

## Knauf Cleaneo Acoustical Plank Ceilings

### Cleaneo Module

D145.de – Knauf Cleaneo Acoustical Plank Ceiling Belgravia

D146.de – Knauf Cleaneo Acoustical Plank Ceiling Plaza

D147.de – Knauf Cleaneo Acoustical Plank Ceiling Contur

D141.de – Knauf Cleaneo Acoustical Bandraster Ceiling Contur

D142.de – Knauf Cleaneo Acoustical Corridor Ceiling Contur

D144.de – Knauf Cleaneo Acoustical Plank Ceiling Visona

### Note on English translation / Hinweise zur englischen Fassung

This is a translation of the System Data Sheet valid in Germany.

All stated details and properties are in compliance with the regulations of the German standards and building regulations. They are only applicable for the specified products, system components, application rules, and construction details in connection with the specifications of the respective certificates and approvals.

Knauf Gips KG denies any liability for applications outside of Germany as this requires changes acc. to the respective national standards and building regulations.

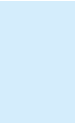

Dies ist eine Übersetzung des in Deutschland gültigen Detailblattes. Alle angegebenen Werte und Eigenschaften entsprechen den in Deutschland gültigen Normen und bauaufsichtlichen Regelungen. Sie gelten nur bei Verwendung der angegebenen Produkte, Systemkomponenten, Anwendungsregeln und Konstruktionsdetails in Verbindung mit den Vorgaben der bauaufsichtlichen Nachweise.

Die Knauf Gips KG lehnt jegliche Haftung für Einsatz und Anwendung außerhalb Deutschlands ab, da in diesem Fall eine Anpassung an nationale Normen und bauaufsichtliche Regelungen notwendig ist.

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## Notes on the document

Knauf system data sheets are the basis for planning and application for planners and professional installers when applying Knauf systems. The contained information and specifications, constructions, details and stated products are based, unless otherwise stated, on the certificates of usability (e.g. National Technical Test Certificate (abP) valid at the date they are published as well as on the applicable standards. Additionally, design and structural requirements and those relating to building physics (fire resistance and sound insulation) are considered.

The contained construction details are examples and can be used in a similar way for various cladding variants of the respective system. At the same time, the demands made on fire resistance and/or sound insulation as well as any necessary additional measures and/or limitations must be observed.

## References to other documents

### System data sheets

- [Knauf Cleaneo Acoustic Board Ceilings D12.de](#)
- [Knauf Free-Spanning Acoustical Plank Ceilings D42.de](#)

### Folders

- [Sound insulation and room acoustics with Knauf \(only sections in English\)](#)

### Access instructions

- [Access to the Cleaneo Acoustical Dropped Ceiling Visona K725V-A01.de](#)

### Product data sheets

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

## Symbols in the system data sheets

The following symbols are used in this document:

### Spacings of ceiling grid

- a Spacing of hangers (anchors)
- b Mounting rail (span width modules) axial spacing
- c Carrying channel axial spacing / crossbar length / Bandraster profile (cladding span width)
- t Axial spacing short crossbar / spacer

### Legend symbols

- 1 Legend number that will be explained when used

## Intended use of Knauf Systems

Please observe the following:

|                |  |
|----------------|--|
| <b>Caution</b> | 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 notes on Knauf systems

### Term definition

Knauf Cleaneo Acoustical Plank Ceilings are implemented as suspended ceilings. The following definition applies acc. to DIN 18168-1:2007-04: 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 which is suspended ...".

The mounting rails in this document are abbreviated as follows:

- TS15/32 = 15 mm wide mounting rail with 32 mm web height
- TS24/38 = 24 mm wide mounting rail with 38 mm web height
- TS24/70L = 24 mm wide mounting rail with 70 mm web height (large span)
- QS24/32 = 24 mm wide crossbar with 32 mm web height

### Field of application

Accessible Knauf Cleaneo Acoustical Plank Ceilings can be found in rooms or corridors where there are special demands with regards to the room acoustics and where the ceiling should also be accessible at every location.

Knauf Cleaneo Acoustical Bandraster Ceiling and Corridor Ceilings Contur offer the benefit, particularly in existing administrative buildings, hospitals, schools and nurseries, etc., that the centre distances of the Bandraster profiles can be adapted relatively flexibly to the shape of the building and its axes, and that most corridor widths can be designed with Cleaneo Contur rectangular panels with an element length of up to 1800 mm.

Furthermore, the acoustical elements contribute to improvement of the room air quality with air-cleaning effect. A diverse range of ceiling designs are implemented with the vast range of perforation patterns such as circular perforations, square perforations, oblong holes and slots and random perforation.

Knauf Cleaneo Acoustical Plank Ceilings are designed for use in normal interior room air conditions, i.e. up to 70% relative humidity and 25 °C as is usually the case for example in offices, facilities accessible to the public or similar.

### Fire resistance

The ceiling elements of Knauf Cleaneo Acoustical Plank Ceilings are classified in fire classification class A2-s1, d0.

### Frame

- Observe the manufacturer's load table. Please contact the manufacturer directly in case of other ceiling constructions, loads and suspender spacings.
- The load per m<sup>2</sup> must be evenly distributed (for fastening/anchoring or point loads see [page 36](#)).
- T rail systems are not included in the scope of delivery from Knauf Gips KG.  
The rail systems are sold in Germany by [Knauf Ceiling Solutions GmbH & Co. KG](#).
- Observe T rail width 15 or 24 mm during the order (diverse element formats).

### Surface

White painted standard surface (similar to RAL 9003, gloss 5. Other colours available on request.

#### Certificates of Usability

| Knauf system | Sound insulation<br>Airborne noise, footfall sound / insertion loss | Sound absorption             |
|--------------|---|------------------------------|
| D145.de      | – <sup>1)</sup>   | A 013-04.16 /<br>A 020-12.01 |
| D146.de      | T 017-07.17   |                              |
| D147.de      | – <sup>1)</sup>   | A 013-04.16                  |
| D141.de      | – <sup>1)</sup>   |                              |
| D142.de      | – <sup>1)</sup>   |                              |
| D144.de      | – <sup>1)</sup>   |                              |

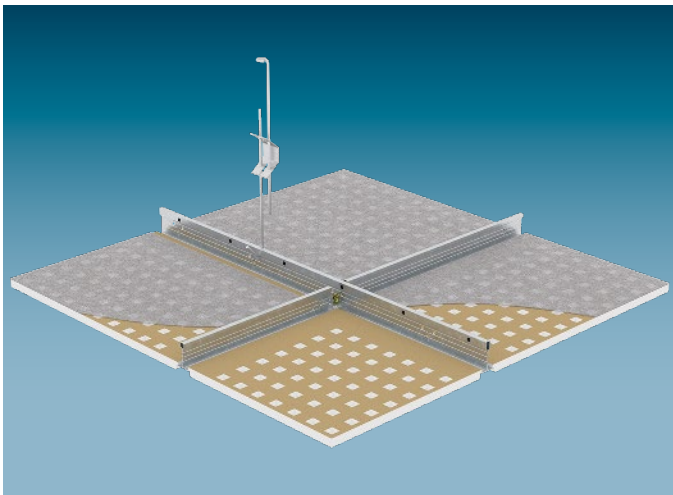
1) The building acoustics parameters can be approximately adopted from the D146.de system.

**Knauf Cleaneo Acoustical Plank Ceilings**

Knauf Cleaneo Acoustical Plank Ceilings consist of a suspended or free-spanning grid in which the surface ready Knauf Cleaneo Acoustical elements can be inserted. The elements are easily demountable enabling easy access to the plenum and simplifying maintenance on service installations. Numerous variants and designs are available to satisfy the respective acoustical and visual requirements.

**Quadratic Acoustical Plank Ceilings**

**D145.de** Cleaneo Acoustical Plank Ceiling Belgravia



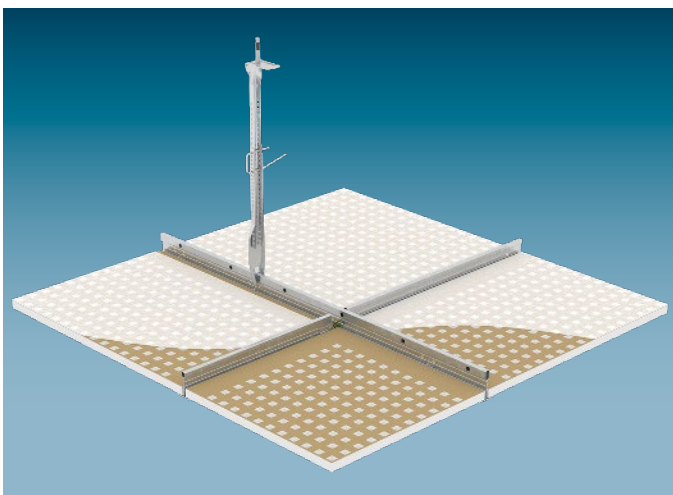
The Cleaneo Acoustical Plank Ceiling Belgravia is an accessible suspended ceiling with square Cleaneo modular elements for lay-in assembly with concealed T rail systems.

**Edge types:**  
Type E

Type E+ (only for Unity)



**D146.de** Cleaneo Acoustical Plank Ceiling Plaza



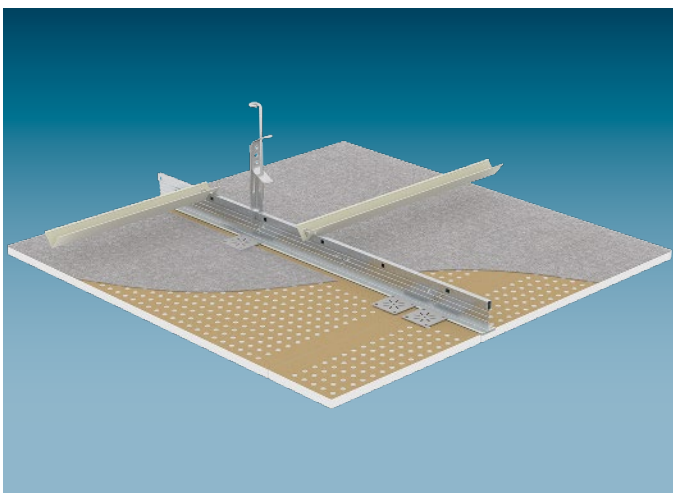
The Cleaneo Acoustical Plank Ceiling Plaza is an accessible suspended ceiling with Cleaneo modular elements (square or rectangular) for lay-in assembly with exposed T rail systems.

**Edge types:**  
Type A

Type A+ (only for Unity)



**D147.de** Cleaneo Acoustical Plank Ceiling Contur



The Cleaneo Acoustical Plank Ceiling Contour is an accessible suspended ceiling with square Cleaneo modular elements for lay-in assembly with concealed T rail systems.

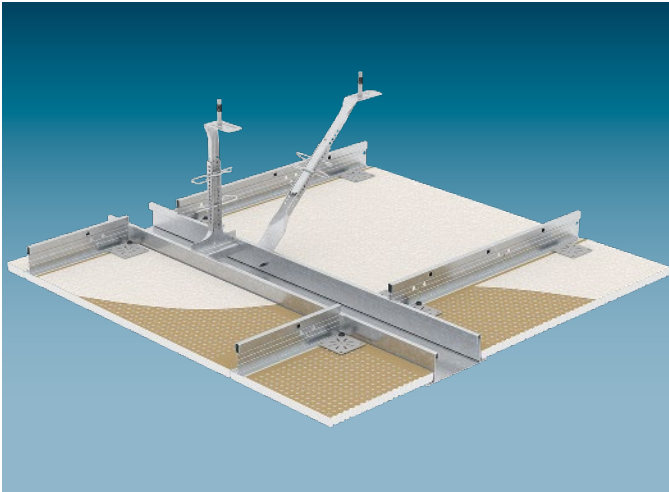
**Edge types:**  
Type D

Type D+ (only for Unity)



**Rectangular Acoustical Plank Ceilings**

**D141.de** Cleaneo Acoustical Strip Ceiling Contur

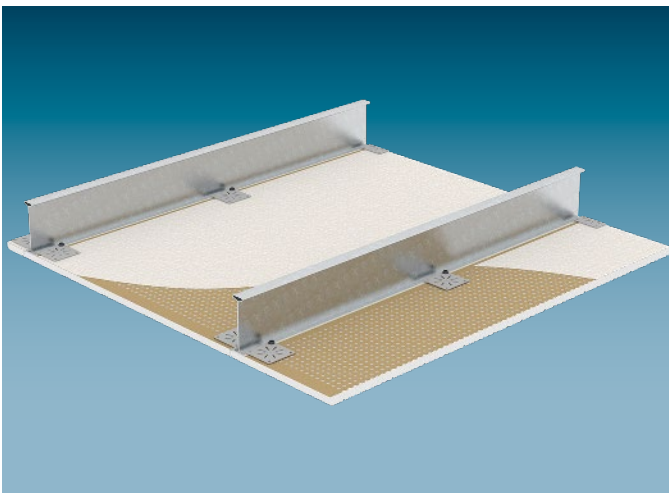


The Cleaneo Acoustical Strip Ceiling Contur is an accessible suspended ceiling with rectangular Cleaneo modular elements for lay-in assembly with concealed T rail systems. The elements are inserted between the Bandraaster and brackets. The room width is variable.

**Edge types:**  
Type D



**D142.de** Cleaneo Acoustical Corridor Ceiling Contour

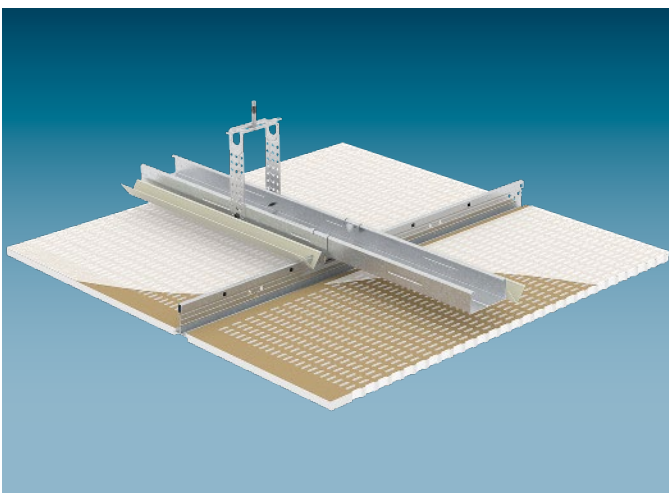


The Cleaneo Acoustical Corridor Ceiling Contour is an accessible suspended ceiling with rectangular Cleaneo modular elements for lay-in assembly with concealed T rail systems. The elements are laid on brackets on both sides. Room widths without frieze up to 1848 mm are possible.

**Edge types:**  
Type D

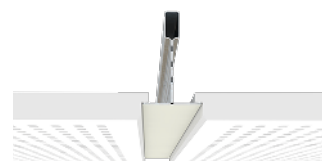


**D144.de** Cleaneo Acoustic Plank Ceiling Visona



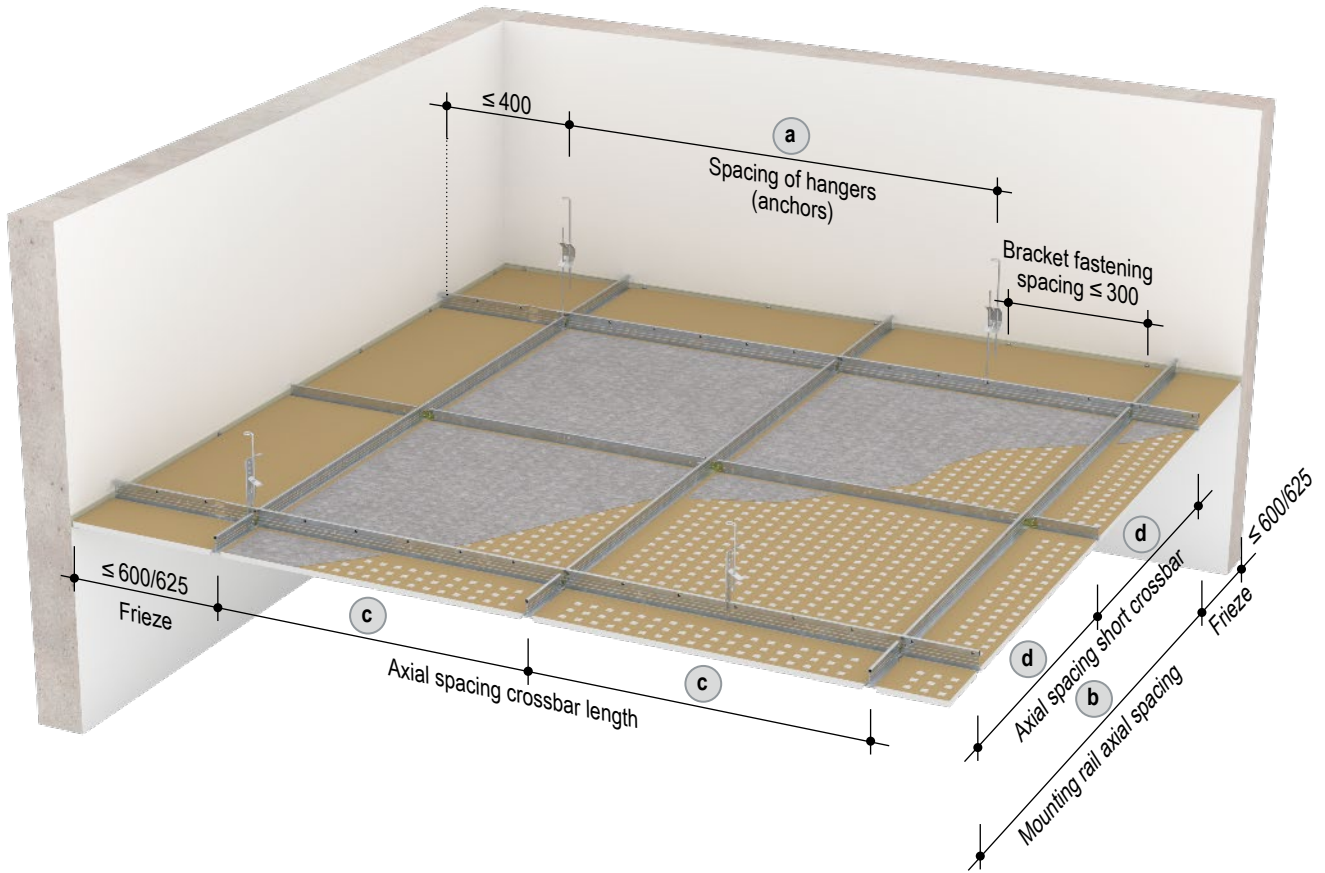
The Cleaneo Acoustical Plank Ceiling Visona is an accessible suspended ceiling with rectangular Cleaneo modular elements for lay-in assembly with CD Channels as carrying channels and concealed T rail systems without crossbars as a mounting rail.

**Edge types:**  
Long edge Type E



Maximum grid spacings

Dimensions in mm



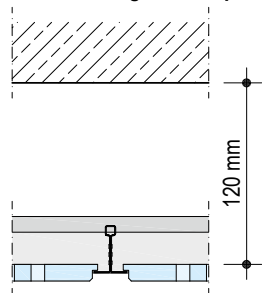
Axial spacings of the grid

| Module<br>mm | a<br>mm | b<br>mm | c<br>mm | t<br>mm |
|--------------|---------|---------|---------|---------|
| 600 x 600    | ≤ 1000  | 1200    | 600     | 600     |
| 625 x 625    | ≤ 1000  | 1250    | 625     | 625     |

Edge type – Width of the mounting rail

| Element edge             | Mounting rail |         |
|--------------------------|---------------|---------|
|                          | TS15/32       | TS24/38 |
| Type E                   |               |         |
| Type E+ (only for Unity) |               | -       |

Minimum height of the plenum



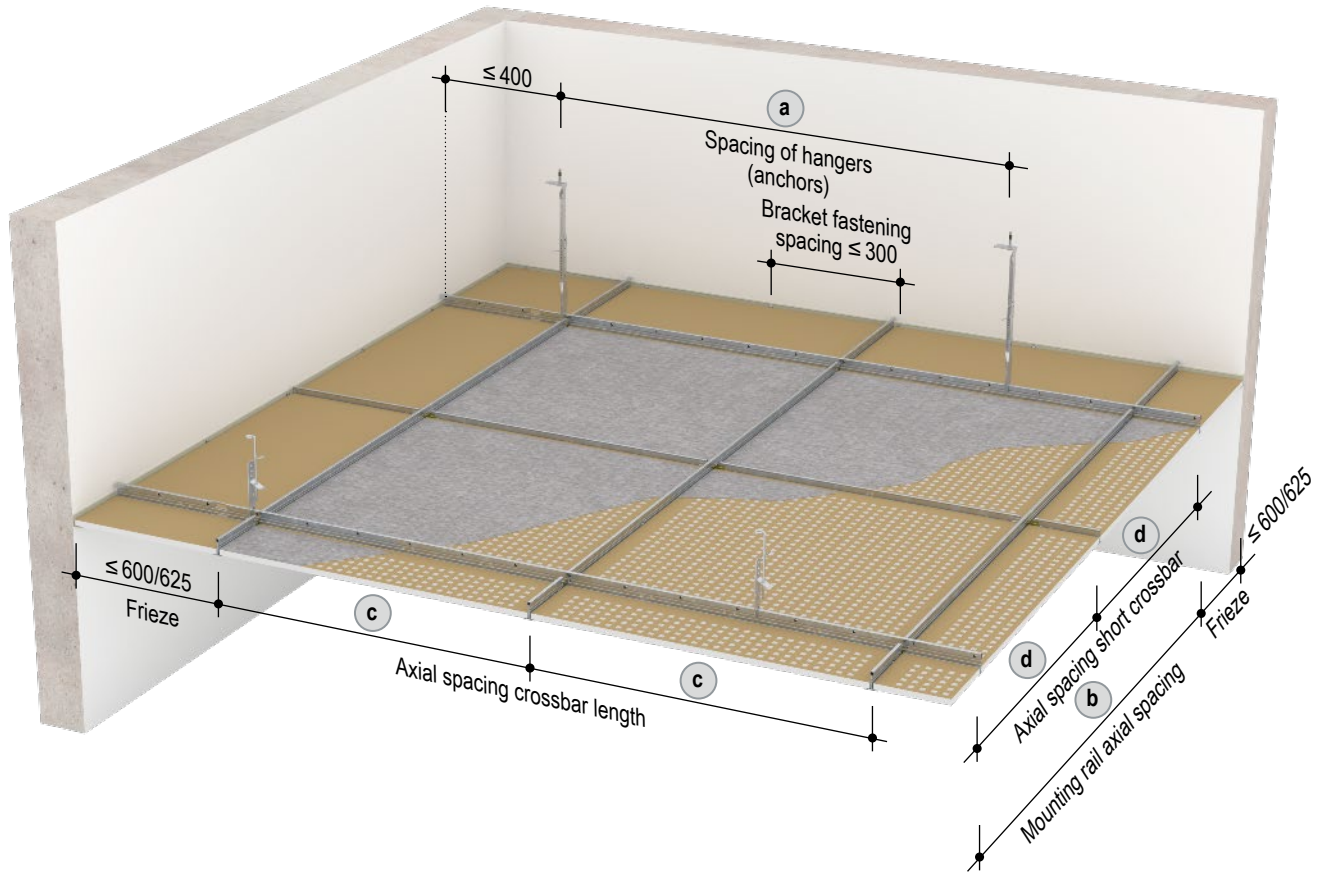
Notes

In case of element edge type E, the element formats differentiate depending on the T rail width (only with Regula). The element format is mandatory and must be stated when placing an order.

Observe the notes on [page 4](#).

