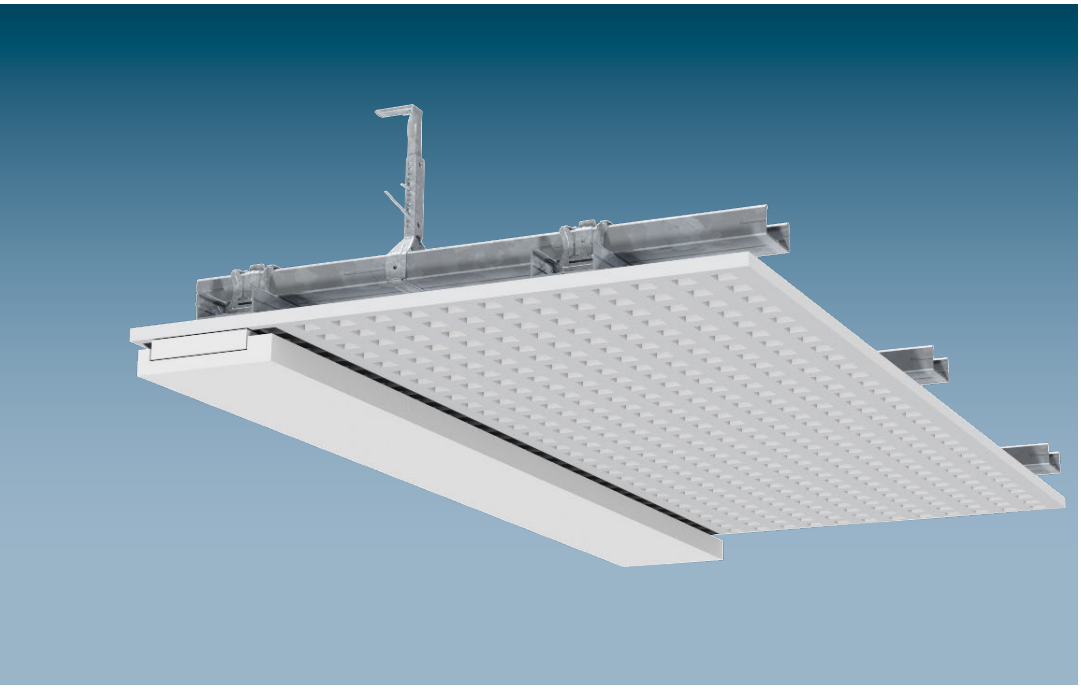


Drywall Systems

D12.de

System Data Sheet 2020-01

Knauf Cleaneo Acoustic Board Ceilings

Cleaneo Classic

D127.de – Knauf Cleaneo Acoustic Board Ceiling
D124.de – Knauf Cleaneo Acoustic Fire Protection Ceiling
D126S.de – Knauf Cleaneo Acoustic Board Ceiling SYSTEXX
D126U.de – Knauf Cleaneo Acoustic Board Ceiling UFF for acoustical plaster
D137.de – Knauf Free-Spanning Cleaneo Acoustic Board Ceiling
D134.de – Knauf Free-Spanning Cleaneo Acoustic Fire Protection Ceiling

Note on English translation / Hinweise zur englischen Fassung

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

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

Contents

Usage instructions

Notes on the document

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

References to other documents

- Suspended ceilings with non-perforated cladding, see system data sheet D11.de Knauf Board Ceilings
- Free-spanning ceilings with non-perforated cladding, see system data sheet D13.de Knauf Free-Spanning Ceilings
- Acoustic wall systems, see technical brochure AK04.de Knauf Acoustic Wall Systems
- Room acoustics with Knauf – Fundamentals and concepts, see brochure AK01.de
- Room Acoustics with Knauf – Data for planning, see brochure AK02.de
- Dropped Ceiling with Lay-in Assembly, see system data sheet D14.de Knauf Acoustic Dropped Ceilings (German only)
- Free-Spanning Acoustical Plank Ceilings , see system data sheet D42.de Free-Spanning Acoustical Plank Ceilings
- Installation Instructions Cleaneo SK – K761S-A01.de
- Installation Instructions Cleaneo UFF – K761U-A01.de
- Installation Instructions Cleaneo linear – K761L-A01.de
- Installation Instructions Cleaneo SYSTEXX Acoustic Board – K737S-A01.de
- Product data sheet K533.de Knauf Cleaneo Caps
- Observe the product data sheets of the Knauf system components.

Symbols in system data sheet

The following symbols are used in this document:

Insulation layers

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

Stud frame spacings

(a) Spacing of suspenders/anchors

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

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

Intended use of Knauf Systems

Please observe the following:

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

General instructions

Term definitions

Suspended ceilings

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

Free-spanning ceilings

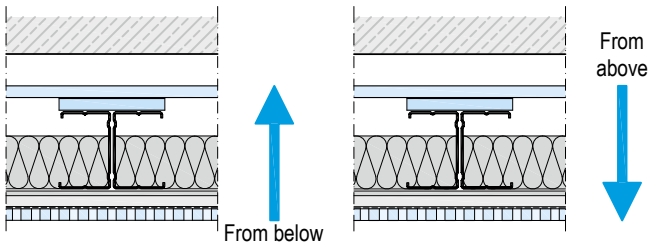
Knauf free-spanning ceilings are sub-ceilings without suspension.
The connection of the ceiling described as "free-spanning" is the support for the freely-supporting profiles, implemented as UW perimeter runners or UA profiles using connection brackets.
The connection described as "constructive" is the perimeter connection to the freely-spanning profiles.

Field of application

The data specified in this system data sheet only applies for ceiling linings / suspended ceilings in interiors.

Fire resistance effect

If the fire resistance effect from the classification of Cleaneo Acoustic board ceiling is achieved without involvement or consideration of the basic ceiling, the fire resistance is referred to as solely. This is relevant in particular when the plenum is to be protected against the exposure to fire from the room (fire resistance solely from below) or a protective effect for the room against fire exposure in the plenum (fire resistance solely from above). A combination of both requirements may be necessary depending on the requirements stipulated by the building inspectorate and/or fire resistance concept.
Even technical fire resistance non-classified ceiling systems classified by a "solely from below" ceiling lining/sub-ceiling for fire resistance requirements can be protected to withstand exposure to fire from the bottom of the ceiling.



Air-cleaning effect

Knauf Cleaneo Classic are perforated or slotted gypsum boards compliant to EN 14190 with air-cleaning effect due to the addition of dehydrated zeolite.

Information on further Cleaneo Classic boards

Cleaneo Thermoboard (Plus)

Cleaneo Thermoboard (Plus) is applied in the cooling and heating ceiling system field. No specifications regarding sound absorption can be made due to the diverse range of grid systems used by manufacturers of the heating/cooling systems.

Dimensioning principles

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

Example: D127.de – Cleaneo Acoustic Board Ceilings without fire resistance

Step 1:

Determination of the rated weight

The rated weight (cladding with grid) of the suspended ceiling/ceiling lining can be read off from the Knauf system tables in dependence on the selected cladding thickness (system variants).

Fire resistance class		Cladding (lateral application)				Rated weight	Furring channel
For fire exposure					Minimum thickness	Without insulation layer	Maximum spacings (b)
From below	From above	Cleaneo Classic	Cleaneo SYSTEXX Acoustic Board	Designpanel	mm	kg/m²	mm
D127.de – Cleaneo Acoustic Board Ceilings…							
–	–	●			**12.5**	12.0	333.5

Note	Rated weights with larger board thicknesses and/or other board types on request.

Step 2:

Consideration of additional loads

Additional loads, e.g. consisting of fire resistance necessary and unnecessary insulation materials, as well as planned fixing loads (see also page 65), increase the total area weight of the ceiling lining / suspended ceiling and must be considered with the rating of the load class.
(Rated weight + weight of additional loads = total surface weight)

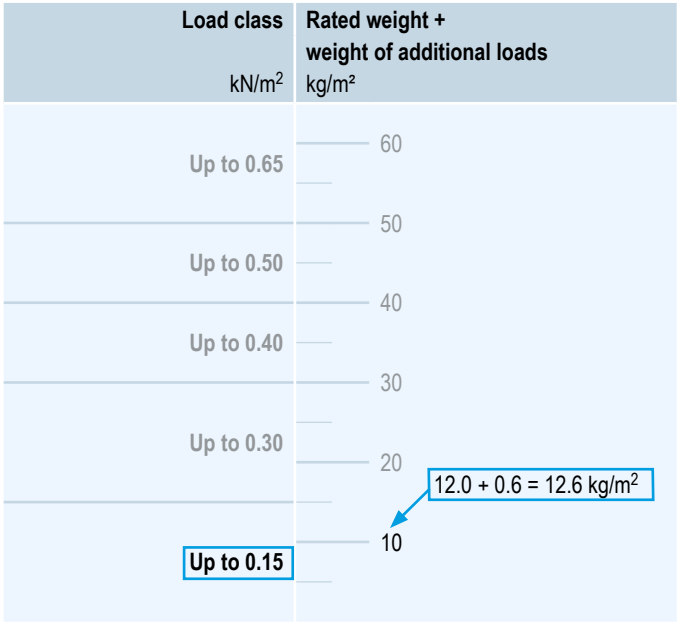
Example additional load: 20 mm insulation material = 0.6 kg/m²

Step 3:

Determination of the load class

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

Determination of the load class



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

Step 4:

Dimensioning of the grid

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

Axial spacings carrying channel (c)	Suspender spacings (a) Load class in kN/m²	
	Up to 0.15	Up to 0.30
500	1200	950
600	1150	900
700	1100	850

Proof of Usability

Knauf System	Fire resistance	Sound insulation Airborne and impact sound	Sound absorption
D127.de	–	T017-07.17	A 013-04.16
D124.de	abP P-2100/199/15-MPA BS	–	
D126S.de	–	–	A 017-05.19
D126U.de	–	–	
D137.de	–	–	A 013-04.16
D134.de	AbP P-SAC-02/III-510	–	

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

Notes on fire resistance

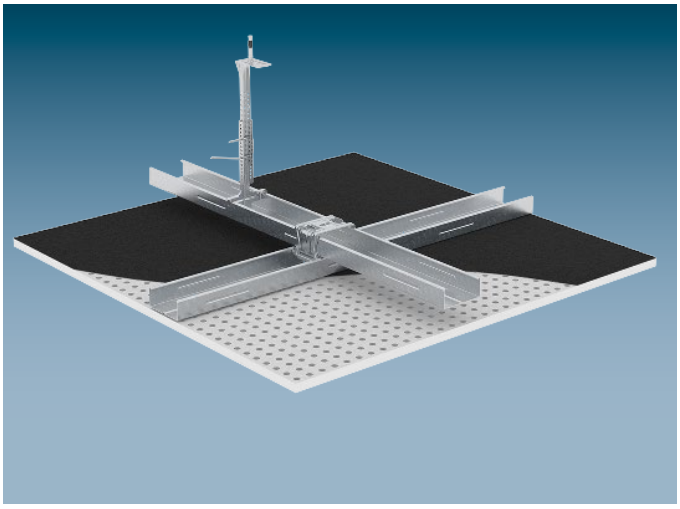
The specifications marked with plus offer additional application options, which are not directly included in the Proof of Usability. On the basis of our technical assessments, we assume that these marked design solutions can be assessed as a non-significant divergence. On request, we can make the documentation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

Cleaneo acoustic board ceilings

Cleaneo Acoustic Board Ceilings consist of a suspended or directly anchored or free spanning grid clad with Cleaneo Classic boards. Various board designs are available to satisfy the respective acoustical and visual requirements.

D127.de Cleaneo Acoustic Board Ceilings

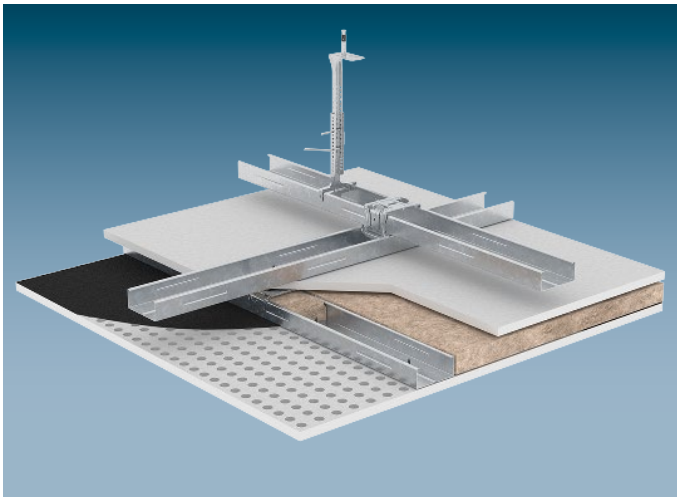
Without fire resistance



Cleaneo Classic boards are fixed with screws to a metal grid of carrying and furring channels (double-layer profile) made of sheet metal profiles CD 60/27. Anchoring of the CD channels is undertaken with suspenders on the basic ceiling.
An insulation layer of at least 20 mm thickness can be placed on the furring channels for the purpose of sound absorption.

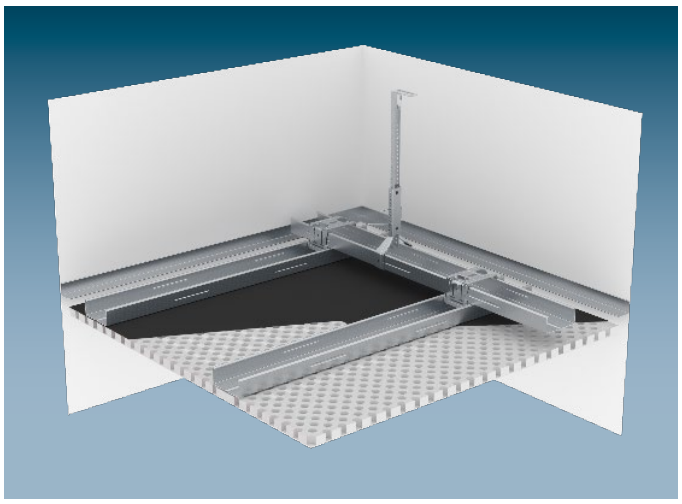
D124.de Cleaneo Acoustic Fire Protection Ceiling

Fire resistance F30 – solely from below



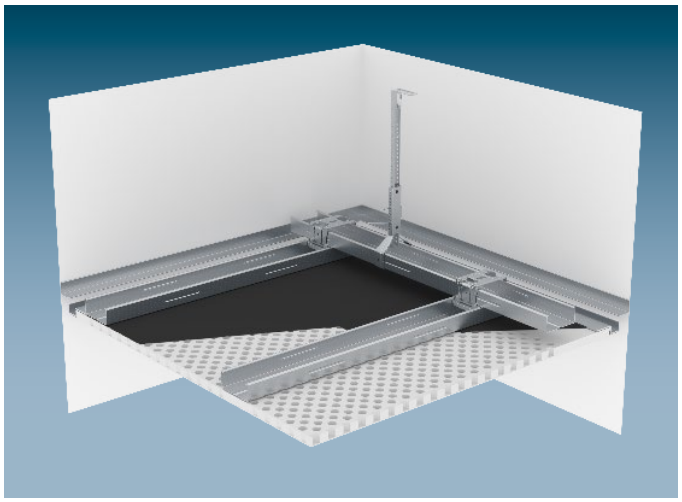
The system consists of two effective levels for fire resistance and acoustics. Knauf Piano fire-resistant boards are fixed with screws to a metal grid of carrying and furring channels (double-layer profile) made of sheet metal profiles CD 60/27 for the upper fire protection effective layer. Anchoring of the CD channels is undertaken with suspenders on the basic ceiling.
Cleaneo Classic boards are fixed with screws to a metal grid of carrying and furring channels (double profile grid) or furring channels (single profile grid) made of sheet metal profiles CD 60/27 for the bottom acoustically effective layer. Anchoring of the CD channels is undertaken with universal brackets (double profile grid) or direct brackets (single profile grid) on the upper level. An obligatory fire protection acoustically effective insulation layer is arranged in the space between the upper and lower levels.

D126S.de Cleaneo Acoustic Board Ceiling SYSTEXX
Without fire resistance



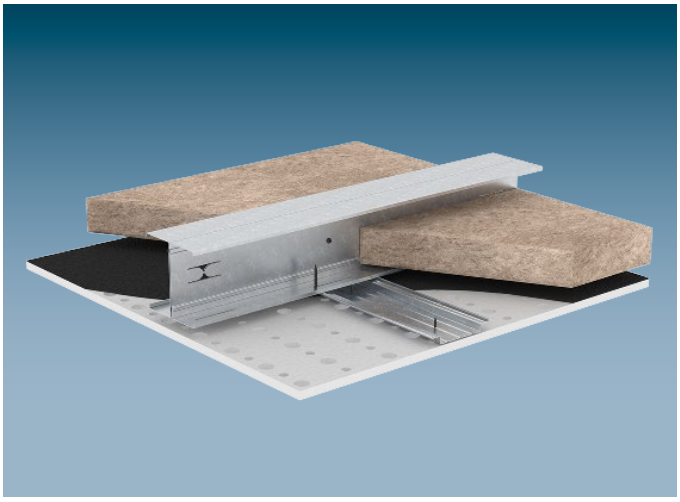
Cleaneo SYSTEXX Acoustic Boards with fleece or foil lamination on the rear side are screw fastened to a metal grid of carrying and furring channels (double-layer profiles) made of sheet metal profiles CD 60/27. Anchoring of the CD channels is undertaken with suspenders on the basic ceiling.
An acoustically effective insulation layer can be laid upon the furring channels.
The connection to the wall is implemented with a shadow gap or frieze lamination but also possible with foil laminated on the rear without shadow gap.
The cladding is lined for a smooth surface with SYSTEXX Silent acoustic wallpaper (available from Vitrulan Textile Glass GmbH).

D126U.de Cleaneo Acoustic Board Ceilings UFF for acoustical plaster
Without fire resistance



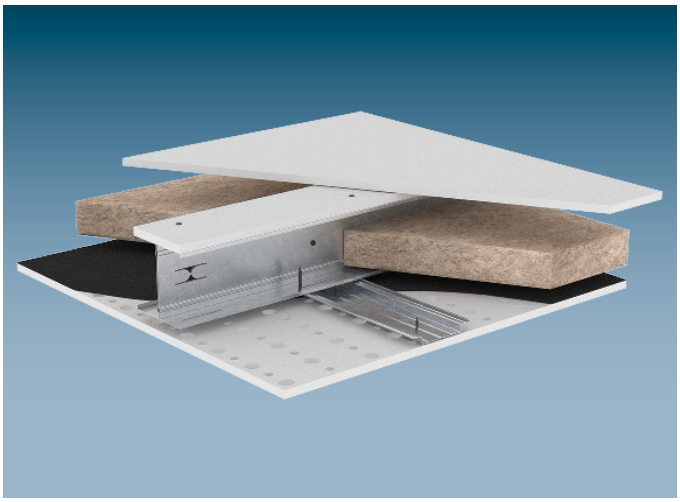
Cleaneo UFF plaster base boards with fleece or foil lamination on the rear side are screw fastened to a metal grid of carrying and furring channels (double-layer profiles) made of sheet metal profiles CD 60/27. Anchoring of the CD channels is undertaken with suspenders on the basic ceiling.
An acoustically effective insulation layer can be laid upon the furring channels.
The connection to wall is implemented with fleece lamination with shadow gap.
The final coating is applied using KRAFT acoustical plaster Picco S or fumi Akustikputz S1 acoustical plaster.

D137.de Free-Spanning Cleaneo Acoustic Board Ceilings
Without fire resistance



Cleaneo Classic boards are fixed with screws to a metal grid of carrying channels made of single or double profiles types CW or UA as well as furring channels made from hat-shaped channels. The carrying channels are anchored only to the flanking walls.
An acoustically effective insulation layer can be laid between the carrying channels (upon the furring channels).

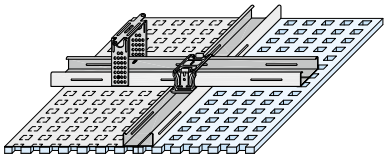
D134.de Free-Spanning Cleaneo Acoustic Fire Protection Ceiling
Fire protection F30 – solely from below and from above



Cleaneo Classic boards are fixed with screws to a metal grid of free-spanning carrying channels made of double profiles types CW or UA with covering strips as well as furring channels made from hat-shaped channels. The carrying channels are anchored only to the flanking walls.
A board layer required for fire protection reasons is laid as a covering on the carrying channels and consists of Knauf Piano fire-resistant board.
An obligatory fire protection acoustically effective insulation layer is arranged between the carrying channels (on the furring channels).

System variants

Cleaneo Acoustic Board Ceilings without fire resistance

	Fire resistance class		Cladding (lateral application)				Rated weight	Furring channel	Insulation layer	
	For fire exposure								required for fire resistance	
	From below	From above	Cleaneo Classic	Cleaneo SYSTEXX Acoustic Board	Designpanel	Minimum thickness mm	Without insulation layer kg/m²	Maximum spacings (b) mm	Minimum thickness mm	Minimum density kg/m³
D127.de Cleaneo Acoustic Board Ceiling										
	–	–	•			**12.5**	12.0	333.5		
				•		**12.5**	9.2	400		
					•	**12.5**	12.0	300		

Maximum spacings of the furring channels (b) in dependence on the design and perforation – see section *"Board design"*.

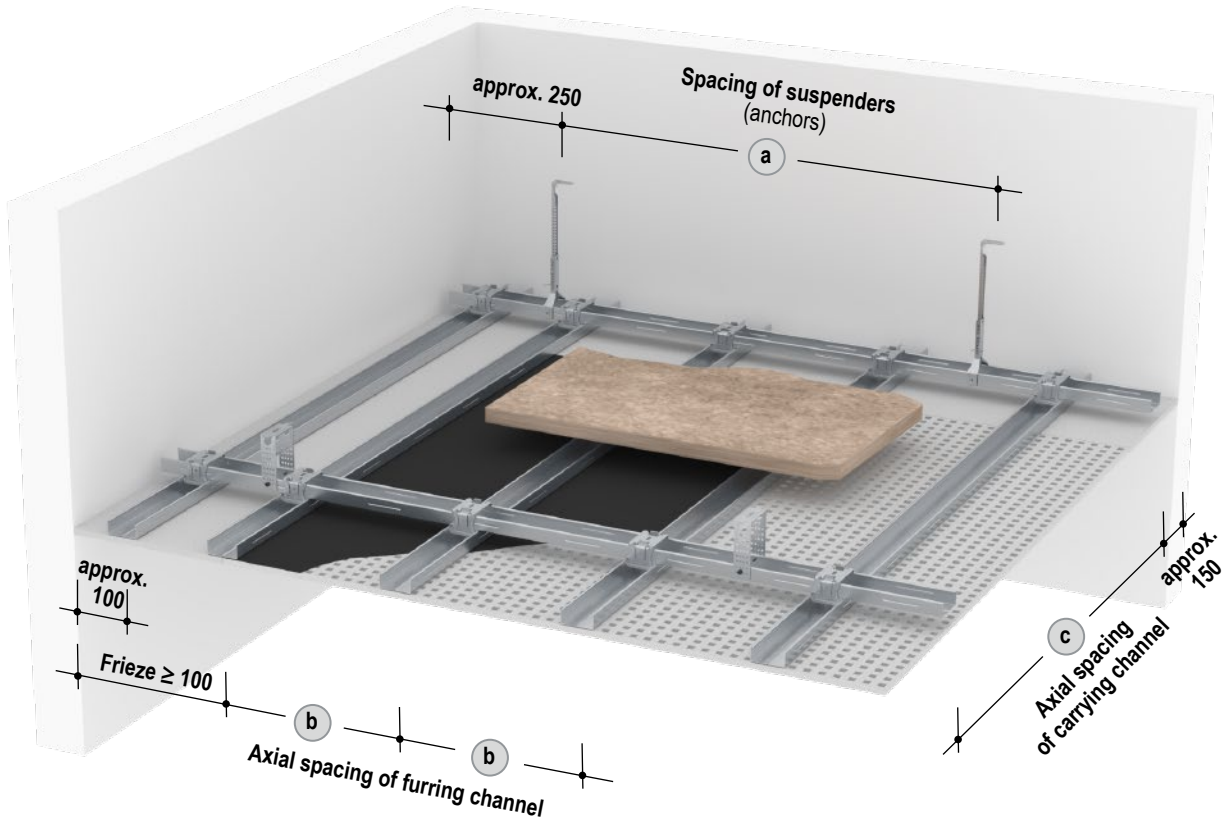
Determination of the load class

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

Note Observe the notes on page 4.

Maximum grid spacings

Dimensions in mm

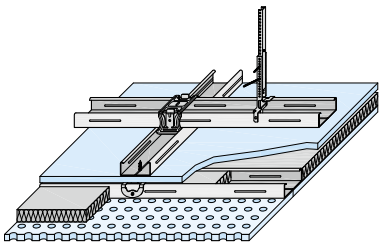
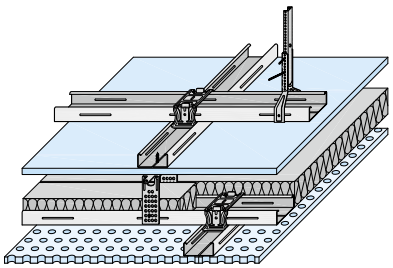


Axial spacings carrying channel (c)	Suspender spacings (a) Load class in kN/m²	
	Up to 0.15	Up to 0.30
500	1200	950
600	1150	900
700	1100	850
800	1050	800
900	1000	800
1000	950	750
1100	900	750
1200	900	–

Note	Customized dimensioning of the ceiling substructure is possible on request.

System variants

Cleaneo Acoustic Fire Protection Ceilings – fire resistance solely from below

Requirements on the basic ceiling with fire exposure	Fire resistance class		1 Grid level Cladding (lateral application)		2 Grid level Cladding (lateral application)			Insulation layer	
From below No fire resistance requirements for basic ceiling/roof construction	For fire exposure		Knauf Piano fire-resistant board	Minimum thickness	Cleaneo Classic	Designpanel	Minimum thickness	Required for fire resistance Minimum thickness	Minimum density
	From below	From above		mm			mm	mm	kg/m³
D124.de Cleaneo Acoustic Fire Protection Ceiling									
 2nd grid level Furring channels only – direct bracket	F30	–	•	12.5	•		12.5	Knauf Insulation Trittschall-Dämmplatte TPE 25	–
						•	12.5		
 2nd grid level Carrying and furring channel – universal brackets	F30	–	•	12.5	•		12.5	Mineral wool (S) 50	50
						•	12.5		

2nd grid level - maximum furring channel spacings (b)

Cleaneo Classic	≤ 333.5 mm
Designpanel	≤ 300 mm

Dependent on the design and perforation – see section *"Board design"*.

Fire resistance permissible suspenders of the 2nd grid level

- Direct Bracket
- Universal Bracket / Damping Universal Bracket

Extension of the fire resistance Proof of Usability
- Based on the system D124.de variants

Prior consultation in acc. to page 6 is recommended.

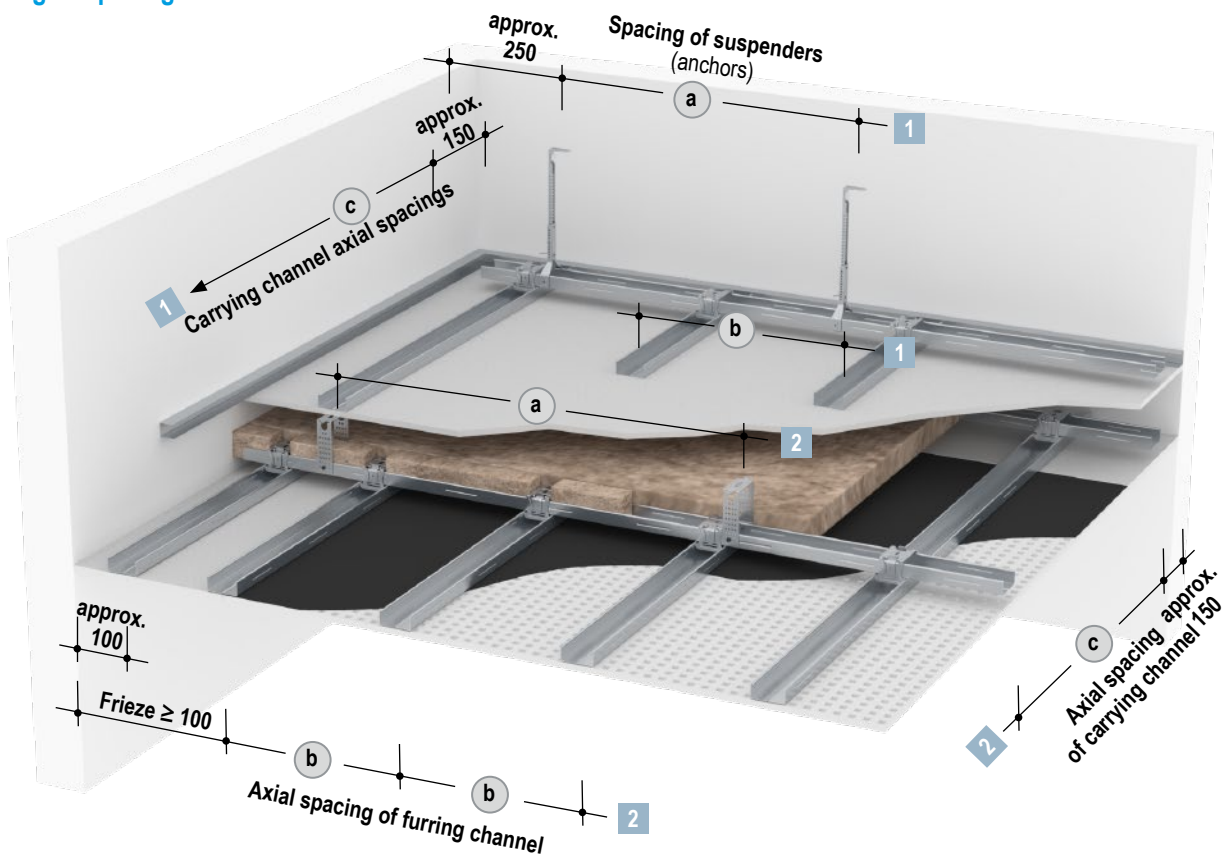
Notes

2nd grid level: Only cladding with perforation ratio ≤ 23.0 % permissible.

Observe the notes on page 4.

Maximum grid spacings

Dimensions in mm



1 Grid level

Axial spacing carrying channel c	Spacing of suspenders a	Axial spacing furring channel b
Carrying and furring channel		
1000	650	400

For further details on the 1st grid level see system data sheet D11.de Knauf Board Ceilings

2 Grid level (≤ 0.15 kN/m²)

Axial spacing carrying channel c	Spacings of suspenders a	Axial spacings furring channel b
Furring channels only – direct bracket		
–	800	≤ 333.5
Carrying and furring channel - universal brackets		
800	800	≤ 333.5

Always arrange suspended profiles of the 2nd grid level lateral to furring channels of the 1st grid level.
Attach fixing alternately to every second furring channel of the 1st grid level with Knauf multi-purpose screws FN 4.3 x 35.

For every anchoring point of the 2nd grid level the maximum load is 100 N (approx. 10 kg).

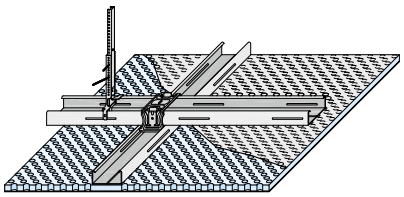
Maximum spacings of the furring channels in dependence on the design and perforation – see section *"Board design"*.

Extension of the fire resistance Proof of Usability
- Based on the system D124.de variants

Prior consultation in acc. to page 6 is recommended.

System variants

Cleaneo Acoustic Board Ceilings (SYSTEXX) – without fire resistance

	Fire resistance class		Cladding (lateral application)		Rated weight	Furring channel	Insulation layer required for fire resistance	
	For fire exposure		Cleaneo SYSTEXX Acoustic Board	Minimum thickness	Without insulation layer	Maximum axial spacing (b)	Minimum thickness	Minimum density
	From below	From above		mm	kg/m²	mm	mm	kg/m³
D126S.de Cleaneo Acoustic Board Ceiling SYSTEXX								
	–	–	•	**12.5**	9.4	400		

System components	Material number	Manufacturer address for purchase	Application
Cleaneo SYSTEXX Acoustic Board Fleece Cleaneo SYSTEXX Acoustic Board Foil	00661387 00661386	Knauf Gips KG Am Bahnhof 7 97346 Iphofen Telephone: +49 9323 / 31-0 Fax: +49 9323 / 31-277 www.knauf.de	Fleece or foil lamination
Cleaneo SYSTEXX Dots – adhesive dots / transfer foil Cleaneo SYSTEXX Tape – silicone tape Cleaneo SYSTEXX Silent – acoustic wallpaper Cleaneo SYSTEXX Tool – special cutter knife for double seam cut Cleaneo SYSTEXX Blade – spare blades for cutter tool		Vitrulan Textile Glass GmbH Bernecker Straße 8 95509 Marktschorgast Germany Telephone: +49 9227 77 210 Fax: +49 9227 77 200 vitrulan-group@vitrulan.com	

Determination of the load class

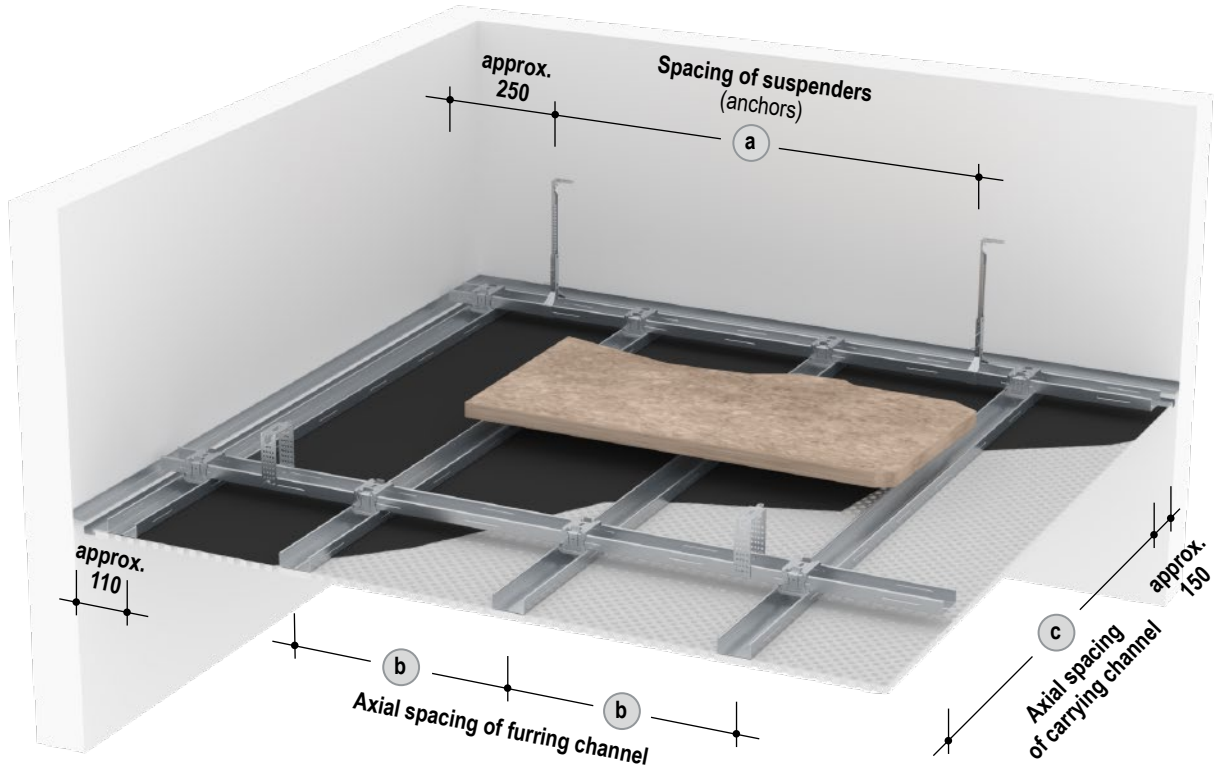
Load class kN/m²	Rated weight + weight of additional loads kg/m²
Up to 0.65	60
Up to 0.50	50
Up to 0.40	40
Up to 0.30	30
Up to 0.15	20
	10

Note	The application of Cleaneo SYSTEXX Silent, Dots and Tape requires a successfully completed training session from Vitrulan Textile Glass GmbH.

Note	Observe the notes on page 4.

Maximum grid spacings

Dimensions in mm



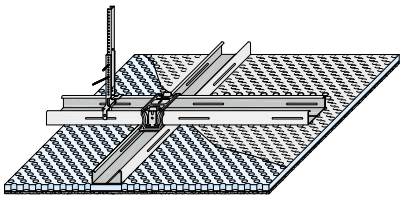
Axial spacings carrying channel c	Suspender spacings a Load class in kN/m² Up to 0.15	Up to 0.30
500	1200	950
600	1150	900
700	1100	850
800	1050	800
900	1000	800
1000	950	750
1100	900	750
1200	900	–

Note	Compensation of the room geometry using edge frieze.

Note	Customized dimensioning of the ceiling substructure is possible on request.

System variants

Cleaneo Acoustic Board Ceilings UFF for acoustical plaster – without fire resistance

	Fire resistance class		Cladding (lateral application)		Rated weight	Furring channel	Insulation layer required for fire resistance	
	For fire exposure		Cleaneo UFF plaster base board	Minimum thickness	Without insulation layer	Maximum axial spacing (b)	Minimum thickness	Minimum density
	From below	From above		mm	kg/m²	mm	mm	kg/m³
D126U.de Cleaneo Acoustic Board Ceiling UFF for acoustical plaster								
	–	–	•	**12.5**	12.7 (incl. 3 kg/m² plaster)	400		

Plaster system		Graining	Coating layer configuration	Manufacturers' supply address	Application
fumi Akustikputz	S1	0.8 mm	■ Sperrgrund barrier coating ■ Adhesive ■ Plaster base fleece ■ Multi-layer coating	Schmidt Akustik GmbH Beethovenstraße 7 67307 Göllheim Telephone: +49 6351 98 98 798 E-Mail: info@akustikputz.de www.akustikputz.de	Fleece or foil lamination
KRAFT acoustical plaster	Picco S	0.3 to 0.5 mm	■ Isoliergrund primer ■ Adhesive ■ Plaster base fleece ■ Multi-layer coating	KRAFT Akustik-Systeme Sonnenhof 4 35440 Linden Telephone: +49 6403 940 608 E-Mail: info@kraft-akustiksysteme.de www.kraft-akustiksysteme.de	Fleece or foil lamination

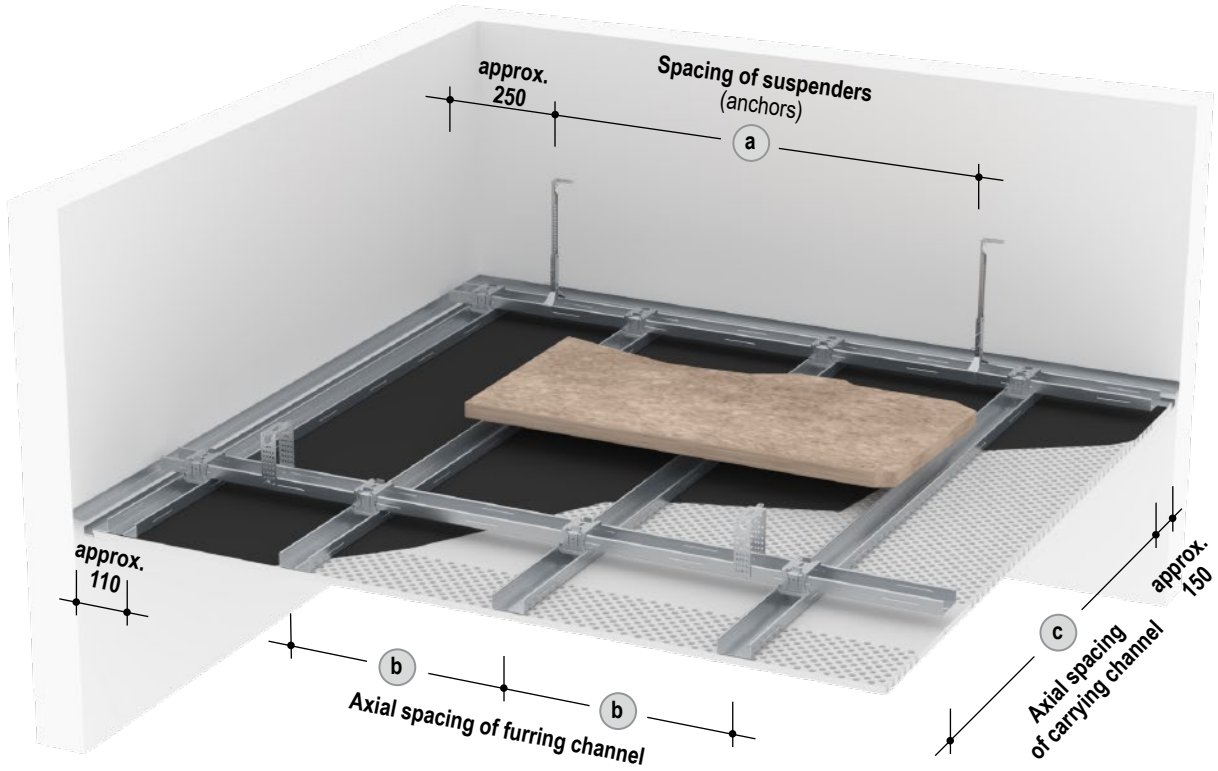
Determination of the load class

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

Note Observe the notes on page 4.

