KNAUF

MINERAL CEILING SOLUTIONS

Installation Manual

Build on us.

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Masaryk University Campus, Brno Czech Republic © Jiří PařízekMatt Livey

General Information

General Installation Conditions

Brief overview

This installation manual replaces all previous documents. It contains information for specifiers and installers of suspended ceilings and wall applications.

Field of validity and application

The installation manual is to be regarded as an application standard and does not represent a complete reference to other existing standards. All statements and guidelines given concerning structural design refer exclusively to Knauf Ceiling Solutions products. It defines dimensions, tolerances on dimensions and necessary installation requirements for suspension and ceiling elements for interiors. In addition, the installer is obliged to observe any project-related specifications and individually applicable standard requirements.
This installation manual is also in line with the guidelines provided in Annex A and Annex B of the suspended ceiling standard EN 13964.

For some areas, however, this installation manual is not valid. These are as follows:

- ceilings in means of transport
- heating and cooling ceilings
- air leakage
- thermal insulation
- ceilings with seismic requirements, except specific indicated solutions
- ceilings subject to requirements regarding ingress of water
- ceilings for exterior applications, for which other extended requirements apply (tunnels, shelters, petrol stations, arcades, public sports facilities, car parks etc.), except specific indicated solutions
- suspended ceilings or its supporting structure, on which you can walk
- ceilings with specific requirements for corrosion resistance, dynamic and/or static effects of loads (swimming pools, underground railway stations etc.)

For mountings of all kinds, the regulations documented here are to be observed.
All specifications and technical information in this manual or other publications referring to Knauf Ceiling Solutions products are based on test results, according to EN 13964. Technical modifications in the interest of improvements may be made by Knauf Ceiling Solutions at any time without prior notice.

The currently valid version can be obtained from Knauf Ceiling Solutions or can be downloaded directly from our website **www.knauf.com**.

Safety

Thin-gauged materials, particularly profiles and cut tile edges, are to be handled with due care in order to prevent injuries and damage. It is the obligation and full responsibility of the ceiling fixer to ensure sufficient safety.

Quality

Knauf Ceiling Solutions is certified in accordance with the ISO 9001 quality standard. For material properties, dimensional accuracy and coloration, our quality standard shall apply.
The installer is responsible for the quality of the finished ceiling, carried out according to the installation instructions shown in this document.

Fire protection

Knauf Ceiling Solutions delivers suspended ceiling components, which can be assembled and form fire protective barrier. Ceiling components have to be assembled in accordance with relevant classification report and country-specific and must comply with the requirements in accordance with EN 13501-1 (Reaction to fire), EN 13501-2 (Resistance to fire) and the country-specific standards and regulations.

Corrosion

In their standard version, Knauf Ceiling Solutions Suspension components are made of galvanised sheet steel or aluminium and thus protected against corrosion in accordance with EN 13964, provided that they are not exposed to any extreme corrosive atmospheres or emissions and the corrosion protection is not damaged during installation or the assembly of parts not supplied by Knauf Ceiling Solutions.

If it is evident from the design that contact corrosion can occur between different materials, this is to be pointed out by the planner and appropriate protective measures defined in accordance with EN ISO 12944-3 point 5.10.

To counteract the danger of condensation forming in ceiling cavities, sufficient rear ventilation of the ceiling construction is to be ensured. It is always advisable to consult a specialist.

General Installation Conditions

A

Statics

In terms of their load-bearing capacity and fitness for use (deflection), all systems documented in the installation instructions are statically tested and documented. Technical documentation of loadbearing elements is in accordance with the valid European Standard EN 13964. Please specify the desired, permitted deflection e.g. EN13964, class 1-3 in advance.
Additional loads are not provided for in their standard version. Apart from that of the dead load, the system constructions described have no load-bearing capacity for other components and are to be attached to supporting components. Neither the suspension nor the top layer must be walked on. The customer is responsible for defining the relevant additional loads and their written documentation.

Material expansion

The expansion of the ceiling construction as a result of temperature fluctuations due to exposure to direct sunlight or the failure of the air conditioning system is usually unproblematic. With very large ceiling areas and different material expansion coefficients, however, this may lead to issues.
Special attention should be paid here to wall joints and, if necessary, expansion joints. Careful, detailed planning and accurate installation are therefore all the more important.

Transport and storage

During transport and subsequent storage, the elements should be protected from moisture, high humidity and weather. Plastic packaging is not waterproof.
Attention should be given to the underlying surface which should be clean, dry and flat (full surface support) to avoid soiling or damage. Elements from different production dates / batches should not be installed within the same area. Recognisable, visibly damaged and broken parts (tiles, profiles, accessories, etc.) must not be installed.

Handling

It is essential to carefully handle both full cartons as well as individual elements, in accordance with workplace safety standards. They must not be thrown, dragged, pushed or slid across the floor. Cartons and elements should not be stood or turned on their corners or edges. No heavy objects should be placed on the cartons. Even short-term external influences can lead to damage. We recommend that any risks that may arise from this type of handling are carefully assessed.
To remove the elements, the packaging should be opened and removed all the way around. Individual elements should be handled carefully, preferably using suitable, clean installation gloves (white material).

Installation conditions

Knauf Ceiling Solutions elements should only be installed once all wet trades have been completed, building is sealed with doors and windows fitted and the room completely dried out. The heating system should be in operation in order to ensure a working temperature of 15 - 20°C.
Before starting the installation, we recommend taking measurements with regards humidity and temperature. It is not recommended to start the installation if the relative humidity is over 70%.
During the subsequent period of use, the relative humidity may not exceed 90% or 95% depending on the type of tile used (see product data sheet).
In rooms with continually high relative humidity, special provisions should be made (see installation guidelines for wet rooms and swimming pools).
Improper handling and lack of observation of the installation conditions invalidates all warranties.

Installation

The individual installation company is responsible for correct, perfect installation as well as observance of the system standards specified here. Knauf Ceiling Solutions products and systems should only be installed by qualified and experienced fixers in order to maintain the high product quality of the Knauf Ceiling Solutions products.
Any materials that are visibly damaged or exhibiting recognisable optical or technical impairments must not be installed. In this case, please contact Knauf Ceiling Solutions.

Fixings

The fixing of the perimeter trim to adjacent walls as well as the installation of the hangers and cross bracing should be carried out with appropriate and approved fixings (by others). As this is dependent on what material is being fixed to, the choice of fixing should always be carried out in consultation with the fixing manufacturer and approvals (ETA: European Technical Approval).

General installation sequence

1 Read the Knauf Ceiling Solutions installation instructions carefully.

2 Check the ceiling layout drawings or installation sketch based on the actual building conditions.

3 Determine the location and layout of ceiling elements (Main Runners and Cross Tees / primary and secondary grid, etc) according to instructions.
The position of the service integrations must also be taken into account.

4 Construction site equipment (scaffolding, assembly area, ladders, power connection, etc.).

5 Check the soffit and walls for the appropriate type of fixings.

6 Attach perimeter trims to the walls at the specified height / level. Depending on the construction of the walls, choose the appropriate type of fixings. For perimeter solutions see separate datasheet.

7 Determine the grid direction and mark suspension points on the structural soffit in the exact module dimensions. The suspension and profile distances must be as specified.

8 Align the grid system according to the specifications and fix to the structural soffit with the selected suspension method. Check the squareness.

9 Install the ceiling elements. At the perimeter, the ceiling elements have to be cut to size on site.

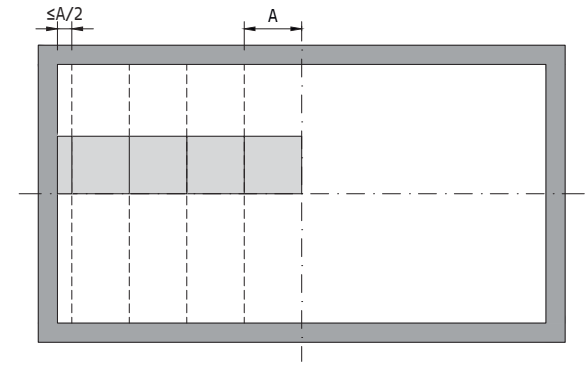
10 In the course of installing the ceiling elements, the service integration components must also be installed. Heavy service integrations must be suspended separately.

11 Align ceiling elements with precise joints and clean any soiled areas as specified.

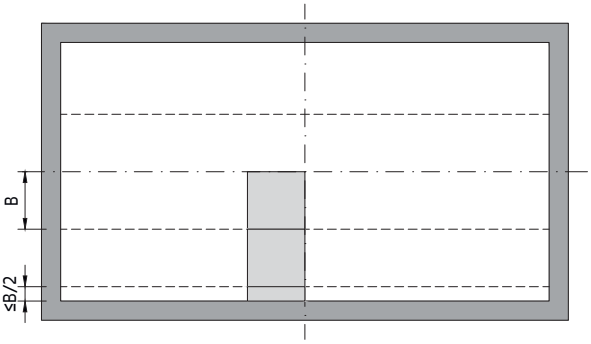
12 Ceiling acceptance by construction management.

Recommended layout for square tiles

Layout 1 - Not recommended



Layout 2 - Not recommended

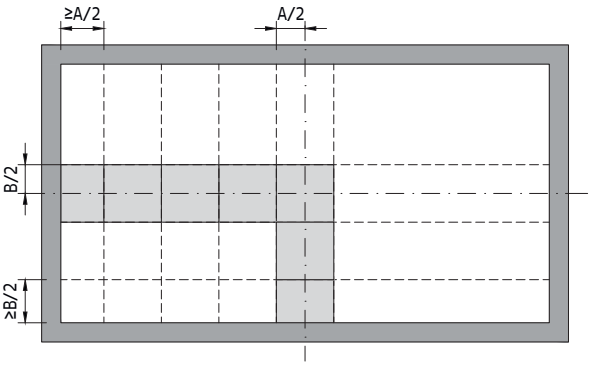


Layout 1 / 2
The ceiling is set out from the middle of the room in modules. In the example shown, the cut tile at the perimeter is very small.

Tile length (A) = tile width (B)

If the cut tile is less than half the tile length (A) or width (B), the layout is not recommended and should be avoided. In addition to requiring more profiles, small cuts appear aesthetically poor. If layout 1 and / or 2 does not provide the desired visual appearance (small tile cuts), layout 3 should be chosen.

Layout 3 - Recommended

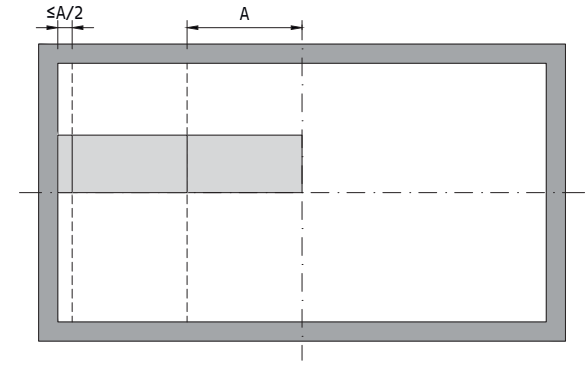


Layout 3
Ceilings with larger cut tiles are aesthetically more pleasing and are more efficient to install. When setting out the ceiling, start from the middle. Ideally the first tile should be directly on the centre line (half the tile each side of the centre) unless this results in a small perimeter cut in which case align the tile edge with the centre line.

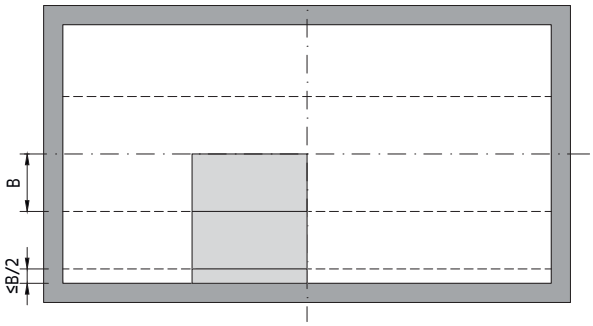
The layout then continues in the other direction.

Recommended layout for rectangular panels

Layout 1 - Not recommended



Layout 2 - Not recommended



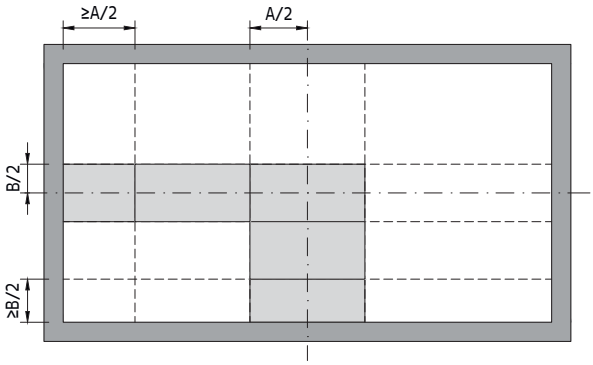
Layout 1 / 2

The ceiling is set out from the middle of the room in modules. In the example shown, the cut panel at the perimeter is very small.

Panel length (A), panel width (B)

If the cut panel is less than half the panel length (A) or width (B), the layout is not recommended and should be avoided. In addition to requiring more profiles, small cuts appear aesthetically poor. If layout 1 and / or 2 does not provide the desired visual appearance (small panel cuts), layout 3 should be chosen.

Layout 3 - Recommended



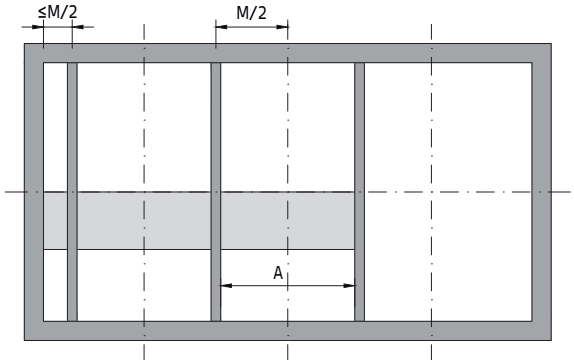
Layout 3

Ceilings with larger cut panels are aesthetically more pleasing and are more efficient to install. When setting out the ceiling, start from the first panel should be directly on the centre line (half the panel each side of the centre) unless this results in a small perimeter cut in which case align the panel edge with the centre line.

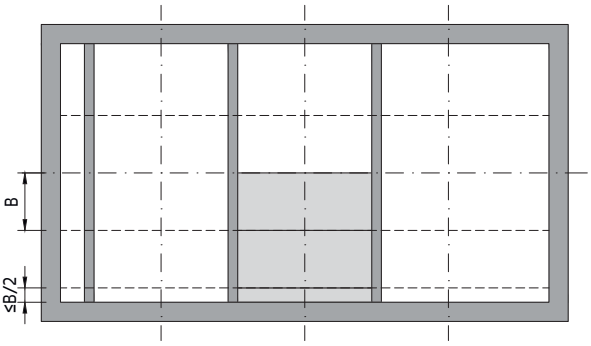
The layout then continues in the other direction.

Recommended layout for linear grid

Layout 1 - Not recommended



Layout 2 - Not recommended



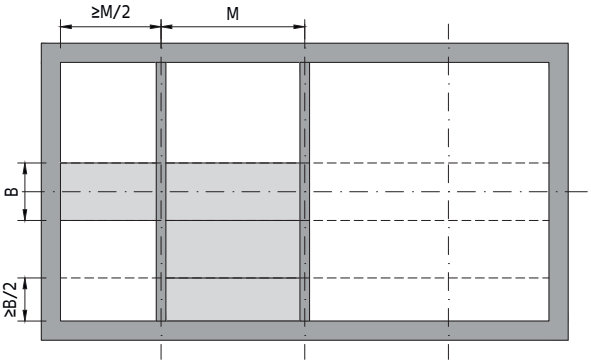
Bandraster module
Each element has an overlay on the Bandraster. The overlay depends on the selected ceiling system. See individual document for more information.

C-Profile module
Since the plates sit between the profiles, the C-Profile width must be subtracted to get the correct panel length (A).

Module length (M), panel length (A), panel width (B)

Layout 1 / 2
If the cut panel is less than half the module length (M) or width (B), it could appear aesthetically poor and is therefore not a recommended layout.

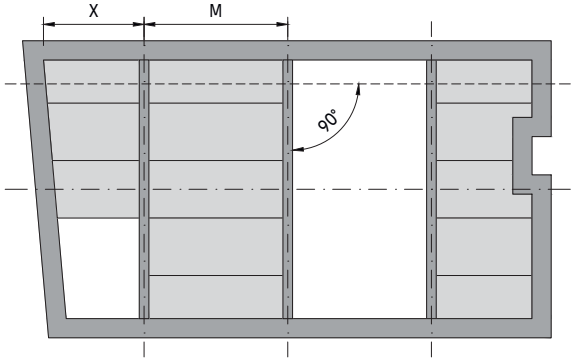
Layout 3 - Recommended



Layout 3
Usually the building center dimension specifies the alignment. The ceiling layout follows this modularisation.

If the layout of the building allows it, it is aesthetically more pleasing and more efficient to install a ceiling with larger cut panels. This will result in a cut panel length greater than half the module length (M) and therefore a correct layout.

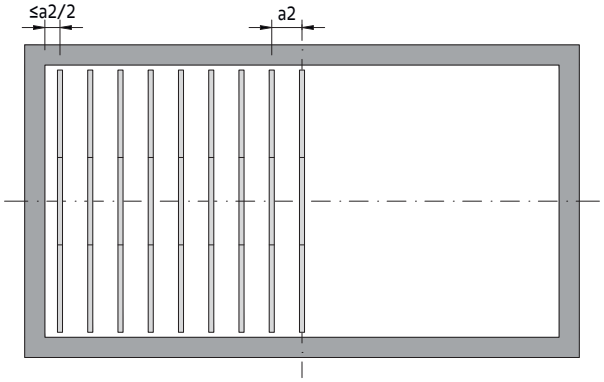
Layout 4 - Guide string / angled rooms and walls



Layout 4
As the rest of the installation follows the first panel, special care should be taken to ensure its correct installation. In order that the joints are aligned with the Bandraster, it is helpful to span a guide string or laser level across the entire room's length. Starting from this reference line, the panels are cut to fit. It is usually enough to measure the width adjacent to the linear grid and then transfer it to the panel to be cut (the element width should be measured in two places). This can then be cut accordingly. The guide string can help to achieve a parallel joint pattern. Wall unevenness can also be better compensated for. Shouldthe cut panels meet with an angled wall, the longest side (X) should equal the panel length; otherwise the layout should be adjusted.

Recommended layout for baffles

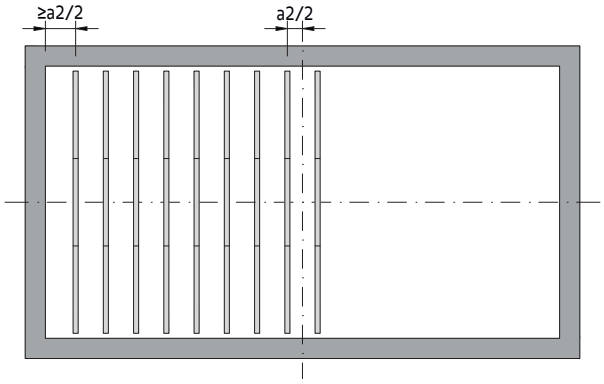
Layout 1 - Not recommended



Layout 1

Starting from the middle of the room, the layout continues in baffle distances of (a2). The example shown results in a very small distance between the last baffle and the wall. If the last baffle distance to the wall is smaller than half (a2), the layout is not recommended for optical reasons.

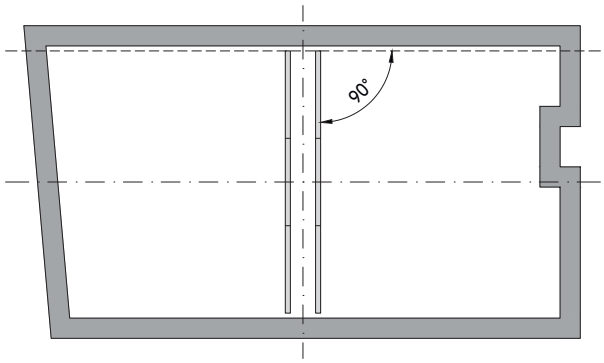
Layout 2 - Not recommended



Layout 2

It is aesthetically more pleasing and more efficient to install a baffle ceiling with a larger distance between the last baffle and the wall. If, as described above, the baffles are set out from the middle of the room but results in an unfavourable layout, the baffle layout should be moved over by half of a distance (a2). This always results in a baffle distance to the wall larger than half a distance (a2).

Layout 3 - Recommended



Layout 3

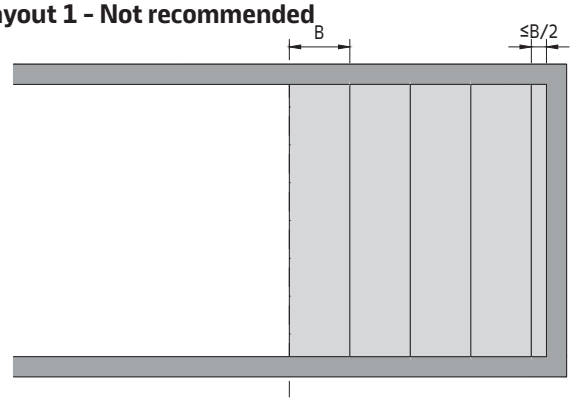
In order that the baffles are aligned in one row, it is helpful to span a guide string or laser level across the entire room's length. Starting from this reference line, the baffles can be aligned in long direction. The guide string can help to achieve a parallel layout. Wall unevenness can also be better compensated for.

Canopy layouts

Where available, positioning devices provided in the packaging can simplify the alignment of the floating ceilings. Especially with non-rectangular shapes, such as circular, etc

Recommended layout for corridors

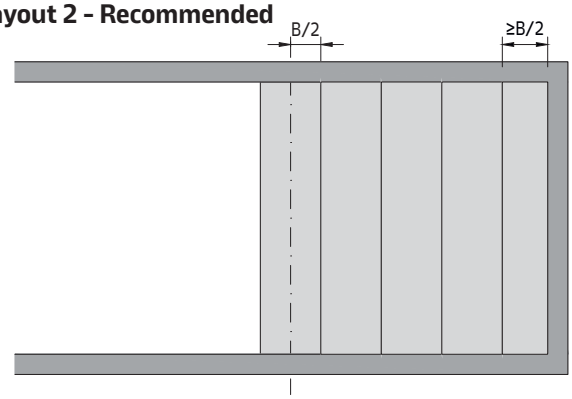
Layout 1 - Not recommended



Layout 1

Starting from the middle of the corridor, the layout continues in element widths (B). The example shown results in a very small cut panel width (B). If the last cut panel is smaller than half a panel width, the layout is not recommended for optical reasons. If layout 1 does not provide the desired visual appearance (small panel cuts), layout 2 should be chosen.

Layout 2 - Recommended



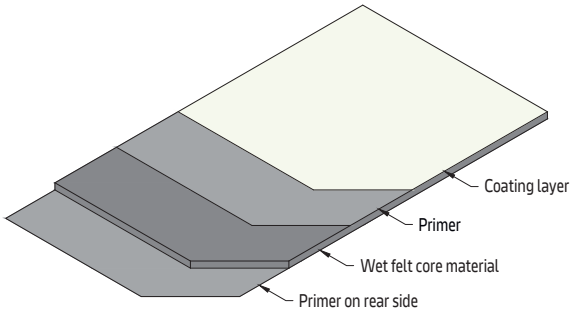
Layout 2

It is aesthetically more pleasing and more efficient to install a ceiling with larger cut panels. If, as described above, the ceiling is set out from the middle of the corridor but results in an unfavourable layout, the ceiling layout should be moved over by half a module width. This always results in a cut panel larger than half a panel width (B).

MINERAL General Information

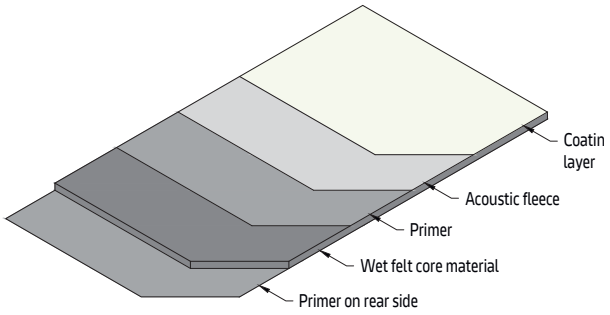
Base material

Material composition for standard wet felt



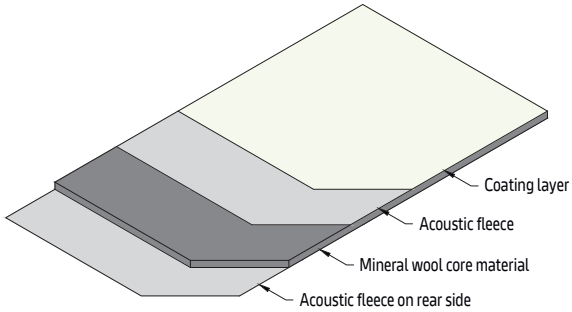
Standard wet felt (colour coated)
Every tile has a uniform paint - primer - core material structure. The key to the technical properties is the core material, which consists of mineral wool, clay, perlite and starch. In addition to different mixing ratios, the tile properties can also be influenced by the density, board thickness and surface structure. All tiles are finished with a two-layer colour coating. In order to balance out the visible side colour coating, the raw board already has a corresponding primer on the rear side.

Material composition for wet felt with an acoustic fleece



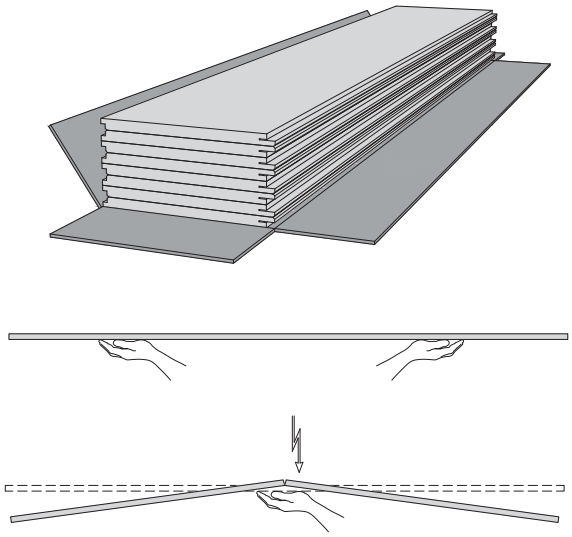
Wet felt with an acoustic fleece
In comparison to standard wet felt tiles, the raw boards are glued at points with a permeable acoustic fleece (scrim). The core material can also be additionally perforated. The open-pored material properties improve the absorption behaviour. It is also possible to use other surface colours when using pre-coloured fleeces.

Material composition for mineral soft board



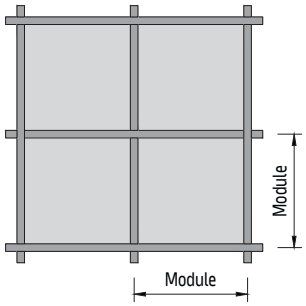
Mineral soft board
The mineral wool core material is enclosed on the front and back by an acoustic fleece (scrim). To ensure uniform colouring , paint is then applied on the visible side.

Edges
Due to the widely varying material properties / strengths, not all combinations of tiles / size and edge design are possible. Visible vertical edge surfaces are coated white.



Handling

To take out the tiles, open the packaging on all sides and then remove completely.
Care must be taken when handling full cartons as well as individual tiles. They must not be thrown, dragged or knocked. The cartons and tiles must not be placed or stored on their edges or corners.
Due to the length of each tile, it is essential to handle and install the tiles using both hands. If the tiles are supported using only one hand, there is a significant risk of breakage.
The individual tiles should always be handled with clean gloves (white material).



Dimensions / deflection / tolerances

Square and rectangular tiles are specified in modular dimensions, such as 600 x 600, 625 x 625, 1200 x 600 mm. This does not represent the actual tile dimensions. The actual dimensions can also differ across systems; module size and tile dimensions are usually different.
Tolerances and deflection are in accordance with EN 13964.

Application area

The use is largely limited to indoor areas. The suitability for the respective / object-related application must be compared with the product data sheet. If system properties are required, the suitability of all system components must be checked (corrosion protection, impact resistance, fire resistance, etc.). Different recommendations regarding cleaning and possibly disinfection apply to the different surfaces - see separate document. The area of application of mineral tiles does not include use in gymnasiums (shock resistance / ball impact resistance class 1A) or covered outdoor areas subject to wind pressure and wind suction.

Security

The relevant PSIS (Product Safety Information Sheet) provides information about the handling of ceiling tiles, possible dangers and personal protective equipment.

Recycling

In some countries, appropriate recycling processes have been established in which original products can be returned and reused as raw materials for new products. For further information, please contact your regional contact.

Disposal

Since the disposal of ceiling tiles is not uniformly regulated internationally or nationally, disposal depends on local regulations and the classification of the respective waste disposal company. A recommendation on the waste treatment process can also be found in the PSIS of the respective product.

Iederz, Groningen, Netherlands © Dion de Bakker

Suspension Systems

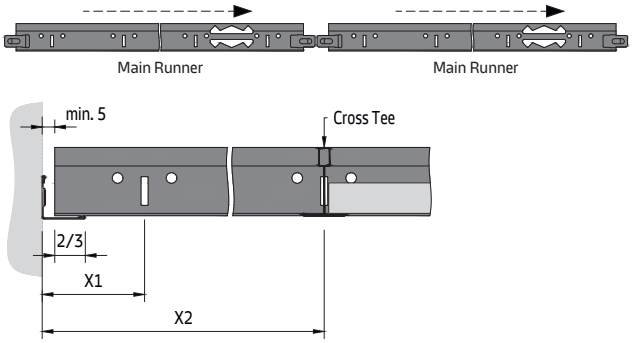
T-GRID (System C)

Exposed grid solution for indoor applications

General information

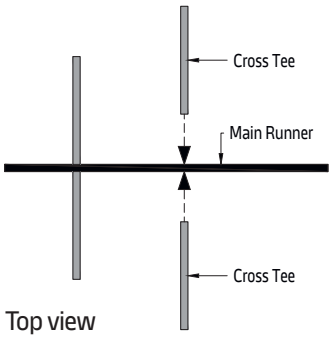
- Suitable for indoor use only
- All profiles meet durability class B, according to EN 13964
- All standard items are held in stock
- Various suspension options availabe, depending on market needs
- Tried and tested solution with extensive experience

Main Runners



The Main Runners should always be installed in the same direction; two fire expansion notches should not be installed directly next to each other. Main Runner cuts result depending on the ceiling symmetry as well as the cut tile width. The profiles should be cut to length so that the punching and therefore the layout of the Cross Tees is aligned. For every new row, the dimension X1 or X2 should be checked. To ensure system alignment (squareness) and stability, all profile cuts should leave a 5–10 mm perimter gap. In addition, the profile shoud sit on the trim to at least 2/3 of the trim flange width.

Main Runner / Cross Tee connection

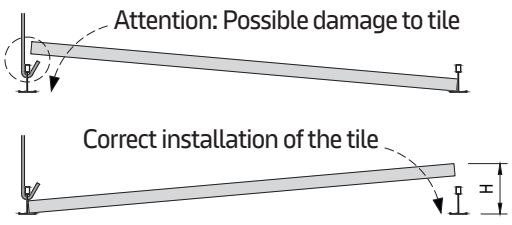


Top view

The handling of the Cross Tee connectors will differ during assembly, depending on the selected grid system (plug / click with audible engagement; left / right aligned), but also during disassembly.

Important information
The appropriate grid system and layout must be determined based upon the tile weight and additional loads. The corresponding load information and available components can be found in the respective datasheets. Components (Main Runners and Cross Tees) from different systems cannot be mixed.

Tile installation direction



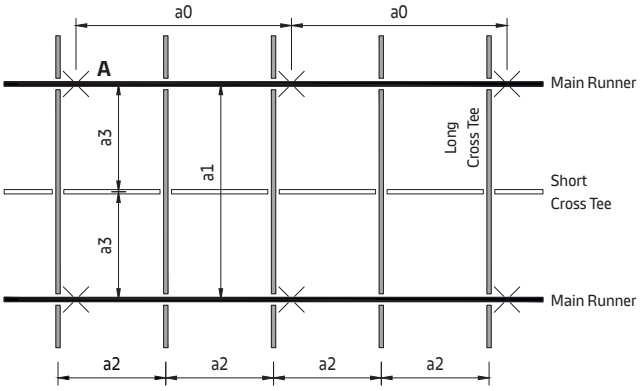
Particularly when using wire hooks, there is risk of damaging the tiles during installation. Please note the installation diagram opposite. Demounting should be carried out accordingly (lifting the tiles on the side with no hanger). In principle, assembly and disassembly should not be carried out starting from Main Runners, as there is always a risk of collision with a hanger and damage to the tile edges. The minimum height (H) to be able to insert and remove the tiles depends on the chosen system and is covered in the specific chapter.

T-Grid (System C)

C01

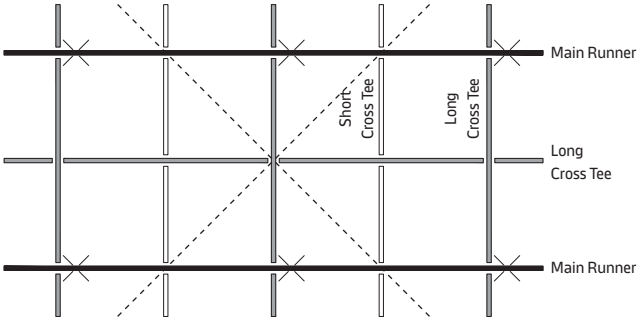
Square tiles

Layout 1



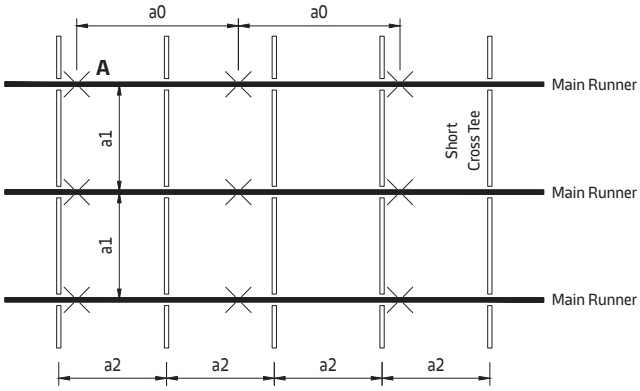
Between the Main Runners centres (a1), a long Cross Tee is fitted at (a2) centres. These Cross Tees are then subdivided by short Cross Tees at (a3) to form the square module layout. The distance (a0) stands for the distance between the suspension points.

Layout 2 - <u>not permitted</u>



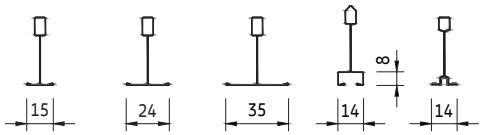
This construction is **<u>not</u>** permitted. A combination of long Cross Tee and second long Cross Tee parallel to the Main Runners due to increased deflection of the system.

Layout 3



Due to the small Main Runner centres (a1) and the use of short Cross Tees at (a2) centres, this construction can support heavier loads. Long Cross Tees are omitted and therefore the material requirements of Main Runners and short Cross Tees is increased.

T-Grid



These are typical examples of T-Grid. Detailed information and available options can be found in the product datasheets.

Parameters

a0 Max. distance between Main Runner suspension points

a1 Distance between Main Runners

a2 Distance between long Cross Tees (module width)

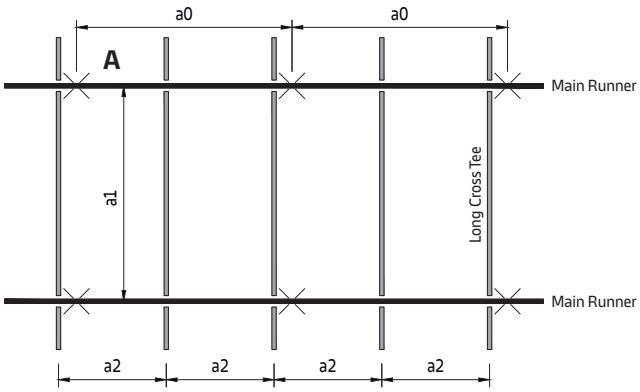
a3 Distance between Main Runner and short Cross Tees (module length)

a4 Distance from wall to first suspension point = max. 250 mm

Values see specific data sheets of the products.

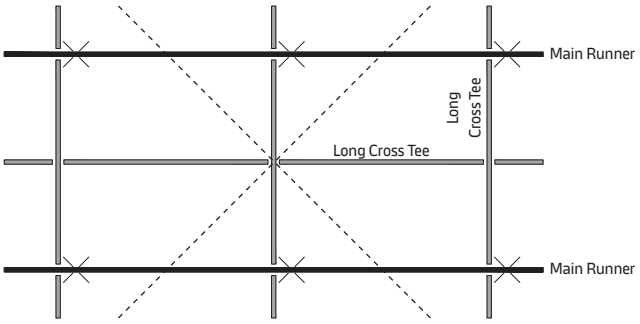
Rectangular tiles

Layout 1



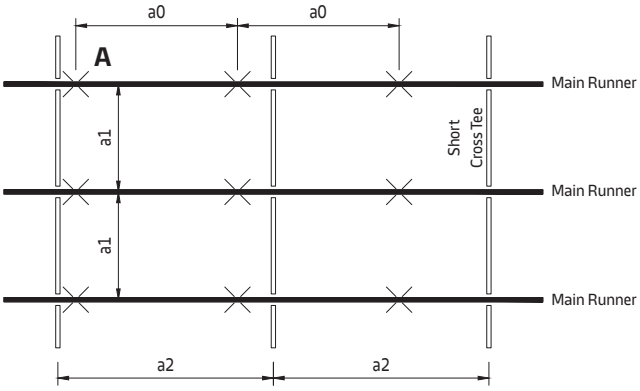
If the tiles are rectangular then the short Cross Tees are not required. Between the Main Runners centres (a1), a long Cross Tee is fitted at (a2) centres.

Layout 2 - <u>not permitted</u>



This construction is **<u>not</u>** permitted. A combination of long Cross Tee and second long Cross Tee parallel to the Main Runners due to increased deflection of the system.

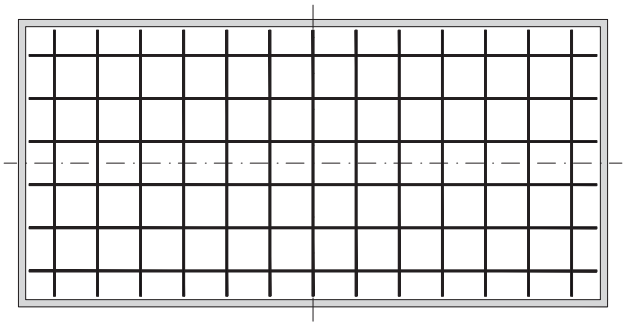
Layout 3



Due to the small Main Runner centres (a1) and the use of short Cross Tees at (a2) centres, this construction can support heavier loads.

Installation guidelines

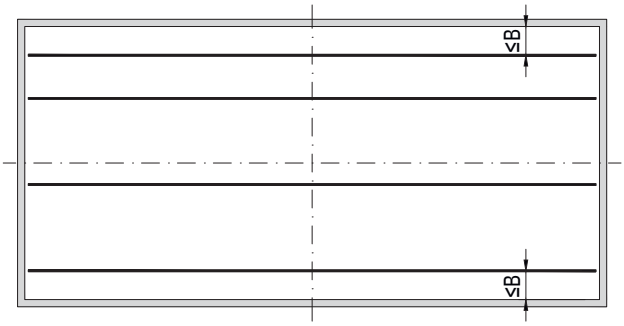
Layout 1



After determining the ceiling symmetry / layout, the direction of the Main Runners is determined. The long side of the room is normally chosen, but sometimes due to fixtures and fittings etc., the short direction may be more favourable.

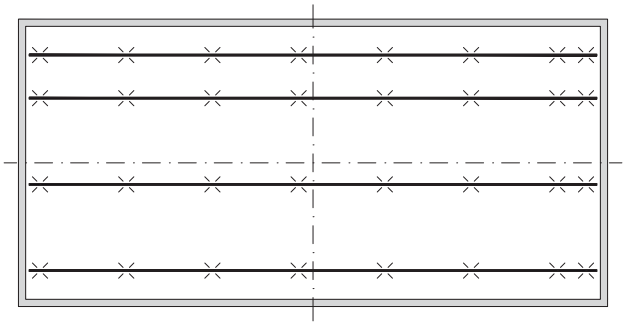
Perimeter trims
As preparation before the installation, all perimeter features (walls, columns etc.) should be marked with the ceiling height (the height of the top edge of the perimeter trim). Perimeter trims should be fixed as per chapter Perimeter trims (approved fixings, centres etc.).

Layout 2



The fixing points of the hangers are determined by the layout of the Main Runners. The distance of the first and last Main Runner from the wall should be smaller than module width B, so that laying long Cross Tees on the perimeter trim is avoided.

Layout 3



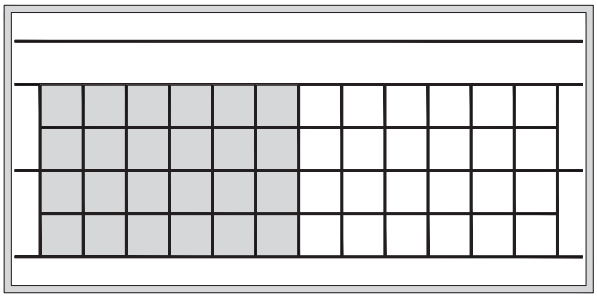
The fixing points are marked on the soffit using a chalk line, for example.

In addition to the relevant system hanger centres (load capacity of the grid system), additional hangers may be required for:
- Main Runner joints / fire expansion notches
- Maximum perimeter distances (first and last hangers)
- Fixtures and fittings

It is recommended that the hangers are adjusted to the required length before installation, later only the fine adjustment is required.

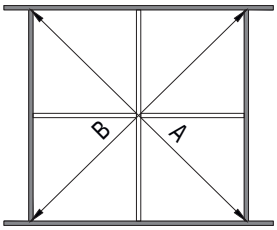
Soffit fixings is carried out with approved fixings as per the screw /plug manufacturer's recommendations. All hangers are to be installed in the same direction (e.g. direction of butterflies or hooks etc.) and vertical.

Layout 4



To complete the system, long and short Cross Tees are installed as required. To align and square the system, it is recommended to insert a few tiles and where necessary adjust the system before the entire grid system installation is complete.

Squareness check



Diagonal A = Diagonal B

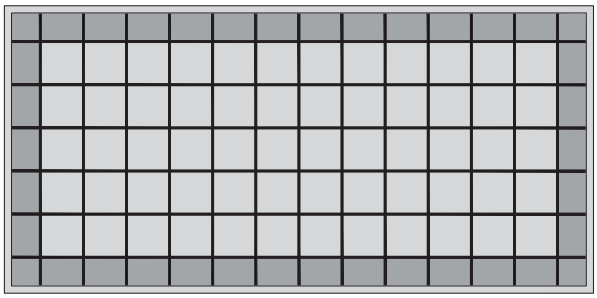
Please ensure that the system and the profiles are installed at right angles to each other or correct this where necessary. This should be done as early as possible in the installation to reduce realignment work to a minimum.

Failure to do so can lead to major problems when installing the tiles, especially with recessed edge designs, e.g. edges at...

MINERAL: Tegular 15, Tegular 24, Tegular 15/90 ...
HERADESIGN: SK-05, SK-06 ...
METAL / MESH / WOOD: Microlook, Tegular...
and semi-exposed systems e.g. Vector edge.

Furthermore, there is an increased risk of damage to tiles during subsequent demounting or maintenance.

Layout 5



Finally, all profile and tile cuts are completed. The minimum support on perimeter trims should be adhered to.

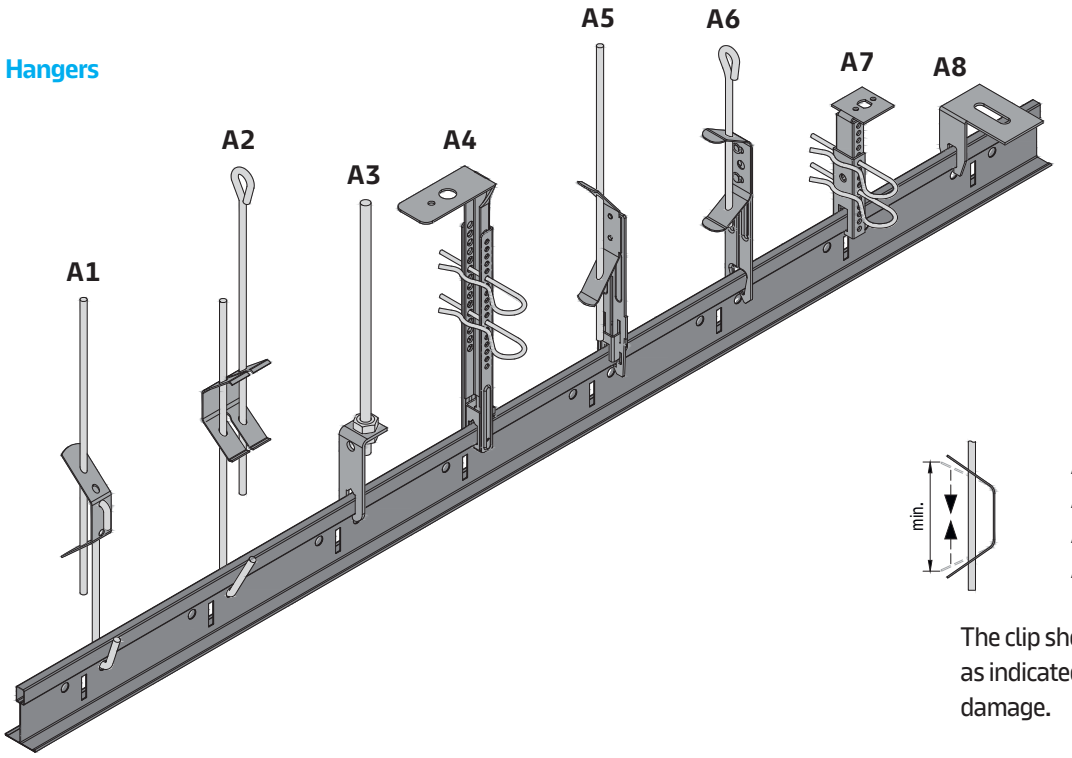
Suspension heights
The following suspension heights enable simple installation of the tiles from below.

For low suspension heights, e.g. direct hangers, the profiles and tiles must be installed alternately.

T-Grid (System C)

C01

Hangers



A1 = min. 25 mm
A2 = min. 38 mm
A5 = min. 25 mm
A6 = min. 52 mm

The clip should only be compressed as indicated to avoid possible damage.

There is a range of suspension hangers available for the System C grid. Depending on the suspension height, object-related circumstances, availability or preference, all types can be used. It is important to ensure however, that the maximum load bearing capacity is not exceeded and the choice fits the system and the requirements.

In the case of push-on hangers, care is needed to ensure that installation and removal of the tiles does not displace the hangers. When using push-on hangers, the direction of installation should be at 90° to the Main Runners, tension free and vertical.

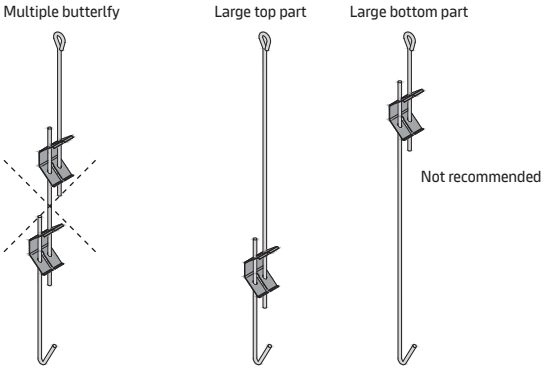
Hangers with visible defects must not be used.
Improper handling, such as forcibly bending open and closed tabs / parts of the hanger, will result in a loss of load-bearing capacity.

Hanger type		Min. installation height (H) [mm]
A1	Butterfly hanger with hook	140
A2	Quick hanger with loop	100
A3	Bent tee bar hanger for threaded rod	100
A4	Nonius top and bottom part	200
A5	Hanger Clickfix II	130
A6	SAH10 plus	130
A7	Direct hanger	80
A8	Direct hanger	65

Not all combinations of grid systems / Main Runner and hanger are possible. This primarily applies to hangers for sliding on and clipping on due to the different profile head heights and shapes - rectangle / roof (peak).

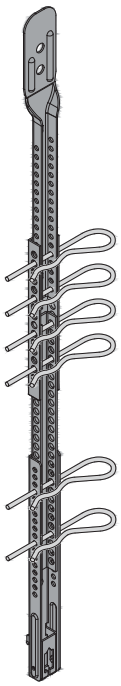
Hanger installation

A2



To facilitate access to the butterfly, it is recommended to use a longer eye wire (top part).

A4



Hangers must be installed vertically. The maximum hanger distance depends on the selected product (see specific product datasheets). In addition, a hanger is required at each Main Runner join and additional loads for service integrations require a minimum of two hangers (see Cutting & Modifications document). It should be ensured, that the distance from the perimeter to the first and last hanger does not exceed the maximum dimension (see specific product pages) and additional hangers should be installed where required.

Angled hangers can significantly reduce the load bearing capacity and not all hangers are suitable for. In most cases, additional measures (cross bracing, additional hangers etc.) are required.

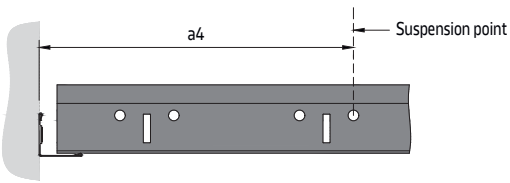
For suspension heights of up to 3000 mm, suitable suspension wires can be obtained as standard for different variants. For suspension heights over 3000 mm Nonius hangers (A4) are recommended.

A combination of multiple butterflies (A2) or extensions is not permitted. Greater suspension heights can be created using suitable special lengths (the longest possible upper section facilitates accessibility and subsequent adjustment). A combination of different hangers / parts is not permitted.

Hangers subject to compression
In normal situations the hangers are subjected to tension (ceiling tiles, grid structure, service integrations, etc.).
Certain applications may subject the hangers to compression forces. These applications can only be carried out with Nonius hangers. It is only limited available and must be clarified in relation to the object. Please make sure that the elements have an overlap of at least 40 mm.

Fire rated applications
For fire rated applications, the relevant test certificates apply. Separate documents are available.

Perimeter hangers



To avoid overloading the perimeter trim, the first hanger must be positioned at a maximum distance from the perimeter (a4). Depending on the system selected, the grid does not necessarily have to rest on the perimeter trim.

Institute of Oncology and Radiology, Belgrade, Serbia © Milos Manojlovic

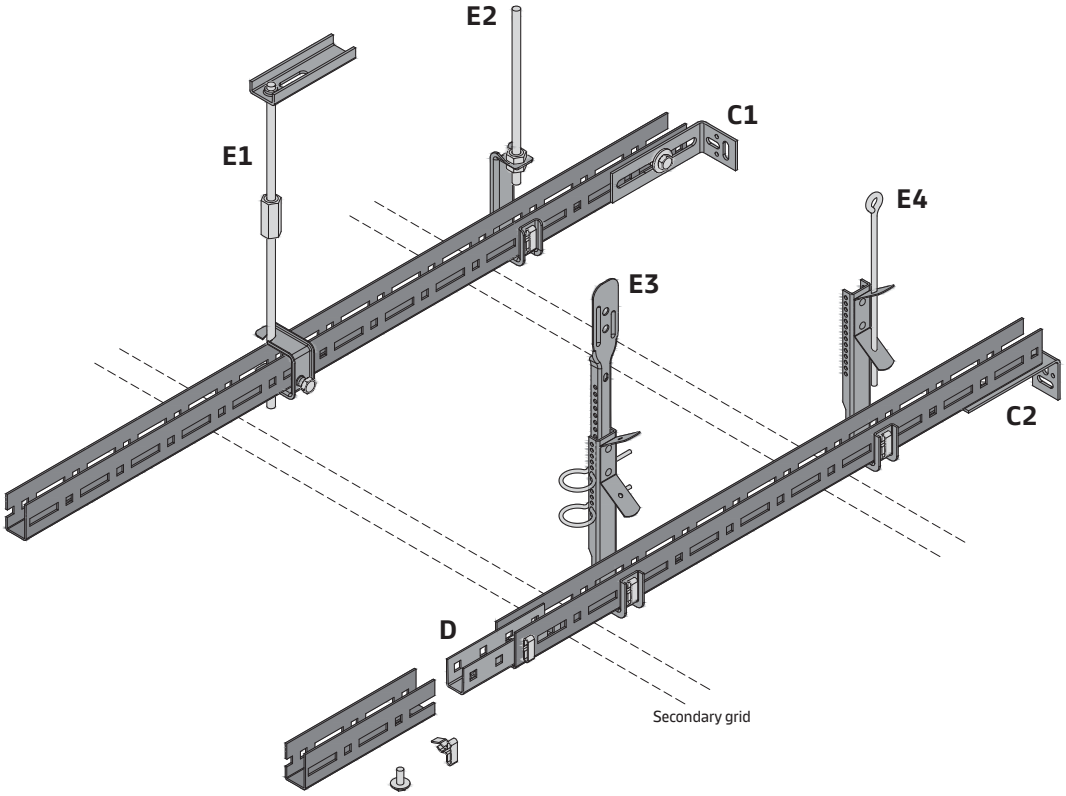
U-PROFILE PRIMARY GRID

Primary grid solution for indoor applications

General information

- Modular primary grid concept for small, medium, large rooms and floating solutions, with a minimum number of components
- For perpendicular installation with secondary grid
- High longitudinal and transverse stability
- Simple and time-saving installation, due to the use of system components
- All standard items are held in stock
- Various suspension options availabe, depending on market needs
- Tried and tested solution with extensive experience

Isometric view

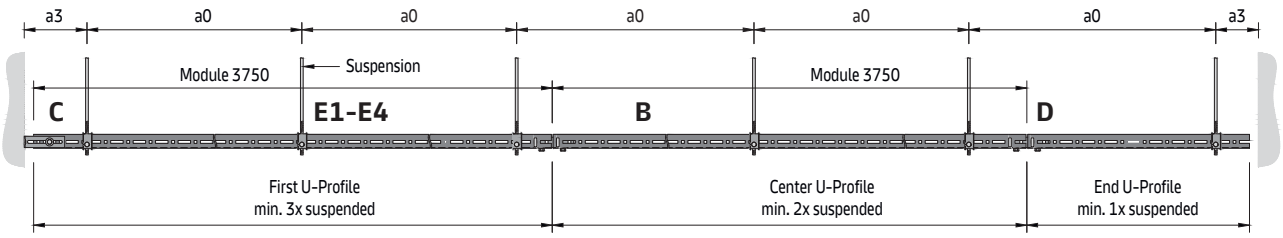


Important information

The U-Profile system fulfils the two conditions required in the European standard (EN 13964) concerning load-bearing capacity (2.5 times the failure criterion) and performance capability (deflection restriction).

Section A

Example with suspension option E1



U-Profile Primary Grid

C02

Primary grid components

Standard components

- M300100 U-Profile
- M300119 Splice connector for U-Profile
- M300140 Wall anchor
- M300120 Plug-in clip for U-Profile
- M311103 Hexagonal nut M6
- M311105 Washer
- M311303 Hexagonal bolt M6 x 16 mm

Suspension options E1 - E4 components

Suspension option D1

- M300121 Clamping bracket for U-Profile
- M311101 Threaded rod M6 x 1000 mm
- M311315 Hexagonal extension nut M6 x 30 mm (optional)
- M311061 Suspension element (optional)

Suspension option D2

- M300366 Hanger for U-Profile
- M311103 Hexagonal nut M6
- M300120 Plug-in clip for U-Profile
- M311315 Hexagonal extension nut M6 x 30 mm (optional)
- M311061 Suspension element (optional)

Suspension option D3

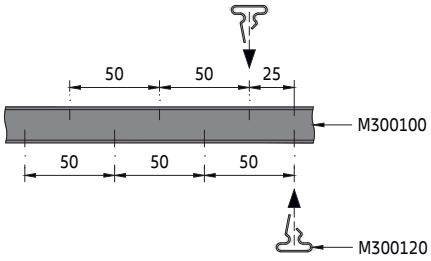
- M300166 Combi-Nonius hanger for U-Profile
- - Nonius top part (various lengths)
- M300036 Nonius locking pin
- M300120 Plug-in clip for U-Profile

Suspension option D4

- M300166 Combi-Nonius hanger for U-Profile
- - Eye wire (various lengths)
- M300120 Plug-in clip for U-Profile

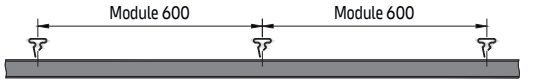
Detail B

U-Profile modulation



The U-Profile primary grid is a modular system based on a spacing of 50 mm. The holes on the lateral sides are offset from each other by 25 mm. This means that distances of 25 mm can be achieved. Other sizes covered by the long holes.

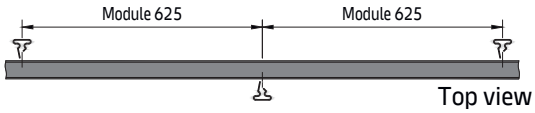
Example B1



Top view

With a module size of e.g. 600 mm, the plug-in clips are always attached to the same side.

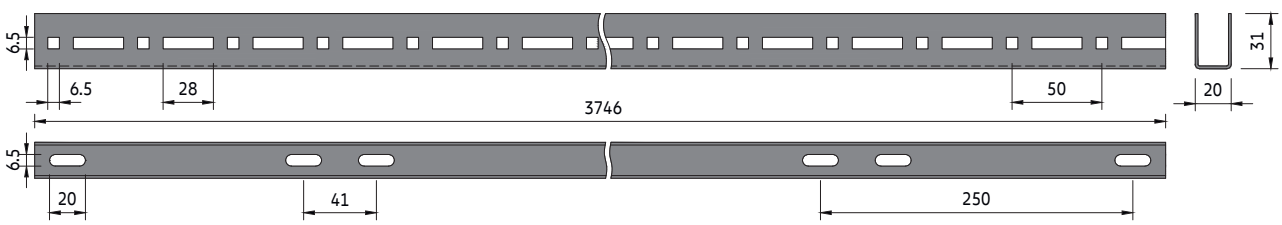
Example B2



Top view

With a module size of e.g. 625 mm, the plug-in clips are attached alternately.

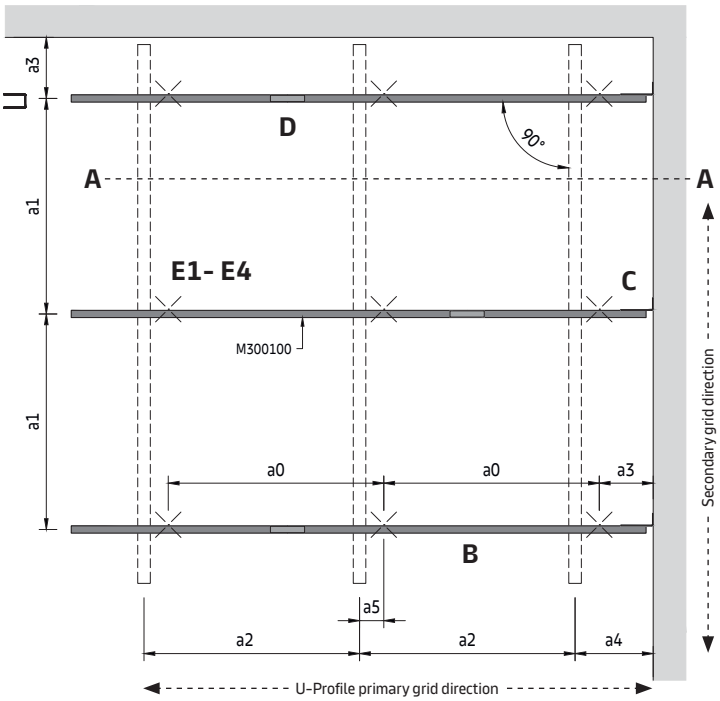
U-Profile



U-Profile Primary Grid

C02

Typical grid layout



Parameters

a0	Distance between U-Profile suspension points = max. 1900 mm
a1	Max. distance between U-Profiles
a2	Distance between secondary grid
a3	Distance from wall = max. 200 mm
a4	Distance from wall = max. panel length
a5	Distance from U-Profile suspension point to hanger = max. 100mm

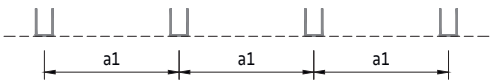
The required distances are shown in combination with the secondary grid and will vary depending on the system chosen.

U-Profile alignment

The U-Profiles should be installed vertically and on the same level, in a max. distance of (a1).

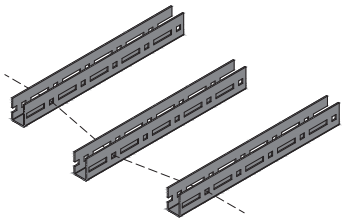
Installed incorrectly

Installed correctly

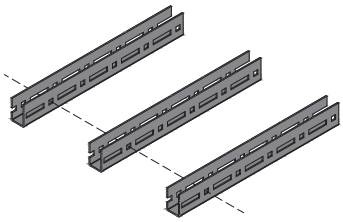


U-Profiles should be aligned with each other in the longitudinal direction, otherwise the module will not be aligned.

Installed incorrectly



Installed correctly

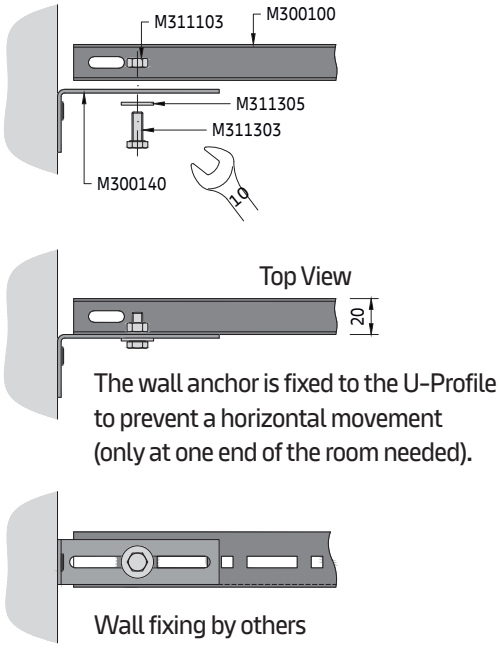


Detail C

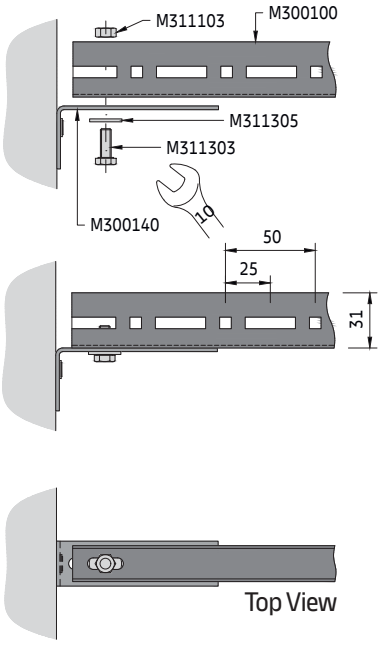
Wall fixing

The wall anchor can be attached either to the side (option C1) or below the U-Profile (option C2). It prevents the U-Profile from swinging and thus contributes to the safe installation of the substructure. The wall anchor has no load-bearing function and is only attached to one end of the room to secure the U-Profile. Maintain a small gap between the U-Profile and the wall.

Option C1



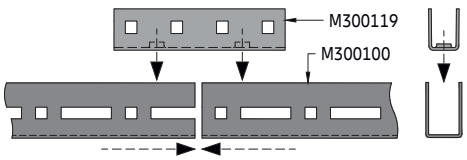
Option C2



Detail D

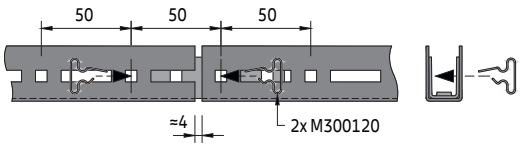
Splice connection

1



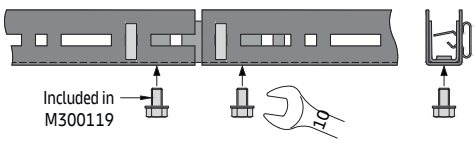
The splice connector for U-Profile comes with two bolts, which must first be removed. The splice connector is then placed between the two ends of the U-Profiles.

2



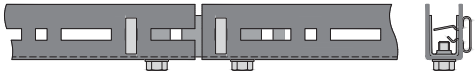
Fix the splice connector with two plug-in clips (large end upwards) at each end. This maintains the modular distance of 50 mm.

3



For a stable connection, the two supplied bolts are attached from below.

4



Since the U-Profile is a modular system, the ends must not touch. There is a distance of approx. 4 mm, depending on the length tolerance of the profile. Joints should be offset across the ceiling area.

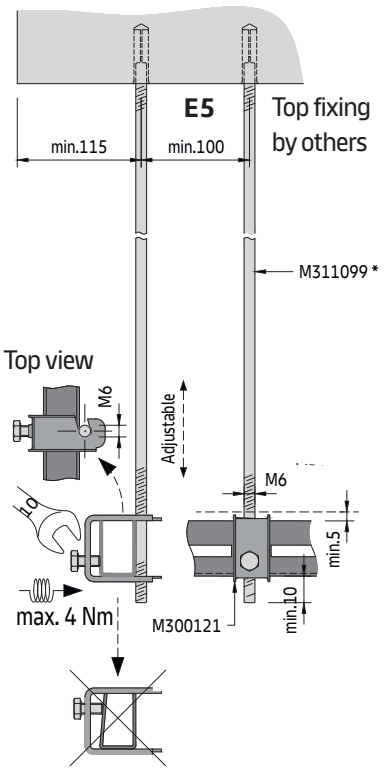
U-Profile Primary Grid

C02

Detail J

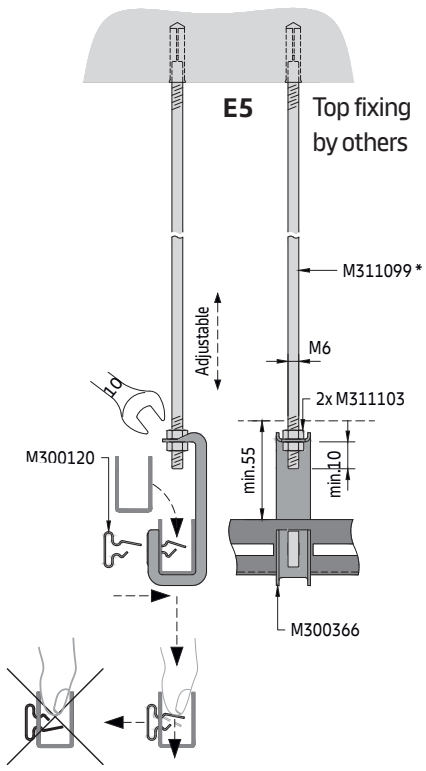
Suspension options

Option E1



Installed incorrectly

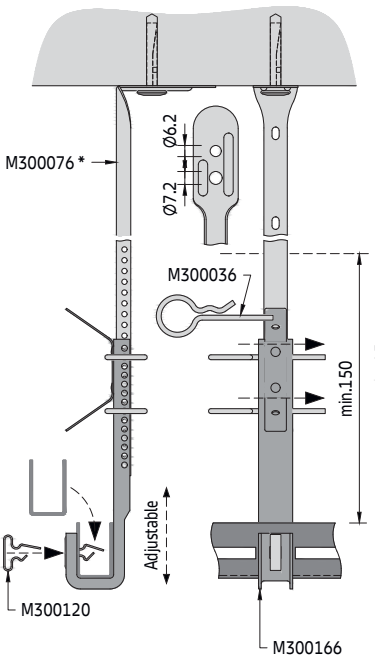
Option E2



Installed incorrectly

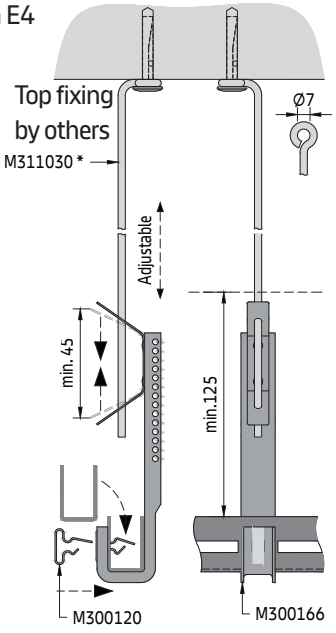
Installed correctly

Option E3



Please make sure that the elements have an overlap of at least 40 mm.

Option E4



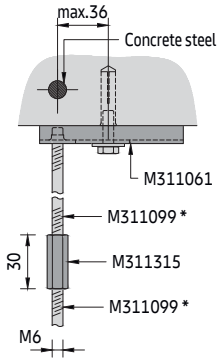
The clip should only be compressed as indicated to avoid possible damage.

The suspension point should always be chosen close to the crossing point of the primary and secondary grid (a5) in order to absorb the ceiling load as best as possible and to prevent the U-Profile from potentially deflecting.

Minimum pull-out force per suspension point = 1.25 kN (failure state)

Maximum permissible load per suspension point = 0.50 kN (incl. 2.5 times safety). These values must always be observed and guaranteed by the installation company for each suspension point irrespective of the type of hanger selected.

Detail E5



Optional top fixing and extension detail for suspension option E1 / E2

* Various lengths available

General installation sequence

1 The position of the suspension points must be marked on the soffit before installation (laser, measuring tape, chalk line, etc.). Then drill the holes and place the top fixing (not offered by Knauf Ceiling Solutions).

2 Set threaded rods, Nonius top parts or eye wires, shorten if necessary.

3 Wherever possible, fixing should begin on the centre axis of the ceiling area.

4 Align the wall angle with the laser (lower edge of the visible side of the ceiling components) and attach to the perimeter walls.

5 Suspension options:
E1 - Fasten the U-Profile to the threaded rod using a clamping bracket and align the height.
E2 - Align the height of the U-Profile hanger and fasten it to the threaded rod with two hexagonal nuts, then hang in the U-Profile and fix the position with plug-in clips.
E3 - Align the height of the combi-Nonius hanger and fasten it to the Nonius top-part with two safety clips, then hang in the U-Profile and fix the position with plug-in clips.
E4 - Align the height of the combi-Nonius hanger and fasten it to the eye wire, then hang in the U-Profile and fix the position with plug-in clips.
The minimum installation height is depending on the selected suspension option **E1 - E4.**

6 U-Profiles should be aligned with each other in the longitudinal direction and joints should be offset. Couple the U-Profiles with splice connectors and fix them to the perimeter walls with the wall anchor at one end of each row of U-Profiles.

7 See secondary grid pages for further steps.

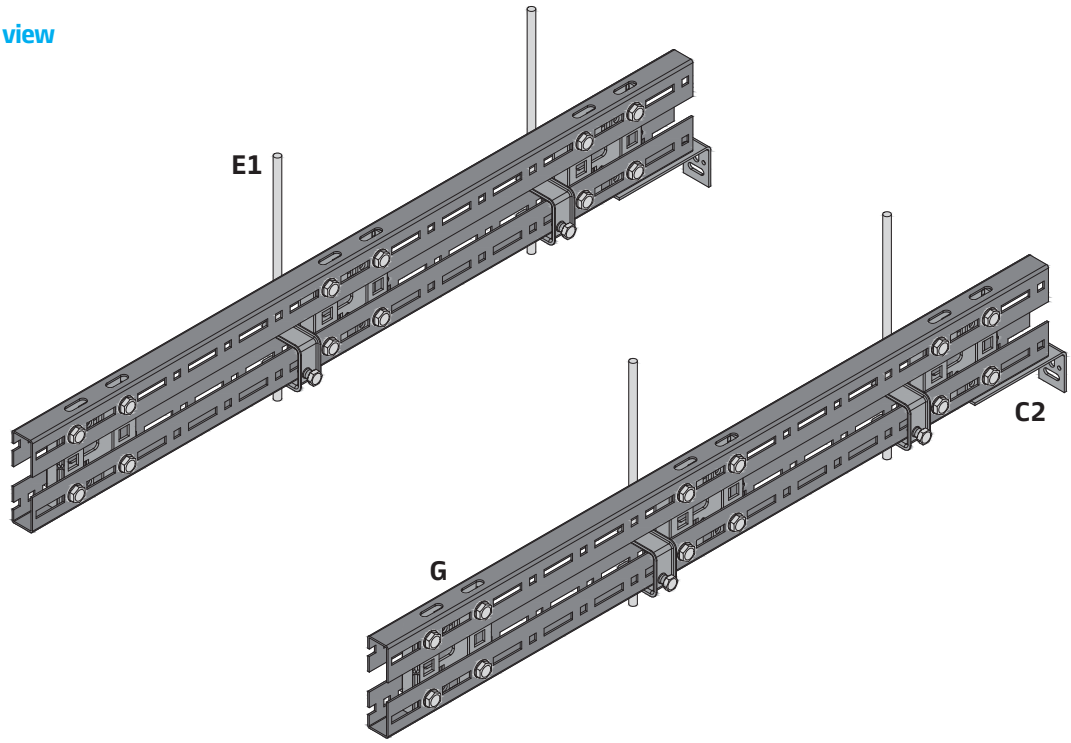
8 Lay full ceiling elements, followed by cut or full perimeter elements.

9 Service integrations and additional loads must be suspended separately from the soffit. The additional measures must be carried out professionally.

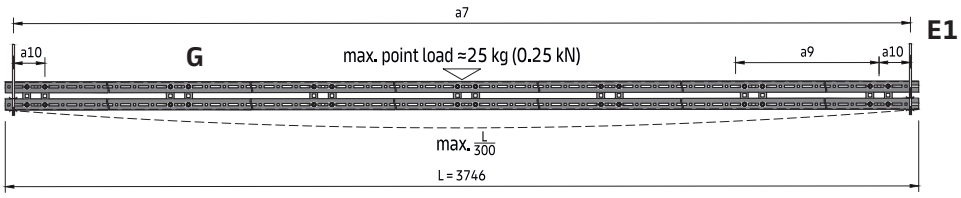
U-Profile bridging carrier

The U-Profile bridging carrier option has been designed as a single or continuous solution for smaller areas where direct suspension from the soffit is not possible with standard spacing. It is based on the standard U-Profile installation.
The bridging carrier can either be added to the standard primary grid structure or installed on top of it as an additional layer. Use on large areas is not recommended as assembly is time consuming, but still quicker than leaving the job site for another solution. The connector and bolts can be stored in the tool box. This means that you always have a quick and easy solution to hand when you need it. When planning, it is important to ensure that the connectors are positioned so that they do not interfere with the suspension point (**E1**) nor the hanger for the secondary grid. The distance between the connectors (a9) and to the suspension point (a10) must not be exceeded.