### Maximum grid spacings

Dimensions in mm



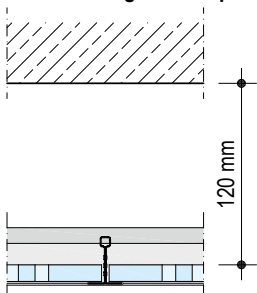
#### Grid axial spacings:

| Module<br>mm | a<br>mm | b<br>mm | c<br>mm | d<br>mm |
|--------------|---------|---------|---------|---------|
| 600 x 600    | ≤ 1000  | 1200    | 600     | 600     |
| 625 x 625    | ≤ 1000  | 1250    | 625     | 625     |
| 600 x 1200   | ≤ 1000  | 1200    | 600     | –       |
| 625 x 1250   | ≤ 1000  | 1250    | 625     | –       |

#### Edge type – Width of the mounting rail

| Element edge                | Mounting rail |         |
|-----------------------------|---------------|---------|
|                             | TS15/32       | TS24/38 |
| Type A                      |               |         |
| Type A+<br>(only for Unity) |               | –       |

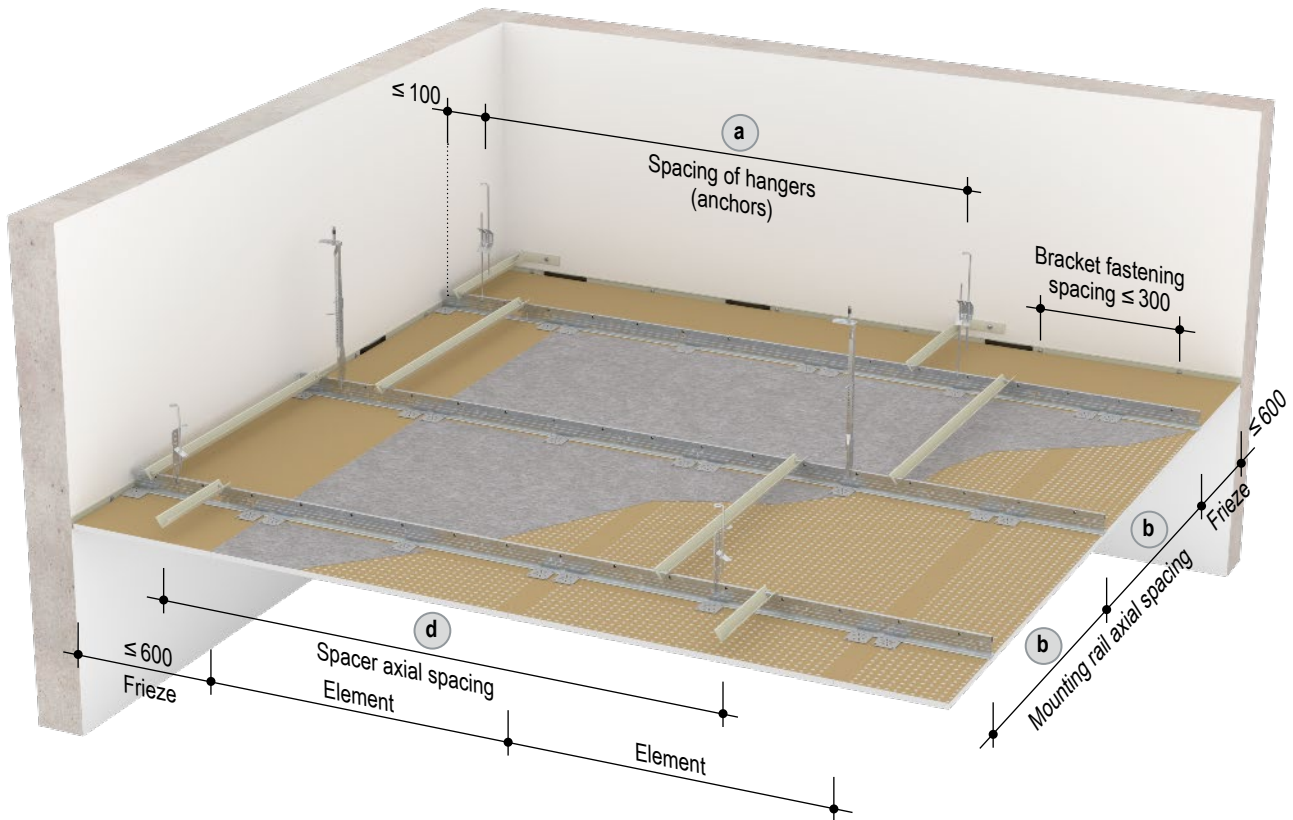
#### Minimum height of the plenum



**Note** Observe the notes on [page 4](#).

Maximum grid spacings

Dimensions in mm



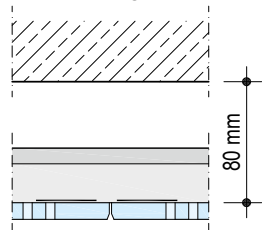
Grid axial spacings:

| Module    | a      | b   | d      |
|-----------|--------|-----|--------|
| mm        | mm     | mm  | mm     |
| 600 x 600 | ≤ 1200 | 600 | ≤ 1200 |

Edge type – Width of the mounting rail

| Element edge             | Mounting rail TS24/38 |
|--------------------------|-----------------------|
| Type D                   |                       |
| Type D+ (only for Unity) |                       |

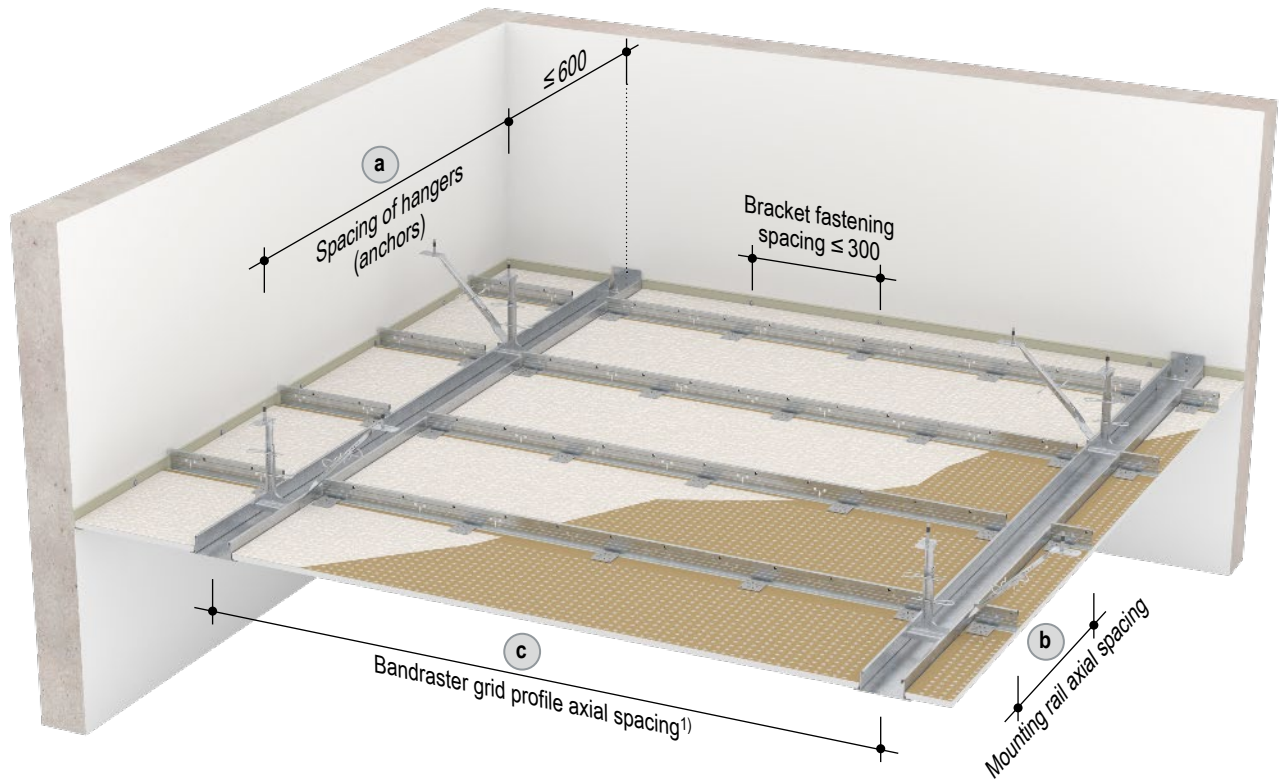
Minimum height of the plenum



**Note** Observe the notes on [page 4](#).

Maximum grid spacings

Dimensions in mm



Grid axial spacings:

| Module<br>mm | a<br>mm | b<br>mm | c <sup>1)</sup><br>mm | T rail systems      |
|--------------|---------|---------|-----------------------|---------------------|
| 400 x 1200   | ≤ 900   | 400     | 1280                  | TS24/38 or TS24/70L |
| 400 x 1500   | ≤ 900   | 400     | 1580                  |                     |
| 400 x 1800   | ≤ 900   | 400     | 1880                  | TS24/70L            |

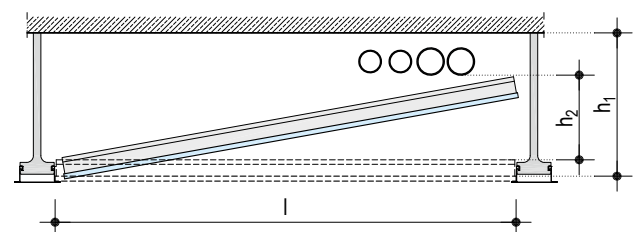
1) The specified dimensions relate to the use of Bandraster profiles DP 100.

In case of element lengths > 1500 mm only TS24/70L mounting rails are permissible.

Edge type – Width of the mounting rail

| Element edge | Mounting rail |          |
|--------------|---------------|----------|
|              | TS24/38       | TS24/70L |
| Type D       |               |          |

Required plenum  $h_1$  or required installation height  $h_2$  in dependence on the element length  $l$

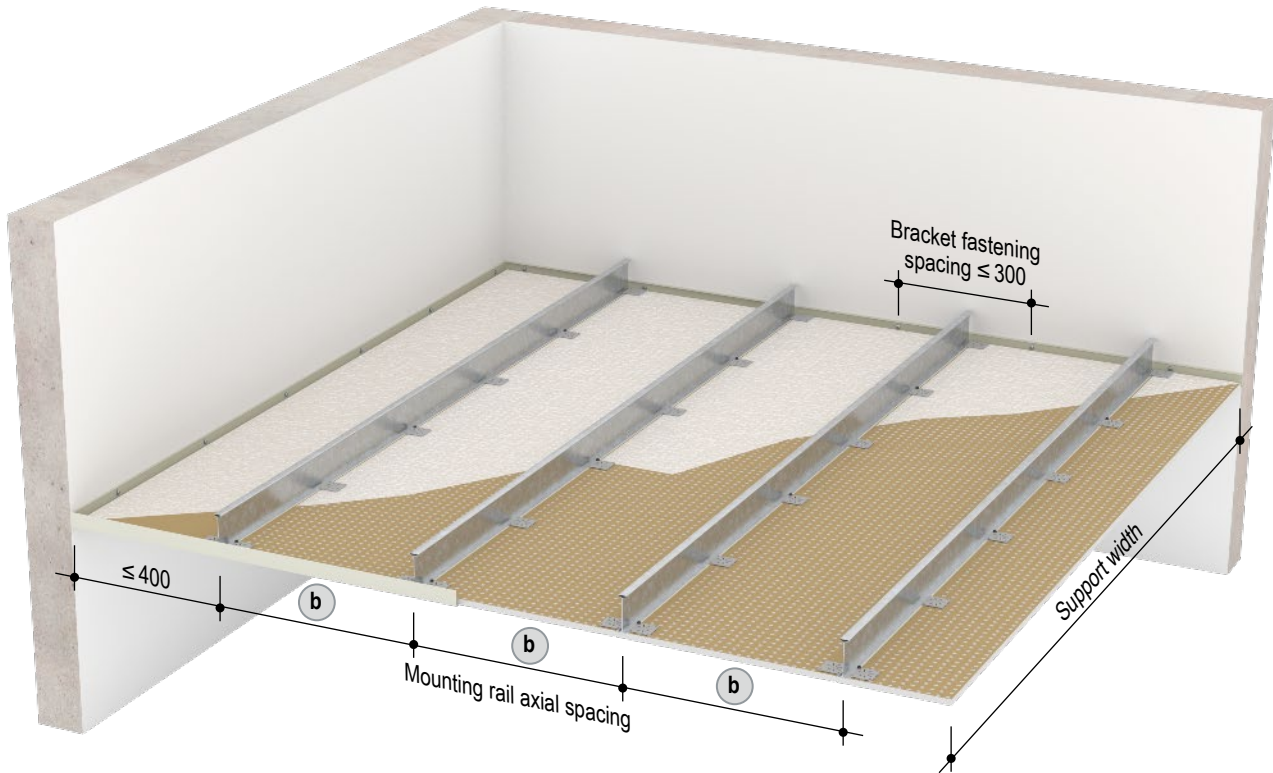


| Element length $l$<br>mm | Required plenum $h_1$<br>mm | Required installation height $h_2$<br>mm |
|--------------------------|-----------------------------|--|
| 1200                     | ≥ 165                       | ≥ 100                                    |
| 1500                     | ≥ 165                       | ≥ 100                                    |
| 1800                     | ≥ 165                       | ≥ 150                                    |

**Notes** T rails and elements may not be joined or extended. Observe the notes on [page 4](#).

Maximum grid spacings

Dimensions in mm



Grid axial spacings / maximum room widths

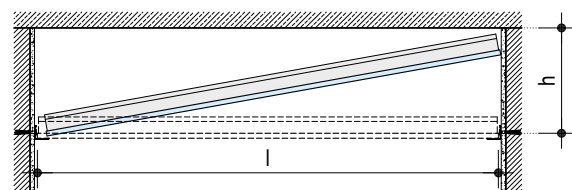
| Module<br>mm | b<br>mm | Element<br>length<br>mm | Room with when used with        |   | T rail systems      |
|--------------|---------|-------------------------|---------------------------------|---|---------------------|
|              |         |                         | Wall bracket<br>30/30/0.7<br>mm | Stepped wall bracket<br>42/20/23/24/0.7<br>mm |                     |
| 400 x 1200   | 400     | 1200                    | ≤ 1208                          | ≤ 1248  | TS24/38 or TS24/70L |
| 400 x 1500   | 400     | 1500                    | ≤ 1508                          | ≤ 1548  |                     |
| 400 x 1800   | 400     | 1800                    | ≤ 1808                          | ≤ 1848  | TS24/70L            |

In case of element lengths > 1500 mm only TS24/70L mounting rails are permissible.

Edge type – Width of the mounting rail

| Element edge | Mounting rail |          |
|--------------|---------------|----------|
|              | TS24/38       | TS24/70L |
| Type D       |               |          |

Required plenum h in dependence on the element length l



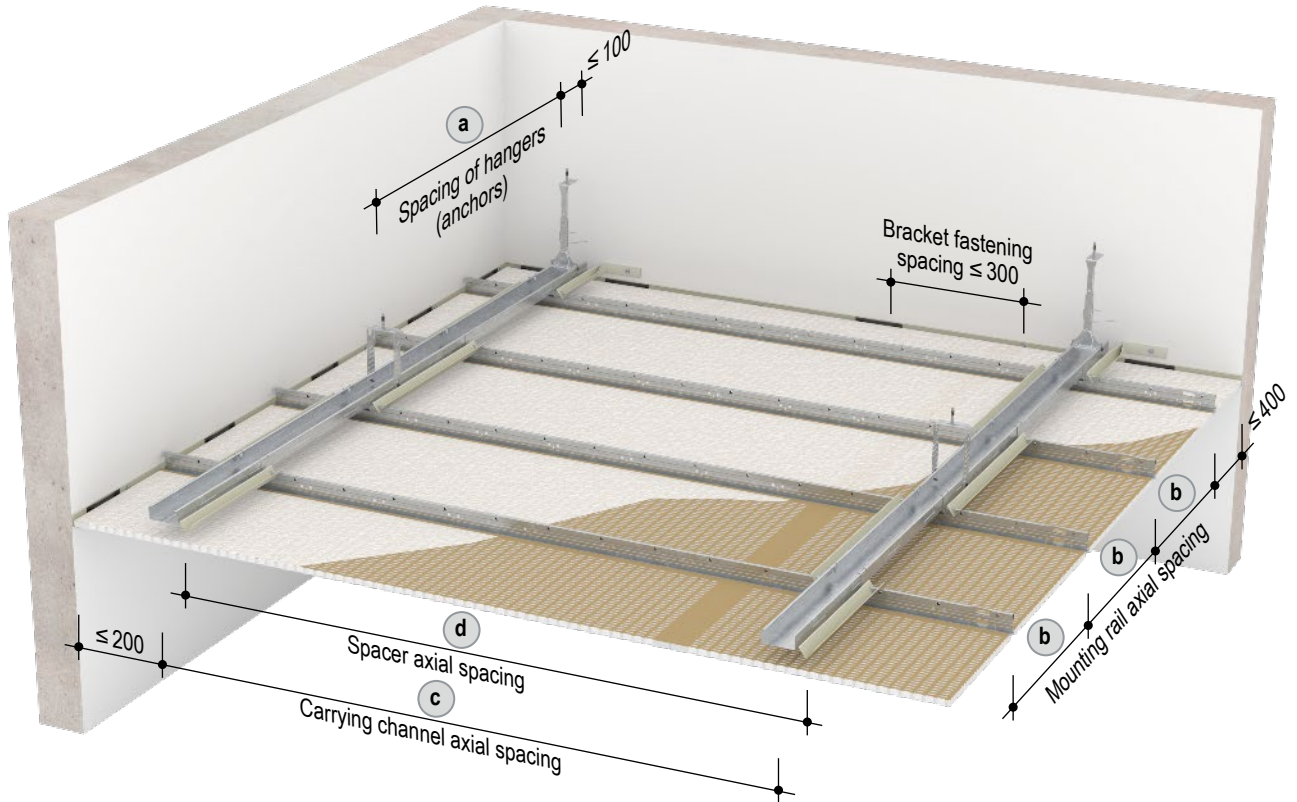
| Element length l<br>mm | Required plenum height h        |   |
|------------------------|---------------------------------|---|
|                        | Wall bracket<br>30/30/0.7<br>mm | Stepped wall bracket<br>42/20/23/24/0.7<br>mm |
| 1200                   | ≥ 250                           | ≥ 100   |
| 1500                   | ≥ 250                           | ≥ 100   |
| 1800                   | ≥ 300                           | ≥ 150   |

Service installations or other built-ins in the plenum may not be present in the space required for insertion of the ceiling elements.

|              |  |
|--------------|--|
| <b>Notes</b> | T rails and elements may not be joined or extended.<br>Observe the notes on <a href="#">page 4</a> . |
|--------------|--|

Maximum grid spacings

Dimensions in mm



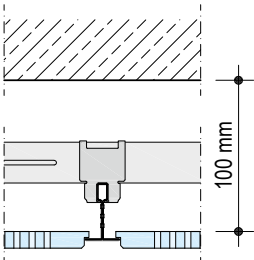
Axial spacings of the grid

| Module     | a     | b   | c      | d      |
|------------|-------|-----|--------|--------|
| mm         | mm    | mm  | mm     | mm     |
| 400 x 1200 | ≤ 800 | 400 | ≤ 1200 | ≤ 1200 |

Edge type – Width of the mounting rail

| Element edge         | Mounting rail TS24/38 |
|----------------------|-----------------------|
| Long edge<br>Type E  |                       |
| Front edge<br>Type B |                       |

Minimum height of the plenum



**Note** Observe the notes on [page 4](#).

Cleaneo module elements

Scheme drawings

| Edge types   | Face side – boards | Description  |
|--|--------------------|--|
| <b>Acoustical element Belgravia</b>                        |                    |  |
| Type E<br>   |                    | Belgravia acoustical elements with edge type E consisting of perforated gypsum boards with all around non-perforated perimeter. The surrounding notch edge with lightly bevelled visible edge offers an appealing optical appearance with concealed T rails.   |
| Type E+ (only for Unity)<br>                               |                    | Belgravia acoustical elements with edge type E+ consist of perforated gypsum board right up to the perimeter. The surrounding notch edge with elegant sharp visible edge offers an sophisticated optical appearance with concealed T rails.  |
| <b>Acoustical element Plaza</b>                            |                    |  |
| Type A<br>   |                    | Plaza acoustical elements with edge type A consisting of perforated gypsum boards with all around non-perforated perimeter. The elements are placed onto the T rails. The T rail is exposed and is highlighted by the slight protrusion.   |
| Type A+ (only for Unity)<br>                               |                    | Plaza acoustical elements with edge type A+ consist of perforated gypsum board right up to the perimeter. The elements are placed onto the T rails. The support area of the T rail has been slightly milled out so that the rail is surface flush with the element. The T rail is exposed but is not highlighted by the surface flush alignment.   |
| <b>Acoustical element Contur</b>                           |                    |  |
| Type D<br>   |                    | Contour acoustical elements with edge type D consisting of perforated gypsum boards with all around non-perforated perimeter. The elements are suspended in the T rail by the metal platelets located on the rear side. The T rail is not visible due to its concealed installation. The all around bevelled cut edges are butt jointed to one another. It produces a consistent look with non-perforated edges and slightly visible joints.             |
| Type D+ (only for Unity)<br>                               |                    | Contour acoustical elements with edge type D consist of perforated gypsum board right up to the perimeter. The elements are suspended in the T rail by the metal platelets located on the rear side. The T rail is not visible due to its concealed installation. The all around square bevelled cut edges are butt jointed to one another. It produces a consistent look with almost continuous perforation and slightly exposed precise joints.        |
| <b>Bandraster ceiling / corridor ceiling</b><br>Type D<br> |                    | Contour acoustical rectangular elements with edge type D consisting of perforated gypsum boards with all around non-perforated perimeter. The elements are suspended in the T rail by the metal platelets located on the rear side. The T rail is not visible due to its concealed installation. The all around bevelled cut edges are butt jointed to one another. It produces a consistent look with non-perforated edges and slightly visible joints. |
| <b>Acoustical element Visona</b>                           |                    |  |
| Long edge Type E<br>                                       |                    | Contour acoustical rectangular elements perforated gypsum boards with all around non-perforated perimeter. The notch on the long edge offers an appealing optical appearance with concealed T rails. The bevelled cut edges of the front edges are butt jointed to one another. The double-sided support on the mounting rails without crossbars allows the elements to be installed with any offset.  |
| Front edge Type B<br>                                      |                    |  |

### Light reflection

The paint on the Cleaneo acoustic elements has a low degree of gloss where good light propagation is guaranteed. This is a feature that is retained for an extended period of time. The light reflection values of the finished Cleaneo acoustic elements are influenced by the perforation design of the element, as well as by the colour and degree of gloss of the factory-applied paint.

The light reflection requirements depend on the activity in the room. Offices with direct lighting have a minimum requirement of 70 %.