Maximum grid spacings

Dimensions in mm

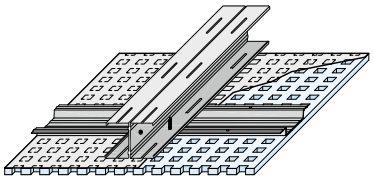


Axial spacings carrying channel (c)	Suspender spacings (a) Load class in kN/m²	
	Up to 0.15	Up to 0.30
500	1200	950
600	1150	900
700	1100	850
800	1050	800
900	1000	800
1000	950	750
1100	900	750
1200	900	–

Note	Customized dimensioning of the ceiling substructure is possible on request.

System variants

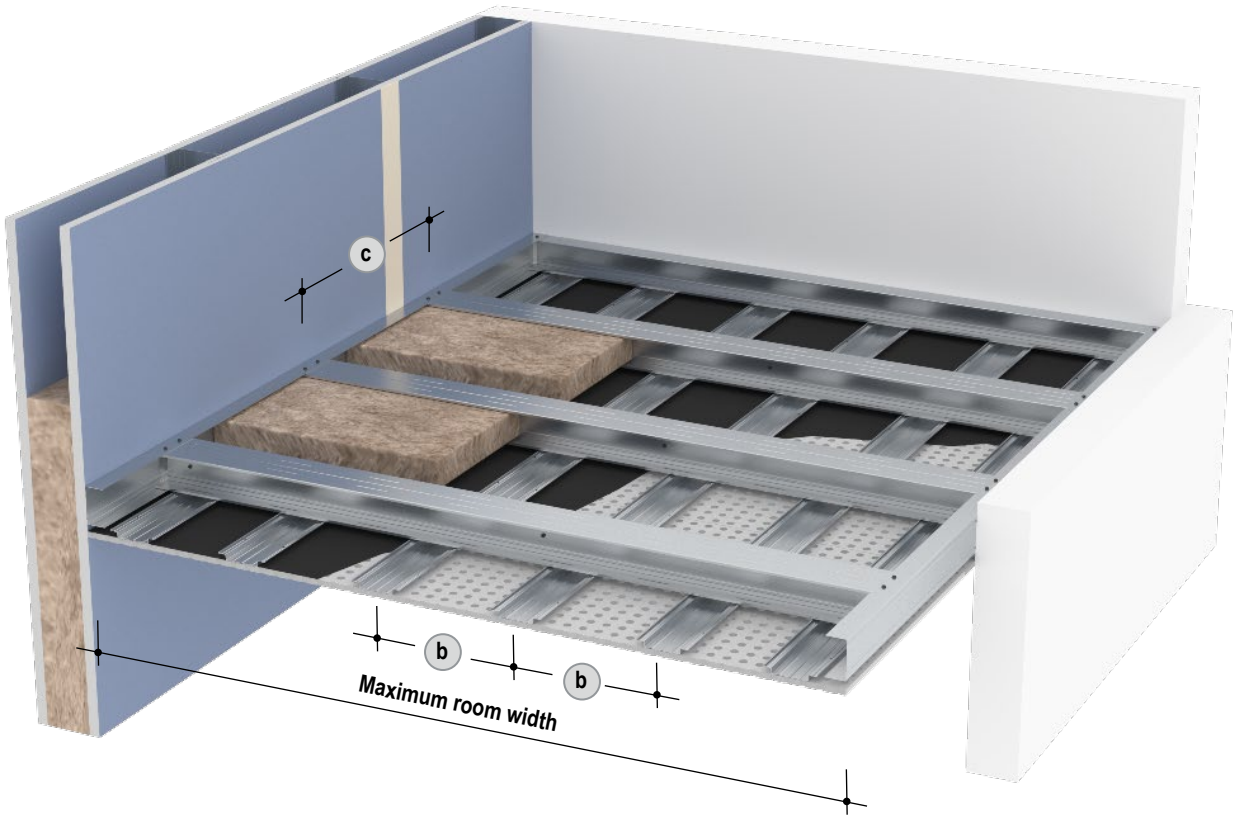
Free-Spanning Cleaneo Acoustic Board Ceilings without fire resistance

	Fire resistance class		Cladding (lateral application)				Carrying channel CW-/UA-single / double profile	Furring channel Hat-shaped channel 98/15	Insulation layer required for fire resistance	
	For fire exposure		Cleaneo Classic	Cleaneo SYSTEXX Acoustic Board	Designpanel	Minimum thickness	Maximum spacings (c)	Maximum spacings (b)	Minimum thickness	Minimum density
	From below	From above				mm	mm	mm	mm	kg/m³
D137.de Free-Spanning Cleaneo Acoustic Board Ceiling										
	–	–	•			**12.5**	625	333.5		
				•		**12.5**	625	400		
					•	**12.5**	625	300		

Maximum spacings of the furring channels (b) in dependence on the design and perforation – see section *"Board design"*.

Note Observe the notes on page 4.

Maximum room widths / grid spacings



Profile	Maximum room widths[1] Carrying channel spacings (c) 500 mm m	625 mm m
CW single profile metal gauge 0.6 mm		
CW 50	2.05	1.95
CW 75	2.55	2.45
CW 100	3.00	2.85
CW 125	3.40	3.25
CW 150	3.75	3.60
UA single profile metal gauge 2.0 mm		
UA 50	2.45	2.35
UA 75	3.05	2.90
UA 100	3.60	3.45
UA 125	4.05	3.90
UA 150	4.50	4.35

Profile	Maximum room widths[1] Carrying channel spacings (c) 500 mm m	625 mm m
CW double profile metal gauge 0.6 mm		
2x CW 50	2.40	2.25
2x CW 75	2.95	2.85
2x CW 100	3.45	3.30
2x CW 125	3.90	3.75
2x CW 150	4.35	4.15
UA double profile metal gauge 2.0 mm		
2x UA 50	2.80	2.65
2x UA 75	3.40	3.30
2x UA 100	4.00	3.90
2x UA 125	4.50	4.40
2x UA 150	5.00	4.85

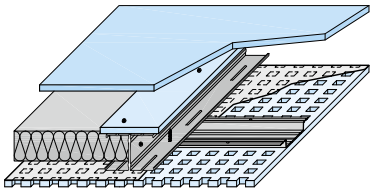
1) *Max. room widths including additional loads (0.03 kN/m² = 3 kg/m²) for insulation layers necessary for acoustical measures and/or fixing loads.*

CW profile / UA profile as carrying channel		UW perimeter runner on connection to wall load bearing
(2x) CW/UA 50	→	UW 50
(2x) CW/UA 75	→	UW 75
(2x) CW/UA 100	→	UW 100
(2x) CW/UA 125	→	UW 125
(2x) CW/UA 150	→	UW 150

Notes	
	Larger room widths possible on request.
	Free-spanning ceiling profiles may not be joined or extended (larger room widths possible with centre suspension)

System variants

Free-Spanning Cleaneo Acoustic Fire Protection Ceiling – fire resistance solely from below and from above (plenum)

Requirements on the basic ceiling for fire exposure	Fire resistance class		Cladding (lateral application)				Carrying channel CW/UA double stud profile	Furring channel Hat-shaped channel 98/15	Insulation layer Required for fire resistance	
	For fire exposure		Knauf Piano fire-resistant board	Cleaneo Classic	Designpanel	Minimum thickness	Maximum spacings (c)	Maximum spacings (b)	Minimum thickness	Minimum density
	From below	From above				mm	mm	mm	mm	kg/m³
From below No fire resistance requirements for basic ceiling/roof construction **From above** (Plenum) Raw ceiling must have same fire resistance class as the suspended ceiling										
D134.de Free-Spanning Cleaneo Acoustic Fire Protection Ceiling										
Covering strips **12.5 mm Knauf Piano fire-resistant board** 	**F30**	**F30**	•	•		**12.5** + **12.5** Additional board layer (covering board)	625	333.5	Mineral wool (S) 50	50
			•		•	**12.5** + **12.5** Additional board layer (covering board)	625	300		

Maximum spacings of the furring channels (b) in dependence on the design and perforation – see section *"Board design"*.

Permissible connections to wall

Connection	Solid wall (e.g. concrete, reinforced concrete or masonry) Fire resistance class	Lightweight partition (metal stud partition) plus Fire resistance class
Direct		
Load-bearing	≥ F30	≥ F30
Constructional		
Shadow gap		
Load-bearing	≥ F30	≥ F30
Constructional		

plus **Extension of the fire resistance Proof of Usability**
■ For connection to lightweight partitions (metal stud partitions)
Prior consultation in acc. to page 6 is recommended.

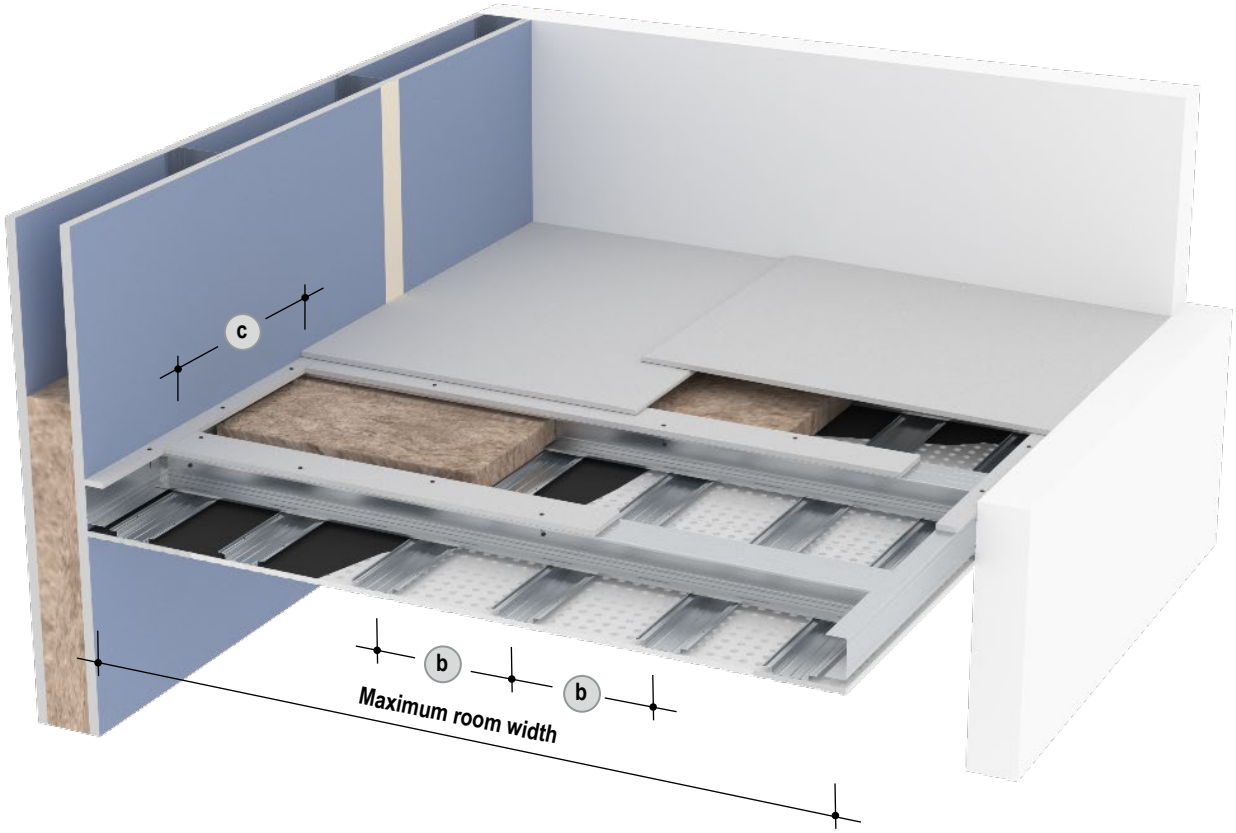
Notes

Flanking components (walls) must have at least the same fire resistance class.

Only cladding with perforation ratio ≤ 23.0 % permissible.

Observe the notes on page 4.

Maximum room widths / grid spacings



CW profile / UA profile as carrying channel		UW perimeter runner on connection to wall load bearing
2x CW/UA 50	→	UW 50
2x CW/UA 75	→	UW 75
2x CW/UA 100	→	UW 100
2x CW/UA 125	→	UW 125
2x CW/UA 150	→	UW 150

plus **Extension of the fire resistance Proof of Usability**
- When implemented with carrying channels CW 50 / 75 / 100 / 125
- When implemented with carrying channels UA

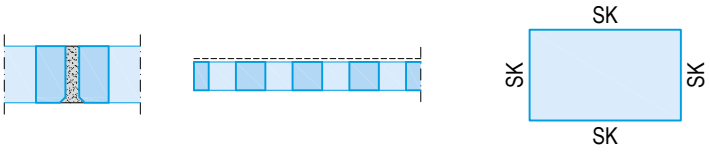
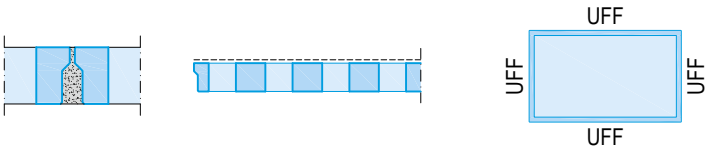
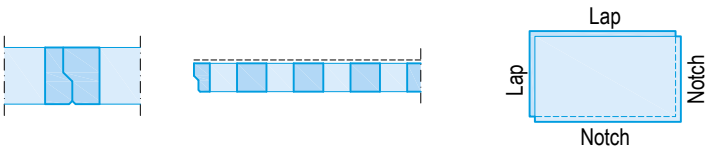
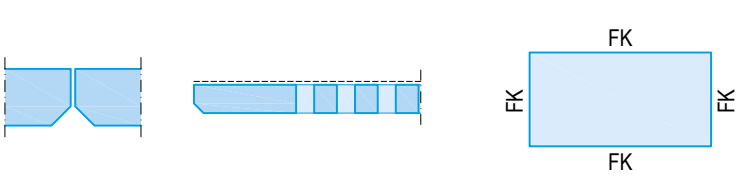
Prior consultation in acc. to page 6 is recommended.

Profile		Maximum room widths[1] Carrying channel spacings (c) 500 mm m	625 mm m
CW double profile metal gauge 0.6 mm			
2x CW 50		2.05	1.85
2x CW 75	plus	2.60	2.35
2x CW 100	plus	3.00	2.80
2x CW 125	plus	3.40	3.25
2x CW 150	plus	3.80	3.60
UA double profile metal gauge 2.0 mm			
2x UA 50		2.45	2.35
2x UA 75	plus	3.05	2.95
2x UA 100	plus	3.60	3.45
2x UA 125	plus	4.10	3.95
2x UA 150	plus	4.50	4.35

1) *Max. room widths including additional loads (0.03 kN/m² = 3 kg/m²) for insulation layers necessary for fire protection and/or acoustical measures and/or fixing loads.*

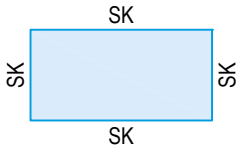
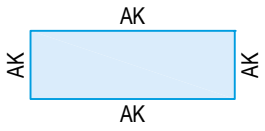
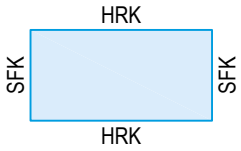
Cleaneo Classic boards

Scheme drawings

Standard edge types	Face side – board	Description
Continuous perforation		
4SK 4-side cut square edge		**Cleaneo SK** are perforated gypsum boards with continuous perforation and have a 4-side cut square edge (4SK) as standard. They are applied with a joint of approx. 3 mm that is filled with Uniflott. The edges are marked in red and blue. During installation, always arrange a red board marking to a blue board marking (front and long edges).
UFF surrounding notch joint		**Cleaneo UFF** are perforated gypsum boards with continuous perforation. The special edge design of the four-sided UFF edge (surrounding notch joint) enable a simple precise alignment. When applying boards abutting, the precise board dimensions automatically allow for the correct perforation spacing. During installation, always arrange a red board marking to a blue board marking (front and long edges).
linear circumferential rebated edges		**Cleaneo linear** are perforated gypsum boards with continuous perforation and have a circumferential (shiplap) rebated edge (2 edges with notch and 2 edges with lap) for accurate application without joint filling as well as a bright white face paper for direct coating. When applying boards abutting, the precise board dimensions automatically allow for the correct perforation spacing.
4FK four-sided cut edge square edged and bevelled		**Cleaneo Complete** are perforated gypsum boards with an unperforated edge. The special edge design of the four-sided bevelled 4FK edge enable a simple precise alignment. The boards have their own finished printed surface and are applied joint on joint.

Cleaneo Classic boards

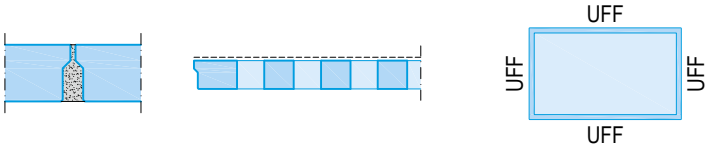
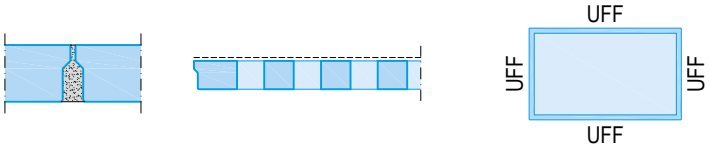
Scheme drawings

Standard edge types	Face side – board	Description
Block perforation		
4SK 4-side cut square edge 		**Cleaneo block perforation** are perforated gypsum boards with block perforation and have a 4-side cut square edge (4SK) as standard. They are applied with a joint of approx. 3 mm that is filled with Uniflott. The four-sided tapered edge type (AK) offer the prerequisite for jointing, resulting in a perfect surface with a high level of crack resistance. Jointing is implemented using Uniflott and Fugendeckstreifen Kurt joint tape on all edges.
4AK 4-sided tapered edge 		**Designpanel** is a perforated gypsum board with block perforation. The four-sided tapered edge type (AK) offer the prerequisite for jointing, resulting in a perfect surface with a high level of crack resistance. Jointing is implemented using Uniflott and Fugendeckstreifen Kurt joint tape on all edges.
Block slots		
SFK Front edge - bevelled cut edge  + **HRK** Long edge - half rounded 	 Further edge types: **4SK** 4-side cut square edge	**Cleaneo slotline** are perforated gypsum boards with block perforation and feature as standard a half-rounded long edge (HRK) as well as a bevelled cut face edges (SFK). Jointing can be implemented in the same way as with non-perforated boards with the non-perforated edge.

D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

Cleaneo Classic boards

Scheme drawings

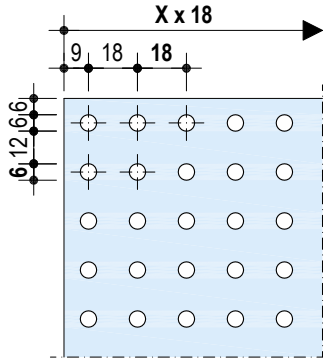
Standard edge type	Face side - board	Description
Cleaneo SYSTEXX Acoustic Board – with rear side fleece or foil laminated on the rear		
UFF surrounding notch joint		The special edge design of the four-sided UFF edge (surrounding notch joint) enables a simple precise alignment. When applying boards abutting, the precise board dimensions automatically allow for the correct perforation spacing. During installation, always arrange a red board marking to a blue board marking (front and long edges). Jointing is applied wih Uniflott on all edges.
Cleaneo UFF plaster base board – with rear side fleece or foil laminated on the rear		
UFF surrounding notch joint		The special edge design of the four-sided UFF edge (surrounding notch joint) enables a simple precise alignment. When applying boards abutting, the precise board dimensions automatically allow for the correct perforation spacing. During installation, always arrange a red board marking to a blue board marking (front and long edges). Jointing is applied wih Uniflott on all edges.

Cleaneo Classic boards – continuous perforation

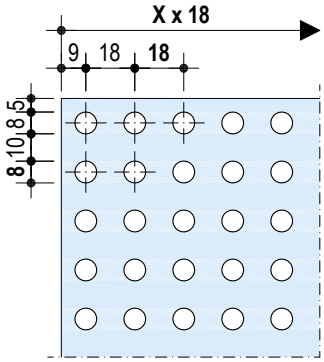
Scheme drawings I Face side I Dimensions in mm

Design	Perforation	Perforation ratio (Board) %	Board dimensions (Standard sizes) Width mm	Length mm	Furring channel Maximum spacings (b) mm	Edge designs 4SK	UFF	linear
Standard circular perforation	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	–	●	–

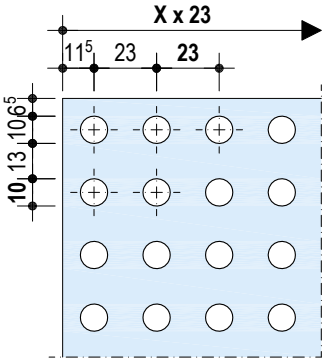
Standard circular perforation 6/18 R



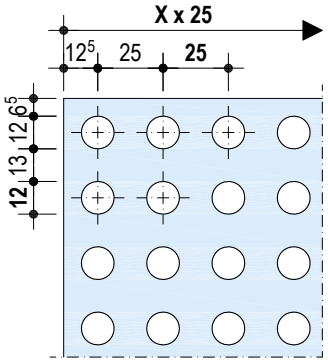
Standard circular perforation 8/18 R



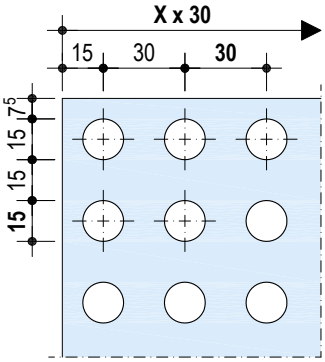
Standard circular perforation 10/23 R



Standard circular perforation 12/25 R



Standard circular perforation 15/30 R



Board dimensions = X x perforation spacings (X = number of perforations)

Axial spacings of the furring channel (b) : With case related manufacturing (e.g. according to installation plan), the axial spacings must be adapted to the board dimensions (observe the maximum permissible axial spacings).

Other variants or customized designs with Cleaneo Classic boards on request.

D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

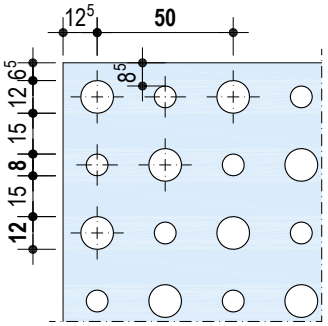
D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

Cleaneo Classic boards – continuous perforation

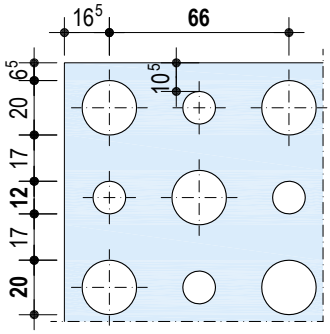
Scheme drawings I Face side I Dimensions in mm

Design	Perforation	Perforation ratio (Board) %	Board dimensions (Standard sizes) Width mm	Length mm	Furring channel Maximum spacings (b) mm	Edge designs 4SK	UFF	linear
Alternating circular perforation	8/12/50 R	13.1	1200	2000	333.3	–	●	–
	12/20/66 R	19.6	1188	1980	330	–	●	●

Alternating circular perforation 8/12/50 R

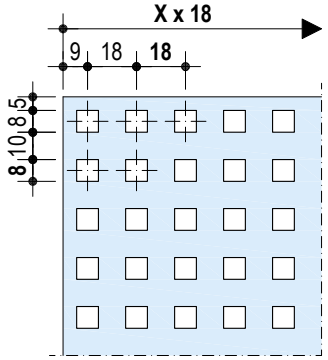


Alternating circular perforation 12/20/66 R

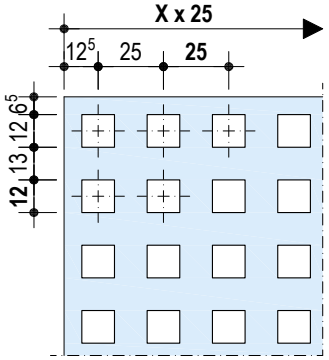


Design	Perforation	Perforation ratio (Board) %	Board dimensions (Standard sizes) Width mm	Length mm	Furring channel Maximum spacings (b) mm	Edge designs 4SK	UFF	linear
Standard square perforation	8/18 Q	19.8	1188	1998	333	●	●	–
	12/25 Q	23.0	1200	2000	333.3	●	●	●

Standard square perforation 8/18 Q



Standard square perforation 12/25 Q



Board dimensions = X x perforation spacings (X = number of perforations)

Axial spacings of the furring channel (b) : With case related manufacturing (e.g. according to installation plan), the axial spacings must be adapted to the board dimensions (observe the maximum permissible axial spacings).

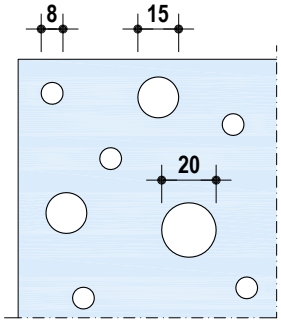
Other variants or customized designs with Cleaneo Classic boards on request.

Cleaneo Classic boards – continuous perforation

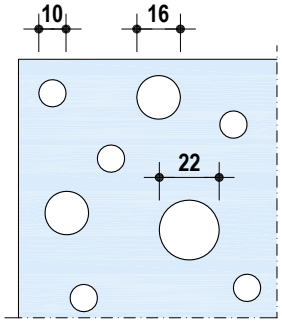
Scheme drawings I Face side I Dimensions in mm

Design	Perforation	Perforation ratio (Board) %	Board dimensions (Standard sizes) Width mm	Length mm	Furring channel Maximum spacings (b) mm	Edge designs 4SK	UFF	linear
Random perforation	8/15/20 R	9.9	1200	2000	333.3	●	●	–
	10/16/22 R	12.6	1200	2000	333.3	–	●	–
	12/20/35 R	9.8	1200	1875	312.5	–	●	–
Random perforation RE	–	13.6	1199	1999	333.3	–	●	–

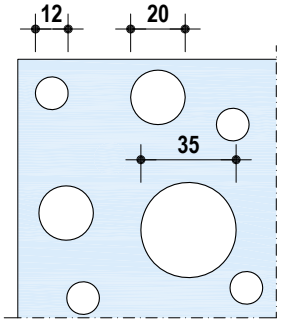
Random perforation 8/15/20 R



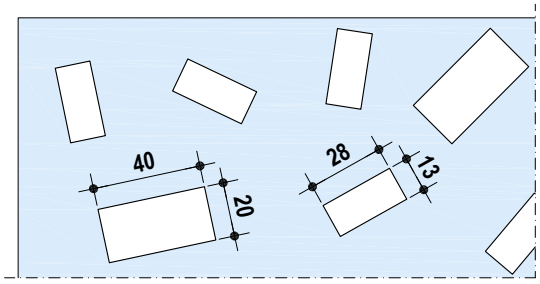
Random perforation 10/16/22 R



Random perforation 12/20/35 R



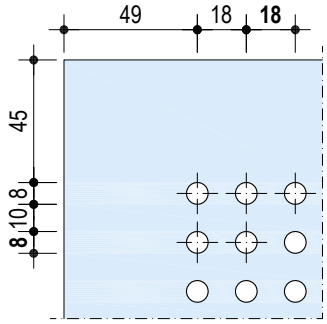
Random perforation RE



Cleaneo Classic boards – Complete

Design	Perforation	Perforation ratio (Board) %	Board dimensions (Standard sizes) Width mm	Length mm	Furring channel Maximum spacings (b) mm	Edge designs 4FK
Standard circular perforation	8/18 R	12.6	620	1250	250	●

Standard circular perforation 8/18 R



Axial spacings of the furring channel (b) : With case related manufacturing (e.g. according to installation plan), the axial spacings must be adapted to the board dimensions (observe the maximum permissible axial spacings).

Other variants or customized designs with Cleaneo Classic boards on request.

D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

Cleaneo SK boards – non-perforated board edges / areas

Cleaneo Classic boards with continuous perforation and cut edge type (SK) are available on request with non-perforated board edges, e.g. for frieze application or connection to non-perforated ceiling surfaces. Non-perforated edges are possible on all sides. The non-perforated edges can also be implemented as a tapered edge (AK).

Please consider when planning and ordering:

- Match the axial spacings of the furring channels to the board dimensions
- Observe the maximum permissible axial spacings for the respective perforation.

Possible perforations:

- Standard circular perforation
- Alternating circular perforation
- Standard square perforation

Boards must be from the same manufacturing batch, and this is why boards in case related manufacturing (e.g. boards manufactured according to an installation plan) or boards with non-perforated edges cannot be combined with boards manufactured in the standard production process.

Cleaneo Classic boards can also be manufactured with non-perforated board areas.

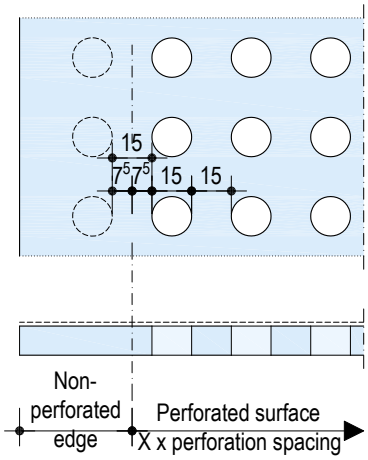
- Non-perforated areas in the longitudinal and/or lateral board direction
- Several non-perforated areas per board
- Only on the grid of the perforation spacing.

Edge designs	Board dimensions	Non-perforated board edges
4SK 	Observe the maximum standard size for the respective perforation.	All edge types possible
4AK 4-sided tapered edge 	Maximum 1200 x 2400 mm	4-sided non-perforated edges ≥ 69 mm

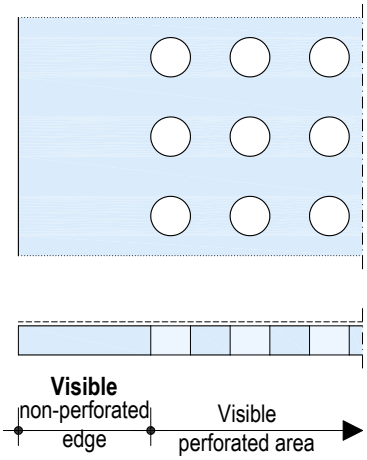
Dimensional specifications for non-perforated board edges

Scheme drawings I Face side I Dimensions in mm

Technical production specification (example 15/30 R)



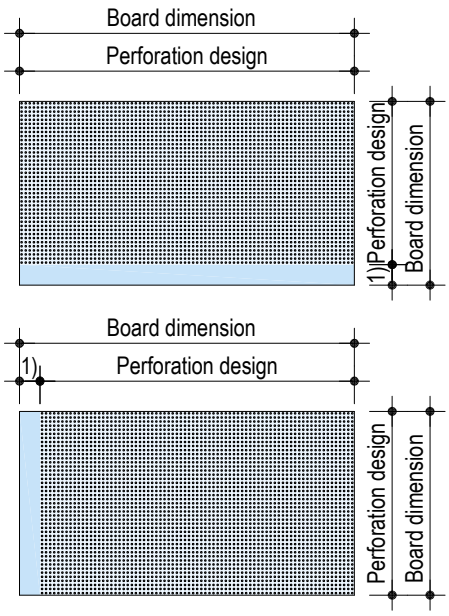
Optical appearance



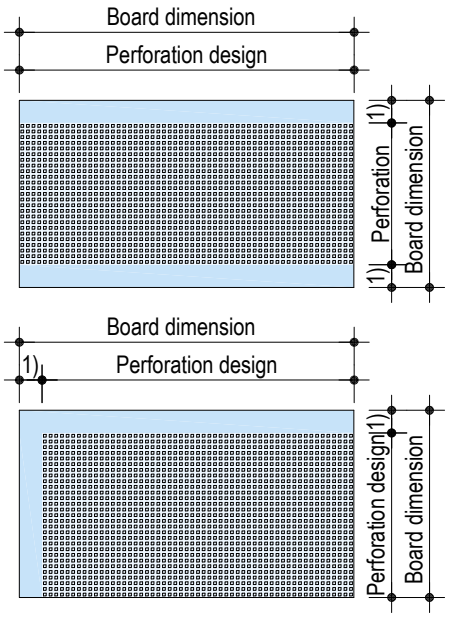
Cleaneo Classic boards – non-perforated board edges

Scheme drawings I Face side I **Technical production** specifications

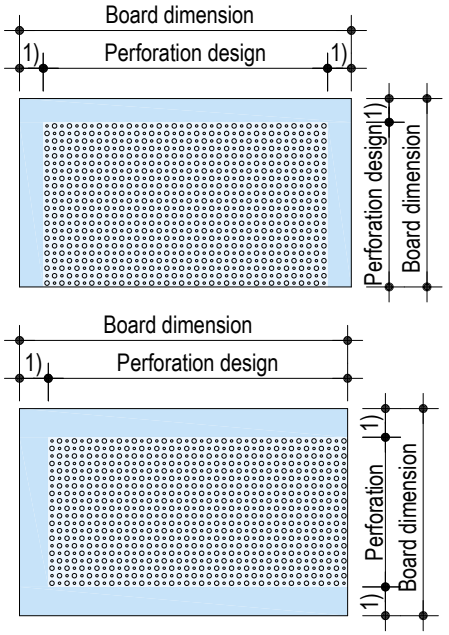
1-sided non-perforated – 4SK – example 8/18 R



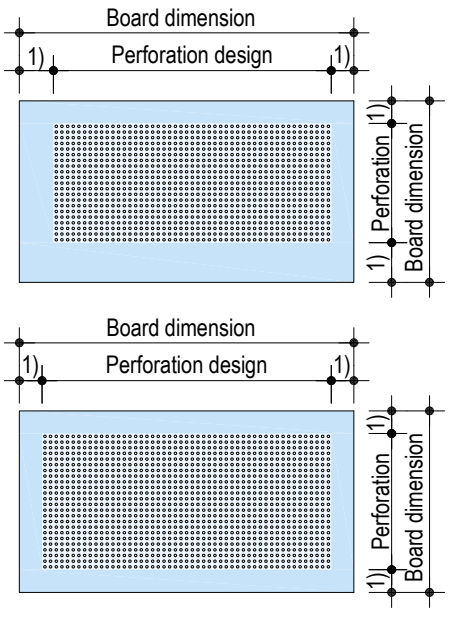
2-sided non-perforated – 4SK – example 12/25 Q



3-sided non-perforated – 4SK – example 12/20/66 R



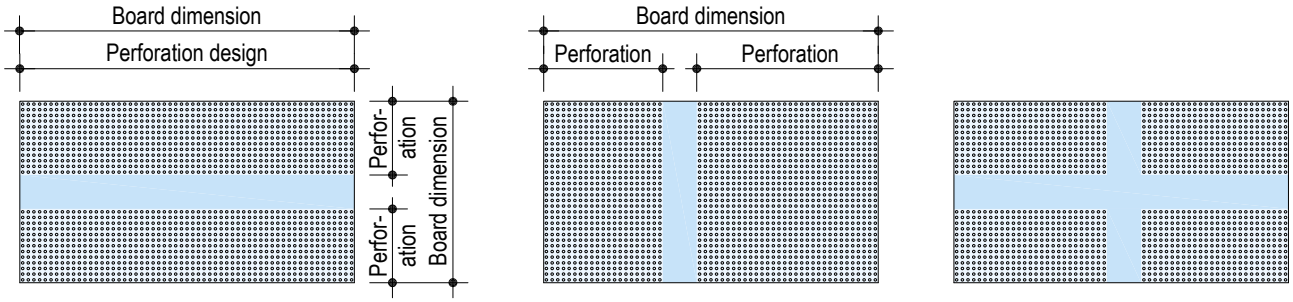
4-sided non-perforated – 4SK / 4AK – example 12/25 R



1) = non-perforated edge

Cleaneo Classic boards – non-perforated board edges

Example 12/25 R



D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

Cleaneo Classic boards – Block perforation

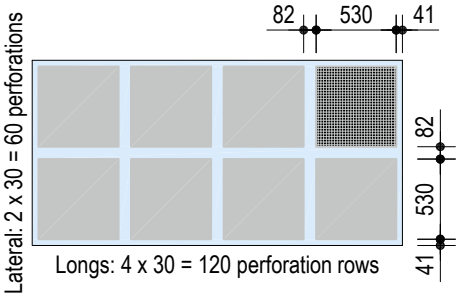
Dimensions are **optical** specifications (see page 28)

Design	Perforation	Perforations per "Block"		Edge – non-perforated		Perforation ratio (Board)	Board dimensions (Standard sizes)		Furring channel Maximum spacings (b)	Edge designs	
		Lateral	Long	Lateral	Long		Width	Length		4SK	4AK
				mm	mm	%	mm	mm	mm		
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	●	○

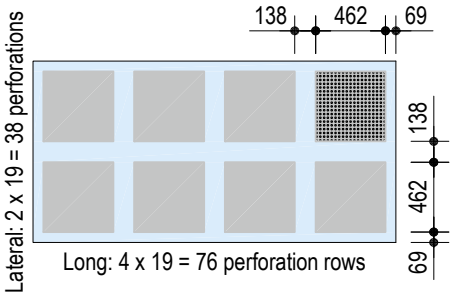
● Standard edge types ○ Other edge types

Scheme drawings I Face side I Dimensions in mm

Design B4 – 8/18 R



Design B4 – 12/25 R or 12/25 Q



Boards must be from the same manufacturing batch, and this is why boards in case related manufacturing (e.g. boards manufactured according to an installation plan) cannot be combined with boards manufactured in the standard production process.

Axial spacings of the furring channel (b) : With case related manufacturing (e.g. according to installation plan), the axial spacings must be adapted to the board dimensions (observe the maximum permissible axial spacings).

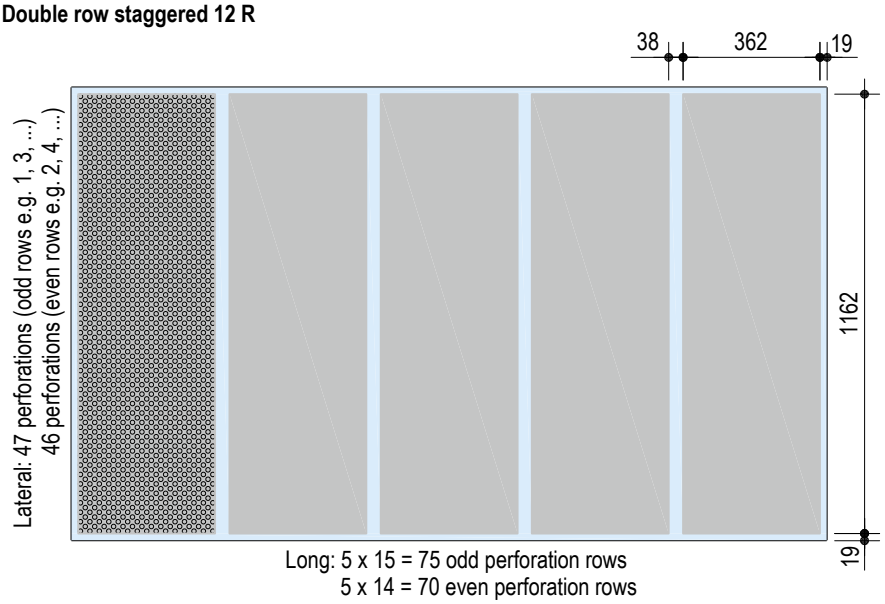
Other variants or customized designs with Cleaneo Classic boards – block perforation on request.

