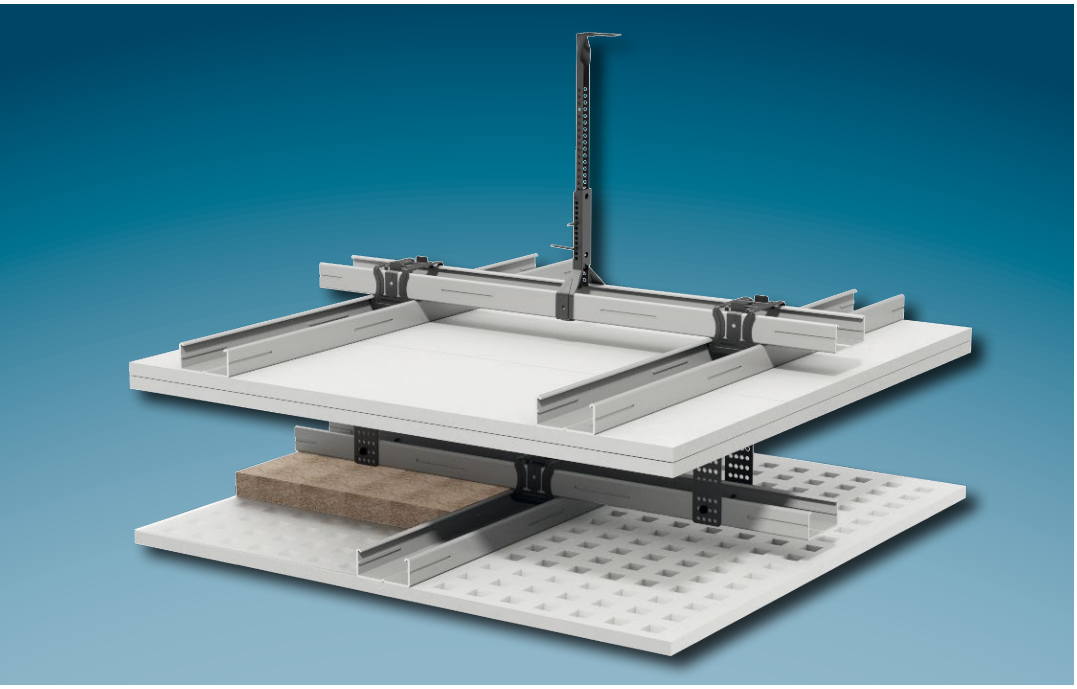


Drywall Systems

D11.de

System Data Sheet 2015-11

Knauf Board Ceilings

D111.de Wood frame

D112.de Metal grid

D113.de Flush metal grid

D116.de Large-span metal grid

Note on English translation / Hinweise zur englischen Fassung

This is a translation of the system catalogue 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.

Contents

Usage instructions

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) and/or approvals) 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

- Free-spanning ceilings, see System Data Sheet D13.de “Knauf Free-spanning Ceilings”
- Board ceilings under wooden batten ceilings (basic ceilings of building type IV), see System Data Sheet D15.de “Knauf Holzbalkendecken-Systeme” (German only)
- Board ceilings under wooden rafter roofs, see System Data Sheet D61.de “Knauf Dachgeschoss-Systeme” (German only)
- Board ceiling under trapezoid sheet metal panels and roofs, see System Data Sheet K217.de “Knauf Trapezblech-Systeme” (German only)
- Acoustic ceilings, see System Data Sheet D12.de “Knauf Cleaneo® Acoustic Ceilings”
- Ceilings for exterior areas, see brochure Tro96 “Knauf Drystar”
- Observe the Product Data Sheets of the Knauf system components

Symbols in System Data Sheet

The following symbols are used in this document:

- **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)
- **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)*

General instructions

Terms

Knauf board ceilings can be applied as ceiling linings or suspended ceilings. The following definition applied 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 underceilings the substructure is suspended. …”.

Field of application

The data specified in this System Data Sheet only applies for ceiling linings/suspended ceilings in interiors. Knauf board ceilings can be used for exterior areas not directly exposed to the weather under specific circumstances, such as with a rust-proofed grid and suitable boards, e.g. Knauf Drystar Board. A preliminary dimensioning of the grid/wood frame taking the demands that apply in exterior areas into consideration (pressure/suction) can be undertaken on request.

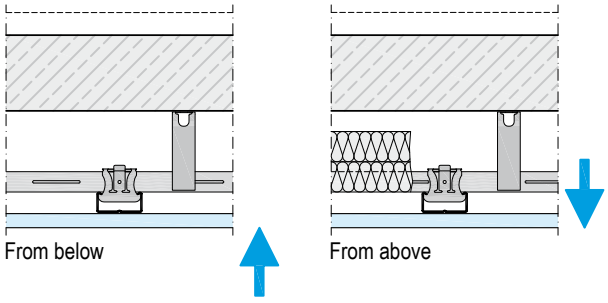
Fire resistance effect

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*).
A combination of both requirements may be necessary depending on the requirements stipulated by the building inspectorate and/or fire resistance concept.

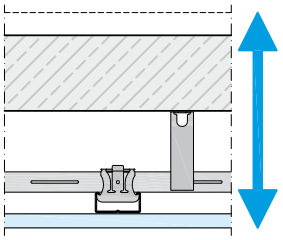
With respect to the fire resistance *solely*, Knauf board ceilings can be classified according to the interaction with the basic ceiling. If the type in quest in involves solid ceilings, they are categorized as types I to III acc. to DIN 4102-4.
Wood joist ceilings are categorized as type IV and are not dealt with in this System Data Sheet.
Fire resistance interacting with the basic ceiling is relevant from room to room with requirements on the fire resistance.

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

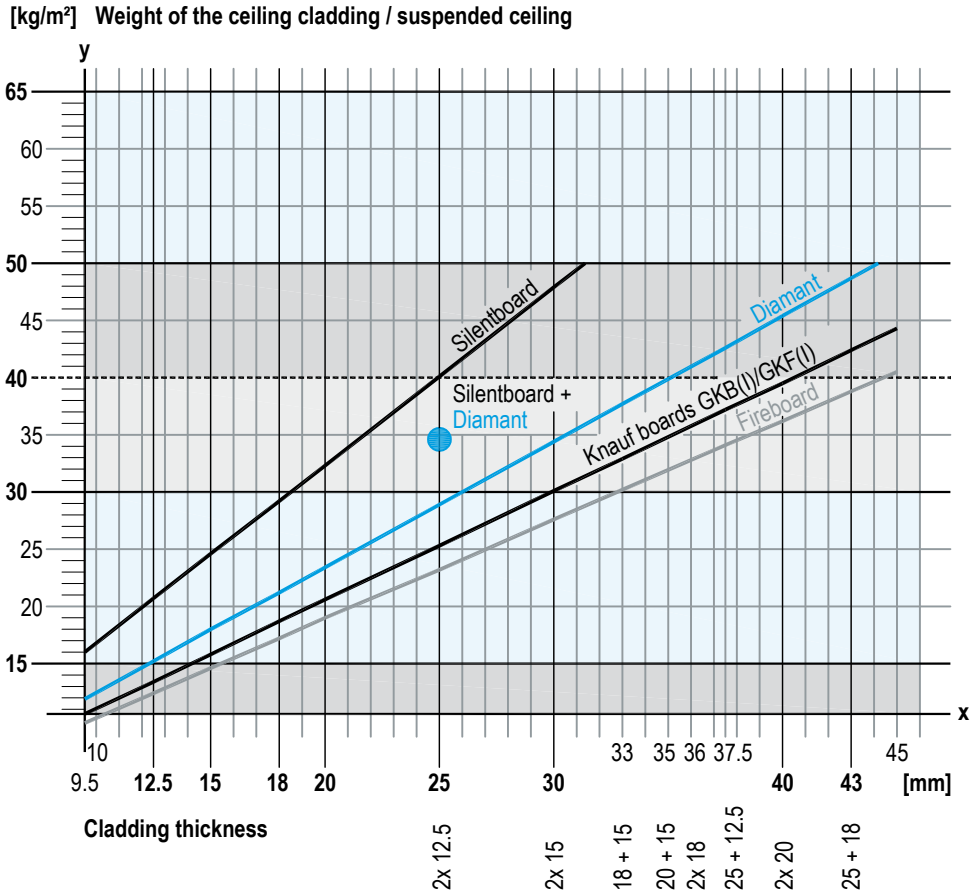


Dimensioning principles

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.

Load class [kN/m²]
0.50 < p ≤ 0.65[1)]
0.30 < p ≤ 0.50
0.30 < p ≤ 0.40 (with fire resistance from above)
0.15 < p ≤ 0.30
≤ 0.15

1) 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. Rating acc. to DIN 18168



Step 1: Determination of the ceiling cladding / subceiling weight depending on the cladding thickness

The area weight of the ceiling lining / suspended ceiling including the substructure in kg/m² should be read off at the intersection point with the diagonals shown on the y-axis in dependence on the selected cladding thickness in mm (x-axis).

Step 2: Consideration of additional loads

Additional loads consisting of fire resistance necessary and unnecessary insulation materials (max. 0.05 kN/m² = 5 kg/m²), as well as those from the system *Multi-level Ceiling System* (max. 0.15 kN/m² = 15 kg/m²) increase the total area weight of the ceiling cladding / suspended ceiling and must be considered with the dimensioning of the load class. The intersection point from the diagram determined with the diagonals must be offset by the level of the additional area load (kg/m²) in the direction of the y-axis (upwards).

Step 3: Determination of the load class

Based on the total area load of the ceiling lining / subceiling, the corresponding load class (kN/m²) is to be determined.

Step 4: Dimensioning of the grid

Using the determined load class, the maximum permissible spacings of the suspenders (a) as well as the profiles/timber battens (b) and (c) can be read off from the tables on the technical and building physical data of the systems on the following pages as dependent on the fire resistance requirements and selected grid.

Certificate of usability

Knauf System	Fire resistance Suspended ceilings allocated solely to a single fire rating	Suspended ceilings in conjunction with basic ceilings of types I to III	Sound insulation Airborne and impact sound (Knauf sound protection proofs)
D111.de	–	–	–
D112.de	F30: AbP P-2100/199/15-MPA BS F90: AbP P-3400/4965-MPA BS	AbP P-3155/3992-MPA BS	Diamant: Floor T 007-06.10 Subceiling T 008-10.10 Floor + subceiling T 009-10.10 Silentboard / Silentboard+Diamant: Floor T 007-06.10 Subceiling T 010-06.12 Floor + subceiling T 011-06.12
D113.de	F30: AbP P-2100/199/15-MPA BS F90: AbP P-3400/4965-MPA BS	–	–
D116.de	F30: AbP P-2100/199/15-MPA BS F90: AbP P-3400/4965-MPA BS	AbP P-3155/3992-MPA BS	–

Notes on fire resistance

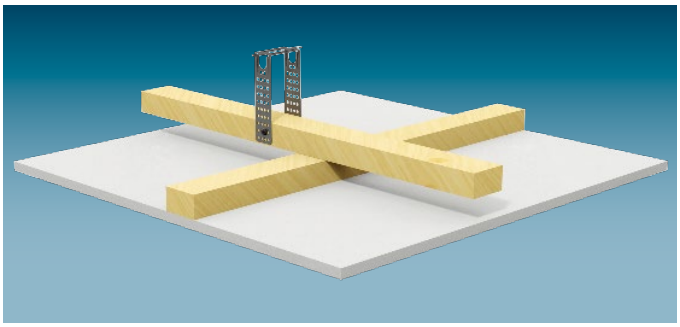
The specifications marked with plus offer additional application options, which are not directly included in the Certificate of Usability. On the basis of our technical assessments, we assume that these marked design solutions can be assessed as a non-significant divergence. We can make the documentation 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.

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.

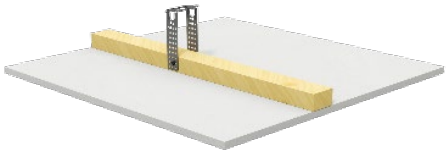
Knauf Board Ceiling

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.

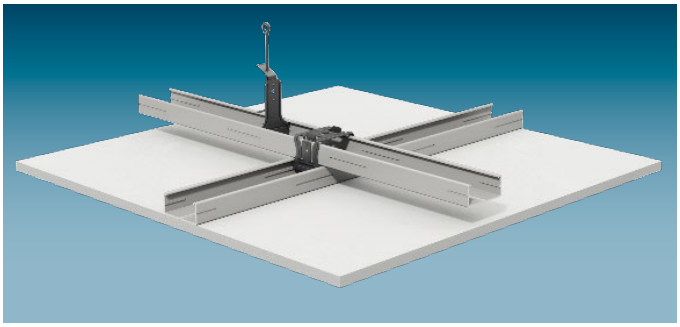
D111.de Wood frame



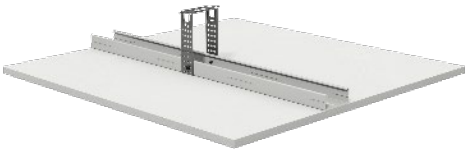
Knauf boards are fixed with screws to a wood frame made of carrying timber battens and furring timber battens (double batten frame) or just simple furring timber battens (single batten frame).
The grid is fastened using suspenders or is anchored directly to the basic ceiling using suitable fasteners.



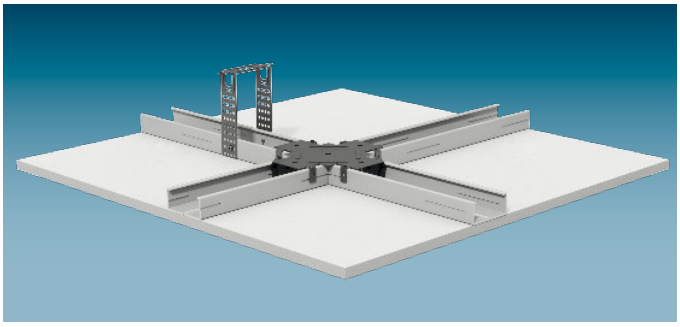
D112.de Metal grid



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 or hat-shaped channels.
Anchoring of the CD channels is undertaken with suspenders on the basic ceiling; hat-shaped channels are anchored directly onto the basic ceiling.

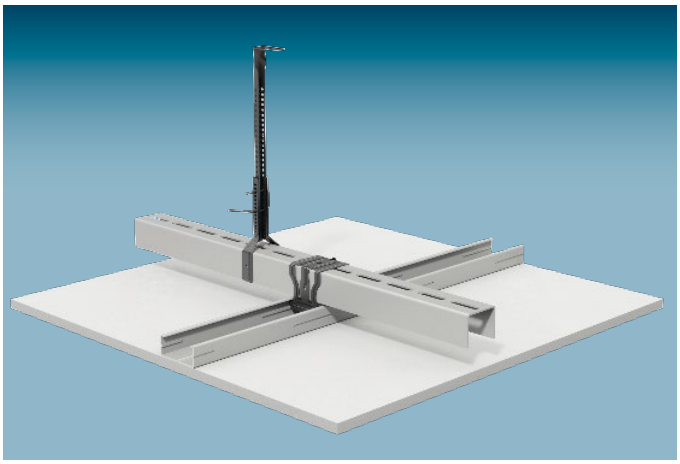


D113.de Flush metal grid



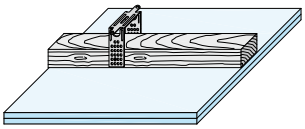
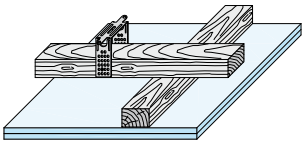
Knauf boards are fixed with screws to a metal grid of flush carrying and furring channels made of sheet metal profiles CD 60/27.
Anchoring of the grid is undertaken with suspenders on the basic ceiling.
Low construction heights can be implemented using this system.
Furthermore, the application of a necessary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

D116.de 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.

Without fire resistance

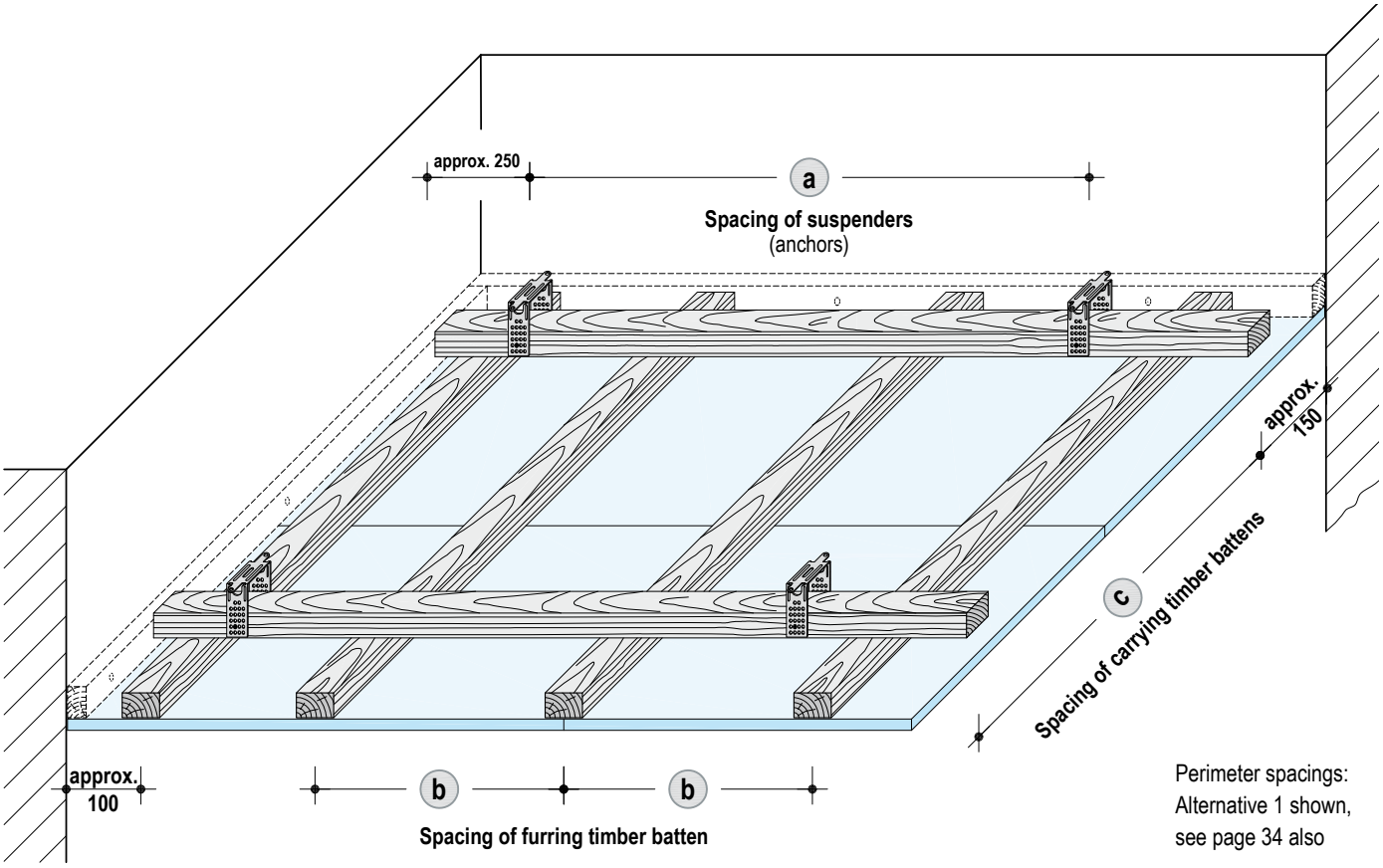
Requirements on the basic ceiling for fire exposure **From below** No fire resistance requirements for basic ceiling/roof construction **From above** (Plenum) Basic ceiling must have same fire resistance class as suspended ceiling	Fire resistance For fire exposure From below	From above	**Cladding** (lateral application) **Knauf Bauplatte wallboard**	Feuerschutzplatte Knauf Piano	Massivbauplatte Solid Board	**Diamant**	**Silentboard**	Fireboard	Minimum thickness mm	**Furring timber batten** Max. axial spacings (b) mm	Insulation layer required for fire resistance Minimum thickness mm	Min. density kg/m³
D111.de Knauf board ceiling with wood frame												
 e.g. furring timber batten only	–	–	■						**12.5**	500	–	
						■			**12.5**	500		
							■		**12.5**	400		
 e.g. carrying timber batten and furring timber batten			■						**2x 12.5**	500		
						■			**2x 12.5**	500		
						■	■		**12.5 + 12.5**	400		

With combined cladding always use Diamant as a cover layer

Note	Observe the notes on page 4

Maximum grid spacings

Dimensions in mm



Perimeter spacings:
Alternative 1 shown,
see page 34 also

Without fire resistance – carrying timber batten and furring timber batten ≥ 50x30 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 – furring timber batten only ≥ 50x30 mm

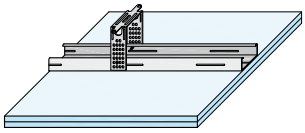
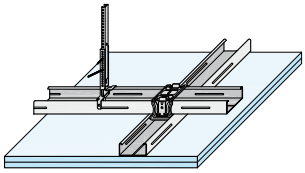
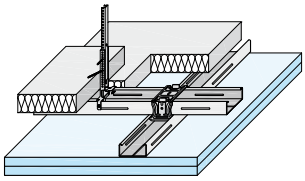
Axial spacings Furring timber batten (b)	Spacings of suspenders/anchors (a) Load class in kN/m²		
	Up to 0.15	Up to 0.30	Up to 0.50[1)]
≤ 500	1200	950	800
625	–	900	750
800	–	800	700

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 8 and 34

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

Fire resistance solely from below and/or above (fire resistance in conjunction with basic ceiling, see page 22 and following)

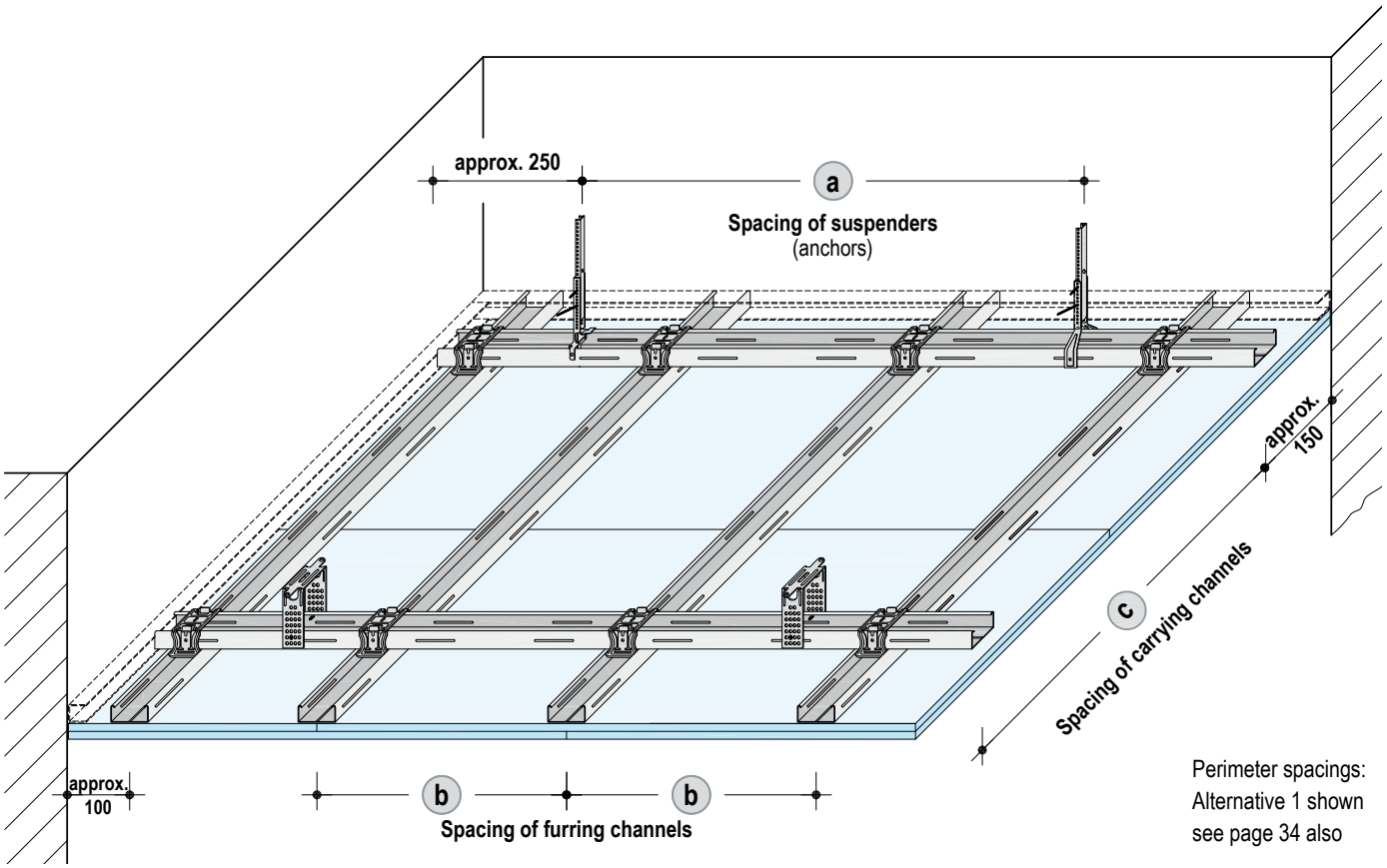
Requirements on the basic ceiling For fire exposure **From below** No fire resistance requirements for basic ceiling/roof construction **From above** (Plenum) Basic ceiling must have same fire resistance class as suspended ceiling	Fire resistance For fire exposure From below	From above	Cladding (lateral application) Knauf Bauplatte wallboard	Feuerschutzplatte Knauf Piano	Knauf Feuerschutzplatte	Massivbauplatte Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	Furring channel Max. axial spacings (b) mm	Insulation layer required for fire resistance Minimum thickness mm	Min. density kg/m³
D112.de Knauf board ceiling with metal grid													
 e.g. furring channel only	–	–	■							12.5	500	–	
			■							2x 12.5			
	F30			■						2x 12.5	500	Without or with Mineral wool (G)	
							■			2x 12.5	500		
								■		2x 12.5	400		
						■				20	625		
 e.g. carrying and furring channel	F90	–				■				25 + 18	500	Without or with Mineral wool (G)	
					■					2x 20			
									■	2x 20			
	–	F30			■					15	500	Mineral wool (S) 40 40 + Mineral wool (S) 40 40 150 mm wide on carrying channel	
							■			15	500		
					■					18	625		
	F30	F30		■						2x 12.5	500		
							■			2x 12.5	500		
								■		2x 12.5	400		
									■	15	400	Mineral wool (S) 2x 40 40	
	F90	F90				■				25 + 18	500	Mineral wool (S) 40 40 + Mineral wool (S) 40 40 150 mm wide on carrying channel	
					■								
						■				2x 20			
									■	2x 20			

Extension of the fire resistance certificate of usability
■ Divergences from the construction variants pages 12 and 13
Prior consultation in acc. to Page 6 is recommended.

Note Observe the notes on page 4

Maximum grid spacings

Dimensions in mm



Perimeter spacings:
Alternative 1 shown
see page 34 also

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/ 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 0.15	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	1200	1000	900	850	800

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[3)]	650[3)]
800	800	–	–	–

1) Use suspenders of load carrying capacity class 0.40 kN
2) Not valid for furring channel spacing (b) 800 mm
3) Only permissible for furring channel spacing (b) max. 500 mm

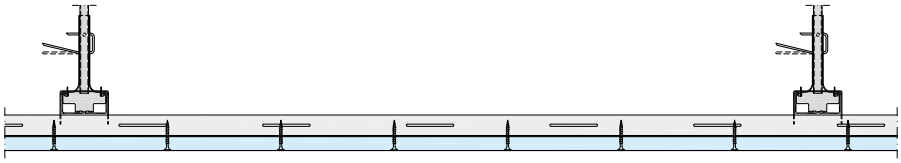
For axial spacings of furring channel also refer to pages 10 and 34

Notes	
	Observe additional constructional measures with *fire resistance solely from above* in accordance with page 63.
	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).

Fire protection solely from below and/or from above acc. to AbP P-2100/199/15-MPA BS

Note	The system variants shown here generally show the exact system variants as in the National Technical Test Certificate (AbP). Divergences, e.g. use of other suspenders, other spacings of the grid as well as other cladding are possible in accordance with the specifications on pages 10 and 11. The notes acc. to page 6 apply accordingly.

