_P/V ratio ≤ 300 m^{-1} and an upper cover of in-situ concrete or prefabricated boards with structurally active in-situ concrete layer or prefabricated parts made of hollow core planks made of steel or reinforced and prestressed concrete
Ceiling type III	
Ceilings made of reinforced concrete or prestressed concrete slabs made of standard concrete, however not with components or filler joists made of light concrete or bricks	
	Reinforced concrete or prestressed concrete slabs made of standard concrete
	Reinforced concrete joist ceilings with beams and filler joists made of standard concrete
	Two-way flat slab ceiling and dropped ceiling made of standard concrete
	Reinforced concrete or prestressed concrete hollow core slabs
	Ribbed concrete cover without filler joists or with filler joists made of normal concrete

Load-bearing ceilings subject to fire resistance requirements must generally withstand exposure to fire from the bottom of the ceiling as well as from the top of the top of the ceiling.

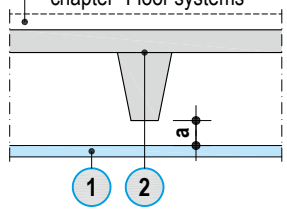
If the basic ceiling alone does not comply with the required fire resistance class, an additional suspended ceiling / ceiling lining made of Knauf boards in conjunction with a basic ceiling can provide the required fire resistance. For a classification from above, additional measures may be necessary, e.g. classified screeds acc. to the folder "Brandschutz mit Knauf - *Fire protection with Knauf*", chapter "Bodensysteme - *Floor systems*".



The specifications of the German National Technical Test Certificate (AbP) assume, among other factors, that in the plenum area between basic ceiling and suspended ceiling, that no combustible components are located with the exception of components that are elements of the suspended ceiling construction. Combustible cable insulation and freely exposed not easily flammable materials, which are as evenly distributed as possible, are considered to be quiet safe if the fire load is ≤ 7 kWh/m^2.

System variants

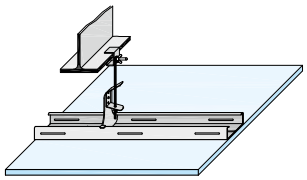
D112.de/D116.de Fire resistance in conjunction with basic ceilings of types I to III



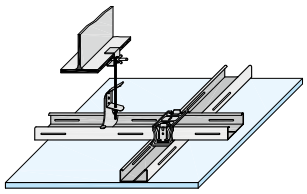
3 If necessary, refer to the Fire protection folder chapter "Floor systems"

Fire resistance
From below and from above
1 + 2 + possibly 3

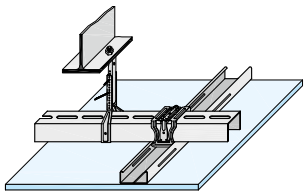
Fire resistance class	Basic ceiling type acc. to DIN 4102–4			1 Ceiling lining/suspended ceiling Cladding (lateral application)							Rated weight[1]	Furring channel	Insulation layer	Minimum suspension height
				Knauf Piano fire-resistant board	Knauf Fire-Resistant Board	Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness	Without insulation layer	Max. axial clearances b	In the ceiling plenum	Basic ceiling lower edge Upper edge cladding a
	I	II	III							mm	kg/m²	mm		mm
D112.de/D116.de Board ceiling with metal grid														
F30					•					15	15.5	500	Permissible G	40
							•			15	17.9		Permissible G	40
						•				20	19.9		Not permissible	15
	F30			•						12.5	13.3	500	Not permissible	40
							•			12.5	15.3		Not permissible	40
								•		12.5	21.0	400	Not permissible	40
					•					15	15.5	500	G	40
							•			15	17.9		G	40
						•				20	19.9		Not permissible	15
		F30		•						12.5	13.3	500	Not permissible	40
							•			12.5	15.3		Not permissible	40
								•		12.5	21.0	400	Not permissible	40
				•						12.5	13.3	500	G	80
							•			12.5	15.3		G	80
								•		12.5	21.0	400	G	80
					•					15	15.5	500	G	40
							•			15	17.9		G	40
						•				20	19.9		Not permissible	15



D112.de Furring channel/ Hat-shaped channel



D112.de Carrying channel and furring channel CD



D116.de Carrying channel and furring channel UA + CD

1) *Rated weight of specification valid for frame D112.de Metal grid CD 60/27, for determining the rated weight with grid D116.de Large-span metal grid 2.8 kg/m² are to be added to the stated table values.*

Possible suspenders in case of fire resistance requirements:
Ankerfix Rapid Hanger CD / Universal brackets / Damping Universal Brackets / Nonius suspender / Nonius stirrup

Determination of the load class

Load class kN/m²	Nominal weight + weight of additional loads kg/m²
Up to 0.65	60
Up to 0.50	50
Up to 0.40	40
Up to 0.30	30
Up to 0.15	20
	10

Notes

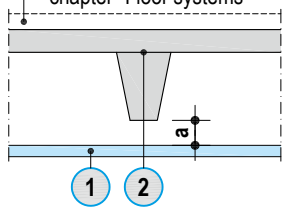
plus Extension of the fire resistance Certificate of Usability, see page 6.

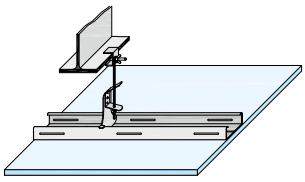
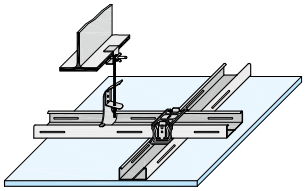
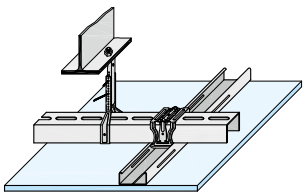
2 3 see page 22

Observe the notes on pages 4 to 6.

System variants

D112.de/D116.de Fire resistance in conjunction with basic ceilings of types I to III



Fire resistance class	Basic ceiling type acc. to DIN 4102–4			1 Ceiling lining/suspended ceiling Cladding (lateral application)							Rated weight[1]	Furring channel	Insulation layer	Minimum suspension height
Fire resistance From below and from above 1 + 2 + possibly 3	I	II	III	Knauf Piano fire-resistant board	Knauf Fire-Resistant Board	Solid Board	Diamant	Silentboard	Fireboard	Minimum Thick-ness	Without insulation layer	Max. ax-ial clear-ances b	In the ceiling plenum	Basic ceiling lower edge Upper edge cladding a
										mm	kg/m²	mm		mm
D112.de/D116.de Board ceiling with metal grid														
 *D112.de Furring channel/Hat-shaped channel*	F60				•					2x 15	28.7	500	Not permissible	15
							•			2x 15	33.5		Not permissible	15
		F60			•					2x 15	28.7	500	Not permissible	15
							•			2x 15	33.5		Not permissible	15
 *D112.de Carrying channel and furring channel CD*			F60	•						12.5	13.6	400	Not permissible	80
							•			12.5	15.6		Not permissible	80
								•		12.5	21.0		Not permissible	80
					•					15	15.8		Not permissible	40
							•			15	18.2		Not permissible	40
 *D116.de Carrying channel and furring channel UA + CD*					•					15	15.8		S	80
							•			15	18.2		S	80
						•				20	20.2		Not permissible	15

1) Rated weight of specification valid for frame D112.de Metal grid CD 60/27, for determining the rated weight with grid D116.de Large-span metal grid 2.8 kg/m² are to be added to the stated table values.

- Insulation layer S : Thickness ≥ 50 mm; density ≥ 40 kg/m³
- Possible suspenders in case of fire resistance requirements: Ankerfix Rapid Hanger CD / Universal brackets / Damping Universal Brackets / Nonius suspender / Nonius stirrup

Notes

plus Extension of the fire resistance Certificate of Usability, see page 6.

2 3 see page 22

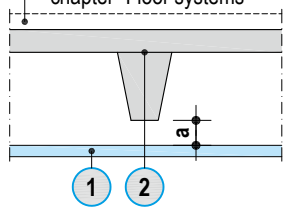
Observe the notes on pages 4 to 6.

Determination of the load class

Load class kN/m²	Nominal weight + weight of additional loads kg/m²
Up to 0.65	60
	50
Up to 0.50	40
Up to 0.40	30
Up to 0.30	20
Up to 0.15	10

System variants

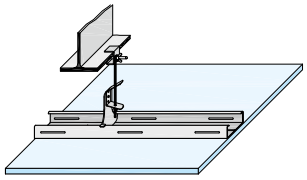
D112.de/D116.de Fire resistance in conjunction with basic ceilings of types I to III



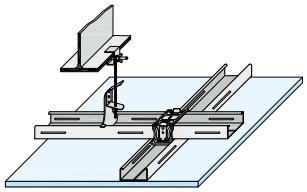
3 If necessary, refer to the Fire protection folder chapter "Floor systems"

Fire resistance
From below and from above
1 + 2 + possibly 3

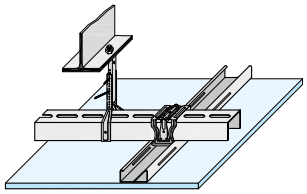
Fire resistance class	Basic ceiling type acc. to DIN 4102–4			1 Ceiling lining/suspended ceiling Cladding (lateral application)							Rated weight[1]	Furring channel	Insulation layer	Minimum suspension height
				Knauf Piano fire-resistant board	Knauf Fire-Resistant Board	Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness	Without insulation layer	Max. axial clearances b	In the ceiling plenum	Basic ceiling lower edge Upper edge cladding a
	I	II	III							mm	kg/m²	mm		mm
D112.de/D116.de Board ceiling with metal grid														
F90									•	**15**[2]	16.2	400	Not permissible	200
									•	**20**	19.0		Not permissible	40
									•	**25**[2]	24.1		Not permissible	15
									•	**25**	23.1		S	80
	F90								•	**12.5**	13.8	400	Not permissible	200
									•	**15**[2]	16.2		Not permissible	30
									•	**20**	19.0		Not permissible	15
									•	**20**	19.0		S	80
		F90							•	**12.5**	13.8	400	Not permissible	40
									•	**15**[2]	16.2		Not permissible	15
									•	**15**	15.2		S	80
					•					**15**	15.5	500	Not permissible	80
							•			**15**	17.9		Not permissible	80



D112.de Furring channel/Hat-shaped channel



D112.de Carrying channel and furring channel CD



D116.de Carrying channel and furring channel UA + CD

1) *Rated weight of specification valid for frame D112.de Metal grid CD 60/27, for determining the rated weight with grid D116.de Large-span metal grid 2.8 kg/m² are to be added to the stated table values.*

2) *Apply backing to board joints with ≥ 100 mm wide and ≥ 15 mm thick Knauf Fireboard strips.*

- Insulation layer S : Thickness ≥ 50 mm; density ≥ 40 kg/m³
- Possible suspenders in case of fire resistance requirements: Ankerfix Rapid Hanger CD / Universal brackets / Damping Universal Brackets / Nonius suspender / Nonius stirrup

Notes

plus Extension of the fire resistance Certificate of Usability, see page 6.

2 3 see page 22

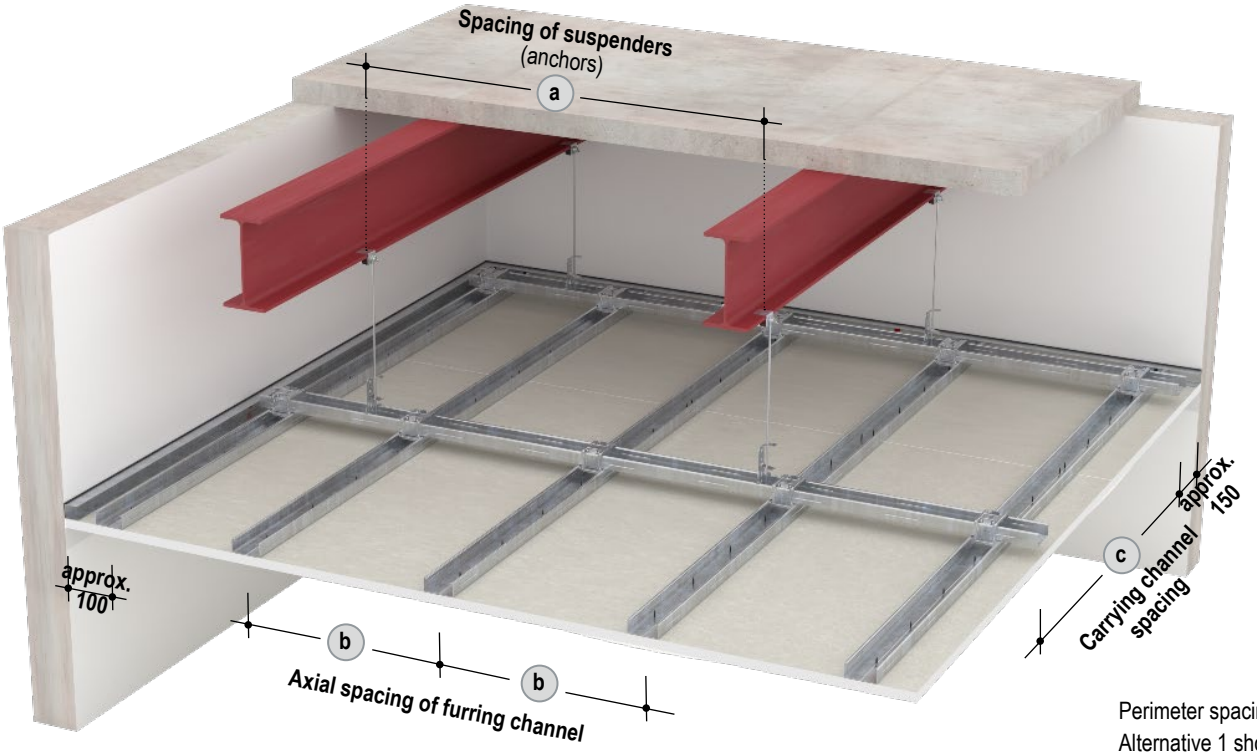
Observe the notes on pages 4 to 6.

Determination of the load class

Load class kN/m²	Nominal weight + weight of additional loads kg/m²
Up to 0.65	60
Up to 0.50	50
Up to 0.40	40
Up to 0.30	30
Up to 0.15	20
	10

D112.de Maximum grid spacings

Dimensions in mm



Perimeter spacings: Alternative 1 shown, see also page 30

Fire resistance in conjunction with basic ceilings of types I to III
carrying and furring channel

Axial spacings carrying channel (c)	Suspender spacings (a) Load class in kN/m²				
	Up to 0.15	Up to 0.30	Up to 0.40[1)]	Up to 0.50[1)]	Up to 0.65[1)]
500	1200	950	850	800	700
600	1100	900	800	700	700
700	1000	850	750	700[2)]	650[2)]
800	1000	800	–	–	–
900	1000	–	–	–	–

Fire resistance in conjunction with basic ceilings of types I to III
furring/hat-shaped channel only

Axial spacings furring channel (c)	Spacings of suspenders/anchors (a) Load class in kN/m²				
	Up to 0.15	Up to 0.30	Up to 0.40[1)]	Up to 0.50[1)]	Up to 0.65[1)]
400	1400	1150	1050	1000	900
500	1300	1050	950	900	850

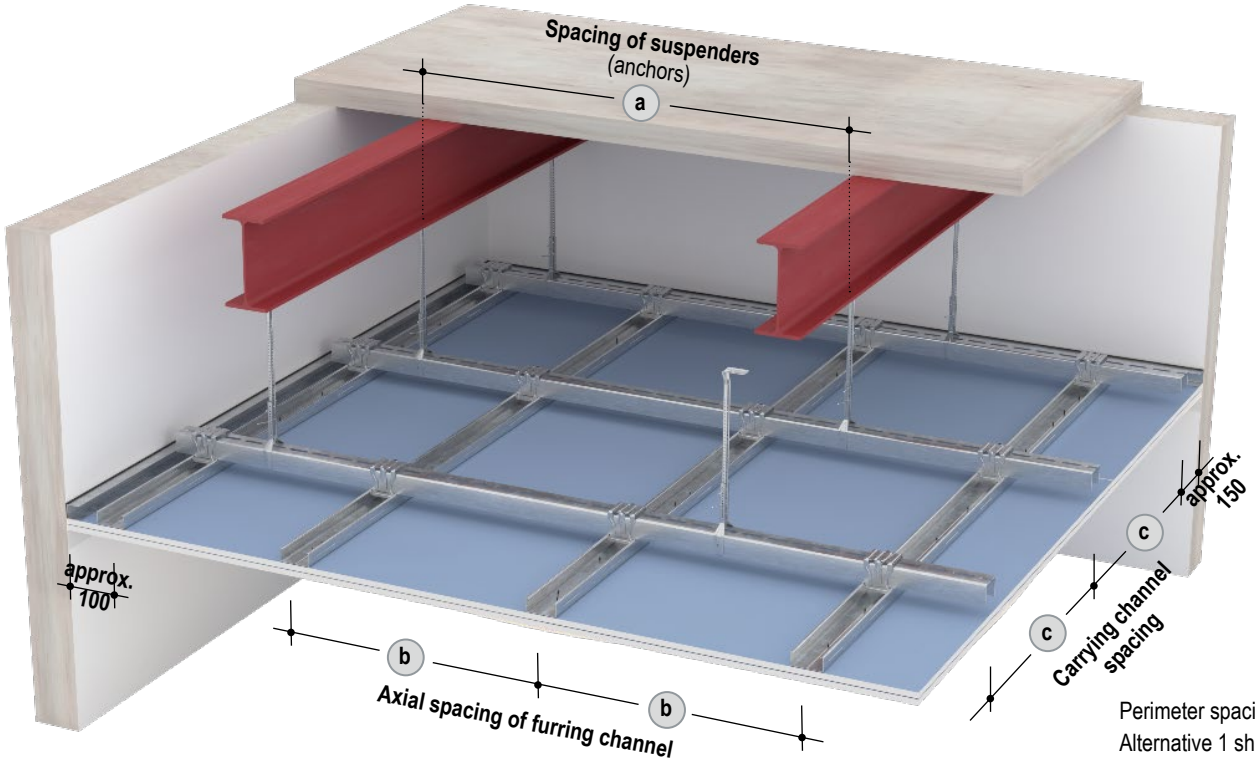
Note	
	plus Extension of the fire resistance Certificate of Usability, see page 6.

1) *Use suspenders of load carrying capacity class 0.40 kN*
2) *Only permissible for furring channel spacing (b) max. 500 mm*

■ For axial spacings of furring channels also refer to pages 23 to 25

D116.de Maximum grid spacings

Dimensions in mm



Perimeter spacings: Alternative 1 shown, see also page 30

Fire resistance in conjunction with basic ceilings of types I to III
carrying and furring channel UA + CD

Axial spacings carrying channel (c)	Suspender spacings (a) Nonius stirrup 0.40 kN Load class in kN/m²				
	Up to 0.15	Up to 0.30	Up to 0.40	Up to 0.50	Up to 0.65
500	1400	1150	1000	950	850
600	1350	1050	950	900	800
700	1250	1000	900	850	750
800	1200	950	850	800	–
900	1150	900	800	–	–
1000	1100	900[1)]	–	–	–

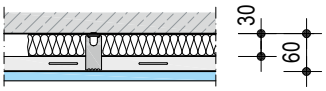
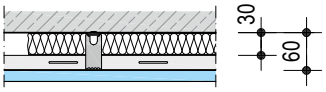
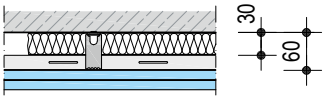
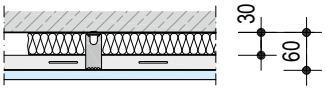
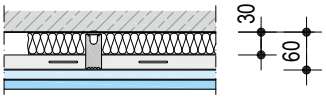
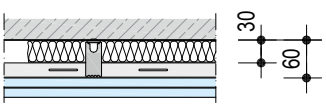
1) Only permissible for furring channel spacing (b) max. 500 mm

■ For axial spacings furring channels also refer to pages 23 to 25

Note	plus Extension of the fire resistance Certificate of Usability, see page 6.

