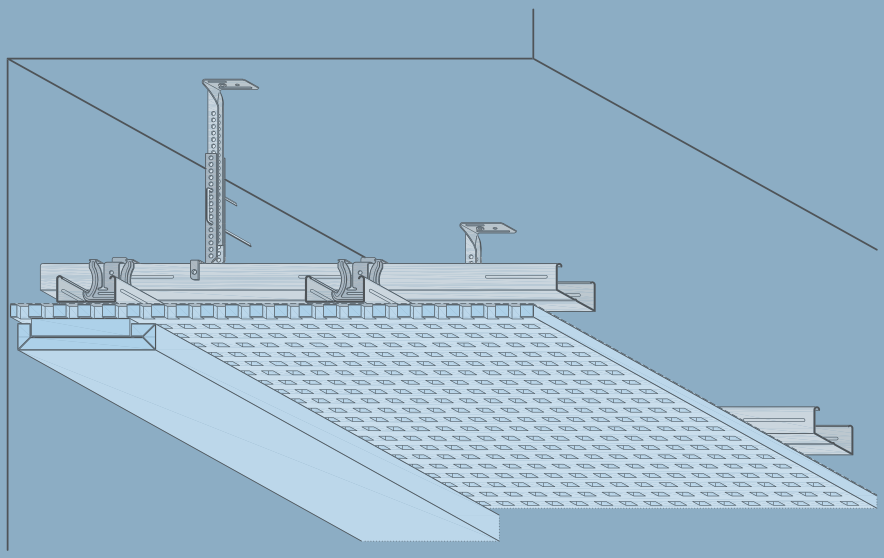


D12

New regulations come into effect on 01.04.2014 for constructions with fire protection requirements. The valid solutions for these constructions can be found in the appropriate section of the Knauf Fire Protection Folder at www.knauf-brandschutz.de

Drywall Systems | 05/2011

D12 Knauf Cleaneo Acoustic Ceilings

D127 – Knauf Cleaneo Acoustic Design Ceiling

D124 – Knauf Cleaneo Acoustic Fire Protection Ceiling

D123 – Knauf Cleaneo Acoustic Design Ceiling under Knauf Board Ceiling (Multi-level Ceiling System)

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.

D12 Knauf Cleaneo Acoustic Ceilings

Contents

See notes on english translation on page 1

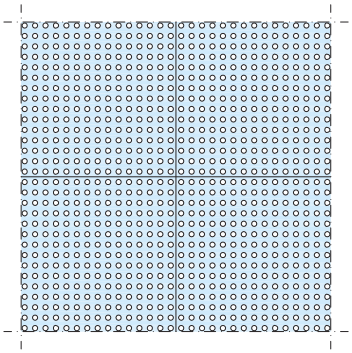
D12 Knauf Cleaneo Acoustic Ceilings

Knauf Cleaneo Acoustic board, edge types

See notes on english translation on page 1

Knauf Cleaneo Acoustic Board is a perforated or slotted 12.5 mm gypsum board with air-cleaning effect including a black or white acoustical fleece on the back (specify colour when ordering). Black Knauf Acoustical Fleece is recommended if the perforation is Ø ≥ 15 mm.

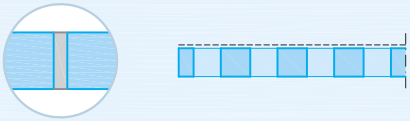
Continuous perforations

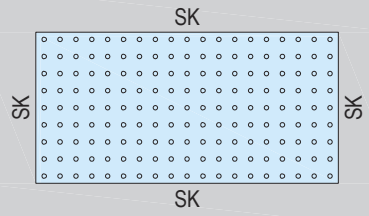


Standard edge types

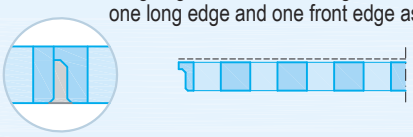
Scheme drawings for face side

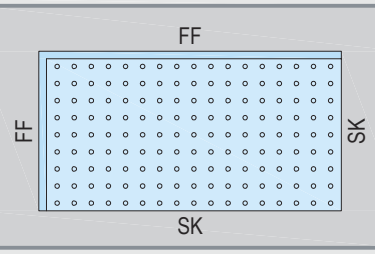
4 SK Four-side cut edge



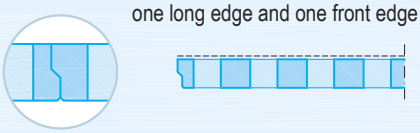


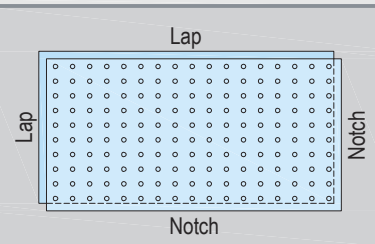
FF One long edge and one front edge as FF and one long edge and one front edge as SK



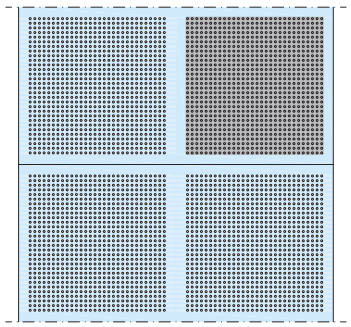


linear One long edge and one front edge as notch and one long edge and one front edge as lap



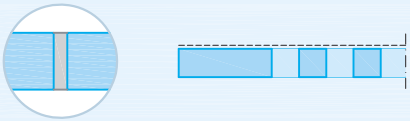


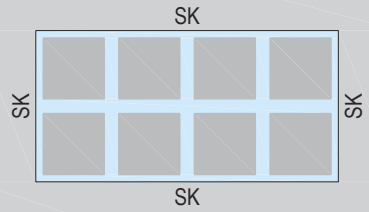
Block perforations



Standard edge type

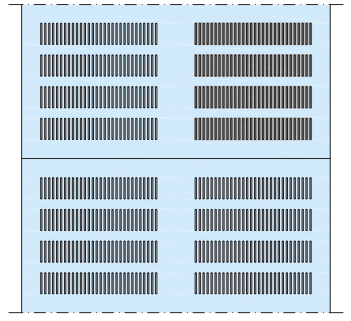
4 SK Four-side cut edge





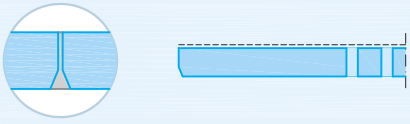
■ Further edge type:
4 AK four-side tapered edge

Block perforation "slotline"



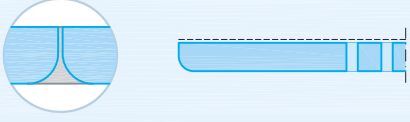
Standard edge types

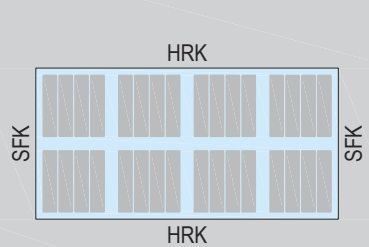
SFK Bevelled cut edge



\+

HRK Half-rounded long edge





■ Further edge types:
4 SK four-side cut edge
4 AK four-side tapered edge

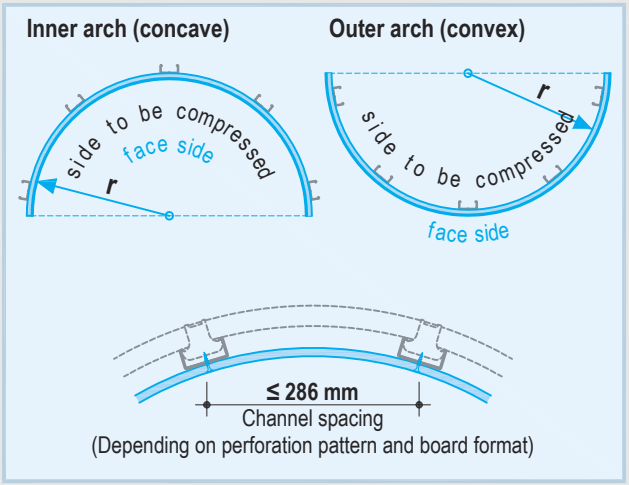
D12 Knauf Cleaneo Acoustic Ceilings

Bending radius, screw fastening of the boards, ball impact safety

See notes on english translation on page 1

Bending radius - Knauf Cleaneo Acoustic SK

Perforation Board thick. t = 12.5 mm	Bending radius - r - in longitudinal direction Dry bending - Concave or convex -	 Moistened bending - Concave -
Standard Circular R	≥ 3000 mm	≥ 2000 mm
Alternating Circular R		
Standard Square Q		
Random PLUS R	≥ 3500 mm	≥ 2500 mm



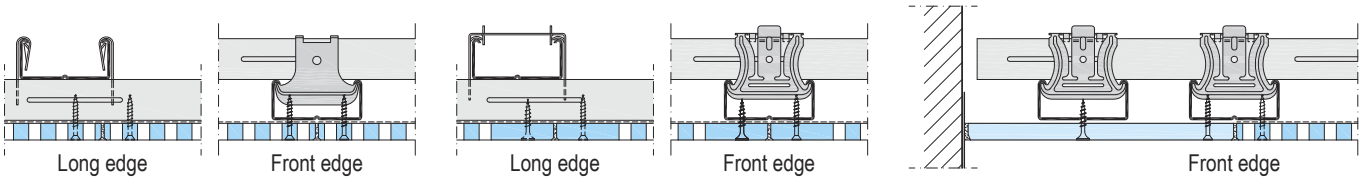
■ **Dry bending (concave and convex)**
Pre-bending of the boards on a template before application is recommended (preferably with a slightly smaller radius) in order to ease tensions in the structure.

■ **Moistened bending (concave)**
Lightly moisten the face side several times with a roller (do not perforate with a spiked roller and do not apply with a spray gun to prevent wetting of the gypsum core).

Screw fastening of Knauf boards

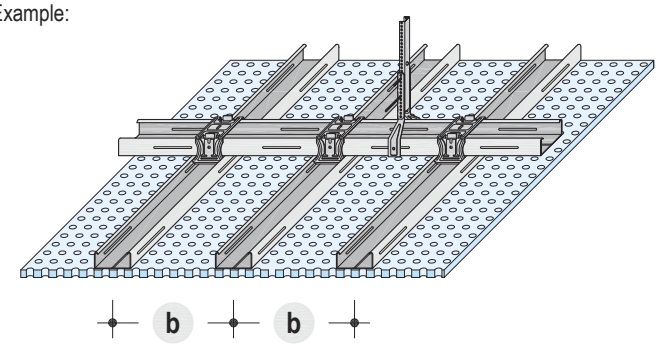
Screw spacing 170 mm

■ Perforated areas: **SN 3.5x30** ■ Non-perforated perimeter: **TN 3.5x25** or **SN 3.5x30** ■ Frieze: **TN 3.5x25** or **SN 3.5x30**



Ball impact safety

Example:



Ball impact safety acc. to DIN 18032-3 (without ceiling built-in elements)
Proof: PZ 55150/9013617-1
Expert report MPA Stuttgart 30.10.2009

■ **Ball impact safety is certified with continuous perforation and block perforation**

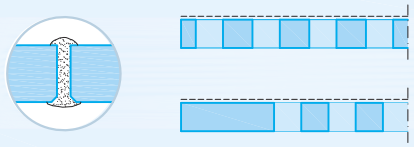
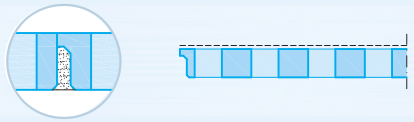
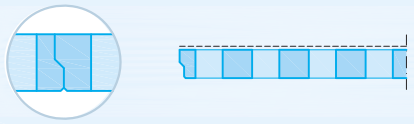
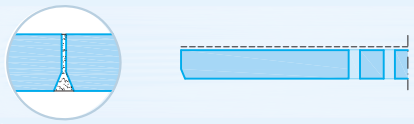
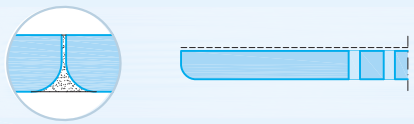
■ **Exact furring channel spacing dependent on perforation pattern**
(For suspender spacing + carrying channel spacing refer to the corresponding ceiling system)

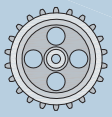
Design	Perforation			Board thickness Knauf Cleaneo Acoustic	Furring channel b Axial spacing
Standard Circular R	■ 12/25 R	■ 15/30 R	■ 20/42 R	12.5 mm	≤ 200 mm
Alternating Circular R	■ 12/20/66 R				
Standard Square Q	■ 8/18 Q	■ 12/25 Q			
Standard Circular R	■ 6/18 R	■ 8/18 R	■ 10/23 R	12.5 mm	≤ 250 mm
Alternating Circular R	■ 8/12/50 R				
Random PLUS R	■ 8/15/20 R	■ 12/20/35 R			
Standard Circular R	■ 12/25 R			15 mm	≤ 250 mm
Standard Square Q	■ 8/18 Q	■ 12/25 Q			
Standard Circular R	■ 8/18 R	■ 10/23 R		15 mm	≤ 333.5 mm
Alternating Circular R	■ 8/12/50 R				
Random PLUS R	■ 8/15/20 R				

D12 Knauf Cleaneo Acoustic Ceilings

Application and joint filling

See notes on english translation on page 1

Edge types	Application and jointing	Frieze made of non-perforated board strips
4 SK Four-side cut edge 	■ Bevel face side edges of the boards with Sanding Mesh and remove dust ■ Prime cut edges (SK) with Knauf Tiefengrund ■ Align boards via perforation pattern ■ Fill joints fully with TRIAS / Uniflott ■ Joint finishing with Knauf Finish Pastös or Readygips	■ Bevel cut edges of board strips (SK) on the face side with Sanding Mesh ■ Prime cut edges of board strips with Knauf Tiefengrund ■ Apply boards with 3–4 mm joint width ■ Fill joints fully with TRIAS / Uniflott
FF One long edge and one front edge as FF and one long edge and one front edge as SK 	■ Butt-joint edges ■ Align boards via perforation pattern ■ Fill joints fully with TRIAS / Uniflott ■ Joint finishing with Knauf Finish Pastös or Readygips	■ Bevel cut edges of board strips (SK) on the face side with Sanding Mesh ■ Prime cut edges of board strips with Knauf Tiefengrund ■ Apply boards with 3–4 mm joint width ■ Fill joints fully with TRIAS / Uniflott
linear One long edge and one front edge as notch and one long edge and one front edge as lap 	■ Butt-joint edges ■ Align boards via perforation pattern ■ Fill screw heads with Knauf Snowboard-Finish	■ Bevel cut edges of board strips (SK) on the face side with Sanding Mesh ■ Prime cut edges of board strips with Knauf Tiefengrund ■ Apply boards with 3–4 mm joint width ■ Fill joints fully with TRIAS / Uniflott Alternative: (without joint filling) non-perforated edge strips Cleaneo linear
4 AK Four-side tapered edge 	■ Butt-joint edges ■ Align boards ■ Fill joints fully with TRIAS / Uniflott / Fugenfüller Leicht ■ Joint Tape Kurt ■ Joint finishing with Knauf Finish Pastös or Readygips	■ Use board strips with tapered long edge (AK) ■ Butt-joint edges ■ Jointing with TRIAS / Uniflott / Fugenfüller Leicht ■ Joint Tape Kurt
SFK Front edge - bevelled 	■ Prime cut edges with Knauf Tiefengrund ■ Butt-joint edges ■ Align boards ■ Fill joints fully with TRIAS / Uniflott ■ Joint finishing with Knauf Finish Pastös or Readygips	■ Bevel the edges of the board strips on the face side with Sanding Mesh ■ Apply boards with 3–4 mm joint width ■ Prime cut edges with Knauf Tiefengrund ■ Fill joints fully with TRIAS / Uniflott
HRK Long edge - half-rounded 	■ Butt-joint edges ■ Align boards ■ Fill joints fully with TRIAS / Uniflott ■ Joint finishing with Knauf Finish Pastös or Readygips	■ Use board strips with HRK or HRAK ■ Butt-joint edges ■ Fill joints fully with TRIAS / Uniflott



Pilot Wheel
To clean the holes after hardening of the filling compound.
Available for perforations: 6/18 R, 8/18 R, 10/23 R, 12/25 R, 15/30 R (order handle separately)

D12 Knauf Cleaneo Acoustic Ceilings

Board design – Continuous perforation

See notes on english translation on page 1

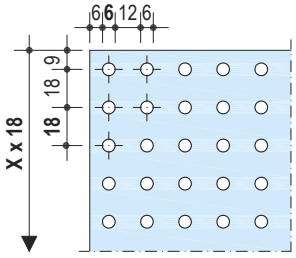
Continuous perforations

Board dimension = X x perforation spacing

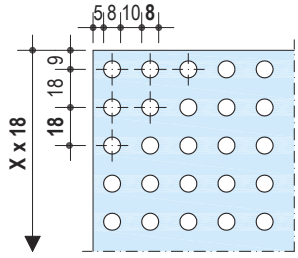
Design	Perforation	Perforation ratio (Board) %	Board dimensions (Standard size) Width mm	Length mm	Furring channel Max. axial spacing b mm	Edge types 4 SK	FF	linear
Standard Circular R	6/18 R	8.7	1188	1998	333	●	●	-
	8/18 R	15.5	1188	1998	333	●	●	●
	10/23 R	14.8	1196	2001	333.5	●	●	●
	12/25 R	18.1	1200	2000	333.3	●	●	●
	15/30 R	19.6	1200	1980	330	●	●	-
	20/42 R	17.8	1176	1974	329.3	●	-	-
Alternating Circular R	8/12/50 R	13.1	1200	2000	333.3	●	●	-
	12/20/66 R	19.6	1188	1980	330	●	●	●
Standard Square Q	8/18 Q	19.8	1188	1998	333	●	●	-
	12/25 Q	23.0	1200	2000	333.3	●	●	●
Random PLUS R	8/15/20 R	9.9	1200	1875 or 2500	312.5	●	●	-
	12/20/35 R	9.8	1200		312.5	●	●	-

Scheme drawings, face side, dimensions in mm

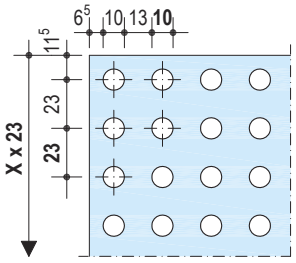
Standard Circular 6/18 R



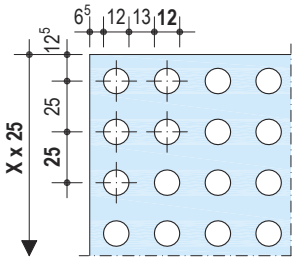
Standard Circular 8/18 R



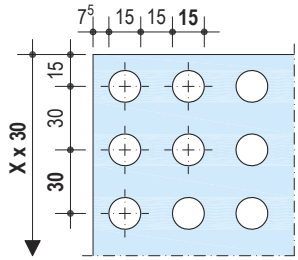
Standard Circular 10/23 R



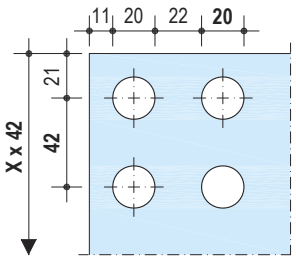
Standard Circular 12/25 R



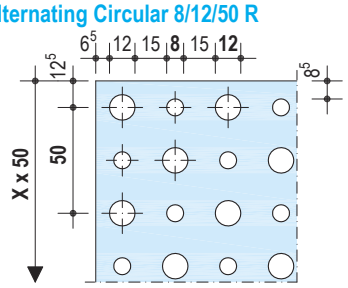
Standard Circular 15/30 R



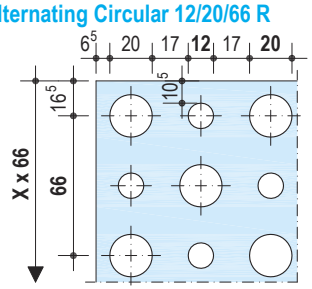
Standard Circular 20/42 R



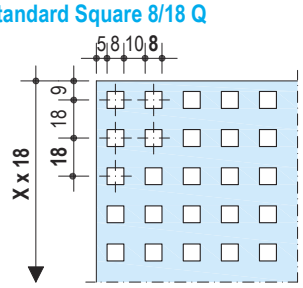
Alternating Circular 8/12/50 R



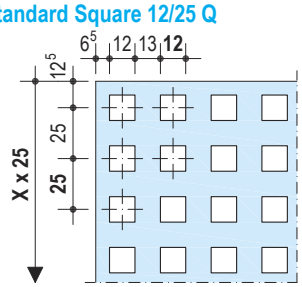
Alternating Circular 12/20/66 R



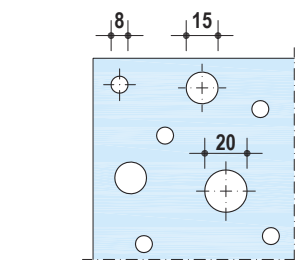
Standard Square 8/18 Q



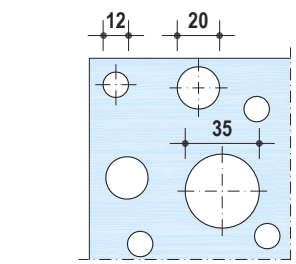
Standard Square 12/25 Q



Random PLUS 8/15/20 R



Random PLUS 12/20/35 R



■ **Furring channel axial spacing: b**
For customized production (e.g. according to installation plan), match axial spacings to these board dimensions (while observing max. permissible axial spacing)

■ Other types and/or customized designs for Knauf Cleaneo Acoustic boards available on request

D12 Knauf Cleaneo Acoustic Ceilings

Board design – Continuous perforation – Non-perforated perimeters

See notes on english translation on page 1

Continuous perforation - Non-perforated perimeters

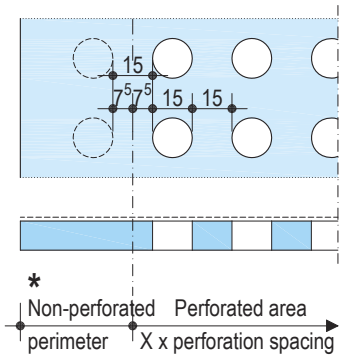
Design	Board dimensions		Furring channel Max. axial spacing b mm	Edge types	
	4 SK	4 AK		4 SK	4 AK
Standard Circular R Alternating Circular R Standard Square Q Random PLUS R	Observe max. standard size of the respective perforation	Max. 1200 x 2400 mm	Match to board dimension Observe max. permissible axial spacings of the respective perforation	All perimeter types possible	4-side non-perforated perimeter ≥ 69 mm

■ Boards should be from a single production batch. Therefore, customized boards (e.g. according to an installation plan) or boards with non-perforated perimeters cannot be combined with boards manufactured to standard specifications.