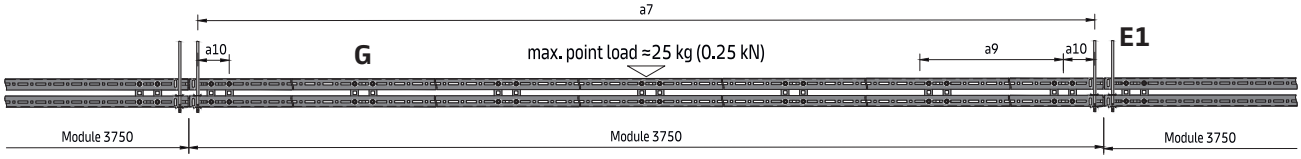
Isometric view



Single bridging carrier

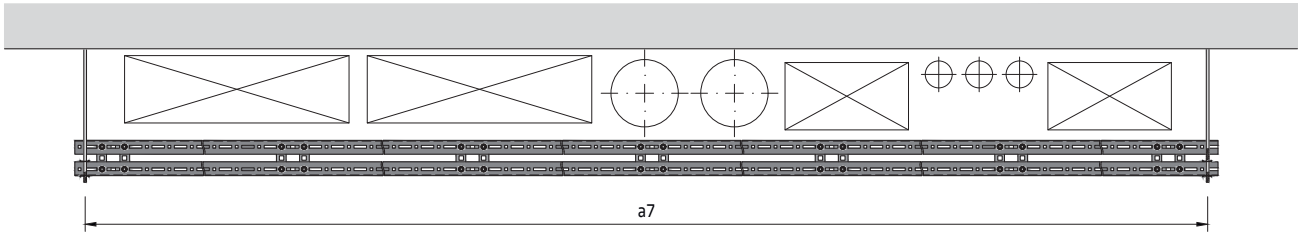


Continuous bridging carrier



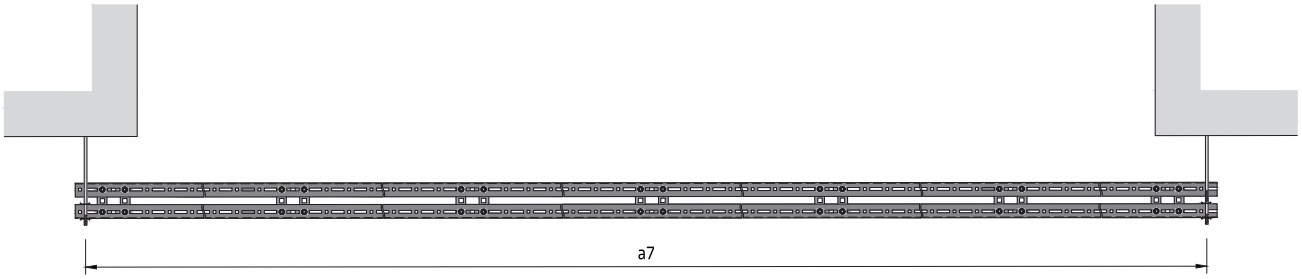
Application area 1

No fixation possible, due to building equipment



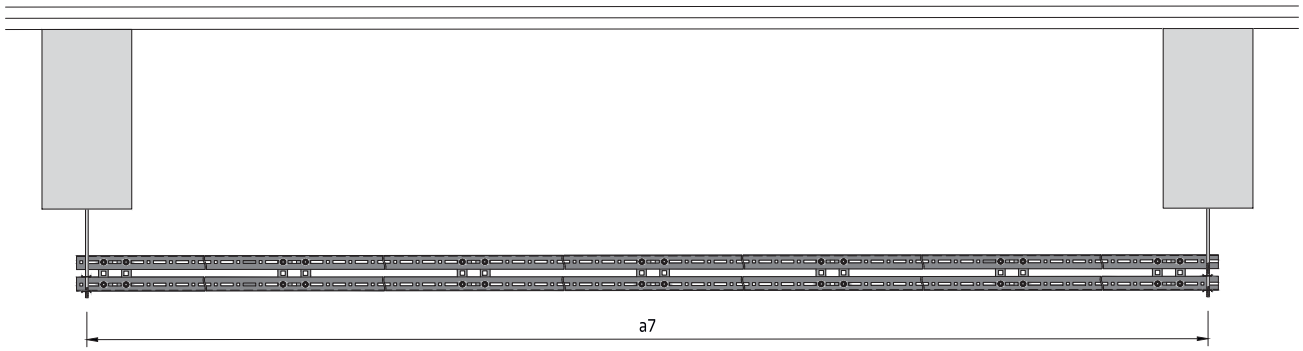
Application area 2

No fixation possible, due to ceiling aperture



Application area 3

No fixation possible, except on beams



U-Profile bridging carrier components

Standard components

- M300101 Connector for U-Profile bridging carrier
- M311195 Thread cutting bolt M6 x 10 mm

U-Profile Primary Grid

C02

Spacing for DP12 A-Bar / L-Profile

a7 [mm]	System without additional load a8 [mm]	System with additional load +4 kg/m² a8 [mm]
2800	1900	1900
2900	1900	1900
3000	1900	1800
3100	1900	1650
3200	1900	1500
3300	1900	1350
3400	1900	1250
3500	1750	1150
3600	1600	1050
3700	1500	950

Spacing for Spring-T / J-Bar

a7 [mm]	System without additional load a8 [mm]	System with additional load +4 kg/m² a8 [mm]
2800	1900	1900
2900	1900	1900
3000	1900	1750
3100	1900	1550
3200	1900	1400
3300	1900	1300
3400	1800	1200
3500	1650	1100
3600	1500	1000
3700	1400	900

Spacing for H-Profile 28 / H-Profile 35

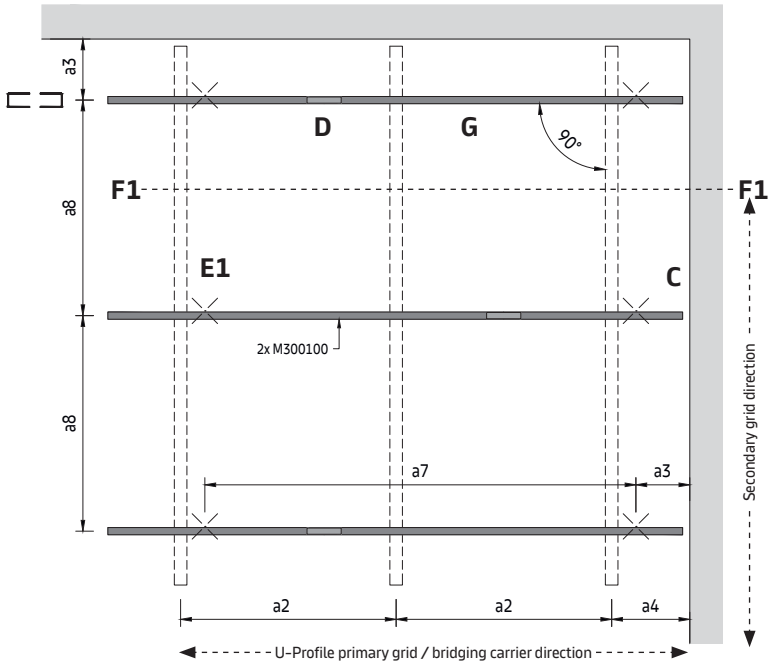
a7 [mm]	System without additional load a8 [mm]	System with additional load +4 kg/m² a8 [mm]
2800	1900	1900
2900	1900	1900
3000	1900	1800
3100	1900	1700
3200	1900	1550
3300	1900	1400
3400	1900	1250
3500	1850	1150
3600	1700	1050
3700	1550	1000

Spacing for C-Profile / Bandraster

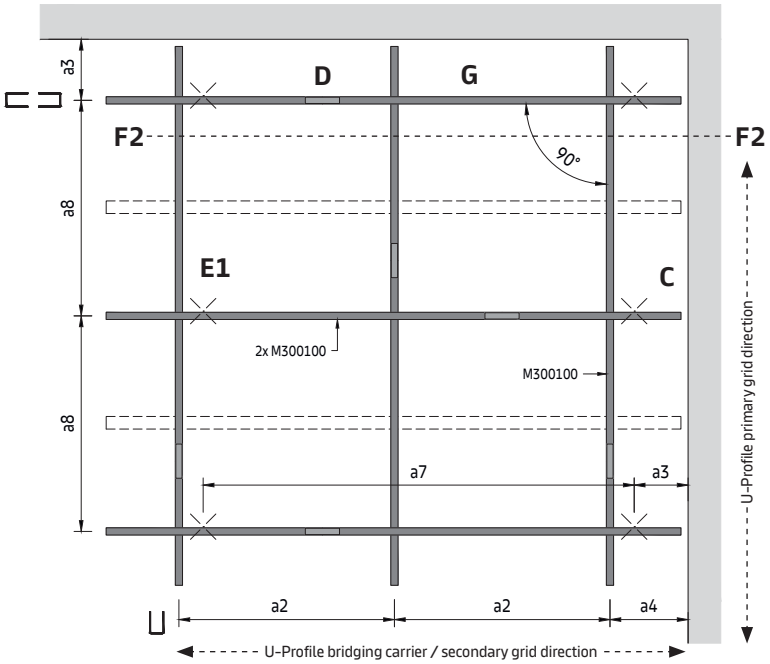
a7 [mm]	System without additional load a8 [mm]	System with additional load +4 kg/m² a8 [mm]
2800	1900	1900
2900	1900	1750
3000	1900	1550
3100	1900	1400
3200	1850	1300
3300	1700	1150
3400	1550	1050
3500	1400	1000
3600	1300	900
3700	1200	850

Typical grid layout

Bridging carrier as part of the U-Profile primary grid



Bridging carrier as additional layer above the U-Profile primary grid



Parameters

a7 Distance between U-Profile bridging carrier suspension points = max. 3700 mm

a8 Max. distance between U-Profiles bridging carriers

a9 Distance between U-Profile bridging carrier connectors = max. 600 mm

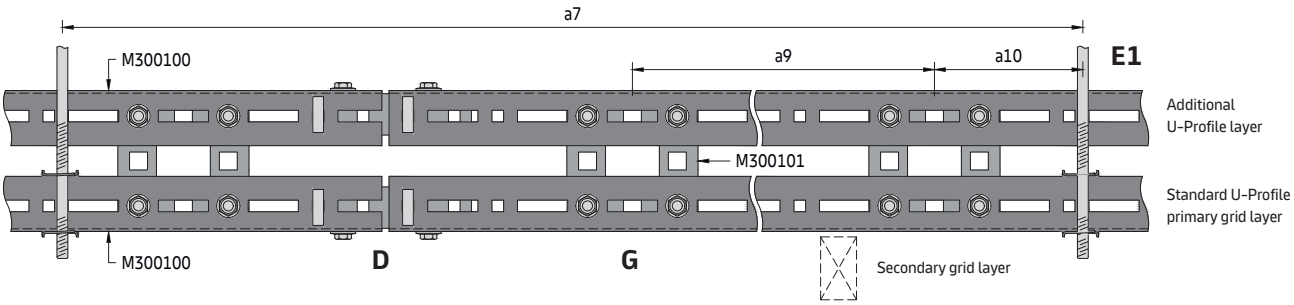
a10 Distance between U-Profile suspension point and connector = max. 100 mm

U-Profile Primary Grid

C02

Section F1

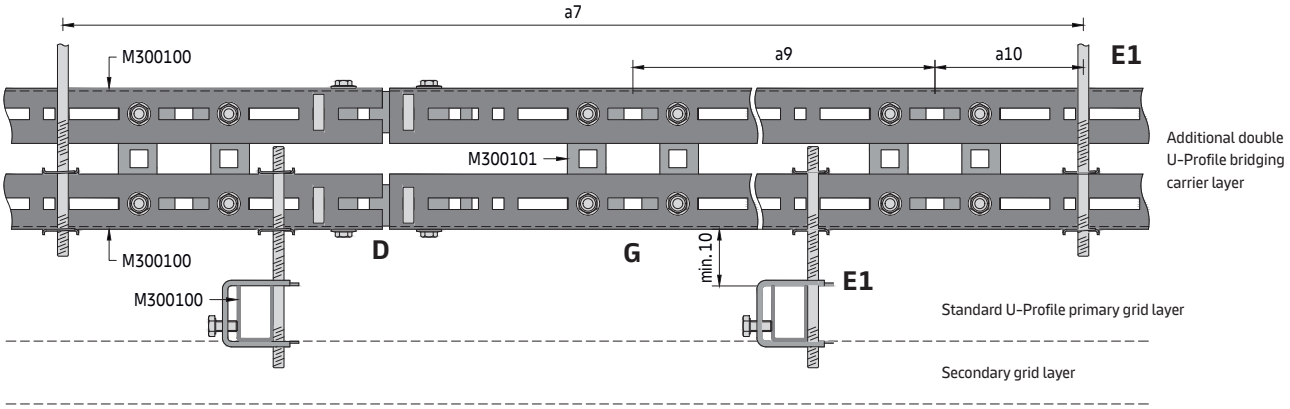
Bridging carrier as part of the U-Profile primary grid



With this option, the U-Profile is reinforced with a second one above it. The secondary grid below is installed as in the standard installation.

Section F2

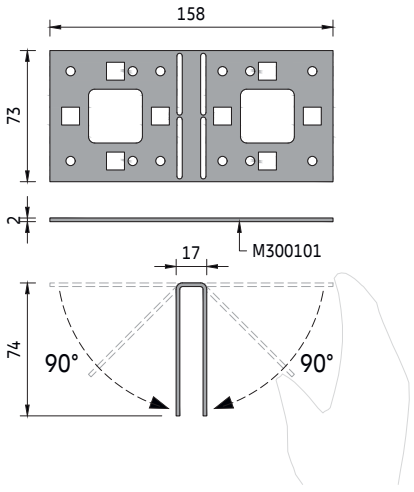
Bridging carrier as additional layer above the U-Profile primary grid



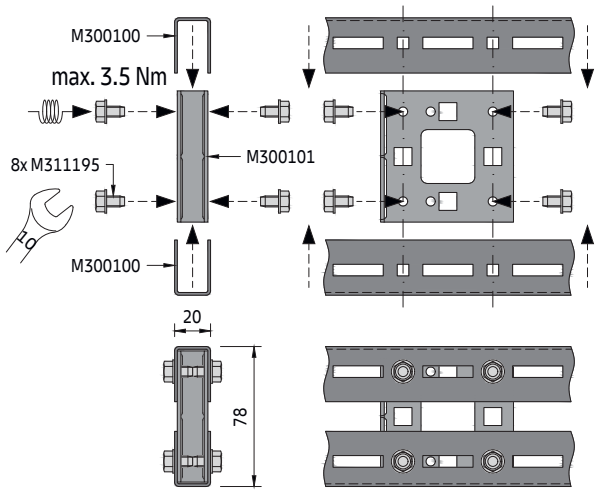
With this option, the U-Profile primary grid and the secondary grid are installed as in the standard installation. Additionally, a U-Profile bridging carrier layer is added above.

Detail G

Connector



The connector is supplied as a flat piece, which saves space, and is hand bent into a U-shape before installation.



Place the connector between the two U-Profile layers and connect it with the thread cutting bolts. In order to create a stable connection, 8 bolts are required per connector.

Stiegelmeyer Kępno sp. z o.o, Poland © Szymon Polański

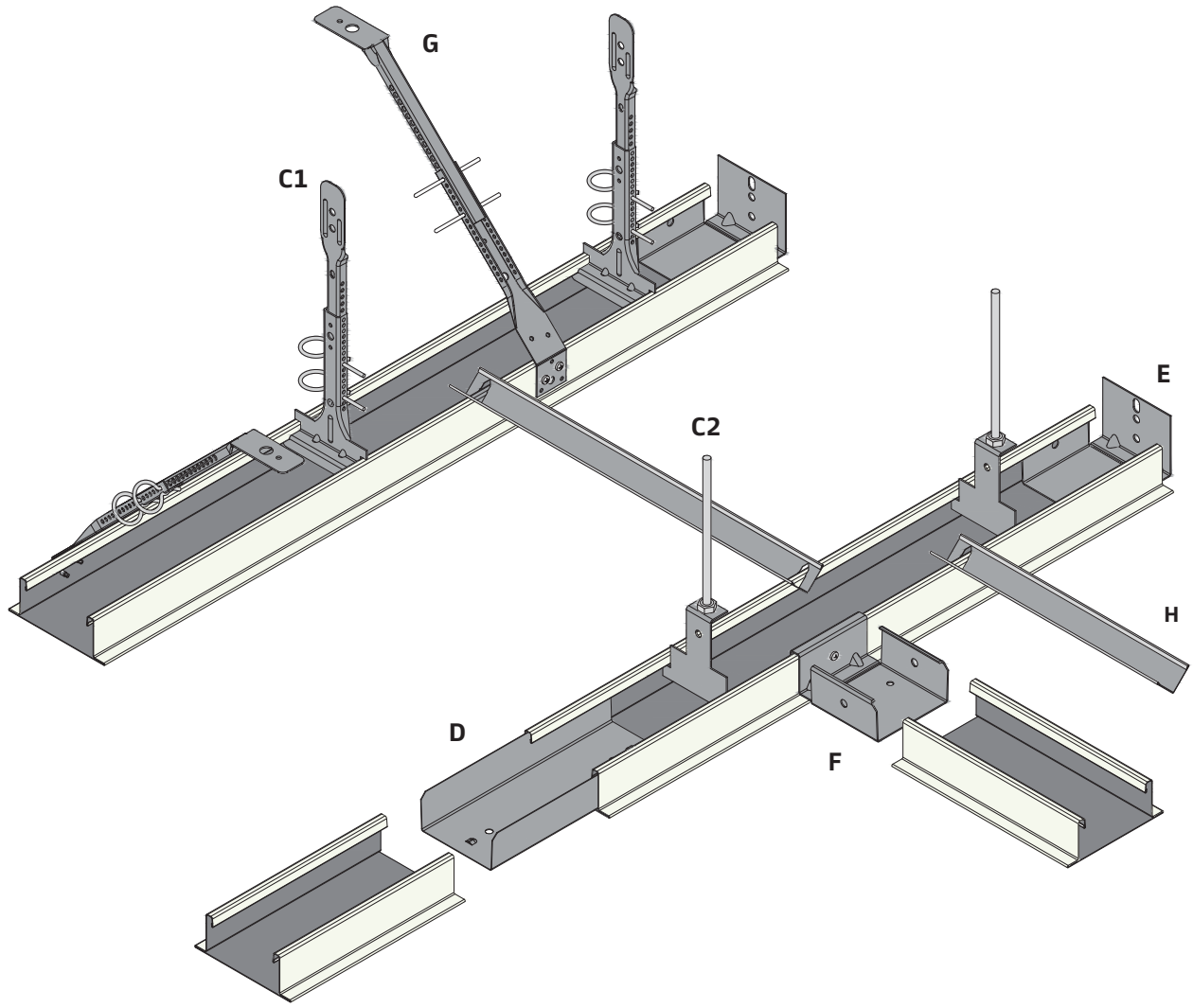
BANDRASTER

Exposed grid solution for indoor applications

General information

- Suitable for indoor use only, not secured against draft
- All profiles meet durability class B, according to EN 13964
- Bandraster available in different widths
- All standard items are held in stock
- Various suspension options availabe, depending on market needs
- Tested solution with long time experience
- Only for horizontal ceiling surfaces, without inclination
- Connection of light partition walls to Bandraster, see separate datasheet

Isometric view unslotted option

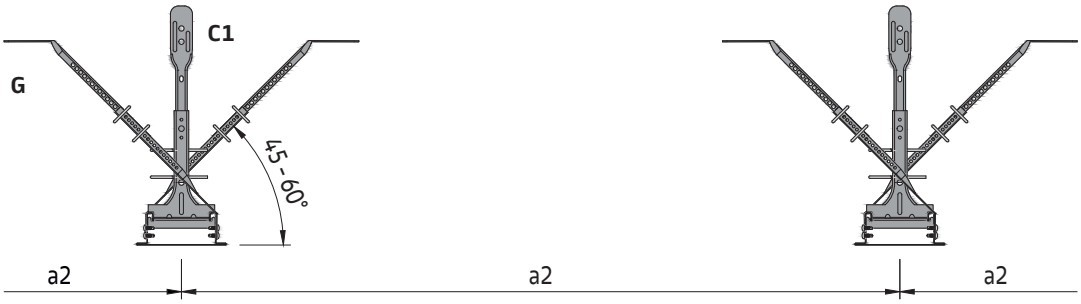


Important information

The profiles should be loaded symmetrically.
All Bandraster must be permanently secured against displacement with transverse bracings.

Section A1

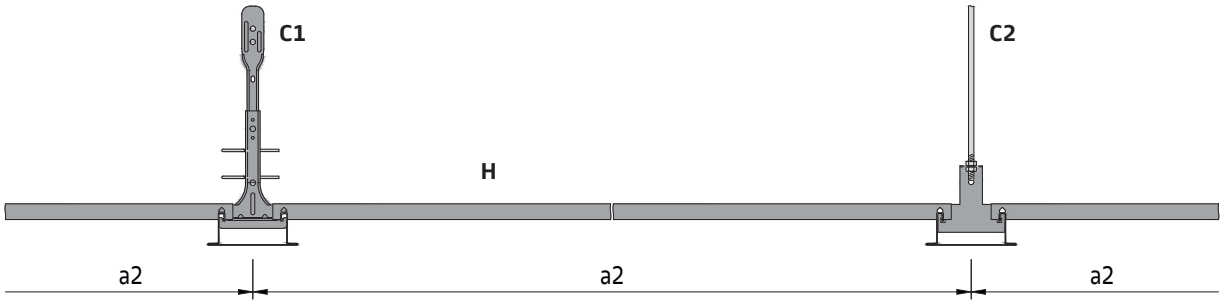
Example with suspension option C1 and angle bracing G



Angle bracings to be arranged staggered / alternately.
In the area of the hangers and angle bracing, the ability of maintencance work is limited. For detailed information, see detail F.

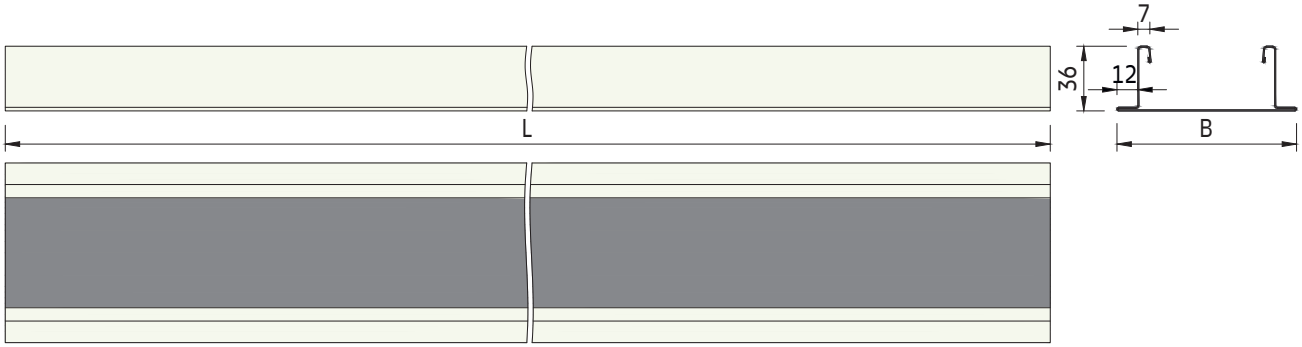
Section A2

Example with suspension option C1 / C2 and spacer bars H

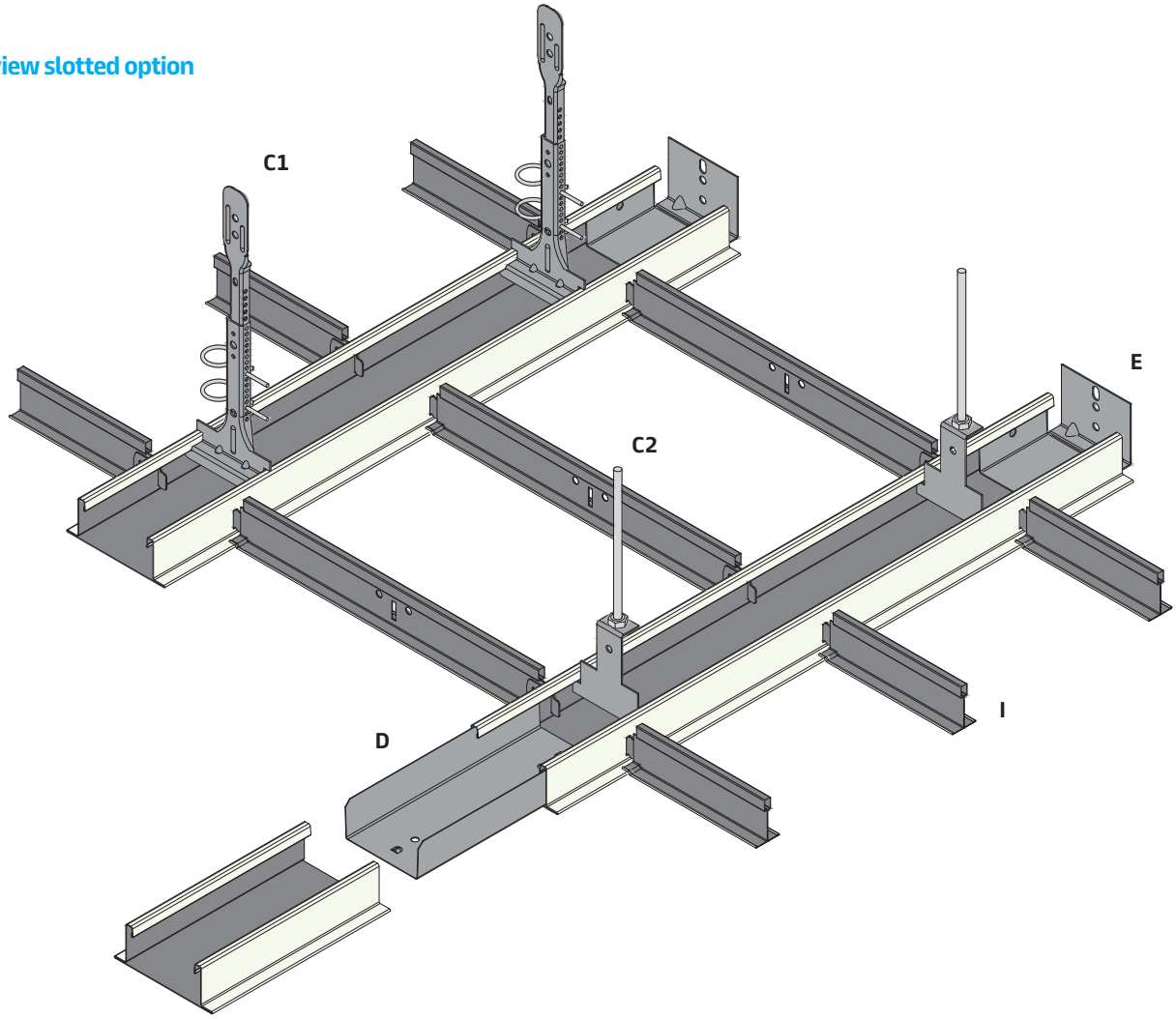


If the spacer bar runs over a panel that is to be extracted, then the spacer bar can be unhooked. Before the panel is reinserted, care should be taken to ensure that the spacer bar is correctly placed back. Spacer bar for a panel thickness of max. 24 mm.

Bandraster unslotted



Isometric view slotted option

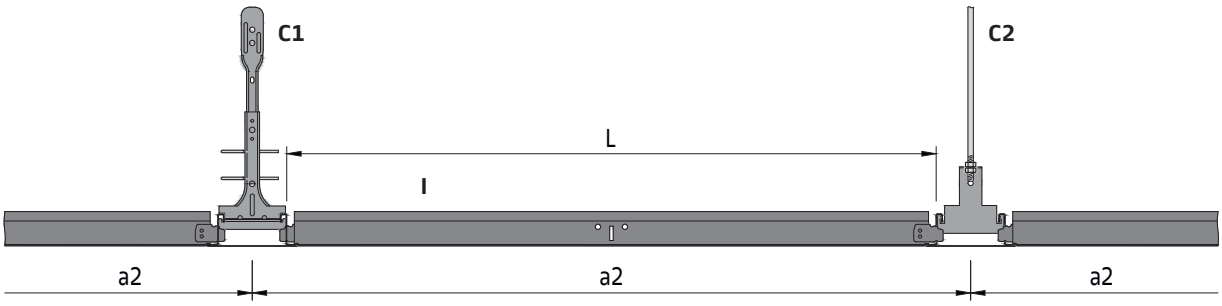


Important information

The profiles should be loaded symmetrically and straightened with each other so that the slots are aligned.
All Bandraster must be permanently secured against displacement with transverse bracings.

Section A3

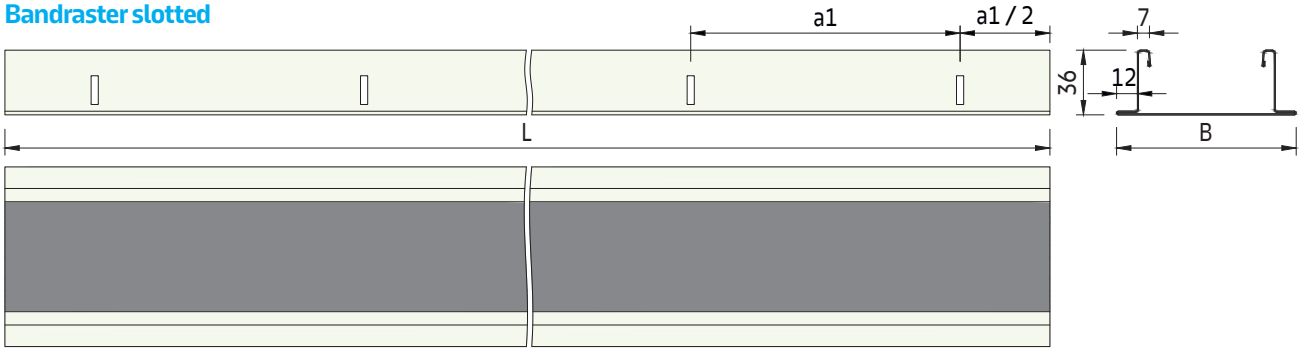
Example with suspension option C1 / C2 and Cross Tees I



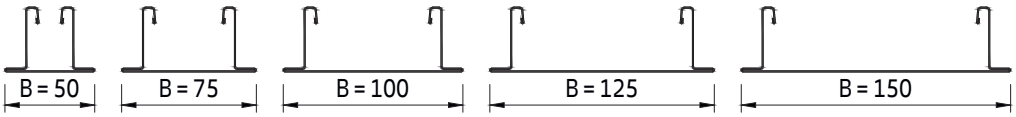
Cross tees should not be hung separately as this makes it more difficult to insert and remove the panels and can damage them.
See separate T-Grid document for detailed information.
Cross Tee length (L) = a2 - Bandraster width (B) + 2x 12 mm
Example: Bandraster centres (a2) of 1500 mm - with Bandraster width (B) of 100 mm + 2x 12 mm = Cross Tee length (L) of 1424 mm
For a free defined distance between Bandraster centres (a2), custom lengths of the Cross Tees are necessary.

Bandraster
C06

Bandraster slotted



Bandraster dimensions



Detailed information and available options can be found in the product datasheets.

Accessories

Components					
Bandraster [mm]	50	75	100	125	150
Splice connector for Bandraster	P11 DP50	P21 DP75	P31 DP100	P41 DP125	P51 DP150
Wall connector for Bandraster	P311 DP50	P312 DP75	P313 DP100	P314 DP125	P315 DP150

Suspension options B1 - B2 components

Suspension option B1					
Nonius bottom part for Bandraster	P12 DP50	P14 DP75	P18 DP100	P22 DP125	P24 DP150
Nonius top part (various lengths)					
Security pin					
Self-drilling screw 3.9 x 9 mm					

Suspension option B2					
Strip / rod connector for Bandraster	SR12 DP50	SR14 DP75	SR18 DP100	-	-
Threaded rod (various lengths)					
Hexagonal nut M6					

Transverse bracing

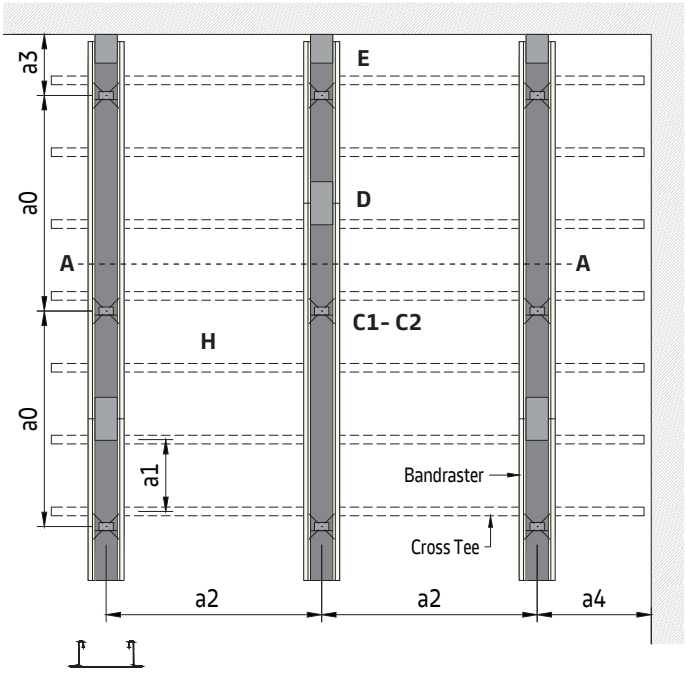
Transverse bracing for unslotted Bandraster	Transverse bracing for slotted Bandraster
Nonius angle bracing (various lengths)	Cross Tees (various lengths)
Spacer bar (various lengths)	

Optional grid components

Components					
Cross connector for Bandraster	P811 DP50	P812 DP75	P813 DP100	P814 DP125	P51 DP150

Bandraster
C06

Typical grid layout



Parameters

a0 Distance between Bandraster suspension points = max. 1200 mm

a1 Distance between Cross Tees = 300 / 312.5 mm *

a2 Distance between Bandraster centres

a3 Distance from wall = max. 250 mm / max. 600 mm (fixed to wall)

a4 Distance from wall = max. panel length **

The required distances are shown in combination with the secondary grating and will vary depending on the system chosen.

* Further custom options available on request
** Could be decisive for the choice of perimeter trim

Hanger spacing

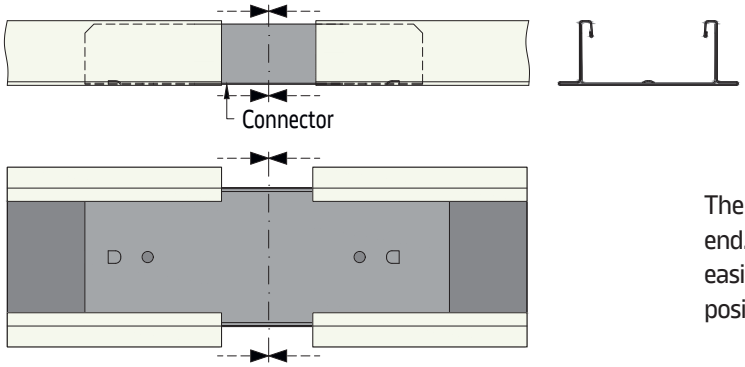
Panel weight up to 7.5 kg/m²				
a2 [mm]	1200	1800	2000	2500
a0 [mm]	1200	1200	1200	1200

Panel weight up to 9.5 kg/m²				
a2 [mm]	1200	1800	2000	2500
a0 [mm]	1200	1000	1000	1000

Detail D

Splice connection

1



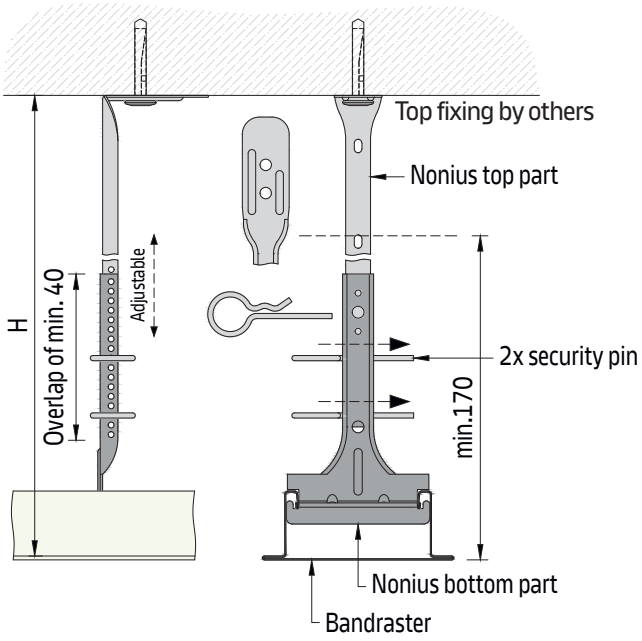
The connectors for the Bandraster must be inserted from the end. Make sure the connector is centred. To make centring easier, you can carefully use a screwdriver to adjust the position using the small tabs on the back of the connector.

2

The ends of the Bandraster should be brought together without a gap. Stagger the joints.

Detail C
Suspension options

Option C1



Maximum permissible load per suspension point = 0.4 kN (≈40 kg). These values must always be observed and guaranteed by the installation company for each suspension point irrespective of the type of hanger selected.

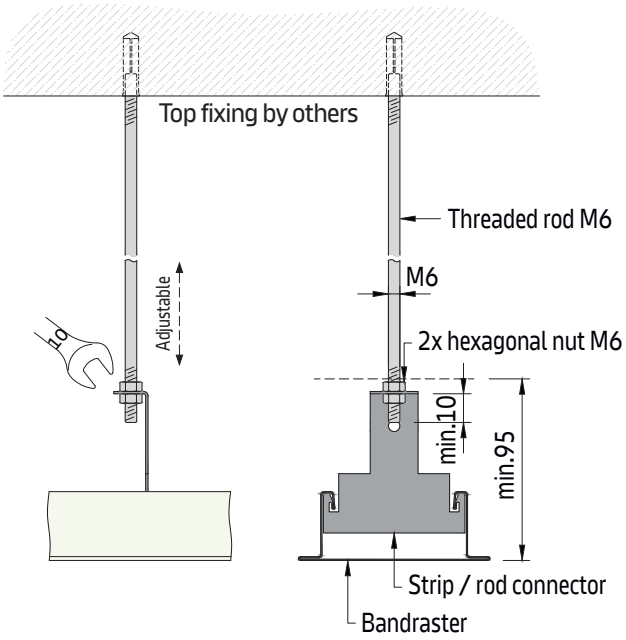
Nonius hanger top part

Hanger height (H)	min. [mm]	max. [mm]
Nonius top part 85 mm	165 *	195
Nonius top part 135 mm	165	245
Nonius top part 235 mm	235	345
Nonius top part 340 mm	340	445

Hanger height (H) = Measured from structural soffit to the Bandraster face, including the construction height of the Bandraster and the Nonius lower part.

* The shortest possible hanger height with standard accessories

Option C2



Maximum permissible load per suspension point = 0.32 kN (≈32 kg). These values must always be observed and guaranteed by the installation company for each suspension point irrespective of the type of hanger selected.

The lock nut must be tightened (torque).

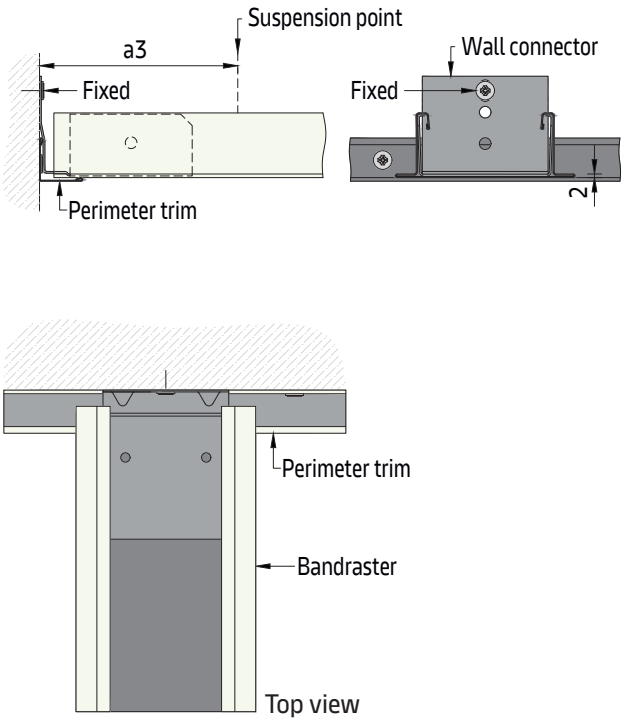
Detail E

Wall connector installation

The wall connector prevents the Bandraster from swinging and thus contributes to the safe installation of the substructure. It is just pushed on, screw fixing into the Bandraster is not normally required.

Option E1

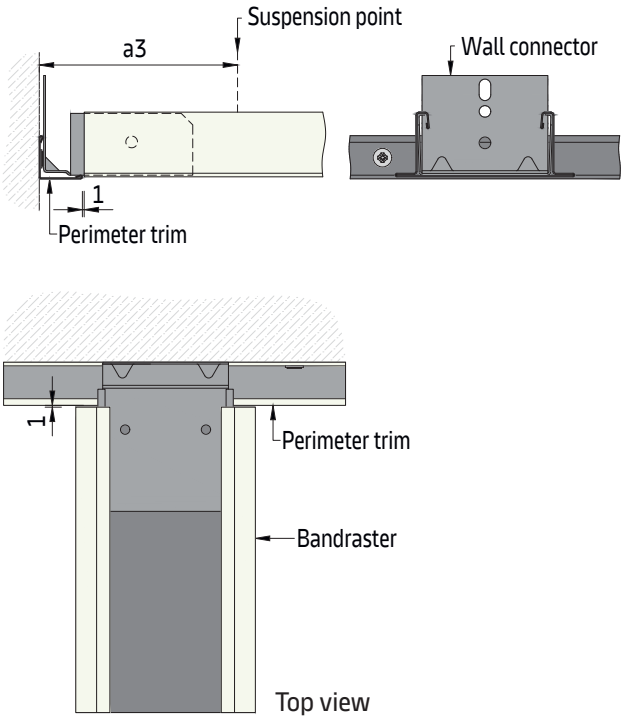
Bandraster resting on the perimeter trim



The Bandraster cannot simply rest on the perimeter trim. Supporting the Bandraster purely on the perimeter trim will lead to a visual deformation. A height offset of about 2 mm can be seen.

Option E2

Butt-connected Bandraster



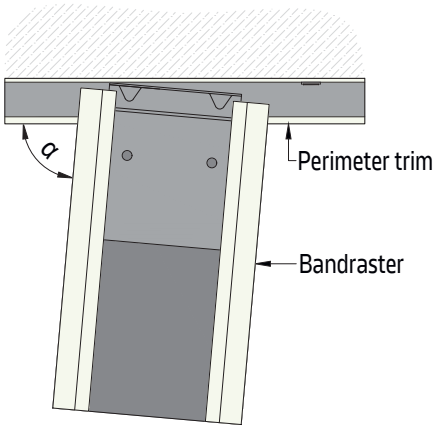
A more time consuming installation that produces a better finish is to install the Bandraster at the same level as the perimeter trim. To connect the perimeter trim to the Bandraster at the same height, the connector is used to aid height adjustment. A small expansion joint between the end of the Bandraster and the perimeter trim of 1 mm is required.

Wall fixing

Option A: The wall connector is fixed to the wall or supporting structure, with suitable fixings. The connector must be fixed as accurately as possible, because any displacement will be visible on the finished ceiling. The first suspension point must be installed at a max. of 600 mm (a3) from the wall. As shown at detail E1.

Option B: The wall connector is not fixed to the wall. To ensure that no load is transferred to the perimeter trim, the first suspension point must be installed at a maximum of 250 mm (a3) from the wall. This method removes any potential issues caused by fixing the wall connector to the wall. As shown at detail E2.

Angled connection



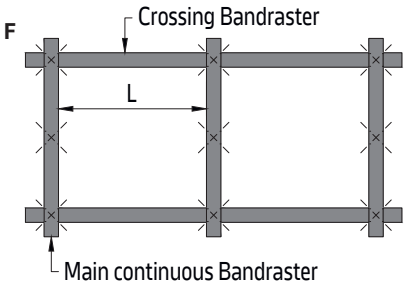
Due to the architecture or inaccuracies in the building, angled connections (α) are often necessary. Firstly, provisionally install the Bandraster and mark the cut position, before finally cutting and fixing. It is recommended to cut the Bandraster with a metal mitre saw. The use of an angle grinder is not recommended. The wall connector is only used as an assembly aid. The first suspension point is at max. 250 mm

General installation sequence

1 The position of the suspension points must be marked on the soffit before installation (laser, measuring tape, chalk line, etc.). Then drill the holes and place the top fixing (not offered by Knauf Ceiling Solutions).
2 Set threaded rods or Nonius top parts, shorten if necessary.
3 Wherever possible, fixing should begin on the centre axis of the ceiling area.
4 Align the wall angle with the laser (lower edge of the visible side of the ceiling components) and attach to the boundary walls.
5 Suspension options:
C1 - Insert the Nonius bottom part into the Bandraster and fasten it to the Nonius top-part with two safety pins.
C2 - Align the height of the strip / rod connector and fasten it to the threaded rod with two hexagonal nuts, then hang in the Bandraster.
The minimum installation height is depending on the selected suspension option **C1 - C2.**
6 The Bandraster should be aligned with each other in the longitudinal direction, when using Cross Tees, joints should be offset. Couple the Bandraster with splice connectors and fix them to the boundary walls with the wall connector (optional).
7 Secure the Bandraster against displacement with transverse bracings.
8 Lay full ceiling elements, followed by cut or full perimeter elements.
9 Service integrations and additional loads must be suspended separately from the soffit. The additional measures must be carried out professionally.

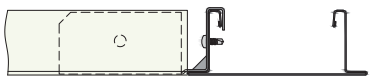
Detail F

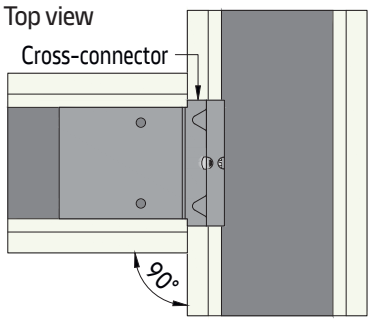
Cross-connector installation for tartan grid layout option

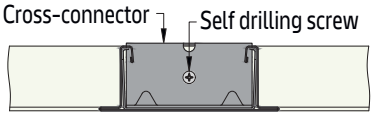


With the cross-connector, a tartan grid layout can be simulated without using crossing-boxes. Bandraster cut to length are installed across the continuous Bandraster. If necessary, the crossing Bandraster can also be fixed to the cross-connector with a self-drilling screw.

Crossing Bandraster (L) = module length - Bandraster width (B)

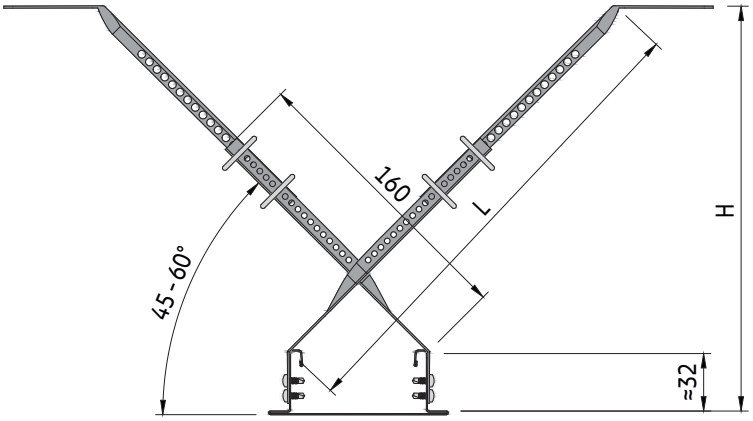






Detail G

Nonius angle bracing



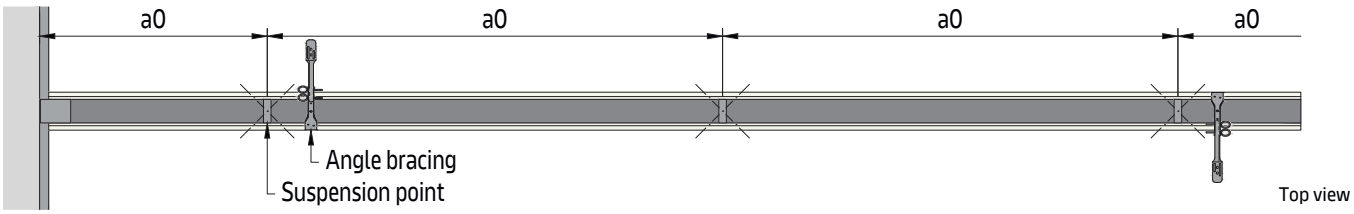
To accommodate horizontal forces during installation and maintenance, cross braces need to be permanently installed.

Nonius angle bracings are used in connection with Nonius upper parts as cross-bracing. These are screwed to the Bandraster from the outside with two self-screwing screws 3.9 x 9 mm. The Nonius upper part is then fixed with suitable fixings.
For a rigid construction, two security pins have to be used. Upper and lower parts must overlap by a minimum of 40 mm.

The angle braces are to be installed alternately, at an angle of 45 - 60° and next to each second suspension point, max. 2400 mm.
For large suspension heights (H) it is recommended to reduce the distance.

45° angle: L = (H - 32) x 1.414

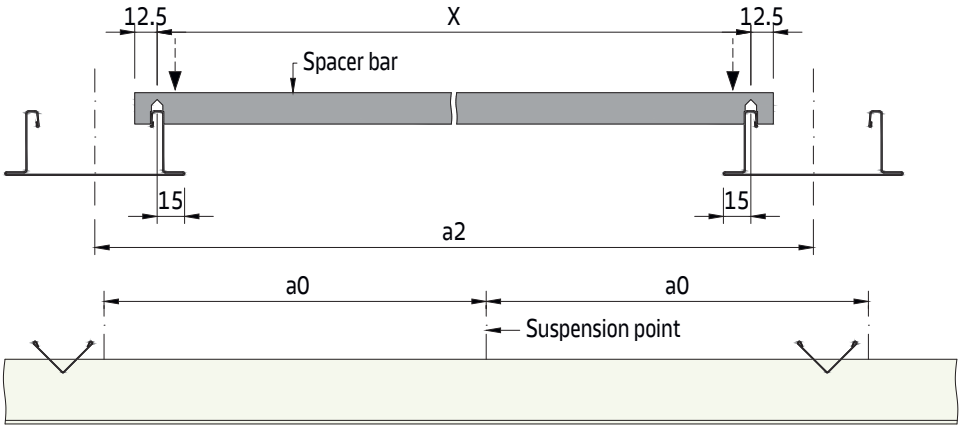
60° angle: L = (H - 32) x 1.155



Top view

Detail H

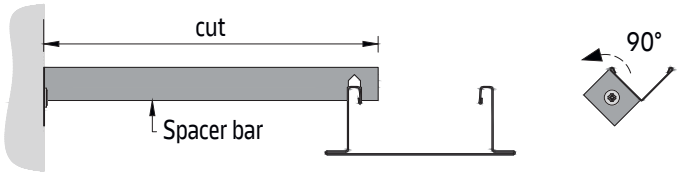
Spacer bar



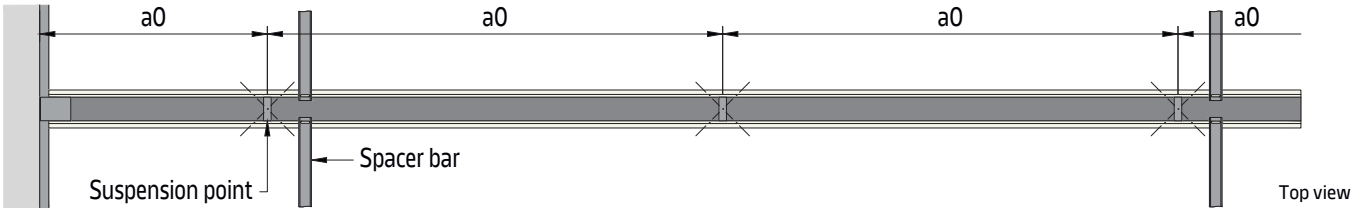
The spacer bars can be inserted from above and should be attached continuously, without offset, to each second suspension point, max. 2400 mm. Spacer bar for a panel thickness of max. 24 mm.

X = a2 - Bandraster width (B) + 30

Last row cut and fixed to wall



To avoid horizontal movement, the spacer bars can be slotted at one end and bent 90° inside or outward. This allows it to be attached to the wall.



Top view

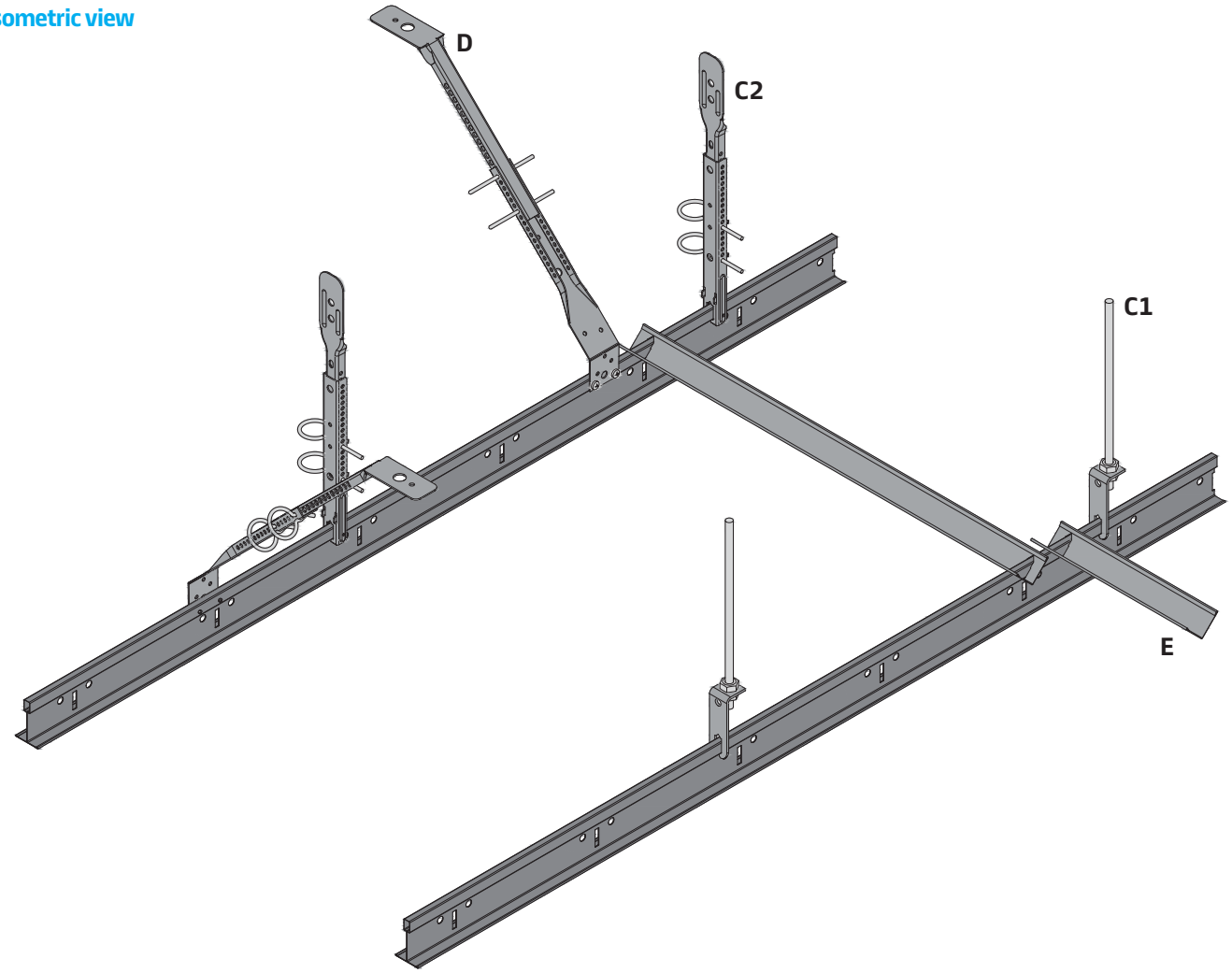
T-GRID MAIN RUNNER FOR LINEAR SOLUTIONS

Exposed grid solution for indoor applications

General information

- Suitable for indoor use only, not secured against draft
- All profiles meet durability class B, according to EN 13964
- All standard items are held in stock
- Various suspension options availabe, depending on market needs
- Tested solution with long time experience
- Only for horizontal ceiling surfaces, without inclination

Isometric view

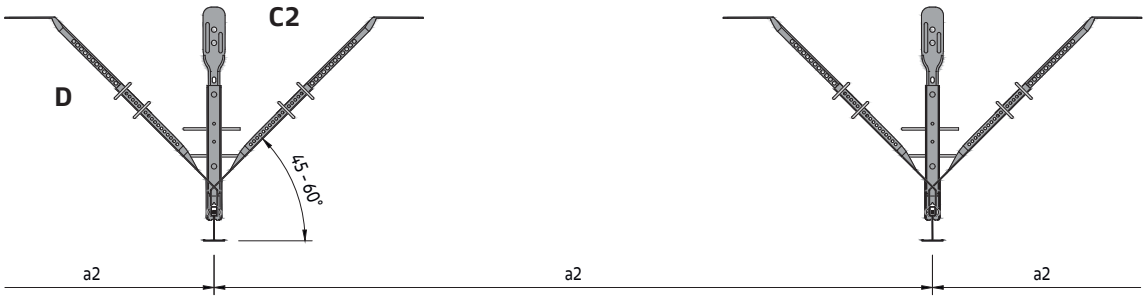


Important information

The profiles should be loaded symmetrically.
All Main Runners must be permanently secured against displacement with transverse bracings.
The ability to revise the ceiling is limited in the area of the suspension points and transverse bracing.

Section A1

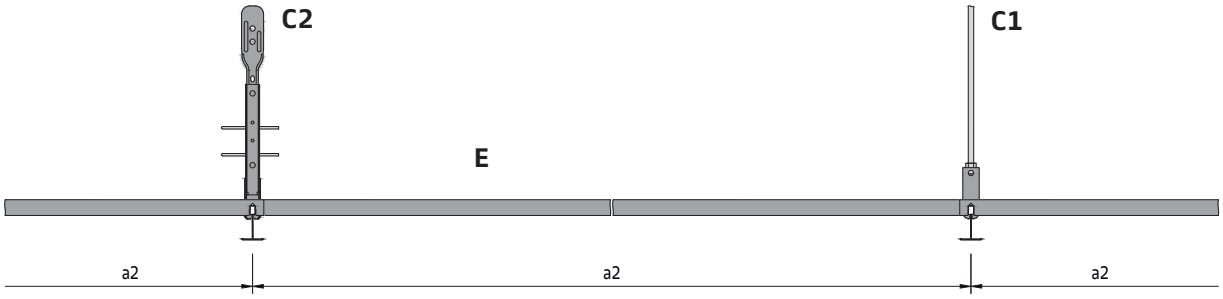
Example with suspension option C2 and angle bracing D



Angle bracings to be arranged staggered / alternately.
In the area of the hangers and angle bracing, the ability of maintencance work is limited. For detailed information, see detail C.

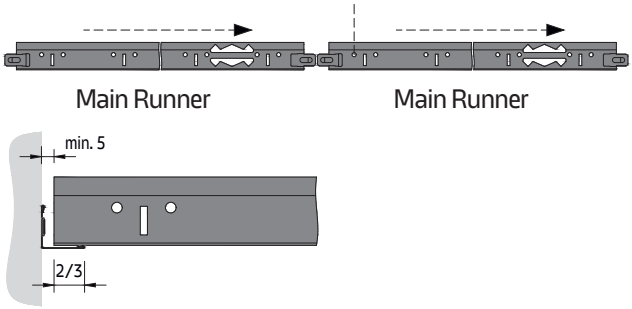
Section A2

Example with suspension option C1 / C2 and spacer bars E



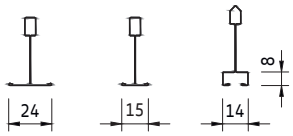
If the spacer bar runs over a panel that is to be extracted, then the spacer bar can be unhooked. Before the panel is reinserted, care should be taken to ensure that the spacer bar is correctly placed back. Spacer bar for a panel thickness of max. 30 mm.

Main Runners



The Main Runners should always be installed in the same direction; two fire expansion notches can not be installed directly next to each other.
The suspension points must be placed near the joint.
To enable system alignment (squareness), all profile cuts should be carried out with a 5–10 mm allowance. The remaining contact surface must be at least 2/3 of the leg length.

T-Grid

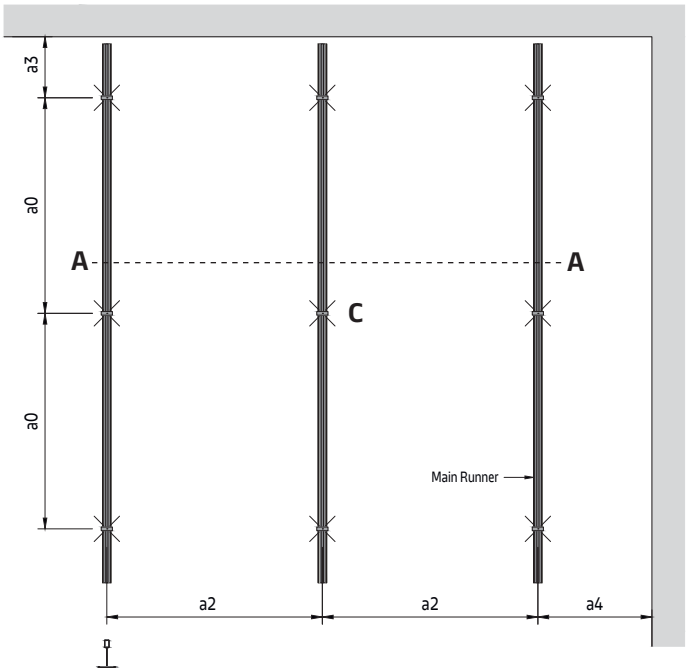


These are typical examples of T-Grid. Detailed information and available options can be found in the product datasheets.

T-Grid Main Runner for linear solutions

C08

Typical grid layout



Parameters

a0 Distance between Main Runner suspension points *

a2 Distance between Main Runner centres *

a3 Distance from wall = max. 250 mm

a4 Distance from wall = max. panel length

* Distance between suspension points and Main Runner centres depends on the max. permissible suspension load, panel weight and length and T-Grid used

Hanger spacing for T-Grid 24

Panel weight up to 7.5 kg/m²				
a2 [mm]	1200	1800	2000	2500
a0 [mm]	1000	1000	1000	800

Panel weight up to 9.5 kg/m²				
a2 [mm]	1200	1800	2000	2500
a0 [mm]	1000	850	750	600

Hanger spacing for T-Grid 15 / Perfectline

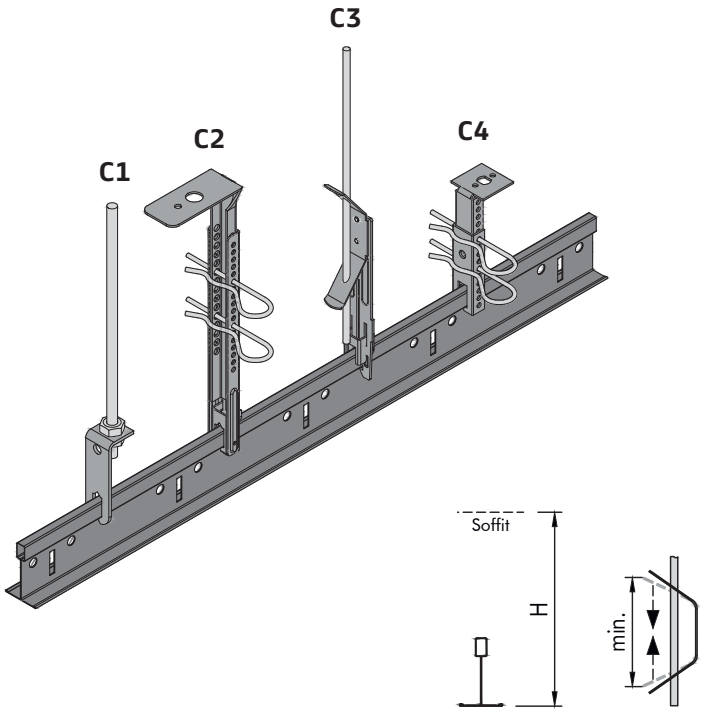
Panel weight up to 7.5 kg/m²		
a2 [mm]	1200	1800
a0 [mm]	1000	850

Panel weight up to 9.5 kg/m²		
a2 [mm]	1200	1800
a0 [mm]	1000	750

General installation sequence

1 The position of the suspension points must be marked on the soffit before installation (laser, measuring tape, chalk line, etc.). Drill the holes and place the top fixing (not offered by Knauf Ceiling Solutions).
2 Set threaded rods or Nonius top parts, shorten if necessary.
3 Wherever possible, fixing should begin on the centre axis of the ceiling area.
4 Align the wall angle with the laser (lower edge of the visible side of the ceiling components) and attach to the boundary walls.
5 Suspension options:
B1 - Align the height of the strip / rod connector and fasten it to the threaded rod with two hexagonal nuts, then hang in the Main Runner.
B2 - Insert the Nonius bottom part into the Main Runner and fasten it to the Nonius top-part with two safety pins.
The minimum installation height is depending on the selected suspension option **B1 - B2.**
7 Secure the Main Runner against displacement with transverse bracings.
8 Lay full ceiling elements, followed by cut or full perimeter elements.
9 Service integrations and additional loads must be suspended separately from the soffit. The additional measures must be carried out professionally.

Hangers



There is a range of suspension hangers available for the T-Grid. Depending on the suspension height, object-related circumstances, availability or preference, all types can be used. It is important to ensure however, that the maximum load bearing capacity is not exceeded and the choice fits the system and the requirements.
In the case of push-on hangers, care is needed to ensure that installation and removal of the panels does not displace the hangers. When using push-on hangers, the direction of installation should be at 90° to the Main Runners, tension free and vertical.
Hangers with visible defects must not be used.
Improper handling, such as forcibly bending open and closed tabs / parts of the hanger, will result in a loss of load-bearing capacity

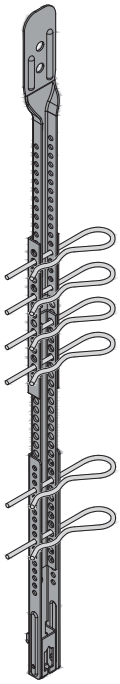
C3 = min. 25 mm
The clip should only be compressed as indicated to avoid possible damage.

Hanger type		Min. installation height (H) [mm]
C1	Bent tee bar hanger for threaded rod	100
C2	Nonius top and bottom part	200
C3	Hanger Clickfix II	130
C4	Direct hanger	80

Transverse bracing
Nonius angle bracing (various lengths)
Spacer bar (various lengths)

Not all combinations of grid systems / Main Runner and hanger are possible. This primarily applies to hangers for sliding on and clipping on due to the different profile head heights and shapes - rectangle / roof (peak)

Hanger installation



C2

Nonius hanger extension

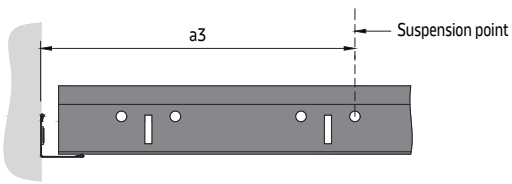
Hangers must be installed vertically. The maximum hanger distance depends on the selected product (see specific product datasheets).
In addition, a hanger is required at each Main Runner join and additional loads for service integrations require a minimum of two hangers (see Cutting & Modifications document).

It should be ensured, that the distance from the perimeter to the first and last hanger does not exceed the maximum dimension (see specific product pages) and additional hangers should be installed where required.
Angled hangers can significantly reduce the load bearing capacity and not all hangers are suitable for. In most cases, additional measures (cross bracing, additional hangers etc.) are required.
For suspension heights over 3000 mm Nonius hangers (C3) are recommended.

Hangers subject to compression
In normal situations the hangers are subjected to tension (ceiling panels, grid structure, service integrations, etc.). Certain applications may subject the hangers to compression forces. These applications can only be carried out with Nonius hangers. The solution has limited applicability and must be clarified in relation to the object.

Fire rated applications
For fire rated applications, the relevant test certificates apply. Separate documents are available.

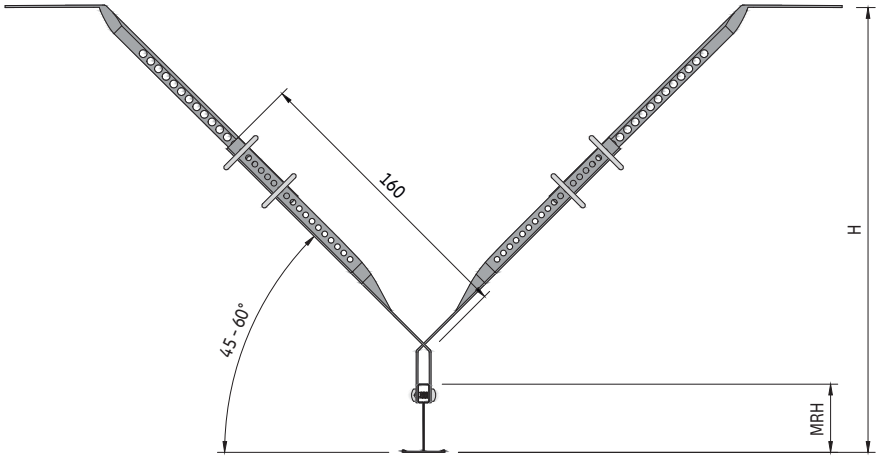
Perimeter hangers



To avoid overloading the perimeter trim, the first hanger must be positioned at a maximum distance from the perimeter (a3). The choice of perimeter trim depends on its material gauge, as well as the panel weight and length. See separate document.

Detail D

Nonius angle bracing

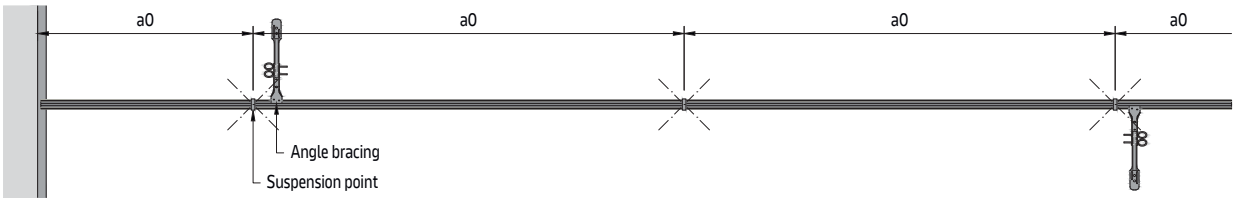


To accommodate horizontal forces during installation and maintenance, cross braces need to be permanently installed.

Nonius angle bracings are used in connection with Nonius upper parts as cross-bracing. These are screwed to the Main Runner from the outside with two self-screwing screws 3.9 x 9 mm. The Nonius upper part is then fixed with suitable fixings. For a rigid construction, two security pins can be used. Upper and lower parts must overlap by a minimum of 40 mm.

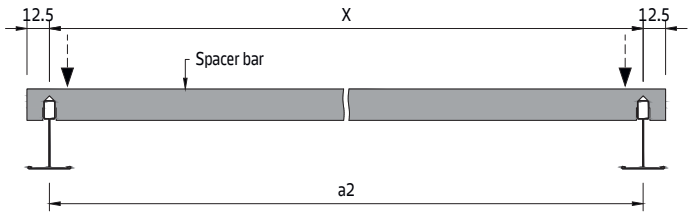
The angle braces are to be installed alternately, at an angle of 45 - 60° and next to each second suspension point, max. 2000 mm. For large suspension heights (H) it is recommended to reduce the distance.

45° angle: L = (H -MRH) x 1.414
60° angle: L = (H - MRH) x 1.155
MRH = Main Runner height

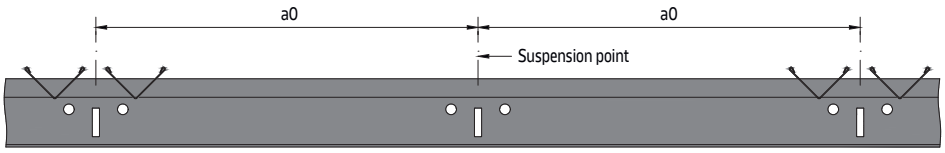


Detail E

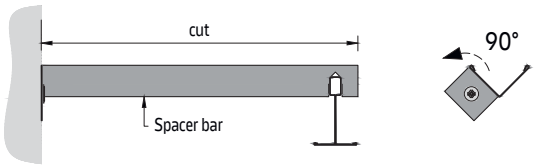
Spacer bar



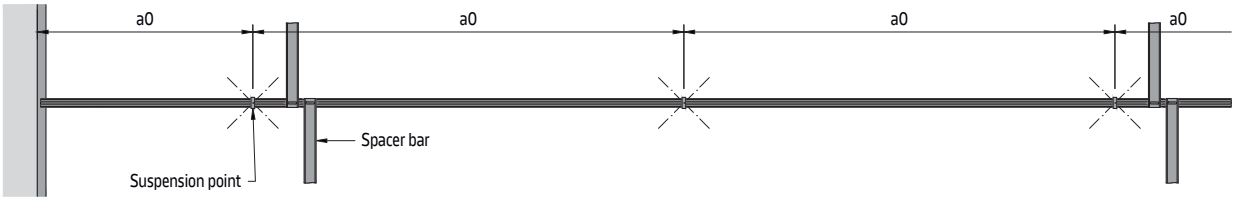
The spacer bars can be inserted from above and should be attached alternately, at each second suspension point, max. 2000 mm.
Spacer bar for a panel thickness of max. 30 mm.
X = a2



Last row cut and fixed to wall



To avoid horizontal movement, the spacer bars can be slotted at one end and bent 90° inside or outward. This allows it to be attached to the wall.