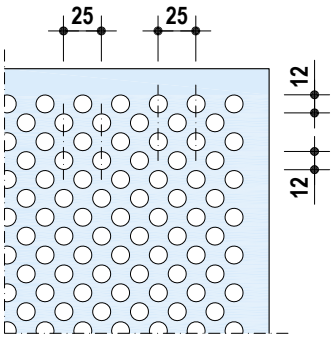
Cleaneo SYSTEXX Acoustic Board – Block perforation

Design	Perforation	Perforations per "Block"				Edge – non-perforated		Perforation ratio (Board)	Board dimensions (Standard size)		Furring channel Maximum axial spacing (b)	Edge types
		Odd rows		Even rows								
		Lateral	Long	Lateral	Long	Lateral	Long		Width	Length		UFF
						mm	mm	%	mm	mm	mm	
Block perforation	12/25 R	47	15	46	14	19	19	31.8	1200	2000	400	●

Double row staggered 12 R

Scheme drawings I Face side I Dimensions in mm





Cleaneo Classic boards – slotline

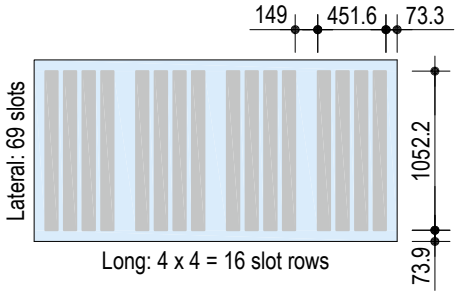
Dimensions are **optical** specifications (see page 28)

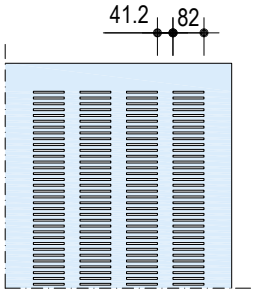
Design	Slots per "Block"		Edge – non-slotted		Slot ratio	Board dimensions (Standard sizes)		Furring channel Maximum spacings (b)	Edge designs		
	Lateral	Long	Lateral	Long	(Board)	Width	Length		HRK Bevel	4SK	4AK
			mm	mm	%	mm	mm	mm			
B6 – slotline	69	4	73.9	73.3	15.7	1200	2400	300	●	○	–

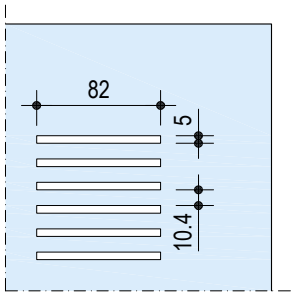
● Standard edge types ○ Other edge types

Design B6 – slotline

Scheme drawings I Face side I Dimensions in mm







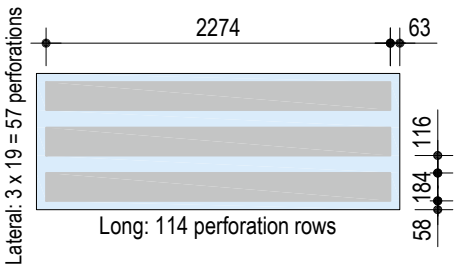
Direction of the slots only possible longitudinal to board

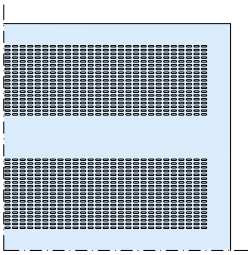
Designpanel

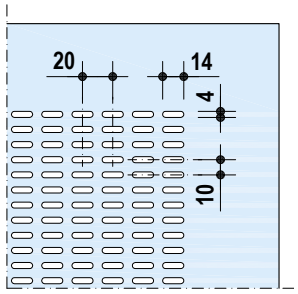
Design	Perforation	Perforations per "Block"		Edge – non-perforated		Perforation ratio (Board)	Board dimensions (Standard sizes)		Furring channel Maximum spacings (b)	Edge types
		Lateral	Long	Lateral	Long		Width	Length		4AK
				mm	mm	%	mm	mm	mm	
Tangent T3L1	Tangent	19	114	58	63	15.8	900	2400	300	●
Micro M2F	Micro	58	58	61	61	8.4	1200	2400	300	●

Tangent T3L1 (900 x 2400)

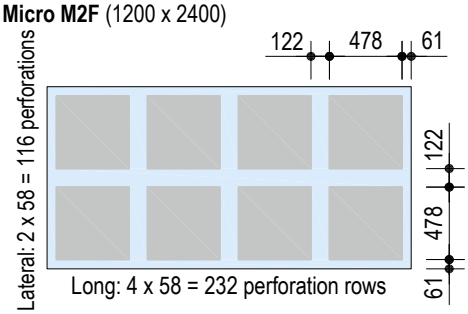
Scheme drawings I Face side I Dimensions in mm

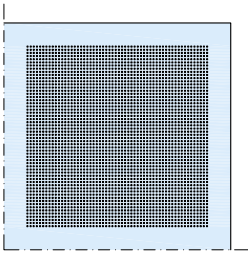


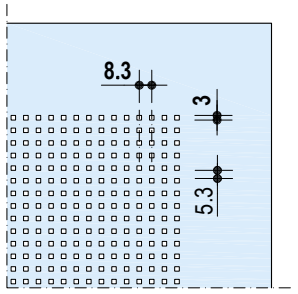




Micro M2F (1200 x 2400)







Boards must be from the same manufacturing batch, and this is why boards in case related manufacturing (e.g. boards manufactured according to an installation plan) cannot be combined with boards manufactured in the standard production process.

Axial spacings of the furring channel (b) : With case related manufacturing (e.g. according to installation plan), the axial spacings must be adapted to the board dimensions (observe the maximum permissible axial spacings).

Other variants or customized designs with Cleaneo Classic boards – slotline or Designpanel on request.

D127.de D124.de D126S.de D126U.de D137.de D134.de

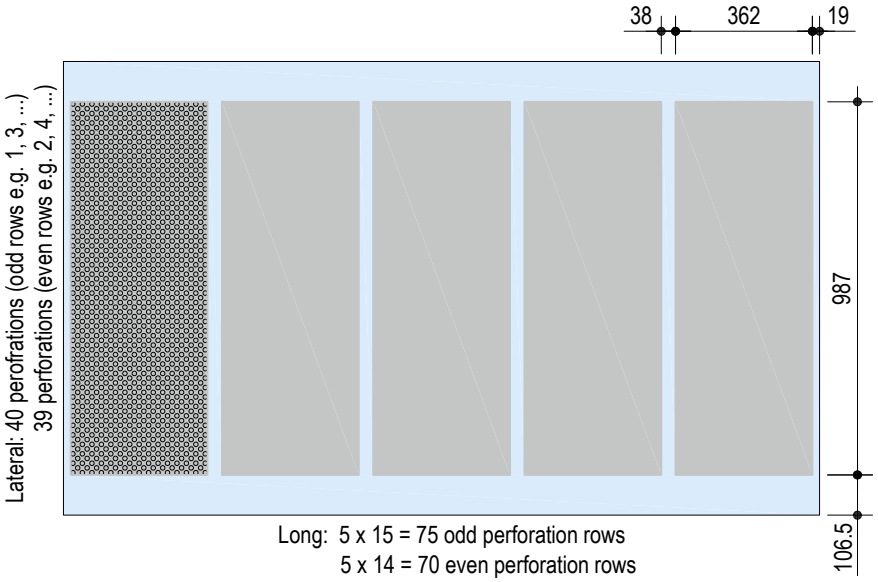
Cleaneo UFF plaster base board

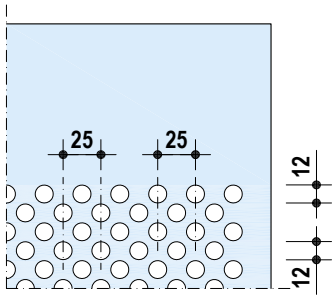
Dimensions are **optical** specifications (see page 28)

Design	Perforation	Perforations per "Block"				Edge – non-perforated		Perforation ratio (Board)	Board dimensions (Standard size)		Furring channel Maximum axial spacing	Edge types
		Odd rows		Even rows								
		Lateral	Long	Lateral	Long	Lateral	Long		Width	Length	b	UFF
		mm		mm		mm	mm	%	mm	mm	mm	
Block perforation	12/25 R	40	15	39	14	106.5	19.0	27.0	1200	2000	400	•

Double row staggered 12 R

Scheme drawings I Face side I Dimensions in mm





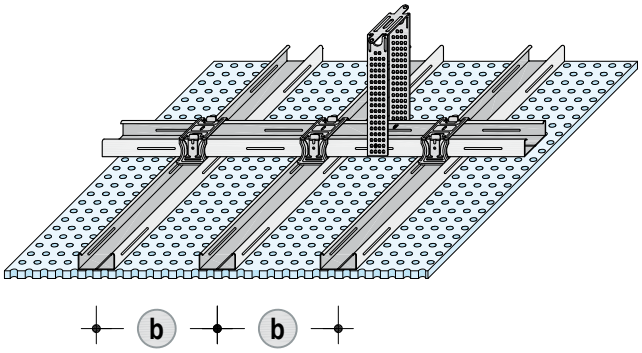
Ball impact safety (Cleaneo Classic)

Design	Perforation	Cladding Minimum thickness mm	Furring channel Maximum spacing b mm
Standard circular perforation	12/25 R 15/30 R	12.5	200
Alternating circular perforation	12/20/66 R		
Standard square perforation	8/18 Q 12/25 Q		
Random perforation RE	–		
Standard circular perforation	6/18 R 8/18 R 10/23 R	12.5	250
Complete	8/18 R		
Alternating circular perforation	8/12/50 R		
Random perforation	8/15/20 R 10/16/22 R 12/20/35 R		
Standard circular perforation	12/25 R 15/30 R	15	250
Alternating circular perforation	12/20/66 R		
Standard square perforation	12/25 Q		
Standard circular perforation	8/18 R 10/23 R	15	333.5
Alternating circular perforation	8/12/50 R		
Random perforation	8/15/20 R		

Exact spacings of the furring channels (b) in dependence on the design and perforation – see section *"Board design"*.
Ball impact safety with continuous perforation and block perforation.
Ball impact safety acc. to DIN 18032-3 / DIN EN 13964 Annex D.
Installation of a ball impact safe access panel possible.

With board thickness 15 mm only cut square edge SK or UFF is possible.

Note	Ball impact safety valid for systems D127.de and "Multi-level Ceiling System". For systems D124.de and D137.de on request.

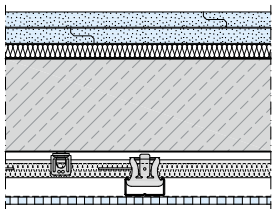


Furring channel axial profile

Airborne and impact sound insulation

Test configuration

Scheme drawings



Suspended ceiling D127.de

- Damping Universal Bracket
- Mineral wool insulation layer acc. to EN 13162; length-related flow resistance acc. to EN 29053: r ≥ 5 kPa · s/m²
- Carrying and furring channel CD 60/27
- Cleaneo Acoustic 6/18 R or 12/25 Q

Terms

R_w = Weighted sound reduction index in dB without sound transmission via flanking building components

$L_{n,w}$ = Weighted normalized impact sound level in dB without sound transmission via flanking building components

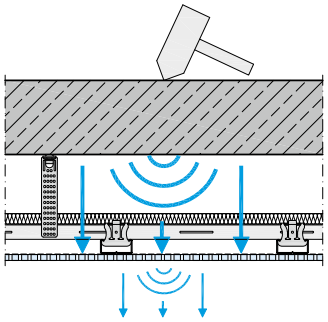
$\Delta R_{w,heavy}$ = Weighted sound reduction index in conjunction with a standard reference ceiling with a mass per unit area of 350 +/- 50 kg/m² acc. to EN ISO 10140-5:2010-12 appendix B

$\Delta L_{n,w}$ = Weighted reduction of impact sound pressure level in dB

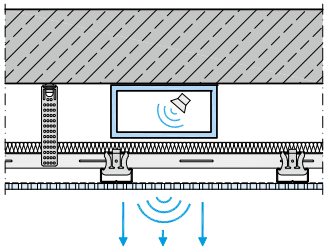
calc = Forecast value

Definitions

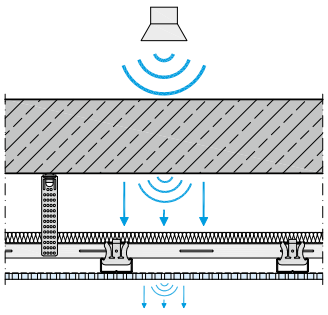
Footfall sound insulation (reduction of impact sound pressure level ΔL_n [dB])



Insertion loss D_E [dB]



Airborne sound insulation (reduction index $\Delta R_{w,heavy,P}$ [dB])



The following applies for calculated values acc. to EN 12354 on the following pages

- Margin for conversion of the forecast values in calculation value following the DIN 4109-2:2016 for ceilings:
  - 3 dB with normalized impact sound level
  - 2 dB with airborne sound reduction index
- Calculation of the sound reduction index and normalized impact sound level according to the procedure detailed in the EN 12354/2000
  - Part 1: Airborne sound insulation between rooms
  - Part 2: Impact sound insulation between rooms

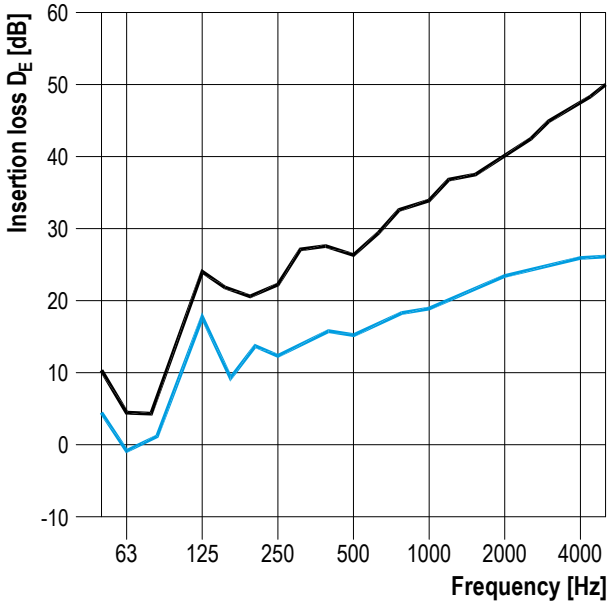
Insertion loss D_E

The insertion loss D_E is determined acc. to VDI 3755:2015-1 and is defined as the equivalent sound absorption area A corrected difference of the mean sound level L with and without suspended ceiling:

$$D_E = L_{without} - L_{with} + 10\log\left(\frac{A_{with}}{A_{without}}\right)$$

When D_E is used it is important to observe that it is dependent on the actual background noise and the position of the source and can thus be used by experienced specialists as an orientation value for planning. This value is only specified as a frequency-dependent value. The curve progressions and further details can be taken from the proof T017-07.17.

Example: Frequency-dependent insertion loss D_E



— Nonius suspender,
2x 80 mm partition insulation board TP 115,
Carrying and furring channel CD 60/27,
12.5 mm Cleaneo 6/18 R
Construction depth 400 mm

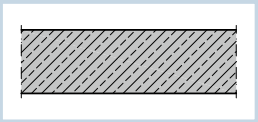
— Nonius suspender,
20 mm acoustic insulation board TP 120 A,
Carrying and furring channel CD 60/27,
12.5 mm Cleaneo 6/18 R
Construction depth 400 mm

Note	The verification of the new DIN 4109:2016-07 is no longer according to calculation values $R_{w,R}$ or $L_{n,w,R}$, but rather with the values obtained on the test rig $R_w/L_{n,w}$ rounded off to a single position following the decimal point. Only at the end of the forecast after consideration of all the perimeter surfaces (flanking surfaces) involved in the transmission of sound is an element of forecast uncertainty included in dependence on the type of separating constructional component.

Airborne and impact sound insulation with Cleaneo 6/18 R

Scheme drawings I Dimensions in mm

Basic ceiling
Reinforced concrete ceiling
140 mm, approx. 320 kg/m² (standard reference floor)



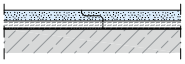
Without floor

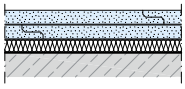
Sound reduction index / normalized impact sound level

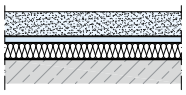
Basic ceiling + flooring construction
Floor construction

Knauf pre-fab floor screed
- 1x 18 mm Brio WF
- 2x 23 mm Brio
- 20 mm Knauf Insulation Trittschall-Dämmplatte TP-GP

Knauf flowing screed
- 40 mm Knauf FE50
- 9.5 mm Knauf Wallboard
- 25 mm mineral wool Trittschall-Dämmplatte stiffness group 10

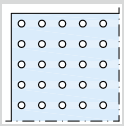






	R_w dB	$R_{w,R}$ dB	$L_{n,w}$ dB	$L_{n,w,R}$ dB	Improvement index $\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB
Without suspended ceiling	**53.5**	**51**	**79.5**	**81**	6	20	10	28	–	37

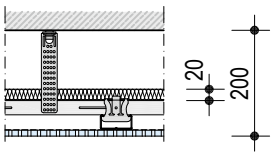
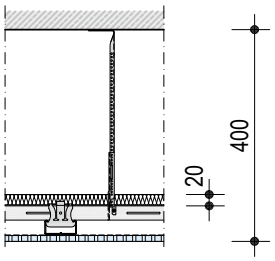
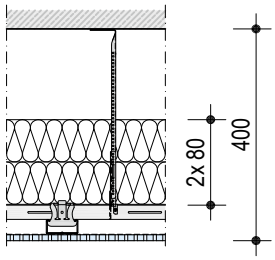
Basic ceiling + suspended ceiling
Cleaneo 6/18 R



Improvement index

Basic ceiling + flooring + subceiling

Calculated values according to the procedure detailed in the DIN EN 12354-1:2000 (airborne sound) and DIN EN 12354-2:2000 (impact sound)

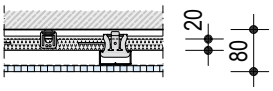
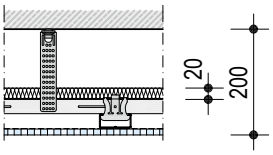
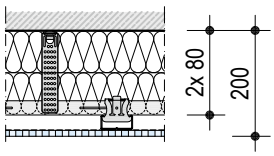
	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB	$R_{w,calc}$ dB	$R_{w,R}$ dB	$L_{n,w,calc}$ dB	$L_{n,w,R}$ dB	$R_{w,calc}$ dB	$R_{w,R}$ dB	$L_{n,w,calc}$ dB	$L_{n,w,R}$ dB	$R_{w,calc}$ dB	$R_{w,R}$ dB	$L_{n,w,calc}$ dB	$L_{n,w,R}$ dB
 ■ Damping Universal Bracket ■ 20 mm Akustik-Dämmplatte TP 120 A	**12.0**	**20.1**	66	64	48	51	71	69	41	44	–	–	31	34
 ■ Nonius suspender ■ 20 mm Akustik-Dämmplatte TP 120 A	**11.3**	**19.2**	67	65	48	51	72	70	40	43	–	–	31	34
 ■ Nonius suspender ■ 2x 80 mm partition insulation board TP 115	**15.6**	**25.9**	69	67	45	48	75	73	38	41	–	–	28	31

Note	The divergent insulation layers have no significant influence on the sound absorption coefficient.

Airborne and impact sound insulation with Cleaneo 12/25 Q

Scheme drawings I Dimensions in mm

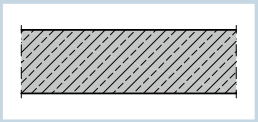
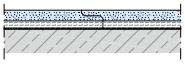
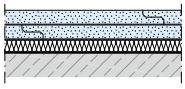
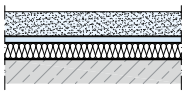
Basic ceiling Reinforced concrete ceiling 140 mm, approx. 320 kg/m² (standard reference floor)	Without floor				Basic ceiling + flooring construction Floor construction Knauf pre-fab floor screed ■ 1x 18 mm Brio WF		■ 2x 23 mm Brio ■ 20 mm Knauf Insulation Trittschall-Dämmplatte TP-GP		Knauf flowing screed ■ 40 mm Knauf FE50 ■ 9.5 mm Knauf Wallboard ■ 25 mm mineral wool Trittschall-Dämmplatte stiffness group 10	
	Sound reduction index / normalized impact sound level				Improvement index					
	R_w dB	$R_{w,R}$ dB	$L_{n,w}$ dB	$L_{n,w,R}$ dB	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB
Without suspended ceiling	**53.5**	**51**	**79.5**	**81**	6	20	10	28	–	37

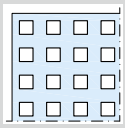
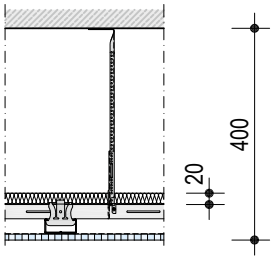
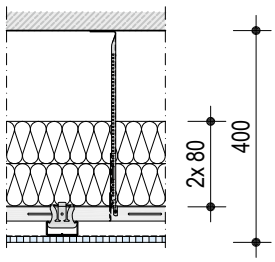
Basic ceiling + suspended ceiling Cleaneo 12/25 Q	Improvement index		Basic ceiling + flooring + subceiling Calculated values according to the procedure detailed in the DIN EN 12354-1:2000 (airborne sound) and DIN EN 12354-2:2000 (impact sound)											
	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB	$R_{w,calc}$ dB	$R_{w,R}$ dB	$L_{n,w,calc}$ dB	$L_{n,w,R}$ dB	$R_{w,calc}$ dB	$R_{w,R}$ dB	$L_{n,w,calc}$ dB	$L_{n,w,R}$ dB	$R_{w,calc}$ dB	$R_{w,R}$ dB	$L_{n,w,calc}$ dB	$L_{n,w,R}$ dB
 ■ Damping Universal Bracket ■ 20 mm Akustik-Dämmplatte TP 120 A	**4.8**	**14.5**	59	57	55	58	64	62	48	51	–	–	39	42
 ■ Damping Universal Bracket ■ 20 mm Akustik-Dämmplatte TP 120 A	**8.3**	**14.4**	63	61	51	54	68	66	44	47	–	–	34	37
 ■ Damping Universal Bracket ■ 2x 80 mm partition insulation board TP 115	**13.4**	**25.3**	67	65	48	51	73	71	41	44	–	–	29	32

Note	The divergent insulation layers have no significant influence on the sound absorption coefficient.

Airborne and impact sound insulation with Cleaneo 12/25 Q (continued)

Scheme drawings I Dimensions in mm

Basic ceiling		Basic ceiling + flooring construction									
Reinforced concrete ceiling 140 mm, approx. 320 kg/m² (standard reference floor) 	Without floor	**Floor construction**									
		Knauf pre-fab floor screed						**Knauf flowing screed**			
		■ 1x 18 mm Brio WF		■ 2x 23 mm Brio ■ 20 mm Knauf Insulation Trittschall-Dämmplatte TP-GP				■ 40 mm Knauf FE50 ■ 9.5 mm Knauf Wallboard ■ 25 mm mineral wool Trittschall-Dämmplatte stiffness group 10			
											
	Sound reduction index / normalized impact sound level	**Improvement index**									
	R_w dB	$R_{w,R}$ dB	$L_{n,w}$ dB	$L_{n,w,R}$ dB	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB	
Without suspended ceiling	**53.5**	**51**	**79.5**	**81**	6	20	10	28	–	37	

Basic ceiling + suspended ceiling				Basic ceiling + flooring + subceiling											
Cleaneo 12/25 Q 	**Improvement index**			**Calculated values according to the procedure detailed in the DIN EN 12354-1:2000 (airborne sound) and DIN EN 12354-2:2000 (impact sound)**											
	$\Delta R_{w,heavy}$ dB	$\Delta L_{n,w}$ dB		$R_{w,calc}$ dB	$R_{w,R}$ dB	$L_{n,w,calc}$ dB	$L_{n,w,R}$ dB	$R_{w,calc}$ dB	$R_{w,R}$ dB	$L_{n,w,calc}$ dB	$L_{n,w,R}$ dB	$R_{w,calc}$ dB	$R_{w,R}$ dB	$L_{n,w,calc}$ dB	$L_{n,w,R}$ dB
 ■ Nonius suspender ■ 20 mm Akustik-Dämmplatte TP 120 A	**7.8**	**14.1**		64	62	50	53	69	67	43	46	–	–	34	37
 ■ Nonius suspender ■ 2x 80 mm partition insulation board TP 115	**12.8**	**22.6**		66	64	48	51	72	70	40	43	–	–	31	34

Note	The divergent insulation layers have no significant influence on the sound absorption coefficient.

D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

Definitions

Definitions of the sound absorption coefficients following EN ISO 11654

The building materials and substances used in a room can be sound reflective from an acoustical point of view, so that they have no or very low sound absorbing characteristics. In this case, the rated sound absorption coefficient α_w is practically 0.
In contrast, there are materials that are highly sound absorbing. Should 100% of the impinging sound energy be absorbed, i.e. the sound energy is fully converted to heat energy, the rated sound absorption coefficient α_w is practically 1.

α_s indicates the values of the frequency-dependent sound absorption coefficient measured in a reverberation chamber in third octaves. The practical sound absorption coefficient is formed based on this factor.

α_p are the values of the frequency-dependent, practical sound absorption coefficient made up of three third octaves. They are frequently used for frequency-dependent prognoses.

α_w is the rated sound absorption coefficient. It is independent of the frequency and specified as a single value quantity. The determination of the single value quantity is undertaken in accordance with the procedure described on page 39.

Shape indicators as suffixes to the rated sound absorption coefficient provide some indication of whether an absorbing material is particularly effective in the low, medium or high frequency range.
The following indicators are used:

- L, when the product is particularly effective in the low frequency range.
  e.g. α_w = 0.60 (L)
- M, when the product is particularly effective in the medium frequency range.
  e.g. α_w = 0.70 (M)
- H, when the product is particularly effective in the high frequency range.
  e.g. α_w = 0.85 (H)
- Combinations are possible.
  e.g. α_w = 0.70 (MH)

Sound absorption class and descriptive term acc. to VDI 3755

Weighted Sound absorption coefficient α_w	Rating
≥ 0.80	Extremely absorbing
0.60 to 0.75	Highly absorbing
0.30 to 0.55	Absorbing
0.15 to 0.25	Hardly absorbing
≤ 0.10	Reflecting

Knauf sound absorption diagrams

On the following pages, the frequency-dependent absorption values for room acoustic prognoses as dependent on the perforation pattern, the construction depth and insulation layer are listed. In addition to the values in tabular form, the curve progression of the frequency-dependent absorption response is represented in a graph.

For planar surfaces, the characteristic quantity for the practical sound absorption coefficient is the response between the octave frequencies of 125 Hz to 4000 Hz. Furthermore, the sound absorption coefficient α_w is specified as a single value quantity in addition to an NRC (Noise Reduction Coefficient) for the products. The American NRC quantity is determined from the α_s values as an arithmetic mean value of the third-octave frequencies 250 Hz, 500 Hz, 1000 Hz and 2000 Hz, and rounded off and expressed to the nearest multiple of 0.05.

For the majority of the listed items the acoustic quality was determined by measurement in a reverberation chamber in accordance with a standardized test procedure. The results of the tests are compiled in a test certificate and can be requested from the Technical Advisory Service.

The values shown in italics are projected absorption coefficients based on an empirical process performed on the basis of a large number of measurements in a simplified procedure as well as experience of the response of absorbent materials with variations in the construction depths, insulation material layers and perforation ratios of the surfaces.

Note	The Knauf Raumakustikrechner (room acoustics calculator) is available for individual calculation when Knauf acoustic products are employed (currently in German only). http://www.knauf.de/profi/tools-services/tools/raumakustikrechner/

D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

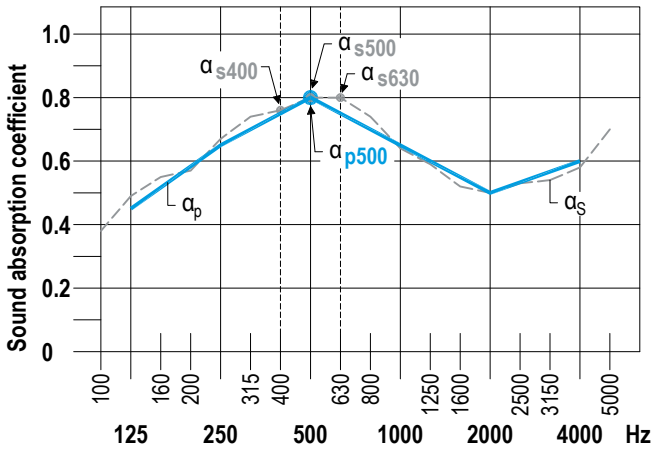
Determination of the single value quantity of the sound absorption coefficient α_w

1) Sound absorption coefficient

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

α_p = **Practical sound absorption coefficient**
from α_S on octave bands converted acc. to DIN EN ISO 11654

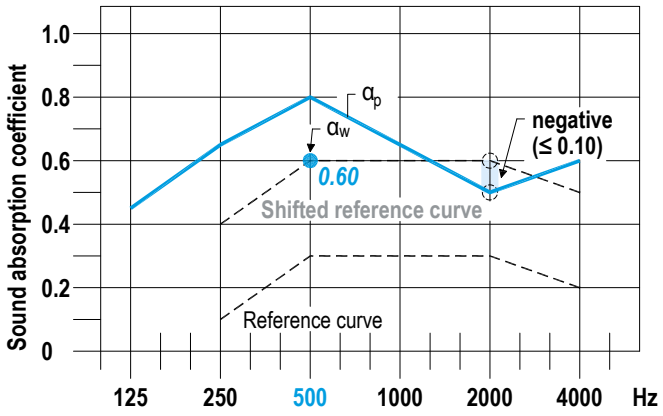
Example for 500 Hz: $\alpha_p 500 = \frac{\alpha_S 400 + \alpha_S 500 + \alpha_S 630}{3}$



2) Weighted sound absorption coefficient

α_w = **Weighted sound absorption coefficient**
acc to DIN EN ISO 11654
Single number parameter of sound absorption coefficient
determined from a shifted reference curve
(sum of all negative deviations ≤ 0.10) and the point of intersection at **500 Hz** acc. to DIN EN ISO 11654

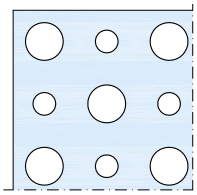
Example:



3) Shape indicators

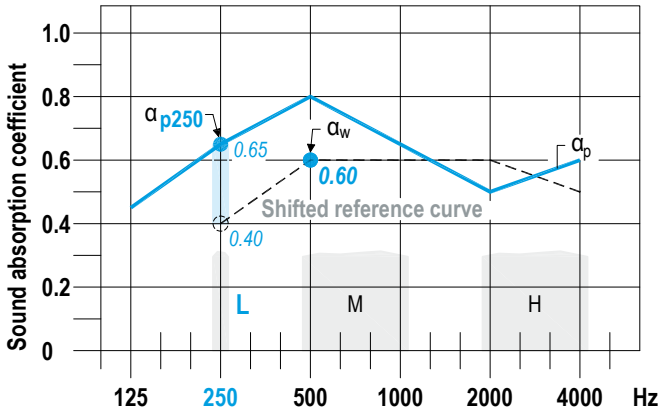
α_w with shape indicators = α_w (...)
if α_p exceeds the reference curve for a single octave frequency by **≥ 0.25** then add:
(L) at 250 Hz **(M)** at 500 or 1000 Hz **(H)** at 2000 or 4000 Hz

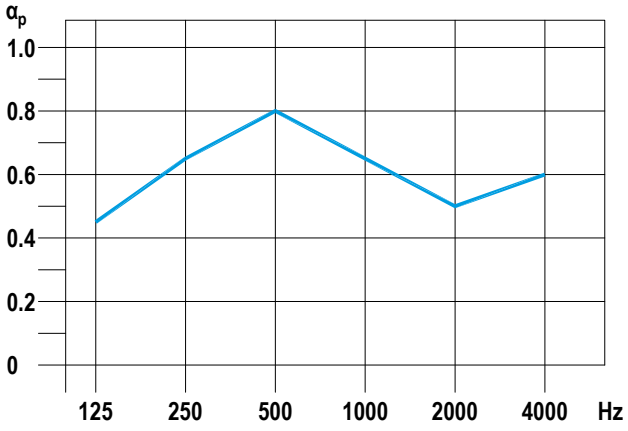
Example



Alternating circular perforation 12/20/66 R
with acoustical fleece
Perforation ratio: 19.6 %

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





Construction depth 200 mm

α_p	0.45	0.65	0.80	0.65	0.50	0.60

α_w **= 0.60 (L)** Highly absorbing

Requirements for the insulation layer

For those in the tables on the following pages for Cleaneo Acoustic Board Ceilings "with insulation layer"

Systems		Con-struc-tion depth	Mineral wool EN 13162 Thickness	Length-re-lated flow resistance	Insulation layer - examples	Weights of the insulation layer For rating the grid
		mm	mm	kPa·s/m²	Knauf Insulation	kg/m²
D127.de	Cleaneo Classic	≥ 65	20	≥ 11	Akustik-Dämmplatte TP 120 A	0.6
	Cleaneo Complete		40	≥ 5	Trennwand-Dämmplatte TP 115	0.8
	Designpanel		50	≥ 11	Akustik-Dämmplatte TP 440	1.5
	Cleaneo SYSTEXX Acoustic Board	65	20	≥ 11	Akustik-Dämmplatte TP 120 A	0.6
		≥ 80	40	≥ 5	Trennwand-Dämmplatte TP 115	0.8
D124.de	2nd grid level - furring channels only	≥ 40.5	25	Not specified	Trittschall-Dämmplatte TPE	3.1
	2nd grid level - carrying and furring channels		40	≥ 10	Fire Protection Insulation Board DPF-40[1)]	1.8
D126S.de	Cleaneo SYSTEXX Acoustic Board + Cleaneo SYSTEXX Silent	65	20	≥ 11	Akustik-Dämmplatte TP 120 A	0.6
		≥ 80	40	≥ 5	Trennwand-Dämmplatte TP 115	0.8
D126U.de	Cleaneo UFF plaster base board	65	20	≥ 11	Akustik-Dämmplatte TP 120 A	0.6
		≥ 80	40	≥ 5	Trennwand-Dämmplatte TP 115	0.8
D137.de	Cleaneo Classic	≥ 65	20	≥ 11	Akustik-Dämmplatte TP 120 A	0.6
	Designpanel		50	≥ 11	Akustik-Dämmplatte TP 440	1.5
D134.de		≥ 90	50	≥ 16	Fire Protection Insulation Board DPF-50	2.9

1) *Sound absorption tested with Knauf Insulation Fire Protection Insulation Board DPF-40. Required for fire resistance: Mineral wool (S), thickness ≥ 50 mm; density ≥ 50 kg/m³*

Note Should there be demands made regarding the reaction to fire of acoustic ceilings (e.g. non-combustible), it will be necessary to provide proof for all materials, including (incorporated) mineral wool used as an acoustic lining.

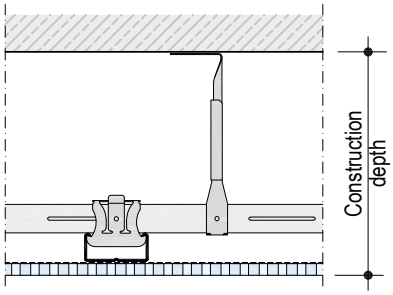
Construction depth

The construction depth is a decisive property for the acoustic effectiveness of suspended ceilings. With an increase in spacings, the sound absorption values in the low frequency range improve.

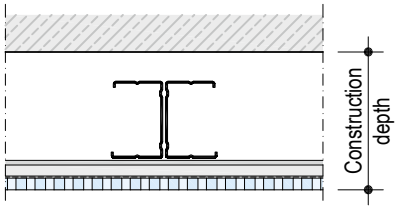
The construction depths have differing effects depending on the suspended ceiling system.