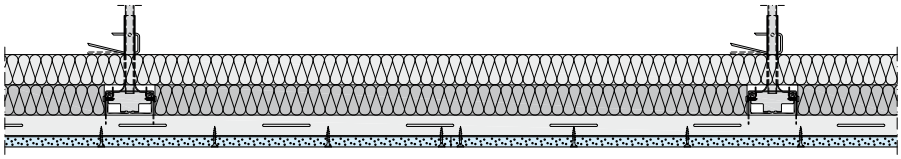
Knauf board ceiling D112.de with metal grid



- **Fire protection class F30 solely from below**
- Double layer profile (carrying and furring channel)
- Without insulation layer

Design alternatives		
Connection to solid walls	Perimeter runner	UD 28/27, fastening spacing ≤ 625 mm
Suspension	Description	Nonius hanger, spacing a ≤ 700 mm
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 1000 mm CD 60/27, axial spacing b ≤ 625 mm Intersection connector for CD
Mineral wool insulation layer EN 13162	without	–
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 20 mm Massivbauplatte Solid Board, single-layer ≤ 625 mm x 2600 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 ≤ 170 mm

Knauf board ceiling D112.de with metal grid



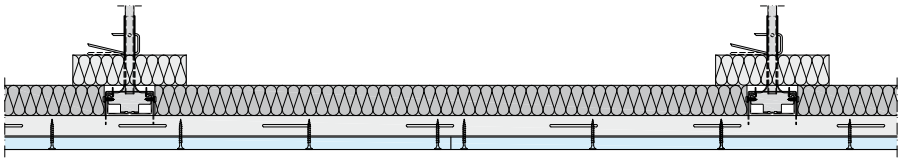
- **Fire resistance class F30 solely from below and from above**
- Double layer profile (carrying and furring channel)
- With insulation layer

Design alternatives		
Connection to solid walls	Perimeter runner	UD 28/27, fastening spacing ≤ 300 mm
Suspension	Description Suspension height	Nonius hanger spacing a ≤ 750 mm (≤ 900 mm with fire resistance solely from above) (with fire resistance from above screw to carrying channel) ≤ 1500 mm (with fire resistance from above)
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 850 mm CD 60/27, axial spacing b ≤ 400 mm Intersection connector for CD
Mineral wool insulation layer EN 13162	Thickness Density Melting point acc. to DIN 4102-17	2x 40 mm ≥ 40 kg/m³ ≥ 1000 °C
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 15 mm Fireboard, single-layer ≤ 1250 mm x 2500 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 ≤ 150 mm

Fire protection solely from below and/or from above acc. to AbP P-2100/199/15-MPA BS and AbP P-3400/4965-MPA BS

Note	The system variants shown here generally show the exact system variants as in the National Technical Test Certificate (AbP). Divergences, e.g. use of other suspenders, other spacings of the grid as well as other cladding are possible in accordance with the specifications on pages 10 and 11. The notes acc. to page 6 apply accordingly.

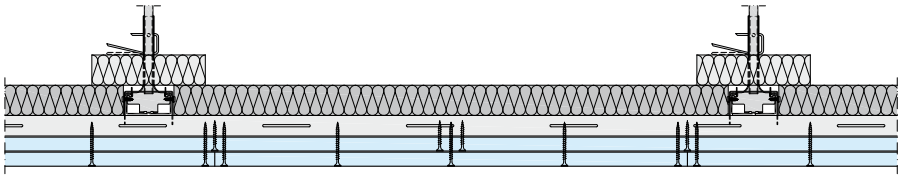
Knauf board ceiling D112.de with metal grid



- **Fire protection class F30 solely from above**
- Double layer profile (carrying and furring channel)
- With insulation layer

Design alternatives		
Connection to solid walls	Perimeter runner	UD 28/27, fastening spacing ≤ 625 mm
Suspension	Description Suspension height	Nonius hanger, spacing a ≤ 750 mm (screw to carrying channel) ≤ 1500 mm
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 850 mm CD 60/27, axial spacing b ≤ 625 mm Intersection connector for CD
Mineral wool insulation layer EN 13162	Thickness Density Melting point acc. to DIN 4102-17	1x 40 mm (additional 150 mm wide strip on carrying channels) ≥ 40 kg/m³ ≥ 1000 °C
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 18 mm Knauf Feuerschutzplatte fire-resistant board, single-layer ≤ 1250 mm x 2500 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 ≤ 170 mm

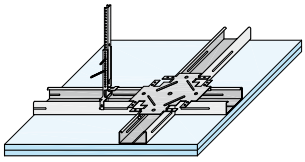
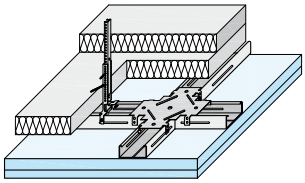
Knauf board ceiling D112.de with metal grid



- **Fire resistance class F90 solely from below and from above**
- Double layer profile (carrying and furring channel)
- With insulation layer

Design alternatives		
Connection to solid walls	Perimeter runner	UD runner 28/27, fastening spacing ≤ 400 mm
Suspension	Description Suspension height	Nonius hanger, spacing a ≤ 750 mm (with fire resistance from above screw to carrying channel) ≤ 1500 mm (with fire resistance from above)
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 800 mm CD 60/27, axial spacing b ≤ 500 mm Intersection connector for CD
Mineral wool insulation layer EN 13162 (only necessary with fire resistance from above)	Thickness Density Melting point acc. to DIN 4102-17	1x 40 mm (additional 150 mm wide strip on carrying channels) ≥ 40 kg/m³ ≥ 1000 °C
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 2 x2 0 mm Massivbauplatte Solid Board, double-layer ≤ 625 mm x 2500 mm Knauf Schnellbauschraube Drywall Screw TN 3.5x35 mm (first layer) Knauf Schnellbauschraube Drywall Screw TN 3.5x55 mm (second layer) ≤ 510 mm (first layer), ≤ 170 mm (second layer)

Fire protection solely from below and/or from above (fire resistance in conjunction with the basic ceiling see page 22 and following)

Requirements on the basic ceiling with fire exposure	Fire resistance class		Cladding (lateral application)								Furring channel	Insulation layer	
From below No fire resistance requirements for basic ceiling/roof construction **From above** (Plenum) Basic ceiling must have same fire resistance class as suspended ceiling	For fire exposure From below	From above	Knauf Bauplatte wallboard	Feuerschutzplatte Knauf Piano	Knauf Feuerschutzplatte	Massivbauplatte Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	Max. axial spacings (b) mm	required for fire resistance Minimum thickness mm	Min. density kg/m³
D113.de Knauf board ceiling with flush metal grid													
	–	–	■							12.5	500	–	
			■							2x 12.5			
	F30	–		■						2x 12.5	500	Without or with Mineral wool (G)	
							■			2x 12.5	500		
								■		2x 12.5	400		
	F90					■				25 + 18	400	Without or with Mineral wool (G)	
					■								
									■	2x 20			
	–	F30			■					15	500	Mineral wool (S) 40	40
							■			15			
	F30	F30		■						2x 12.5	500	Without or with Mineral wool (G)	
							■			2x 12.5	500		
								■		2x 12.5	400		
									■	15	400	Mineral wool (S) 2x 40	40
	F90	F90				■				25 + 18	400	Mineral wool (S) 2x 40	40
					■								
						■				2x 20			
									■	2x 20			

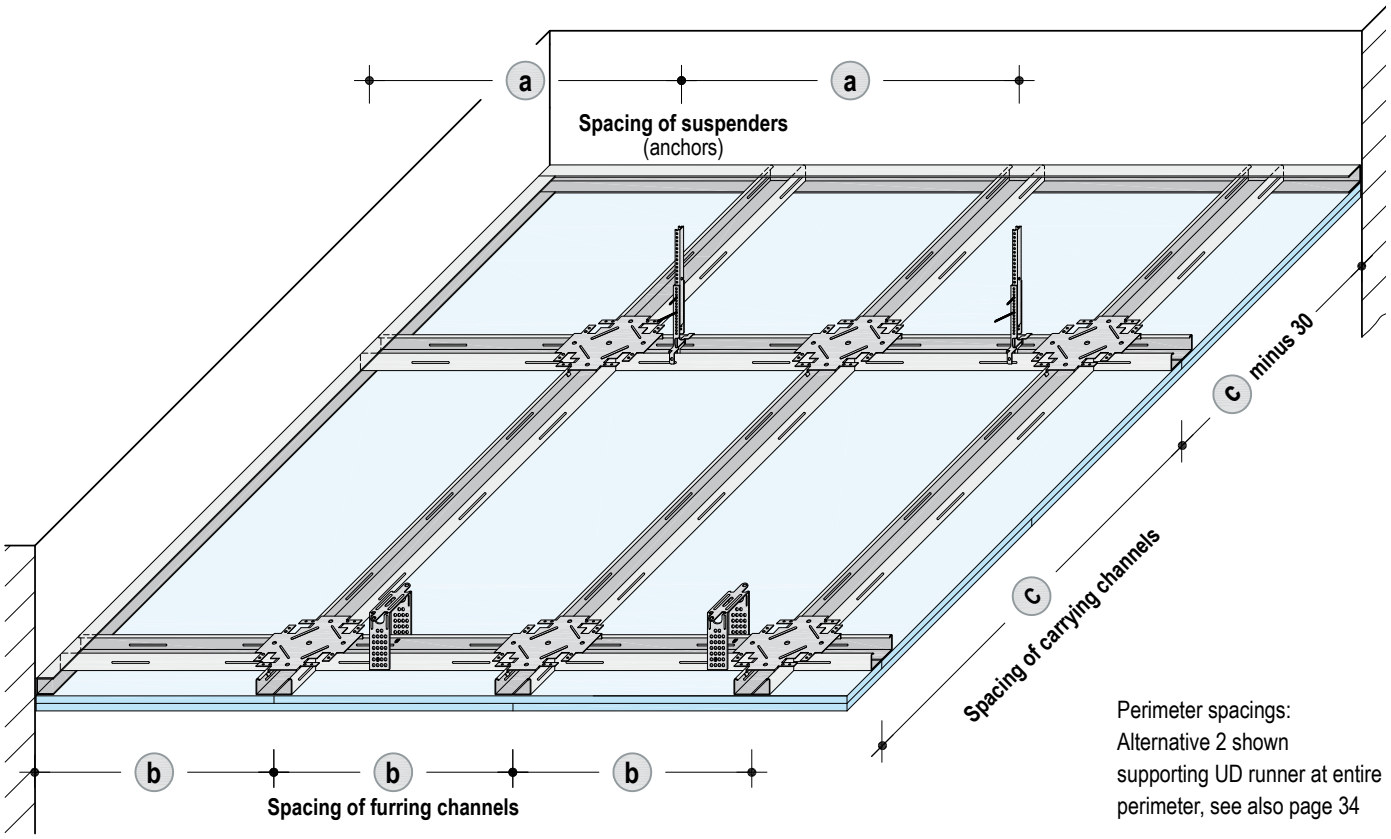
Universal connector as profile connection also possible

Extension of the fire resistance certificate of usability
■ Divergences from the construction variants pages 16 and 17
Prior consultation in acc. to Page 6 is recommended.

Note Observe the notes on page 4

Maximum grid spacings

Dimensions in mm



Perimeter spacings:
Alternative 2 shown
supporting UD runner at entire perimeter, see also page 34

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	550
800	700	650	600	–
900	700	600	550	–
1000	650	600	550	–
1100	650	600	–	–
1200	600	550	–	–
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

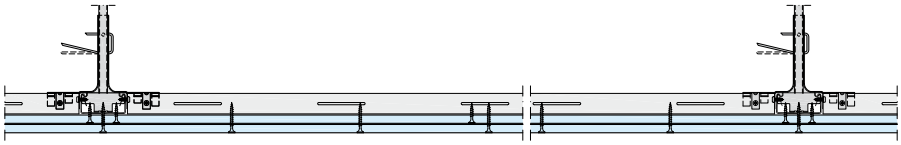
For axial spacings of furring channel also refer to pages 14 and 34

Notes	
	Observe additional constructional measures with *fire resistance solely from above* in accordance with page 63.
	Customized dimensioning of the ceiling substructure is possible on request.

Fire protection solely from below and/or from above acc. to AbP P-2100/199/15-MPA BS

Note	The system variants shown here generally show the exact system variants as in the National Technical Test Certificate (AbP). Divergences, e.g. use of other suspenders, other spacings of the grid as well as other cladding are possible in accordance with the specifications on pages 14 and 15. The notes acc. to page 6 apply accordingly.

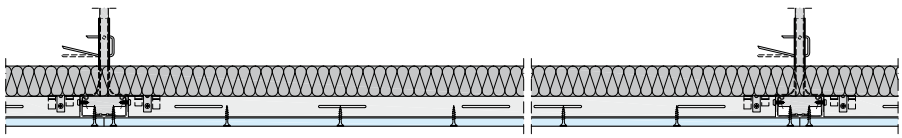
Knauf board ceiling D113.de with flush metal grid



- **Fire resistance class F30 solely from below and from above**
- Flush layer profile (carrying and furring channel)
- Without insulation layer

Design alternatives		
Connection to solid wall and light partitions	Perimeter runner	UD 28/27, fastening spacing to solid walls ≤ 300 mm Fastening to light partitions with 2x Knauf Universalschrauben multi-purpose screws FN 4.3x35 each (longer if required with wall cladding > 2x 12,5 mm) in each stud as well as between studs with Knauf *Gypsum board screws*
Suspension	Description Suspension height	Nonius hanger, spacing a ≤ 650 mm (with fire resistance from above screw to carrying channel) ≤ 1500 mm (with fire resistance from above)
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 1250 mm CD 60/27, axial spacing b ≤ 500 mm, with Silentboard b ≤ 400 mm Flush connector (with fire resistance from above screw fasten to furring channel) or universal connector
Mineral wool insulation layer EN 13162	without	–
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 2x 12.5 mm Feuerschutzplatte Knauf Piano GKF / Diamant GKFI / Silentboard GKF, double-layer ≤ 1250 mm x 2500 mm Knauf Schnellbauschrauben drywall screws TN 3.5x25 or XTN 3.9x23 (first layer), Knauf Schnellbauschrauben drywall screws TN 3.5x25 or XTN 3.9x38 (second layer), ≤ 500 mm (first layer), ≤ 170 mm (second layer)

Knauf board ceiling D113.de with flush metal grid



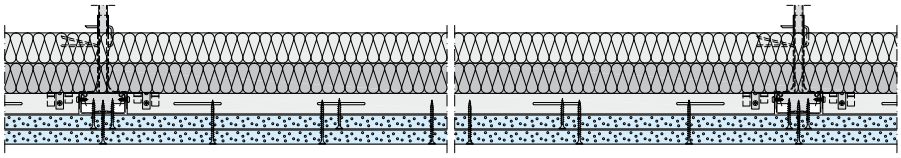
- **Fire protection class F30 solely from above**
- Flush layer profile (carrying and furring channel)
- With insulation layer

Design alternatives		
Connection to solid walls	Perimeter runner	UD 28/27, fastening spacing ≤ 300 mm
Suspension	Description Suspension height	Nonius hanger, spacing a ≤ 850 mm (screw to carrying channel) ≤ 1500 mm
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 1250 mm CD 60/27, axial spacing b ≤ 400 mm Flush connector (fasten to furring channel)
Mineral wool insulation layer EN 13162	Thickness Density Melting point acc. to DIN 4102-17	1x 40 mm ≥ 40 kg/m³ ≥ 1000 °C
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 15 mm Fireboard or Knauf Feuerschutzplatte, single-layer ≤ 1250 mm x 2500 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 ≤ 150 mm

Fire protection solely from below and/or from above acc. to AbP P-3400/4965-MPA BS

Note	The system variants shown here generally show the exact system variants as in the National Technical Test Certificate (AbP). Divergences, e.g. use of other suspenders, other spacings of the grid as well as other cladding are possible in accordance with the specifications on pages 14 and 15. The notes acc. to page 6 apply accordingly.

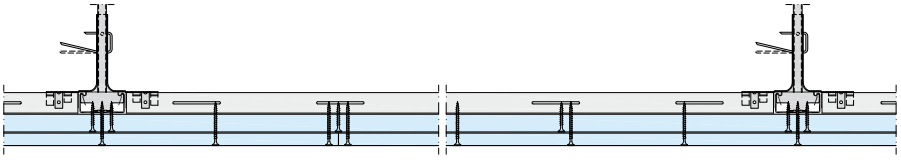
Knauf board ceiling D113.de with flush metal grid



- **Fire resistance class F90 solely from below and from above**
- Flush layer profile (carrying and furring channel)
- With insulation layer

Design alternatives		
Connection to solid walls	Perimeter runner	UD 28/27, fastening spacing ≤ 400 mm
Suspension	Description	Nonius suspender (with fire resistance from above screw to carrying channel) or threaded rod M8 Spacing a ≤ 750 mm (≤ 800 mm with fire resistance solely from above)
	Suspension height	≤ 1500 mm (with fire resistance from above)
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 1250 mm CD 60/27, axial spacing b ≤ 400 mm Flush connector (with fire resistance from above screw fasten to furring channel)
Mineral wool insulation layer EN 13162	Thickness Density Melting point acc. to DIN 4102-17	2x 40 mm (1x 40 mm with fire resistance solely from below) ≥ 40 kg/m³ ≥ 1000 °C
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 2x 20 mm Fireboard, double-layer ≤ 1250 mm x 2500 mm Knauf Schnellbauschrauben drywall screwsTN 3.5x35 (first layer), Knauf Schnellbauschrauben drywall screws TN 3.5x55 (second layer) ≤ 300 mm (first layer), ≤ 150 mm (second layer)

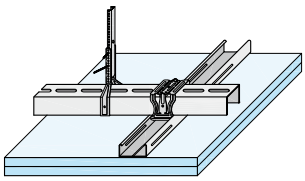
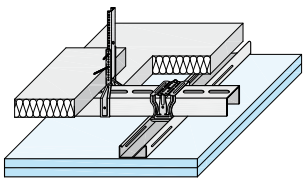
Knauf board ceiling D113.de with flush metal grid



- **Fire protection class F90 solely from below**
- Flush layer profile (carrying and furring channel)
- Without insulation layer

Design alternatives		
Connection to solid walls	Perimeter runner	UD 28/27, fastening spacing ≤ 300 mm
Suspension	Description	Nonius hanger, spacing a ≤ 650 mm
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 1250 mm CD 60/27, axial spacing b ≤ 400 mm Flush Connector
Mineral wool insulation layer EN 13162	Without	–
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 25 mm Massivbauplatte Solid Board + 18 mm Knauf Feuerschutzplatte fire-resistant board, double-layer ≤ 625 mm x 2400 mm (Massivbauplatte Solid Board), ≤ 1250 mm x 2400 mm (Knauf Feuerschutzplatte fire-resistant board) Knauf Schnellbauschrauben drywall screws TN 3.5x35 (first layer), Knauf Schnellbauschrauben drywall screws TN 3.5x55 (second layer) ≤ 300 mm (first layer), ≤ 150 mm (second layer)

Fire protection solely from below and/or from above (fire resistance in conjunction with the basic ceiling see page 22 and following)

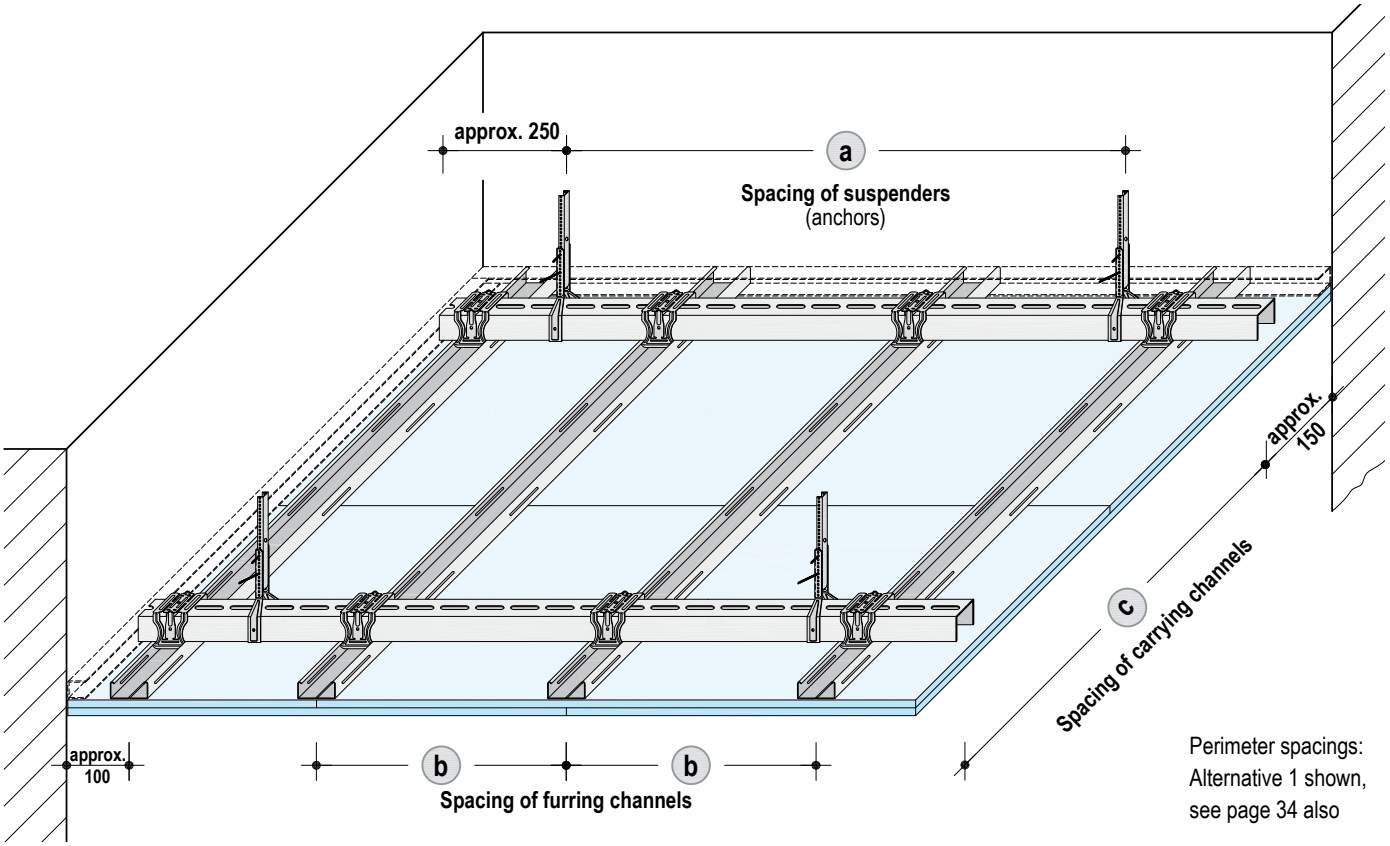
Requirements on the basic ceiling For fire exposure **From below** No fire resistance requirements for basic ceiling/roof construction **From above** (Plenum) Basic ceiling must have same fire resistance class as suspended ceiling	Fire resistance class For fire exposure		Cladding (lateral application)								Furring channel	Insulation layer required for fire resistance	
	From below	From above	Knauf Bauplatte wallboard	Feuerschutzplatte Knauf Piano	Knauf Feuerschutzplatte	Massivbauplatte Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	Max. axial spacings (b) mm	Minimum thickness mm	Min. density kg/m³
D116.de Knauf board ceiling with large-span flush metal grid													
	–	–	■							12.5	500	–	
			■							2x 12.5			
	F30	–		■						2x 12.5	500	Without or with Mineral wool (G)	
							■			2x 12.5	500		
								■		2x 12.5	400		
						■				20	625		
	F90					■				25 + 18	500	Without or with Mineral wool (G)	
					■					2x 20			
									■	2x 20			
	–	F30			■					15	500	Mineral wool (S) 60 50 + Mineral wool (S) 60 50 100 mm wide on carrying channel	
							■			15			
					■					18	625	Mineral wool (S) 40 40 + Mineral wool (S) 40 40 150 mm wide on carrying channel	
	F30	F30		■						2x 12.5	500		
							■			2x 12.5	500		
								■		2x 12.5	400		
									■	15	400	Mineral wool (S) 2x 40 40	
	F90	F90			■	■				25 + 18	500	Mineral wool (S) 40 40 + Mineral wool (S) 40 40 150 mm wide on carrying channel	
						■				2x 20			
									■	2x 20			

Extension of the fire resistance certificate of usability
■ Divergences from the construction variants pages 20 and 21
Prior consultation in acc. to Page 6 is recommended.

Note Observe the notes on page 4

Maximum grid spacings

Dimensions in mm



Perimeter spacings:
Alternative 1 shown,
see page 34 also

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
Nonius stirrup 0.40 kN				
500	2600	2050[1)]	1600	1200
600	2450	1950[1)]	1300	1000
700	2300	1850[1)]	1100[2)]	850
800	2200	1650	1000[2)]	–
900	2150	1450	–	–
1000	2050	1300	–	–
1100	2000	1200[2)]	–	–
1200	1950	–	–	–
1300	1900	–	–	–
1400	1850	–	–	–
1500	1750	–	–	–

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[3)]	–	–	–
Threaded rod M8				
500	1700	1500	1400	1300
600	1600	1400	1300	1200
700	1500	1350	1250	1100[3)]
800	1400	1300	1200	–
900	1400	1250[3)]	–	–
1000	1300[3)]	1200[3)]	–	–

1) With fire resistance solely from below: Spacing of suspender (a) max. 1700 mm
2) Not valid for furring channel spacing (b) 800 mm
3) Only permissible for furring channel spacing (b) max. 500 mm

For axial spacings of furring channel also refer to pages 18 and 34

Notes

Observe additional constructional measures with *fire resistance solely from above* in accordance with page 63.

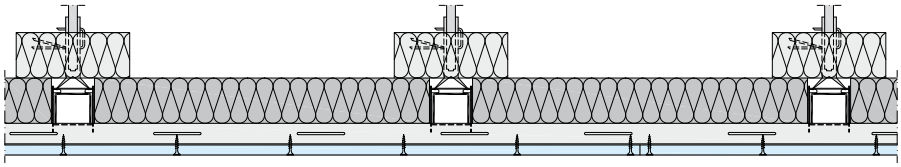
Customized dimensioning of the ceiling substructure is possible on request.

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

Fire protection solely from above acc. to AbP P-2100/199/15-MPA BS

Note	The system variants shown here generally show the exact system variants as in the National Technical Test Certificate (AbP). Divergences, e.g. use of other suspenders, other spacings of the grid as well as other cladding are possible in accordance with the specifications on pages 18 and 19. The notes acc. to page 6 apply accordingly.

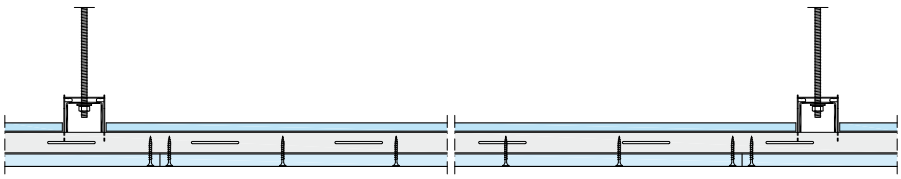
Knauf board ceiling D116.de with large-span metal grid



- **Fire protection class F30 solely from above**
- Double layer profile (carrying and furring channel)
- With insulation layer

Design alternatives		
Connection to solid walls	Perimeter runner	UD 28/27, fastening spacing ≤ 300 mm
Suspension	Description Suspension height	Nonius hanger, spacing a ≤ 2000 mm ≤ 1500 mm
Grid	Carrying channel Furring channel Connection of the profiles	UA50, axial spacing c ≤ 500 mm CD 60/27, axial spacing b ≤ 500 mm Intersection connector for UA with CD Channel
Mineral wool insulation layer EN 13162	Thickness Density Melting point acc. to DIN 4102-17	1x 60 mm (additional 100 mm wide strip on carrying channels) ≥ 50 kg/m³ ≥ 1000 °C
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 15 mm Knauf Feuerschutzplatte fire-resistant board, single-layer ≤ 1250 mm x 2000 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 ≤ 150 mm

Knauf board ceiling D116.de with large-span metal grid



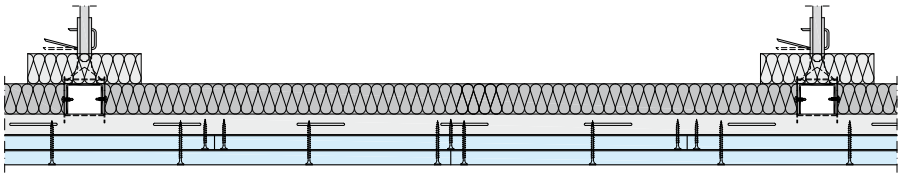
- **Fire protection class F30 solely from above**
- Double layer profile (carrying and furring channel)
- Without insulation layer

Design alternatives		
Connection to solid walls	Perimeter runner	UD 28/27, fastening spacing ≤ 300 mm
Suspension	Description Suspension height	Threaded rod M8, spacing a ≤ 1200 mm ≤ 1500 mm
Grid	Carrying channel Furring channel Connection of the profiles	UA50, axial spacing c ≤ 1300 mm CD 60/27, axial spacing b ≤ 400 mm Intersection connector for UA with CD Channel
Top side covering on the furring channels	Board thickness/type	≥ 12.5 mm Feuerschutzplatte Knauf Piano, loosely applied, joint overlay ≥ 70 mm
Mineral wool insulation layer EN 13162	without	–
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 18 mm Knauf Feuerschutzplatte fire-resistant board, single-layer ≤ 1250 mm x 2000 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 ≤ 150 mm

Fire protection solely from below and from above acc. to AbP P-3400/4965-MPA BS

Note	The system variants shown here generally show the exact system variants as in the National Technical Test Certificate (AbP). Divergences, e.g. use of other suspenders, other spacings of the grid as well as other cladding are possible in accordance with the specifications on pages 18 and 19. The notes acc. to page 6 apply accordingly.