Airborne and impact sound insulation

Dimensions in mm

Basic ceiling ⟷ **Reinforced concrete ceiling** 140 mm, approx. 320 kg/m² (standard reference floor)	Without floor		**Basic ceiling + flooring construction** ⟷ **Floor construction** **Knauf pre-fab floor screed** ■ 1x 18 mm Brio WF		■ 2x 23 mm Brio ■ 20 mm Knauf Insulation Trittschall-Dämmplatte TP-GP		**Knauf flowing screed** ■ 40 mm Knauf FE50 ■ 9.5 mm Knauf GKB ■ 25 mm mineral wool Trittschall-Dämmplatte stiffness group 10	
	R_w (C I C_{tr}) dB	$L_{n,w}$ (C_I I $C_{I,50\text{-}2500}$) dB	R_w (C I C_{tr}) dB	$L_{n,w}$ (C_I I $C_{I,50\text{-}2500}$) dB	R_w (C I C_{tr}) dB	$L_{n,w}$ (C_I I $C_{I,50\text{-}2500}$) dB	R_w (C I C_{tr}) dB	$L_{n,w}$ (C_I I $C_{I,50\text{-}2500}$) dB
Without suspended ceiling	53 (-2 I -6)	80 (-12 I -12)	58 (-2 I -7)	57 (0 I 0)	62 (-2 I -7)	49 (1 I 4)	65 (– I –)	41 (– I –)
Basic ceiling + suspended ceiling **D112.de** ⟷			Basic ceiling + flooring + subceiling ⟷					
 ■ 12.5 mm Diamant	70 (-3 I -8)	55 (-5 I -1)	71[1] (-3 I -10)	44 (2 I 4)	74[1] (-6 I -15)	39 (5 I 12)	70[2] (– I –)	30[1] (– I –)
 ■ 15 mm Diamant	70[3] (-3 I -8)	55[3] (-5 I -1)	72 (-3 I -9)	45 (2 I 7)	74[1)3)] (-5 I -15)	39[3] (5 I 12)	70[2] (– I –)	30[1)3)] (– I –)
 ■ 2x 12.5 mm Diamant	74 (-2 I -7)	52 (-6 I -2)	76 (-3 I -9)	39 (1 I 5)	80[1] (-6 I -14)	33 (5 I 13)	74[2] (– I –)	24[1] (– I –)
 ■ 12.5 mm Silentboard	72 (-2 I -7)	50 (-3 I 2)	74[1] (-3 I -10)	41 (1 I 5)	78[1] (-6 I -14)	34 (5 I 13)	72[2] (– I –)	26[1] (– I –)
 ■ 12.5 mm Silentboard ■ 12.5 mm Diamant	74 (-2 I -6)	49 (-5 I 1)	77[1] (-3 I -10)	38 (1 I 6)	81[1] (-6 I -14)	32 (5 I 12)	74[2] (– I –)	23[1] (– I –)
 ■ 2x 12.5 mm Silentboard	75 (-2 I -7)	48 (-4 I 1)	78[1] (-3 I -10)	37 (1 I 5)	81[1] (-5 I -13)	30 (6 I 13)	75[2] (– I –)	22[1] (– I –)

1) Calculation based on the detailed procedure acc. to EN 12354.

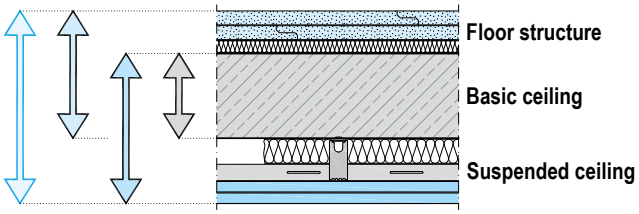
2) Measured values of basic ceiling and suspended ceiling without flooring.

3) Values derived from cladding 12.5 mm.

4) Enhanced margin of 4 dB for consideration of the test with partial screed surface.

Larger suspension heights / larger thickness's of the basic ceiling improve sound insulation

Test configuration



R_W or alt $L_{n,w}$

Suspended ceiling D112.de

- Furring channel CD 60/27
- Insulation layer 30 mm
  (e.g. Knauf Insulation Akustik-Dämmplatte TP 120 A)
- Damping Universal Bracket
- Cladding

Demands on the insulation layer (e.g. from Knauf Insulation):
Mineral wool insulation layer 30 mm acc. to EN 13162;
length-related flow resistance of 5 kPa·s/m² ≤ r ≤ 50 kPa·s/m²

Note	Airborne and impact sound insulation with Knauf Acoustic Ceilings, see technical brochure Sound insulation with Knauf Ceilings SS05.de

Permissible cladding span widths (lateral cladding)

Dimensions in mm

Board thickness's	Maximum spacings furring timber batten/furring channel (b)		
	Without fire resistance	With fire resistance	Ball impact safety D112.de/D113.de/ D116.de Universal Bracket/Nonius suspension
12.5 Knauf Wallboard	500	–	–
12.5 / 2x 12.5 Silentboard	400	Spacings of the furring channels acc. to pages 10, 12, 14, 16, 18, 20, 23, 24, 25	312.5
12.5 / 2x 12.5	500		
15 / 2x 15	550		
18 / 25 + 18	625		
20 / 2x 20 / 20 + 12.5	625		
25	800		

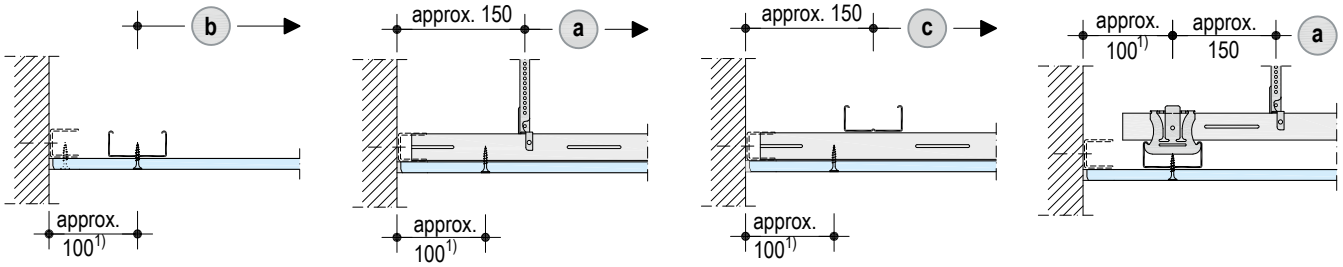
When coating with a plaster of layer thickness ≥ 6 mm (e.g. cooling ceilings) furring channel axial spacing ≤ 312.5 mm. Observe the additional load due to the plaster layer when dimensioning the grid in accordance with page 7.

Perimeter spacings of the grid (Scheme drawings – examples)

Dimensions in mm

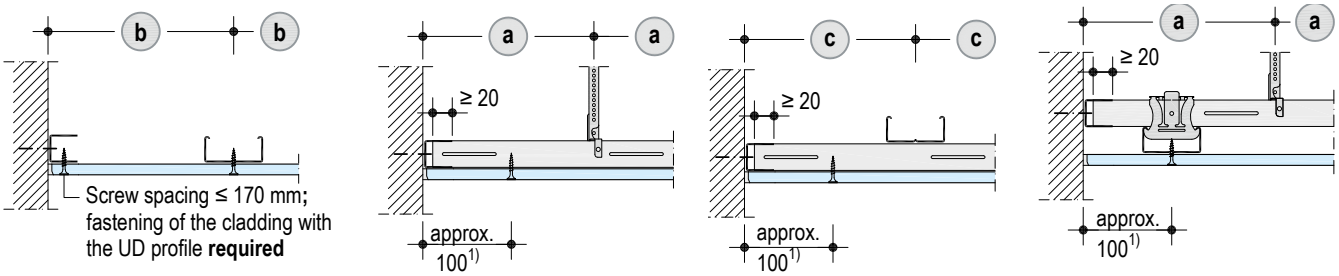
Alternative 1: Non-load-bearing connection (connection is not used for load-bearing of the ceiling)

- Without perimeter joint backing
- Backing with UD runner as installation aid
- With fire protection and sound insulation – Spacing of UD runner up to approx. 1 m



Alternative 2: Load-bearing connection

- The spacing of the UD Runners is reduced to ≤ 625 mm (for fire resistance too). Use fasteners and anchors suited to the substrate.
- In load-bearing UD runners, the carrying / furring channels should be inserted by at least 20 mm.
- The maximum permissible spacings for suspenders, carrying / furring channels are given in the tables for the respective systems.



Legend

(a) *Spacing of suspenders*

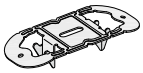
(b) *Axial spacing furring channel (cladding span width)*

(c) *Axial spacing carrying channel (spacing furring channel)*

1) Maximum projection of the cladding

Suspenders

Dimensions in mm

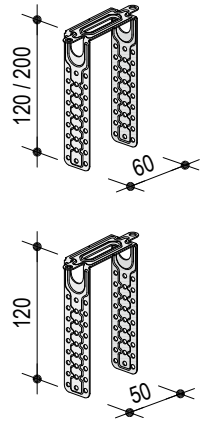
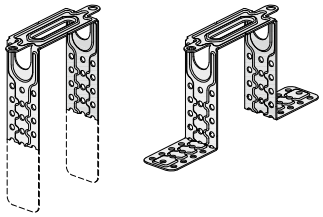
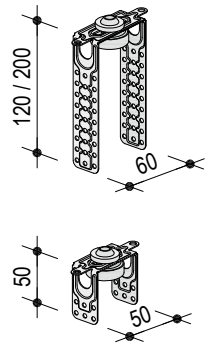
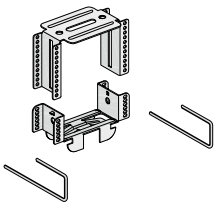
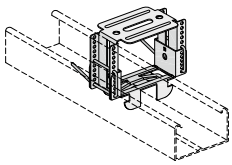
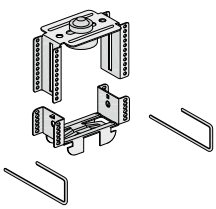
Suspension	Drawing		Comment
Multi-level ceiling system – 0.15 kN (15 kg) load-bearing capacity class			
Direct Bracket For CD 60/27	 Bend side tabs		Anchor to fire protection ceiling with **Knauf FN 4.3 x 35** or **Knauf FN 4.3 x 65**
0.25 kN (25 kg) load-bearing capacity class			
Ankerfix Rapid Hanger CD For CD 60/27		 Suspended with **Hanging Wire**	■ Anchoring to the reinforced concrete ceiling with **Knauf Ceiling Steel Dowel** ■ Anchor to beam (timber/concrete/steel) with **1x Knauf FN 4.3 x 35** ■ Anchoring to the trapezoid sheet metal with **an approved anchoring element**

Note Anchoring to basic ceilings made of other building materials with specially approved or standardized anchoring elements.

D111.de
D112.de
D113.de
D116.de

Suspenders, continued

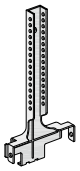
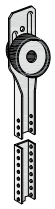
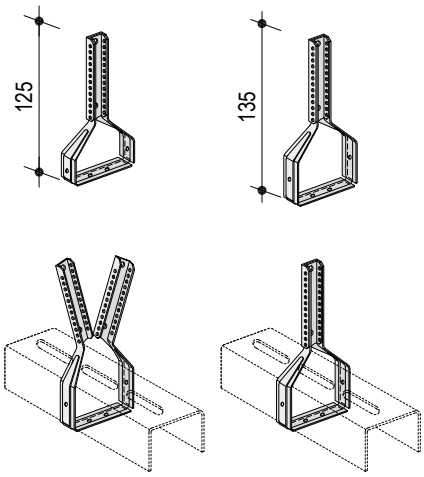
Dimensions in mm

Suspension	Drawing		Comment
0.40 kN (40 kg) load-bearing capacity class			
Universal Bracket For CD 60/27 For timber batten 50 x 30 For UA 50/40		 Bend or cut the Universal Bracket / Damping Universal Bracket according to the required suspension height, screw fasten with ■ Timber batten (2x Knauf TN 3.5 x 25) ■ CD 60/27 (2x Metal Screws LN 3.5 x 11) ■ UA 50/40 (2x Metal Screws LB 3.5 x 9.5) .	■ Anchoring to the reinforced concrete ceiling with **1x Knauf Ceiling Steel Dowel** at centre ■ Anchoring to the joist with **2x Knauf TN 3.5 x 35** or **2x Knauf TN 3.9 x 35** in the tabs (sufficient joist width required) or **1x Knauf FN 4,3 x 35** at center ■ Anchoring to the trapezoid sheet metal with **an approved anchoring element**
Damping Universal Bracket For CD 60/27 For timber batten 50 x 30 For UA 50/40			■ Anchoring to reinforced concrete ceiling with **1x suitable steel dowel** at centre (observe the anchoring length) ■ Anchor to beam with **1x Knauf FN 4.3 x 65** at center (observe the anchoring length) ■ Anchoring to the trapezoid sheet metal with **an approved anchoring element** (observe the anchoring length)
Adjustable Universal Bracket For CD 60/27 Not permissible with fire resistance requirement		 Adjustable Universal Bracket/Adjustable Damping Universal Bracket to be adjusted to suit the required upper grid level. Connect the upper and lower section with **2x Nonius pins** (secure against sliding out).	■ Anchoring to the reinforced concrete ceiling with **1x Knauf Ceiling Steel Dowel** at centre ■ Anchoring to the joist with **2x Knauf TN 3.5 x 35** or **2x Knauf TN 3.9 x 35** in the circular perforations or **1x Knauf FN 4.3 x 35** at center ■ Anchoring to the trapezoid sheet metal with **an approved anchoring element**
Adjustable damping Universal Bracket For CD 60/27 Not permissible with fire resistance requirement			■ Anchoring to reinforced concrete ceiling with **1x suitable steel dowel** at centre (observe the anchoring length) ■ Anchor to beam with **1x Knauf FN 4.3 x 65** at center (observe the anchoring length) ■ Anchoring to the trapezoid sheet metal with **an approved anchoring element** (observe the anchoring length)

Note Anchoring to basic ceilings made of other building materials with specially approved or standardized anchoring elements.

Suspenders, continued

Dimensions in mm

Suspension	Drawing		Comment
0.40 kN (40 kg) load-bearing capacity class			
Nonius hanger bottom For CD 60/27	 Screw tabs to CD 60/27 (2x Metal Screws LN 3.5 x 11) in case of: ■ *Fire protection from above (plenum)* and/or ■ Total ceiling load ≥ 0.5 kN/m² (Knauf recommendation: Screw fasten in case of total ceiling load ≥ 0.4 kN/m² to increase the installation safety)	Suspended with **Nonius Hanger Top**  or **Nonius Swing Top**  and **1x Nonius Pin** (secure against slide out)  or **2x Nonius Clip**  If required use additional **Nonius connector** 	**Nonius Hanger Top:** ■ Anchoring to the reinforced concrete ceiling with **Knauf Ceiling Steel Dowel** ■ Anchor to joist with **1x Knauf FN 4.3 x 35** ■ Anchoring to the trapezoid sheet metal with **an approved anchoring element** **Nonius Swing Top:** ■ Anchoring to reinforced concrete ceiling with **1x suitable steel dowel** (observe the anchoring length) ■ Anchor to beam/joist with **1x Knauf FN 4.3 x 65** (observe the anchoring length) ■ Anchoring to the trapezoid sheet metal with **an approved anchoring element** (observe the anchoring length)
Nonius Stirrup Height 125 mm: For CD 60/27 Height 135 mm: For UA 50/40, For timber batten 50 x 30 (screw fix at side with TN 3.5 x 25)	 Bend Nonius stirrup around channel and fit together until it snaps in		

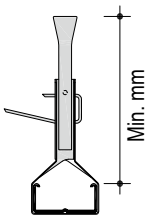
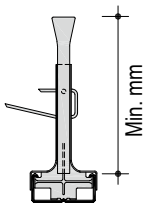
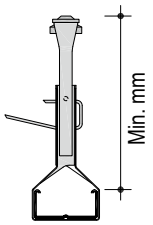
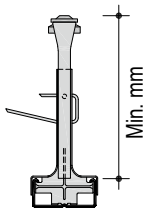
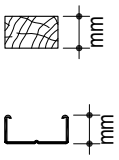
Note Anchoring to basic ceilings made of other building materials with specially approved or standardized anchoring elements.

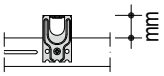
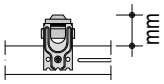
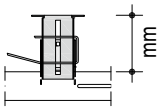
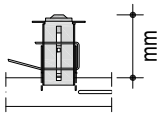
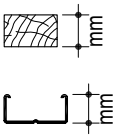
D111.de
D112.de
D113.de
D116.de

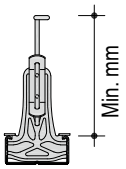
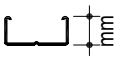
Total construction height

Dimensions in mm

The total construction height of the ceiling results from the sum of suspenders, height of the grid and cladding thickness

System	Suspended with Nonius Top Nonius Stirrup	Nonius Suspender	Nonius Hanger Top Nonius Stirrup	Nonius Suspender	Frame Batten (w x h) Profile	Total grid height
						
D112.de	–	130	–	140	CD 60/27	27
	130	130	140	140	CD 60/27 + CD 60/27	54
D113.de	–	130	–	140	CD 60/27	27
D116.de	130	–	140	–	UA 50/40 + CD 60/27	67

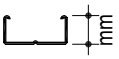
System	Direct suspension Universal Bracket	Damping Universal Bracket	Adjustable Universal Bracket	Adjustable Damping Universal Bracket	Frame Batten (w x h) Profile	Total grid height
						
D111.de	20 – 180	25 – 190	–	–	50 x 30	30
	20 – 180	25 – 190	–	–	50 x 30 + 50 x 30	60
D112.de	10 – 180	18 – 190	35 – 85	40 – 90	CD 60/27	27
	15 – 180	18 – 190	35 – 85	40 – 90	CD 60/27 + CD 60/27	54
D113.de	30 –180	30 – 190	35 – 85	40 – 90	CD 60/27	27
D116.de	15 -190	25 – 200	–	–	UA 50/40 + CD 60/27	67

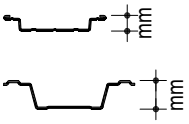
System	Suspended with wire Ankerfix Rapid Hanger CD	Frame Profile	Total grid height
			
D112.de	110	CD 60/27	27
	110	CD 60/27 + CD 60/27	54
D113.de	110	CD 60/27	27

Total construction height (continued)

Dimensions in mm

The construction height of the ceiling results from the sum of suspenders, height of the grid and cladding thickness.

System	Multi-level Ceiling System Direct Bracket	Grid Profile	Total grid height
			
D112.de	4	CD 60/27	27

System	Top-Hat profile / Resilient Channel	Grid Profile	Total grid height
	Directly anchored to basic ceiling		
D112.de	–	Hat-Shaped Channel 98/15	15
		Resilient Channel 60/27	27

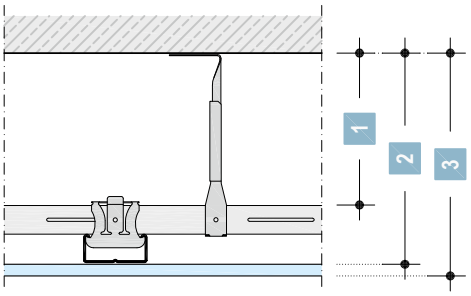
Calculation example – determination of total construction height

e.g. D112.de With metal grid

	Steps		Dimensions in mm
1	**Upper grid level** with Nonius Suspender		130
2	**Height of grid** Carrying channel CD and furring channel CD	+	54
3	**Cladding thickness** 2x 12.5 mm	+	25
4	**Sum**	=	209

Approx. 210 mm required total height of suspended ceiling

Term definition



1 Upper grid level (height of suspension / installation height)

2 Suspension height (height of the ceiling plenum)

3 Total construction height (construction / total height / depth)

Planning of joints

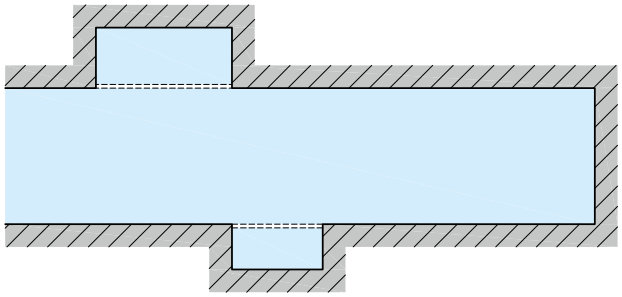
Observe the following criteria when planning movement and expansion joints:

- Use control joints in the case of ceiling areas exceeding approx. 15 m in length, e.g. for narrow ceiling spaces caused by a break of a wall.
- Should the free deformation be prevented, for example, by protruding solid components, the spacings must be reduced.
- With heating ceiling systems the side lengths must be reduced to approx. 7.5 m.
- Cooling ceilings with surfaces ≥ 100 m^2 should be subdivided by expansion joints.
- Movement joints have to be transferred into the construction of the suspended board ceilings.
- Separate connections of boards to components made of a different building material, especially columns, or thermally highly stressed built-ins such as lighting fixtures, for instance with shadow gaps.