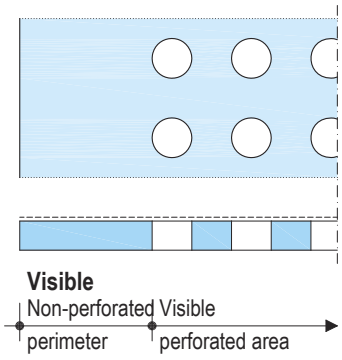
Dimensions for non-perforated perimeters

Scheme drawings - Example: 15/30 R

■ **Production-related specification**



■ **Optical specification**



Edge types

4 SK Four-side cut edge

4 AK Four-side tapered edge

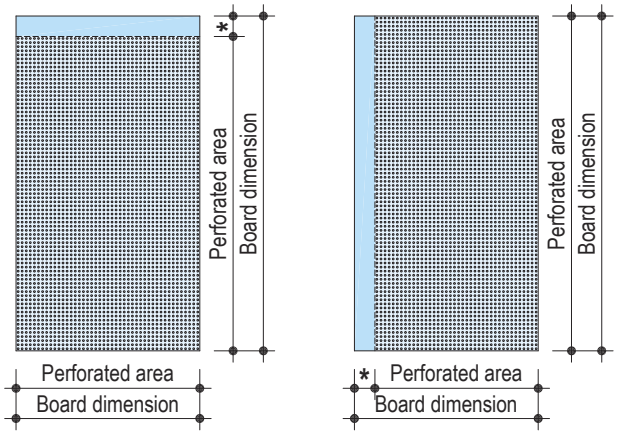
* = Non-perforated perimeter
1 to 4-sides available

Non-perforated perimeter

Scheme drawings, face side - **Production-related specification**

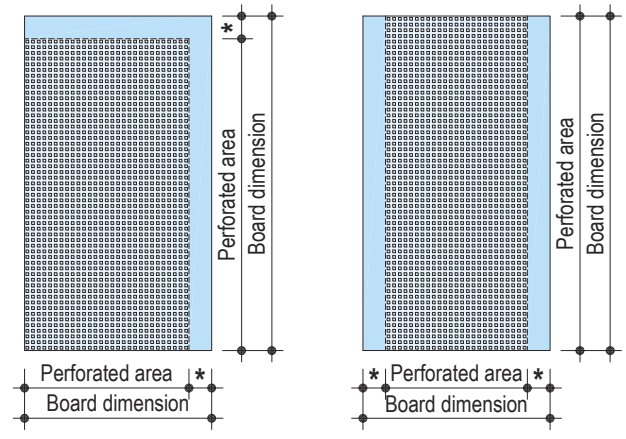
1-side non-perforated perimeter

Example: 8/18 R



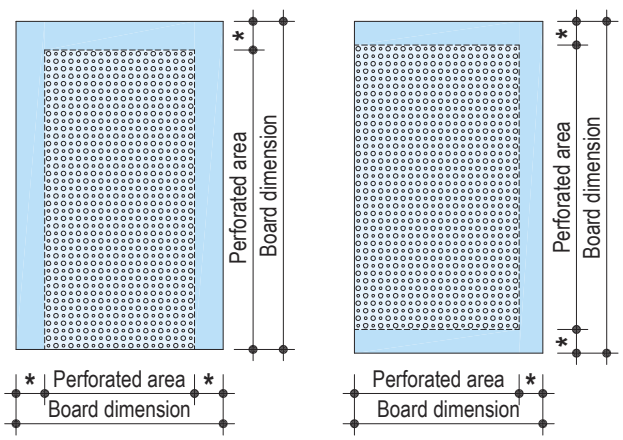
2-side non-perforated perimeter

Example: 12/25 Q



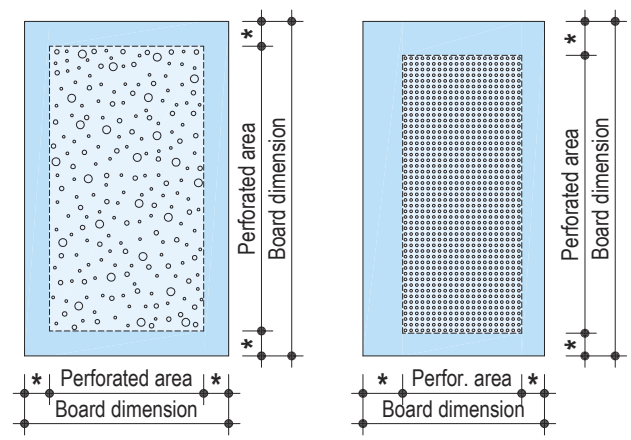
3-side non-perforated perimeter

Example: 12/20/66 R



4-side non-perforated perimeter

Examples: 12/20/35 R and 12/25 R



D12 Knauf Cleaneo Acoustic Ceilings

Board design – Block perforation

See notes on english translation on page 1

Block perforation

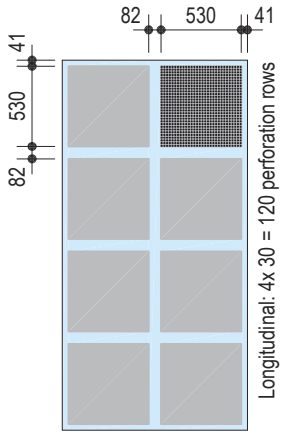
Perimeter dimensions are optical specifications (see page 7)

Design	Perforation	Perforations per "Block"		Perimeter Non-perforated		Perforation ratio	Board dimensions (Standard size)		Furring channel Max. axial spacings	Edge type	
		Lateral	Longitud.	Lateral mm	Longitud. mm	(Board) %	Width mm	Length mm	b mm	4 SK	4 AK
B4	8/18 R	30	30	41	41	12.1	1224	2448	312.5	●	-
	12/25 R	19	19	69	69	11.3	1200	2400	300	●	○
	12/25 Q	19	19	69	69	14.4	1200	2400	300	●	○
B5	8/18 R	13	13	41	41	9.1	1224	2448	312.5	●	-
	12/25 R	7	7	69	69	6.2	1200	2400	300	●	○
	12/25 Q	7	7	69	69	7.8	1200	2400	300	●	○
B6	8/18 R	64	30	41	41	12.9	1224	2448	312.5	●	-
	12/25 R	43	19	69	69	12.8	1200	2400	300	●	○
	12/25 Q	43	19	69	69	16.3	1200	2400	300	●	○

● Standard edge type ○ Other edge types

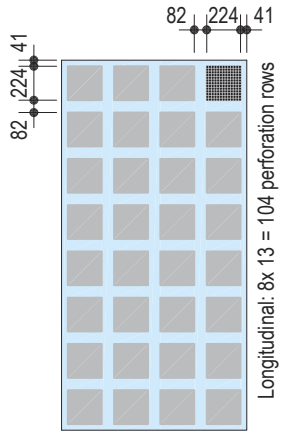
Scheme drawings, face side - dimensions in mm

Design B4 - 8/18 R



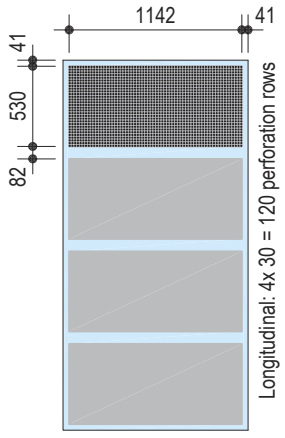
Lateral: 2x 30 = 60 perforations

Design B5 - 8/18 R



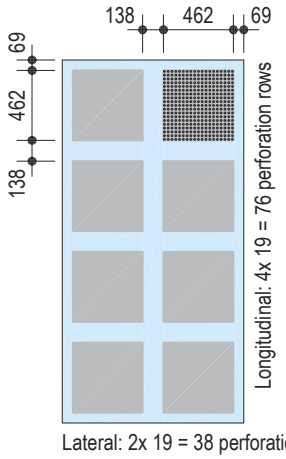
Lateral: 4x 13 = 52 perforations

Design B6 - 8/18 R



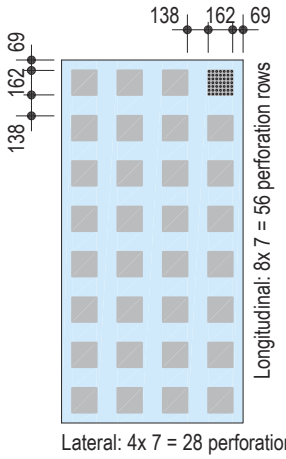
Lateral: 64 perforations

Design B4 - 12/25 R or **12/25 Q**



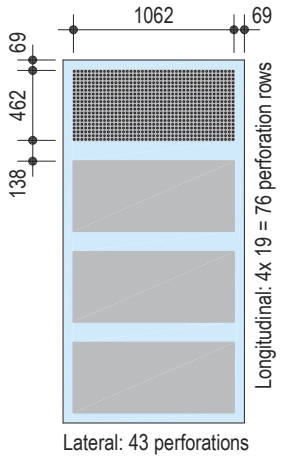
Lateral: 2x 19 = 38 perforations

Design B5 - 12/25 R or **12/25 Q**



Lateral: 4x 7 = 28 perforations

Design B6 - 12/25 R or **12/25 Q**



Lateral: 43 perforations

- Boards should be from a single production batch. Therefore, customized boards (e.g. according to an installation plan) or boards with non-perforated perimeters cannot be combined with boards manufactured to standard specifications.
- **Furring channel axial spacing b :**
  For customized production (e.g. according to installation plan), match axial spacings to these board dimension (while observing max. permissible axial spacing)
- Other types and/or customized designs for Knauf Cleaneo Acoustic boards available on request

D12 Knauf Cleaneo Acoustic Ceilings

Board design – Block slots “slotline”

See notes on english translation on page 1

Block slots "slotline"

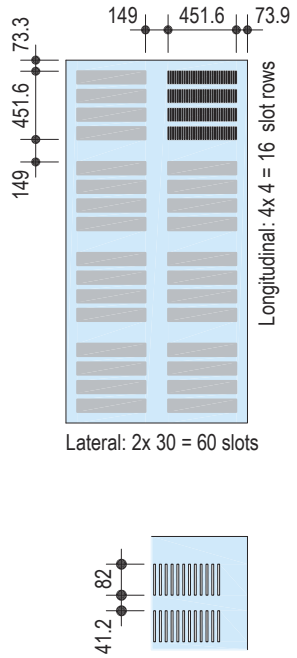
Perimeter dimensions are optical specifications (see page 7)

Design	Slots per "Block"		Perimeter non-slotted		Slot ratio	Board dimensions (standard size)		Furring channels Max. axial spacing	Edge type		
	Lateral	Long.	Lateral mm	Long. mm	(Board) %	Width mm	Length mm	b mm	HRK SFK	4 SK	4 AK
B4 - "slotline"	30	4	73.9	73.3	**13.7**	1200	2400	**300**	●	○	○
B5 - "slotline"	4x 6	4	73.9	73.3	**10.9**	1200	2400	**300**	●	○	○
B6 - "slotline"	69	4	73.9	73.3	**15.7**	1200	2400	**300**	●	○	○

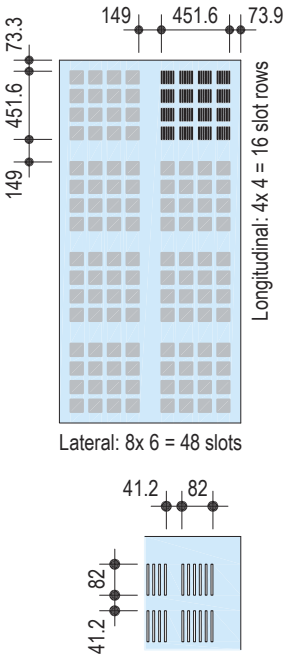
● Standard edge type ○ Other edge types

Scheme drawings, face side - dimensions in mm

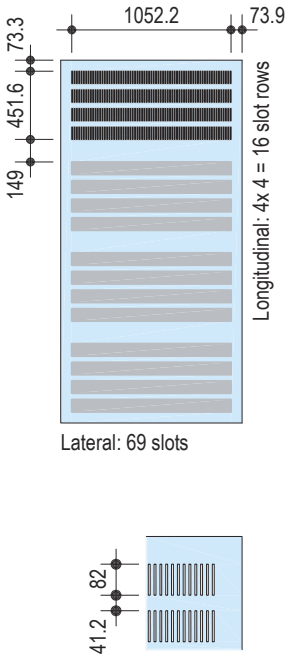
Design B4 - "slotline"



Design B5 - "slotline"



Design B6 - "slotline"



- Boards should be from a single production batch. Therefore, customized boards (e.g. according to an installation plan) or boards with non-perforated perimeters cannot be combined with boards manufactured to standard specifications.
- **Furring channel axial spacing (b):**
  For customized production (e.g. according to installation plan), match axial spacings to these board dimensions (while observing max. permissible axial spacing)
- Other types and/or customized designs for Knauf Cleaneo Acoustic boards available on request
- Slots are only possible in longitudinal direction of the boards

D12 Knauf Cleaneo Acoustic Ceilings

Sound absorption – Basics

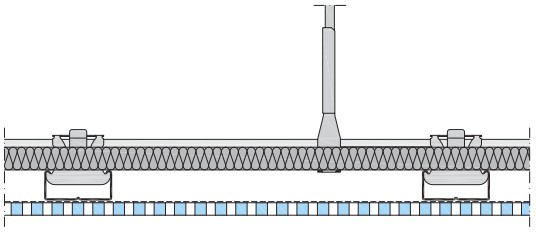
See notes on english translation on page 1

Material

- **Cladding:** Knauf Cleaneo Acoustic board, 12.5 mm thick with laminated fleece on rear (acoustical fleece)
- **Insulation:** D127: Mineral wool to DIN EN 13162, 20 mm thick, e.g. Knauf Insulation Akustik-Dämmplatte TP 120 A length-related flow resistance acc. to DIN EN 29053, r ≥ 10 kPa·s/m²
  D124: Mineral wool as specified on pages 28 / 29

Positioning of the insulation layer

Scheme drawing D127



- Apply acoustically effective mineral wool above the furring channels

Sound absorption classes

according to DIN EN ISO 11654; rated according to VDI 3755

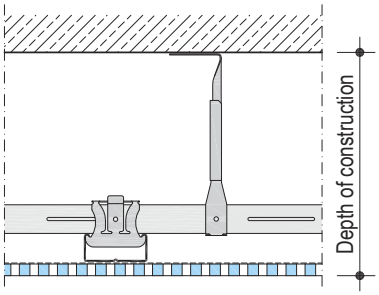
Rated sound absorption coefficient α_w	Sound absorption class	Rating
≥ 0.9	A	extremely absorbing
0.8 and 0.85	B	extremely absorbing
0.6 to 0.75	C	highly absorbing
0.3 to 0.55	D	absorbing
0.15 to 0.25	E	hardly absorbing
≤ 0.1	F *)	reflecting

*) rated as “not classified” according to DIN EN ISO 11654

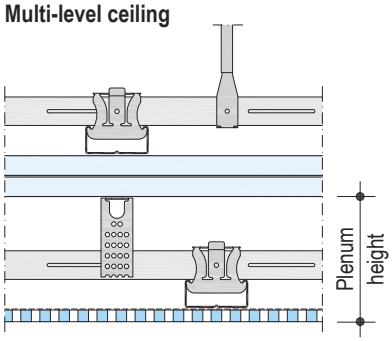
Ceiling configuration for systems D127 Knauf Cleaneo Acoustic Design Ceiling / Multi-level ceiling

Scheme drawings

D127



Multi-level ceiling



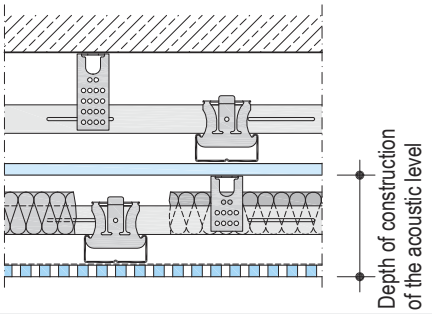
Notes:

- The decisive factor for acoustic effectiveness is the depth of construction.
- Increased depths of construction improve sound absorption coefficients of low frequencies. At the same time, higher efficiency can be achieved across a wider frequency spectrum.

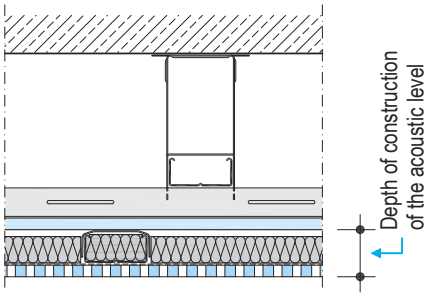
Ceiling configuration for system D124 Knauf Cleaneo Acoustic Fire Protection Ceiling

Scheme drawings

2nd substructure level with Universal Bracket



2nd substructure level with Direct Bracket

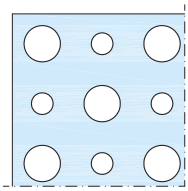


Notes:

- The sound absorption of the system is mainly dependent on the depth of construction of the acoustic level

All sound absorption coefficients stated on pages 12 to 21 only apply for boards with factory laminated Knauf Acoustical Fleece and the respective depth of construction, e.g. 200 mm = declared as [E-200] according to DIN EN ISO 354

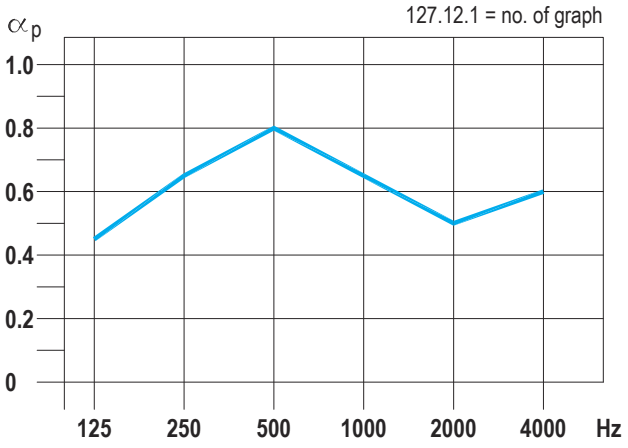
Example



Alternating Circular 12/20/66 R

with acoustical fleece

Perforation ratio: **19.6 %**



Depth of construction 200 mm

α_p	0.45	0.65	0.8	0.65	0.5	0.6

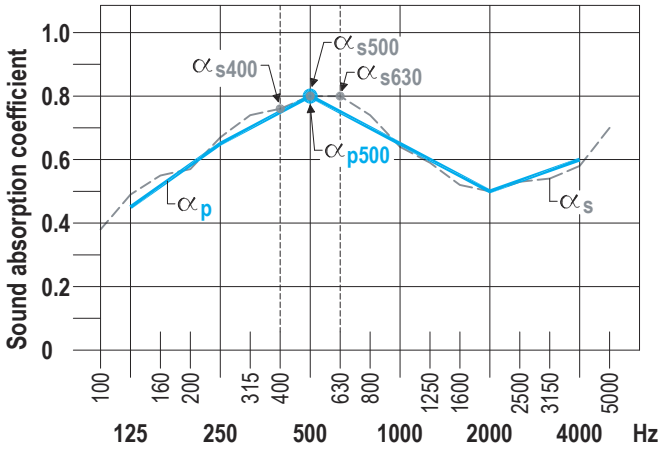
α_w **= 0.60 (L)** Class: **C** (highly absorbing)

1 Sound absorption coefficient

α_s = **Sound absorption coefficient for third octave bandwidth**
frequency-dependent value of sound absorption coefficient according to DIN EN ISO 354, measured in third octave bands

α_p = **Practical sound absorption coefficient**
from α_s on octave bands converted according to DIN EN ISO 11654

Example for 500 Hz: $\alpha_{p500} = \frac{\alpha_{s400} + \alpha_{s500} + \alpha_{s630}}{3}$

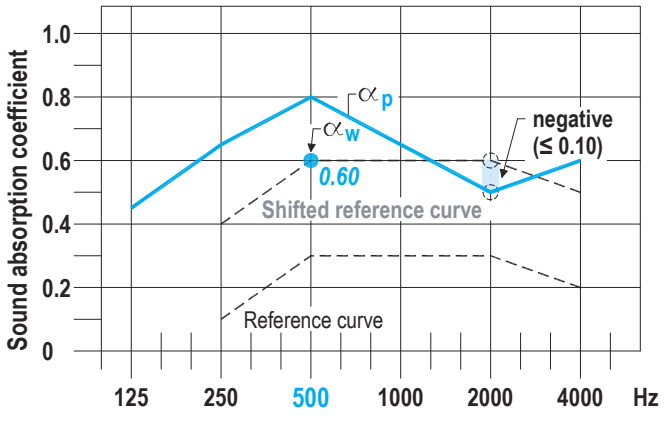


2 Rated sound absorption coefficient

α_w = **Rated sound absorption coefficient**
according to DIN EN ISO 11654

= **Single number parameter of sound absorption coefficient**
determined from shifted reference curve (negative deviation ≤ 0.10) and point of intersection at **500 Hz** according to DIN EN ISO 11654