Scheme drawings

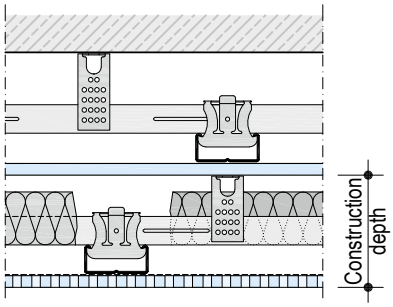
D127.de, D126S.de, D126U.de



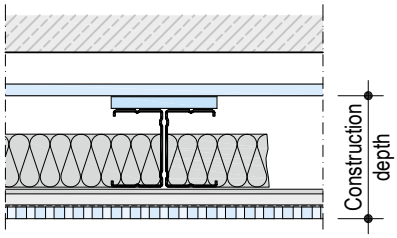
D137.de



D124.de

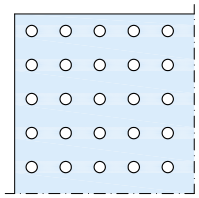
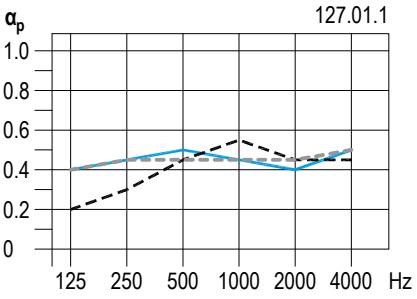
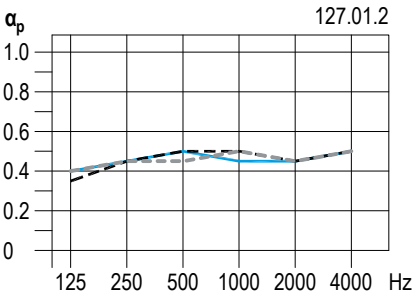
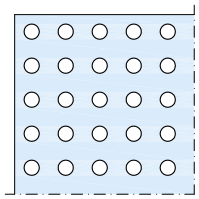
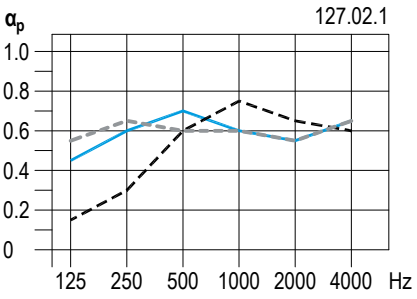
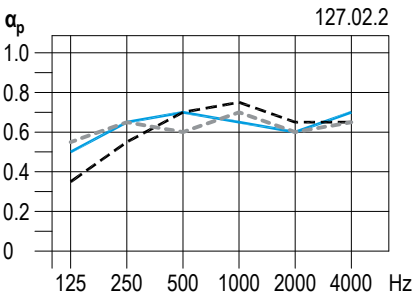


D134.de



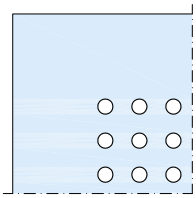
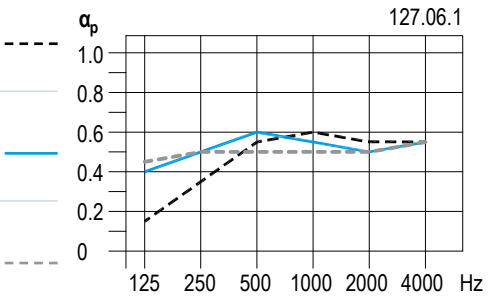
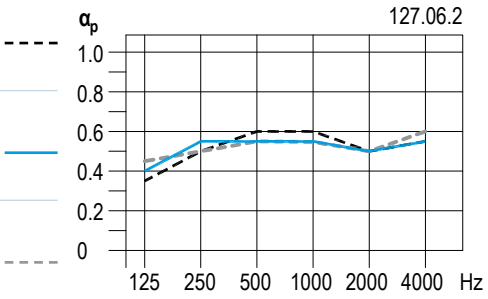
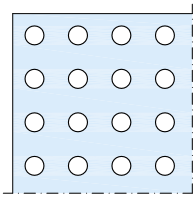
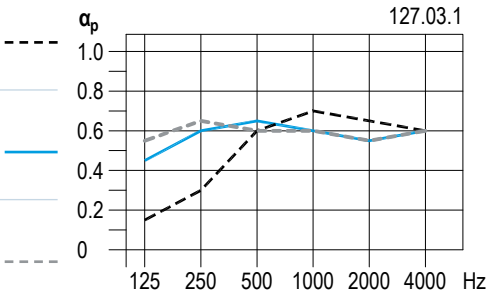
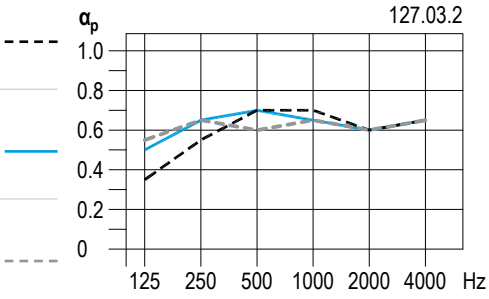
D127.de Cleaneo Acoustic Board Ceiling

12.5 mm Cleaneo Classic boards with Acoustical Fleece

Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
Standard circular perforation 6/18 R  Perforation ratio: 8.7 %	**Without insulation layer**									
	65	0.45	**0.50**	0.20	0.30	0.45	0.55	0.45	0.45	
	200	0.45	**0.45**	0.40	0.45	0.50	0.45	0.40	0.50	
	400	0.45	**0.45**	0.40	0.45	0.45	0.45	0.45	0.50	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.50	**0.50**	0.35	0.45	0.50	0.50	0.45	0.50	
	200	0.45	**0.50**	0.40	0.45	0.50	0.45	0.45	0.50	
	400	0.45	**0.50**	0.40	0.45	0.45	0.50	0.45	0.50	
Standard circular perforation 8/18 R  Perforation ratio: 15.5 %	**Without insulation layer**									
	65	0.55	**0.60**	0.15	0.30	0.60	0.75	0.65	0.60	
	200	0.60	**0.60**	0.45	0.60	0.70	0.60	0.55	0.65	
	400	0.60	**0.60 (L)**	0.55	0.65	0.60	0.60	0.55	0.65	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.65	**0.70**	0.35	0.55	0.70	0.75	0.65	0.65	
	200	0.65	**0.65**	0.50	0.65	0.70	0.65	0.60	0.70	
	400	0.65	**0.65**	0.55	0.65	0.60	0.70	0.60	0.65	

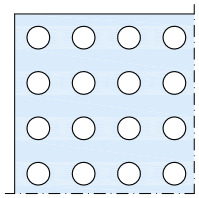
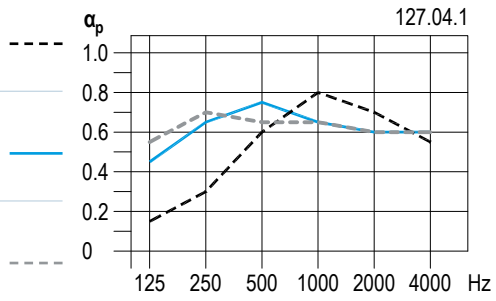
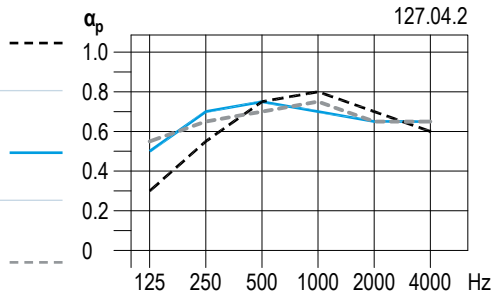
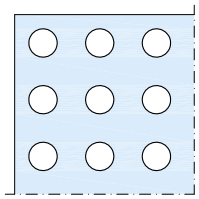
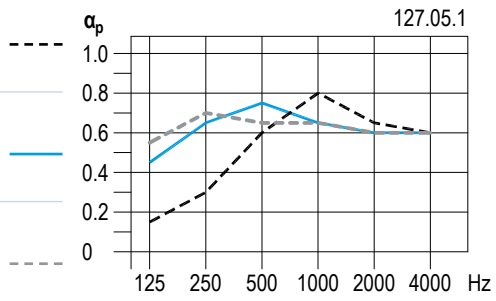
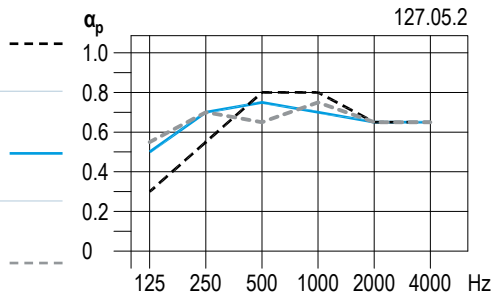
D127.de Cleaneo Acoustic Board Ceiling

12.5 mm Cleaneo Classic boards with Acoustical Fleece

Perforation pattern	Construction depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
Standard circular perforation 8/18 R Complete  Perforation ratio: 12.6 %	**Without insulation layer**									
	65	0.50	**0.55**	0.15	0.35	0.55	0.60	0.55	0.55	
	200	0.50	**0.55**	0.40	0.50	0.60	0.55	0.50	0.55	
	400	0.50	**0.50**	0.45	0.50	0.50	0.50	0.50	0.55	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.55	**0.60**	0.35	0.50	0.60	0.60	0.50	0.55	
	200	0.55	**0.55**	0.45	0.55	0.55	0.55	0.50	0.55	
	400	0.55	**0.55**	0.45	0.50	0.55	0.55	0.50	0.60	
Standard circular perforation 10/23 R  Perforation ratio: 14.8 %	**Without insulation layer**									
	65	0.55	**0.60**	0.15	0.30	0.60	0.70	0.65	0.60	
	200	0.60	**0.60**	0.45	0.60	0.65	0.60	0.55	0.60	
	400	0.60	**0.60 (L)**	0.55	0.65	0.60	0.60	0.55	0.60	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.65	**0.70**	0.35	0.55	0.70	0.70	0.60	0.65	
	200	0.65	**0.65**	0.50	0.65	0.70	0.65	0.60	0.65	
	400	0.65	**0.65**	0.55	0.65	0.60	0.65	0.60	0.65	

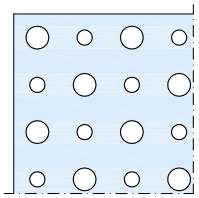
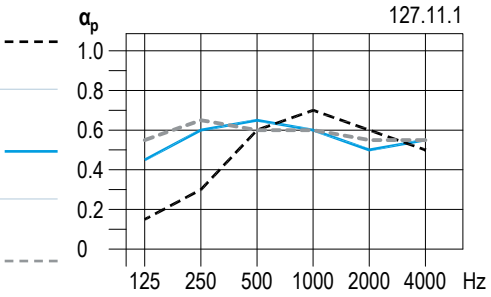
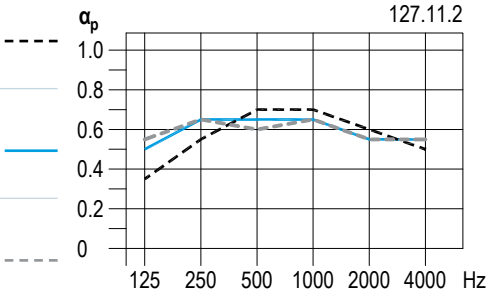
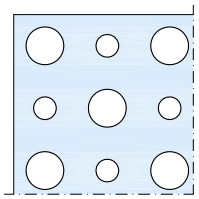
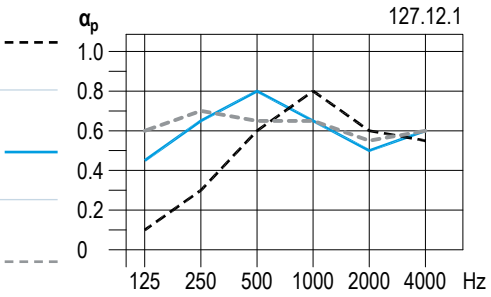
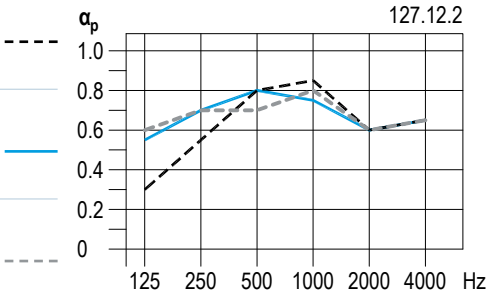
D127.de Cleaneo Acoustic Board Ceiling

12.5 mm Cleaneo Classic boards with Acoustical Fleece

Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
	Without insulation layer									
Standard circular perforation 12/25 R  Perforation ratio: 18.1 %	**65**	0.60	**0.60**	0.15	0.30	0.60	0.80	0.70	0.55	
	200	0.65	**0.65**	0.45	0.65	0.75	0.65	0.60	0.60	
	400	0.65	**0.65 (L)**	0.55	0.70	0.65	0.65	0.60	0.60	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.70	**0.75**	0.30	0.55	0.75	0.80	0.70	0.60	
	200	0.70	**0.70**	0.50	0.70	0.75	0.70	0.65	0.65	
	400	0.70	**0.70**	0.55	0.65	0.70	0.75	0.65	0.65	
	Without insulation layer									
Standard circular perforation 15/30 R  Perforation ratio: 19.6 %	**65**	0.60	**0.60**	0.15	0.30	0.60	0.80	0.65	0.60	
	200	0.65	**0.65**	0.45	0.65	0.75	0.65	0.60	0.60	
	400	0.65	**0.65 (L)**	0.55	0.70	0.65	0.65	0.60	0.60	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.70	**0.75**	0.30	0.55	0.80	0.80	0.65	0.65	
	200	0.70	**0.70**	0.50	0.70	0.75	0.70	0.65	0.65	
	400	0.70	**0.70**	0.55	0.70	0.65	0.75	0.65	0.65	

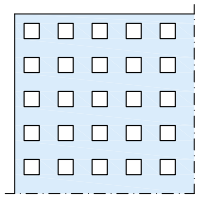
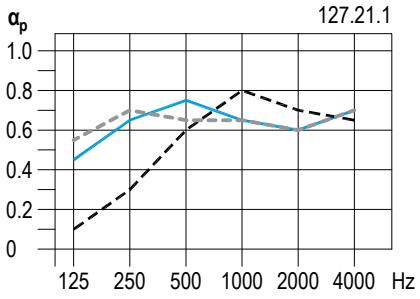
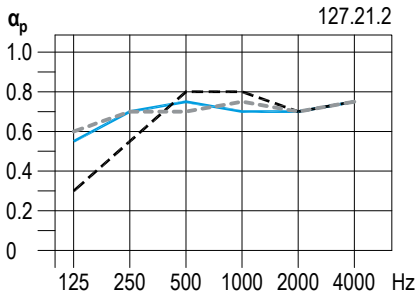
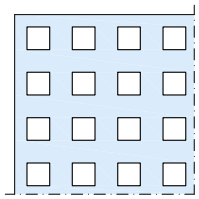
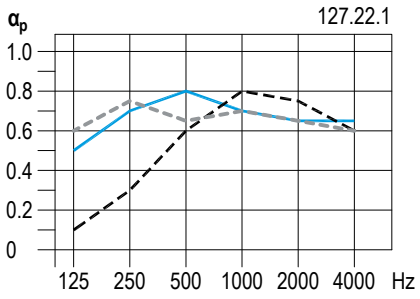
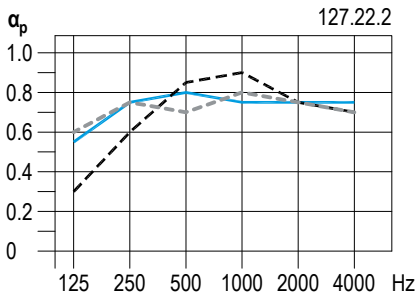
D127.de Cleaneo Acoustic Board Ceiling

12.5 mm Cleaneo Classic boards with Acoustical Fleece

Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
Alternating circular perforation 8/12/50 R  Perforation ratio: 13.1 %	**Without insulation layer**									
	65	0.55	**0.60**	0.15	0.30	0.60	0.70	0.60	0.50	
	200	0.60	**0.60**	0.45	0.60	0.65	0.60	0.50	0.55	
	400	0.60	**0.60 (L)**	0.55	0.65	0.60	0.60	0.55	0.55	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.65	**0.65**	0.35	0.55	0.70	0.70	0.60	0.50	
	200	0.60	**0.65**	0.50	0.65	0.65	0.65	0.55	0.55	
	400	0.60	**0.60 (L)**	0.55	0.65	0.60	0.65	0.55	0.55	
Alternating circular perforation 12/20/66 R  Perforation ratio: 19.6 %	**Without insulation layer**									
	65	0.55	**0.60**	0.10	0.30	0.60	0.80	0.60	0.55	
	200	0.65	**0.60 (L)**	0.45	0.65	0.80	0.65	0.50	0.60	
	400	0.65	**0.65 (L)**	0.60	0.70	0.65	0.65	0.55	0.60	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.70	**0.70**	0.30	0.55	0.80	0.85	0.60	0.65	
	200	0.70	**0.70**	0.55	0.70	0.80	0.75	0.60	0.65	
	400	0.70	**0.70**	0.60	0.70	0.70	0.80	0.60	0.65	

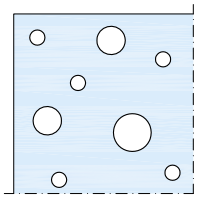
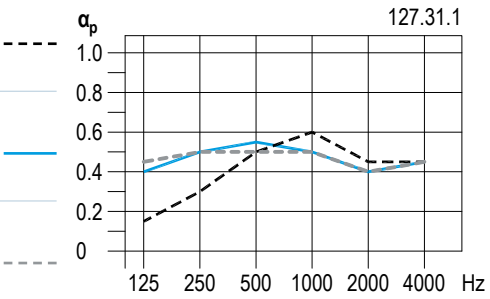
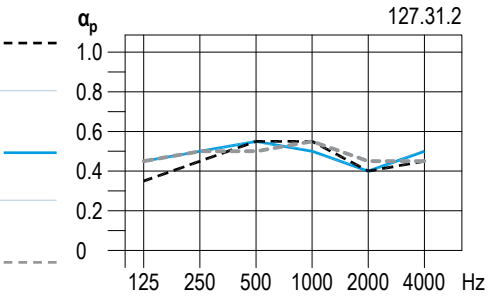
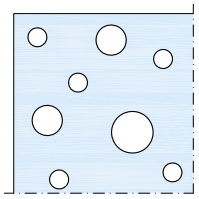
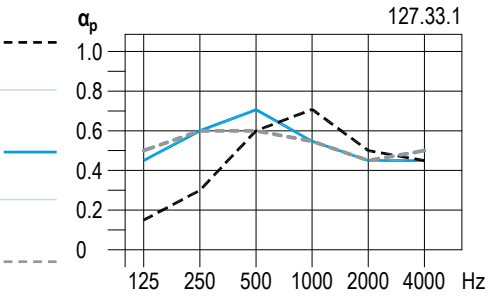
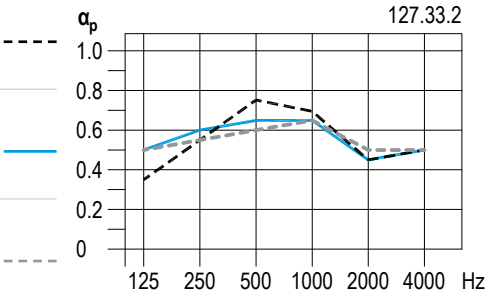
D127.de Cleaneo Acoustic Board Ceiling

12.5 mm Cleaneo Classic boards with Acoustical Fleece

Perforation pattern	Construction depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
Standard square perforation 8/18 Q  Perforation ratio: 19.8 %	**Without insulation layer**									
	65	0.60	**0.60**	0.10	0.30	0.60	0.80	0.70	0.65	
	200	0.65	**0.65**	0.45	0.65	0.75	0.65	0.60	0.70	
	400	0.65	**0.65 (L)**	0.55	0.70	0.65	0.65	0.60	0.70	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.70	**0.75**	0.30	0.55	0.80	0.80	0.70	0.75	
	200	0.70	**0.75**	0.55	0.70	0.75	0.70	0.70	0.75	
	400	0.70	**0.75**	0.60	0.70	0.70	0.75	0.70	0.75	
Standard square perforation 12/25 Q  Perforation ratio: 23.0 %	**Without insulation layer**									
	65	0.60	**0.60**	0.10	0.30	0.60	0.80	0.75	0.60	
	200	0.70	**0.70**	0.50	0.70	0.80	0.70	0.65	0.65	
	400	0.70	**0.70 (L)**	0.60	0.75	0.65	0.70	0.65	0.60	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.75	**0.80**	0.30	0.60	0.85	0.90	0.75	0.70	
	200	0.75	**0.80**	0.55	0.75	0.80	0.75	0.75	0.75	
	400	0.75	**0.75**	0.60	0.75	0.70	0.80	0.75	0.70	

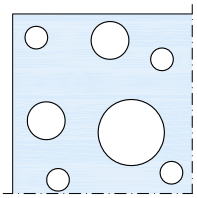
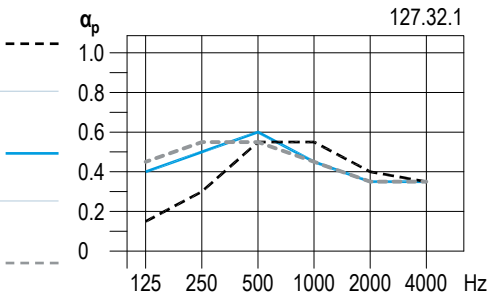
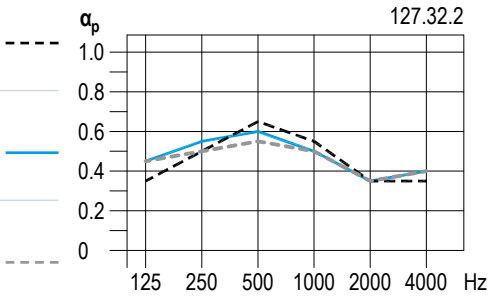
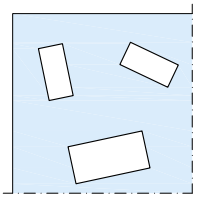
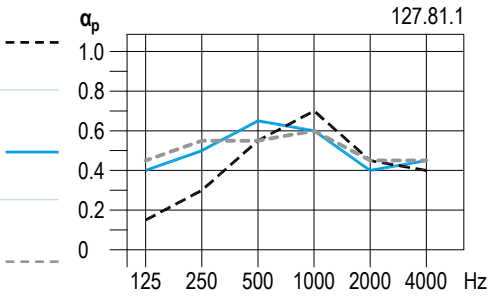
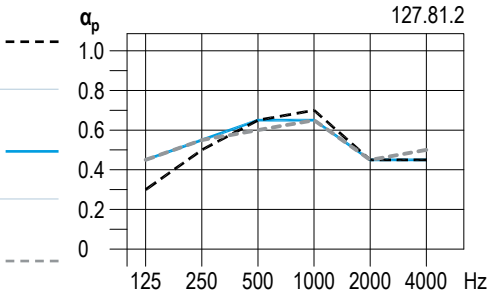
D127.de Cleaneo Acoustic Board Ceiling

12.5 mm Cleaneo Classic boards with Acoustical Fleece

Perforation pattern	Construction depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
Random 8/15/20 R  Perforation ratio: 9.9 %	**Without insulation layer**									
	65	0.45	**0.50**	0.15	0.30	0.50	0.60	0.45	0.45	
	200	0.50	**0.50**	0.40	0.50	0.55	0.50	0.40	0.45	
	400	0.45	**0.50**	0.45	0.50	0.50	0.50	0.40	0.45	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.50	**0.50**	0.35	0.45	0.55	0.55	0.40	0.45	
	200	0.50	**0.50**	0.45	0.50	0.55	0.50	0.40	0.50	
	400	0.50	**0.50**	0.45	0.50	0.50	0.55	0.45	0.45	
Random 10/16/22 R  Perforation ratio: 12.6 %	**Without insulation layer**									
	65	0.50	**0.55**	0.15	0.30	0.60	0.70	0.50	0.45	
	200	0.55	**0.55**	0.45	0.60	0.70	0.55	0.45	0.45	
	400	0.55	**0.55 (L)**	0.50	0.60	0.60	0.55	0.45	0.50	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.60	**0.55 (L)**	0.35	0.55	0.75	0.70	0.45	0.50	
	200	0.60	**0.55 (L)**	0.50	0.60	0.65	0.65	0.45	0.50	
	400	0.55	**0.60**	0.50	0.55	0.60	0.65	0.50	0.50	

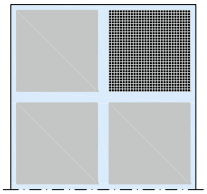
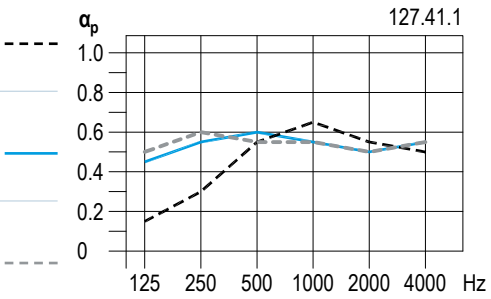
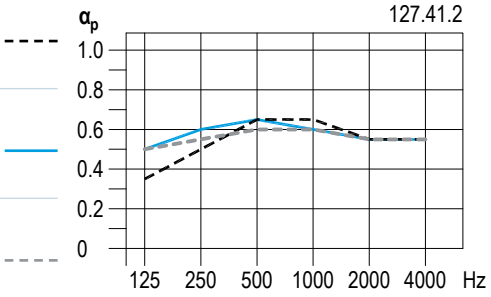
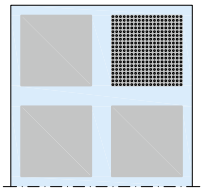
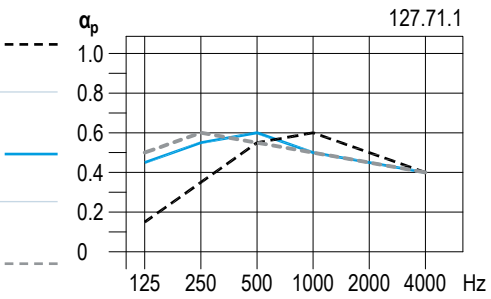
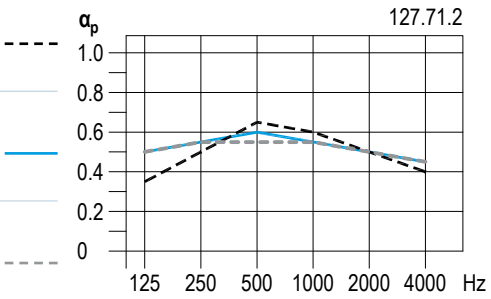
D127.de Cleaneo Acoustic Board Ceiling

12.5 mm Cleaneo Classic boards with Acoustical Fleece

Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
Random perforation 12/20/35 R  Perforation ratio: 9.8 %	**Without insulation layer**									
	65	0.45	**0.45**	0.15	0.30	0.55	0.55	0.40	0.35	
	200	0.50	**0.45 (L)**	0.40	0.50	0.60	0.45	0.35	0.35	
	400	0.45	**0.45 (L)**	0.45	0.55	0.55	0.45	0.35	0.35	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.50	**0.45 (L)**	0.35	0.50	0.65	0.55	0.35	0.35	
	200	0.50	**0.45 (L)**	0.45	0.55	0.60	0.50	0.35	0.40	
	400	0.50	**0.45 (L)**	0.45	0.50	0.55	0.50	0.35	0.40	
Random perforation RE  Perforation ratio: 13.6 %	**Without insulation layer**									
	65	0.50	**0.50**	0.15	0.30	0.55	0.70	0.45	0.40	
	200	0.55	**0.50**	0.40	0.50	0.65	0.60	0.40	0.45	
	400	0.55	**0.55**	0.45	0.55	0.55	0.60	0.45	0.45	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.55	**0.55**	0.30	0.50	0.65	0.70	0.45	0.45	
	200	0.55	**0.55**	0.45	0.55	0.65	0.65	0.45	0.45	
	400	0.55	**0.55**	0.45	0.55	0.60	0.65	0.45	0.50	

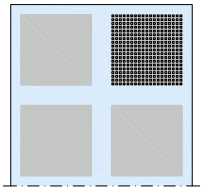
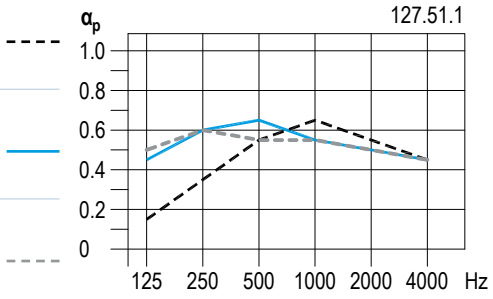
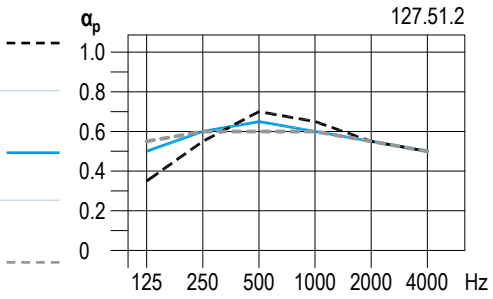
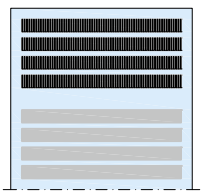
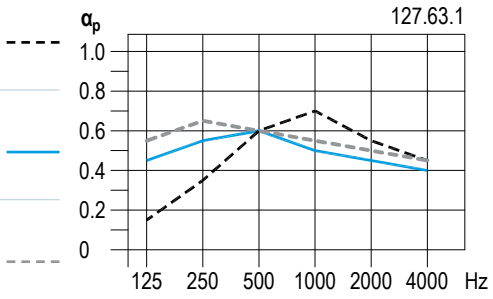
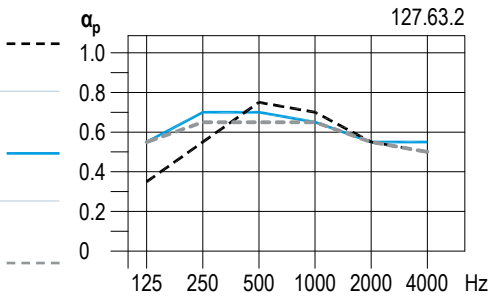
D127.de Cleaneo Acoustic Board Ceiling

12.5 mm Cleaneo Classic boards with Acoustical Fleece

Perforation pattern	Construction depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
	Without insulation layer									
Block perforation Design B4 8/18 R  Perforation ratio: 12.1 %	**65**	0.50	**0.55**	0.15	0.30	0.55	0.65	0.55	0.50	
	200	0.55	**0.55**	0.45	0.55	0.60	0.55	0.50	0.55	
	400	0.50	**0.55 (L)**	0.50	0.60	0.55	0.55	0.50	0.55	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.60	**0.65**	0.35	0.50	0.65	0.65	0.55	0.55	
	200	0.60	**0.60**	0.50	0.60	0.65	0.60	0.55	0.55	
	400	0.55	**0.60**	0.50	0.55	0.60	0.60	0.55	0.55	
	Without insulation layer									
Block perforation Design B4 12/25 R  Perforation ratio: 11.3 %	**65**	0.50	**0.55**	0.15	0.35	0.55	0.60	0.50	0.40	
	200	0.50	**0.50 (L)**	0.45	0.55	0.60	0.50	0.45	0.40	
	400	0.50	**0.50 (L)**	0.50	0.60	0.55	0.50	0.45	0.40	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.55	**0.55**	0.35	0.50	0.65	0.60	0.50	0.40	
	200	0.55	**0.55**	0.50	0.55	0.60	0.55	0.50	0.45	
	400	0.55	**0.55**	0.50	0.55	0.55	0.55	0.50	0.45	

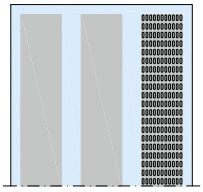
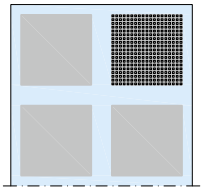
D127.de Cleaneo Acoustic Board Ceiling

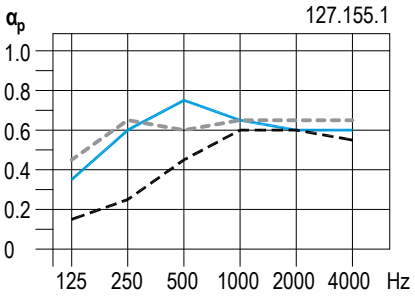
12.5 mm Cleaneo Classic boards with Acoustical Fleece

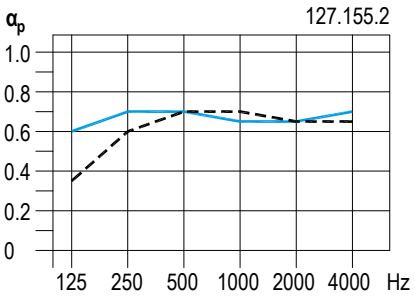
Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
	Without insulation layer									
Block perforation Design B4 12/25 Q  Perforation ratio: 14.4 %	**65**	0.50	**0.55**	0.15	0.35	0.55	0.65	0.55	0.45	
	200	0.55	**0.55 (L)**	0.45	0.60	0.65	0.55	0.50	0.45	
	400	0.55	**0.55 (L)**	0.50	0.60	0.55	0.55	0.50	0.45	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.60	**0.60**	0.35	0.55	0.70	0.65	0.55	0.50	
	200	0.60	**0.60**	0.50	0.60	0.65	0.60	0.55	0.50	
	400	0.60	**0.60**	0.55	0.60	0.60	0.60	0.55	0.50	
	Without insulation layer									
slotline Design B6  Slot ratio: 15.7 %	**65**	0.55	**0.55**	0.15	0.35	0.60	0.70	0.55	0.45	
	200	0.50	**0.50 (L)**	0.45	0.55	0.60	0.50	0.45	0.40	
	400	0.60	**0.55 (L)**	0.55	0.65	0.60	0.55	0.50	0.45	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.65	**0.60**	0.35	0.55	0.75	0.70	0.55	0.50	
	200	0.65	**0.65 (L)**	0.55	0.70	0.70	0.65	0.55	0.55	
	400	0.60	**0.60 (L)**	0.55	0.65	0.65	0.65	0.55	0.50	

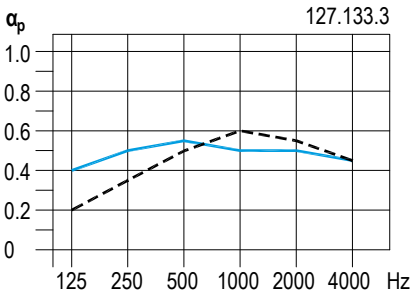
D127.de Cleaneo Acoustic Board Ceiling

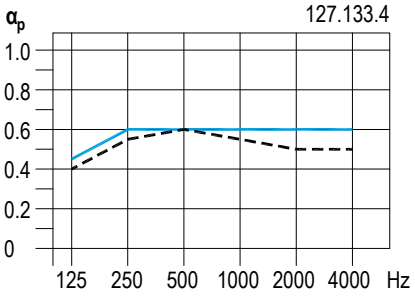
12.5 mm Designpanel with acoustical fleece

Perforation pattern	Construction depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Tangent T3L1  Perforation ratio: 15.8 %	**Without insulation layer**								
	65	*0.50*	***0.50***	*0.15*	*0.25*	*0.45*	*0.60*	*0.60*	*0.55*
	200	0.65	**0.65**	0.35	0.60	0.75	0.65	0.60	0.60
	400	0.65	**0.65**	0.45	0.65	0.60	0.65	0.65	0.65
	With insulation layer (For requirements on insulation layer see page 40)								
	65	*0.65*	***0.70***	*0.35*	*0.60*	*0.70*	*0.70*	*0.65*	*0.65*
	200	*0.70*	***0.70***	*0.60*	*0.70*	*0.70*	*0.65*	*0.65*	*0.70*
	400	–	–	–	–	–	–	–	–
Micro M2F 1200 x 2400  Perforation ratio: 8.4 %	**Without insulation layer**								
	65	*0.50*	***0.55***	*0.20*	*0.35*	*0.50*	*0.60*	*0.55*	*0.45*
	200	*0.50*	***0.55***	*0.40*	*0.50*	*0.55*	*0.50*	*0.50*	*0.45*
	400	–	–	–	–	–	–	–	–
	With insulation layer (For requirements on insulation layer see page 40)								
	65	*0.55*	***0.55***	*0.40*	*0.55*	*0.60*	*0.55*	*0.50*	*0.50*
	200	*0.60*	***0.60***	*0.45*	*0.60*	*0.60*	*0.60*	*0.60*	*0.60*
	400	–	–	–	–	–	–	–	–





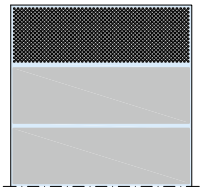


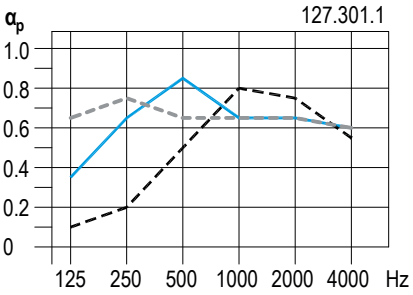


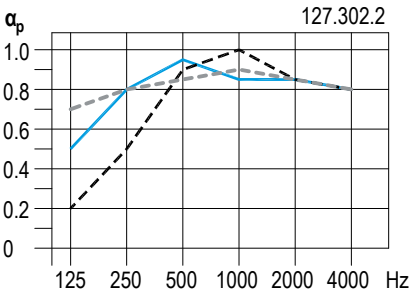
Absorption values in italics are calculated values. The basis used here is an empirical derivation from a range of simplified measurements with variations in the construction depths, perforation ratios and insulation material layers.

D127.de Cleaneo Acoustic Board Ceiling

12.5 mm Cleaneo SYSTEXX Acoustic Board with Acoustical Fleece

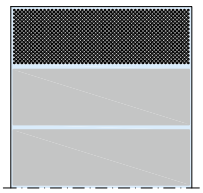
Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
	Without insulation layer								
Alternating circular perforation 12/25 R  Perforation ratio: 31.8 %	**65**	0.55	**0.50**	0.10	0.20	0.50	0.80	0.75	0.55
	200	0.70	**0.70**	0.35	0.65	0.85	0.65	0.65	0.60
	400	0.65	**0.65 (L)**	0.65	0.75	0.65	0.65	0.65	0.60
	With insulation layer (For requirements on insulation layer see page 40)								
	65	0.80	**0.80**	0.20	0.50	0.90	1.00	0.85	0.80
	200	0.85	**0.90**	0.50	0.80	0.95	0.85	0.85	0.80
	400	0.85	**0.90**	0.70	0.80	0.85	0.90	0.85	0.80

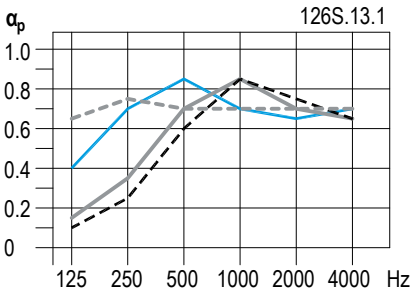


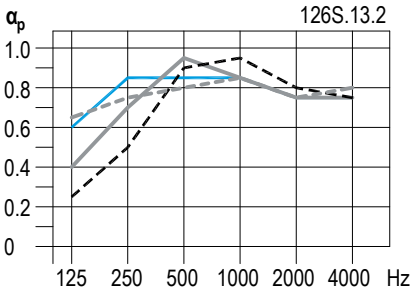


D126S.de Cleaneo Acoustic Board Ceiling SYSTEXX

12.5 mm Cleaneo SYSTEXX Acoustic Board with Acoustical Fleece

Perforation pattern	Construction depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
	Without insulation layer								
Alternating circular perforation 12/25 R 	**65**	0.65	**0.55**	0.10	0.25	0.60	0.85	0.75	0.65
	80	0.65	**0.65**	0.15	0.35	0.70	0.85	0.70	0.65
	200	0.70	**0.70**	0.40	0.70	0.85	0.70	0.65	0.70
	400	0.70	**0.70 (L)**	0.65	0.75	0.70	0.70	0.70	0.70
	With insulation layer (For requirements on insulation layer see page 40)								
Perforation ratio: 31.8 %	**65**	0.80	**0.80**	0.25	0.50	0.90	0.95	0.80	0.75
In conjunction with Cleaneo SYSTEXX Silent	**80**	0.80	**0.85**	0.40	0.70	0.95	0.85	0.75	0.75
	200	0.80	**0.85**	0.60	0.85	0.85	0.85	0.75	0.75
	400	0.80	**0.80**	0.65	0.75	0.80	0.85	0.75	0.80

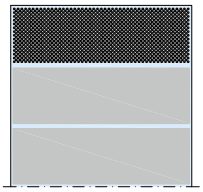


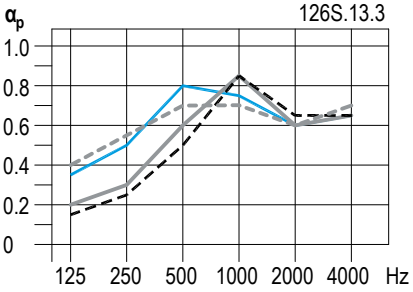


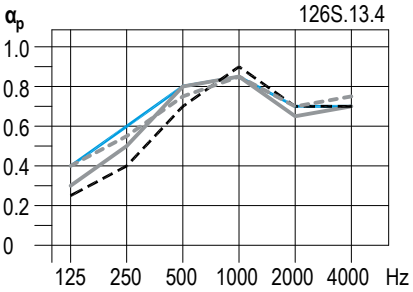
The specified values relate to the Cleaneo SYSTEXX Acoustic Board Fleece **with** cladding with Cleaneo SYSTEXX Silent.

D126S.de Cleaneo Acoustic Board Ceiling SYSTEXX

12.5 mm Cleaneo SYSTEXX Acoustic Board with foil laminated on the rear

Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
	Without insulation layer								
Alternating circular perforation 12/25 R  Perforation ratio: 31.8 % In conjunction with Cleaneo SYSTEXX Silent	**65**	0.55	**0.50 (MH)**	0.15	0.25	0.50	0.85	0.65	0.65
	80	0.60	**0.60 (M)**	0.20	0.30	0.60	0.85	0.60	0.65
	200	0.65	**0.70**	0.35	0.50	0.80	0.75	0.60	0.65
	400	0.65	**0.70**	0.40	0.55	0.70	0.70	0.60	0.70
	With insulation layer (For requirements on insulation layer see page 40)								
	65	0.65	**0.70**	0.25	0.40	0.70	0.90	0.70	0.70
	80	0.70	**0.70**	0.30	0.50	0.80	0.85	0.65	0.70
	200	0.75	**0.80**	0.40	0.60	0.80	0.85	0.70	0.70
	400	0.70	**0.75**	0.40	0.55	0.75	0.85	0.70	0.75

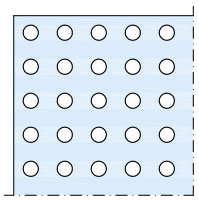
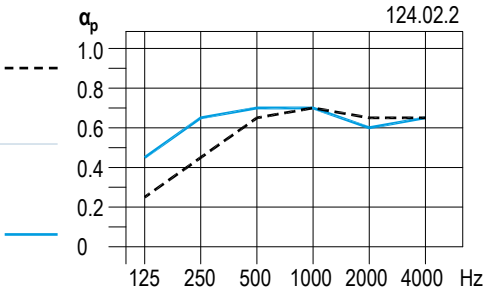
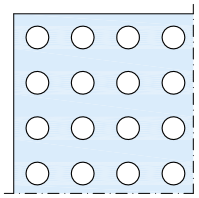
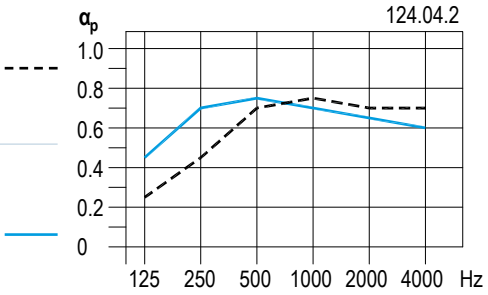
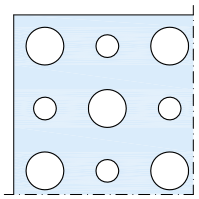
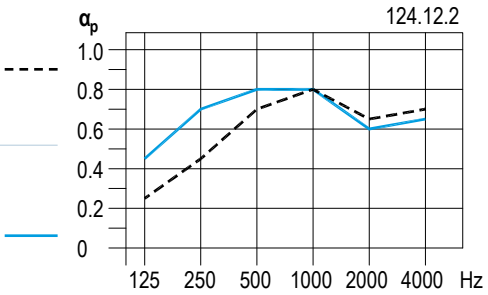
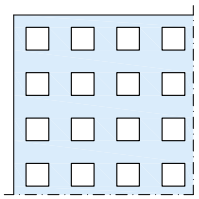
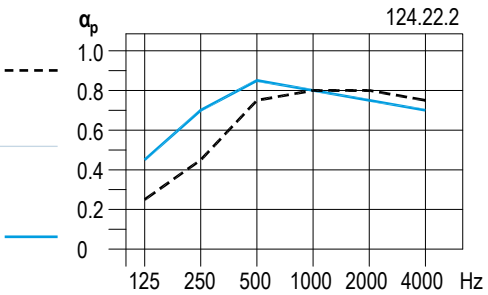




The specified values relate to the Cleaneo SYSTEXX Acoustic Board Foil **with** cladding with Cleaneo SYSTEXX Silent.