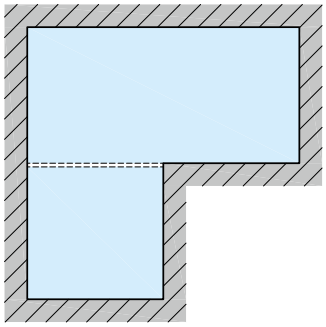
Examples with reduced free deformation

Expansion joints/movement joints

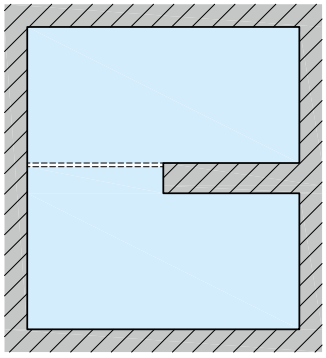
Hall ceiling with alcoves and protrusions – bay joints



Protruding solid constructions



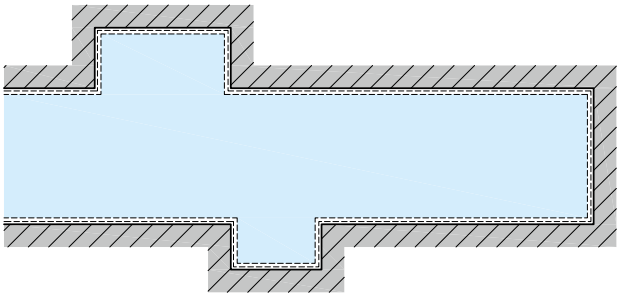
Protruding wall sections



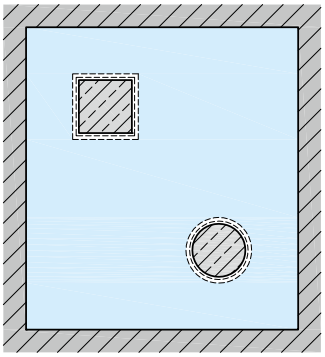
Design analogue to details: D111.de-C3, D112.de-C3, D113.de-C4
see page 47

Deflection heads

Hall ceiling with alcoves and protrusions – circumferential deflection heads



Suspended ceiling with recesses for columns



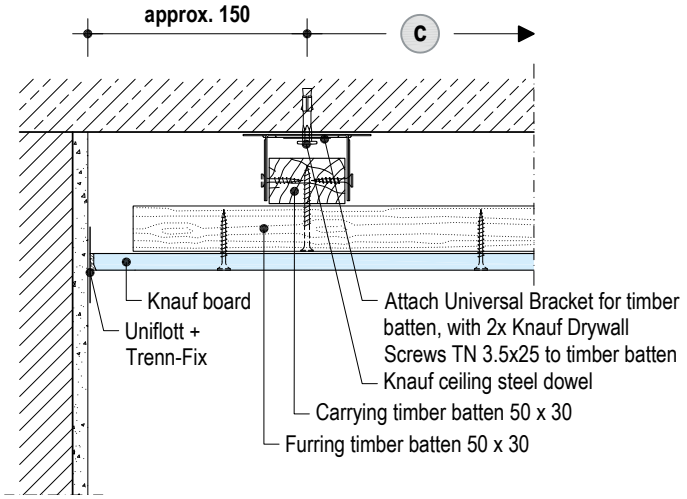
Design analogue to detail: D112.de-D7 see page 43

Details

Scale 1:5 I Dimensions in mm

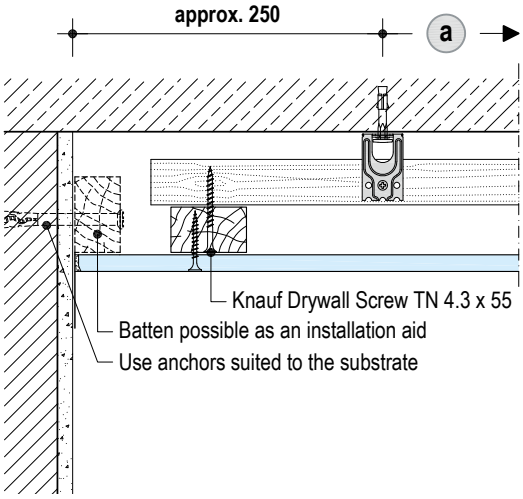
D111.de-A1 Connection to wall

Without fire resistance



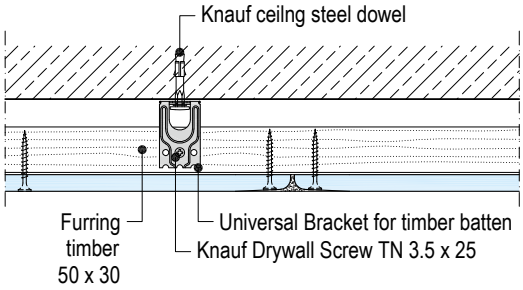
D111.de-D2 Connection to wall

Without fire resistance



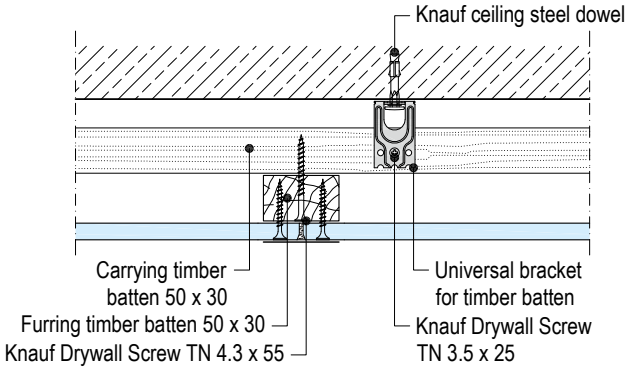
D111.de-B3 Longitudinal edge – Furring batten/Universal bracket

Without fire resistance



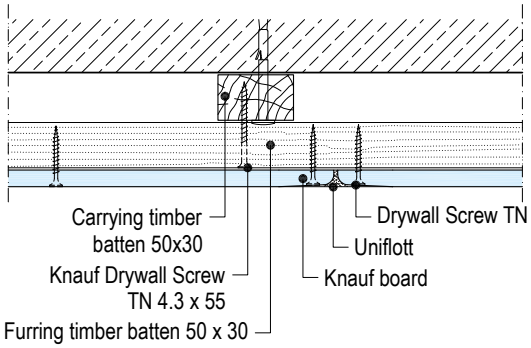
D111.de-C2 Front edge – Carrying channel/furring batten/Universal Bracket

Without fire resistance



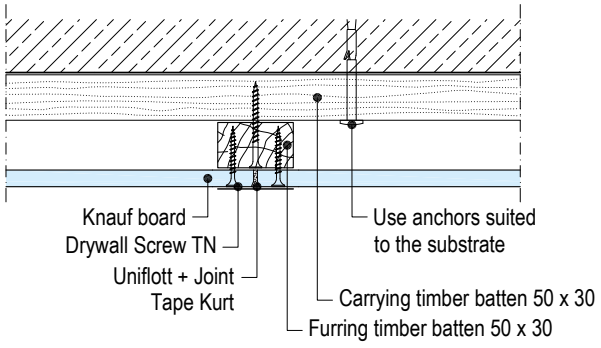
D111.de-B4 Longitudinal edge –Carrying channel/furring batten/directly anchored

Without fire resistance



D111.de-C1 Front edge –Carrying channel/furring batten/directly anchored

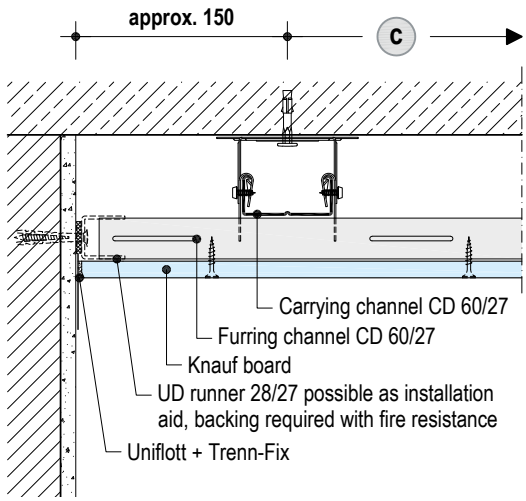
Without fire resistance



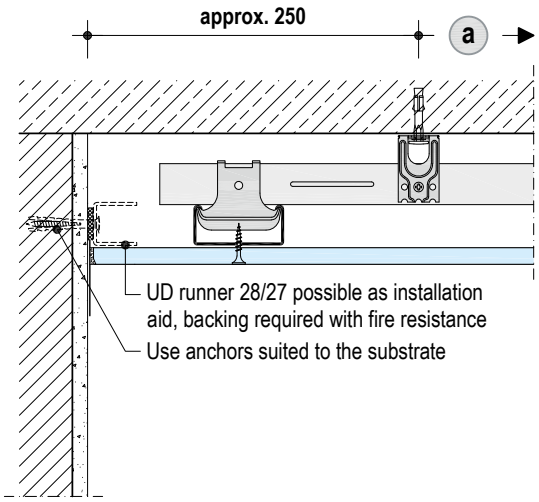
Details

Scale 1:5 I Dimensions in mm

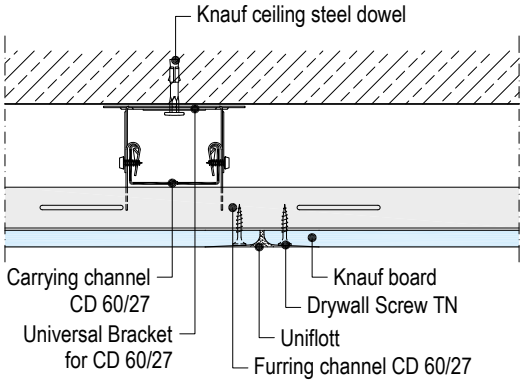
D112.de-A2 Connection to wall



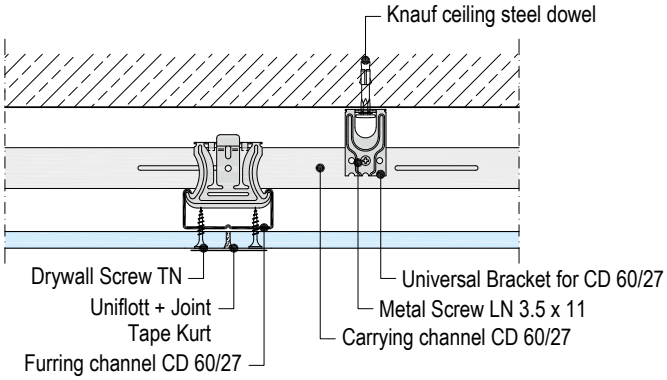
D112.de-D2 Connection to wall



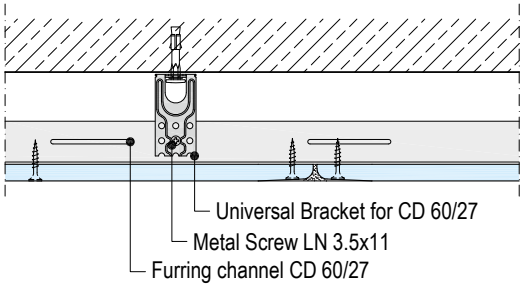
D112.de-B2 Longitudinal edge – Carrying channel/furring channel/Universal Bracket



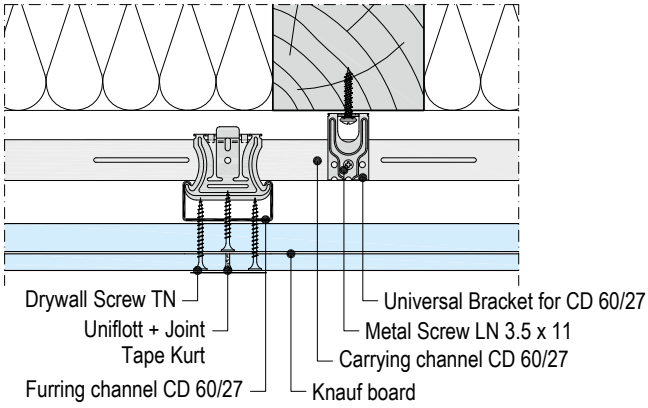
D112.de-C2 Front edge – Carrying channel/furring channel/Universal Bracket



D112.de-B9 Longitudinal edge – Furring channel/Universal Bracket



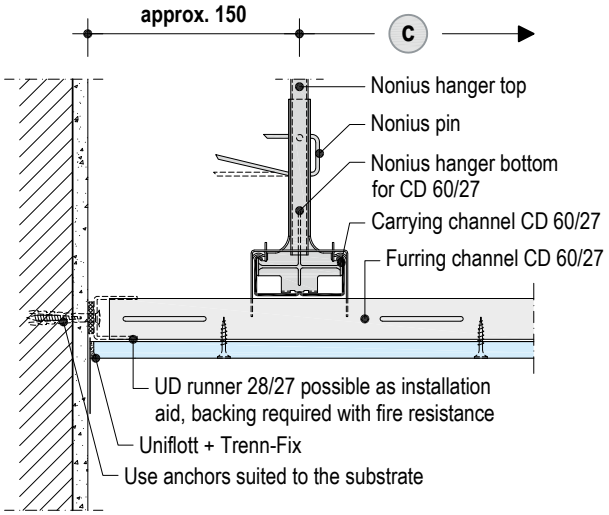
D112.de-C100 Front edge – Carrying channel/furring channel/Universal Bracket



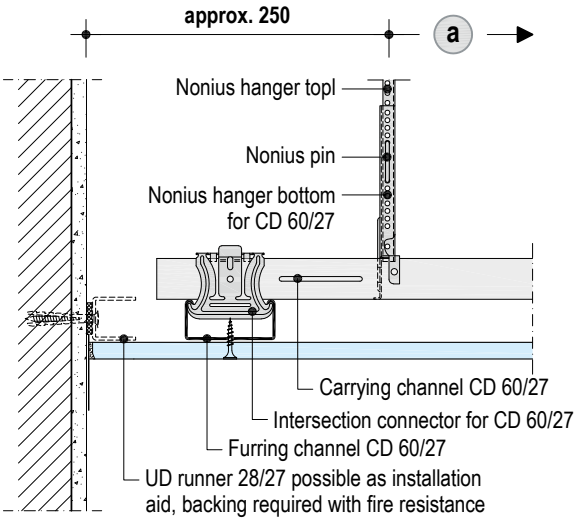
Details

Scale 1:5 I Dimensions in mm

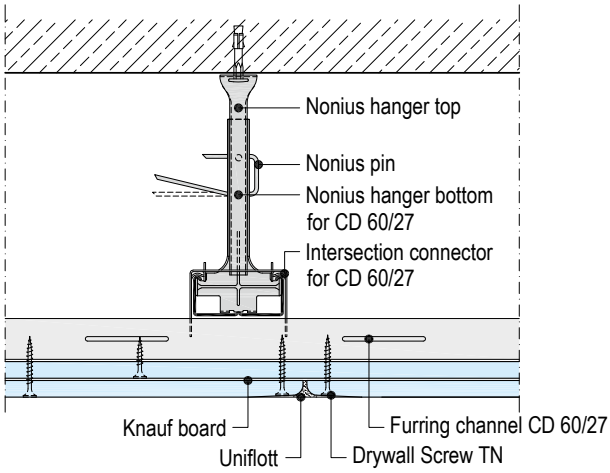
D112.de-A1 Connection to wall



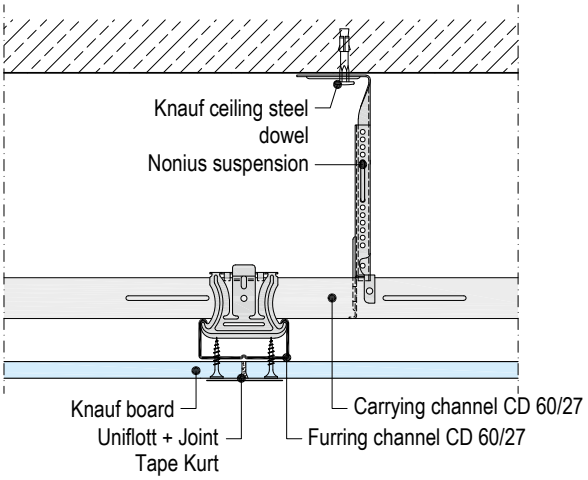
D112.de-D3 Connection to wall



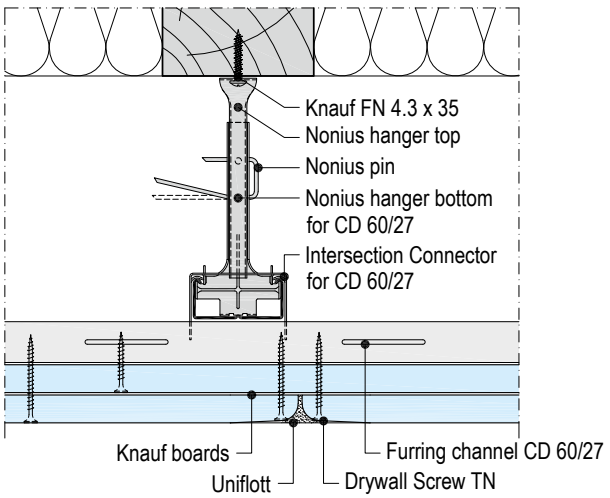
D112.de-B7 Longitudinal edge – Carrying channel/furring channel/Nonius hanger



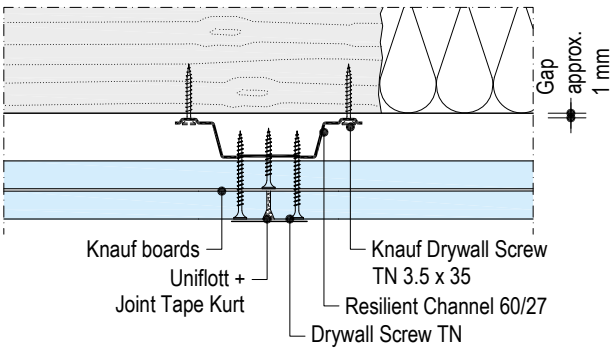
D112.de-C7 Front edge – Carrying channel/furring channel/ Nonius hanger



D112.de-B100 Longitudinal edge – Carrying channel/furring channel/Nonius hanger



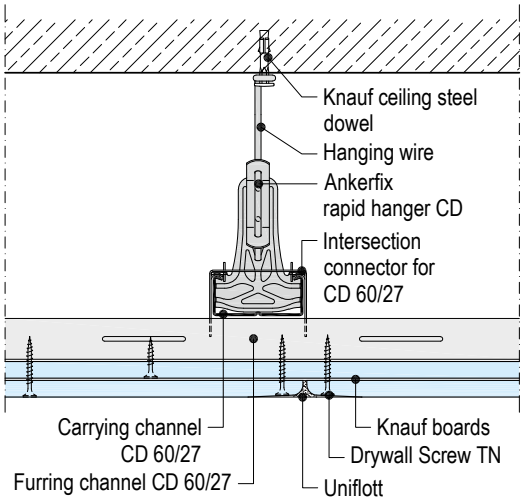
D112.de-C101 Front edge – Resilient Channel



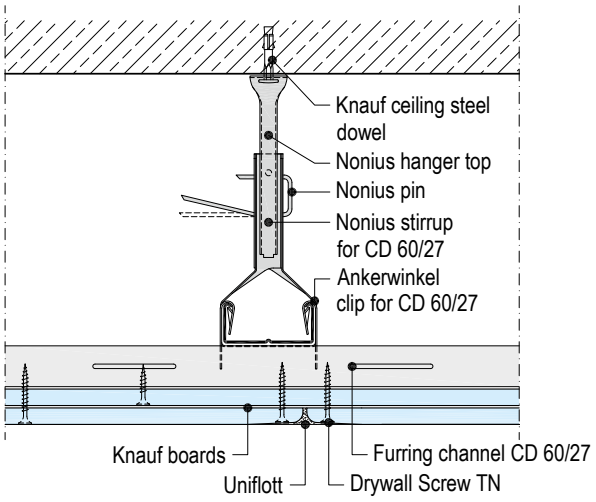
Details

Scale 1:5

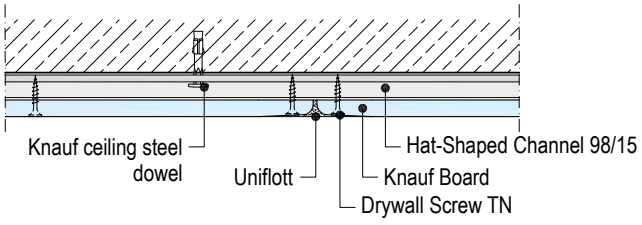
D112.de-B4 Longitudinal edge – Carrying channel/furring channel/Ankerfix