Eiffel Palace, Budapest, Hungary © Boris Vezmar

Eiffel Palace, Budapest, Hungary © Boris Vezmar

Exposed Grid Ceilings

MINERAL Board
MINERAL Tegular

15 or 24 mm T-Grid

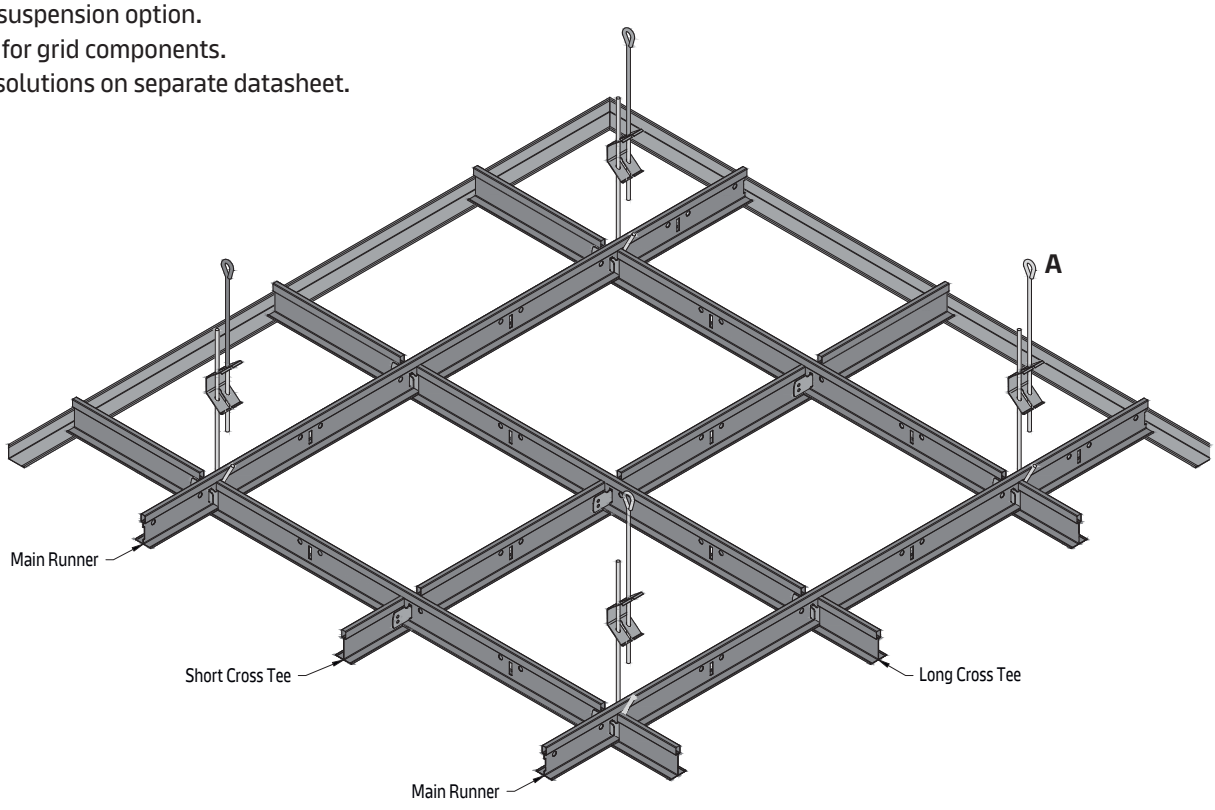
Exposed grid solution for indoor applications

General information

- Exposed lay-in grid system for small, medium and large rooms
- Typical ceiling weight 2.6 - 12 kg/m² (indicative value for tiles, without additional load)
- Tiles are mostly easily installed and fully demountable
- Systems can be installed with hold down clips to prevent movement
- Seismic, impact and fire resistance design application available, see separate documents

Isometric view

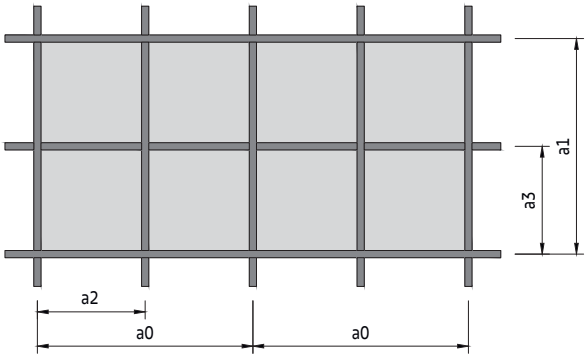
Select the suspension option.
See T-Grid for grid components.
Perimeter solutions on separate datasheet.



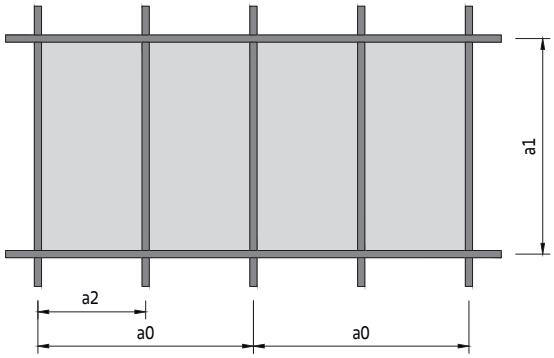
MINERAL Board
MINERAL Tegular
D01.001

Standard layout options

Square tiles

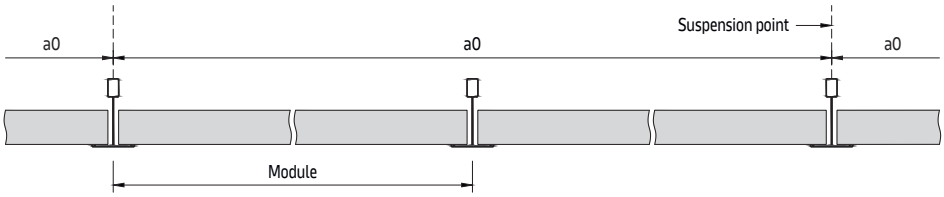


Rectangular tiles, without short Cross Tees

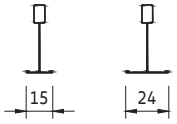


Section B

Example with MINERAL Board

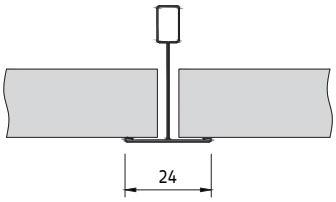


T-Grid

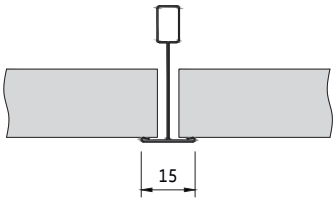


MINERAL Board

Installed on 24 mm T-Grid, butt-cut (System C)

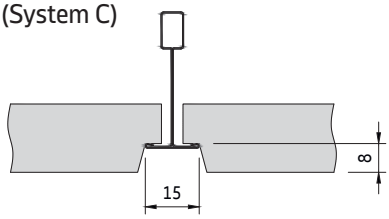


Installed on 15 mm T-Grid, butt-cut (System C)



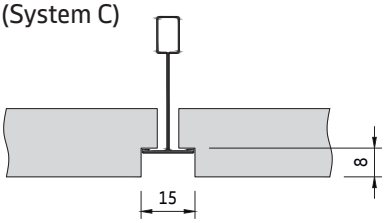
MINERAL Tegular 15

Tiles with 8 mm rebate
Installed on 15 mm T-Grid (System C)



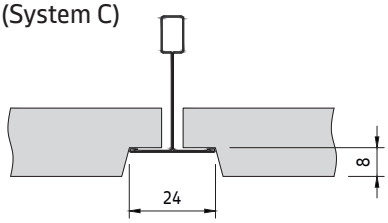
MINERAL Tegular 15/90

Tiles with 8 mm rebate
Installed on 15 mm T-Grid (System C)



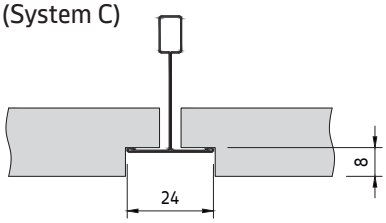
MINERAL Tegular 24

Tiles with 8 mm rebate
Installed on 24 mm T-Grid (System C)



MINERAL Tegular 24/90

Tiles with 8 mm rebate
Installed on 24 mm T-Grid (System C)



Optional grid components

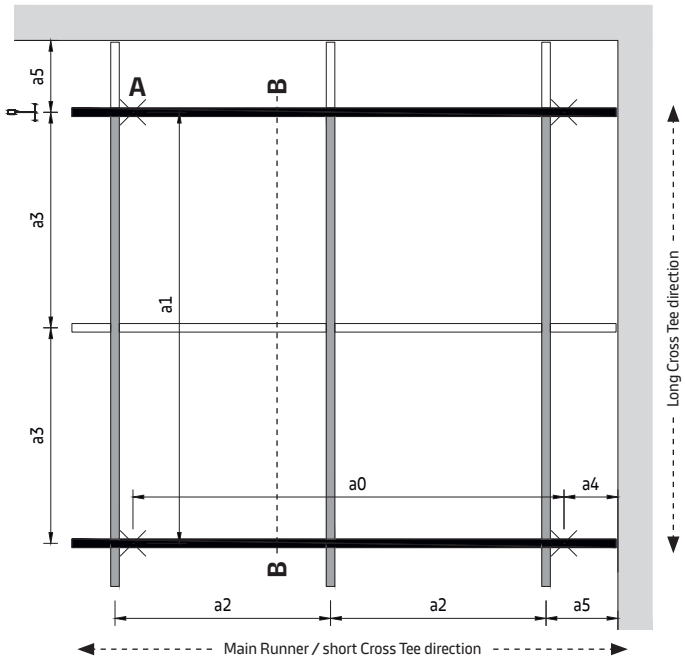
Components

- Hold down clip

See Main Runner for grid components

MINERAL Board
MINERAL Tegular
D01.001

Typical grid layout



Parameters

a0	Max. distance between Main Runner suspension points
a1	Distance between Main Runner
a2	Distance between Cross Tees (module width)
a3	Distance between Cross Tees (module length)
a4	Distance from wall = max. 400 mm
a5	Distance from wall = max. module length / width, (min. ½ module length / width is recommended)

Spacing

System without additional load		
Module [mm]	**a0 [mm]**	**a1 [mm]**
600	1200	1200
625	1250	1250

Start with the module width / distance between the long Cross Tees (a2) and take the values for (a0) and (a1) next to it. The shown values for (a0) are maximum allowed distances.

Material required per m² (no waste included)

System without additional load [pcs/m²]

Components	Module [mm]	600 x 600	625 x 625	1200 x 300	1200 x 600	1250 x 625
Main Runner	[m/m²]	0.84	0.80	0.84	0.84	0.80
Long Cross-Tee	[m/m²]	1.67	1.60	3.34	1.67	1.60
Short Cross-Tee	[m/m²]	0.84	0.80	0.00	0.00	0.00
Suspension points (A)	[pcs/m²]	0.70	0.64	0.70	0.70	0.64

The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout. The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others.

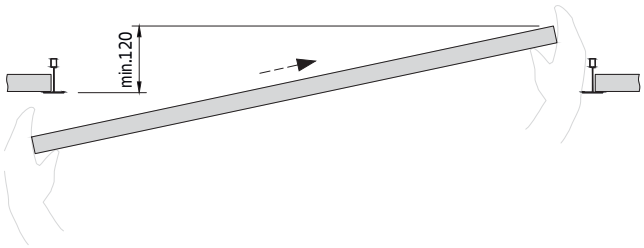
Not including perimeter trims.

Detail C

Example with MINERAL Board

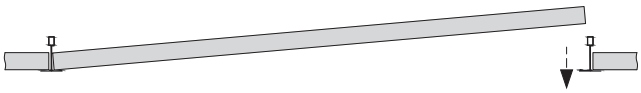
Tile insertion

1



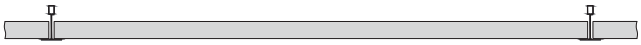
Insert the tile diagonally. The minimum recommended installation height is 120 mm, depending on the edge detail, module size and selected suspension method. If the indicated minimum installation height is not met, then only gradual removal of the elements is possible (cross-tee / panel / cross-tee / etc.). Revisionability would therefore be limited.

2



Place it on the T-Grid.

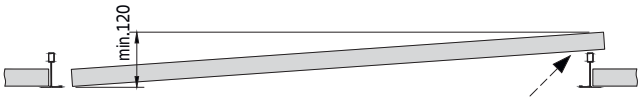
3



Tile extraction

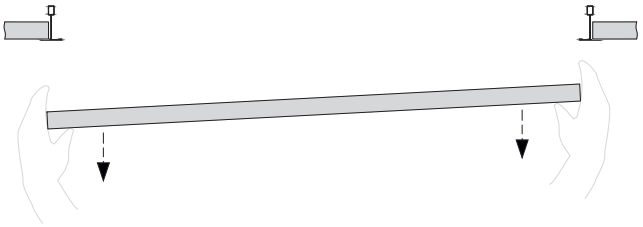
1

2



Lift the tile in one corner.

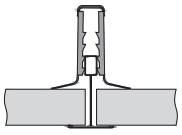
3



Remove it diagonally downwards.

Detail D

Example with MINERAL Board



In areas with open windows, doors or atriums where there is the possibility of substantial pressure differentials, the ceiling tiles should be held in place with hold down clips (approx. 6 pcs./m²). After the ceiling tiles have been installed, the clips are pressed onto the T-Grid until the clip sits firmly against the tile.

MINERAL Board
MINERAL Tegular

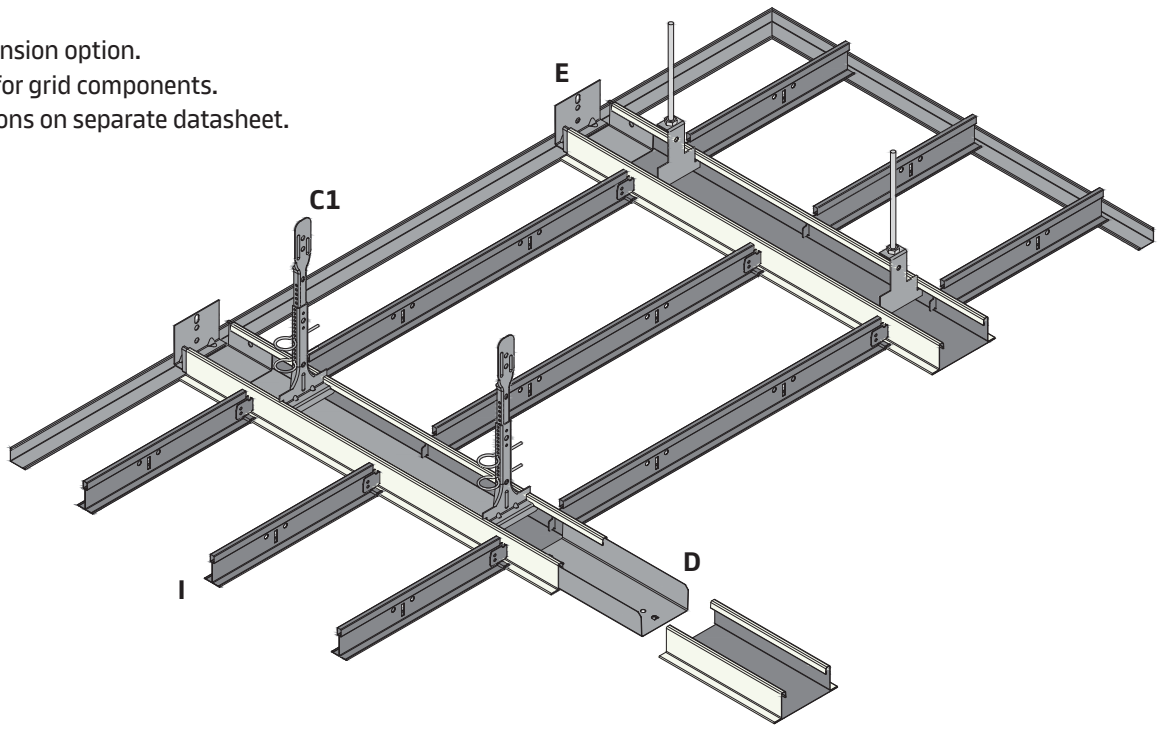
Slotted Bandraster + 24 mm T-Grid
Exposed grid solution for indoor applications

General information

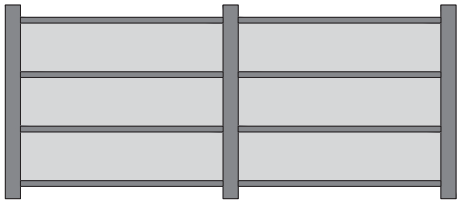
- Exposed lay-in grid system for medium and large rooms
- Typical ceiling weight 2.6 - 12 kg/m² (indicative value for panels, without additional load)
- Panels are mostly easily installed and fully demountable
- Only for horizontal ceiling surfaces, without inclination
- Systems can be installed with hold down clips to prevent movement
- Seismic, impact and fire resistance design application available, see separate documents

Isometric view

Select the suspension option.
See Bandraster for grid components.
Perimeter solutions on separate datasheet.



Standard layout



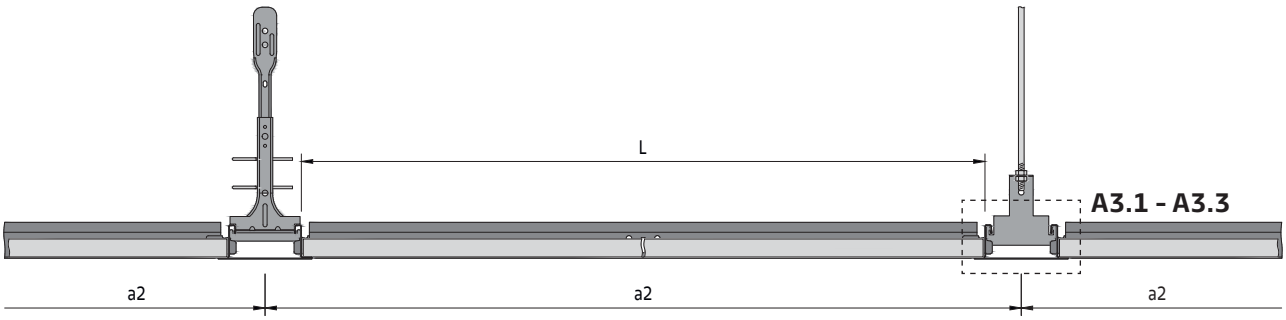
Optional grid components

Components

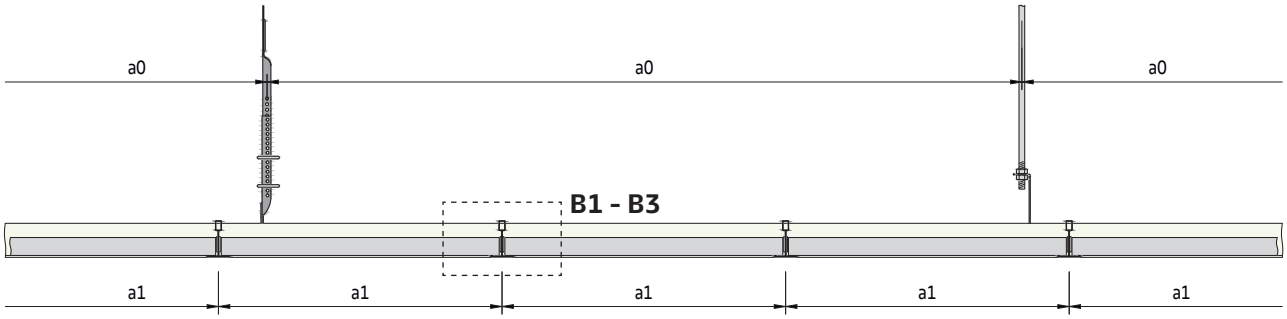
- Hold down clip

MINERAL Board
MINERAL Tegular
D01.001.1

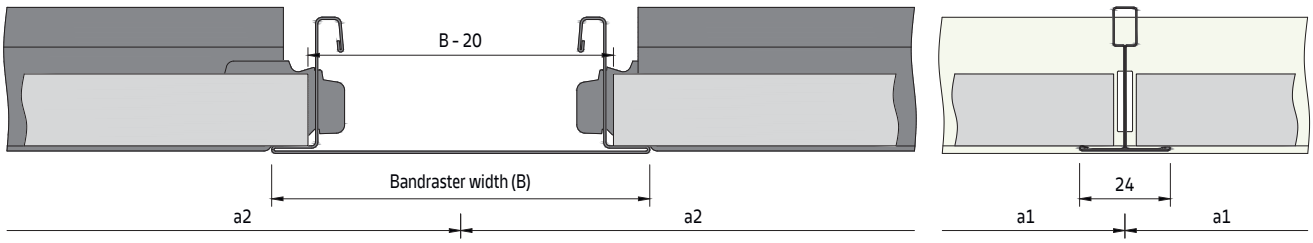
Section A3
Example with MINERAL Board



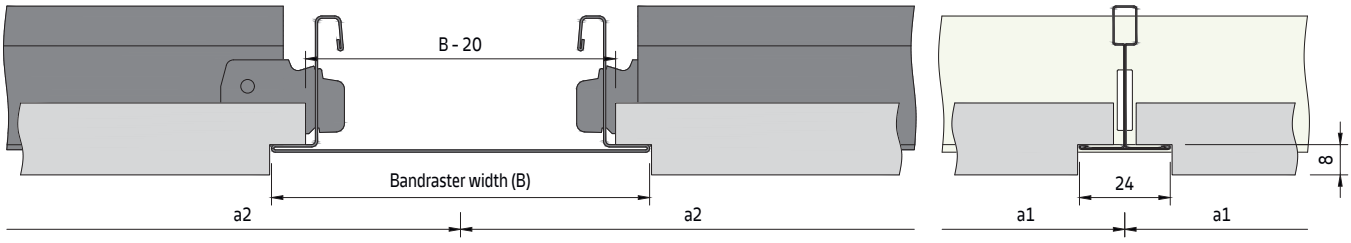
Section B
Example with MINERAL Board



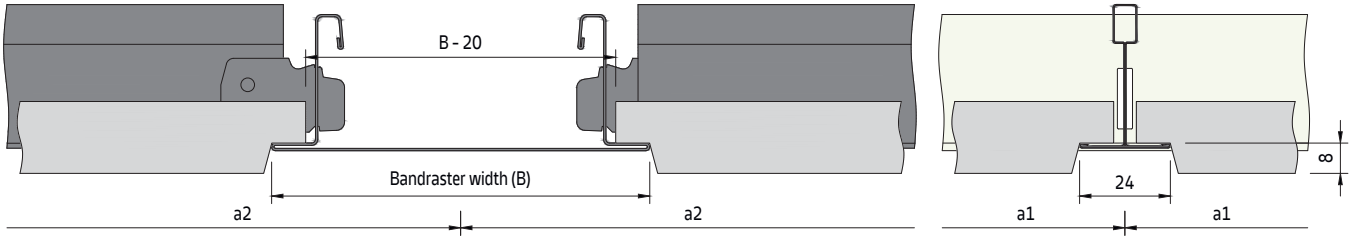
A3.1 MINERAL Board



A3.2 MINERAL Tegular 24/90
Panels with 8 mm rebate

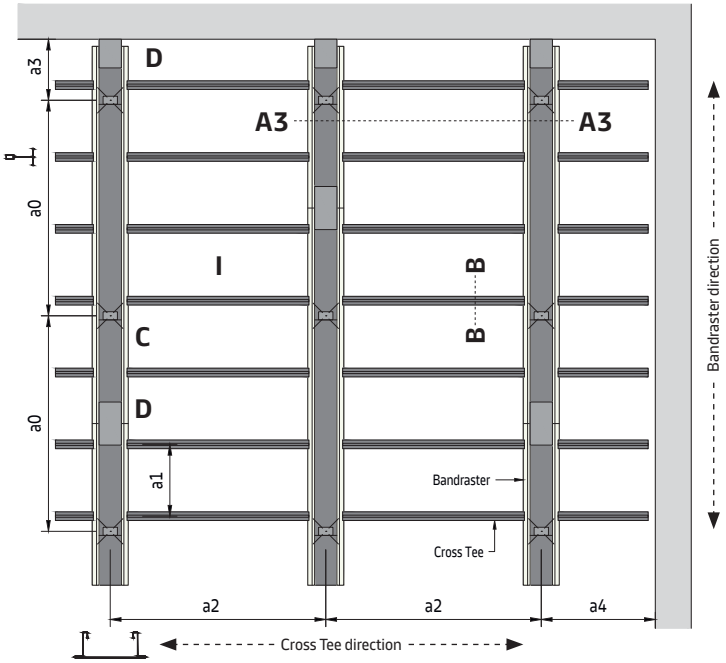


A3.3 MINERAL Tegular 24
Panels with 8 mm rebate



MINERAL Board
MINERAL Tegular
D01.001.1

Typical grid layout



Parameters

a0 Distance between Bandraster suspension points = max. 1200 mm
a1 Distance between Cross Tees = 300 / 312.5 mm *
a2 Distance between Bandraster centres = max. 2500 mm
a3 Distance from wall = max. 250 mm / max. 600 mm (fixed to wall)
a4 Distance from wall = max. panel length
a5 Module length = Bandraster width + panel length - 20 mm
Module width = panel width + 6 mm

* Further custom options available on request

The module length (M) of the requested ceiling is equal to the distance between the Bandraster centres (a2). On the appropriate spacing table, read across the line headed (a2) to the required module length then read down to determine the suspension point spacing (a0). Find the values in the separate Bandraster document. The shown values are maximum allowed distances and can be reduced but not exceeded.

Material required per m² (no waste included)

System without additional load [pcs/m²]

	Module width [mm]	300				312.5			
Components	**Panel length [mm]**	**1200**	**1800**	**2000**	**2500**	**1250**	**1800**	**2000**	**2500**
Mineral panel	[pcs/m²]	2.78	1.85	1.67	1.33	2.67	1.78	1.60	1.28
Bandraster	[m/m²]	0.80	0.56	0.50	0.40	0.83	0.56	0.50	0.40
Cross-Tee	[m/m²]	3.33	3.33	3.33	3.33	3.20	3.20	3.20	3.20
Splice connector for Bandraster	[pcs/m²]	0.24	0.15	0.14	0.12	0.23	0.15	0.14	0.12
Wall connector for Bandraster	[pcs/m²]	0.17	0.11	0.10	0.08	0.16	0.11	0.10	0.08
Suspension points (C)	[pcs/m²]	0.67	0.45	0.40	0.32	0.64	0.45	0.40	0.32

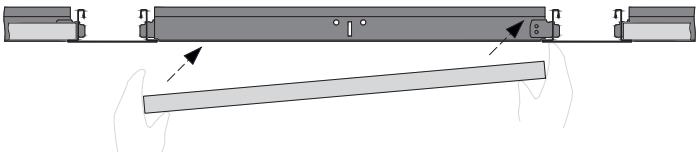
The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout. The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others.

Not including perimeter trims.

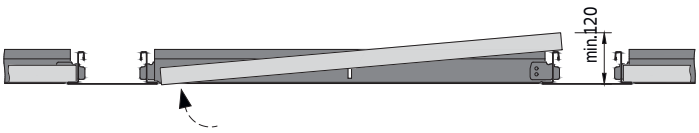
Detail J

Example with MINERAL Board

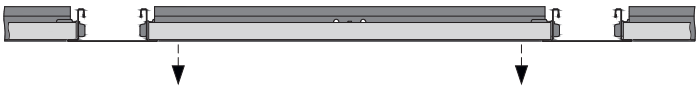
Panel insertion

1 

Insert the panel diagonally.

2 

The minimum recommended installation height is 120 mm, depending on the edge detail, module size and selected suspension method. If the indicated minimum installation height is not met, then only gradual removal of the elements is possible (cross-tee / panel / cross-tee / etc.). Revisionability would therefore be limited.

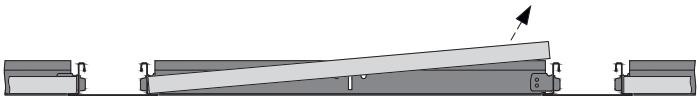
3 

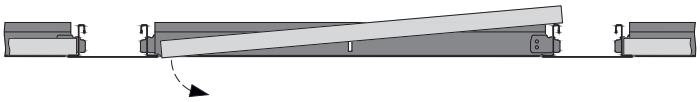
Place it on the Bandraster and the Cross Tees.

Panel extraction

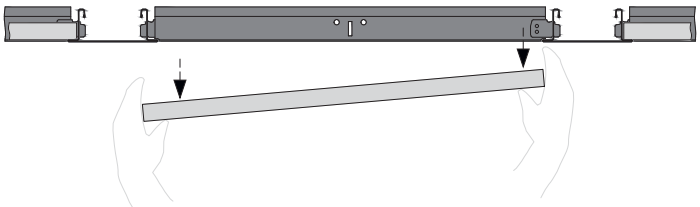
1 

Lift the panel in one corner.

2 

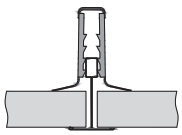
3 

Remove it diagonally downwards.

4 

Detail K

Example with MINERAL Board



In areas with open windows, doors or atriums where there is the possibility of substantial pressure differentials, the ceiling panels should be held in place with hold down clips (approx. 6 pcs./m²). After the ceiling panels have been installed, the clips are pressed onto the Cross Tee until the clip sits firmly against the panel.

MINERAL Vector

24 mm T-Grid

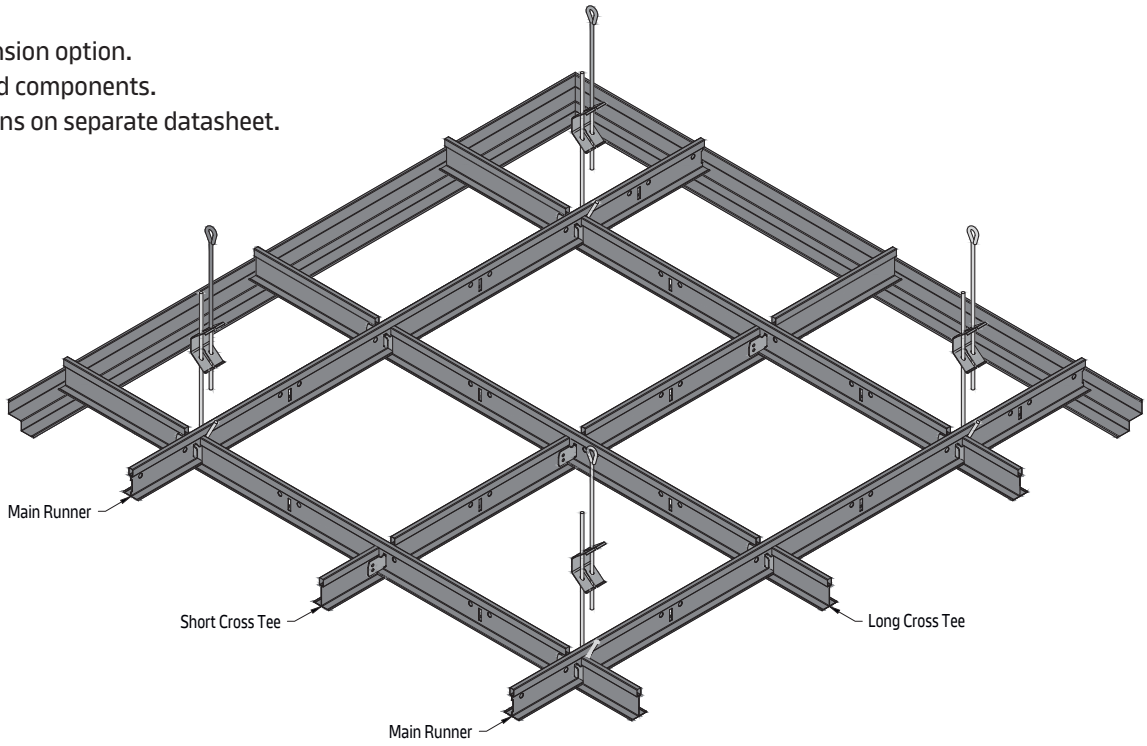
Semi-concealed grid solution for indoor applications

General information

- Semi-concealed lay-in grid system for small, medium and large rooms
- Typical ceiling weight ≈8.6 kg/m² (indicative value for tiles, without additional load)
- Tiles are easily installed, fully demountable and downwards accessible, no space in the ceiling void needed
- Tiles are downward accessible for minimal plenum height
- Only for horizontal ceiling surfaces, without inclination
- System can be installed with hold down clips to prevent movement

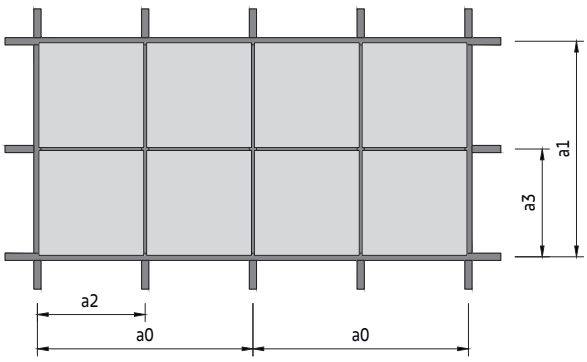
Isometric view

Select the suspension option.
See T-Grid for grid components.
Perimeter solutions on separate datasheet.

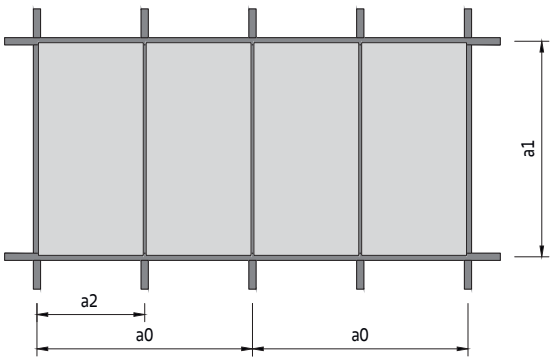


Standard layout

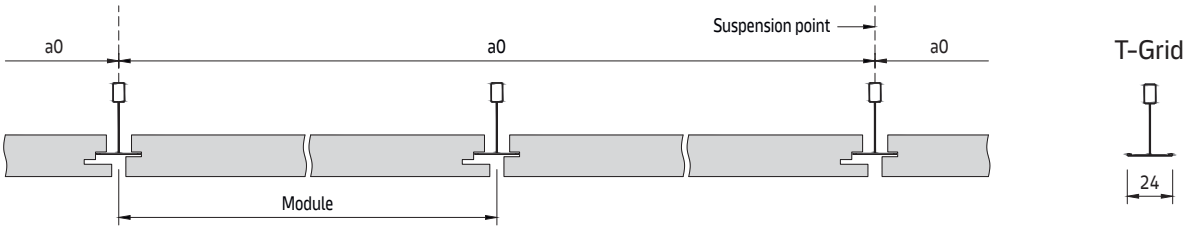
Square tiles



Rectangular tiles, without short Cross Tees

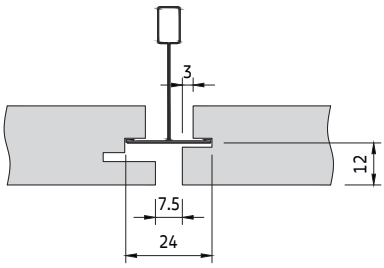


Section B

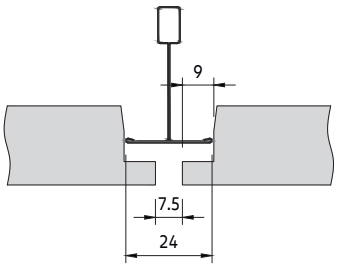


Tiles with 7.5 mm reveal
Installed on 24 mm T-Grid (System C)

Long edge detail with kerf



Short edge detail with recess



Knauf Ceiling Solutions offers various T-Grid solutions. Both plug and clip systems can be used, as long as the loading capacity of the system is sufficient. Joggling / overlapping the Cross-Tees proves advantageous as they tend to twist less when loaded from one side (tile installation).
Make sure that the T-Grid you choose can withstand a load of 8.6kg/m².

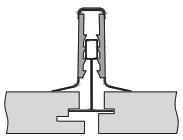
Grid components

Standard components:
- DCC8 Perimeter wedge

Optional components:
- Hold down clip

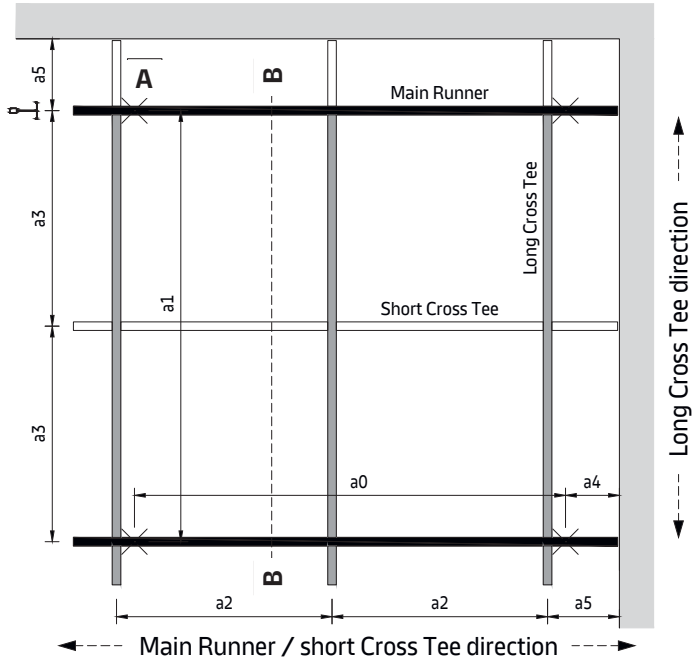
See Main Runner for grid components.

Detail C



In areas with open windows, doors or atriums where there is the possibility of substantial pressure differentials, the ceiling tiles should be held in place with hold down clips (approx. 6 pcs./m²). After the ceiling tiles have been installed, the clips are pressed onto the T-Grid until the clip sits firmly against the tile. The use of a hold down clip prevents the ceiling from being inspectable.

Typical grid layout



Parameters

a0 Max. distance between Main Runners suspension points
a1 Distance between Main Runners
a2 Distance between Cross Tees (module width)
a3 Distance between Cross Tees (module length)
a4 Distance from wall = max. 200 mm
a5 Distance from wall = max. module length / width, (min. ½ module length / width is recommended)

Spacing

System without additional load		
a2 [mm]	**a0 [mm]**	**a1 [mm]**
600	1000	1200
625	1000	1250

Start with the module width / distance between the long Cross Tees (a2) and take the values for (a0) and (a1) next to it. The shown values for (a0) are maximum allowed distances.

Material required per m² (no waste included)

System without additional load [pcs/m²]

Components	Module [mm]	600 x 600	625 x 625	1200 x 600	1250 x 625
Main Runner	[m/m²]	0.84	0.80	0.84	0.80
Long Cross Tee	[m/m²]	1.67	1.60	1.67	1.60
Short Cross Tee	[m/m²]	0.84	0.80	0.00	0.00
Suspension points (A)	[pcs/m²]	0.84	0.80	0.84	0.80

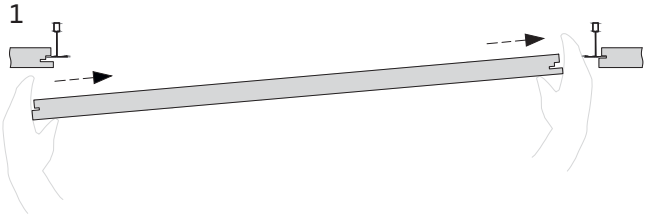
The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout. The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others.

Not including perimeter trims.

Detail D

Tile insertion

1



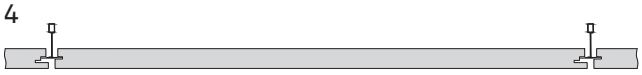
One edge is delivered with a double kerf. This edge is the first to engage the suspension system. Ensure that the horizontal leg of the T-Grid sits in the kerf, otherwise the following steps can not be carried out.

2

3

Gently lift up the tile, until the kerf on the opposite side can be inserted. This should be done with little effort, as the tiles only have to be raised to the grid level.

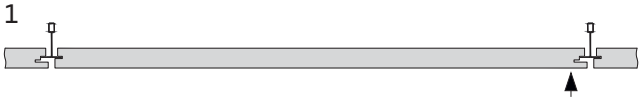
4



The tile only needs to be lightly pulled back. Ensure that the tile remains pushed up so that the grid goes into the kerf. At the same time the other side slides over on the lower level and lies flush in the system. The tile is installed correctly when it is inserted and lowered into the final position.

Tile extraction

1



All full tiles can be removed and reinstalled downwardly without movement up into the plenum area. Removal occurs in the opposite sequence to installation.

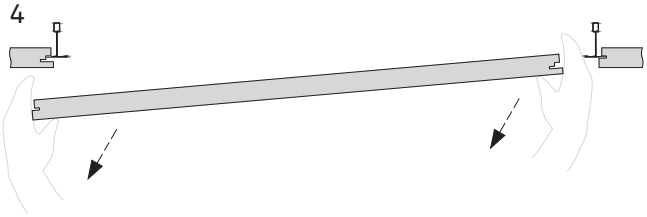
2

First check which side of the tile has the edge with the double kerf. This side can be pushed up against the grid system easily and with little effort. The tile is slid in the direction of the double kerf while maintaining gentle upward pressure. Please note that the opposite side of the tile will slide off the grid and that the tile could fall down if you are not careful.

3

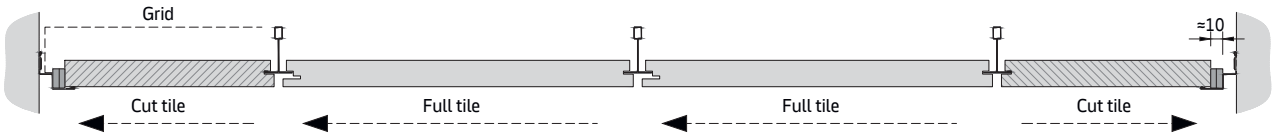
Finally, the tile is tilted downwards a little (up to 100 mm), then removed from the grid system at a flat angle in the direction of the free edge of the tile. Please note that excessive tilting of the tile could potentially cause damage to the tile edge.

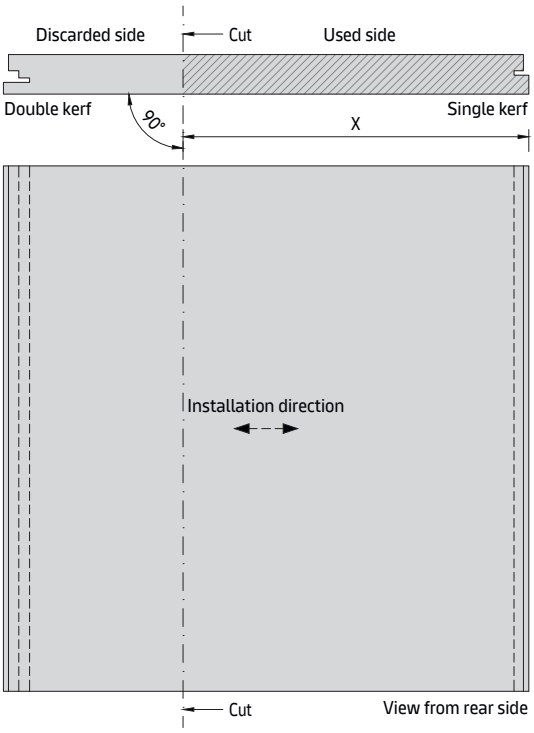
4



Detail E1

Standard shadowline perimeter trim detail

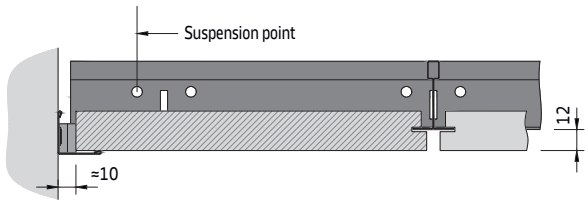




In the standard configuration, the perimeter detail uses a shadowline perimeter trim 19/11/13/19. The tiles rest on the lower edge of the trim and the grid system is supported on the upper leg. The fine-tuning of the perimeter trim and ceiling system means installation is significantly simplified. Particularly with both cut grid and tiles which can be easily installed. When cutting tiles, always use the single-kerfed side and discard the double-kerfed side. Every tile at the perimeter must be secured with a perimeter wedge. Due to this, tiles should be cut at right angles, back cut by ≈10 mm. Cut tiles are only partly accessible. For the purposes of clarity, the direction of assembly of the tiles will be indicated by an arrow. Due to the design of the tile, support only occurs on two sides of the tile as represented by the direction of the arrow.
For further information on installing the perimeter trim, see the perimeter trims chapter.

Detail E2

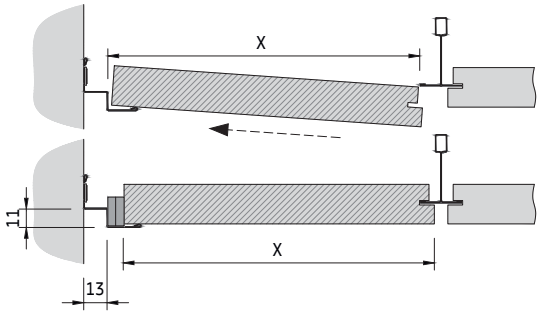
L-perimeter trim detail



As an alternative to the standard configuration, the system can be connected to the wall by means of normal L-wall angles or other shadowline trims. Ensure that only the tiles lie on the perimeter trim, as the grid system must be installed higher in this construction.
For further information on installing the perimeter trim, see the perimeter trims chapter.

Detail F

Cut tile size

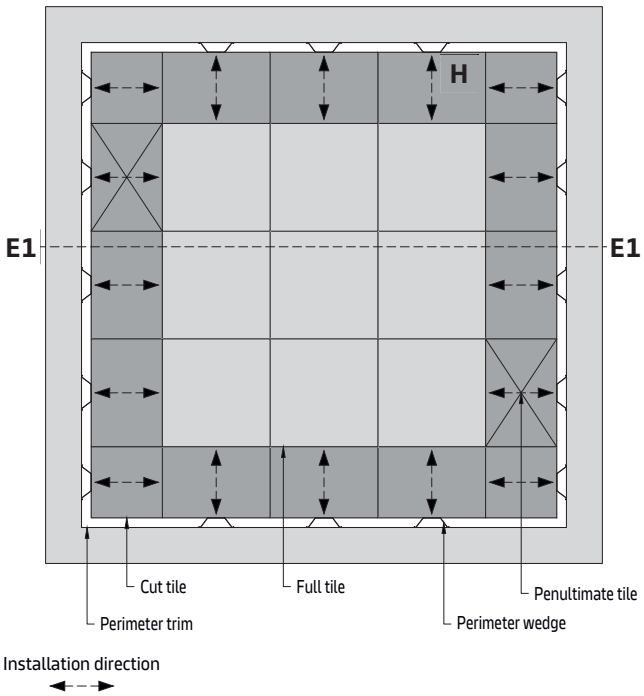


The cut tiles lie on the shadow trim and the T-Grid system. The exact width is determined by:
Dimension X between the vertical edge of the perimeter trim and the T-Grid.

Always install cut tiles with a perimeter wedge!

Detail G

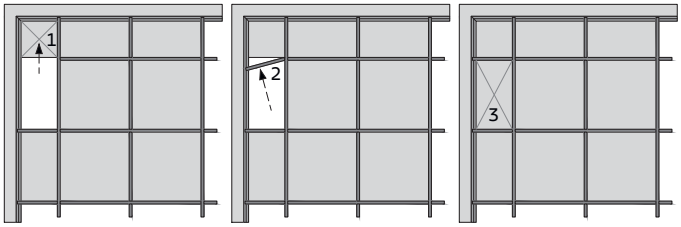
Typical ceiling layout with full and cut square tiles



Installation begins with full tiles. If these are difficult to install, then the grid system should be checked for squareness. The direction of installation should always be perpendicular to the Main Runners, as shown in the diagram. The tiles are fitted between the Main Runner and the short Cross Tees. The sequence of installation is not important - they can be installed in rows or in sections. The next step is to fit the cut tiles at the perimeter. Please note that if the walls are irregular, the width of the cut tiles may need to vary along the edge of the wall. The direction of installation should always be in the direction of the wall. The cut edges of the tiles are pushed onto the perimeter trim and then pulled in the opposite direction until the T-Grid slots into the kerf (detail F).

The corner tiles need to be cut to different dimensions due to the different edge configurations.

Corner tile installation - Option A

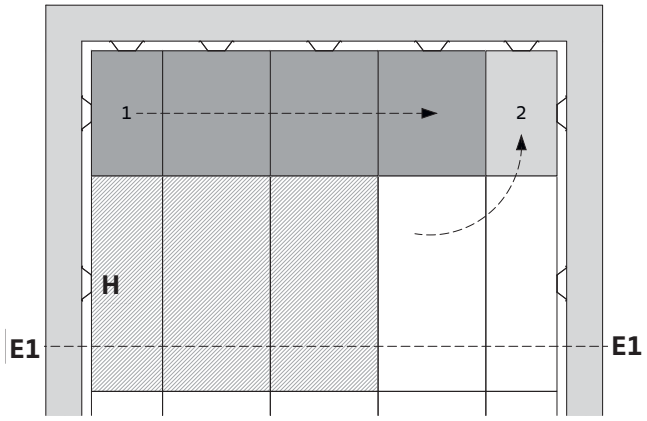


Option A:
The corner tiles are installed as the penultimate tile (simpler option). The orientation of the tile is not so important in this case.

1 Insert the cut corner tile
2 Insert the Cross Tee
3 Insert the cut penultimate tile

Option B:
The corner tiles are installed last, which requires a certain amount of finesse. Since the tiles are inserted diagonally, a little more height is required in the plenum. There is an increased risk of the edges being damaged.

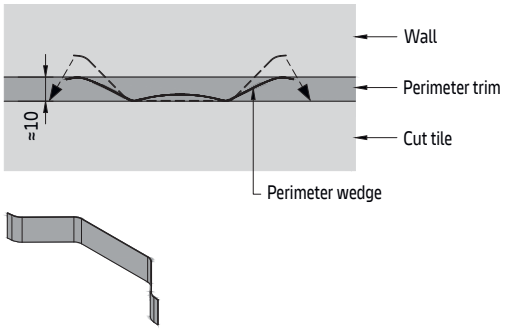
Typical ceiling layout with full and cut rectangular tiles



1 The cut tiles and the long Cross Tees should always be installed alternately. Before installing the next tile, a cut Cross Tee should be installed. Every tile at the perimeter should be secured with a perimeter wedge. Due to this, tiles should be cut at right angles, back cut by 10 mm.

2 Ensure that the corner tiles are cut ≈10 mm smaller on two sides and secured with two perimeter wedges. Cut tiles are only partially accessible. The entire row, beginning in the corner, must be dismantled, back to the required opening.

Detail H
Perimeter wedge



The perimeter cut tiles are installed and held in place using a perimeter wedge to ensure that they do not move. The wedge presses the opposite edge of the tile tightly against the grid system ensuring no tile movement at the perimeter. Suitable pliers can be used to “gloosen” the wedge to ease installation, reducing effort and time.

A perimeter wedge is required for every cut tile (see ceiling layout). This also applies to tiles in corners. The wedge is required irrespective of whether L-perimeter trim or shadowline trim is used. Cut tiles without wedges can move as a result of building movement or maintenance.

The simplest method of installing the wedge is immediately after the installation of each tile from the adjacent field. This can be carried out for all tiles, including corner tiles, except the last tiles in a row (=penultimate tile, marked in the ceiling layout with a border). For the last tile, the wedge should be installed before the tile and is then pressed on to the perimeter trim as the tile is pushed into position.

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MINERAL K2C2

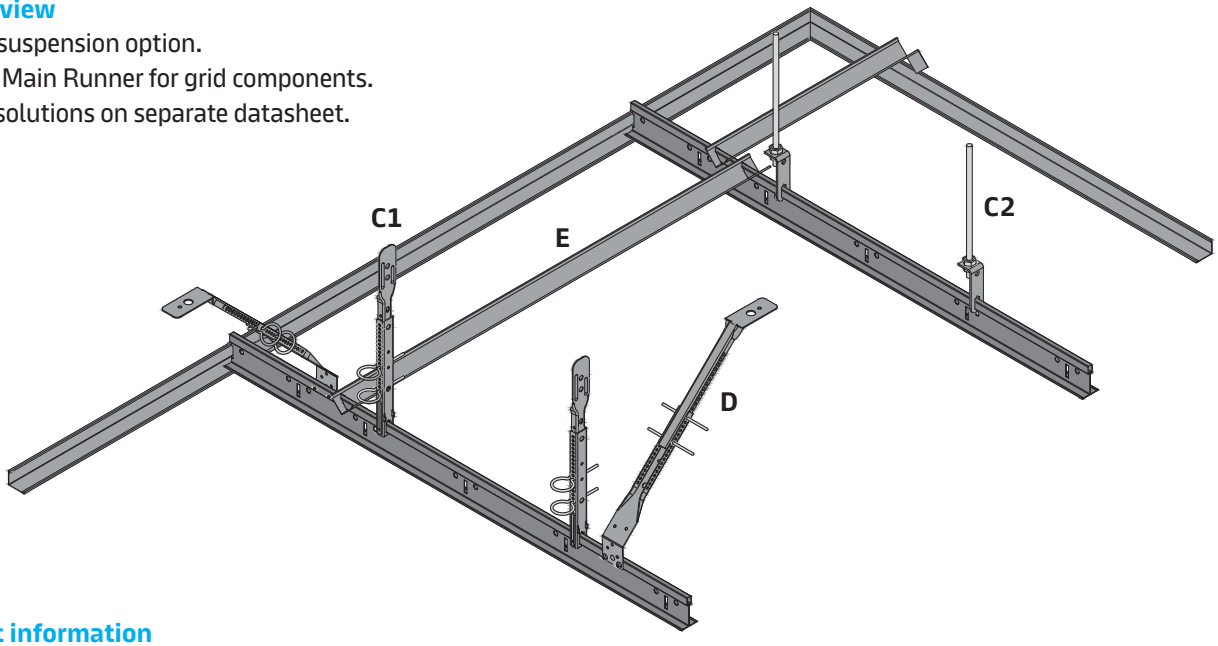
T-Grid Main Runner + T-Grid, Z-Profile or U-Profile reinforcement
Exposed grid solution for indoor applications

General information

- Exposed lay-in grid system for medium and large rooms
- Typical ceiling weight 2.6 - 12 kg/m² (indicative value for panels, without additional load)
- Panels are mostly easily installed and fully demountable
- Only for horizontal ceiling surfaces, without inclination
- Impact and fire resistance design application available, see separate documents

Isometric view

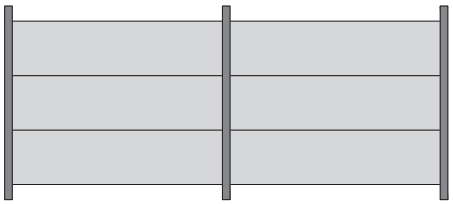
Select the suspension option.
See T-Grid Main Runner for grid components.
Perimeter solutions on separate datasheet.



Important information

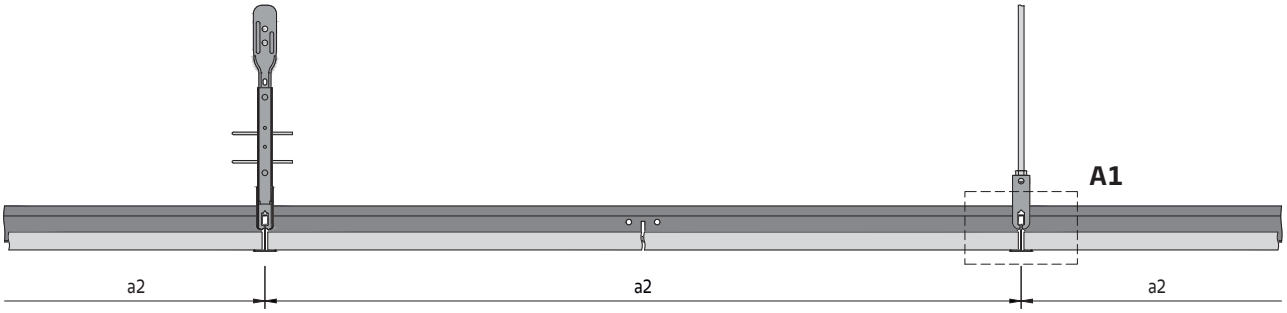
The profiles should be loaded symmetrically.
All T-Grid Main Runners must be permanently secured against displacement with transverse bracings.
Planks with a thickness of 35 mm can be installed using either T24/62 mm T-Grid and spacer bars or a standard 24 mm T-Grid and angle bracing.

Standard layout



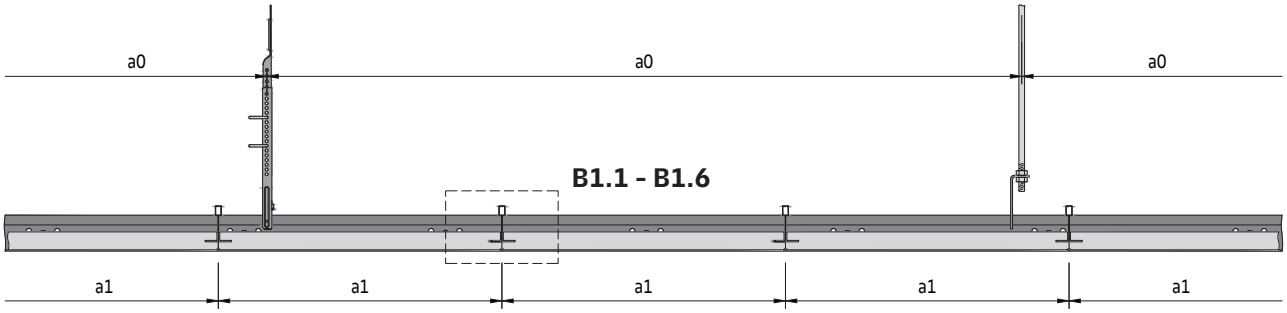
Section A

Example with T-Grid reinforcement

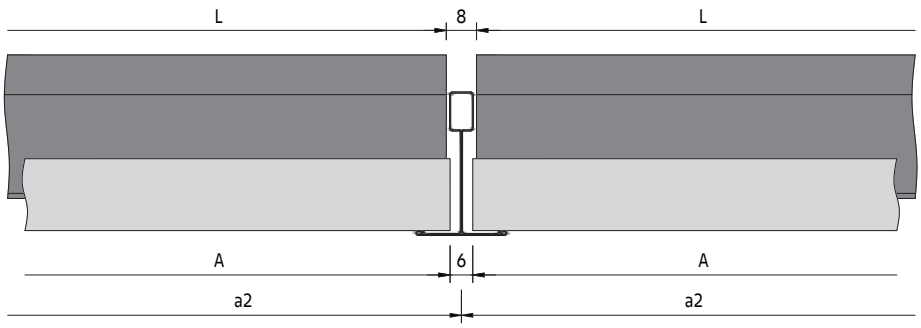


Section B

Example with T-Grid reinforcement



A1 Example with T-Grid reinforcement



Panel length (A) = module length = distance between T-Grid Main Runner (a2) - 6 mm
Reinforcement profile length (L) = panel length (A) - 2 mm

Grid components

Standard components:

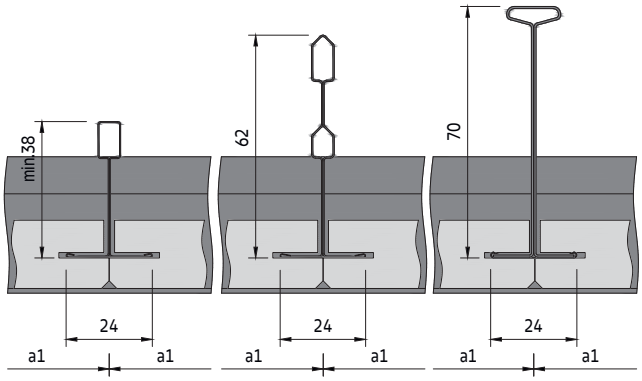
- T-Grid / Z-Profile / U-Profile

Optional components:

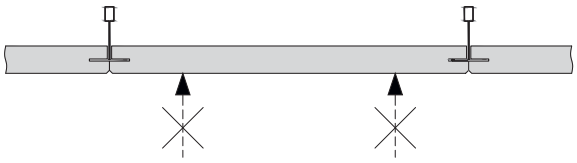
- Double bent T bar hanger

T-Grid reinforcement options

B1.1 **B1.2** **B1.3**

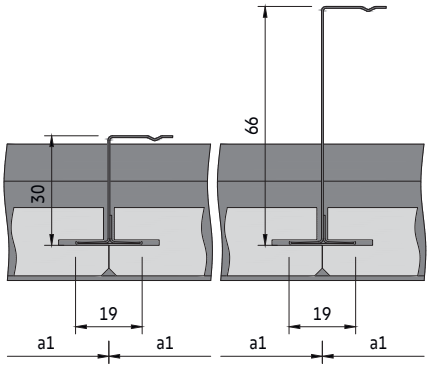


These are typical examples of T-Grid, Z-Profiles and U-Profiles. The profile type is depending on the panel length and weight. Detailed information and available options can be found in the product datasheets. Depending on the reinforcement profile used, the panels may be demountable or non-accessible. If T-Grid or Z-Profiles are used as reinforcement profiles, the panels cannot be removed after installation as they are joined to the adjacent tiles via the profile.

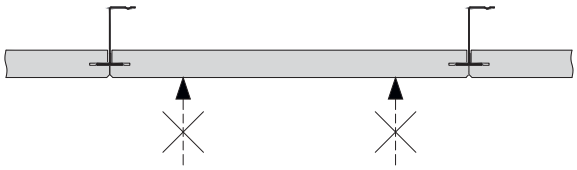


Z-Profile reinforcement options

B1.4 **B1.5**

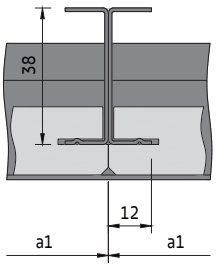


When using Z-Profiles, ensure that the profiles are installed as in B1.4 / B1.5. If the profile is reversed, it could cause an obstruction when removing the panels.

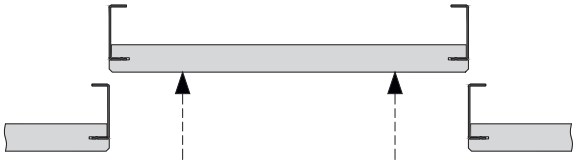


U-Profile reinforcement option

B1.6



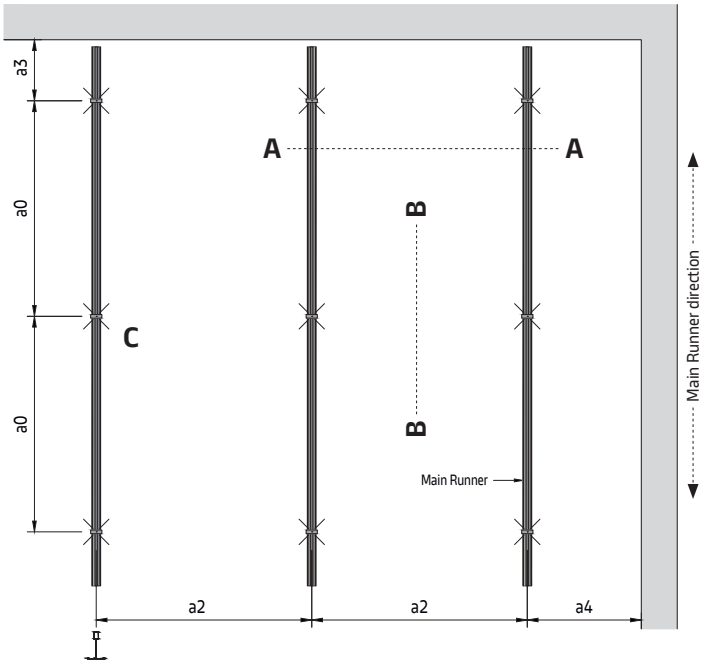
If the panels need to be demountable when using the K2C2 edge, a U-Profile can be used (two profiles required per panel).



Module lengths per panel weight

Profile	Panel weight [kg/m²] length [mm]	7.5	9.5
24 mm T-Grid	[mm]	1800	1740
24/62 mm T-Grid	[mm]	2500	2500
24/70 mm T-Grid	[mm]	2500	2500
30 mm Z-Profile	[mm]	1800	1800
66 mm Z-Profile	[mm]	2500	2500
38 mm U-Profile	[mm]	2500	2410

Typical grid layout



Parameters

a0 Distance between Main Runner suspension points = max. 1200 mm
a1 Distance between reinforcement profiles
a2 Distance between Main Runner centres = max. 2500 mm
a3 Distance from wall = max. 250 mm / max. 600 mm (fixed to wall)
M Module length = a2
a4 Distance from wall = max. panel length
L Reinforcement profile length = M - 8 mm

To determine suspension layout

The module length (M) of the requested ceiling is equal to the distance between the Main Runner centres (a2). On the appropriate spacing table, read across the line headed (a2) to the required module length then read down to determine the suspension point spacing (a0). Find the values in the separate T-Grid Main Runner document. The shown values are maximum allowed distances and can be reduced but not exceeded.

Material required per m² (no waste included)

System without additional load [pcs/m²]

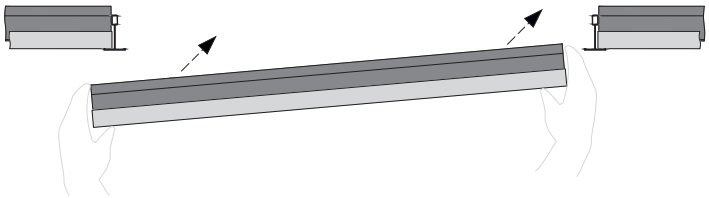
Components	Module width [mm]	300				312.5			
	Module length [mm]	1200	1800	2000	2500	1250	1800	2000	2500
Mineral panel	[pcs/m²]	2.78	1.85	1.67	1.33	2.67	1.78	1.60	1.28
T-Grid Main Runner	[m/m²]	0.80	0.56	0.50	0.40	0.83	0.56	0.50	0.40
Option with reinforcement profile (T or Z)	[m/m²]	3.33	3.33	3.33	3.33	3.20	3.20	3.20	3.20
Option with reinforcement profile (U)	[m/m²]	6.66	6.66	6.66	6.66	6.40	6.40	6.40	6.40
Suspension points (C) with panel weight up to 7.5 kg/m²	[pcs/m²]	0.83	0.56	0.50	0.50	0.83	0.56	0.50	0.50
Suspension points (C) with panel weight up to 9.5 kg/m²	[pcs/m²]	0.83	0.65	0.65	0.65	0.83	0.65	0.65	0.65

The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout. The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others. Not including perimeter trims.

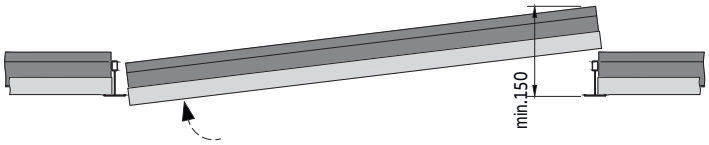
Detail F

Example with T-Grid reinforcement

Panel insertion

1 

Insert the panel diagonally.

2 

The minimum recommended installation height is 150 mm, depending on the edge detail, module size and selected suspension method. Please note that the required installation height may vary for inspection purposes.

3 

Place it on the T-Grid Main Runners and the profiles.

4 

Place one panel including the profile, followed by the next (A / B / C / etc.) and push them together until they stop. Single panels cannot be removed after installation as they are joined to the adjacent panels via the profile. U-Profiles can be used when access to the ceiling void is required.

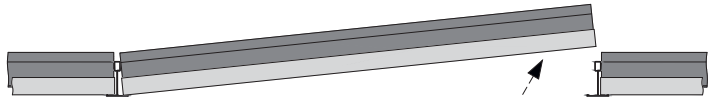
Panel extraction

1 

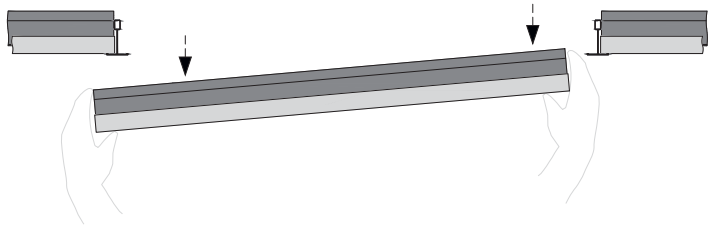
Due to the edge configuration, the reinforcement profile is fully integrated on both sides.

2 

Start with the last panel and remove it one profiled panel at a time until you reach the desired panel.

3 

Lift the panel above the T-Grid Main Runner.

4 

Remove it downwards.

BASF Medical Center Ludwigshafen, Germany © Thilo Ross

MINERAL K2C2

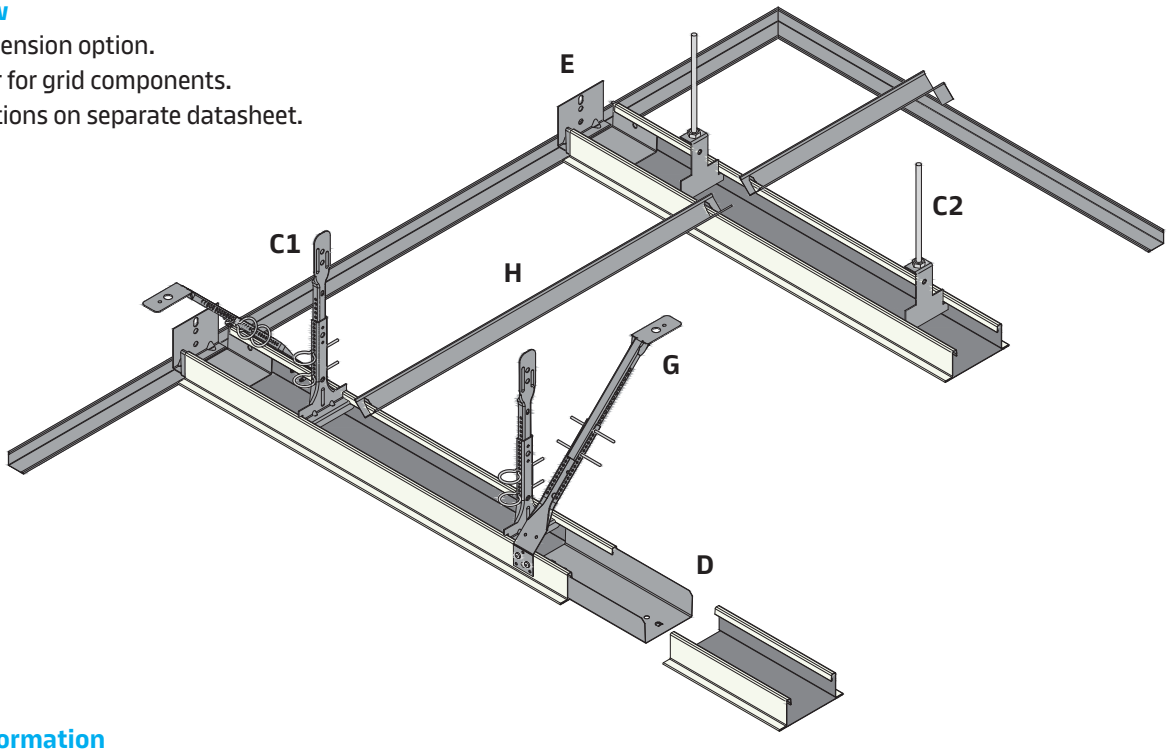
Bandraster + T-Grid, Z-Profile or U-Profile reinforcement
Exposed grid solution for indoor applications

General information

- Exposed lay-in grid system for medium and large rooms
- Typical ceiling weight 3.8 - 8.6 kg/m² (indicative value for panels, without additional load)
- Panels are mostly easily installed and fully demountable
- Only for horizontal ceiling surfaces, without inclination
- Impact and fire resistance design application available, see separate documents

Isometric view

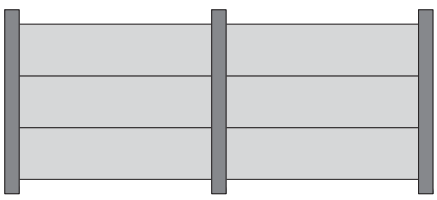
Select the suspension option.
See Bandraster for grid components.
Perimeter solutions on separate datasheet.



Important information

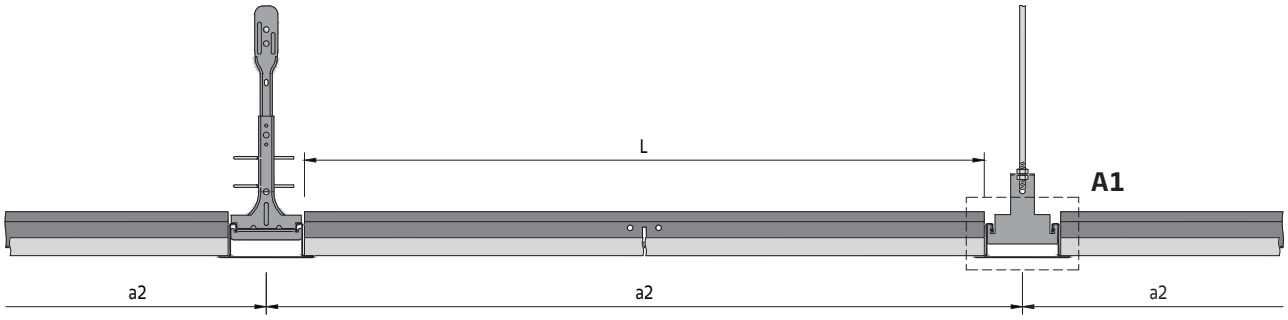
The profiles should be loaded symmetrically.
All Bandraster must be permanently secured against displacement with transverse bracings.
Planks with a thickness of 35 mm should be installed using Bandraster and angle bracing.

Standard layout



Section A

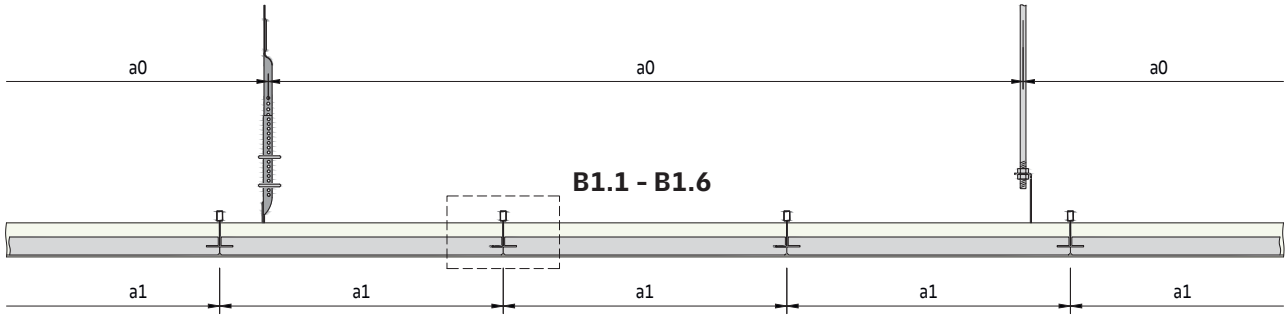
Example with T-Grid reinforcement



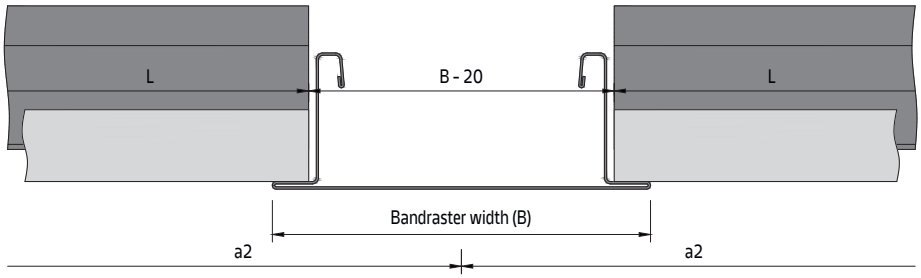
Reinforcement profile length (L) = panel length

Section B

Example with T-Grid reinforcement



A1 Example with T-Grid reinforcement



Panel length = a2 - Bandraster width + 20 mm

Grid components

Standard components:

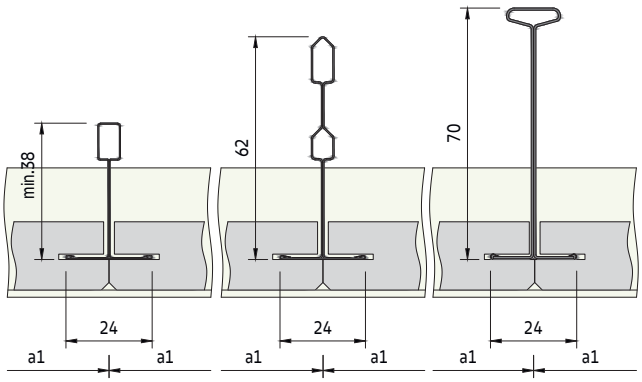
- T-Grid / Z-Profile / U-Profile

Optional components:

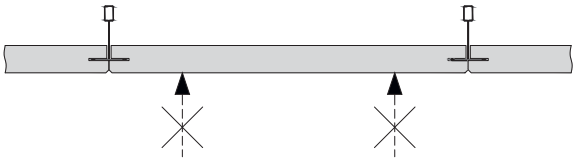
- Double bent T bar hanger

T-Grid reinforcement options

B1.1 **B1.2** **B1.3**

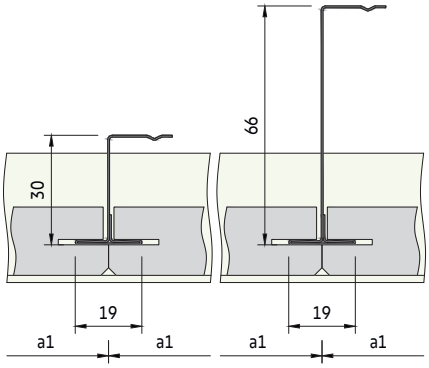


These are typical examples of T-Grid, Z-Profiles and U-Profiles. The profile type is depending on the panel length and weight. Detailed information and available options can be found in the product datasheets. Depending on the reinforcement profile used, the panels may be demountable or non-accessible. If T-Grid or Z-Profiles are used as reinforcement profiles, the panels cannot be removed after installation as they are joined to the adjacent tiles via the profile.