Example:



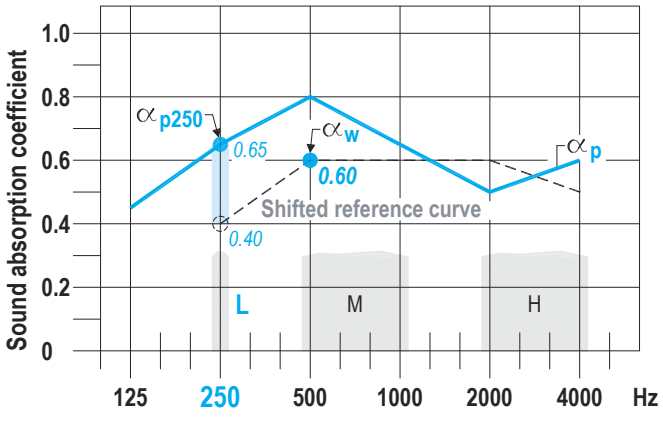
3 Shape indicators

α_w **with shape indicator** = α_w **(...)**

If α_p exceeds the reference curve for a single octave frequency by **≥ 0.25** then add:

(L) at 250 Hz **(M)** at 500 or 1000 Hz **(H)** at 2000 or 4000 Hz

Example (250 Hz): 0.65 - 0.40 = 0.25 (≥ 0.25) = (L) → α_w **= 0.60 (L)**

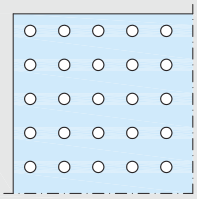


D127 Knauf Cleaneo Acoustic Design Ceiling

Sound absorption – Continuous perforation

See notes on english translation on page 1

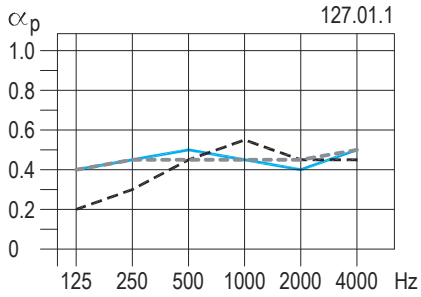
Standard Circular 6/18 R



Perforation ratio: **8.7 %**

Knauf sound insulation proof: A 001-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.2	0.3	0.45	0.55	0.45	0.45

α_w = **0.50** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.4	0.45	0.5	0.45	0.4	0.5

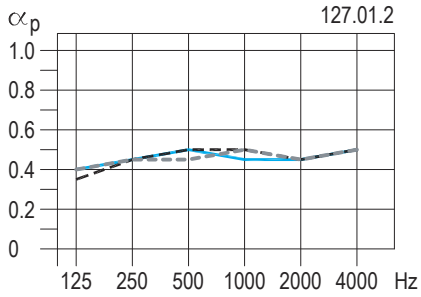
α_w = **0.45** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.4	0.45	0.45	0.45	0.45	0.5

α_w = **0.45** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.45	0.5	0.5	0.45	0.5

α_w = **0.50** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.4	0.45	0.5	0.45	0.45	0.5

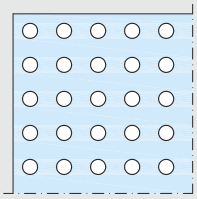
α_w = **0.50** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.4	0.45	0.45	0.5	0.45	0.5

α_w = **0.50** Class: **D** (absorbing)

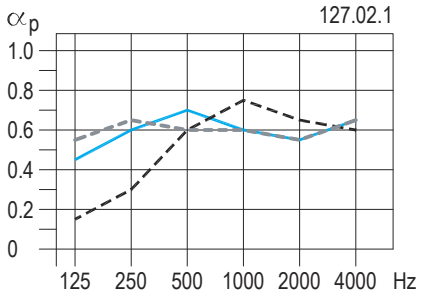
Standard Circular 8/18 R



Perforation ratio: **15.5 %**

Knauf sound insulation proof: A 001-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.3	0.6	0.75	0.65	0.6

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.45	0.6	0.7	0.6	0.55	0.65

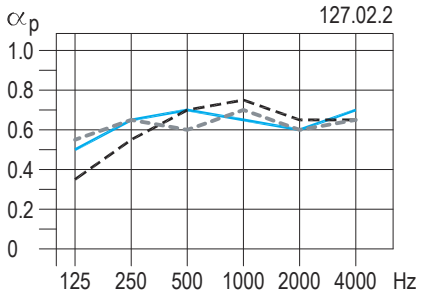
α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.55	0.65	0.6	0.6	0.55	0.65

α_w = **0.60 (L)** Class: **C** (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.55	0.7	0.75	0.65	0.65

α_w = **0.70** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.5	0.65	0.7	0.65	0.6	0.7

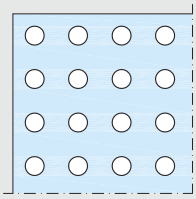
α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.55	0.65	0.6	0.7	0.6	0.65

α_w = **0.65** Class: **C** (highly absorbing)

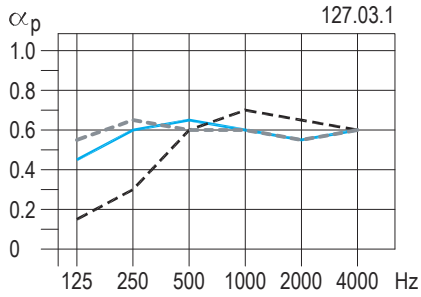
Standard Circular 10/23 R



Perforation ratio: **14.8 %**

Knauf sound insulation proof: A 001-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.3	0.6	0.7	0.65	0.6

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.45	0.6	0.65	0.6	0.55	0.6

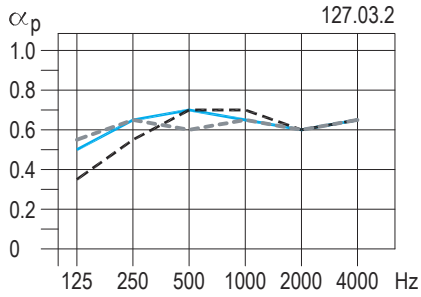
α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.55	0.65	0.6	0.6	0.55	0.6

α_w = **0.60 (L)** Class: **C** (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.55	0.7	0.7	0.6	0.65

α_w = **0.70** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.5	0.65	0.7	0.65	0.6	0.65

α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.55	0.65	0.6	0.65	0.6	0.65

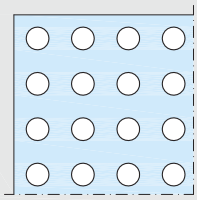
α_w = **0.65** Class: **C** (highly absorbing)

D127 Knauf Cleaneo Acoustic Design Ceiling

Sound absorption – Continuous perforation

See notes on english translation on page 1

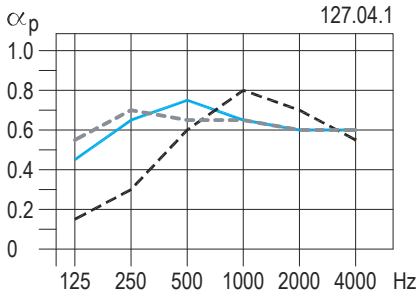
Standard Circular 12/25 R



Perforation ratio: **18.1 %**

Knauf sound insulation proof: A 001-10.09

■ with acoustical fleece



Depth of construction 65 mm – – – – –

α_p	0.15	0.3	0.6	0.8	0.7	0.55

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm ——

α_p	0.45	0.65	0.75	0.65	0.6	0.6

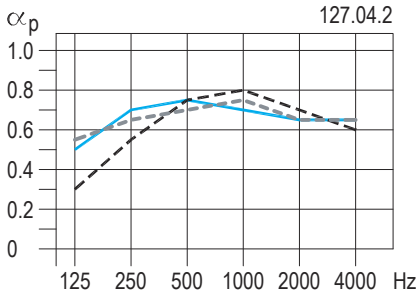
α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 400 mm – – – – –

α_p	0.55	0.7	0.65	0.65	0.6	0.6

α_w = **0.65 (L)** Class: **C** (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm – – – – –

α_p	0.3	0.55	0.75	0.8	0.7	0.6

α_w = **0.75** Class: **C** (highly absorbing)

Depth of construction 200 mm ——

α_p	0.5	0.7	0.75	0.7	0.65	0.65

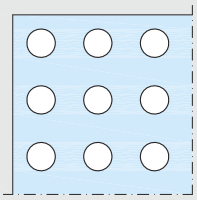
α_w = **0.70** Class: **C** (highly absorbing)

Depth of construction 400 mm – – – – –

α_p	0.55	0.65	0.7	0.75	0.65	0.65

α_w = **0.70** Class: **C** (highly absorbing)

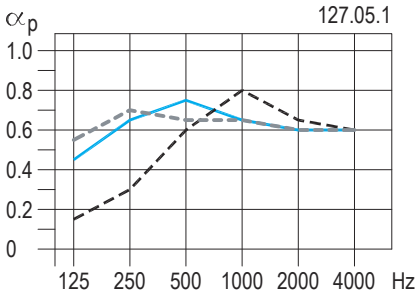
Standard Circular 15/30 R



Perforation ratio: **19.6 %**

Knauf sound insulation proof: A 001-10.09

■ with acoustical fleece



Depth of construction 65 mm – – – – –

α_p	0.15	0.3	0.6	0.8	0.65	0.6

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm ——

α_p	0.45	0.65	0.75	0.65	0.6	0.6

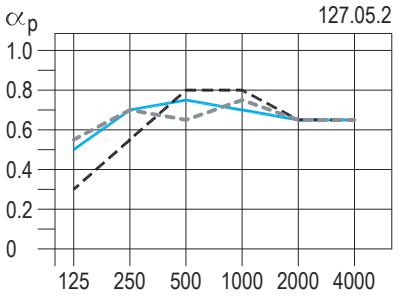
α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 400 mm – – – – –

α_p	0.55	0.7	0.65	0.65	0.6	0.6

α_w = **0.65 (L)** Class: **C** (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm – – – – –

α_p	0.3	0.55	0.8	0.8	0.65	0.65

α_w = **0.75** Class: **C** (highly absorbing)

Depth of construction 200 mm ——

α_p	0.5	0.7	0.75	0.7	0.65	0.65

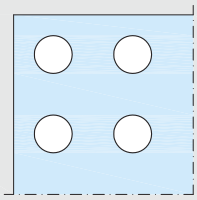
α_w = **0.70** Class: **C** (highly absorbing)

Depth of construction 400 mm – – – – –

α_p	0.55	0.7	0.65	0.75	0.65	0.65

α_w = **0.70** Class: **C** (highly absorbing)

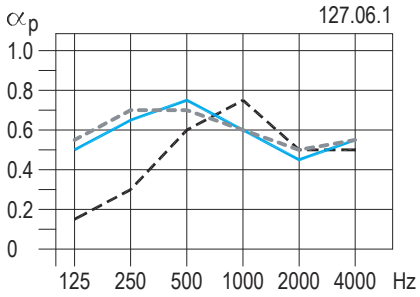
Standard Circular 20/42 R



Perforation ratio: **17.8 %**

Knauf sound insulation proof: A 001-10.09

■ with acoustical fleece



Depth of construction 65 mm – – – – –

α_p	0.15	0.3	0.6	0.75	0.5	0.5

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm ——

α_p	0.5	0.65	0.75	0.6	0.45	0.55

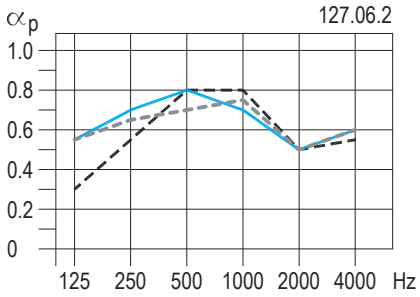
α_w = **0.55 (L)** Class: **D** (absorbing)

Depth of construction 400 mm – – – – –

α_p	0.55	0.7	0.7	0.6	0.5	0.55

α_w = **0.60 (L)** Class: **C** (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm – – – – –

α_p	0.3	0.55	0.8	0.8	0.5	0.55

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm ——

α_p	0.55	0.7	0.8	0.7	0.5	0.6

α_w = **0.60 (L)** Class: **C** (highly absorbing)

Depth of construction 400 mm – – – – –

α_p	0.55	0.65	0.7	0.75	0.5	0.6

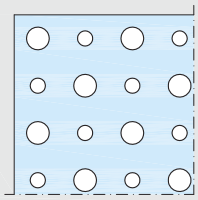
α_w = **0.60 (L)** Class: **C** (highly absorbing)

D127 Knauf Cleaneo Acoustic Design Ceiling

Sound absorption – Continuous perforation

See notes on english translation on page 1

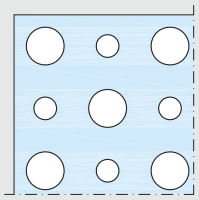
Alternating Circular 8/12/50 R



Perforation ratio: **13.1 %**

Knauf sound insulation proof: A 002-10.09

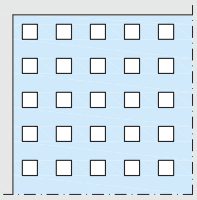
Alternating Circular 12/20/66 R



Perforation ratio: **19.6 %**

Knauf sound insulation proof: A 002-10.09

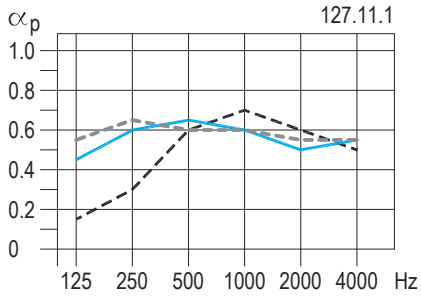
Standard Square 8/18 Q



Perforation ratio: **19.8 %**

Knauf sound insulation proof: A 003-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.3	0.6	0.7	0.6	0.5

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.45	0.6	0.65	0.6	0.5	0.55

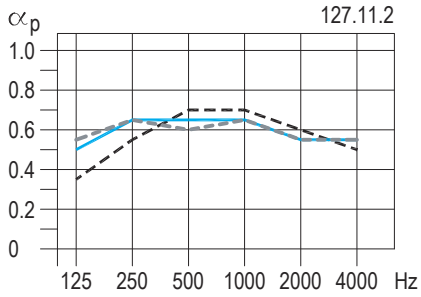
α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.55	0.65	0.6	0.6	0.55	0.55

α_w = **0.60 (L)** Class: **C** (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.55	0.7	0.7	0.6	0.5

α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.5	0.65	0.65	0.65	0.55	0.55

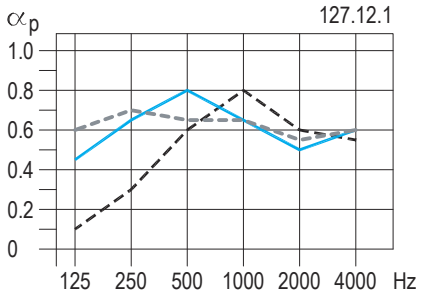
α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.55	0.65	0.6	0.65	0.55	0.55

α_w = **0.60 (L)** Class: **C** (highly absorbing)

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.1	0.3	0.6	0.8	0.6	0.55

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.45	0.65	0.8	0.65	0.5	0.6

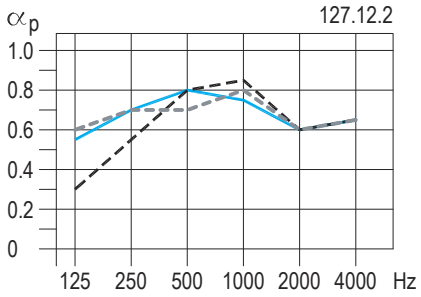
α_w = **0.60 (L)** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.6	0.7	0.65	0.65	0.55	0.6

α_w = **0.65 (L)** Class: **C** (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.3	0.55	0.8	0.85	0.6	0.65

α_w = **0.70** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.55	0.7	0.8	0.75	0.6	0.65

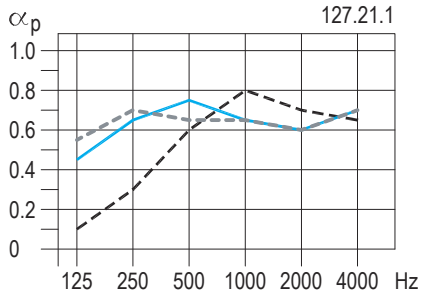
α_w = **0.70** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.6	0.7	0.7	0.8	0.6	0.65

α_w = **0.70** Class: **C** (highly absorbing)

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.1	0.3	0.6	0.8	0.7	0.65

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.45	0.65	0.75	0.65	0.6	0.7

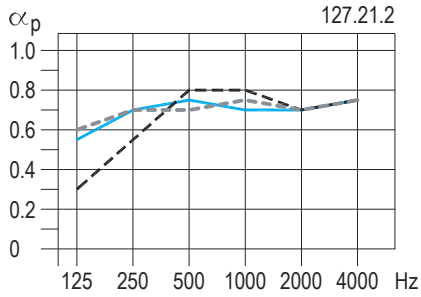
α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.55	0.7	0.65	0.65	0.6	0.7

α_w = **0.65 (L)** Class: **C** (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.3	0.55	0.8	0.8	0.7	0.75

α_w = **0.75** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.55	0.7	0.75	0.7	0.7	0.75

α_w = **0.75** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.6	0.7	0.7	0.75	0.7	0.75

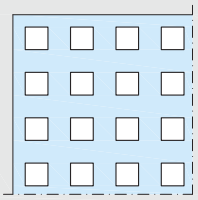
α_w = **0.75** Class: **C** (highly absorbing)

D127 Knauf Cleaneo Acoustic Design Ceiling

Sound absorption – Continuous perforation

See notes on english translation on page 1

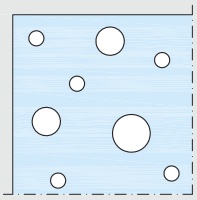
Standard Square 12/25 Q



Perforation ratio: 23.0 %

Knauf sound insulation proof: A 003-10.09

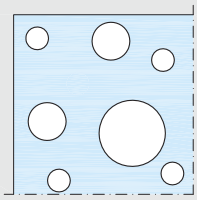
Random PLUS 8/15/20 R



Perforation ratio: 9.9 %

Knauf sound insulation proof: A 004-10.09

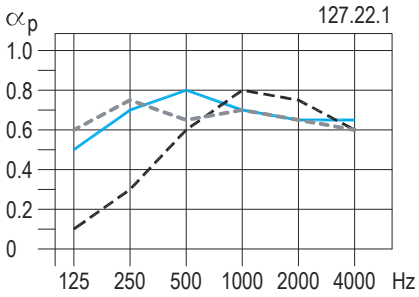
Random PLUS 12/20/35 R



Perforation ratio: 9.8 %

Knauf sound insulation proof: A 004-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.1	0.3	0.6	0.8	0.75	0.6

α_w = 0.60 Class: C (highly absorbing)

Depth of construction 200 mm

α_p	0.5	0.7	0.8	0.7	0.65	0.65

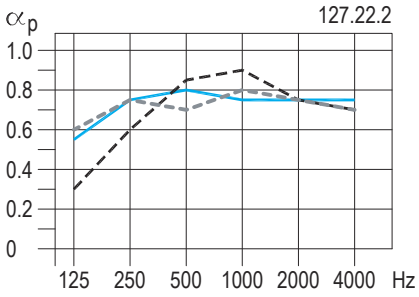
α_w = 0.70 Class: C (highly absorbing)

Depth of construction 400 mm

α_p	0.6	0.75	0.65	0.7	0.65	0.6

α_w = 0.70 (L) Class: C (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.3	0.6	0.85	0.9	0.75	0.7

α_w = 0.80 Class: B (extremely absorbing)

Depth of construction 200 mm

α_p	0.55	0.75	0.8	0.75	0.75	0.75

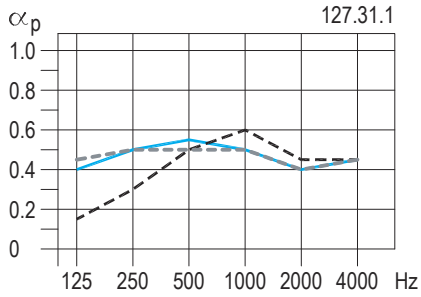
α_w = 0.80 Class: B (extremely absorbing)

Depth of construction 400 mm

α_p	0.6	0.75	0.7	0.8	0.75	0.7

α_w = 0.75 Class: C (highly absorbing)

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.3	0.5	0.6	0.45	0.45

α_w = 0.50 Class: D (absorbing)

Depth of construction 200 mm

α_p	0.4	0.5	0.55	0.5	0.4	0.45

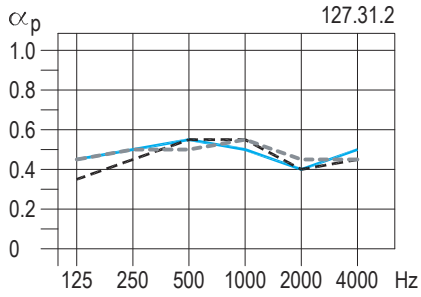
α_w = 0.50 Class: D (absorbing)

Depth of construction 400 mm

α_p	0.45	0.5	0.5	0.5	0.4	0.45

α_w = 0.50 Class: D (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.45	0.55	0.55	0.4	0.45

α_w = 0.50 Class: D (absorbing)