D112.de-B1 Longitudinal edge – Carrying channel/furring channel/Nonius stirrup

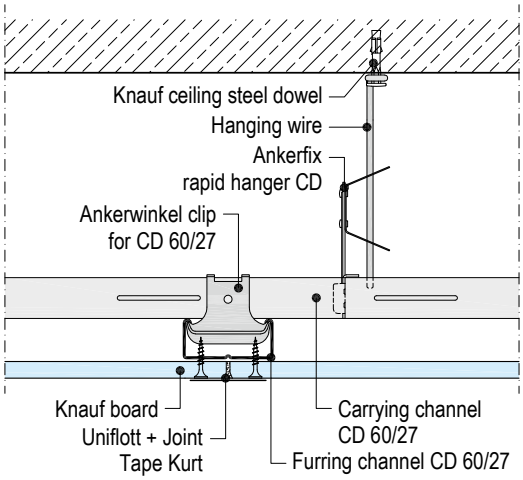


D112.de-B10 Longitudinal edge – Hat-shaped channel

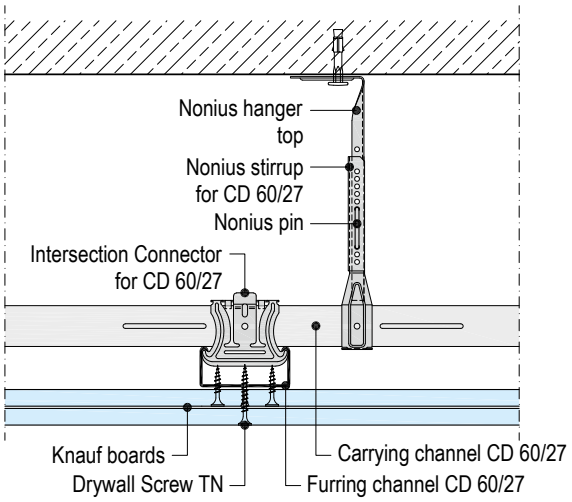


plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

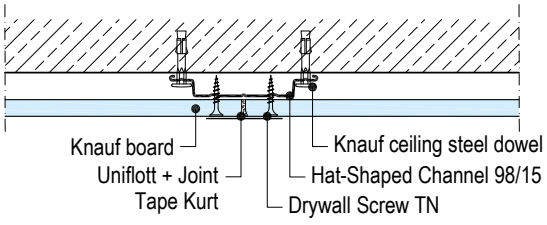
D112.de-C4 Front edge – Carrying channel/furring channel/Ankerfix



D112.de-C1 Front edge – Carrying channel/furring channel/Nonius stirrup



D112.de-C10 Front edge – Hat-shaped channel



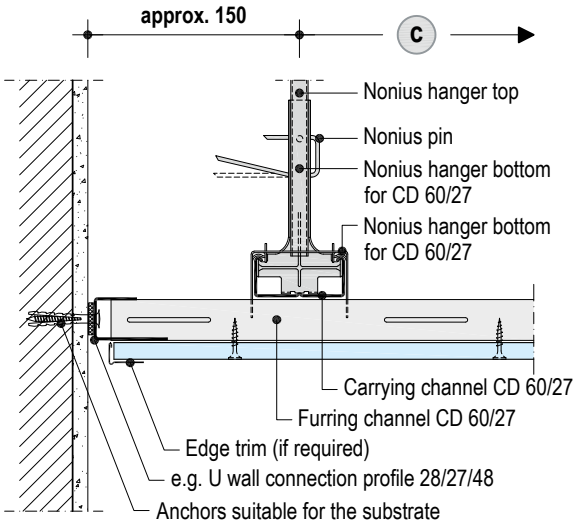
plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

Details

Scale 1:5 I Dimensions in mm

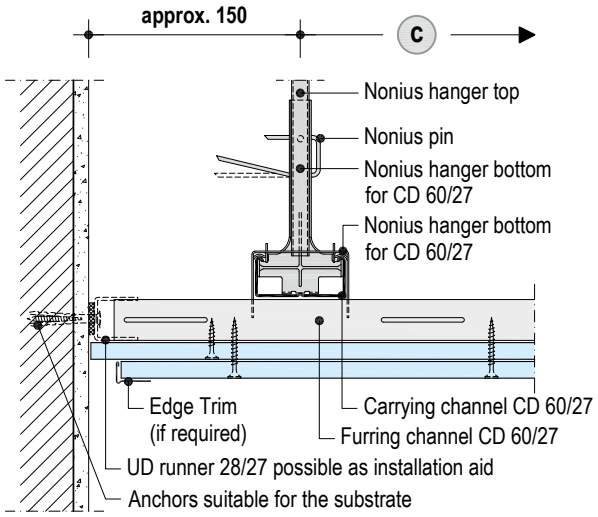
D112.de-A3 Connection to wall with face joint

Without fire resistance

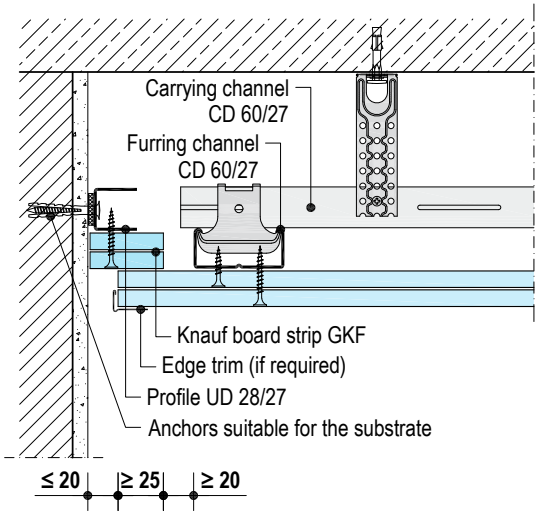


D112.de-A4 Connection to wall with face joint

Without fire resistance

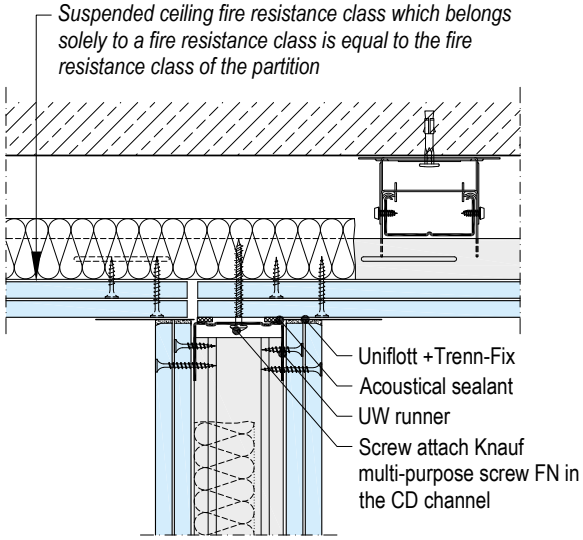


D112.de-D4 Connection to wall with shadow gap



plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

D112.de-B6 Connection of lightweight partition to ceiling

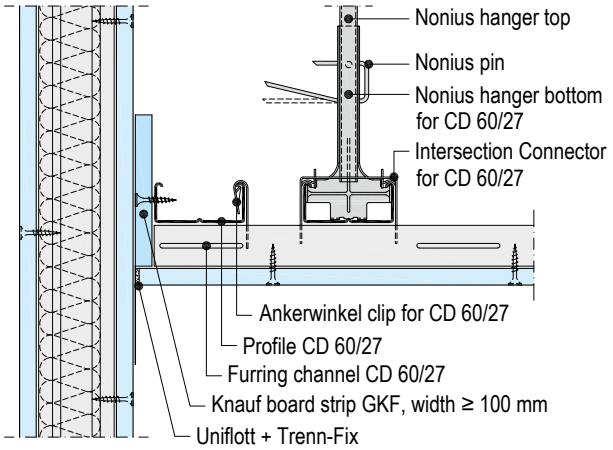


plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

Details

Scale 1:5

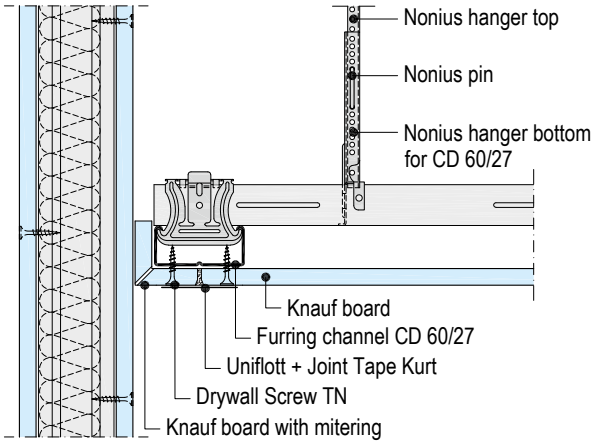
D112.de-A5 Vertically sliding connection to wall



plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

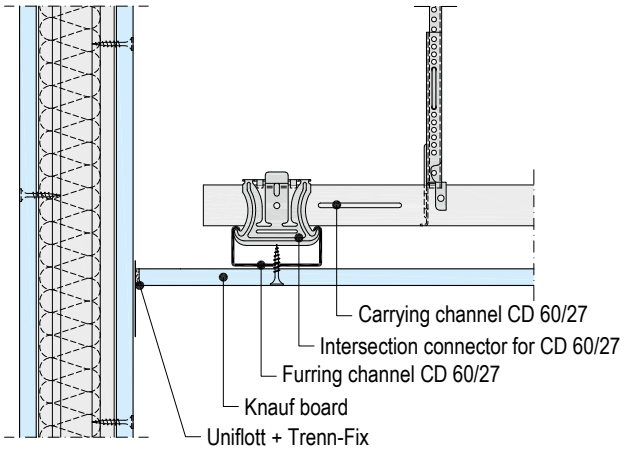
D112.de-D5 Vertically sliding connection to wall

Without fire resistance



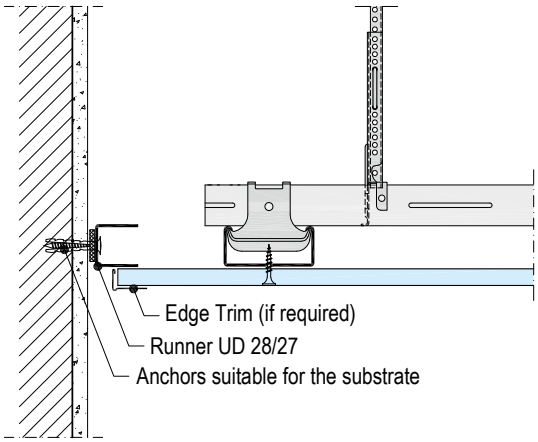
D112.de-D6 Sliding connection to wall

Without fire resistance



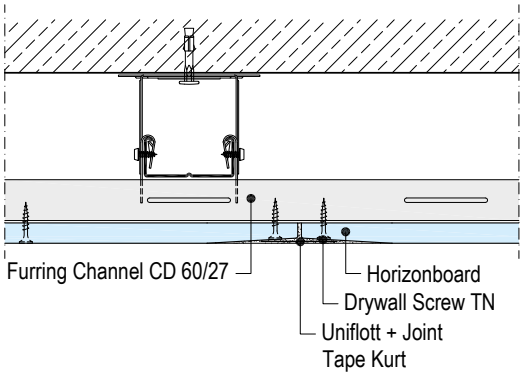
D112.de-D7 Sliding connection to wall

Without fire resistance



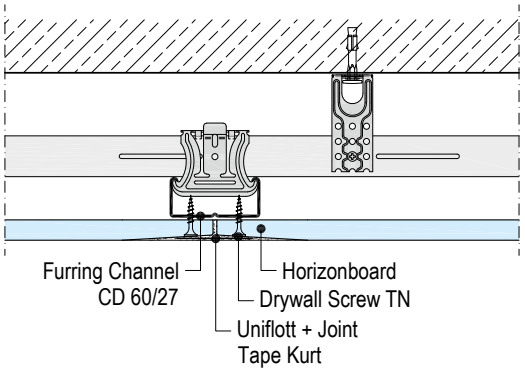
D112.de-B8 Longitudinal edge – Horizonboard

Without fire resistance



D112.de-C8 Front edge – Horizonboard

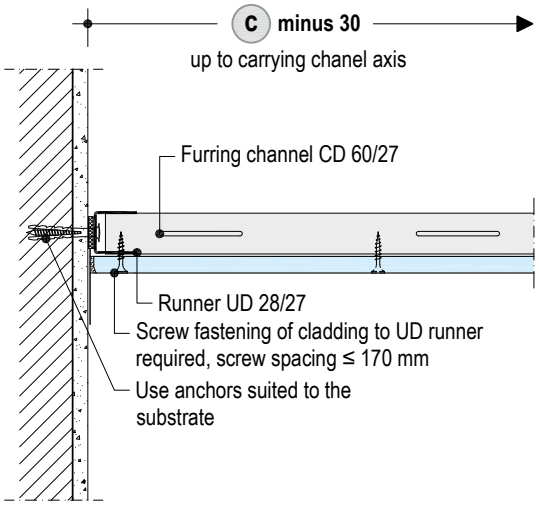
Without fire resistance



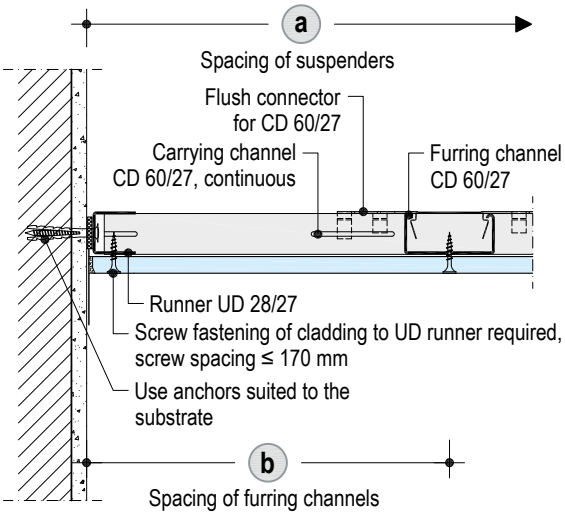
Details

Scale 1:5 I Dimensions in mm

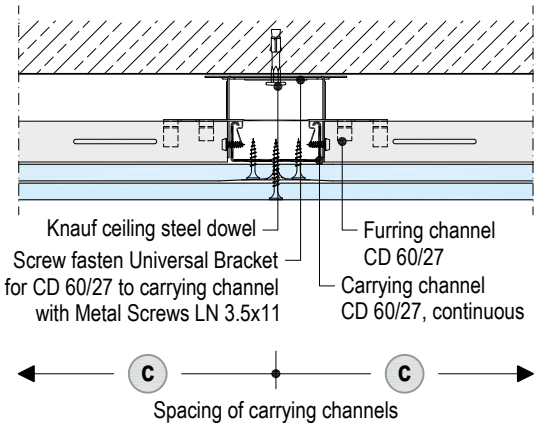
D113.de-A2 load-bearing connection to wall



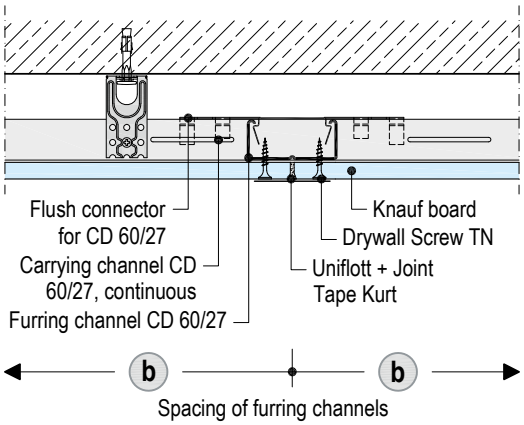
D113.de-D2 load-bearing connection to wall



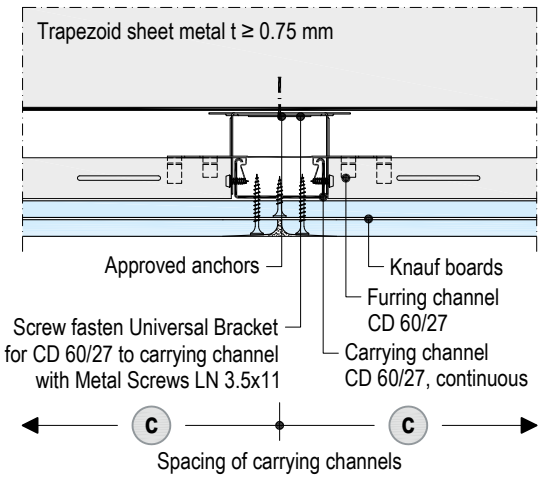
D113.de-B2 Longitudinal edge – flush/Universal Bracket



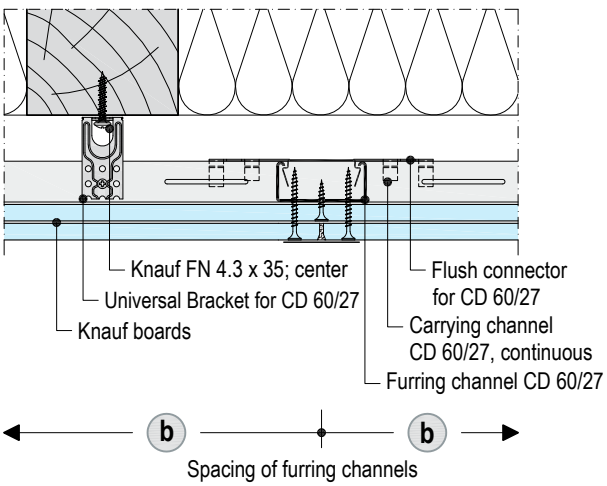
D113.de-C2 Front edge – flush/Universal Bracket



D113.de-B50 Longitudinal edge – flush/Universal Bracket



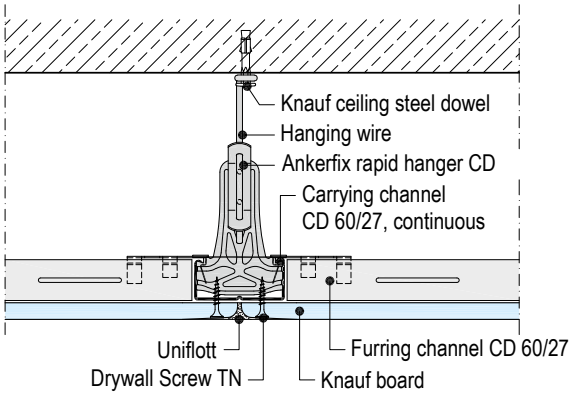
D113.de-C100 Front edge – flush/Universal Bracket



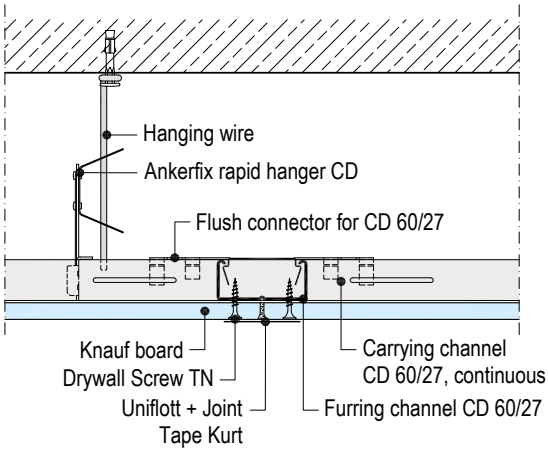
Details

Scale 1:5

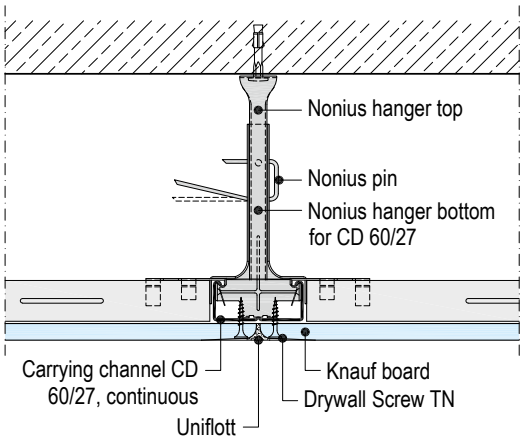
D113.de-B1 Longitudinal edge – flush/Ankerfix