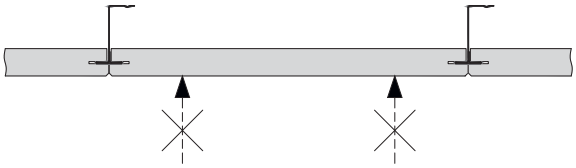


Z-Profile reinforcement options

B1.4 **B1.5**

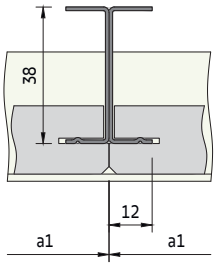


When using Z-Profiles, ensure that the profiles are installed as in B1.4 / B1.5. If the profile is reversed, it could cause an obstruction when removing the panels.

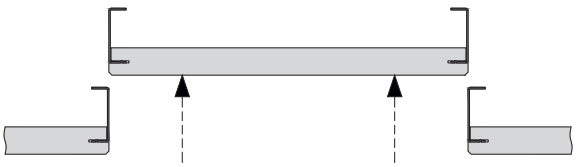


U-Profile reinforcement option

B1.6



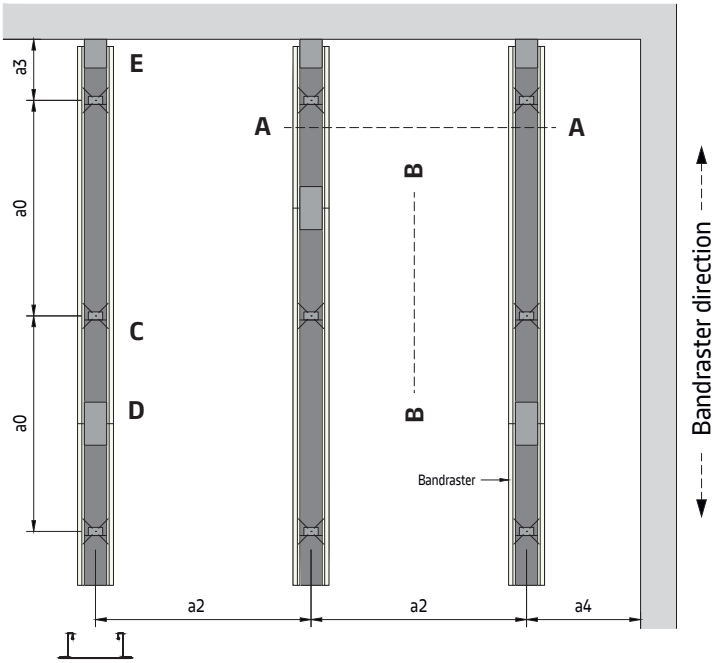
If the panels need to be demountable when using the K2C2 edge, a U-Profile can be used (two profiles required per panel).



Module lengths per panel weight

Profile	Panel weight [kg/m²] length [mm]	7.5	9.5
24 mm T-Grid	[mm]	1800	1740
24/62 mm T-Grid	[mm]	2500	2500
24/70 mm T-Grid	[mm]	2500	2500
30 mm Z-Profile	[mm]	1800	1800
66 mm Z-Profile	[mm]	2500	2500
38 mm U-Profile	[mm]	2500	2410

Typical grid layout



Parameters

a0 Distance between Bandraster suspension points = max. 1200 mmm
a1 Distance between reinforcement profiles
a2 Distance between Bandraster centres = max. 2500 mm
a3 Distance from wall = max. 250 mm / max. 600 mm (fixed to wall)
a4 Distance from wall = max. panel length
M Module length = a2
Module width = panel width

To determine suspension layout

The module length (M) of the requested ceiling is equal to the distance between the Bandraster centres (a2). On the appropriate spacing table, read across the line headed (a2) to the required module length then read down to determine the suspension point spacing (a0). Find the values in the separate Bandraster document. The shown values are maximum allowed distances and can be reduced but not exceeded.

Material required per m² (no waste included)

System without additional load [pcs/m²]

Components	Module width [mm]	300				312.5			
	Module length [mm]	1200	1800	2000	2500	1250	1800	2000	2500
Mineral panel	[pcs/m²]	2.78	1.85	1.67	1.33	2.67	1.78	1.60	1.28
Bandraster	[m/m²]	0.80	0.56	0.50	0.40	0.83	0.56	0.50	0.40
Option with reinforcement profile (T or Z)	[m/m²]	3.33	3.33	3.33	3.33	3.20	3.20	3.20	3.20
Option with reinforcement profile (U)	[m/m²]	6.66	6.66	6.66	6.66	6.40	6.40	6.40	6.40
Suspension points (C) with panel weight up to 7.5 / 9.5 kg/m²	[pcs/m²]	0.83/ 0.83	0.56/ 0.65	0.50/ 0.65	0.50/ 0.65	0.83/ 0.83	0.50/ 0.65	0.50/ 0.65	0.50/ 0.65

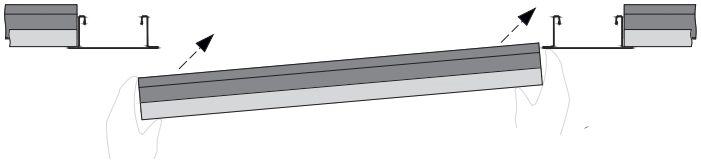
The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout. The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others. Not including perimeter trims.

Detail J

Example with T-Grid reinforcement

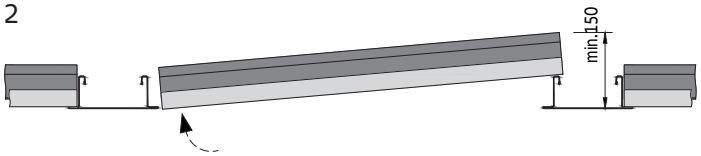
Panel insertion

1



Insert the panel diagonally.

2



The minimum recommended installation height is 150 mm, depending on the edge detail, module size and selected suspension method. Please note that the required installation height may vary for inspection purposes.

3

Place it on the Bandraster and the profiles.

4

Place one panel including the profile, followed by the next (A / B / C / etc.) and push them together until they stop. Single panels cannot be removed after installation as they are joined to the adjacent panels via the profile. U-Profiles can be used when access to the ceiling void is required.

Panel extraction

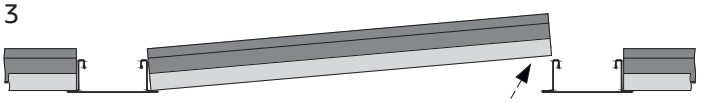
1

Due to the edge configuration, the reinforcement profile is fully integrated on both sides.

2

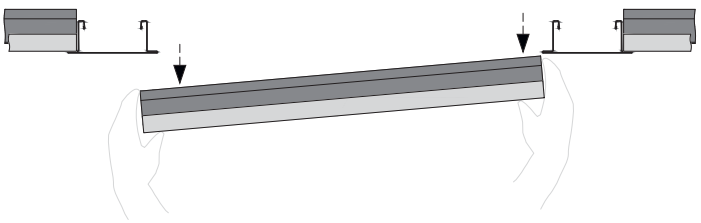
Start with the last panel and remove it one profiled panel at a time until you reach the desired panel.

3



Lift the panel above the Bandraster.

4



Remove it downwards.

BASF Medical Center Ludwigshafen, Germany © Thilo Ross

MINERAL SL2

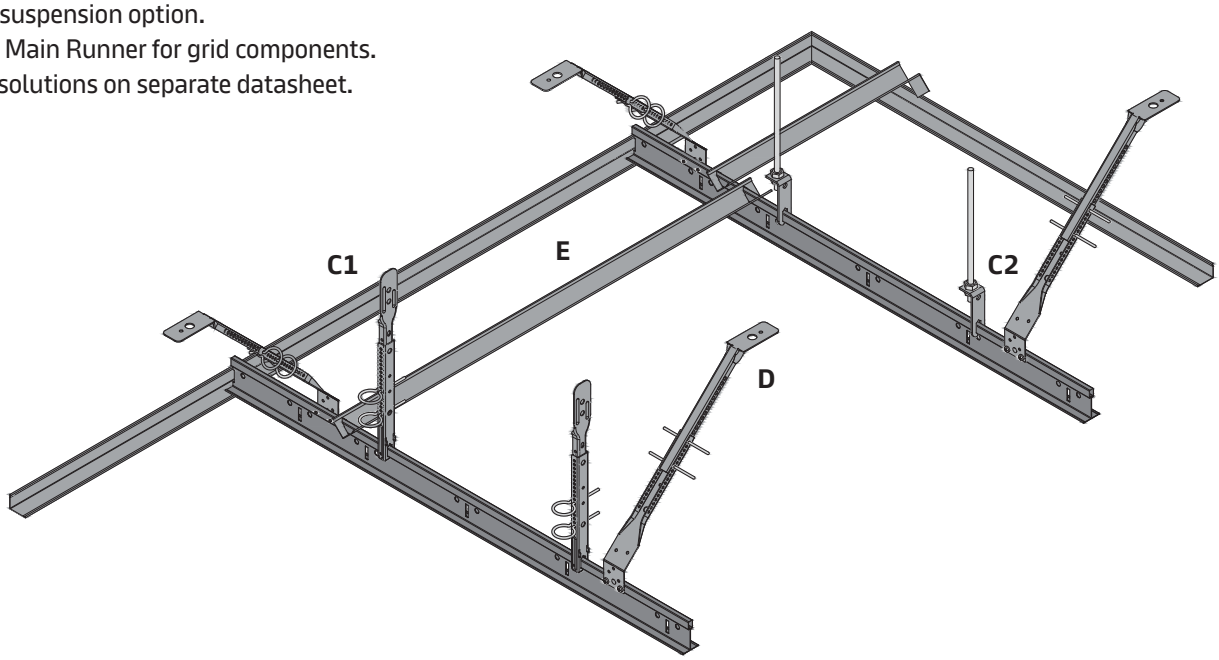
T-Grid Main Runner + T-Grid or Z-Profile reinforcement
Exposed grid solution for indoor applications

General information

- Exposed lay-in grid system for medium and large rooms
- Typical ceiling weight 5.0 - 8.6 kg/m² (indicative value for panels, without additional load)
- Panels are mostly easily installed and fully demountable
- Only for horizontal ceiling surfaces, without inclination
- Impact and fire resistance design application available, see separate documents

Isometric view

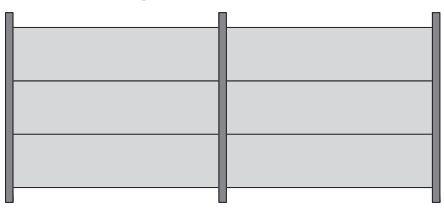
Select the suspension option.
See T-Grid Main Runner for grid components.
Perimeter solutions on separate datasheet.



Important information

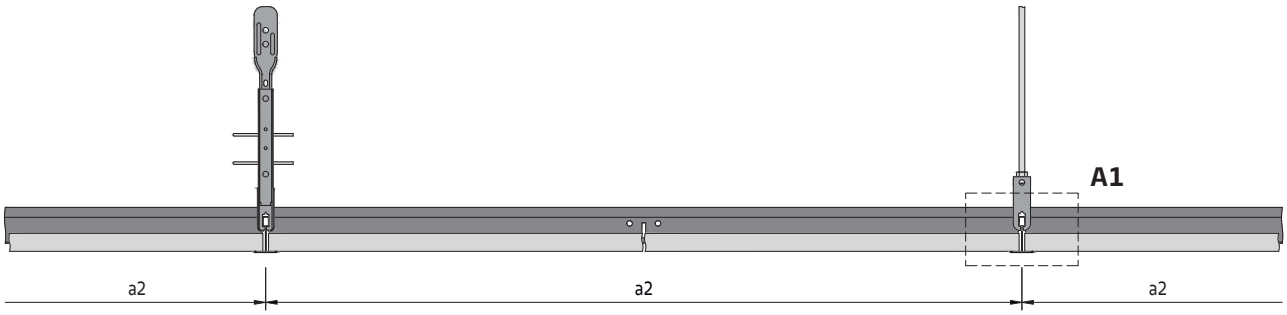
The profiles should be loaded symmetrically.
All T-Grid Main Runners must be permanently secured against displacement with transverse bracings.
Planks with a thickness of 35 mm can be installed using either T24/62 mm T-Grid and spacer bars or a standard 24 mm T-Grid and angle bracing.

Standard layout



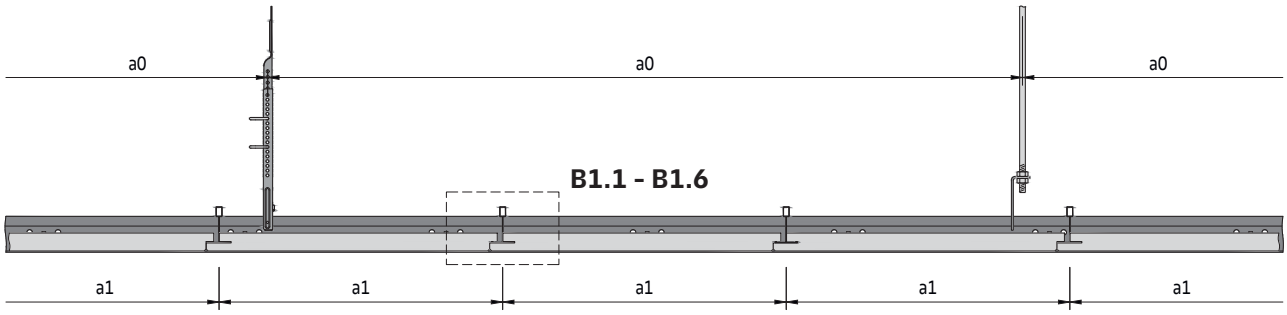
Section A

Example with T-Grid reinforcement

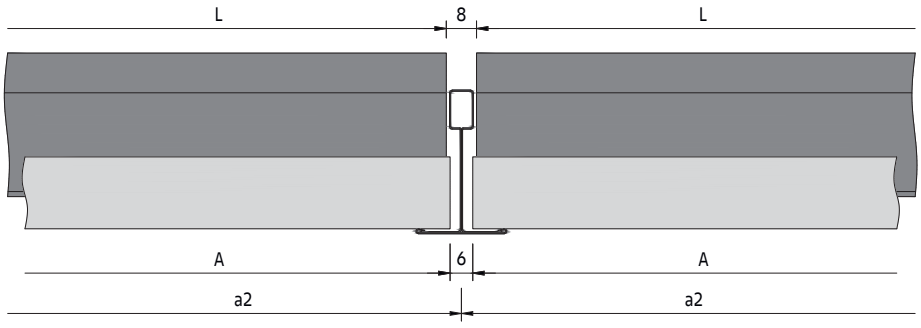


Section B

Example with T-Grid reinforcement



A1 Example with T-Grid reinforcement



Panel length (A) = module length = distance between T-Grid Main Runner (a2) - 6 mm
Reinforcement profile length (L) = panel length (A) - 2 mm

Grid components

Standard components:

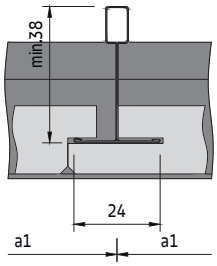
- – T-Grid / Z-Profile

Optional components:

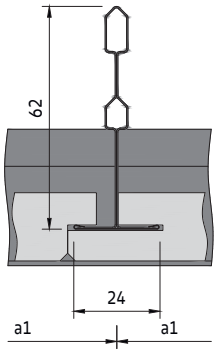
- AWDN23 Double bent T bar hanger

T-Grid reinforcement options

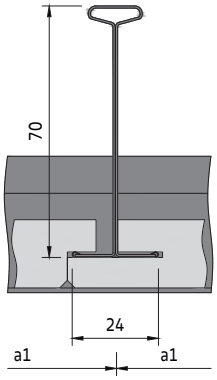
B1.1



B1.2

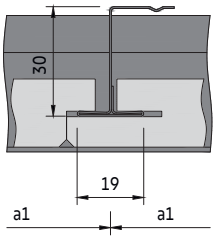


B1.3

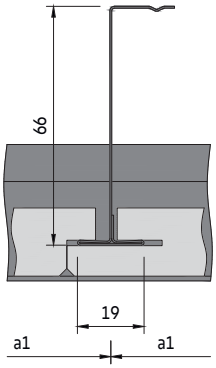


Z-Profile reinforcement options

B1.4



B1.5



These are typical examples of T-Grid and Z-Profiles. The profile type is depending on the panel length and weight. Detailed information and available options can be found in the product datasheets. When using Z-Profiles, ensure that the profiles are installed as in B1.4 - B1.5. If the profile is reversed, it could cause an obstruction when removing the panels.

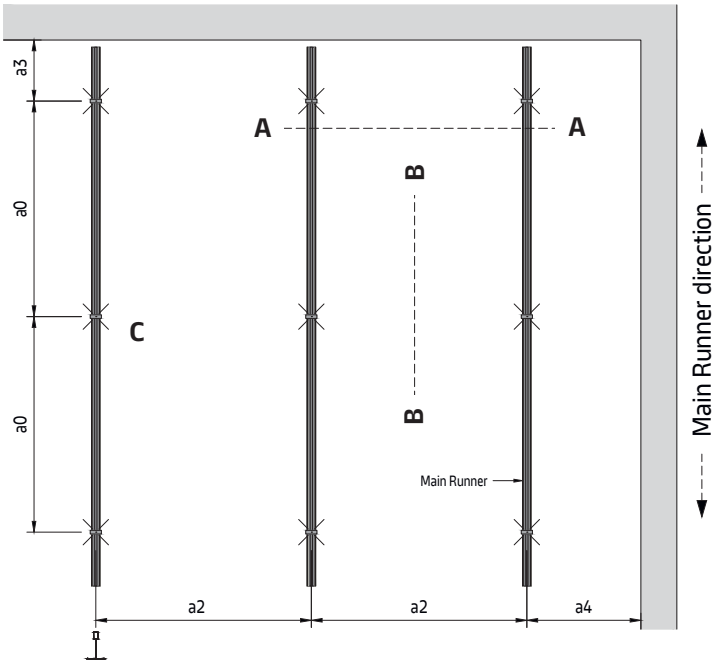
Module lengths per panel weight

Profile	Panel weight [kg/m²] length [mm]	7.5	9.5
24 mm T-Grid	[mm]	1800	1740
24/62 mm T-Grid	[mm]	2500	2500
24/70 mm T-Grid	[mm]	2500	2500
30 mm Z-Profile	[mm]	1800	1800
66 mm Z-Profile	[mm]	2500	2500

MINERAL SL2

D01.004

Typical grid layout



Parameters

a0	Distance between Main Runner suspension points = max. 1200 mm
a1	Distance between reinforcement profiles
a2	Distance between Main Runner centres = max. 2500 mmm
a3	Distance from wall = max. 250 mm / max. 600 mm (fixed to wall)
a4	Distance from wall = max. panel length
M	Module length = a2
L	Reinforcement profile length = M - 8 mm

To determine suspension layout

The module length (M) of the requested ceiling is equal to the distance between the Main Runner centres (a2). On the appropriate spacing table, read across the line headed (a2) to the required module length then read down to determine the suspension point spacing (a0). Find the values in the separate T-Grid Main Runner document. The shown values are maximum allowed distances and can be reduced but not exceeded.

Material required per m² (no waste included)

System without additional load [pcs/m²]

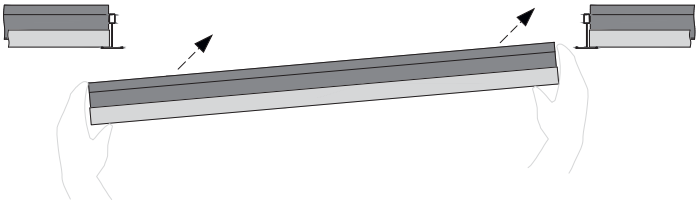
Components	Module width [mm]	300				312.5			
	Module length [mm]	1200	1800	2000	2500	1250	1800	2000	2500
Mineral panel	[pcs/m²]	2.78	1.85	1.67	1.33	2.67	1.78	1.60	1.28
T-Grid Main Runner	[m/m²]	0.80	0.56	0.50	0.40	0.83	0.56	0.50	0.40
Option with reinforcement profile (T or Z)	[m/m²]	3.33	3.33	3.33	3.33	3.20	3.20	3.20	3.20
Suspension points (C) with panel weight up to 7.5 / 9.5 kg/m²	[pcs/m²]	0.83/ 0.83	0.56/ 0.65	0.50/ 0.65	0.50/ 0.65	0.83/ 0.83	0.56/ 0.65	0.50/ 0.65	0.50/ 0.65

The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout.
The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others. Not including perimeter trims.

Detail F
Example with T-Grid reinforcement

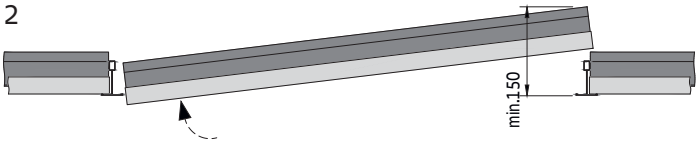
Panel insertion

1



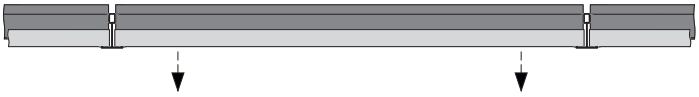
Insert the panel diagonally.

2



The minimum recommended installation height is 150 mm, depending on the edge detail, module size and selected suspension method. If the indicated minimum installation height is not met, then only gradual removal of the elements is possible (profile / panel / profile / etc.). Revisionability would therefore be limited. Please note that the required installation height may vary for inspection purposes.

3



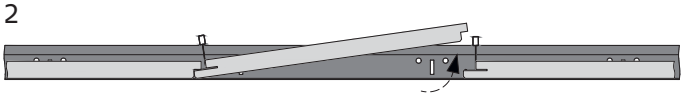
Place it on the T-Grid Main Runners and the profiles.

Panel extraction

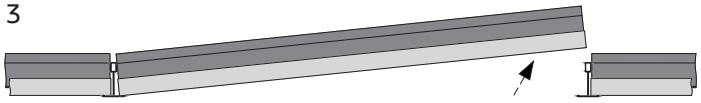
1

Due to the edge configuration, the reinforcement profile is fully integrated on both sides and therefore the panel can be gently lifted and tilted for removal.

2

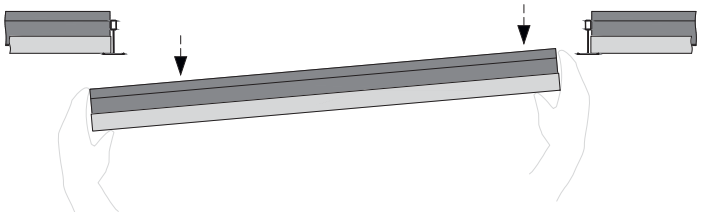


3



Remove it diagonally downwards.

4



CZ Notino, Brno, Czech Republic © Jiří Hloušek

MINERAL SL2

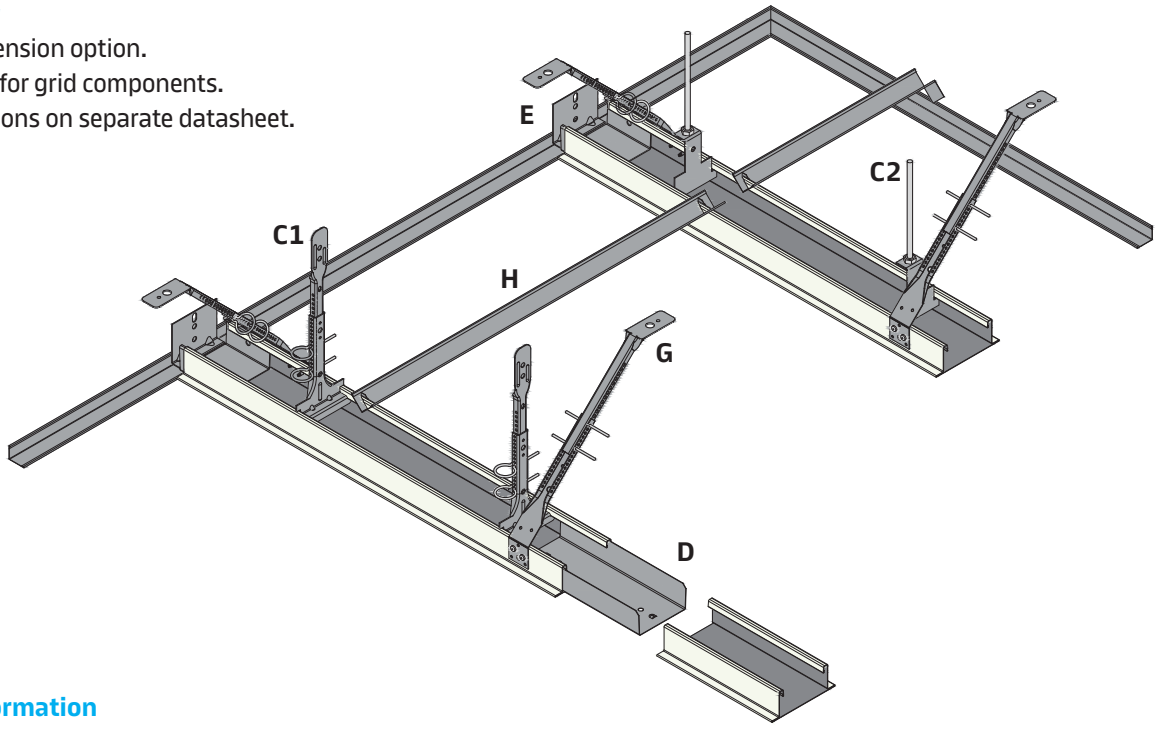
Bandraster + T-Grid or Z-Profile reinforcement
Exposed grid solution for indoor applications

General information

- Exposed lay-in grid system for medium and large rooms
- Typical ceiling weight 5.0 - 8.6 kg/m² (indicative value for panels, without additional load)
- Panels are mostly easily installed and fully demountable
- Only for horizontal ceiling surfaces, without inclination
- Impact and fire resistance design application available, see separate documents

Isometric view

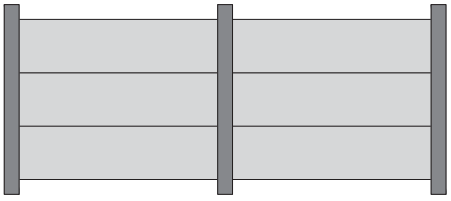
Select the suspension option.
See Bandraster for grid components.
Perimeter solutions on separate datasheet.



Important information

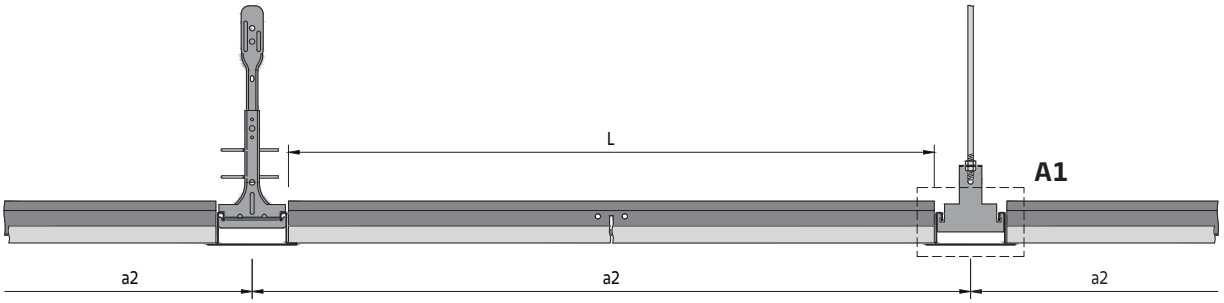
The profiles should be loaded symmetrically.
All Bandraster must be permanently secured against displacement with transverse bracings.
Planks with a thickness of 35 mm should be installed using Bandraster and angle bracing.

Standard layout



Section A

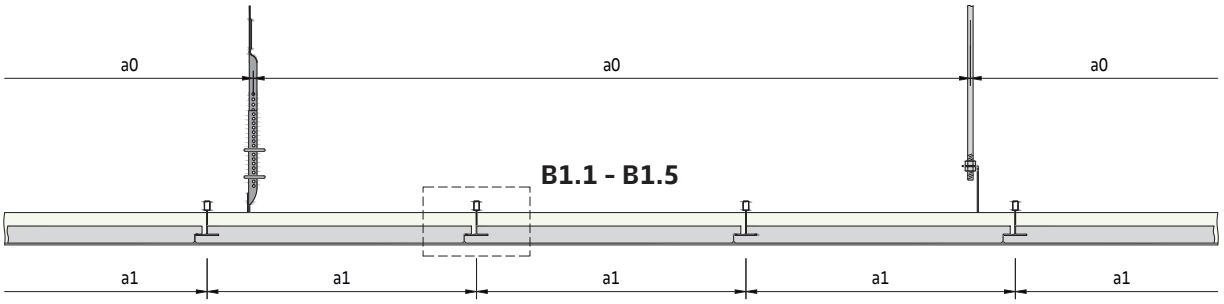
Example with T-Grid reinforcement



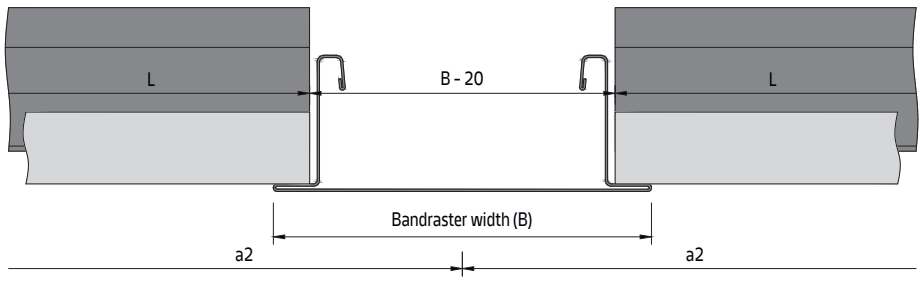
Reinforcement profile length (L) = panel length

Section B

Example with T-Grid reinforcement



A1 Example with T-Grid reinforcement



Panel length = a2 - Bandraster width + 20 mm

Grid components

Standard components:

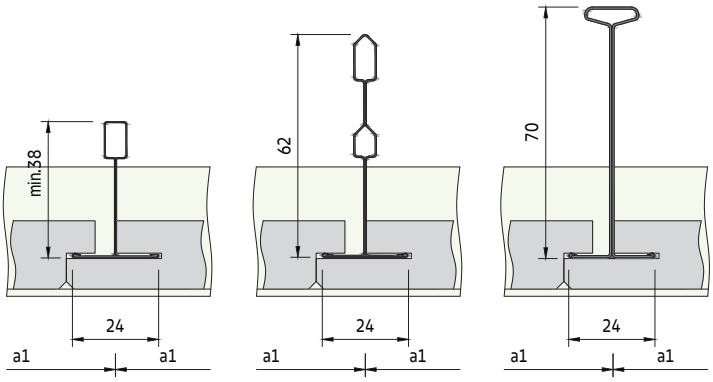
- T-Grid / Z-Profile

Optional components:

- AWDN23 Double bent T bar hanger

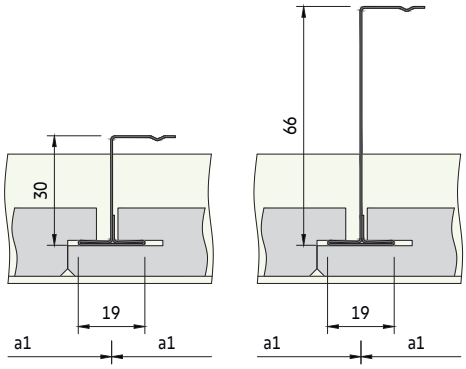
T-Grid reinforcement options

B1.1 **B1.2** **B1.3**



Z-Profile reinforcement options

B1.4 **B1.5**

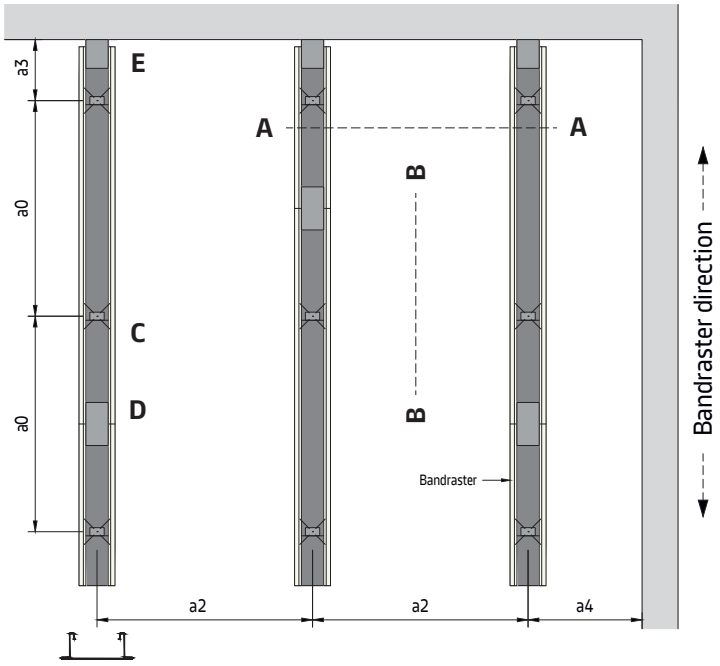


These are typical examples of T-Grid and Z-Profiles. The profile type is depending on the panel length and weight. Detailed information and available options can be found in the product datasheets. When using Z-Profiles, ensure that the profiles are installed as in B1.4 - B1.5. If the profile is reversed, it could cause an obstruction when removing the panels.

Module lengths per panel weight

Profile	Panel weight [kg/m²] length [mm]	7.5	9.5
24 mm T-Grid	[mm]	1800	1740
24/62 mm T-Grid	[mm]	2500	2500
24/70 mm T-Grid	[mm]	2500	2500
30 mm Z-Profile	[mm]	1800	1800
66 mm Z-Profile	[mm]	2500	2500

Typical grid layout



Parameters

a0 Distance between Main Runner suspension points = max. 1200 mm
a1 Distance between reinforcement profiles
a2 Distance between Main Runner centres = max. 2500 mmm
a3 Distance from wall = max. 250 mm / max. 600 mm (fixed to wall)
a4 Distance from wall = max. panel length
M Module length = a2
Module width = panel width

To determine suspension layout

The module length (M) of the requested ceiling is equal to the distance between the Main Runner centres (a2). On the appropriate spacing table, read across the line headed (a2) to the required module length then read down to determine the suspension point spacing (a0). Find the values in the separate T-Grid Main Runner document. The shown values are maximum allowed distances and can be reduced but not exceeded.

Material required per m² (no waste included)

System without additional load [pcs/m²]

Components	Module width [mm]	300				312.5			
	Module length [mm]	1200	1800	2000	2500	1250	1800	2000	2500
Mineral panel	[pcs/m²]	2.78	1.85	1.67	1.33	2.67	1.78	1.60	1.28
Bandraster	[m/m²]	0.80	0.56	0.50	0.40	0.83	0.56	0.50	0.40
Reinforcement profile (T or Z)	[m/m²]	3.33	3.33	3.33	3.33	3.20	3.20	3.20	3.20
Splice connector for Bandraster	[pcs/m²]	0.24	0.15	0.14	0.12	0.23	0.15	0.14	0.12
Wall connector for Bandraster	[pcs/m²]	0.17	0.11	0.10	0.08	0.16	0.11	0.10	0.08
Suspension points (C)	[pcs/m²]	0.67	0.45	0.40	0.32	0.64	0.45	0.40	0.32

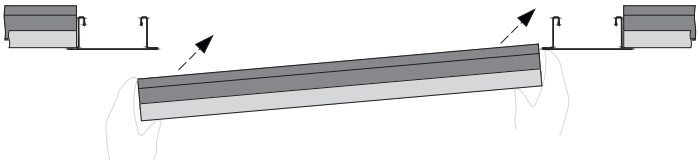
The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout. The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others. Not including perimeter trims.

Detail J

Example with T-Grid reinforcement

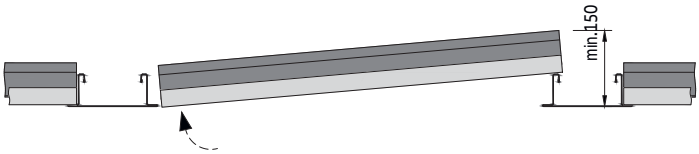
Panel insertion

1



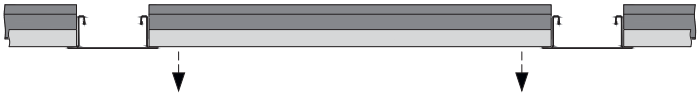
Insert the panel diagonally.

2



The minimum recommended installation height is 150 mm, depending on the edge detail, module size and selected suspension method. If the indicated minimum installation height is not met, then only gradual removal of the elements is possible (profile / panel / profile / etc.). Revisionability would therefore be limited. Please note that the required installation height may vary for inspection purposes.

3



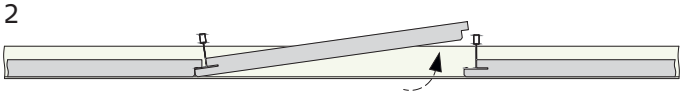
Place it on the Bandraster and the profiles.

Panel extraction

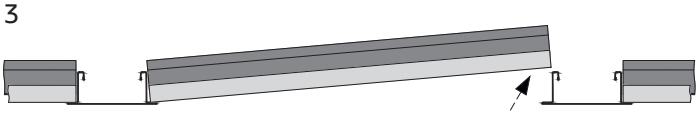
1

Due to the edge configuration, the reinforcement profile is fully integrated on both sides and therefore the panel can be gently lifted and tilted for removal.

2

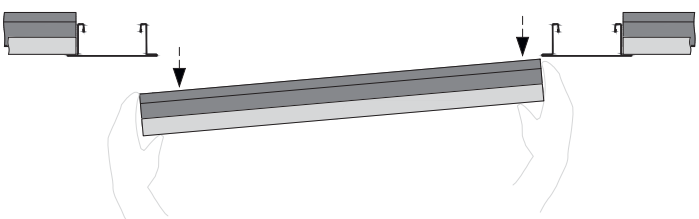


3



Remove it diagonally downwards.

4



CZ Notino, Brno, Czech Republic © Jiří Hloušek

Campbell Heidelberg, Gebäude 3 (Gemeinschaftsschule Heidelberg), Heidelberg, Germany © Lukas Huneke

Concealed Grid Ceilings

MINERAL K4C4

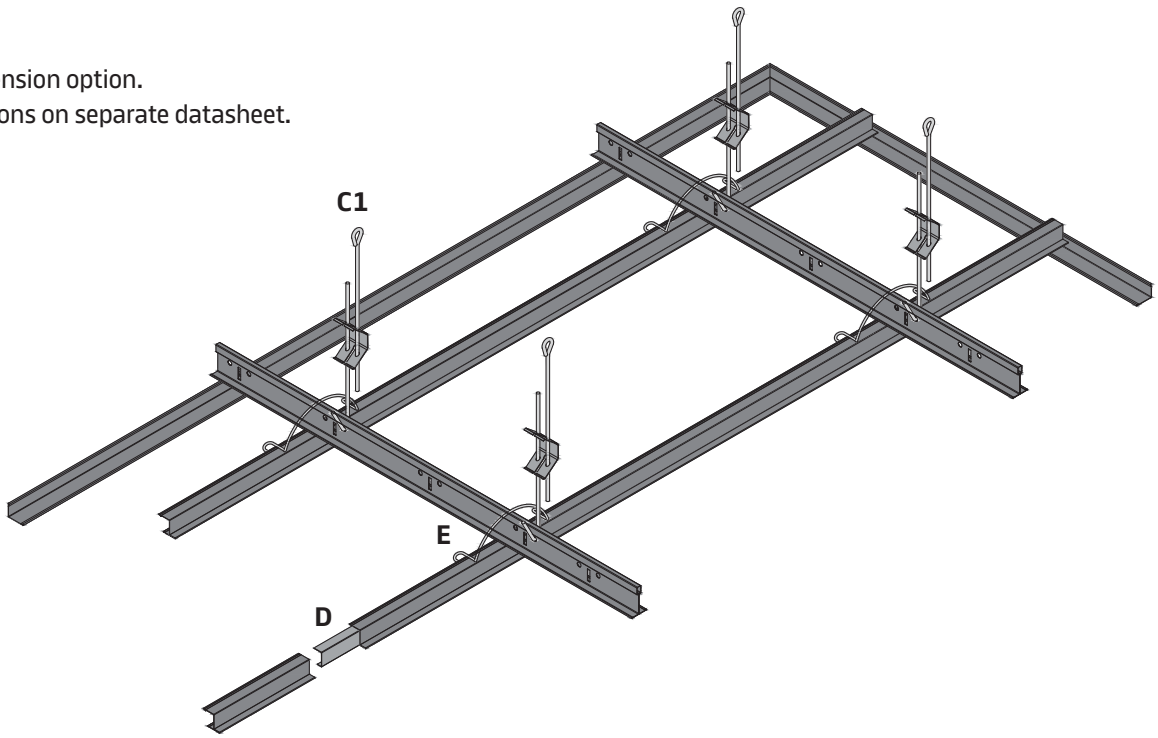
T-Grid Main Runner + Z-Profile
Concealed grid solution for indoor applications

General information

- Concealed lay-in grid system for small, medium and large rooms
- Typical ceiling weight 4.5 - 8.5 kg/m² (indicative value for tiles, without additional load)
- Due to the design of the edge details, tiles are no more demountable
- Only for horizontal ceiling surfaces, without inclination

Isometric view

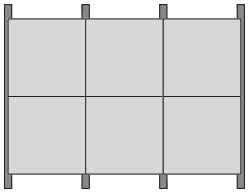
Select the suspension option.
Perimeter solutions on separate datasheet.



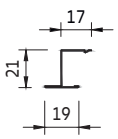
Important information

The profiles should be loaded symmetrically. All Bandraster must be permanently secured against displacement with transverse bracings.

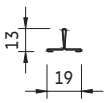
Standard layout



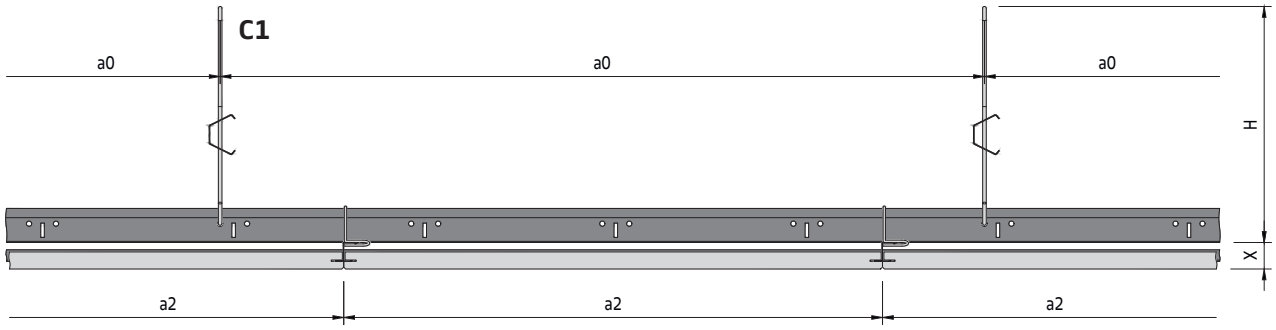
Z-Profile



Reinforcement profile

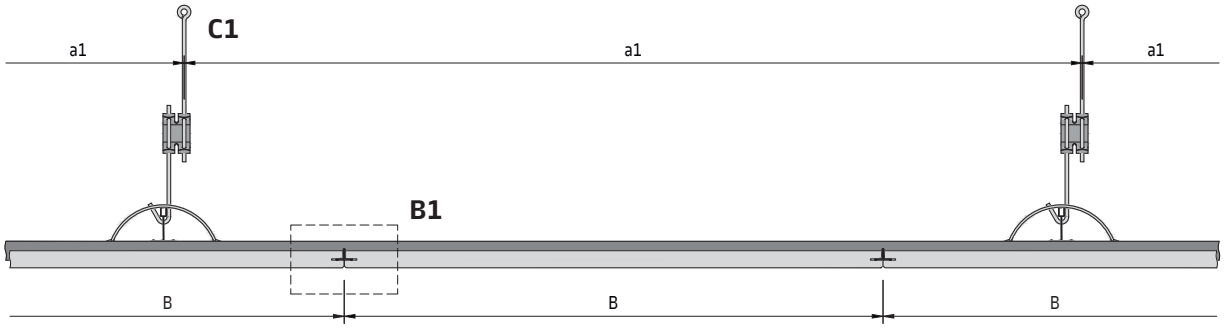


Section A



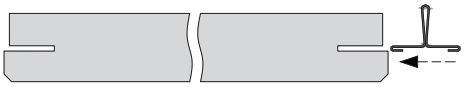
The distance (X) between the bottom edge of the T-Grid and the visible side depends on the thickness of the tile.
Thickness 15 mm: X = 29 mm, thickness 19 mm: X = 30 mm, thickness 24 mm: X = 33 mm, thickness 30 mm: X = 33 mm

Section B

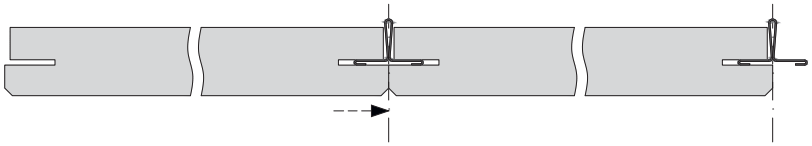


B1

1



2



Insert the reinforcement profile into the kerf. Place the tile on the grid so that the profile is inserted into the kerf of the neighbouring tile and that no gap is left.

Grid components

Standard components:

- \- T-Grid Main Runner
- DCZ12 4000 Z-Profile
- PHVZ-DCZ12 Splice connector for Z-Profile
- DCC15 Wire clip
- DCT-19/13 T-Profile

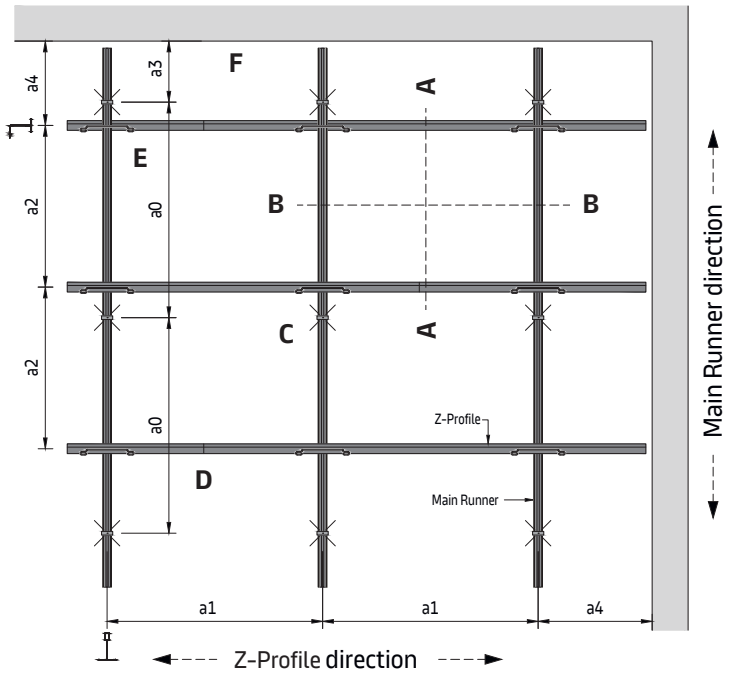
Optional components:

- DCC8 Perimeter wedge

MINERAL K4C4

D01.100

Typical grid layout



Parameters

a0	Distance between Main Runner suspension points = max. 1250 mm
a1	Distance between Main Runner centres = max. 1250 mm
a2	Distance between Z-Profiles = tile length (A)
a3	Distance from wall = max. 250 mm
a4	Distance from wall = max. tile length (A) / tile width (B)
M	Module size = tile length / tile width 600 x 600, 625 x 625 mm

The shown values are maximum allowed distances and can be reduced but not exceeded.

General installation sequence

1 The position of the suspension points must be marked on the soffit before installation (laser, measuring tape, chalk line, etc.). Then drill the holes and place the top fixing (not offered by Knauf Ceiling Solutions).

2 Set threaded rods or Nonius top parts, shorten if necessary.

3 Wherever possible, fixing should begin on the centre axis of the ceiling area.

4 Align the wall angle with the laser (lower edge of the visible side of the ceiling components) and attach to the boundary walls.

5 Suspension options:
- **C1** - Align the height of the quick hanger and hang in the Main Runner.
- **C2** - Align the height of the strip / rod connector and fasten it to the threaded rod with two hexagonal nuts, then hang in the Main Runner.
- **C3** - Insert the Nonius bottom part into the Main Runner and fasten it to the Nonius top part with two safety pins.
- **C4** ...

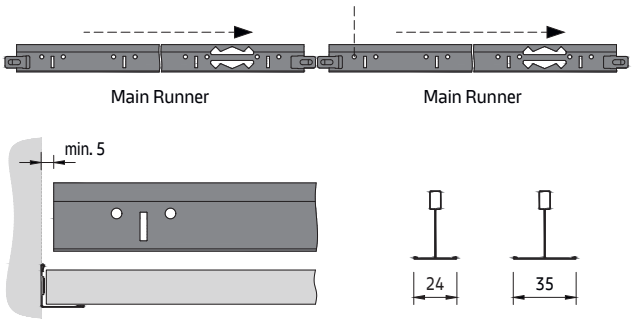
The minimum installation height is depending on the selected suspension option **C4-C5**.

6 Install the Z-Profile below the Main Runner, by using wire clips.

7 Lay full ceiling elements, followed by cut or full perimeter elements.

8 Service integrations and additional loads must be suspended separately from the soffit. The additional measures must be carried out professionally.

Main Runners

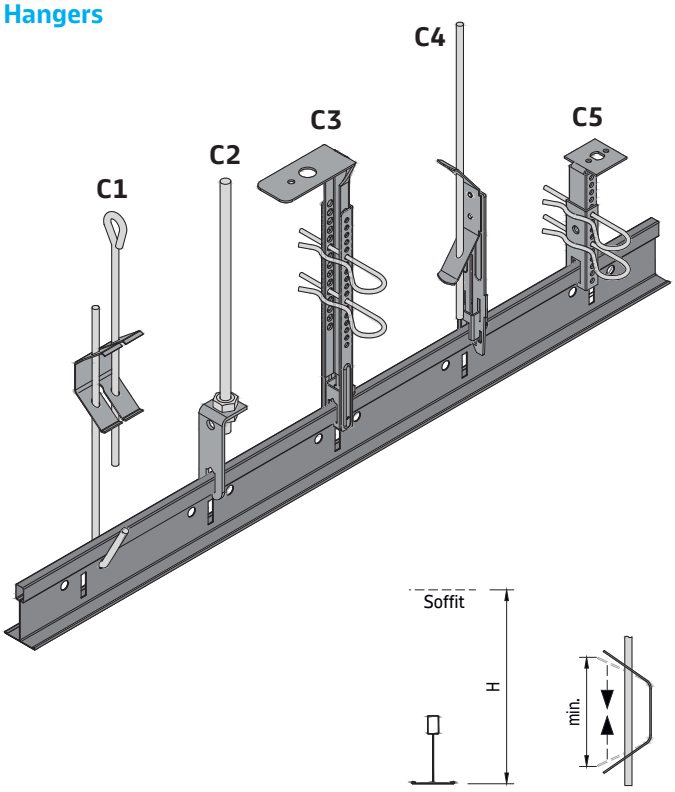


The Main Runners should always be installed in the same direction; two fire expansion notches cannot be installed directly next to each other.

The suspension points must be placed near the joint. To enable system alignment (squareness), all profile cuts should be carried out with a 5-10 mm allowance.

These are typical examples of T-Grid. Detailed information and available options can be found in the product datasheets.

Hangers



There is a range of suspension hangers available for the T-Grid. Depending on the suspension height, object-related circumstances, availability or preference, all types can be used. It is important to ensure however, that the maximum load bearing capacity is not exceeded and the choice fits the system and the requirements.
In the case of push-on hangers, care is needed to ensure that installation and removal of the panels does not displace the hangers. When using push-on hangers, the direction of installation should be at 90° to the Main Runners, tension free and vertical.
Hangers with visible defects must not be used.
Improper handling, such as forcibly bending open and closed tabs / parts of the hanger, will result in a loss of load-bearing capacity.

C1 = min. 38 mm
C4 = min. 25 mm

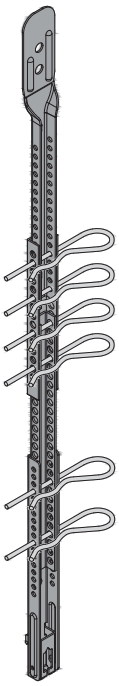
The clip should only be compressed as indicated to avoid possible damage.

Hanger type		Min. installation height (H) [mm]
C1	Quick hanger with loop	100
C2	Bent tee bar hanger for threaded rod	100
C3	Nonius top and bottom part	200
C4	Hanger Clickfix II	130
C5	Direct hanger	80

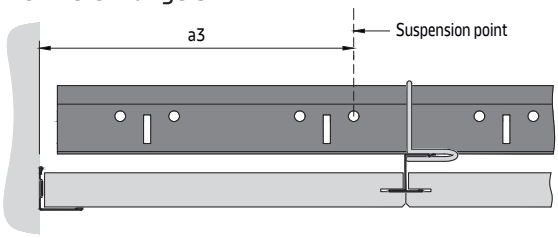
Not all combinations of grid systems / Main Runner and hanger are possible. This primarily applies to hangers for sliding on and clipping on due to the different profile head heights and shapes - rectangle / roof (peak).

Hanger installation

C3
Nonius hanger extension



Perimeter hangers



Hangers must be installed vertically. The maximum hanger distance depends on the selected product (see specific product datasheets).

In addition, a hanger is required at each Main Runner join and additional loads for service integrations require a minimum of two hangers (see Cutting & Modifications document). It should be ensured, that the distance from the perimeter to the first and last hanger doesnot exceed the maximum dimension (see specific product pages) andadditional hangers should be installed where required. Angled hangers can significantly reduce the load bearing capacity and not all hangers are suitable for. In most cases, additional measures (cross bracing, additional hangers etc.) are required. For suspension heights over 3000 mm Nonius hangers (C3) are recommended.

Hangers subject to compression
In normal situations the hangers are subjected to tension (ceiling panels, grid structure, service integrations, etc.).
Certain applications may subject the hangers to compression forces These applications can only be carried out with Nonius hangers. The solution has limited applicability and must be clarified in relation to the object.

Fire rated applications
For fire rated applications, the relevant test certificates apply. Separate documents are available.

To avoid overloading the perimeter trim, the first hanger must be positioned at a maximum distance from the perimeter (a3). The choice of perimeter trim depends on its material gauge, as well as the panel weight and length. See separate document.

Material required per m² (no waste included)

System without additional load [pcs/m²]

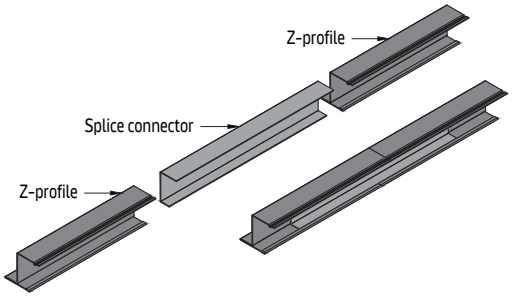
Components	Module length [mm]	1200	1250
T-Grid Main Runner	[m/m²]	0.84	0.80
Z-Profile	[m/m²]	1.67	1.60
Splice connector for Z-Profile	[pcs/m²]	0.42	0.40
Wire clip	[pcs/m²]	1.39	1.28
Suspension points (C)	[pcs/m²]	0.70	0.64
Reinforcement profile	[pcs/m²]	2.78	2.56
Perimeter wedge	[pcs/m²]	0.50	0.50

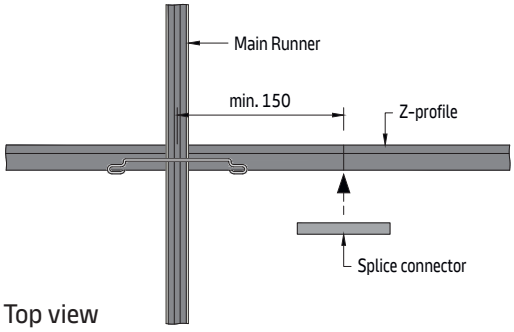
The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout. The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others.

Not including perimeter trims.

Detail D

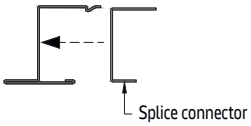
Z-Profile connection





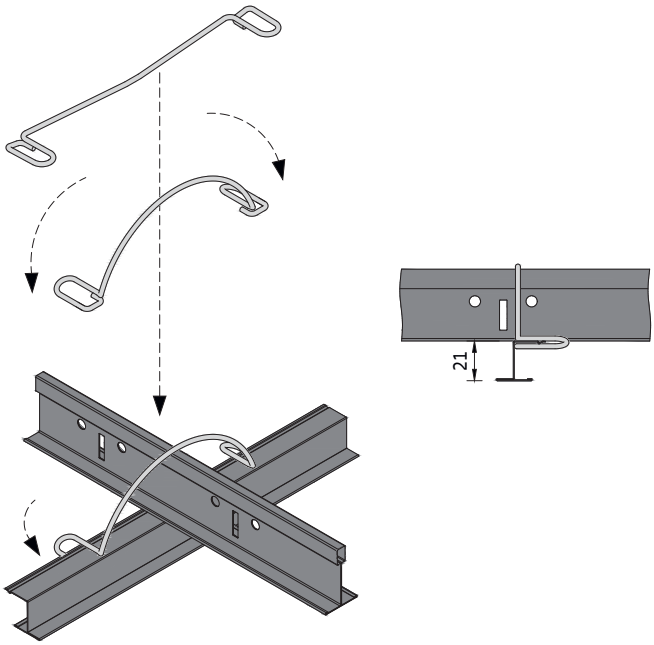
Top view

Push the splice connector between both ends of the Z-Profiles so that it is centred during the joint.
Make sure that the joint is offset from the wire clip position (detail E), otherwise installation will be more difficult.



Detail E

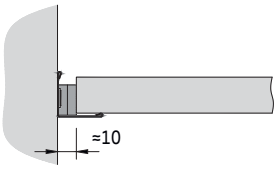
Wire clip



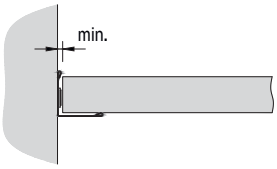
The Z-Profiles are fixed to the Main Runners with wire clips. The wire clips are delivered as flat wires and shaped on site and get fully pushed onto the upper leg of the Z-Profile.

Detail F

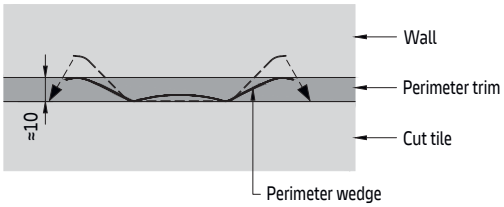
F1 - Perimeter detail with perimeter wedge



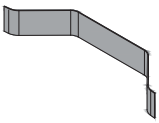
F2 - Perimeter detail without perimeter wedge



F3 - Perimeter wedge



Top view



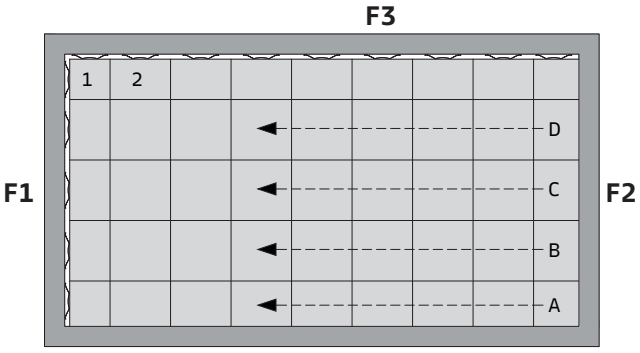
Tiles can be installed without a perimeter wedge by cutting them to size so that the minimum possible distance to the wall is used so that the tiles cannot shift horizontally and possibly fall down.

The perimeter cut tiles are installed and held in place using a perimeter wedge to ensure that they do not move. The wedge presses the opposite edge of the tile tightly against the grid system ensuring no tile movement at the perimeter. Suitable pliers can be used to “gloosen” the wedge to ease installation, reducing effort and time.

A perimeter wedge is required for every cut tile. This also applies to tiles in corners. The wedge is required irrespective of whether L-perimeter trim or shadowline trim is used. Cut tiles without wedges can move as a result of building movement or maintenance. It can only be omitted if it is ensured that the tiles cannot slip or that there are no visible joints.

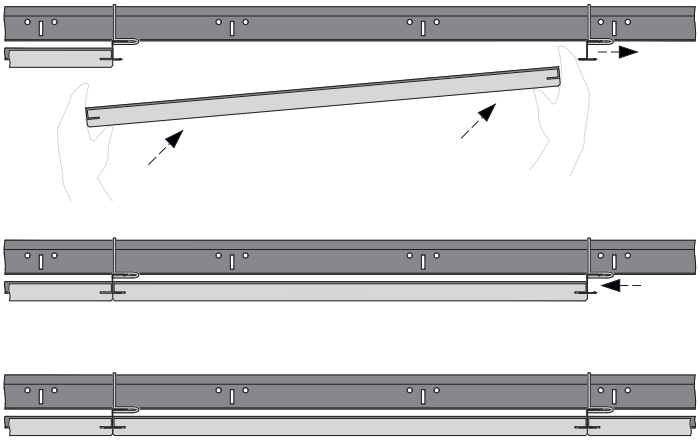
The simplest method of installing the wedge is immediately after the installation of each tile from the adjacent field. This can be carried out for all tiles, including corner tiles, except the last tiles in a row (1). For the penultimate (last) tile (2), the wedge should be installed before the tile and is then pressed on to the perimeter trim as the tile is pushed into position.

The tiles are installed row by row (A / B / C / etc.), cut tiles row without perimeter wedge (A) first.

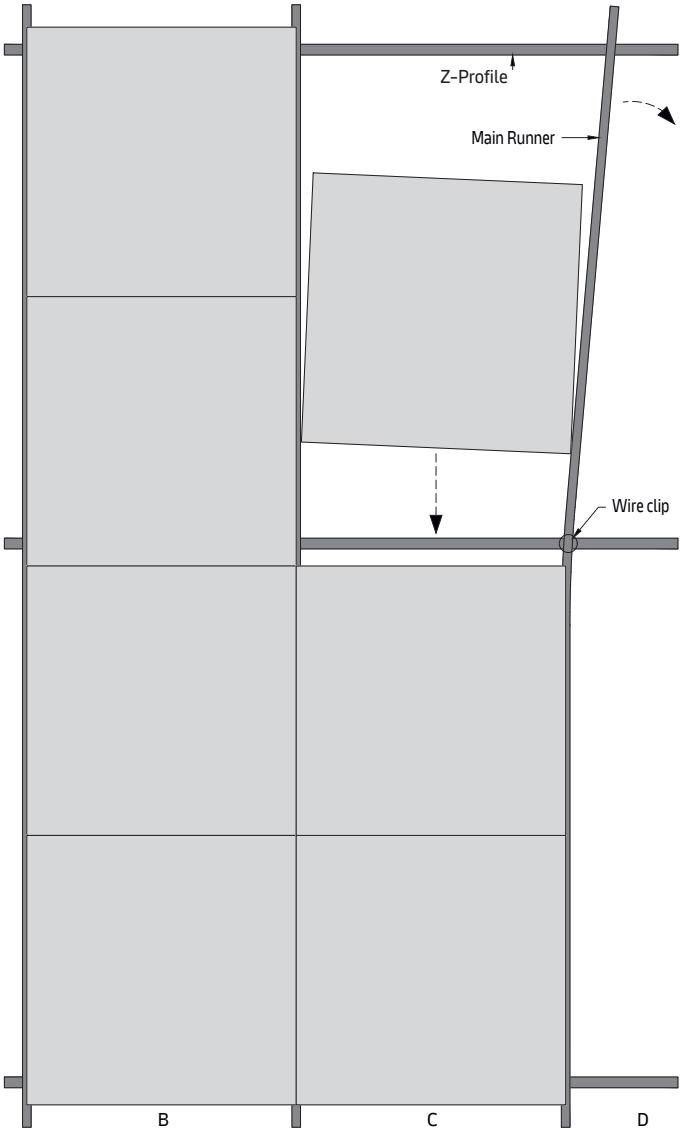


Detail G

Tile insertion



Before starting the installation of the tiles, insert the reinforcement profile into the kerf, as shown in detail B1. The tiles are installed row by row (A / B / C / etc.), cut tiles row without perimeter wedge (A) first. In order to insert the tiles, the Z-Profile must be bent slightly outwards without damaging it. As soon as the tiles are resting on the kerfs, the Z-Profile can be brought back into position and secured with wire clips. Square tiles should always be laid in the same direction. In unfavourable grazing light, irregularities can occur even on very smooth and fine surfaces. To prevent this, we recommend directional installation. Single tiles cannot be removed after installation as they are joined to the adjacent panels via the profile.



MINERAL Finesse

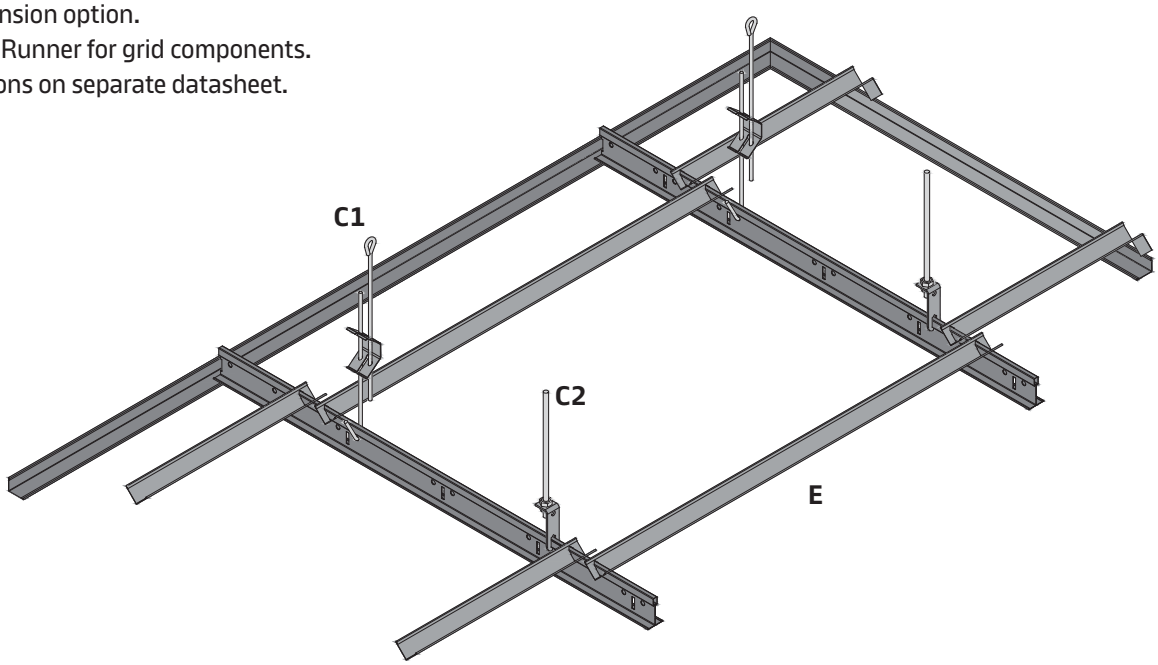
T-Grid Main Runner
Concealed grid solution for indoor applications

General information

- Concealed lay-in grid system for small, medium and large rooms
- Typical ceiling weight 5.0 - 8.6 kg/m² (indicative value for tiles, without additional load)
- Panels are mostly easily installed and fully demountable
- Only for horizontal ceiling surfaces, without inclination
- Specific side-arm supported luminaires (lighting fittings) are required due to the concealed grid system and asymmetric tile design.

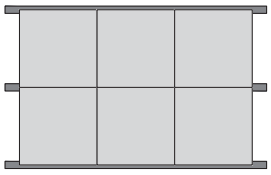
Isometric view

Select the suspension option.
See T-Grid Main Runner for grid components.
Perimeter solutions on separate datasheet.

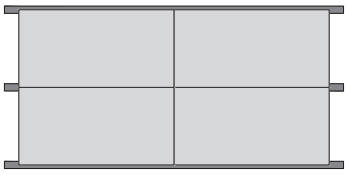


Standard layout options

Square tiles

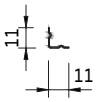


Rectangular tiles

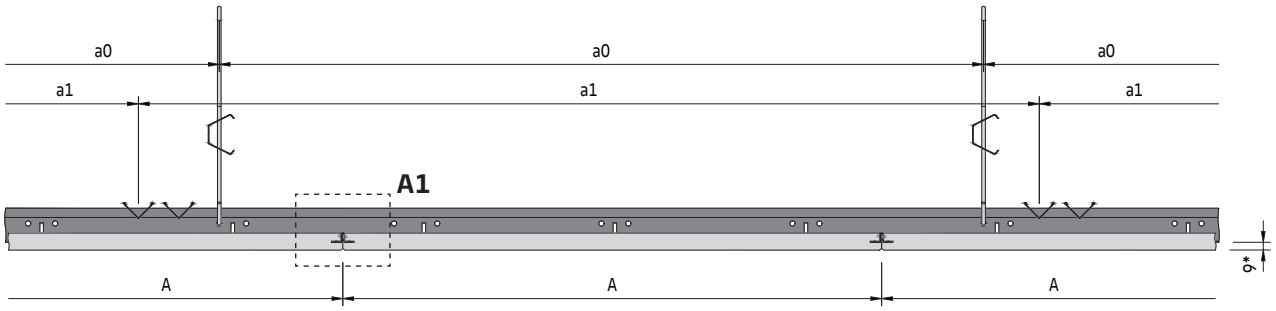


Use the installation with Z-Profile for staggered layouts, otherwise the revisionability is severely limited.

Concealed L-Profile

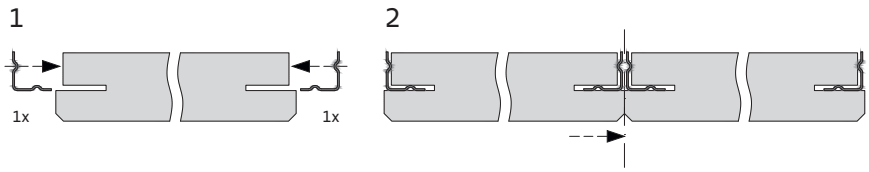


Section A

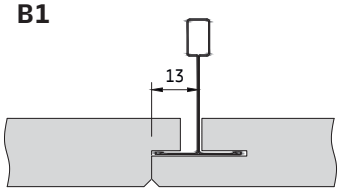


* For tiles thicker than 24 mm = 12 mm

A1

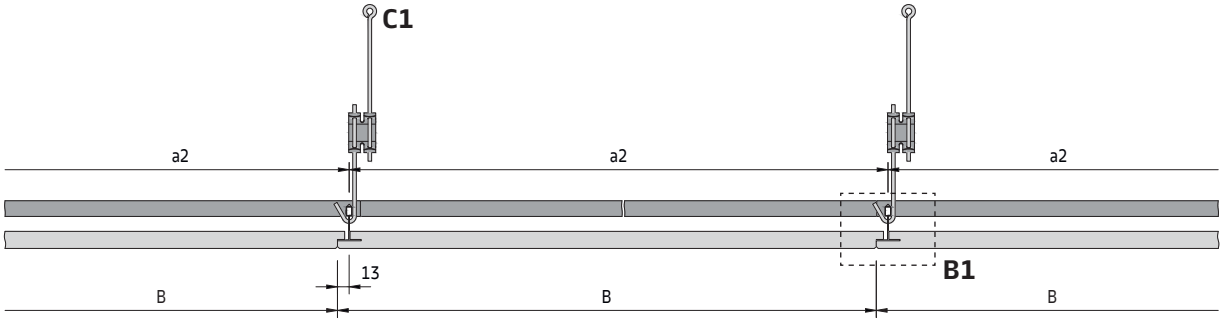


B1



Insert the concealed L-Profile into the kerf on both opposite sides. Place the tile on the grid so that no gap is left. The kerfed edge is on the long side of the tile.

Section B



Grid components

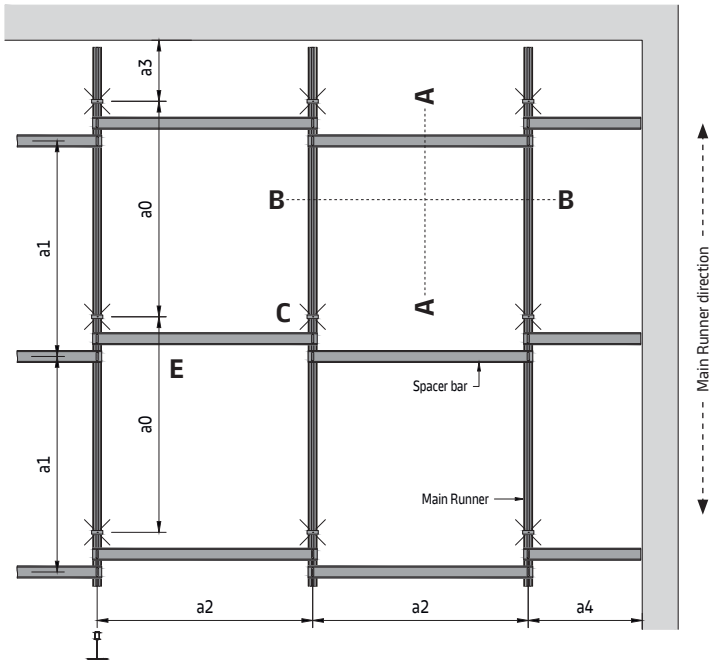
Standard components:

- – T-Grid Main Runner
- DMK Spacer bar
- VA/K60 L-Profile

Optional components:

- DCC8 Perimeter wedge

Typical grid layout



Parameters

a0	Distance between Main Runner suspension points = 1200 / 1250 mm *
a1	Distance between spacer bar centres
a2	Distance between Main Runners = tile width (B)
a3	Distance from wall = max. 400 mm
a4	Distance from wall = max. tile length (A) / tile width (B)
M	Module size = tile length / tile width 600 x 600, 625 x 625, 1200 x 600, 1250 x 625 mm

The shown values are maximum allowed distances and can be reduced but not exceeded.

* For larger spacing see datasheet for 24 mm T-Grid

General installation sequence

1 The position of the suspension points must be marked on the soffit before installation (laser, measuring tape, chalk line, etc.). Then drill the holes and place the top fixing (not offered by Knauf Ceiling Solutions).

2 Set eye wires, threaded rods or Nonius top parts, shorten if necessary.

3 Wherever possible, fixing should begin on the centre axis of the ceiling area.

4 Align the wall angle with the laser (lower edge of the visible side of the ceiling components) and attach to the boundary walls.