#### Surfaces Knauf acoustical elements

| Design        | Paint coating  | Gloss   | Gloss on substrate | Reflection % |
|---------------|----------------|---------|--------------------|--------------|
| Cubus         | Standard white | Gloss 5 | Gloss 2            | 73.0         |
| Globe         | Standard white | Gloss 5 | Gloss 2            | 72.8         |
| Micro         | Standard white | Gloss 5 | Gloss 2            | 72.1         |
| Quadril       | Standard white | Gloss 5 | Gloss 2            | 75.1         |
| Regula        | Standard white | Gloss 5 | Gloss 2            | 82.6         |
| Tangent       | Standard white | Gloss 5 | Gloss 2            | 70.9         |
| Unity 3       | Standard white | Gloss 5 | Gloss 2            | 69.2         |
| Unity 6       | Standard white | Gloss 5 | Gloss 2            | 72.8         |
| Unity 8/15/20 | Standard white | Gloss 5 | Gloss 2            | 72.2         |
| Unity 9       | Standard white | Gloss 5 | Gloss 2            | 73.0         |

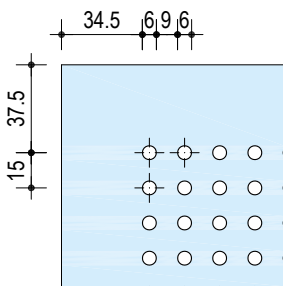
Cleaneo modules – Belgravia elements

Scheme drawings – Face side | Dimensions in mm

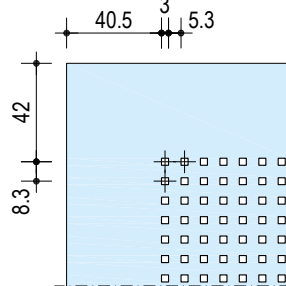
| Design                         | Perforation<br>mm | Axial perforation<br>mm | Perforation ratio element<br>% | Module W x L<br>mm | Element format W x L |               | Thick-<br>ness<br>mm | Edge<br>EN 13964 | Weight<br>approx.<br>kg/m <sup>2</sup> |
|--------------------------------|-------------------|-------------------------|--------------------------------|--------------------|----------------------|---------------|----------------------|------------------|--|
|                                |                   |                         |                                |                    | TS15/32<br>mm        | TS24/38<br>mm |                      |                  |  |
| Globe (circular perforation)   | Ø 6               | 15                      | 10.2                           | 600 x 600          | -                    | 585 x 585     | 12.5                 | E                | 8.2                                    |
|                                |                   |                         | 9.4                            | 625 x 625          |                      | 610 x 610     |                      |                  |  |
| Micro (square perforation)     | 3 x 3             | 8.3                     | 10.3                           | 600 x 600          | -                    | 584 x 584     | 12.5                 | E                | 8.2                                    |
|                                |                   |                         | 9.4                            | 625 x 625          |                      | 610 x 610     |                      |                  |  |
| Cubus (square perforation)     | 9 x 9             | 20                      | 16.9                           | 625 x 625          | -                    | 610 x 610     | 12.5                 | E                | 8.1                                    |
| Quadril (square perforation)   | 12 x 12           | 30                      | 13.0                           | 600 x 600          | -                    | 585 x 585     | 12.5                 | E                | 8.1                                    |
|                                |                   |                         | 11.9                           | 625 x 625          |                      | 610 x 610     |                      |                  |  |
| Tangent (slots)                | 4 x 14            | 10/20                   | 21.1                           | 625 x 625          | 619 x 619            | -             | 12.5                 | E                | 8.2                                    |
| Regula (non-perforated)        | -                 | -                       | 0.0                            | 600 x 600          | -                    | 585 x 585     | 12.5                 | E                | 9.9                                    |
|                                |                   |                         |                                | 625 x 625          | 619 x 619            | 610 x 610     |                      |                  |  |
| Unity 6 (circular perforation) | Ø 6               | 15                      | 11.9                           | 625 x 625          | 619 x 619            | -             | 12.5                 | E+               | 9.1                                    |
| Unity 8/15/20 (circular)       | Ø 8/15/20         | -                       | 10.8                           | 625 x 625          | 619 x 619            | -             | 12.5                 | E+               | 8.2                                    |
| Unity 3 (square perforation)   | 3.5 x 3.5         | 8.3                     | 17.2                           | 625 x 625          | 619 x 619            | -             | 12.5                 | E+               | 8.1                                    |
| Unity 9 (square perforation)   | 9 x 9             | 20                      | 18.9                           | 625 x 625          | 619 x 619            | -             | 12.5                 | E+               | 9.1                                    |
| Regula (non-perforated)        | -                 | -                       | 0.0                            | 625 x 625          | 619 x 619            | -             | 12.5                 | E+               | 9.9                                    |

Other formats on request

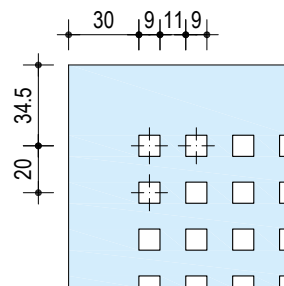
Globe (circular perforation Ø 6)



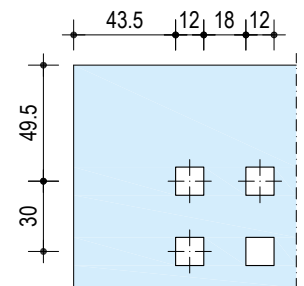
Micro (square perforation 3 x 3)



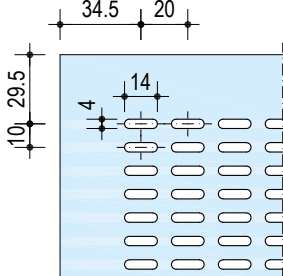
Cubus (square perforation 9 x 9)



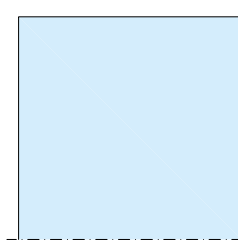
Quadril (square perforation 12 x 12)



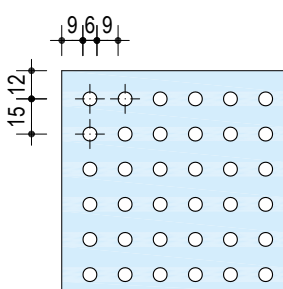
Tangent (slots 4 x 14)



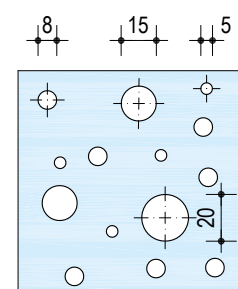
Regula (non-perforated)



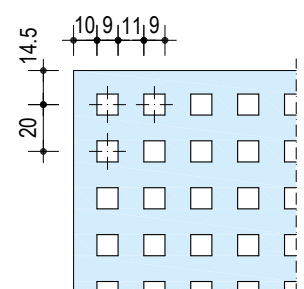
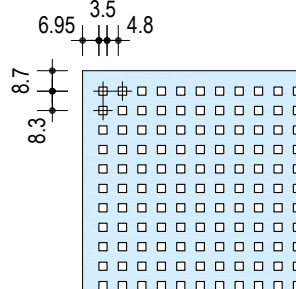
Unity 6 (circular perforation Ø 6)



Unity 8/15/20 (circular perforation Ø 8/15/20)



Unity 3 (square perforation 3.5 x 3.5) Unity 9 (square perforation 9 x 9)



**Caution** Observe T rail width 15 or 24 mm during the order, as there are different element sizes!

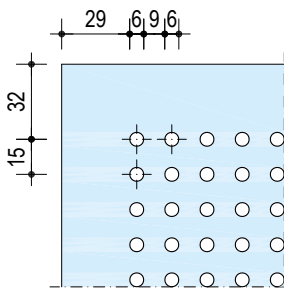
### Cleaneo modules – Plaza elements

Scheme drawings – Face side | Dimensions in mm

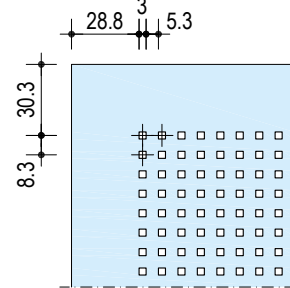
| Design                         | Perforation<br>mm | Axial perforation<br>mm | Perforation ratio element<br>% | Module W x L<br>mm | Element format W x L |               | Thick-ness<br>mm | Edge<br>EN 13964 | Weight approx.<br>kg/m <sup>2</sup> |
|--------------------------------|-------------------|-------------------------|--------------------------------|--------------------|----------------------|---------------|------------------|------------------|-------------------------------------|
|                                |                   |                         |                                |                    | TS15/32<br>mm        | TS24/38<br>mm |                  |                  |                                     |
| Globe (circular perforation)   | Ø 6               | 15                      | 10.6                           | 600 x 600          | 594 x 594            | 594 x 594     | 9.5              | A                | 7.5                                 |
|                                |                   |                         |                                | 625 x 625          | 619 x 619            | 619 x 619     | 12.5             |                  | 9.25                                |
|                                |                   |                         |                                | 600 x 1200         | 594 x 1194           | 594 x 1194    | 9.5              |                  | 7.5                                 |
|                                |                   |                         |                                | 625 x 1250         | 619 x 1244           | 619 x 1244    | 12.5             |                  | 9.25                                |
| Micro (square perforation)     | 3 x 3             | 8.3                     | 10.3                           | 600 x 600          | 594 x 594            | 594 x 594     | 9.5              | A                | 7.5                                 |
|                                |                   |                         |                                | 625 x 625          | 619 x 619            | 619 x 619     | 12.5             |                  | 9.25                                |
| Cubus (square perforation)     | 9 x 9             | 20                      | 16.3                           | 625 x 625          | 619 x 619            | 619 x 619     | 12.5             | A                | 9.0                                 |
| Quadril (square perforation)   | 12 x 12           | 30                      | 11.9                           | 600 x 600          | 594 x 594            | 594 x 594     | 9.5              | A                | 7.5                                 |
|                                |                   |                         |                                | 625 x 625          | 619 x 619            | 619 x 619     | 12.5             |                  | 9.0                                 |
| Tangent (slots)                | 4 x 14            | 10/20                   | 21.1                           | 625 x 625          | 619 x 619            | 619 x 619     | 12.5             | A                | 9.0                                 |
| Regula (non-perforated)        | -                 | -                       | 0.0                            | 600 x 600          | 594 x 594            | 594 x 594     | 9.5              | A                | 8.1                                 |
|                                |                   |                         |                                | 625 x 625          | 619 x 619            | 619 x 619     | 12.5             |                  | 9.5                                 |
|                                |                   |                         |                                | 600 x 1200         | 594 x 1194           | 594 x 1194    | 9.5              |                  | 8.1                                 |
| Unity 6 (circular perforation) | Ø 6               | 15                      | 11.9                           | 625 x 625          | 619 x 619            | -             | 12.5             | A+               | 9.1                                 |
| Unity 8/15/20 (circular)       | Ø 8/15/20         | -                       | 10.8                           | 625 x 625          | 619 x 619            | -             | 12.5             | A+               | 7.5                                 |
| Unity 3 (square perforation)   | 3.5 x 3.5         | 8.3                     | 17.2                           | 625 x 625          | 619 x 619            | -             | 12.5             | A+               | 7.5                                 |
| Unity 9 (square perforation)   | 9 x 9             | 20                      | 18.9                           | 625 x 625          | 619 x 619            | -             | 12.5             | A+               | 9.1                                 |
| Regula (non-perforated)        | -                 | -                       | 0.0                            | 625 x 625          | 619 x 619            | -             | 12.5             | A+               | 8.1                                 |

Other formats on request

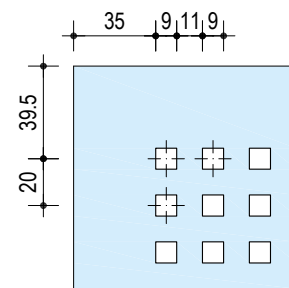
**Globe (circular perforation Ø 6)**



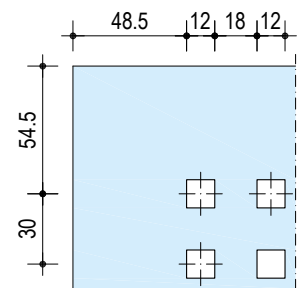
**Micro (square perforation 3 x 3)**



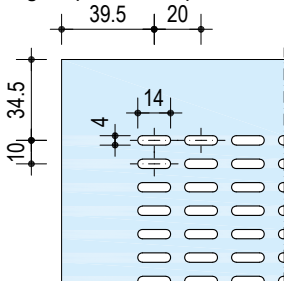
**Cubus (square perforation 9 x 9)**



**Quadril (square perforation 12 x 12)**



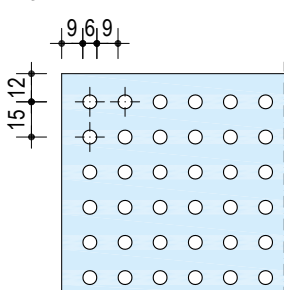
**Tangent (slots 4 x 14)**



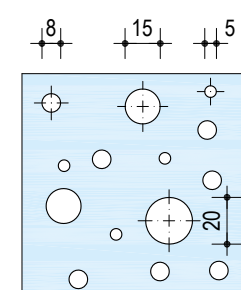
**Regula (non-perforated)**



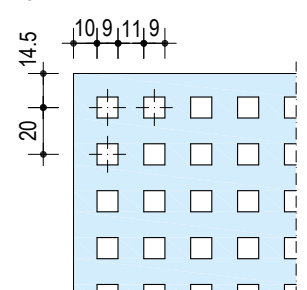
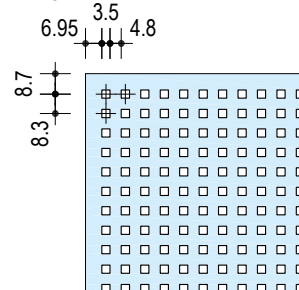
**Unity 6 (circular perforation Ø 6)**



**Unity 8/15/20 (circular perforation Ø 8/15/20)**



**Unity 3 (square perforation 3.5 x 3.5) Unity 9 (square perforation 9 x 9)**



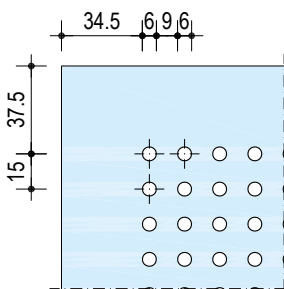
Cleaneo modules – Contur elements

Scheme drawings – Face side | Dimensions in mm

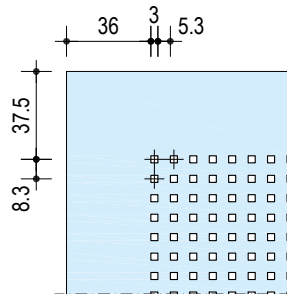
| Design                               | Perforation | Axial perforation | Perforation ratio element | Module W x L | Element format W x L<br>TS24/38 | Thickness | Edge EN 13964 | Weight approx.    |
|--------------------------------------|-------------|-------------------|---------------------------|--------------|---------------------------------|-----------|---------------|-------------------|
|                                      | mm          | mm                | %                         | mm           | mm                              | mm        |               | kg/m <sup>2</sup> |
| Globe (circular perforation)         | Ø 6         | 15                | 10.2                      | 600 x 600    | 600 x 600                       | 12.5      | D             | 9.2               |
| Micro (square perforation)           | 3 x 3       | 8.3               | 10.2                      | 600 x 600    | 600 x 600                       | 12.5      | D             | 9.2               |
| Quadril (square perforation)         | 12 x 12     | 30                | 13.0                      | 600 x 600    | 600 x 600                       | 12.5      | D             | 9.1               |
| Tangent (slots)                      | 4 x 14      | 10/20             | 19.7                      | 600 x 600    | 600 x 600                       | 12.5      | D             | 9.1               |
| Regula (non-perforated)              | –           | –                 | 0.0                       | 600 x 600    | 600 x 600                       | 12.5      | D             | 9.9               |
| Unity 6 (circular perforation)       | Ø 6         | 15                | 11.9                      | 600 x 600    | 600 x 600                       | 12.5      | D+            | 9.1               |
| Unity 8/15/20 (circular perforation) | Ø 8/15/20   | –                 | 10.8                      | 600 x 600    | 600 x 600                       | 12.5      | D+            | 9.2               |
| Unity 3 (square perforation)         | 3.5 x 3.5   | 8.3               | 17.2                      | 600 x 600    | 600 x 600                       | 12.5      | D+            | 9.1               |
| Unity 9 (square perforation)         | 9 x 9       | 20                | 18.9                      | 600 x 600    | 600 x 600                       | 12.5      | D+            | 9.1               |
| Regula (non-perforated)              | –           | –                 | 0.0                       | 600 x 600    | 600 x 600                       | 12.5      | D+            | 9.9               |

Other formats on request

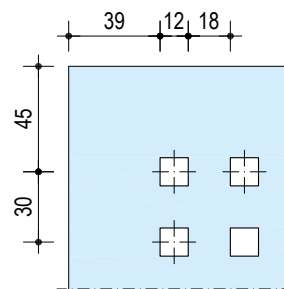
Globe (circular perforation Ø 6)



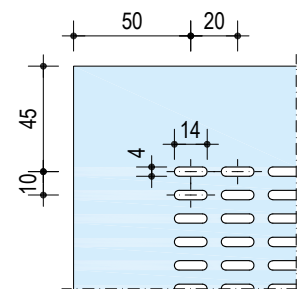
Micro (square perforation 3 x 3)



Quadril (square perforation 12 x 12)



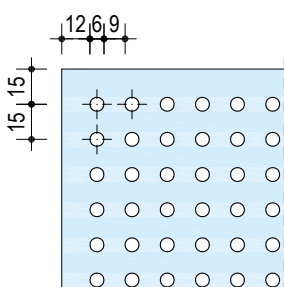
Tangent (slots 4 x 14)



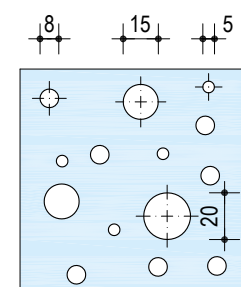
Regula (non-perforated)



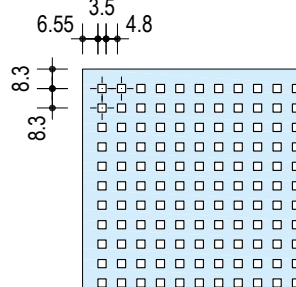
Unity 6 (circular perforation Ø 6)



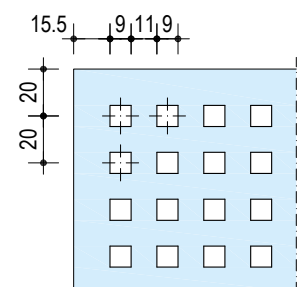
Unity 8/15/20 (circular perforation Ø 8/15/20)



Unity 3 (square perforation 3.5 x 3.5)



Unity 9 (square perforation 9 x 9)

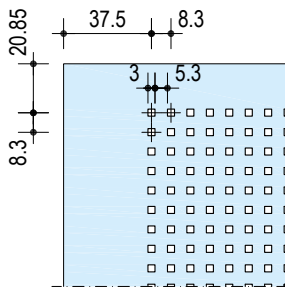


#### Cleaneo modules – Contur elements for Bandrastrer ceilings

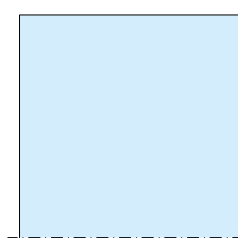
Scheme drawings – Face side | Dimensions in mm

| Design                     | Perforation<br>mm | Axial perforation<br>mm | Perforation ratio<br>element<br>% | Module<br>W x L<br>mm | Element format W x L |                | Thick-<br>ness<br>mm | Edge<br>EN 13964 | Weight<br>approx.<br>kg/m <sup>2</sup> |
|----------------------------|-------------------|-------------------------|-----------------------------------|-----------------------|----------------------|----------------|----------------------|------------------|--|
|                            |                   |                         |                                   |                       | TS24/38<br>mm        | TS24/70L<br>mm |                      |                  |  |
| Micro (square perforation) | 3 x 3             | 8.3                     | 10.5                              | 400 x 1200            | 400 x 1200           | 400 x 1200     | 12.5                 | D                | 9.2                                    |
|                            |                   |                         |                                   | 400 x 1500            | 400 x 1500           | 400 x 1500     |                      |                  |  |
|                            |                   |                         |                                   | 400 x 1800            | –                    | 400 x 1800     |                      |                  |  |
| Regula (non-perforated)    | –                 | –                       | 0.0                               | 400 x 1800            | –                    | 400 x 1800     | 12.5                 | D                | 9.9                                    |

Micro (square perforation 3 x 3)



Regula (non-perforated)



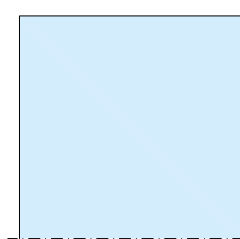
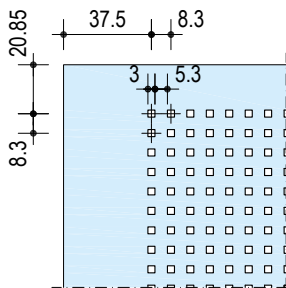
Cleaneo modules – Contur elements for corridor ceilings

Scheme drawings – Face side | Dimensions in mm

| Design                     | Perforation<br>mm | Axial perforation<br>mm | Perforation ratio element<br>% | Module W x L<br>mm | Element format W x L |                | Thick-ness<br>mm | Edge<br>EN 13964 | Weight approx.<br>kg/m <sup>2</sup> |
|----------------------------|-------------------|-------------------------|--------------------------------|--------------------|----------------------|----------------|------------------|------------------|-------------------------------------|
|                            |                   |                         |                                |                    | TS24/38<br>mm        | TS24/70L<br>mm |                  |                  |                                     |
| Micro (square perforation) | 3 x 3             | 8.3                     | 10.5                           | 400 x 1200         | 400 x 1200           | 400 x 1200     | 12.5             | D                | 9.2                                 |
|                            |                   |                         |                                | 400 x 1500         | 400 x 1500           | 400 x 1500     |                  |                  |                                     |
|                            |                   |                         |                                | 400 x 1800         | –                    | 400 x 1800     |                  |                  |                                     |
| Regula (non-perforated)    | –                 | –                       | 0.0                            | 400 x 1800         | –                    | 400 x 1800     | 12.5             | D                | 9.9                                 |

Micro (square perforation 3 x 3)

Regula (non-perforated)



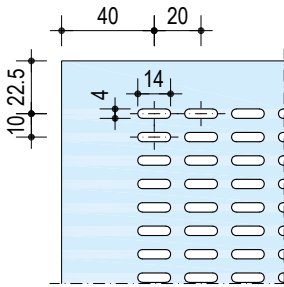
Cleaneo modules – Visona elements

Scheme drawings – Face side | Dimensions in mm

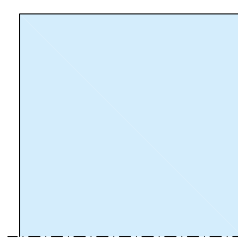
| Design                  | Perforation<br>mm | Axial perforation<br>mm | Perforation ratio element<br>% | Module<br>W x L<br>mm | Element format<br>W x L<br>TS24/38<br>mm | Thick-ness<br>mm | Edge<br>EN 13964 | Weight approx.<br>kg/m <sup>2</sup> |
|-------------------------|-------------------|-------------------------|--------------------------------|-----------------------|--|------------------|------------------|-------------------------------------|
| Tangent (slots)         | 4 x 14            | 10/20                   | 21.3                           | 400 x 1200            | 383 x 1200                               | 12.5             | E/B              | 8.2                                 |
| Regula (non-perforated) | –                 | –                       | 0.0                            | 400 x 1200            | 383 x 1200                               | 12.5             | E/B              | 9.0                                 |

Other formats on request

Tangent (slots 4 x 14)



Regula (non-perforated)



D145.de

D146.de

D147.de

D141.de

D142.de

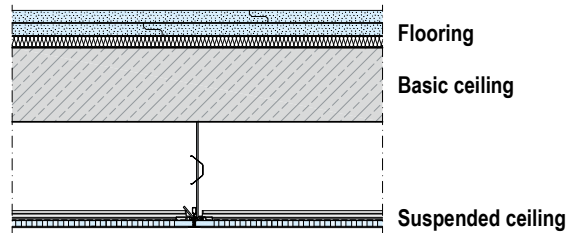
D144.de

### Airborne and impact sound insulation

Scheme drawings

#### Test configuration

##### Example D146.de Cleaneo Acoustic Plank Ceiling Plaza



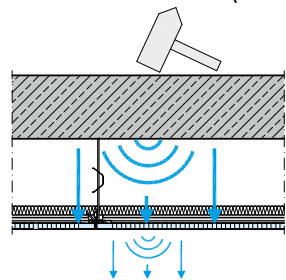
- Rapid Hanger with hanging wire
- Mineral wool insulation layer, acc. to DIN EN 13162, length-related flow resistance of  $5 \text{ kPa}\cdot\text{s}/\text{m}^2 \leq r \leq 50 \text{ kPa}\cdot\text{s}/\text{m}^2$  acc. to DIN 4109-33
- Mounting rail TS24/38 and crossbar QS24/32
- Plaza Tangent, edge type A, 625 x 625 mm

#### Terms

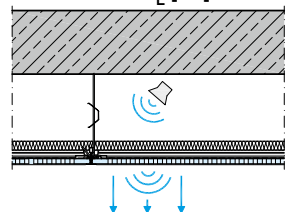
- $R_w$  = Weighted sound reduction index in dB without sound transmission via flanking building components
- $L_{n,w}$  = Weighted normalized impact sound pressure level in dB without sound transmission via flanking building components
- $C_1$  or  $C_{1,50-2500}$  = Spectrum adaptation term for footfall sound pressure level values in dB, that can be added to single number values, to take the features of determined sound spectra into consideration.
- $\Delta R_{w,heavy}$  = Weighted sound reduction index in conjunction with a standard reference ceiling with a mass per unit area of  $350 \pm 50 \text{ kg}/\text{m}^2$  acc. to DIN 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

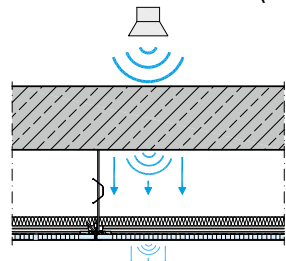
##### Footfall sound insulation (reduction of impact sound pressure level $\Delta L_n$ [dB])



##### Insertion loss $D_E$ [dB]



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



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

- 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

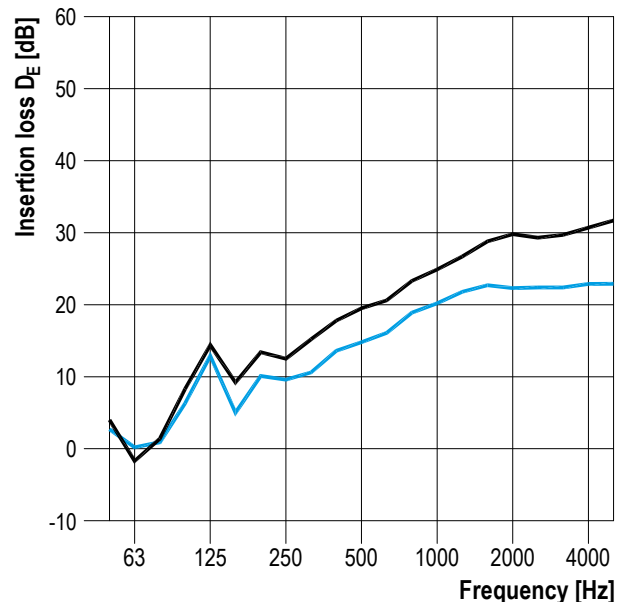
#### Insertion loss $D_E$

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:

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

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 T 017-07.17.