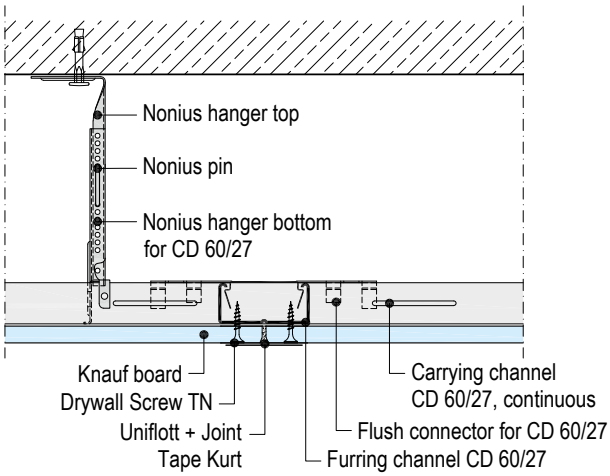
D113.de-C1 Front edge – flush/Ankerfix



D113.de-B5 Longitudinal edge – flush/Nonius hanger

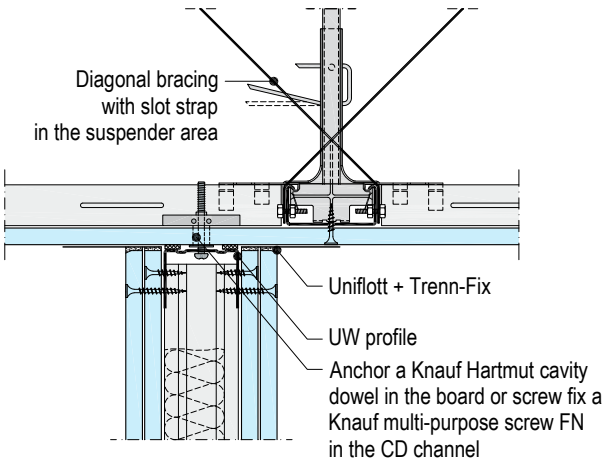


D113.de-C5 Front edge – flush/Nonius hanger

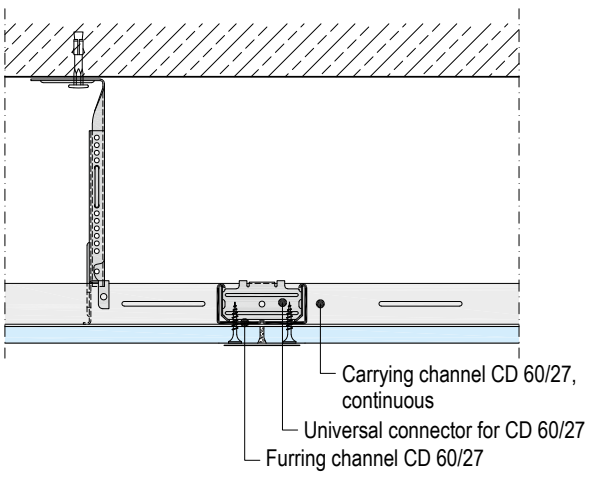


D113.de-B4 Connection of lightweight partition to ceiling

Without fire resistance



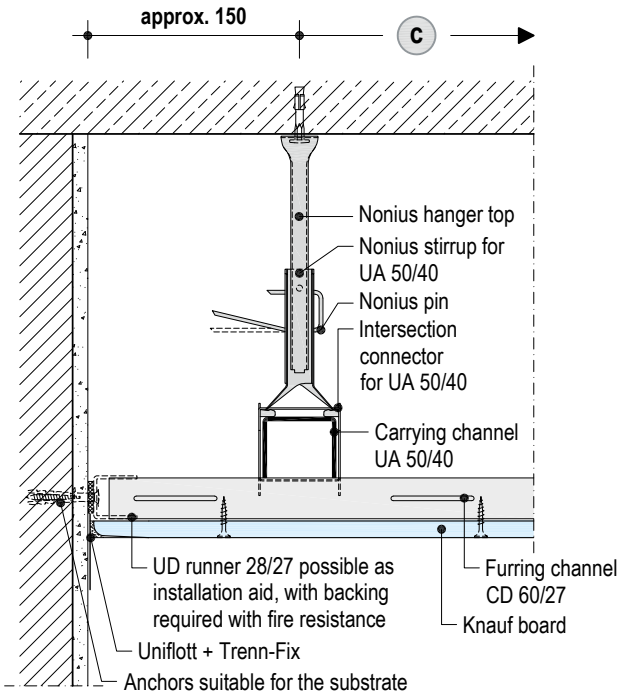
D113.de-C6 Profile connection with universal connector



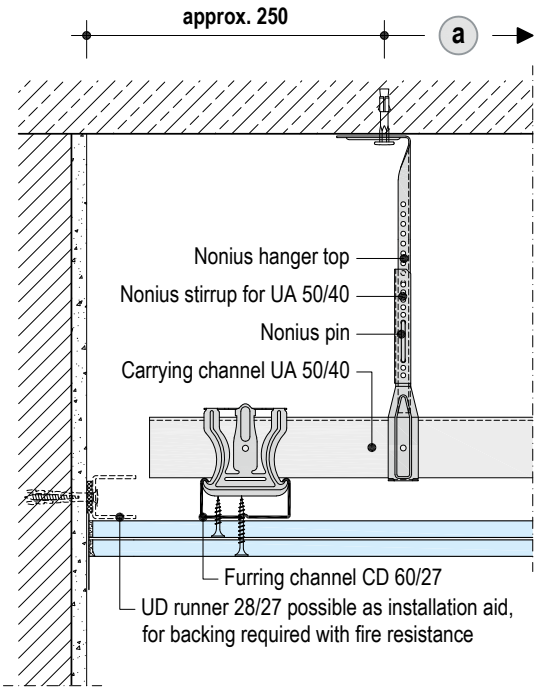
Details

Scale 1:5 I Dimensions in mm

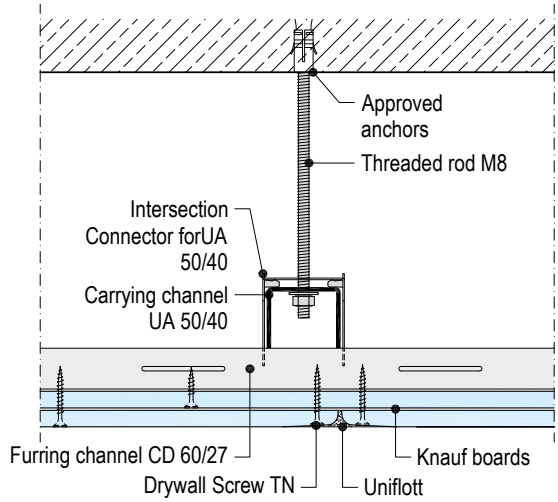
D116.de-A1 Connection to wall



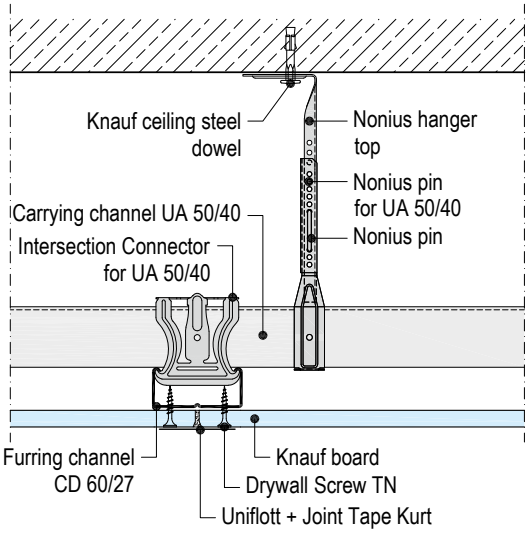
D116.de-D1 Connection to wall



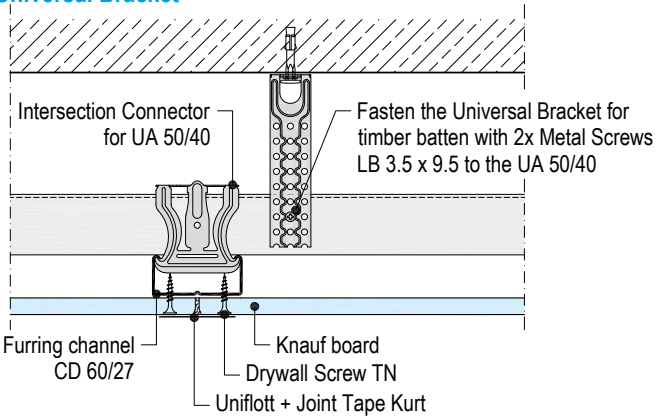
D116.de-B2 Longitudinal edge – Carrying channel/furring channel/threaded rod



D116.de-C1 Front edge – Carrying channel/furring channel/ Nonius stirrup



D116.de-C2 Front edge – Carrying channel/furring channel/ Universal Bracket

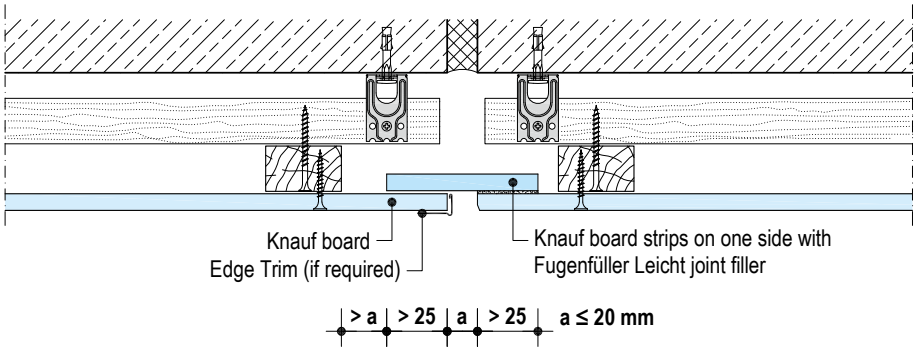


Movement joints

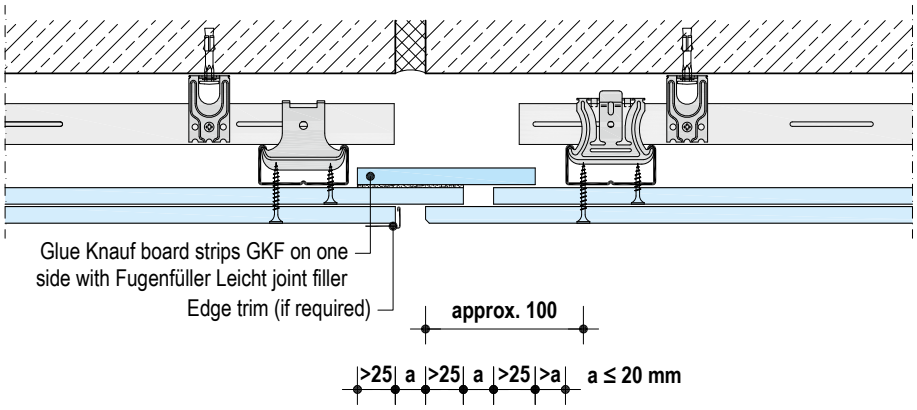
Scale 1:5 I Dimensions in mm

D111.de-C3 Movement joint

Without fire resistance

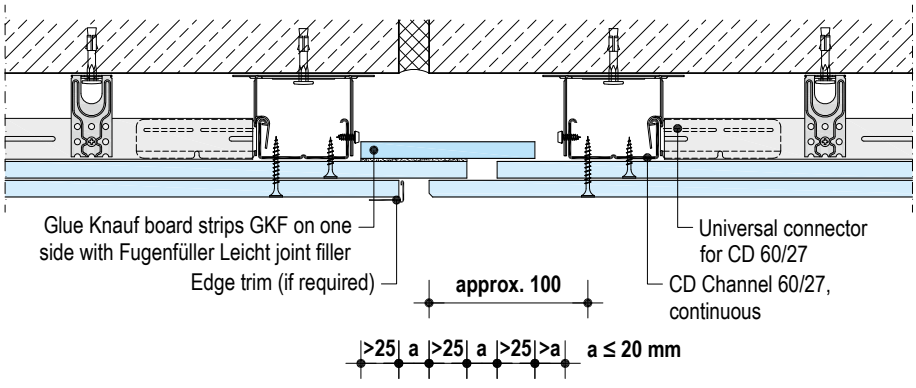


D112.de-C3 Movement joint



plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

D113.de-C4 Movement joint

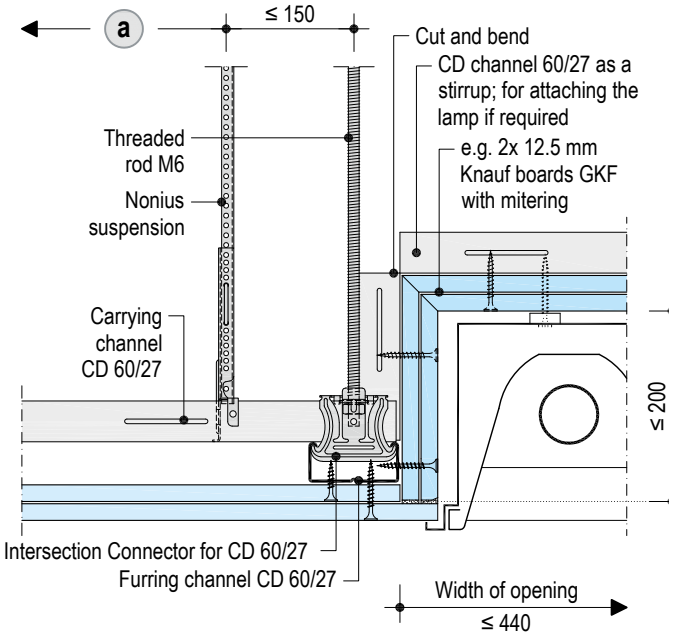


plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

Fire protection encasement of lighting fixtures

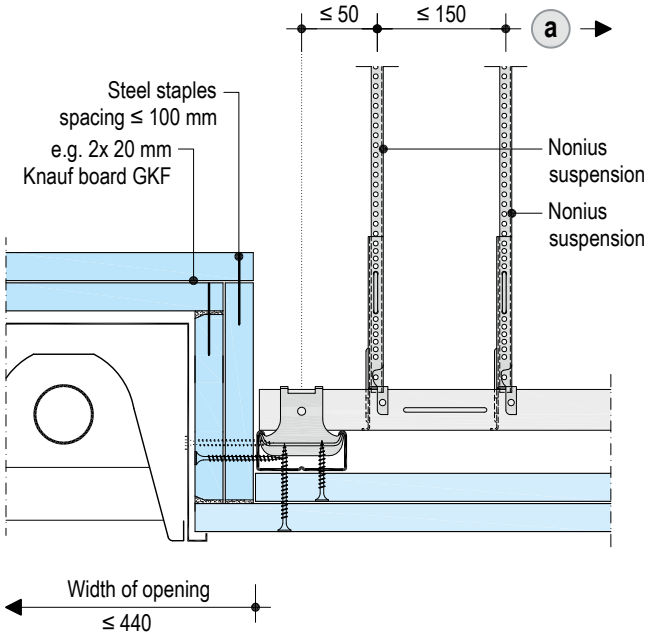
Scale 1:5 I Dimensions in mm

D112.de-SO10 Luminaire – Mitring – F30



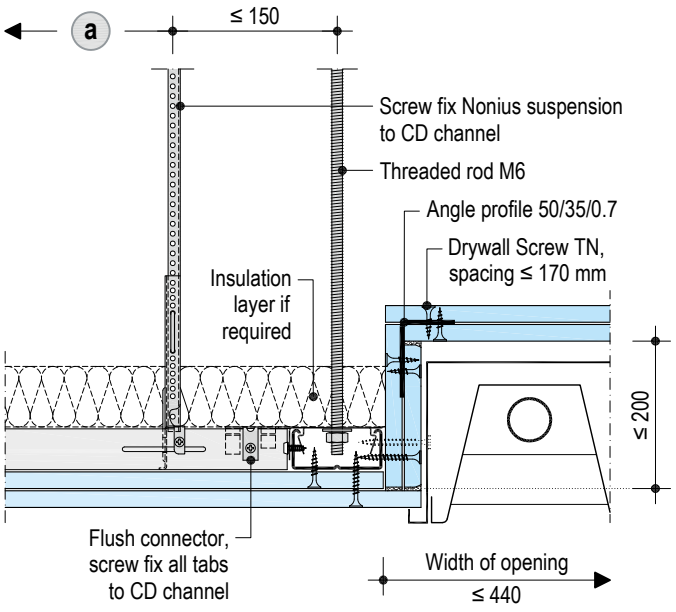
plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

D112.de-SO11 Luminaire – Encasement stapled – F90



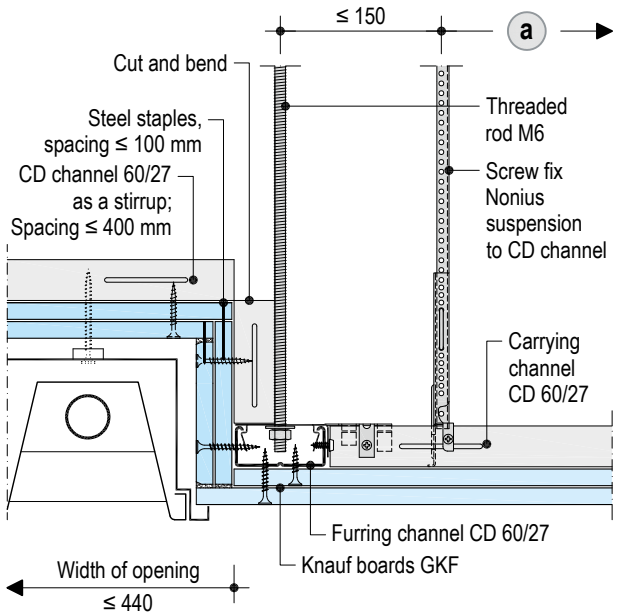
plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

D113.de-SO15 Luminaire – Encasement screw fastened – F30



plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

D113.de-SO16 Luminaire – Encasement stapled – F30



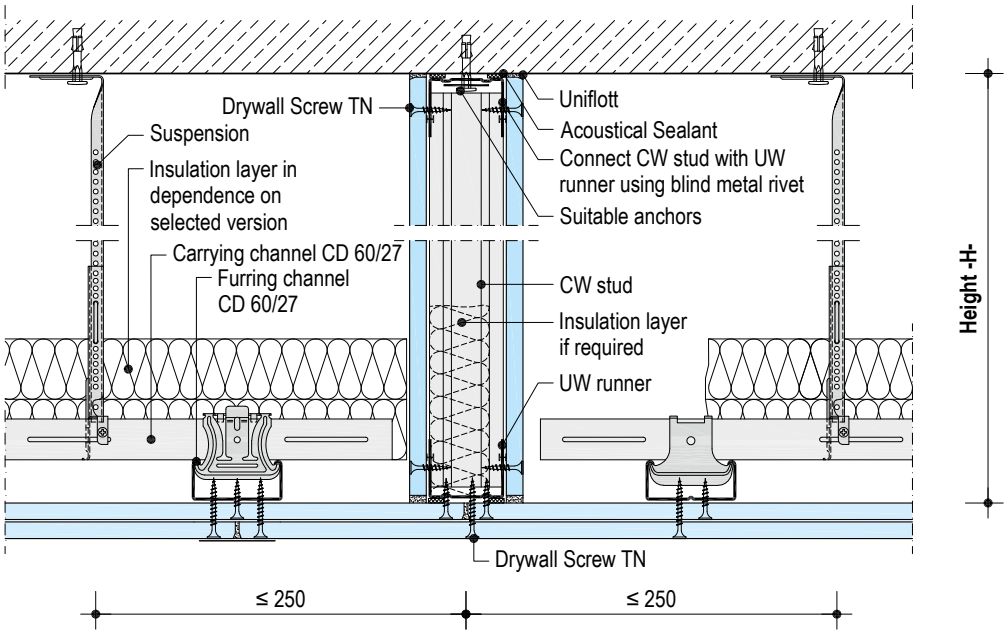
plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

- Permissible weight of the lighting fixture maximum 10 kg/unit (≈ 100 N/unit) and maximum 5 kg per m^2 of ceiling surface (higher weights on request)
- Fastening of the lighting fixtures to the ceiling grid or to the CD channel stirrup
- Additional profile CD 60/27 for perimeter (also on the front ends of the fire resistance encasement)
- Maximum dimension 440 x 1420 mm (outer edge of fire resistance encasement)
- With fire resistance class F90 at least 4 additional suspenders are required (with side lengths > 750 mm, at least 6)