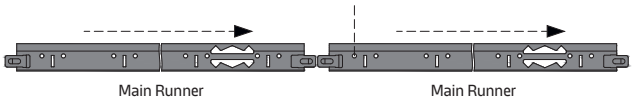
5 Suspension options:
C1 - Align the height of the quick hanger and hang in the Main Runner.
C2 - Align the height of the strip / rod connector and fasten it to the threaded rod with two hexagonal nuts, then hang in the Main Runner.
C3 - Insert the Nonius bottom part into the Main Runner and fasten it to the Nonius top part with two safety pins.
C4 ...
The minimum installation height is depending on the selected suspension option. **C1-C5**

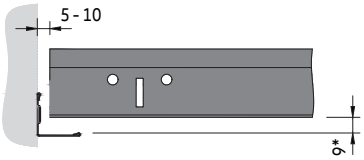
6 Use spacer bars to fix the position of the Main Runners.

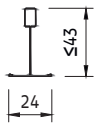
7 Lay full ceiling elements, followed by cut or full perimeter elements

8 Service integrations and additional loads must be suspended separately from the soffit. The additional measures must be carried out professionally.

Main Runners







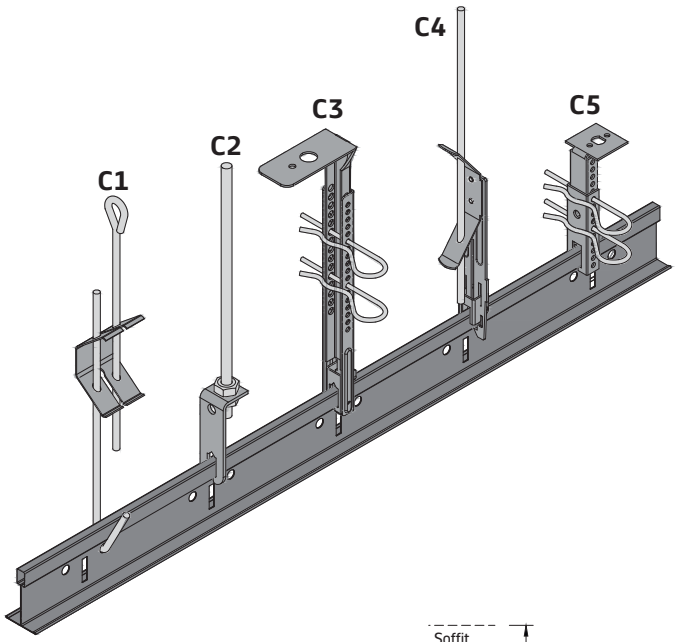
This is a typical example of T-Grid.
Detailed information and available options can be found in the product datasheets.

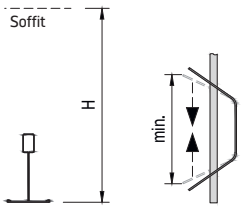
The Main Runners should always be installed in the same direction; two fire expansion notches can not be installed directly next to each other.

The suspension points must be placed near the joint.
To enable system alignment (squareness), all profile cuts should be carried out with a 5–10 mm allowance.

* Distance from top edge of T-Grid leg to top edge of perimeter trim = 9 mm
For tiles thicker than 24 mm = 12 mm

Hangers





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In the case of push-on hangers, care is needed to ensure that installation and removal of the panels does not displace the hangers. When using push-on hangers, the direction of installation should be at 90° to the Main Runners, tension free and vertical.

Hangers with visible defects must not be used.

Improper handling, such as forcibly bending open and closed tabs / parts of the hanger, will result in a loss of load-bearing capacity.

C1 = min. 38 mm
C4 = min. 25 mm

The clip should only be compressed as indicated to avoid possible damage.

Hanger type		Min. installation height (H) [mm]
C1	Quick hanger with loop	100
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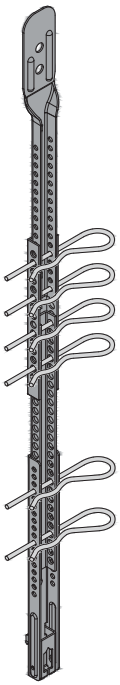
C4	Hanger Clickfix II	130
C5	Direct hanger	80

Not all combinations of grid systems / Main Runner and hanger are possible. This primarily applies to hangers for sliding on and clipping on due to the different profile head heights and shapes - rectangle / roof (peak).

Hanger installation

C3
Nonius hanger extension



Hangers must be installed vertically. The maximum hanger distance depends on the selected product (see specific product datasheets).

In addition, a hanger is required at each Main Runner join and additional loads for service integrations require a minimum of two hangers (see Cutting & Modifications document). It should be ensured, that the distance from the perimeter to the first and last hanger does not exceed the maximum dimension (see specific product pages) and additional hangers should be installed where required. Angled hangers can significantly reduce the load bearing capacity and not all hangers are suitable for. In most cases, additional measures (cross bracing, additional hangers etc.) are required.
For suspension heights over 3000 mm Nonius hangers (C3) are recommended.

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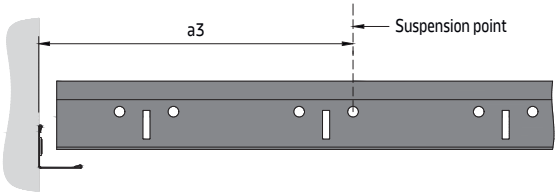
In normal situations the hangers are subjected to tension (ceiling panels, grid structure, service integrations, etc.).
Certain applications may subject the hangers to compression forces These applications can only be carried out with Nonius hangers. The solution has limited applicability and must be clarified in relation to the object.

Fire rated applications
For fire rated applications, the relevant test certificates apply. Separate documents are available.

Perimeter hangers



To avoid overloading the perimeter trim, the first hanger must be positioned at a maximum distance from the perimeter (a3). The choice of perimeter trim depends on its material gauge, as well as the panel weight and length.
See separate document.

Material required per m² (no waste included)

System without additional load [pcs/m²]

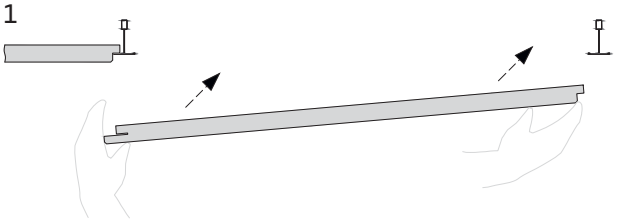
Components	Module length [mm]	600 x 600	625 x 625	1200 x 600	1250 x 625
T-Grid Main Runner	[m/m²]	1.67	1.60	1.67	1.60
Spacer bar	[pcs/m²]	1.39	1.28	1.39	1.28
Suspension points (C)	[pcs/m²]	1.39	1.28	1.39	1.28
Reinforcement angle	[pcs/m²]	5.56	5.12	2.78	2.56
Perimeter wedge	[pcs/m²]	0.50	0.50	0.50	0.50

The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout. The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others.
Not including perimeter trims.

Detail D

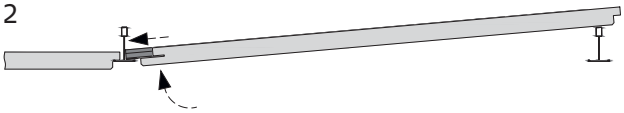
Tile insertion

1



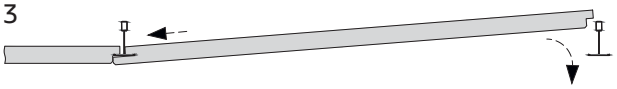
Insert the tile diagonally.

2



Insert the concealed L-Profile into the kerf of the tile, as shown in detail A1, however it should be displaced by 40 - 50 mm (detail D1). This is necessary so that the concealed L-Profile sits on the Main Runner and does not hinder the further installation. Prepared like this, the tile can be manoeuvred into the ceiling void and the protruding concealed L-Profile lay onto the Main Runner.

3



Finally, the tile is pushed in the direction of the protruding concealed L-Profile and the kerfed edge onto the Main Runner.

4

Rest the tile on the Main Runner.

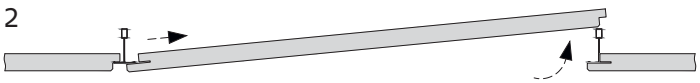
Detail D1

Tile extraction

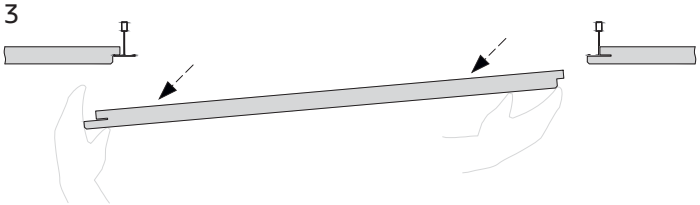
1

Lift the tile so that it can be removed from the Main Runner.

2



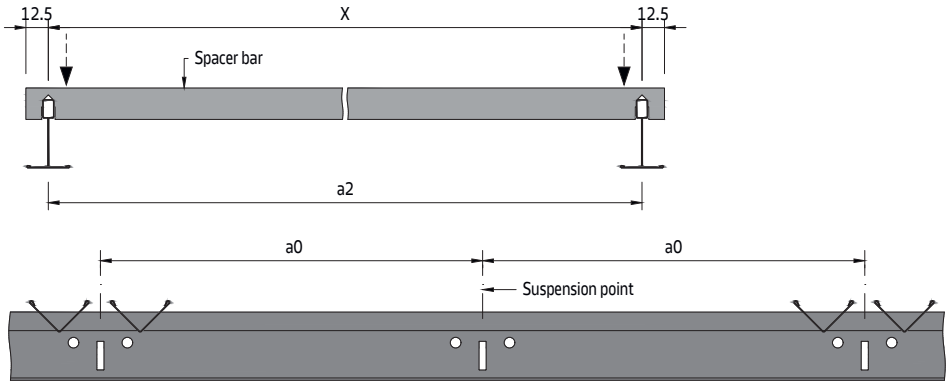
3



Remove it diagonally downwards.

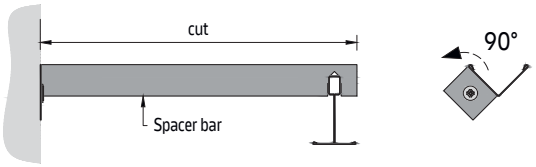
Detail E

Spacer bar



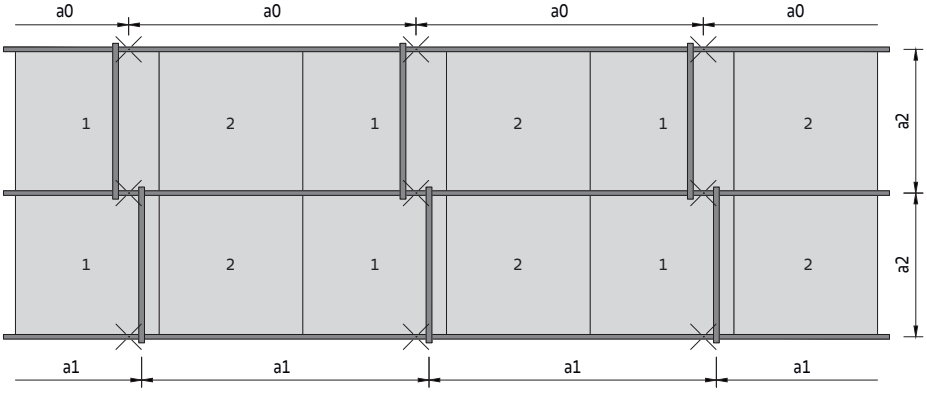
The spacer bars can be inserted from above and should be attached alternately.

Last row cut and fixed to wall



To avoid horizontal movement, the spacer bars can be slotted at one end and bent 90° inside or outward.
This allows it to be attached to the wall.

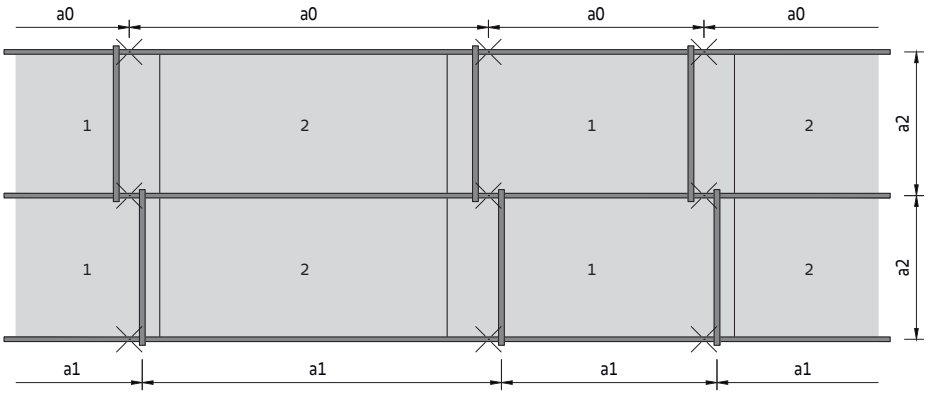
Square tiles layout



Spacer bars are always situated directly alongside the suspension points. The suspension points (a0) are the same distance apart as the spacer bars (a1). This ensures that only every second tile is lay between the suspension points and the spacer bars.

1 = blocked tile
2 = removable tile

Rectangular tiles layout

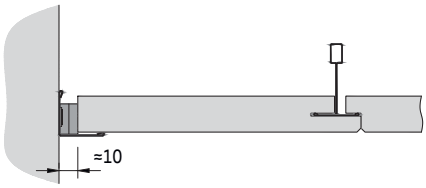


If rectangular tiles are to be installed, this should already be taken into account when installing the suspension points (a0). It is important to ensure that every second tile is installed without a hanger or spacer bar behind. Therefore, the suspension points (a0) alternate between ≈1500 and ≈1000 mm.

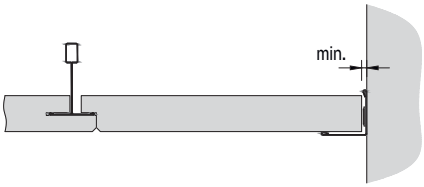
1 = blocked tile
2 = removable tile

Detail F

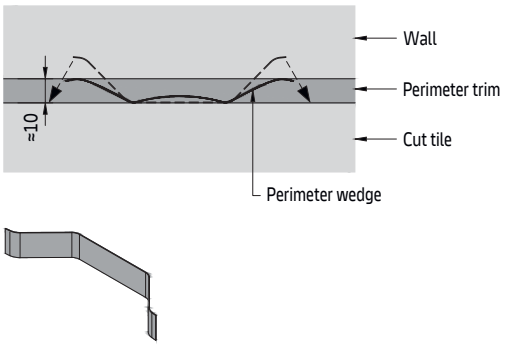
F1 - Perimeter detail with perimeter wedge



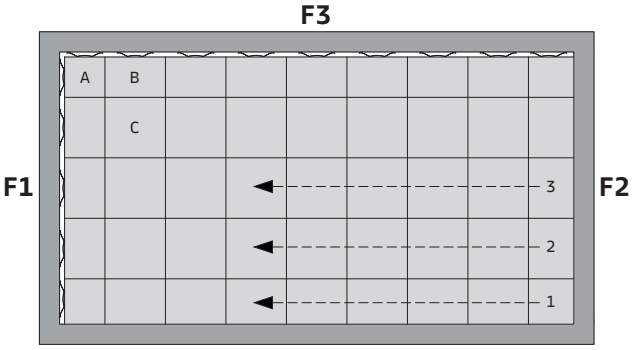
F2 - Perimeter detail without perimeter wedge



F3 - Perimeter wedge



The perimeter cut tiles are installed and held in place using a perimeter wedge to ensure that they do not move. The wedge presses the opposite edge of the tile tightly against the grid system ensuring no tile movement at the perimeter. Suitable pliers can be used to “gloosen” the wedge to ease installation, reducing effort and time. A perimeter wedge is required for every cut tile. This also applies to tiles in corners. The wedge is required irrespective of whether L-perimeter trim or shadowline trim is used. Cut tiles without wedges can move as a result of building movement or maintenance. It can only be omitted if it is ensured that the tiles cannot slip or that there are no visible joints.
The simplest method of installing the wedge is immediately after the installation of each tile from the adjacent field. This can be carried out for all tiles, including corner tiles, except the last tiles in a row (=penultimate tile, marked in the ceiling layout with a border). For the last tile, the wedge should be installed before the tile and is then pressed onto the perimeter trim as the tile is pushed into position. Tiles can be installed optionally without a perimeter wedge by cutting them to size so that the minimum possible distance to the wall is maintained to prevent the tiles from shifting horizontally, creating an open joint between the tiles and possibly causing them to fall down.



As it can be difficult to align an individual Main Runner, we do not recommend to begin with the cut tiles (row 1). The second and third rows should be started instead. Special attention should be given to the first tiles (cut tiles) of these rows, as they will later determine the face joint pattern. The cut tiles must be cut to the exact size and installed in alignment as well as at right angles to the main runners. The cut tiles of the first row are then subsequently installed. These must be cut to the exact size required and installed without perimeter wedges. The installation of the cut tiles as the second step in the installation has the advantage that the first Main Runners are held in place by the other rows (2 and 3) and can not be moved. Cutting the tiles to the exact size required is therefore easier to achieve. The remaining rows are completed step by step.
The last row is installed with a cut tile. However, this is not cut to fit exactly, but 10 mm smaller than the measured size and then installed with a perimeter wedge.
The corner tiles (A) are the last to be installed. As these are installed with perimeter wedges on two sides, it is easier to install them as the penultimate tile. The one from last tile in a row (B) should then be installed as the last tile. Should the installation of perimeter wedges cause a problem, they can also be installed over adjacent tiles (C).

MINERAL Finesse

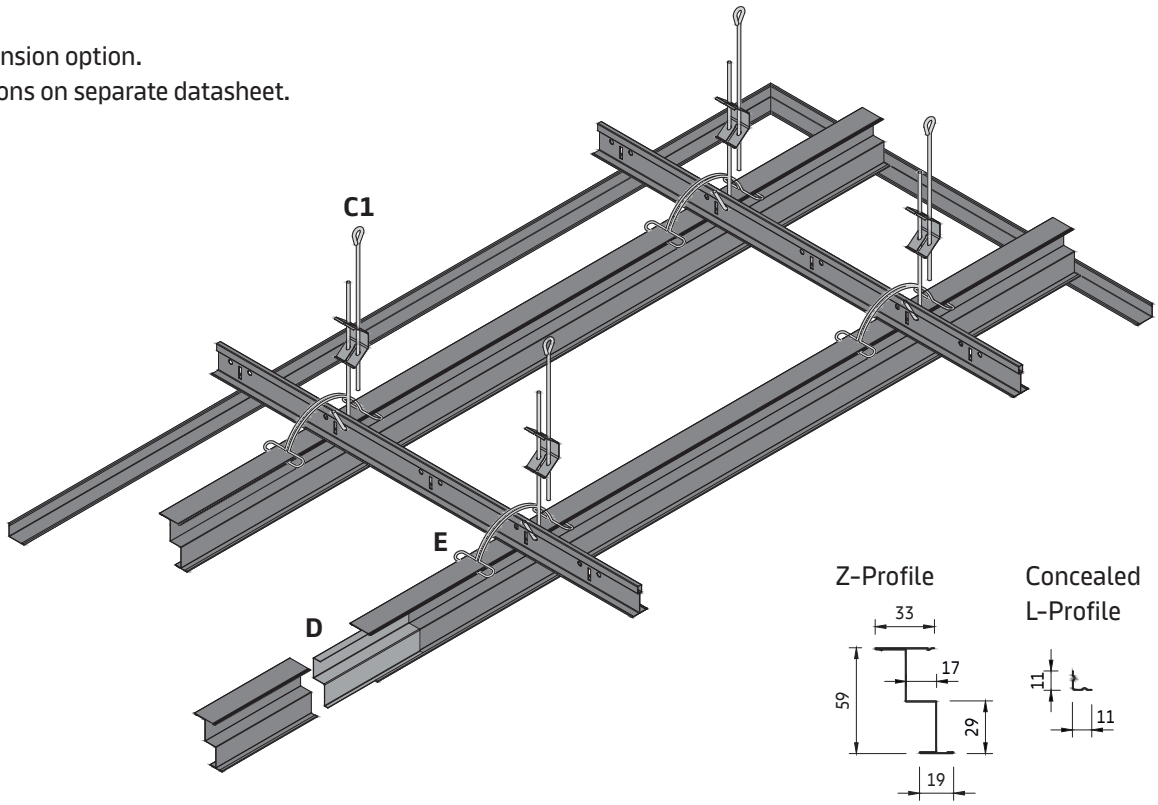
T-Grid Main Runner + Z-Profile
Concealed grid solution for indoor applications

General information

- Concealed lay-in grid system for small, medium and large rooms
- Typical ceiling weight 5.0 - 8.6 kg/m² (indicative value for tiles, without additional load)
- Panels are mostly easily installed and fully demountable
- Only for horizontal ceiling surfaces, without inclination
- Specific side-arm supported luminaires (lighting fittings) are required due to the concealed grid system and asymmetric tile design
- Assembly and disassembly takes place at the height of the Z-Profile, no distance to service integrations is required

Isometric view

Select the suspension option.
Perimeter solutions on separate datasheet.

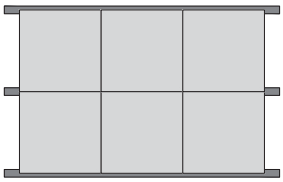


Z-Profile

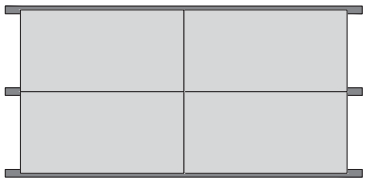
Concealed L-Profile

Standard layout options

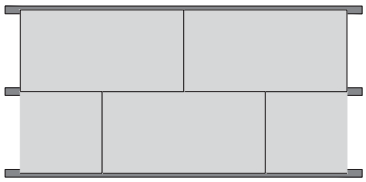
Square tiles



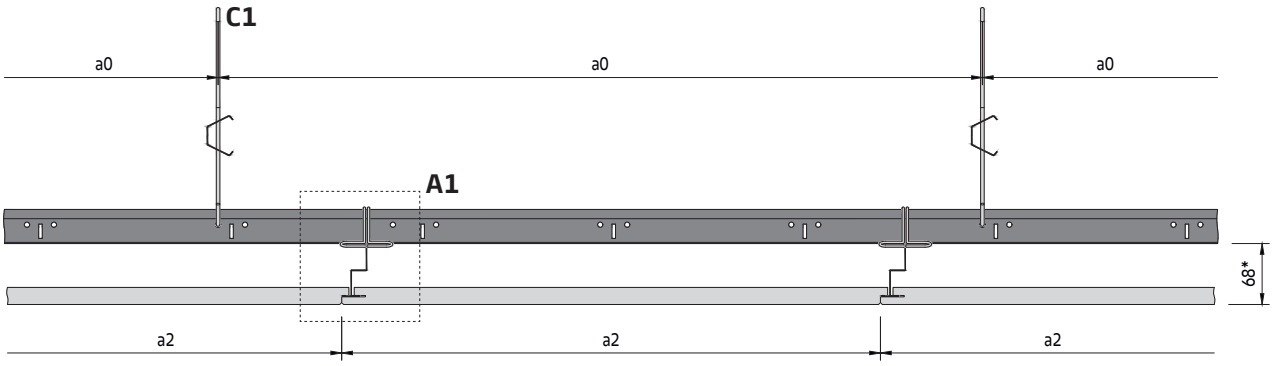
Rectangular tiles



Staggered layout

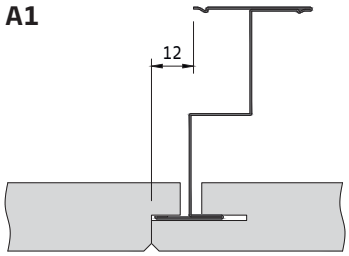


Section A

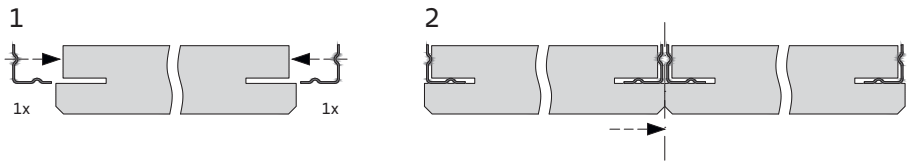


* For tiles thicker than 24 mm = 71 mm

A1

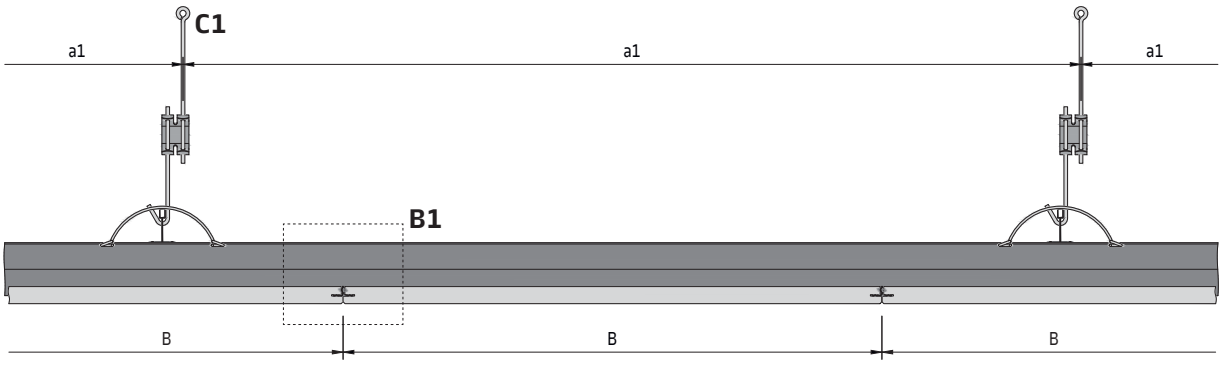


B1



Insert the concealed L-Profile into the kerf on both opposite sides. Place the tile on the grid so that no gap is left. The kerfed edge is on the long side of the tile.

Section B



Grid components

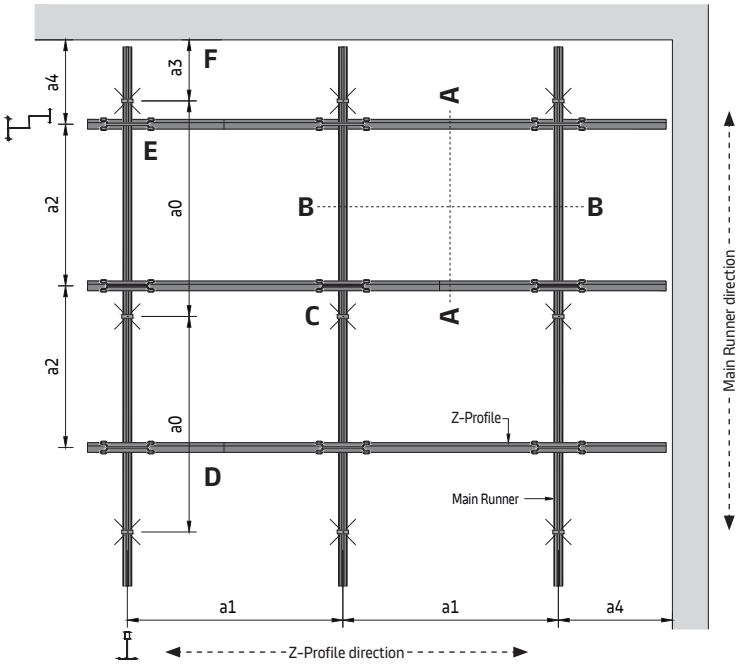
Standard components

- – T-Grid Main Runner
- DCZ57 4000 Z-Profile
- ZPV-DCZ57 Splice connector for Z-Profile
- DCC15 Wire clip
- VA/K L-Profile

Optional components

- DCC8 Perimeter wedge

Typical grid layout



Parameters

a0 Distance between Main Runner suspension points = max 1250 mm

a1 Distance between Main Runner centres = max. 1250 mm

a2 Distance between Z-Profiles = tile length (A)

a3 Distance from wall is variable

a4 Distance from wall = max. tile length (A) / tile width (B)

M Module size = tile length / tile width 600 x 600, 625 x 625, 1200 x 600, 1250 x 625 mm

The shown values are maximum allowed distances, depending on the tile weight and can be reduced but not exceeded.

General installation sequence

1 The position of the suspension points must be marked on the soffit before installation (laser, measuring tape, chalk line, etc.). Then drill the holes and place the top fixing (not offered by Knauf Ceiling Solutions).

2 Set eye wires, threaded rods or Nonius top parts, shorten if necessary.

3 Wherever possible, fixing should begin on the centre axis of the ceiling area.

4 Align the wall angle with the laser (lower edge of the visible side of the ceiling components) and attach to the boundary walls.

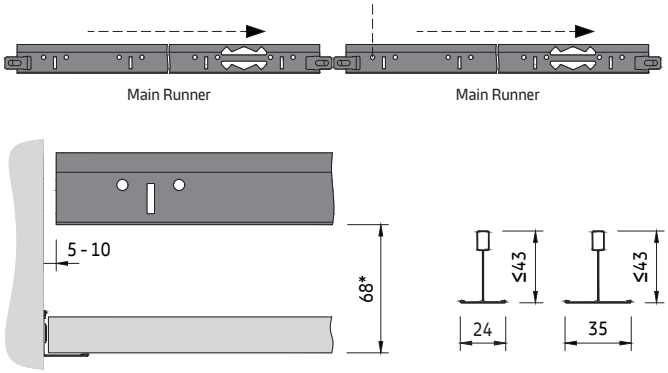
5 Suspension options:
C1 - Align the height of the quick hanger and hang in the Main Runner.
C2 - Align the height of the strip / rod connector and fasten it to the threaded rod with two hexagonal nuts, then hang in the Main Runner.
C3 - Insert the Nonius bottom part into the Main Runner and fasten it to the Nonius top-part with two safety pins.
C4 ...
The minimum installation height is depending on the selected suspension option. **C1-C5**

6 Use spacer bars to fix the position of the Main Runners, by using wire clips.

7 Lay full ceiling elements, followed by cut or full perimeter elements.

8 Service integrations and additional loads must be suspended separately from the soffit. The additional measures must be carried out professionally.

Main Runners

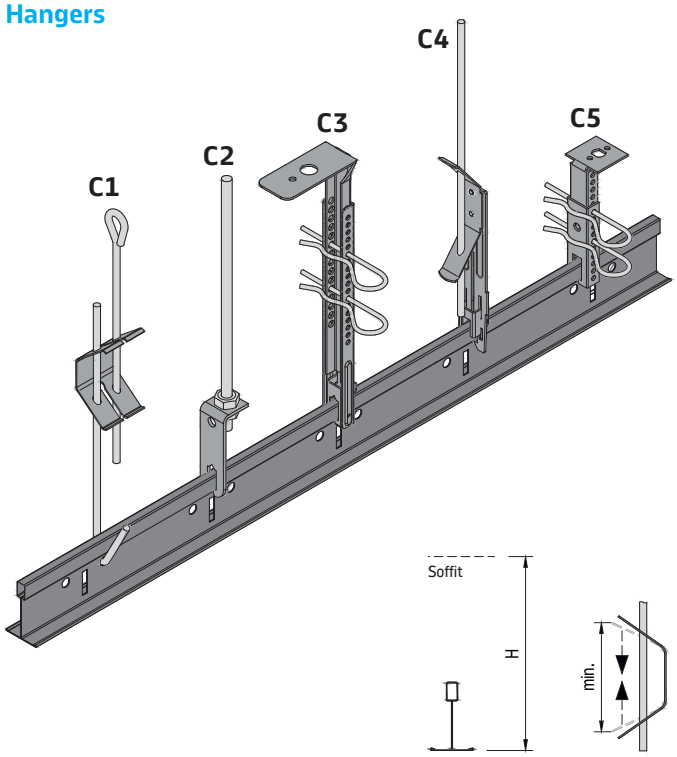


The Main Runners should always be installed in the same direction; two fire expansion notches can not be installed directly next to each other.

The suspension points must be placed near the joint. To enable system alignment (squareness), all profile cuts should be carried out with a 5-10 mm allowance.

These are typical examples of T-Grid.
Detailed information and available options can be found in the product datasheets.

Hangers



There is a range of suspension hangers available for the T-Grid. Depending on the suspension height, object-related circumstances, availability or preference, all types can be used.
It is important to ensure however, that the maximum load bearing capacity is not exceeded and the choice fits the system and the requirements.

In the case of push-on hangers, care is needed to ensure that installation and removal of the panels does not displace the hangers. When using push-on hangers, the direction of installation should be at 90° to the Main Runners, tension free and vertical.

Hangers with visible defects must not be used. Improper handling, such as forcibly bending open and closed tabs / parts of the hanger, will result in a loss of load-bearing capacity.

C1 = min. 38 mm
C4 = min. 25 mm

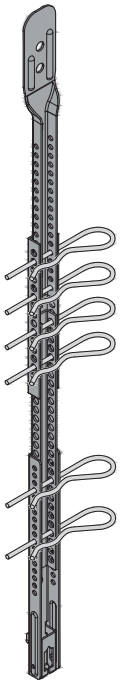
The clip should only be compressed as indicated to avoid possible damage.

Hanger type		Min. installation height (H) [mm]
C1	Quick hanger with loop	100
C2	Bent tee bar hanger for threaded rod	100
C3	Nonius top and bottom part	200
C4	Hanger Clickfix II	130
C5	Direct hanger	80

Not all combinations of grid systems / Main Runner and hanger are possible. This primarily applies to hangers for sliding on and clipping on due to the different profile head heights and shapes - rectangle / roof (peak).

Hanger installation

C3
Nonius hanger extension

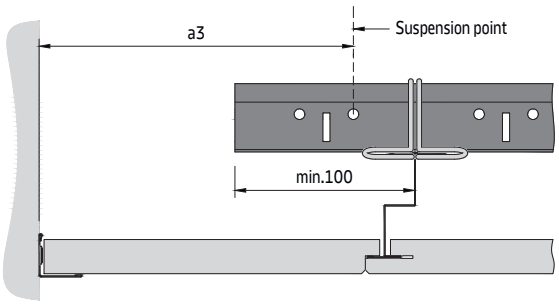


Hangers must be installed vertically. The maximum hanger distance depends on the selected product (see specific product datasheets).

In addition, a hanger is required at each Main Runner join and additional loads for service integrations require a minimum of two hangers (see Cutting & Modifications document). It should be ensured, that the distance from the perimeter to the first and last hanger does not exceed the maximum dimension (see specific product pages) and additional hangers should be installed where required.
Angled hangers can significantly reduce the load bearing capacity and not all hangers are suitable for. In most cases, additional measures (cross bracing, additional hangers etc.) are required.
For suspension heights over 3000 mm Nonius hangers (C3) are recommended.

Hangers subject to compression
In normal situations the hangers are subjected to tension (ceiling panels, grid structure, service integrations, etc.). Certain applications may subject the hangers to compression forces. These applications can only be carried out with Nonius hangers. The solution has limited applicability and must be clarified in relation to the object.

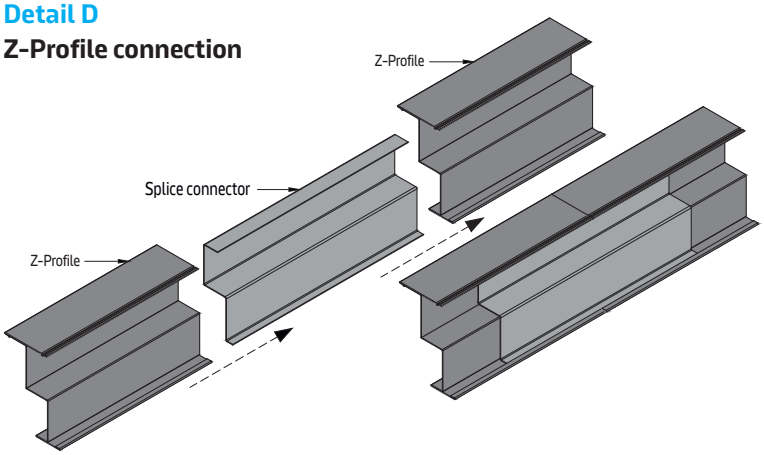
Fire rated applications
For fire rated applications, the relevant test certificates apply. Separate documents are available. Perimeter hangers.

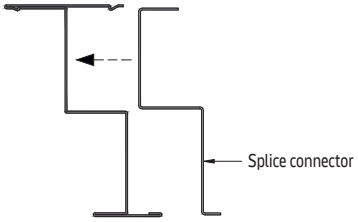


The choice of perimeter trim depends on its material gauge, as well as the panel weight and length. See separate document. Distance (a3) is variable.

Detail D

Z-Profile connection

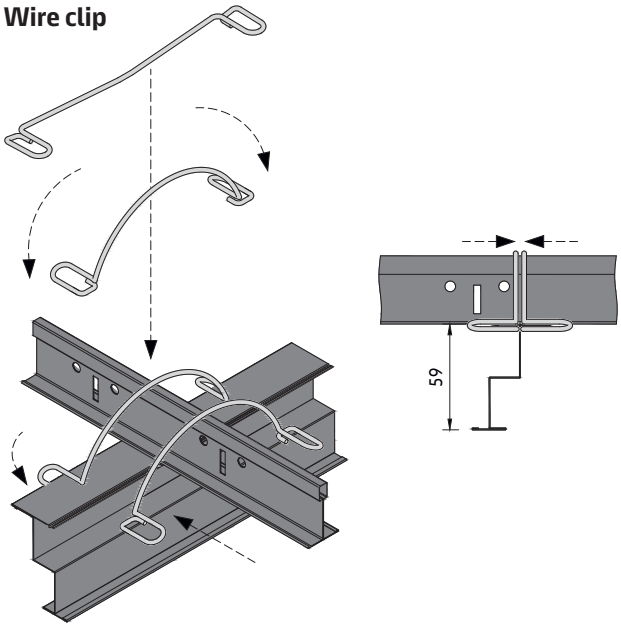




Push the splice connector between both ends of the Z-Profiles so that it is centred during the joint.

Detail E

Wire clip



The Z-Profiles are fixed to the Main Runners with wire clips. The wire clips are delivered as flat wires and shaped on site and get fully pushed onto the upper leg of the Z-Profile.

Material required per m² (no waste included)

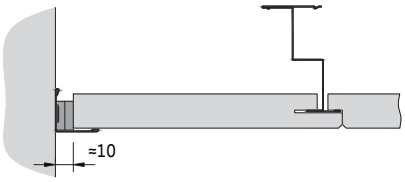
System without additional load [pcs/m²]

Components	Module length [mm]	600 x 600	625 x 625	1200 x 600	1250 x 625
T-Grid Main Runner	[m/m²]	0.84	1.60	0.84	0.80
Z-Profile	[m/m²]	1.67	1.60	1.67	1.60
Splice connector for Z-Profile	[pcs/m²]	0.42	0.40	0.42	0.40
Wire clip	[pcs/m²]	2.78	2.56	2.78	2.56
Suspension points (C)	[pcs/m²]	0.70	0.64	0.70	0.64
L-Profile	[pcs/m²]	5.56	5.12	2.78	2.56
Perimeter wedge	[pcs/m²]	0.50	0.50	0.50	0.30

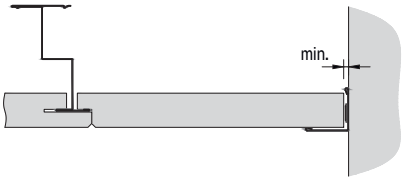
The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout. The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others. Not including perimeter trims.

Detail F

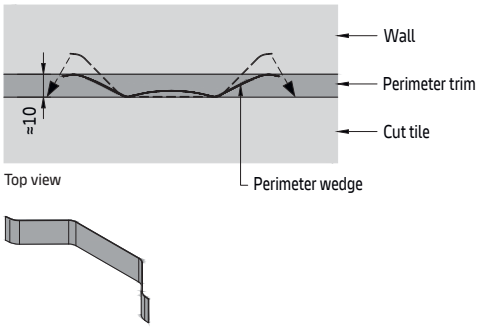
F1 - Perimeter detail with perimeter wedge



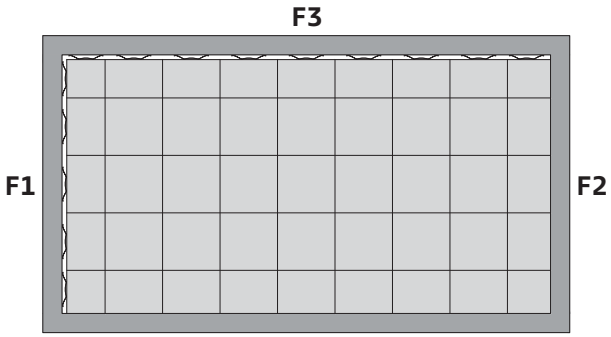
F2 - Perimeter detail without perimeter wedge



F3 - Perimeter wedge

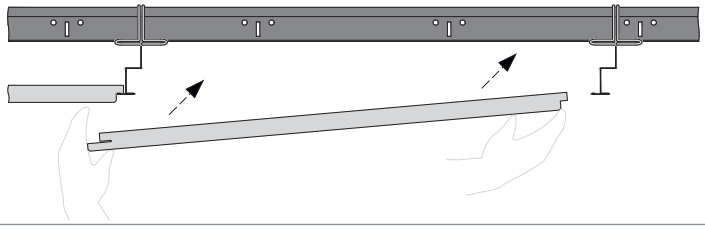


The perimeter cut tiles are installed and held in place using a perimeter wedge to ensure that they do not move. The wedge presses the opposite edge of the tile tightly against the grid system ensuring no tile movement at the perimeter. Suitable pliers can be used to “gloosen” the wedge to ease installation, reducing effort and time. A perimeter wedge is required for every cut tile. This also applies to tiles in corners. The wedge is required irrespective of whether L-perimeter trim or shadowline trim is used. Cut tiles without wedges can move as a result of building movement or maintenance. It can only be omitted if it is ensured that the tiles cannot slip or that there are no visible joints.
The simplest method of installing the wedge is immediately after the installation of each tile from the adjacent field. This can be carried out for all tiles, including corner tiles, except the last tiles in a row (=penultimate tile, marked in the ceiling layout with a border). For the last tile, the wedge should be installed before the tile and is then pressed onto the perimeter trim as the tile is pushed into position. Tiles can be installed optionally without a perimeter wedge by cutting them to size so that the minimum possible distance to the wall is maintained to prevent the tiles from shifting horizontally, creating an open joint between the tiles and possibly causing them to fall down.

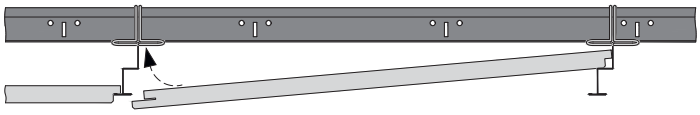


Detail G

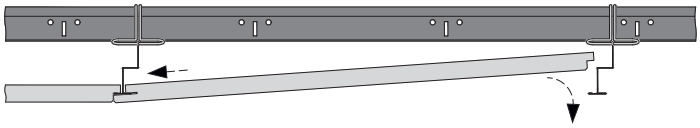
Tile insertion

1 

Insert the tile diagonally.

2 

Insert the concealed L-Profile into the kerf of the tile, as shown in detail B1, however it should be displaced by 40 - 50 mm (detail G1).
This is necessary so that the concealed L-Profile sits on the Z-Profile and does not hinder the further installation. Prepared like this, the tile can be manoeuvred into the ceiling void and the protruding concealed L-Profile lay onto the Z-Profile.

3 

Rest the tile on the Z-Profile.

4 

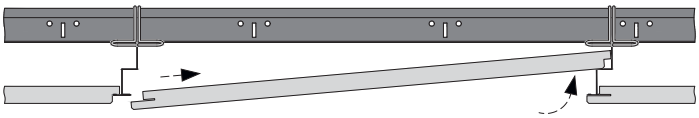
Repeat the process.

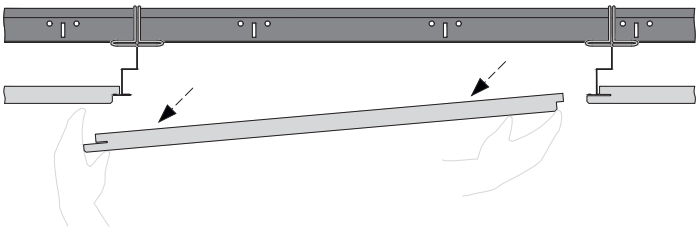
Detail G1

Tile extraction

1 

Lift the tile so that it can be removed from the Z-Profile.

2 

3 

Remove it diagonally downwards.

PET Centre, Imaging Diagnostic Centre, Oncology Institute of Vojvodina, Serbia © Aleksandar Milutinović

Free Span Corridor Ceilings

MINERAL Board
MINERAL Tegular

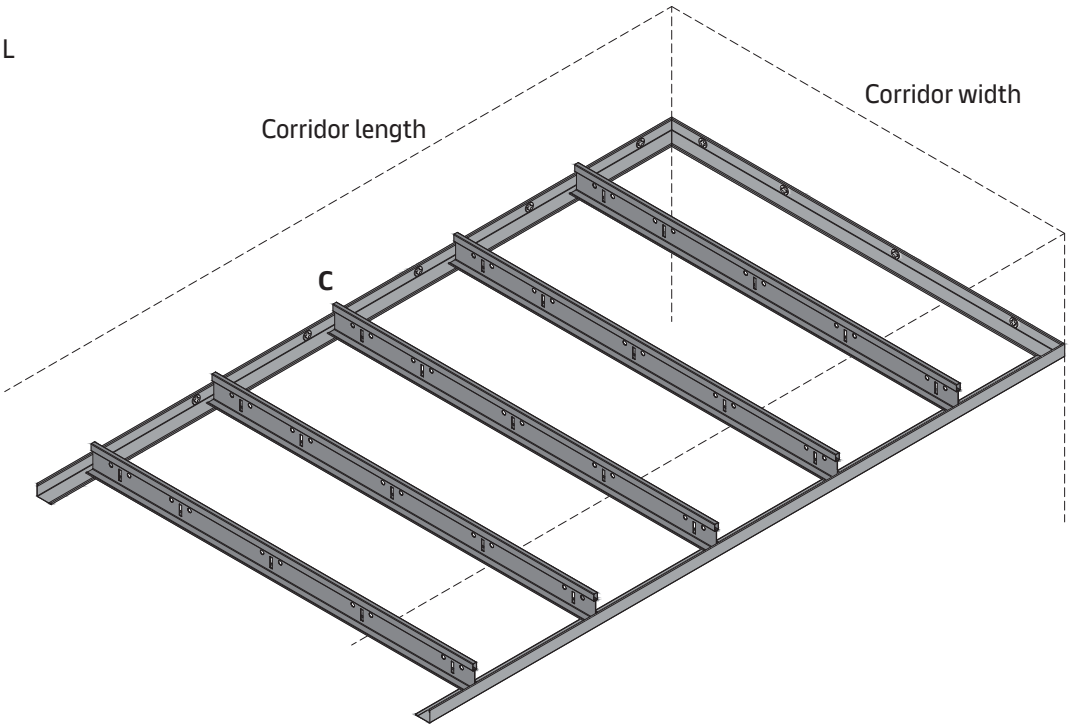
24 mm T-Grid on perimeter trim
Corridor solution for indoor applications

General information

- Exposed lay-in grid system for corridors
- Range of perimeter trims
- Typical ceiling weight 2.6 - 12 kg/m² (indicative value for panels, without additional load)
- Panels are easily installed and fully demountable
- Only for horizontal ceiling surfaces, without inclination
- Systems can be installed with hold down clips to prevent movement
- Seismic, impact and fire resistance design application available, see separate documents

Isometric view

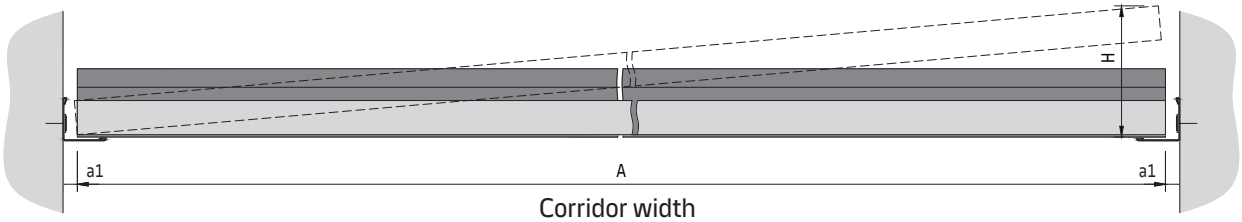
Example with perimeter L



Standard layout

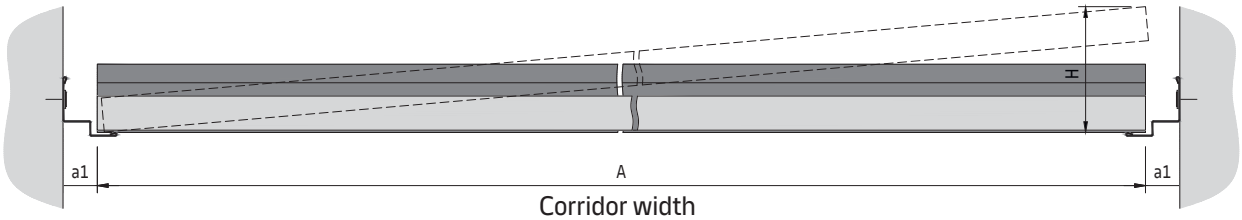
MINERAL Board
MINERAL Tegular
D01.400

Section A
Example with MINERAL Board and perimeter L



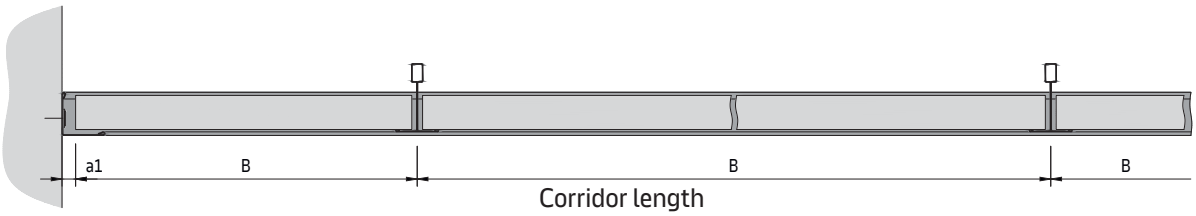
Corridor width

Section A
Example with MINERAL Board and shadowline perimeter



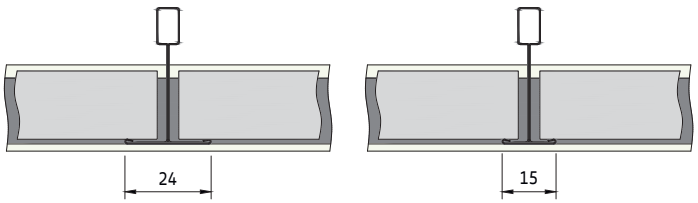
Corridor width

Section B
Example with MINERAL Board and perimeter L

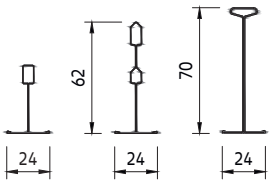


Corridor length

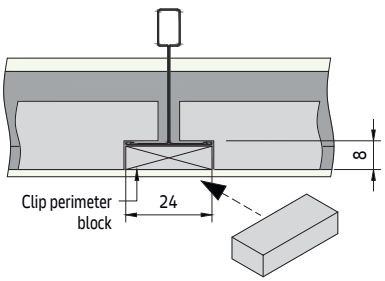
MINERAL Board
Installed on 24 mm T-Grid



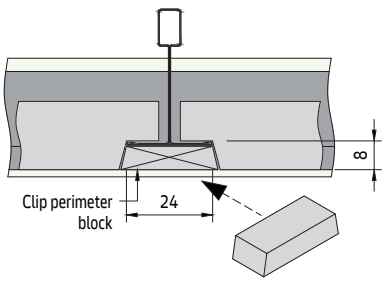
T-Grid



MINERAL Tegular 24/90
Tiles with 8 mm rebate
Installed on 24 mm T-Grid



MINERAL Tegular 24
Tiles with 8 mm rebate
Installed on 24 mm T-Grid



When using an L-perimeter trim, the T-Grid rests on a clip perimeter block.

MINERAL Board
MINERAL Tegular
D01.400

How to define the panel length (A)
Measure the corridor width. The distance measured at the widest point is used to define the panel length.
Panel length (A) = corridor width - 2x a1
In the narrower corridor areas, the panels may have to be cut to size.
See perimeter trim range for (a1) distances, perimeter trim options and detailed information.

Parameters
a Distance from wall to panel (depending on the selected perimeter trim)
X Distance between perimeter trim fixing points to wall
A Panel length
B Panel width

Grid components
- T-Grid Main Runner
- Perimeter trim / shadowline perimeter trim

Max. panel length

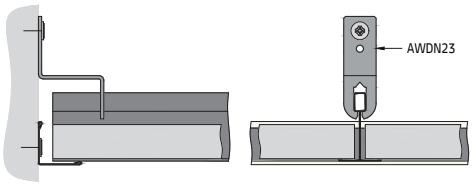
		Panel weight [kg/m²]		
Profile		**5,5**	**7,5**	**9,5**
24 mm T-Grid	[mm]	1930	1800	1740
24/62 mm T-Grid	[mm]	2500	2500	2500
24/70 mm T-Grid	[mm]	2500	2500	2500

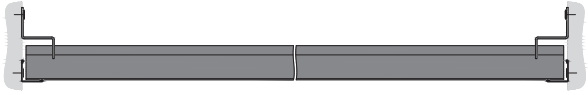
Material required per m² (no waste included)

	Module width [mm]	**300**				**312.5**			
Components	**Module length [mm]**	**1200**	**1800**	**2000**	**2500**	**1250**	**1800**	**2000**	**2500**
T-Grid Main Runner	[m/m²]	3.34	3.34	3.34	3.34	3.20	3.20	3.20	3.20
Clip perimeter block	[pcs/m²]	5.56	3.70	3.33	2.67	5.33	3.56	3.20	2.56
Double bent T-bar hanger (each profile)	[pcs/m²]	5.56	3.70	3.33	2.67	5.33	3.56	3.20	2.56

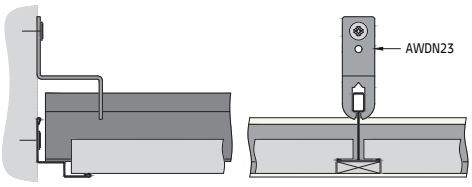
Detail C

C1 - MINERAL Board example with L-perimeter trim





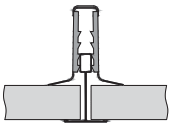
C2 - MINERAL Tegular 24/90 example with shadowline perimeter trim



National regulations
Please take into account and inform yourself in advance about further national requirements. For free-spann corridor solutions it may be necessary to additionally secure profiles in the perimeter area, by using AWDN23 accessories. In this case, the support on a perimeter trim is not sufficient.

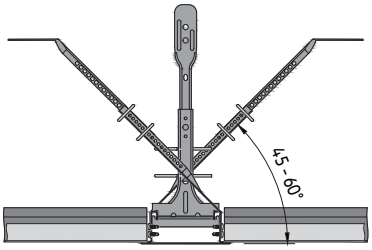
MINERAL Board
MINERAL Tegular
D01.400

Detail D
Example with MINERAL Board



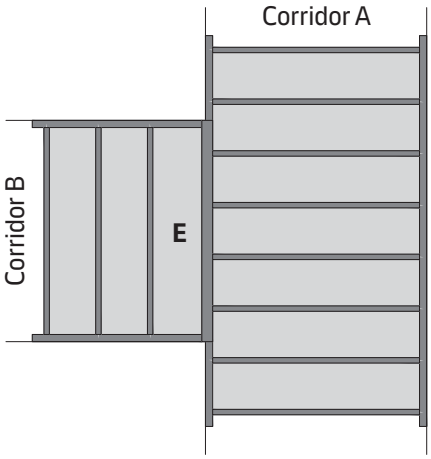
In areas with open windows, doors or atriums where there is the possibility of substantial pressure differentials, the ceiling panels should be held in place with hold down clips (approx. 6 pcs./m²). After the ceiling panels have been installed, the clips are pressed onto the T-Grid until the clip sits firmly against the panel.

Detail E
Transition with Bandraster



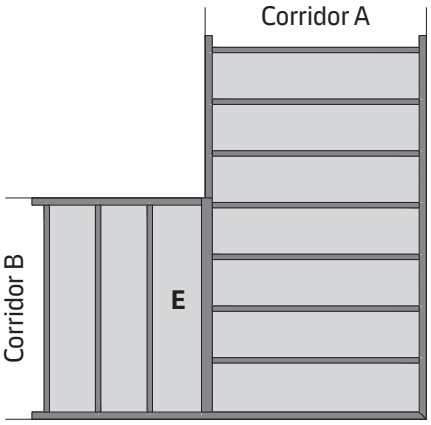
With T-junctions and corners you can use a Bandraster for the transition. Bandrasters are available in different widths, the narrowest version being 50 mm. Nonius angle bracings are used in connection with Nonius upper parts as cross-bracing. These are screwed to the Bandraster from the outside with two self-screwing screws 3.9 x 9 mm. The Nonius upper part is then fixed with suitable fixings. For a rigid construction, two security pins have to be used. Upper and lower parts must overlap by a minimum of 40 mm. The angle braces are to be installed alternately, at an angle of 45 - 60°. For detailed information see separate document for Bandraster. The cut panel length is shorter in the Bandraster area than in the perimeter trim. Make sure that the panel length in the transition area is adjusted so that the panels cannot fall down.

T-junction



Corridor A runs through, corridor B connects to it and forms a T-junction.

Corner



Corridor A runs to the end, corridor B connects to it and forms a transition.

MINERAL K2C2

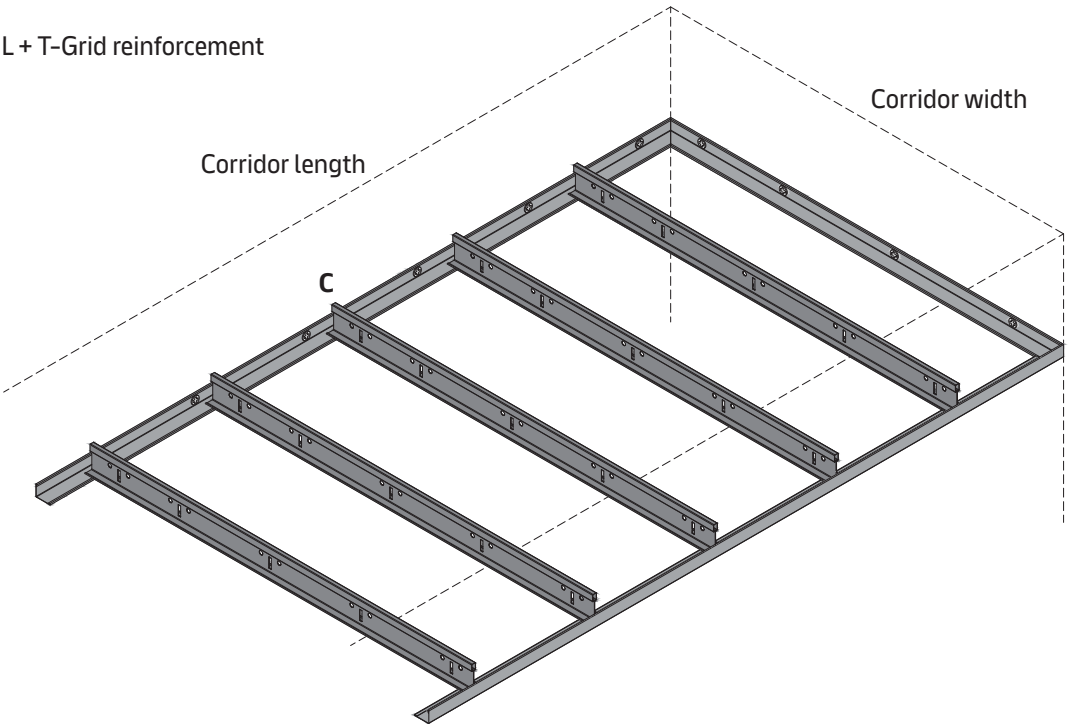
T-Grid, Z-Profile or U-Profile reinforcement on perimeter trim
Corridor solution for indoor applications

General information

- Concealed lay-in grid system for corridors
- Range of perimeter trims
- Typical ceiling weight 3.8 - 8.6 kg/m² (indicative value for panels, without additional load)
- Panels are mostly easily installed and fully demountable
- Only for horizontal ceiling surfaces, without inclination
- Impact and fire resistance design application available, see separate documents

Isometric view

Example with perimeter L + T-Grid reinforcement



Standard layout

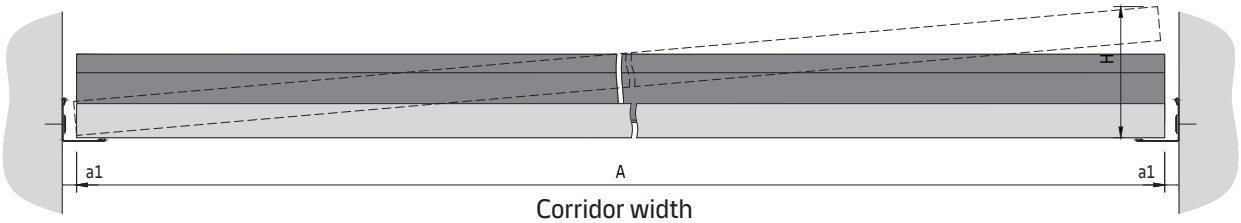
Installation height (H) for U-Profile reinforcement

Perimeter trim	Panel length (A) [mm]	
	≤1800	>1800
L-perimeter trim	250	350
Shadowline perimeter trim	100	150

The shown values are min. needed heights.

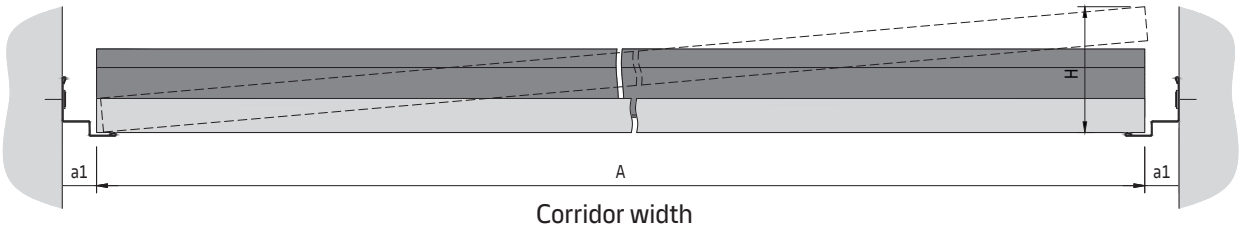
MINERAL K2C2
D01.402

Section A
Example with perimeter L + T-Grid reinforcement



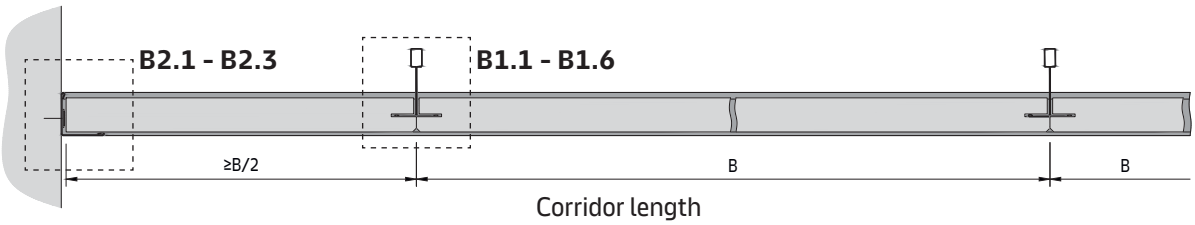
Corridor width

Section A
Example with shadowline perimeter + T-Grid reinforcement



Corridor width

Section B
Example with perimeter L + T-Grid reinforcement



Corridor length

How to define the panel length (A)
Measure the corridor width. The distance measured at the widest point is used to define the panel length.
Panel length (A) = corridor width - 2x a1
In the narrower corridor areas, the panels may have to be cut to size.
See perimeter trim range for perimeter trim options and detailed information.

Parameters
a1 Distance from wall to panel, max. 1/3 of the perimeter width (depending on the selected perimeter trim)
X Distance between perimeter trim fixing points to wall
A Panel length
B Panel width

Grid components
Standard components
- \- T-Grid / Z-Profile / U-Profile
- \- Perimeter trim / shadowline perimeter trim

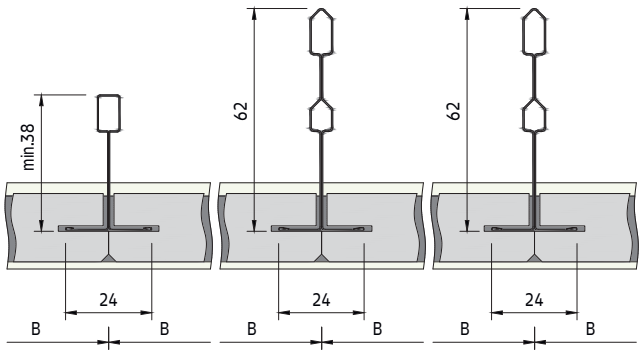
Optional components
- AWDN23 Double bent T-bar hanger

Module lengths per panel weight

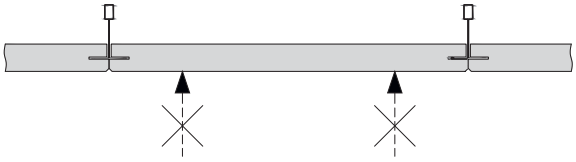
Profile		Panel weight [kg/m²]	
		7,5	9,5
24 mm T-Grid	[mm]	1800	1740
24/62 mm T-Grid	[mm]	2500	2500
24/70 mm T-Grid	[mm]	2500	2500
30 mm Z-Profile	[mm]	1800	1800
66 mm Z-Profile	[mm]	2500	2500
38 mm U-Profile	[mm]	2500	2410

T-Grid reinforcement options

B1.1 **B1.2** **B1.3**

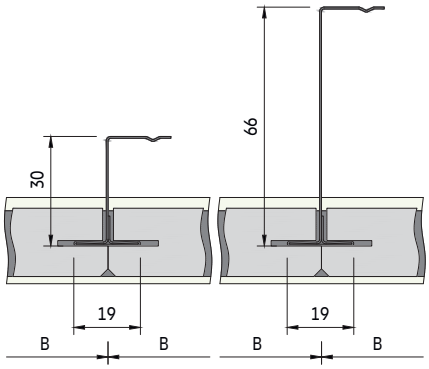


These are typical examples of T-Grid, Z-Profiles and U-Profiles. The profile type is depending on the panel length and weight. Detailed information and available options can be found in the product datasheets. Depending on the reinforcement profile used, the panels may be demountable or non-accessible. If T-Grid or Z-Profiles are used as reinforcement profiles, the panels cannot be removed after installation as they are joined to the adjacent tiles via the profile.

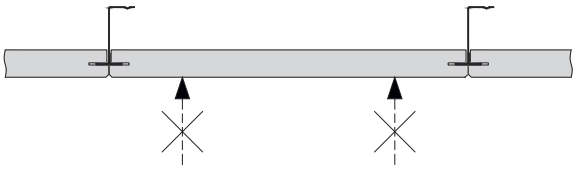


Z-Profile reinforcement options

B1.4 **B1.5**

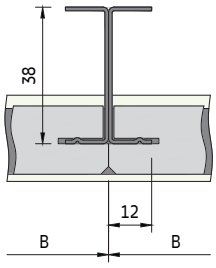


When using Z-Profiles, ensure that the profiles are installed as in B1.4 / B1.5. If the profile is reversed, it could cause an obstruction when removing the panels.

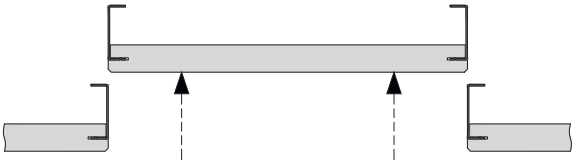


U-Profile reinforcement option

B1.6



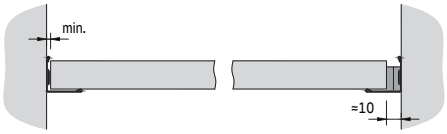
If the panels need to be demountable when using the K2C2 edge, a U-Profile can be used (two profiles required per panel). The option with U-Profiles and a shadowline perimeter trim results in the lowest installation height.



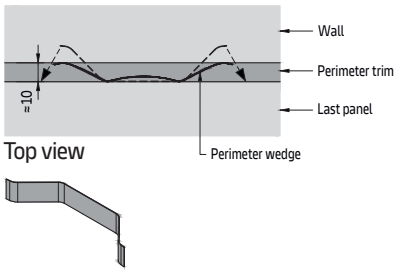
Perimeter wedge

Example with MINERAL Board

B2.1 - First panel **B2.2 - Last panel**



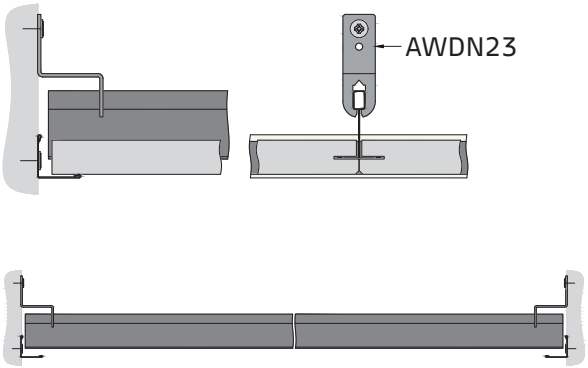
B2.3 - Perimeter wedge



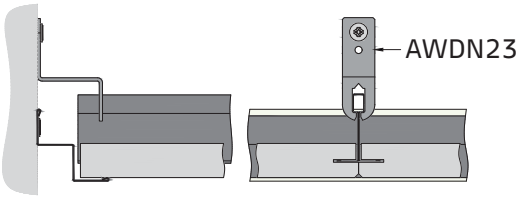
The first panel is cut to size so that the minimum possible distance to the wall is used and the panel cannot shift horizontally and possibly fall down.
The last panel is secured against slipping with a perimeter wedge. The perimeter wedge presses the opposite edge of the panel firmly against the neighboring panel and ensures that it does not move. Using suitable pliers, the wedge can be “loosened” to make assembly easier and thus save effort and time.

Detail C

C1 - Example with L-perimeter trim + T-Grid reinforcement



C2 - Example with shadowline perimeter trim + T-Grid reinforcement



National regulations
Please take into account and inform yourself in advance about further national requirements. For free-spann corridor solutions it may be necessary to additionally secure profiles in the perimeter area, by using AWDN23 accessories. In this case, the support on a perimeter trim is not sufficient.

Material required per m² (no waste included)

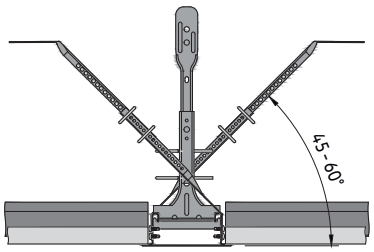
System without additional load [pcs/m²]

	Module width [mm]	300				312.5			
Components	**Module length [mm]**	**1200**	**1800**	**2000**	**2500**	**1250**	**1800**	**2000**	**2500**
T-Grid / Z-Profile	[m/m²]	3.34	3.34	3.34	3.34	3.20	3.20	3.20	3.20
U-Profile	[m/m²]	6.68	6.68	6.68	6.68	6.40	6.40	6.40	6.40
Double bent T-bar hanger	[pcs/m²]	5.56	3.70	3.33	2.67	5.12	3.56	3.20	2.56

The shown quantities are theoretical and based on an ideal layout, without considering the actual room layout. The ideal layout is based on a calculation of 10 x 10 m (100 m²). This calculation does not allow any damage, spare nor wastage. The final quantities and type of suspension have to be checked before ordering. Soffit and wall fixings by others.
Not including perimeter trims.

Detail D

Transition with Bandraster

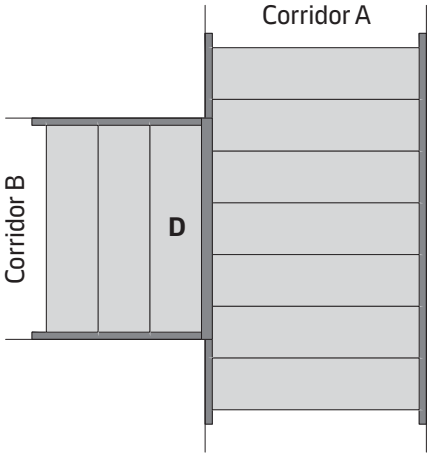


With T-junctions and corners you can use a Bandraster for the transition. Bandrasters are available in different widths, the narrowest version being 50 mm.

Nonius angle bracings are used in connection with Nonius upper parts as cross-bracing. These are screwed to the Bandraster from the outside with two self-screwing screws 3.9 x 9 mm. The Nonius upper part is then fixed with suitable fixings. For a rigid construction, two security pins have to be used. Upper and lower parts must overlap by a minimum of 40 mm. The angle braces are to be installed alternately, at an angle of 45 - 60°. For detailed information see separate document for Bandraster.

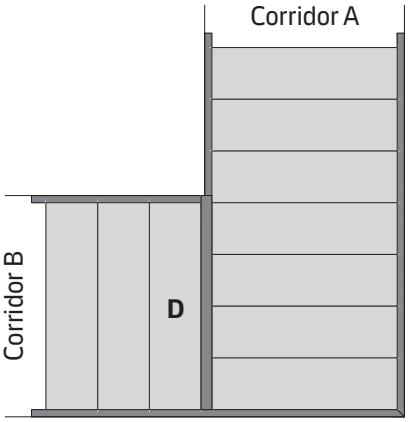
The cut panel length is shorter in the Bandraster area than in the perimeter trim. Make sure that the panel length in the transition area is adjusted so that the panels cannot fall down.

T-junction



Corridor A runs through, corridor B connects to it and forms a T-junction.

Corner



Corridor A runs to the end, corridor B connects to it and forms a transition.