Depth of construction 200 mm

α_p	0.45	0.5	0.55	0.5	0.4	0.5

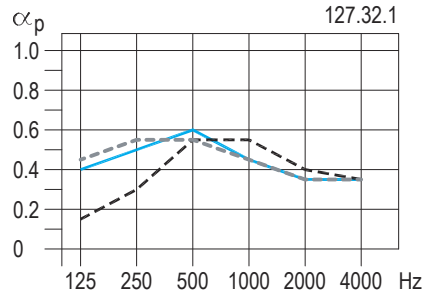
α_w = 0.50 Class: D (absorbing)

Depth of construction 400 mm

α_p	0.45	0.5	0.5	0.55	0.45	0.45

α_w = 0.50 Class: D (absorbing)

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.3	0.55	0.55	0.4	0.35

α_w = 0.45 Class: D (absorbing)

Depth of construction 200 mm

α_p	0.4	0.5	0.6	0.45	0.35	0.35

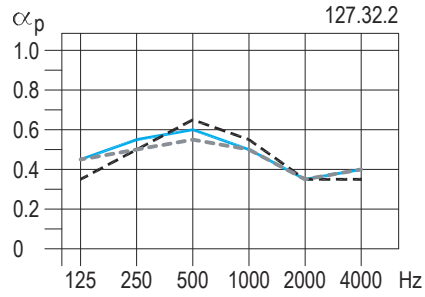
α_w = 0.45 (L) Class: D (absorbing)

Depth of construction 400 mm

α_p	0.45	0.55	0.55	0.45	0.35	0.35

α_w = 0.45 (L) Class: D (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.5	0.65	0.55	0.35	0.35

α_w = 0.45 (L) Class: D (absorbing)

Depth of construction 200 mm

α_p	0.45	0.55	0.6	0.5	0.35	0.4

α_w = 0.45 (L) Class: D (absorbing)

Depth of construction 400 mm

α_p	0.45	0.5	0.55	0.5	0.35	0.4

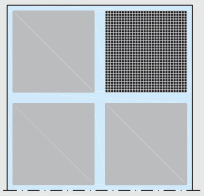
α_w = 0.45 (L) Class: D (absorbing)

D127 Knauf Cleaneo Acoustic Design Ceiling

Sound absorption – Block perforation 8/18 R

See notes on english translation on page 1

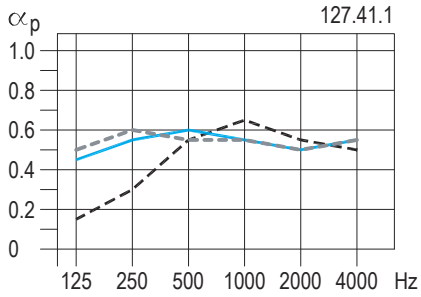
Design B4 - 8/18 R



Perforation ratio: **12.1 %**

Knauf sound insulation proof: A 006-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.3	0.55	0.65	0.55	0.5

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.45	0.55	0.6	0.55	0.5	0.55

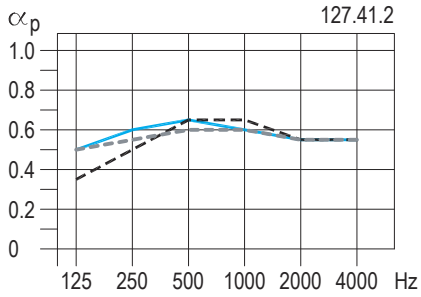
α_w = **0.55** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.5	0.6	0.55	0.55	0.5	0.55

α_w = **0.55 (L)** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.5	0.65	0.65	0.55	0.55

α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.5	0.6	0.65	0.6	0.55	0.55

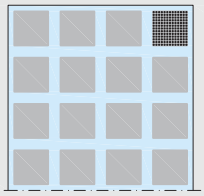
α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.5	0.55	0.6	0.6	0.55	0.55

α_w = **0.60** Class: **C** (highly absorbing)

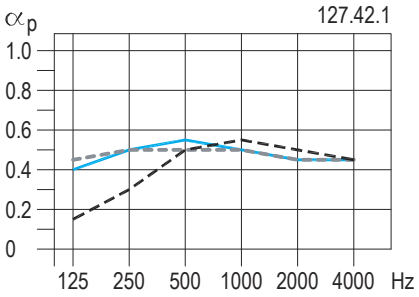
Design B5 - 8/18 R



Perforation ratio: **9.1 %**

Knauf sound insulation proof: A 006-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.3	0.5	0.55	0.5	0.45

α_w = **0.50** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.4	0.5	0.55	0.5	0.45	0.45

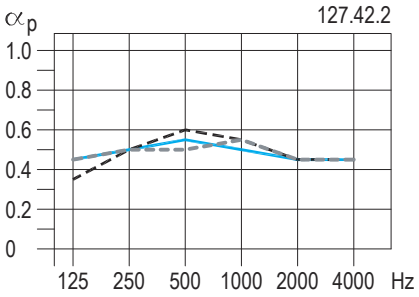
α_w = **0.50** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.45	0.5	0.5	0.5	0.45	0.45

α_w = **0.50** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.5	0.6	0.55	0.45	0.45

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.45	0.5	0.55	0.5	0.45	0.45

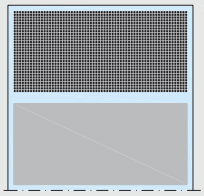
α_w = **0.50** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.45	0.5	0.5	0.55	0.45	0.45

α_w = **0.50** Class: **D** (absorbing)

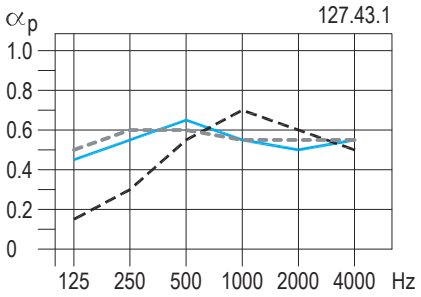
Design B6 - 8/18 R



Perforation ratio: **12.9 %**

Knauf sound insulation proof: A 006-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.3	0.55	0.7	0.6	0.5

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.45	0.55	0.65	0.55	0.5	0.55

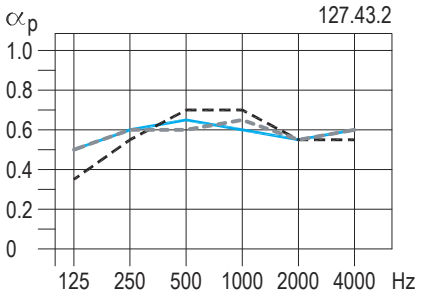
α_w = **0.55** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.5	0.6	0.6	0.55	0.55	0.55

α_w = **0.60** Class: **C** (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.55	0.7	0.7	0.55	0.55

α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.5	0.6	0.65	0.6	0.55	0.6

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.5	0.6	0.6	0.65	0.55	0.6

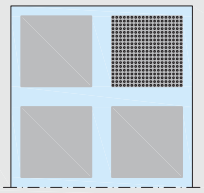
α_w = **0.60** Class: **C** (highly absorbing)

D127 Knauf Cleaneo Acoustic Design Ceiling

Sound absorption – Block perforation 12/25 R

See notes on english translation on page 1

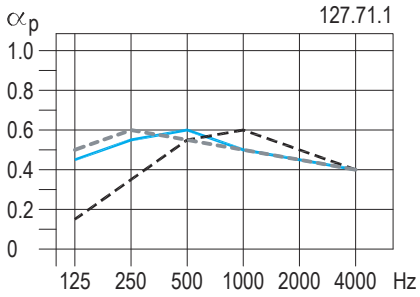
Design B4 - 12/25 R



Perforation ratio: **11.3 %**

Knauf sound insulation proof: A 006-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.35	0.55	0.6	0.5	0.4

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.45	0.55	0.6	0.5	0.45	0.4

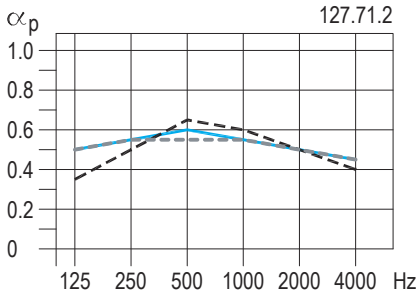
α_w = **0.50 (L)** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.5	0.6	0.55	0.5	0.45	0.4

α_w = **0.50 (L)** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.5	0.65	0.6	0.5	0.4

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.5	0.55	0.6	0.55	0.5	0.45

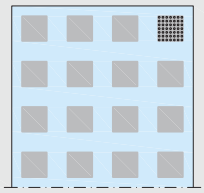
α_w = **0.55** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.5	0.55	0.55	0.55	0.5	0.45

α_w = **0.55** Class: **D** (absorbing)

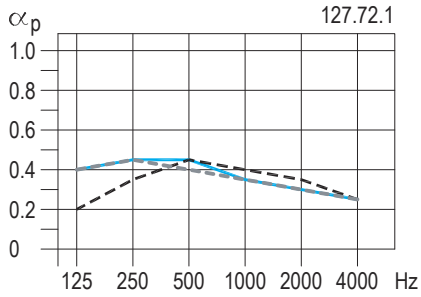
Design B5 - 12/25 R



Perforation ratio: **6.2 %**

Knauf sound insulation proof: A 006-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.2	0.35	0.45	0.4	0.35	0.25

α_w = **0.40** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.4	0.45	0.45	0.35	0.3	0.25

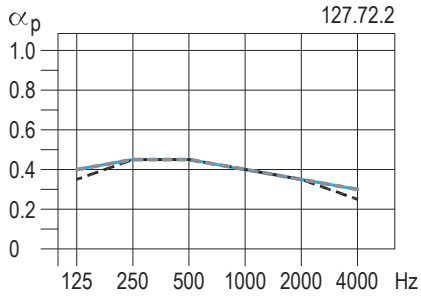
α_w = **0.35 (L)** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.4	0.45	0.4	0.35	0.3	0.25

α_w = **0.35 (L)** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.45	0.45	0.4	0.35	0.25

α_w = **0.40 (L)** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.4	0.45	0.45	0.4	0.35	0.3

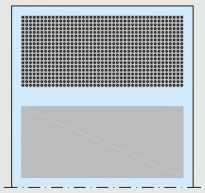
α_w = **0.40 (L)** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.4	0.45	0.45	0.4	0.35	0.3

α_w = **0.40 (L)** Class: **D** (absorbing)

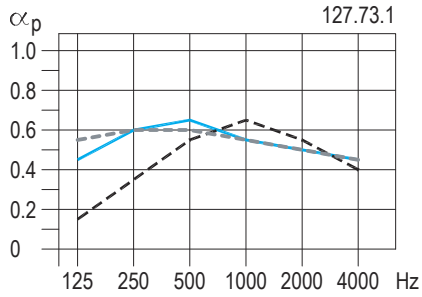
Design B6 - 12/25 R



Perforation ratio: **12.8 %**

Knauf sound insulation proof: A 006-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.35	0.55	0.65	0.55	0.4

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.45	0.6	0.65	0.55	0.5	0.45

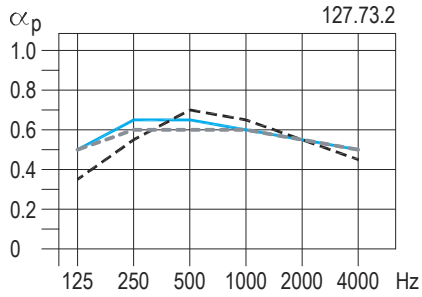
α_w = **0.55 (L)** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.55	0.6	0.6	0.55	0.5	0.45

α_w = **0.55 (L)** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.55	0.7	0.65	0.55	0.45

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.5	0.65	0.65	0.6	0.55	0.5

α_w = **0.60 (L)** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.5	0.6	0.6	0.6	0.55	0.5

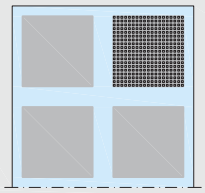
α_w = **0.60** Class: **C** (highly absorbing)

D127 Knauf Cleaneo Acoustic Design Ceiling

Sound absorption – Block perforation 12/25 Q

See notes on english translation on page 1

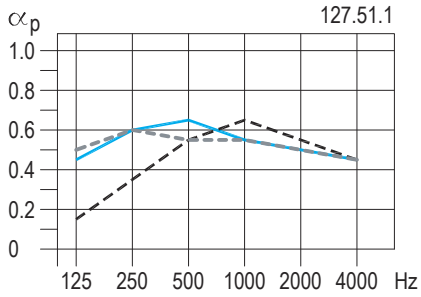
Design B4 - 12/25 Q



Perforation ratio: **14.4 %**

Knauf sound insulation proof: A 007-10.09

■ with acoustical fleece



Depth of construction 65 mm – – – – –

αp	0.15	0.35	0.55	0.65	0.55	0.45

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm ——

αp	0.45	0.6	0.65	0.55	0.5	0.45

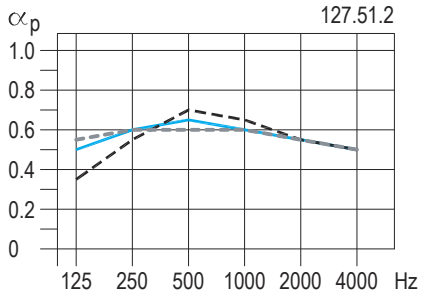
α_w = **0.55 (L)** Class: **D** (absorbing)

Depth of construction 400 mm – – – – –

αp	0.5	0.6	0.55	0.55	0.5	0.45

α_w = **0.55 (L)** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm – – – – –

αp	0.35	0.55	0.7	0.65	0.55	0.5

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm ——

αp	0.5	0.6	0.65	0.6	0.55	0.5

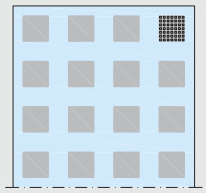
α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 400 mm – – – – –

αp	0.55	0.6	0.6	0.6	0.55	0.5

α_w = **0.60** Class: **C** (highly absorbing)

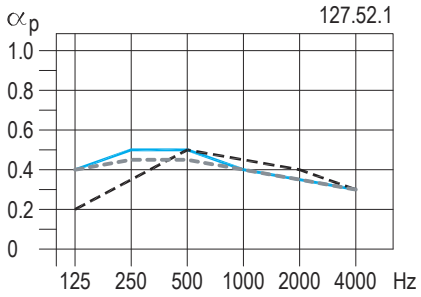
Design B5 - 12/25 Q



Perforation ratio: **7.8 %**

Knauf sound insulation proof: A 007-10.09

■ with acoustical fleece



Depth of construction 65 mm – – – – –

αp	0.2	0.35	0.5	0.45	0.4	0.3

α_w = **0.45** Class: **D** (absorbing)

Depth of construction 200 mm ——

αp	0.4	0.5	0.5	0.4	0.35	0.3

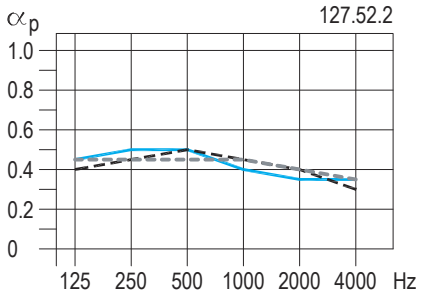
α_w = **0.40 (L)** Class: **D** (absorbing)

Depth of construction 400 mm – – – – –

αp	0.4	0.45	0.45	0.4	0.35	0.3

α_w = **0.40 (L)** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm – – – – –

αp	0.4	0.45	0.5	0.45	0.4	0.3

α_w = **0.45** Class: **D** (absorbing)

Depth of construction 200 mm ——

αp	0.45	0.5	0.5	0.4	0.35	0.35

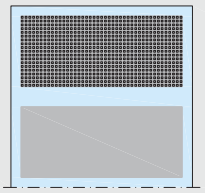
α_w = **0.40 (L)** Class: **D** (absorbing)

Depth of construction 400 mm – – – – –

αp	0.45	0.45	0.45	0.45	0.4	0.35

α_w = **0.45** Class: **D** (absorbing)

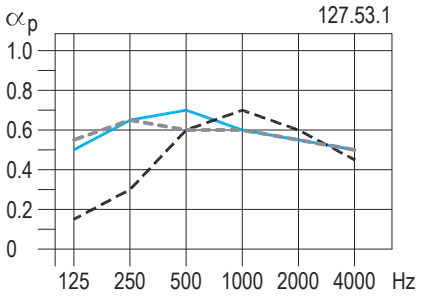
Design B6 - 12/25 Q



Perforation ratio: **16.3 %**

Knauf sound insulation proof: A 007-10.09

■ with acoustical fleece



Depth of construction 65 mm – – – – –

αp	0.15	0.3	0.6	0.7	0.6	0.45

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm ——

αp	0.5	0.65	0.7	0.6	0.55	0.5

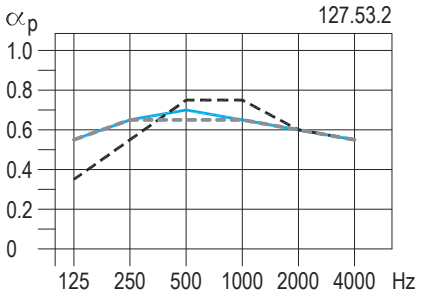
α_w = **0.60 (L)** Class: **C** (highly absorbing)

Depth of construction 400 mm – – – – –

αp	0.55	0.65	0.6	0.6	0.55	0.5

α_w = **0.60 (L)** Class: **C** (highly absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm – – – – –

αp	0.35	0.55	0.75	0.75	0.6	0.55

α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 200 mm ——

αp	0.55	0.65	0.7	0.65	0.6	0.55

α_w = **0.65** Class: **C** (highly absorbing)

Depth of construction 400 mm – – – – –

αp	0.55	0.65	0.65	0.65	0.6	0.55

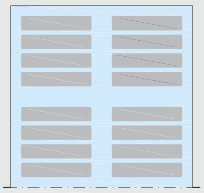
α_w = **0.65** Class: **C** (highly absorbing)

D127 Knauf Cleaneo Acoustic Design Ceiling

Sound absorption – Block slots "slotline"

See notes on english translation on page 1

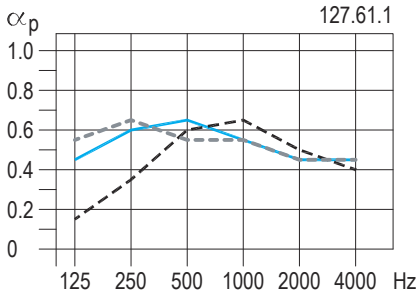
Design B4 - "slotline"



Slot ratio: **13.7 %**

Knauf sound insulation proof: A 005-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.35	0.6	0.65	0.5	0.4

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.45	0.6	0.65	0.55	0.45	0.45

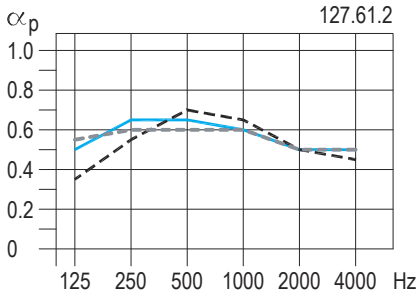
α_w = **0.55 (L)** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.55	0.65	0.55	0.55	0.45	0.45

α_w = **0.55 (L)** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.55	0.7	0.65	0.5	0.45

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.5	0.65	0.65	0.6	0.5	0.5

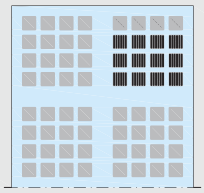
α_w = **0.60 (L)** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.55	0.6	0.6	0.6	0.5	0.5

α_w = **0.60** Class: **C** (highly absorbing)

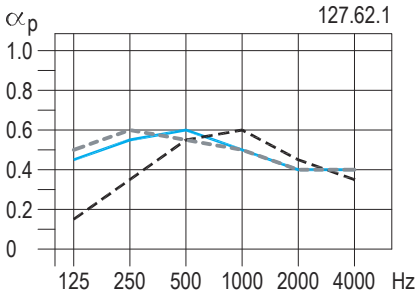
Design B5 - "slotline"



Slot ratio: **10.9 %**

Knauf sound insulation proof: A 005-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.35	0.55	0.6	0.45	0.35

α_w = **0.50** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.45	0.55	0.6	0.5	0.4	0.4

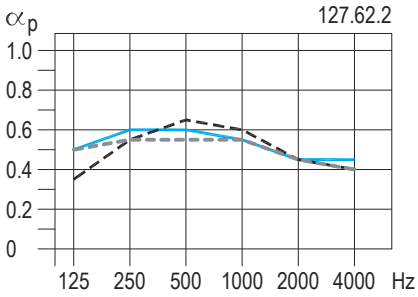
α_w = **0.50 (L)** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.5	0.6	0.55	0.5	0.4	0.4

α_w = **0.50 (L)** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.55	0.65	0.6	0.45	0.4

α_w = **0.50 (L)** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.5	0.6	0.6	0.55	0.45	0.45

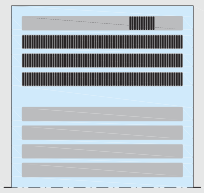
α_w = **0.55 (L)** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.5	0.55	0.55	0.55	0.45	0.4

α_w = **0.50 (L)** Class: **D** (absorbing)

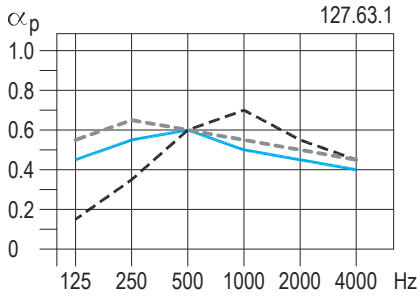
Design B6 - "slotline"



Slot ratio: **15.7 %**

Knauf sound insulation proof: A 005-10.09

■ with acoustical fleece



Depth of construction 65 mm

α_p	0.15	0.35	0.6	0.7	0.55	0.45

α_w = **0.55** Class: **D** (absorbing)