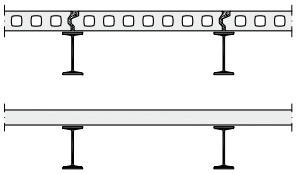
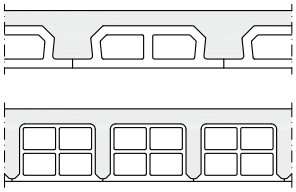
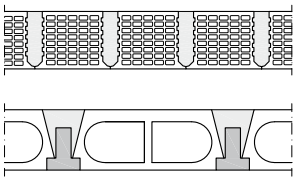
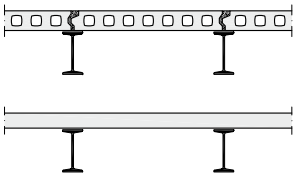
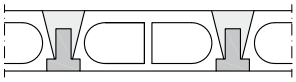
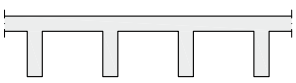
Knauf board ceiling D116.de with large-span metal grid



- **Fire resistance class F90 solely from below and from above**
- Double layer profile (carrying and furring channel)
- With insulation layer

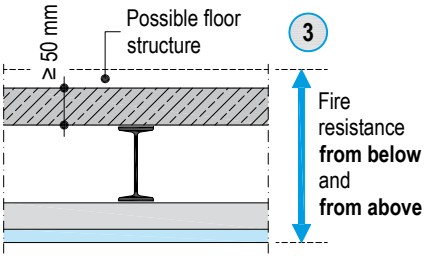
Design alternatives		
Connection to solid wall and light partitions	Perimeter runner	UD 28/27, fastening spacing to solid walls ≤ 400 mm Fastening to light partitions with 2x Knauf Universal-schrauben multi-purpose screw FN 4.3x35 each (longer if required with wall cladding > 2x 12,5 mm) in each stud
Suspension	Description Suspension height	Nonius hanger, spacing a ≤ 800 mm (with fire resistance from above screw to carrying channel) or threaded rod M8, spacing ≤ 1200 mm ≤ 1500 mm (with fire resistance from above)
Grid	Carrying channel Furring channel Connection of the profiles	UA50, axial spacing c ≤ 1000 mm CD 60/27, axial spacing b ≤ 400 mm Intersection connector for UA with CD Channel
Mineral wool insulation layer EN 13162 (only necessary with fire resistance from above)	Thickness Density Melting point acc. to DIN 4102-17	1x 40 mm (additional 150 mm wide strip on carrying channels) ≥ 40 kg/m³ ≥ 1000 °C
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 2x20 mm Massivbauplatte Solid Board, double-layer ≤ 625 mm x 2500 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 (first layer), Knauf Schnellbauschrauben drywall screws TN 3.5x55 (second layer) ≤ 300 mm (first layer), ≤ 170 mm (second layer)

Fire resistance in conjunction with basic ceilings of types I to III

(2) Basic ceilings	System selection
Ceiling type I	
	Ceilings with exposed steel beams in the plenum area with a U/A 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 a U/A ratio ≤ 300 m^{-1} and an upper cover of in-situ concrete or prefabricated boards with structurally active in-situ concrete layer or perfabricated 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.

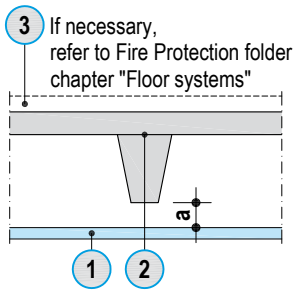
If the basic ceiling alone does not comply with the required fire resistance class, an additional suspended ceiling / ceiling lining made of Knauf boards in conjunction with a basic ceiling can provide the required fire resistance. For a classification from above, additional measures may be necessary,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



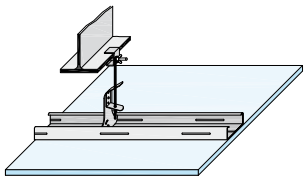
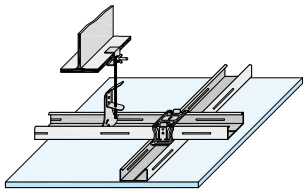
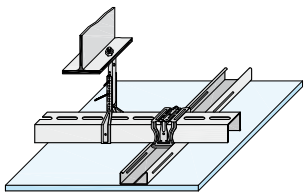
The specifications of the German National Technical Test Certificate (AbP) assume, among other factors, that in the plenum area between basic ceiling and suspended ceiling, that no combustible components are located with the exception of components that are elements of the suspended ceiling construction. 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/m².

Fire resistance in conjunction with basic ceilings of types I to III

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



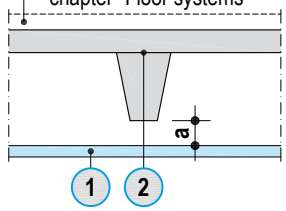
3 If necessary, refer to Fire Protection folder chapter "Floor systems"

Fire resistance From below and from above 1 + 2 + possibly 3	Fire resistance class Basic ceiling type acc. to DIN 4102–4 I	II	III	1 Cladding (lateral application) Feuerschutzplatte Knauf Piano	Knauf Feuerschutzplatte	Massivbauplatte Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	Furring channel Max. axial spacings b mm	Insulation layer In the ceiling plenum	Minimum suspension height Basic ceiling lower edge upper edge cladding a mm
D112.de/D116.de Knauf board ceiling with metal grid													
	F30				■					15		Permissible	40
							■			15	500	Permissible	40
						■				20		Not permissible	15
D112.de Furring channel/Hat-shaped channel		F30		■						12.5		Not permissible	40
							■			12.5	500	Not permissible	40
or								■		12.5	400	Not permissible	40
					■					15		G	40
							■			15	500	G	40
						■				20		Not permissible	15
D112.de Carrying channel and furring channel CD			F30	■						12.5		Not permissible	40
							■			12.5	500	Not permissible	40
or								■		12.5	400	Not permissible	40
				■						12.5		G	80
							■			12.5	500	G	80
								■		12.5	400	G	80
D116.de Carrying channel and furring channel UA+CD					■					15		G	40
							■			15	500	G	40
						■				20		Not permissible	15

plus Extension of the fire resistance certificate of usability
■ Divergences from the construction variants pages 28 and 29
Prior consultation in acc. to Page 6 is recommended.

Notes
2 3 See page 22
Observe the notes on page 4

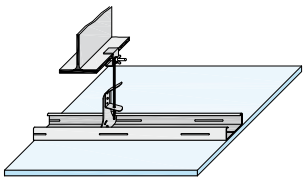
D112.de/D116.de Fire resistance in conjunction with basic ceilings of types I to III



(3) If necessary, refer to Fire Protection folder chapter "Floor systems"

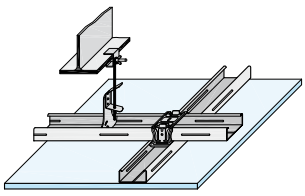
Fire resistance
From below and from above
(1) + (2) + possibly (3)

Fire resistance class	Basic ceiling type acc. to DIN 4102–4			(1) Cladding (lateral application)							Furring channel	Insulation layer	Minimum suspension height
				Feuerschutzplatte Knauf Piano	Knauf Feuerschutzplatte	Massivbauplatte Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness	Max. axial spacings (b)	In the ceiling plenum	Basic ceiling lower edge upper edge cladding a
	I	II	III							mm	mm		mm
D112.de/D116.de Knauf board ceiling with metal grid													
F60					■					2x 15	500	Not permissible	15
							■			2x 15		Not permissible	15
	F60				■					2x 15	500	Not permissible	15
							■			2x 15		Not permissible	15
		F60		■						12.5	400	Not permissible	80
							■			12.5		Not permissible	80
								■		12.5		Not permissible	80
					■					15		Not permissible	40
							■			15		Not permissible	40
					■					15		(S)	80
							■			15		(S)	80
						■				20		Not permissible	15



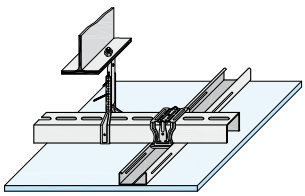
D112.de Furring channel/Hat-shaped channel

or



D112.de Carrying channel and furring channel CD

or



D116.de Carrying channel and furring channel UA+CD

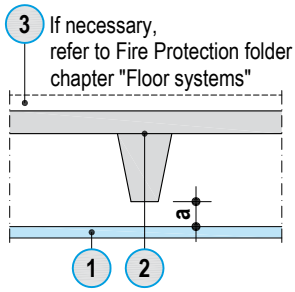
Insulation layer (S) : Thickness ≥ 50 mm; density ≥ 40 kg/m³

plus Extension of the fire resistance certificate of usability
■ Divergences from the construction variants pages 28 and 29
Prior consultation in acc. to Page 6 is recommended.

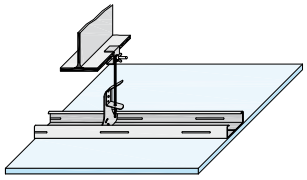
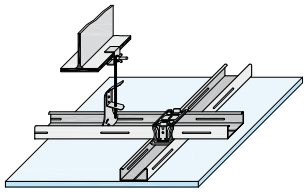
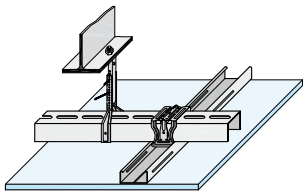
Notes
(2) (3) See page 22
Observe the notes on page 4

Fire resistance in conjunction with basic ceilings of types I to III

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



(3) If necessary, refer to 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 I	II	III	(1) **Cladding** (lateral application) Feuerschutzplatte Knauf Piano	Knauf Feuerschutzplatte	Massivbauplatte Solid Board	Diamant	Silentboard	Fireboard	Minimum thickness mm	**Furring channel** Max. axial spacings (b) mm	**Insulation layer** In the ceiling plenum	**Minimum suspension height** Basic ceiling lower edge upper edge cladding **a** mm
D112.de/D116.de Knauf board ceiling with metal grid													
 *D112.de Furring channel/Hat-shaped channel*	**F90**								■	**15**[1]	400	Not permissible	200
									■	**20**		Not permissible	40
									■	**25**[1]		Not permissible	15
									■	**25**		(S)	80
or  *D112.de Carrying channel and furring channel CD*		**F90**							■	**12.5**	400	Not permissible	200
									■	**15**[1]		Not permissible	30
									■	**20**		Not permissible	15
									■	**20**		(S)	80
or  *D116.de Carrying channel and furring channel UA+CD*			**F90**						■	**12.5**	400	Not permissible	40
									■	**15**[1]		Not permissible	15
									■	**15**		(S)	80
					■					**15**	500	Not permissible	80
							■			**15**		Not permissible	80

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

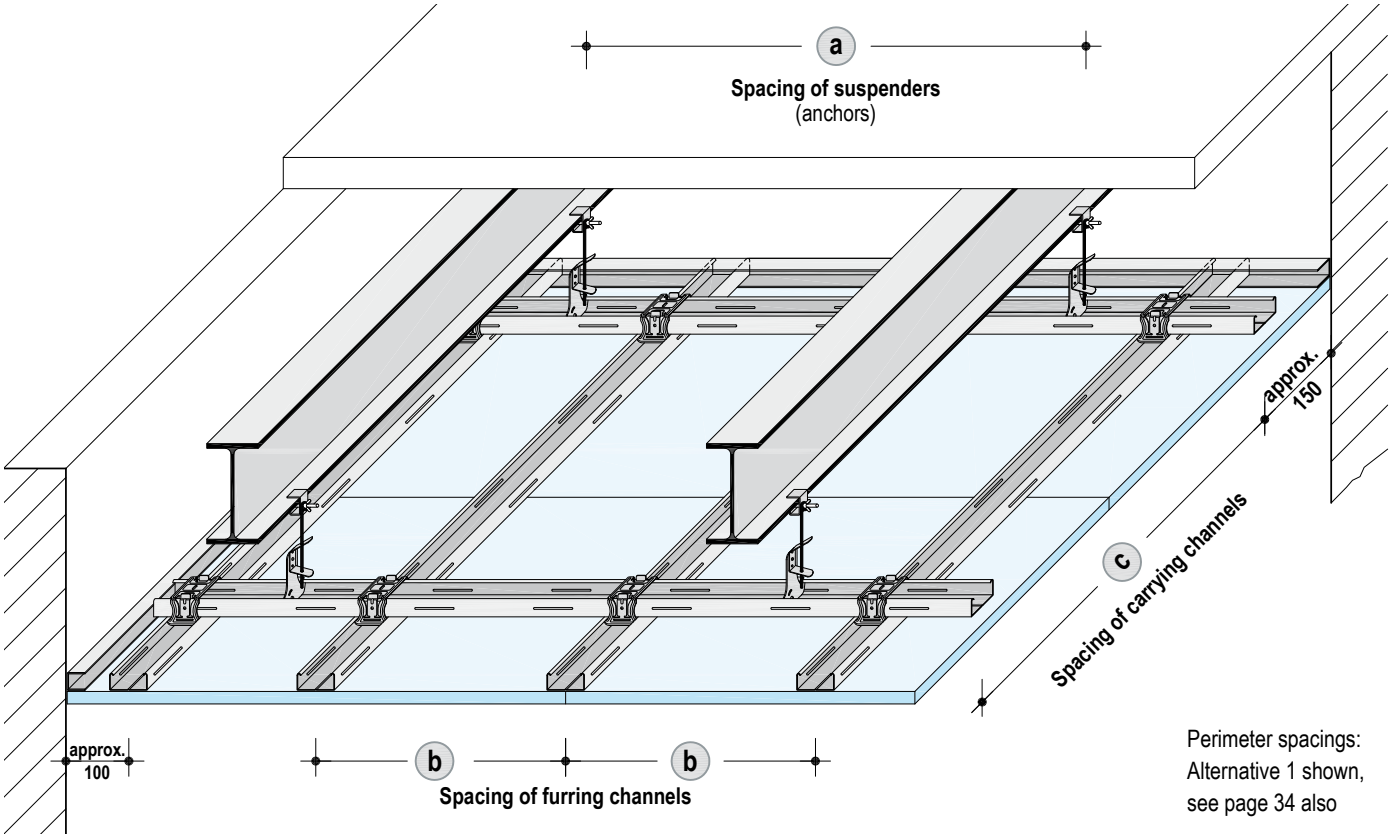
Insulation layer (S) : Thickness ≥ 50 mm; density ≥ 40 kg/m³

plus **Extension of the fire resistance certificate of usability**
■ Divergences from the construction variants pages 28 and 29
Prior consultation in acc. to Page 6 is recommended.

Notes
(2) (3) See page 22
Observe the notes on page 4

D112.de Maximum grid spacings

Dimensions in mm



Perimeter spacings:
Alternative 1 shown,
see page 34 also

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 (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)]
400	1400	1150	1050	1000	900
500	1300	1050	950	900	850

Extension of the fire resistance certificate of usability
■ Divergences from the construction variants pages 28 and 29
Prior consultation in acc. to Page 6 is recommended.

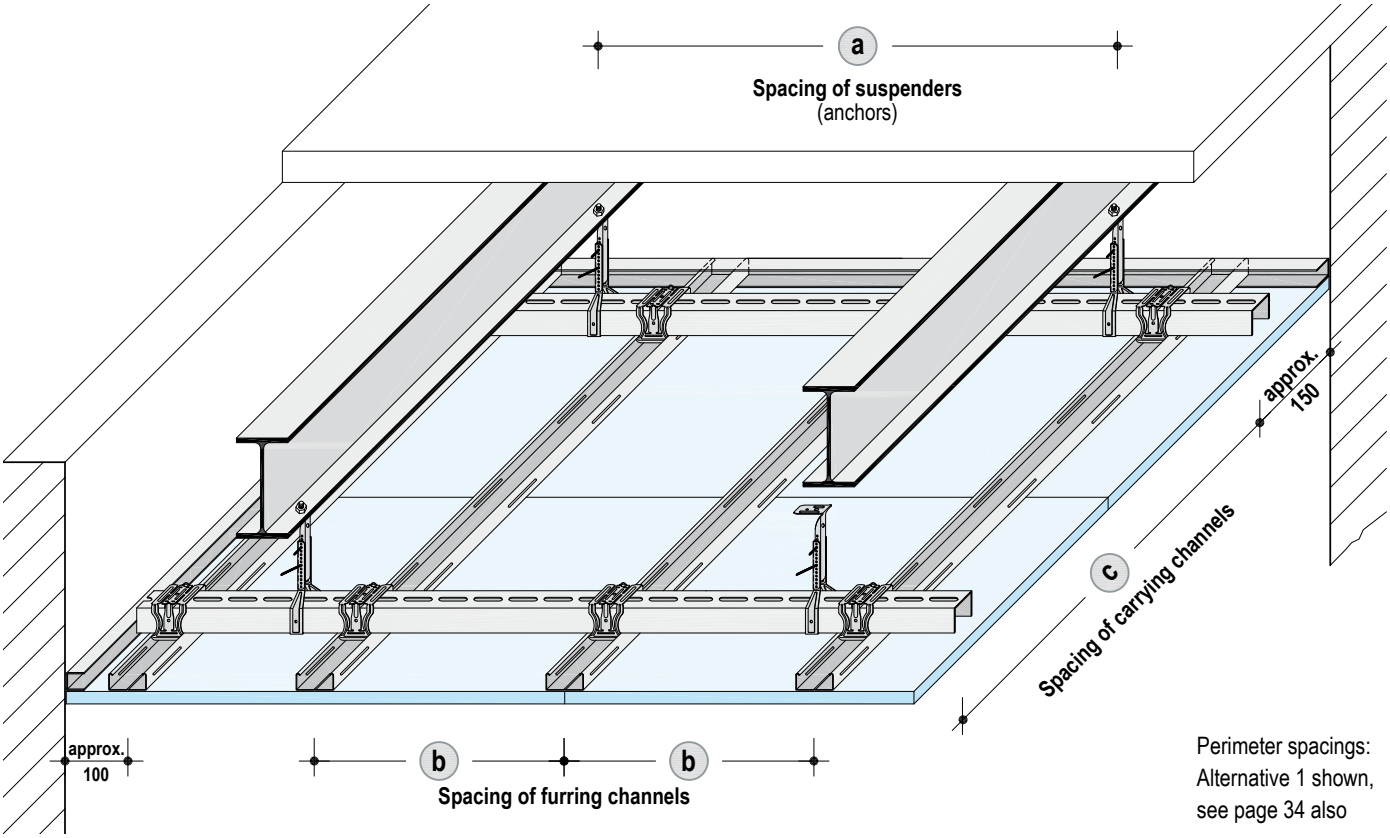
1) Use suspenders of load carrying capacity class 0.40 kN
2) Only permissible for furring channel spacing (b) max. 500 mm

For axial spacings of furring channel also refer to pages 23, 24 and 25

Fire resistance in conjunction with basic ceilings of types I to III

D116.de Maximum grid spacings

Dimensions in mm



Perimeter spacings:
Alternative 1 shown,
see page 34 also

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

Carrying channel spacings (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 of furring channel also refer to pages 23, 24 and 25

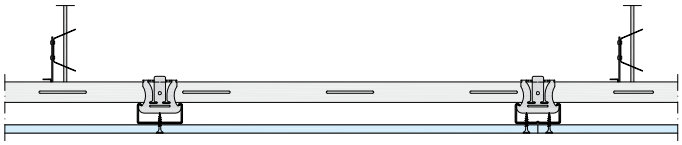
Extension of the fire resistance certificate of usability
■ Divergences from the construction variants pages 28 and 29
Prior consultation in acc. to Page 6 is recommended.

Fire resistance in conjunction with basic ceilings of types I to III acc. to AbP P-3155/3992-MPA BS

Note	The system variants shown here generally show the exact system variants as in the National Technical Test Certificate (AbP). Divergences, e.g. use of other suspenders, other spacings of the grid as well as other cladding are possible in accordance with the specifications on pages 23 to 27. The notes acc. to page 6 apply accordingly.

Knauf board ceiling D112.de with metal grid or D113.de with flush metal grid

Scheme drawing D112.de

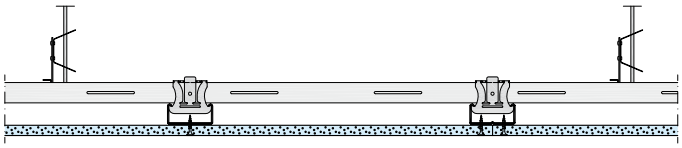


- **Fire resistance F30 in conjunction with basic ceilings of types I, II or III**
- Double layer profile (carrying and furring channel)
- Without insulation layer
- Concrete thickness ≥ 90 mm

Design alternatives		
Connection to wall	Perimeter runner	U profile 30/30, fastening spacing ≤ 500 mm
Suspension	Description Suspension height	Hanging wire with Ankerfix rapid hanger, spacing a ≤ 750 mm ≥ 120 mm
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 1250 mm, with Silentboard c ≤ 600 mm CD 60/27, axial spacing b ≤ 500 mm, with Silentboard b ≤ 400 mm Intersection connector for CD (D112.de) or flush connector (D113.de)
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners	≥ 12,5 mm Feuerschutzplatte Knauf Piano GKF / Diamant GKFI / Silentboard GKF, single-layer ≤ 1250 mm x 2000 mm Knauf Schnellbauschrauben drywall screws TN 3.5x25 or XTN 3.9x23 ≤ 150 mm

Knauf board ceiling D112.de with metal grid or D113.de with flush metal grid

Scheme drawing D112.de



- **Fire resistance F90 in conjunction with basic ceilings of type I**
- Double layer profile (carrying and furring channel)
- Without insulation layer
- Concrete thickness ≥ 125 mm

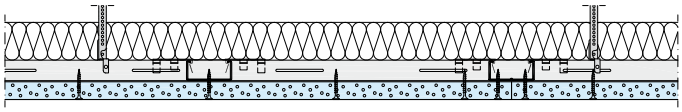
Design alternatives		
Connection to wall	Perimeter runner	U profile 30/30, fastening spacing ≤ 500 mm
Suspension	Description Suspension height	Hanging wire with Ankerfix rapid hanger, spacing a ≤ 750 mm ≥ 210 mm
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 1250 mm CD 60/27, axial spacing b ≤ 400 mm Intersection connector for CD (D112.de) or flush connector (D113.de)
Cladding	Board thickness/type Maximum board size Fastening Spacing of fasteners Joints	≥ 15 mm Fireboard, single-layer ≤ 1250 mm x 2000 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 ≤ 150 mm Apply backing to board joints with 100 mm wide and 15 mm thick Fireboard strips and screw fasten.

Fire resistance in conjunction with basic ceilings of types I to III acc. to AbP P-3155/3992-MPA BS

Note	The system variants shown here generally show the exact system variants as in the National Technical Test Certificate (AbP). Divergences, e.g. use of other suspenders, other spacings of the grid as well as other cladding are possible in accordance with the specifications on pages 23 to 27. The notes acc. to page 6 apply accordingly.

Knauf board ceiling D112.de with metal grid or D113.de with flush metal grid

Scheme drawing D113.de

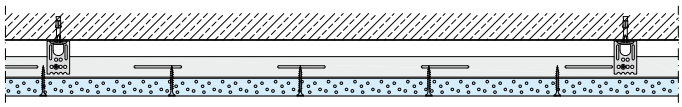


- **Fire resistance F90 in conjunction with basic ceilings of type I**
- Double layer profile (carrying and furring channel)
- With insulation layer
- Concrete thickness ≥ 125 mm

Design alternatives		
Connection to wall	Perimeter runner	UD 28/27, fastening spacing ≤ 500 mm
Suspension	Description Suspension height	Nonius hanger, spacing a ≤ 650 mm ≥ 160 mm
Grid	Carrying channel Furring channel Connection of the profiles	CD 60/27, axial spacing c ≤ 1250 mm CD 60/27, axial spacing b ≤ 400 mm Intersection connector for CD (D112.de) or flush connector (D113.de)
Cladding and thermal insulation	Board thickness/type Maximum board size Fastening Spacing of fasteners Insulation layer	≥ 25 mm Fireboard, single-layer ≤ 1250 mm x 2000 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 ≤ 170 mm Lay a 50 mm mineral wool covering of “Rockwool Thermarock 40” on the fully surface on top of the metal grid

Knauf board ceiling D112.de with metal grid

Scheme drawing with CD 60/27

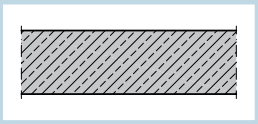
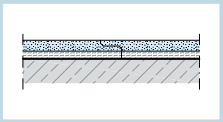
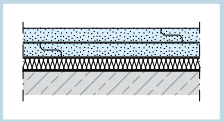
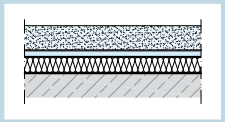
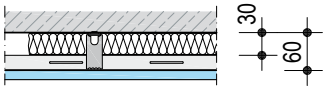
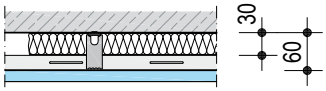
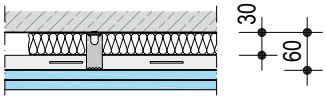
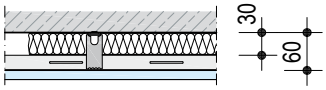
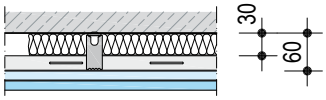
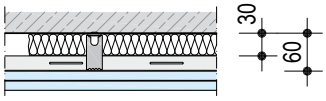


- **Fire resistance F90 in conjunction with basic ceilings of types I, II or III**
- Single-layer profile (furring channel)
- Concrete thickness ≥ 125 mm

Design alternatives			
		Basic ceiling of type I	**Basic ceiling ot type II o III**
Connection to wall	Perimeter runner	UD 28/27, fastening spacing ≤ 625 mm	UD 28/27, fastening spacing ≤ 625 mm
Suspension	Suspension CD 60/27 suspension height/plenum	Universal bracket for CD 60/27 ≥ 15 mm	Universal bracket for CD 60/27 ≥ 30 mm
Grid	Furring channel Spacing of suspender a or fastening spacing a	CD 60/27 or hat-shaped channel CD 98/15 Axial spacing b ≤ 400 mm ≤ 750 mm	CD 60/27 or hat-shaped channel CD 98/15 Axial spacing b ≤ 400 mm ≤ 750 mm
Cladding and lightweight partition	Board thickness/type Maximum board size Fastening Spacing of fasteners Joints With connection to lightweight partition	≥ 25 mm Fireboard ≤ 1250 mm x 2000 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 ≤ 170 mm Apply backing to board joints with 100 mm wide and 15 mm thick Fireboard strips. Knauf metal stud partition W112.de, minimum 100 mm thick, at least F90, acc. to AbP P-3310/563/07-MPA BS	≥ 15 mm Fireboard ≤ 1250 mm x 2000 mm Knauf Schnellbauschrauben drywall screws TN 3.5x35 ≤ 170 mm

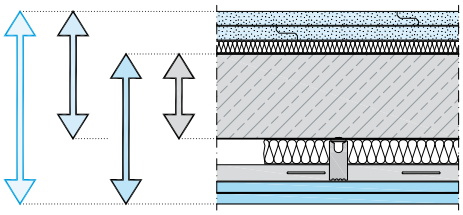
Airborne and impact sound insulation

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 	
	$R_{w,R}$ dB	$L_{n,w,R}$ **dB**	$R_{w,R}$ dB	$L_{n,w,R}$ **dB**	$R_{w,R}$ dB	$L_{n,w,R}$ **dB**	$R_{w,R}$ dB	$L_{n,w,R}$ **dB**
Without suspended ceiling	51	**82**	56	**59**	60	**51**	55	**43**
Basic ceiling + suspended ceiling **D112.de** ⟷			Basic ceiling + flooring + subceiling			⟷		
 ■ 12.5 mm Diamant	68	**57**	67[1]	**48**	70[1]	**43**	68[2]	**34[1]**
 ■ 15 mm Diamant	≥ 68[3]	**≤ 57[3]**	70	**47**	≥ 70[3]	**≤ 43[3]**	≥ 68[3]	**≤ 34[3]**
 ■ 2x 12.5 mm Diamant	72	**54**	72[1]	**43**	76[1]	**37**	72[2]	**28[1]**
 ■ 12.5 mm Silentboard	70	**52**	70[1]	**45**	74[1]	**38**	70[2]	**30[1]**
 ■ 12.5 mm Silentboard ■ 12.5 mm Diamant	72	**51**	73[1]	**42**	77[1]	**36**	72[2]	**27[1]**
 ■ 2x 12.5 mm Silentboard	73	**50**	74[1]	**41**	77[1]	**34**	73[2]	**26[1]**

1) Calculation based on the detailed procedure acc. to EN 12354
2) Measured values of basic ceiling and suspended ceiling without flooring
3) Calculation values derived from cladding 12.5 mm
Larger suspension heights / larger thicknesses 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
Mineral wool insulation layer 30 mm, acc. to EN 13162,
length-related flow resistance acc. to EN 29053 r ≥ 5 kPa·s/m²
(e.g. Knauf Insulation Akustik-Dämmplatte TP 120 A)
Direktschwingabhänger damping universal bracket
Cladding

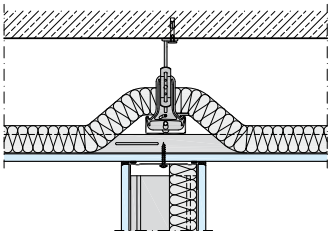
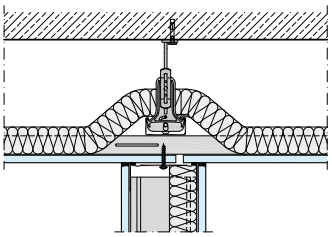
Terms

- 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
- Index R is used to differentiate between the calculation value and the test stand values.