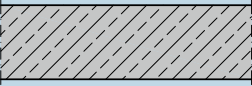
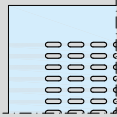
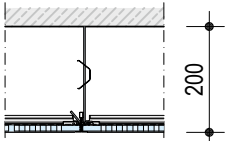
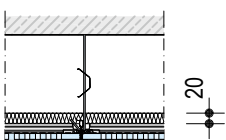
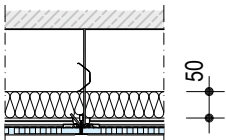
#### Example: Frequency-dependent insertion loss $D_E$



- Rapid Hanger with hanging wire, 50 mm Akustik-Dämmplatte TP 440, Mounting rail TS24/38 and crossbar QS24/32, 12.5 mm Plaza Tangent, edge type A, 625 x 625 mm Total construction height 200 mm
- Rapid Hanger with hanging wire, 20 mm Akustik-Dämmplatte TP 120 A, Mounting rail TS24/38 and crossbar QS24/32, 12.5 mm Plaza Tangent, edge type A, 625 x 625 mm Total construction height 200 mm

#### Airborne and impact sound insulation with D146.de Cleaneo Acoustical Plank Ceiling Plaza with Tangent element

Dimensions in mm

| Basic ceiling<br>Reinforced concrete ceiling<br>140 mm, approx. 320 kg/m <sup>2</sup><br>(standard reference floor)   | Without floor   |                        | Basic ceiling + flooring construction  |   |                            |   |                            |   |
|---|---|------------------------|--|---|----------------------------|---|----------------------------|---|
|   | Sound reduction index/<br>normalized impact<br>sound pressure level |                        | Floor construction   |   | Knauf pre-fab floor screed |   | Knauf flowing screed       |   |
|    | $R_w$<br>dB   | $L_{n,w}$<br>dB        | $\Delta R_{w,heavy}$<br>dB   | $\Delta L_{n,w}$<br>dB                            | $\Delta R_{w,heavy}$<br>dB | $\Delta L_{n,w}$<br>dB                            | $\Delta R_{w,heavy}$<br>dB | $\Delta L_{n,w}$<br>dB                            |
| Without suspended ceiling   | 53.5  | 79.5                   | 6  | 20  | 10                         | 28  | —                          | 37  |
| Basic ceiling + subceiling<br>Plaza Tangent<br>14-4/20 slots<br>Perforation ratio<br>21.1 %   | Improvement index   |                        | Basic ceiling + flooring + subceiling<br>Calculated values according to the procedure detailed in the DIN EN 12354-1:2000<br>(airborne sound) and DIN EN 12354-2:2000 (impact sound) |   |                            |   |                            |   |
|    | $\Delta R_{w,heavy}$<br>dB  | $\Delta L_{n,w}$<br>dB | $R_{w,calc}$<br>dB   | $L_{n,w,calc}$<br>( $C_1   C_{1,50-2500}$ )<br>dB | $R_{w,calc}$<br>dB         | $L_{n,w,calc}$<br>( $C_1   C_{1,50-2500}$ )<br>dB | $R_{w,calc}$<br>dB         | $L_{n,w,calc}$<br>( $C_1   C_{1,50-2500}$ )<br>dB |
| <br>■ Rapid Hanger with hanging wire<br>■ Without insulation                   | 6.4   | 8.3                    | 62   | 53<br>(1   2)                                     | 67                         | 46<br>(1   8)                                     | —                          | 37<br>(—   —)                                     |
| <br>■ Rapid Hanger with hanging wire<br>■ 20 mm Akustik-Dämmplatte<br>TP 120 A | 8.3   | 15.1                   | 62   | 51<br>(2   3)                                     | 68                         | 44<br>(2   10)                                    | —                          | 35<br>(—   —)                                     |
| <br>■ Rapid Hanger with hanging wire<br>■ 50 mm Akustik-Dämmplatte<br>TP 440   | 10.0  | 19.5                   | 63   | 50<br>(2   4)                                     | 69                         | 43<br>(2   11)                                    | —                          | 34<br>(—   —)                                     |

#### Note

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

## 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  $\alpha_w$  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  $\alpha_w$  is practically 1.

- $\alpha_s$  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.
- $\alpha_p$  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.
- $\alpha_w$  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 25](#).

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

## Sound absorption class and descriptive term acc. to VDI 3755

| Weighted sound absorption coefficient $\alpha_w$ | Rating              |
|--|---------------------|
| $\geq 0.80$                                      | Extremely absorbing |
| 0.60 to 0.75                                     | Highly absorbing    |
| 0.30 to 0.55                                     | Absorbing           |
| 0.15 to 0.25                                     | Hardly absorbing    |
| $\leq 0.10$                                      | 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 total construction height 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  $\alpha_w$  is specified as a single value quantity in addition to an NRC (Noise Reduction Coefficient) for the products. The procedure for determination of the rated sound absorption coefficient is explained on the following page. The American NRC quantity is determined from the  $\alpha_s$  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 **blue** 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 overall construction heights, insulation material layers and perforation ratios of the surfaces.

## Note

The Knauf [Knauf Raumakustikrechner](#) (room acoustics calculator) is available for individual calculation when Knauf Cleaneo acoustic products are employed (currently in German only).

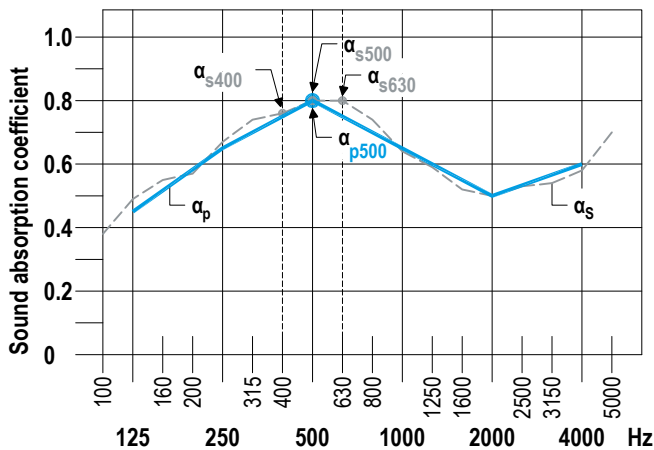
### Determination of the single value quantity of the sound absorption coefficient $\alpha_w$

#### 1. Sound absorption coefficient

$\alpha_s$  = **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

$\alpha_p$  = **Practical sound absorption coefficient**  
from  $\alpha_s$  on octave bands converted acc. to DIN EN ISO 11654

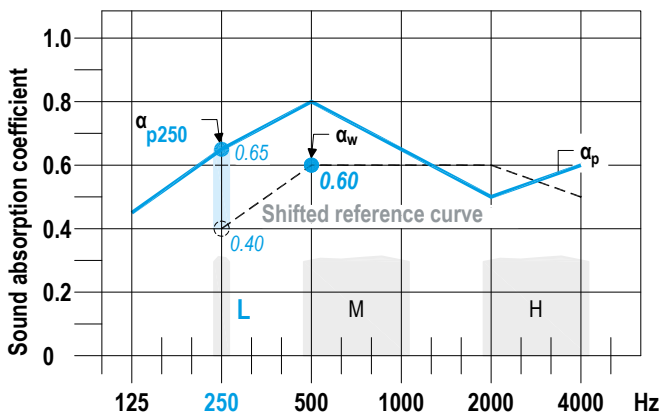
$$\text{Example for 500 Hz: } \alpha_p 500 = \frac{\alpha_s 400 + \alpha_s 500 + \alpha_s 630}{3}$$



#### 3. Shape indicators

$\alpha_w$  with shape indicators =  $\alpha_w(\dots)$   
if  $\alpha_p$  exceeds the reference curve for a single octave frequency by  $\geq 0.25$ , then add:  
(L) at 250 Hz (M) at 500 or 1000 Hz (H) at 2000 or 4000 Hz

Example (250 Hz):  $0.65 - 0.40 = 0.25 (\geq 0.25) = (L) \rightarrow \alpha_w = 0.60 (L)$

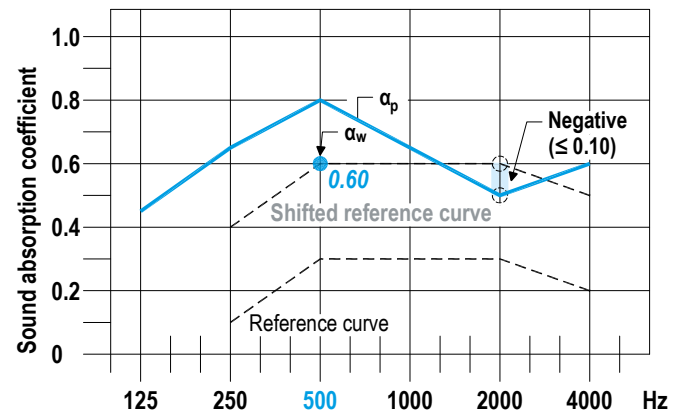


#### 2. Weighted sound absorption coefficient

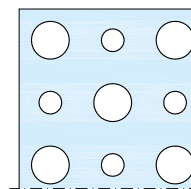
$\alpha_w$  = **Weighted sound absorption coefficient**  
acc to DIN EN ISO 11654

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

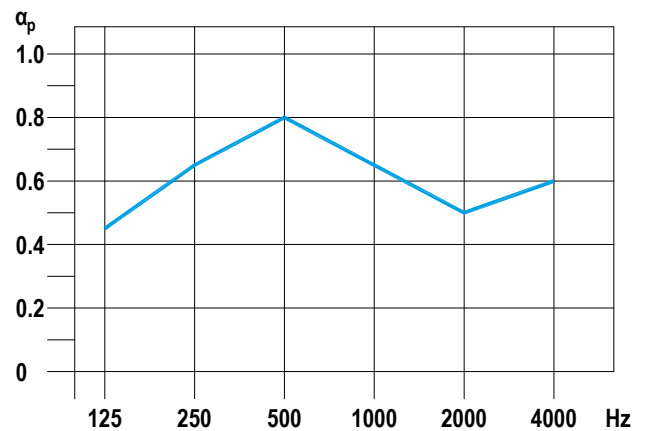
Example:



#### Example



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



Total construction depth 200 mm

|            |      |      |      |      |      |      |
|------------|------|------|------|------|------|------|
| $\alpha_p$ | 0.45 | 0.65 | 0.80 | 0.65 | 0.50 | 0.60 |
|------------|------|------|------|------|------|------|

$\alpha_w = 0.60 (L)$

Highly absorbing

Requirements for the insulation layer

For those in the tables on the following pages for Knauf Cleaneo Acoustical Plank Ceilings "with insulation layer"

| Systems  | Mineral wool EN 13162 thickness mm | Length-related flow resistance kPa·s/m <sup>2</sup> | Insulation layer Knauf Insulation |
|--|------------------------------------|---|-----------------------------------|
| D145.de Cleaneo Acoustic Plank Ceiling Belgravia     | 50                                 | ≥ 11  | Akustik-Dämmplatte TP 440         |
|  | 20                                 | ≥ 12  | Akustik-Dämmplatte TP 120 A       |
|  | 40                                 | ≥ 5   | Partition-Dämmplatte TP 115       |
| D146.de Cleaneo Acoustic Plank Ceiling Plaza         | 50                                 | ≥ 11  | Akustik-Dämmplatte TP 440         |
|  | 20                                 | ≥ 12  | Akustik-Dämmplatte TP 120 A       |
|  | 40                                 | ≥ 5   | Partition-Dämmplatte TP 115       |
| D147.de Cleaneo Acoustic Plank Ceiling Contur        | 50                                 | ≥ 11  | Akustik-Dämmplatte TP 440         |
|  | 20                                 | ≥ 12  | Akustik-Dämmplatte TP 120 A       |
|  | 40                                 | ≥ 5   | Partition-Dämmplatte TP 115       |
| D141.de Cleaneo Acoustical Bandraster Ceiling Contur | 50                                 | ≥ 11  | Akustik-Dämmplatte TP 440         |
|  | 20                                 | ≥ 12  | Akustik-Dämmplatte TP 120 A       |
|  | 40                                 | ≥ 5   | Partition-Dämmplatte TP 115       |
| D142.de Cleaneo Acoustical Corridor Ceiling Contur   | 50                                 | ≥ 11  | Akustik-Dämmplatte TP 440         |
|  | 20                                 | ≥ 12  | Akustik-Dämmplatte TP 120 A       |
|  | 40                                 | ≥ 5   | Partition-Dämmplatte TP 115       |
| D144.de Cleaneo Acoustic Plank Ceiling Visona        | 50                                 | ≥ 11  | Akustik-Dämmplatte TP 440         |
|  | 20                                 | ≥ 12  | Akustik-Dämmplatte TP 120 A       |
|  | 40                                 | ≥ 5   | Partition-Dämmplatte TP 115       |

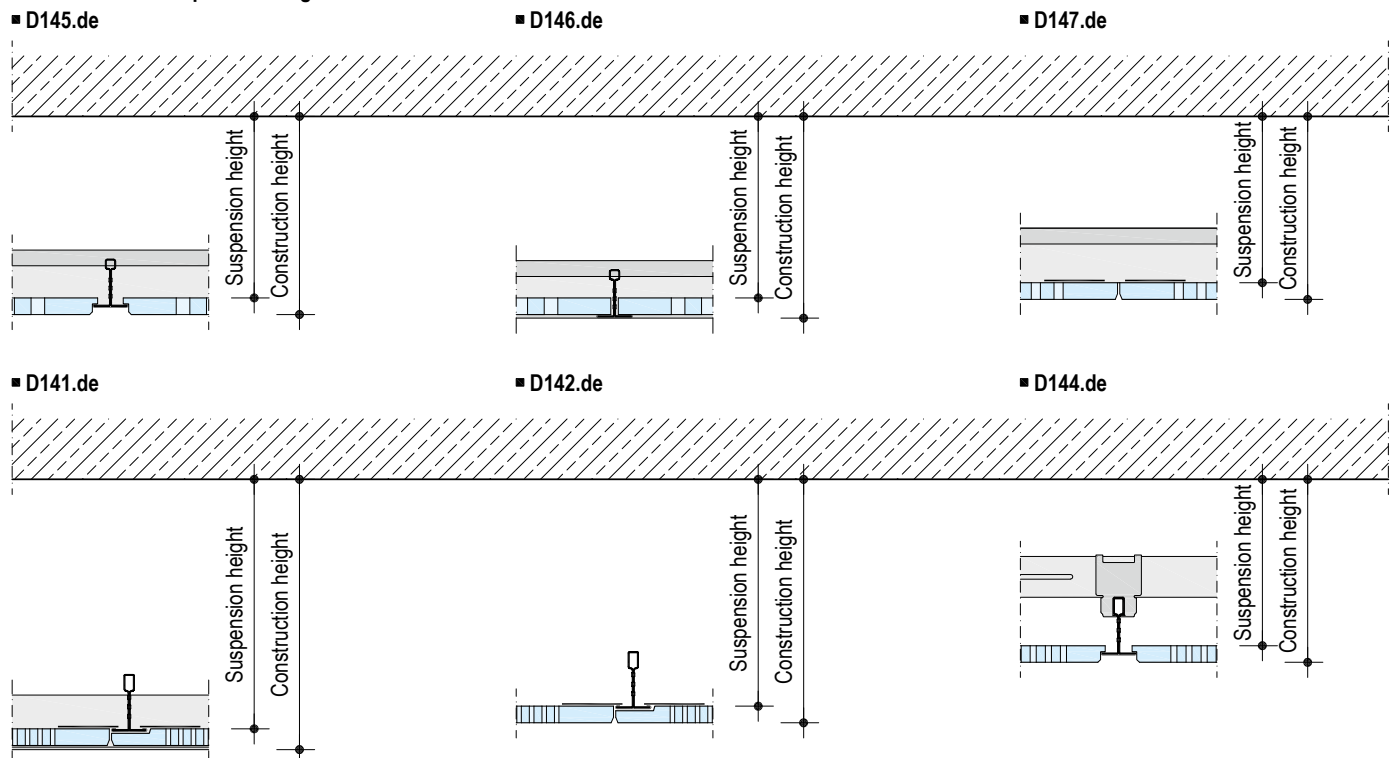
Total construction height

Scheme drawings

The overall construction height (construction depth) is a decisive property for the acoustic effectiveness of suspended ceilings. It is the distance between the basic ceiling or the closed, acoustically hard ceiling up to the visible side of the suspended ceiling.

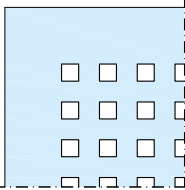
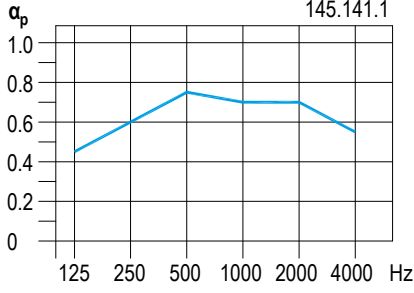
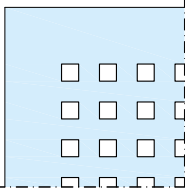
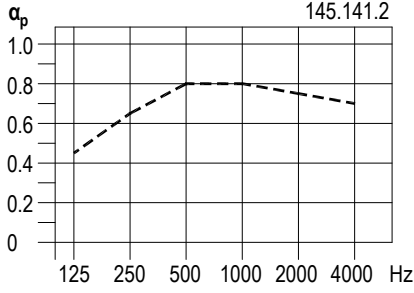
As a contrast, the suspension height is the clearance between the basic ceiling and the rear of the suspended ceiling.

Cleaneo acoustical plank ceilings:



**D145.de Cleaneo Acoustical Plank Ceiling / D146.de Cleaneo Acoustical Plank Ceiling Plaza**

12.5 mm Cleaneo module element with acoustical fleece

| Perforation pattern   | Total construction height mm | NRC  | $\alpha_w$  | Frequency-dependent absorption coefficient $\alpha_p$ |        |        |         |         |         |  |
|---|------------------------------|------|-------------|---|--------|--------|---------|---------|---------|--|
|   |                              |      |             | 125 Hz  | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |  |
| <b>Without insulation layer</b>   |                              |      |             |   |        |        |         |         |         |  |
| Cubus 9/20 Q<br> | 65                           | -    | -           | -   | -      | -      | -       | -       | -       |   |
|   | 200                          | 0.65 | <b>0.70</b> | 0.45  | 0.60   | 0.75   | 0.70    | 0.70    | 0.55    |  |
|   | 500                          | -    | -           | -   | -      | -      | -       | -       | -       |  |
| <b>With insulation layer (For requirements on insulation layer see page 26)</b>                   |                              |      |             |   |        |        |         |         |         |  |
| Cubus 9/20 Q<br> | 65                           | 0.75 | <b>0.80</b> | 0.45  | 0.65   | 0.80   | 0.80    | 0.75    | 0.70    |  |
|   | 200                          | -    | -           | -   | -      | -      | -       | -       | -       |  |
|   | 500                          | -    | -           | -   | -      | -      | -       | -       | -       |  |

D145.de

D146.de

D147.de

D141.de

D142.de

D144.de

D145.de Cleaneo Acoustical Plank Ceiling Belgravia / D146.de Cleaneo Acoustical Plank Ceiling Plaza / D147.de Cleaneo Acoustical Plank Ceiling Contur

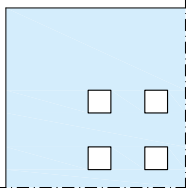
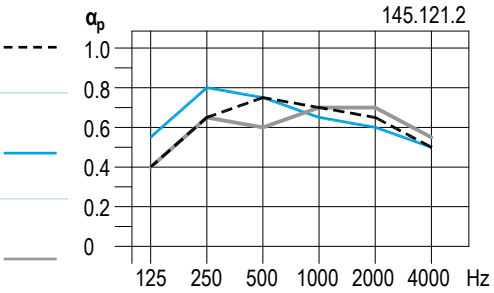
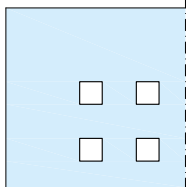
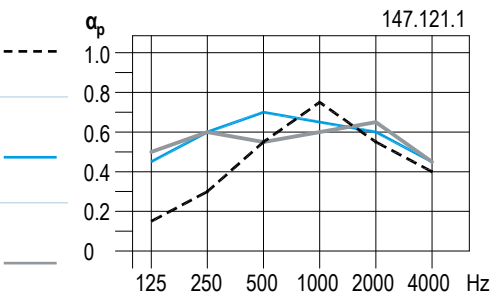
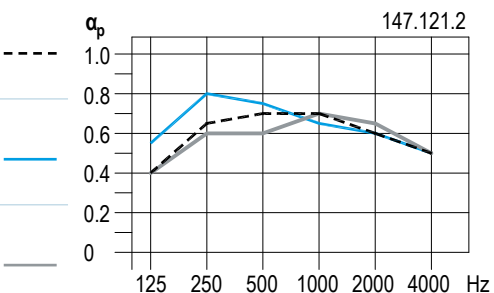
12.5 mm Cleaneo module element with acoustical fleece

| Perforation pattern      | Total construction height mm  | NRC      | $\alpha_w$ | Frequency-dependent absorption coefficient $\alpha_p$ |      |      |      |      |      |  |
|--------------------------|---|----------|------------|---|------|------|------|------|------|--|
|                          |   |          |            | 125   | 250  | 500  | 1000 | 2000 | 4000 |  |
|                          |   |          |            | Hz  | Hz   | Hz   | Hz   | Hz   | Hz   |  |
| <b>Globe 6/15 R</b><br>  | <b>Without insulation layer</b>   |          |            |   |      |      |      |      |      |  |
|                          | 65  | 0.60     | 0.55 (M)   | 0.10  | 0.35 | 0.65 | 0.80 | 0.60 | 0.40 |  |
|                          | 200   | 0.65     | 0.60       | 0.45  | 0.65 | 0.80 | 0.65 | 0.55 | 0.45 |  |
|                          | 500   | 0.65     | 0.60 (L)   | 0.40  | 0.65 | 0.60 | 0.60 | 0.55 | 0.45 |  |
|                          | <b>With insulation layer (For requirements on insulation layer see page 26)</b> |          |            |   |      |      |      |      |      |  |
|                          | 65  | 0.75     | 0.65 (L)   | 0.35  | 0.70 | 0.80 | 0.75 | 0.60 | 0.50 |  |
| 200                      | 0.70  | 0.60 (L) | 0.55       | 0.75  | 0.75 | 0.65 | 0.55 | 0.50 |      |  |
| 500                      | 0.70  | 0.70     | 0.40       | 0.65  | 0.70 | 0.75 | 0.65 | 0.55 |      |  |
| <b>Micro 3/8.3 Q</b><br> | <b>Without insulation layer</b>   |          |            |   |      |      |      |      |      |  |
|                          | 65  | 0.60     | 0.65       | 0.15  | 0.40 | 0.60 | 0.70 | 0.65 | 0.55 |  |
|                          | 200   | 0.70     | 0.70       | 0.50  | 0.65 | 0.75 | 0.70 | 0.65 | 0.55 |  |
|                          | 500   | 0.60     | 0.60       | 0.35  | 0.55 | 0.55 | 0.55 | 0.60 | 0.60 |  |
|                          | <b>With insulation layer (For requirements on insulation layer see page 26)</b> |          |            |   |      |      |      |      |      |  |
|                          | 65  | 0.80     | 0.75       | 0.40  | 0.70 | 0.90 | 0.85 | 0.70 | 0.60 |  |
| 200                      | 0.60  | 0.60     | 0.55       | 0.55  | 0.60 | 0.55 | 0.55 | 0.60 |      |  |
| 500                      | 0.60  | 0.65     | 0.40       | 0.55  | 0.55 | 0.65 | 0.65 | 0.65 |      |  |

Blue absorption values are forecast 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.