Ceiling bulkhead

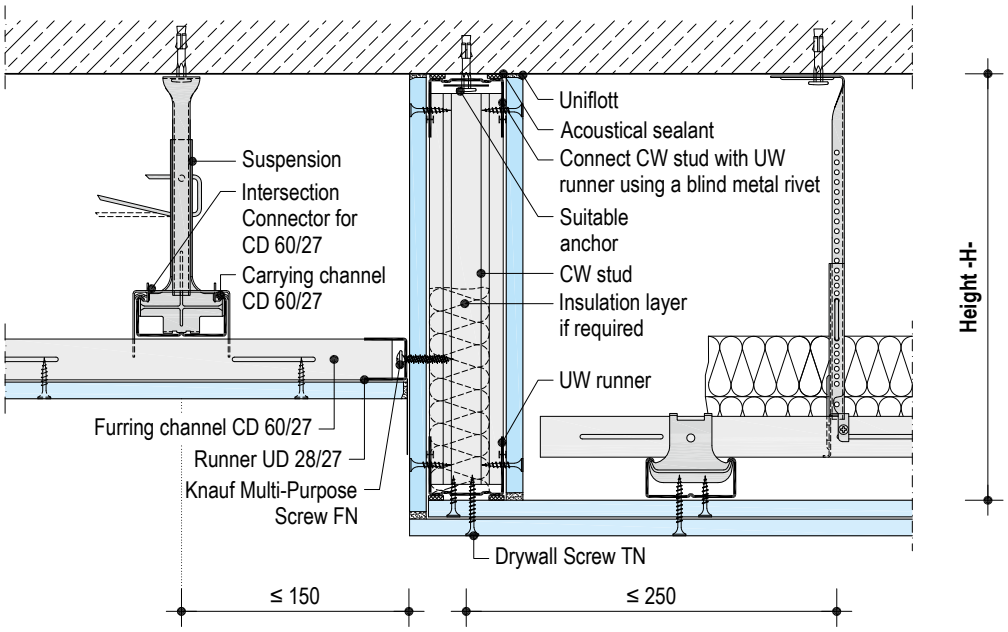
Scale 1:5 I Dimensions in mm

D112.de-SO14 Ceiling bulkhead



Extension of the fire resistance Certificate of Usability
Prior consultation in acc. to page 6 recommended

D112.de-SO15 Ceiling bulkhead



Extension of the fire resistance Certificate of Usability
Prior consultation in acc. to page 6 recommended

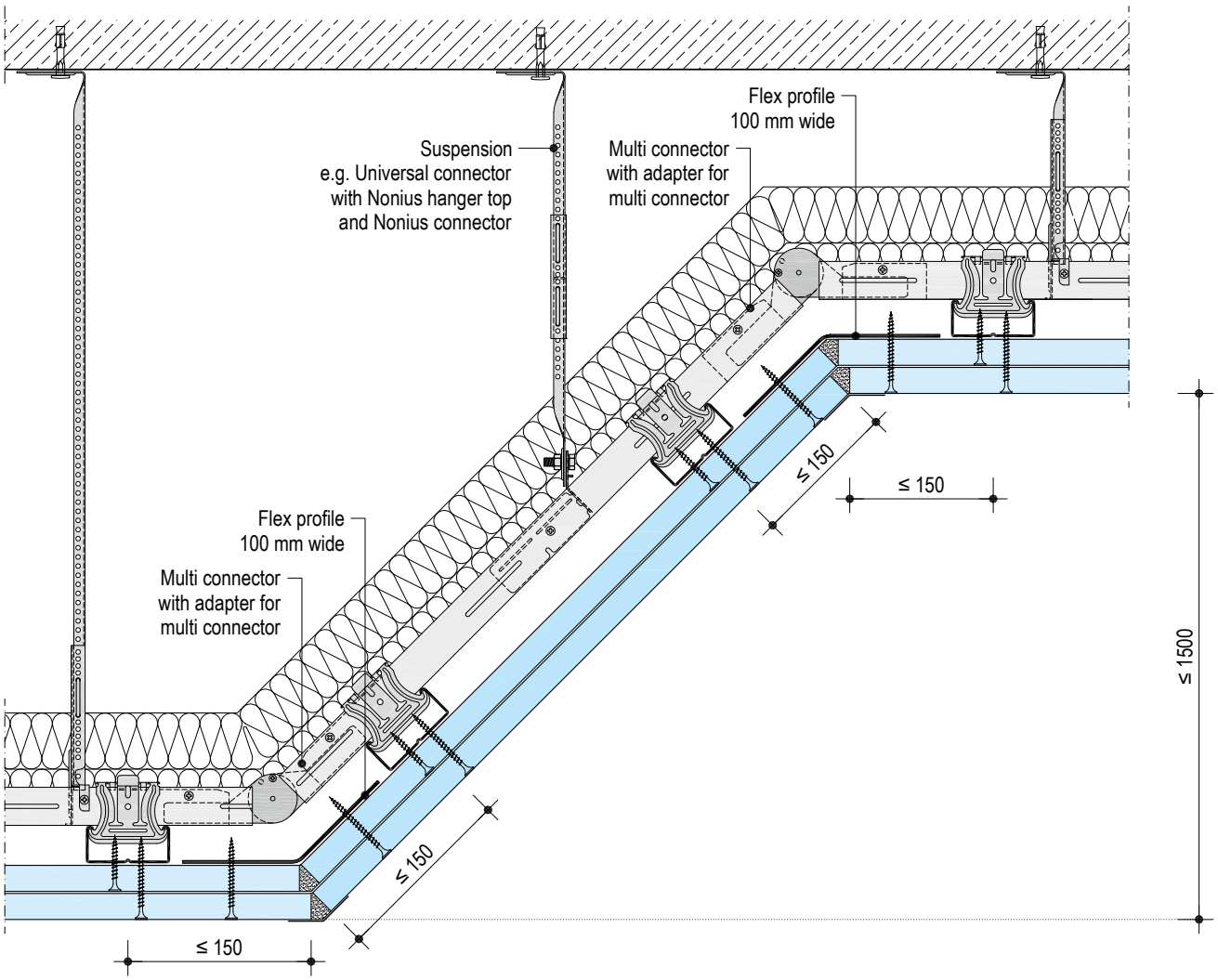
- Maximum height -H- of the ceiling bulkhead
  - 1400 mm: 1x 12.5 mm Knauf board GKF per bulkhead side
  - 1000 mm: 2x 12.5 mm Knauf board GKF per bulkhead side

  Double heights are possible (without fire resistance) with halved spacings of the Knauf Ceiling Steel Dowels.
- Ceiling bulkhead fire resistance class must be at least the fire resistance class of the board ceiling. Fire resistance variant ceiling bulkhead acc. to system data sheet
- Fixing of the ceiling bulkhead to the basic ceiling with suitable anchors a ≤ 1000 mm;
  (e.g. Knauf Deckennagel ceiling steel dowel with washer, depending on the profile dimension Ø ≥ 30 mm, d = 1.5 to 3 mm)
- Freely suspended bulkhead without fire resistance (not connected to the suspended ceiling) on request

Split level ceiling

Scale 1:5 I Dimensions in mm

D112.de-SO16 Split level ceiling 45°



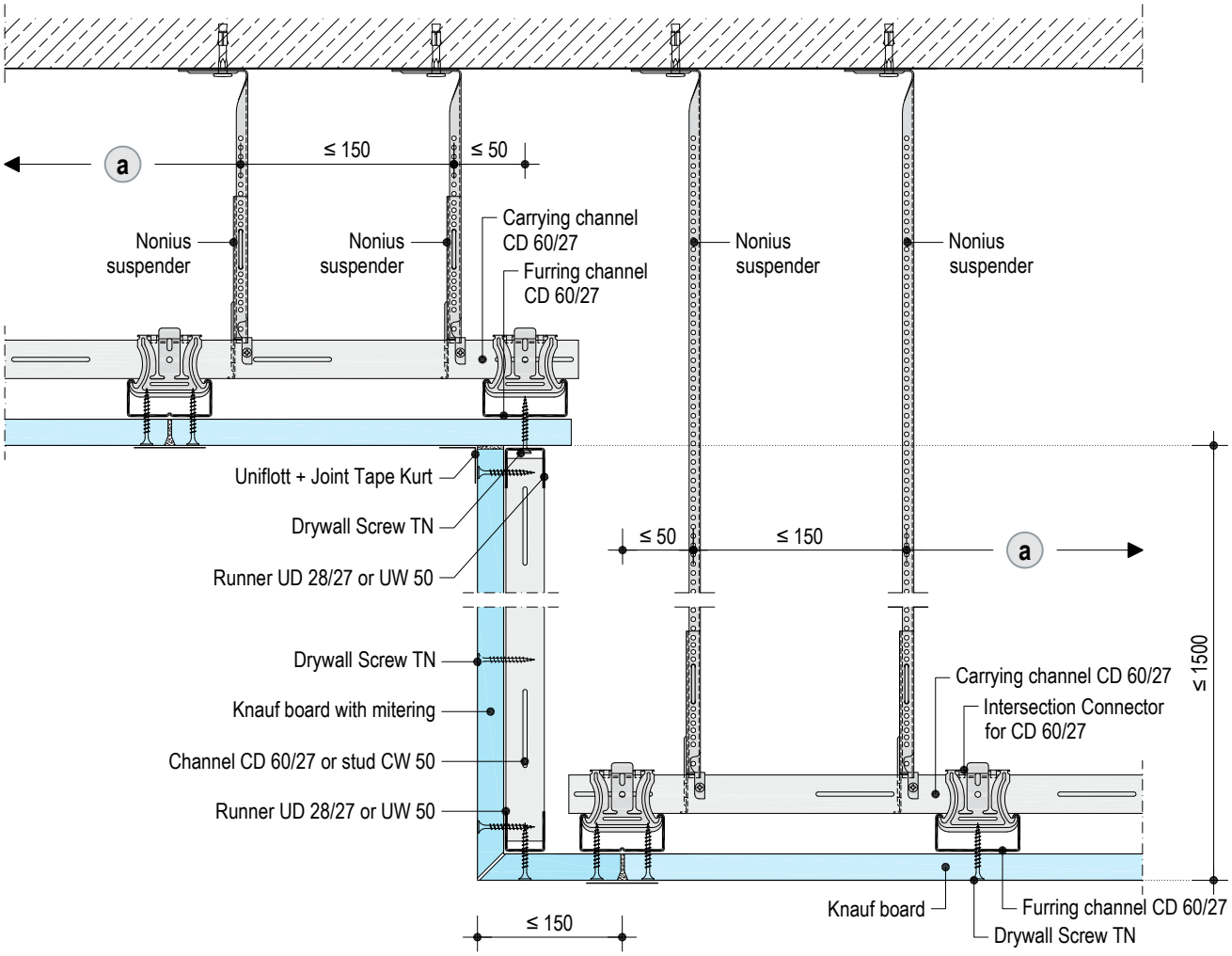
plus **Extension of the fire resistance Certificate of Usability**
Prior consultation in acc. to page 6 recommended

Split level ceiling

Scale 1:5 I Dimensions in mm

D112.de-SO17 Split level ceiling 90°

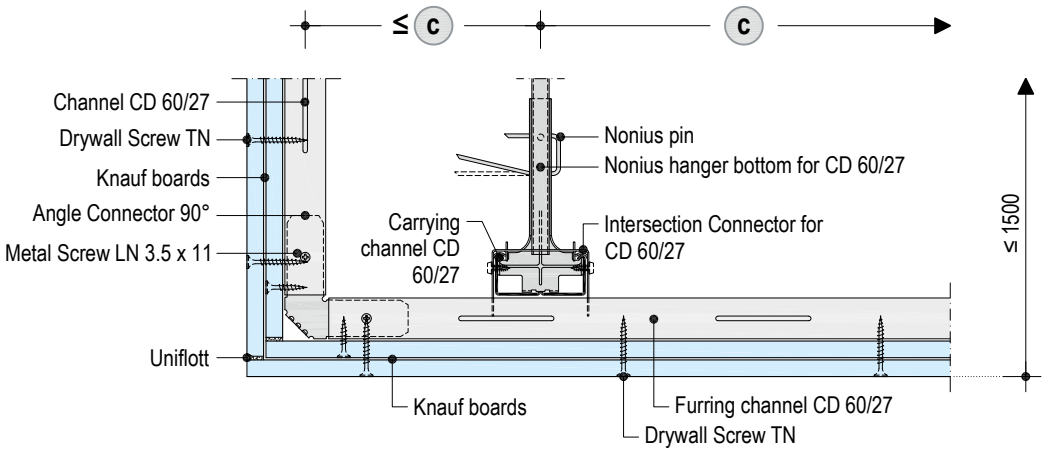
Fire protection solely from below



Extension of the fire resistance Certificate of Usability
Prior consultation in acc. to page 6 recommended

D112.de-SO21 Split level ceiling 90° alternative

Fire protection solely from below

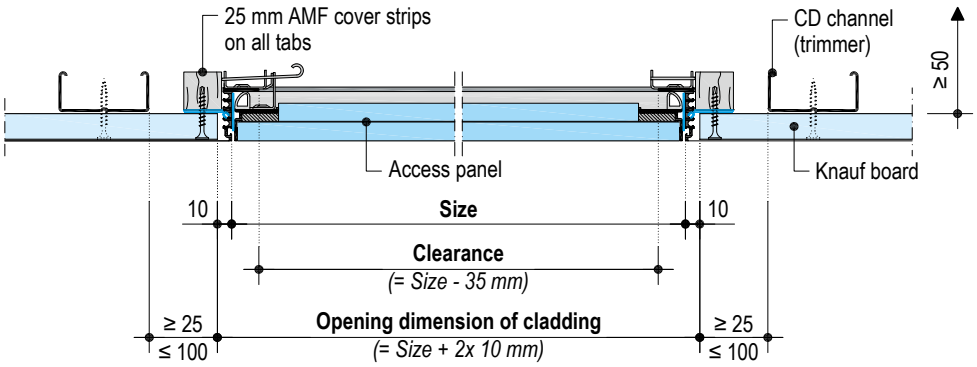


Extension of the fire resistance Certificate of Usability
Prior consultation in acc. to page 6 recommended

Access panel REVO BS30 ceiling

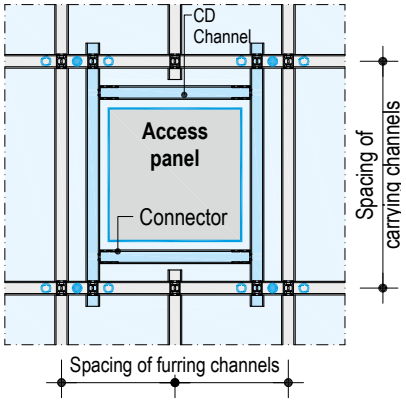
Scheme drawings I Dimensions in mm

Vertical section

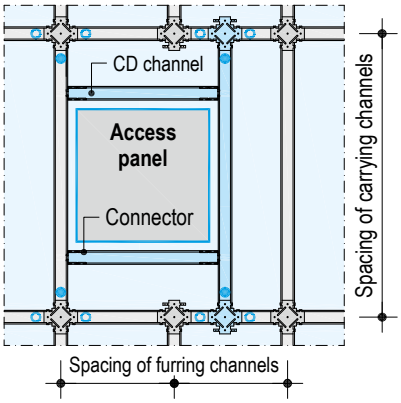


Top view

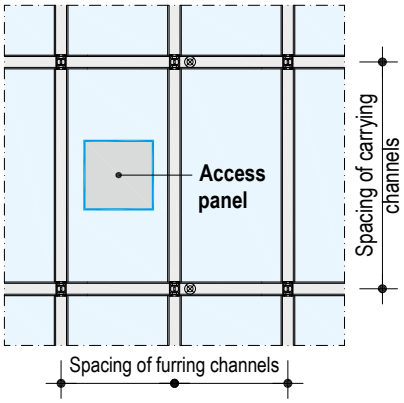
Double layer profile (e.g. D112.de)



Flush profile (D113.de)



Installation without trimmer:
Only with access panels 300 x 300 mm



Legend

- *Additional grid*
- *4 additional suspension points (e.g. Nonius suspension)*
- *Alternative suspension points*

Universal connectors are required for the trimmers. Further suspenders are required if the suspended profiles are to be exchanged.

Notes

Cladding thickness, dimensions, available options and further information, see product data sheet REVO BS30 ceiling E121.de.

Observe the enclosed installation instructions of the access panels.

Note

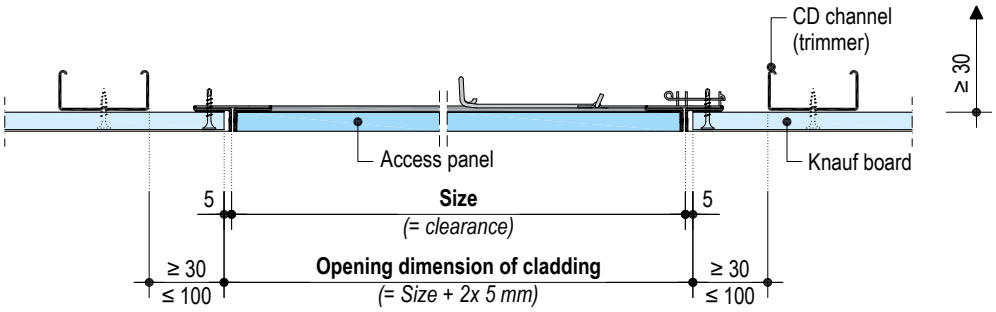
plus Extension of the fire resistance Certificate of Usability, see page 6.

Access panel REVO 12.5

Scheme drawings I Dimensions in mm

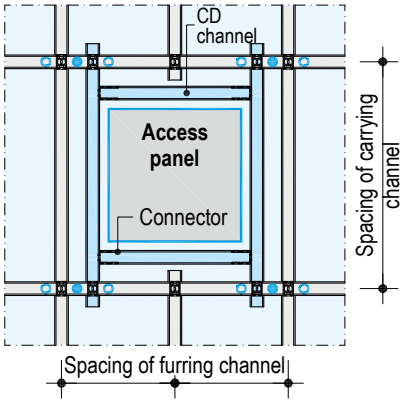
Vertical section

Without fire resistance

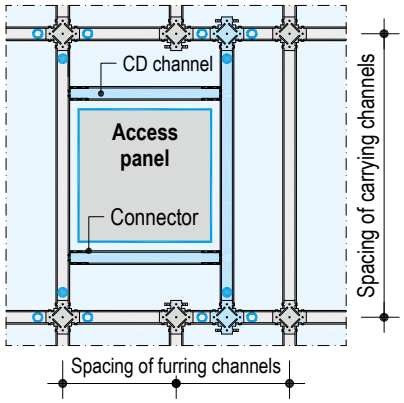


Top view

Double layer profile (e.g. D112.de)



Flush profile (D113.de)



Legend

Additional grid

4 additional suspension points (e.g. Nonius suspension)

Alternative suspension points

Universal connectors are required for the trimmers. Further suspenders are required if the suspended profiles are to be exchanged.

Notes	Cladding thickness, dimensions, available options and further information, see product data sheet REVO 12.5 E112.de. Observe the enclosed installation instructions of the access panels.

Lightweight partitions to be connected from below to fire resistant classified ceiling systems

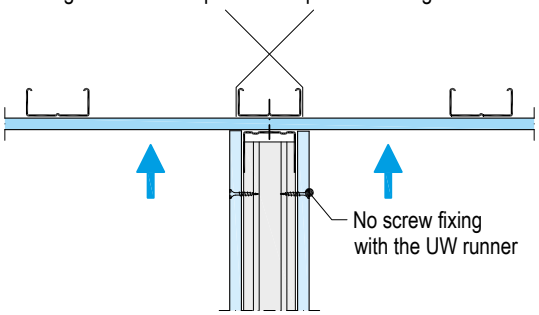
In principle, partitions may only be connected to fire protection classified ceiling systems if it is ensured that in case of fire where the partition is destroyed prematurely, the remaining elements can collapse without creating an additional load to the ceiling.
In addition, horizontal bracing of the suspended ceiling (max. ceiling area size 15 m x 15 m) or load transfer to the flanking constructional components is required when connecting to the suspended ceiling. (further connections on request).

Note	Should there be fire protection requirements for the connected partition, the suspended ceiling alone must feature at least the same fire resistance class.