Verification acc. to E DIN 4109:2013

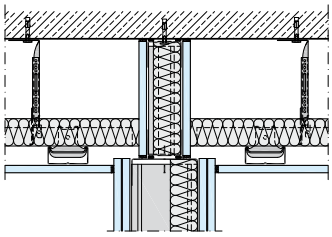
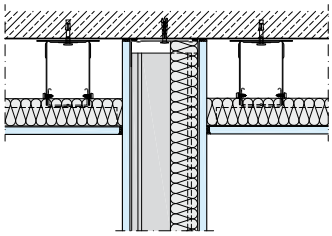
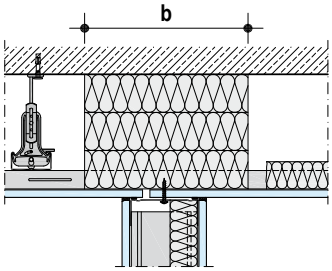
The verification of the DIN 4109:2013 currently in the draft phase is no longer according to calculation values, but rather with the values obtained on the test rig rounded off to a single position following the decimal point.
Only at the end of the forecast after consideration of all the perimeter surfaces (flanking surfaces) involved in the transmission of sound is an element of forecast uncertainty included in dependence on the type of separating constructional component.
Should test rig values not be available, the forecast can be performed on the safe side with the calculation values + margin.
If the margin has not been expressed separately and is thus not evident from these documents, a margin of 2 dB can be applied.

Flanking normalized level difference of Knauf board ceiling under solid ceilings

Construction examples Knauf system D112.de Suspension height 400 mm		**Cladding** Minimum thickness mm	**Weighted normalized level difference $D_{n,f,w}$** Without mineral wool layer dB	With full surface mineral wool layer **≥ 50 mm** dB	 **≥ 80 mm** dB
Connection of partition to suspended ceiling Continuous cladding		Single-layer ≥ 12.5	**48**	**49**	**50**
		Double-layer ≥ 2x 12.5	**55**	**56**	**56**
Connection of partition to suspended ceiling Separated cladding		Single-layer ≥ 12.5	**50**	**54**	**56**
		Double-layer ≥ 2x 12.5	**57**	**59**	**59**

The values can be used up to a suspension height of 400 mm. Should the suspension height exceed 400 mm, the values should be reduced by 1 dB. By provision of a board bulkhead the normalized level difference can be raised by 20 dB, however only up to a maximum of 67 dB.

Flanking normalized level difference of Knauf board ceiling under solid ceilings

Construction examples Knauf system D112.de Suspension height 400 mm		**Cladding** Minimum thickness mm	**Weighted normalized level difference $D_{n,f,w}$** With full surface mineral wool layer **≥ 40 mm** dB
Separation of the plenum By a bulkhead made of boards		Single-layer ≥ 12.5	**67**
Connection of partition to solid ceiling The cladding up to the solid ceiling acts effectively as a separating bulkhead for the plenum		Single-layer ≥ 12.5	**67**
Connection of partition to suspended ceiling Cladding separated with absorbent bulkhead[1)] ≥ 400 mm		Single-layer ≥ 12.5	**62**

1) Absorbent bulkhead made of mineral wool acc. to EN 13162, length related flow resistance value r ≥ 8 kPa·s/m²

Improvement factors of the weighted normalized level difference $D_{n,f,w}$ of suspended ceilings for table on page 32 using an absorbent bulkhead with horizontal sound transmission in accordance with the table on page 33.

Minimum width of the absorbent bulkhead b in mm	Improvement factor in dB
300	12
400	14
500	15
600	17
800	20
1000	22

- Absorbent bulkhead made of mineral wool acc. to EN 13162, length related flow resistance value r ≥ 8 kPa·s/m².
- The highest value for the table on page 32 and the improvement factor can only be a maximum of 62 dB.

Permissible cladding span widths (lateral cladding)

Dimensions in mm

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

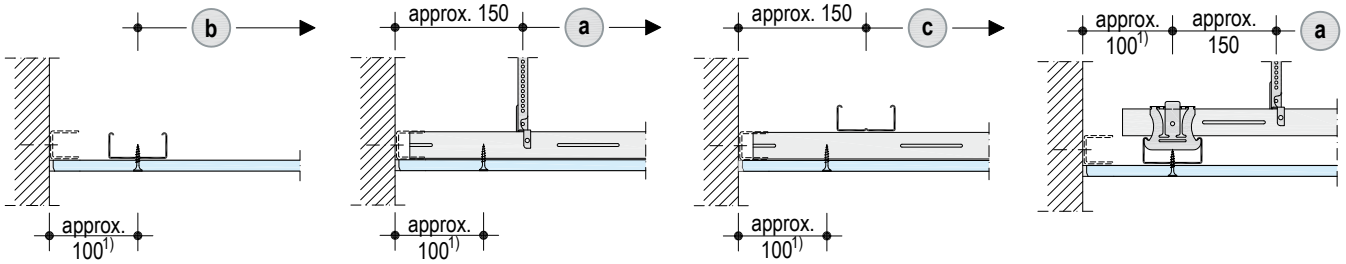
When coating with a plaster of layer thickness ≥ 6 mm (e.g. cooling ceilings) furring channel axial spacing ≤ 312.5 mm. Observe the additional load due to the plaster layer when dimensioning the grid in accordance with page 5.

Perimeter spacings of the grid (Scheme drawings – examples)

Dimensions in mm

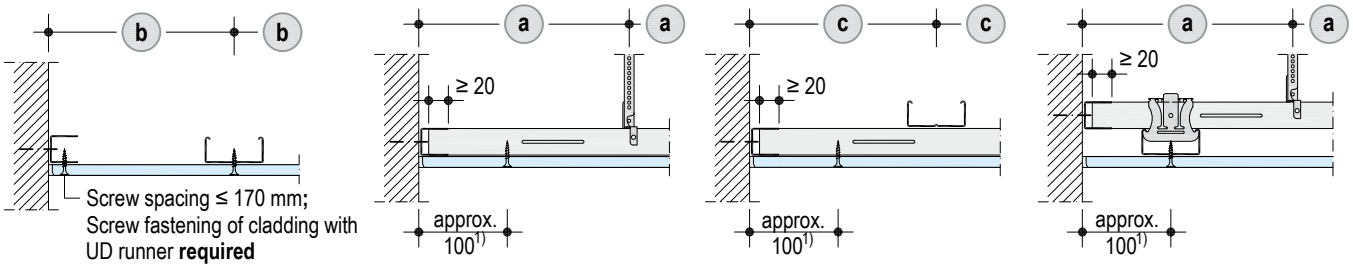
Alternative 1: Non-load-bearing connection (connection is not used for load-bearing of the ceiling)

- Without perimeter joint backing
- Backing with UD runner as installation aid, in case of fire resistance and sound protection, spacing of anchors of UD runner up to approx. 1 m



Alternative 2: Load-bearing connection

- The spacing of the UD runner anchors 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*

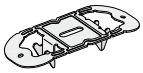
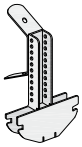
(b) *Axial spacing furring channel (cladding span width)*

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

1) Maximum projection of the cladding

Suspenders

Dimensions in mm

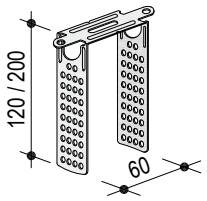
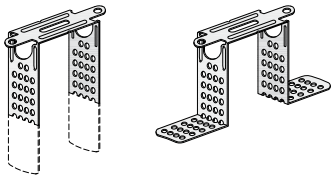
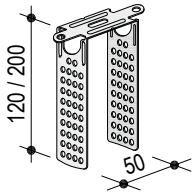
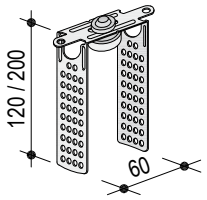
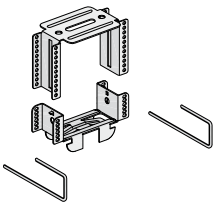
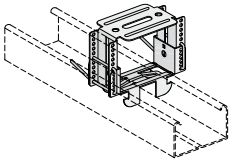
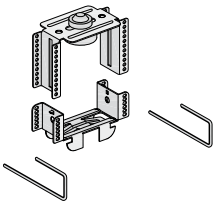
<table>
<tr><th>Suspension</th><th>Drawing</th><th></th><th>Comment</th></tr>
<tr><td colspan="4">Multi-level ceiling system – 0.15 kN (15 kg) load-bearing capacity class</td></tr>
<tr><td>Direct bracket
For CD 60/27</td><td> 
Bend side tabs</td><td></td><td>Anchor to fire protection ceiling with Knauf FN 4.3x35 or Knauf FN 4.3x65</td></tr>
<tr><td colspan="4">0.25 kN (25 kg) load-bearing capacity class</td></tr>
<tr><td>Ankerfix Basic[1)]
Without lock
For CD 60/27</td><td>  </td><td rowspan="3"> 
Suspended with
hanging wire</td><td rowspan="3">Anchoring to reinforced concrete ceiling with
Knauf Ceiling Steel Dowels</td></tr>
<tr><td>Ankerfix[1)]
With lock
For CD 60/27</td><td>  </td></tr>
<tr><td>Combo hanger
For CD 60/27</td><td>  </td></tr>
<tr><td>Rapid wood hanger
For wood frames
(batten cross-section ≥ 40x60)</td><td>  </td><td></td><td></td></tr>
</table>

1) Ankerfix Basic is the attractively priced variant of the Ankerfix suspender. During application, extreme care must be taken to avoid rattling (suspender must be positioned vertically) as readjustment is not possible. The Ankerfix suspender with lock enables realignment of the grid after installation of the suspender. After the lock is closed, a secure frictional and form locking connection with the profile is established.

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

Suspenders, continued

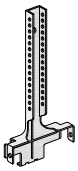
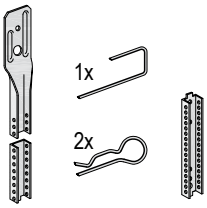
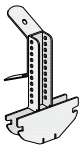
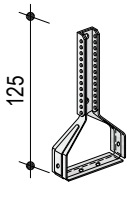
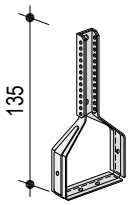
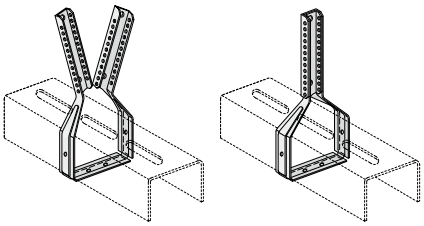
Dimensions in mm

Suspension	Drawing		Comment
0.40 kN (40 kg) load-bearing capacity class			
Universal brackets For CD 60/27			Anchoring to reinforced concrete ceiling with **1x Knauf Deckennagel ceiling steel dowel** at centre
For timber batten 50x30		Bend or cut the universal bracket/ damping universal bracket according to the required suspension height, screw fix to CD 60/27 (2x metal screws LN 3.5x11).	
Damping universal bracket For CD 60/27			Anchoring to reinforced concrete ceiling with **1x suitable steel dowel** at centre (observe anchoring depth)
Adjustable universal bracket For CD 60/27			Anchoring to reinforced concrete ceiling with **1x Knauf Deckennagel ceiling steel dowel** at centre
Adjustable damping universal bracket For CD 60/27		Adjustable universal bracket/adjustable damping universal bracket to be adjusted to suit the required installation height. Connect the upper and lower section with **2x Nonius pins** (secure against sliding out).	Anchoring to reinforced concrete ceiling with **1x suitable steel dowel** at centre (observe anchoring depth)

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

Suspenders, continued

Dimensions in mm

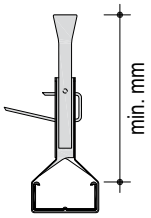
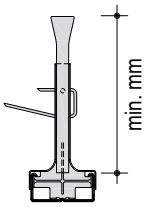
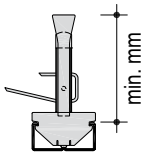
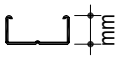
Suspension	Drawing		Comment
0.40 kN (40 kg) load-bearing capacity class			
Nonius hanger bottom For CD 60/27	 Screw tabs to CD 60/27 (2x metal screws LN 3.5x11) in case of: ■ *Fire protection from above (plenum)* and/or ■ Total ceiling load ≥ 0.5 kN/m² (Knauf recommendation: Screw fasten in case of total ceiling load ≥ 0.4 kN/m² to increase the installation safety)	 Suspended with **Nonius hanger top** and **1x Nonius pin** (secure against sliding out) or **2x Nonius bop pins** If required use additional **Nonius connector**	Anchoring to reinforced concrete ceiling with **Knauf Ceiling Steel Dowels**
Combo Hanger For CD 60/27			
Nonius stirrup Height 125 mm: For CD 60/27 Height 135 mm: For UA 50/40, For timber batten 50x30 (screw fix at side with TN 3.5x25)	   Bend Nonius stirrup around channel and fit together until it snaps in		

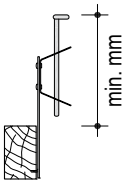
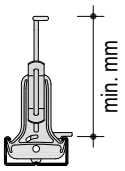
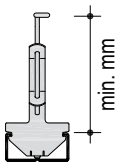
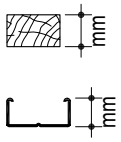
Note	Anchoring to basic ceilings made of other building materials with specially approved or standardized anchoring elements.

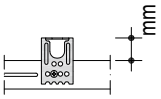
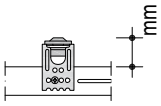
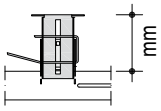
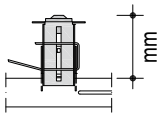
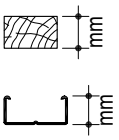
Construction heights

Dimensions in mm

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

System	Suspender with Nonius top Nonius stirrup	Nonius suspender	Combo Hanger	Frame profiles	Total lower edge height
					
D112.de	–	130	130	CD 60/27	27
	130	130	130	CD 60/27 + CD 60/27	54
D113.de	–	130	130	CD 60/27	27
D116.de	130	–	–	UA 50/40 + CD 60/27	67

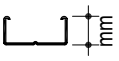
System	Suspended with wire Rapid wood hanger for wood	Ankerfix rapid hanger	Combo Hanger	Grid Batten (wxh) profiles	Total lower edge height
					
D111.de	110	–	–	50x30 + 40x60	90
D112.de	–	110	110	CD 60/27	27
	–	110	110	CD 60/27 + CD 60/27	54
D113.de	–	110	110	CD 60/27	27

System	Direct suspension Universal bracket	Damping universal bracket	Adjustable universal bracket	Adjustable damping universal bracket	Grid Batten (wxh) profile	Total lower edge height
						
D111.de	5 – 180	–	–	–	50x30	30
	5 – 180	–	–	–	50x30 + 50x30	60
D112.de	5 – 180	15 – 190	35 – 85	40 – 90	CD 60/27	27
	15 – 180	15 – 190	35 – 85	40 – 90	CD 60/27 + CD 60/27	54
D113.de	5 –180	15 – 190	35 – 85	40 – 90	CD 60/27	27

Constuction heights, 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 lower edge height
D112.de	4	CD 60/27	27

System	Hat-shaped channel	Frame profile	
	Directly anchored to basic ceiling		Total lower edge height
D112.de	–	Hat-Shaped Channel 98/15	15

Calculation example – determination of construction height

Steps			Dimensions in mm
1	**Height of the hanger** D112.de with Nonius suspender		130
2	**Height of grid** Carrying channel CD and furring channel CD	+	54
3	**Thickness of cladding** 2x 12.5 mm	+	25
4	**Sum**	=	209

Approx. 210 mm required height of construction of suspended ceiling

Planning of joints

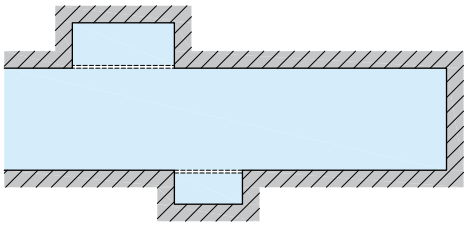
Observe the following criteria when planning movement and expansion joints:

- 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 m² should be subdivided by expansion joints.
- Movement joints have to be transferred into the construction of the 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.

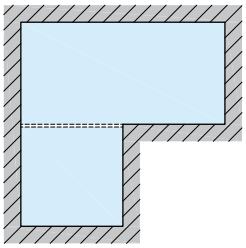
Examples with reduced free deformation

Expansion joints/movement joints

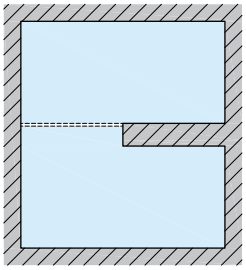
Hall ceiling with alcoves and protrusions – bay joints



Protruding solid constructions



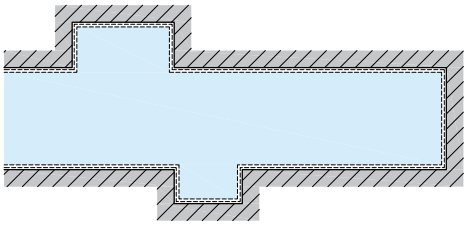
Protruding wall sections



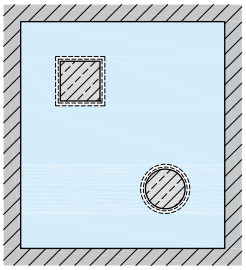
Design analogue to details: D111.de-C3, D112.de-C3, D113.de-C4

Deflection heads

Hall ceiling with alcoves and protrusions – circumferential deflection heads



Suspended ceiling with recesses for columns



Design analogue to detail: D112.de-D7

Attachment of loads to Knauf board ceilings

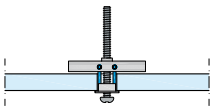
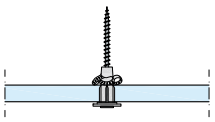
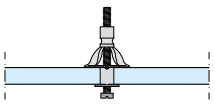
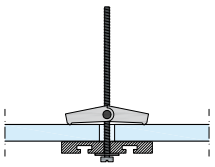
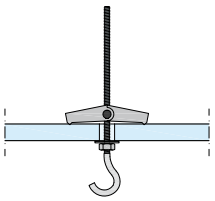
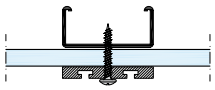
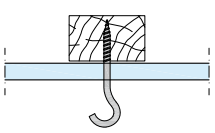
Additional loads, e.g. lighting fixtures, curtain rails and similar can be fixed to board ceilings using universal dowel plugs, cavity dowels or spring toggle dowels or Knauf Hartmut Hohlraumdübel cavity dowels provided that there are no demands made on the fire resistance.

- Light loads:
  Point loads attached directly to the cladding may not exceed 6 kg per board span width and metre (spacing between two furring channels).
- Higher loads:
  Single loads attached to the frame may not exceed 10 kg per profile and metre.

Existing demands on the fire resistance are subject to the following limitations: The attachment of additional loads (such as lighting fixtures) to the grid with a max. weight of 5 kg/m² and a maximum load of 10 kg per suspension point is permissible with suitable fasteners. Mounted elements with a weight up to 0.5 kg/m² (e.g. smoke detectors, motion sensors) may by attached to any position on the cladding.

The following generally applies to the loads fastened to the cladding or the grid: These additional loads must be considered in the calculation of the self-weight of the board ceiling in acc. with the diagram on page 5.

Heavy loads must be anchored directly on load-bearing building elements (basic ceiling) or on auxiliary constructions.

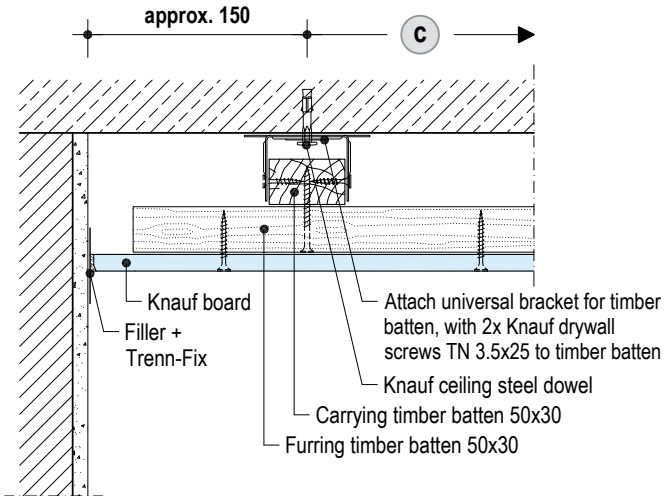
Fastening in the cladding Maximum of 6 kg per board span width and metre (with fire resistance maximum 0.5 kg per m²)	
	Knauf Hartmut Hohlraumdübel cavity dowel Screw M5
	Plastic cavity dowel Ø 8 mm or Ø 10 mm
	Metal cavity dowel Screw M5 or M6
	Spring toggle dowel e.g. curtain rail
	Spring toggle dowel e.g. roof suspension hooks
Fastening to the grid Maximum 10 kg per profile and metre (with fire resistance maximum 5 kg per m²)	
	Knauf Universalschraube FN multi-purpose screw e.g. curtain rail
	Ceiling hook

Details

Scale 1:5 I Dimensions in mm

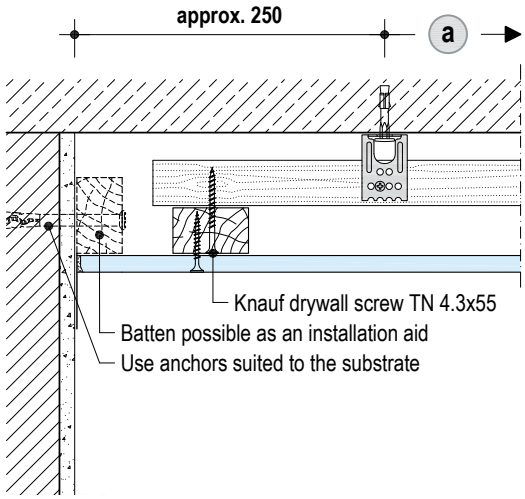
D111.de-A1 Connection to wall

Without fire resistance



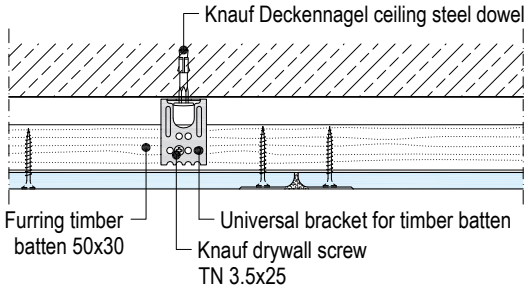
D111.de-D2 Connection to wall

Without fire resistance



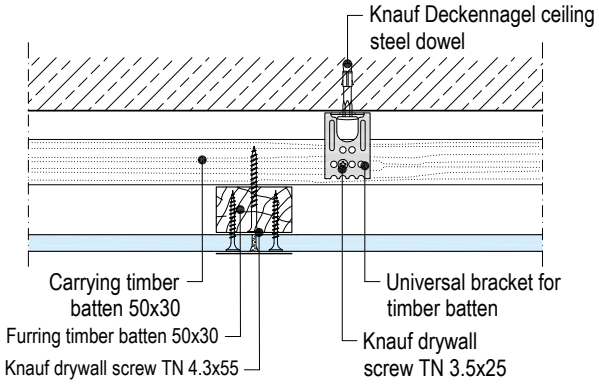
D111.de-B3 Longitudinal edge – Furring batten/Universal bracket

Without fire resistance



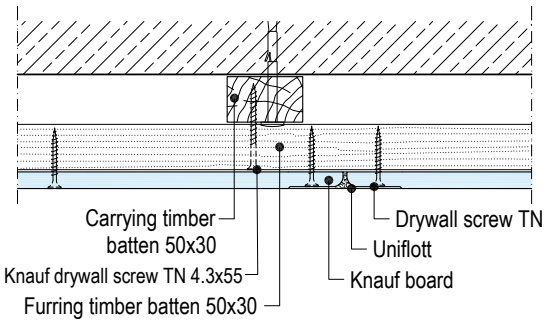
D111.de-C2 Front edge – Carrying channel/furring batten/ universal bracket

Without fire resistance



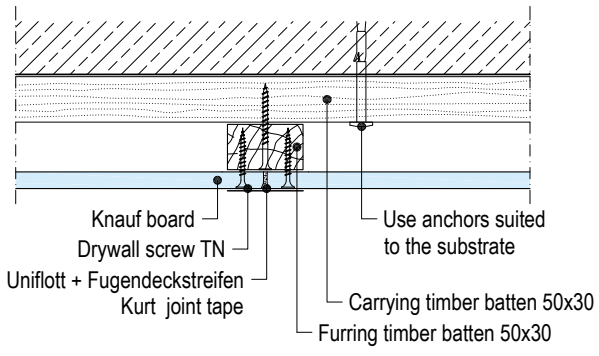
D111.de-B4 Longitudinal edge – Carrying channel/furring batten/ directly anchored

Without fire resistance



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

Without fire resistance

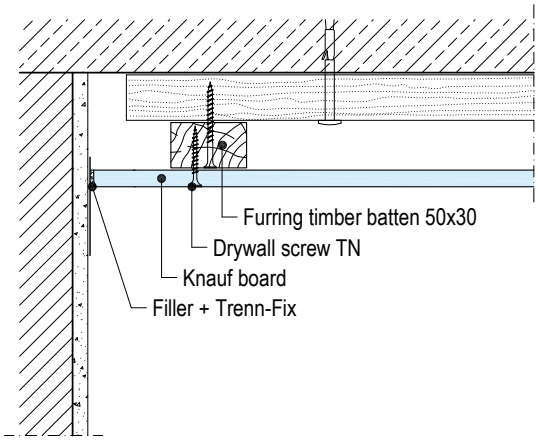


Details

Scale 1:5 I Dimensions in mm

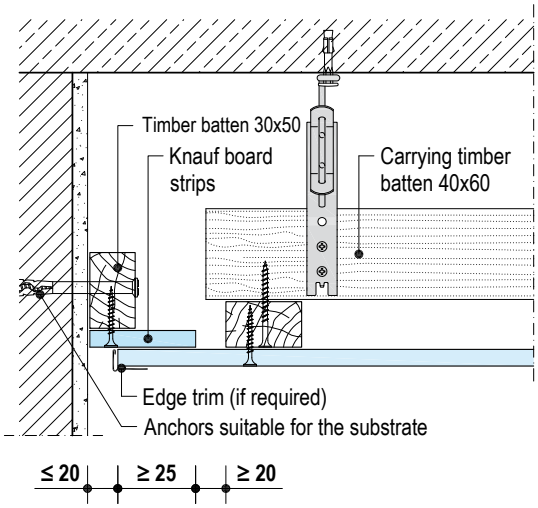
D111.de-D1 Connection to wall

Without fire resistance



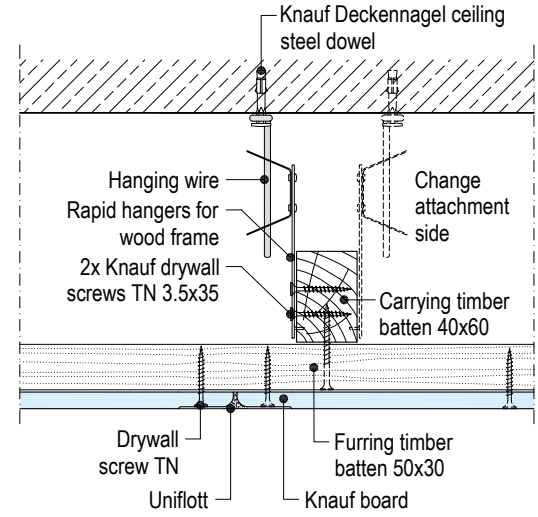
D111.de-D8 Connection to wall – shadow gap

Without fire resistance



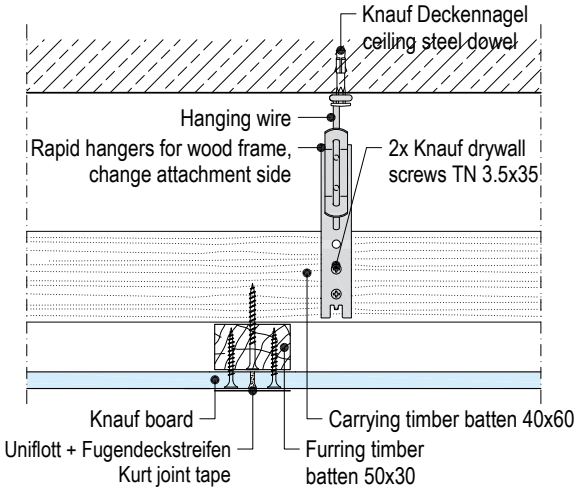
D111.de-B2 Longitudinal edge – Carrying channel/furring batten/rapid hanger