BASF Medical Center Ludwigshafen, Germany © Thilo Ross

MINERAL SL2

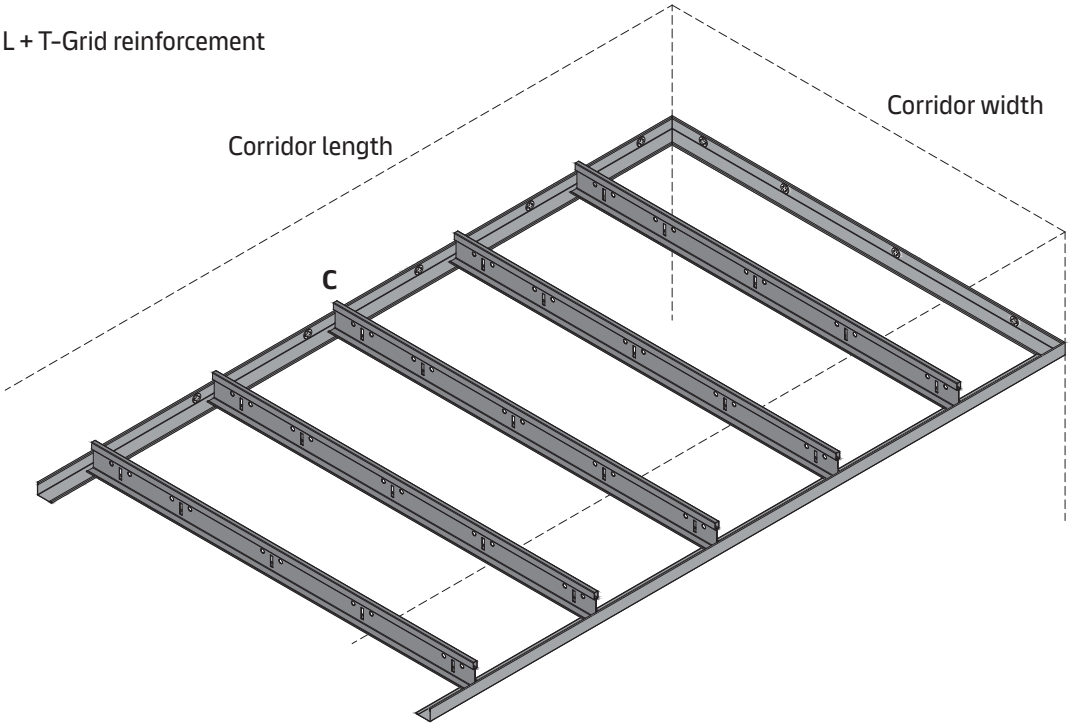
T-Grid or Z-Profile reinforcement on perimeter trim
Corridor solution for indoor applications

General information

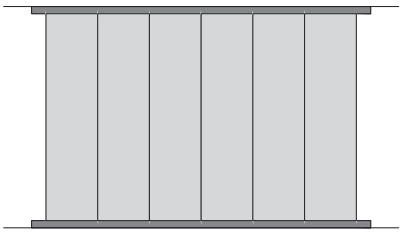
- Range of perimeter trims
- Typical ceiling weight 5.0 - 8.6 kg/m² (indicative value for panels, without additional load)
- Panels are mostly easily installed and fully demountable
- Only for horizontal ceiling surfaces, without inclination
- Impact and fire resistance design application available, see separate documents

Isometric view

Example with perimeter L + T-Grid reinforcement



Standard layout



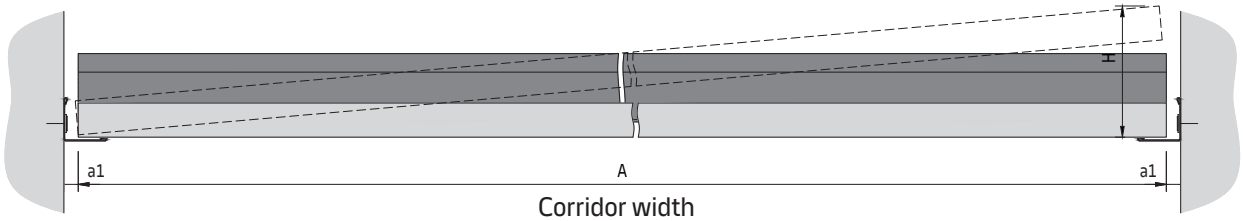
Installation height (H)

Perimeter trim	Panel length (A) [mm]	
	≤1800	>1800
Shadowline perimeter trim	300	350
Double bent T-bar hanger	150	200

The shown values are min. needed heights.

Section A

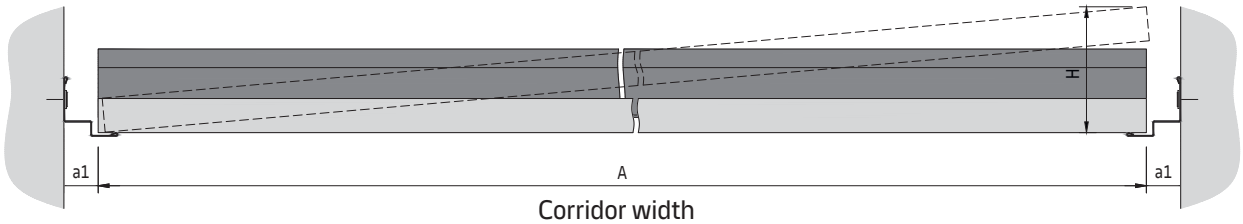
Example with perimeter L + T-Grid reinforcement



Corridor width

Section A

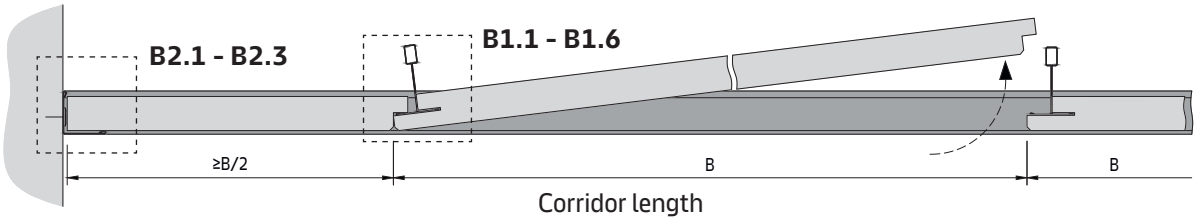
Example with shadowline perimeter + T-Grid reinforcement



Corridor width

Section B

Example with perimeter L + T-Grid reinforcement



Corridor length

How to define the panel length (A)

Measure the corridor width. The distance measured at the widest point is used to define the panel length.
Panel length (A) = corridor width - 2x a1
In the narrower corridor areas, the panels may have to be cut to size.
See perimeter trim range for perimeter trim options and detailed information.

Parameters

a1 Distance from wall to panel, max. 1/3 of the perimeter width (depending on the selected perimeter trim)
X Distance between perimeter trim fixing points to wall
A Panel length
B Panel width

Grid components

Standard components

- \- T-Grid / Z-Profile
- \- Perimeter trim / shadowline perimeter trim

Optional components

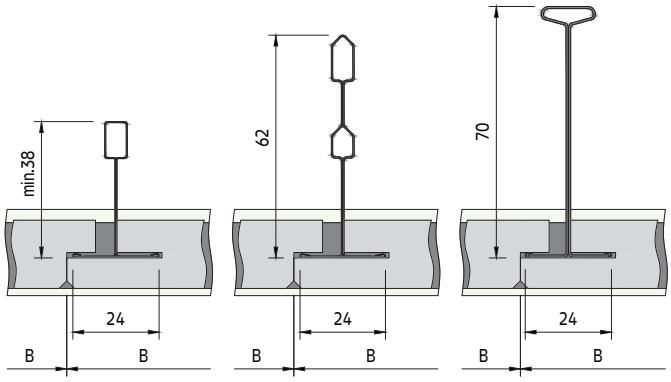
- AWDN23 Double bent T-bar hanger

Module lengths per panel weight

Profile		Panel weight [kg/m²]	
		7,5	9,5
24 mm T-Grid	[mm]	1800	1740
24/62 mm T-Grid	[mm]	2500	2500
24/70 mm T-Grid	[mm]	2500	2500
30 mm Z-Profile	[mm]	1800	1800
66 mm Z-Profile	[mm]	1800	1800

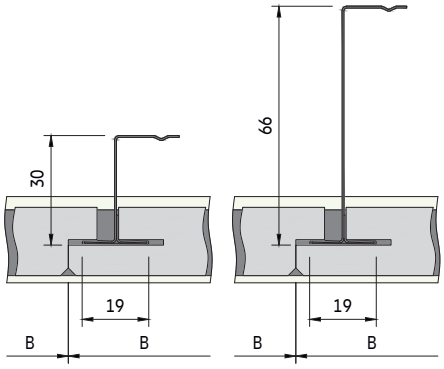
T-Grid reinforcement options

B1.1 **B1.2** **B1.3**



Z-Profile reinforcement options

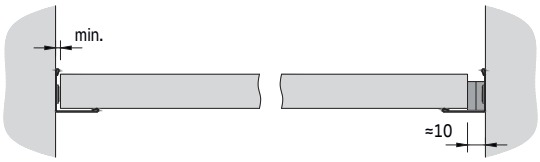
B1.4 **B1.5**



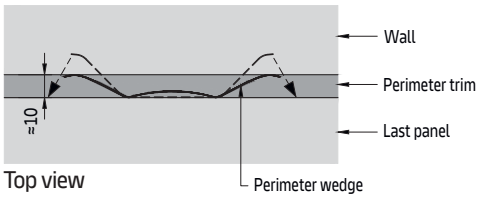
These are typical examples of T-Grid and Z-Profiles. The profile type is depending on the panel length and weight. Detailed information and available options can be found in the product datasheets. When using Z-Profiles, ensure that the profiles are installed as in B1.4 - B1.5. If the profile is reversed, it could cause an obstruction when removing the panels.

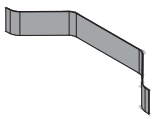
Perimeter wedge

B2.1 - First panel **B2.2 - Last panel**



B2.3 - Perimeter wedge





The first panel is cut to size so that the minimum possible distance to the wall is used and the panel cannot shift horizontally and possibly fall down. The last panel is secured against slipping with a perimeter wedge. The perimeter wedge presses the opposite edge of the panel firmly against the neighbouring panel and ensures that it does not move. Using suitable pliers, the wedge can be "loosened" to make assembly easier and thus save effort and time.

Material required per m² (no waste included)

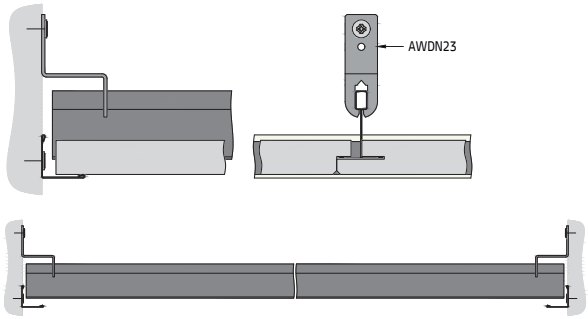
System without additional load [pcs/m²]

Components	Module width [mm]	300				312.5			
	Module length [mm]	1200	1800	2000	2500	1250	1800	2000	2500
T-Grid / Z-Profile	[m/m²]	3.34	3.34	3.34	3.34	3.20	3.20	3.20	3.20
Double bent T-bar hanger	[pcs/m²]	5.56	3.70	3.33	2.67	5.33	3.56	3.20	2.56

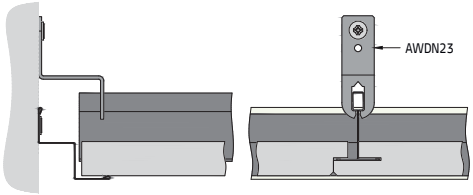
The shown quantities are theoretical and based on an ideal layout, without considering the actual corridor layout. This calculation does not allow any damage, spare nor wastage. The final quantities have to be checked before ordering. Wall fixings by others. Not including perimeter trims.

Detail C

C1 - Example with L-perimeter trim + T-Grid reinforcement



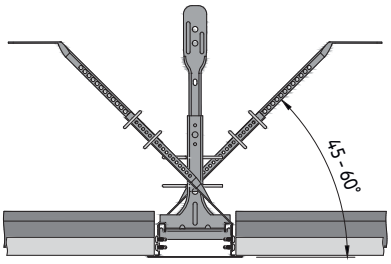
C2 - Example with shadowline perimeter trim + T-Grid reinforcement



National regulations
Please take into account and inform yourself in advance about further national requirements. For free-spann corridor solutions it may be necessary to additionally secure profiles in the perimeter area, by using AWDN23 accessories. In this case, the support on a perimeter trim is not sufficient. By using this accessory, access to the ceiling cavity is no longer guaranteed.

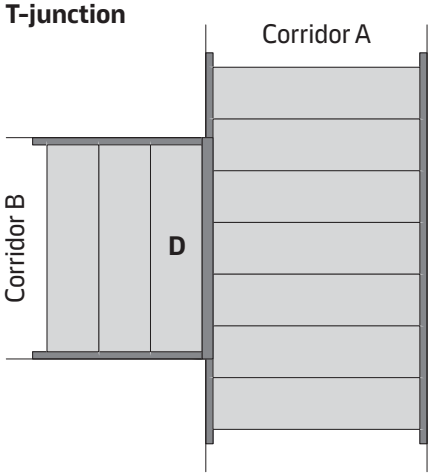
Detail C

Transition wth Bandraster



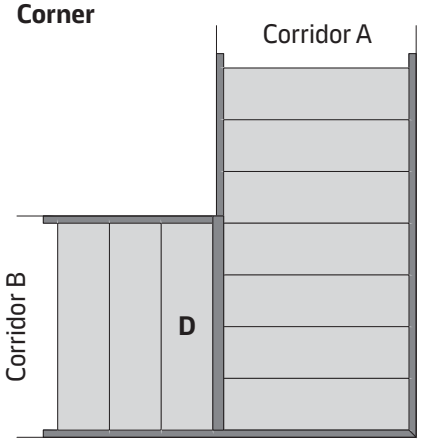
With T-junctions and corners you can use a Bandraster for the transition. Bandrasters are available in different widths, the narrowest version being 50 mm.
Nonius angle bracings are used in connection with Nonius upper parts as cross-bracing. These are screwed to the Bandraster from the outside with two self-screwing screws 3.9 x 9 mm. The Nonius upper part is then fixed with suitable fixings. For a rigid construction, two security pins have to be used. Upper and lower parts must overlap by a minimum of 40 mm. The angle braces are to be installed alternately, at an angle of 45 - 60°. For detailed information see separate document for Bandraster.
The cut panel length is shorter in the Bandraster area than in the perimeter trim. Make sure that the panel length in the transition area is adjusted so that the panels cannot fall down.

T-junction



Corridor A runs through, corridor B connects to it and forms a T-junction.

Corner



Corridor A runs to the end, corridor B connects to it and forms a transition.

Cantonal School Chur, Switzerland © Foto Lautenschlager

Floating Ceilings – Canopies

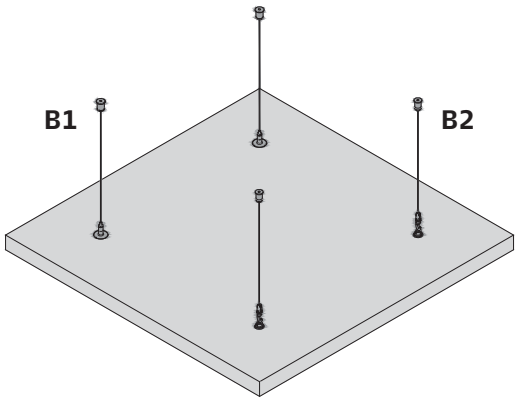
MINERAL Sonic Element

Hanging wire
Single canopy solution for indoor applications

General information

- Hanging wire for single suspension in open spaces
- Typical canopy weight 6.0 kg/m² (indicative value without additional load)
- Canopies are easily installed and fully demountable
- Acoustic & design elements
- Only for horizontal ceiling surfaces, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

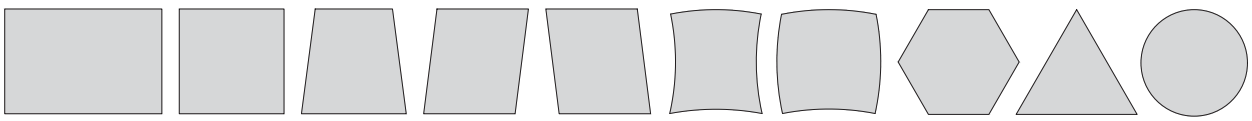
Isometric view



Important information

The hanging wires are supplied in a length of 1000 mm. Further lengths are available on request. Please make sure that the visible side is protected during the assembly and cannot be scratched. The canopies must always be stored on a dry and flat surface and can either be stacked (max 8 pieces) or stand on the long edge (no stacking permitted). In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of canopies, the elements must always be carried by two when removing the packaging and at all times when handling the canopies, clean white cotton gloves should be worn. For standard shapes, every package includes a positioning device to mark the suspension points. The canopy was designed for horizontal installation. Since these are single canopies, a lateral distance of at least 200 mm is recommended for installation. The rear side of the canopy is not delivered in the same quality as the visible side (below). This should be taken into account if it is visible.

Standard shapes



Components

Standard components

- TS-1 Hanging wire
- SAE-GHD 1 Hanging wire
- CS7051A Spiral anchor

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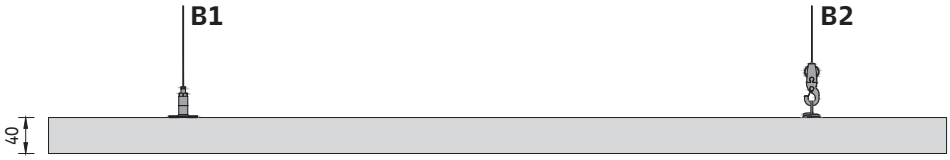
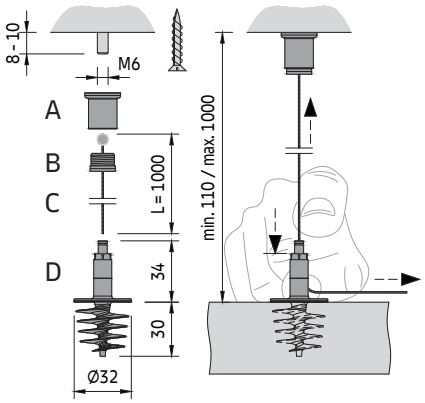
Section A



Detail B1

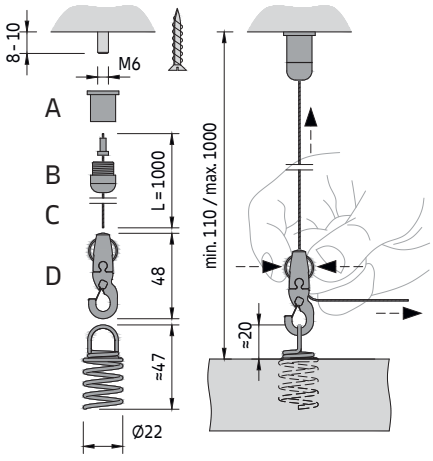
TS-1 hanging wire installation



1. Place an M6 threaded bolt on the raw ceiling or use alternative a wood screw to fix the structure gripper anchor (A) (not offered by Knauf Ceiling Solutions).
2. Take the hanging wire (C) and loop it through the top of the gripper anchor cap (B).
3. Screw the gripper anchor cap (B) onto the structure gripper anchor (A).
4. Screw the spiral anchor (D) clockwise into the back of the canopy, until it rests flush. Caution: Do not overtighten!
5. Guide the hanging wire (C) into the spiral anchor (D). Pull the wire through the height adjustor, in an angle of ≈90°. Do not pull the wire upwards, otherwise it may be damaged. Make sure that the wires are pulled tight so that the weight of the canopy is evenly distributed.
6. Then either roll up the wire and deposit it on the canopy or cut it away. After cutting it away, it can no longer be adjusted in height. Repeat this for all suspension points. The hanging wire can be subsequently shortened using the height adjuster.

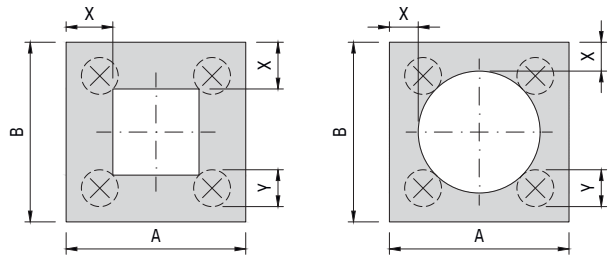
Detail B2

SAE-GHD 1 hanging wire installation



1. Place an M6 threaded bolt on the raw ceiling or use alternative a wood screw to fix the structure gripper anchor (A) (not offered by Knauf Ceiling Solutions).
2. Take the hanging wire (C) and loop it through the top of the gripper anchor cap (B).
3. Screw the gripper anchor cap (B) onto the structure gripper anchor (A).
4. Screw the spiral anchor (CS7051A) clockwise into the back of the canopy. The spiral anchor should protrude ≈20 mm. Caution: Do not overtighten or undertighten!
5. Guide the hanging wire (C) into the height adjustor with carabiner (D). Pull the wire through the height adjustor, in an angle of ≈90°. Do not pull the wire upwards, otherwise it may be damaged. Make sure that the wires are pulled tight so that the weight of the canopy is evenly distributed.
6. Then either roll up the wire and deposit it on the canopy or cut it away. After cutting it away, it can no longer be adjusted in height. Repeat this for all suspension points. The hanging wire can be subsequently shortened using the height adjuster.

Cut-outs for service integrations



Distance from cut-out to canopy edge (X) = min. 300 mm
Distance from cut-out to suspension point (Y) = min. 100 mm
Service integrations >0.3 kg must be suspended separately

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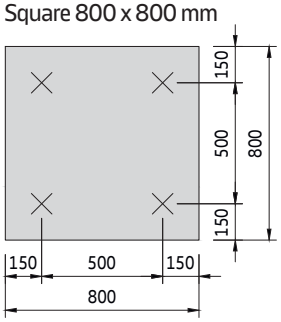
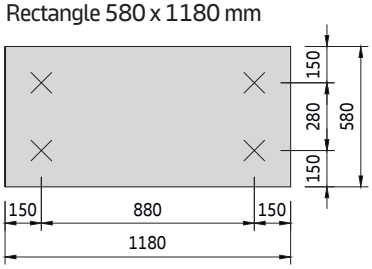
Standard shapes

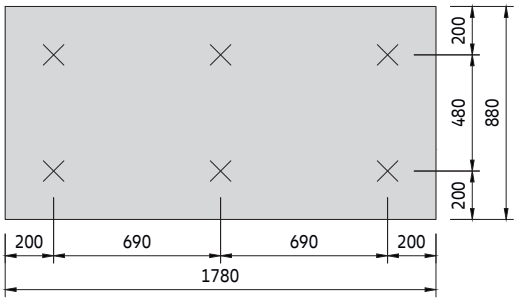
Square 800 x 800 mm



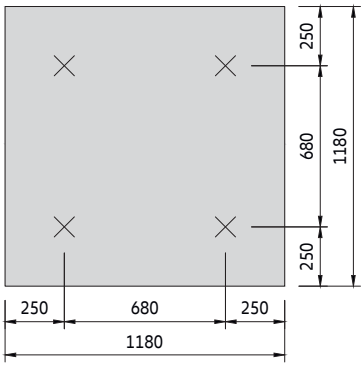
Rectangle 580 x 1180 mm



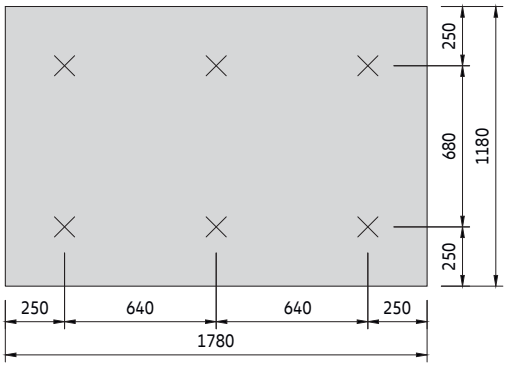
Rectangle 880 x 1780 mm



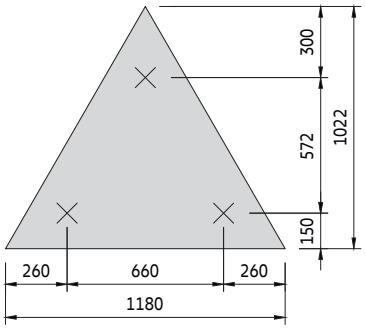
Square 1180 x 1180 mm



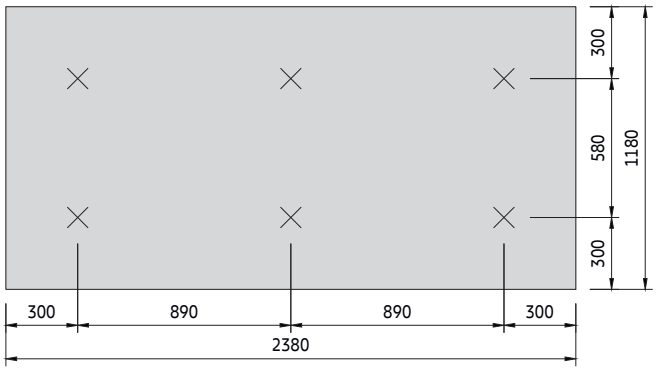
Rectangle 1180 x 1780 mm



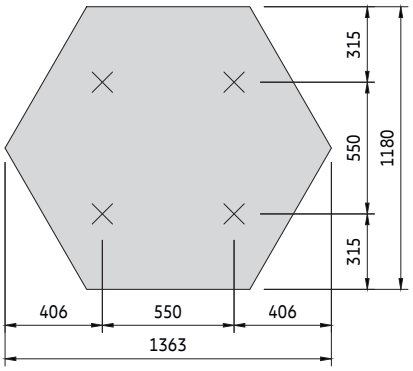
Triangle 1180 x 1022 mm



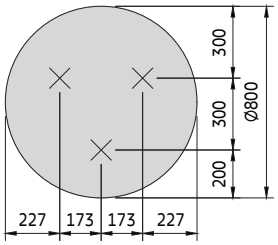
Rectangle 1180 x 2380 mm



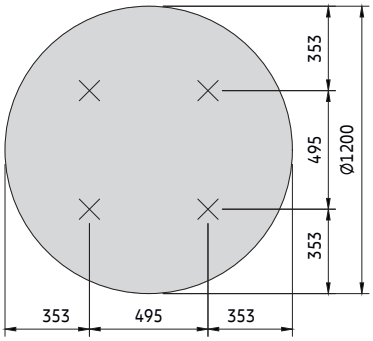
Hexagon 1363 x 1180 mm



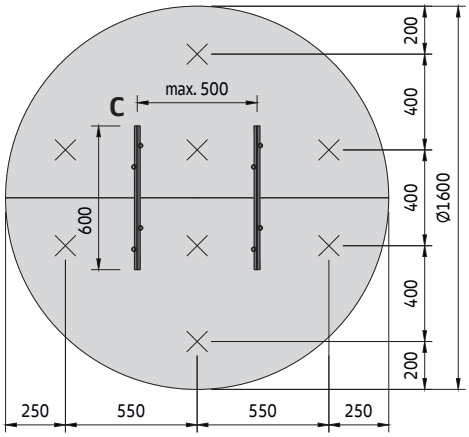
Circle Ø800 mm



Circle Ø1200 mm



Circle Ø1600 mm



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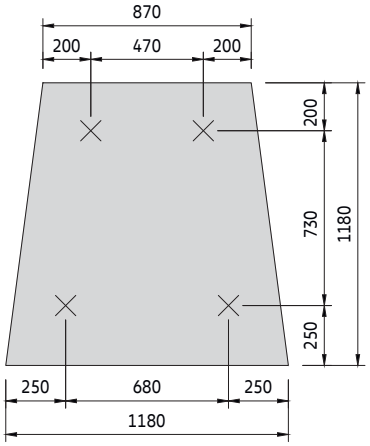
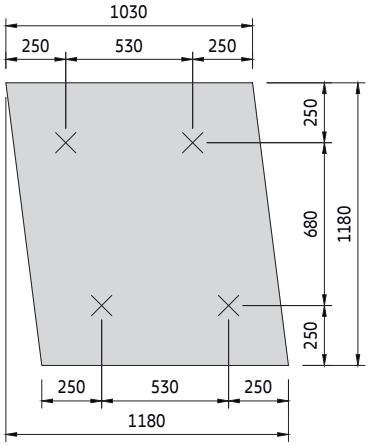
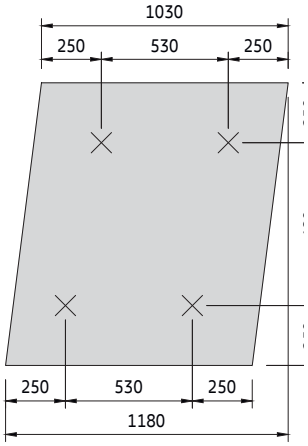
Trapezium 1180 x 1180 mm



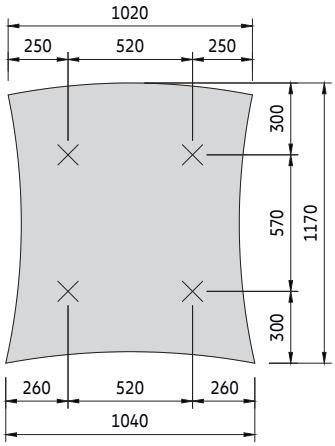
Left Parallelogram 1180 x 1180 mm



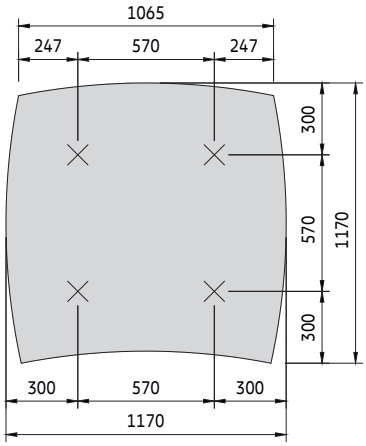
Right Parallelogram 1180 x 1180 mm



Convex 1040 x 1170 mm

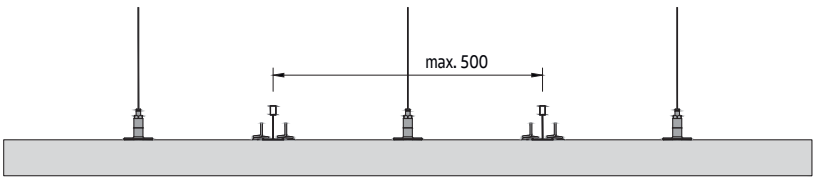


Concave 1040 x 1170 mm



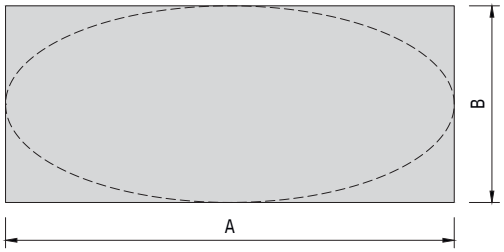
Detail C

Circle Ø1600 mm connection detail



The two canopy halves are connected by three 24 mm T-Grid with a length of 600 mm. The T-Grid are fixed to the back of the canopy with 4 spiral achors, two on the left and two on the right. The canopy halves may have tolerances and must therefore be aligned as best as possible on site.

Vario Design



Configurable parameters
Canopy length (A) = max. 2380 mm
Canopy width (B) = max. 1180 mm
(A) <1.5 m = 4x suspension points per canopy
(A) >1.5 m = 6x suspension points per canopy
Distance between suspension points = max. 900 mm
Custom shapes are available on request

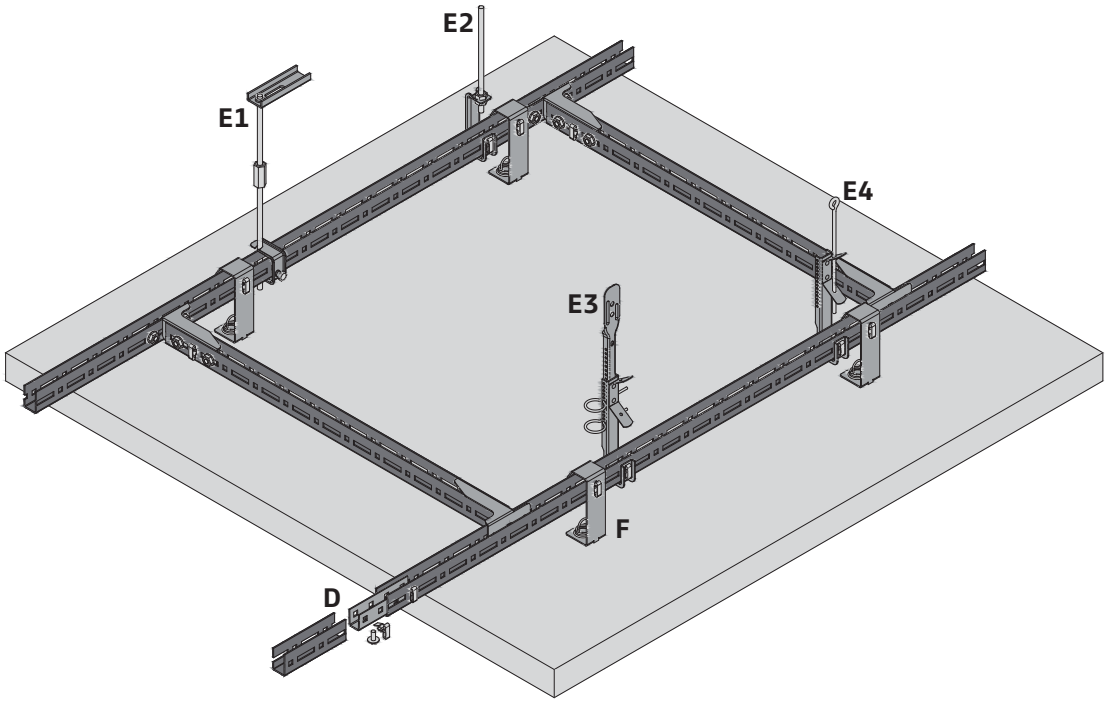
MINERAL Sonic Element

U-Profile cross-connected grid
Concealed grid solution for indoor applications

General information

- For grouped suspension in open spaces
- For perpendicular installation on U-Profile primary grid
- U-Profile made of galvanised steel
- Typical canopy weight 6.0 kg/m² (indicative value without additional load)
- Canopies are easily installed and fully demountable
- Acoustic & design elements
- Only for horizontal ceiling surfaces, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

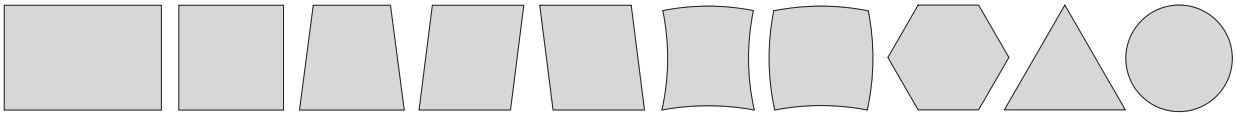
Isometric view



Important information

Please make sure that the visible side is protected during the assembly and cannot be scratched. The canopies must always be stored on a dry and flat surface and can either be stacked (max 8 pieces) or stand on the long edge (no stacking permitted). In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of canopies, the elements must always be carried by two when removing the packaging and at all times when handling the canopies, clean white cotton gloves should be worn. For standard shapes, every package includes a positioning device to mark the suspension points. The rear side of the canopy is not delivered in the same quality as the visible side (below). This should be taken into account if it is visible. It is recommended to draw the position of the U-Profiles, suspension points and hangers in advance using CAD.

Standard shape options



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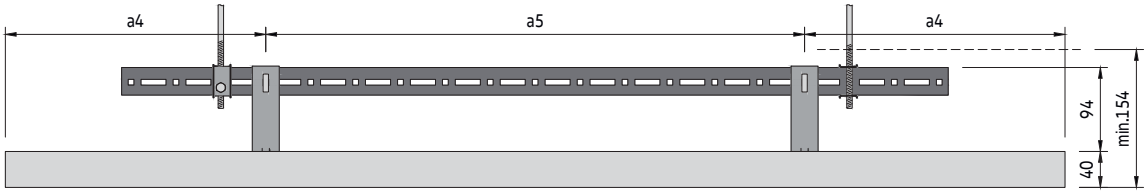
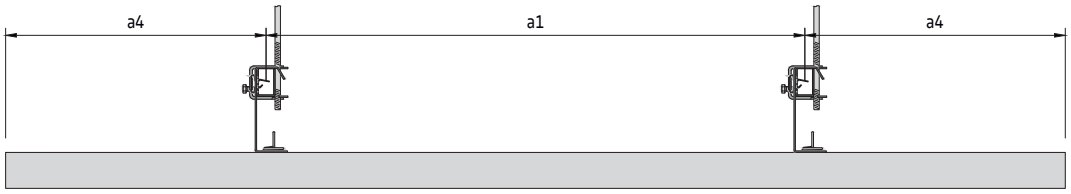
Section A

Example with suspension option E1



Section B

Example with suspension option E1



Grid components

Standard components

- M300100 U-Profile
- M300119 Splice connector for U-Profile
- M300140 Wall anchor
- M300120 Plug-in clip for U-Profile
- M311103 Hexagonal nut M6
- M311105 Washer
- M311303 Hexagonal bolt M6 x 16 mm
- CS7050A Hanger
- CS7051A Spiral anchor

Suspension option D1

- M300121 Clamping bracket for U-Profile
- M311101 Threaded rod M6 x 1000 mm
- M311315 Hexagonal extension nut M6 x 30 mm (optional)
- M311061 Suspension element (optional)

Suspension option D2

- M300366 Hanger for U-Profile
- M311103 Hexagonal nut M6
- M300120 Plug-in clip for U-Profile
- M311315 Hexagonal extension nut M6 x 30 mm (optional)
- M311061 Suspension element (optional)

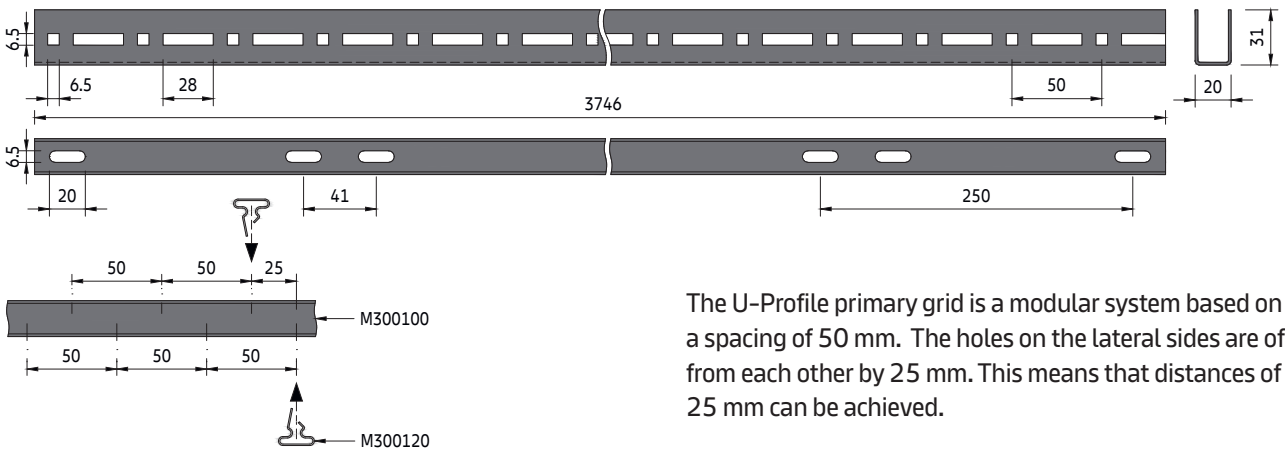
Suspension option D3

- M300166 Combi-Nonius hanger for U-Profile
- \- Nonius top part (various lengths)
- M300036 Nonius locking pin
- M300120 Plug-in clip for U-Profile

Suspension option D4

- M300166 Combi-Nonius hanger for U-Profile
- \- Eye wire (various lengths)
- M300120 Plug-in clip for U-Profile

U-Profile grid



The U-Profile primary grid is a modular system based on a spacing of 50 mm. The holes on the lateral sides are offset from each other by 25 mm. This means that distances of 25 mm can be achieved.

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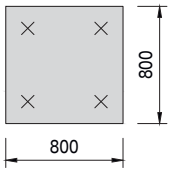
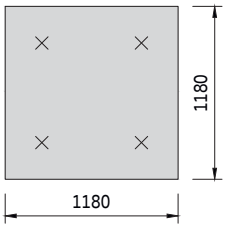
E01.001.1

Standard shapes

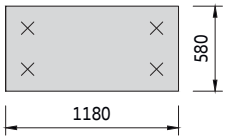
Square



Square



Rectangle



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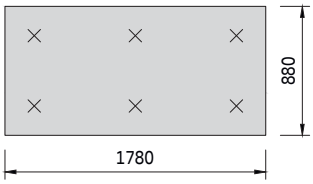

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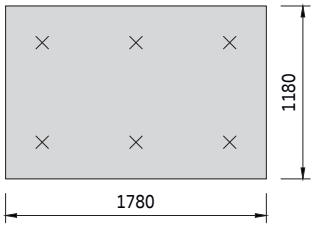
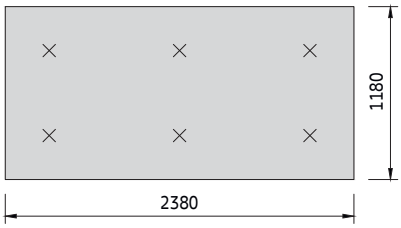
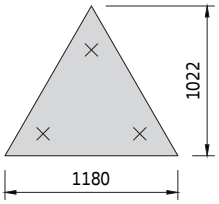


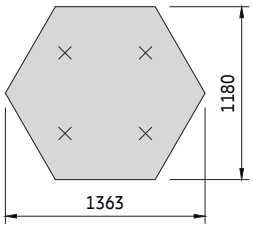
Rectangle



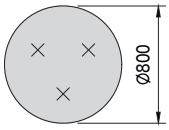
Triangle



Hexagon



Circle



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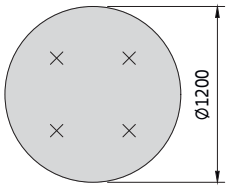
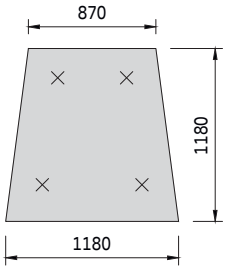
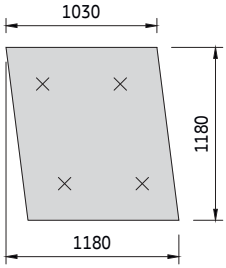


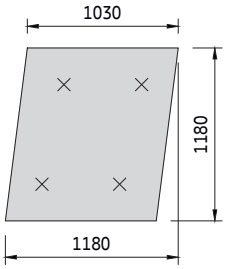
Trapezium



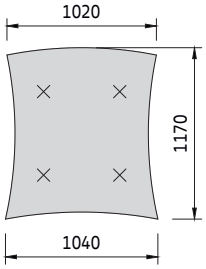
Left Parallelogram



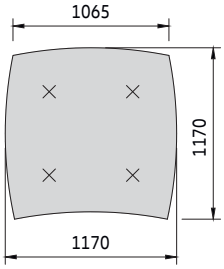
Right Parallelogram



Convex

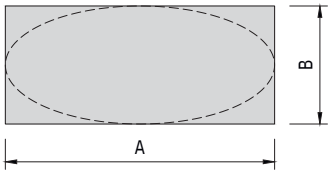


Concave



View from rear side with position of the suspension points

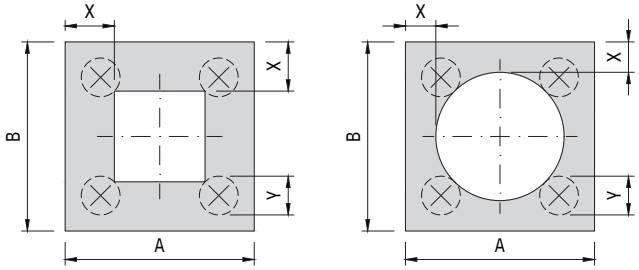
Vario Design



Configurable parameters

Canopy length (A) = max. 2380 mm
Canopy width (B) = max. 1180 mm
(A) <1.5 m = 4x suspension points per canopy
(A) >1.5 m = 6x suspension points per canopy
Custom shapes are available on request

Cut-outs for service integrations



Distance from cut-out to canopy edge (X) = min. 200 mm
Distance from cut-out to hanger (Y) = min. Ø100 mm
Service integrations >0.3 kg must be suspended separately

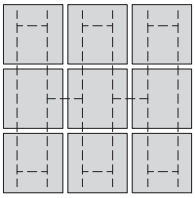
MINERAL Sonic Element

E01.001.1

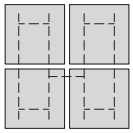
Grouping proposals

A selection of possible configurations

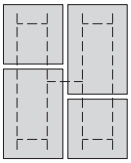
1A



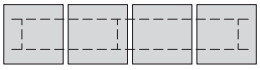
1B



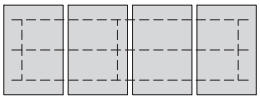
1C



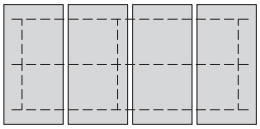
1D



1E



1F



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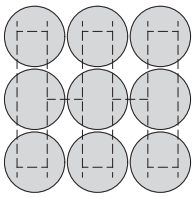

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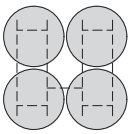

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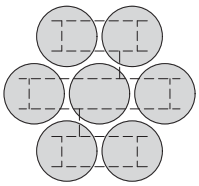

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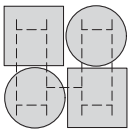

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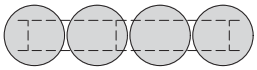

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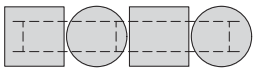

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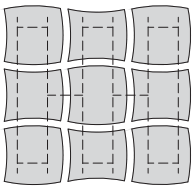

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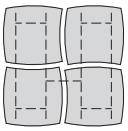

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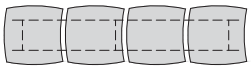

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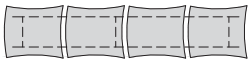

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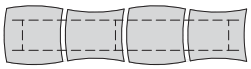

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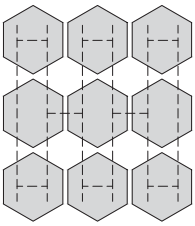

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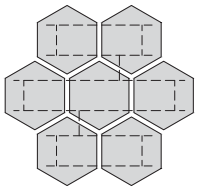

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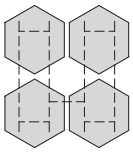

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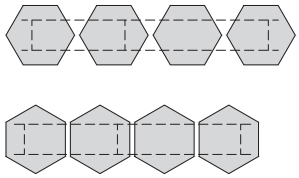

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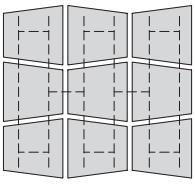

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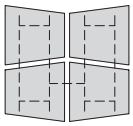

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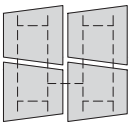

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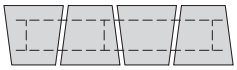

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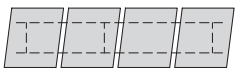

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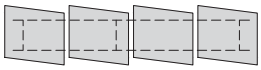

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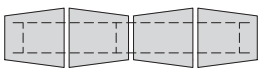

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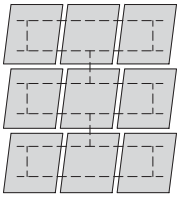

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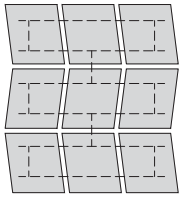

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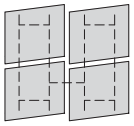

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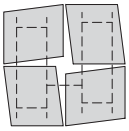

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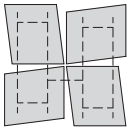

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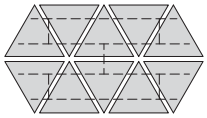

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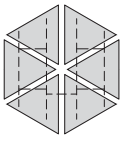

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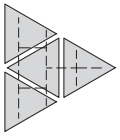

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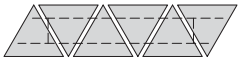

MINERAL Sonic Element

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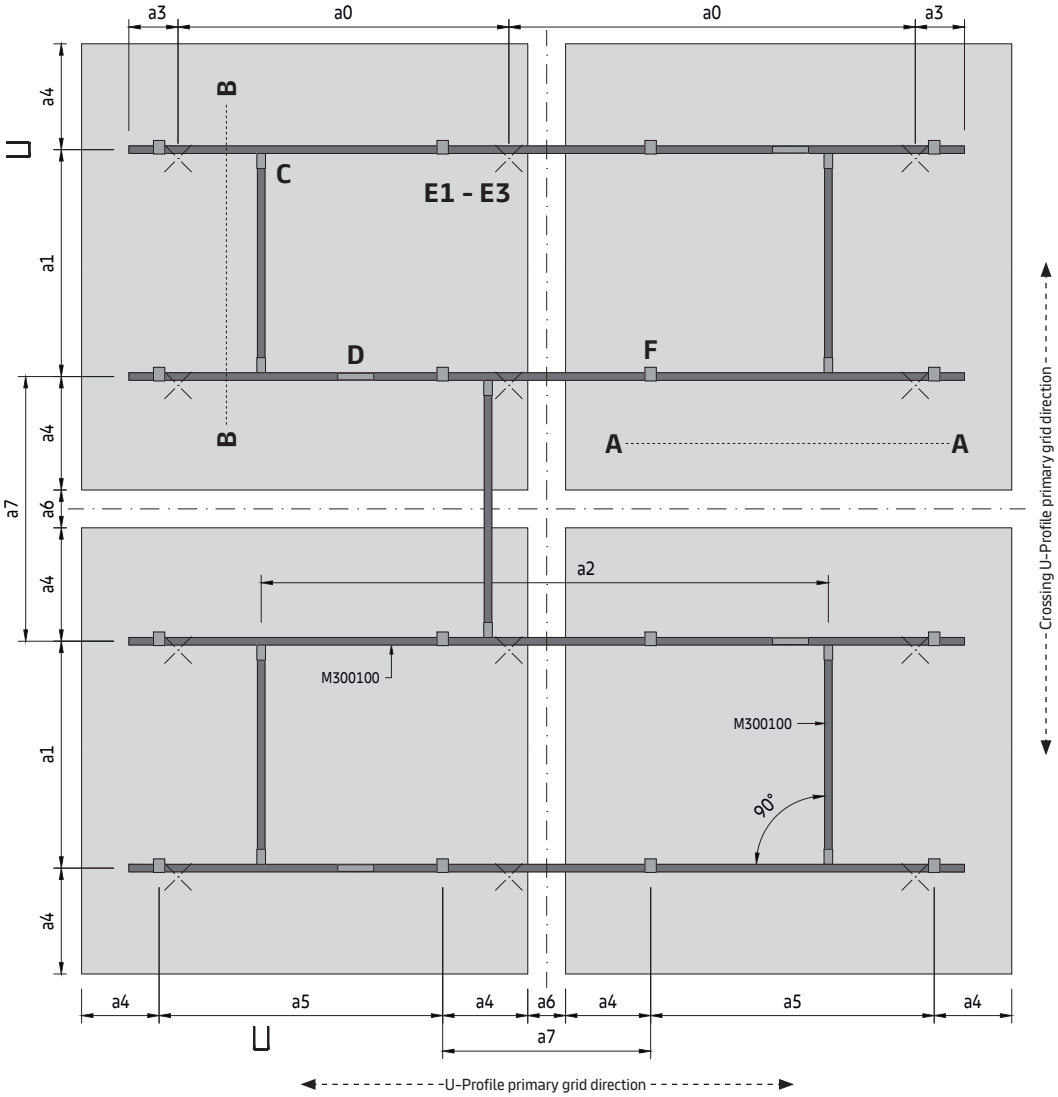
Parameters

a0 Distance between U-Profile suspension points = max. 1500 mm
a1 Distance between U-Profiles = max. 700 mm (in steps of 25 mm)
a2 Distance between crossing U-Profiles = max. 3000 mm (in steps of 50 mm)
a3 Distance from suspension point to U-Profile end = max. 200 mm
a4 Distance from hanger to canopy edge = max. 300 mm
a5 Distance between hangers = max. 900 mm (in steps of 50 mm)
a6 Distance between canopies = min. 50 mm
a7 Distance between U-Profiles = a4 + a6 + a4 (multiple of 25 mm)

Typical grid layout

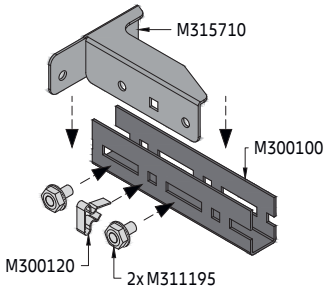
Example with square shapes



Detail C

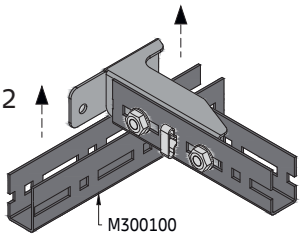
Cross-connector installation

1



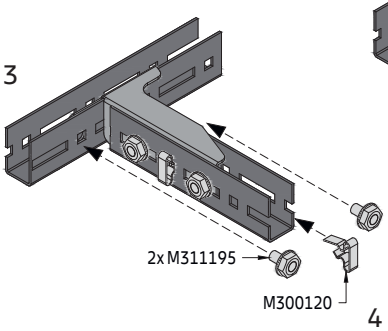
The cross-connector for U-Profile is fixed at both ends of the U-Profile primary grid. In order for this to work, a module dimension in 25 mm steps must be maintained. The plug-in clip can be used for positioning. The fixation itself is done with thread cutting screws. Standard M6 bolts cannot be used.

2



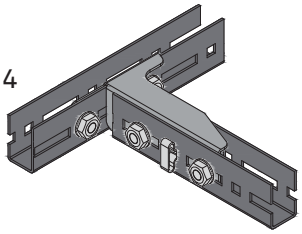
Align the lateral U-Profile in the longitudinal direction and insert it so that the cross-connector is hooked.

3



Again use a plug-in clip and two thread cutting screws to fix the lateral U-Profile to the cross-connector.

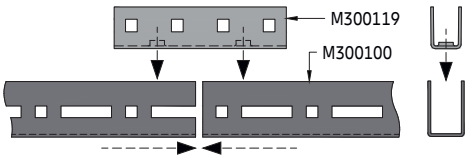
4



The two profiles are now connected. Only a 90° connection is possible.

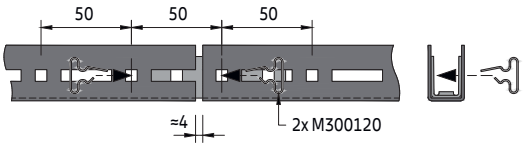
Splice connector installation

1



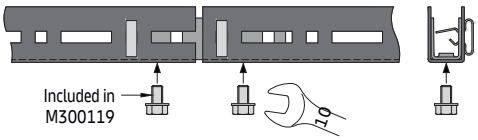
The splice connector for U-Profile comes with two bolts and is placed between the two ends of the U-Profiles.

2



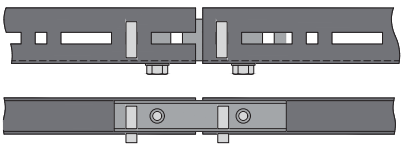
Fix the splice connector with two plug-in clips (large end upwards) at each end. This ensures the modular distance of 50 mm.

3



For a stable connection, the two supplied bolts are attached from below.

4



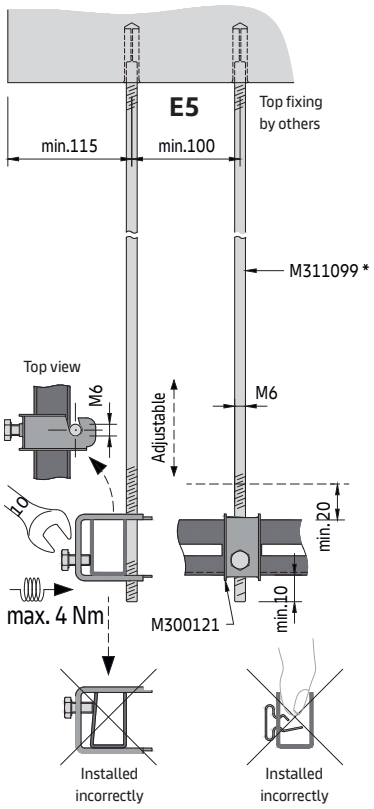
Top view

Since the U-Profile is a modular system, the ends must not touch. There is a distance of approx. 4 mm, depending on the length tolerance of the profile. Joints should be offset.

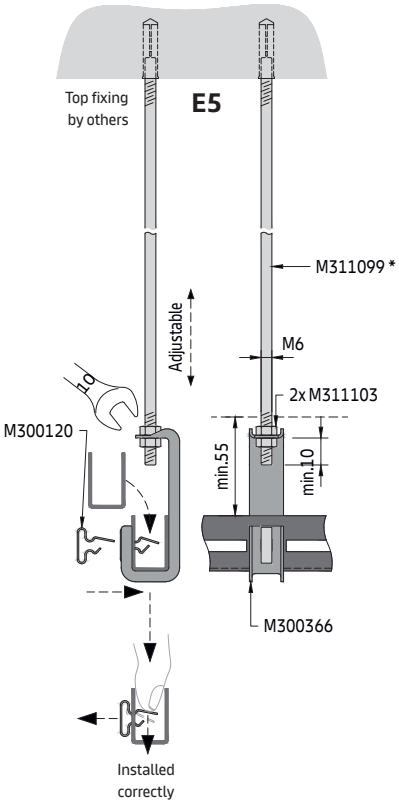
Detail E

Suspension options

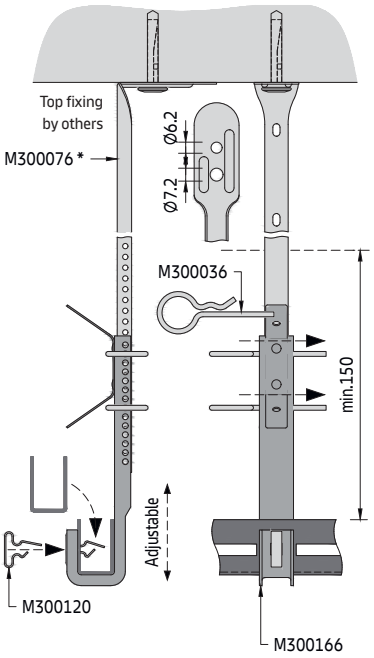
Option E1



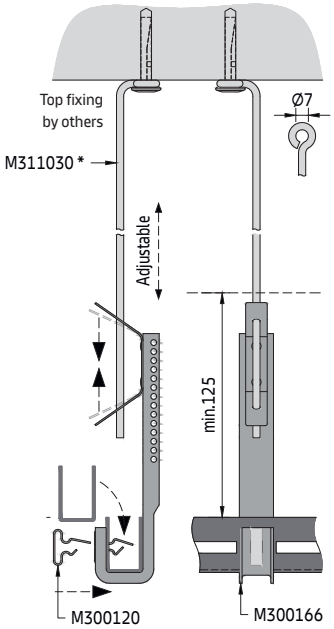
Option E2



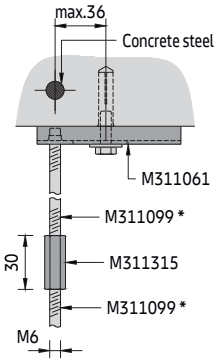
Option E3



Option E4



Detail E5



Optional top fixing and extension detail for suspension option E1 / E2

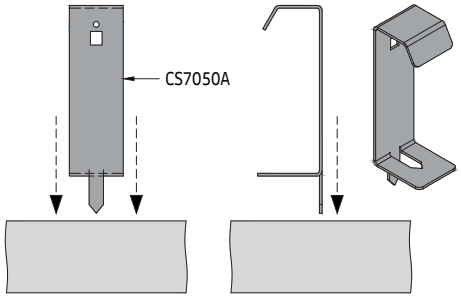
* Various lengths available

The suspension point should always be chosen close to the crossing point of the primary and secondary grid (a5) in order to absorb the ceiling load as best as possible and to prevent the U-Profile from potentially deflecting. Minimum pull-out force per suspension point = 1.25 kN (failure state).
Maximum permissible load per suspension point = 0.50 kN (incl. 2.5 times safety).
These values must always be observed and guaranteed by the installation company for each suspension point irrespective of the type of hanger selected.

Detail F

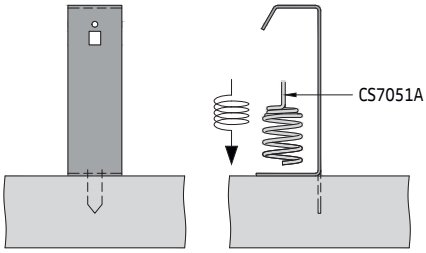
Hanger

1



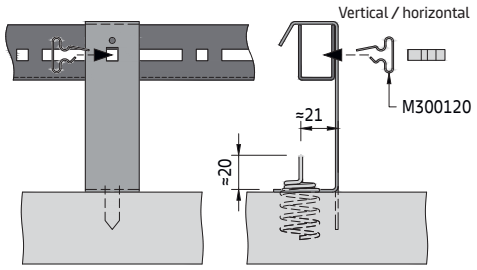
Place the hanger on the back of the canopy. The pin on the bottom is pushed in until it stops. Make sure all hangers are correctly aligned and pointing in the same direction.

2



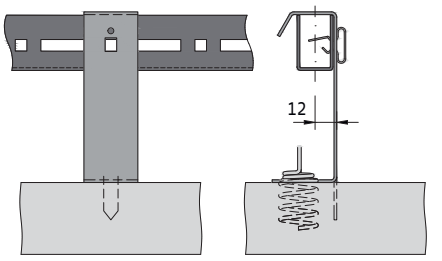
Screw the spiral anchor clockwise into the back of the canopy, through the hanger tab. The spiral anchor should protrude ≈20 mm.
Caution: Do not overtighten or undertighten!

3



Once all hangers have been attached, the canopy can be hung on the U-Profile. Fix hanger with plug-in clips (inserted vertically or horizontally).

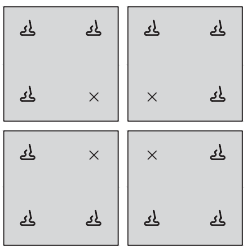
4



At least 4 hangers are required per canopy, except for triangles, small circles and rectangular shapes, where 3 are sufficient.

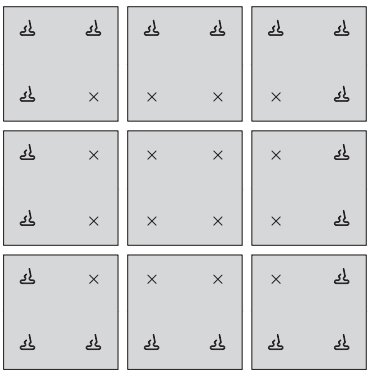
For groups of 2 x 2, 3 x 3 and more elements, depending on the distance between the canopies, not all hangers can be secured with plug-in clips.

Example A (2 x 2 elements)



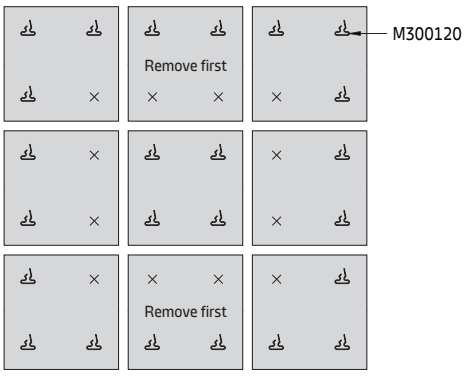
The outer hangers are fixed with a plug-in clip, the inner ones remain unsecured.

Example B (3 x 3 elements)



The outer hangers are fixed with a plug-in clip, the inner ones remain unsecured. The canopy in the centre remains unsecured and can be removed at any time.

Example C (3 x 3 elements)

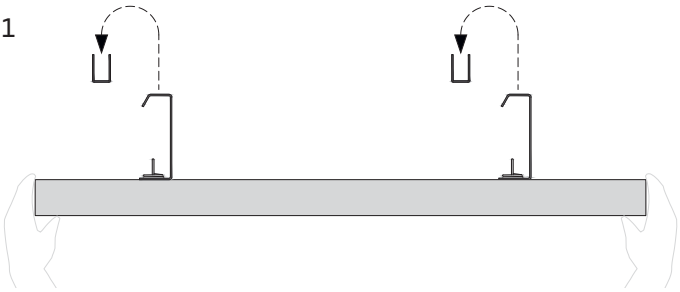


The outer hangers and the ones on the centre canopy are fixed with a plug-in clip, the remaining ones stay unsecured. In order to remove the canopy in the centre, two outer elements must first be removed.

Detail G

Canopy insertion

1



Hang the canopy with the hangers on the U-Profile. Make sure that the canopy is kept horizontal. Make sure that all hangers are attached to the U-Profile.

2

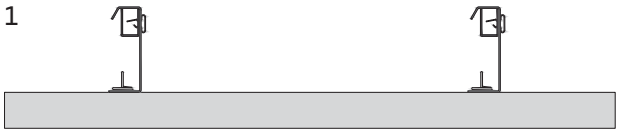
Lock the position of the canopy with plug-in clips where it is possible.

3

A lateral space of min. 50 mm is needed in order to be able to hook-on the canopies. Depending on the layout, you may need to allow more space to reach the plug-in clips by hand. Be careful when handling so as not to damage the edges.

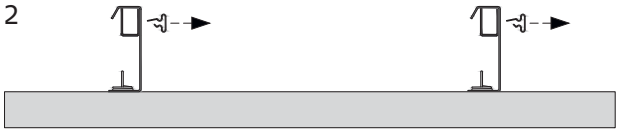
Canopy extraction

1



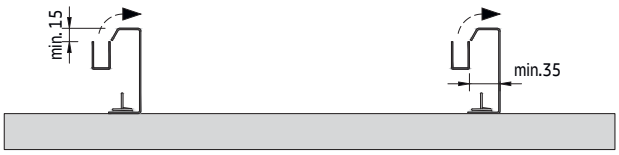
Before the canopy can be removed, the position of the plug-in clips must be checked and whether there is sufficient lateral clearance.

2



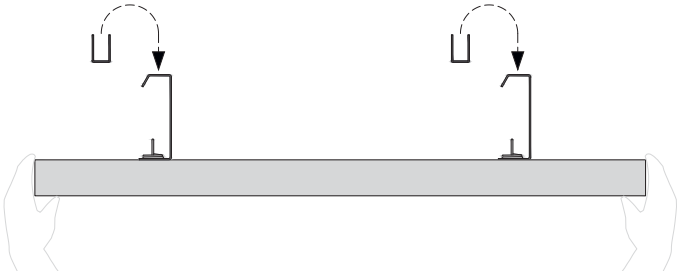
Remove the plugin clips without damaging the edges.

3



Lift the canopy at least 15 mm and move it horizontally at least 35 mm away from the U-Profile. The canopy should always be kept horizontal during removal. Be careful when handling so as not to damage the edges. Store the canopy in a safe place where it will not be damaged.

4



Domel, Łomża, Poland © Szymon Polański

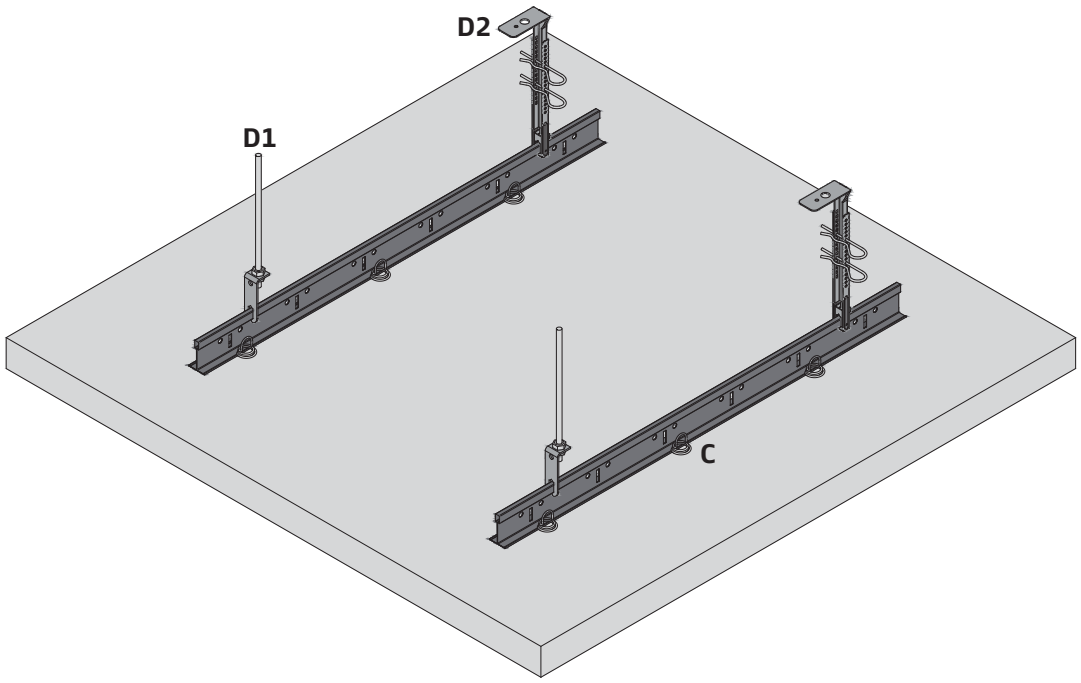
MINERAL Sonic Element

T-Grid Main Runner
Single canopy solution for indoor applications

General information

- Hanging wire for single suspension in open spaces
- Typical canopy weight 6.0 kg/m² (indicative value without additional load)
- Canopies are easily installed and fully demountable
- Acoustic & design elements
- Only for horizontal ceiling surfaces, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

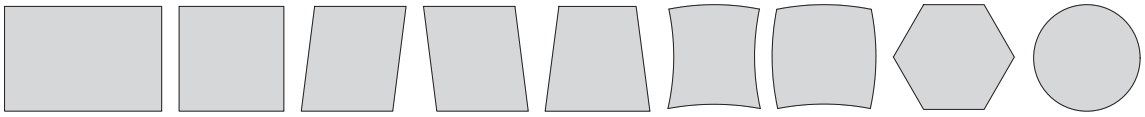
Isometric view



Important information

Please make sure that the visible side is protected during the assembly and cannot be scratched. The canopies must always be stored on a dry and flat surface and can either be stacked (max 8 pieces) or stand on the long edge (no stacking permitted). In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of canopies, the elements must always be carried by two when removing the packaging and at all times when handling the canopies, clean white cotton gloves should be worn. Since these are single canopies, a lateral distance of at least 200 mm is recommended for installation. The rear side of the canopy is not delivered in the same quality as the visible side (below). This should be taken into account if it is visible.

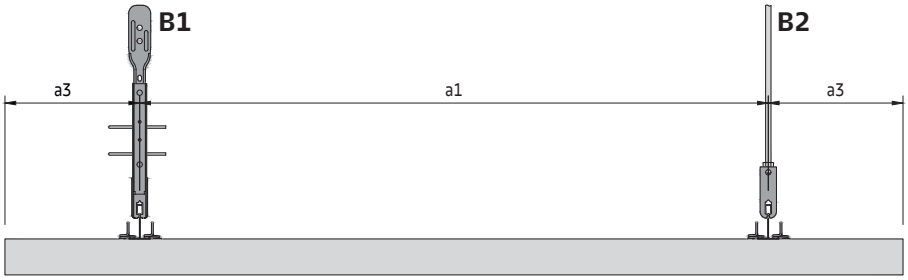
Standard shape options



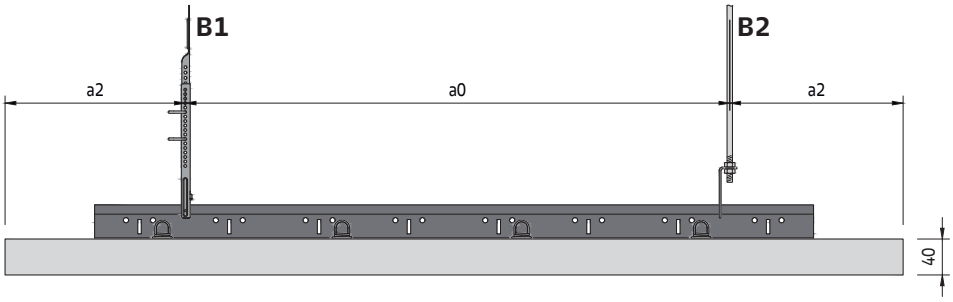
MINERAL Sonic Element

E01.001.2

Section A

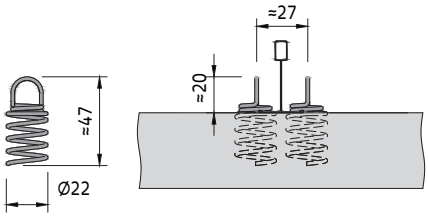


Section B



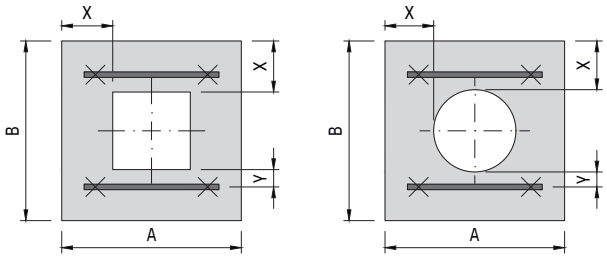
Detail C

CS7051A spiral anchor



The canopy is suspended by two 24 mm T-Grids. The T-Grid is fixed to the back of the canopy with spiral achors, on both sides of the profile.
Caution: Do not overtighten or undertighten!

Cut-outs for service integrations



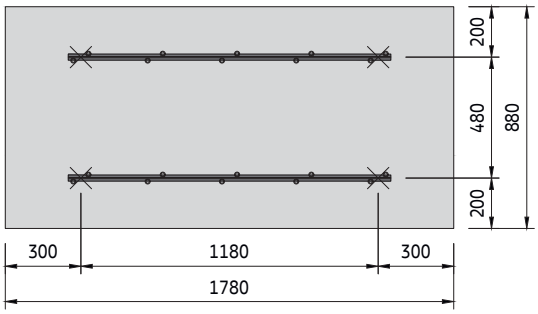
Distance from cut-out to canopy edge (X) = min. 200 mm
Distance from cut-out to hanger (Y) = min. Ø100 mm
Service integrations >0.3 kg must be suspended separately.