Design of the connections

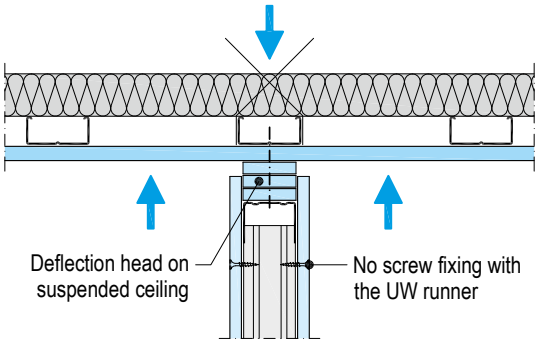
Fire exposure *solely from below*

On suspended ceilings with fire resistance *from below*, the connection to the ceiling must be implemented without screw fixing to the UW profile, but the cladding must extend up to the suspended ceiling.



Fire exposure *solely from above*

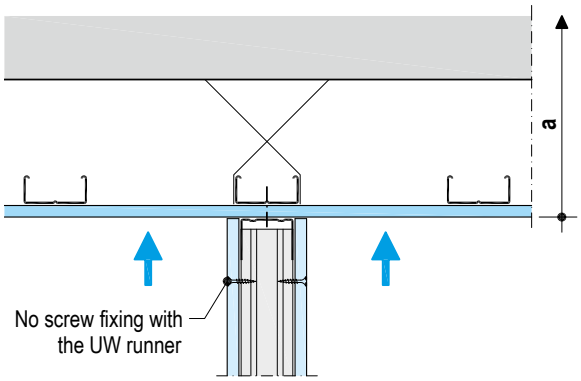
On suspended ceilings with fire resistance *from above*, implement a deflection head in a standard design with at least 15 mm freedom of movement.



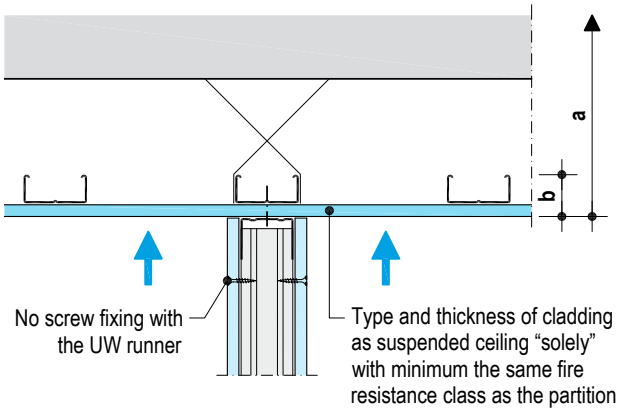
Suspended ceilings in conjunction with basic ceilings of types I to III

For suspended ceilings in conjunction with basic ceilings of types I to III, the stated fire resistance class only applies for the entire ceiling system (**a**).

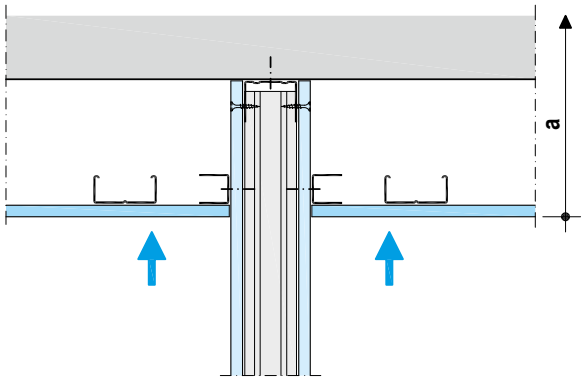
Implement ceiling connection of partitions without fire resistance without screw fastening to the UW runner.



If partitions with fire protection requirements are connected to the suspended ceiling, the classification of the suspended ceilings alone must at (**b**) least be the same fire resistance class as the partition.



Partitions with the same fire resistance class as the entire ceiling system (**a**) must be fastened to the basic ceiling.



Note	plus Extension of the fire resistance Certificate of Usability, see page 6.

Bracing

Scheme drawings

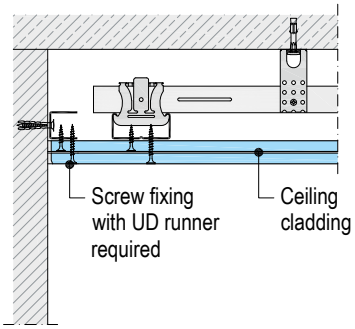
Non-load-bearing interior partitions can be connected to the suspended ceiling system provided that they are braced sufficiently. The bracing can be implemented locally by arranging slotted steel strap suspenders in the suspender area or by load transfer via the ceiling diaphragm to the flanking partitions connected to the basic ceiling.

With door build-ins, the cladding thickness of the suspended ceiling ≥ 15 mm Diamant or ≥ 18 mm Knauf boards, Load transfer preferably by transfer to the flanking partitions connected to the basic ceiling.

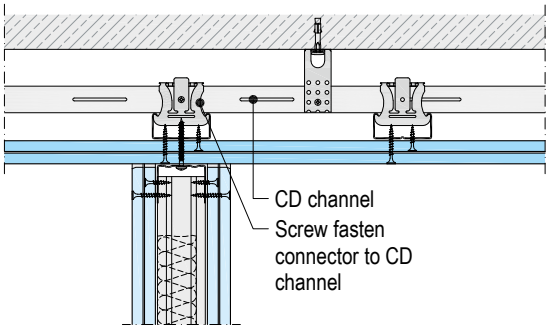
The loads should by transferred directly to the basic ceiling on walls with built-in sanitary accessories (WC Sanistands, etc.)

Load transfer via horizontal bracing

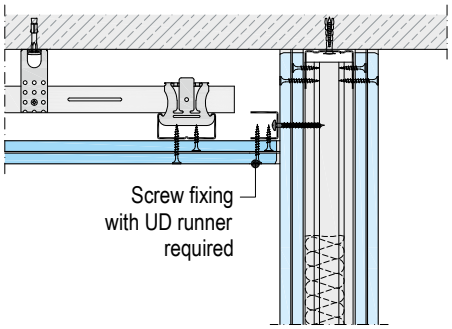
Load-bearing connection on solid wall



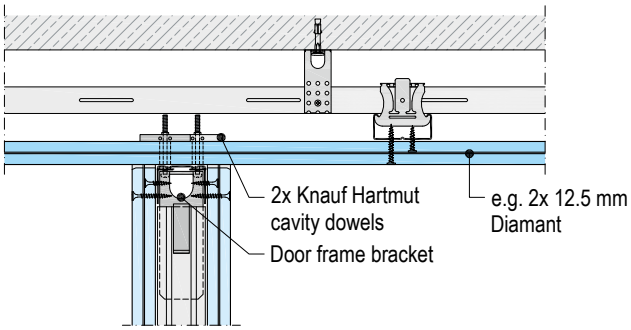
Connection to metal stud partition



Load-bearing connection on metal stud partition

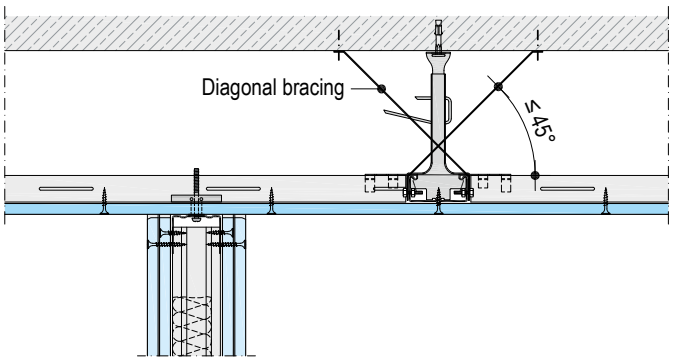


Connection of metal stud partition in door opening area
Without fire resistance

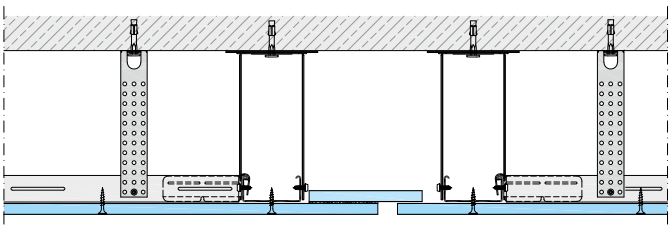


Horizontal bracing by diagonal bracing

Diagonal bracing in the suspended area
Spacing ≤ 800 mm (angle ≤ 45°)
Permissible wall height ≤ 4 m

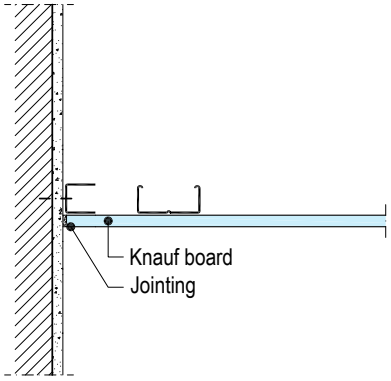


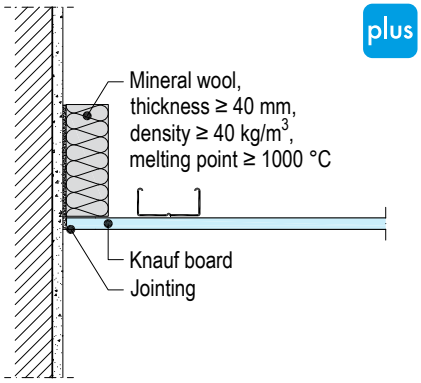
Movement joint

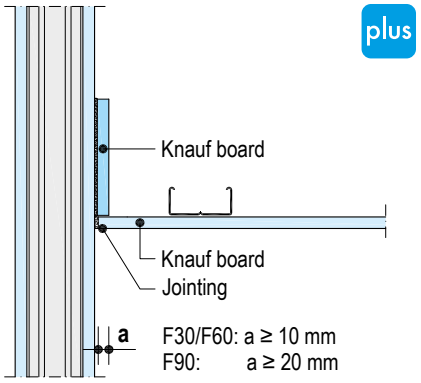


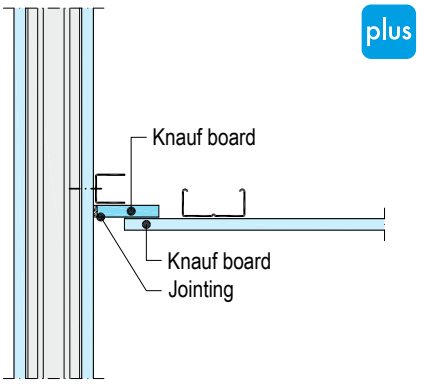
Lateral connection of technical fire resistance classified ceiling systems to technical fire resistance classified partitions

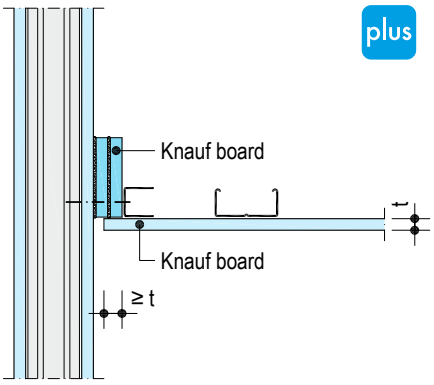
Suspended ceilings in conjunction with basic ceilings of types I to III as well as solely suspended ceilings with fire resistance from below and/or from above, that comply with fire resistance classes F30 to F90, can be connected to partitions if they also have at least the same fire resistance class.
The partition substrate in the connection area must be even. If necessary, measures to level it will be required. The connection to the suspended ceiling must be sealed and backed.











Note plus Extension of the fire resistance Certificate of Usability, see page 6.

Additionally necessary constructional measures with fire resistance from above (from the plenum)

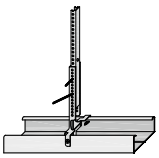
Anchoring to the reinforced concrete basic ceiling

Use fire protection approved anchors

Knauf Ceiling Steel Dowels

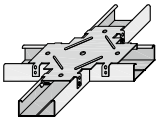
Nonius hanger bottom for CD 60/27

Screw fasten the tabs to the CD 60/27 (2x metal screws LN 3.5 x 11)



Flush connector for CD 60/27

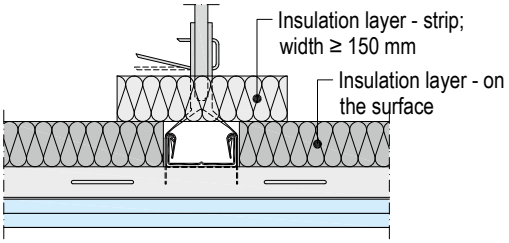
Bend the tabs and screw fasten with the furring channel
(4x Metal Screws LN 3.5 x 11)



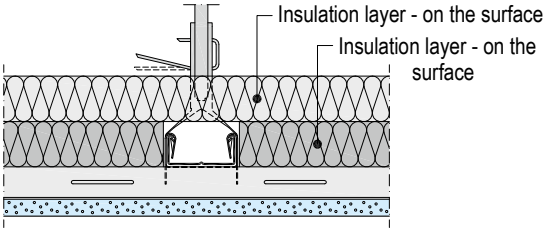
Insulation layer

D112.de Metal grid

Single-layer insulation, with covering strip on the carrying channel

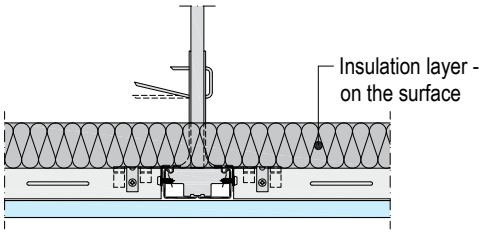


Double-layer insulation

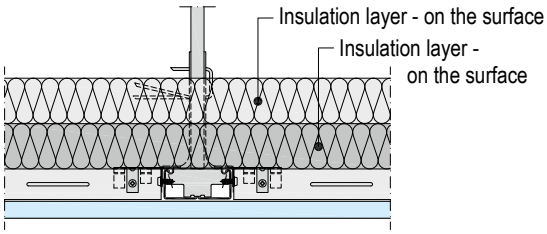


D113.de Flush metal grid

Single-layer insulation

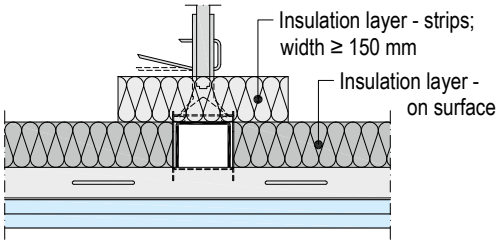


Double-layer insulation

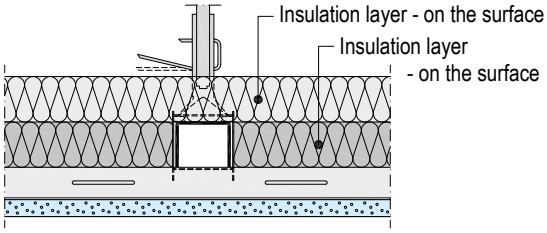


D116.de Large-span metal grid

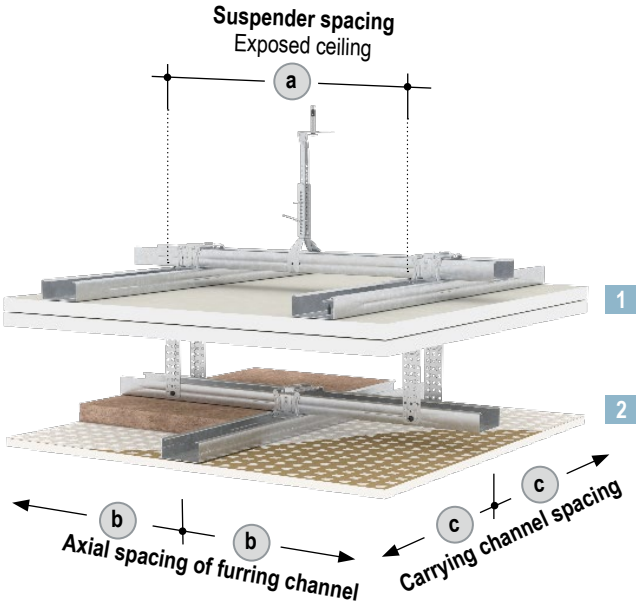
Single-layer insulation, with covering strip on the carrying channel



Double-layer insulation



Exposed ceiling under fire protection ceiling



Legend

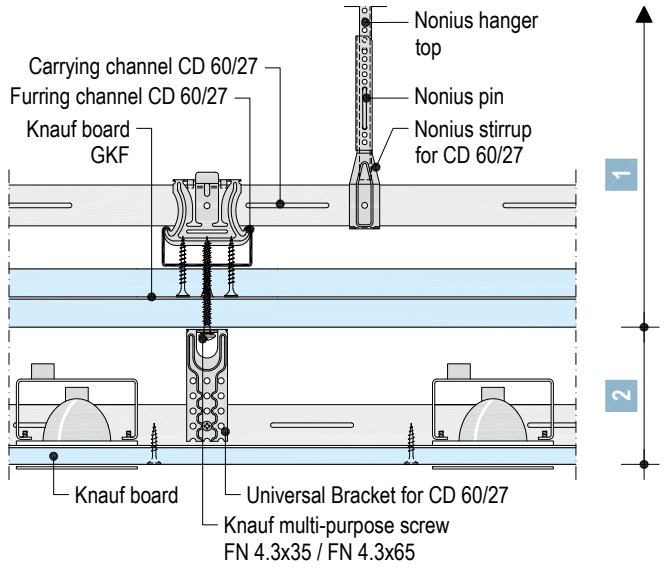
1 *Fire protection ceiling*

2 *Exposed ceiling*

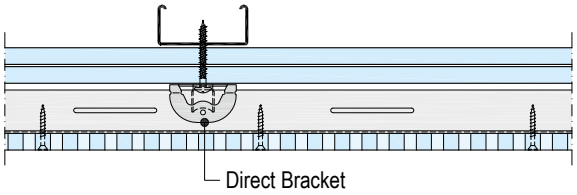
Detail

Scale 1:5

D112.de-D112.de-C1 Front edge – Multi-level ceiling system



Exposed ceiling – alternative:



Note	plus Extension of the fire resistance Certificate of Usability, see page 6.

1 Axial spacings fire resistant ceiling

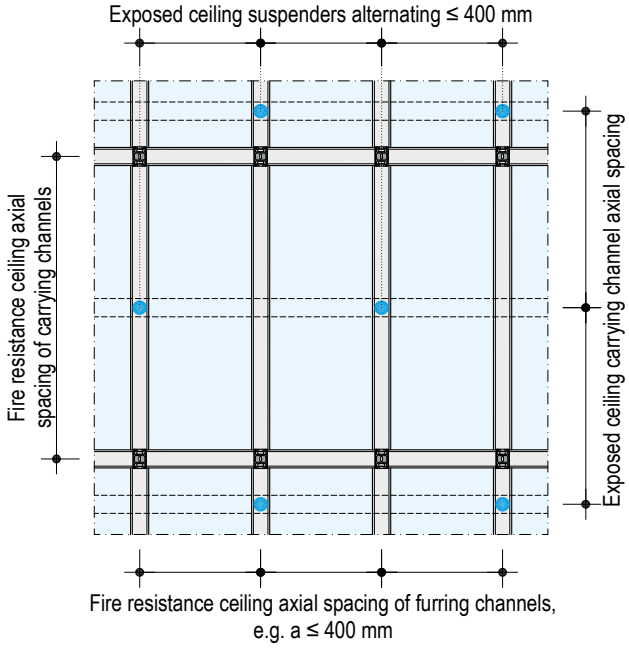
The additional load of the suspended ceiling (exposed ceiling ≤ 0.15 kN/m²) must be considered with the grid of the fire protection ceiling, see page 7. The spacings of the fire resistant ceiling grid result from the specifications of the respective system ceilings taking the additional weight of the exposed ceiling into consideration.