Without fire resistance



D111.de-C4 Front edge – Carrying channel/furring batten/rapid hanger

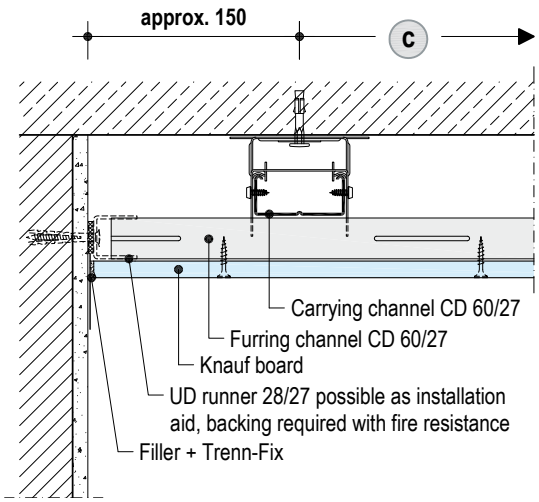
Without fire resistance



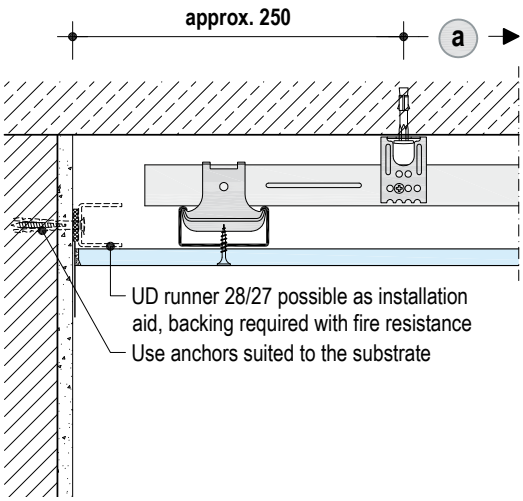
Details

Scale 1:5 I Dimensions in mm

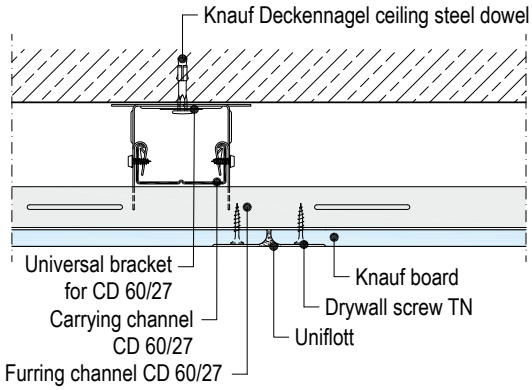
D112.de-A2 Connection to wall



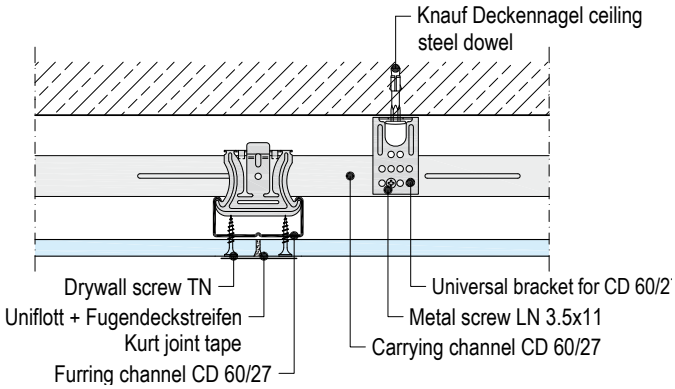
D112.de-D2 Connection to wall



D112.de-B2 Longitudinal edge – Carrying channel/furring channel/universal bracket



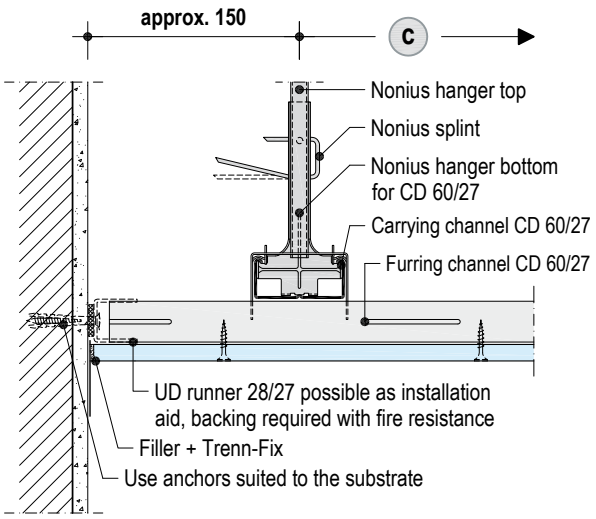
D112.de-C2 Front edge – Carrying channel/furring channel/universal bracket



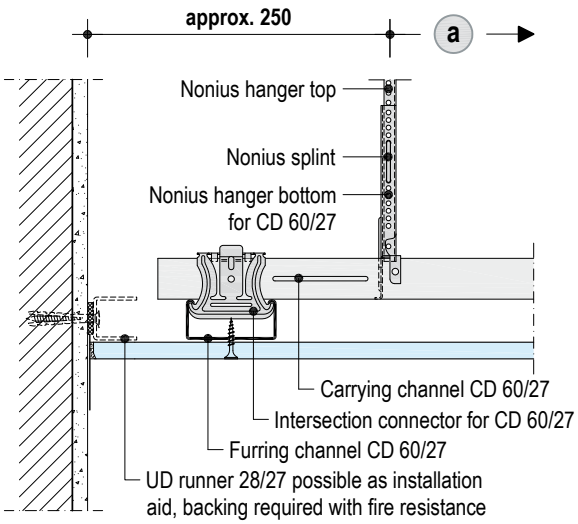
Details

Scale 1:5 I Dimensions in mm

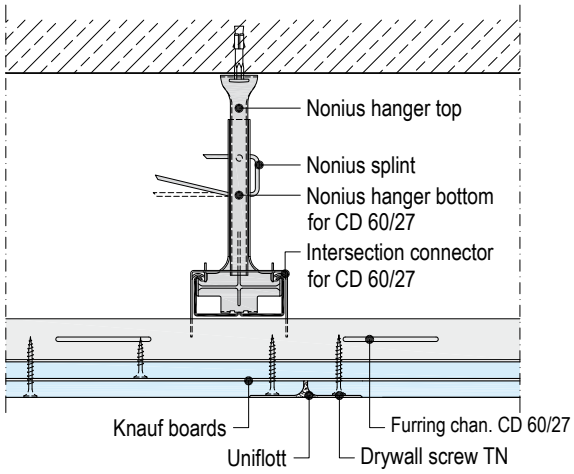
D112.de-A1 Connection to wall



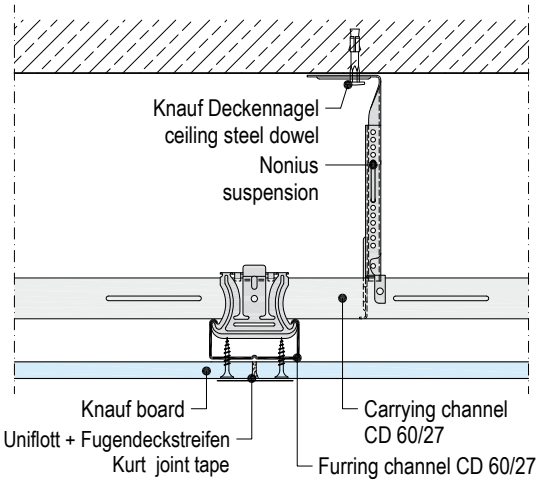
D112.de-D3 Connection to wall



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



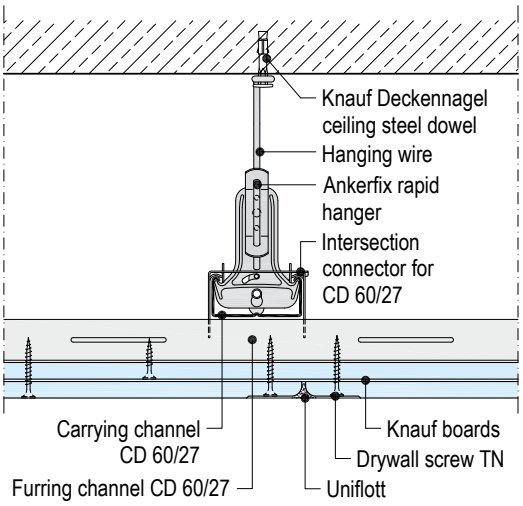
D112.de-C7 Front edge – Carrying channel/furring channel/Nonius hanger



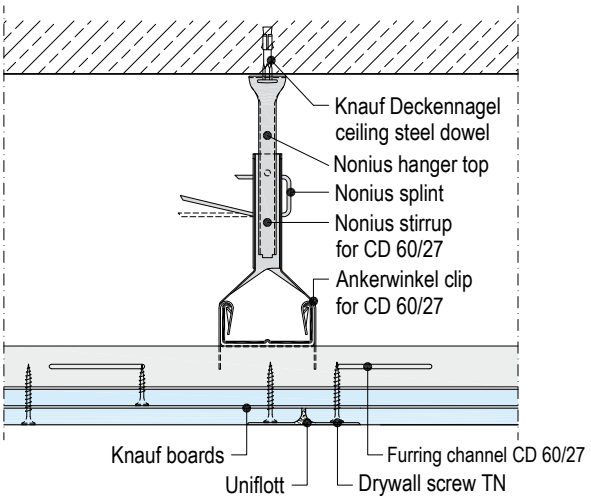
Details

Scale 1:5

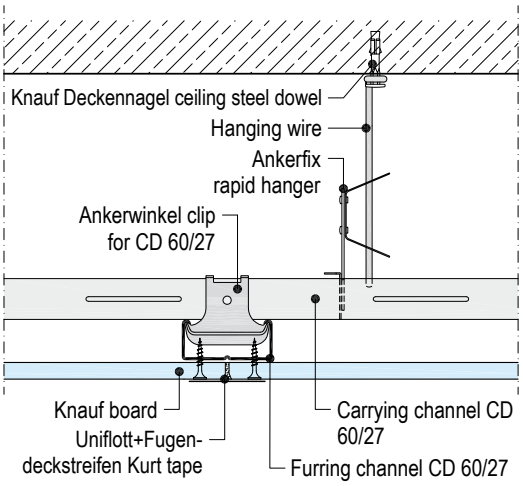
D112.de-B4 Longitudinal edge – Carrying channel/furring channel/Ankerfix



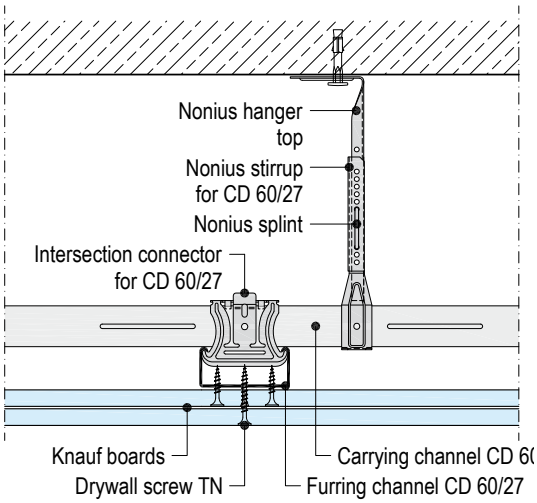
D112.de-B1 Longitudinal edge – Carrying channel/furring channel/Nonius stirrup



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



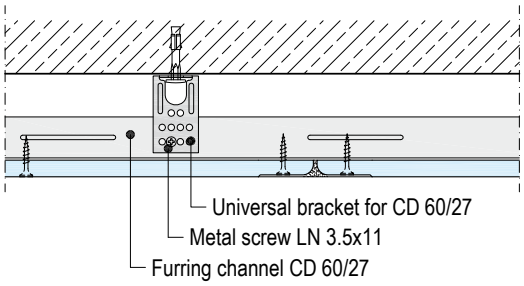
D112.de-C1 Front edge – Carrying channel/furring channel/Nonius stirrup



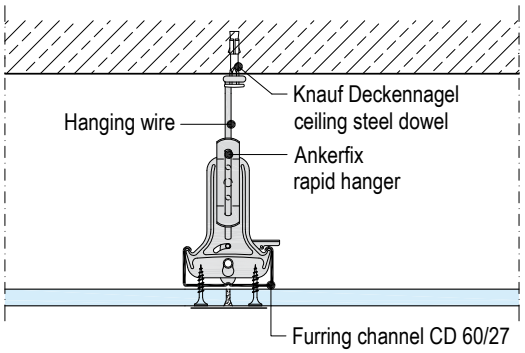
Details

Scale 1:5

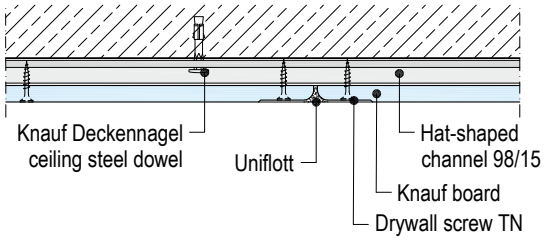
D112.de-B9 Longitudinal edge – Furring channel/universal bracket



D112.de-C9 Front edge – Furring channel/Ankerfix

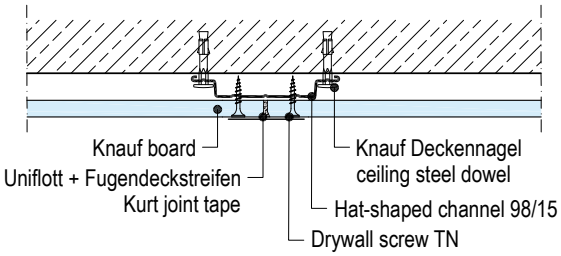


D112.de-B10 Longitudinal edge – Hat-shaped channel



plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

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



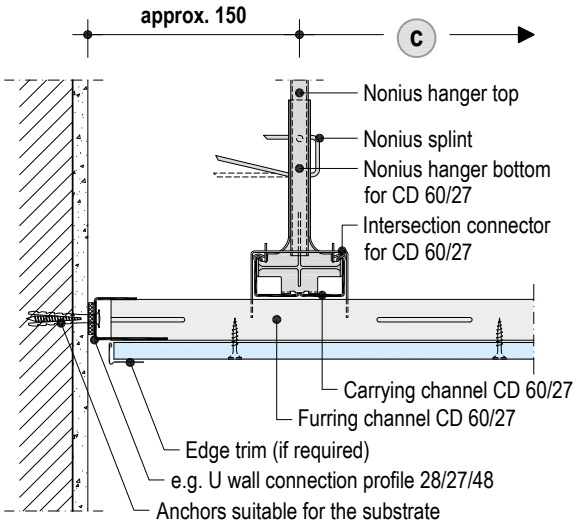
plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

Details

Scale 1:5 I Dimensions in mm

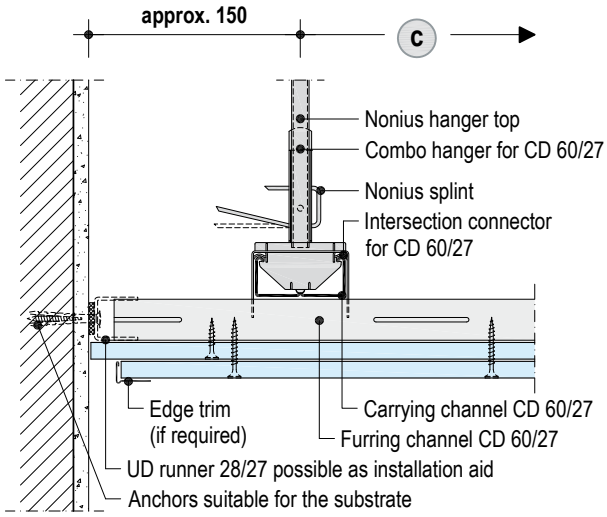
D112.de-A3 Connection to wall with face joint

Without fire resistance

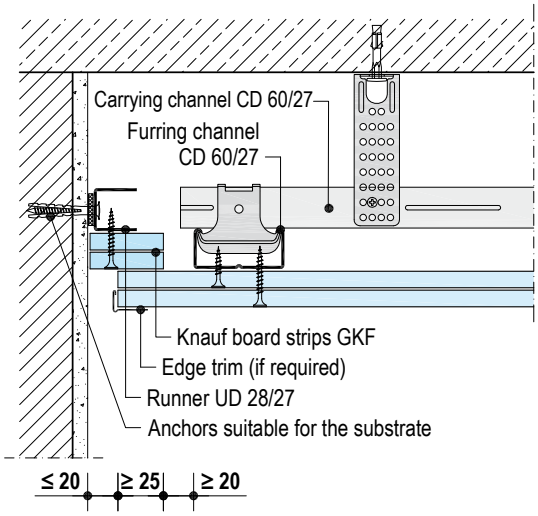


D112.de-A4 Connection to wall with face joint

Without fire resistance

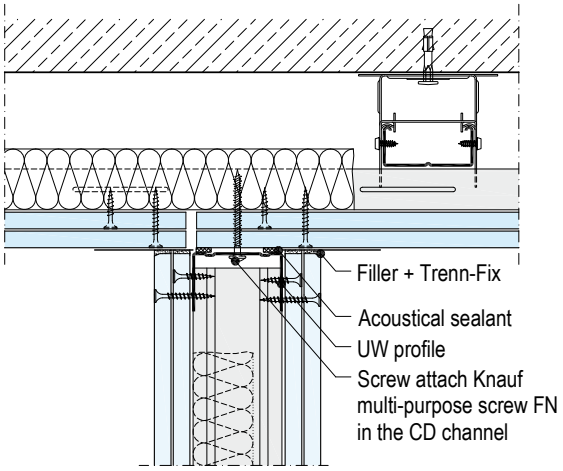


D112.de-D4 Connection to wall with shadow gap



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

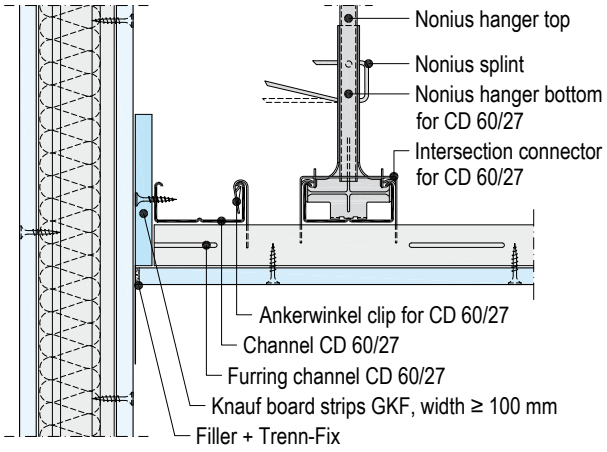


plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

Details

Scale 1:5

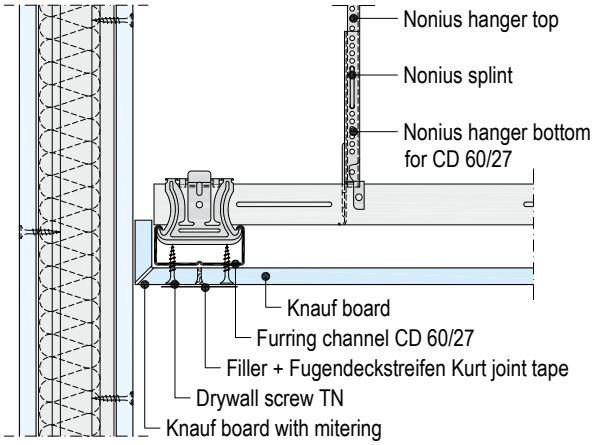
D112.de-A5 Vertically sliding connection to wall



plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

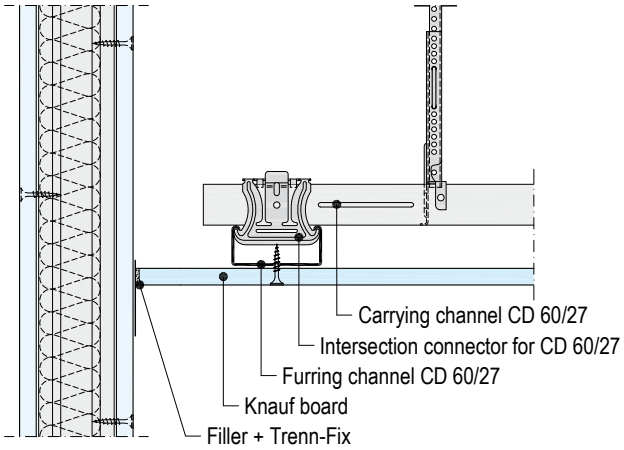
D112.de-D5 Vertically sliding connection to wall

Without fire resistance



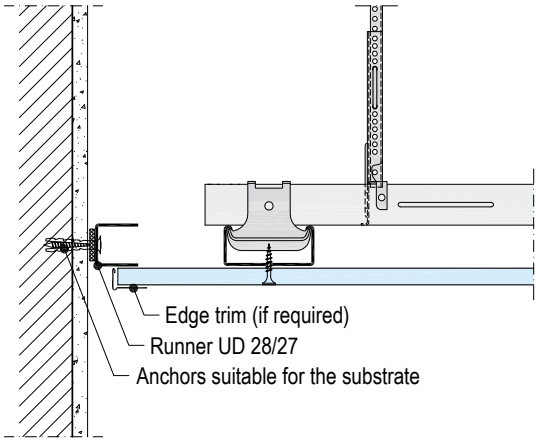
D112.de-D6 Sliding connection to wall

Without fire resistance



D112.de-D7 Sliding connection to wall

Without fire resistance

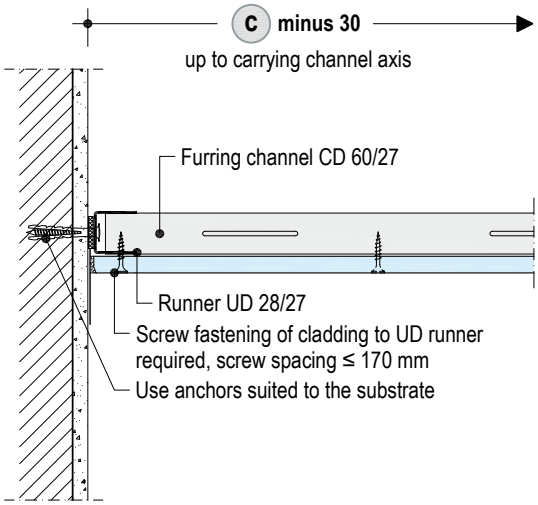


D113.de Knauf board ceiling with flush metal grid

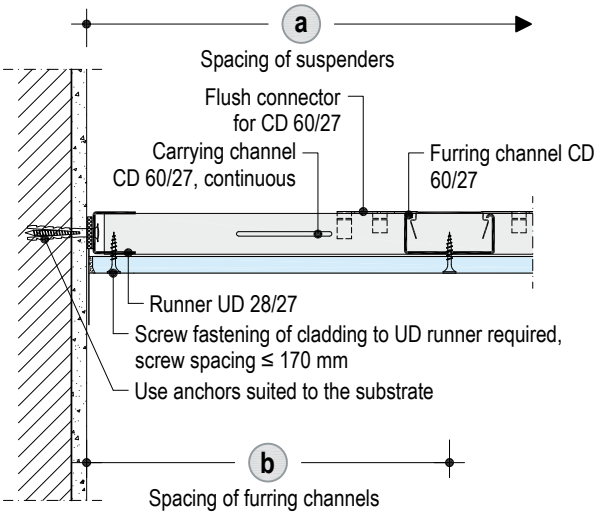
Details

Scale 1:5 I Dimensions in mm

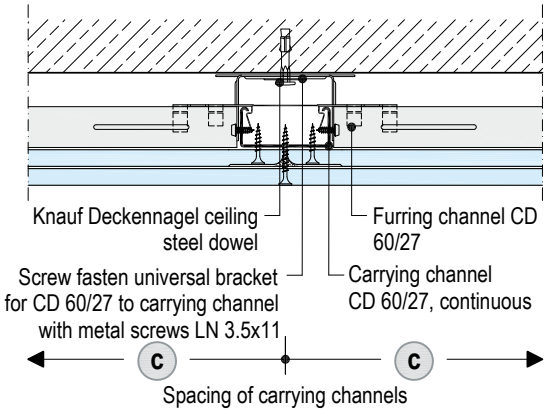
D113.de-A2 Load-bearing connection to wall



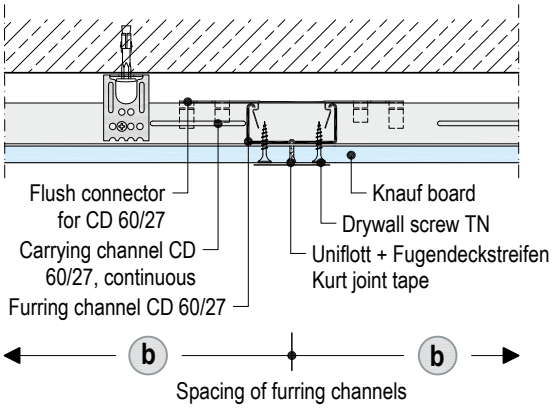
D113.de-D2 Load-bearing connection to wall



D113.de-B2 Longitudinal edge – flush/universal bracket



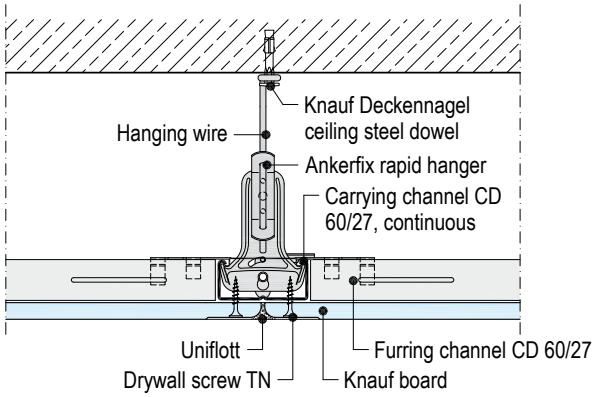
D113.de-C2 Front edge – flush/universal bracket



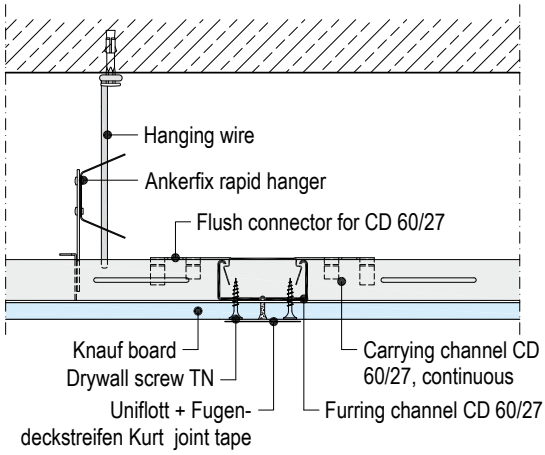
Details

Scale 1:5

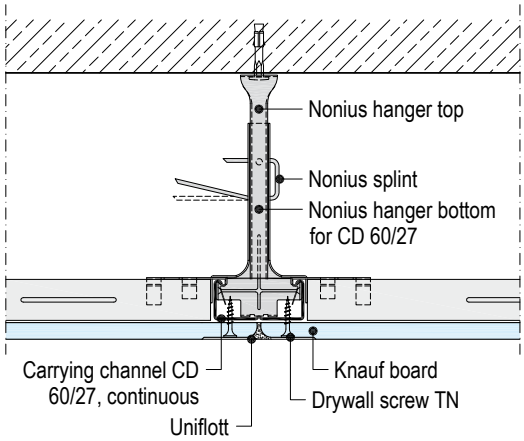
D113.de-B1 Longitudinal edge – flush/Ankerfix