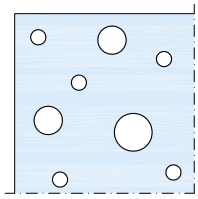
D124.de Cleaneo Acoustic Fire Protection Ceiling

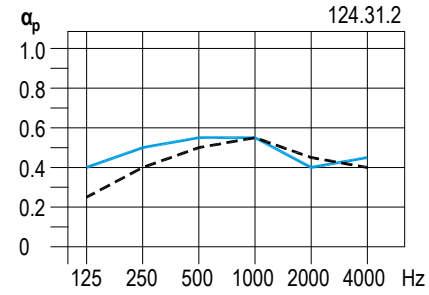
12.5 mm Cleaneo Classic boards with Acoustical Fleece and mineral wool

Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
Standard circular perforation 8/18 R	**With insulation layer** (For requirements on insulation layer see page 40)									
 Perforation ratio: 15.5 %	**40.5**	0.60	**0.65**	0.25	0.45	0.65	0.70	0.65	0.65	
	112.5	0.65	**0.70**	0.45	0.65	0.70	0.70	0.60	0.65	
Standard circular perforation 12/25 R	**With insulation layer** (For requirements on insulation layer see page 40)									
 Perforation ratio: 18.1 %	**40.5**	0.65	**0.70**	0.25	0.45	0.70	0.75	0.70	0.70	
	112.5	0.70	**0.70**	0.45	0.70	0.75	0.70	0.65	0.60	
Alternating circular perforation 12/20/66 R	**With insulation layer** (For requirements on insulation layer see page 40)									
 Perforation ratio: 19.6 %	**40.5**	0.65	**0.70**	0.25	0.45	0.70	0.80	0.65	0.70	
	112.5	0.75	**0.70**	0.45	0.70	0.80	0.80	0.60	0.65	
Standard square perforation 12/25 Q	**With insulation layer** (For requirements on insulation layer see page 40)									
 Perforation ratio: 23.0 %	**40.5**	0.70	**0.75**	0.25	0.45	0.75	0.80	0.80	0.75	
	112.5	0.80	**0.80**	0.45	0.70	0.85	0.80	0.75	0.70	

D124.de Cleaneo Acoustic Fire Protection Ceiling

12.5 mm Cleaneo Classic boards with Acoustical Fleece and mineral wool

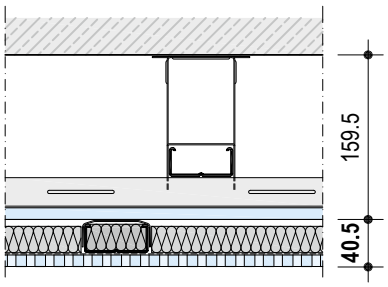
Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
With insulation layer (For requirements on insulation layer see page 40)									
Random 8/15/20 R  Perforation ratio: 9.9 %	**40.5**	0.45	**0.50**	0.25	0.40	0.50	0.55	0.45	0.40
	112.5	0.50	**0.50**	0.40	0.50	0.55	0.55	0.40	0.45

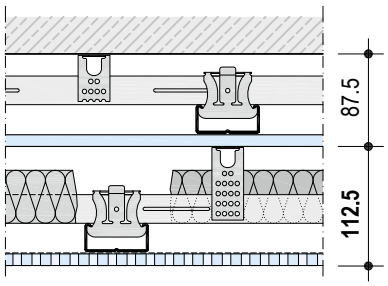


Test configuration

The construction depth for acoustic fire protection ceilings is defined up to the first, acoustically closed level.
For this system it is up to the non-perforated board of the 1st Grid level

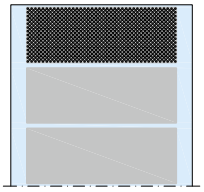
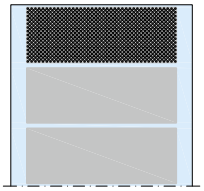
Scheme drawings I Dimensions in mm

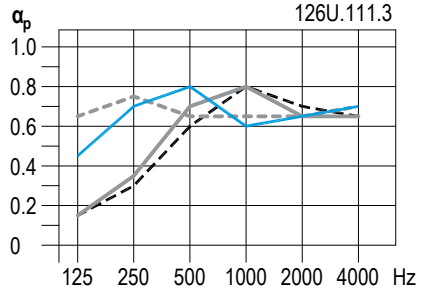


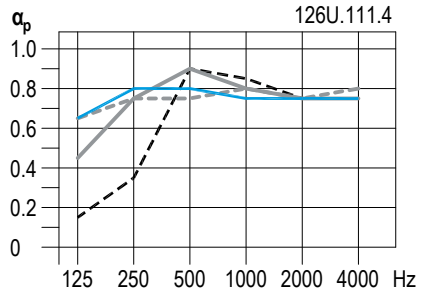


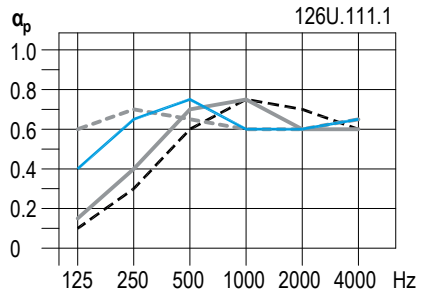
D126U.de Cleaneo Acoustic Board Ceiling UFF for acoustical plaster

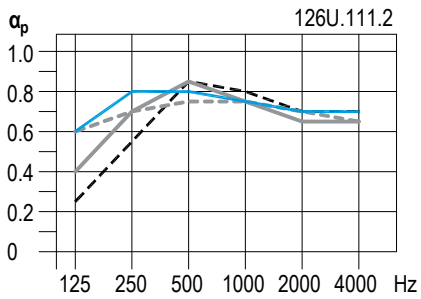
12.5 mm Cleaneo UFF plaster base board with acoustical fleece

Perforation pattern	Construction depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
Alternating circular perforation 12/25 R  Perforation ratio: 27.0 % In conjunction with **fumi acoustical plaster**	**Without insulation layer**									
	65	0.60	**0.60**	0.15	0.30	0.60	0.80	0.70	0.65	
	80	0.65	**0.65**	0.15	0.35	0.70	0.80	0.65	0.65	
	200	0.70	**0.65 (L)**	0.45	0.70	0.80	0.60	0.65	0.70	
	400	0.65	**0.65 (L)**	0.65	0.75	0.65	0.65	0.65	0.70	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.75	**0.80**	0.25	0.55	0.90	0.85	0.75	0.75	
	80	0.80	**0.80**	0.45	0.75	0.90	0.80	0.75	0.75	
	200	0.80	**0.80**	0.65	0.80	0.80	0.75	0.75	0.75	
	400	0.75	**0.80**	0.65	0.75	0.75	0.80	0.75	0.80	
Alternating circular perforation 12/25 R  Perforation ratio: 27.0 % In conjunction with **KRAFT acoustical plaster**	**Without insulation layer**									
	65	0.60	**0.60**	0.10	0.30	0.60	0.75	0.70	0.60	
	80	0.60	**0.65**	0.15	0.40	0.70	0.75	0.60	0.60	
	200	0.65	**0.65**	0.40	0.65	0.75	0.60	0.60	0.65	
	400	0.65	**0.65 (L)**	0.60	0.70	0.65	0.60	0.60	0.65	
	With insulation layer (For requirements on insulation layer see page 40)									
	65	0.75	**0.75**	0.25	0.55	0.85	0.80	0.70	0.70	
	80	0.75	**0.75**	0.40	0.70	0.85	0.75	0.65	0.65	
	200	0.75	**0.75 (L)**	0.60	0.80	0.80	0.75	0.70	0.70	
	400	0.70	**0.75**	0.60	0.70	0.75	0.75	0.70	0.65	





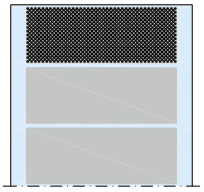
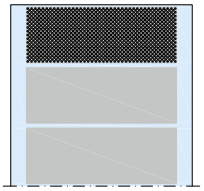


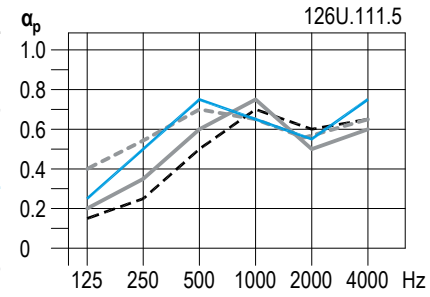


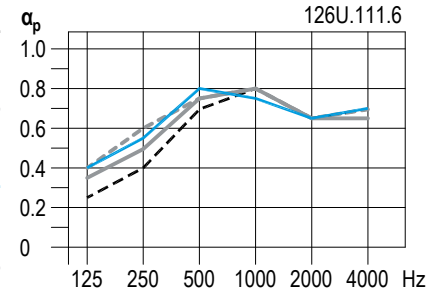
The specified values relate to the Cleaneo UFF Plaster Base Board Fleece **with** coating with fumi or KRAFT acoustical plaster.

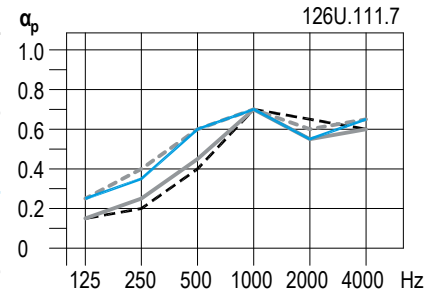
D126U.de Cleaneo Acoustic Board Ceiling UFF for acoustical plaster

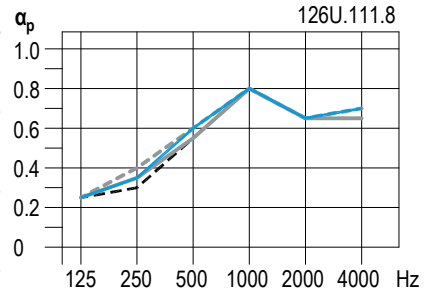
12.5 mm Cleaneo UFF plaster base board with foil laminated on the rear

Perforation pattern	Construction depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Alternating circular perforation 12/25 R  Perforation ratio: 27.0 % In conjunction with **fumi acoustical plaster**	**Without insulation layer**								
	65	0.50	**0.50 (H)**	0.15	0.25	0.50	0.70	0.60	0.65
	80	0.55	**0.55**	0.20	0.30	0.60	0.75	0.50	0.60
	200	0.60	**0.65**	0.35	0.50	0.75	0.65	0.55	0.65
	400	0.60	**0.65**	0.40	0.55	0.70	0.65	0.55	0.65
	With insulation layer (For requirements on insulation layer see page 40)								
	65	0.65	**0.65**	0.25	0.40	0.70	0.80	0.65	0.70
	80	0.65	**0.70**	0.35	0.50	0.75	0.80	0.65	0.65
	200	0.70	**0.75**	0.40	0.55	0.80	0.75	0.65	0.70
	400	0.70	**0.75**	0.40	0.60	0.75	0.80	0.65	0.70
Alternating circular perforation 12/25 R  Perforation ratio: 27.0 % In conjunction with **KRAFT acoustical plaster**	**Without insulation layer**								
	65	0.50	**0.45 (MH)**	0.15	0.20	0.40	0.70	0.65	0.60
	80	0.50	**0.50**	0.15	0.25	0.45	0.70	0.55	0.60
	200	0.55	**0.60**	0.25	0.35	0.60	0.70	0.55	0.65
	400	0.55	**0.60**	0.25	0.40	0.60	0.70	0.60	0.65
	With insulation layer (For requirements on insulation layer see page 40)								
	65	0.55	**0.55 (M)**	0.25	0.30	0.55	0.80	0.65	0.65
	80	0.60	**0.60**	0.25	0.35	0.55	0.80	0.65	0.65
	200	0.60	**0.60**	0.25	0.35	0.60	0.80	0.65	0.70
	400	0.60	**0.65**	0.25	0.40	0.60	0.80	0.65	0.70





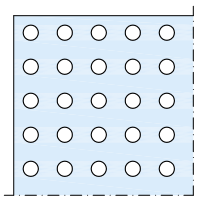
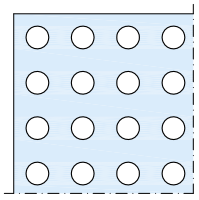
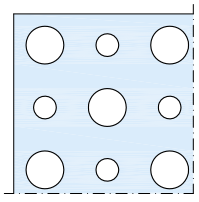
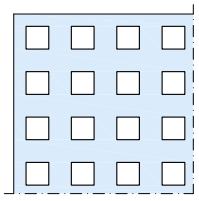


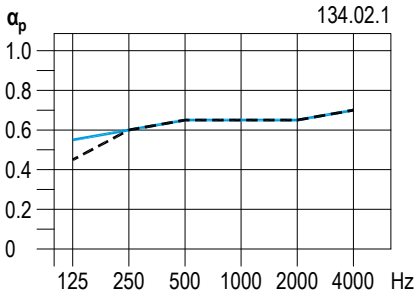


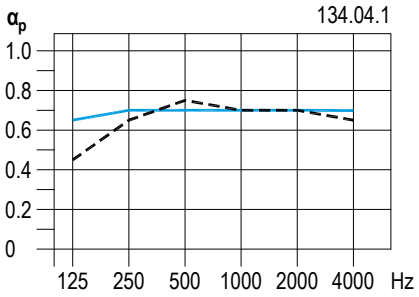
The specified values relate to the Cleaneo UFF Plaster Base Board Foil **with** coating with fumi or KRAFT acoustical plaster.

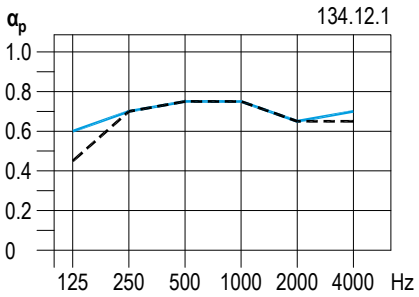
D134.de Free-Spanning Cleaneo Acoustic Fire Protection Ceiling

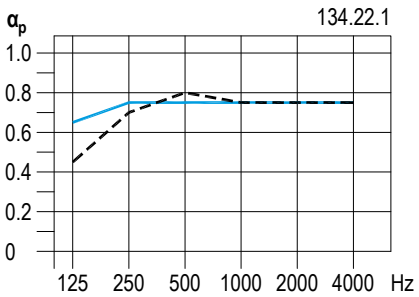
12.5 mm Cleaneo Classic boards with Acoustical Fleece and mineral wool

Perforation pattern	Construction depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
Standard circular perforation 8/18 R	**With insulation layer** (For requirements on insulation layer see page 40)									
 Perforation ratio: 15.5 %	**90**	0.65	**0.65**	0.45	0.60	0.65	0.65	0.65	0.70	----
	190	0.65	**0.65**	0.55	0.60	0.65	0.65	0.65	0.70	——
Standard circular perforation 12/25 R	**With insulation layer** (For requirements on insulation layer see page 40)									
 Perforation ratio: 18.1 %	**90**	0.70	**0.75**	0.45	0.65	0.75	0.70	0.70	0.65	----
	190	0.70	**0.70**	0.65	0.70	0.70	0.70	0.70	0.70	——
Alternating circular perforation 12/20/66 R	**With insulation layer** (For requirements on insulation layer see page 40)									
 Perforation ratio: 19.6 %	**90**	0.70	**0.75**	0.45	0.70	0.75	0.75	0.65	0.65	----
	190	0.70	**0.75**	0.60	0.70	0.75	0.75	0.65	0.70	——
Standard square perforation 12/25 Q	**With insulation layer** (For requirements on insulation layer see page 40)									
 Perforation ratio: 23.0 %	**90**	0.75	**0.80**	0.45	0.70	0.80	0.75	0.75	0.75	----
	190	0.75	**0.75**	0.65	0.75	0.75	0.75	0.75	0.75	——



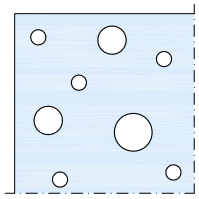


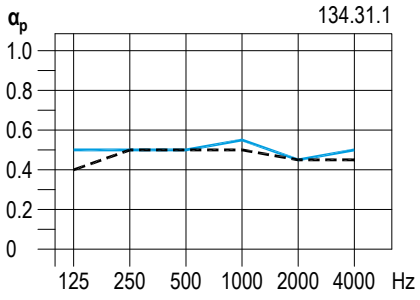




D134.de Free-Spanning Cleaneo Acoustic Fire Protection Ceiling

12.5 mm Cleaneo Classic boards with Acoustical Fleece and mineral wool

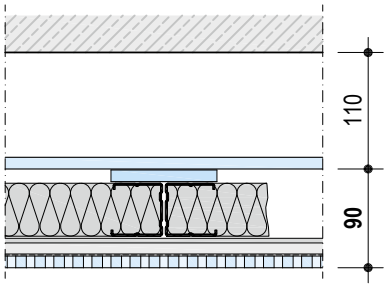
Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Random 8/15/20 R	**With insulation layer** (For requirements on insulation layer see page 40)								
 Perforation ratio: 9.9 %	**90**	0.50	**0.50**	0.40	0.50	0.50	0.50	0.45	0.45
	190	0.50	**0.50**	0.50	0.50	0.50	0.55	0.45	0.50

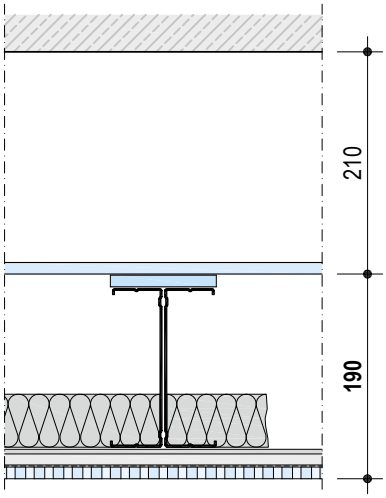


D134.de Test configuration

The construction depth for acoustic fire protection ceilings is defined up to the first, acoustically closed level.
For this system it is up to the non-perforated full surface covering.

Scheme drawings I Dimensions in mm





D137.de Free-Spanning Cleaneo Acoustic Board Ceiling

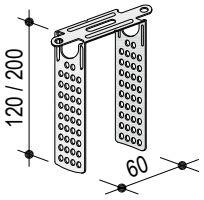
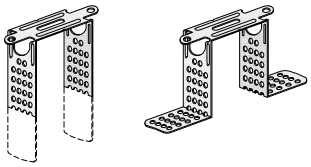
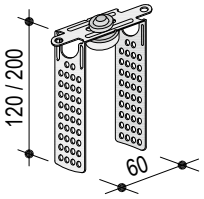
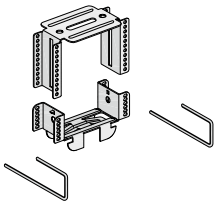
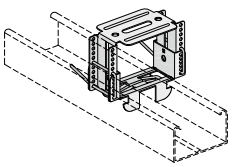
12.5 mm Cleaneo Classic boards with Acoustical Fleece

Perforation pattern	Con-struc-tion depth mm	NRC	α_w	Frequency-dependent absorption coefficient α_p 125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz

For this system, the absorption values of system D127.de can be used when the construction depth is taken into consideration.

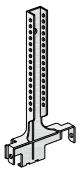
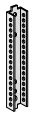
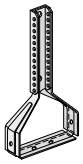
Suspenders

Dimensions in mm

Suspension	Drawing		Anchors
0.15 kN (15 kg) load-carrying capacity class			
Direct bracket For CD 60/27	 Bend side tabs		D124.de – 2nd grid level: Anchoring on 1st Grid level with **Knauf FN 4.3 x 35** Multi-level ceiling system: Anchor to fire protection ceiling with **Knauf FN 4.3x35** or **Knauf FN 4.3x65**
0.40 kN (40 kg) load-carrying capacity class			
Universal Bracket For CD 60/27		 Bend or cut the universal bracket / damping universal bracket according to the required suspension height, screw fix to CD 60/27 (2x metal screws LN 3.5 x 11).	Anchoring to the reinforced concrete ceiling with **1x Knauf Ceiling Steel Dowel** at centre D124.de – 2nd grid level: Anchoring on 1st Grid level with **1x Knauf FN 4.3 x 35** at centre Multi-level ceiling system: Anchoring to fire resistance ceiling with **1x Knauf FN 4.3 x 35** or **1x Knauf FN 4.3 x 65** at centre
Damping Universal Bracket For CD 60/27			Anchoring to the reinforced concrete ceiling with **1x suitable steel dowels** at centre (observe the anchoring length)
Adjustable Universal Bracket For CD 60/27		 Adjustable universal bracket to be adjusted to suit the required installation height. Connect the upper and lower section with **2x Nonius pins** (secure against sliding out).	Anchoring to reinforced concrete ceiling with **1x Knauf Deckennagel ceiling steel dowel** at centre

Notes	
	Anchoring to basic ceilings made of other building materials with specially approved or standardized anchoring elements. Use rigid suspenders only.

Suspenders (continued)

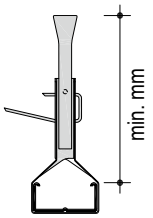
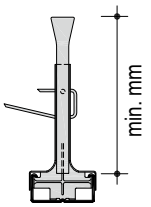
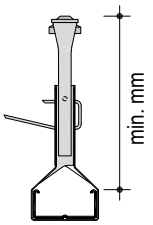
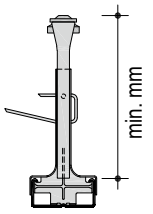
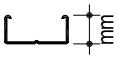
Suspension	Drawing		Anchors
0.40 kN (40 kg) load-carrying capacity class			
Nonius hanger bottom For CD 60/27		Suspended with  **Nonius Hanger Top** or **Nonius Hanger Top** and  **1x Nonius Pin** (secure against slide out) or  **2x Nonius clip** If required use additional  **Nonius connector.**	**Nonius Hanger Top** Anchoring to reinforced concrete ceiling with **Knauf Ceiling Steel Dowels** **Nonius Swing Top** Anchoring to the reinforced concrete ceiling with **1x suitable steel dowels** at centre (observe the anchoring length)
Nonius stirrup For CD 60/27	 Bend Nonius stirrup around channel and fit together until it snaps in		

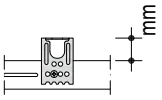
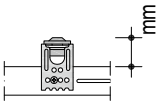
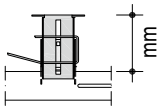
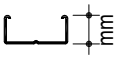
Notes	Anchoring to basic ceilings made of other building materials with specially approved or standardized anchoring elements. Use rigid suspenders only.

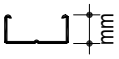
Construction heights

Dimensions in mm

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

Systems	Nonius suspender With Nonius top Nonius stirrup	Nonius suspender	With Nonius Swing Top Nonius stirrup	Nonius suspender	Grid profile	Total grid height
						
D127.de D126S.de D126U.de	130	130	140	140	CD 60/27 + CD 60/27	54
D124.de	*1st grid level:* carrying and furring channel					
	130	130	–	–	CD 60/27 + CD 60/27	54

Systems	Direct suspension Universal bracket	Damping Universal Bracket	Adjustable Universal Bracket	Grid profile	Total grid height
					
D127.de D126S.de D126U.de	5 – 180	15 – 190	35 – 85	CD 60/27 + CD 60/27	54
D124.de	*1st grid level:* carrying and furring channel				
	5 – 180	–	35 – 85	CD 60/27 + CD 60/27	54
	2nd grid level: carrying and furring channel				
	5 – 180	–	–	CD 60/27 + CD 60/27	54

Systems	Multi-level ceiling system or 2nd grid level – D124.de Direct bracket	Grid profile	Total grid height
			
D127.de	4	CD 60/27	27
D124.de	*2nd grid level:* Only furring channel		
	4	CD 60/27	27

Calculation examples – determination of construction height

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

D127.de – steps		Dimensions in mm
1	**Height of the hanger** With Nonius suspender	130
2	**Height of grid** Carrying channel CD and furring channel CD	+ 54
3	**Cladding thickness** 12.5 mm (Cleaneo Classic Board)	+ 12,5
4	**Sum**	= 196.5

Approx. 197 mm required height of construction of suspended ceiling.

D124.de – steps		Dimensions in mm
1	**Height of suspenders** *1st grid level:* With Nonius suspender *2nd grid level:* With universal brackets	130 + 60
2	**Height of grid** *1st grid level:* Carrying channel CD and furring channel CD *2nd grid level:* Only furring channel CD	+ 54 + 27
3	**Cladding thickness** *1st grid level:* 12.5 mm (GKF) *2nd grid level:* 12.5 mm (Cleaneo Classic Board)	+ 12.5 + 12.5
4	**Sum**	= 296

Approx. 296 mm required height of construction of suspended ceiling.

Planning of joints

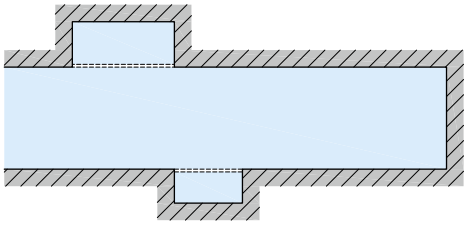
Observe the following criteria when planning movement and expansion joints:

- Use control joints in the case of ceiling areas exceeding approx. 15 m in length, e.g. for narrow ceiling spaces caused by a break of a wall.
- The spacings must be reduced should the free deformation be prevented, for example, by protruding solid components.
- With heating ceiling systems the side lengths must be reduced to approx. 7.5 m.
- Cooling ceilings with surfaces ≥ 100 m² should be subdivided by expansion joints.
- Movement joints have to be transferred into the construction of the board ceilings.
- Separate connections of boards to components made of a different building material, especially columns, or thermally highly stressed built-ins such as lighting fixtures, for instance with shadow gaps.

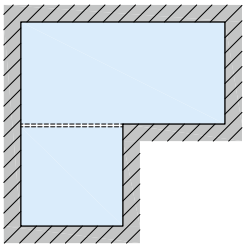
Examples with reduced free deformation

Expansion joints/movement joints

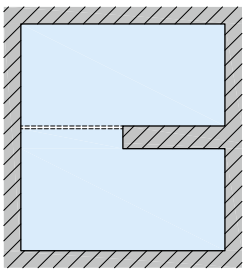
Hall ceiling with alcoves and protrusions – bay joints



Protruding solid constructions



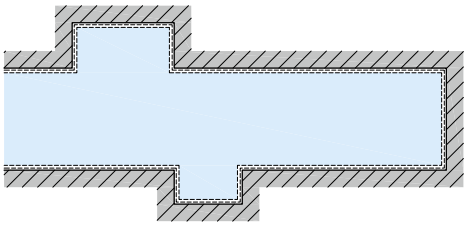
Protruding wall sections



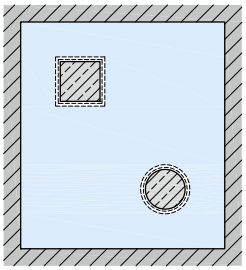
Design analogue to details on page 78

Deflection heads

Hall ceiling with alcoves and protrusions – circumferential deflection heads



Suspended ceiling with recesses for columns



Design analogue to details on page 78

Attachment of loads to Cleaneo Acoustic Board Ceilings

Additional loads, e.g. lighting fixtures, curtain rails and similar can be fixed to Cleaneo Acoustic board ceilings using universal dowel plugs, cavity dowels or spring toggle dowels or Knauf Hartmut Hohlraumdübel cavity.

They must be determined for determination of the load class and/or the maximum room width.

Notes	Heavy loads must be anchored directly on load-bearing building elements (basic ceiling) or on auxiliary constructions. As an alternative for free-spanning ceilings, separate rating of the maximum room widths is possible on request.

Each load introduction surface of the Cleaneo Acoustic Board Ceiling may not exceed the weight threshold values of the fastened components:

Permissible weight per ceiling surface in kg/m²	
Without fire resistance	With fire resistance[1)]
Suspended acoustical board ceiling	
15	6 [1)]
Free-spanning acoustical board ceiling	
3	3

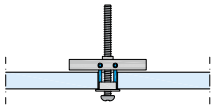
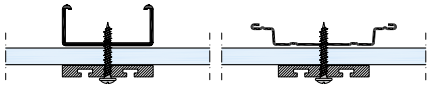
1) *When implemented as a fire protection ceiling with exposed ceiling (Multi-level Ceiling System)15 kg/m² is the permissible total weight for suspension of the exposed ceiling on the fire protection ceiling (including insulation layer and attached loads).*

Furthermore, the following conditions apply:

For every anchoring point the following weights of components attached to the acoustic board ceilings may not be exceeded:

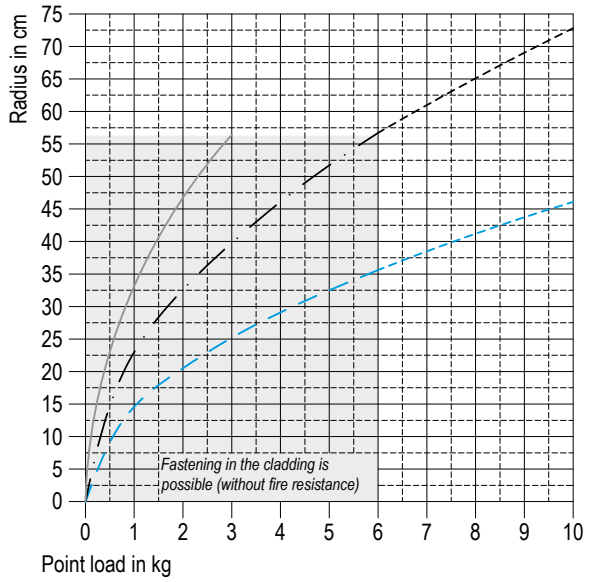
Anchoring method	Permissible weight per anchoring point in kg	
	Without fire resistance	With fire resistance
Suspended acoustical board ceiling		
Fastening in the cladding [2)]	0.5	0.5
Fastening to the grid	10	10
Free-spanning acoustical board ceiling		
Fastening in the cladding [2)]	0.5	0.5
Fastening to the grid	3	3

2) *Fastening in the cladding not permissible with Cleaneo SYSTEXX Acoustic Board and Cleaneo UFF plaster base board*

Fastening in the cladding	
	Knauf Hartmut Hohlraumdübel cavity dowel Screw M5
Fastening to the grid	
	Knauf Universalschraube FN multi-purpose screw e.g. curtain rail

In order to avoid a local overload of the ceiling, it is necessary to comply with the minimum spacings between the individual fastened loads. The minimum spacing between two anchoring points is dependent on both effective radii of the individual loads.

The effective radius of the individual load can be taken from the following diagram in dependence on the permissible weight per unit area for additional loads:

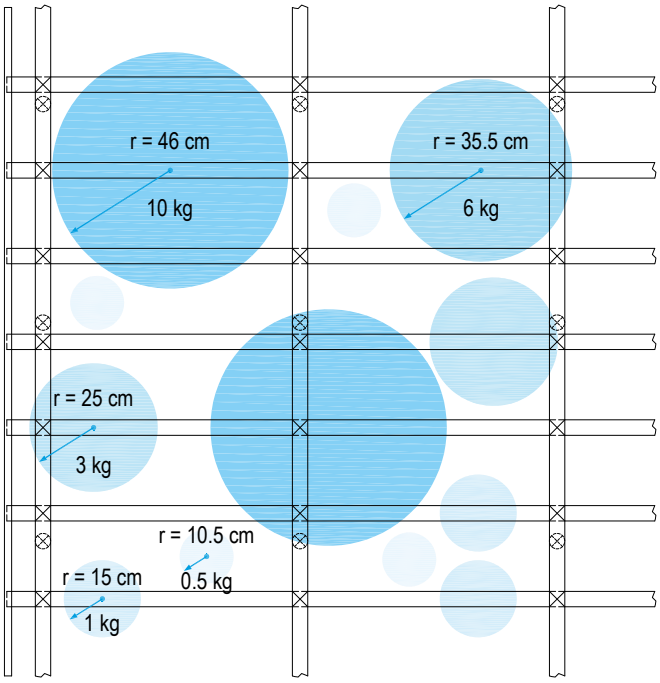


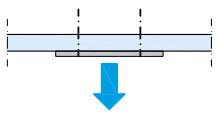
3 kg/m² permissible additional weight (on the exposed ceiling under a fire protection ceiling, see page 82)

6 kg/m² permissible additional weight (with fire resistance)

15 kg/m² permissible additional weight (without fire resistance)

Example of an attachment scheme with 15 kg/m²



Notes	 The attached loads can be introduced with several anchoring elements.
	For attachment of loads with “multi-level ceiling system” see page 82

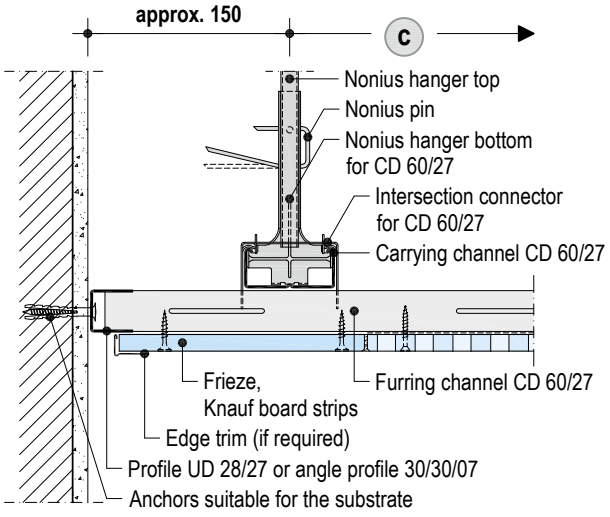
D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

Details

Scale 1:5 I Dimensions in mm

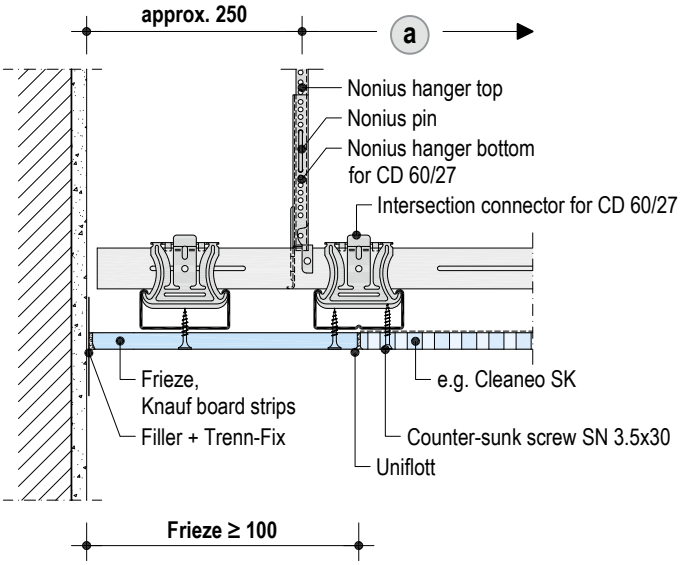
D127.de-A1 Connection to wall – exposed joint

Without fire resistance



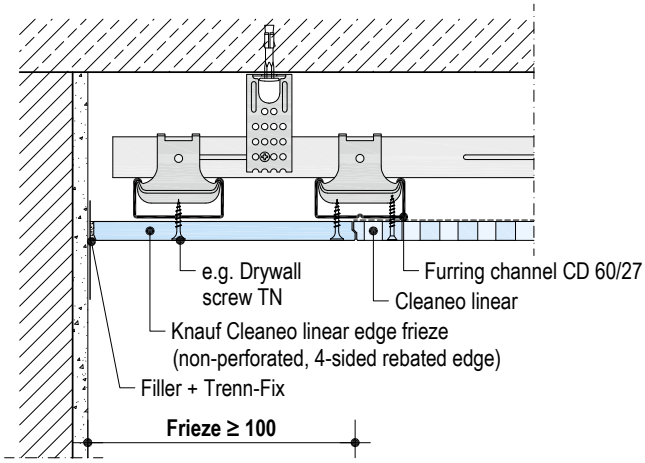
D127.de-D3 Connection to wall – jointed frieze

Without fire resistance



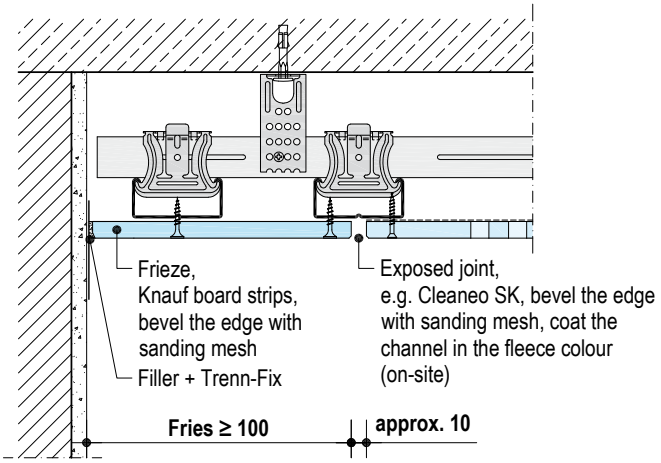
D127.de-D4 Connection to wall – unjointed frieze

Without fire resistance



D127.de-D2 Connection to wall – frieze exposed joint

Without fire resistance

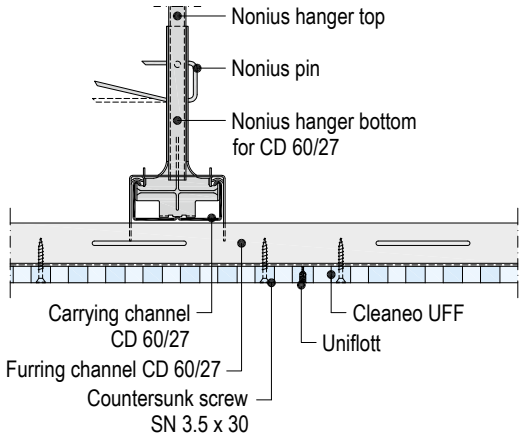


Details

Scale 1:5

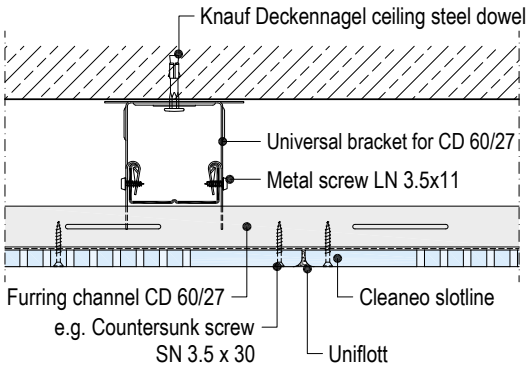
D127.de-B3 Long edge – UFF

Without fire resistance I Continuous perforation



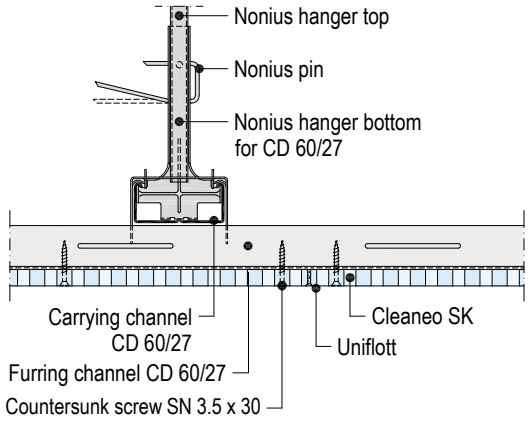
D127.de-B1 Long edge – HRK (half-rounded edge)

Without fire resistance I slotline



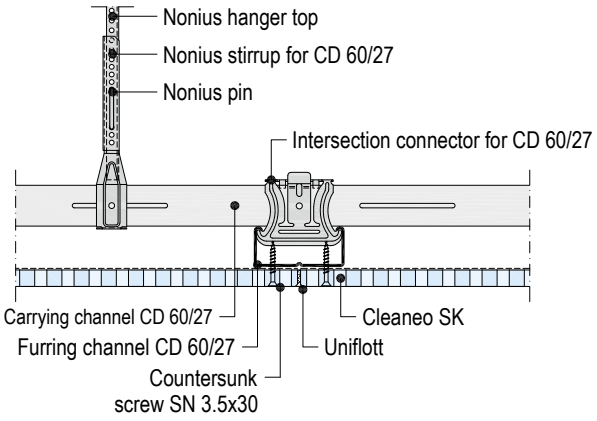
D127.de-B2 Long edge – 4SK (4-side square edge)

Without fire resistance I Continuous perforation



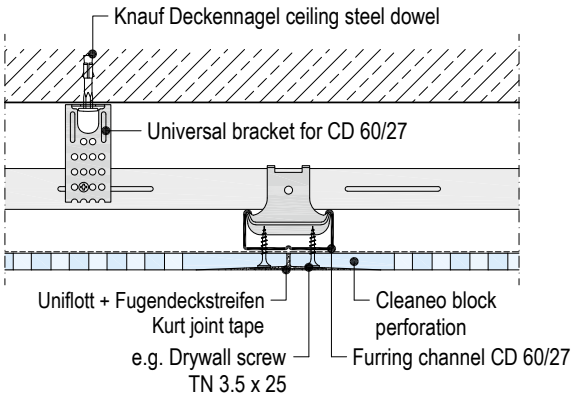
D127.de-C1 Front edge – 4SK (4-sided square edge)

Without fire resistance I Continuous perforation



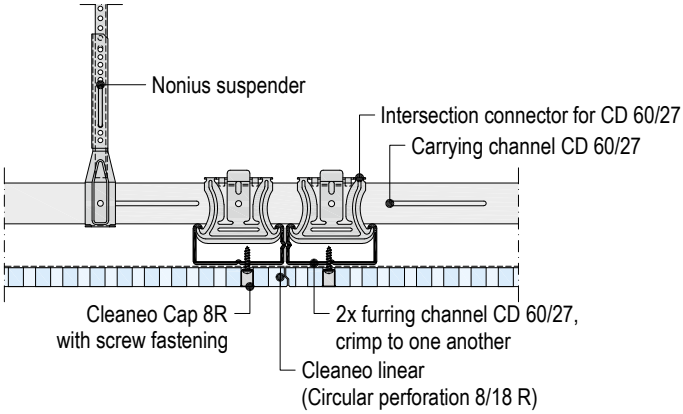
D127.de-C2 Front edge – 4AK (4-sided tapered edge)