Depth of construction 200 mm

α_p	0.45	0.55	0.6	0.5	0.45	0.4

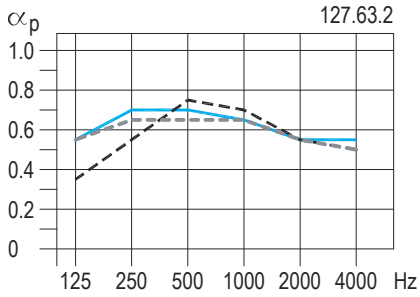
α_w = **0.50 (L)** Class: **D** (absorbing)

Depth of construction 400 mm

α_p	0.55	0.65	0.6	0.55	0.5	0.45

α_w = **0.55 (L)** Class: **D** (absorbing)

■ with acoustical fleece + mineral wool



Depth of construction 65 mm

α_p	0.35	0.55	0.75	0.7	0.55	0.5

α_w = **0.60** Class: **C** (highly absorbing)

Depth of construction 200 mm

α_p	0.55	0.7	0.7	0.65	0.55	0.55

α_w = **0.65 (L)** Class: **C** (highly absorbing)

Depth of construction 400 mm

α_p	0.55	0.65	0.65	0.65	0.55	0.5

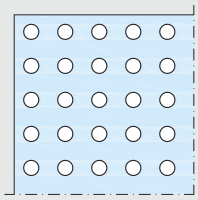
α_w = **0.60 (L)** Class: **C** (highly absorbing)

D124 Knauf Cleaneo Acoustic Fire Protection Ceiling

Sound absorption – Continuous perforation

See notes on english translation on page 1

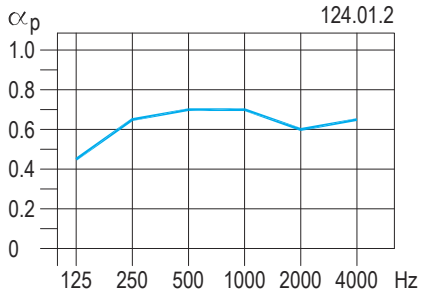
Standard Circular 8/18 R



Perforation ratio: **15.5 %**

Knauf sound insulation proof: A 008-10.09

■ D124 with Universal Bracket
with acoustical fleece + mineral wool

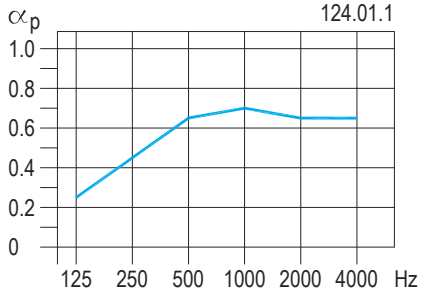


Depth of construction of the acoustic level **112.5 mm**

α_p	0.45	0.65	0.7	0.7	0.6	0.65

α_w = **0.70** Class: **C** (highly absorbing)

■ D124 with Direct Bracket
with acoustical fleece + mineral wool

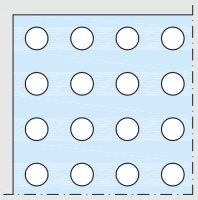


Depth of construction of the acoustic level **40.5 mm**

α_p	0.25	0.45	0.65	0.7	0.65	0.65

α_w = **0.65** Class: **C** (highly absorbing)

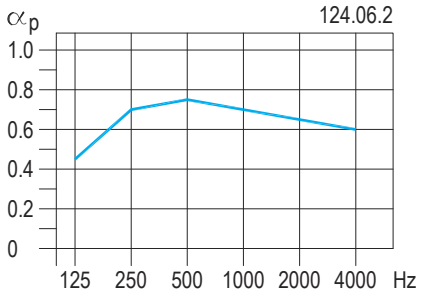
Standard Circular 12/25 R



Perforation ratio: **18.1 %**

Knauf sound insulation proof: A 008-10.09

■ D124 with Universal Bracket
with acoustical fleece + mineral wool

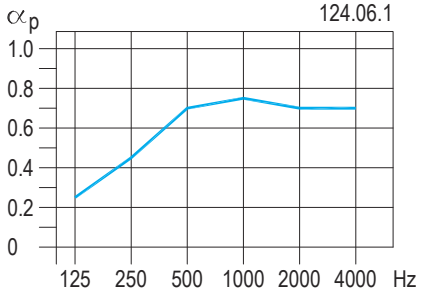


Depth of construction of the acoustic level **112.5 mm**

α_p	0.45	0.7	0.75	0.7	0.65	0.6

α_w = **0.70** Class: **C** (highly absorbing)

■ D124 with Direct Bracket
with acoustical fleece + mineral wool

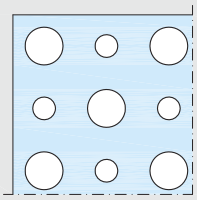


Depth of construction of the acoustic level **40.5 mm**

α_p	0.25	0.45	0.7	0.75	0.7	0.7

α_w = **0.70** Class: **C** (highly absorbing)

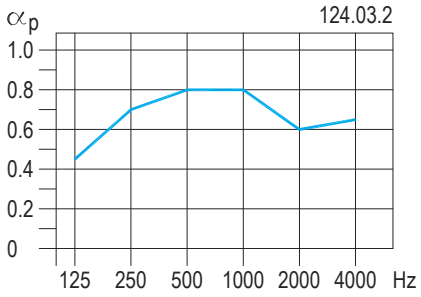
Alternating Circular 12/20/66 R



Perforation ratio: **19.6 %**

Knauf sound insulation proof: A 008-10.09

■ D124 with Universal Bracket
with acoustical fleece + mineral wool

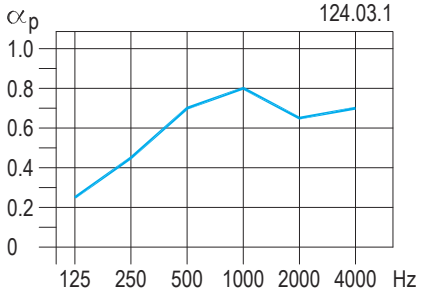


Depth of construction of the acoustic level **112.5 mm**

α_p	0.45	0.7	0.8	0.8	0.6	0.65

α_w = **0.70** Class: **C** (highly absorbing)

■ D124 with Direct Bracket
with acoustical fleece + mineral wool



Depth of construction of the acoustic level **40.5 mm**

α_p	0.25	0.45	0.7	0.8	0.65	0.7

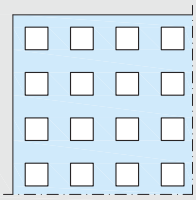
α_w = **0.70** Class: **C** (highly absorbing)

D124 Knauf Cleaneo Acoustic Fire Protection Ceiling

Sound absorption – Continuous perforation

See notes on english translation on page 1

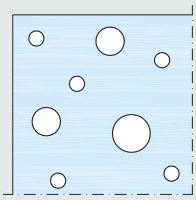
Standard Square 12/25 Q



Perforation ratio: 23.0 %

Knauf sound insulation proof: A 008-10.09

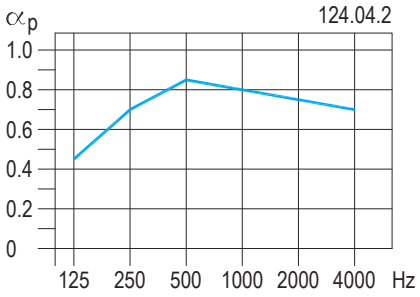
Random PLUS 8/15/20 R



Perforation ratio: 9.9 %

Knauf sound insulation proof: A 008-10.09

■ D124 with Universal Bracket
with acoustical fleece + mineral wool

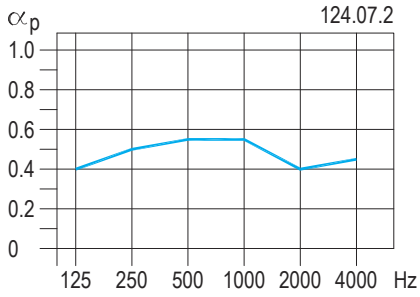


Depth of construction of the acoustic level 112.5 mm

α_p	0.45	0.7	0.85	0.8	0.75	0.7

α_w = 0.80 Class: B (extremely absorbing)

■ D124 with Universal Bracket
with acoustical fleece + mineral wool

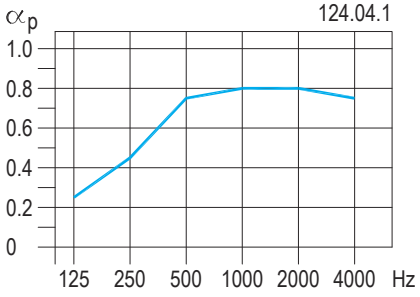


Depth of construction of the acoustic level 112.5 mm

α_p	0.4	0.5	0.55	0.55	0.4	0.45

α_w = 0.50 Class: D (absorbing)

■ D124 with Direct Bracket
with acoustical fleece + mineral wool

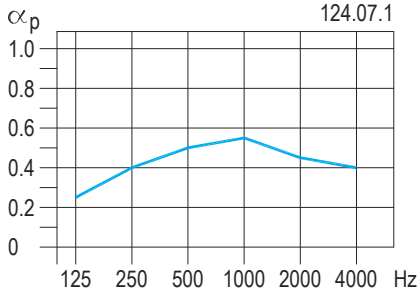


Depth of construction of the acoustic level 40.5 mm

α_p	0.25	0.45	0.75	0.8	0.8	0.75

α_w = 0.75 Class: C (highly absorbing)

■ D124 with Direct Bracket
with acoustical fleece + mineral wool



Depth of construction of the acoustic level 40.5 mm

α_p	0.25	0.4	0.5	0.55	0.45	0.4

α_w = 0.50 Class: D (absorbing)

D12 Knauf Cleaneo Acoustic Ceilings

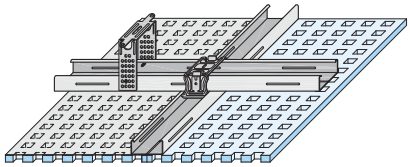
Building physical and technical properties

See notes on english translation on page 1

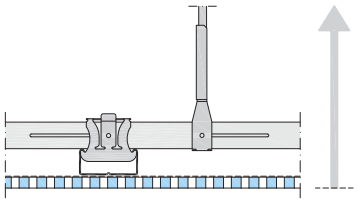
Scheme drawings

Knauf System	Acoustic	Fire protection	Ball impact safe	Properties / Function

D127 Knauf Cleaneo Acoustic Design Ceiling

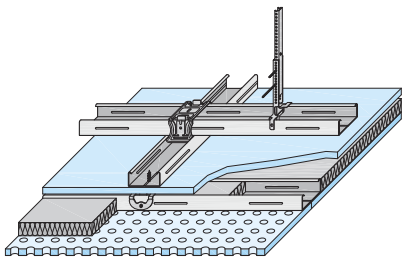


Sound absorption (see pages 10-19) | . | Ball impact safe (see page 4)



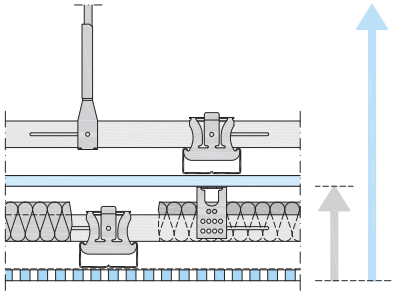
D124 Knauf Cleaneo Acoustic Fire Protection Ceiling

■ 1st substructure level as double level grid



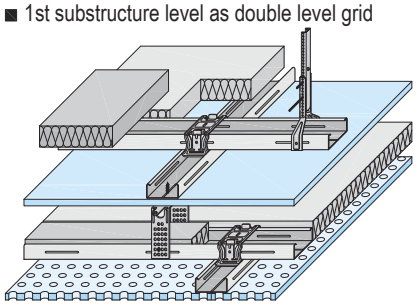
■ 2nd substructure level fastened with Direct Bracket

Sound absorption (see pages 10 / 11, 20 / 21) | F30 ■ from below (Mineral wool see page 28 / 29) | Ball impact safe (see page 4)



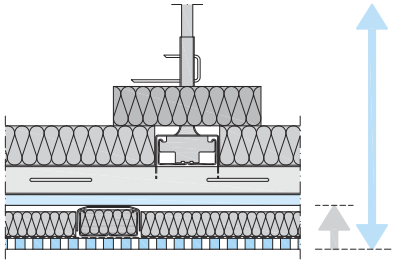
■ 2nd substructure level fastened with Universal Bracket

■ 1st substructure level as double level grid



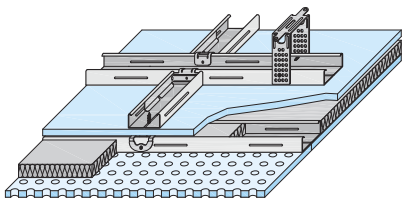
■ 2nd substructure level fastened with Universal Bracket

Sound absorption (see pages 10 / 11, 20 / 21) | F30 ■ from below and from above (Mineral wool see page 28 / 29) | Ball impact safe (see page 4)



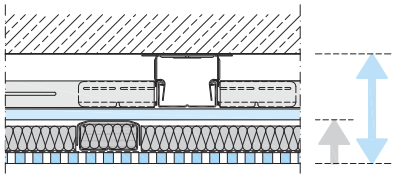
■ 2nd substructure level fastened with Direct Bracket

■ 1st substructure level with flush grid



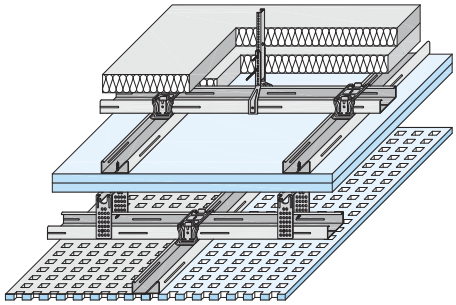
■ 2nd substructure level fastened with Direct Bracket

Sound absorption (see pages 10 / 11, 20 / 21) | F30 ■ from below and from above (Mineral wool see page 28 / 29) | Ball impact safe (see page 4)



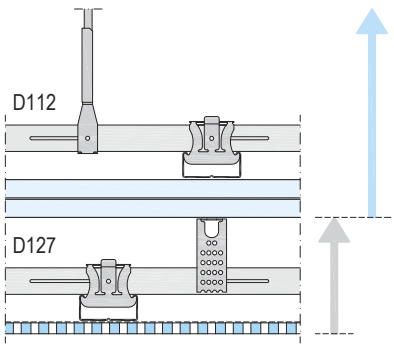
■ 2nd substructure level fastened with Direct Bracket

Knauf Multi-level ceiling (Fire protection ceiling e.g. ceiling D112 + Knauf Cleaneo Acoustic Design Ceiling D127)



■ Fire protection from below and from above

Sound absorption (see pages 10-19) | F30 - F90 ■ from below ■ from above (see page 30) ■ from below and from above | Ball impact safe (see page 4)



■ Fire protection shown from below

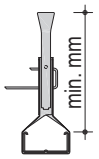
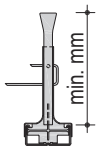
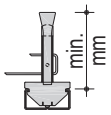
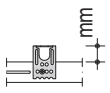
D12 Knauf Cleaneo Acoustic Ceilings

Construction heights / load capacity classes according to DIN 18168-2 / channel connections

See notes on english translation on page 1

Construction heights

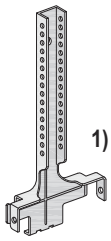
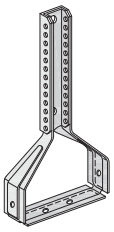
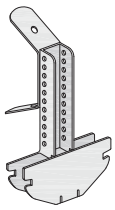
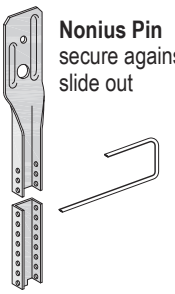
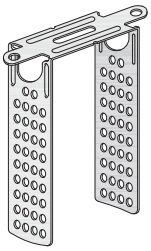
Height of the construction = sum of the suspension height, height of the substructure and cladding thickness

System	Suspension system					Channels		Cladding	
	 Nonius Stirrup	 Nonius Hanger Bottom	 Combo Hanger	 Universal Bracket	D124 / Multi-level ceiling  Direct Bracket	 CD Channel wxh	Total height mm	Thick-ness mm	Board type
D127	**130**	**130**	**130**	**15 - 180**	**-**	60x27+ 60x27	**54**	**12.5**	Knauf Cleaneo Acoustic board
D124	1st substructure level double level grid **130**	**130**	**130**	**15 - 180**	**-**	60x27+ 60x27	**54**	**12.5**	Knauf Fire-Resistant board GKF
	1st substructure level with flush grid **-**	**-**	**-**	**35 - 180**	**-**	60x27	**27**		
	+							+	
	2nd substructure level **-**	**-**	**-**	**-**	**1**	60x27	**27**	**12.5**	Knauf Cleaneo Acoustic board
	-	**-**	**-**	**15 - 180**	**-**	60x27+ 60x27	**54**		
Multi-level ceiling system: Construction height dependent on the construction type									

Calculation example: D127 with Nonius Hanger (130 mm), double level grid channel (54 mm) and cladding (12.5 mm) = 196.5 mm
Approx. 197 mm required height of construction for Knauf Cleaneo Acoustic Design Ceiling

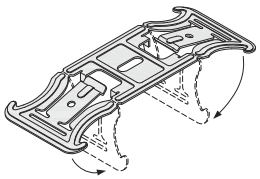
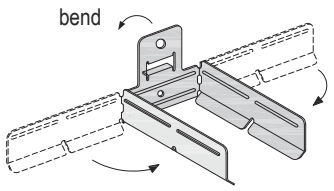
Suspender Load bearing class 0.40 kN (40 kg)

Anchoring of hangers to basic ceiling see System Data Sheet D11 Knauf Board Ceilings

Nonius Hanger Bottom for CD 60x27	**Nonius Stirrup** for CD 60x27	**Combo Hanger** for CD 60x27	**Nonius Hanger Top** with Nonius Pin	**Nonius Connector**	**Universal Bracket** for CD 60x27
 1)	or 	or 	suspended with  **Nonius Pin** secure against slide out	as required 	 Cut or bend the Universal Bracket to suit the required height

1) Screw the tabs to CD 60x27 (2x Metal Screws LN 3.5x9 mm) for:
- **Total ceiling load ≥ 0.50 kN/m²** (Knauf recommends it for enhancing installation safety from a total ceiling load ≥ 0.4 kN/m²)
- **Fire protection from below and from above** (plenum)
  Only necessary if no fire protection insulation is required in the plenum

Channel connections for carrying channel / furring channel - load capacity class 0.25 kN

Intersection Connector for CD 60x27	2x **Ankerwinkel Clips** for CD 60x27	**Universal Connector** for CD 60x27
 bend to 90° before installation	 bend during installation	 adapt during installation

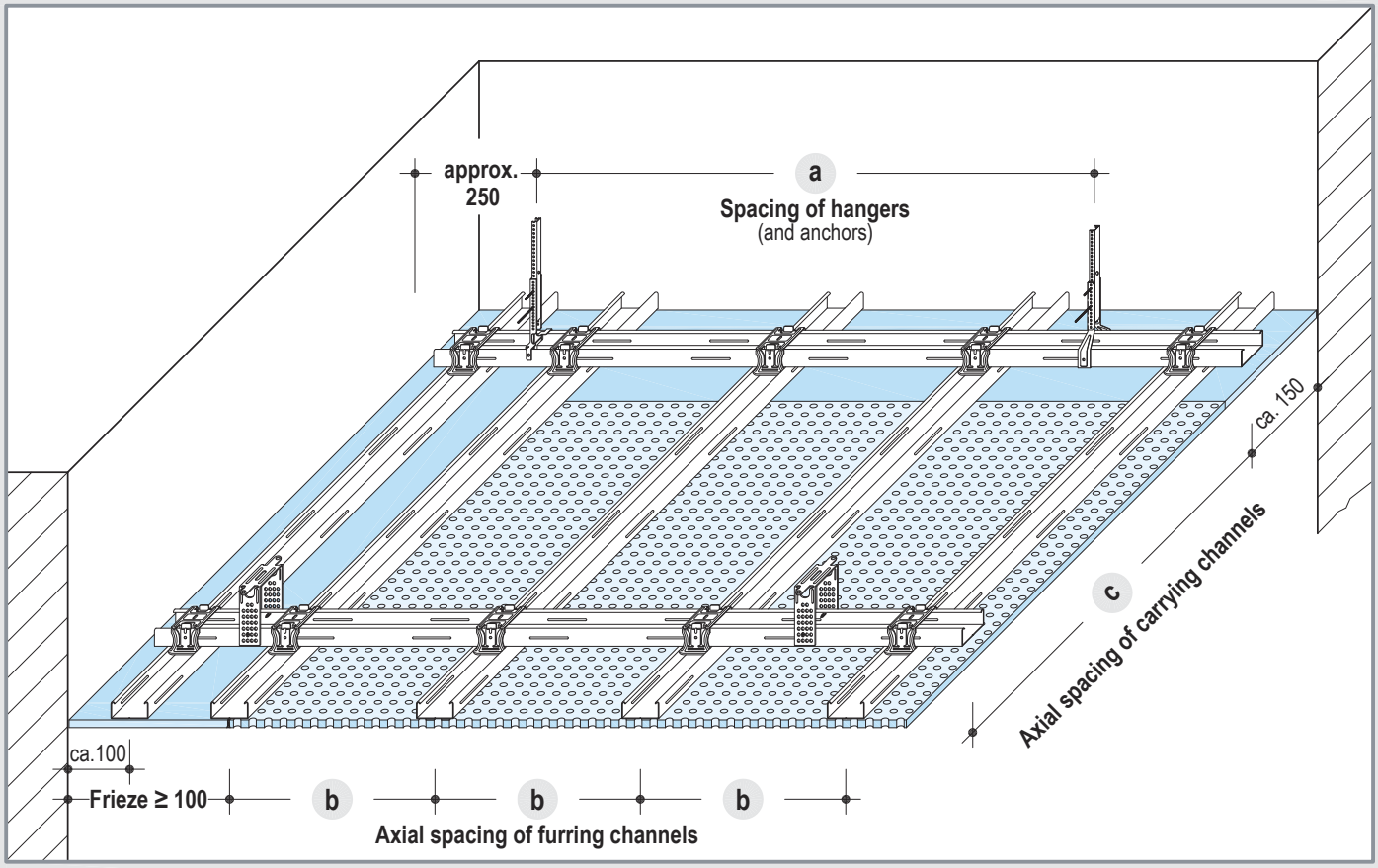
D127 Knauf Cleaneo Acoustic Design Ceiling