MINERAL Sonic Element

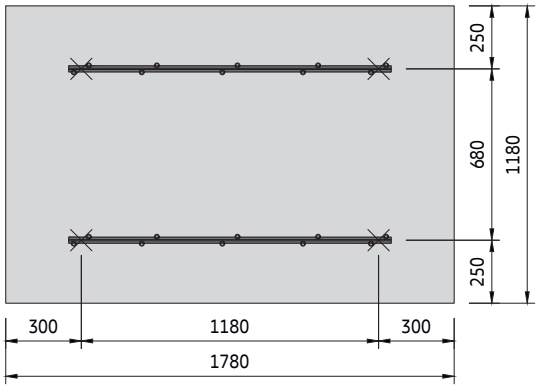
E01.001.2

Standard shapes

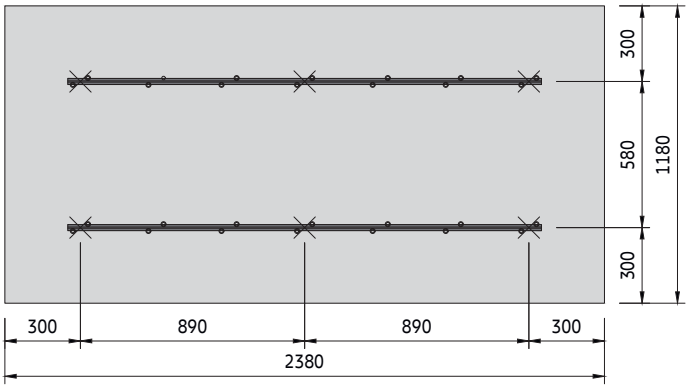
Rectangle 880 x 1780 mm



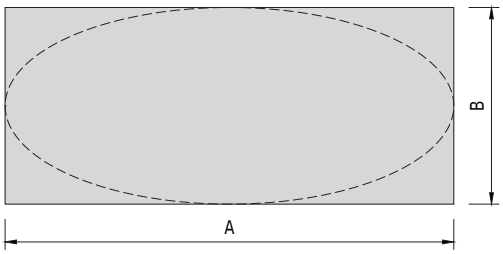
Rectangle 1180 x 1780 mm



Rectangle 1180 x 2380 mm



Vario Design

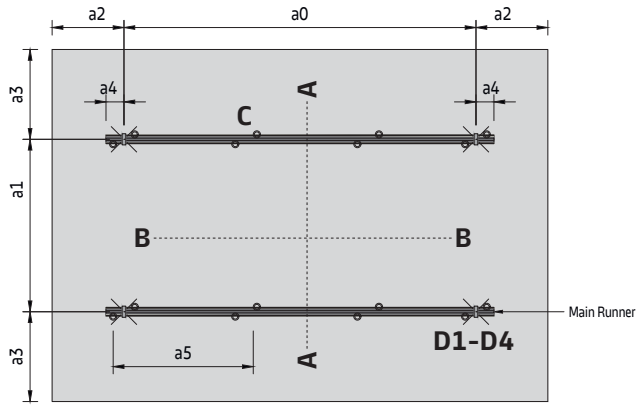


Configurable parameters
Canopy length (A) = max. 2380 mm
Canopy width (B) = max. 1180 mm
Custom shapes are available on request

MINERAL Sonic Element

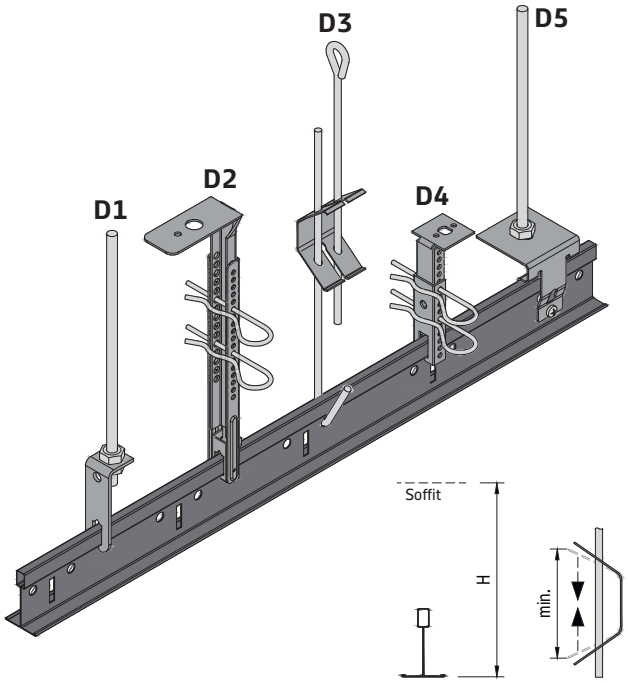
E01.001.2

Typical grid layout



Parameters

a0 Distance between T-Grid suspension points = max. 1200 mm
a1 Distance between T-Grid = max. 700 mm
a2 Distance from edge to suspension point = max. 300 mm
a3 Distance from edge to T-Grid = max. 300 mm
a4 Distance from suspension point to T-Grid end = max. 50 mm
a5 Distance between spiral anchors = max. 500 mm



There is a range of suspension hangers available for the T-Grid. Depending on the suspension height, object-related circumstances, availability or preference, all types can be used. It is important to ensure however, that the maximum load bearing capacity is not exceeded and the choice fits the system and the requirements. In the case of push-on hangers, care is needed to ensure that installation and removal of the panels does not displace the hangers. When using push-on hangers, the direction of installation should be at 90° to the Main Runners, tension free and vertical. Hangers with visible defects must not be used. Improper handling, such as forcibly bending open and closed tabs / parts of the hanger, will result in a loss of load-bearing capacity. If hanger D1, D2 or D4 is used, a blocker must be placed at the ends of the T-Grid to prevent the canopy from slipping out. A self-drilling screw can be used as a blocker, for example.

D3 = min. 38 mm

Hangers

Hanger type		Min. installation height (H) [mm]
C1	Bent tee bar hanger with threaded rod	100
C2	Nonius top and bottom part	200
C3	Quick hanger with loop	100
C4	Direct hanger	100
C5	GFV50 Hanger with threaded rod	100

Not all combinations of grid systems / Main Runner and hanger are possible. This primarily applies to hangers for sliding on and clipping on due to the different profile head heights and shapes - rectangle / roof (peak).

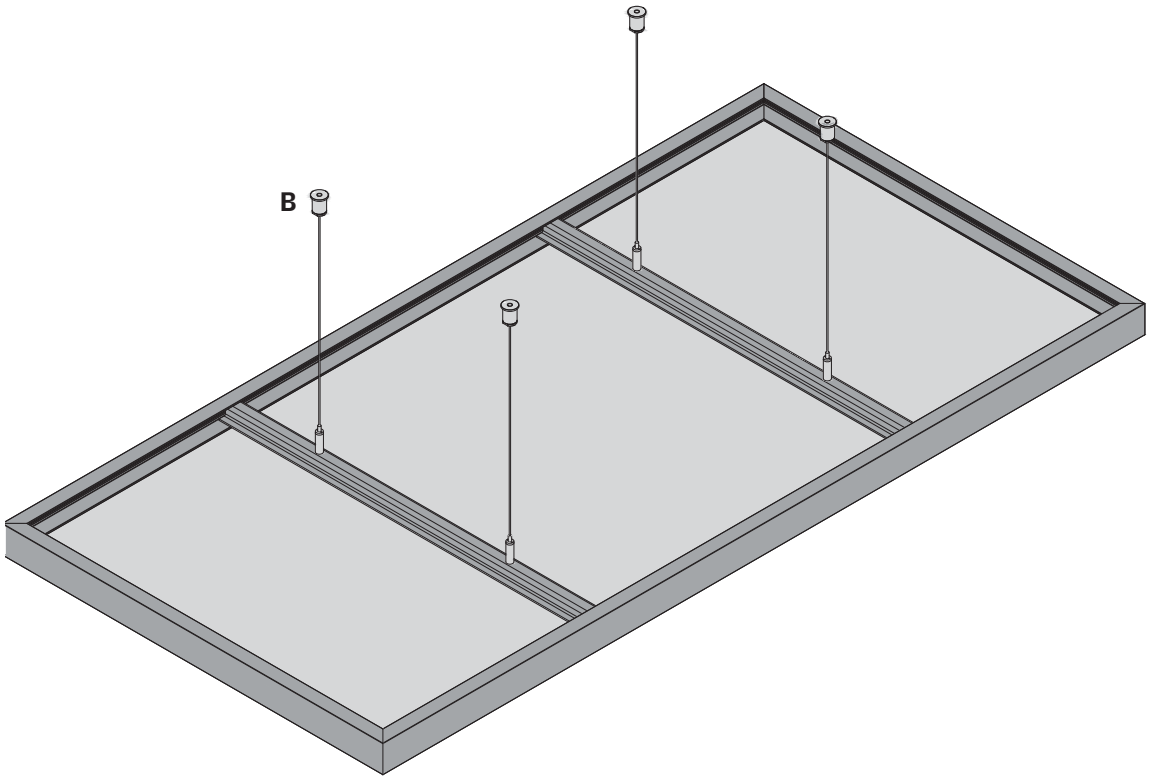
MINERAL Sonic Line

Hanging wire
Single canopy solution for indoor applications

General information

- Hanging wire for single suspension in open spaces
- Typical canopy weight 5.0 – 20.0 kg/pc
- Canopies are easily installed and fully demountable
- Acoustic & design elements
- Only for horizontal ceiling surfaces, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

Isometric view



Important information

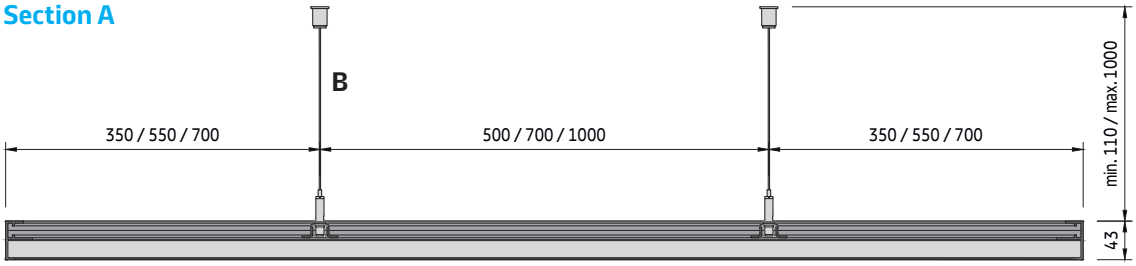
The hanging wires are supplied in a length of 1000 mm. Further lengths are available on request. Please make sure that the visible side is protected during the assembly and cannot be scratched. The canopies must always be stored on a dry and flat surface and can either be stacked (max 8 pieces) or stand on the long edge (no stacking permitted). In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of canopies, the elements must always be carried by two when removing the packaging and at all times when handling the canopies, clean white cotton gloves should be worn. Ensure that only the frames of the canopies are handled. Since these are single canopies, a lateral distance of at least 150 mm is recommended for installation.

Standard shape options

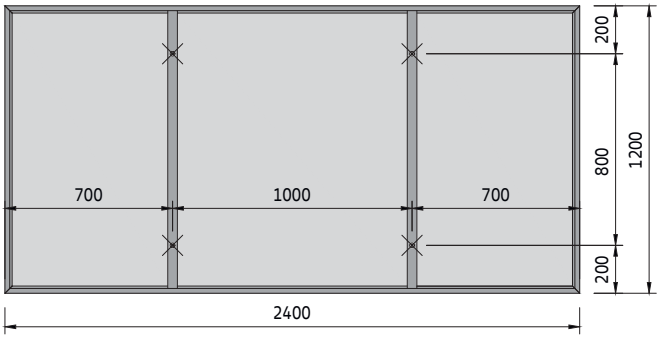
MINERAL Sonic Line

E01.002

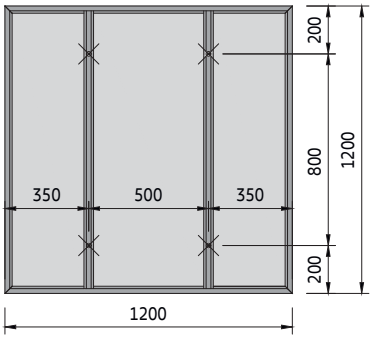
Section A



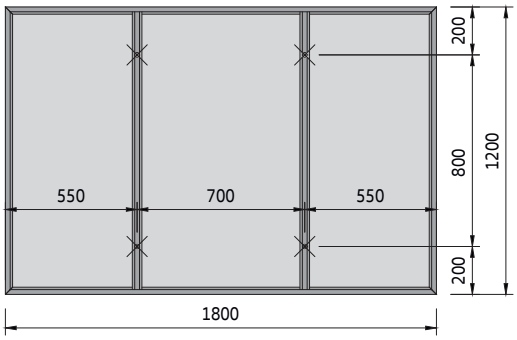
Rectangle 2400 x 1200 mm



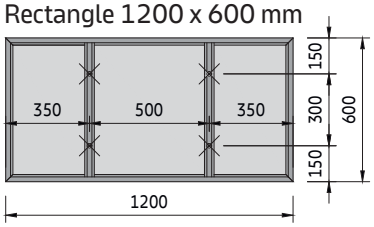
Square 1200 x 1200 mm



Rectangle 1800 x 1200 mm

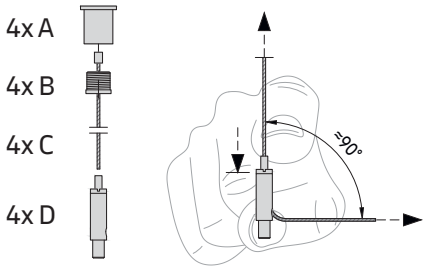


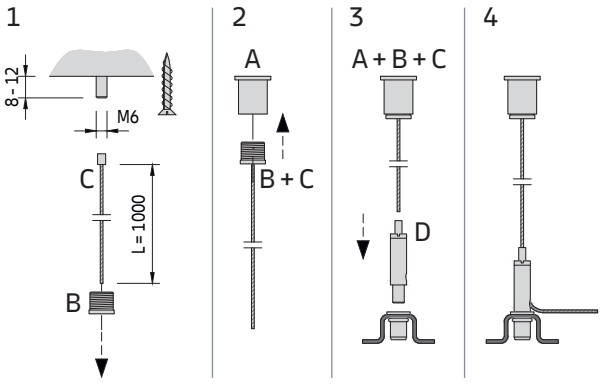
Rectangle 1200 x 600 mm



Section B

CS7052A wire hanging installation





1. Place an M6 threaded bolt on the raw ceiling or use alternative a wood screw to fix the structure gripper anchor (A) (not offered by Knauf Ceiling Solutions). Take the hanging wire (C) and loop it through the top of the gripper anchor cap (B).

2. Screw the gripper anchor cap (B) onto the structure gripper anchor (A).

3. Screw the height adjuster (D) into the profile on the back of the canopy. Guide the hanging wire (C) into the height adjuster (D). Pull the wire through the height adjuster, in an angle of ≈90°. Do not pull the wire upwards, otherwise it may be damaged. Make sure that the wires are pulled tight so that the weight of the canopy is evenly distributed.

4. Then either roll up the wire and deposit it on the canopy or cut it away. After cutting it away, it can no longer be adjusted in height. Repeat this for all four suspension points. The hanging wire can be subsequently shortened using the height adjuster.

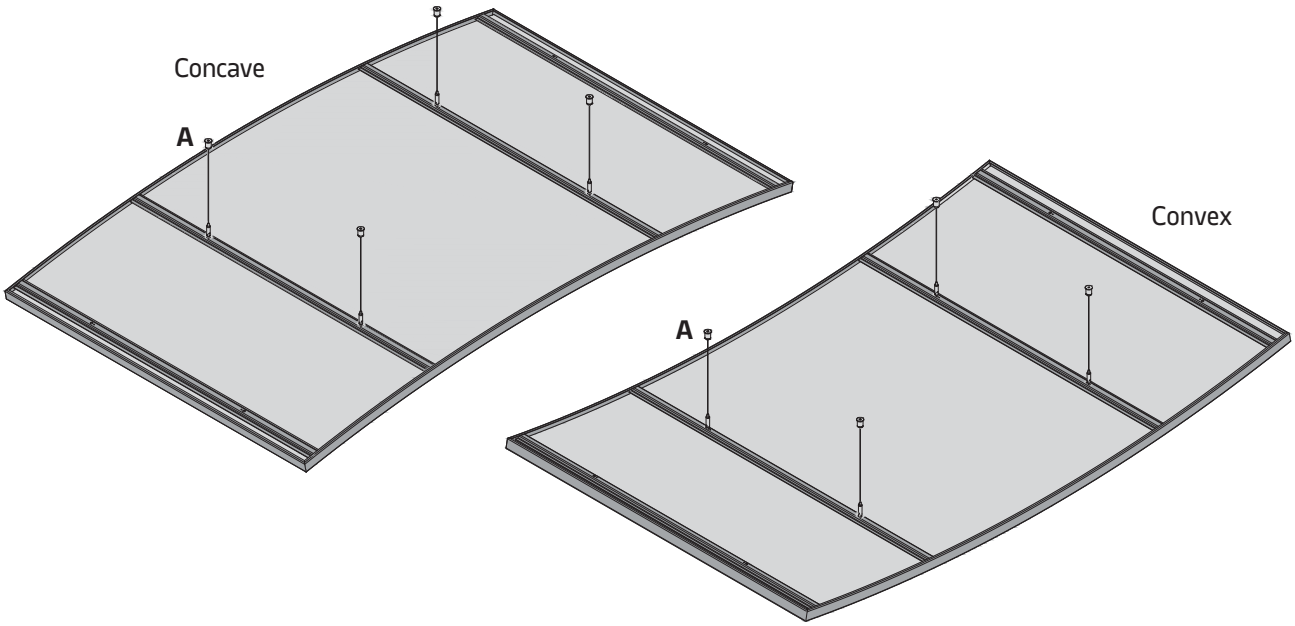
MINERAL Sonic Line Arc

Hanging wire
Single canopy solution for indoor applications

General information

- Hanging wire for single suspension in open spaces
- Typical canopy weight 16.0 kg/pc
- Canopies are easily installed and fully demountable
- Acoustic & design elements
- Only for horizontal ceiling surfaces, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

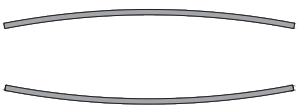
Isometric view



Important information

The hanging wires are supplied in a length of 1000 mm. Further lengths are available on request. Please make sure that the visible side is protected during the assembly and cannot be scratched. The canopies must always be stored on a dry and flat surface and can either be stacked (max 8 pieces) or stand on the long edge (no stacking permitted). In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of canopies, the elements must always be carried by two when removing the packaging and at all times when handling the canopies, clean white cotton gloves should be worn. Ensure that only the frames of the canopies are handled. Since these are single canopies, a lateral distance of at least 150 mm is recommended for installation. No service integrations allowed.

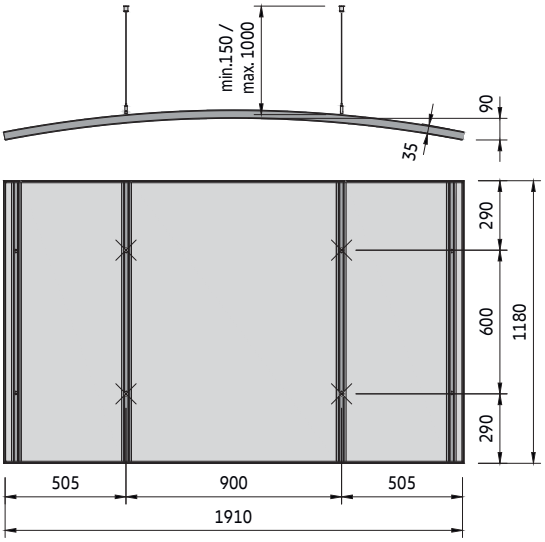
Standard shape options



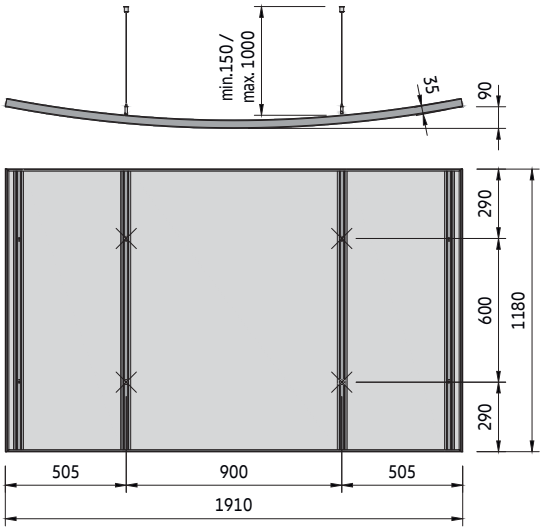
MINERAL Sonic Line Arc

E01.003

Concave 1910 x 1180 mm

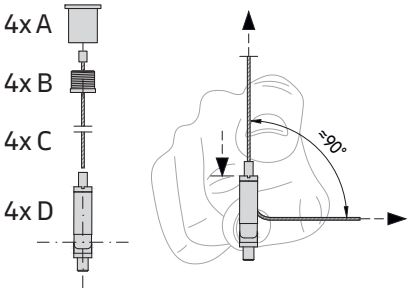


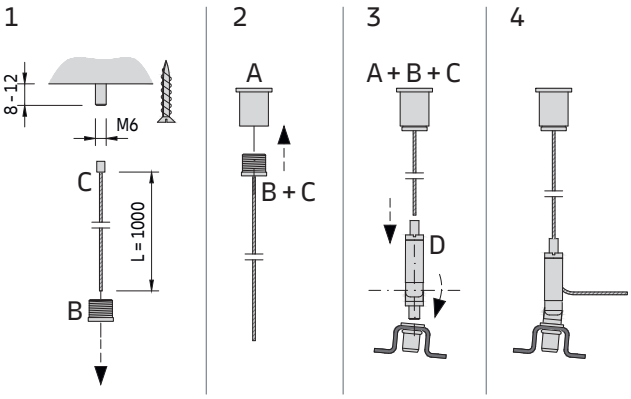
Convex 1910 x 1180 mm



Section A

CS7053A wire hanging installation





1. Place an M6 threaded bolt on the raw ceiling or use alternative a wood screw to fix the structure gripper anchor (A) (not offered by Knauf Ceiling Solutions). Take the hanging wire (C) and loop it through the top of the gripper anchor cap (B).

2. Screw the gripper anchor cap (B) onto the structure gripper anchor (A).

3. Screw the height adjuster (D) into the profile on the back of the canopy. The height adjuster is flexible and adapts to the angle. Guide the hanging wire (C) into the height adjuster (D). Pull the wire through the height adjuster, in an angle of ≈90°. Do not pull the wire upwards, otherwise it may be damaged. Make sure that the wires are pulled tight so that the weight of the canopy is evenly distributed.

4. Then either roll up the wire and deposit it on the canopy or cut it away. After cutting it away, it can no longer be adjusted in height. Repeat this for all four suspension points.
The hanging wire can be subsequently shortened using the height adjuster.

Berufskolleg Digital Lab, Brakel, Germany © Matthias Groppe

Floating Ceilings – Baffles

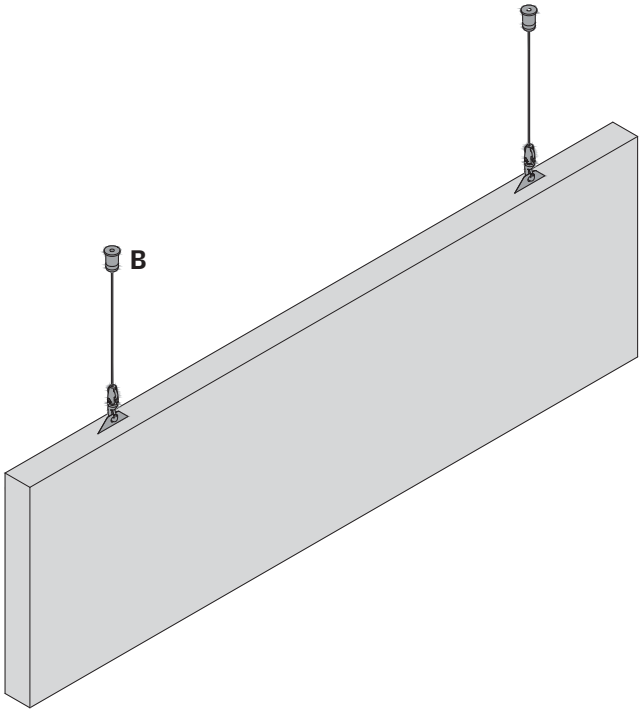
MINERAL Baffle Element

Hanging wire
Single suspended solution for indoor applications

General information

- Hanging wire for single suspension
- Typical ceiling weight 3.8 – 7.5 kg/pc (indicative value without additional load)
- Baffles are easily installed and fully demountable
- Acoustic & design elements
- Only for horizontal installation, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

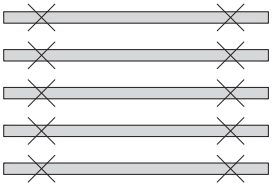
Isometric view



Important information

This type of suspension is intended for a smaller number of baffles or if they are not to be aligned parallel. Grouping with the U-Profile is recommended for larger areas.
The hanging wires are supplied in a length of 1000 mm. Further lengths are available on request. Please make sure that the visible sides of the baffle are protected during the assembly and cannot be scratched. The baffles must always be stored on a dry and flat surface. In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of baffles, clean white cotton gloves should be worn.
It is recommended to keep a lateral distance between the baffles of at least 100 mm and from the ends to other objects min. 30 mm. This installation depends on the dimensions and configuration of the baffle.

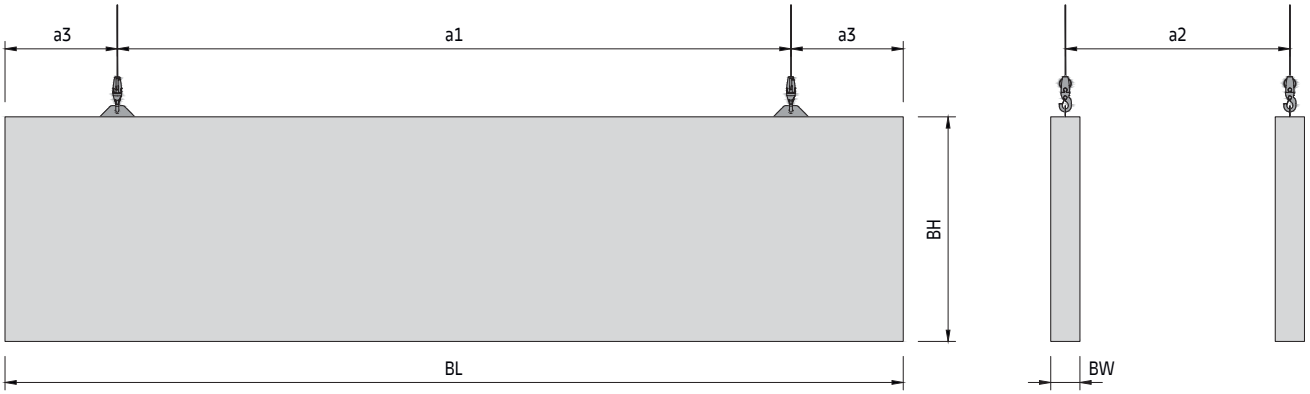
Standard shape options



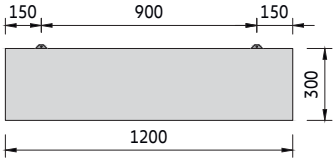
MINERAL Baffle Element

E01.100

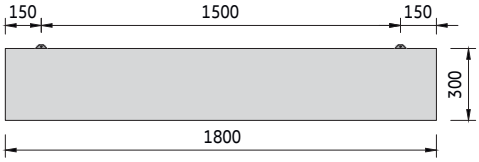
Section A



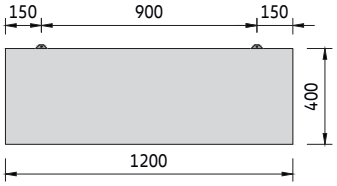
Rectangle 1200 x 300 mm



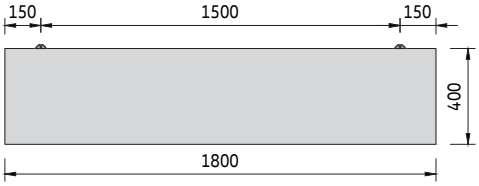
Rectangle 1800 x 300 mm



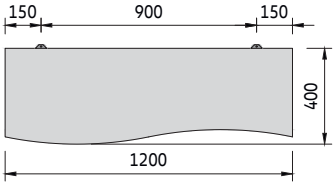
Rectangle 1200 x 400 mm



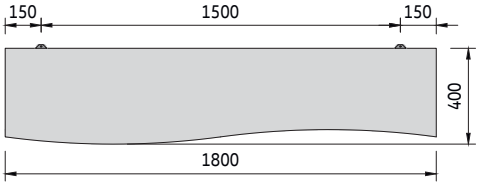
Rectangle 1800 x 400 mm



Arc 1200 x 400 mm



Arc 1800 x 400 mm



Vario Design

Custom sizes and shapes are available on request.

Parameters

a1	Distance between suspension points = 900 / 1500 mm
a2	Distance between baffles = min. 100 mm
a3	Distance from baffle end to baffle hanger = 150 mm
BL	Baffle length = max. 1800 mm
BH	Baffle height = min. 300 / max. 600 mm
BW	Baffle width = 39 mm

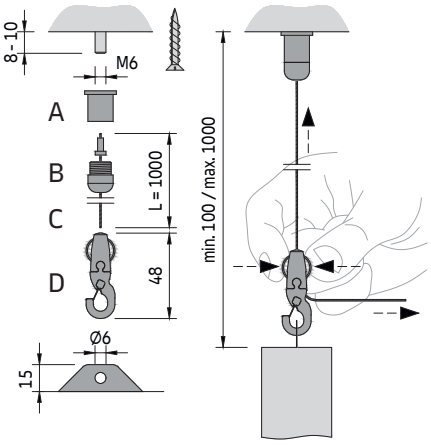
Components

Standard components

- SAE-GHD 1 Hanging wire
- CS5549 Splice connector

Detail B

SAE-GHD 1 hanging wire installation



1. Place an M6 threaded bolt on the raw ceiling or use alternative a wood screw to fix the structure gripper anchor (A) (not offered by Knauf Ceiling Solutions).

2. Take the hanging wire (C) and loop it through the top of the gripper anchor cap (B).

3. Screw the gripper anchor cap (B) onto the structure gripper anchor (A).

4. Guide the hanging wire (C) into the height adjuster with carabiner (D). Pull the wire through the height adjuster, in an angle of ≈90°. Do not pull the wire upwards, otherwise it may be damaged.

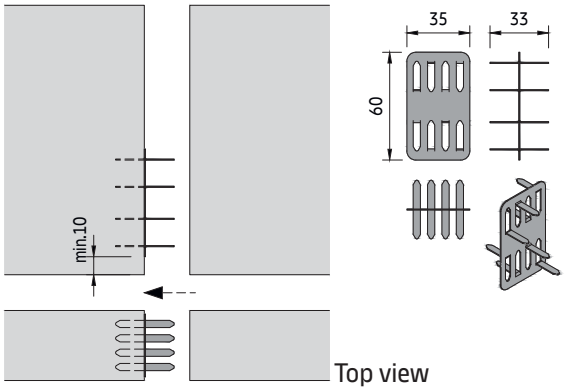
5. Hang the baffle on the two carabiners.

6. Then either roll up the wire and deposit it on the baffle or cut it away. After cutting it away, it can no longer be adjusted in height. Repeat this for all four suspension points. The hanging wire can be subsequently shortened using the height adjuster.

Detail B

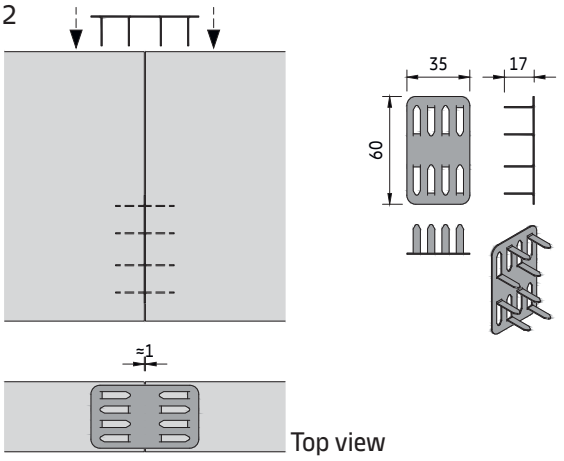
CS5549 splice connection

1



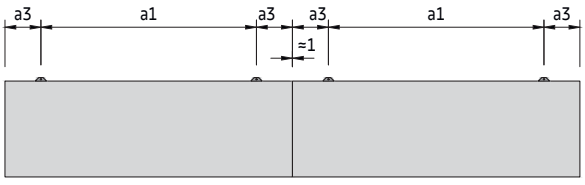
Top view

2

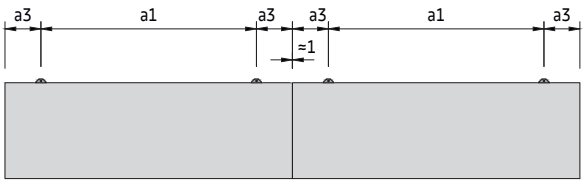


Top view

Rectangle



Arc



1. Press the bottom splice connector into the first baffle until it is flush, eaving at least 10 mm of space from the bottom edge. Make sure the splice connector is centered.

2. Press the top splice connector onto the baffle from above until it is flush. Make sure the splice connector is centred. There is a gap of ≈1 mm between the baffles.

LUCRON, Steinerka Business Centre, Bratislava, Slovakia © BoysPlayNice

MINERAL Baffle Element

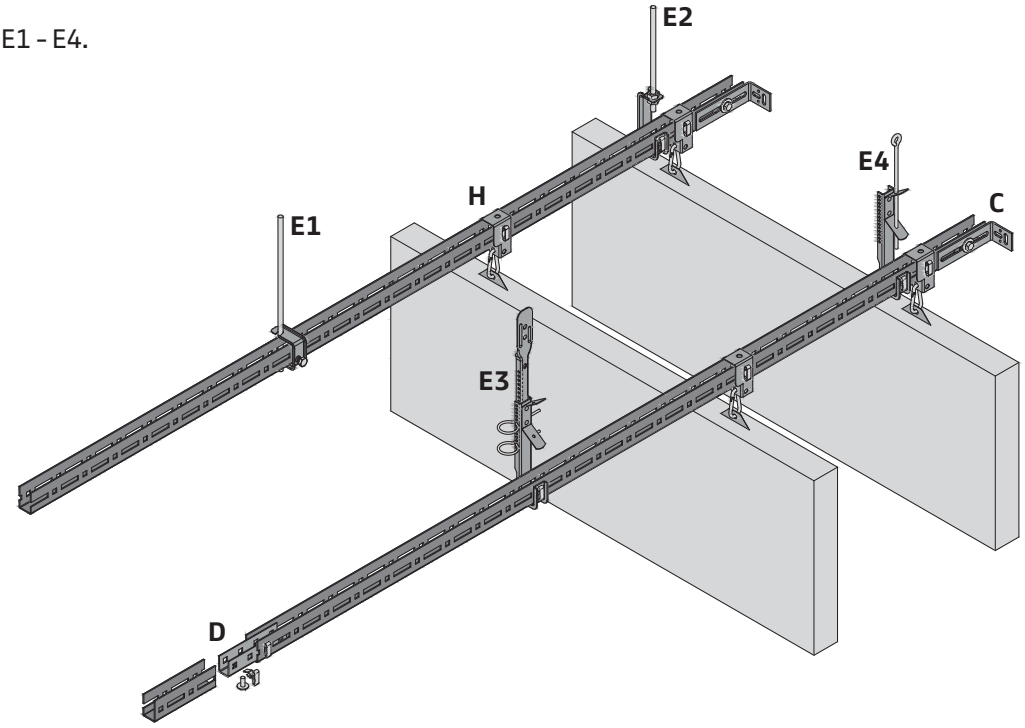
U-Profile primary grid + hanger for baffle
Semi-exposed grid solution for indoor applications

General information

- Semi-exposed hook-on grid system for medium and large rooms
- Fully configurable solution with variable baffle spacing
- For perpendicular or parallel installation on U-Profile primary grid
- Typical ceiling weight 3.8 - 7.5 kg/m² (indicative value without additional load)
- Baffles parallel aligned
- Baffles are easily installed and fully demountable
- Only for horizontal installation, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

Isometric view

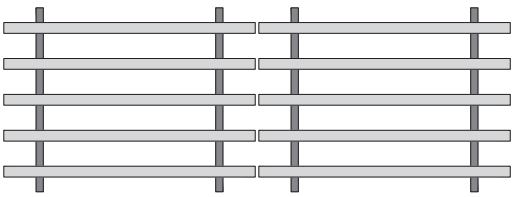
Select the suspension option E1 - E4.



Important information

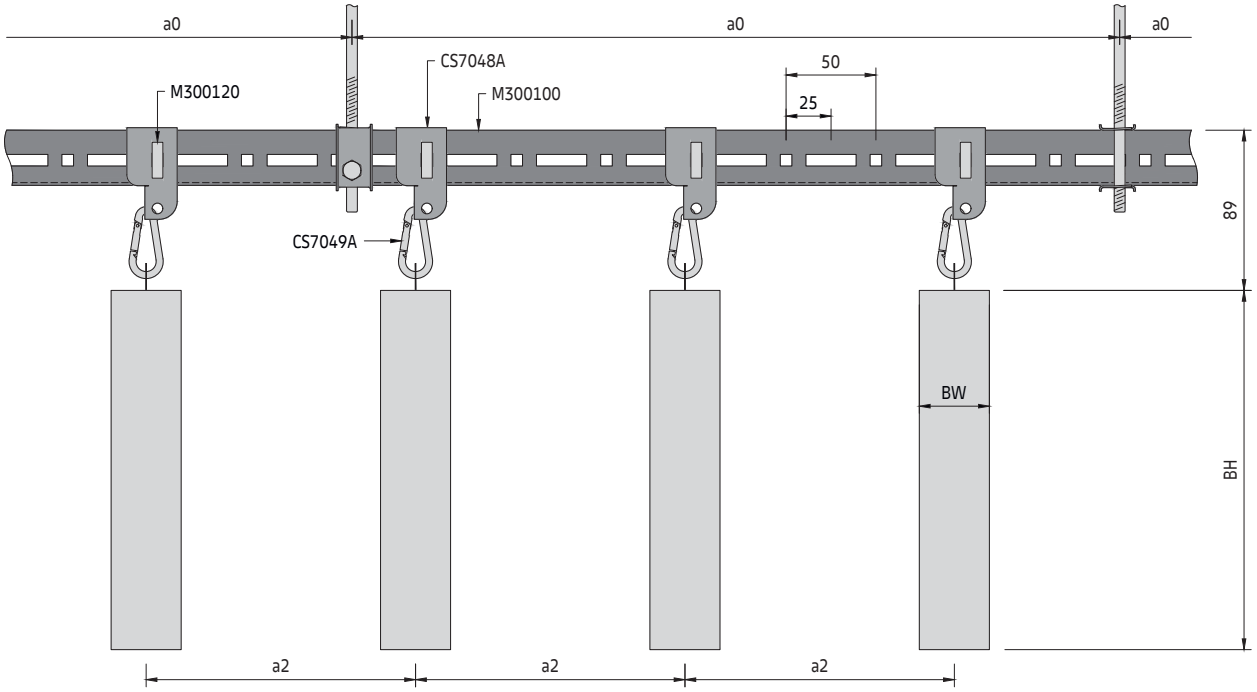
Please make sure that the visible sides of the baffles are protected during the assembly and cannot be scratched. The baffles must always be stored on a dry and flat surface. In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of baffles, clean white cotton gloves should be worn. It is recommended to keep a lateral distance between the baffles of at least 100 mm and from the ends to other objects min. 30 mm.

Standard layout



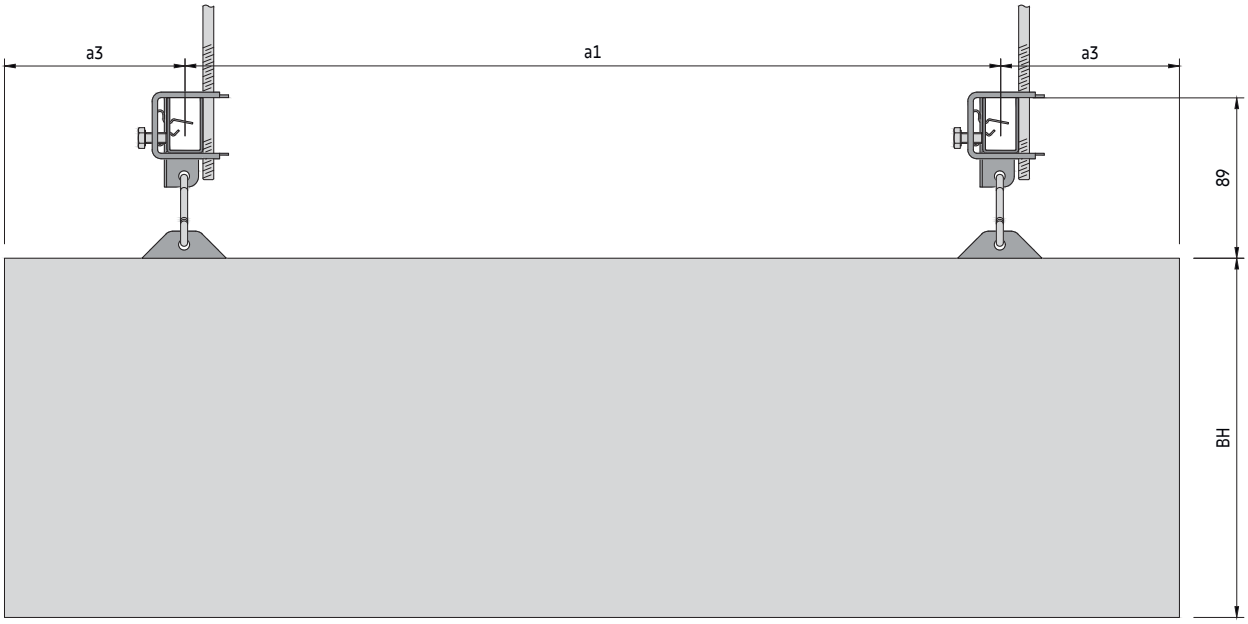
Section F

Example with suspension option E1.



Section G

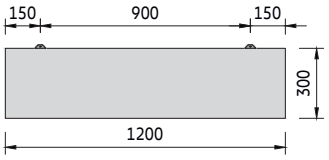
Example with suspension option E1- E4.



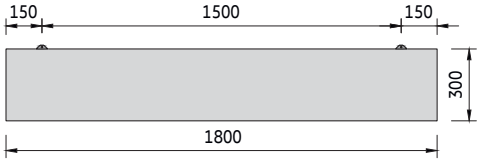
MINERAL Baffle Element

E01.100.1

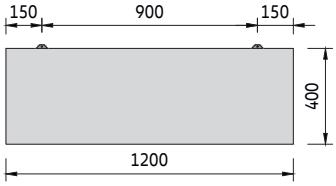
Rectangle 1200 x 300 mm



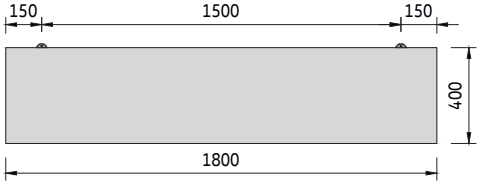
Rectangle 1800 x 300 mm



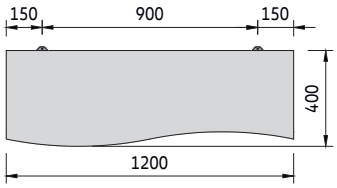
Rectangle 1200 x 400 mm



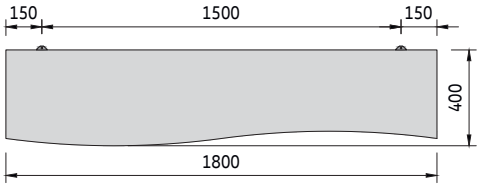
Rectangle 1800 x 400 mm



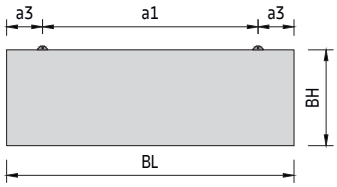
Arc 1200 x 400 mm



Arc 1800 x 400 mm



Vario Design



Custom sizes and shapes are available on request.

Typical baffle weight

Baffle height (H) [mm]

300	3.10 kg/m
400	4.15 kg/m
500	5.20 kg/m
600	6.25 kg/m

Grid components

Standard components

- CS7048A Hanger for baffle
- CS7049A Carabiner

MINERAL Baffle Element

E01.100.1

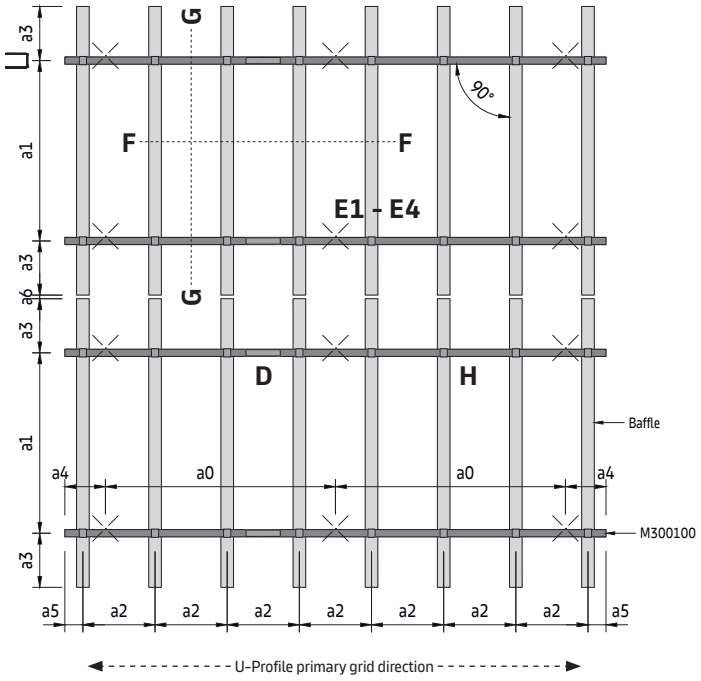
Spacing

System without additional load / baffle height (H)				
a2 [mm]	300 mm a0 [mm]	400 mm a0 [mm]	500 mm a0 [mm]	600 mm a0 [mm]
100	750	700	650	600
200	1050	1000	950	850
300	1300	1200	1100	1000
400	1500	1400	1200	1100
500	1600	1550	1300	1200
600	1700	1600	1400	1300
700	1750	1700	1500	1400
800	1800	1750	1600	1500
900	1850	1800	1700	1650
1000	1900	1850	1800	1800

Parameters

a0 Distance between U-Profile suspension points = max. 1200 mm
a1 Distance between U-Profiles = 900 / 1500 mm
a2 Distance between baffles = min. 100 mm
a3 Distance from baffle end to baffle hanger = 150 mm
a4 Distance from U-Profile end to suspension point = max. 200 mm
a5 Distance from U-Profile end to baffle centre = min. 25 mm
a6 Distance between baffle ends = min. 10 mm
BL Baffle length = max. 1800 mm
BH Baffle height = min. 300 / max. 600 mm
BW Baffle width = 39 mm

Typical grid layout



To determine suspension layout

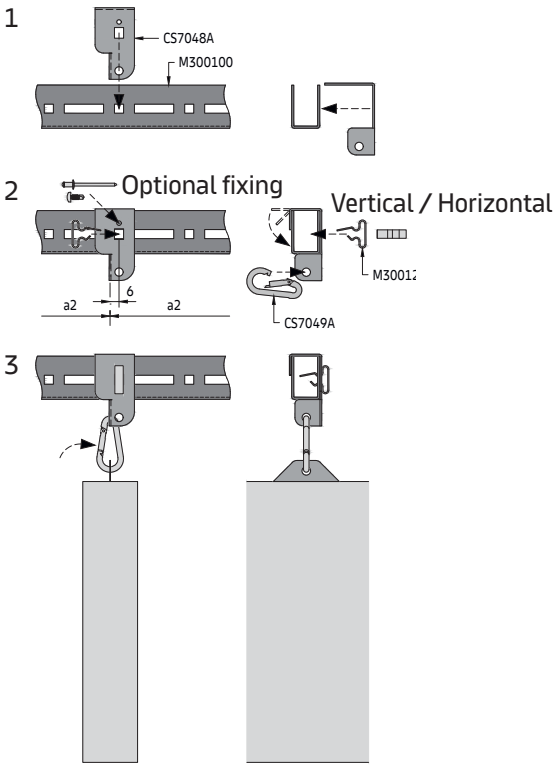
The baffle distance (a2) and the baffle height (BH) of the requested ceiling are the required values to determine suspension layout. On the appropriate spacing table for baffle height (BH), read down the column headed (a2) to the required baffle spacing then read across to determine the suspension point spacing (a0).
The shown values are maximum allowed distances and can be reduced but not exceeded.

MINERAL Baffle Element

E01.100.1

Section F

Example with suspension option E1



1. Place hanger on the U-Profile from the side.

2. Bend the upper part 90° downwards and insert the carabiner below the U-Profile. Fix hanger with plug-in clips at the specified module spacing (inserted vertically or horizontally). If the baffle distance does not fit with the modulation of the U-Profile (25 mm increments), the plug-in clip needs to be inserted into a long hole. The hanger position can alternatively be fixed by using a pop-rivet or self-drilling screw.

3. Hook the baffle on the carabiner. To prevent the baffles from being damaged by lateral pressure at the lower end, they are not rigidly connected to the hanger. The baffles are held in position by their own weight and therefore do not move due to an air flow or vibrations.

System without additional load [pcs/m²] (1200 / 1800 mm length)									
Components	**a2 [mm]**	**100**	**200**	**300**	**400**	**500**	**600**	**800**	**1000**
M300100	U-Profile	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30
M300119	Splice connector for U-Profile	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30	0.44 / 0.30
M300120	Plug-in clip for U-Profile	17.55 / 11.71	9.21 / 6.15	6.43 / 4.30	5.05 / 3.38	4.21 / 2.82	3.66 / 2.45	2.96 / 1.99	2.55 / 1.71
CS7048A	Hanger for baffle	16.67/ 11.11	8.33 / 5.55	5.55 / 3.70	4.17 / 2.78	3.33 / 2.22	2.78 / 1.85	2.08 / 1.39	1.67 / 1.11
CS7049A	Carabiner	16.67/ 11.11	8.33 / 5.55	5.55 / 3.70	4.17 / 2.78	3.33 / 2.22	2.78 / 1.85	2.08 / 1.39	1.67 / 1.11
Various	Suspension points (E1 - E4) for (H) = 300 mm	2.22 / 1.48	1.59 / 1.06	1.28 / 0.85	1.11 / 0.74	1.04 / 0.69	0.98 / 0.65	0.93 / 0.62	0.88 / 0.58
Various	Suspension points (E1 - E4) for (H) = 400 mm	2.38 / 1.59	1.67 / 1.11	1.39 / 0.93	1.19 / 0.79	1.08 / 0.72	1.04 / 0.69	0.95 / 0.63	0.90 / 0.60
Various	Suspension points (E1 - E4) for (H) = 500 mm	2.59 / 1.71	1.75 / 1.17	1.52 / 1.01	1.39 / 0.93	1.28 / 0.85	1.19 / 0.79	1.04 / 0.69	0.93 / 0.62
Various	Suspension points (E1 - E4) for (H) = 600 mm	2.78 / 1.85	1.96 / 1.31	1.67 / 1.11	1.52 / 1.01	1.39 / 0.93	1.28 / 0.85	1.11 / 0.74	0.93 / 0.62

RVA Brussel (National Employment Service), Belgium © Dion de Bakker

MINERAL Baffle Element

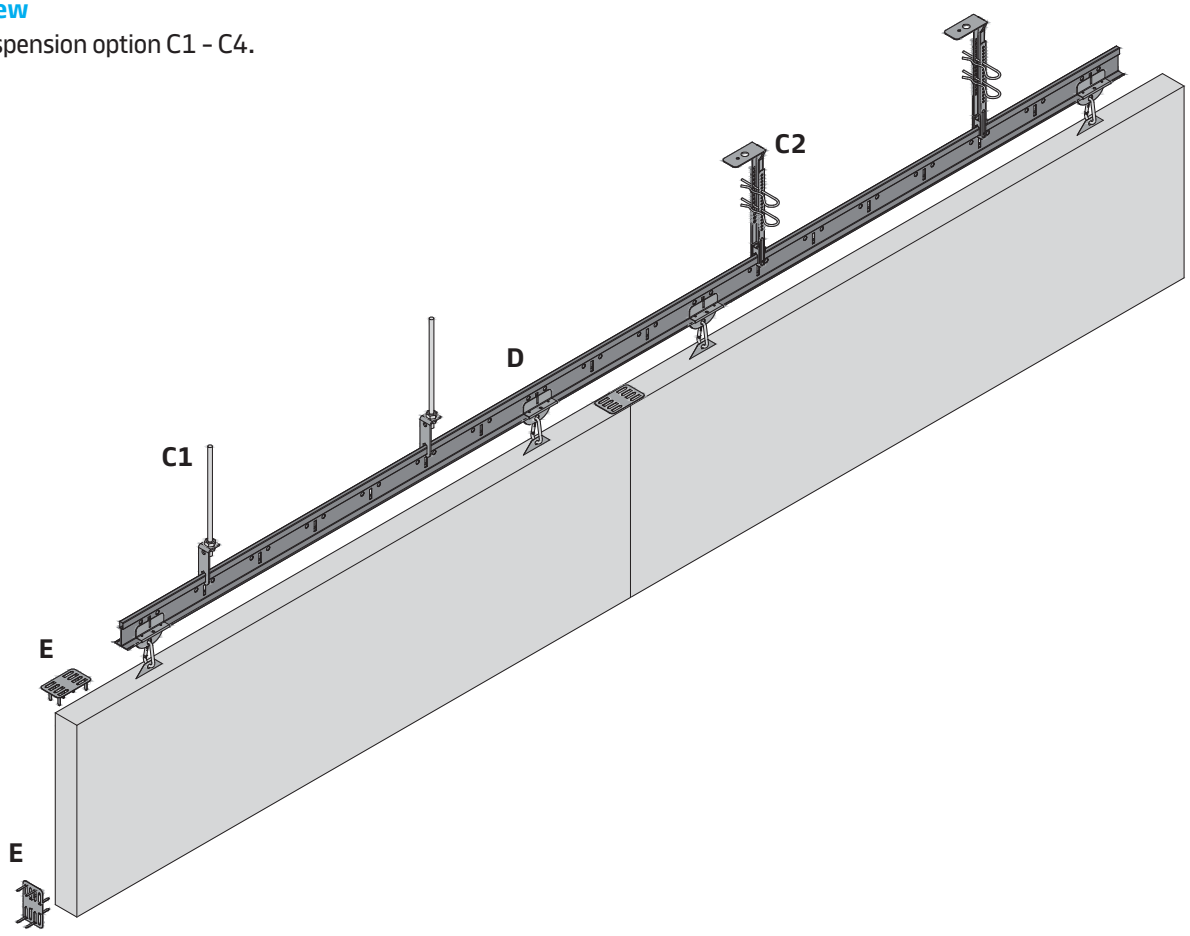
T-Grid Main Runner
Semi-exposed grid solution for indoor applications

General information

- Semi-exposed grid system for medium and large rooms
- T-Grid Main Runner for parallel installation
- Typical ceiling weight 3.8 - 7.5 kg/m² (indicative value without additional load)
- Baffles are easily installed and fully demountable
- Only for horizontal installation, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

Isometric view

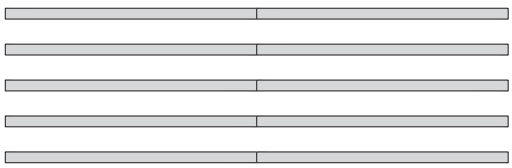
Select the suspension option C1 - C4.



Important information

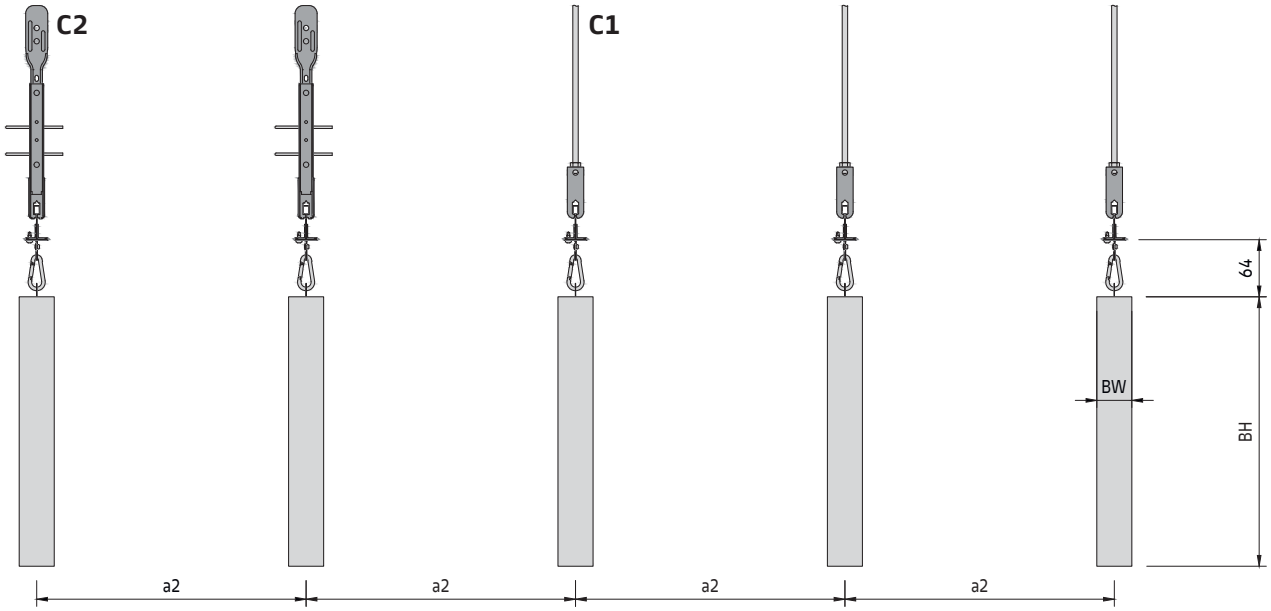
Please make sure that the visible sides of the baffles are protected during the assembly and cannot be scratched. The baffles must always be stored on a dry and flat surface. In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of baffles, clean white cotton gloves should be worn. It is recommended to keep a lateral distance between the baffles of at least 100 mm and from the ends to other objects min. 30 mm.

Standard layout



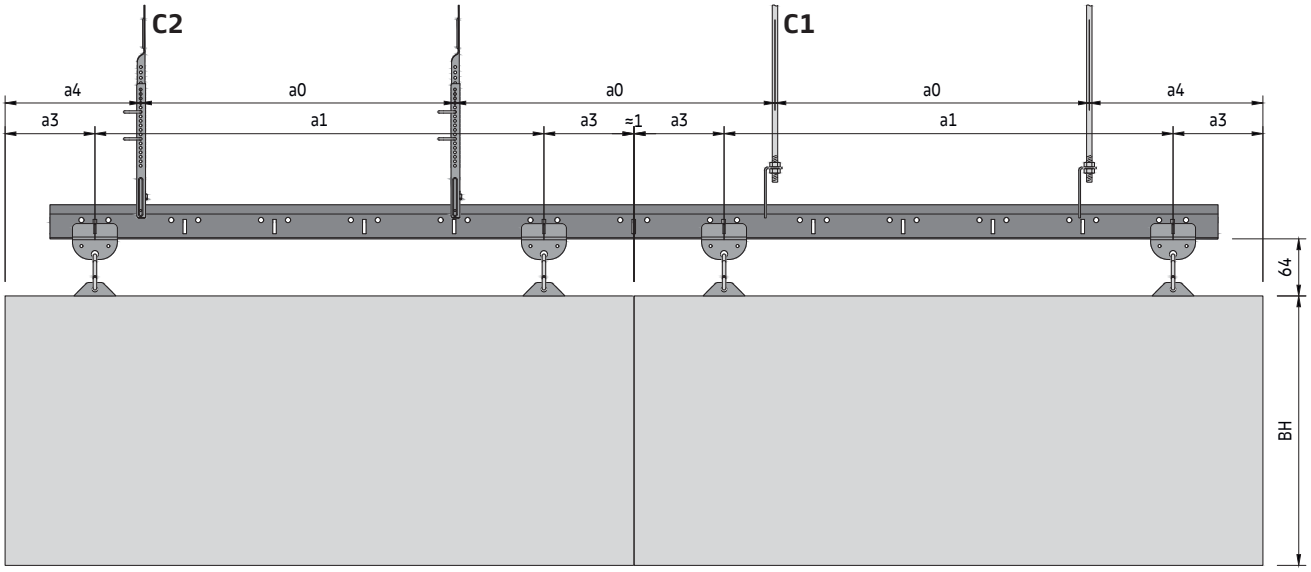
Section A

Example with suspension option C1 / C2

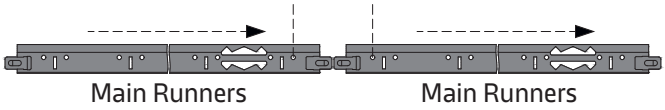


Section B

Example with suspension option C1 / C2



Main Runners

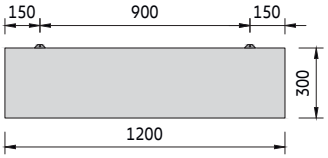


The Main Runners should always be installed in the same direction; two fire expansion notches can not be installed directly next to each other. The suspension points must be placed near the joint.

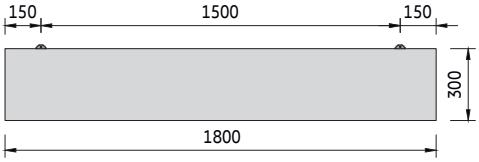
MINERAL Baffle Element

E01.100.2

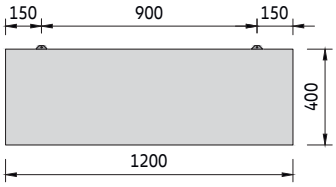
Rectangle 1200 x 300 mm



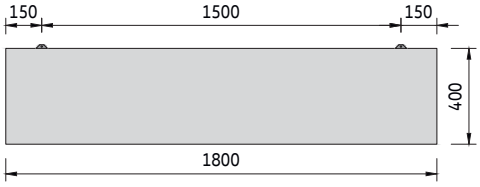
Rectangle 1800 x 300 mm



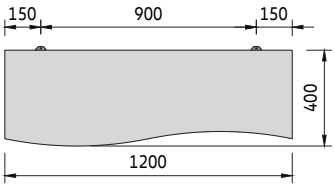
Rectangle 1200 x 400 mm



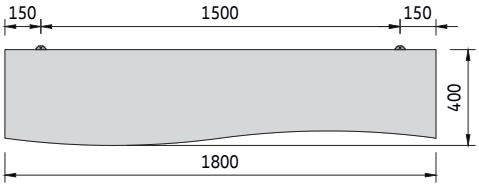
Rectangle 1800 x 400 mm



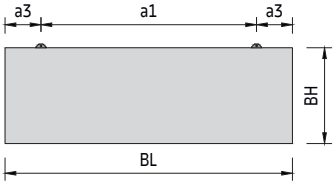
Arc 1200 x 400 mm



Arc 1800 x 400 mm



Vario Design

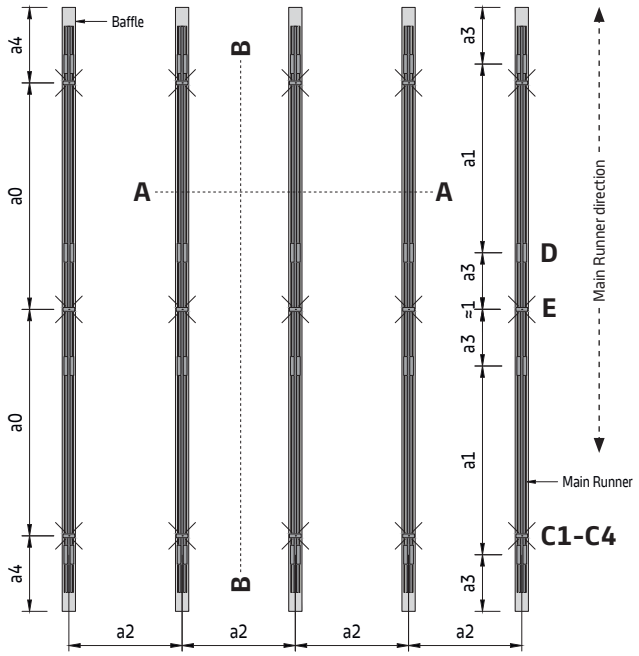


Custom sizes and shapes are available on request.

Typical baffle weight

Baffle height (H) [mm]	
300	3.10 kg/m
400	4.15 kg/m
500	5.20 kg/m
600	6.25 kg/m

Typical grid layout



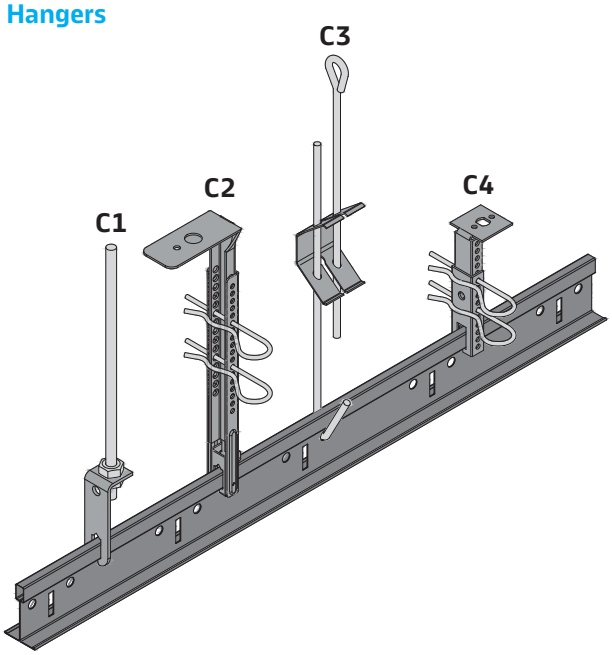
Parameters

a0	Distance between U-Profile suspension points = max. 1200 mm
a1	Distance between U-Profiles = 900 / 1500 mm
a2	Distance between baffles = min. 100 mm
a3	Distance from baffle end to baffle hanger = 150 mm
a4	Distance from U-Profile end to suspension point = max. 200 mm
a5	Distance from U-Profile end to baffle centre = min. 25 mm
a6	Distance between baffle ends = min. 10 mm
BL	Baffle length = max. 1800 mm
BH	Baffle height = min. 300 / max. 600 mm
BW	Baffle width = 39 mm

MINERAL Baffle Element

E01.100.2

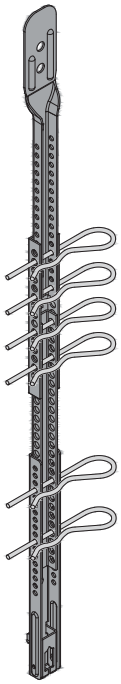
Hangers



There is a range of suspension hangers available for the T-Grid. Depending on the suspension height, object-related circumstances, availability or preference, all types can be used. It is important to ensure however, that the maximum load bearing capacity is not exceeded and the choice fits the system and the requirements. In the case of push-on hangers, care is needed to ensure that installation and removal of the baffle does not displace the hangers. When using push-on hangers, the direction of installation should be at 90° to the Main Runners, tension free and vertical. Hangers with visible defects must not be used. Improper handling, such as forcibly bending open and closed tabs / parts of the hanger, will result in a loss of load-bearing capacity.

Hanger installation

C2
Nonius hanger extension



Hangers must be installed vertically. In addition, a hanger is required at each Main Runner joint. Angled hangers can significantly reduce the load bearing capacity and not all hangers are suitable. For suspension heights over 3000 mm Nonius hangers (C2) are recommended.

Hanger type		Min. installation height (H) [mm]
C1	Bent tee bar hanger with threaded rod	100
C2	Nonius top and bottom part	200
C3	Quick hanger with loop	100
C4	Direct hanger	80

Not all combinations of grid systems / Main Runner and hanger are possible. This primarily applies to hangers for sliding on and clipping on due to the different profile head heights and shapes - rectangle / roof (peak).

Components

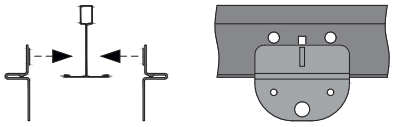
Standard components

- CS5548BCZ Hanger
- CS5549 Splice connector

Detail D

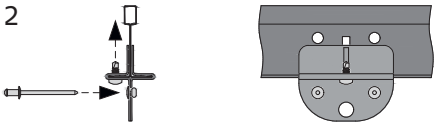
CS5548BCZ hanger installation

1



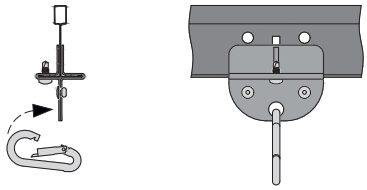
The baffle hanger is delivered in three parts (two brackets and one carabiner). Insert the brackets sideways onto the T-Grid until they click into place.

2



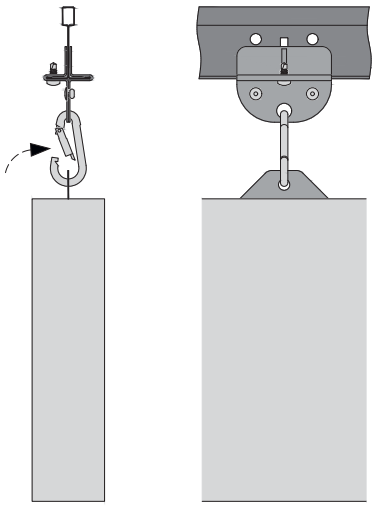
Secure the brackets optionally with two pop-rivets and use a self-drilling screw to prevent longitudinal movement.

3



Insert the carabiner into the brackets from below.

4

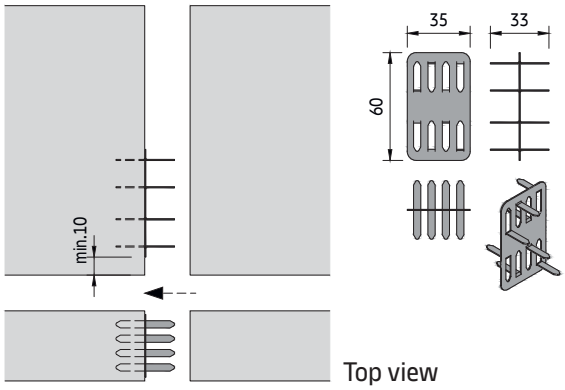


Hook the baffle on the carabiner. To prevent the baffles from being damaged by lateral pressure at the lower end, they are not rigidly connected to the hanger. The baffles are held in position by their own weight and therefore do not move due to an air flow or vibrations.

Detail E

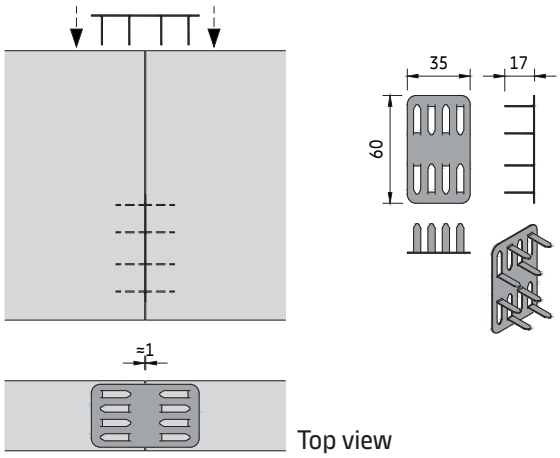
CS5549 splice connection

1



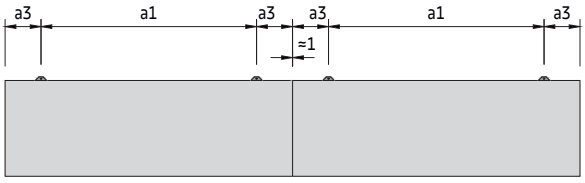
Press the bottom splice connector into the first baffle until it is flush, leaving at least 10 mm of space from the bottom edge. Make sure the splice connector is centred.

2

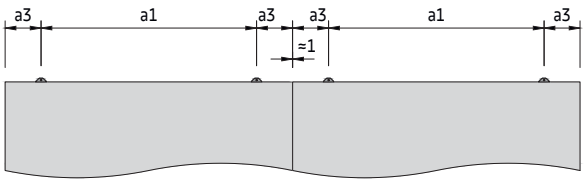


Press the top splice connector onto the baffle from above until it is flush. Make sure the splice connector is centred. There is a gap of ≈1 mm between the baffles.

Rectangle



Arc



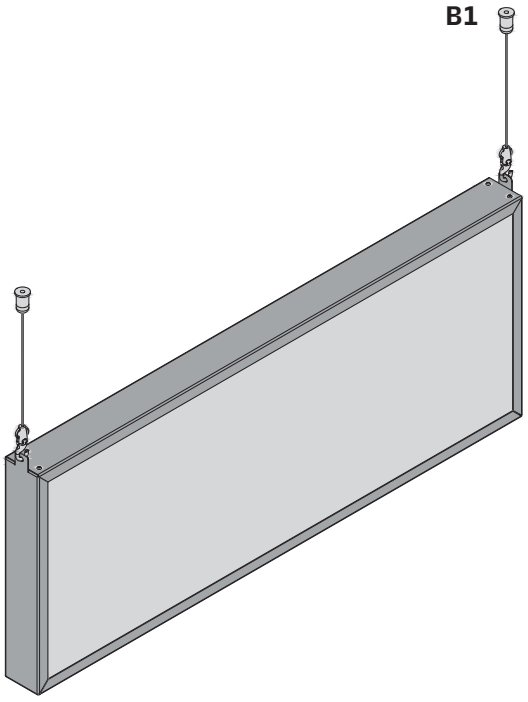
MINERAL Baffle Line L/N

Hanging wire
Single suspended solution for indoor applications

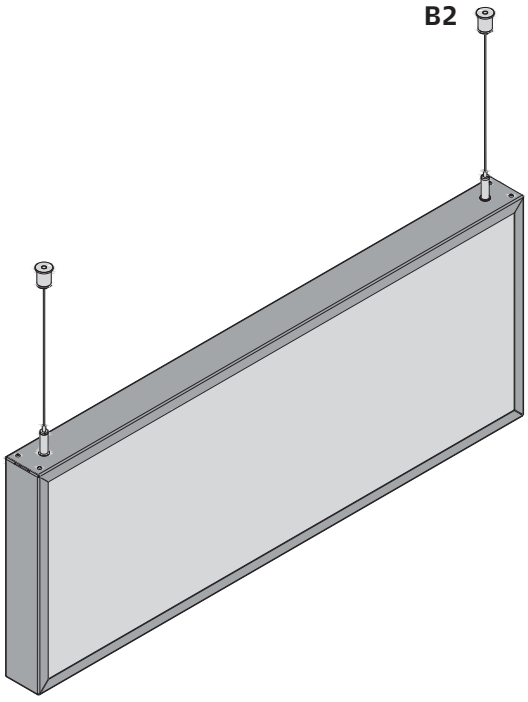
General information

- Hanging wire for single suspension
- Typical ceiling weight 3.2 – 6.0 kg/pc
- Baffles are easily installed and fully demountable
- Acoustic & design elements
- Only for horizontal installation, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

Isometric view

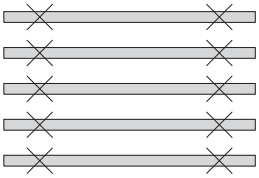


MINERAL Baffle Line L



MINERAL Baffle Line N

Standard layout

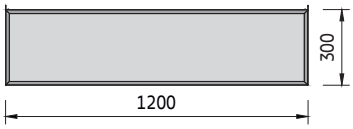


MINERAL Baffle Line L/N

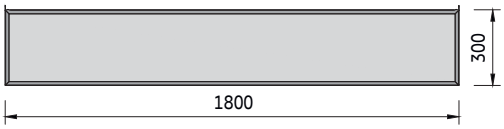
E01.101

Standard Shapes

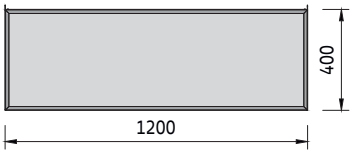
Rectangle 1200 x 300 mm



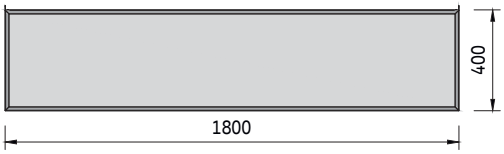
Rectangle 1800 x 300 mm



Rectangle 1200 x 400 mm



Rectangle 1800 x 400 mm

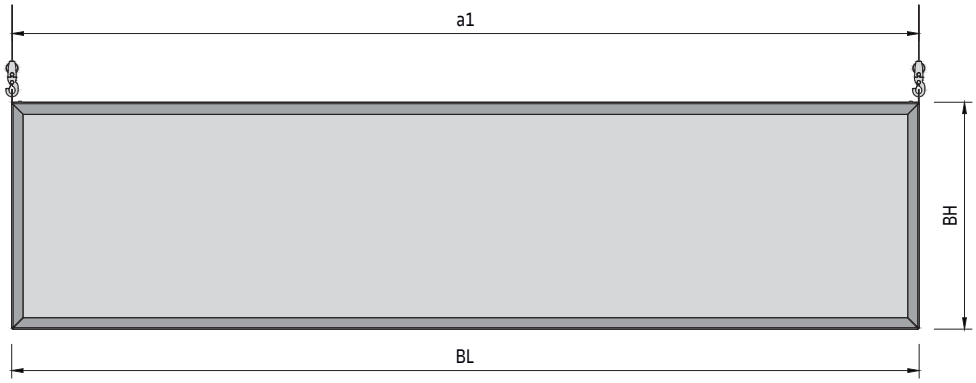


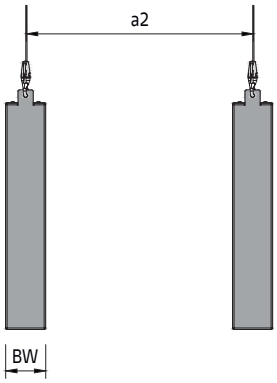
Important information

This type of suspension is intended for a smaller number of baffles or if they are not to be aligned parallel. Grouping with the U-Profile is recommended for larger areas. The hanging wires are supplied in a length of 1000 mm. Further lengths are available on request. Please make sure that the visible sides of the baffle are protected during the assembly and cannot be scratched. The baffles must always be stored on a dry and flat surface. In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of baffles, clean white cotton gloves should be worn. Ensure that only the frames of the baffles are handled. It is recommended to keep a lateral distance between the baffles of at least 100 mm and from the ends to other objects min. 30 mm.
This installation depends on the dimensions and configuration of the baffle.