Without fire resistance I Block perforation



D127.de-C3 Front edge – linear

Without fire resistance I Continuous perforation 8/18 R



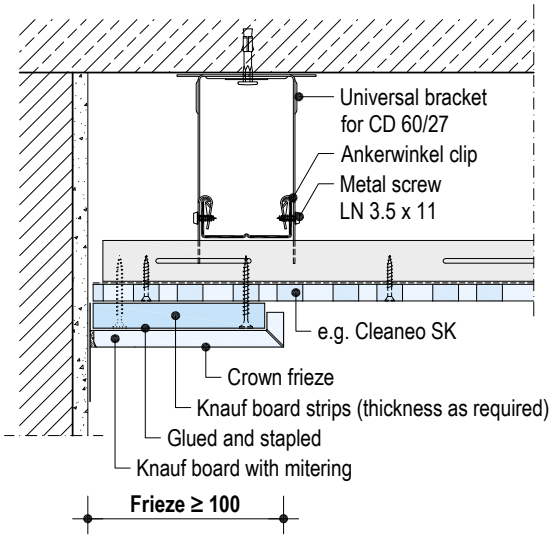
Further data for fixing boards with Cleaneo Caps see page 88

Details

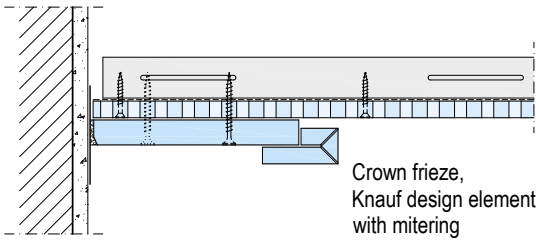
Scale 1:5 I Dimensions in mm

D127.de-A2 Crown frieze – Horizontal shadow gap

Without fire resistance

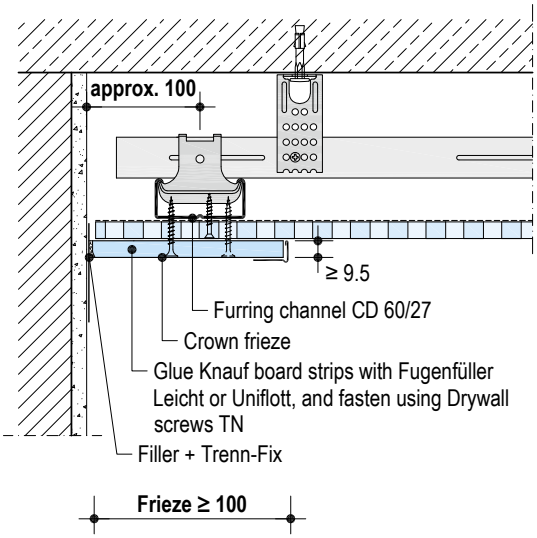


Variant

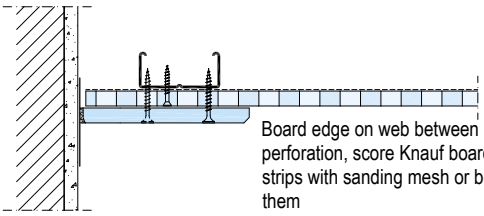


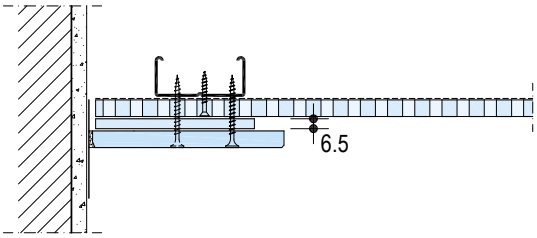
D127.de-D1 Crown frieze

Without fire resistance



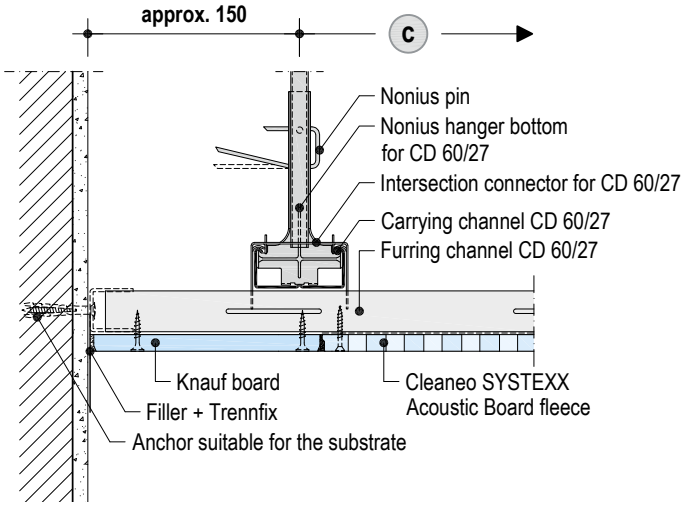
Variants





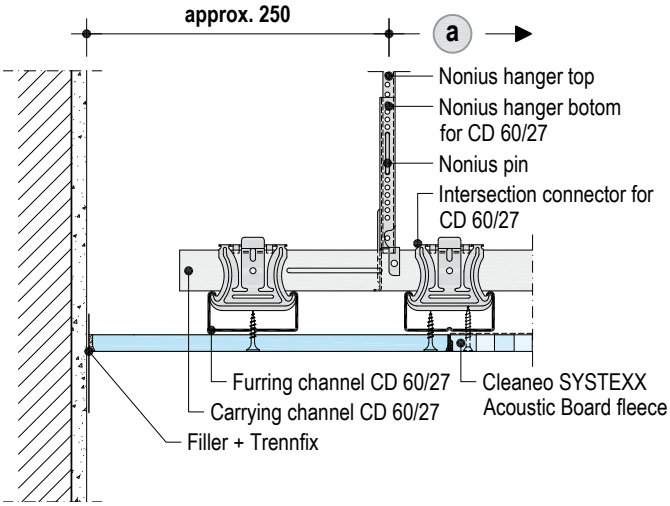
D127.de-A300 Connection to wall – frieze

Without fire resistance



D127.de-D300 Connection to wall – frieze

Without fire resistance

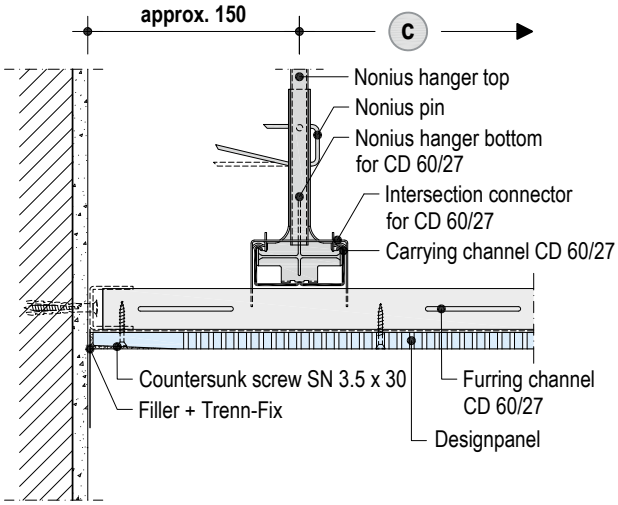


Details

Scale 1:5 I Dimensions in mm

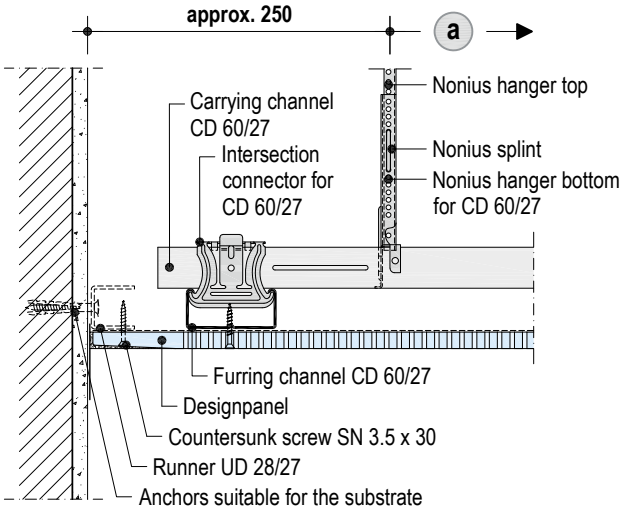
D127.de-A100 Connection to wall – Designpanel

Without fire resistance



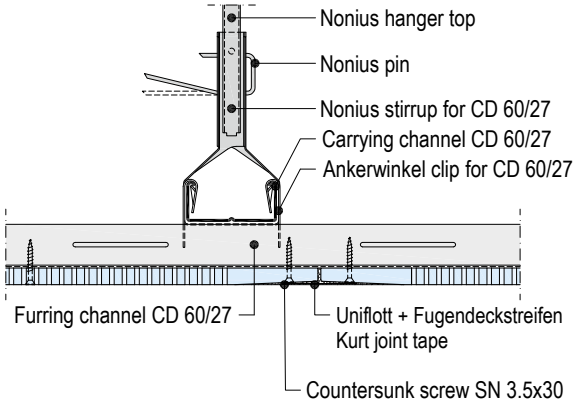
D127.de-D100 Connection to wall – Designpanel

Without fire resistance



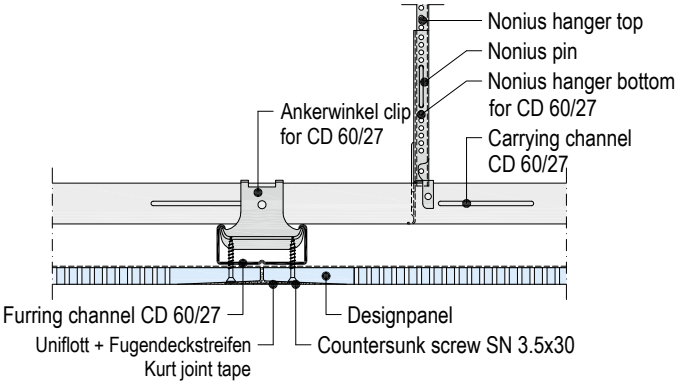
D127.de-B100 Long edge – Designpanel

Without fire resistance



D127.de-C100 Front edge – Designpanel

Without fire resistance

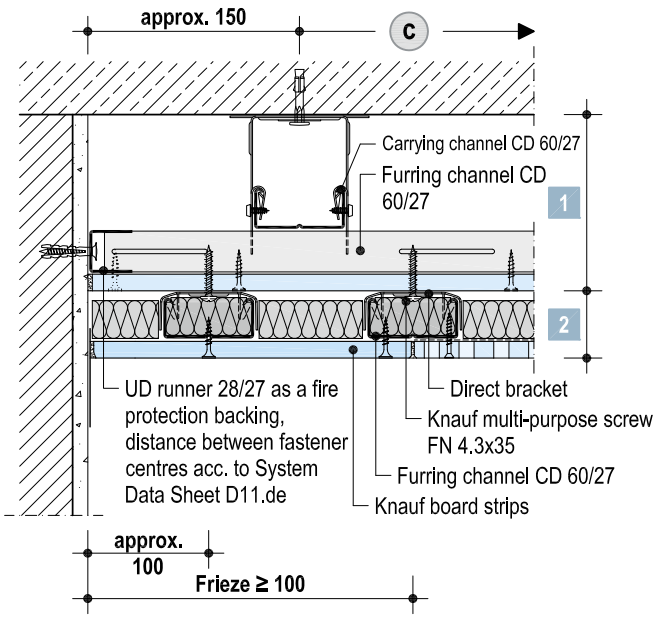


Details

Scale 1:5 I Dimensions in mm

D124.de-vu-A1 Connection to wall

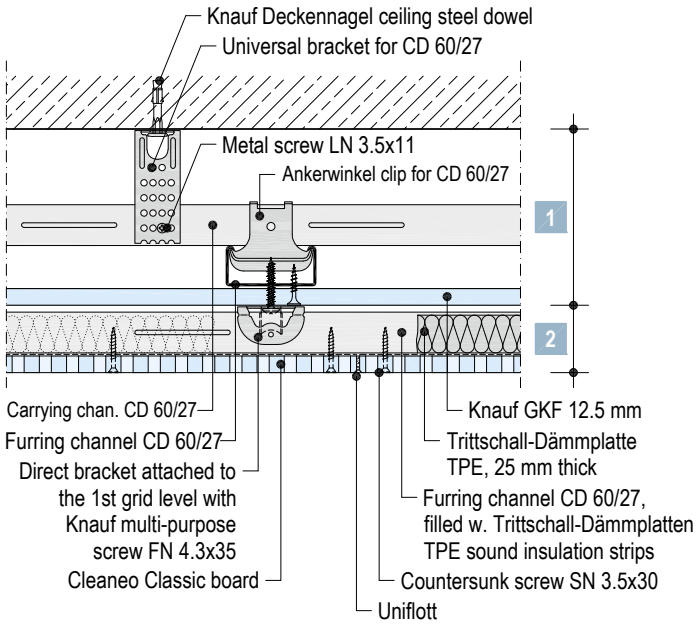
2nd grid level: Furring channel only



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

D124.de-vu-B1 Long edge

2nd grid level: Furring channel only



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

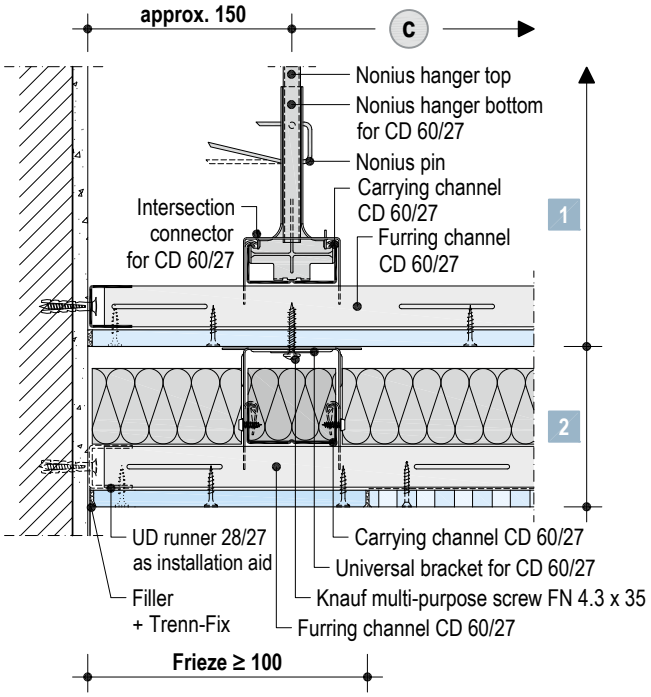
1 *1st Grid level*
2 *2nd Grid level*

Details

Scale 1:5 I Dimensions in mm

D124.de-vu-A2 Connection to wall

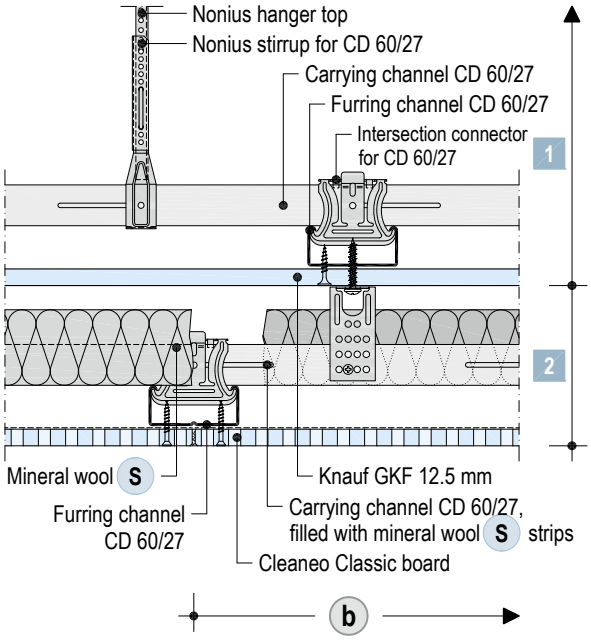
2nd grid level: Carrying and furring channel



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

D124.de-vu-C1 Front edge

2nd grid level: Carrying and furring channel



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

1 *1st grid level*
2 *2nd grid level*

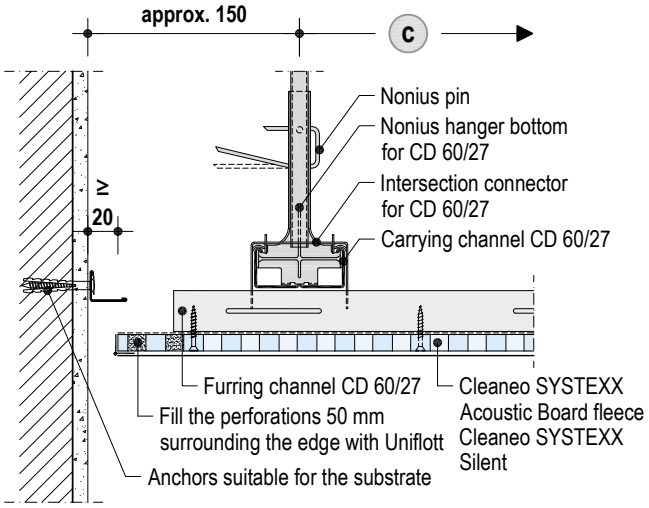
S Mineral wool insulation layer acc. to EN 13162
Non-combustible
Thickness ≥ 50 mm, density ≥ 50 kg/m³
Melting point ≥ 1000 °C; acc. to DIN 4102-17
(insulating material, e.g. from Knauf Insulation)

Details

Scale 1:5 I Dimensions in mm

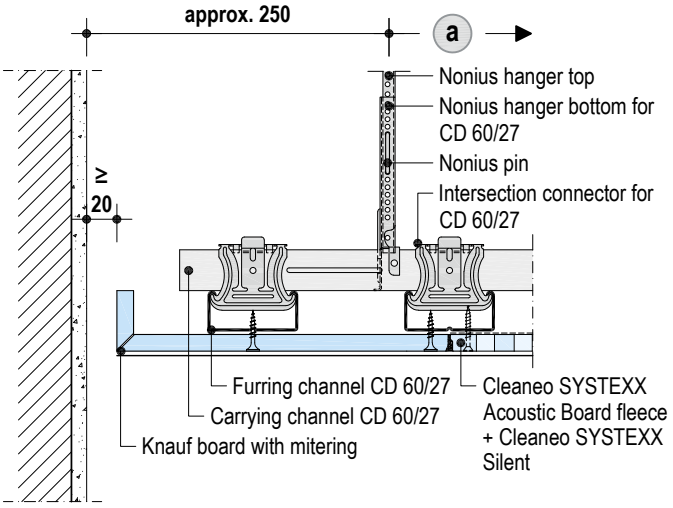
D126S.de-A1 Connection to wall

Without fire resistance



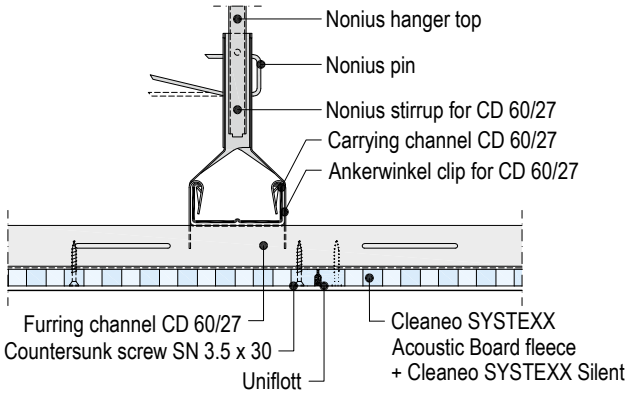
D126S.de-D1 Connection to wall

Without fire resistance



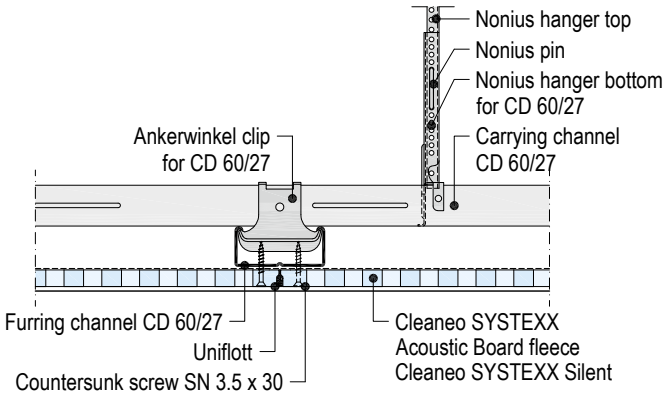
D126S.de-B1 Long edge

Without fire resistance



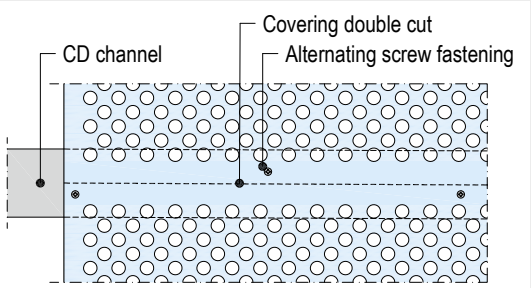
D126S.de-C1 Front edge

Without fire resistance



Note

The screw fixing must alternate the spacing to the centre line of the non-perforated area between the blocks, as the double cut for the wall covering runs along the centre line.

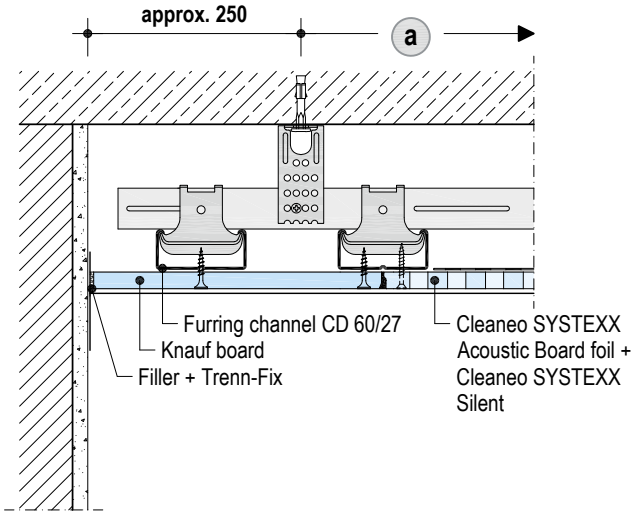


Details

Scale 1:5 I Dimensions in mm

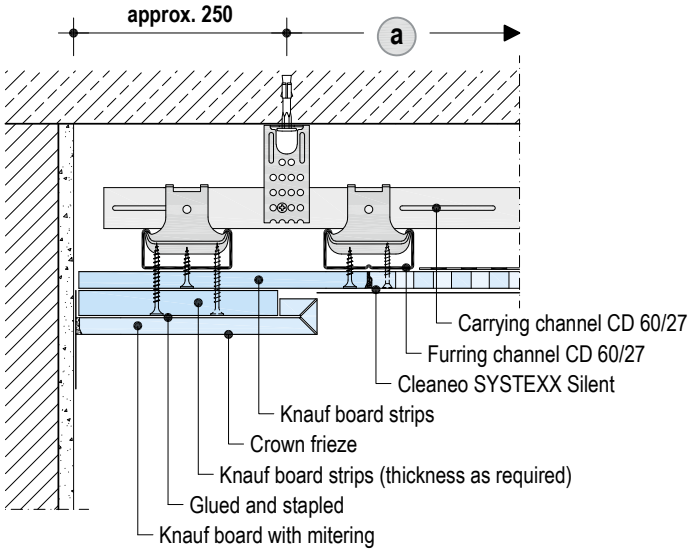
D126S.de-D11 Connection to wall – frieze

Without fire resistance



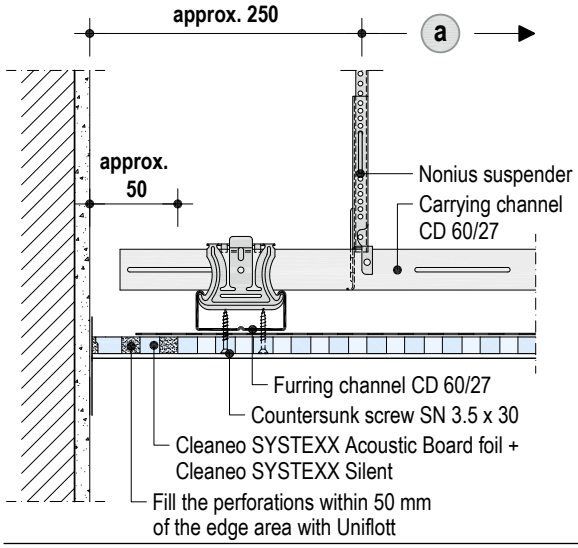
D126S.de-D12 Connection to wall – Crown frieze fitted

Without fire resistance



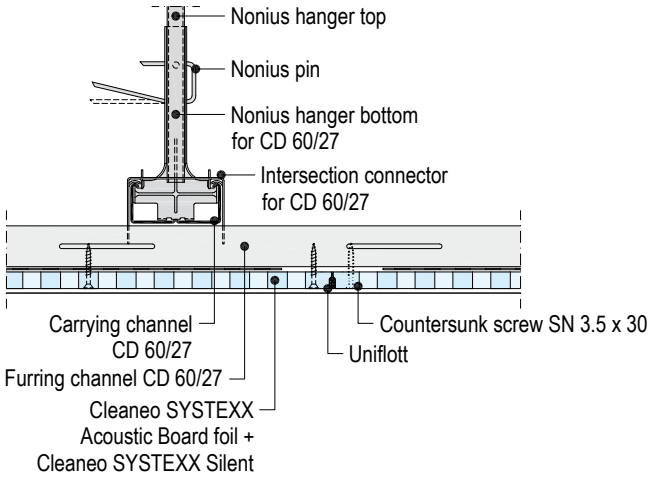
D126S.de-D10 Connection to wall

Without fire resistance



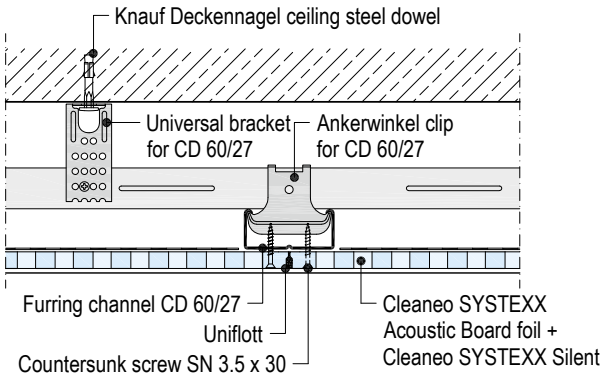
D126S.de-B10 Long edge

Without fire resistance



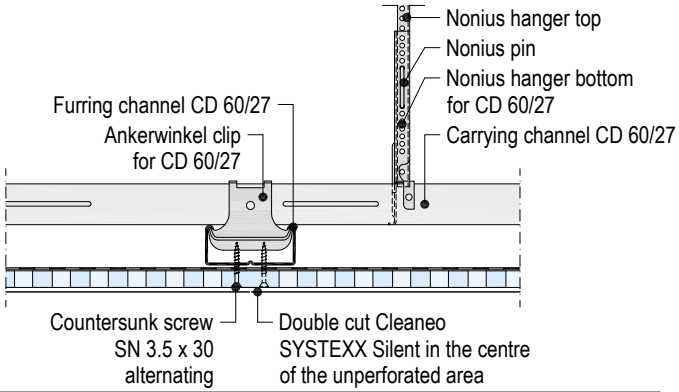
D126S.de-C10 Front edge

Without fire resistance



D126S.de-C11 Front edge

Without fire resistance



Note The screw fastening must alternate the spacing to the centre line of the non-perforated area between the blocks, as the double cut for the wall covering runs along the centre line (see page 72).

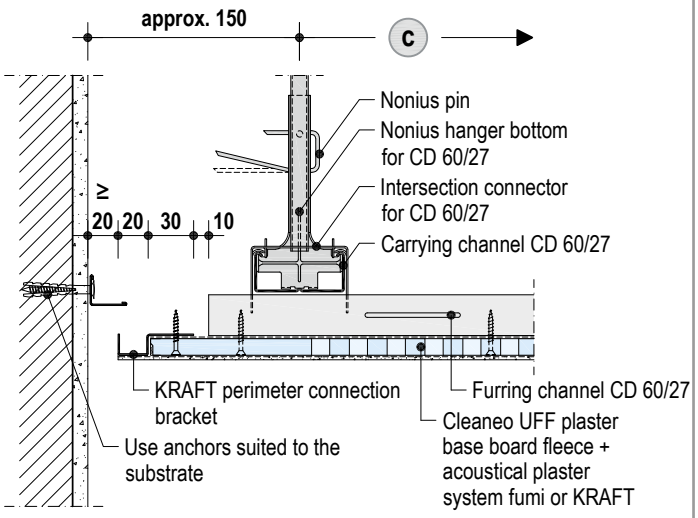
D126U.de Cleaneo Acoustic Board Ceiling UFF for acoustical plaster

Details

Scale 1:5 I Dimensions in mm

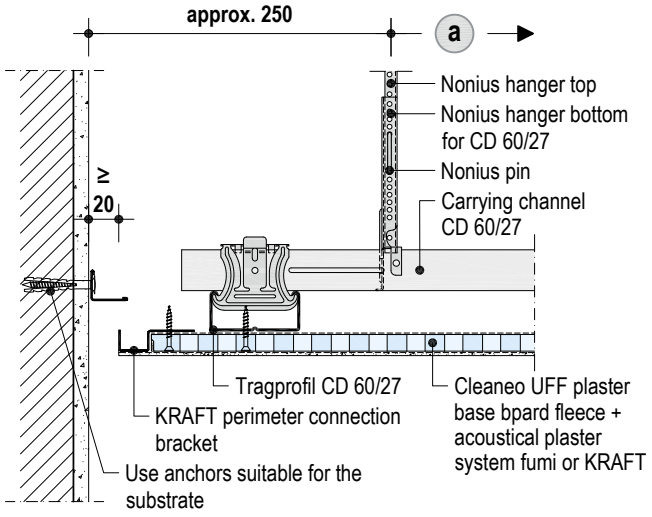
D126U.de-A1 Connection to wall

Without fire resistance



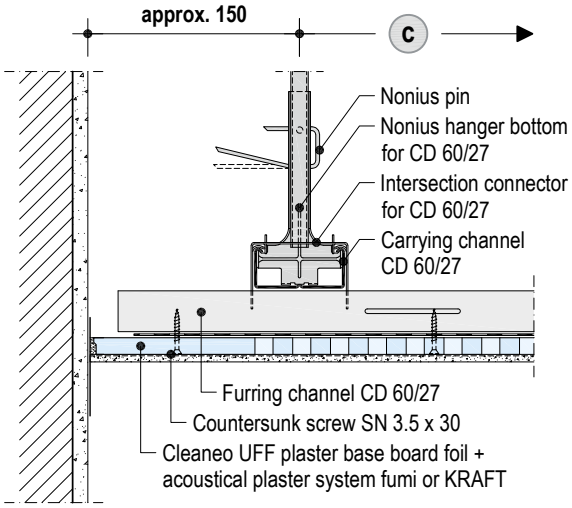
D126U.de-D1 Connection to wall

Without fire resistance



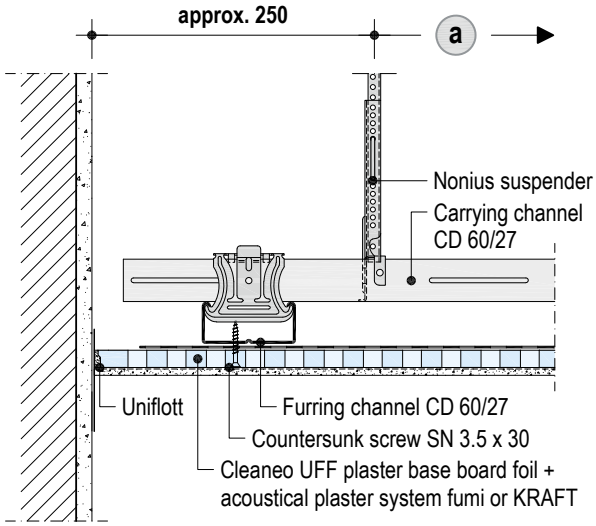
D126U.de-A2 Connection to wall

Without fire resistance



D126U.de-D2 Connection to wall

Without fire resistance



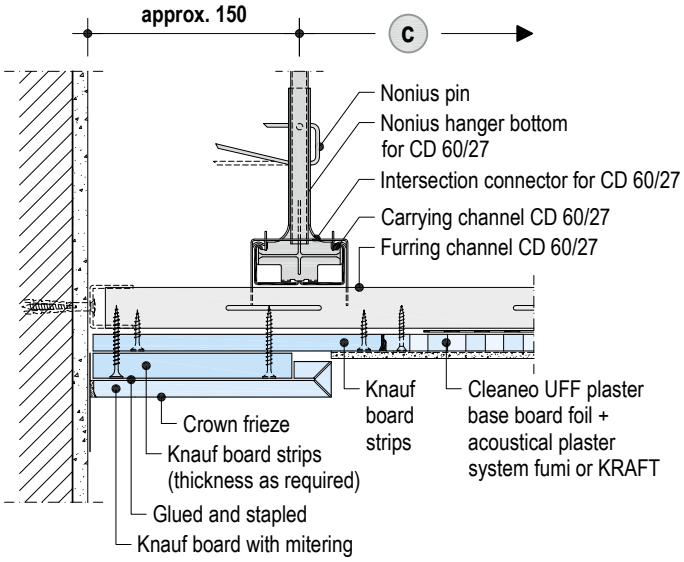
D126U.de Cleaneo Acoustic Board Ceiling UFF for acoustical plaster

Details

Scale 1:5 I Dimensions in mm

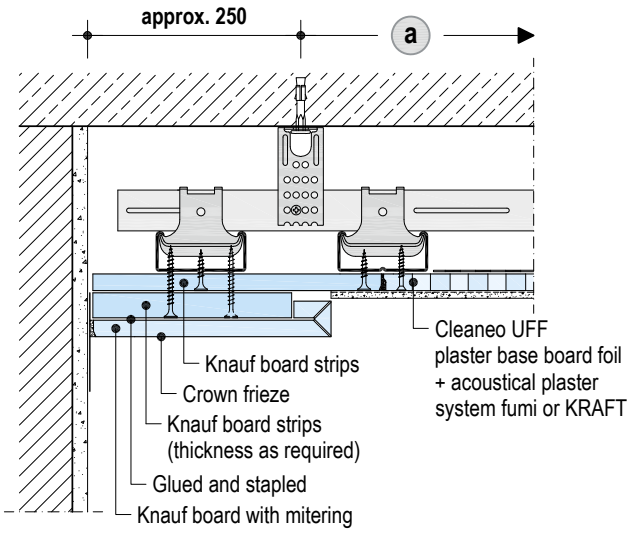
D126U.de-A3 Connection to wall – Crown frieze

Without fire resistance



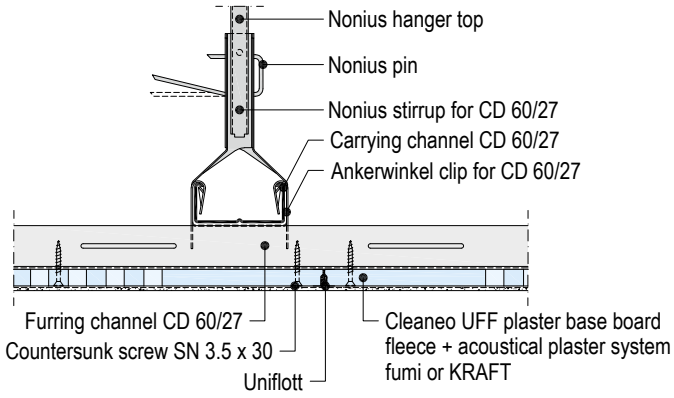
D126U.de-D3 Connection to wall – Crown frieze

Without fire resistance



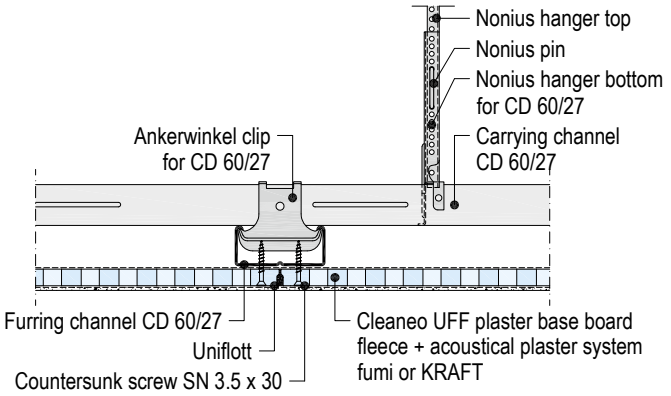
D126U.de-B1 Long edge

Without fire resistance



D126U.de-C1 Front edge

Without fire resistance

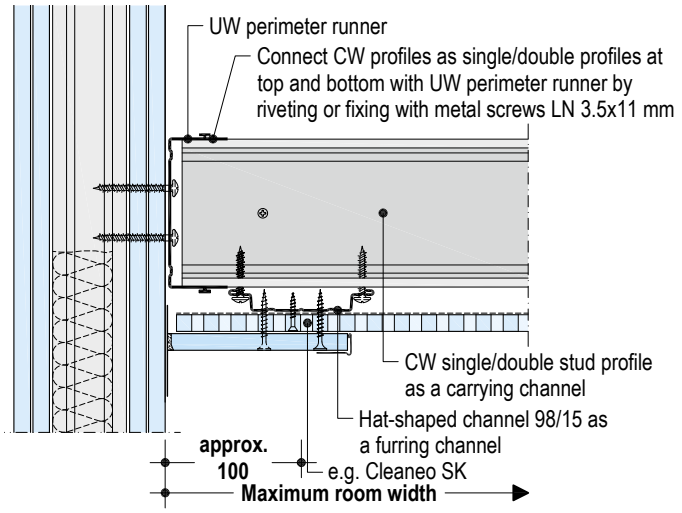


Details

Scale 1:5 I Dimensions in mm

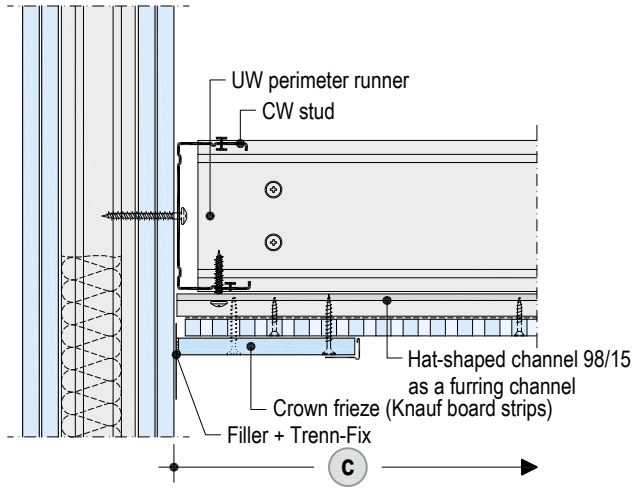
D137.de-D1 Load bearing connection to wall

Without fire resistance



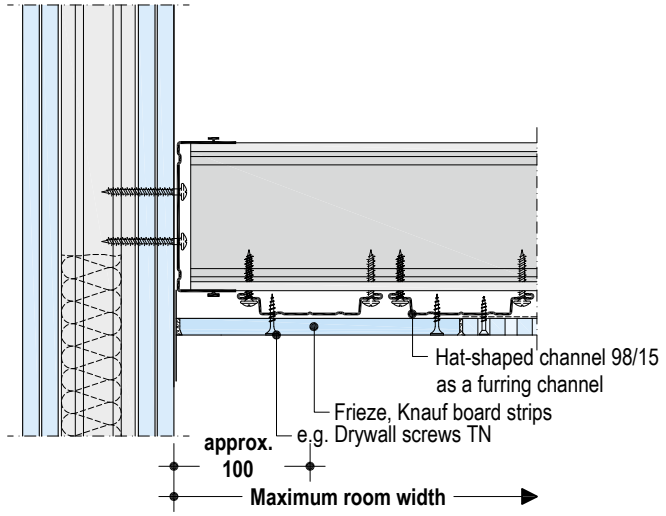
D137.de-A1 Structural connection to wall