Substructure spacings

See notes on english translation on page 1

Metal substructure

All dimensions in mm



Maximum substructure spacings

All dimensions in mm

Carrying channel axial spacing c	Hanger spacing load class kN/m² a ≤ 0.15	a ≤ 0.30	Furring channel Axial spacing b
500	1200	950	
600	1150	900	
700	1100	850	
800	1050	800	
900	1000	800	
1000	950	750	max. 333.5
1100	900	750	
1200	900	650	
1300	850		
1400	850		
1500	850		

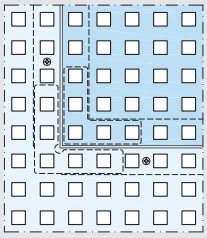
Furring channel axial spacing dependent on perforation pattern (see pages 6-9)

Note

Board weight + substructure + mineral wool 20 mm
< 15 kg/m² (0.15 kN/m²)
Additional built-in layers increase the total weight of the ceiling and and can lead to a reclassification of the load class up to 0.30 kN/m (see als System Data Sheet D11 Knauf Board Ceilings, chapter "Dimensioning of Substructure")

Knauf alutop Access Panel for D127 Knauf Cleaneo Acoustic Design Ceiling

see E112C Knauf alutop Access Panel
REVO Apertura Board 12.5



Drawing shows face side

Other System/Product Data Sheets	D11 Knauf Board Ceilings / D131 Knauf Free-Spanning Ceilings / D19 Knauf Ceiling Design K761 Knauf Cleaneo Acoustic

D127 Knauf Cleaneo Acoustic Design Ceiling

Details

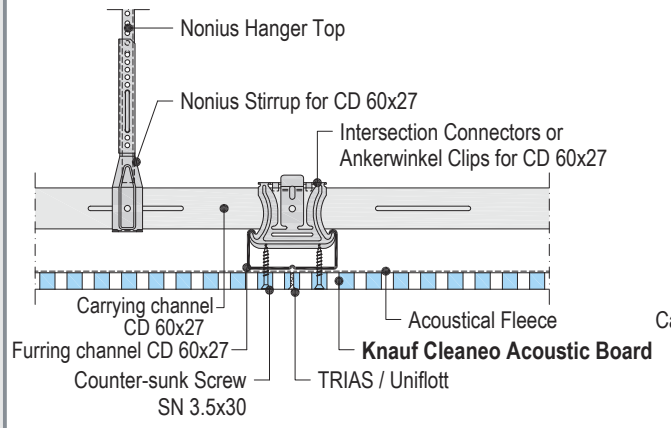
See notes on english translation on page 1

Details scale 1:5

All dimensions in mm

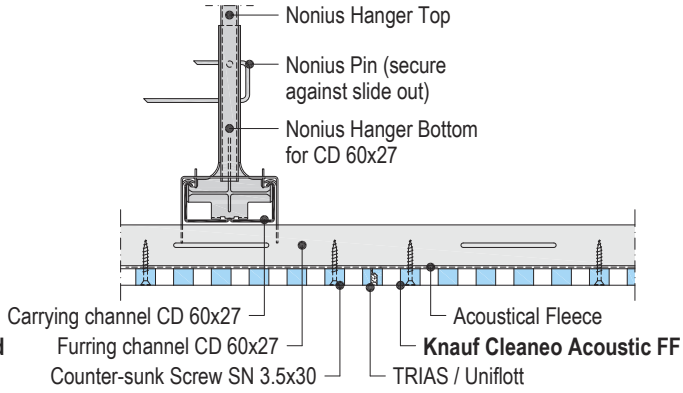
D127-C1 Front edge joint 4 SK

■ e.g. Continuous perforation



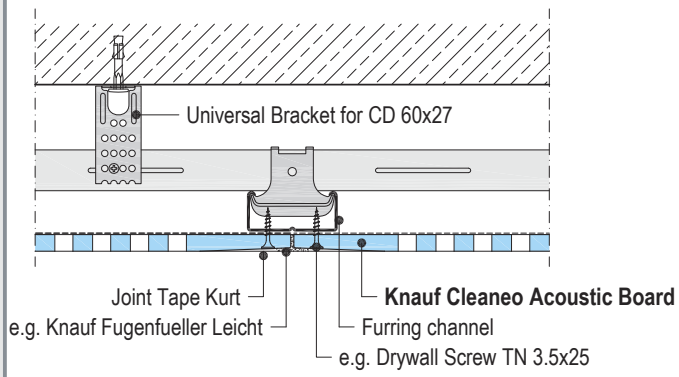
D127-B3 Long edge joint FF

■ e.g. Continuous perforation



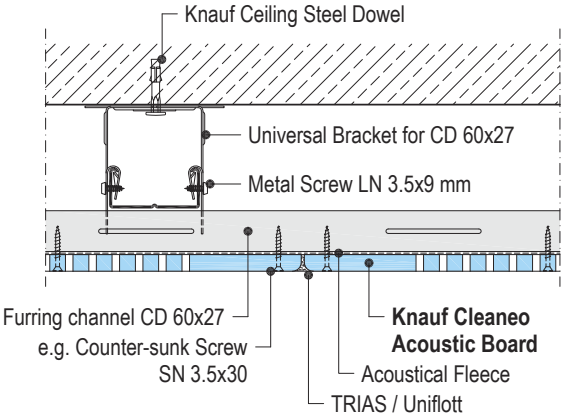
D127-C2 Front edge joint 4 AK

■ e.g. Block perforation

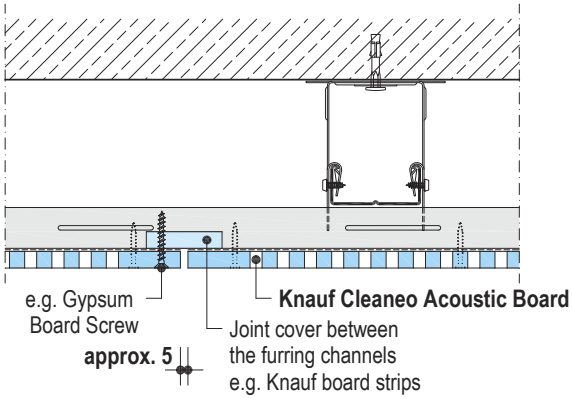


D127-B1 Long edge joint HRK

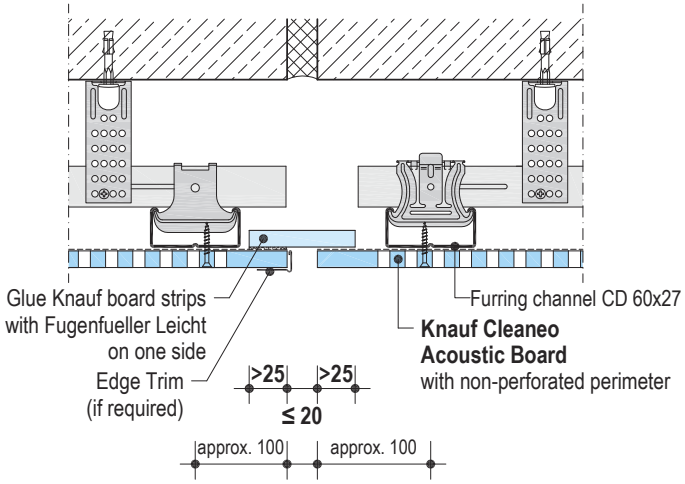
■ e.g. Block slots "slotline"



D127-SO12 Expansion joints, long edge



D127-SO13 Movement joint



D127 Knauf Cleaneo Acoustic Design Ceiling

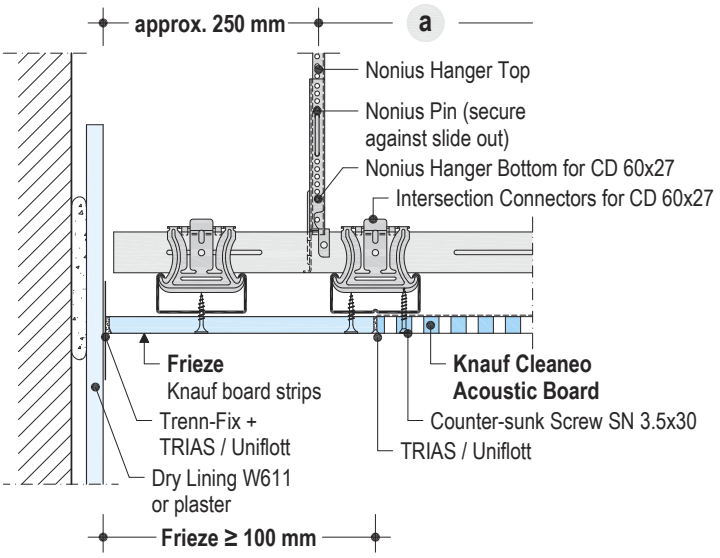
Details

See notes on english translation on page 1

Details scale 1:5

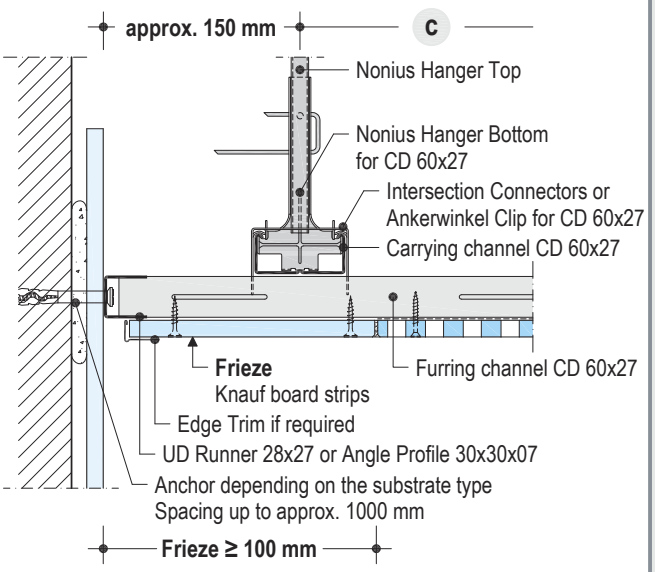
D127-D3 Connection to wall

■ Frieze with joint filling

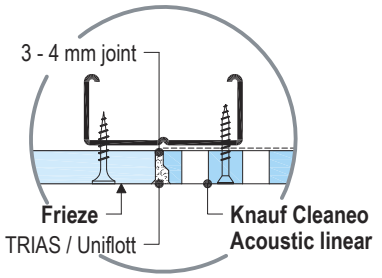


D127-A1 Connection to wall with exposed joint

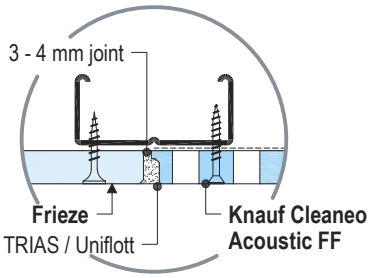
■ Frieze with joint filling



■ Connection to Frieze with Knauf Cleaneo Acoustic linear

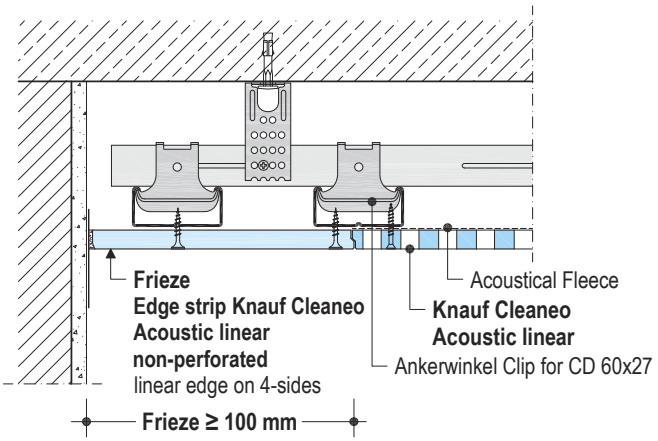


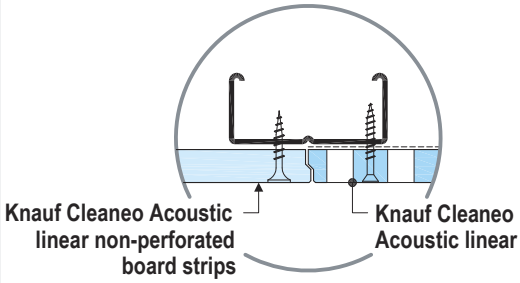
■ Connection to Frieze with Knauf Cleaneo Acoustic FF



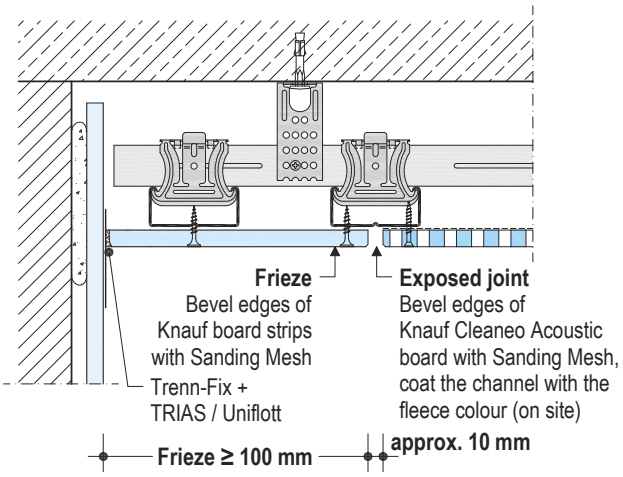
D127-D4 Non-filled frieze

■ with frieze edge Knauf Cleaneo linear

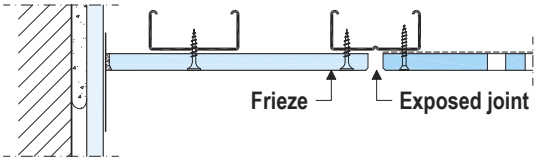




D127-D2 Frieze with exposed joint



■ Alternative



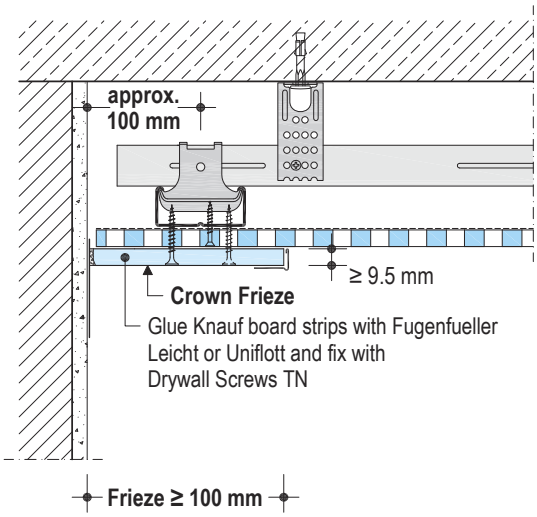
D127 Knauf Cleaneo Acoustic Design Ceiling

Details

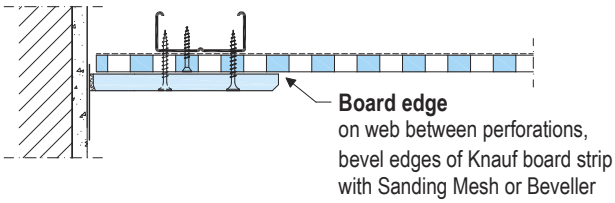
See notes on english translation on page 1

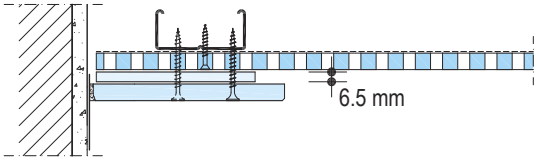
Details scale 1:5

D127-D1 Crown frieze

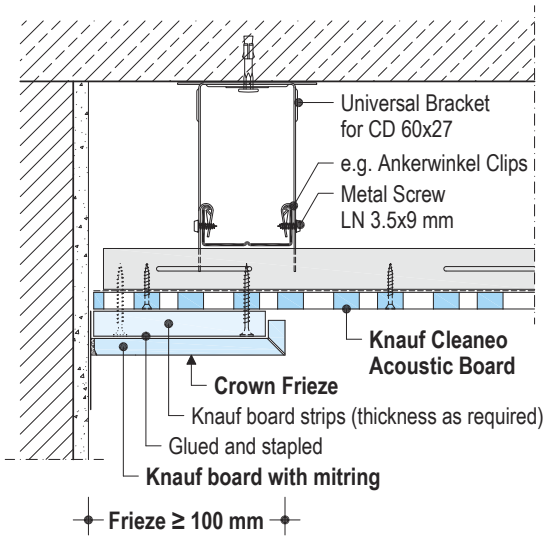


■ Alternatives

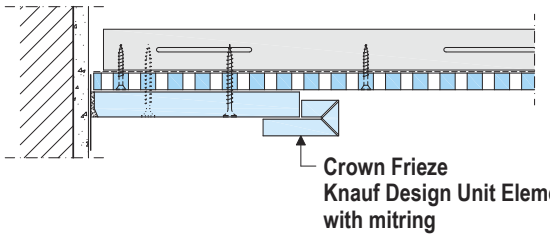




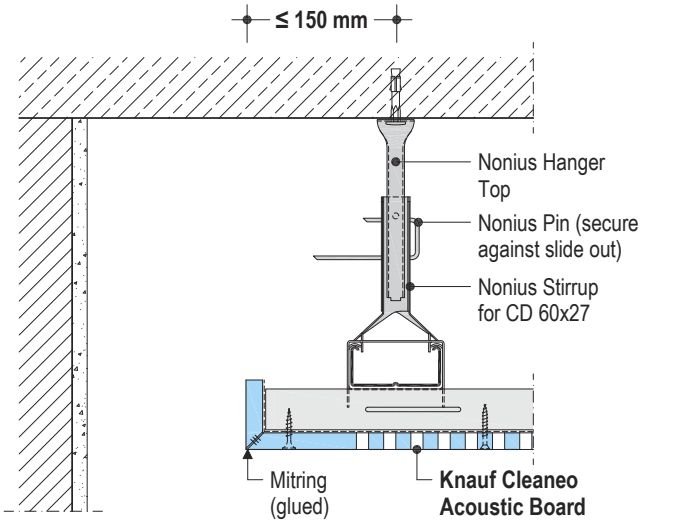
D127-SO6 Crown frieze with horizontal shadow gap



■ Alternatives

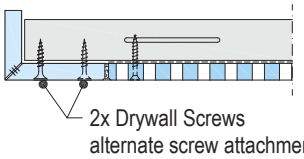


D127-SO7 Ceiling canopy

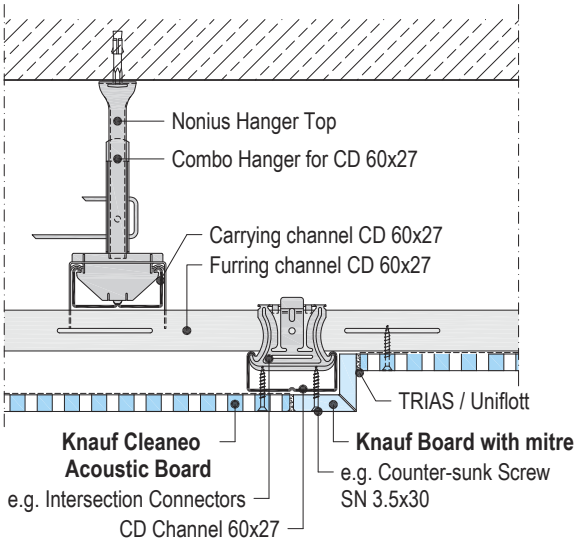


■ Alternatives

Knauf board with mitring + Knauf Cleaneo Acoustic Board with continuous perforation



D127-SO3 Cornice



D124 Knauf Cleaneo Acoustic Fire Protection Ceiling

Substructure spacings / Details

See notes on english translation on page 1

Suspended ceiling, providing fire resistance solely

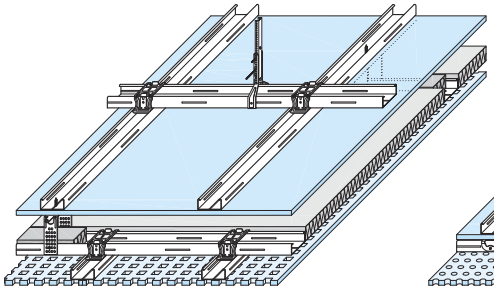
F30 ■ **solely from below** ■ **solely from below and from above** (plenum) Proof: ABP P-3400/4965

For fire exposure from below: No fire protection requirements on the basic ceiling / roof construction

For fire exposure from above: Basic ceiling should be the same fire resistance as the suspended ceiling