#### D145.de Cleaneo Acoustical Plank Ceiling Belgravia / D146.de Cleaneo Acoustical Plank Ceiling Plaza / D147.de Cleaneo Acoustical Plank Ceiling Contur

12.5 mm Cleaneo module element with acoustical fleece

| Perforation pattern  | Total construction height mm   | NRC      | $\alpha_w$ | Frequency-dependent absorption coefficient $\alpha_p$ |      |      |      |      |      |   |
|--|--|----------|------------|---|------|------|------|------|------|---|
|  |  |          |            | 125   | 250  | 500  | 1000 | 2000 | 4000 |   |
|  |  |          |            | Hz  | Hz   | Hz   | Hz   | Hz   | Hz   |   |
| Only Belgravia/ Plaza<br>Quadril<br>12/30 Q<br> | <b>Without insulation layer</b>  |          |            |   |      |      |      |      |      |   |
|  | 65   | 0.60     | 0.55 (M)   | 0.15  | 0.30 | 0.60 | 0.80 | 0.60 | 0.40 |    |
|  | 200  | 0.65     | 0.60       | 0.45  | 0.60 | 0.70 | 0.65 | 0.60 | 0.45 |   |
|  | 500  | 0.65     | 0.55 (L)   | 0.50  | 0.65 | 0.60 | 0.60 | 0.50 | 0.45 |   |
|  | <b>With insulation layer</b> (For requirements on insulation layer see <a href="#">page 26</a> ) |          |            |   |      |      |      |      |      |   |
|  | 65   | 0.70     | 0.65       | 0.40  | 0.65 | 0.75 | 0.70 | 0.65 | 0.50 |   |
| 200  | 0.75   | 0.65 (L) | 0.55       | 0.80  | 0.75 | 0.65 | 0.60 | 0.50 |      |   |
| 500  | 0.65   | 0.65     | 0.40       | 0.65  | 0.60 | 0.70 | 0.70 | 0.55 |      |   |
| Contur only<br>Quadril<br>12/30 Q<br>         | <b>Without insulation layer</b>  |          |            |   |      |      |      |      |      |   |
|  | 65   | 0.55     | 0.55       | 0.15  | 0.30 | 0.55 | 0.75 | 0.55 | 0.40 |  |
|  | 200  | 0.65     | 0.60       | 0.45  | 0.60 | 0.70 | 0.65 | 0.60 | 0.45 |   |
|  | 500  | 0.60     | 0.55 (L)   | 0.50  | 0.60 | 0.55 | 0.60 | 0.55 | 0.45 |   |
|  | <b>With insulation layer</b> (For requirements on insulation layer see <a href="#">page 26</a> ) |          |            |   |      |      |      |      |      |   |
|  | 65   | 0.65     | 0.65       | 0.40  | 0.65 | 0.70 | 0.70 | 0.60 | 0.50 |  |
| 200  | 0.75   | 0.65 (L) | 0.55       | 0.80  | 0.75 | 0.65 | 0.60 | 0.50 |      |   |
| 500  | 0.65   | 0.65     | 0.40       | 0.60  | 0.60 | 0.70 | 0.65 | 0.50 |      |   |

Blue absorption values are forecast 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.

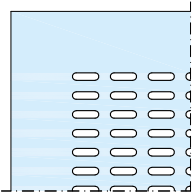
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D145.de Cleaneo Acoustical Plank Ceiling Belgravia / D146.de Cleaneo Acoustical Plank Ceiling Plaza / D147.de Cleaneo Acoustical Plank Ceiling Contur

12.5 mm Cleaneo module element with acoustical fleece

| Perforation pattern   | Total construction height mm | NRC  | $\alpha_w$ | Frequency-dependent absorption coefficient $\alpha_p$ |        |        |         |         |         |  |
|---|------------------------------|------|------------|---|--------|--------|---------|---------|---------|--|
|   |                              |      |            | 125 Hz  | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |  |
| <b>Without insulation layer</b>   |                              |      |            |   |        |        |         |         |         |  |
| 65  |                              | 0.65 | 0.55 (M)   | 0.10  | 0.30   | 0.55   | 0.80    | 0.85    | 0.75    |  |
| 200   |                              | 0.70 | 0.80       | 0.45  | 0.65   | 0.80   | 0.75    | 0.75    | 0.75    |  |
| 400   |                              | 0.70 | 0.75       | 0.45  | 0.65   | 0.65   | 0.75    | 0.75    | 0.85    |  |
| <b>With insulation layer (For requirements on insulation layer see page 26)</b> |                              |      |            |   |        |        |         |         |         |  |
| 65  |                              | 0.85 | 0.90       | 0.35  | 0.70   | 0.95   | 0.95    | 0.85    | 0.85    |  |
| 200   |                              | 0.90 | 0.90       | 0.75  | 0.90   | 0.90   | 0.85    | 0.90    | 0.95    |  |
| 500   |                              | 0.90 | 0.90       | 0.75  | 0.90   | 0.90   | 0.90    | 0.90    | 0.90    |  |

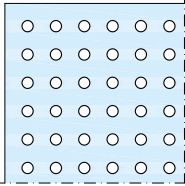
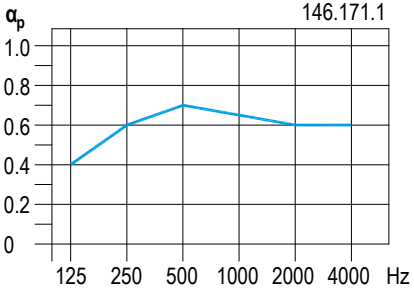
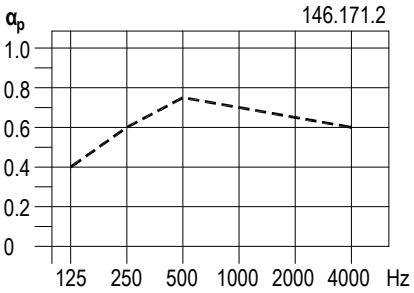
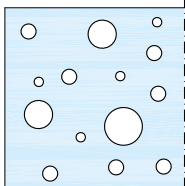
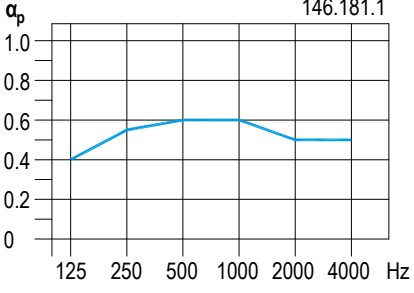
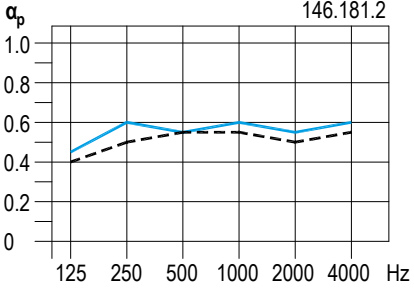
Tangent  
14-4/20 slots



Blue absorption values are forecast 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.

#### D145.de Cleaneo Acoustical Plank Ceiling Belgravia / D146.de Cleaneo Acoustical Plank Ceiling Plaza / D147.de Cleaneo Acoustical Plank Ceiling Contur

12.5 mm Cleaneo module element with acoustical fleece

| Perforation pattern   | Total construction height mm   | NRC  | $\alpha_w$ | Frequency-dependent absorption coefficient $\alpha_p$ |      |      |      |      |      |   |   |
|---|--|------|------------|---|------|------|------|------|------|---|---|
|   |  |      |            | 125   | 250  | 500  | 1000 | 2000 | 4000 |   |   |
|   |  |      |            | Hz  | Hz   | Hz   | Hz   | Hz   | Hz   |   |   |
| <b>Unity 6</b><br><b>6/15 R</b><br>            | <b>Without insulation layer</b>  |      |            |   |      |      |      |      |      |   |   |
|   | 65   | -    | -          | -   | -    | -    | -    | -    | -    | - |    |
|   | 200  | 0.60 | 0.65       | 0.40  | 0.60 | 0.70 | 0.65 | 0.60 | 0.60 |   |   |
|   | 500  | -    | -          | -   | -    | -    | -    | -    | -    |   |   |
|   | <b>With insulation layer</b> (For requirements on insulation layer see <a href="#">page 26</a> ) |      |            |   |      |      |      |      |      |   |   |
|   | 65   | 0.65 | 0.70       | 0.40  | 0.60 | 0.75 | 0.70 | 0.65 | 0.60 | - |   |
| 200   | -  | -    | -          | -   | -    | -    | -    | -    | -    |   |   |
| 500   | -  | -    | -          | -   | -    | -    | -    | -    | -    |   |   |
| <b>Unity 8/15/20</b><br><b>8/15/20 R</b><br> | <b>Without insulation layer</b>  |      |            |   |      |      |      |      |      |   |   |
|   | 65   | -    | -          | -   | -    | -    | -    | -    | -    | - |  |
|   | 200  | 0.55 | 0.60       | 0.40  | 0.55 | 0.60 | 0.60 | 0.50 | 0.50 |   |   |
|   | 500  | -    | -          | -   | -    | -    | -    | -    | -    |   |   |
|   | <b>With insulation layer</b> (For requirements on insulation layer see <a href="#">page 26</a> ) |      |            |   |      |      |      |      |      |   |   |
|   | 65   | 0.55 | 0.55       | 0.40  | 0.50 | 0.55 | 0.55 | 0.50 | 0.55 | - |  |
| 200   | 0.60   | 0.60 | 0.45       | 0.60  | 0.55 | 0.60 | 0.55 | 0.60 | -    |   |   |
| 500   | -  | -    | -          | -   | -    | -    | -    | -    | -    |   |   |

Blue absorption values are forecast 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.

D145.de  
D146.de  
D147.de  
D141.de  
D142.de  
D144.de

D145.de Cleaneo Acoustical Plank Ceiling Belgravia / D146.de Cleaneo Acoustical Plank Ceiling Plaza / D147.de Cleaneo Acoustical Plank Ceiling Contur

12.5 mm Cleaneo module element with acoustical fleece

| Perforation pattern  | Total construction height mm | NRC         | $\alpha_w$ | Frequency-dependent absorption coefficient $\alpha_p$ |      |      |      |      |                  |                  |
|--|------------------------------|-------------|------------|---|------|------|------|------|------------------|------------------|
|  |                              |             |            | 125   | 250  | 500  | 1000 | 2000 | 4000             |                  |
|  |                              |             |            | Hz  | Hz   | Hz   | Hz   | Hz   | Hz               |                  |
| <b>Unity 3</b><br>3.5/8.3 Q  |                              |             |            |   |      |      |      |      |                  |                  |
|  |                              |             |            |   |      |      |      |      |                  |                  |
| <b>Without insulation layer</b>  |                              |             |            |   |      |      |      |      |                  |                  |
| 65   |                              | -           | -          | -   | -    | -    | -    | -    | -                | <p>146.161.1</p> |
| 200  | 0.75                         | <b>0.80</b> | 0.50       | 0.80  | 0.85 | 0.75 | 0.75 | 0.80 |                  |                  |
| 500  |                              | -           | -          | -   | -    | -    | -    | -    |                  |                  |
| <b>With insulation layer</b> (For requirements on insulation layer see <a href="#">page 26</a> ) |                              |             |            |   |      |      |      |      |                  |                  |
| 65   | 0.80                         | <b>0.85</b> | 0.35       | 0.65  | 0.85 | 0.85 | 0.75 | 0.85 | <p>146.161.2</p> |                  |
| 200  | 0.85                         | <b>0.85</b> | 0.60       | 0.85  | 0.85 | 0.85 | 0.85 | 0.90 |                  |                  |
| 500  |                              | -           | -          | -   | -    | -    | -    | -    |                  |                  |
| <b>Unity 9</b><br>9/9 Q  |                              |             |            |   |      |      |      |      |                  |                  |
|  |                              |             |            |   |      |      |      |      |                  |                  |
| <b>Without insulation layer</b>  |                              |             |            |   |      |      |      |      |                  |                  |
| 65   |                              | -           | -          | -   | -    | -    | -    | -    | <p>146.191.1</p> |                  |
| 200  | 0.80                         | <b>0.75</b> | 0.45       | 0.75  | 0.85 | 0.75 | 0.75 | 0.65 |                  |                  |
| 500  |                              | -           | -          | -   | -    | -    | -    | -    |                  |                  |
| <b>With insulation layer</b> (For requirements on insulation layer see <a href="#">page 26</a> ) |                              |             |            |   |      |      |      |      |                  |                  |
| 65   | 0.85                         | <b>0.90</b> | 0.40       | 0.80  | 0.90 | 0.90 | 0.85 | 0.80 | <p>146.191.2</p> |                  |
| 200  | 0.85                         | <b>0.85</b> | 0.55       | 0.85  | 0.85 | 0.80 | 0.85 | 0.80 |                  |                  |
| 500  |                              | -           | -          | -   | -    | -    | -    | -    |                  |                  |

#### D141.de Cleaneo Acoustic Bandraster Ceiling Contour / D142.de Cleaneo Acoustic Corridor Ceiling Contur

12.5 mm Cleaneo module elements with acoustical fleece

| Perforation pattern   | Total construction height mm | NRC  | $\alpha_w$ | Frequency-dependent absorption coefficient $\alpha_p$ |      |      |      |      |      |  |
|---|------------------------------|------|------------|---|------|------|------|------|------|--|
|   |                              |      |            | 125   | 250  | 500  | 1000 | 2000 | 4000 |  |
|   |                              |      |            | Hz  | Hz   | Hz   | Hz   | Hz   | Hz   |  |
| <b>Without insulation layer</b>   |                              |      |            |   |      |      |      |      |      |  |
| <b>Micro 3/8.3 Q</b>  | 200                          | 0.70 | 0.70       | 0.50  | 0.65 | 0.75 | 0.70 | 0.65 | 0.55 |  |
|   | 500                          | 0.60 | 0.60       | 0.35  | 0.55 | 0.55 | 0.55 | 0.60 | 0.60 |  |
| <b>With insulation layer (For requirements on insulation layer see page 26)</b> |                              |      |            |   |      |      |      |      |      |  |
| <b>Micro 3/8.3 Q</b>  | 200                          | 0.60 | 0.60       | 0.55  | 0.55 | 0.60 | 0.55 | 0.55 | 0.60 |  |
|   | 500                          | 0.60 | 0.65       | 0.40  | 0.55 | 0.55 | 0.65 | 0.65 | 0.65 |  |

#### D144.de Cleaneo Acoustic Plank Ceiling Visona

12.5 mm Cleaneo module element with acoustical fleece

| Perforation pattern   | Total construction height mm | NRC  | $\alpha_w$ | Frequency-dependent absorption coefficient $\alpha_p$ |      |      |      |      |      |  |
|---|------------------------------|------|------------|---|------|------|------|------|------|--|
|   |                              |      |            | 125   | 250  | 500  | 1000 | 2000 | 4000 |  |
|   |                              |      |            | Hz  | Hz   | Hz   | Hz   | Hz   | Hz   |  |
| <b>Without insulation layer</b>   |                              |      |            |   |      |      |      |      |      |  |
| <b>Tangent 14-4/20 slots</b>  | 65                           | 0.65 | 0.55 (M)   | 0.10  | 0.30 | 0.55 | 0.80 | 0.85 | 0.75 |  |
|   | 200                          | 0.75 | 0.80       | 0.45  | 0.65 | 0.80 | 0.75 | 0.75 | 0.75 |  |
|   | 500                          | 0.70 | 0.75       | 0.45  | 0.70 | 0.70 | 0.70 | 0.75 | 0.80 |  |
| <b>With insulation layer (For requirements on insulation layer see page 26)</b> |                              |      |            |   |      |      |      |      |      |  |
| <b>Tangent 14-4/20 slots</b>  | 65                           | 0.90 | 0.95       | 0.40  | 0.75 | 0.95 | 0.95 | 0.85 | 0.90 |  |
|   | 200                          | 0.90 | 0.90       | 0.75  | 0.90 | 0.90 | 0.85 | 0.85 | 0.95 |  |
|   | 500                          | 0.90 | 0.90       | 0.75  | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |  |

Blue absorption values are forecast 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.

Hangers

Scheme drawings

| Suspension                         |  |   |                                   |                                |  |   |
|------------------------------------|--|---|-----------------------------------|--------------------------------|--|---|
| Product description                | <b>Universal Bracket</b><br>for CD 60/27 | <b>Nonius Hanger Bottom</b><br>For CD 60/27 and<br>2x Nonius Clip/<br>1x Nonius Pin <sup>2)</sup> | <b>Rapid Hanger SAH10-Plus</b>    | <b>Rapid Hanger SoS/10/30</b>  | <b>Nonius suspender No. 228</b><br>with safety pins DPK607 | <b>Rapid Hanger SAH5</b><br>with safety pins DPK607 |
|                                    |  |   |                                   |                                |  |   |
| Description                        | Universal Bracket for CD Channel         | Nonius hanger bottom for CD Channel   | Rapid hanger with clamping spring | Rapid hanger with hanging wire | Nonius hanger bottom for T rails                           | Nonius suspender for T rails                        |
| Profile / T rail                   | Profile CD 60/27                         | Profile CD 60/27  | T rail TS24/38                    | T rail TS24/38                 | T rail TS24/38   | T rail TS24/38                                      |
| Loadbearing capacity <sup>1)</sup> | 0.40 kN                                  | 0.40 kN   | 0.20 kN                           | 0.15 kN                        | 0.30 kN  | 0.15 kN   |
| Minimum suspension height          | 10 mm / 35 mm <sup>3)</sup>              | 130 mm  | 175 mm                            | 220 mm                         | 240 mm   | 80 mm   |

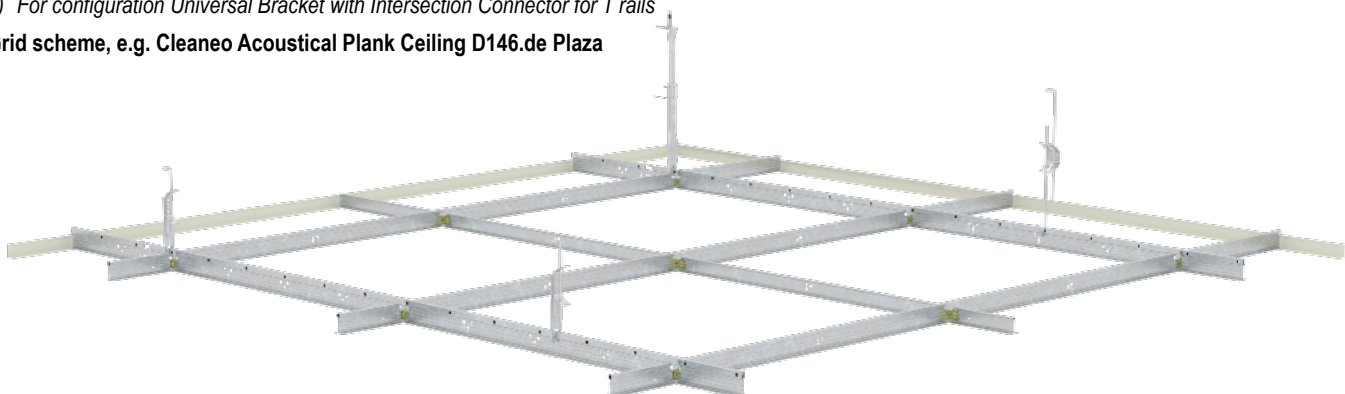
| Suspension                         |                     |                          |                                    |   |
|------------------------------------|---------------------|--------------------------|------------------------------------|---|
| Product description                | <b>Hanging Wire</b> | <b>Nonius Hanger Top</b> | <b>Nonius Coupling as required</b> | Fastening to wood joist ceiling with <b>Knauf FN 4.3 x 35 mm</b><br>Fastening to reinforced concrete ceiling with <b>Knauf Ceiling Steel Dowels</b> |
|                                    |                     |                          |                                    |   |
| Loadbearing capacity <sup>1)</sup> | 0.25 kN             | 0.40 kN                  | 0.30 kN                            |   |

1) Acc. to DIN EN 13964

2) Secure against slide out

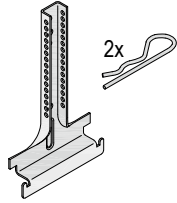
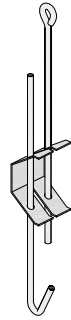
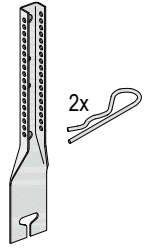
3) For configuration Universal Bracket with Intersection Connector for T rails




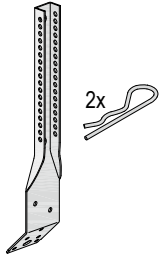
Grid scheme, e.g. Cleaneo Acoustical Plank Ceiling D146.de Plaza



Hangers

Scheme drawings

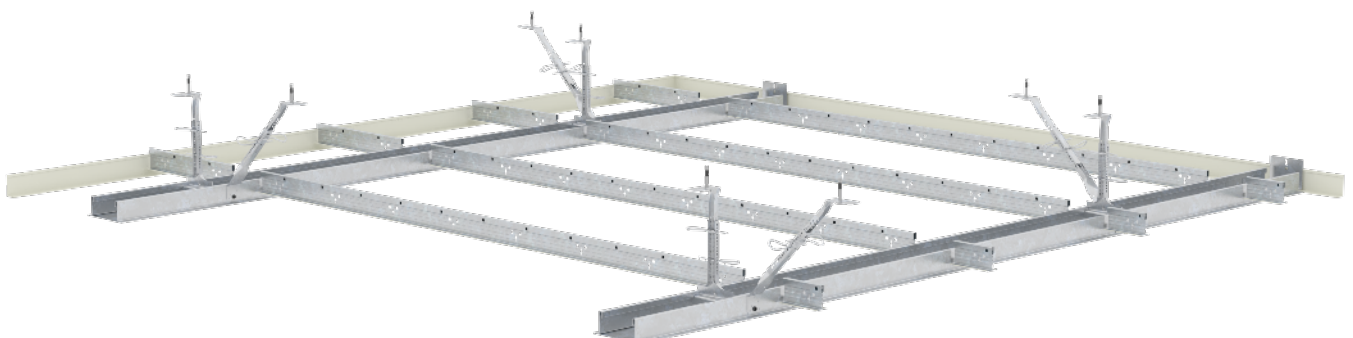
| Suspension                         |   |   |   |
|------------------------------------|---|---|---|
| Product description                | <b>Nonius Suspender P12/P14/P18/P22/P24</b> with safety pin DPK607                | <b>Rapid Hanger SoS/10/30</b> as required <sup>2)</sup>                           | <b>Nonius Suspender No. 240</b> as required <sup>2)</sup>                           |
|                                    |  |  |  |
| Description                        | Nonius hanger bottom for Bandraaster profile                                      | Rapid hanger with hanging wire  | Nonius hanger bottom for T rails  |
| Profile / T rail                   | DP 50/75/100/125/150  | T rail TS24/38  | T rail TS24/70L   |
| Loadbearing capacity <sup>1)</sup> | 0.30 kN   | 0.15 kN   | 0.35 kN   |
| Minimum suspension height          | 165 mm  | 220 mm  | 270 mm  |

| Suspension                         |   |   |   |   |   |
|------------------------------------|---|---|---|---|---|
| Product description                | <b>Hanging Wire</b>   | <b>Nonius Hanger Top</b>  | <b>Nonius Coupling</b> as required  | <b>Nonius Bottom for lateral bracing</b> with safety pin DPK607                       |   |
|                                    |  |  |  |  | Fastening to wood joist ceiling with <b>Knauf FN 4.3 x 35 mm</b><br>Fastening to reinforced concrete ceiling with <b>Knauf Ceiling Steel Dowels</b> |
| Loadbearing capacity <sup>1)</sup> | 0.25 kN   | 0.40 kN   | 0.30 kN   | 0.30 kN   |   |

1) Acc. to DIN EN 13964

2) For additional loads see "Anchoring of loads" on page 36

Grid scheme, e.g. Cleano Acoustical Bandraaster Ceiling D141.de Contur



### Anchoring of loads

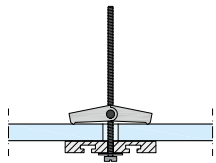
Scheme drawings

D145.de Cleaneo Acoustical Plank Ceiling Belgravia  
 D146.de Cleaneo Acoustical Plank Ceiling Plaza  
 D144.de Cleaneo Acoustical Plank Ceiling Contur

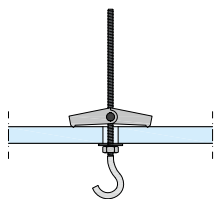
#### Loads up to 2.5 kg per module

In case of modules up to a size of 400 x 1200 mm (Visona) or 625 x 625 mm (Belgravia, Plaza) which do **not** have Tangent perforation, loads up to 2.5 kg per module can be installed directly without reinforcement.