2 Maximum axial spacings of exposed ceiling Dimensions in mm

Axial spacing of furring channel of the fire resistant ceiling = Suspender spacings[1] of the exposed ceiling (a)	Anchoring of suspenders	Axial spacings carrying channel (c)	Axial spacings Furring channel (b)	
			Board ceilings	Cleaneo acoustic board ceilings
≤ 312.5	Alternating (see below)	≤ 1000	≤ 500	≤ 333.5 Dependent on design and perforation
≤ 400	Alternating (see below)	≤ 800		
≤ 500	In every furring channel	≤ 1200		
≤ 625	In every furring channel	≤ 1000		
≤ 800	In every furring channel	≤ 800		

1) Load class in kN/m² up to 0.15

Alternating fastening of the suspenders of the exposed ceiling



● *Suspenders of exposed ceiling*

Suspension must be fastened to the furring channels of the fire protection

Notes	
	Rated weight of Knauf Cleaneo Acoustic Board Ceilings as an exposed ceiling 12.0 kg/m², non-perforated ceiling see tables of system variants.
	The fastening of exposed ceilings with max. weight per unit area of 15 kg/m² or max. 10 kg per suspender on the fire resistant ceiling is permissible. The fastening of the suspenders in the exposed ceiling is undertaken directly in the furring channel of the fire resistance ceiling using suitable fasteners e.g. Knauf Multi-Purpose Screws FN 4.3 x 35 / FN 4.3 x 65.
	Always apply suspended channels of exposed ceiling lateral to furring channel of the fire resistance ceiling.
	With exposed metal ceiling suspension height min. 150 mm

Installation of the grid

Anchoring to basic ceilings

Anchoring of the suspension must be undertaken using anchors suitable for the substrate:

- Reinforced concrete: Knauf Deckennagel ceiling steel dowels / suitable steel dowels
- Other building materials: Use anchors specially suited to the materials or standardized anchors.

Anchoring to joists

- The anchoring of the suspenders to the wooden joists is undertaken using Knauf Drywall Screws TN or Knauf Multi-Purpose Screw FN.

Fastening of suspenders to wooden joists with Knauf screws

Suspenders	Fastening to wooden joists
Penetration depth in wooden joists ≥ 5 t_n, minimum 24 mm	
Universal Bracket / Adjustable Universal Bracket / Nonius suspension / Wire suspension	FN 4.3 x 35
Damping Universal Bracket / Adjustable Damping Universal Bracket / Nonius Hanger Top	FN 4.3 x 65
Universal Bracket fastened in the tabs	2x TN 3.5 x 35 / 2x TN 3.9 x 35
Adjustable Universal Bracket fastened in the circular holes	2x TN 3.5 x 35 / 2x TN 3.9 x 35

- *Perimeter spacings of fasteners acc. to DIN EN 1995-1-1*
- d_n = *rated diameter*

Anchoring to the trapezoid sheet metal

- Anchoring to the trapezoid sheet metal is undertaken with an approved anchor.

Note	The dampening rubbers may only be slightly compressed when the swing suspenders are anchored.

Suspension

Suspension of the carrying or furring timber battens or carrying or furring channels exclusively with suspenders acc. to pages 31 to 33 (observe additional measures if necessary).
Refer to the system tables in the "Data for planning" section for the anchoring spacings on ceilings and profiles/batten spacings.

Connection to wall

- With UD Runner 28/27 as a load-bearing connection.
- Installation aid or with fire resistance: Anchoring to the construction material with suitable fasteners/anchors, spacing max. 1 m (non-load-bearing) or 625 mm (load-bearing).
- Ensure a carefully applied seal for sound insulation requirements analogue to the specifications of the DIN 4109-33:2016-07 section 4.1.1.3 (e.g. Trennwandkitt acoustical sealant) (Recommendation: always with Trennwandkitt acoustical sealant).

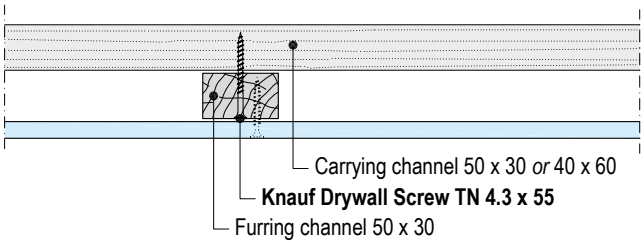
Timber battens / profiles

Carrying timber battens/profiles or furring timber battens/profiles must be connected with suspenders and aligned flush in the required suspension height.

Stagger all timber batten or profile joints.

D111.de Wood frame

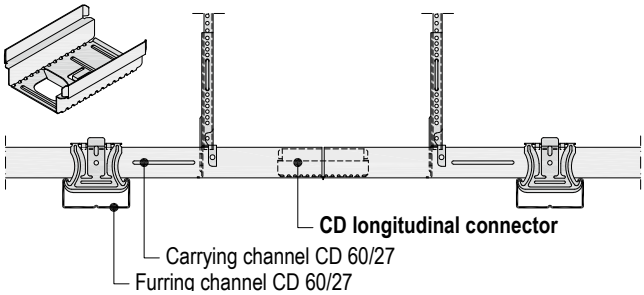
Connection carrying channel and furring channel



D112.de Metal grid with CD profiles 60/27

Profile connections

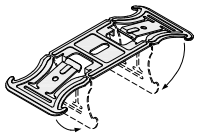
Profile extensions of the carrying or furring channel CD with CD longitudinal connector, arranged alternately.



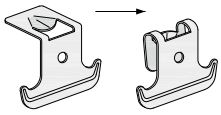
Connection carrying channel CD and furring channel CD

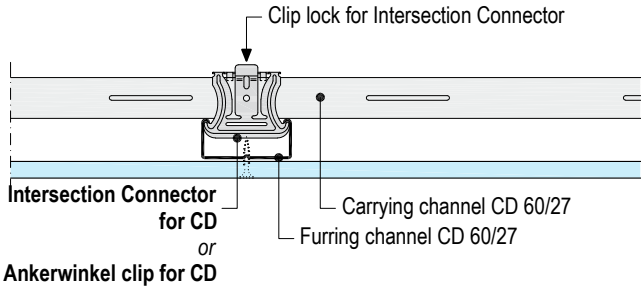
With a double layer profile grid, the connection of the carrying and furring channels in the intersections is undertaken with:

- Intersection connectors for CD 60/27:
  Before the installation, bend to 90° and after installation close the clip lock to ensure a secure hold.



- 2x Ankerwinkel clips for CD 60/27 (alternative)
  Bend with assembly.



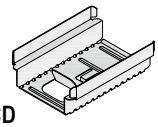


Installation of the grid (continuation)

D113.de Flush metal grid

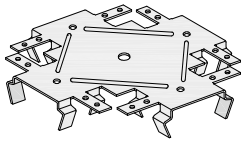
Profile connections

Profile extensions of the carrying channel CD with CD longitudinal connector – arranged alternately.

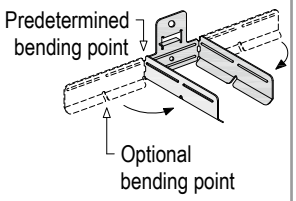


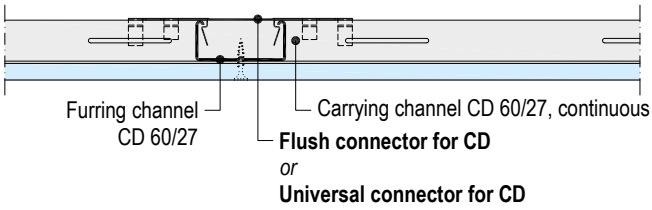
Connection carrying channel CD and furring channel CD

- Flush connector for CD 60/27
  Additional measures with *fire resistance from above*:
  Bend the tabs and screw fasten with the furring channel (4x Metal Screws LN 3.5 x 11)



- Alternative:
  2x Universal Connector for CD 60/27
  - Supplied un-bent
  - Set approximately to suit application
  - Set precisely with installation

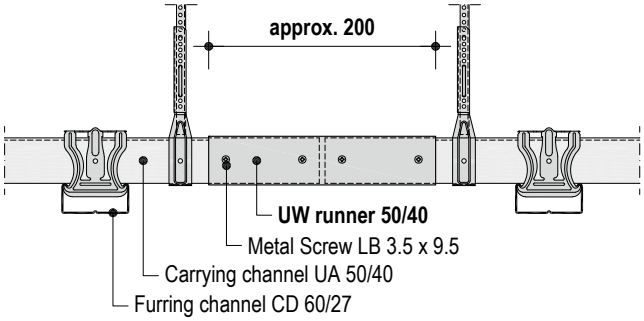




D116.de Metal grid UA / CD

Profile connections

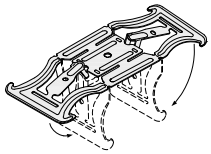
Arranged alternately

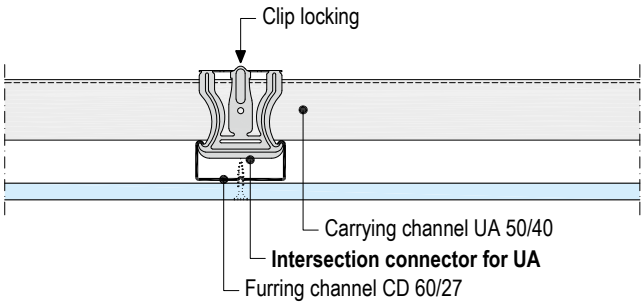


Connection carrying channel UA and furring channel CD

With a double layer profile grid, the connection of the carrying and furring channels in the intersections is undertaken with:

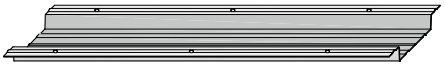
- Intersection Connector for UA profile
  Before installation, bend to 90° and after installation close the clip lock to ensure a secure hold

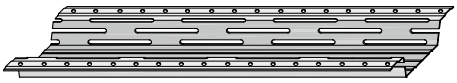




Resilient Channel / Hat-Shaped Channel

Anchoring of the Resilient Channel / Hat-Shaped Channel must be undertaken using anchors suitable for the substrate.
Stagger all rail / profile joints





Note	For optimum effectiveness install the Resilient Channel with about 1 mm spacing. For this purpose, unscrew the screws by about half a turn after they have been screwed in flush, to ensure that the Resilient Channel is hanging by the screw heads.

Cladding installation

- Commence with the fixing of the boards in the board centre or on the board corner to avoid buckling.
- Every board layer should be pushed firmly onto the grid and attached as an independent layer.

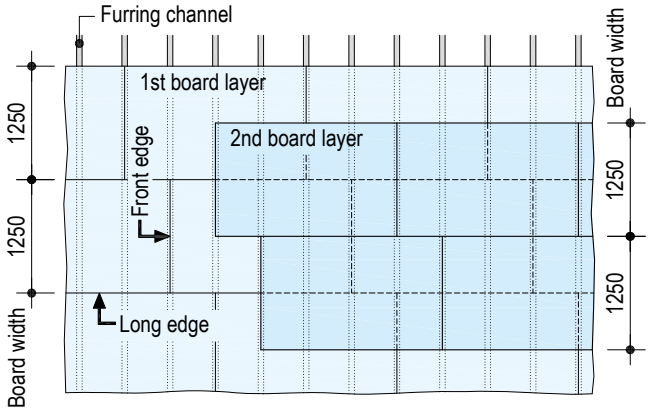
Installation schemes

Scheme drawings I Dimensions in mm

Knauf boards – lateral cladding application

Board width

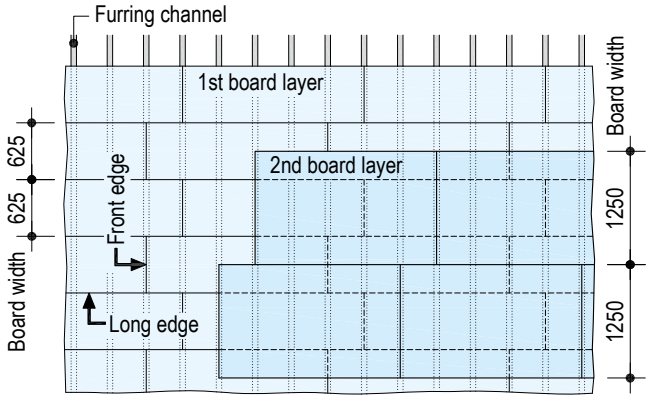
1st layer: **1250 mm** e.g. Fire-resistant board Knauf Piano
2nd layer: **1250 mm** e.g. Fire-resistant board Knauf Piano



- Apply Knauf Boards lateral to the furring timber batten/furring channel.
- Arrange the board joints on the furring timber batten/furring channels (stagger by at least 400 mm).
- Stagger the front edge joints between board layers.
- Stagger the long joints between the board layers by at least half a board width.

Board width

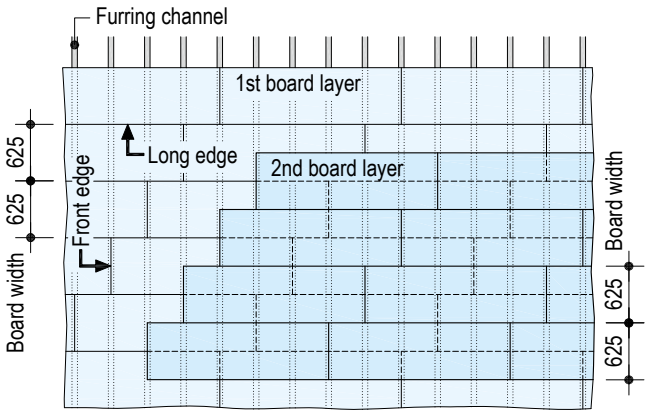
1st layer: **625 mm** e.g. Silentboard
2nd layer: **1250 mm** e.g. Diamant



- Apply Knauf Boards lateral to the furring timber batten/furring channel.
- Arrange the board joints on the furring timber batten/furring channels (stagger by at least 400 mm).
- Stagger the front edge joints between board layers.
- Stagger the long joints between the board layers by at least half a board width to the 1st layer

Board width

1st layer: **625 mm** e.g. Silentboard
2nd layer: **625 mm** e.g. Silentboard

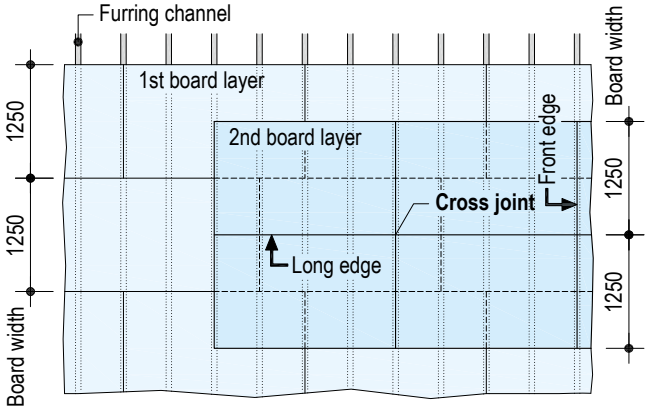


- Apply Knauf Boards lateral to the furring timber batten/furring channel.
- Arrange the board joints on the furring timber batten/furring channel (stagger by at least 400 mm).
- Stagger the front edge joints between board layers.
- Stagger the long joints between the board layers by at least half a board width.

Horizonboard – lateral application – cross joint

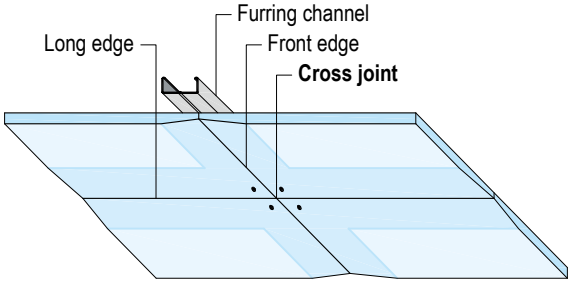
Board width

1st layer: **1250 mm** e.g. Knauf Wallboard
2nd layer: **1250 mm** Horizonboard



- Install Horizonboard lateral to the furring timber batten/furring channel.
- Arrange the board joints on the furring timber batten/furring channels (stagger by at least 400 mm).
- Stagger the front edge joints between board layers in case of multi-level cladding.
- Stagger the long joints between the board layers by at least half a board width.

With double-layer cladding: Only apply Knauf Horizonboard to the second layer. Knauf boards of the first layer (boards application as above) must have the same board format as the Horizonboard.



Fastening of the cladding

Fasteners to be used

Dimensions in mm

Cladding Thickness mm	Metal stud frame (penetration ≥ 10 mm) Metal gauge **s ≤ 0.7 mm** Drywall Screws **TN**	 Diamant Screws **XTN**	Wood frame Penetration depth **≥ 5 d_n** Drywall Screws **TN**	 Diamant Screws **XTN**
12.5	TN 3.5 x 25	XTN 3.9 x 23	TN 3.5 x 35	XTN 3.9 x 33
15	TN 3.5 x 25	XTN 3.9 x 33	TN 3.5 x 35	XTN 3.9 x 38
18 / 20 / 25	TN 3.5 x 35	–	TN 3.5 x 45	–
2x 12.5	TN 3.5 x 25 + TN 3.5 x 35	XTN 3.9 x 23 + XTN 3.9 x 38	TN 3.5 x 35 + TN 3.5 x 45	XTN 3.9 x 33 + XTN 3.9 x 55
2x 15 / 20 + 12,.5	TN 3.5 x 35 + TN 3.5 x 45	–	–	–
2x 20	TN 3.5 x 35 + TN 3.5 x 55	–	–	–
25 + 18	TN 3.5 x 35 + TN 3.5 x 55	–	–	–

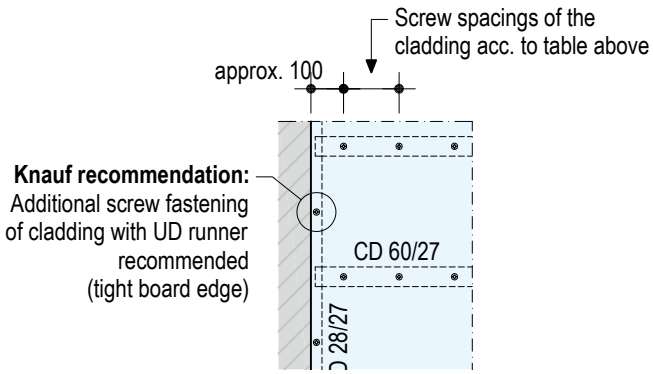
- d_n = nominal diameter (e.g. with Drywall Screw TN TN 3.5 x 35, 5x 3.5 mm → ≥ 17.5 mm penetration depth)
- Always use Diamant Screws for Diamant or Silentboard cladding.

Maximum fastener spacings – Knauf board cladding

Cladding	1st layer Board width 1250	 Board width 625	2nd layer Board width 1250	 Board width 625
1-layer	170	150	–	–
2-layer	500[1)]	300[1)]	170	150

1) Fasten the second board layer within a working day, otherwise the spacing for fastening of single layer cladding must be used.

Additional screw fastening UD runner



Note	For details on jointing as well as coating and claddings, see brochure Knauf Jointing Competence Tro89.de

Information on Sustainability

Knauf Board Ceiling

Information on sustainability of Knauf Board Ceilings

Building assessment systems ensure the sustainable quality of buildings and constructional structures by a detailed assessment of ecological, economic, social, functional and technical aspects.

In Germany, the following certification systems are of particular relevance

- DGNB System
  Deutsches Gütesiegel Nachhaltiges Bauen
- BNB
  Bewertungssystem Nachhaltiges Bauen - Quality rating system for environmentally sustainable building)
- QNG
  Quality seal for sustainable buildings
- LEED
  Leadership in Energy and Environmental Design

Knauf products and Knauf Board Ceiling can positively influence many of these criteria.

DGNB/BNB/QNG

Ecological quality

- Ecological performance evaluation of the building:
  Relevant environmental data are contained in the EPD for gypsum boards and fillers.
- Risks for the local environment:
  - Gypsum as an ecological material
  - Profiles are hot-dip galvanized and free of Chromium VI

Economic quality

- Building related life-cycle costs:
  Cost-effective Knauf Drywalling
- Flexibility and suitability for conversion:
  Flexible Knauf Drywalling

Technical quality

- Sound insulation:
  Exceeding the demands of the standard with Knauf sound installation
- Ease of dismantling and recycling:
  Possible with Knauf Drywalling

LEED

Materials and Resources

- Building Life-Cycle Impact Reduction:
  Relevant ecological performance evaluation data are contained in the EPDs for gypsum boards and filler.
- Environmental Product Declarations:
  Relevant data are contained in the EPD for gypsum boards and fillers.
- Sourcing of Raw Materials:
  Recycled content in Knauf gypsum boards, e.g. board liner

Indoor Environmental Quality

- Low-Emitting Materials:
  Knauf products are regularly subject to VOC measurement.

Videos for Knauf systems and products can be found under the following link:
youtube.com/knauf

Find the right system for your requirements!
knauf.de/systemfinder

The Knauf Infothek App now provides all the current information and documents from Knauf Gips KG at any time and in every location in a clear and comfortable way.
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The stated constructional and structural design specifications and characteristics of building physics of Knauf systems can only be ensured with the exclusive use of Knauf system components, or other products expressly recommended by Knauf.