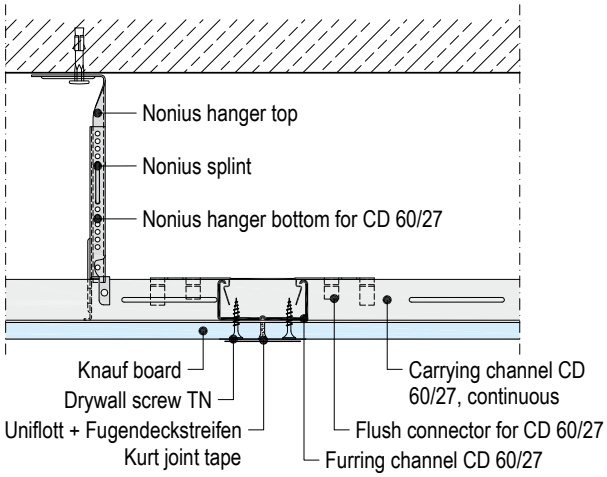
D113.de-C1 Front edge – flush/Ankerfix



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

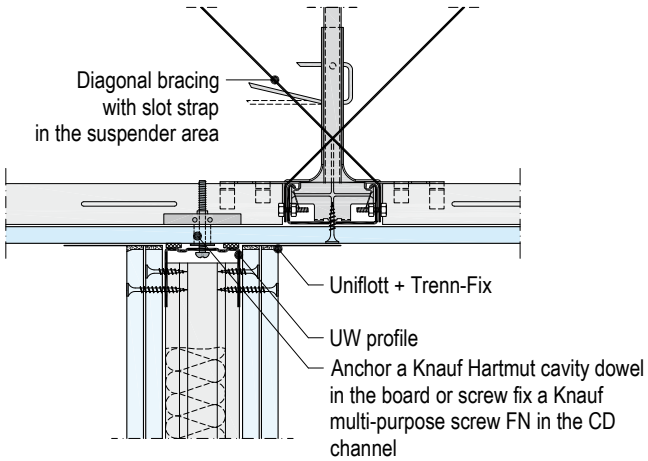


D113.de-C5 Front edge – flush/Nonius hanger

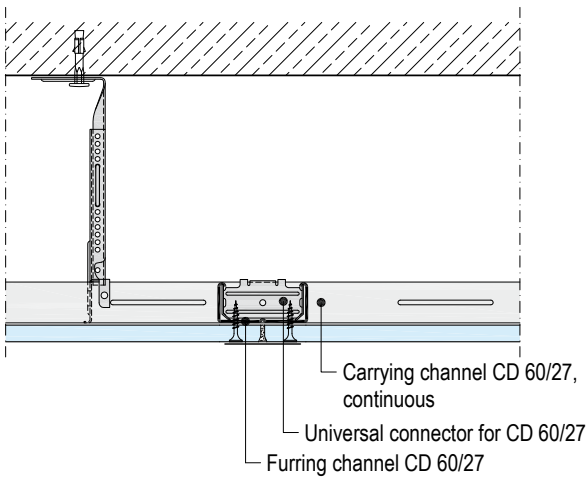


D113.de-B4 Connection of lightweight partition to ceiling

Without fire resistance



D113.de-C6 Profile connection with universal connector

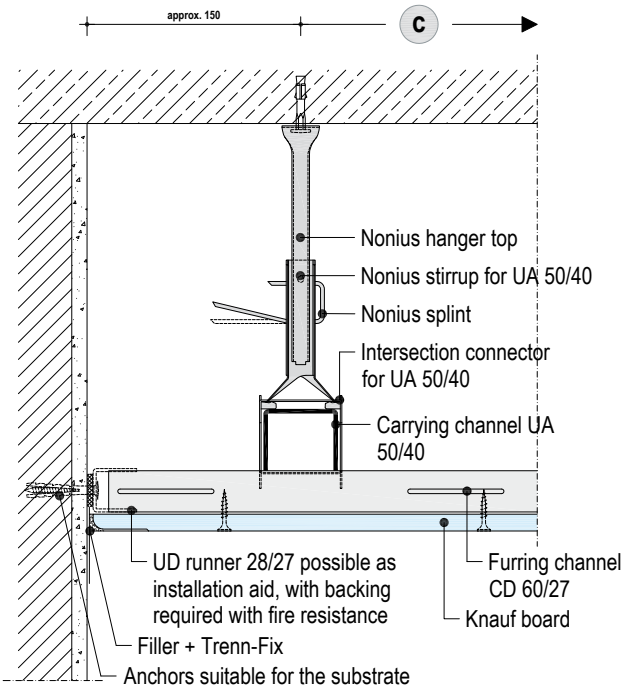


D116.de Knauf board ceiling with large-span metal grid

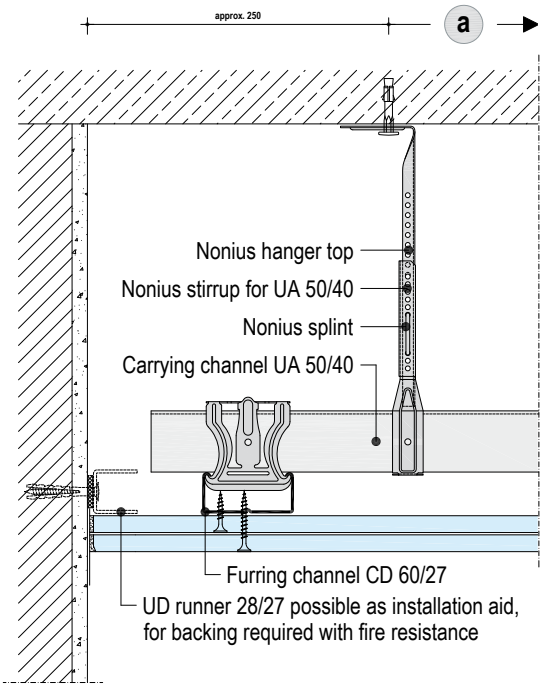
Details

Scale 1:5 I Dimensions in mm

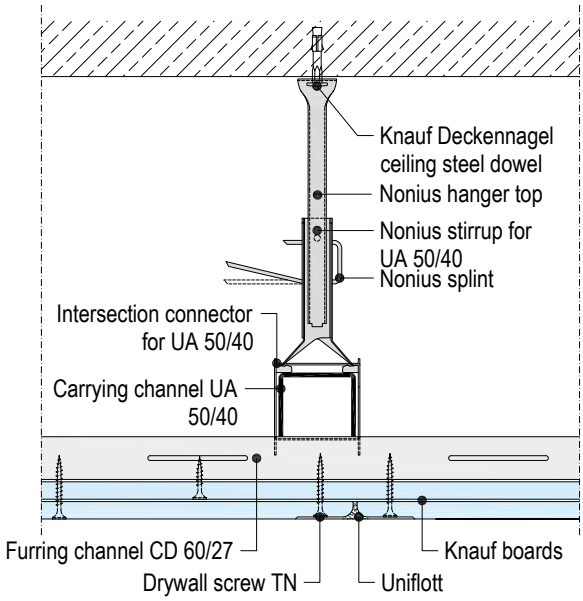
D116.de-A1 Connection to wall



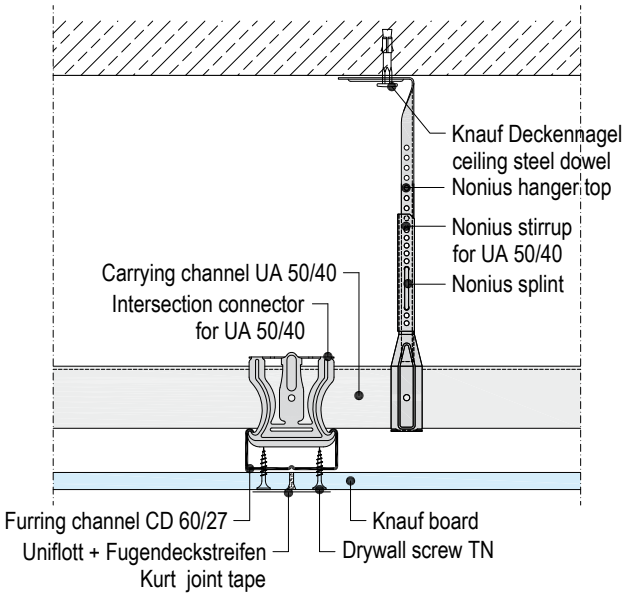
D116.de-D1 Connection to wall



D116.de-B1 Longitudinal edge – Carrying channel/furring channel/Nonius stirrup



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

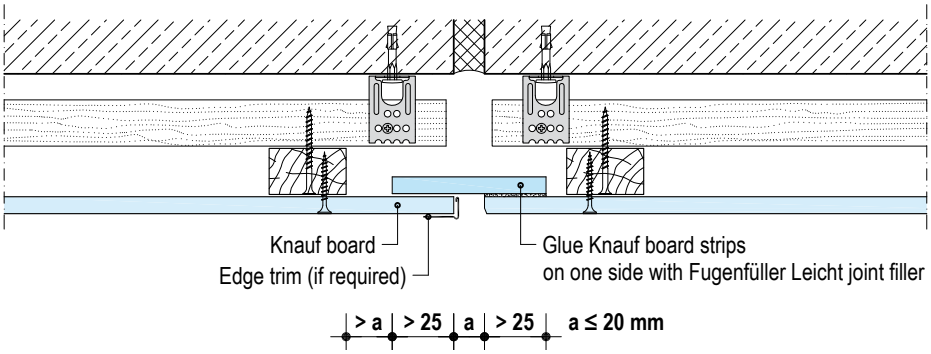


Movement joints

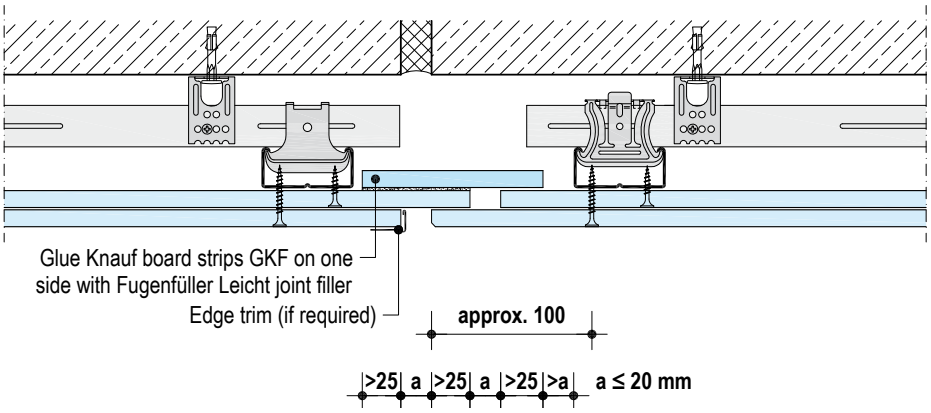
Scale 1:5 I Dimensions in mm

D111.de-C3 Movement joint

Without fire resistance

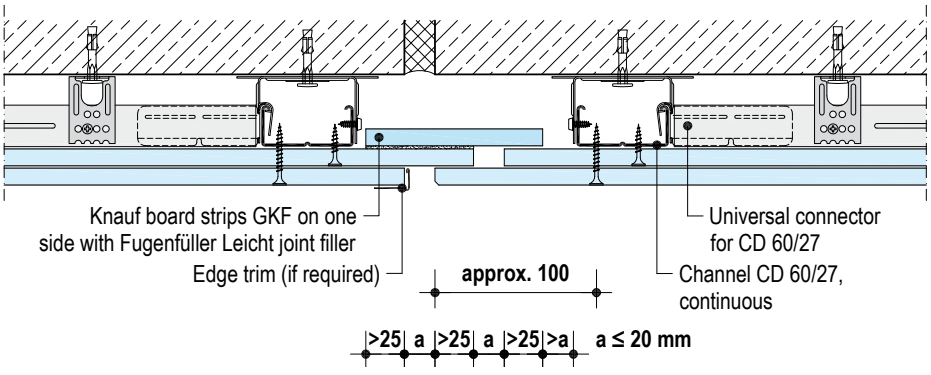


D112.de-C3 Movement joint



plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

D113.de-C4 Movement joint

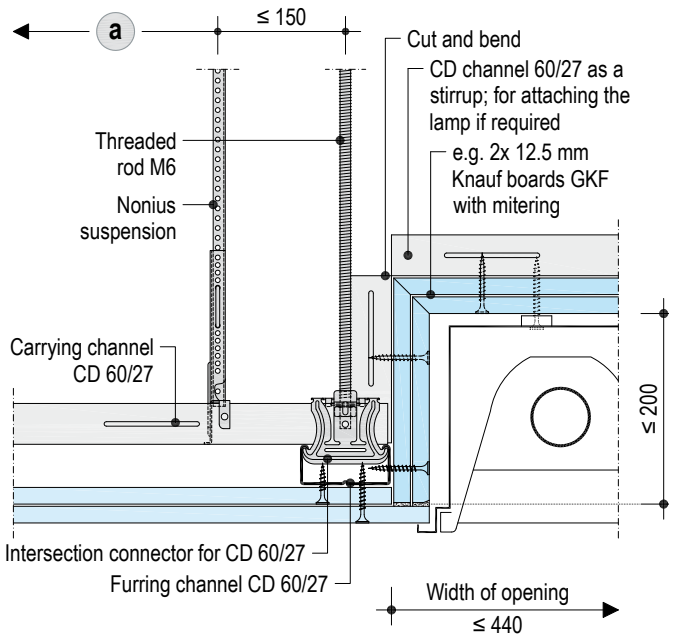


plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

Fire protection encasement of lighting fixtures

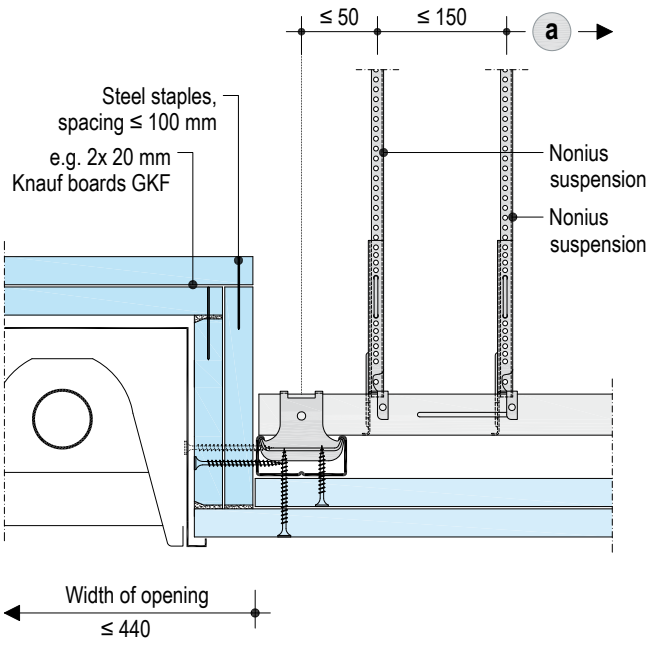
Scale 1:5 I Dimensions in mm

D112.de-SO10 Luminaire – Mitring – F30



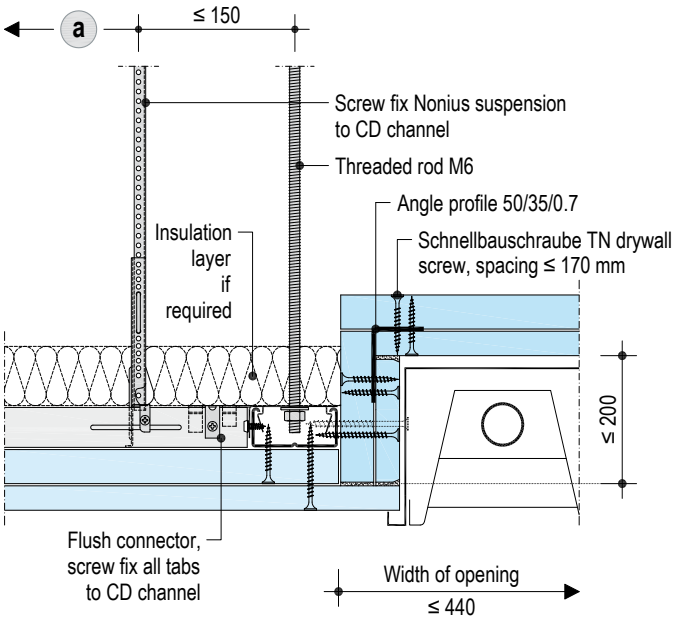
plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

D112.de-SO11 Luminaire – Encasement stapled – F90



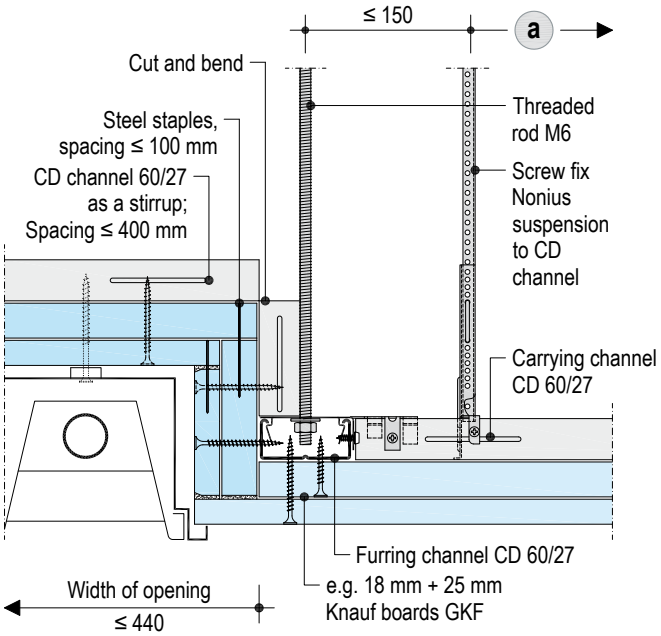
plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

D113.de-SO10 Luminaire – Encasement screw fastened – F90



plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

D113.de-SO11 Luminaire – Encasement stapled – F90



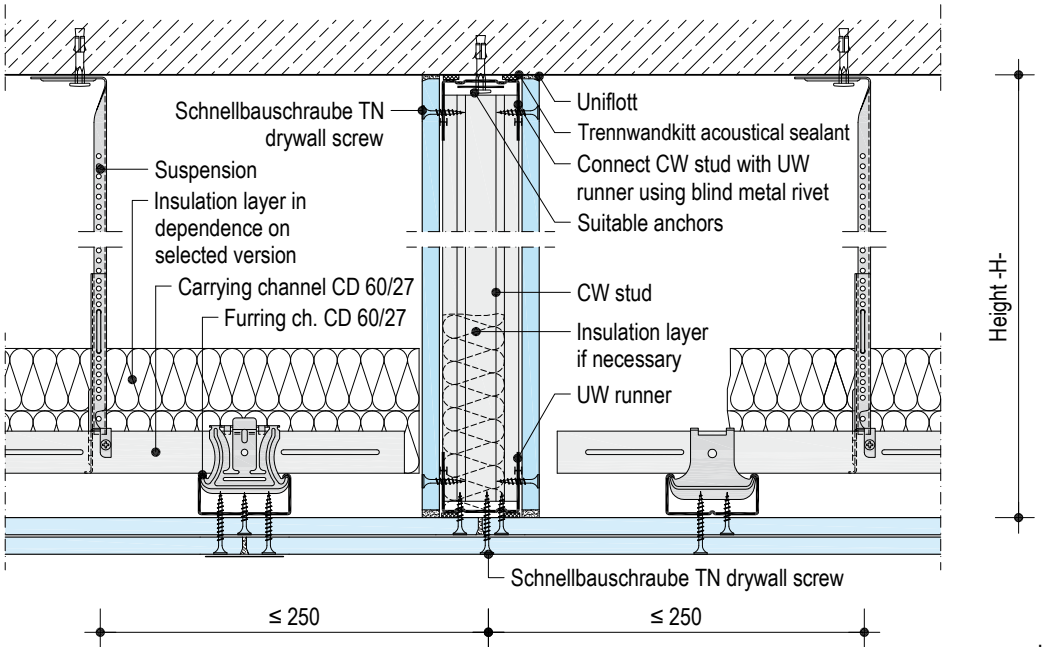
plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

- Permissible weight of the lighting fixture maximum 10 kg/unit (≈ 100 N/unit) and maximum 5 kg per m² 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 440x1420 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

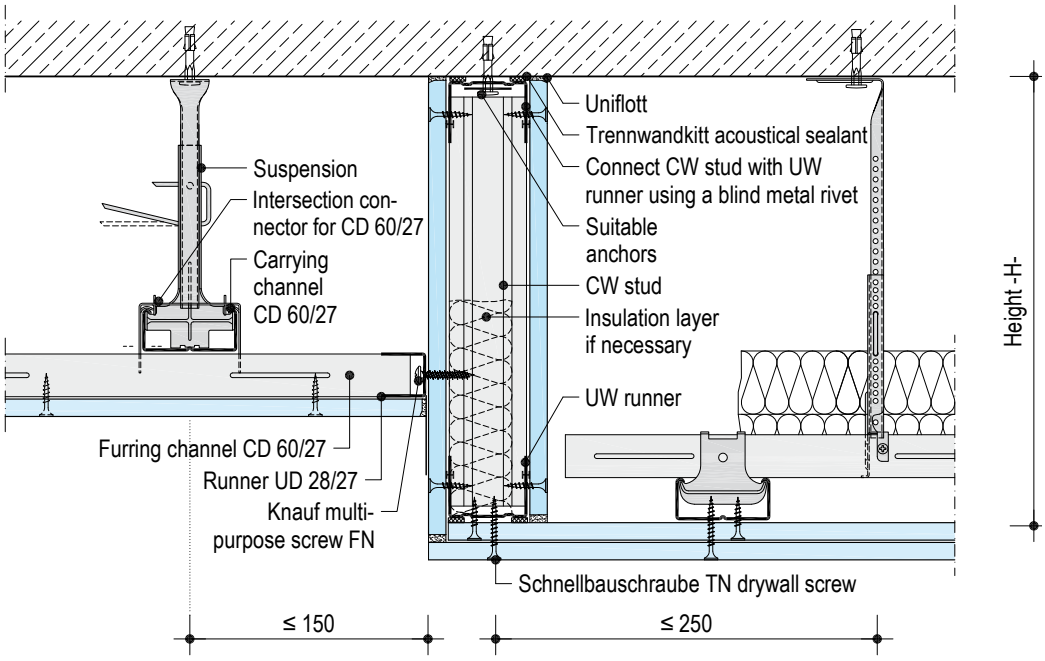
Scale 1:5 I Dimensions in mm

D112.de-SO14 Ceiling bulkhead



plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

D112.de-SO15 Ceiling bulkhead



plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

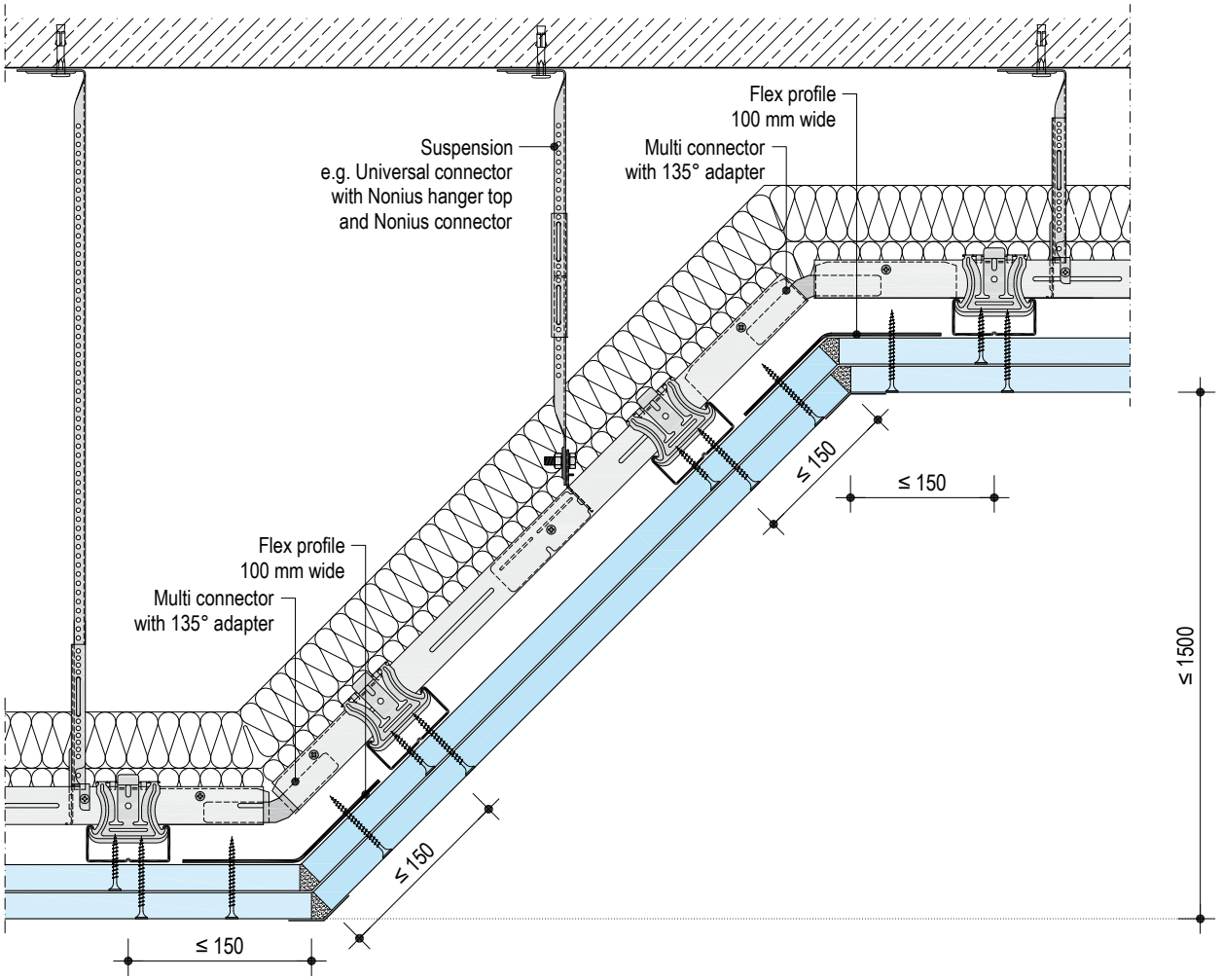
- Maximum height -H- of the ceiling bulkhead
  - 1400 mm: 1x 12.5 mm Knauf board GKF per bulkhead side
  - 1000 mm: 2x 12.5 mm Knauf board GKF per bulkhead side

- 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

D112.de-SO16 Split level ceiling 45°

Scale 1:5 I Dimensions in mm



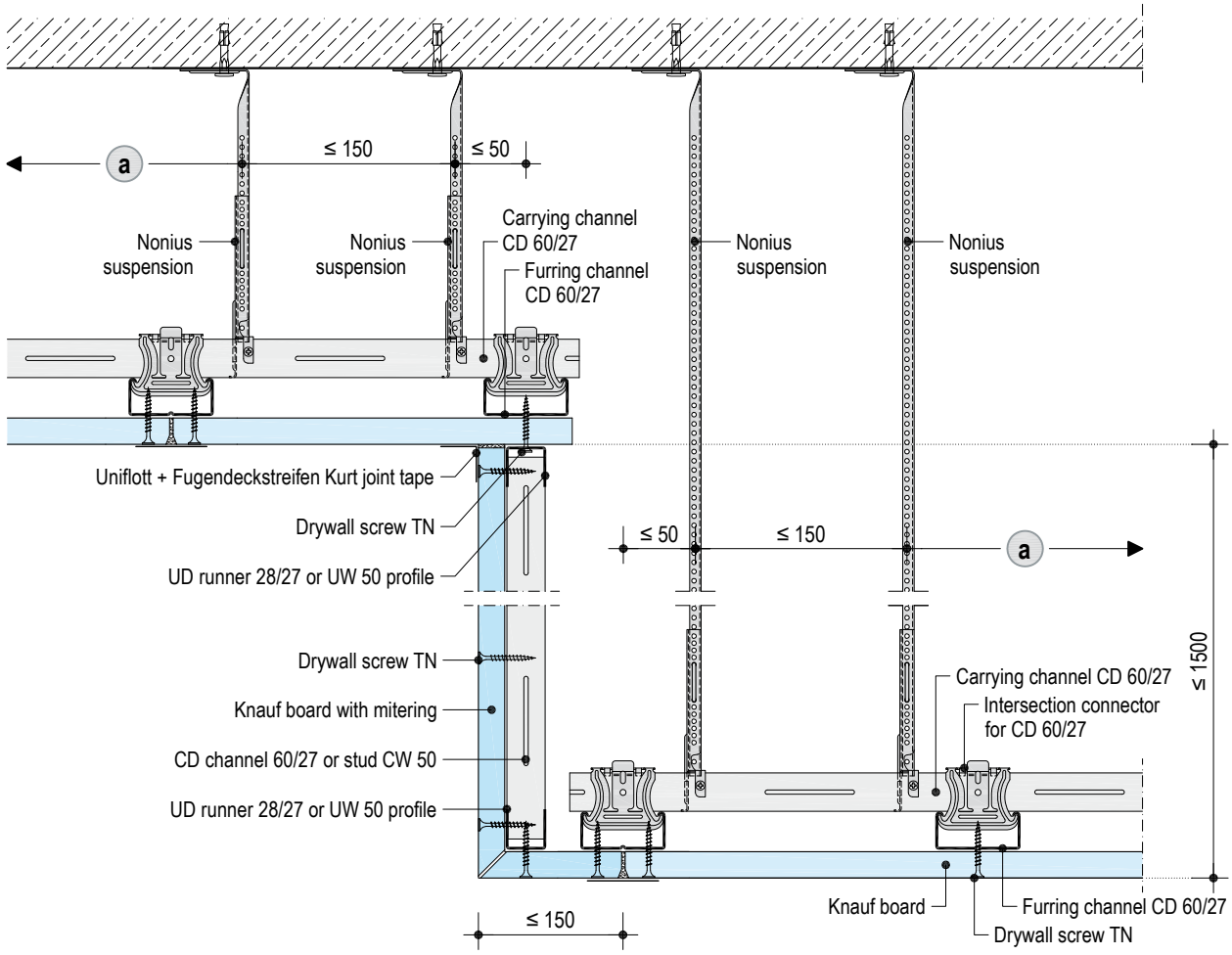
Extension of the fire resistance certificate of usability
Prior consultation in acc. to Page 6 recommended

Split level ceiling

Scale 1:5 I Dimensions in mm

D112.de-SO17 Split level ceiling 90°

Fire protection solely from below

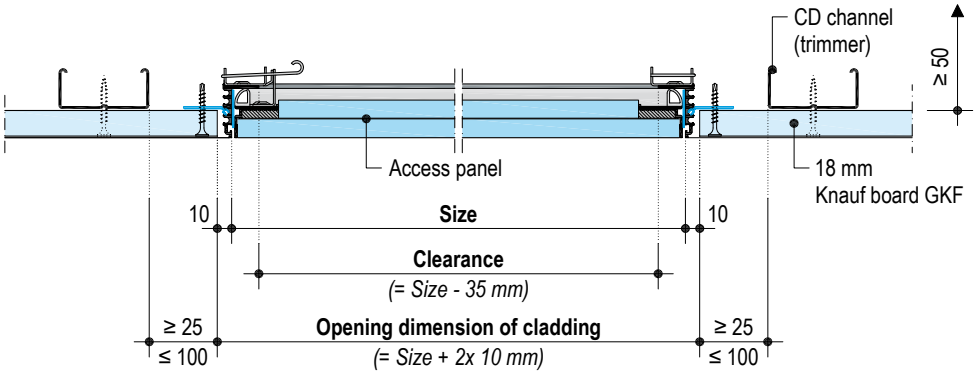


plus **Extension of the fire resistance certificate of usability**
Prior consultation in acc. to Page 6 recommended

Knauf alutop access panel REVO BS30 ceiling

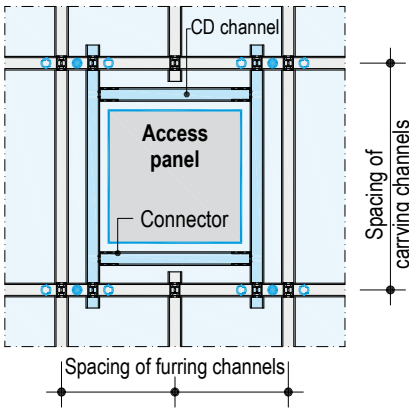
Scheme drawings I Dimensions in mm

Vertical sections

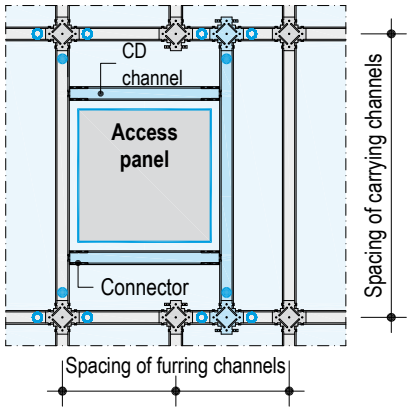


Top view

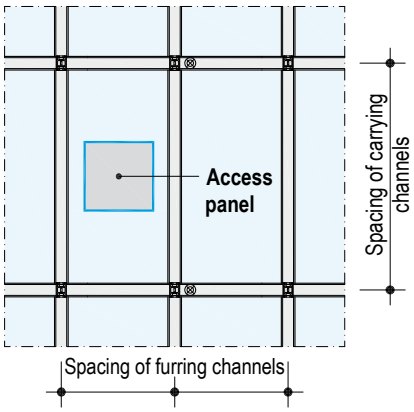
Double layer profile (e.g. D112.de)



Flush profile (D113.de)



Installation without trimmer:
With access panels 300x300 mm



Note	Cladding thickness, dimensions, available options and further information, see Product Data Sheet E121.de. Observe the enclosed installation instructions of the access panels.