#### Fastening in the cladding

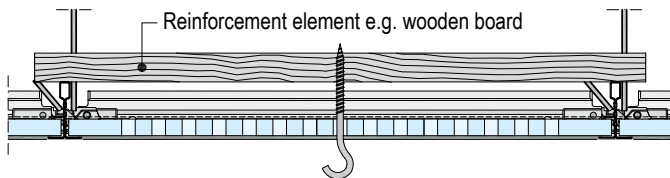


Spring toggle dowel  
 e.g. curtain rail



Spring toggle dowel  
 e.g. roof suspension hooks

For larger modules and for acoustical elements with Tangent perforation, a reinforcement element with sufficient load capacity can be installed behind the acoustical elements. The reinforcement elements must extend up to the support rails to ensure that the weight is distributed. Installation of additional hangers should be considered.



The fastened loads must also be observed when rating the grid. Observe the manufacturer's load tables.

#### Loads exceeding 2.5 kg per module

Loads exceeding 2.5 kg per module must be fastened separately to ensure that the suspended ceiling is not overloaded.

#### D147.de Cleaneo Acoustic Plank Ceiling Contur

In case of built-ins up to 3 kg per module, a reinforcement element with sufficient load capacity can be installed behind the acoustical elements. The reinforcement elements must extend up to the support rails to ensure that the weight is distributed.

The fastened loads must also be observed when rating the grid. Observe the manufacturer's load tables.

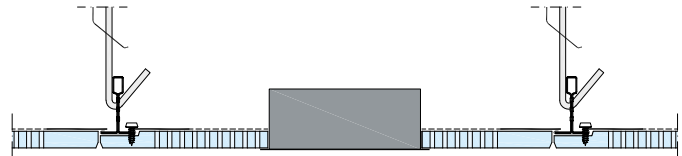
Built-ins exceeding 3 kg must be fastened separately to ensure that the ceiling is not overloaded. When installing louvre luminaires, ensure that they are suitable for the eccentric Knauf Contur system, e.g. Radolux.

D141.de Cleaneo Acoustic Bandraaster Ceiling Contour  
 D142.de Cleaneo Acoustic Corridor Ceiling Contur

#### Loads up to 1 kg per module

The elements can carry loads directly up to 1 kg per module and without reinforcement.

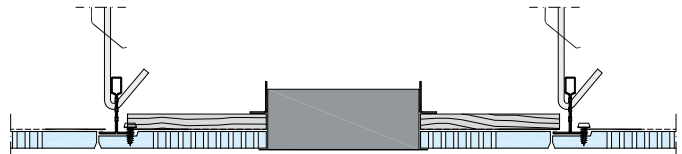
Installation of additional hangers is necessary.



#### Loads up to 3 kg per module

For larger loads up to 3 kg, a reinforcement element with sufficient load capacity can be installed behind the acoustical elements. The reinforcement elements must extend up to the support rails to ensure that the weight is distributed.

Installation of additional hangers is necessary.

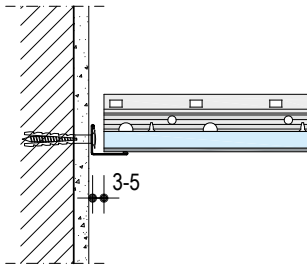


**Wall bracket application** Scheme drawings | Dimensions in mm

- D145.de Cleaneo Acoustical Plank Ceiling Belgravia
- D146.de Cleaneo Acoustical Plank Ceiling Plaza
- D147.de Cleaneo Acoustical Plank Ceiling Contur

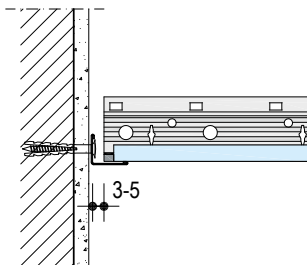
**D144.de Cleaneo Acoustical Plank Ceiling Visiona**

**L wall bracket with edge design SK**



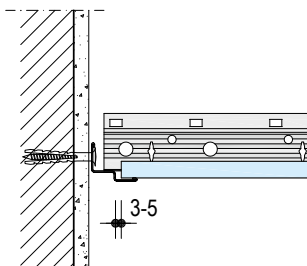
The support of the rails and elements on the L-shaped wall connection is the most frequently implemented construction. Both the rail and the element cut edges lie directly on the horizontal arm (at least 2/3, but 3-5 mm clearance).

**L wall bracket with edge design SK filler piece**



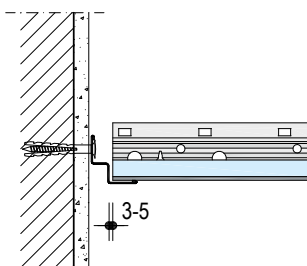
The elements lay directly on the horizontal arm of the L shaped wall connection. A 6.5 mm thick filler piece is placed underneath to support the rail. The rail sections lay directly on the horizontal arm (at least 2/3, but 3-5 mm clearance).

**Stepped wall bracket with SK edge design with countersunk rail system**



The cut edges of the grid, consisting of support and crossrails, rest on the upper horizontal arm of the stepped wall bracket 25/15/8/15, the elements on the lower arm (at least 2/3, but 3-5 mm clearance in each case). The height level of the lower horizontal arm corresponds to the lower edge of the ceiling element. The edge elements/cut edges are only cut to length vertically in this design configuration. The recessed edge design and the different heights create a cavity that can be closed with a filler piece for aesthetic reasons.

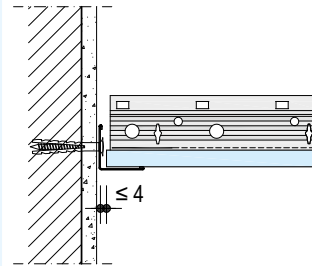
**Stepped wall bracket with SK edge design without height offset with countersunk rail system**



An application variant shows the use of stepped wall bracket (shadow groove). Both the rail and the element cut edges lie directly on the horizontal arm (at least 2/3, but 3-5 mm clearance).

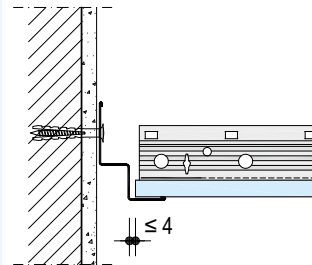
- D141.de Cleaneo Acoustic Bandraester Ceiling Contour
- D142.de Cleaneo Acoustic Corridor Ceiling Contur

**L wall bracket with edge design SK**



The support of the rails and elements on the L-shaped wall connection is the most frequently implemented construction. The element cut edges lie directly on the horizontal arm (maximum 4 mm clearance).

**Stepped wall bracket with SK edge design without height offset with countersunk rail system**



An application variant shows the use of stepped wall bracket (shadow groove). The element cut edges lie directly on the horizontal arm (maximum 4 mm clearance).

D145.de

D146.de

D147.de

D141.de

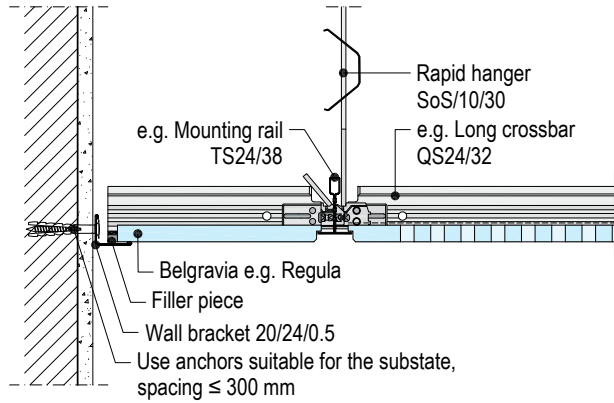
D142.de

D144.de

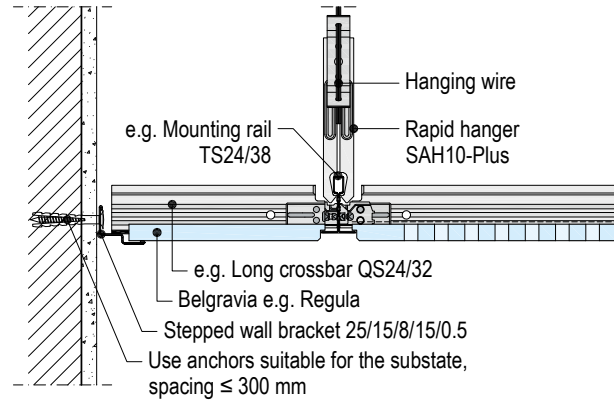
Details

Scale 1:5 | Dimensions in mm

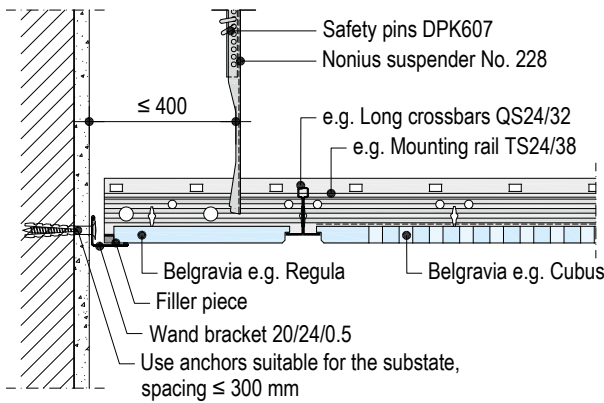
D145.de-D10 Connection to wall with wall bracket



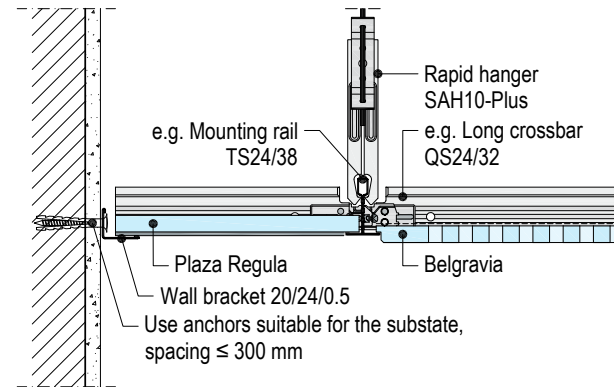
D145.de-D11 Connection to wall with stepped wall bracket



D145.de-A10 Connection to wall with wall bracket

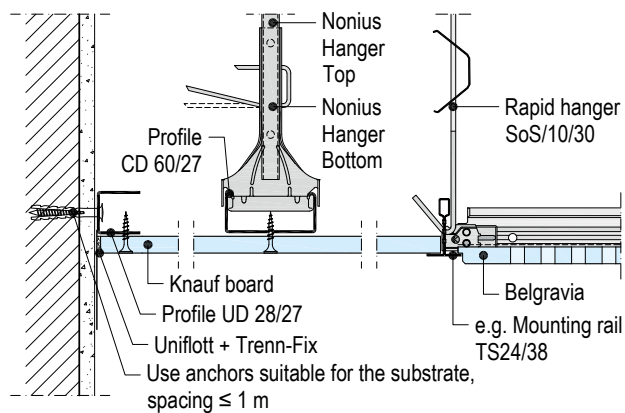


D145.de-SO10 Plaza-Frieze for Cleaneo Cleaneo Acoustic Plank Ceiling Belgravia

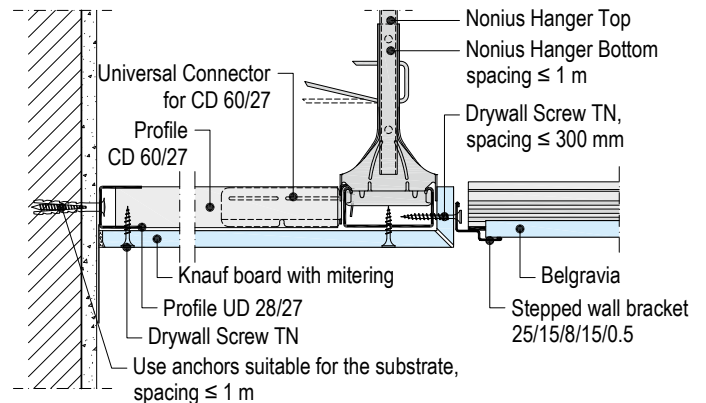


D145.de-SO11 Gypsum board frieze

■ For frieze widths exceeding 600/625 mm



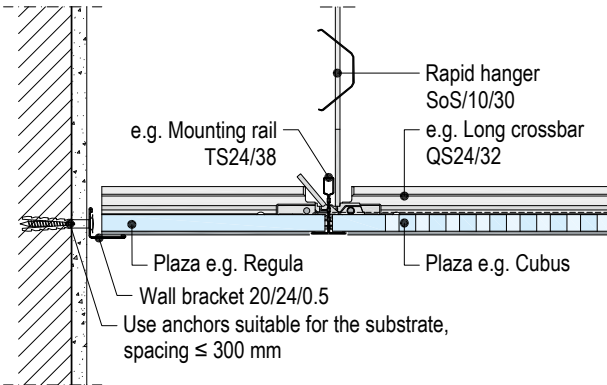
D145.de-SO13 Gypsum board frieze with shadow gap



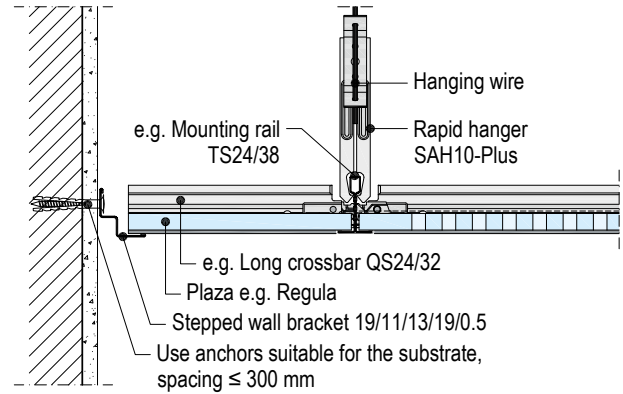
#### Details

Scale 1:5 | Dimensions in mm

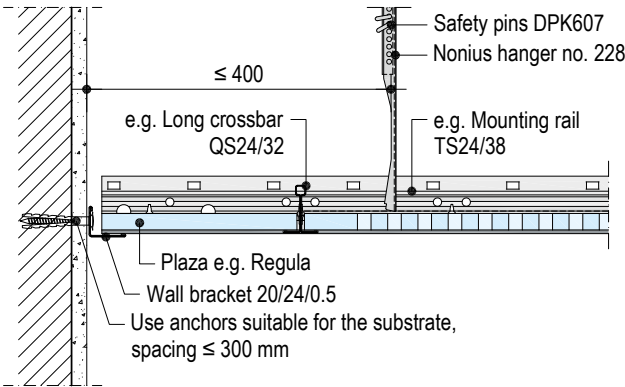
#### D146.de-D10 Connection to wall with wall bracket



#### D146.de-D11 Connection to wall with stepped wall bracket

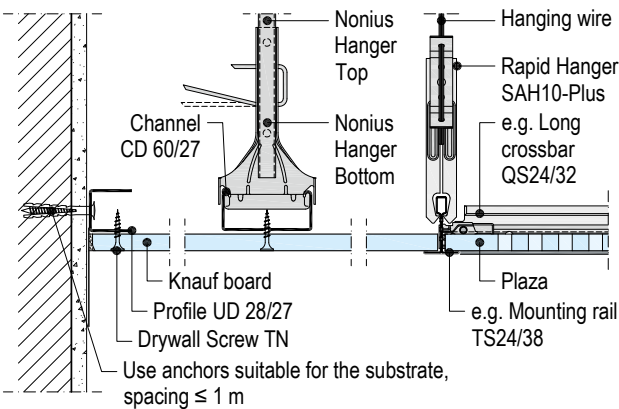


#### D146.de-A10 Connection to wall with wall bracket

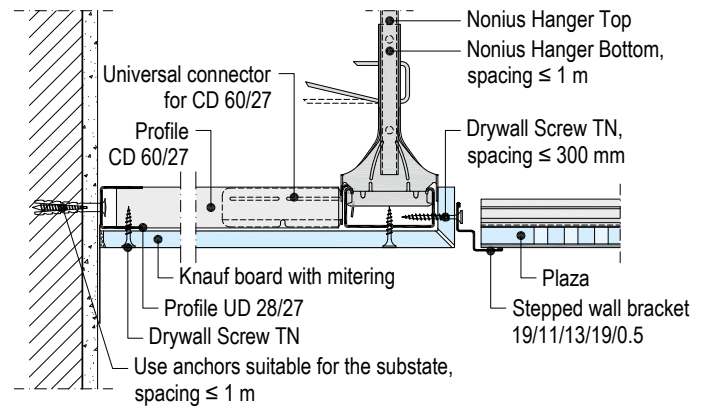


#### D146.de-SO10 Gypsum board frieze

■ For frieze widths exceeding 600/625 mm



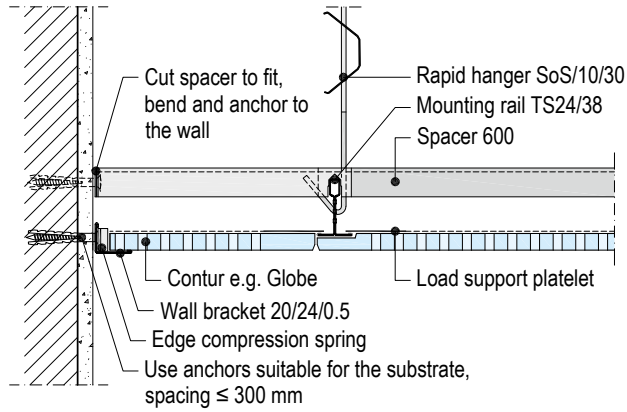
#### D146.de-SO11 Gypsum board frieze with shadow gap



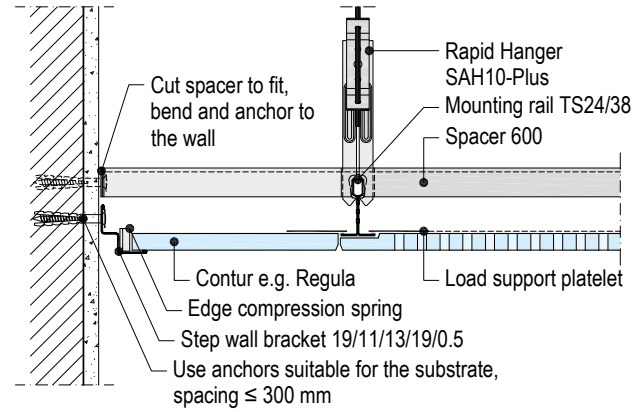
Details

Scale 1:5 | Dimensions in mm

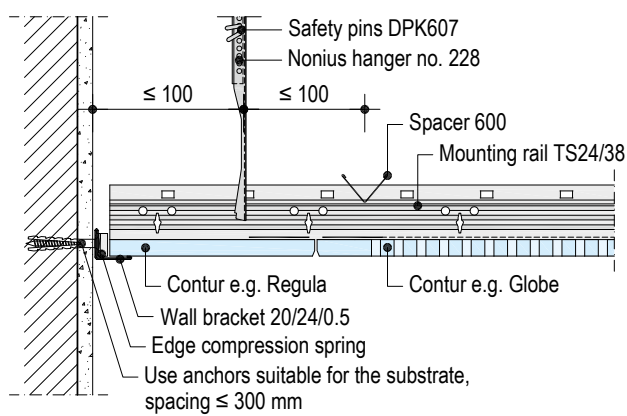
D147.de-A10 Connection to wall with wall bracket



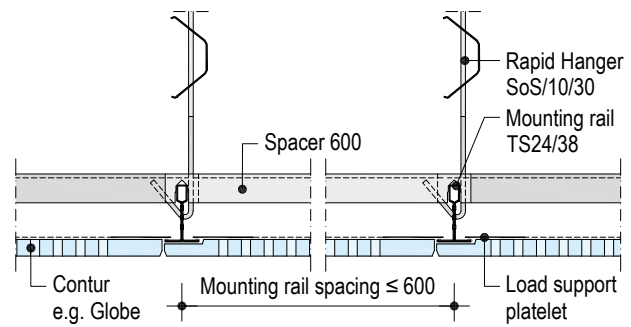
D147.de-A11 Connection to wall with stepped wall bracket



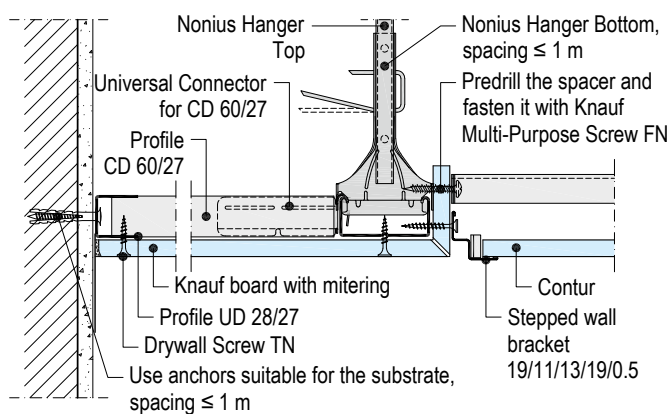
D147.de-D10 Connection to wall with wall bracket



D147.de-B10 Section – Lateral to support rail



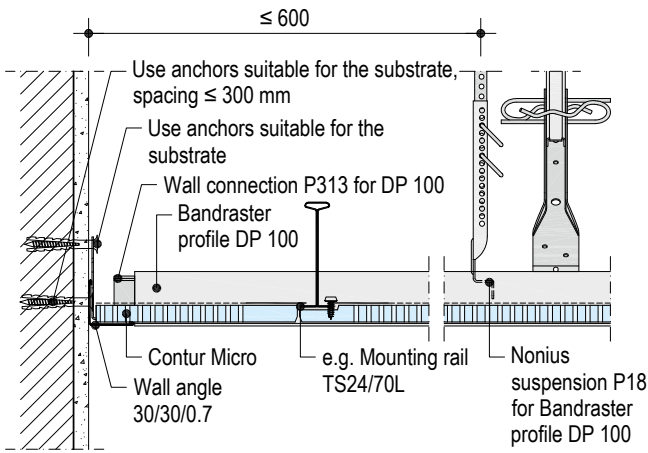
D147.de-SO10 Gypsum board frieze with shadow gap



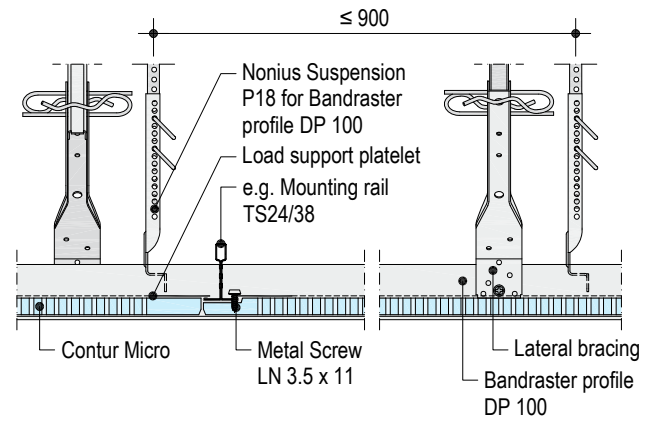
**Details**

Scale 1:5 | Dimensions in mm

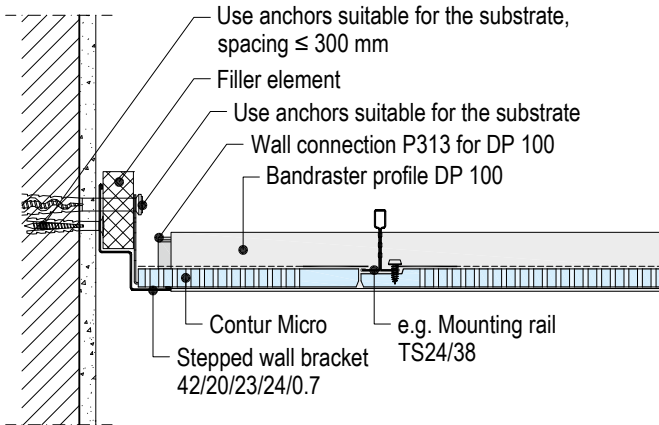
**D141.de-A2 Connection to wall with wall bracket**