Without fire resistance



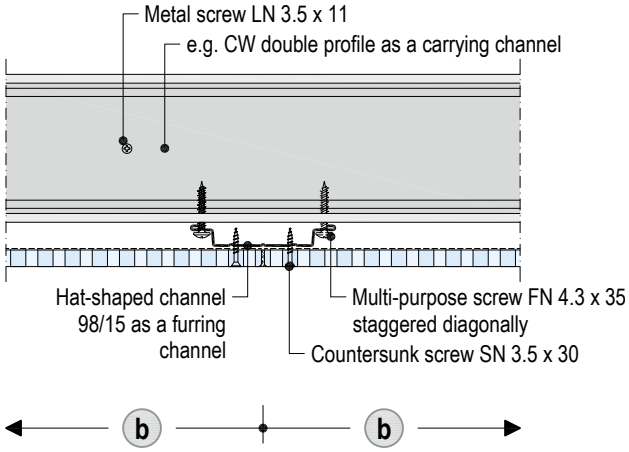
D137.de-D2 Load bearing connection to wall – Frieze

Without fire resistance



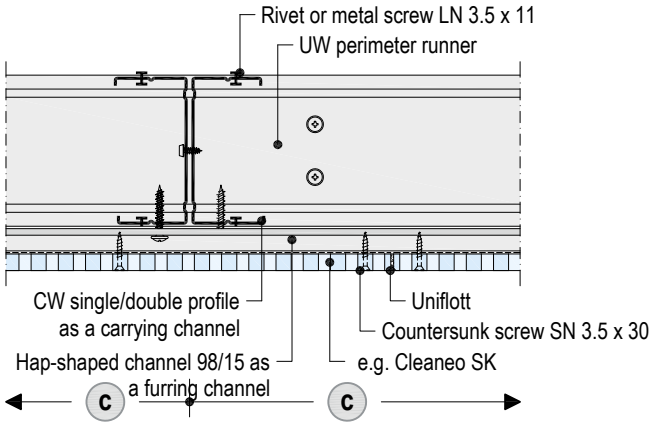
D137.de-B1 Front edge

Without fire resistance



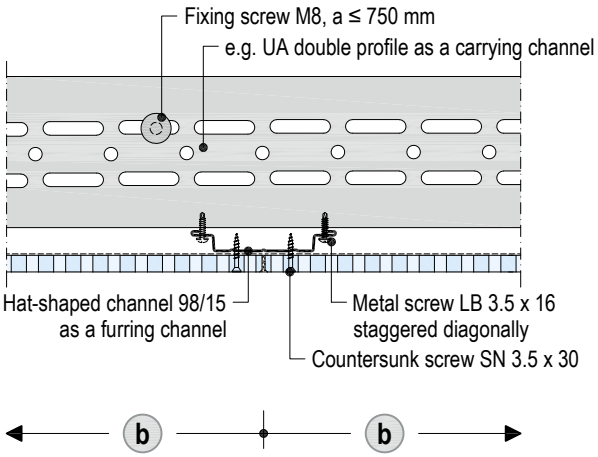
D137.de-C1 Long edge

Without fire resistance



D137.de-B10 Front edge

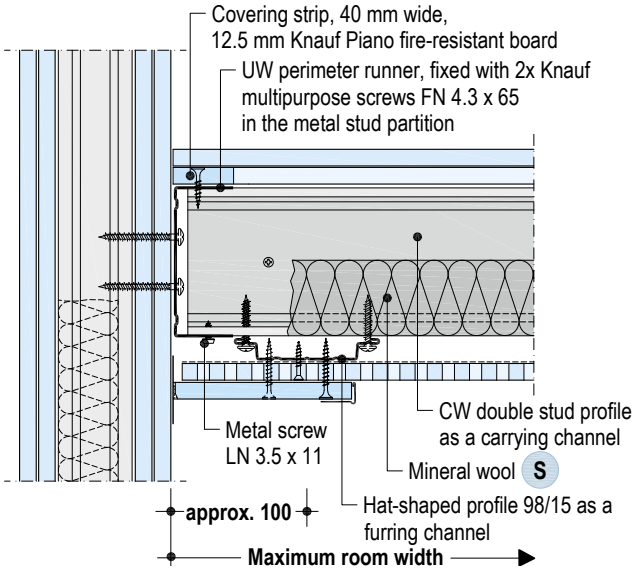
Without fire resistance



Details

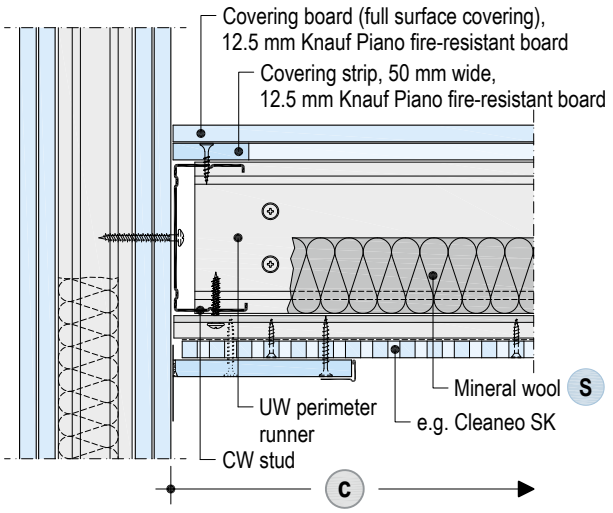
Scale 1:5 I Dimensions in mm

D134.de-vuvo-D1 Load bearing connection to wall



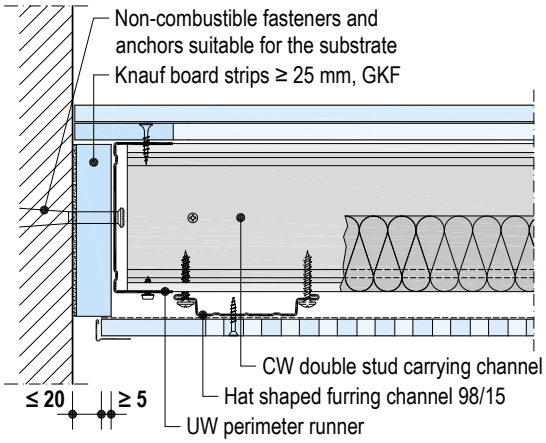
plus **Extension of the fire resistance proof of usability**
Prior consultation in acc. to page 6 recommended

D134.de-vuvo-A1 Structural connection to wall

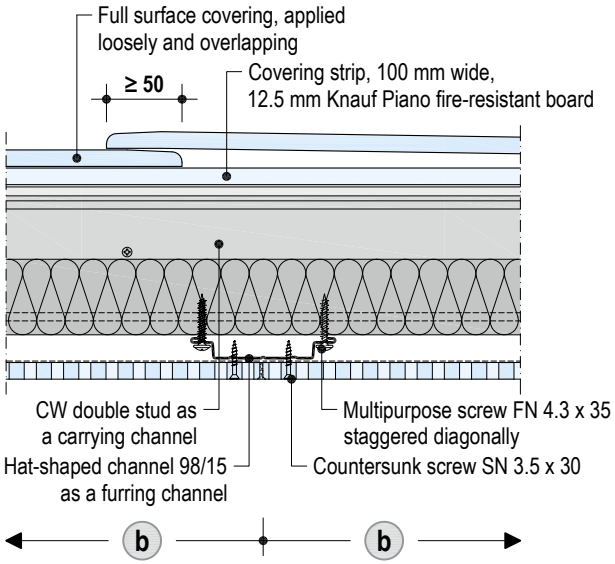


plus **Extension of the fire resistance proof of usability**
Prior consultation in acc. to page 6 recommended

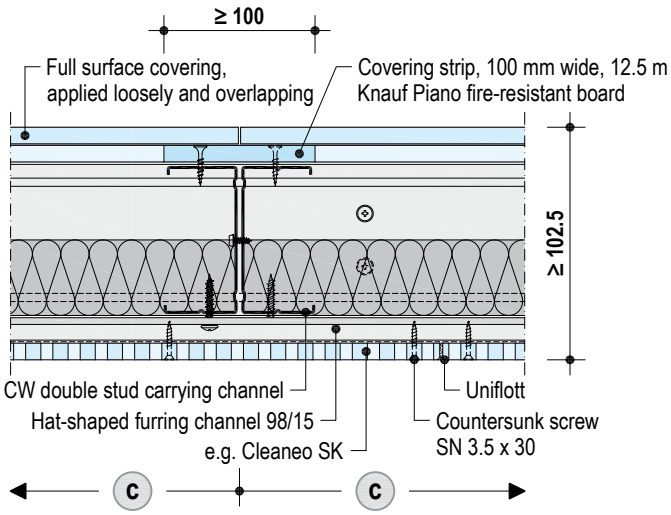
D134.de-vuvo-D2 Load bearing connection to wall – Shadow gap



D134.de-vuvo-B1 Front edge



D134.de-vuvo-C1 Long edge



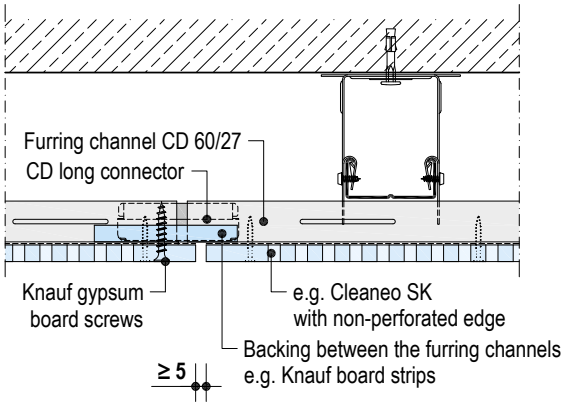
S Mineral wool insulation layer acc. to EN 13162
Non-combustible
Thickness ≥ 50 mm, density ≥ 50 kg/m³
Melting point ≥ 1000 °C; acc. to DIN 4102-17
(insulating material, e.g. from Knauf Insulation)

Expansion joints/movement joints

Scale 1:5 I Dimensions in mm

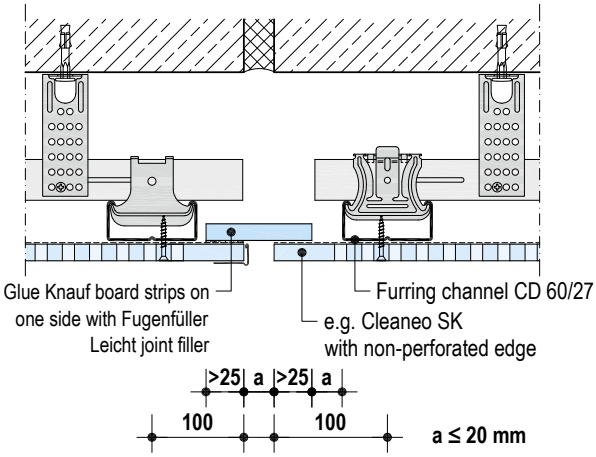
D127.de-SO12 Expansion joint – Long edge

Without fire resistance



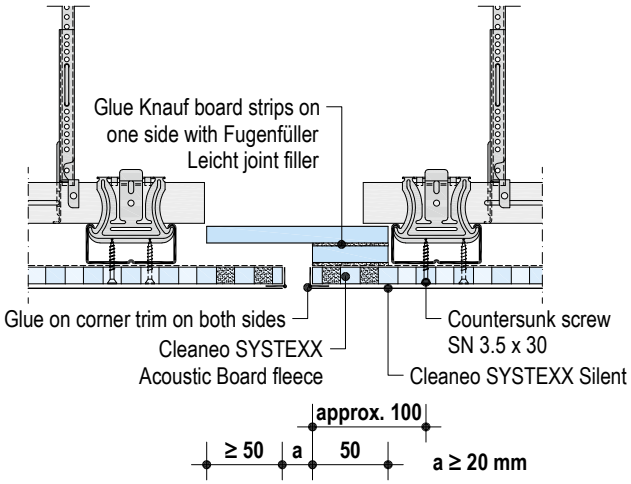
D127.de-SO13 Movement joint

Without fire resistance



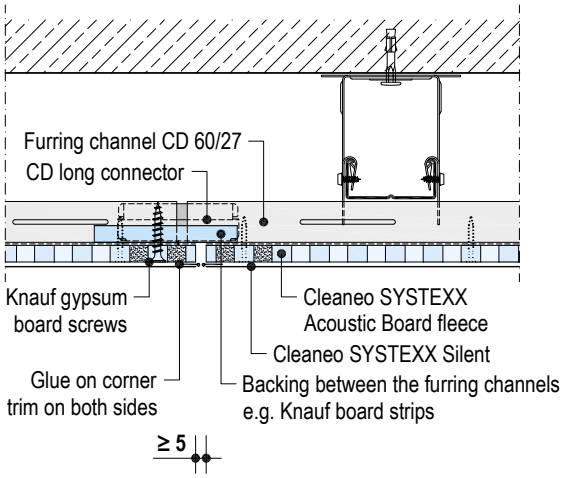
D126S.de-C2 Movement joint

Without fire resistance



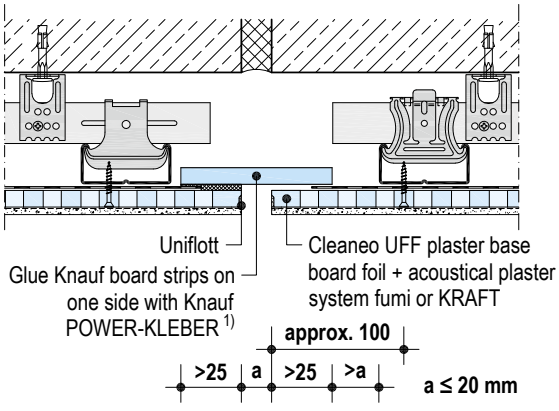
D126S.de-SO10 Expansion joint – Long edge

Without fire resistance



D126U.de-C4 Movement joint

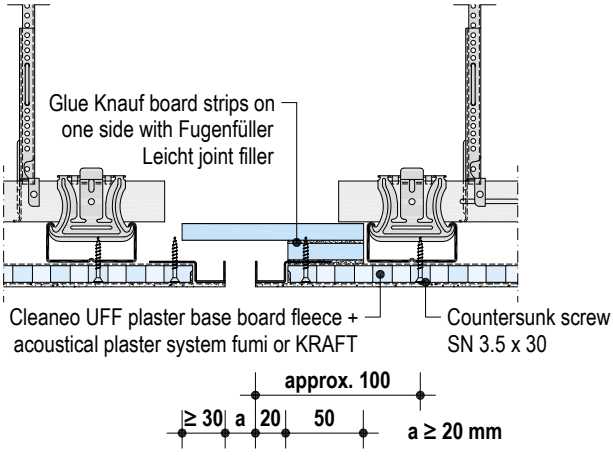
Without fire resistance



1) Knauf Bauprodukte GmbH

D126U.de-C2 Movement joint

Without fire resistance

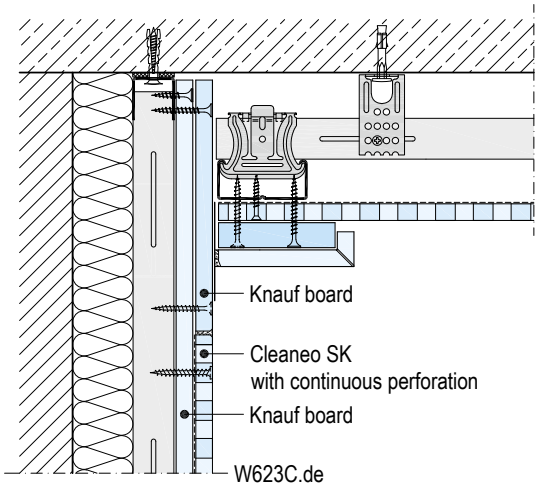


Details

Scale 1:5 I Dimensions in mm

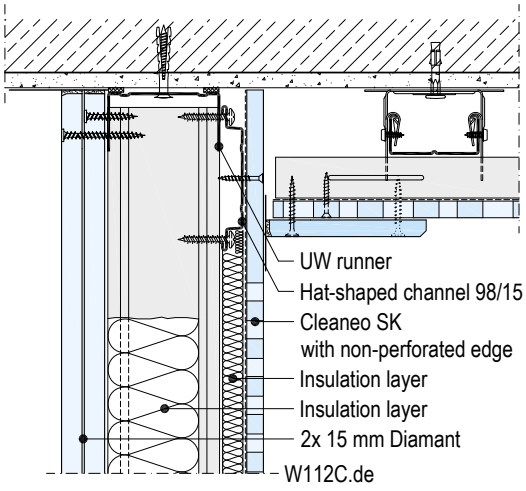
D127.de-SO14 Ceiling connection to furring

Without fire resistance



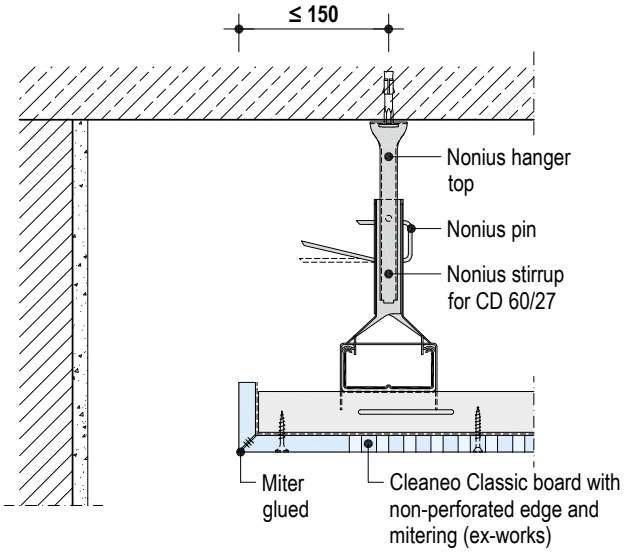
D127.de-SO15 Ceiling connection to partition

Without fire resistance

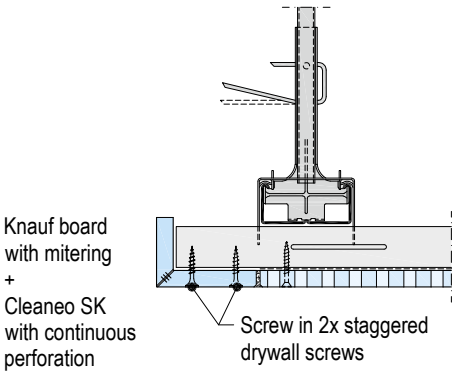


D127.de-SO7 Canopy

Without fire resistance

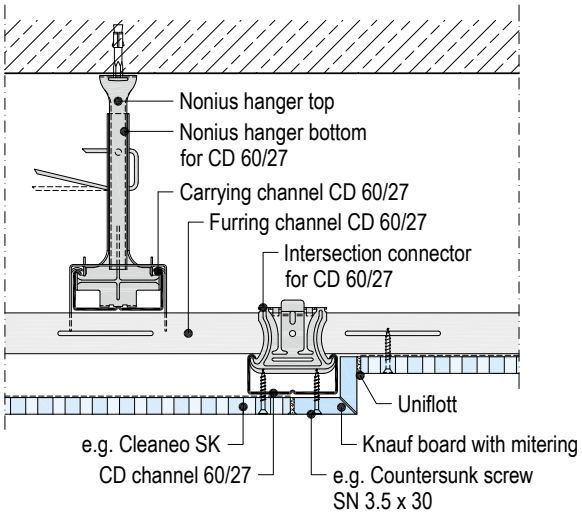


Variant



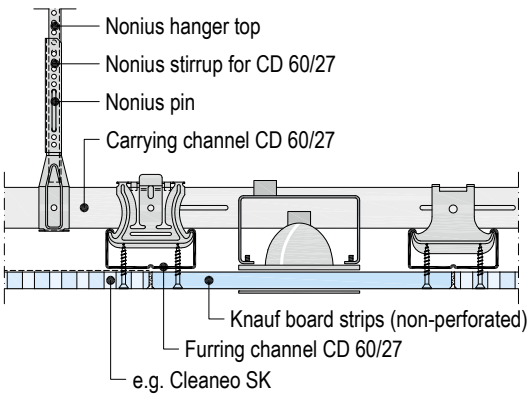
D127.de-SO3 Split level ceiling

Without fire resistance



D127.de-SO16 Ceiling spotlight installation

Without fire resistance



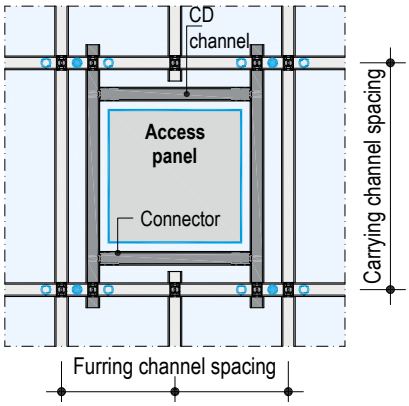
Access panel for Cleaneo Acoustic Board Ceilings

Scheme drawings I Dimensions in mm

General grid design

Top view

Double layer profile e.g. D127.de



Legend

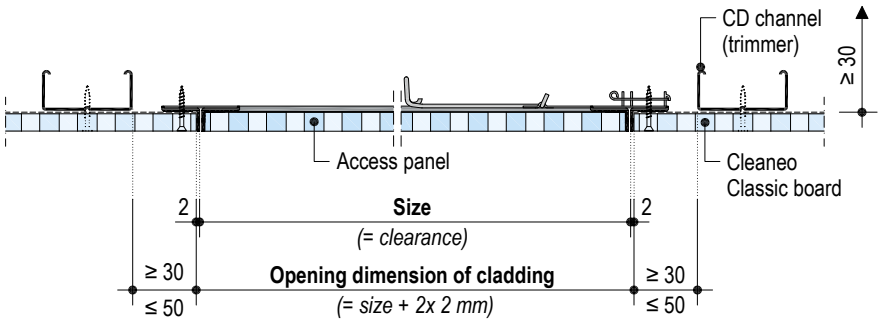
	Additional grid
●	*4 additional suspension points (e.g. Nonius suspension)*
○	*Alternative suspension points*

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

Knauf access panel REVO Lochplatte 12.5

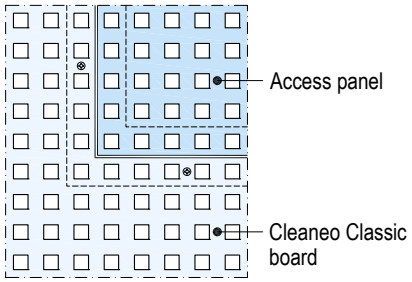
Installation with Cleaneo Classic or Designpanel

Vertical section



Ceiling bottom view

Design, e.g.
standard square perforation 12/25 Q

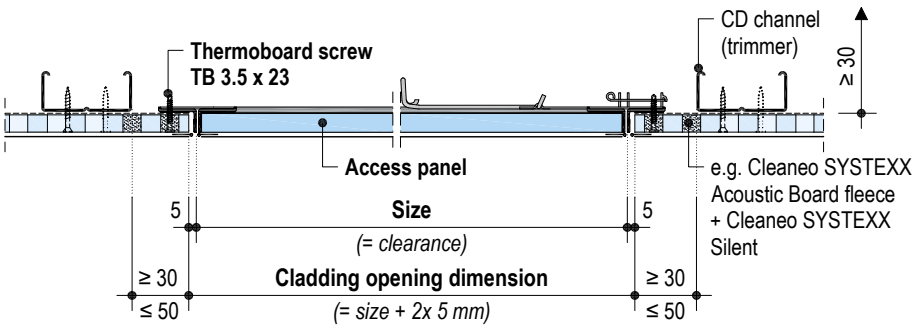


Notes	
	Cladding thickness, dimensions, available options and further information, see product data sheet E112C.de REVO perforated board 12.5
	Observe the enclosed installation instructions of the access panels.

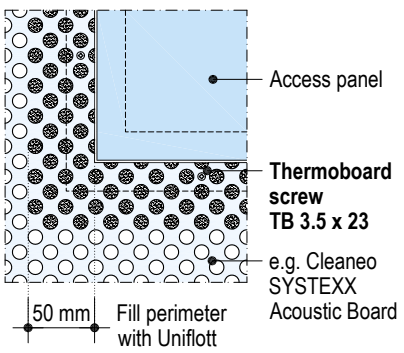
Knauf access panel REVO 12.5

Installation with Cleaneo UFF plaster base board or Cleaneo SYSTEXX Acoustic Board

Vertical section



Ceiling bottom view

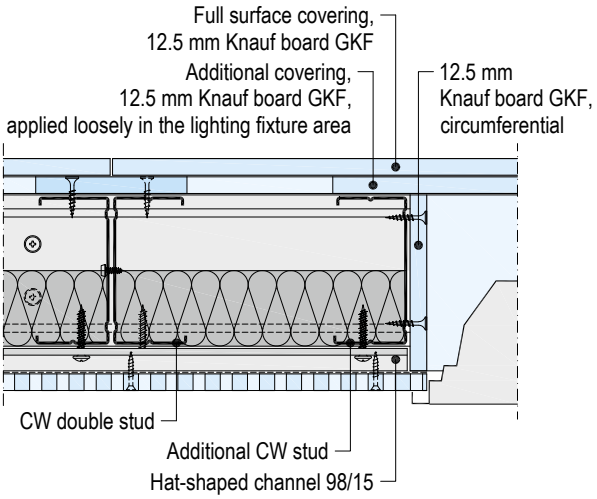


Notes	
	Screw fix the frame of the access panel at entire perimeter with **Thermoboard screws TB 3.5 x 23 mm**.
	Dimensions, available options and further information, see product data sheet E112.de REVO 12.5.
	Observe the enclosed installation instructions of the access panels.

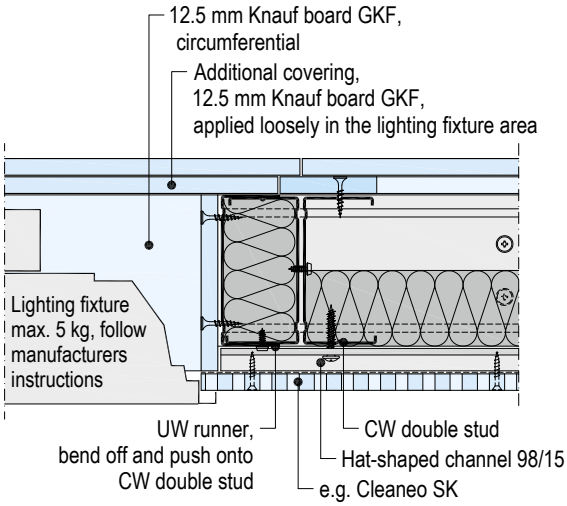
Fire resistance encasement F30 for lighting fixtures

Scale 1:5 I Dimensions in mm

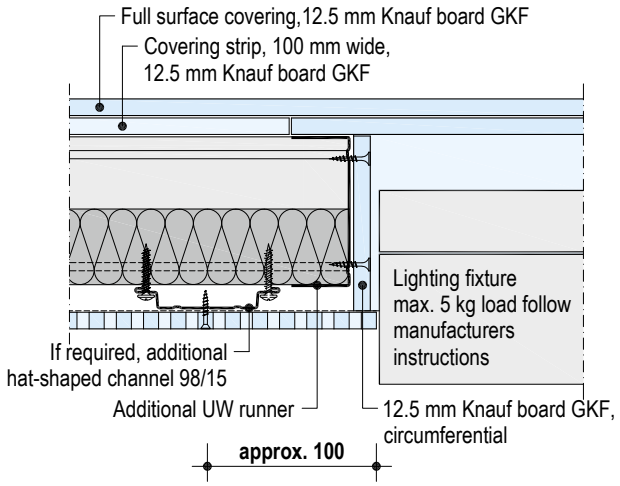
D134.de-SO-C1 Lighting fixture – cross-section



D134.de-SO-C2 Lighting fixture – cross-section

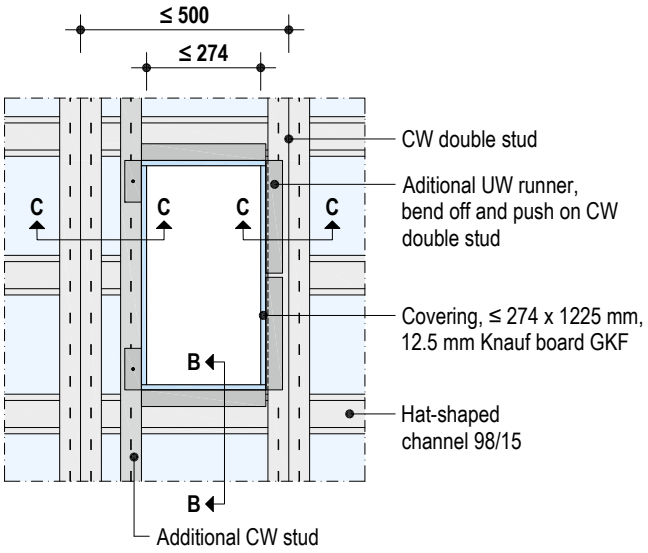


D134.de-SO-B1 Lighting fixture – longitudinal section

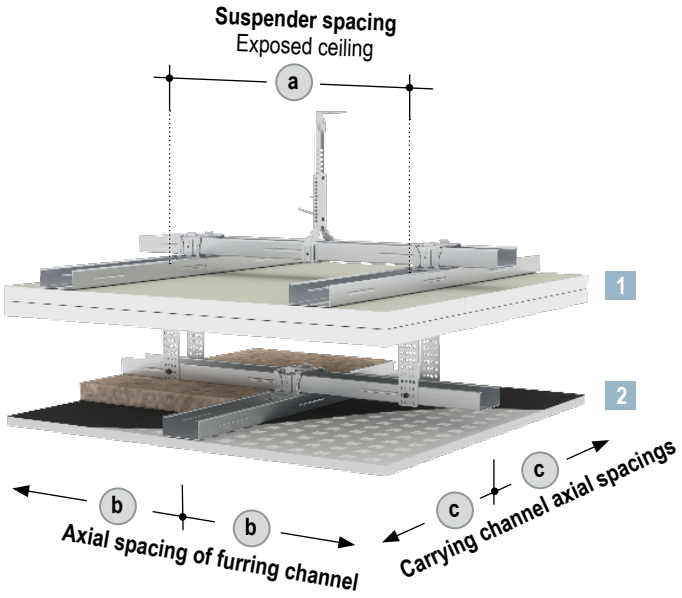


Top view

Scheme drawings I Dimensions in mm



Exposed ceiling under fire protection ceiling



Legend

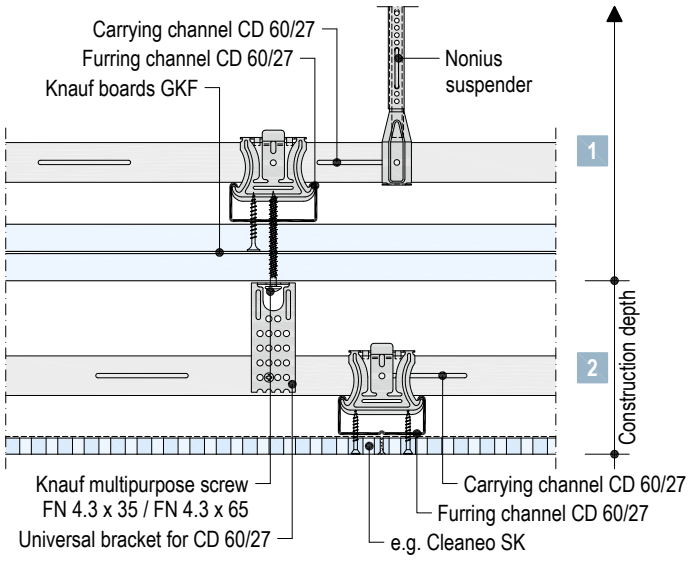
1 *Fire protection ceiling e.g. D112.de*

2 *Revealed ceiling D127.de*

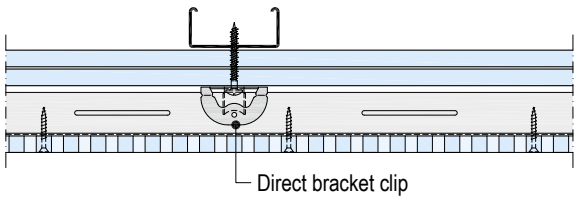
Detail

Scale 1:5

D127.de-SO8 Front edge – multi-level ceiling system



Revealed ceiling - alternative:



plus **Extension of the fire resistance Proof of Usability**
■ Due to multi-level ceiling system design
Prior consultation in acc. to page 6 is recommended.

1 Axial spacings fire protection ceiling

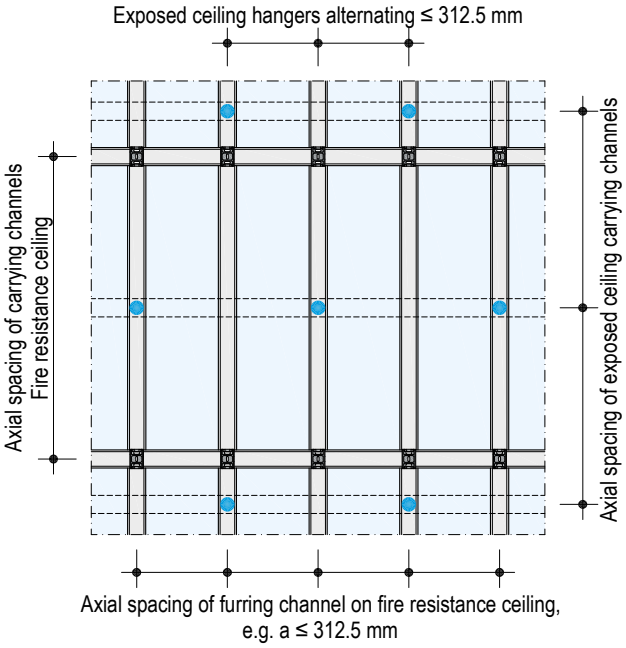
The additional load of the suspended ceiling (exposed ceiling ≤ 0.15 kN/m²) must be considered with the grid of the fire protection ceiling, see system data sheet D11.de Knauf Board Ceiling section "*Dimensioning of the grid*". The spacings of the fire protection ceiling grid result from the specifications of the respective system ceilings taking the additional weight of the exposed ceiling into consideration.

2 Maximum axial spacings of exposed ceiling Dimensions in mm

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

1) Load class in kN/m² up to 0.15

Alternating fastening of the suspenders of the exposed ceiling



● *Suspenders of exposed ceiling*

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

Notes

Fire protection ceiling: System D112.de, D113.de or D116. de possible (see system data sheet D11.de Knauf Board Ceilings).

Always apply suspended channels of exposed ceiling lateral to furring channel of the fire resistance ceiling.

Load of exposed ceiling per suspension point maximum 100 N.

Installation of the grid

Anchoring to basic ceilings

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

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

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

With system D124.de, anchor the universal brackets/direct brackets of the 2nd grid level in the furring channels of the 1st grid level with Knauf multi-purpose screw FN 4.3x35.

Suspension

Suspension of the carrying and furring channels exclusively with suspenders acc. to page 60 and page 61.
Refer to the system tables in the *"Data for planning"* section for the anchoring spacings on ceilings and profiles.

Connection to wall

Perimeter connection profile UD 28/27 as a load bearing connection, installation aid or with fire resistance.
Anchoring to the substrate with suitable fasteners/anchors, spacing maximum 1 m (non-load bearing) or 625 mm (load-bearing).
Further information for application as a load-bearing or non-load bearing connection, see system data sheet D11.de Knauf Board Ceilings.

Note	With system D124.de, a load-bearing connection in acc. to system data sheet D11.de Knauf Board Ceilings may be required for frieze application. Observe permissible overhangs of the cladding and the grid.

Scheme drawings

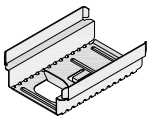
Profiles

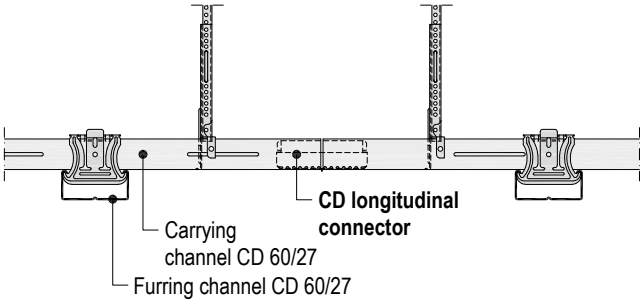
Connect the carrying channels with suspenders and align flush at the required suspension height.

With system D124.de, clip in the 2nd grid level as a construction variant with single layer profile grid furring channels into the direct brackets.

Profile connections

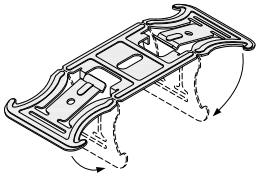
Implement the longitudinal joints of the carrying and furring channel CD with CD longitudinal connectors. Stagger all profile joints.





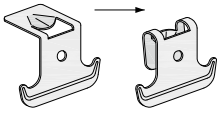
With a double layer profile grid, the connection of the carrying and furring channels as the intersections is undertaken with:

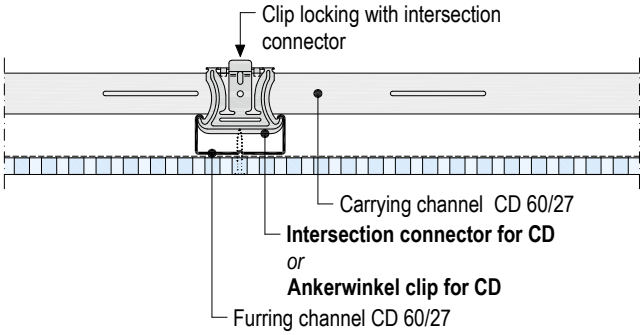
- Intersection connectors for CD 60/27:
  Before the installation, bend to 90° and after installation close the clip lock to ensure a secure hold.



- 2x Ankerwinkel clips for CD 60/27 (alternative)

  Bend with assembly.





Installation of the grid – free-spanning CW profiles

Carrying channel

Carrying channels made of Knauf CW profiles as single or double profiles. In case of fire protection requirements, only double profiles are permissible. Double profile: Screw fastening with metal screws LN 3.5 x 11 at spacings of ≤ 750 mm.

Load-bearing connection to wall

Apply a load-bearing perimeter connection made of UW profiles. Anchoring acc. to table below.
Connect CW profiles as double profiles at the web with metal screws LN 3.5 x 11 at a spacing of max. 750 mm.
Support of the CW profiles in the UW runners ≥ 30 mm. Connect the upper and lower flanges of the UW runner / CW profiles (with double profiles both flanges) by riveting, screw fixing or crimping. For system D134.de the connection of the upper flanges is not necessary.

Structural connection to wall

Apply a structural perimeter connection made of UW runners or CW profiles. Distance between fastener centres maximum 625 mm. Fasten to solid walls with Knauf nailable plugs, on lightweight partitions with Knauf multi-purpose screws FN 4.3 x 65 in every stud of the partition.

Furring channels

Fasten the hat-shaped channel as a furring channel laterally to the free-spanning carrying channels CW at the necessary axial spacing (dependent on the design and perforation) using 2 diagonally offset multi-purpose screws FN 4.3 x 35 at every junction point. (With carrying channel UA use metal screws LB 3.5 x 16).

Additional measures with system D134.de

Attach Knauf Piano fire-resistant boards, 12.5 mm thick, 100 mm wide, as covering strips on CW double profiles with TN 3,5 x 25 alternating at clearances of ≤ 250 mm. Also attach covering strips, 40 mm or 50 mm wide to the UW perimeter runners / CW profiles.

Anchoring of the supporting UW perimeter runners with CW carrying channels

Anchoring substrate	Fastener		Maximum distance between fastener centres D137.de mm	Maximum distance between fastener centres D134.de mm
Metal stud partitions (anchoring in metal studs or Flex Profiles)	2x Multi-Purpose Screws FN 4.3 x 35 Cladding thickness ≤ 20 mm		625	625
	2x Knauf Multi-Purpose Screws FN 4.3 x 65			
Reinforced concrete wall	Knauf Ceiling Steel Dowels		300	300
	Knauf Nailable Plug L 8/80			–
Stable masonry without cavities or light concrete (density ≥ 1000 kg/m³)	Knauf Nailable Plug L 8/80		300	–
	Fasteners and anchors suitable for the substrate		300 [1)]	–
	Non-combustible fasteners and anchors suitable for the substrate		–	300 [1)]
Other substrates	Fasteners and anchors suitable for the substrate		300 [1)]	–
	Non-combustible fasteners and anchors suitable for the substrate		–	300 [1)]

1) Minimum load-bearing capacity: Shear 0.35 kN.