Legend

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

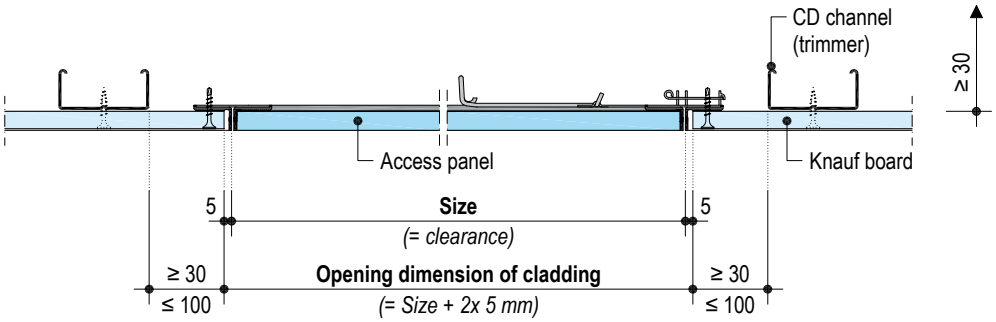
Universal connectors are required for the trimmers. Further suspenders are required if the suspended profiles are to be exchanged.

Knauf alutop access panel REVO

Scheme drawings I Dimensions in mm

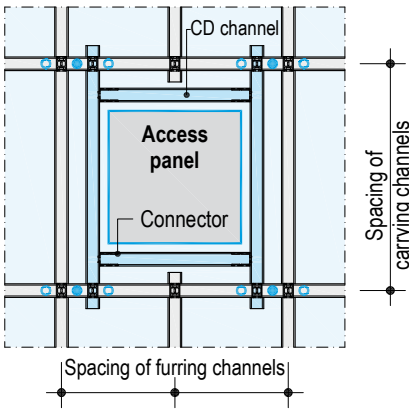
Vertical sections

Without fire resistance

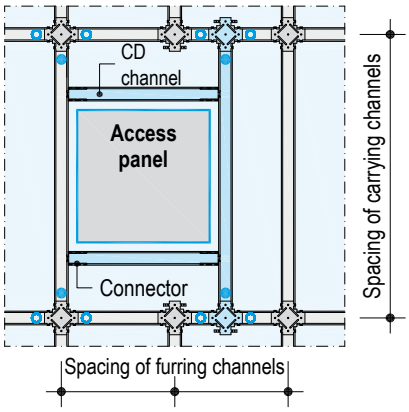


Top view

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



Flush profile (D113.de)



Note	Cladding thickness, dimensions, available options and further information, see Product Data Sheet E112.de. Observe the enclosed installation instructions of the access panels.

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.

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

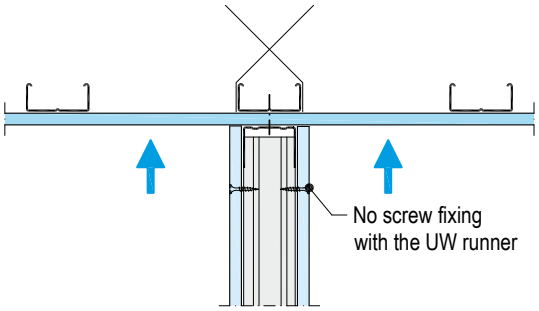
Technical fire resistance classified ceiling systems (suspended ceilings) may only be connected to partitions when it is assured in the event of a fire, that should the partition be destroyed prematurely, the remaining elements can collapse without creating an additional load to the ceiling.
Horizontal bracing of the suspended ceiling (max. 15 m x 15 m ceiling area size) or load transfer to the flanking constructional components is necessary.
The following design of the connections is possible. (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

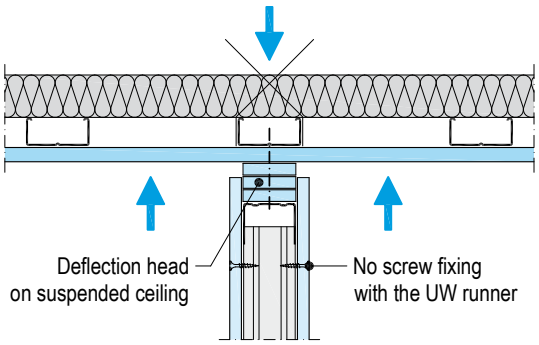
Fire exposure *solely from below*

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*

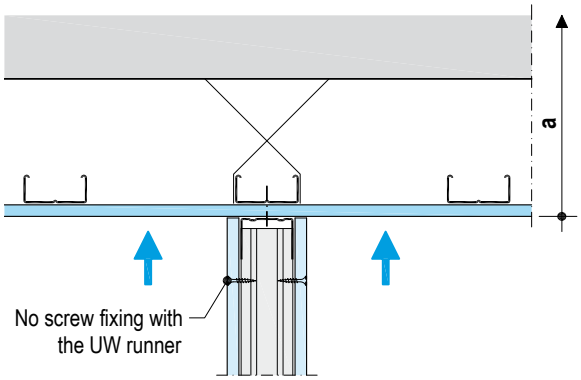
On suspended ceilings with fire resistance *from above*, implement a deflection head in a standard design with at least 15 mm freedom of movement.



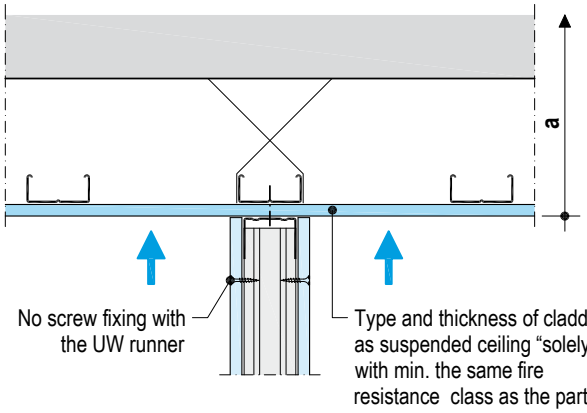
Suspended ceilings in conjunction with basic ceilings of types I to III

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).

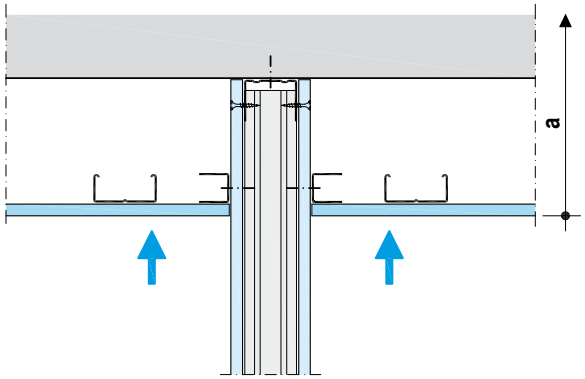
Implement ceiling connection of partitions without fire resistance without screw fastening to the UW runner.



If partitions with fire protection requirements are connected to the suspended ceiling, the classification of the suspended ceilings alone must at 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.



Extension of the fire resistance certificate of usability
■ Connections of lightweight partitions
Prior consultation in acc. to Page 6 is recommended.

Bracing

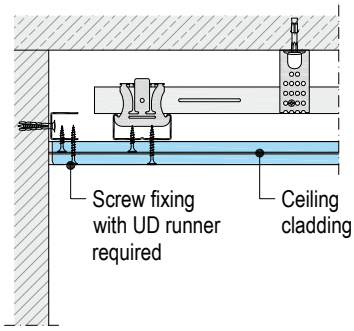
Non-load-bearing interior partitions can be connected to the suspended ceiling system provided that they are braced sufficiently. The bracing can be implemented locally by arranging slotted steel strap suspenders in the suspender area or by load transfer via the ceiling diaphragm to the flanking partitions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

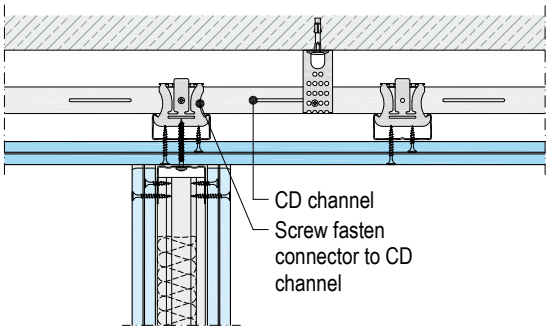
The loads should be transferred directly to the basic ceiling on walls with built-in sanitary accessories (WC sanistands, etc.)

Horizontal bracing via load transfer

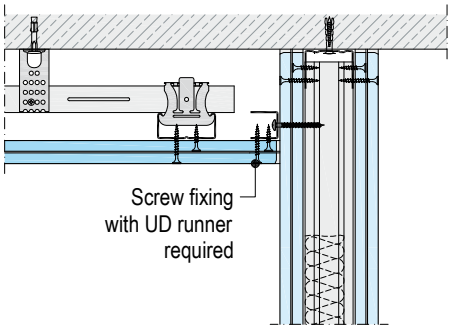
Load-bearing connection on solid wall



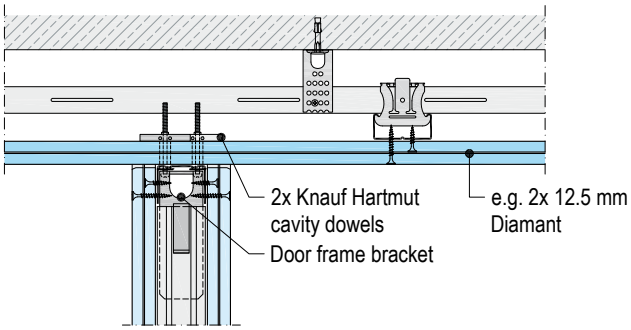
Connection to metal stud partition



Load-bearing connection on metal stud partition

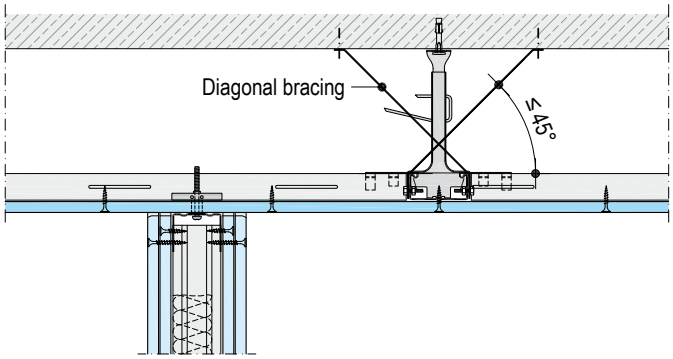


Connection of metal stud partition in door opening area
Without fire resistance

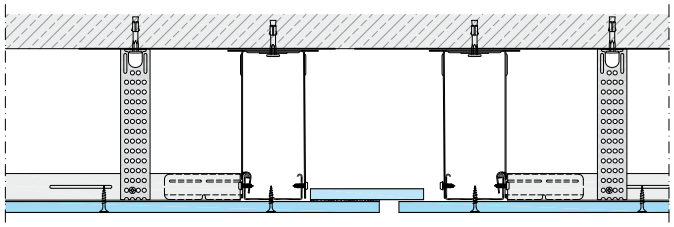


Horizontal bracing by diagonal bracing

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

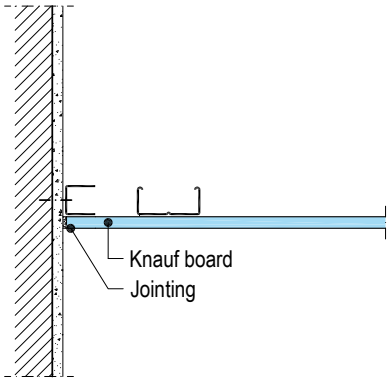


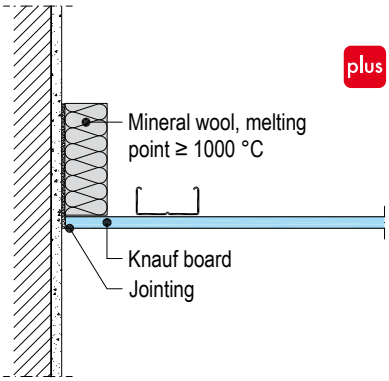
Movement joint

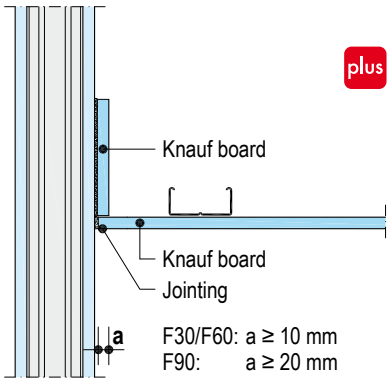


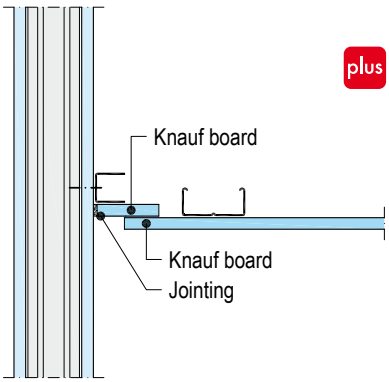
Lateral connection of technical fire resistance classified ceiling systems to technical fire resistance classified partitions

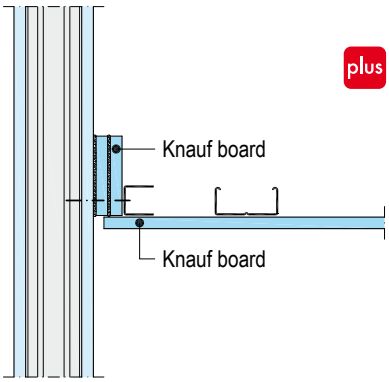
Suspended ceilings in conjunction with basic ceilings of types I to III as well as solely suspended ceilings with fire resistance from below and/or from above, that comply with fire resistance classes F30 to F90, can be connected to partitions if they also have at least the same fire resistance class.
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.







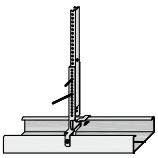
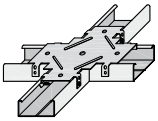




plus **Extension of the fire resistance certificate of usability**
- Alternative connection backing and connections to lightweight partitions

Prior consultation in acc. to Page 6 is recommended.

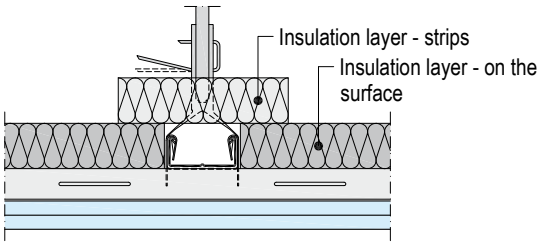
Additionally necessary constructional measures with fire resistance from above (from the plenum)

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 3.5x11)
Flush connector for CD 60/27	
	Bend the tabs and screw fasten with the furring channel (4x metal screws LN 3.5x11)

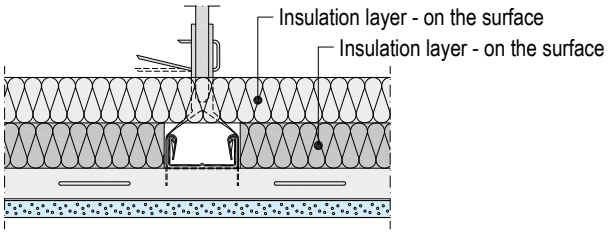
Insulation layer

D112.de Metal grid

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

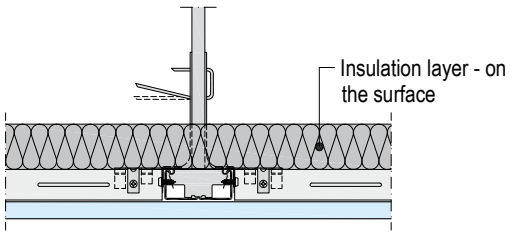


Double-layer insulation

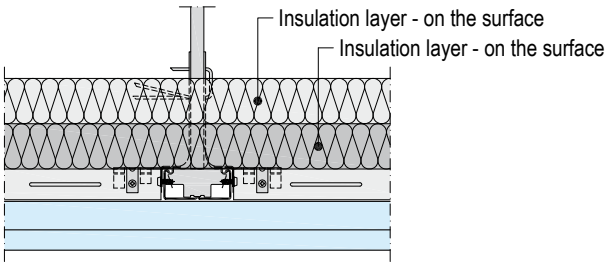


D113.de Flush metal grid

Single-layer insulation

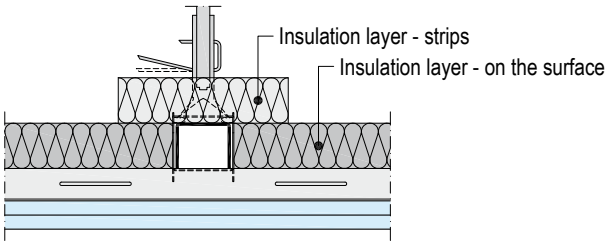


Double-layer insulation

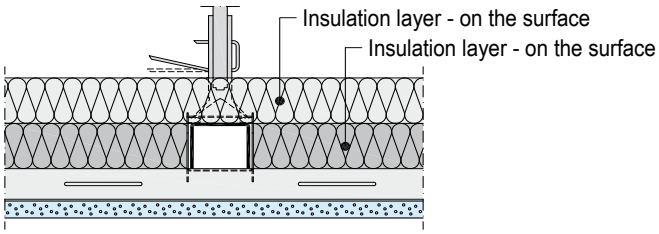


D116.de Large-span metal grid

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



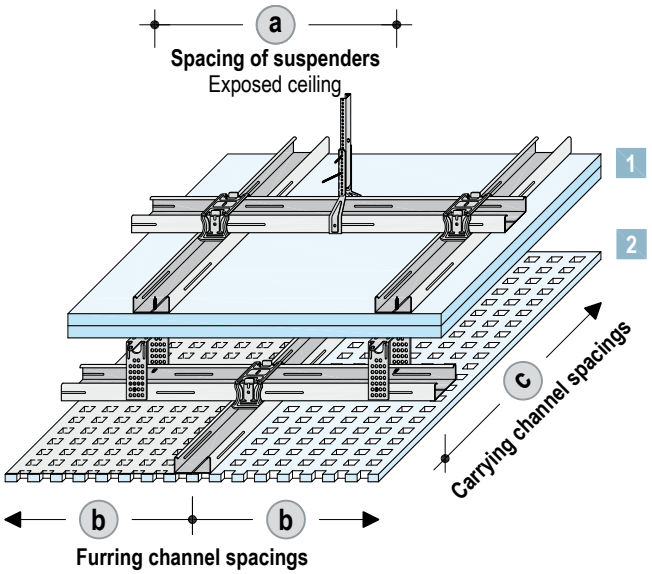
Double-layer insulation



Note	Type, thickness and density of the insulation layer in acc. to specifications of the respective system variants.

Exposed ceiling under fire protection ceiling

Dimensions in mm



Legend

1 *Fire protection ceiling*

2 *Exposed ceiling*

1 Axial spacings fire protection 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 also page 5 *Dimensioning of the grid*.

The spacings of the fire protection ceiling grid result from the specifications of the respective system ceilings taking the additional weight of the exposed ceiling into consideration.

2 Maximum spacings of exposed ceiling

Axial spacings carrying channel c	Spacings of suspenders[1] a Load class in kN/m² Up to 0.15	Axial spacings Furring channel b
800	800[2]	500 (for Cleaneo Acoustic ceilings, see D12.de)
1000	400/500	
1200	400/500	

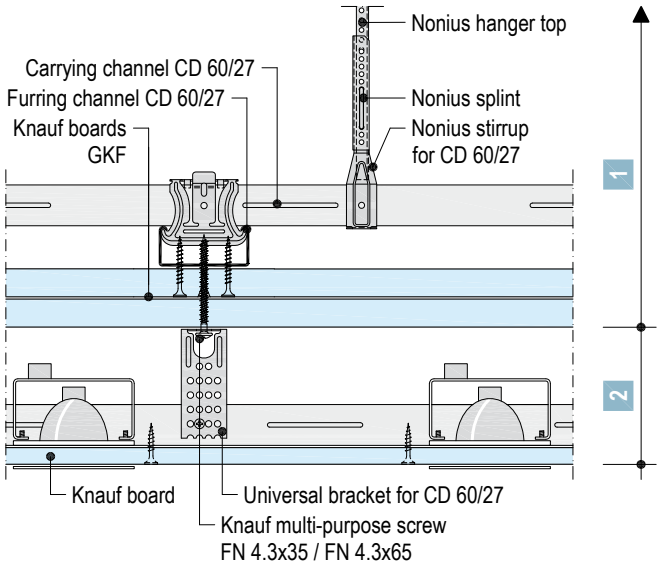
1) Suspension must be fastened to the furring channels of the fire protection ceiling

2) With furring channel axial spacing 400 mm (fire protection ceiling), attach alternately to every second furring channel of the fire protection ceiling
With furring channel axial spacing 500/625 mm (fire protection ceiling), attach to every furring channel of the fire protection ceiling

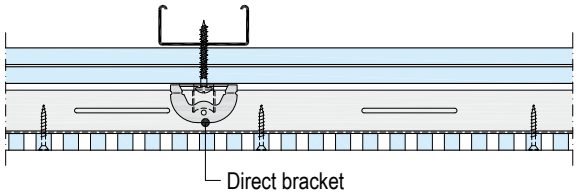
Detail

Scale 1:5 I Dimensions in mm

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



Alternative:



plus Extension of the fire resistance certificate of usability
■ Multi-level ceiling system design
Prior consultation in acc. to Page 6 is recommended.

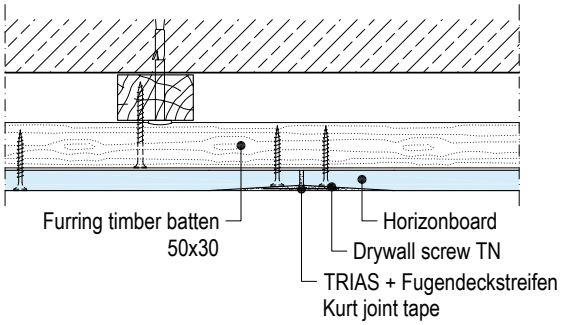
Note	
	Always apply suspended channels of exposed ceiling lateral to furring channel of the fire protection ceiling. Load of exposed ceiling per suspension point maximum 100 N. With exposed metal ceiling suspension height min. 150 mm.

Cladding with Knauf Horizonboard

Scale 1:5

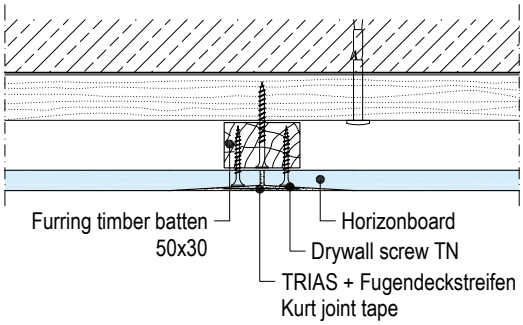
D111.de-B5 Longitudinal edge – Horizonboard

Without fire resistance



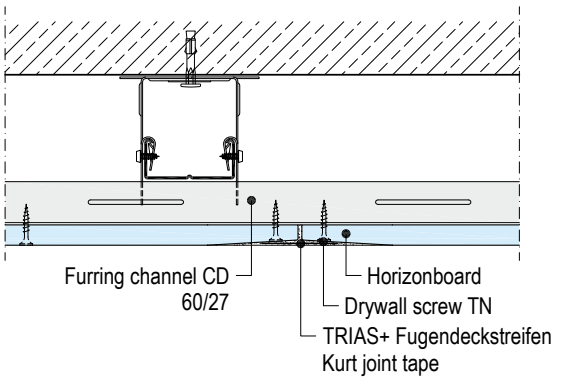
D111.de-C5 Front edge – Horizonboard

Without fire resistance



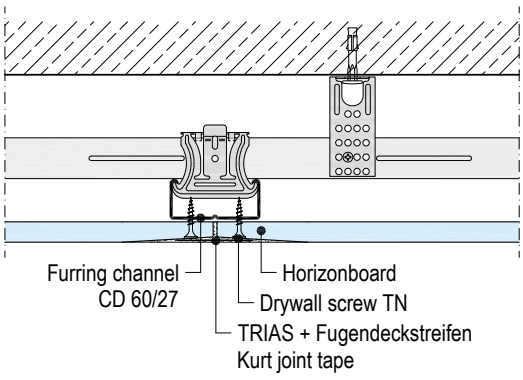
D112.de-B8 Longitudinal edge – Horizonboard

Without fire resistance



D112.de-C8 Front edge – Horizonboard

Without fire resistance



Note	Versions with fire protection on request

Installation of the grid

Anchoring to basic ceilings

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

- Made of reinforced concrete: Knauf Deckennagel ceiling steel dowels / suitable steel dowels
- Made of other building materials: Specially approved or standardized anchoring elements for the building material.

With fire resistance *from above* use fire protection approved anchor (Knauf Deckennagel ceiling steel dowel).

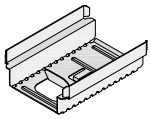
Suspension

Suspension of the carrying and furring channels exclusively with suspenders acc. to pages 35 to 37 (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.

Timber battens/profiles

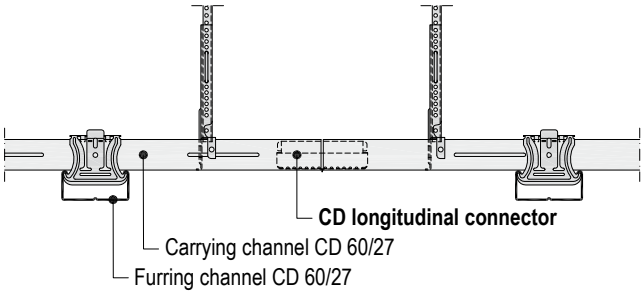
Carrying timber battens/profiles or furring timber battens/profiles must be connected with suspenders and aligned flush in the required suspension height.

- Stagger all profile joints
- Profile extensions of the furring channel CD with CD longitudinal connector

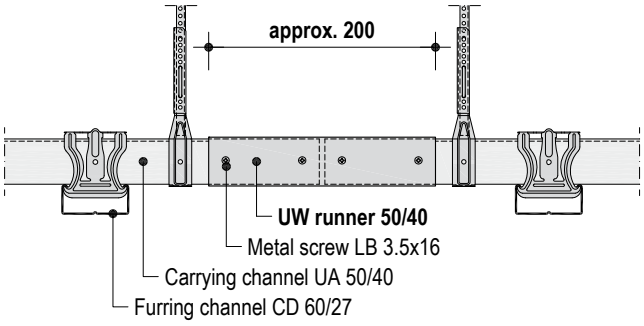


Implement the longitudinal joints of the carrying channels (profile extensions) as follows.