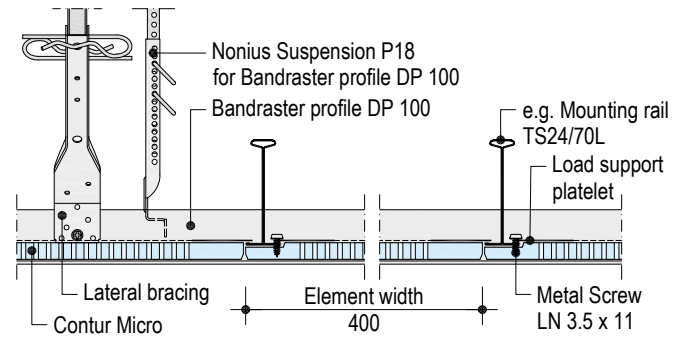
**D141.de-B2 Section – Lateral to support rail**



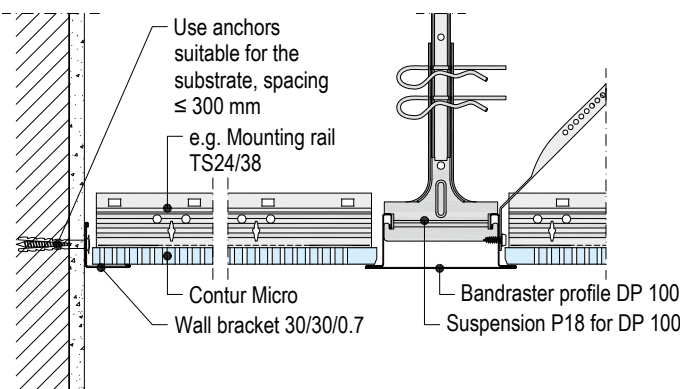
**D141.de-A3 Connection to wall with stepped wall bracket**



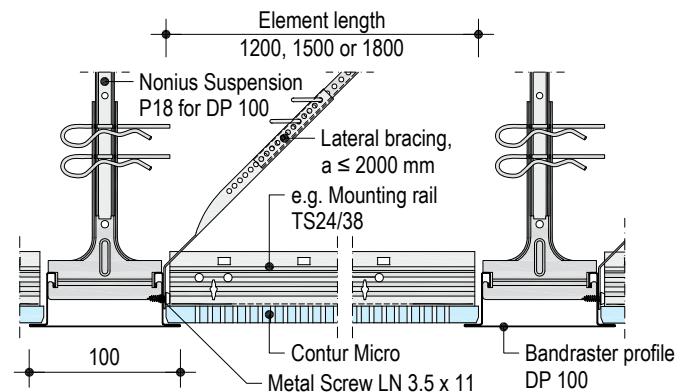
**D141.de-B1 Section – Lateral to support rail**



**D141.de-D2 Connection to wall with wall bracket**



**D141.de-C1 Section – Parallel to support rail**

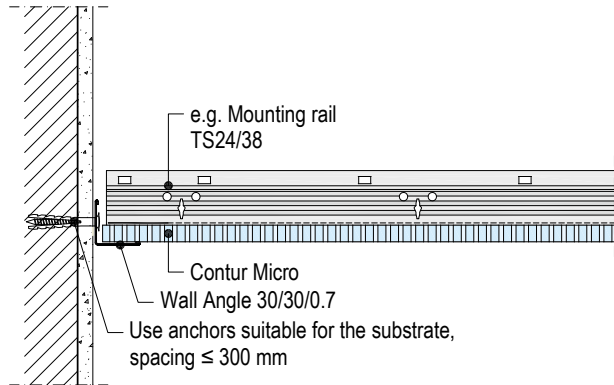


**Note** In case of element lengths > 1500 mm only TS24/70L mounting rails are permissible.

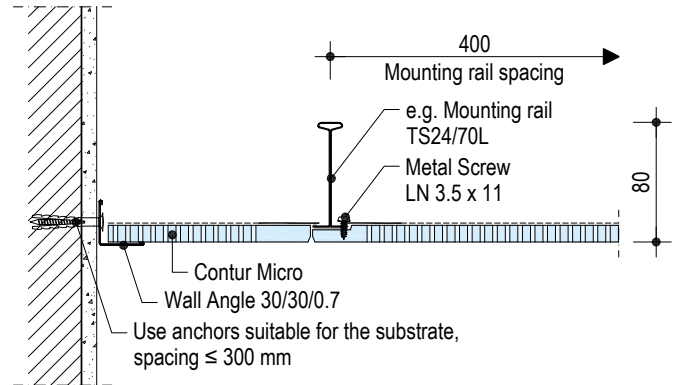
Details

Scale 1:5 | Dimensions in mm

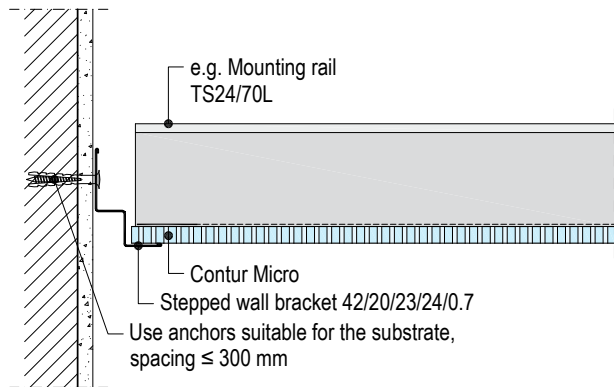
D142.de-A1 Connection to wall with wall bracket



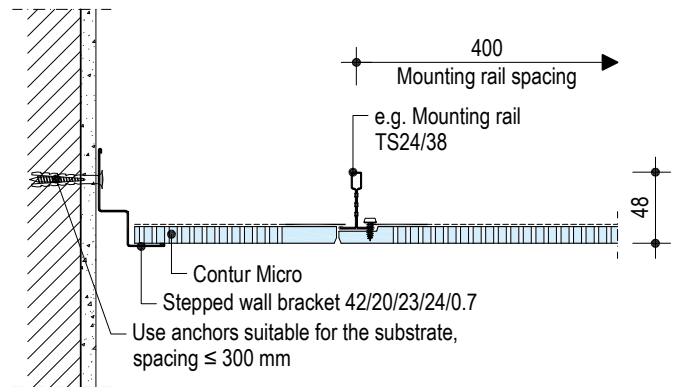
D142.de-D1 Connection to wall with wall bracket



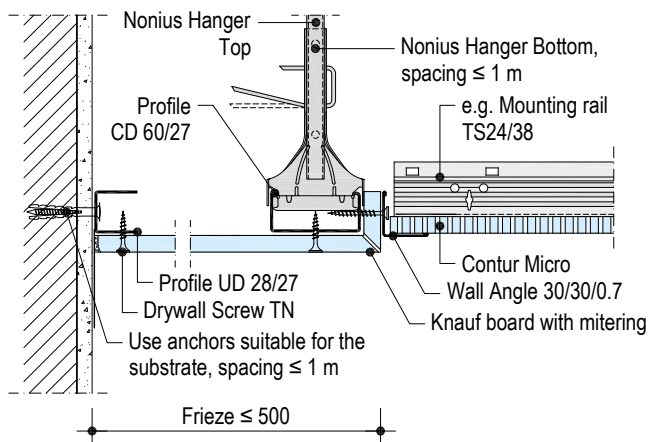
D142.de-A2 Connection to wall with stepped wall bracket



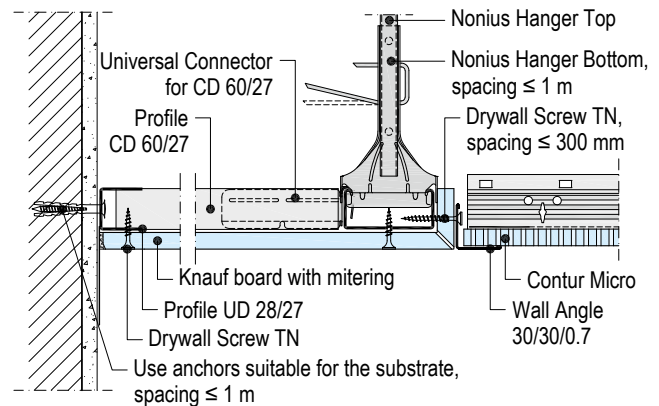
D142.de-D2 Connection to wall with stepped wall bracket



D142.de-SO1 Gypsum board frieze with shadow gap



D142.de-SO2 Gypsum board frieze

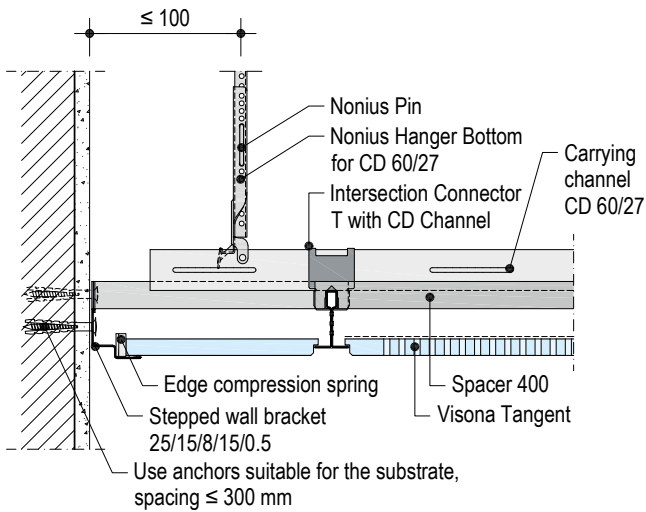


**Note** In case of element lengths > 1500 mm only TS24/70L mounting rails are permissible.

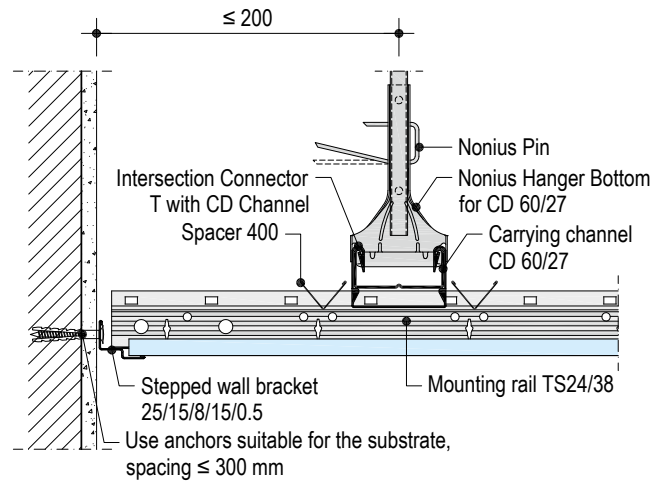
#### Details

Scale 1:5 | Dimensions in mm

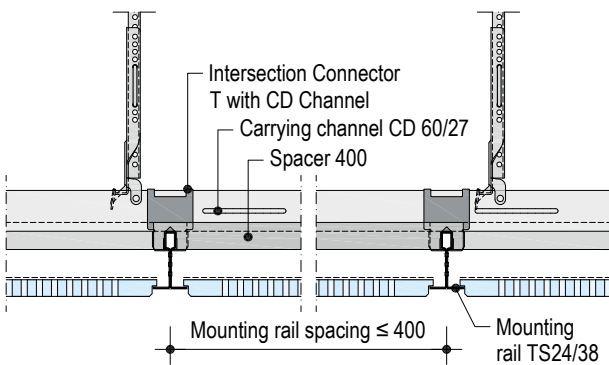
#### D144.de-A1 Connection to wall with stepped wall bracket



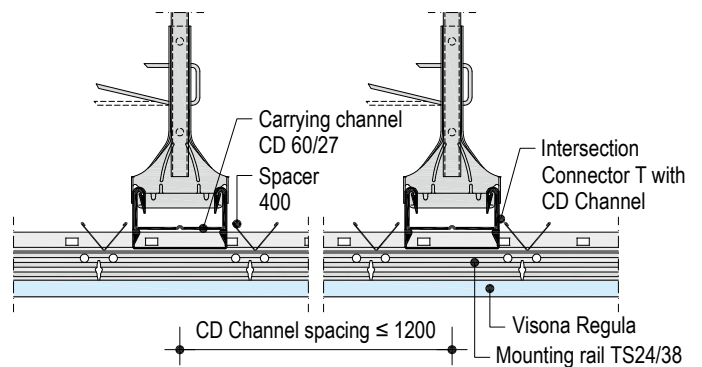
#### D144.de-D1 Connection to wall with stepped wall bracket



#### D144.de-B1 Section – Lateral to mounting rail



#### D144.de-C1 Section – Parallel to mounting rail



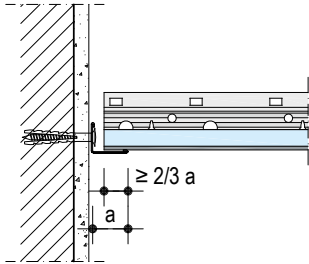
### Installation of the grid

**Note** Install hangers and the fasteners of lamp housings **before** the installation of the suspended ceiling.

#### Cutting the boards, profiles and rails to fit

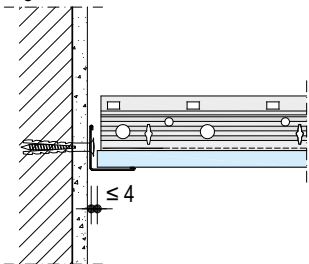
Cleaneo Acoustical Plank Ceilings D145.de Belgravia / D146.de Plaza / D147.de Contur / D144.de Visona

- Cut the rails using a metal shears, hacksaw or miter saw (special saw blade), starting with the lap followed by the flange.
- Cut all rails to length so that the contact surface is at least 2/3 of the horizontal arm "a" of the wall bracket.



Cleaneo Acoustic Bandrastrer Ceiling Contour D141.de Contour / Cleaneo Acoustic Corridor Ceiling D142.de Contur

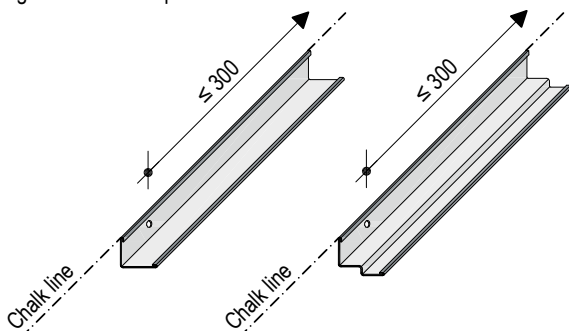
- Cut the rails using a metal shears, hacksaw or miter saw (special saw blade), starting with the lap followed by the flange.
- Cut the boards in the edge area so that the spacing between the board edge and the vertical arm of the wall bracket is a maximum of 4 mm.



Shorten all profiles opposite the edge length of the boards by 5 mm, remove the connector of the T rails if necessary.

#### Installation wall bracket / stepped wall bracket

1. Mark the position of the wall bracket relative to the required ceiling height on walls and pillars.

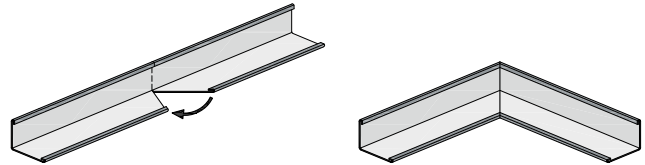


- Observe the required minimum suspension heights according to the hangers on the [pages 34](#) and [35](#).
  - Observe the required minimum clearance below installations, supports and the like.
2. Attach the wall brackets/stepped wall brackets with a maximum fixing spacing of 300 mm.  
Select the fasteners to suit the substrate.

Scheme drawings | Dimensions in mm

**Note** Always use fasteners with a flat head when installing the wall bracket or stepped wall bracket, as incorrect installation can lead to deformation of the wall bracket.

Mitre the horizontal flange of the wall bracket in the corner area and fold over. Alternatively, butt joint the two wall brackets that meet one another in the corners.



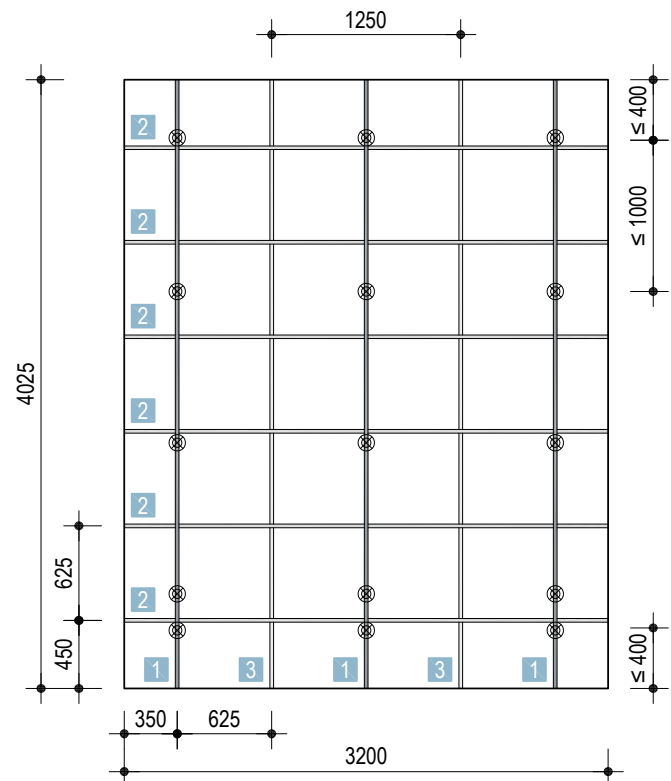
#### Grid layout

Align the ceiling surface to the middle of the room or according to the ceiling plans.

Set the course of the support and crossrails so that the acoustic elements in the wall area are at least half the element width (e.g. 312.5 mm for an element width of 625 mm). Observe the direction of the beams, for example, as a fastening option or work according to the installation scheme.

Manifolds and ventilation system components affect the position and configuration distribution of the ceiling.

**Grid scheme, e.g. Cleaneo Acoustical Plank Ceiling D145.de Belgravia**



- 1 — Mounting rail
- 2 — Long crossbar
- 3 — Short crossbar
- ⊗ Position of the suspender

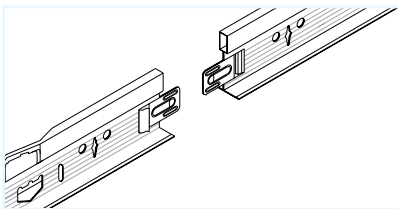
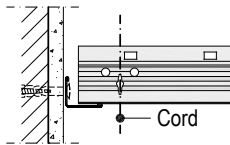
### Installation of the grid – continuation

Scheme drawing

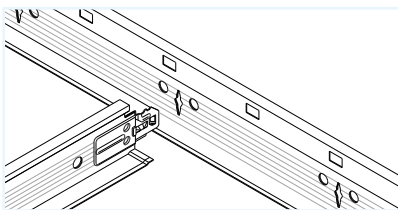
#### Grid assembly

##### Cleaneo Acoustical Plank Ceilings D145.de Belgravia / D146.de Plaza

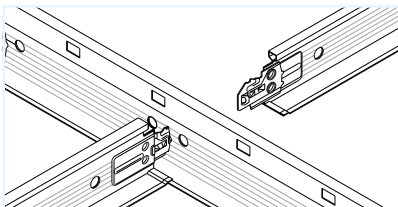
1. Mark the rail alignment in the lateral and longitudinal direction using cords. Check the right angle!
2. Fasten the hangers securely to the primary construction using anchors suitable for the substrate. Install the first hangers a maximum of 400 mm from the wall. All further hangers at spacing of maximum 1000 mm. Install further hangers should the ceiling be subject to a load with lighting housings or similar.
3. Fasten support rails to the hangers. Install the first support rail maximum 600/625 mm (depending on the module size) from the wall, and install all further support rails with axial spacings of maximum 1200/1250 mm.  
Align the support rails parallel to one another so that the slots/punches are aligned (directly opposite each other).  
Use a cord to assist.
4. Lay the cut-off end of the support rail onto the wall bracket, at least 2/3 of the horizontal arm, but with at least 3 to 5 mm clearance, see scheme drawing on [page 44](#).  
Put the support rails in the longitudinal direction together and lock them.



5. Apply the crossbars. For the D146.de Plaza first install the long crossbar and then the short crossbar.  
Insert the catch of the crossbar into the slot of the support rail and lock it (clicks when it engages) with light pressure.



Should two crossbars meet within a punched hole section, insert the end of the second crossbar to the left of the first crossbar.



If the crossbar is punched on one side, insert a small nail into the opening of the crossbar clip to ensure full pull-out resistance.

6. After installation is complete, ensure that the rails are aligned correctly. Adjust the suspenders so that they are taut and the ceiling surface is level.

##### Cleaneo Acoustical Plank Ceiling D147.de Contur

1. Fasten the hangers securely to the primary construction using anchors suitable for the substrate. Install the first hangers a maximum of 100 mm from the wall. All further hangers at spacing of maximum 1200 mm. Install further hangers should the ceiling be subject to a load with lighting enclosures or similar.
2. Fasten support rails to the hangers. Install the first support rail maximum 600 mm from the wall, and install all further support rails with axial spacings of maximum 600 mm parallel to one another.
3. Lay the cut-off end of the support rail onto the wall bracket, at least 2/3 of the horizontal arm, but with at least 3 to 5 mm clearance, see scheme drawing on [page 44](#).  
Put the support rails together in the longitudinal direction and lock them.
4. Fix the first crossbar aligned to the wall and fix it with suitable spacers, which must be screwed to the wall. Now install further 600 spacers at a spacing of ≤ 1200 mm (spacing to the hangers ≤ 100 mm). The spacers should be arranged in an alternating fashion to improve the bracing.
5. After installation is complete, ensure that the rails are aligned correctly. Adjust the hangers so that they are taut and the ceiling surface is level.

#### Caution

When using fixed hangers (50 mm), install the spacers **together** with the support rails, otherwise it will not be possible to install them.

#### Note

Further information for installation of the T rail systems is available from the manufacturer ([Knauf Ceiling Solutions GmbH & Co. KG](#)).

### Installation of the grid – continuation

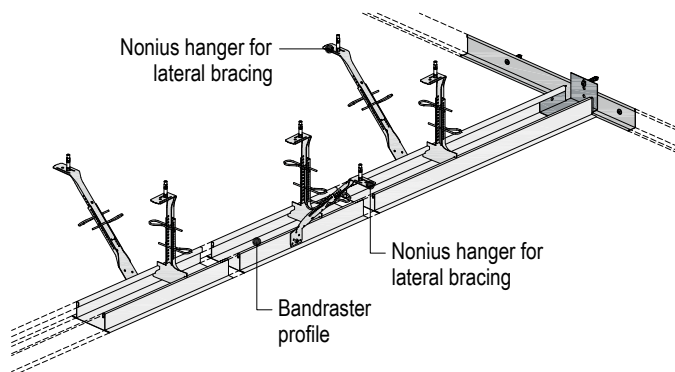
#### Cleaneo Acoustical Bandraster Ceiling D141.de Contur

##### Frame assembly

1. Fasten the hangers securely to the primary construction using anchors suitable for the substrate. Install the first hangers a maximum of 600 mm from the wall. All further hangers at spacing of maximum 900 mm. Install further hangers should the ceiling be subject to a load with lighting fixtures or similar.
2. Fasten Bandraster profiles to the hangers. Install the first profile maximum 1200/1500/1800 mm (depending on the element size) from the wall, and install all further Bandraster profiles with axial spacings of maximum 1200/1500/1800 mm parallel to one another.
3. Fasten the cut-off section of the Bandraster profile to the wall with the wall connection shoe.
4. After installation is complete, ensure that the rails are aligned correctly. Adjust the hangers so that they are taut and the ceiling surface is level.