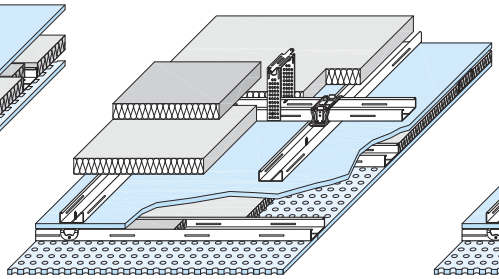
Examples: All dimensions in mm

■ **Double level grid**
F30 ■ solely from below



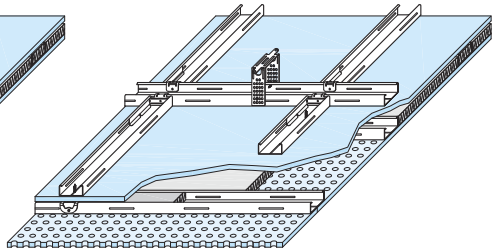
2nd substructure level with Universal Bracket, carrying channel and furring channel

■ **Double level grid**
F30 ■ solely from below and above



2nd substructure level with Direct Bracket, furring channel only

■ **Flush grid**
F30 ■ solely from below and above



2nd substructure level with Direct Bracket, furring channel only

1st Substructure level — Max. spacings

Carrying channel Axial spacing	Hangers Spacing	Furring channel Axial spacing
Double level grid, carrying channels and furring channels		
F30 ■ solely from below		
1000	**650**	**400**
F30 ■ solely from below and from above		
850	**650**	**400**
Flush grid		
F30 ■ solely from below and from above		
1250	**650**	**400**

■ **1st substructure level:** All constructional details not stated for the 1st substructure level can be found in the Knauf System Data Sheet D11

2nd Substructure level ≤ 0.15 kN/m² — Max. spacings

Carrying channel Axial spacing	Hangers Spacing	Furring channel Axial spacing dependent on perforation (pgs. 6-9) b
Single level grid, furring channels only		
■ Fastened with Direct Bracket		
-	**800**	**max. 333.5**
Double level grid, carrying channel and furring channels		
■ Fastened with Universal Bracket		
800	**800**	**max. 333.5**

■ Install suspended channels of 2nd substructure level always laterally to furring channels of 1st substructure level

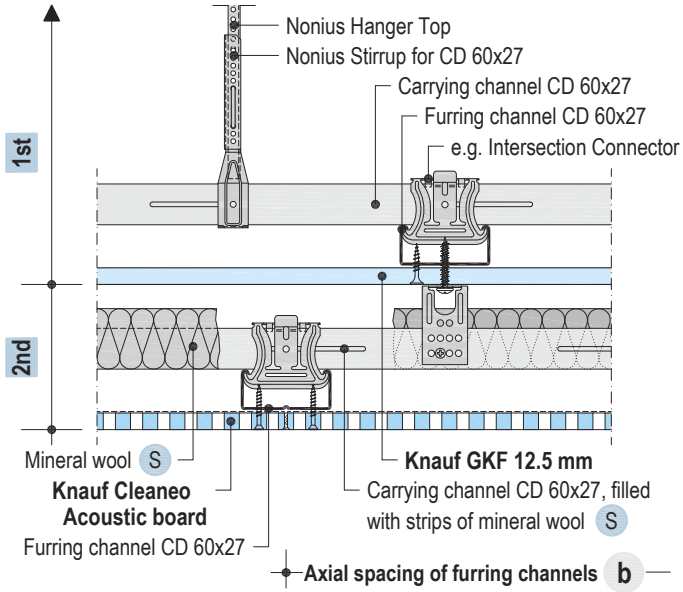
■ Anchor alternately at every 2nd furring channel of the 1st substructure level using Knauf Multi-purpose Screws FN 4.3x35

■ **Max. load per anchor of the 2nd substructure level is 100 N**

Details, scale 1:5

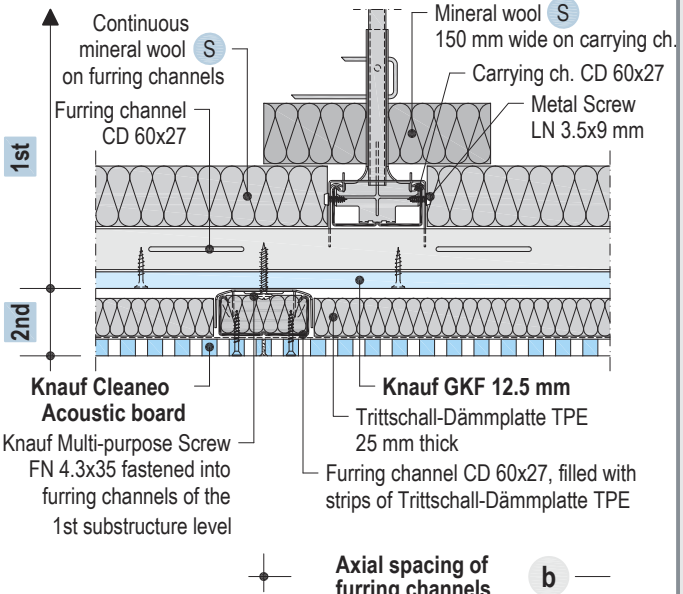
D124vu-C1 Front edge joint

■ 1st substructure level as double level grid
F30 ■ solely from below



D124vuvo-C1 Front edge joint

■ 1st substructure level as double level grid
F30 ■ solely from below and from above



D124 Knauf Cleaneo Acoustic Fire Protection Ceiling

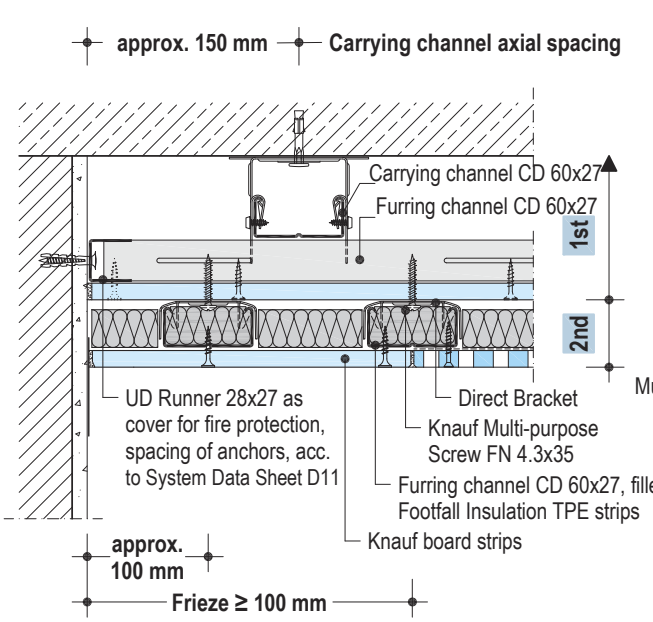
Details

See notes on english translation on page 1

Details, scale 1:5

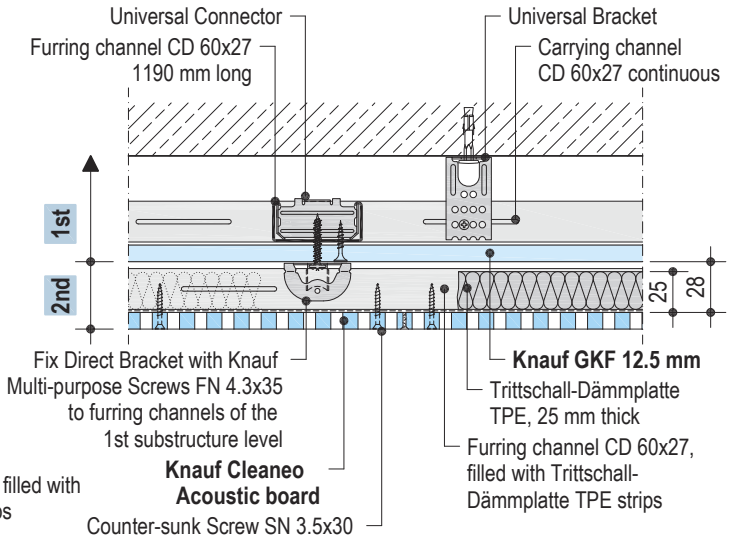
D124vu-A1 Connection to wall

■ 1st ceiling level with double level grid F30 ■ solely from below



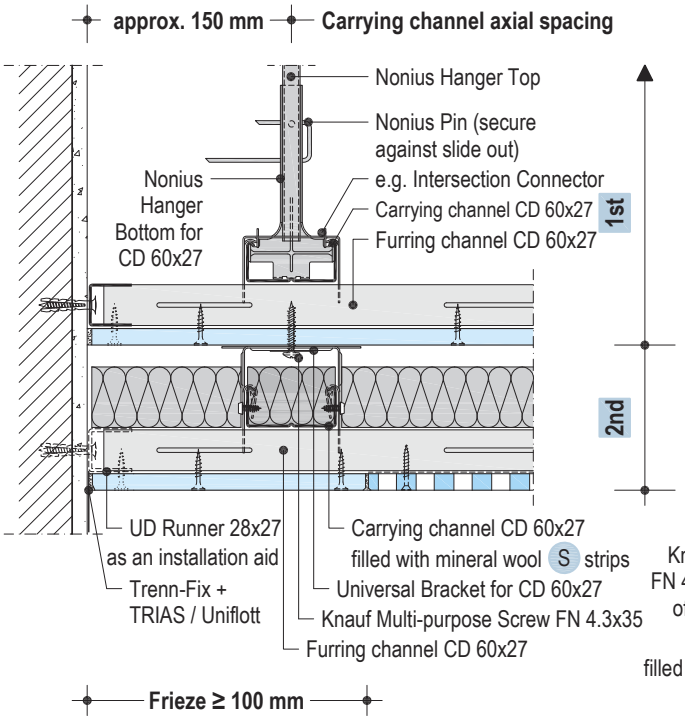
D124vuvo-B10 Long edge joint

■ 1st ceiling level with flush grid F30 ■ solely from below and from above



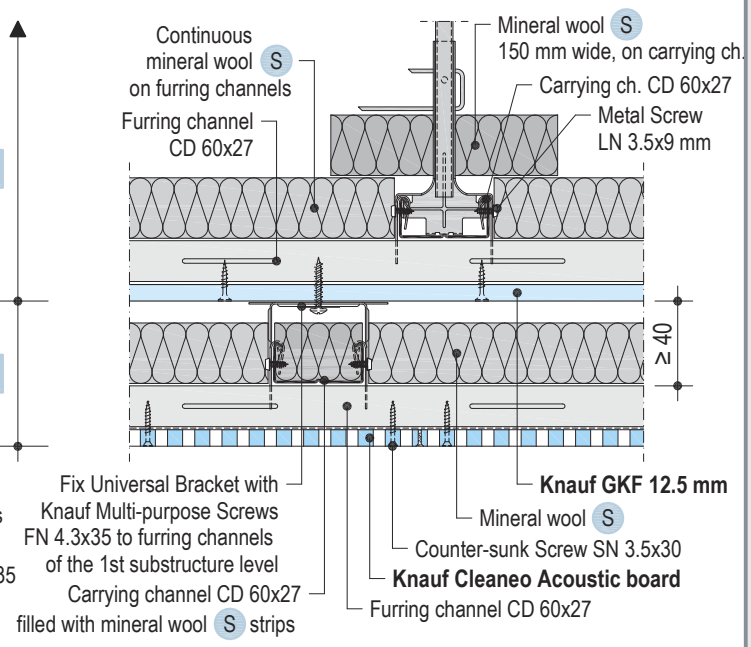
D124vu-A2 Connection to wall

■ 1st ceiling level with double level grid F30 ■ solely from below



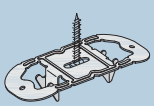
D124vuvo-B1 Long edge joint

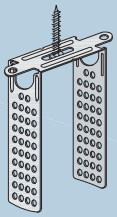
■ 1st ceiling level as a double level grid F30 ■ solely from below and from above



S Mineral wool insulation according to DIN EN 13162
building material class A, thickness 40 mm, density ≥ 40 kg/m³
melting point ≥ 1000 °C according to DIN 4102-17
e.g. Knauf Insulation Feuerschutzplatte DPF-40

Direct Bracket
for CD 60x27
Bend side tabs





Universal Bracket
for CD 60x27
Cut or bend the Universal Bracket to the required height

D127 Knauf Cleaneo Acoustic Design Ceiling

Knauf Cleaneo Acoustic Design Ceiling below Knauf Ceilings (Multi-level ceiling)

See notes on english translation on page 1

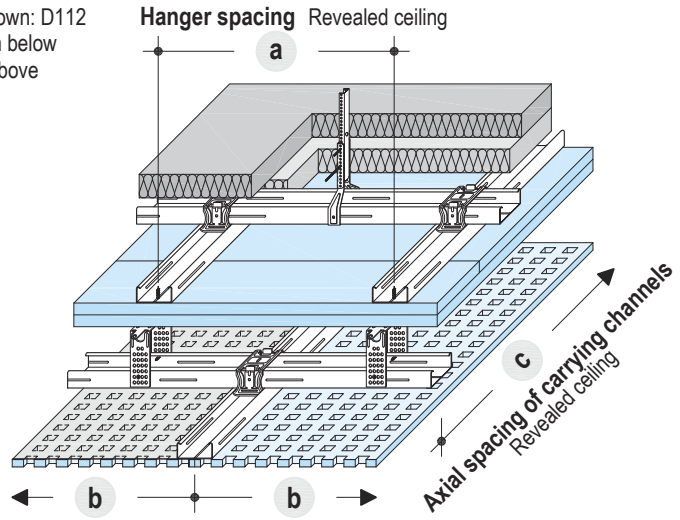
Revealed ceiling D127 below fire protection level e.g. ceiling system D112

All dimensions in mm

F30 - F90 ■ solely from below ■ solely from above ■ solely from below and from above

Proof: according to construction of fire protection level

System shown: D112
F90 ■ from below
and from above



1 Fire protection level

Knauf System Ceiling D112, D116
(according to System Data Sheet D11 Knauf Board Ceilings)

■ Hangers: Universal Bracket or Nonius suspension

2 Revealed ceiling ≤ 0.15 kN/m²

Knauf Cleaneo Acoustic Design Ceiling D127

■ Install suspended channels of revealed ceiling always laterally to furring channels of fire protection level.

■ Anchoring of suspenders into furring channels of fire protection level with Knauf Multi-purpose Screws FN 4.3x35 / FN 4.3x65

■ **Max. load per revealed ceiling suspension 100 N**

1 Fire protection level - Knauf System Ceiling D112, D116

■ Fire protection from above / from below and from above

Max. component spacings for constructions with additional revealed ceiling level ≤ 0.15 kN/m² (multi-level ceiling system)

Fire resistance class with fire exposure ■ **From above** (from the plenum)	**Carrying channels** Axial spacing c	**Suspenders** Spacings a
■ D112 Knauf Board Ceiling with metal substructure		
F30	**750**	600
F60 - F90	**600**	600
■ D116 Knauf Board Ceiling with metal substructure UA/CD		
F30	**1000**	800
F60 - F90	**600**	750

■ Observe the additionally required constructional measures of the respective system ceiling for fire resistance from above in accordance with System Data Sheet D11.

■ Fire protection from below

Max. substructure component spacings according to System Data Sheet D11

The additional load of the revealed ceiling (≤ 0.15 kN/m²) must be considered with the substructure of the fire protection level (see System Data Sheet D11 - Knauf Board Ceilings chapter “Dimensioning of the substructure”).

The spacings of the substructure of the fire protection level are given by the specifications of the respective ceiling system (e.g. D112) taking the additional load of the revealed ceiling into consideration.

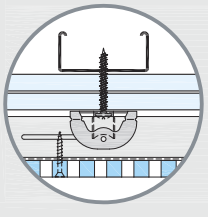
2 Revealed ceiling ≤ 0.15 kN/m²

Max. substructure spacings

Carrying channel Axial spacing c	**Suspender**[1] Spacings a Load class kN/m² ≤ 0.15	**Furring channel** Spacing depending on the perforation (see page 6-9) b
800	800 [2]	**max. 333.5**
1200	400 / 500	

1) Hangers are to be anchored on the furring channels of the fire protection level.

2) With a furring channel spacing of 400 mm (fire protection level), anchor alternating to every second furring channel. With furring channel spacings 500 / 625 mm, anchor to every fire protection furring channel.

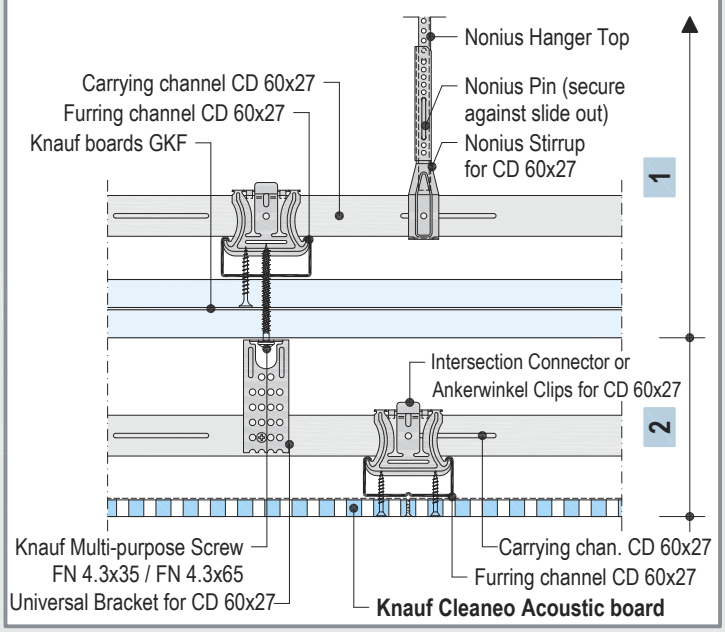


Alternative suspension:
Direct Bracket
(bend side tabs)
+
Knauf Multi-purpose Screw
FN 4.3x35 / FN 4.3x65

Detail, scale 1:5

Shown: Fire resistance from below

D127-SO8 Ceiling D127 below ceiling D112

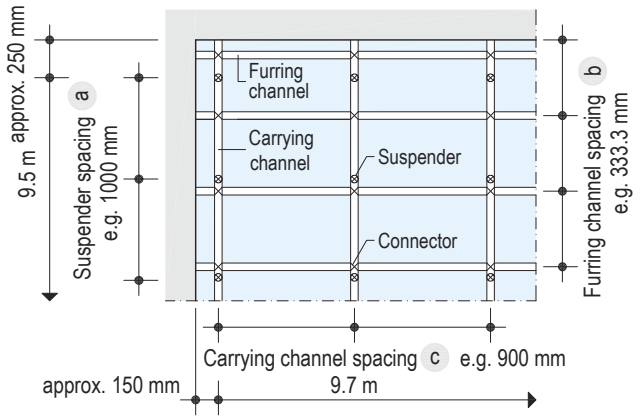


D12 Knauf Cleaneo Acoustic Ceilings

Material requirement

See notes on english translation on page 1

Material requirement example: Double level grid



- The quantity relates to a ceiling area of: 10 m x 10 m = 100 m²
- Without allowance for loss and waste

Material requirement of selected examples

1 **D127:** Axial spacing of furring channel 333.3 mm, spacing of suspender 1000 mm, carrying channel axial spacing 900 mm

2 **D124:** 1st level: Double-level grid
2nd level: Single-level grid, axial spacing 333.3 mm
Direct Bracket
Fire resistance from below

3 **D124:** 1st level: Double-level grid
2nd level: Double-level grid, axial spacing of furring channel 333.3 mm, Universal Bracket
Fire resistance from below and from above

4 **D124:** 1st level: Flush grid
2nd level: Single level grid, axial furring ch. spacing 333.3 mm
Direct Bracket
Fire resistance from below and from above

- as req. = as required
- *italics = not provided by Knauf*
- alt. = alternatively

Material requirement per m² of ceiling

Description	Unit	Quantity as average value			
		1 D127	2 D124	3 D124	4 D124
Connection to wall					
Knauf UD Runner 28x27x0.6; 3 m long	m	as req.	0.4	0.4	0.8
Fastners approved for the substrate e.g. Knauf Steel Ceiling Dowel with reinforced concrete	pcs	as req.	0.4	0.4	1.4
Substructure					
Approved anchors e.g. Knauf Steel Ceiling Dowel	pcs	1.3	1.8	2.1	1.2
Knauf Universal Bracket for CD 60x27	pcs	1.3	1.8	2.1	1.2
2x Knauf Metal Screw LN 3.5x9 mm (connection to CD channel)		2.6	3.6	4.2	2.4
or Knauf Nonius Hanger Top		1.3	1.8	2.1	-
Knauf Nonius Pin		1.3	1.8	2.1	-
Knauf Nonius Hanger Bottom for CD 60x27		1.3	1.8	2.1	-
2x Knauf Metal Screw LN 3.5x9 mm (connection to CD channel)		-	3.6	4.2	-
alt. Knauf Combo Hanger for CD 60x27	pcs	1.3	1.8	2.1	-
alt. Knauf Nonius Stirrup for CD 60x27		1.3	1.8	2.1	-
Knauf Multi-purpose Screw FN 4.3x35 mm **2nd substructure level**	pcs	-	4.3	2	3.5
Knauf Universal Bracket for CD 60x27 **2nd substructure level**	pcs	-	-	2	-
2x Knauf Metal Screw LN 3.5x9 mm (connection to CD channel)		-	-	4	-
alt. Knauf Direct Bracket for CD 60x27		-	4.3	-	3.5
Knauf CD Channel 60x27x0.6; 4 m long	m	4.3	6.8	8.4	3.7
Knauf Multi-Connector (as extension connection for CD Channels)	pcs	0.9	1.4	1.7	0.8
Knauf CD Channel 60x27x0.6; 1,19 m long	m	-	-	-	2.4
Knauf Intersection Connector for CD 60x27	pcs	3.7	2.9	7.7	-
alt. 2x Knauf Ankerwinkel Clip for CD 60x27	pcs	7.4	5.8	15.4	-
2x Knauf Universal Connector for CD 60x27	pcs	-	-	-	3.8
Insulation layer - (See pages 28, 29 for fire protection)	m²	as req.	1	2.2	1
Cladding					
Knauf Cleaneo Acoustic Board, 12.5 mm; with Acoustic Fleece, black or white	m²	1	1	1	1
Knauf Fire-Resistant Board GKF, 12.5 mm		-	1	1	1
Knauf Counter-sunk Screw SN 3.5x30 mm (Knauf Cleaneo Acoustic Board)	pcs	24	24	24	24
Knauf Drywall Screw TN 3.5x25 mm (GKF)		-	20	20	27
Jointing Filling compound dependent on board edge type (see page 5)	kg	as req.	as req.	as req.	as req.
Joint Tape Kurt	m	as req.	as req.	as req.	as req.
Trenn-Fix; 65 mm wide, self-adhesive	m	0.4	0.4	0.4	0.4
Frieze (e.g. Crown Frieze applied)					
Knauf board strips GKB e.g. 12.5 mm	m	as req.	as req.	as req.	as req.
Knauf Drywall Screw TN 3.5x35 mm	pcs	as req.	as req.	as req.	as req.
Knauf Edge Trim 23/13, 2.75 m long	m	as req.	as req.	as req.	as req.