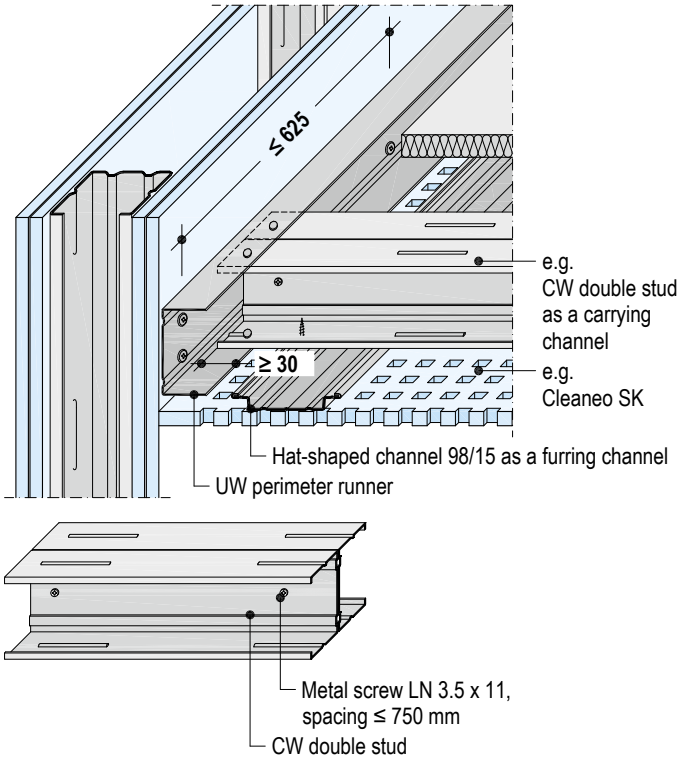
With fire protection up to F30 and a room width ≤ 2.25 m the number of screws can be halved or the spacing for the fasteners can be doubled.

Note	Application and connection of the grid with free-spanning UA profiles in acc. with system data sheet D13.de Knauf Free-Spanning Ceilings.

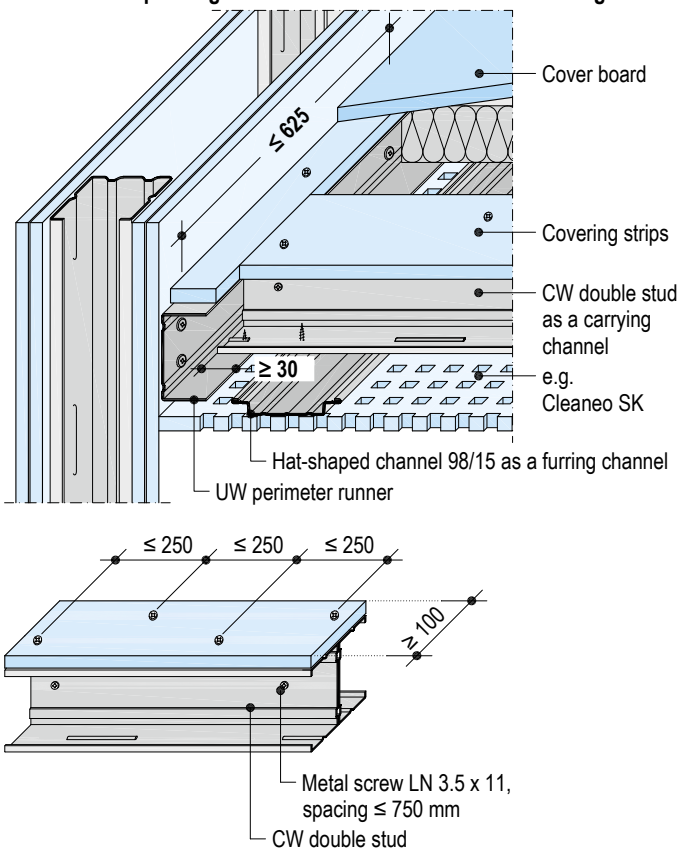
Connection to wall

Scheme drawings I Dimensions in mm

D137.de Free-Spanning Cleaneo Acoustic Board Ceiling



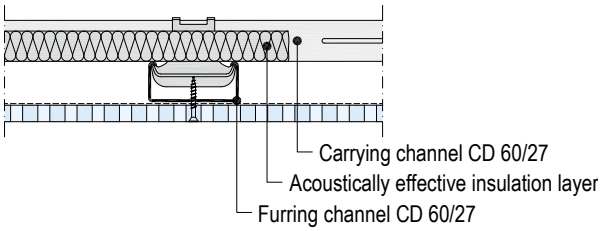
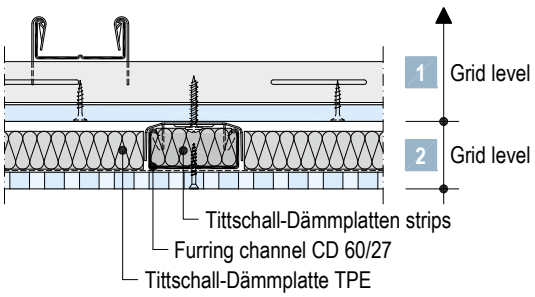
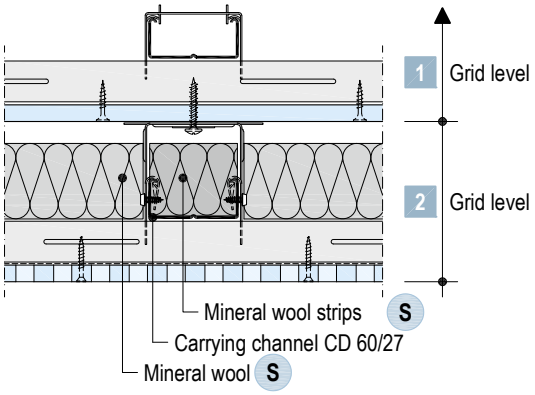
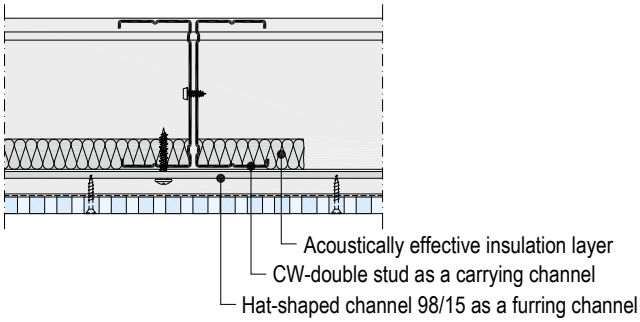
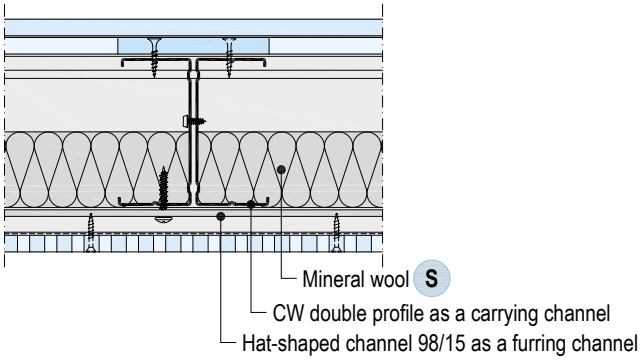
D134.de Free-Spanning Cleaneo Acoustic Fire Protection Ceiling



Note	
	The free-spanning carrying channels may not be joined or extended.
	Application and connection of the grid with free-spanning UA profiles in acc. with system data sheet D13.de Knauf Free-Spanning Ceilings.

Arrangement of the insulation layers

Scheme drawings

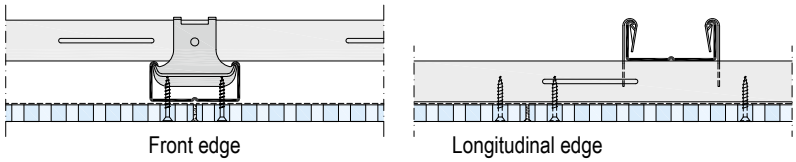
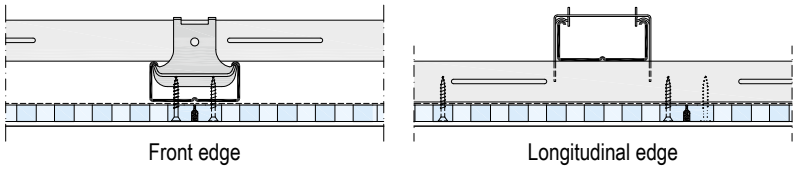
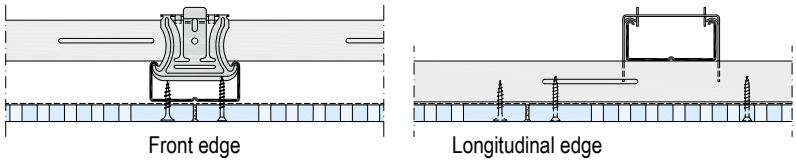
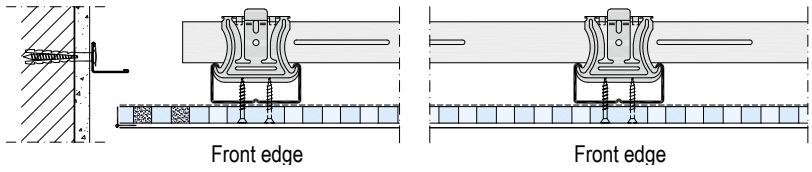
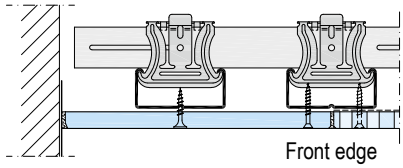
Configuration	**Insulation layer** (see also page 40)
D127.de / D126S.de / D126U.de 	Acoustically effective insulation layer: Lay the insulation layer on the furring channels.
D124.de 	**2nd grid level: Furring channels only – direct bracket** Obligatory fire protection related insulation layer: Fill furring channels of the 2nd grid level with footfall sound insulation strips. Apply Trittschall-Dämmplatten TPE “directly” between the furring channels of the 2nd grid level.
	**2nd grid level: Carrying and furring channel – universal brackets** Obligatory fire protection related insulation layer: Fill the carrying channels of the 2nd grid level with mineral wool S strips (the insulation material can be recessed in the intersection connector area). Apply mineral wool S between the carrying channels (on the furring channels) of the 2nd grid level.
D137.de 	Acoustically effective insulation layer: Apply the insulation layer between the CW single profiles/CW double profiles (carrying channels).
D134.de 	Obligatory fire protection related insulation layer: Apply mineral wool S between the CW double profiles (carrying channels)

Top side covering layer

System D134.de (F30 solely from below and from above).
Apply a loose top covering layer laterally on the double profiles made of Knauf Piano Fire-Resistant Board 12.5 mm and overlap the longitudinal joints by at least 50 mm. Arrange the front edge joints at the centre of the CW double profiles.

Fastening of the cladding

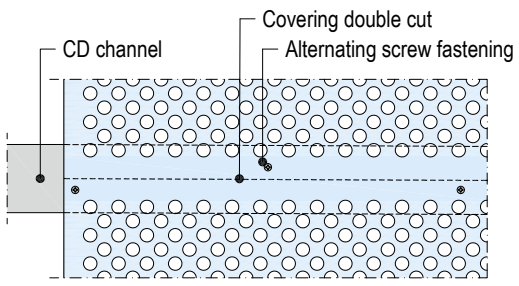
Scheme drawings I Dimensions in mm

Fastening with screws	Fasteners – screw spacing 170 mm
Continuous perforation Cleaneo Classic  	Screw fastening in the continuous perforation area: **Countersunk screw SN 3.5 x 30** alt. **Contrapanel ceiling screw 3.5 x 25** (Cleaneo Complete)
Continuous perforation SYSTEXX Acoustic Board  	Screw fastening in the continuous perforation area: **Countersunk screw SN 3.5 x 30**
Non-perforated edge Cleaneo Classic  	Screw fastening of non-perforated edge: **Drywall screw TN 3.5 x 25** or **Countersunk screw SN 3.5 x 30** alt. **Contrapanel ceiling screw 3.5 x 25** (Cleaneo Complete)
Non-perforated area SYSTEXX Acoustic Board  	Screw fastening non-perforated area: **Countersunk screw SN 3.5 x 30**
Frieze  	Screw fastening of non-perforated frieze: **Drywall screw TN 3.5 x 25** or **Countersunk screw SN 3.5 x 30** alt. **Contrapanel ceiling screw 3.5 x 25** (Cleaneo Complete)

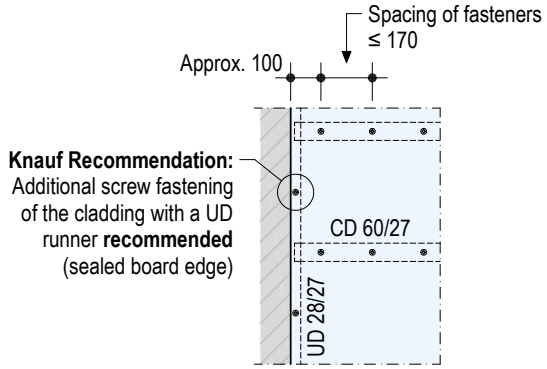
Notes

D126U.de and **D126S.de:** For installation of built-in such as e.g. access panels, **Thermoboard screws TB 3.5 x 23 mm** at entire perimeter.

D126S.de: The screw fixing must alternate the spacing to the centre line of the non-perforated area between the blocks, as the double cut for the wall covering runs along the centre line.

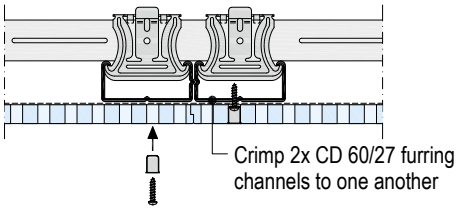
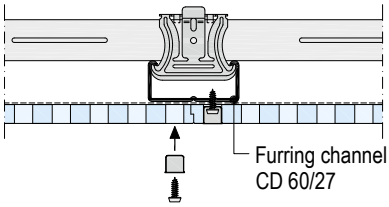
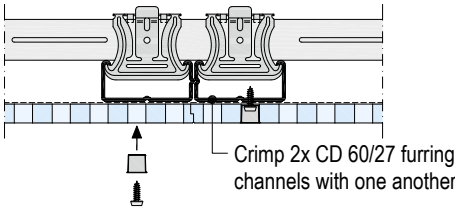


Additional screw fastening UD runner



Fastening of the cladding

Scheme drawings

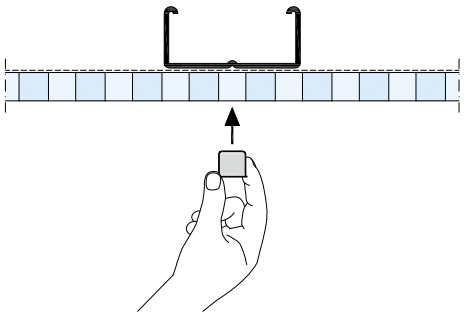
Fastening with Cleaneo Caps	Fasteners – screw spacing 170 mm
Circular perforation 8/18 R  	**Cleaneo Cap 8R** (with enclosed screws) Screw fastening on board joints in the second perforation row. Arrange two furring channels on the front edge joints and crimp them together).
Circular perforation 10/23 R or alt. 12/25 R  	**Cleaneo Cap 10R** (with enclosed screws) alt. **Cleaneo Cap 12R** (with enclosed screws) Screw fastening on board joints in the first perforation row.
Square perforation 12/25 Q  	**Cleaneo Cap 12Q** (with enclosed screws) Screw fastening on board joints in the second perforation row. Arrange two furring channels on the front edge joints and crimp them together). Not permissible with fire resistance requirements.

Cleaneo Caps

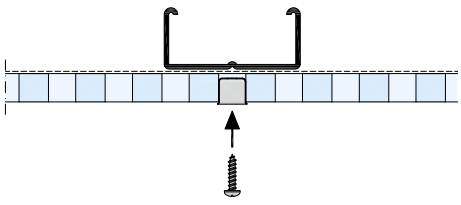
- Fastening for Cleaneo Classic boards with perforations 8/18 R, 10/23 R, 12/25 R and 12/25 Q
- Optically matched to the perforation design
- Concealed installation
- Filling the screws is no longer required

Notes	Can be used with ball impact safety. Can only be used at normal room climatic conditions. Not permissible for systems D126S.de or D126U.de The relative air humidity of the room may only briefly exceed a level of 65 %. For detailed information relating to installation of Cleaneo linear Boards, see Installation guide K761L-A01. For further infomation see product data sheet K533.de Knauf Cleaneo Caps.

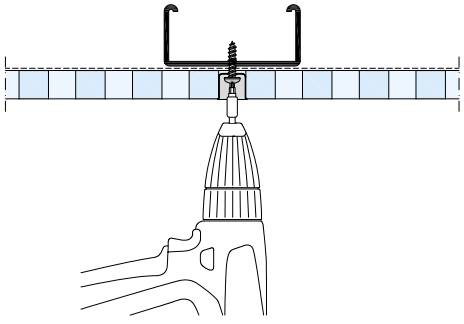
1st Insert the Cleaneo Cap flush



2nd Insert the enclosed screw



3rd Screw fix the screw to the furring channel



Board arrangement

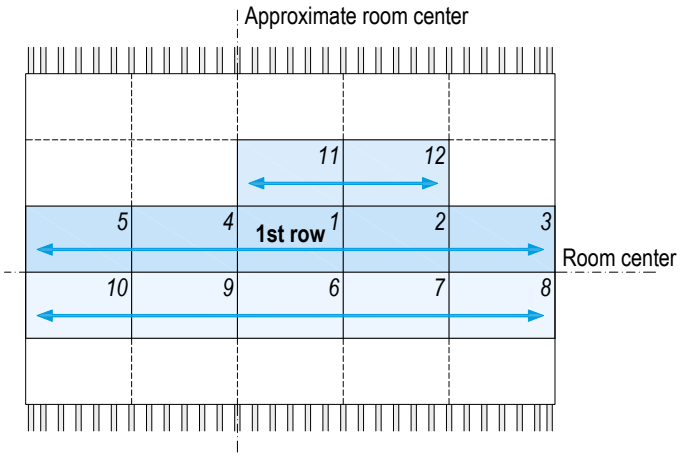
Scheme drawings

Examples: Cleaneo SK

Rooms up to approx. 150 m²:

1st board row: Start application in the middle of the room

Install the remaining board rows: parallel to 1st row

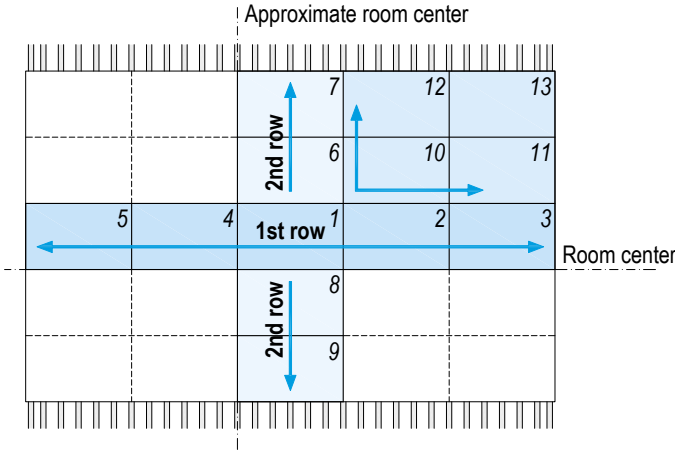


Rooms from approx. 150 m²:

1st board row: Start application in the middle of the room

2nd board row: transverse to 1st row – commence approx. in room centre

Remaining ceiling surface: Install after application of 1st and 2nd row

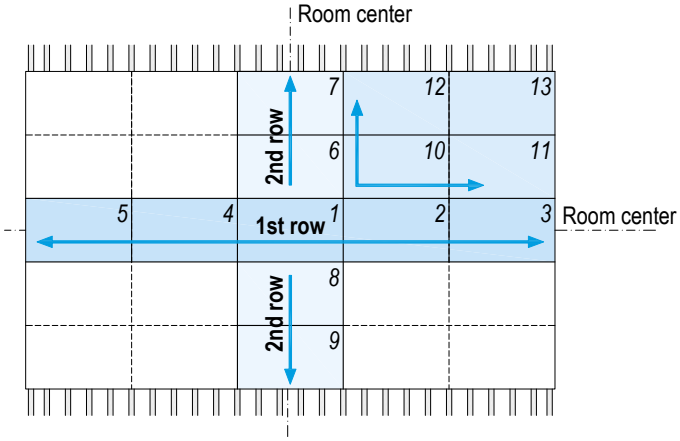


Recommendation for Cleaneo SYSTEXX Acoustic Board

1st board row: Start application in the middle of the room

2nd board row: transverse to 1st row – commence in the room centre

Remaining ceiling surface: Install after application of 1st and 2nd row



Alternative board arrangement Cleaneo SYSTEXX Acoustic Board as applied in rooms exceeding about 150 m² (see above).

Installation schemes

There is a department at Knauf that works with case related computer-aided installation plans. The installation plans are created with a scale of 1:50 showing all required details. The production is geared according to the demands of these plans. Each individual board is numbered on the rear with the corresponding number on the installation plan. For application speed, we recommend preparation of the layouts as installation blueprints in scale 1:50 in DXF or DWG file format.

Required planning specifications:

- Type of cladding
- Perforation type: Standard perforation R / alternating perforation R / square perforation Q / block perforation / slotline
- Separations (e.g. as exposed joints) within a room, particularly when planning segments with continuous perforation
- Ball impact safety according to DIN 18032-3/ DIN EN 13964 appendix D
- Fire protection requirements if required
- Fleece colour: White / black / customized colour
- Perimeter: Non-perforated board edges specifying the width acc. to page 28 and page 29
- Perimeter design of the room with/without shadow gap; width specification
- Frieze: Structure and width
- Frieze application on-site or prefabricated
- In case of perimeter shadow gaps, prefabricated frieze is available in standard widths starting at 50 mm.

Notes	Observe the installation guides for the respective boards (K761S-A01.de / K761U-A01.de / K761L-A01.de / K737S-A01.de). For Cleaneo Complete, cleaning of the ceiling after installation must be taken into consideration. For Cleaneo SYSTEXX Acoustic Board arrange the furring channel at right angles to the incidence of side lighting. Recommendation Cleaneo SYSTEXX Acoustic Board and Cleaneo UFF plaster base boards: Use entire boards only. Cut the boards only in the non-perforated area between the blocks. Random perforation R: From some angles and unfavourable lighting conditions it is possible that the effect of a continuous perforation is hindered by the long edge joints. Depending on the incidence of light/refraction, the impression of the furring channel may be visible with a white acoustical fleece in conjunction with perforations of a diameter ≥ 15 mm.

D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

Jointing

Suitable jointing materials

- Uniflott:
  Hand fill without using joint tape with Cleaneo Classic boards and Feuerschutzplatten Knauf Piano fire-resistant boards.

Jointing of the gypsum boards

Fill the board joints of Cleaneo Classic boards according to the table below to suit the edge type concerned.
Generally fill in visible screw heads (except with Cleaneo Complete Contrapanel ceiling screws with white screw heads).
Fill the board joints with filling compound with Knauf Piano fire-resistant boards (fire protection level system D124.de).

Joint filling of the connection joints

Frieze application is generally recommended for Cleaneo Classic boards with continuous perforation.

Apply Trenn-Fix or Fugendeckstreifen Kurt joint tape when filling joints to adjacent drywall constructions, taking into consideration the conditions and requirements for crack safety.

Observe code of practice no. 3 “Gipsplattenkonstruktionen - Fugen und Anschlüsse” (German only)” [1].

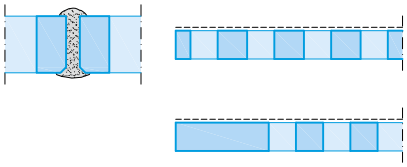
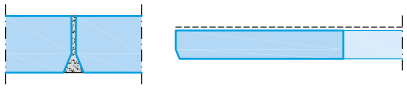
Apply Trenn-Fix when filling joints to adjacent solid or wooden construction components.

Application temperature / climate

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

1) Issued by the German Bundesverband der Gipsindustrie e. V.

Jointing of gypsum board joints of Cleaneo Classic boards

Edge designs	Application and joint filling	Frieze made of non-perforated board strip
4SK 4-side cut square edge 	■ Scuff the board edges on the face side with a sanding mesh and remove the dust ■ Prime the cut edge (SK) with Knauf Tiefengrund primer ■ Align the boards according to perforation design ■ Fill the joints fully with Uniflott	■ Scuff the edges of the sharp cut board strips (SK) on the face side with sanding mesh ■ Prime the cut edges with Knauf Tiefengrund primer ■ Install the board with a joint of 3-4 mm ■ Fill the joints fully with Uniflott
UFF surrounding notch joint 	■ Butt join the boards ■ Align the boards according to perforation design ■ Fill the joints fully with Uniflott	■ Scuff the edges of the sharp cut board strips (SK) on the face side with sanding mesh ■ Prime the cut edges with Knauf Tiefengrund primer ■ Install the board with a joint of 3-4 mm ■ Fill the joints fully with Uniflott
linear Circumferential rebated edges 	■ Butt join the boards ■ Align the boards according to perforation design ■ Fill screw heads, for example, with Uniflott	■ Scuff the edges of the sharp cut board strips (SK) on the face side with sanding mesh ■ Prime the cut edges with Knauf Tiefengrund primer ■ Install the board with a joint of 3-4 mm ■ Fill the joints fully with Uniflott ■ Alternative: (without jointing) non-perforated edge frieze Cleaneo linear
AK 4-side tapered edge 	■ Butt join the boards ■ Align the boards ■ Fill the joints with Uniflott ■ Fugendeckstreifen Kurt joint tape	■ Use board strips with tapered long edge (AK) ■ Butt join the boards ■ Jointing with Uniflott ■ Fugendeckstreifen Kurt joint tape
SFK Front edge bevelled 	■ Prime the cut edges with Knauf Tiefengrund primer ■ Butt join the boards ■ Align the boards ■ Fill the joints completely with Uniflott	■ Scuff the board strips on the face side with a sanding mesh ■ Install the board with a joint of 3-4 mm ■ Prime the cut edges with Knauf Tiefengrund primer ■ Jointing with Uniflott
HRK Long edge - half rounded 	■ Butt join the boards ■ Align the boards ■ Fill the joints completely with Uniflott	■ Use board strips with half-rounded edge (HRK) or half-rounded tapered edge (HRAK) ■ Butt join the board edges ■ Jointing with Uniflott

Coatings and linings

Pretreatment

Before further coating is applied, the filled surface must be free of dust. Gypsum board surfaces should always be primed in compliance with the Code of Practice no. 6 of the BVG (IGG) “Vorbehandlung von Trockenbauflächen aus Gipsplatten zur weitergehenden Oberflächenbeschichtung bzw. -bekleidung.”1) (German only) - issued by the German Bundesverband der Gipsindustrie e. V.

The primer must suit the subsequent paints or coatings.

In order to compensate for the differences in absorption of surfaces, coatings of primer such as Knauf Tiefengrund primer is suitable.

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 Sperrgrund barrier coating.

Suitable coatings

The following coatings can be applied on Cleaneo Classic boards:

- Decorative coats
  - Dispersion paint (e.g. Intol E.L.F., Malerweiss E.L.F.),
  - Multicoloured (rainbow) emulsion
  - Silicate-based emulsion paints with suitable primer.

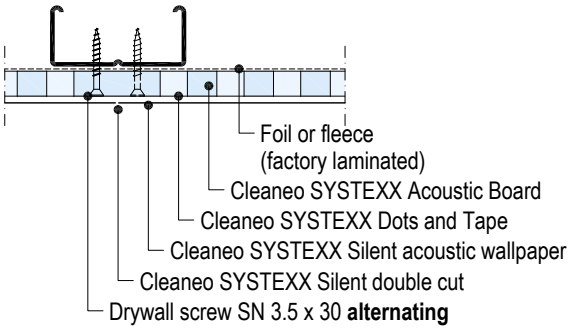
Note	Use a short-hair lambskin roller to prevent paint from entering the perforations and negatively impacting the acoustical effectiveness of the fleece.

Unsuitable coatings

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

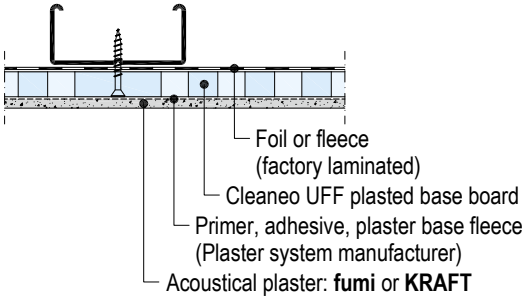
Acoustic wallpaper

System D126S.de with Cleaneo SYSTEXX Silent (acoustic wallpaper) with rear side fleece or laminated foil:



Acoustical plaster

System D126U.de with Cleaneo UFF plaster base boards with rear sided fleece of foil lamination:



The face side fleece incl. adhesive is supplied by the acoustical plaster supplier and glued on at the installation site to apply the top layer

Notes	Observe the specifications of the plaster manufacturer relating to pretreatment and application. After application of plasters, quick drying must be ensured through adequate airing.

D127.de
D124.de
D126S.de
D126U.de
D137.de
D134.de

Material requirement per m² ceiling without allowance for loss and waste

Selected examples

Description		Unit	Quantity as average value D127.de 1	D124.de 2	D126S.de 3	D126U.de 4
Connection to wall Backing as required– observe fire resistance						
Knauf Profil UD 28/27		m	0.4	0.8	–	0.4
Angle Profile		m	–	–	0.4	–
KRAFT edge connection bracket		m	–	–	0.4	–
Suitable anchors, e.g. Knauf Deckennagel ceiling steel dowels with reinforced concrete		pcs	0.4	0.8	0.4	–
Grid						
Suitable anchors, e.g. Knauf Deckennagel ceiling steel dowels with reinforced concrete		pcs	1.2	1.8	1.2	1.2
	Knauf Universal Bracket / Damping Universal Bracket for CD 60/27 2x Knauf Metal Screws LN 3.5 x 11	pcs	1.2 2.4	1.8 3.6	1.2 2.4	1.2 2.4
Alternative	Knauf adjustable universal brackets (incl. 2x Splint)	pcs	1.2	1.8	1.2	1.2
Alternative	Knauf Nonius hanger top + Nonius hanger botttom + Nonius pin	pcs	1.2	1.8	1.2	1.2
Alternative	Knauf Nonius hanger top + Nonius stirrup for CD 60/27 + Nonius pin	pcs	1.2	1.8	1.2	1.2
	Knauf Multipurpose screw FN 4.3 x 35	pcs	–	2	–	–
2nd grid level	Knauf Universal Bracket for CD 60/27 2x Knauf metal screw LN 3.5 x 11	pcs pcs	– –	2 4	– –	– –
Knauf Profile CD 60/27 Knauf CD longitudinal connector		m pcs	4.3 0.9	8.2 1.6	3.7 0.7	3.7 0.7
	Knauf Intersection connector for CD	pcs	3.7	7.2	2.9	2.9
Alternative	2x Knauf Ankerwinkel clip	pcs	7.4	14.4	5.8	5.8
Insulation layer Observe sound absorption / fire protection requirements						
Insulation layer, e.g. Knauf Insulation		m^2	1	1	1	1
Knauf boards Type and thickness, see the system examples, page 93						
Cleaneo Classic		m^2	1	1	1	1
Feuerschutzplatte Knauf Piano, 12.5 mm		m^2	–	1	–	–
Fastening fastening of the boards, Knauf fasteners, see page 87						
Cleaneo Classic		pcs	24	24	21	21
Feuerschutzplatte Knauf Piano fire-resistant board, 12.5 mm		pcs	–	20	–	–
Frieze		pcs	as req.	as req.	as req.	as req.
Acoustical plaster system Products and coating design in accordance with manufacturer specifications, see page 16						
fumi acoustical plaster (Schmidt Akustik GmbH)		m^2	–	–	–	●
KRAFT acoustical plaster (KRAFT Akustik-Systeme)		m^2	–	–	–	●

Legend:

as req. = *as required*

● *Observe details of the manufacturer*

Material not provided by Knauf = printed in italics

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

Note	Material requirement without consideration of the frieze application.

Material requirement per m² ceiling without allowance for loss and waste – (continued)

Description	Unit	Quantity as average value D127.de 1	D124.de 2	D126S.de 3	D126U.de 4
Jointing Consumption quantities of the diverse filling compounds, refer to the product data sheets of the relevant Knauf products					
Knauf filling compound (dependent on the board edge type, see page 90 90)	kg	as req.	as req.	as req.	as req.
1st grid level Knauf filling compound, e.g. Uniflott	kg	–	0.3	–	–
Trenn-Fix, 65 mm wide, self-adhesive	m	0.4	0.4	–	0.4
SYSTEXX System Products and lining use according to manufacturer's specifications, see page 14					
Cleaneo SYSTEXX Silent (Vitrulan Textile Glass GmbH)	m²	–	–	●	–
Cleaneo SYSTEXX Dots (Vitrulan Textile Glass GmbH)	m²	–	–	●	–
Cleaneo SYSTEXX Tape (Vitrulan Textile Glass GmbH)	m	–	–	●	–

Legend:

as req. = as required

● *Specifications according to manufacturer*

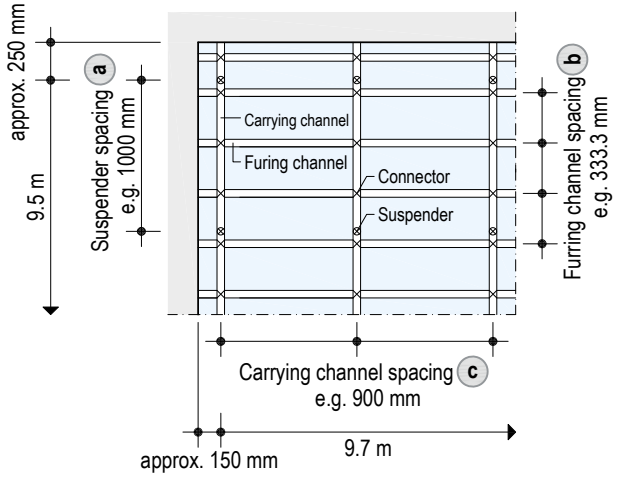
Material not provided by Knauf = printed in italics

System examples for material estimation

System	D127.de 1	D124.de 2 1st grid level	D124.de 2 2nd grid level with universal bracket	D126S.de 3	D126U.de 4
Knauf boards	Cleaneo SK	Feuerschutzplatte Knauf Piano fire-resistant board	Cleaneo SK	Cleaneo SYSTEXX Acoustic Board Fleece	Cleaneo UFF Plaster base board fleece
Board thickness	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm
Load class up to	0.15 kN/m²	–	–	0.15 kN/m²	0.15 kN/m²
Spacing of suspenders	1000 mm	650 mm	800 mm	950 mm	950 mm
Carrying channel axial spacings	900 mm	800 mm	800 mm	1000 mm	1000 mm
Axial spacing of furring channel	333.3 mm	400 mm	333.3 mm	400 mm	400 mm

Note	
	Products (examples) for further construction types: ■ Fastening with Cleaneo Caps, see page 88, if necessary with divergent furring channel design ■ Frieze application with design units, cut-to-length and additional grids if required

Example of material estimation with D127.de



Carrying channel

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

$\frac{9.7\text{ m}}{0.9\text{ m}}$ + 1 pc = 12 pcs

12 (carrying) × 10 m = 120 m

Furring channel

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

$\frac{10\text{ m}}{0.33\text{ m}}$ + 1 pc = 31 pcs

31 (furring) × 10 m = 310 m

Suspender

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

$\frac{9.5\text{ m}}{1\text{ m}}$ + 1 pc = 11 pcs

12 (carrying) × 11 pcs = 132 pcs

Connector

Carrying (pcs) × furring (pcs)

12 (carrying) × 31 (furring) = 372 pcs

Material requirement per m² ceiling without allowance for loss and waste

Selected examples

Description		Unit	Quantity as average value D137.de 5	D134.de 6
Connection to wall				
Knauf UW runner		m	0.8	0.8
Suitable fastener material, e.g.				
	Knauf Multi-purpose Screw FN with Metal Stud Partition	pcs	2.7	2.7
Alternative	Knauf Deckennagel ceiling steel dowel with reinforced concrete	pcs	2.8	2.8
Covering strips 40 mm wide: Feuerschutzplatte Knauf Piano fire-resistant board; 12.5 mm		m^2	–	0.05
Knauf CW profile		m	0.2	0.2
Suitable fastener material, e.g.				
	Knauf Multi-purpose Screw FN with Metal Stud Partition	pcs	as required	as required
Alternative	Knauf Deckennagel ceiling steel dowel with reinforced concrete	pcs	as required	as required
Covering strips 50 mm wide: Feuerschutzplatte Knauf Piano fire-resistant board; 12.5 mm		m^2	–	0.05
Grid				
	Knauf CW single profile e.g. Knauf metal screws LN 3.5 x 11 (connection of CW profile with lateral UW perimeter runner)	m pcs	1.9 3.2	– –
Alternative	Knauf CW double profile Knauf Metal Screw LN 3.5 x 11 (CW profiles screwed at flange) Knauf metal screws LN 3.5 x 11 (connection of CW profile with lateral UW perimeter runner)	m pcs pcs	3.8 3 6.4	3.8 3 3.2
Covering strips 100 mm wide: Feuerschutzplatte Knauf Piano fire-resistant board; 12.5 mm		m^2	–	0.20
Knauf drywall screw TN 3.5 x 25 (covering strip fastening, see page 85)		pcs	–	13
Knauf hat shaped channel 98/15 as a furring channel		m	3.2	3.2
2x Knauf multi-purpose screw FN 4.3 x 35 (connection of hat-shaped channel with CW profile)		pcs	14	14
Insulation layer Observe sound absorption / fire protection requirements				
Insulation layer, e.g. Knauf Insulation		m^2	as required	1
Knauf boards Type and thickness, see the system examples page 95				
Cleaneo Classic		m^2	1	1
Cover board: Feuerschutzplatte Knauf Piano fire-resistant board, 12.5 mm		m^2	–	1.05
Fastening fastening of the boards, Knauf fasteners see page 87				
Cleaneo Classic		pcs	25	25
Frieze		pcs	as required	as required
Jointing Consumption quantities of the diverse filling compounds, refer to the product data sheets of the relevant Knauf products				
Knauf filling compound (dependent on the board edge type, see page 90 90)		kg	as required	as required
Trenn-Fix, 65 mm wide, self-adhesive		m	1	1
Fugendeckstreifen Kurt joint tape		m	as required	as required

Legend

Material not provided by Knauf = printed in italics

The amounts refer to a ceiling area of 2.5 m x 10 m = 25 m².

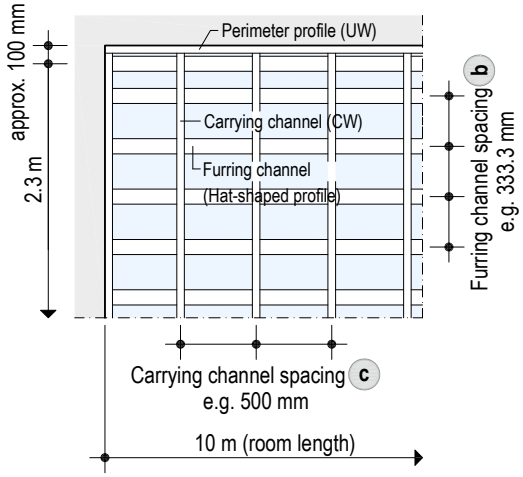
Note	Material requirement without consideration of the frieze application.

System examples for material estimation

System	D137.de 5	D134.de 6
Knauf boards	Cleaneo SK	Cleaneo SK Feuerschutzplatte Knauf Piano fire-resistant board (cover board)
Board thickness	12.5 mm	12.5 mm 12.5 mm
Carrying channel axial spacings (CW single profile / CW double profile)	500 mm	500 mm
Axial spacing of furring channel (Hat-shaped channel 98/15)	333.3 mm	333.3 mm

Note	Products (examples) for further construction types: ■ Free-spanning UA profiles, L connection / T connection, centre suspension – see system sata sheet D13.de Knauf Free-Spanning Ceilings ■ Frieze application with design units, cut-to-length and additional grids if required

Example of material estimation with D137.de (CW single profile)



Carrying channel

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

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

21 (carrying) × 2.5 m = 52.5 m

Furring channel

$\frac{2.3\text{ m}}{b}$ + 1 pc

$\frac{2.3\text{ m}}{0.33\text{ m}}$ + 1 pc = 8 pcs

8 (furring) × 10 m = 80 m

Information on sustainability

Knauf Cleaneo Acoustic Board Ceilings

Information on the sustainability of Cleaneo Acoustic Board Ceilings

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

In Germany the following certification systems are of particular relevance:

- DGNB System
  German seal of approval for environmentally sustainable building from the DGNB (German association for environmentally sustainable building)
- BNB
  (Bewertungssystem Nachhaltiges Bauen - Quality rating system for environmentally sustainable building)
- LEED
  (Leadership in Energy and Environmental Design).

Knauf products and Knauf Cleaneo Acoustic Board Ceilings can positively influence many of these criteria.

DGNB/BNB

Ecological quality

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

Economic quality

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

Sociocultural and functional quality

- Criterion: Acoustical comfort
  Knauf drywalling systems with high-performance absorption

Technical quality

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

LEED

Materials and Resources

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

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

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