##### Lateral bracing installation

Lateral bracing must be permanently attached to absorb horizontal forces during installation and subsequent maintenance work. The lateral bracing must be installed at an angle of 45° to 60° and alternately near the hangers. The screw connection to the Bandraster is from the exterior with LN 3.9 x 11 Metal Screws. Maximum spacing of the lateral bracing ≤ 2000 mm. A reduction of the spacing is recommended with larger suspension heights.



#### Cleaneo Acoustical Corridor Ceiling D142.de Contur

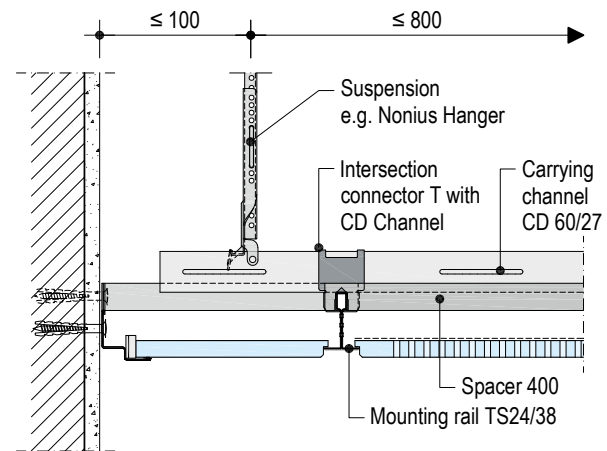
Recommended minimum installation height:

See [page 12](#) table: Required plenum in dependence on the element length.

1. Cut the T rail a maximum of 5 mm shorter than the ceiling element.
2. Installation of the T rails is undertaken together with the ceiling element, see [page 48](#).

Scheme drawings | Dimensions in mm

#### Cleaneo Acoustic Plank Ceiling D144.de Visona



1. Fasten the hangers, e.g. Nonius Hangers securely to the primary construction using anchors suitable for the substrate. Install the first hangers a maximum of 100 mm from the wall. All further hangers at spacing of maximum 800 mm. Install further hangers should the ceiling be subject to a load from lighting housings or similar.
2. Suspend CD Channels as carrying channels (spacing ≤ 1200 mm) rigidly with the hangers. Install the first carrying channel a maximum of 200 mm from the wall.
3. Thread Intersection Connector T with CD Channels onto T rails TS24/38 and attach T rails to CD Channels parallel to each other at a spacing of 400 mm. Install the first support rail a maximum of 400 mm from the wall. Put the support rails together in the longitudinal direction and lock them.
4. Reinforce each T rail at a maximum spacing of 1200 mm with spacer 400. Fix the first crossbar aligned to the wall and with suitable spacers, which must be screwed to the wall. Then install the further spacers. The spacers should be arranged in an alternating fashion to improve the bracing.
5. After installation is complete, ensure that the rails are aligned correctly. Adjust the hangers so that they are taut and the ceiling surface is level.

##### Note

Further information for installation of the T rail systems is available from the manufacturer ([Knauf Ceiling Solutions GmbH & Co. KG](#)).

#### Installation of the ceiling elements

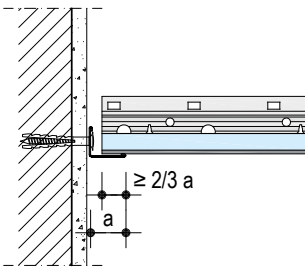
##### Cutting the ceiling elements

###### Note

Always wear clean cotton gloves when working with ceiling elements.

##### Cleaneo Acoustical Plank Ceilings D145.de Belgravia / D146.de Plaza / D147.de Contur / D144.de Visona

- Cut the ceiling elements to size with the face side facing upwards and starting at the front using a fine saw.
- Cut all ceiling elements to length so that the contact surface is at least  $\frac{2}{3}$  of the horizontal arm "a" of the wall bracket.



After cutting, the ceiling elements must be larger than the grid openings:

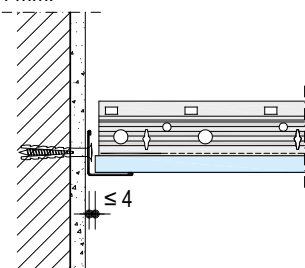
- For T rail ST15/32 at least 9.5 mm
- For T rail ST24/38 at least 15 mm

##### ■ D147.de Cleaneo Acoustical Plank Ceiling Contur

In case the ceiling elements are to be cut where the hangers/suspenders are located, they must be removed beforehand. Grasp the clip with a pliers and carefully pull it out.

##### Cleaner Acoustic Bandraester Ceiling Contour D141.de Contour / Cleaneo Acoustic Corridor Ceiling D142.de Contur

- Cut the ceiling elements to size with the face side facing upwards and starting at the front using a fine saw.
- Cut the elements in the edge area so that the spacing between the element edge and the vertical arm of the wall bracket is a maximum of 4 mm.



#### Installation of the ceiling elements

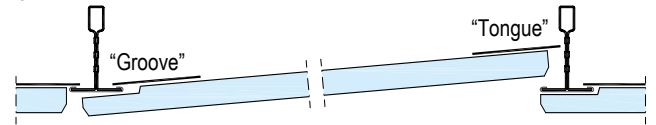
##### Installation of Cleaneo Acoustical Plank Ceilings D145.de Belgravia / D146.de Plaza

1. Insert the ceiling elements by tilting them into the T rails.
2. In the area of open windows, doors and gates (department stores, assembly bays, etc.) with possible air currents, ceiling elements must also be secured in the interior of buildings with compression springs for T rails (approx. 6 per  $m^2$  required). After installing the ceiling elements, the compression springs are pressed onto the T rail from behind until the horizontal brackets of the compression spring clamp the ceiling elements in place (see also "Installation Cleaneo Acoustic Plank Ceiling D144.de Visona" on page 49).

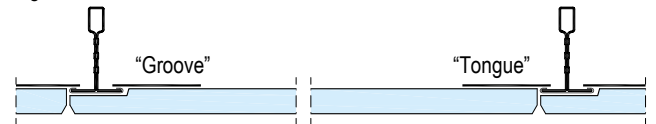
Scheme drawings | Dimensions in mm

##### Installation Cleaneo Acoustic Plank Ceiling D147.de Contur

1. Lift the edge with the 'tongue' over a support rail, align the edge with the 'groove' in the other rail.



Then place the 'tongue' on the support rail and push the ceiling elements together.



Ensure that all retaining devices are in contact with the top of the support rails.

2. In the area of the wall bracket/stepped wall bracket, secure the ceiling panels against unintentional movement using edge compression springs. Install at least one edge compression spring per edge. This always applies to the last element in a row and all elements in the last row (see also "Installation Cleaneo Acoustic Plank Ceiling D144.de Visona" on page 49).

Depending on the pre-tension of the springs, it may be necessary to "relax" them slightly in advance (combination pliers), as otherwise a great deal of force may be required during installation or the elements may be damaged.

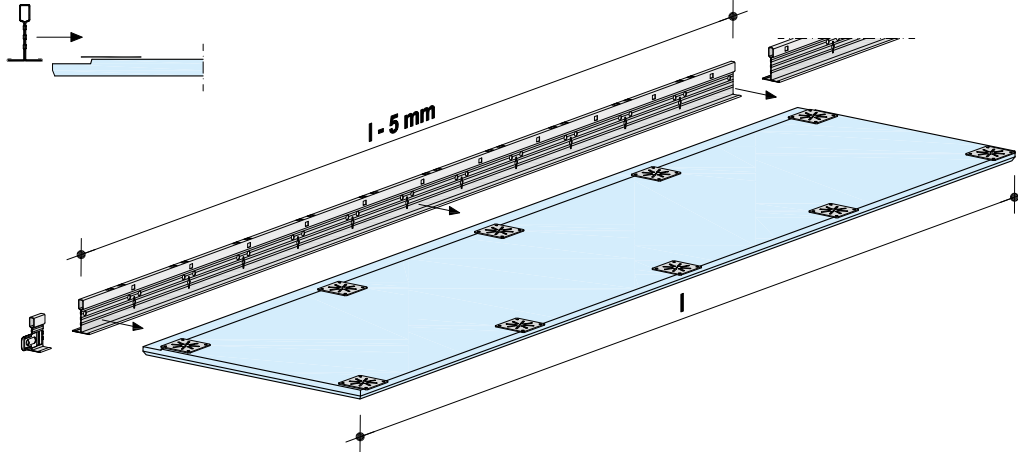
3. In the area of open windows, doors and gates (department stores, assembly bays, etc.) with possible air currents, ceiling elements must also be secured in the interior of buildings with compression springs for T rails (approx. 6 per  $m^2$  required). After installing the ceiling elements, the compression springs are pressed onto the T rail from behind until the horizontal brackets of the compression spring clamp the elements in place (see also "Installation Cleaneo Acoustic Plank Ceiling D144.de Visona" on page 49).

### Installation of the ceiling elements – continuation

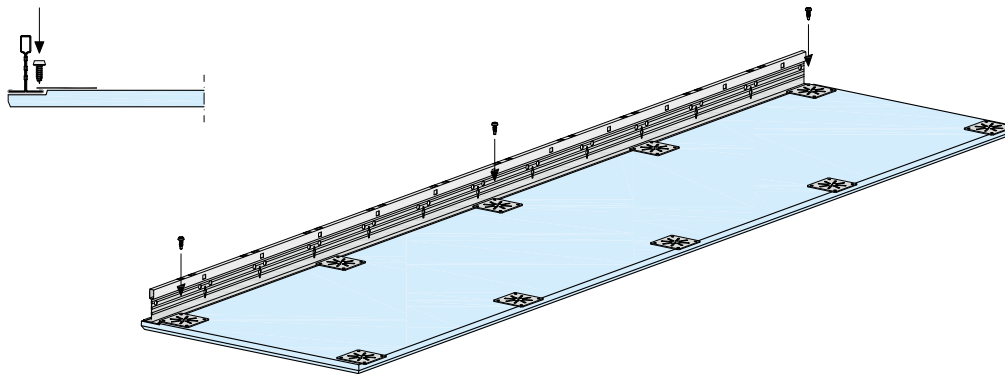
Scheme drawings

#### Installation Cleaner Acoustic Bandraster Ceiling D141.de Contour / Cleaneo Acoustic Corridor Ceiling D142.de Contur

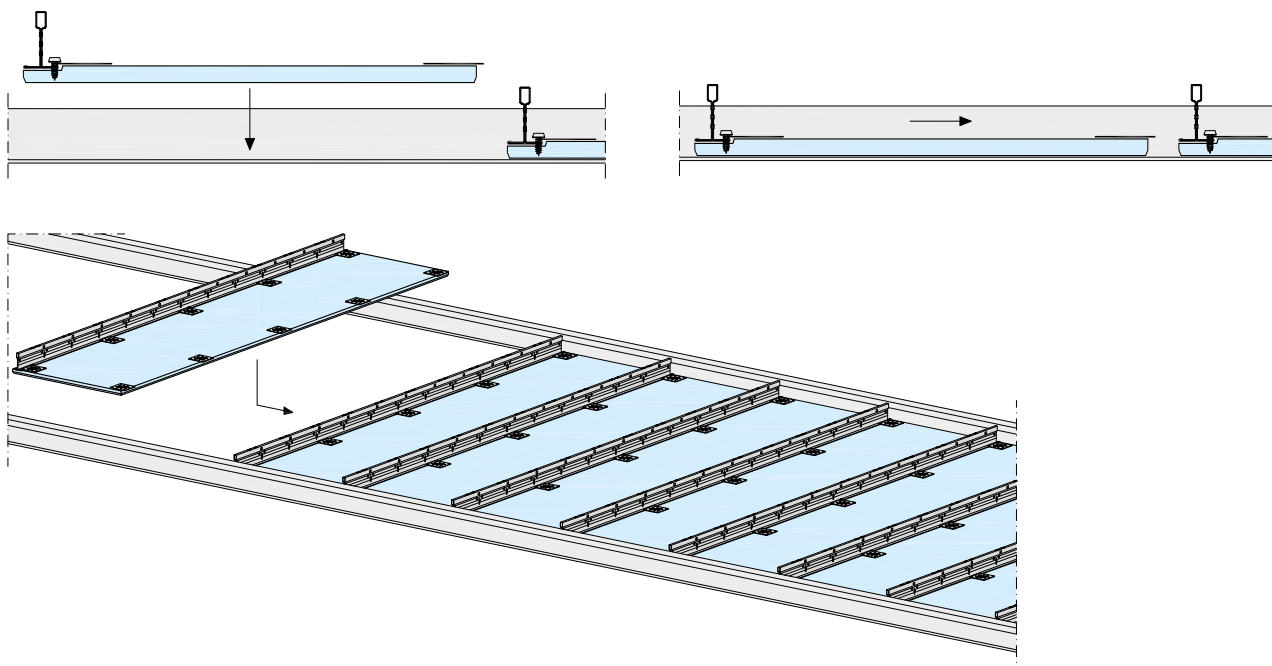
1. The furring channel (T rail TS24/38 or TS24/70L with element length > 1500 mm) to a length 5 mm shorter than the length "l" of the ceiling element, remove the connector of the T rail if necessary and install it at the edge with the "groove".



2. Fasten the furring channel used (T rail TS24/38 or TS24/70L with element length > 1500 mm) with three Metal Screws LN 3.9 x 11 to the ceiling element.



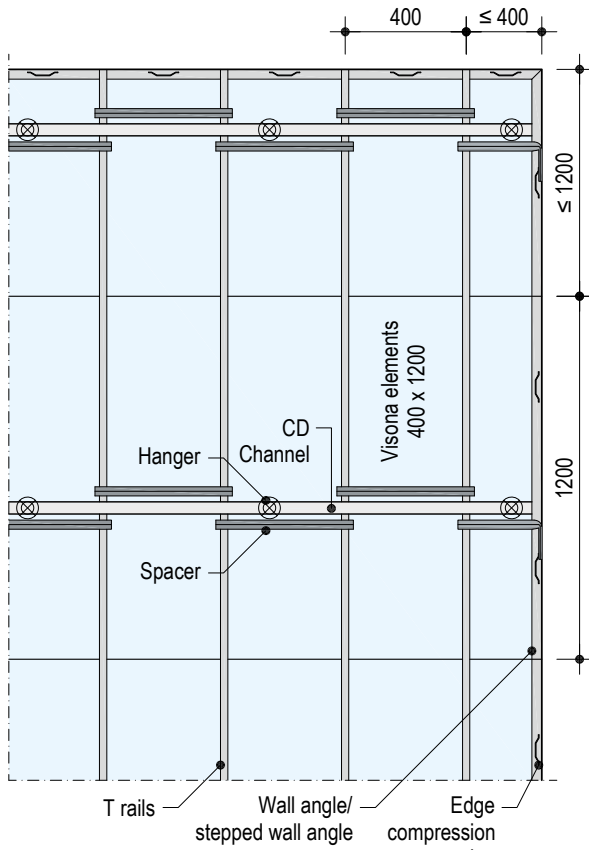
3. Lift the pre-assembled ceiling element through the carrying channel grid or wall bracket and place it on the Bandraster profiles or wall bracket. Then push the ceiling elements together. Ensure that the metal plates rest on the furring channel of the previous ceiling element.



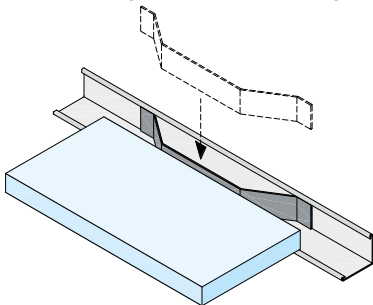
#### Installation of the ceiling elements – continuation

##### Installation Cleaneo Acoustic Plank Ceiling D144.de Visona

1. Insert the ceiling elements by tilting them into the T rails.
2. In the area of the wall bracket/stepped wall bracket, secure the last element against unintentional movement using edge compression springs. Install at least one edge compression spring per edge. This always applies to the last element in a row and all elements in the last row.



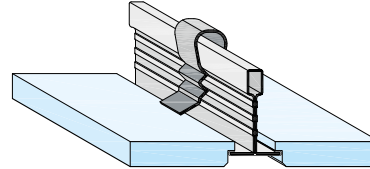
#### Use of the edge compression spring



Depending on the pre-tension of the springs, it may be necessary to “relax” them slightly in advance (combination pliers), as otherwise a great deal of force may be required during installation or the ceilings elements may be damaged.

Scheme drawings | Dimensions in mm

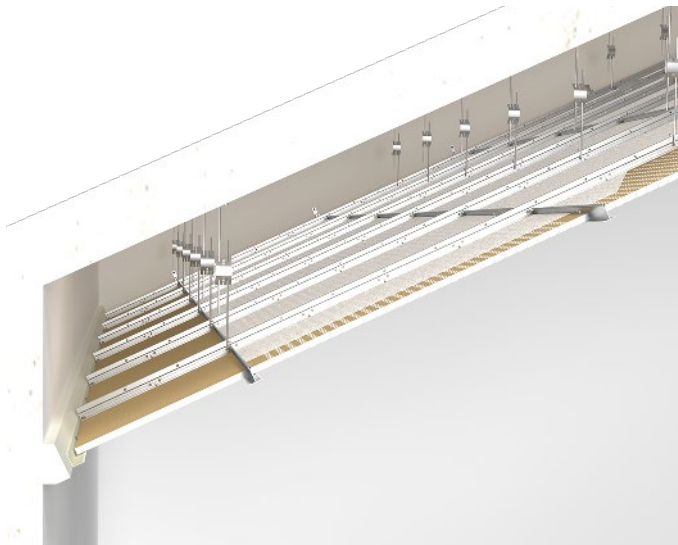
3. In the area of open windows, doors and gates (department stores, assembly bays, etc.) with possible air currents, ceiling elements must also be secured in the interior of buildings with compression springs for T rails (approx. 6 per m<sup>2</sup> required). After installing the ceiling elements, the compression springs are pressed onto the T rail from behind until the horizontal brackets of the compression spring clamp the ceiling elements in place).



### Roof pitch design

Scheme drawings

D145.de Cleaneo Acoustical Plank Ceiling Belgravia  
D146.de Cleaneo Acoustical Plank Ceiling Plaza



When implementing a suspended ceiling in the roof and roof pitch areas, the following points in conjunction with the roof pitch (RP) must be observed:

- $RP \leq 10^\circ$ : Spacings for the main rails of 1200/1250 mm are possible
- $10^\circ < RP \leq 30^\circ$ : Spacings for the main rails of maximum 600/625 mm (deformation of long crossbars)
- $RP > 30^\circ$ : further measures after consultation with the manufacturers of the rail systems

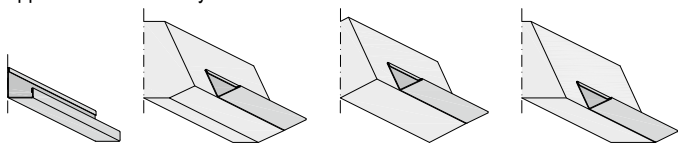
Rapid hangers with hooks, e.g. Rapid hangers SoS/10/30 can be used as suitable hangers. Hangers which are suspended are unsuitable and may not be used. The hanger spacings must comply with the system specifications (= pitch dimension).

Also observe the general information for laying and installation, particularly the points

- Hangers
- Rail systems
- Additional loads

#### Jamb corner wall connection

Generally, the use of an additional rail adapted for the roof pitch is recommended. This must be manufactured on-site or by the installer. We recommend the use of wood or wooden materials as the material of choice. The additional rail as well as the bracket are connected to the wall using screws. The bracket is screwed onto the rail. The additional rail can be applied in different ways as shown in the illustrations.

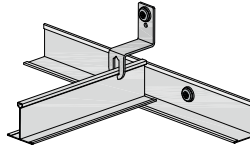


If this is omitted, a gap will be visible between the wall bracket and the panels/suspended ceiling even with smaller roof pitches.

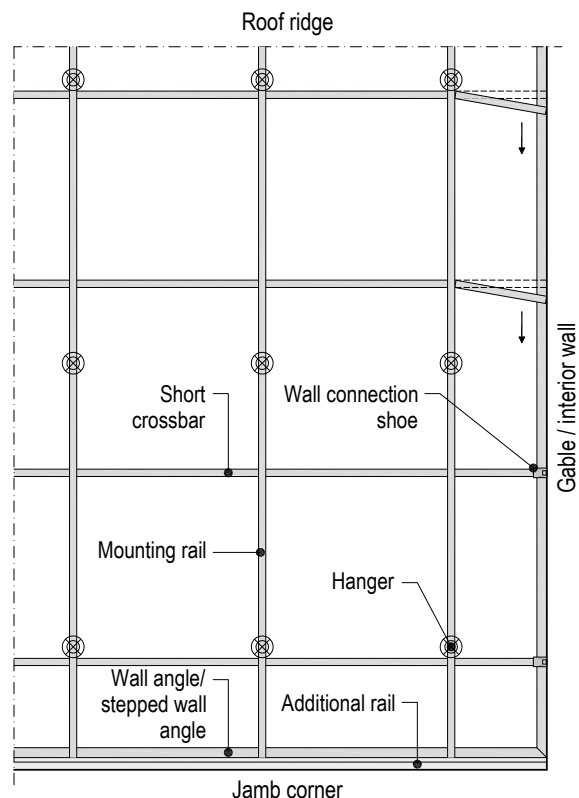
The grid / main rails must be butt-jointed to the wall bracket in the jamb corner area in order to transfer any shear forces that may occur.

#### Gable or interior wall connections

As the cut ends of the short crossbars are only fixed to the main rail on one side, they may slip on the wall bracket if the roof pitch is greater than  $10^\circ$ . To prevent this, the loose ends must be secured using suitable measures (wall connection shoe, bracket, etc.).



Grid scheme, e.g. Cleaneo Acoustical Plank Ceiling D146.de Plaza



#### Note

The wall connection shoe for implementation in the roof pitch areas as well as further information for installation of the T rail systems is available from the manufacturer (Knauf Ceiling Solutions GmbH & Co. KG).

### Cleaneo Acoustical Plank Ceilings

**Note**

Using clean cotton gloves when handling the coated board surfaces to guarantee a clean ceiling without fingerprints.

**Cleaning**

Remove dust with a soft brush or vacuum cleaner. Stains can be removed using a damp cloth during normal cleaning and using neutral detergents. Stains and minor scratches can be wiped off and subsequently painted over.

**Repair**

Stubborn stains and visible damage and scratches on the surfaces can be remedied. Damage and scratches can be filled before repainting and sanded down with sand paper. For this purpose, the repair paint for Cleaneo Modules (white colour shade RAL 9003) or similar can be used and applied with a painter's roller.

**Note**

Use a short pile lambskin roller to ensure that paint does not penetrate into the perforations and affect the acoustical performance of the fleece.

The Cleaneo Acoustic elements can be recoated and painted as required without losing their acoustic properties.

D145.de

D146.de

D147.de

D141.de

D142.de

D144.de

### Information on sustainability of Knauf Cleaneo Acoustical Plank Ceilings

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

In Germany, the following certification systems are of particular relevance:

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

Knauf products and Knauf Cleaneo Acoustical Plank Ceilings can positively influence many of these criteria.

#### DGNB/BNB/QNG

##### Ecological quality

- Climate protection and energy / Life Cycle Assessment  
Relevant environmental data are contained in the EPD for gypsum boards.
- Risks for the local environment:  
Gypsum as an ecological material

##### Economic quality

- Building related life-cycle costs:  
Cost-effective Knauf Drywalling
- Value stability and adaptability  
Flexible Knauf Drywalling (conversion)

##### Sociocultural and functional quality

- Acoustical comfort  
Knauf drywalling systems with high-performance absorption

##### Technical quality

- Circularity:
  - Gypsum multi-recyclable capability
  - Demolition and dismantling capability

#### LEED

##### Materials and Resources

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

##### Indoor Environmental Quality

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



Find the right system for your requirements!  
[knauf.de/systemfinder](https://knauf.de/systemfinder)



Videos for Knauf systems and products can be found under the following link:  
[youtube.com/knauf](https://youtube.com/knauf)

#### Knauf Direct

Technical Advisory Service:

▶ [knauf-direkt@knauf.com](mailto:knauf-direkt@knauf.com)

▶ [www.knauf.com](http://www.knauf.com)

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