Item	Description	No. of units	Unit price	Total price
.....	**Knauf Cleaneo Acoustic SK/ FF/ linear * Design Ceiling D127** Suspended ceiling DIN 18168-1, installation height in m ....., suspension height in cm ..... . Sound absorption coefficient according to DIN EN ISO 11654 α_W = ...,* (at construction depth 65/ 200/ 400 * mm). Special requirements: Ball impact safety according to DIN 18032-3.* Anchored on reinforced concrete/wooden joists, spacing in cm ..... */ steel girders, type ....., spacing in cm ..... *. Substructure made of galvanized sheet metal channels acc. to DIN 18182-1, as double-level grid, suspended with Universal Brackets/Nonius suspenders*, use approved anchors. Cladding made of perforated / slotted * gypsum boards to DIN 18180 a)* Knauf Cleaneo Acoustic SK with air-cleaning effect, application to DIN 18181, single layer, board thickness 12.5/ 15 * mm, Perforation pattern: Design ....., Perforation ....., lamination on rear side with Knauf Acoustic Fleece, colour white / black/ ..... *, Joint treatment: filled/ ..... *, b)* Knauf Cleaneo Acoustic FF with air-cleaning effect, factory primed edges, with rebate edges as spacer, application to DIN 18181, single layer, board thickness 12.5 mm, Perforation pattern: Design ....., Perforation ....., lamination on rear side with Knauf Acoustic Fleece, colour white / black/ ..... *, joint treatment: filled. c)* Knauf Cleaneo Acoustic linear with air-cleaning effect, factory primed edges, white face paper and accurate rebate edges for application without joint filling. Application to DIN 18181, single layer, board thickness 12.5 mm, Perforation pattern: Design ....., Perforation ....., lamination on rear side with Knauf Acoustic Fleece, colour white / black/ ..... *. Insulation made of mineral wool according to DIN EN 13162, thickness 20 mm, length-related flow resistance ≥ 10 kPa· s/m². * Product: Knauf Insulation Akustik-Dämmplatte TP 120 A *or equivalent*. Installation according to Knauf Technical Data Sheet D12, Application according to Knauf Installation Guides TRO14/ TRO14FF/ TRO14L *. Product / system: **Knauf Cleaneo Acoustic SK/ FF/ linear * Design Ceiling D127**	..... m²	..... €	..... €

** Cancel non-applicable items*

Sub-total ..... €

Item	Description	No. of units	Unit price	Total price
.....	**Knauf Cleaneo Acoustic Fire Protection Ceiling D124** Suspended ceiling DIN 18168-1, installation height in m ....., suspension height in cm ..... . Fire resistance class according to DIN 4102-2: F30,* for suspended ceiling solely resistant to fire from below for protecting the basic ceiling and the plenum, */ to fire from the plenum for protecting the room lying below, */ to fire from the plenum and from below for protecting the room lying below, the basic ceiling and the plenum *. Sound absorption coefficient according to DIN EN ISO 11654 α_W = ...,* (at construction depth of the acoustic level 40.5/ 112.5 * mm). Special requirements: Ball impact safety according to DIN 18032-3.* Anchored on reinforced concrete/wood joists, spacing in cm ...../ Steel girders, type ....., axial spacing in cm ..... *. Substructure made of galvanized sheet metal channels acc. to DIN 18182-1. First grid level as double-level grid with carrying and furring channels, suspended with Universal Brackets/Nonius suspenders *, approved anchoring, cladding made of Knauf Fire-Resistant Boards GKF DIN 18180, application to DIN 18181, single layer, board thickness 12.5 mm, Insulation applied on the furring channels as well as 15 cm wide insulation strips on the carrying channels made of mineral wool acc. to DIN EN 13162, thickness ≥ 40 mm, density ≥ 40 kg/m³, melting point ≥ 1000 °C *, Product: Knauf Insulation Feuerschutzplatte DPF-40 *or equivalent*. Second grid level as ■ Single layer grid with furring channels, suspended using Direct Brackets on the furring channels of first grid level, cavity insulation with mineral wool to DIN EN 13162, fill furring channels with mineral wool, thickness min. 25 mm, Product: Knauf Insulation Footfall Sound Panel TPE ***/** ■ Double layer grid with carrying and furring channels, suspended with Universal Brackets on the furring channels of the first grid level, cavity insulation made of mineral wool to DIN EN 13162, thickness min. 40 mm, density ≥ 40 kg/m³, melting point ≥ 1000 °C, length-related flow resistance ≥ 5 kPa·s/m², carring channels filled with mineral wool, Product: Knauf Insulation Feuerschutzplatte DPF-40 *or equivalent* *, Cladding layer made of perforated / slotted * gypsum boards DIN 18180, application to DIN 18181, a)* Knauf Cleaneo Acoustic SK with air-cleaning effect, single layer, board thickness 12.5/ 15 * mm, Perforation pattern: design ....., perforation ....., lamination on rear side with Knauf Acoustic Fleece, colour white / black/ ..... *, Joint treatment: filled/ ..... *, b)* Knauf Cleaneo Acoustic FF with air-cleaning effect, factory primed edges, with rebate edges as spacer, single layer, board thickness 12.5 mm, perforation pattern: design ....., perforation ....., lamination on rear side with Knauf Acoustic Fleece, colour white / black/ ..... *, Joint treatment: filled. c)* Knauf Cleaneo Acoustic linear with air-cleaning effect, factory primed edges, white face paper and accurate rebate edges for application without joint filling, single layer, board thickness 12.5 mm, Perforation pattern: design ....., perforation ....., lamination on rear side with Knauf Acoustic Fleece, colour white / black/ ..... *. Installation according to Knauf System Data Sheet D12, Application according to Knauf Installation Guides TRO14/ TRO14FF/ TRO14L *. Product / System: **Knauf Cleaneo Acoustic Fire Protection Ceiling D124**	..... m²	..... €	..... €

** Cancel non-applicable items*

Sub-total ..... €

D12 Knauf Cleaneo Acoustic Ceilings

Construction, installation plans, planning specifications

See notes on english translation on page 1

Knauf Cleaneo Acoustic Boards

Knauf Cleaneo Acoustic are perforated or slotted gypsum boards according to DIN EN 14190 with air-cleaning effect.
The sound absorption diagrams of the individual Knauf Cleaneo Acoustic boards show values that are only valid in conjunction with factory-laminated Knauf Acoustic Fleece. Optional fleece colours in white or black. Customized colours on request.

Knauf Cleaneo Acoustic SK

Knauf Cleaneo Acoustic SK boards have edge type 4 SK (4 side cut edges) as standard, and are applied with a joint of approx. 3 mm that is filled with TRIAS or Uniflott. They are marked in red and blue on the edges.

- Ivory coloured face paper
- Continuous perforation - seamless appearance
- Edge types 4 SK
- Bending is possible (see page 4)
- Application and jointing in accordance with Knauf Installation Guide TRO14

Knauf Cleaneo Acoustic FF

The special edge types of the Knauf Cleaneo Acoustic FF each with a front and long edge FF as well as a front and long edge SK facilitate simple and precise alignment of perforated boards with continuous perforation. When applying the boards abutting, the precise board dimensions automatically allow for correct perforation spacing.

- Ivory coloured face paper
- Continuous perforation - seamless appearance
- Edge type FF (2 as FF and 2 as SK)
- Off-the-shelf primed and bevelled edges
- Quick and precise application
- Application and jointing in accordance with Knauf Installation Guide TRO14FF

Knauf Cleaneo Acoustic linear

Knauf Cleaneo Acoustic linear with continuous perforation have rebated edges for precise application without the need for joint filling as well as a bright white face paper for direct coating. The precise board dimensions automatically results in the correct perforation spacing when the boards are abutted on application.

- Bright white face paper
- No jointing required
- Edge type *linear* (2 as notch and 2 as lap)
- Off-the-shelf primed and bevelled edges
- Quick application regardless of weather conditions
- Application and jointing in accordance with Knauf Installation Guide TRO14L

Knauf Cleaneo Acoustic with non-perforated perimeter

Knauf Cleaneo Acoustic with continuous perforation are available with one, two, three or four-sided non-perforated perimeter (see page 7).

- Edge type 4 SK / 4 AK

Knauf Cleaneo Acoustic with block perforation

- Edge type 4 SK / 4 AK

Knauf Cleaneo Acoustic with block slots

- Edge type 4 SK / 4 AK / HRK+SFK

Construction

General

- Loads anchored directly to Knauf Cleaneo Acoustic boards are not permissible.
- Ball impact safety according to DIN 18032-3 is provided if specifications on page 4 are observed.
- Connections of gypsum boards to building elements made of other materials, especially to columns, must be seperated by creating control joints allowing for movement, e.g. shadow gaps.
- Movement joints of the building structure must be transferred into the construction of the ceiling system.
- Use control joints in the case of ceiling areas exceeding approx. 15 m or for narrow ceiling spaces caused by a break in the wall. Additional control or expansion joints may be necessary for strongly structured suspended ceilings.
- Knauf profiles are factory galvanized. This corrosion protection is sufficient for indoor rooms including bathrooms or kitchens in residential buildings.

Knauf Cleaneo Acoustic Design Ceiling D127

- Knauf Cleaneo Acoustic Design Ceilings are anchored directly to the basic ceiling as a suspended ceiling.
- Knauf Boards are fastened to a metal grid of carrying channels and furring channels.
- A mineral wool insulation layer with a min. thickness of 20 mm can be installed on the furring channels.

Knauf Cleaneo Acoustic Fire Protection Ceiling D124

- Knauf Cleaneo Acoustic Fire Protection Ceilings as suspended ceilings consist of a fire protection level and an acoustic level.
- Fire protection F30 solely from below, or alternatively, solely from below and from above is provided. Installation of alutop Access Panels is possible.
- The fire protection level is anchored on the basic ceiling with Nonius suspension or Universal Brackets. Knauf Fire-Resistant Boards GKF according to DIN 18180 are fastened to a metal grid of carrying channels and furring channels of CD Channels 60x27 according to DIN 18182-1. Application with flush carrying and furring channels facilitate fire protection F30 from below and from above without insulation layer.
- The acoutsic level is anchored with Direct Brackets or Universal Brackets to the furring channels of the fire protection level. Knauf Cleaneo Acoustic boards are fastened to a single or double metal grid.

Ceiling D127 below ceiling D112

Knauf Ceiling D112 compliant to fire resistance requirement F30, F60 or F90 as a suspended ceiling in conjunction with a Knauf Cleaneo Acoustic Design Ceiling D127, is fastened with Universal Brackets or Direct Brackets on the furring channels of the fire protection level.

Notes

- Random PLUS R: Certain perspectives in a room or unfavourable lighting may lead to a diminished optical appearance of a continuous perforation pattern caused by longitudinal joints.
- Depending on the incidence of light / or refraction, looming of the furring channels can occur in conjunction with white Knauf Acoustic Fleece together with perforations of diameter ≥ 15 mm.

Installation plans

A department at Knauf is engaged in the creation of customized computer-aided and building-related installation plans. They are created on a scale of 1:50 with all the required specs. Production is tailored to the requirements of these plans. The individual boards are numbered identically on the rear and in the plans. To ensure a quick response and delivery, we recommend that you submit your architectural floor plans as DXF or DWG files using a scale of 1:50. Installation plans are also available for Random PLUS R!

Planning specifications

- Perforation type: Standard Circular R / Alternating Circular R / Random PLUS R / Standard Square Q / Block perforation / Block Slots
- Separations (e.g. as exposed joints) within one room, especially when designing segments with continuous perforation
- Ball impact safety according to DIN 18032-3
- Fire resistance: F30 / F60 / F90, solely from below or from below and from above
- Fleece colour: White / black / customized colour
- Perimeter: Non-perforated perimeters with width specifications according to page 7.
- Perimeter design of the room with/without shadow gap; width specification
- Frieze: Structure and width
- Frieze application on-site or pre-fabricated
- In case of perimeter shadow gaps, pre-fabricated frieze is available in standard widths starting at 50 mm.

D12 Knauf Cleaneo Acoustic Ceilings

Application, jointing, coatings

See notes on english translation on page 1

Application - Grid

Knauf Cleaneo Acoustic Design Ceiling D127

Suspended with Nonius suspension or Universal Brackets.

Anchoring to basic ceilings made of

- Wood: Knauf Drywall Screws as Truss Head Screws FN 5.1 x 35 mm (used in accordance with National Technical Approval No. Z- 9.1-251);
- Reinforced concrete: Knauf Ceiling Steel Dowels (use and installation in accordance with European Technical Approval ETA-07/0049);
- Other building materials: Anchors that are approved or standardized for the materials concerned.

Connect carrying channels CD 60x27 with hangers and align them at the required suspension height. Connect furring channels CD 60x27 to carrying channels using Intersection Connectors or Ankerwinkel Clips; the spacing of the furring channels depends on the perforation pattern max. 333.5 mm. Also refer to the table on page 24.

Knauf Cleaneo Acoustic Fire Protection Ceiling D124

Fire protection level: Suspend with Universal Brackets or Nonius suspension with a spacing of max. 650 mm. Spacing of the furring and carrying channel acc. to the table on page 28. For fire protection from above, apply an additional full layer of mineral wool, building material class A, density ≥ 40 kg/m³, melting point ≥ 1000 °C, t ≥ 40 mm above the furring channels and with mineral wool strips that are at least 15 cm wide on the carrying channels. The insulation layer can be omitted with a flush grid.

Acoustic level: Suspend with Direct Bracket (single level grid) or Universal Bracket (double level grid). Max. load per suspension max. 100 N. Axial spacings of the carrying channels and / or furring channels and suspenders in accordance with the tables on pages 6, 8, 9 and 28.

Apply mineral wool, building material class A, density ≥ 40 kg/m³, melting point ≥ 1000 °C, t ≥ 40 mm (e.g. Knauf Insulation Feuerschutzplatte DPF-40) for grid with Universal Brackets or t ≥ 25 mm Knauf Insulation Trittschall-Dämmplatte TPE 25 for fastening with Direct Bracket.

- Single-level grid (one level of parallel channels): Fill furring channel with mineral wool strips and apply mineral wool fully between the furring channels.
- Double level grid (consisting of carrying and furring channels): Fill the carrying channel with mineral wool strips and apply mineral wool fully above the furring channels.

Ceiling D127 below ceiling D112

The grid spacings of ceiling D112 are designed taking into consideration an additional load due to the acoustic level with max. 0.15 kN/m² in accordance with Technical Data Sheet D11.

Knauf Cleaneo Acoustic Design Ceiling D127 as a ceiling lining anchored to furring channels of the fire protection level D112 with Universal Brackets or Direct Brackets and Knauf Multi-purpose Screws FN, with spacing according to table on page 30.

Application - Cladding

Cross-mounting of Knauf Cleaneo Acoustic Boards (for Knauf Cleaneo Acoustic SK 2-4 mm joint width, depending on perforation pattern) laterally to furring channels. Place front edge joints on channels. For Knauf Cleaneo SK, sand down edges slightly with a sanding mesh and prime the face side cut edges (SK). The edges of Knauf Cleaneo Acoustic FF and linear are bevelled and primed off-the-shelf. Knauf Cleaneo Acoustic SK Boards with standard or alternating perforations are colour-coded in red or blue along the face and long edges. Always place the red marking adjacent to the blue marking (front and long edges) for installation. A team of 3 workers is recommended for installation purposes. Align and fit Knauf Cleaneo Acoustic SK Boards using a laser or reference cord intrersecting the continuous perforation rows, the diagonals and the laterals ensuring that the perforation rows continue beyond the board joints.

Use the Perforation Aligner with knobs compatible to the perforation pattern to ensure correct joint width (does not substitute the requirement for correct alignment).

With Knauf Cleaneo Acoustic FF and linear boards, the perforation spacing is automatically correct when the boards are laid joint to joint (rebate edge to SK edge with FF or notch to lap with linear). Press the boards firmly onto the grid during screw fastening. Commence fastening in the corner, where the board is already bordering a board on the long and front side. Fasten the long side first and then the front side. Fasten in accordance with the table on page 4.

After completing ceiling installation, clean off the dust in the joints with a brush.

If the ceiling layout is irregular or not a right angle, seamless non-perforated frieze of at least 100 mm width is recommended.

Observe the installation instructions.

Jointing

Knauf Cleaneo Acoustic SK and FF

Hand fill joints with TRIAS or Uniflott without using joint tape. Fill the screw heads as well. Knauf Cleaneo Acoustic Boards: Prime edges before jointing. Fill joints with Knauf TRIAS or Uniflott using a Hand Pouch gun and skim with Knauf Finish-Pastös in a second run. Any perforations that may have been filled can be cleaned with a compatible pilot wheel before the filling compound hardens.

Jointing should only be undertaken after the boards have been allowed to rest in the given humidity and temperature zones and no more longitudinal changes can be expected, i.e. expansion or contraction. The room temperature may not be below approx. 10 °C (50 °F) when joints are filled.

With mastic asphalt screed, cement screed and self-levelling floor screed, fill the joints only after the screed has been applied.

Knauf Cleaneo Acoustic linear

Fill screw heads with Knauf Snowboard-Finish using a Jet Trowel. Create a smooth surface by sanding when dry.

Coatings

The board surfaces must be dust-free before applying a paint or a coating. Pre-treat and prime gypsum board surfaces before the application of further coatings in accordance with Code of Practice no. 6 of the BVG (IGG) “Vorbehandlung von Trockenbauflächen aus Gipsplatten zur weitergehenden Oberflächenbeschichtung bzw. –bekleidung”. Ensure that the primer and the coating and paint are compatible.

As the surface of Knauf Cleaneo Acoustic linear is primed off-the-shelf, it is unnecessary to treat the surface when the fastners have been filled/treated with Knauf Snowboard-Finish.

The following coatings can be used on Knauf Cleaneo Acoustic boards (do not spray!):

- Coatings:
  Knauf Dispersion Paints (e.g. Knauf Intol E.L.F., Knauf Malerweiss E.L.F.), multicoloured (rainbow) emulsion, silicate-based emulsion paints in conjunction with a suitable primer.

Not suitable are:

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

Note

Gypsum board surfaces that have constantly been exposed to light without any protection can cause yellowing after coating. Therefore, a trial coat is recommended that will extend across several boards including all joints.

Yellowing can, however, be successfully avoided only by using a special primer, such as Knauf Atonol.

For the coating with fumi Acoustic Plaster, the Knauf Cleaneo Acoustic Base Board for fumi Acoustic Plaster with PET foil factory laminated on the rear is available. Detailed information can be found in the Knauf System Data Sheet for system D126 “Knauf Cleaneo Acoustic Ceiling for fumi Acoustic Plaster ”.

D12 Knauf Cleaneo Acoustic Ceilings

Information on sustainability

See notes on english translation on page 1

Information on sustainability of Knauf products and Knauf Cleaneo Acoustic Ceilings

Building assessment systems ensure the sustainable quality of buildings and constructional structures by a detailed assessment of ecological, economic, social, functional and technical aspects. The two certification systems of DGNB (Deutsches Gütesiegel Nachhaltiges Bauen) and LEED (Leadership in Energy and Environmental Design) are of particular relevance in Germany.

Knauf products and Knauf Cleaneo Acoustic Ceiling Systems can positively influence many of these criteria.

DGNB

Ecological quality

- Criterion: Global warming potential, ozone depleting potential, ozone creation potential, acidification potential, overfertilisation potential and waste
  → The relevant environmental data are contained in the EPD for gypsum products

Economic quality

- Criterion: Building related life-cycle costs
  → Cost-efficient Knauf Drywalling

Sociocultural and functional quality

- Criterion: Acoustic comfort
  → Knauf Cleaneo Acoustic Ceilings with high sound absorption coefficients for reduction of the reverberation time
- Criterion: Indoor area hygiene
  → Higel level of air quality due to the Knauf Cleaneo air-cleaning effect
- Criterion: Suitability for conversion
  → Flexible Knauf Drywalling

Technical quality

- Criterion: Fire protection
  → Comprehensive Knauf fire protection know-how
- Criterion: 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

Special Notes

It is certified herewith that the constructions, details and stated products, contained in the System Data Sheet **D12 Knauf Cleaneo Acoustic Ceilings - edition 2011-05**, fully comply with the proofs acc. to the German building legislation, valid at the time of issuing. In addition design and static requirements and those regarding building physics (fire protection and sound insulation) are considered.

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-dateness of the stated proofs have to be regarded.

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* Call rates to Knauf Direct from within the German landline network: 0.39 € per Min., Callers whose phone numbers are not registered in the Knauf address database, e. g. private builders or non-patrons are charged 1.69 €/Min. Calls from mobile phones may differ and will be charged acc. to net provider and call rate.

** Fax: 0.14 €/Min. within the German landline network

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D12/engl./D/05.11/FB/D