- Carrying channel CD with CD longitudinal connector (D112.de/D113.de)



- Carrying channel UA with UW runner (D116.de)



- The connection of the carrying and furring channel at the intersection points for configurations with double profile grid / batten frame is in accordance with the system in the table on page 67

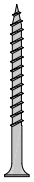
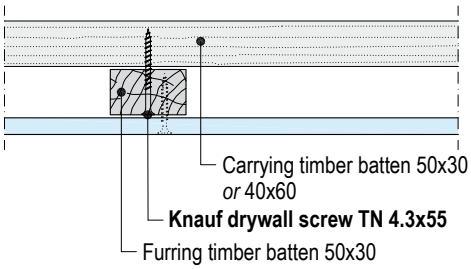
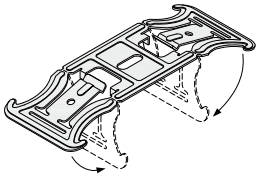
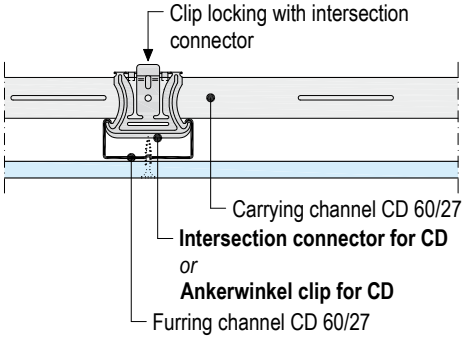
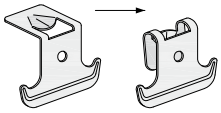
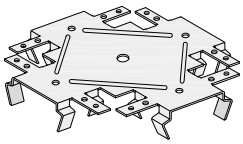
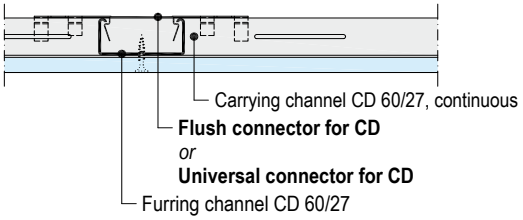
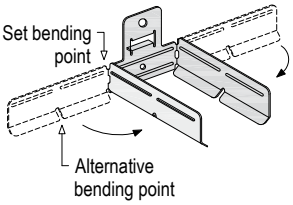
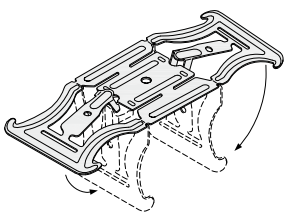
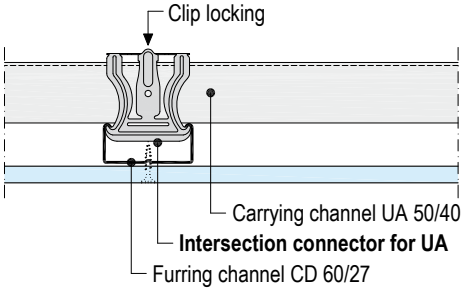
Connection to wall

With profile UD 28/27 as a load-bearing connection, installation aid or with fire resistance.
Anchoring to the substrate with suitable fasteners/anchors, spacing max. 1 m (non-load-bearing) or 625 mm (load-bearing).

In case of sound insulation requirements, seal carefully with Trennwandkitt acoustical sealant in acc. to DIN 4109, supplement 1, section 5.2.

Timber batten/profile connections

Scheme drawings

Description	Connection	Detail
D111.de Connection carrying channel and furring channel		
Knauf Schnellbauschraube drywall screw TN 4.3x55		
D112.de Connection carrying channel CD and furring channel CD		
Intersection connector for CD 60/27 ■ Before installation, bend to 90° and after installation close the clip lock to ensure a secure hold		
Alternative: 2x Ankerwinkel Clips for CD 60/27 ■ Bend for installation		
D113.de Flush 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 3.5x11)		
Alternative: 2x universal connectors for CD 60/27 ■ Supplied non-bent ■ Set approximately to suit application ■ Set precisely with installation		
D116.de Connection carrying channel UA and furring channel CD		
Intersection connector for UA profile ■ Before installation, bend to 90° and after installation close the clip lock to ensure a secure hold		

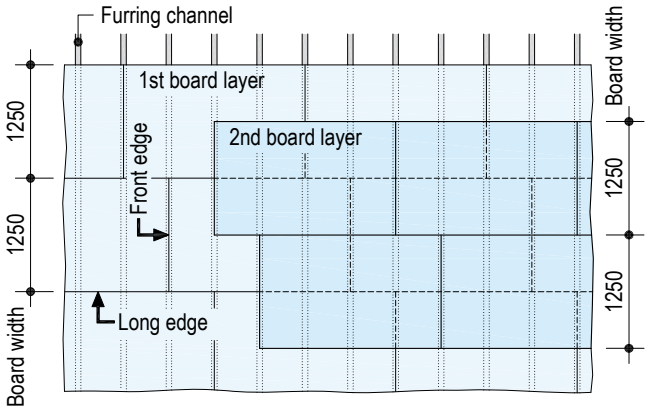
Cladding installation

- 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

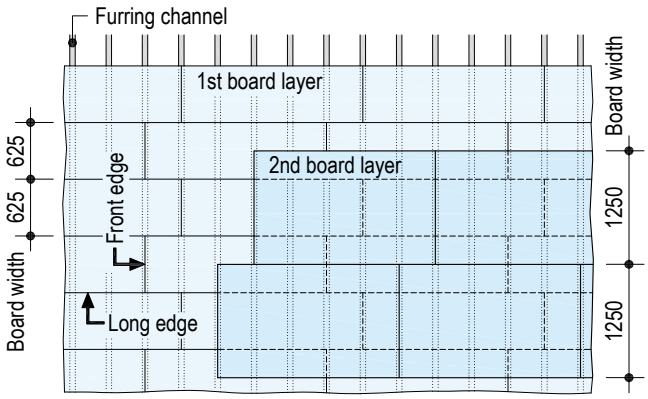
Scheme drawings I Dimensions in mm

Knauf boards – lateral cladding application



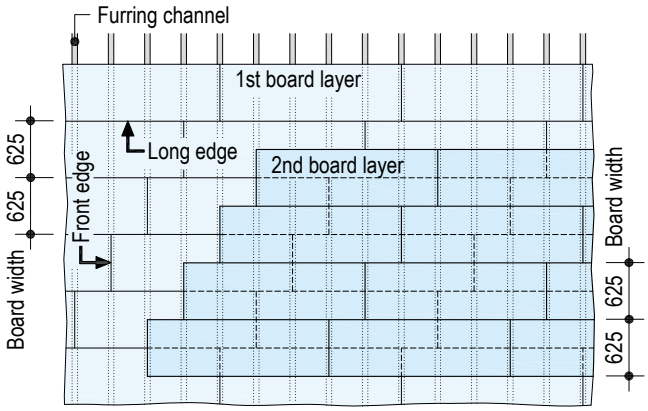
Board width
1st layer: **1250 mm** e.g. Feuerschutzplatte fire-resistant board Knauf Piano GKF 12.5
2nd layer: **1250 mm** e.g. Feuerschutzplatte fire-resistant board Knauf Piano GKF 12.5

- 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 GKF 12.5
2nd layer: **1250 mm** e.g. Diamant GKF 12.5

- 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



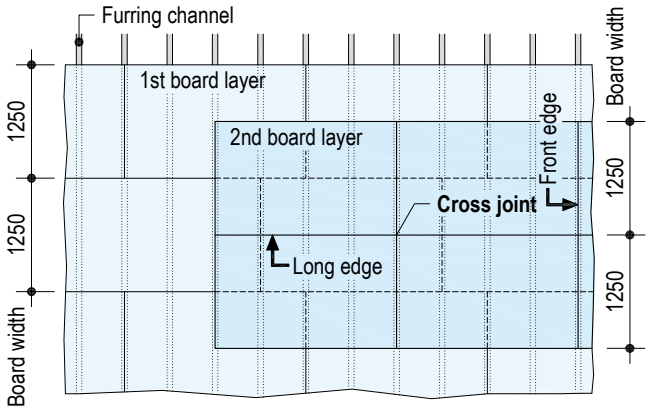
Board width
1st layer: **625 mm** e.g. Silentboard GKF 12.5
2nd layer: **625 mm** e.g. Silentboard GKF 12.5

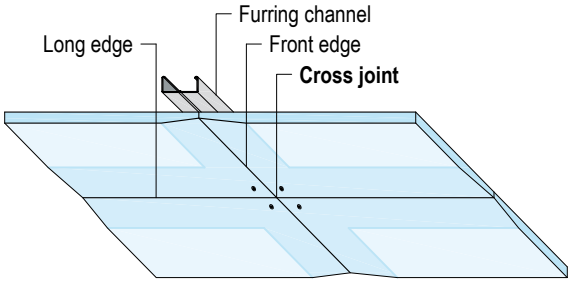
- Apply Knauf boards lateral to the furring timber batten/furring channel.
- Arrange the board joints on the furring timber batten/furring channels (stagger by at least 400 mm).
- Stagger the front edge joints between board layers.
- Stagger the long joints between the board layers by at least half a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

Application scheme

Scheme drawings I Dimensions in mm

Horizonboard – lateral aplication – cross joint





Board width

1st layer: **1250 mm** e.g. Knauf Bauplatte wallboard GKB 12.5
2nd layer: **1250 mm** Horizonboard GKF 12.5

- 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 applies acc. to page 68) must have the same board format as the Horizonboard.

Fastening of the cladding

Dimensions in mm

Cladding Thickness	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 3.5x25	XTN 3.9x23	TN 3.5x35	XTN 3.9x33
15	TN 3.5x25	XTN 3.9x33	TN 3.5x35	XTN 3.9x38
18 / 20 / 25	TN 3.5x35	–	TN 3.5x45	–
2x 12.5	TN 3.5x25 + TN 3.5x35	XTN 3.9x23 + XTN 3.9x38	TN 3.5x35 + TN 3.5x45	XTN 3.9x33 + XTN 3.9x55
2x 15	TN 3.5x25 + TN 3.5x45	–	–	–
2x 20	TN 3.5x35 + TN 3.5x55	–	–	–
25 + 18	TN 3.5x35 + TN 3.5x55	–	–	–

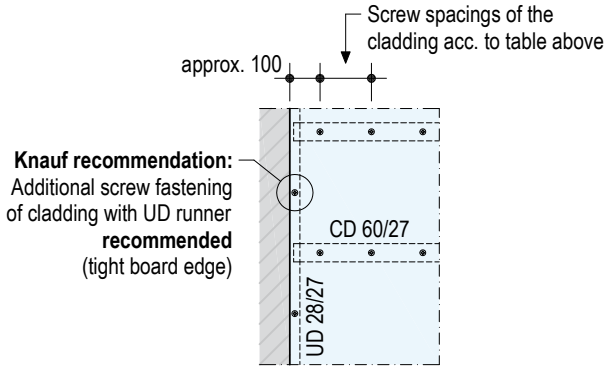
- d_n = nominal diameter (e.g. with drywall screw TN 3.5x35, 5x 3.5 mm → ≥ 17.5 mm penetration depth)
- Always use Diamant Screws when cladding Diamant or Silentboard.

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 layers[1)]	500	300	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



Filling/jointing

Jointing of the boards in the required quality level Q1 to Q4 in accordance with Code of Practice no. 2 "Verspachtelung von Gipsplatten, Oberflächengüten"[1].
With Fireboard, a skim coating of the entire surface with Knauf Fireboard Spachtel filler is additionally required before application of direct coatings or linings.

Suitable jointing materials

- TRIAS: Hand filling *without* board tape in the long joint edges; easy to sand, with high strength and suitable for areas of high humidity, reduced absorption for surfaces with uniform appearance, the ideal filler particularly for systems with Diamant boards
- Uniflott: Hand filling *without* joint tape strips in the long joint edges
- Uniflott impregnated: Hand filling of impregnated boards *without* joint tape in the long edge joints, water-repellent, matching green colour
- Fugenfüller Leicht: Hand filling *with* joint tape, preferably with Knauf Fugendeckstreifen Kurt joint tape
- Fireboard Spachtel filler: Hand filling of Fireboard *with* Fibre Glass Joint Tape

Suitable finish filling compounds

- Q2, application by hand: Fill & Finish, SuperFinish
- Q3/Q4, application by hand: Readygips, SuperFinish
- Q3/Q4, machine application: Readygips, ProSpray Light
- Fireboard Spachtel filler for full surface skimming of Fireboard

Filling of the gypsum boards

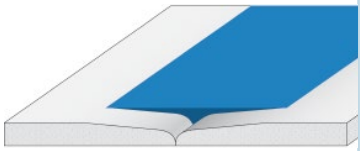
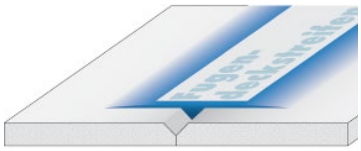
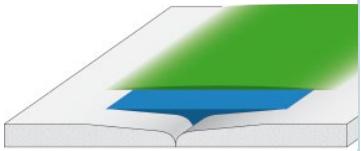
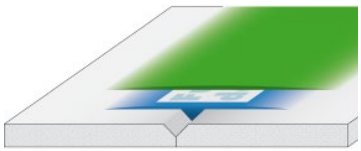
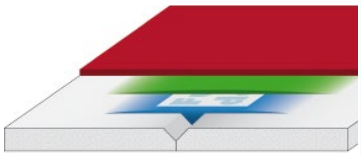
- For multi-layer cladding, fill the lower layers with filler; fill the joints of the visible layer. Filling the joints of covered cladding layers with multi-layer cladding is necessary to provide technical fire resistance and sound insulation properties as well as the structural properties!
- *Recommendation:* Front edge and cut edge joints as well as mixed joints (e.g. half-rounded tapered edge + cut edge) of the visible cladding layers filled using Uniflott or TRIAS, will require the application of Fugendeckstreifen Kurt joint tape as well.
- Fill in visible screw heads.
- Lightly sand visible surfaces after drying of the filler material, if required.

Joint filling of the connection joints

- Apply Trenn-Fix or Fugendeckstreifen Kurt joint tape when filling joints to adjacent drywall constructions, taking into consideration the conditions and requirements for crack safety.
- Observe code of practice no. 3 "Gipsplattenkonstruktionen - Fugen und Anschlüsse" [1] (German only).
- Apply Trenn-Fix when filling joints to adjacent solid or wooden construction components.

Application temperature / climate

- Filling and covering of joints should only take place when no more longitudinal changes can be expected, i.e. expansion or contraction due to humidity or temperature changes.
- Do not apply filling at room or substrate temperatures below approx. +10 °C.
- In case of mastic asphalt screed, cementitious screed and self-levelling screed, fill in board joints after screed has been applied.
- Observe code of practice no. 1 "Baustellenbedingungen" [1] (German only).

Quality levels	Joint implementation Long edges half-rounded tapered edge/half-rounded edge	Joint implementation Front edge bevelled cut edge	Description working steps
Q1			■ Fill the joints with Uniflott, Uniflott imprägniert or TRIAS ■ Fill the visible parts of the fastener
Q2			■ Preliminary jointing in acc. with quality level Q1 ■ Finish (finish compound) until a smooth transition to the board surface with Uniflott, Uniflott imprägniert, TRIAS, Readygips, Fill & Finish or SuperFinish No application marks or ridges may remain visible. Sand off the areas concerned if necessary.
Q3			■ Jointing in acc. with quality level Q2 ■ Wide jointing of the joints as well as clean and accurate removal of the remaining board liner filling the pores, e.g. with Readygips, Knauf SuperFinish, Fill & Finish or ProSpray Light. If necessary, i.e. physical ridges and grooves are not acceptable and the surface must be sanded.
Q4			■ Jointing in acc. with quality level Q2 ■ Complete surface covering of skim coat with a layer thickness of at least 1 mm, e.g. with Readygips

1) Issued by the Industriegruppe Gipsplatten im Bundesverband der Gipsindustrie e.V.

Filling/jointing

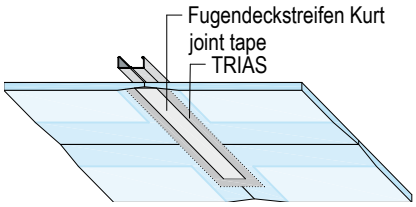
Joint filling with Horizonboard

The four-sided edge type (tapered edge) is the prerequisite for jointing, resulting in a perfect surface with a high level of crack resistance. Knauf drywalling systems with Horizonboard cladding are thus the ideal system solution with premium visual appearance requirements.

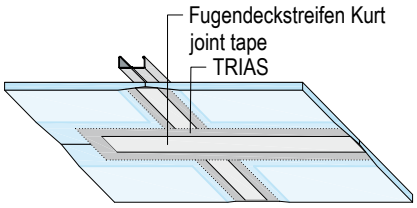
- **When joint filling with Trias and Fugendeckstreifen Kurt joint tape cross joint application - no offset for front edges necessary**
- Highest level of crack resistance in conjunction with Fugendeckstreifen Kurt joint tape.
- High surface quality in just a few steps: Jointing with Knauf TRIAS and Fugendeckstreifen Kurt joint tape in a system achieves surface quality “Q3 Horizon” (comparable with quality level Q3 acc. to Code of Practice No. 2, issued by the Industriegruppe Gipsplatten im Bundesverband der Gipsindustrie e.V.)

With conventional application (staggered front edge joints), quality level Q2 is also possible with Uniflott or Fugenfüller Leicht joint filler, when combined in each case with Fugendeckstreifen Kurt joint.

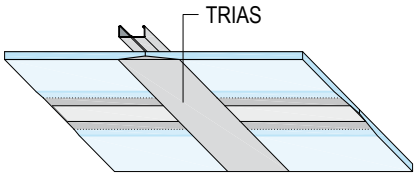
1. **First filling stage front edge**
   with TRIAS + Fugendeckstreifen Kurt joint tape



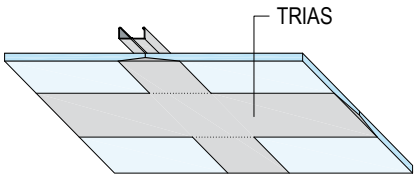
2. **First filling stage longitudinal edge**
   with TRIAS + Fugendeckstreifen Kurt joint tape



3. **Second filling stage front edge**
   with TRIAS



4. **Second filling stage longitudinal edge**
   with TRIAS



Coatings and linings

For direct application of a coarse texture wallpaper, the surface must at least have quality level Q2.
For direct application of a textured paint coat, the surface must at least have quality level Q3.
With Fireboard, the surface must be completely filled in both cases, e.g. with Knauf Fireboard-Spachtel filer.

Pretreatment

Before further coatings or linings (wallpaper) are applied, the filled surface must be free of dust and the surface of the gypsum boards should always be primed, acc. to code of practice no. 6 “Vorbehandlung von Trockenbauflächen aus Gipsplatten zur weitergehenden Oberflächenbeschichtung bzw. –bekleidung” issued by the Industriegruppe Gipsplatten im Bundesverband der Gipsindustrie e.V.
The primer must suit the subsequent coating compound/coatings/linings.
In order to compensate for the differences in absorption of surfaces, coatings of primer such as Knauf Tiefengrund primer or Spezialgrund floor dispersion are suitable.
Where a wallpaper lining is used, a primer that facilitates easier removal of wallpaper for redecoration is recommended.

Suitable coatings and linings

The following coatings/linings can be applied to Knauf boards:

- Wallpapers
  - Paper, fleece, textile and synthetic wallpapers:
    Use only adhesives made of methyl cellulose according to Code of Practice no. 16 “Technische Richtlinien für Tapezier- und Spannarbeiten innen” released by the Bundesausschuss Farbe und Sachwertschutz (German only).
- Plaster and filler materials
  - Top coats (e.g. Noblo, Raumklima Spritzputz spray plaster, Rotkalk Filz)
  - Full surface plaster (e.g. Readygips, ProSpray Light).

  Application of plaster layers only in conjunction with Knauf Fugendeckstreifen Kurt joint tape.
- Decorative coats
  - Dispersion paint (e.g. Intol E.L.F., Malerweiss E.L.F.),
  - Multicoloured (rainbow) emulsion
  - Silicate-based emulsion paints with suitable primer.

After wallpapering or after application of plasters, quick drying must be ensured through adequate airing.

Unsuitable coatings and linings

- Alkaline coats such as lime, water glass paints and silicate-based paints.

Notes	
	Gypsum board surfaces that have constantly been exposed to light without any protection can cause yellowing after coating. The yellowing agents are soluble in water and can penetrate through to the next coating layers and impair the adhesion properties of filler materials. In this case, the application of special primers such as Knauf Sperrgrund barrier coating for finish coats and filler materials and Knauf Atonol for paint coats are recommended.
	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

Material requirement per m² ceiling without allowance for loss and waste.

Description		Unit	Amount as average value						
			D111.de	D112.de		D113.de		D116.de	
			1	2	3	4	5	6	7
Connection to wall Backing as required – Observe fire protection requirements									
Acoustical sealant (pouch)		pcs	0.04	0.04	0.04	0.04	0.04	0.04	0.04
e.g. Profile UD 28/27		m	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Suitable anchors, e.g. Knauf Deckennagel ceiling steel dowels with reinforced concrete		pcs	0.4	0.4	0.4	0.7	0.7	0.4	0.4
Grid									
Suitable anchors, e.g. Knauf Deckennagel ceiling steel dowels with reinforced concrete		pcs	1.3	1.5	2.1	0.7	1.2	0.7	1.8
	Universal bracket for timber batten	pcs	1.3	–	–	–	–	–	–
	2x Knauf Schnellbauschrauben drywall screws TN 3.5x25	pcs	2.6	–	–	–	–	–	–
Alternative	Hanging wire + rapid wood hanger for wood frames	pcs	1.3	–	–	–	–	–	–
	2x Knauf Schnellbauschrauben drywall screws TN 3.5x35	pcs	2.6	–	–	–	–	–	–
	Universal brackets / damping universal brackets for CD	pcs	–	1.5	2.1	0.7	1.2	–	–
	2x metal screw LN 3.5x11	pcs	–	3	4.2	1.4	2.4	–	–
Alternative	Adjustable universal brackets / damping universal brackets (incl. 2x Splint)	pcs	–	1.5	2.1	0.7	1.2	–	–
Alternative	Hanging wire + Ankerfix rapid hanger	pcs	–	1.5	–	0.7	1.2	–	–
Alternative	Hanging wire + combo hanger	pcs	–	1.5	–	0.7	1.2	–	–
Alternative	Nonius hanger top + Nonius hanger botttom + Nonius splint	pcs	–	1.5	2.1	0.7	1.2	–	–
	2x metal screw LN 3.5x11	pcs	–	–	4.2	–	–	–	–
Alternative	Nonius hanger top + Combo hanger + Nonius splint	pcs	–	1.5	2.1	0.7	1.2	–	–
Alternative	Nonius hanger top + Nonius stirrup for CD + Nonius splint	pcs	–	1.5	2.1	–	–	–	–
	Nonius hanger top + Nonius stirrup for UA + Nonius splint	pcs	–	–	–	–	–	0.7	1.8
Carrying timber batten		m	1.2	–	–	–	–	–	–
Furring timber batten		m	2.1	–	–	–	–	–	–
Profile CD 60/27		m	–	3.2	3.5	0.8	0.8	2.1	2.1
Longitudinal connector for CD		pcs	–	0.6	0.7	0.2	0.2	0.4	0.4
Profile CD 60/27 1.19m long		m	–	–	–	1.9	1.9	–	–
Profile UA 50/40		m	–	–	–	–	–	1.1	1.4
Profile UW 50/40 (longitudinal connection UA)		m	–	–	–	–	–	0.04	0.06
Metal screw LB 3.5x16		pcs	–	–	–	–	–	1.8	2.3
Knauf Schnellbauschraube drywall screw TN 4.3x55		pcs	2.5	–	–	–	–	–	–
	Intersection connector for CD	pcs	–	2.3	2.9	–	–	–	–
Alternative	2x Ankerwinkel clip	pcs	–	4.6	5.8	–	–	–	–
	Flush connector	pcs	–	–	–	1.5	1.5	–	–
Alternative	2x Universal connector	pcs	–	–	–	3	3	–	–
Intersection connector for UA		pcs	–	–	–	–	–	2.3	2.9
Insulation layer Observe fire protection requirements									
Insulation layer, e.g. Knauf Insulation		m^2	as req.	as req.	as req.	as req.	as req.	as req.	1.2
Knauf boards Type and thickness, see the legend on page 75									
1st layer		m^2	1	1	1	1	1	1	1
2nd layer		m^2	–	1	1	–	1	–	1

Legend
as req. = as required
Material not provided by Knauf = printed in italics

The amounts refer to a ceiling area of 10 m x 10 m = 100 m²

Material requirement per m² ceiling without allowance for loss and waste.

Description	Unit	Amount as average value						
		D111.de	D112.de		D113.de		D116.de	
		1	2	3	4	5	6	7
Fastening Fastening of the boards – Knauf fasteners								
1st layer	pcs	17	9	13	25	9	17	13
2nd layer	pcs	–	17	21	–	17	–	21
Jointing Consumption quantities of the diverse filling compounds, refer to the product data sheets of the relevant Knauf products								
Knauf filling compound, e.g. Uniflott	kg	0.3	0.5	1	0.3	0.5	0.3	1
Trenn-Fix, 65 mm wide, self-adhesive	m	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Fugendeckstreifen Kurt joint tape (for front edges)	m	0.45	0.45	0.45	0.45	0.45	0.45	0.45

■ With Fireboard cladding: Always use Knauf Fireboard-Spachtel filler + Knauf Glasfaser-Fugendeckstreifen fibre glass joint tape (long and front edges)

The amounts refer to a ceiling area of 10 m x 10 m = 100 m²

Legend

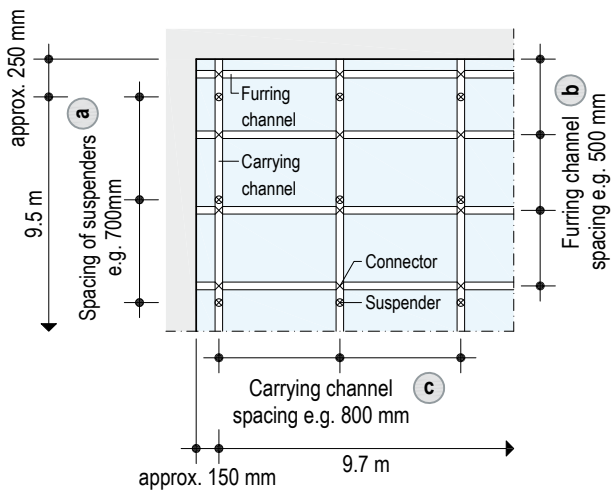
D111.de	1
Alternative	Standard
Knauf boards	GKB/GKBI
Board thickness	12.5 mm
Load class up to	0.15 kN/m²
Suspenders	1000 mm
Carrying timber batten	900 mm
Furring timber batten	500 mm

D113.de	4	5	
Alternative	Standard	Standard	F30 solely from below
Knauf boards	GKB/GKBI	GKB/GKBI	GKF/GKFI
Board thickness	12.5 mm	2x 12.5 mm	
Load class up to	0.15 kN/m²	0.30 kN/m²	
Suspenders	1100 mm	650 mm	
Carrying channel	1250 mm	1250 mm	
Furring channel	500 mm	500 mm	

D112.de	2		3
Alternative	Standard	F30 solely from below	F90 solely from below
Knauf boards	GKB/GKBI	GKF/GKFI	GKF/GKFI
Board thickness	2x 12.5 mm		2x 20 mm
Load class up to	0.30 kN/m²		0.50 kN/m²
Suspenders	750 mm		700 mm
Carrying channel	1000 mm		800 mm
Furring channel	500 mm		500 mm

D116.de	6	7
Alternative	Standard	F90 solely from below and from above
Knauf boards	GKB/GKBI	GKF/GKFI
Board thickness	12.5 mm	2x 20 mm
Load class up to	0.15 kN/m²	0.50 kN/m²
Suspenders	2050 mm	800 mm
Carrying channel	1000 mm	800 mm
Furring channel	500 mm	500 mm

Example material estimate for carrying and furring channels



Carrying channel

$\frac{9.7\text{ m}}{c}$ + 1 pc

$\frac{9.7\text{ m}}{0.8\text{ m}}$ + 1 pc = 14 pcs

14 (carrying channel) × 10 m = 140 m

Furring channel

$\frac{10\text{ m}}{b}$ + 1 pc

$\frac{10\text{ m}}{0.5\text{ m}}$ + 1 pc = 21 pcs

21 (furring channel) × 10 m = 210 m

Suspender

$\frac{9.5\text{ m}}{a}$ + 1 pc

$\frac{9.5\text{ m}}{0.7\text{ m}}$ + 1 pc = 15 pcs

14 (carrying channel) × 15 pcs = 210 pcs

Connector

Carrying channel (pcs) × furring channel (pcs)

14 (carrying channel) × 21 (furring channel) = 294 pcs

Information on the sustainability

Knauf Board Ceiling

Information on the sustainability

Building assessment systems ensure the sustainable quality of buildings and constructional structures by a detailed assessment of ecological, economic, social, functional and technical aspects. The certification systems of the DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen, German association for environmentally sustainable building), BNB (Bewertungssystem Nachhaltiges Bauen, Quality rating system for environmentally sustainable building) and LEED (Leadership in Energy and Environmental Design) are of particular relevance in Germany.
Knauf products and ceiling systems can positively influence many of these criteria.

DGNB/BNB

Ecological quality

- Criterion: Risks for the local environment
  The relevant environmental data are contained in the EPD for gypsum products

Economic quality

- Criterion: Building related life-cycle costs
  Cost-effective Knauf Drywalling

Sociocultural and functional quality

- Criterion: Suitability for conversion
  Flexible Knauf Drywalling

Technical quality

- Criterion: Fire protection
  Comprehensive fire protection know-how
- Criterion: Sound insulation
  Exceeding the demands of the standard with Knauf sound protection
- Criteria: Ease of dismantling and recycling
  Knauf Drywalling is fully compliant

LEED

Materials and Resources

- Credit: Recycled Content
  Recycled content in Knauf boards, e.g. FGD gypsum
- Credit: Regional Materials
  Short transport routes provided by the extensive network of Knauf manufacturing facilities

Detailed information on request

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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.