Detail A1

MINERAL Baffle Line L



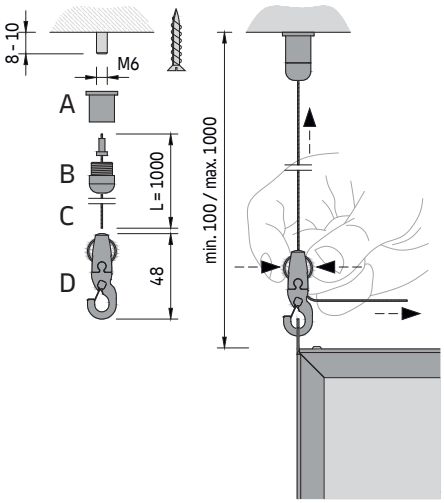


Parameters

a1	Distance between suspension points = 1200 / 1800 mm
a2	Distance between baffles = min. 100 mm
BL	Baffle length = max. 1800 mm
BH	Baffle height = min. 300 / max. 600 mm
BW	Baffle width = 53 mm

Detail B1

SAE-GHD 1 hanging wire installation



1 Place an M6 threaded bolt on the raw ceiling or use alternative a wood screw to fix the structure gripper anchor (A) (not offered by Knauf Ceiling Solutions).

2 Take the hanging wire (C) and loop it through the top of the gripper anchor cap (B).

3 Screw the gripper anchor cap (B) onto the structure gripper anchor (A).

4 Guide the hanging wire (C) into the height adjuster with carabiner (D). Pull the wire through the height adjuster, in an angle of ≈90°. Do not pull the wire upwards, otherwise it may be damaged.

5 Hang the baffle on the two carabiners.

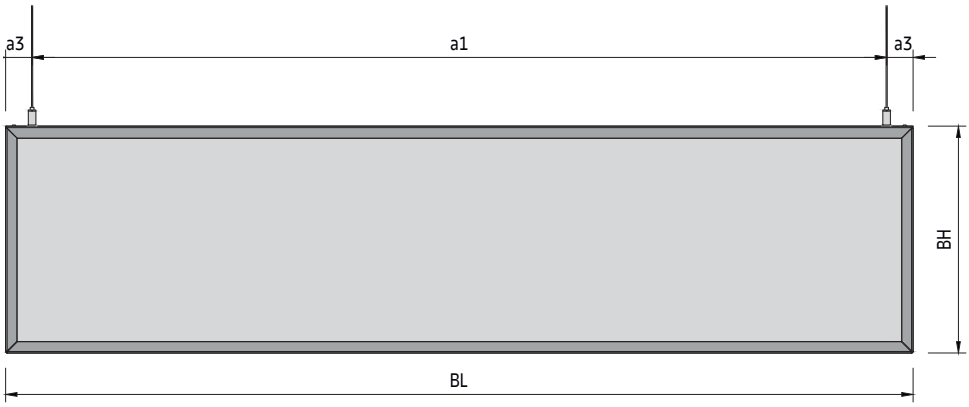
6 After cutting the wire away, it can no longer be adjusted in height. The hanging wire can be subsequently shortened using the height adjuster.

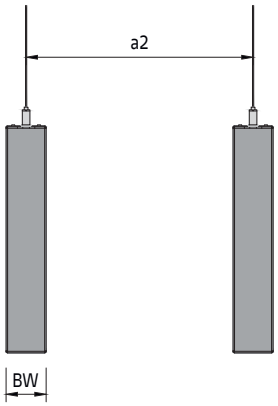
MINERAL Baffle Line L/N

E01.101

Detail A2

MINERAL Baffle Line N



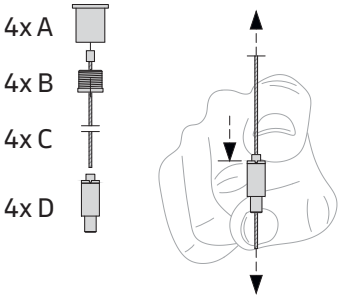


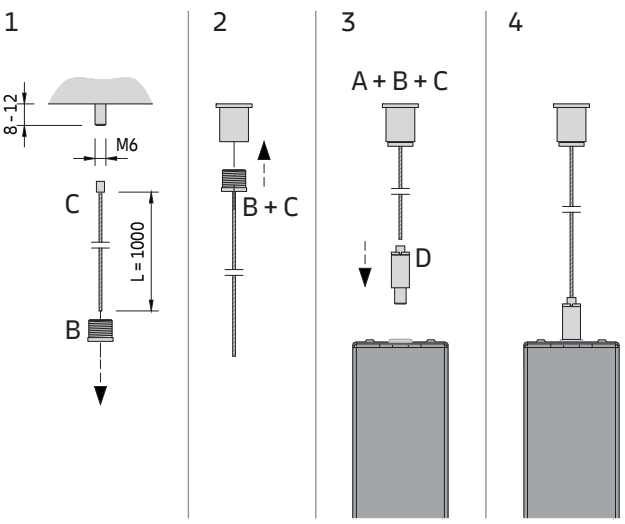
Parameters

a1	Distance between suspension points = 1132 / 1732 mm
a2	Distance between baffles = min. 100 mm
a3	Distance from baffle end to baffle hanger = 34 mm
BL	Baffle length = max. 1800 mm
BH	Baffle height = min. 300 / max. 600 mm
BW	Baffle width = 53 mm

Detail B2

CS7054A hanging wire installation





1 Place an M6 threaded bolt on the raw ceiling or use alternative a wood screw to fix the structure gripper anchor (A) (not offered by Knauf Ceiling Solutions).
Take the hanging wire (C) and loop it through the top of the gripper anchor cap (B).

2 Screw the gripper anchor cap (B) onto the structure gripper anchor (A).

3 Screw the height adjuster (D) into the profile on the top of the baffle. Guide the hanging wire (C) into the height adjuster (D). Pull the wire through the height adjuster.

4 After cutting the wire away, it can no longer be adjusted in height. The hanging wire can be subsequently shortened using the height adjuster.

MINERAL Baffle Line L

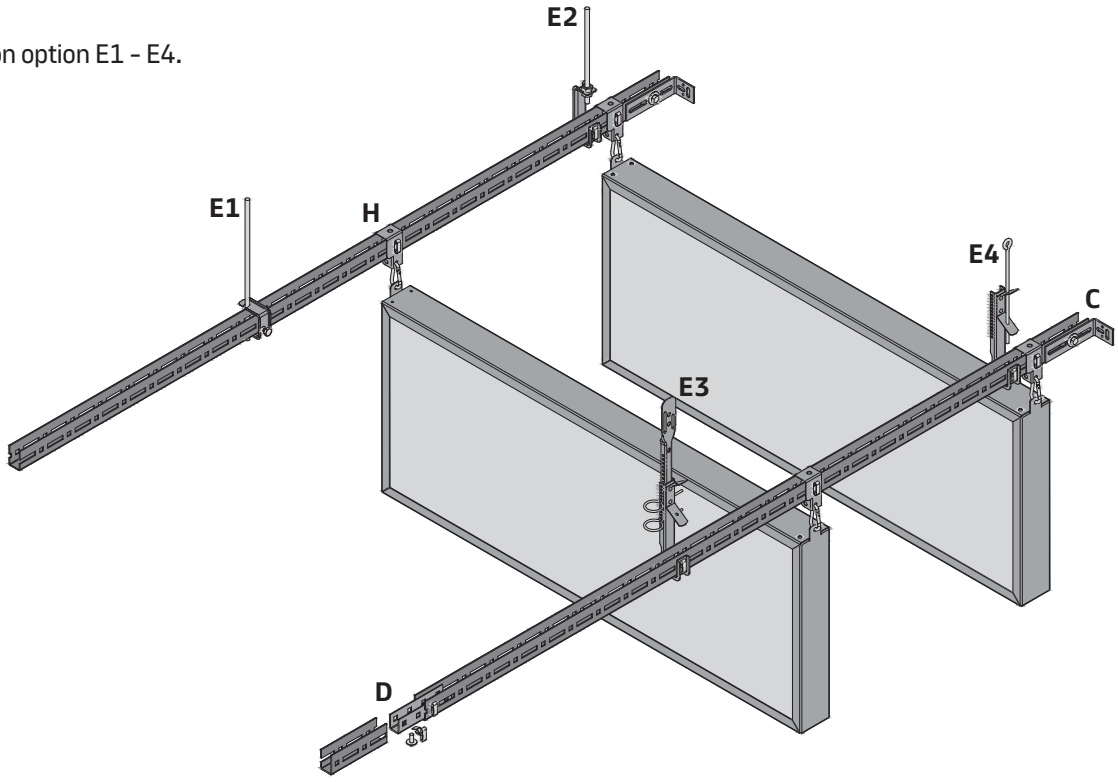
U-Profile primary grid + hanger for baffle
Semi-exposed grid solution for indoor applications

General information

- Semi-exposed hook-on grid system for medium and large rooms
- Fully configurable solution with variable baffle spacing
- For perpendicular or parallel installation on U-Profile primary grid
- Typical ceiling weight 3.2 - 6.0 kg/m²
- Baffles parallel aligned
- Baffles are easily installed and fully demountable
- Only for horizontal installation, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

Isometric view

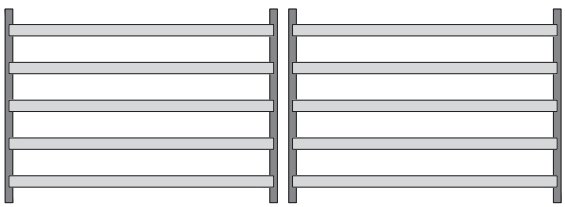
Select the suspension option E1 - E4.



Important information

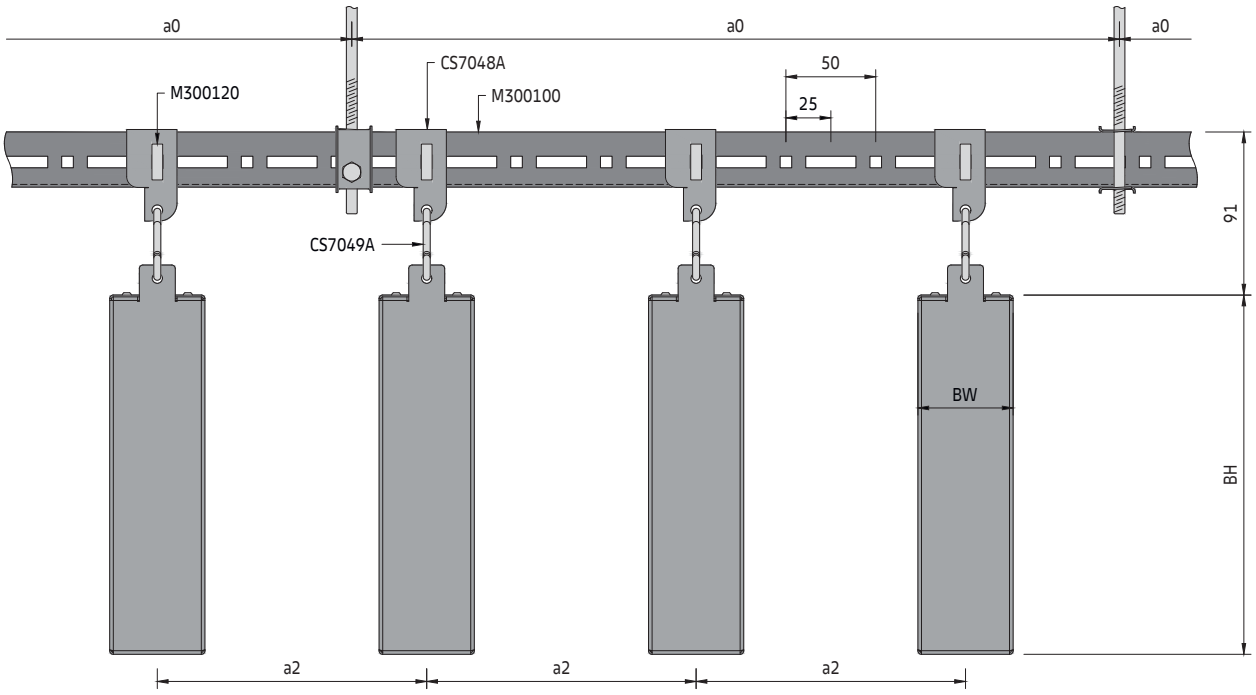
Please make sure that the visible sides of the baffles are protected during the assembly and cannot be scratched. The baffles must always be stored on a dry and flat surface. In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of baffles, clean white cotton gloves should be worn. Ensure that only the frames of the baffles are handled.
It is recommended to keep a lateral distance between the baffles of at least 100 mm and from the ends to other objects min. 50 mm.

Standard layout



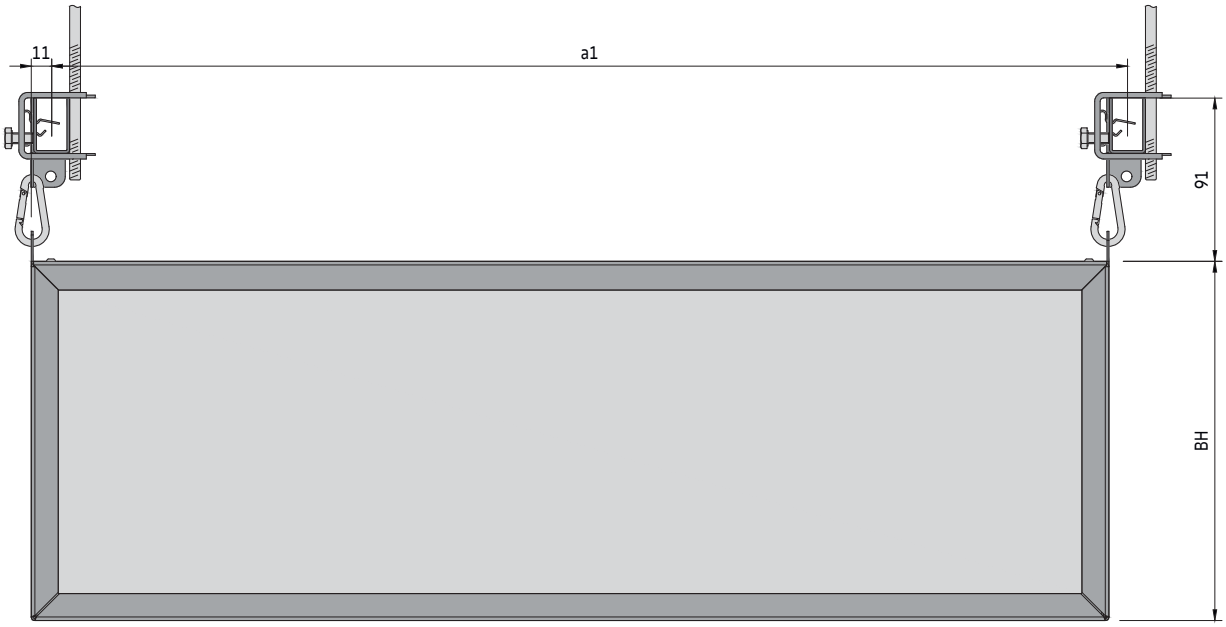
Section F

Example with suspension option E1



Section G

Example with suspension option E1



Grid components

Standard components

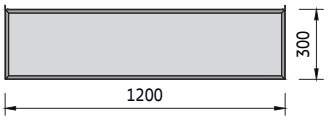
- CS7048A Hanger for baffle
- CS7049A Carabiner

MINERAL Baffle Line L

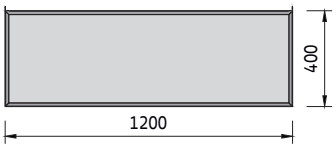
E01.101.1

Standard shapes

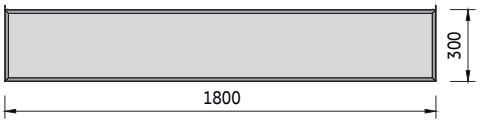
Rectangle 1200 x 300 mm



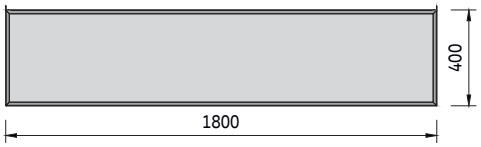
Rectangle 1200 x 400 mm



Rectangle 1800 x 300 mm

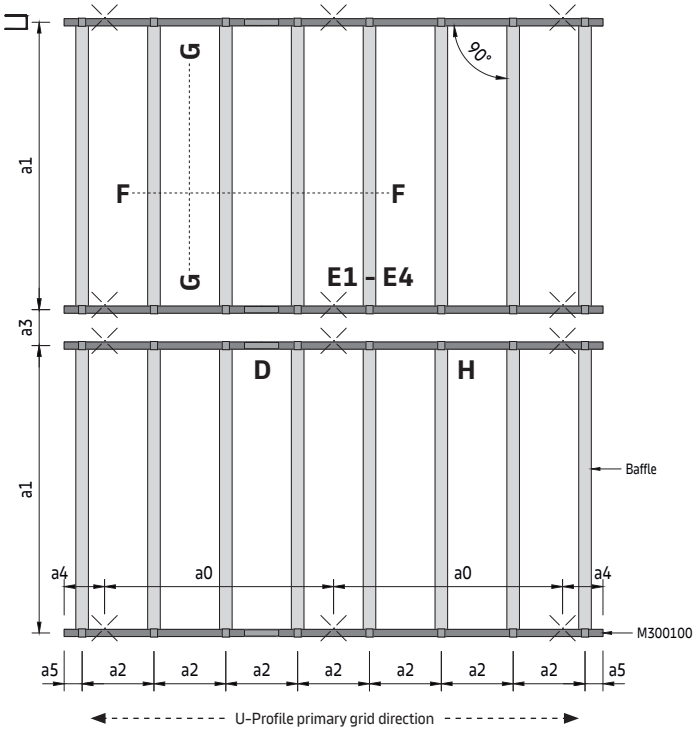


Rectangle 1800 x 400 mm



System without additional load / baffle height (H)		
a2 [mm]	300 mm a0 [mm]	400 mm a0 [mm]
100	750	700
200	1050	1000
300	1300	1200
400	1500	1400
500	1600	1550
600	1700	1600
700	1750	1700
800	1800	1750
900	1850	1800
1000	1900	1850

Typical grid layout



Parameters

a0 Distance between U-Profile suspension points = max. 1900 mm
a1 Distance between U-Profiles = 1200 / 1800 mm
a2 Distance between baffles = min. 100 mm
a3 Distance between baffle ends = min. 50 mm
a4 Distance from U-Profile end to suspension point = max. 200 mm
a5 Distance from U-Profile end to baffle centre = min. 25 mm
BL Baffle length = max. 1800 mm
BH Baffle height = min. 300 / max. 600 mm
BW Baffle width = 53 mm

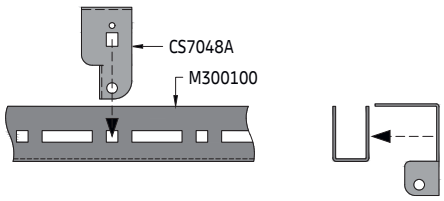
To determine suspension layout

The baffle distance (a2) and the baffle height (BH) of the requested ceiling are the required values to determine suspension layout. On the appropriate spacing table for baffle height (BH), read down the column headed (a2) to the required baffle spacing then read across to determine the suspension point spacing (a0). The shown values are maximum allowed distances and can be reduced but not exceeded.

Detail H

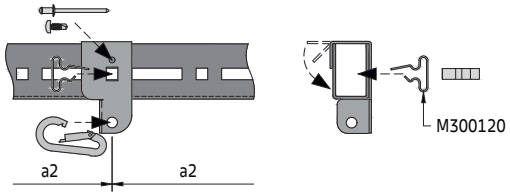
Hanger installation

1



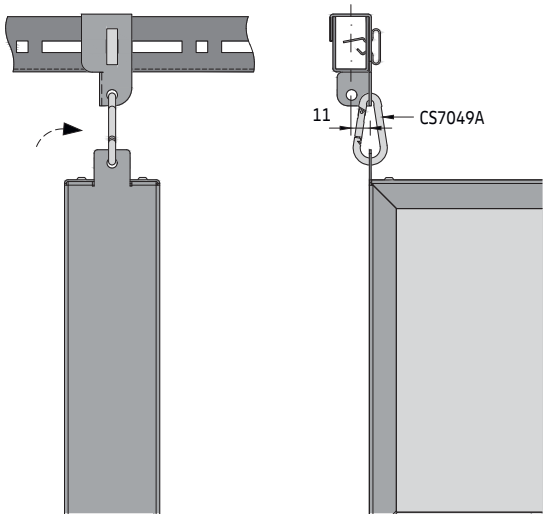
Place hanger on the U-Profile from the side.

2



Bend the upper part 90° downwards and insert the clip below the U-Profile. Fix hanger with plug-in clips at the specified module spacing (inserted vertically or horizontally). If the baffle distance does not fit with the modulation of the U-Profile (25 mm increments), the plug-in clip needs to be inserted into a long hole.
The hanger position can alternatively be fixed by using a pop-rivet or self-drilling screw.

3



Hook the baffle on the carabiner. To prevent the baffles from being damaged by lateral pressure at the lower end, they are not rigidly connected to the hanger. The baffles are held in position by their own weight and therefore do not move due to an air flow or vibrations.

Material required per m² (no waste included)

System without additional load, including standard acoustic infill [pcs/m²] (1200 / 1800 mm length)

Components	a2 [mm]	100	200	300	400	500	600	800	1000
M300100	U-Profile	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30
M300119	Splice connector for U-Profile	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30	0.44/ 0.30
M300120	Plug-in clip for U-Profile	17.55/ 11.71	9.2/ 6.15	6.43/ 4.30	5.05/ 3.38	4.21/ 2.82	3.66/ 2.45	2.96/ 1.99	2.55/ 1.71
CS7048A	Hanger for baffle	16.67/ 11.11	8.33/ 5.55	5.55/ 3.70	4.17/ 2.78	3.33/ 2.22	2.78/ 1.85	2.08/ 1.39	1.67/ 1.11
CS7049A	Carabiner	16.67/ 11.11	8.33/ 5.55	5.55/ 3.70	4.17/ 2.78	3.33/ 2.22	2.78/ 1.85	2.08/ 1.39	1.67/ 1.11
Various	Suspension points (E1 - E4) for (H) = 300 mm	2.22/ 1.48	1.59/ 1.06	1.28/ 0.85	1.11/ 0.74	1.04/ 0.69	0.98/ 0.65	0.93/ 0.62	0.88/ 0.58
Various	Suspension points (E1 - E4) for (H) = 400 mm	2.38/ 1.59	16.67/ 11.11	1.39/ 0.93	1.19/ 0.79	1.08/ 0.72	1.04/ 0.69	0.95/ 0.63	0.90/ 0.60

MINERAL Baffle Line L

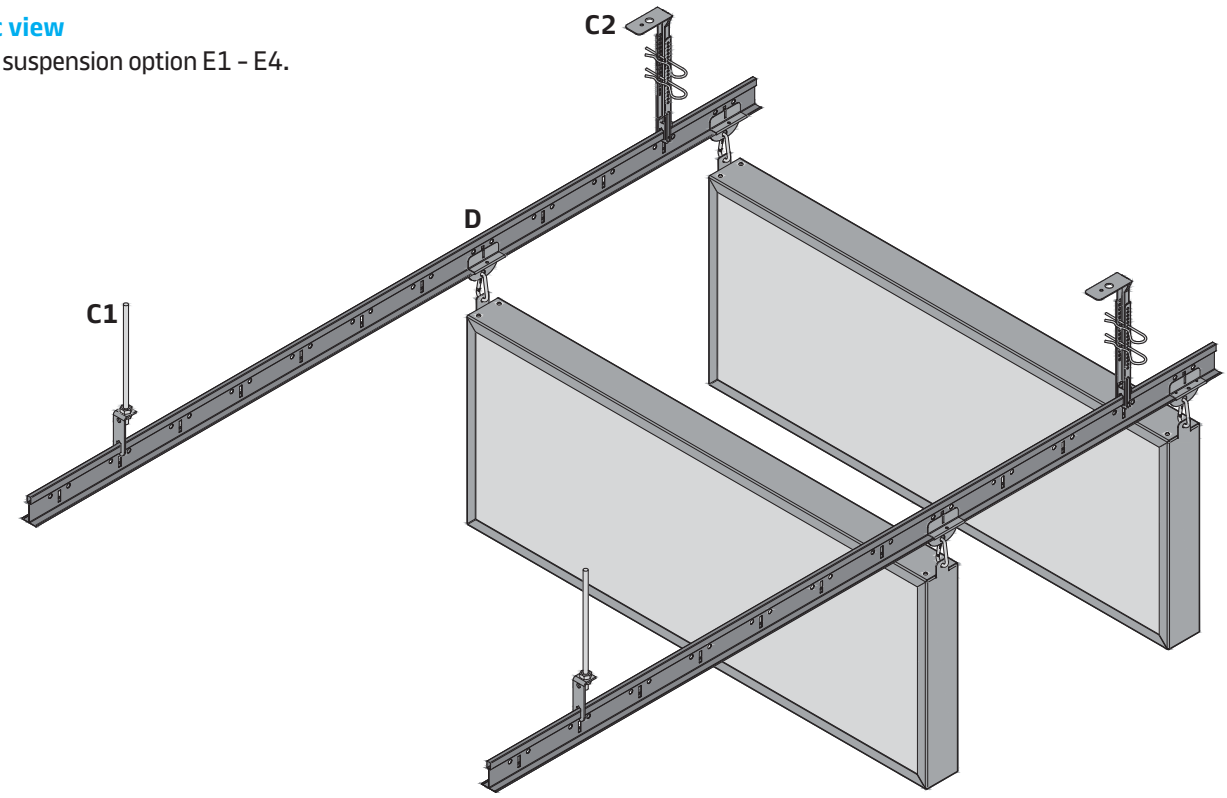
T-Grid Main Runner
Semi-exposed grid solution for indoor applications

General information

- Semi-exposed grid system for medium and large rooms
- T-Grid Main Runner for perpendicular installation
- Typical ceiling weight 3.2 - 6.0 kg/m² (indicative value without additional load)
- Baffles are easily installed and fully demountable
- Only for horizontal installation, without inclination
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation) and when a strong draught is expected

Isometric view

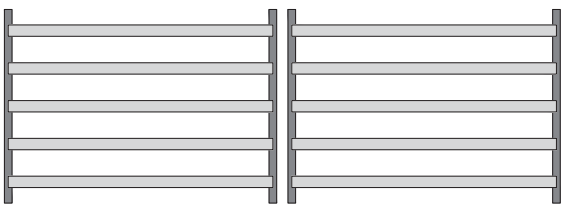
Select the suspension option E1 - E4.



Important information

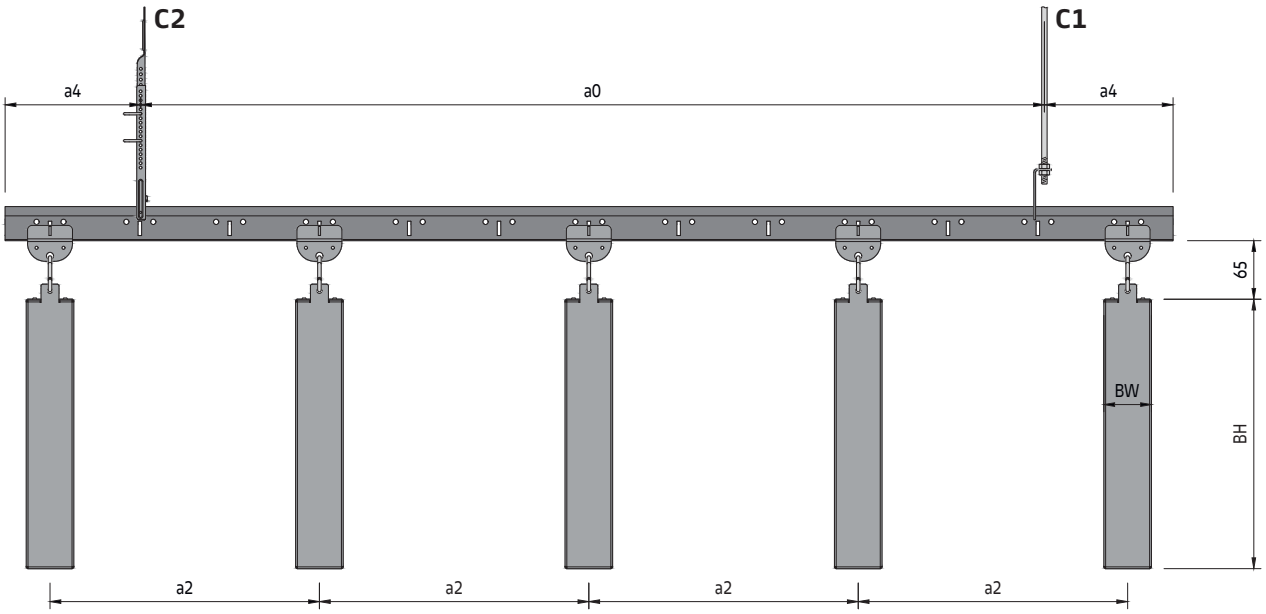
Please make sure that the visible sides of the baffles are protected during the assembly and cannot be scratched. The baffles must always be stored on a dry and flat surface. In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of baffles, clean white cotton gloves should be worn. Ensure that only the frames of the baffles are handled.
It is recommended to keep a lateral distance between the baffles of at least 100 mm and from the ends to other objects min. 50 mm.

Standard layout



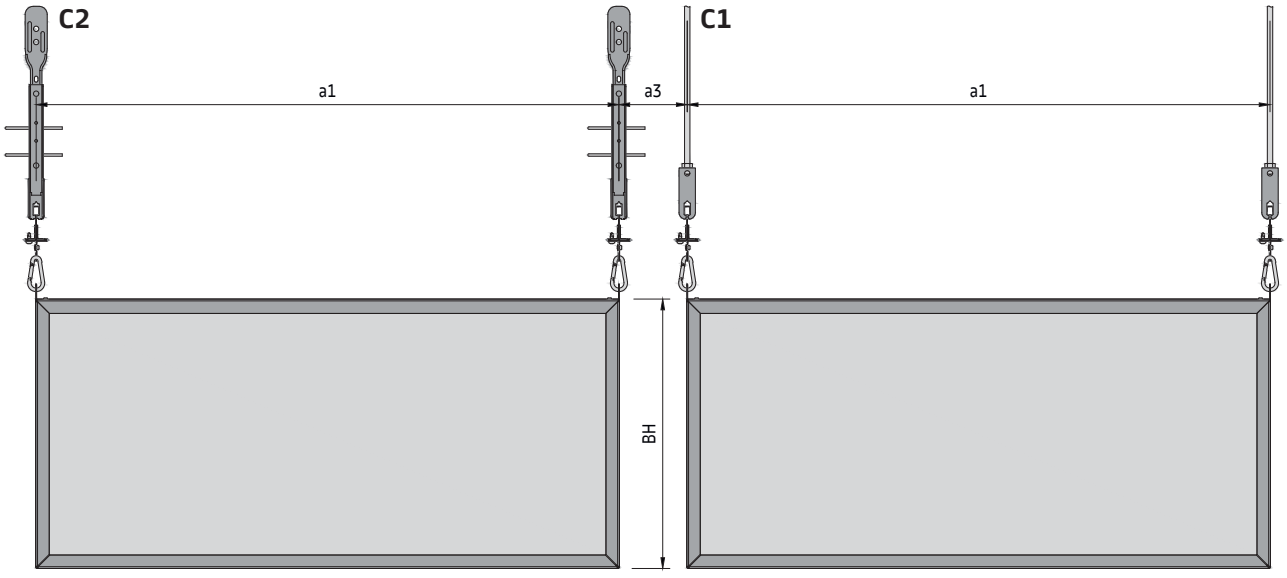
Section A

Example with suspension option C1 / C2

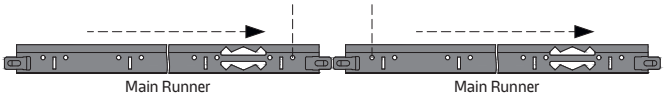


Section B

Example with suspension option C1 / C2



Main Runners



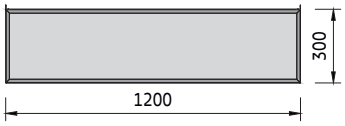
The Main Runners should always be installed in the same direction; two fire expansion notches can not be installed directly next to each other. The suspension points must be placed near the joint.

MINERAL Baffle Line L

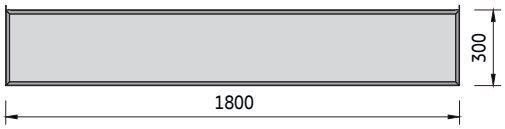
E01.101.2

Standard shapes

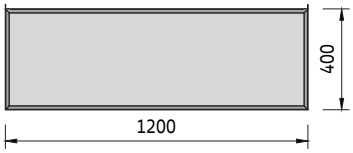
Rectangle 1200 x 300 mm



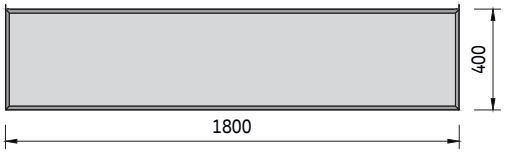
Rectangle 1800 x 300 mm



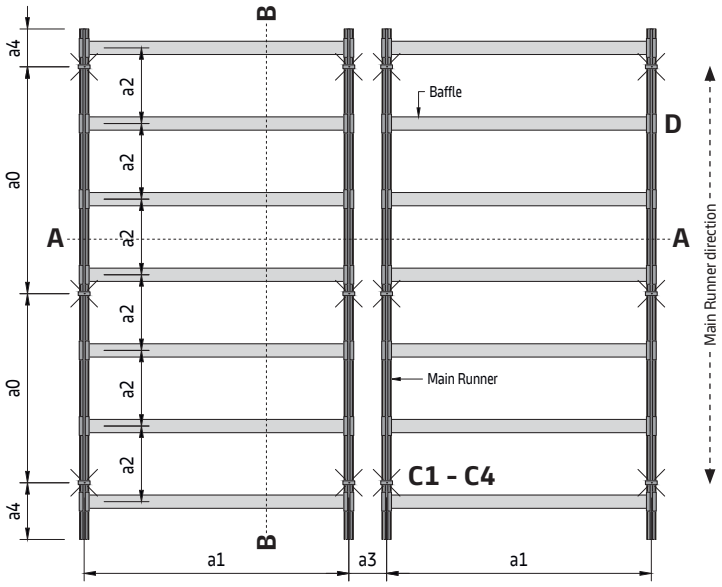
Rectangle 1200 x 400 mm



Rectangle 1800 x 400 mm



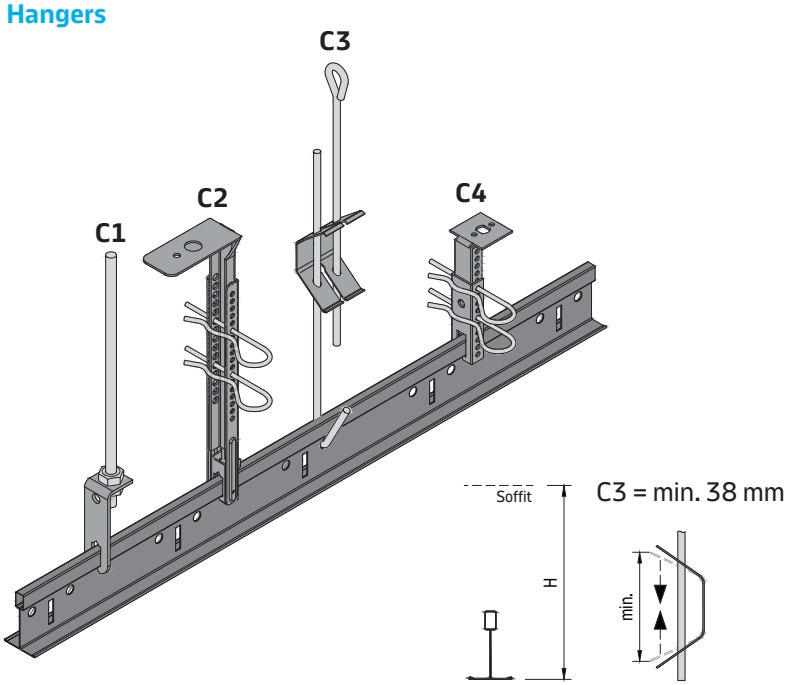
Typical grid layout



Parameters

a0 Distance between T-Grid suspension points = max. 1200 mm
a1 Distance between T-Grid = 1200 / 1800 mm
a2 Distance between baffles = baffle height (H) recommended
a3 Distance between baffle ends = min. 50 mm
a4 Distance from T-Grid end to suspension point = max. 200 mm
BL Baffle length = max. 1800 mm
BH Baffle height = min. 300 / max. 600 mm
BW Baffle width = 53 mm

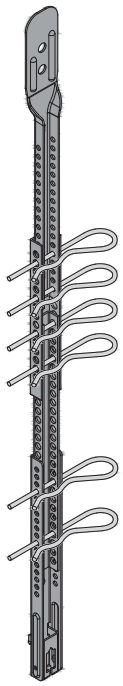
Hangers



There is a range of suspension hangers available for the T-Grid. Depending on the suspension height, object-related circumstances, availability or preference, all types can be used. It is important to ensure however, that the maximum load bearing capacity is not exceeded and the choice fits the system and the requirements. In the case of push-on hangers, care is needed to ensure that installation and removal of the baffles does not displace the hangers. When using push-on hangers, the direction of installation should be at 90° to the Main Runners, tension free and vertical. Hangers with visible defects must not be used. Improper handling, such as forcibly bending open and closed tabs / parts of the hanger, will result in a loss of load-bearing capacity.

Hanger installation

C2
Hanger installation



Hangers must be installed vertically. In addition, a hanger is required at each Main Runner joint. Angled hangers can significantly reduce the load bearing capacity and not all hangers are suitable. For suspension heights over 3000 mm Nonius hangers (C2) are recommended.

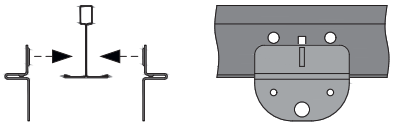
Hanger type		Min. installation height (H) [mm]
C1	Bent tee bar hanger with threaded rod	100
C2	Nonius top and bottom part	200
C3	Quick hanger with loop	130
C4	Direct hanger	80

Not all combinations of grid systems / Main Runner and hanger are possible. This primarily applies to hangers for sliding on and clipping on due to the different profile head heights and shapes - rectangle / roof (peak).

Detail D

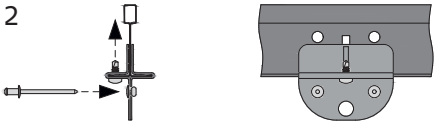
CS5548BCZ hanger installation

1



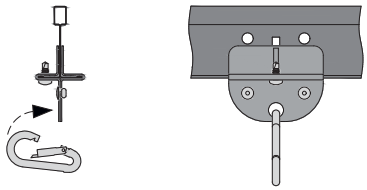
The baffle hanger is delivered in three parts (two brackets and one carabiner). Insert the brackets sideways onto the T-Grid until they click into place.

2



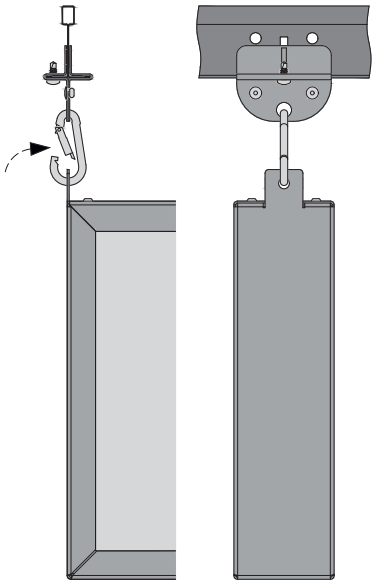
Secure the brackets with two pop-rivets optionally and use a self-drilling screw to prevent longitudinal movement.

3



Insert the carabiner into the brackets from below.

4



Hook the baffle on the carabiner. To prevent the baffles from being damaged by lateral pressure at the lower end, they are not rigidly connected to the hanger. The baffles are held in position by their own weight and therefore do not move due to an air flow or vibrations.

RVA Brussel (National Employment Service), Belgium © Dion de Bakker

© Sepp Eder

Wall Solutions

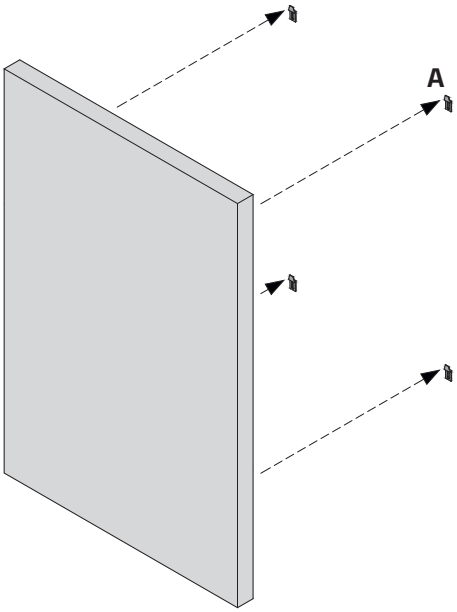
MINERAL Wallcoustic Element

Wall bracket
Single wall absorber solution for indoor application

General information

- Wall bracket for wall absorbers
- For upright or reclined installation
- Typical wall absorber weight 6.0 kg/m² (indicative value without additional load)
- Wall absorbers are easily installed and fully demountable
- Acoustic & design elements
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation)

Isometric view

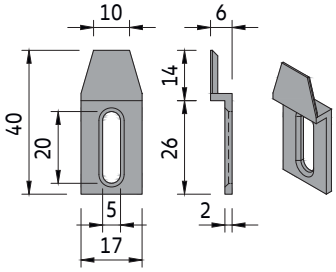


Important information

Make sure that the visible side is protected during the assembly and cannot be scratched. The wall absorbers must always be stored on a dry and flat surface and can either be stacked (max 8 pieces) or stand on the long edge (no stacking permitted). In general, be careful when handling and transporting these large and heavy items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of wall absorbers, the elements must always be carried by two when removing the packaging and at all times when handling the wall absorber, clean white cotton gloves should be worn. These wall absorbers are not protected against lifting nor designed for impact resistance. To secure the product, install it first and use a simple angle on top of the edge, to prevent lifting. For standard shapes, every package includes a positioning device to mark the suspension points. The wall absorbers can be installed without any gap between each other, but we recommend keeping a gap of min. 15 mm between the elements.

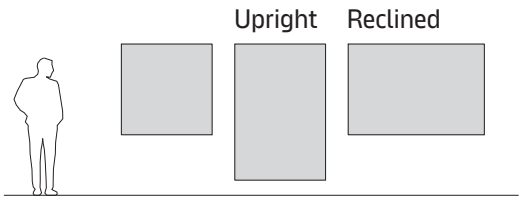
Detail A

CS7047A wall bracket



Fasten the wall brackets to the wall according to the spacing of the spiral anchors on the back of the wall absorbers.

Standard shape options



Components

Standard components

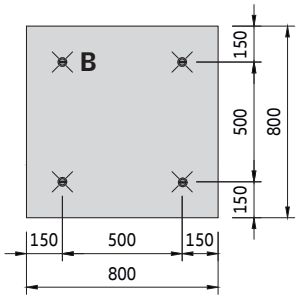
- CS7047A Wall bracket
- CS7013B Spiral anchor

MINERAL Wallcoustic Element

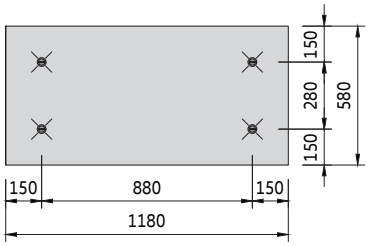
F01.400

Standard shapes

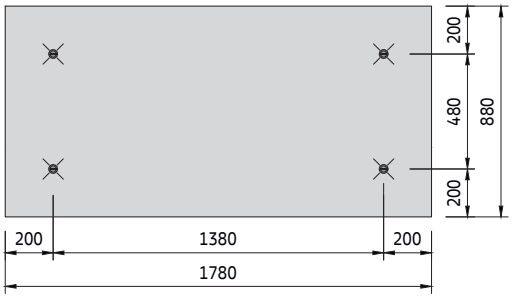
Square 800 x 800 mm



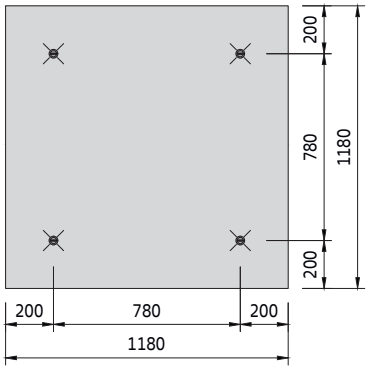
Rectangle 580 x 1180 mm



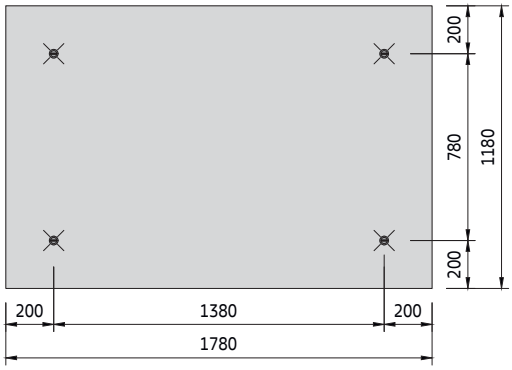
Rectangle 880 x 1780 mm



Square 1180 x 1180 mm



Rectangle 1180 x 1780 mm

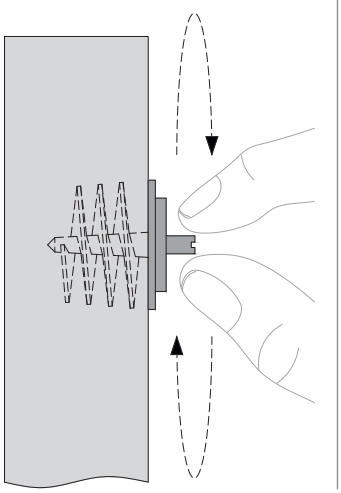


Custom sizes and shapes are available on request.

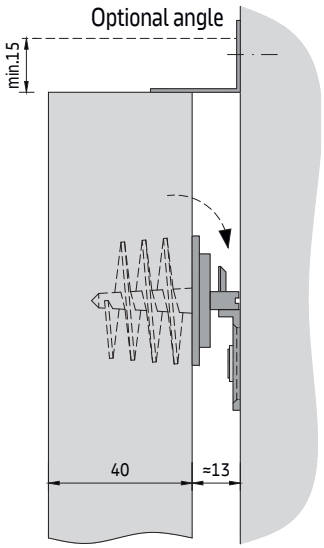
Detail B

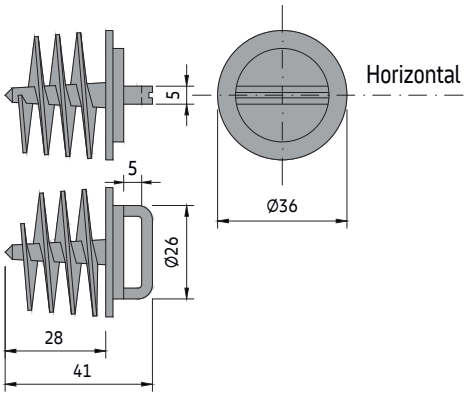
CS7013B spiral anchor

1



2





1 Insert the four spiral anchors on the back of the wall absorber, at the pre-defined position. The end position of the bracket should be horizontal.

2 Hang the wall absorber on the wall bracket with the four spiral anchors. A distance of at least 15 mm is required from the upper edge of the wall absorber so that it can be hung. An optional angle prevents lifting of the wall absorber.

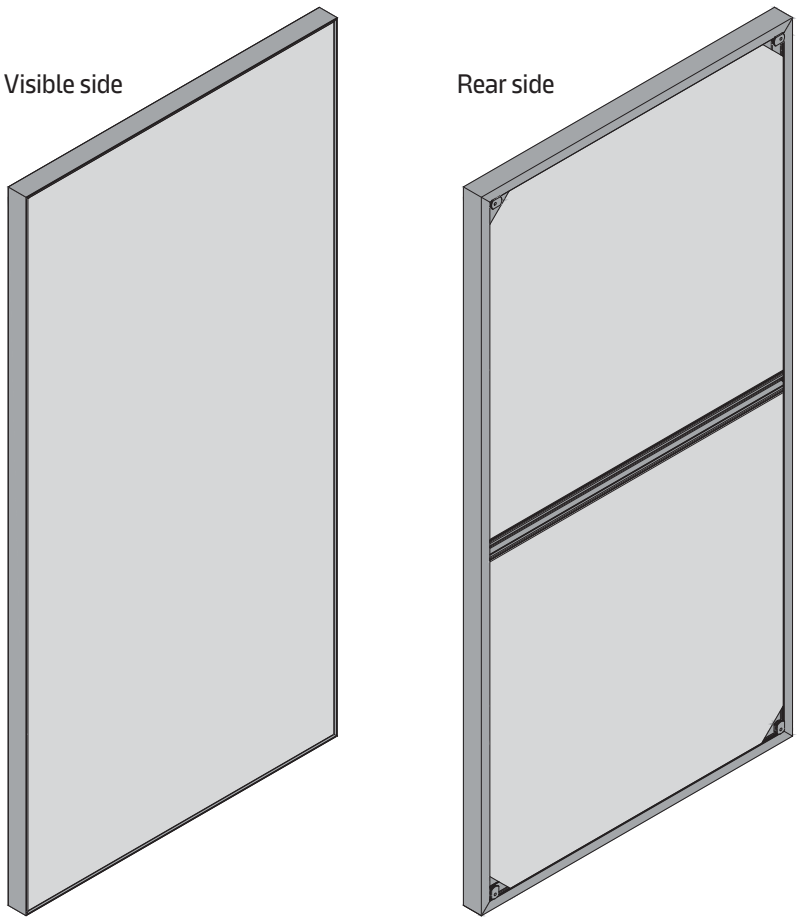
MINERAL Wallcoustic Line

Eccentric bracket
Single wall absorber solution for indoor applications

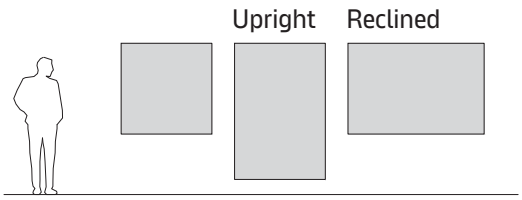
General information

- Eccentric bracket with installation key, fixed to wall
- Typical wall absorber weight 9.4 kg/m²
- Wall absorbers are easily installed, fully demountable by a key and therefore secured against removal
- Acoustic & design elements
- Not suitable for swimming pools and damp rooms (humidity & temperature limitation)

Isometric view



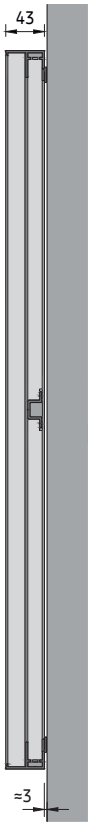
Standard shape options



MINERAL Wallcoustic Line

F01.401

Detail A



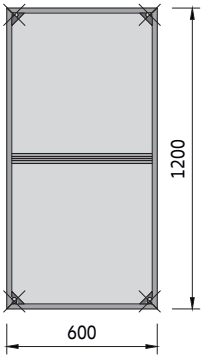
The distance between the wall absorber and the wall is ≈3 mm.

Important information

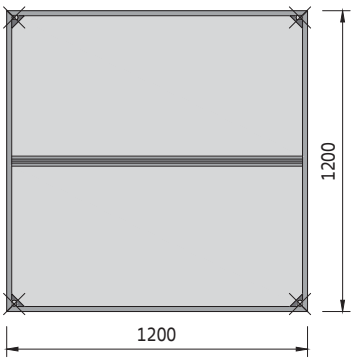
Please make sure that the visible side is protected during the assembly and cannot be scratched. The wall absorbers must always be stored on a dry and flat surface and can either be stacked (max 8 pieces) or stand on the long edge (no stacking permitted). In general, be careful when handling and transporting these large items. Mechanical stress (impacts etc.) can cause damage to the product. During transport and installation of wall absorbers, the elements must always be carried by two when removing the packaging and at all times when handling the wall absorbers, clean white cotton gloves should be worn. Ensure that only the frames of the wall absorbers are handled.

Standard shapes

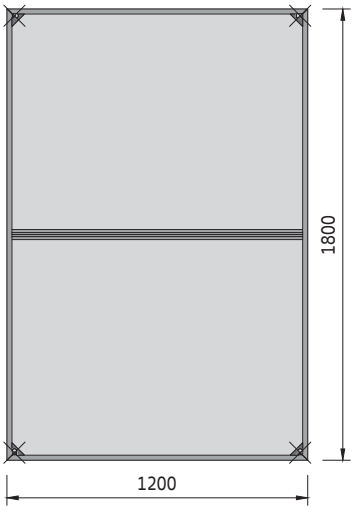
Rectangle 1200 x 600 mm



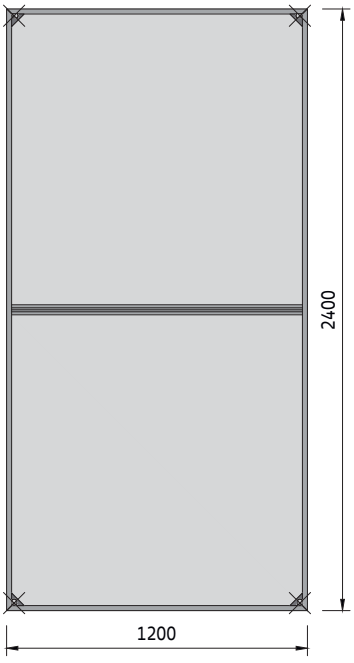
Square 1200 x 1200 mm



Rectangle 1800 x 1200 mm



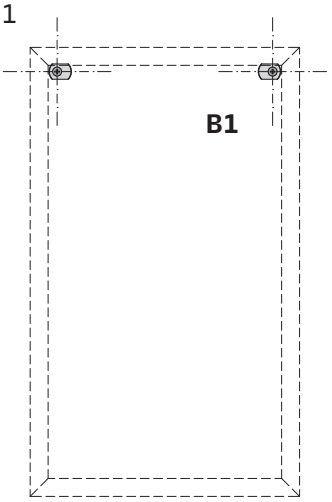
Rectangle 2400 x 1200 mm



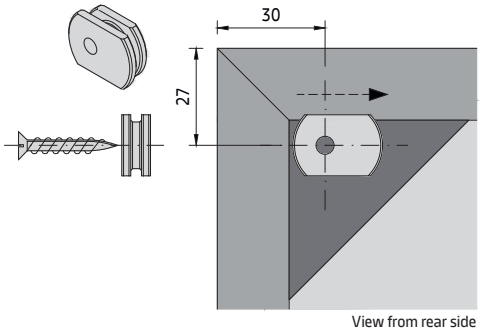
Detail B

Eccentric bracket installation

1

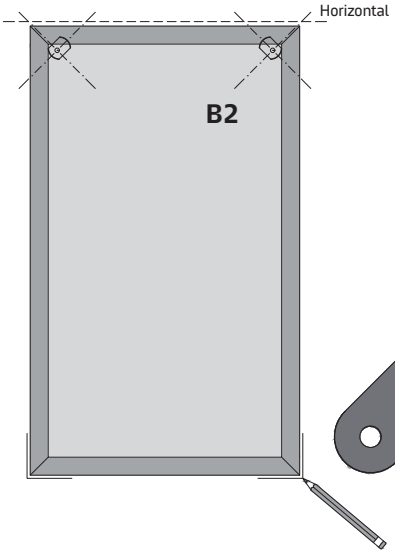


B1

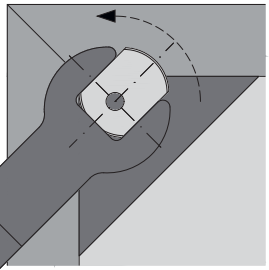


Measure the two top fixing points and fix the eccentric brackets by a flat head screw Ø4.5 mm to the wall so that they are horizontally aligned as shown in detail B1. The eccentric brackets look inward.

2

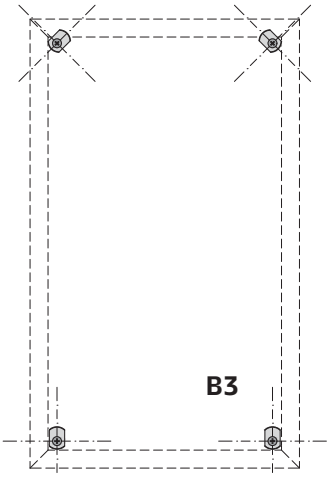


B2

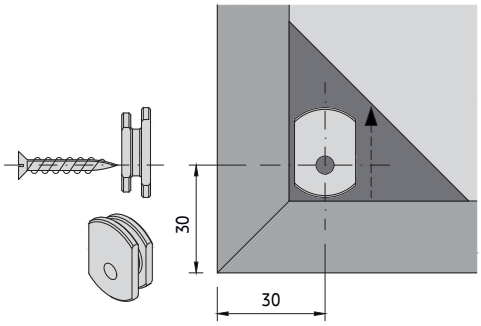


Hang up the wall absorber and use the key to turn the eccentric brackets upward, until the wall absorber is aligned precisely horizontally. Mark the bottom and side edges in the corner area to the wall.

3

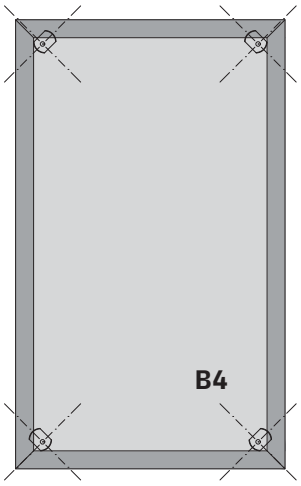


B3

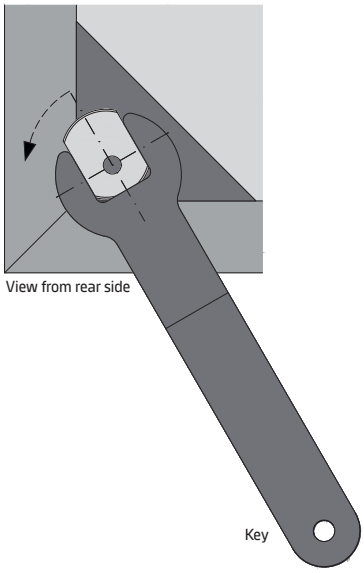


Remove the wall absorber. Measure the two bottom fixing points and fix the eccentric brackets by a flat head screw Ø4.5 mm to the wall so that they are vertically aligned as shown in detail B2. The eccentric brackets look up. They serve to fix the position of the wall absorber.

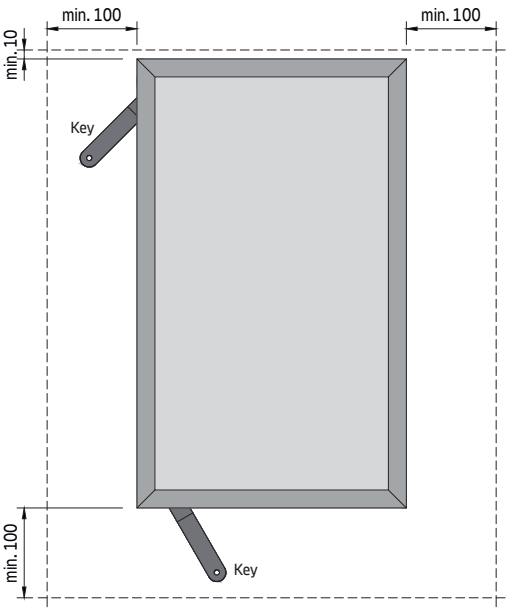
4



B4



Hang up the wall absorber and use the key to turn the bottom eccentric brackets max. 45° outward. Check if the wall absorber is locked by pulling it gently.



To use the key, a minimum clearance around the wall absorber is required. Be careful not to scratch the wall absorber or the wall. Wall absorbers can be installed next to each other without any gaps, but on top of each other they can only be installed with a gap.

Iederz, Groningen, The Netherlands © Dion de Bakker

Perimeter Trims & Transitions

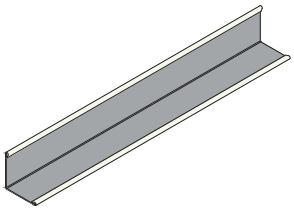
MINERAL Perimeter Solutions

Range of perimeter trims for mineral ceilings
For indoor applications

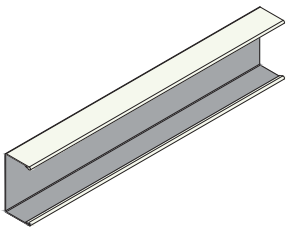
General information

- Solutions for small, medium and large rooms, as well as corridors
- Perimeter trims made of steel
- Perimeter trims for most common construction
- Shadowline trims for alternative construction (shadow gap)
- Available in standard white, further colour options on request
- Perimeter wedge available
- Curved trims and column rings
- For further requirements (fire protection), the stipulations of the respective test certificates are decisive

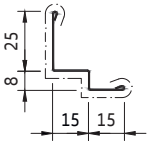
Perimeter L

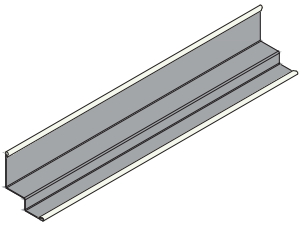


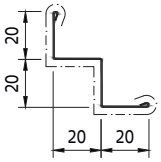
Perimeter C

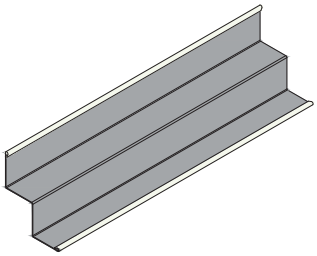


Shadowline perimeter







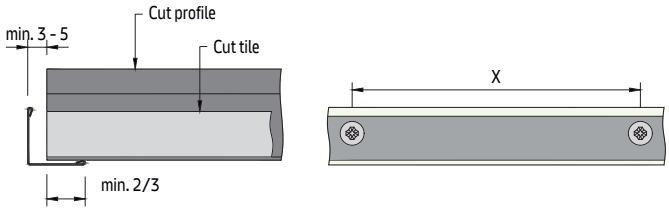


The perimeter trims shown are only a small selection and are intended to illustrate the installation.
Detailed information and available options can be found in the product datasheets.

Grid components

- AWDN23 Double bent T-bar hanger
- DCC8 Perimeter wedge
- A247 Clip perimeter block for Tegular 24/90
- A246 Clip perimeter block for Tegular 24
- - Inside corner cover piece for L-perimeter trim
- - Outside corner cover piece for L-perimeter trim
- - Inside corner cover piece for shadowline perimeter trim
- - Outside corner cover piece for shadowline perimeter trim

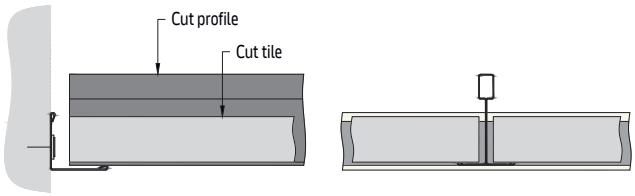
Support & wall fixing



All profiles are cut so that the profile lies on at least 2/3 of the horizontal leg of the perimeter trim. Generally, installation has to be carried out with approved fixings suitable for the type of wall being fixed to. Flat headed screws are recommended to prevent deformation of the trim. Connection to light-weight partition walls can be carried out to the partition framework (max. centres 625 mm) with at least one screw and inbetween with a threaded bolt. Wall fixing centres (X) = max. 350 mm

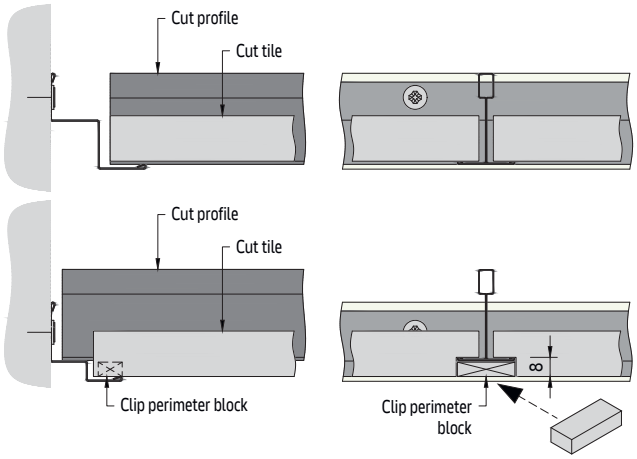
Edge configuration

Perimeter L



The L-perimeter trim is the most common solution. The profiles and tiles are supported directly on the horizontal leg of the perimeter trim.

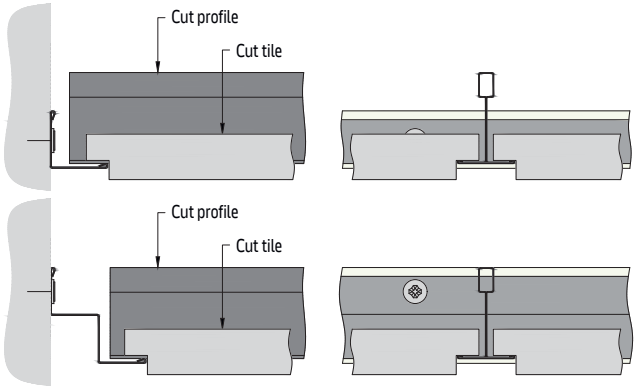
Shadowline perimeter



The use of a shadowline trim offers an alternative solution (shadow gap). The profile and tile are both supported on the lower leg of the trim.

The profile is supported on the upper leg of the shadowline perimeter trim. The tiles are supported on the lower leg. The height of the lower horizontal leg is the height of the underside of the ceiling tile. The perimeter tiles / cut tiles are simply square cut. Cut the tiles appropriately, otherwise they can slip – alternatively use pressure springs. The recessed edge configuration and the different height level create a gap which can be closed using clip perimeter blocks. Mineral tile + T15 or T24 grid, in combination with edges: Tegular 15, 15/90, Tegular 24, 24/90 + SRW 25/15/8/15

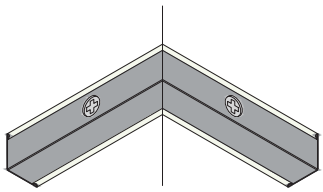
Alternative Tegular edge



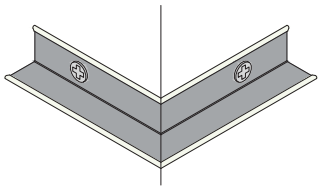
The profile is supported on the upper leg of the shadowline perimeter trim. The tiles are supported on the lower leg. The height of the lower horizontal leg is the height of the underside of the ceiling tile. The perimeter tiles / cut tiles are simply square cut. Cut the tiles appropriately, otherwise they can slip – alternatively use pressure springs. The recessed edge configuration and the different height level create a gap which can be closed using clip perimeter blocks. Mineral tile + T15 or T24 grid, in combination with edges: Tegular 15, 15/90, Tegular 24, 24/90 + SRW 25/15/8/15

Perimeter trim corner details

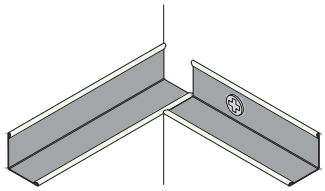
Mitre-cut inside corner



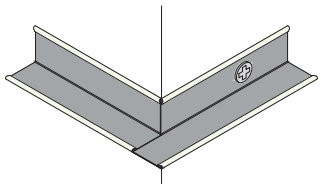
Mitre-cut outside corner



Butt-cut inside corner



Butt-cut outside corner



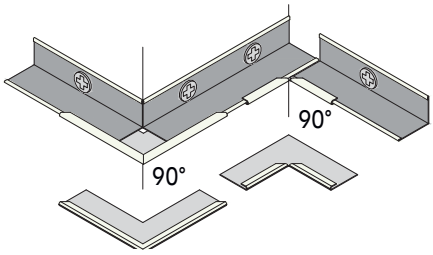
Mitring the corners is the smartest, but also the most time consuming and technically demanding corner finish. This is even harder to implement in rooms that are not square.

In most cases, the best results are achieved by a simple butt cut, with the ends pushed together. In the case of an external corner, it is necessary to notch the vertical leg of the trim otherwise it overlaps where the tile should lie. Corners of varying angle can be easily adapted with this method. Tin snips are suitable for cutting the profiles.

When forming corners with L-perimeter trims it is not recommended to use preformed mouldings / accessories for internal and external corners as the result is not aesthetically pleasing. The mouldings are simply pushed on to form the corner. Mouldings are not available for all perimeter trims.

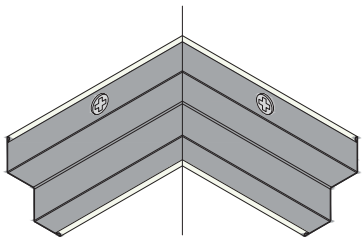
Accessories

Outer corner cover Inner corner cover

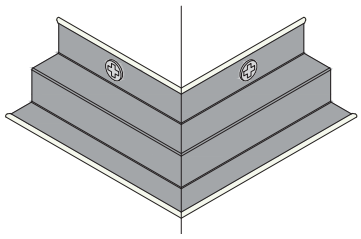


Shadowline perimeter trim corner details

Mitre-cut inside corner



Mitre-cut outside corner

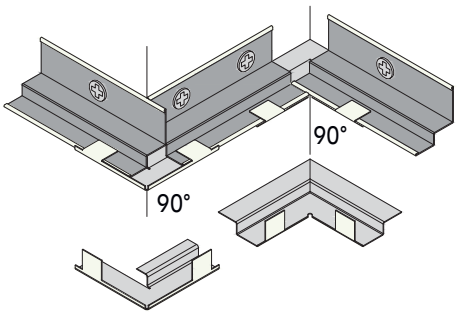


Mitring the corners is the smartest, but also the most time consuming and technically demanding corner finish. This is even harder to implement in rooms that are not square. It also requires the use of a suitable mitre saw.

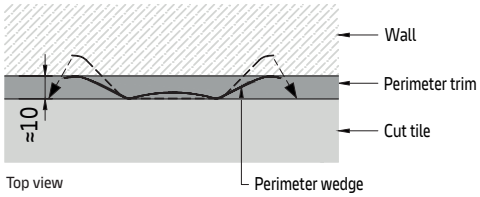
For this reason, for corner finishes of shadowline perimeter trims, we recommend the use of preformed mouldings / accessories for both internal and external corners. Install on pre-installed shadowline perimeter trims by bending the metal lugs over (available for the shadowline trim 25/15/8/15 and 20/20/20/20 mm, check availability in advance).

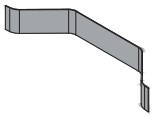
Accessories

Outer corner cover Inner corner cover



Perimeter wedge

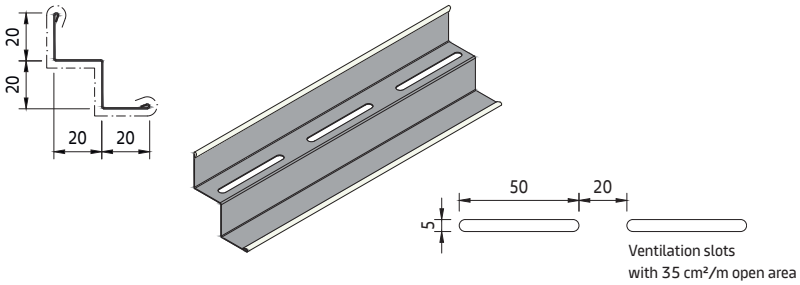




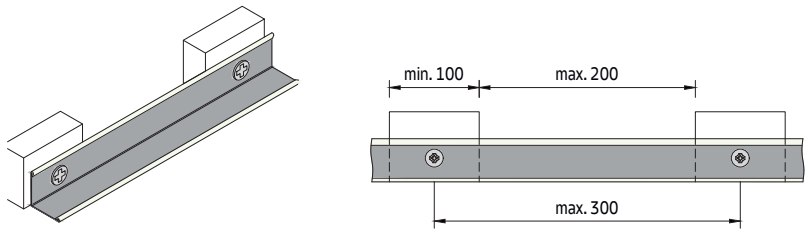
The perimeter cut tiles are installed and held in place using a perimeter wedge to ensure that they do not move. The wedge presses the opposite edge of the tile tightly against the grid system ensuring no tile movement at the perimeter. Suitable pliers can be used to “gloosen” the wedge to ease installation, reducing effort and time.
A perimeter wedge is required for every cut tile (see ceiling layout). This also applies to tiles in corners. The wedge is required irrespective of whether L-perimeter trim or shadowline trim is used. Cut tiles without wedges can move as a result of building movement or maintenance.
It can only be omitted if it is ensured that the tiles cannot slip or that there are no visible joints. The simplest method of installing the wedge is immediately after the installation of each tile from the adjacent field. This can be carried out for all tiles, including corner tiles, except the last tiles in a row (=penultimate tile, marked in the ceiling layout with a border). For the last tile, the wedge should be installed before the tile and is then pressed onto the perimeter trim as the tile is pushed into position.

Perimeter ventilation options

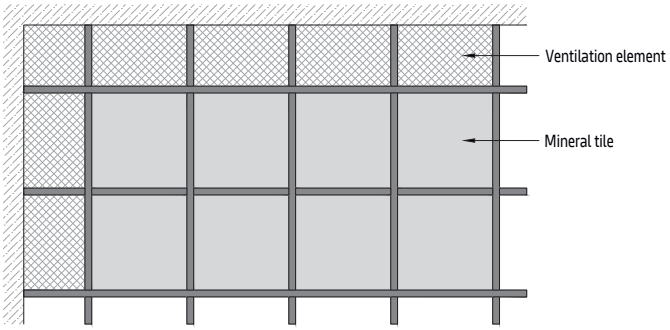
Shadowline perimeter trim with ventilation slots



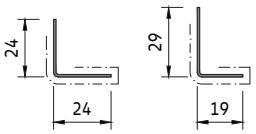
Perimeter trim fixed to blocks

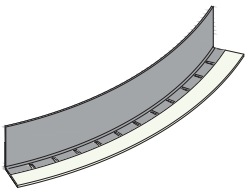


Perimeter ventilation elements



Flexible perimeter trims





When finishing ceilings to curved walls, the use of a flexible wall angle is recommended. They can be easily cut and curved by hand on site.

These trims can be used only in curved toe out (convex) installations.

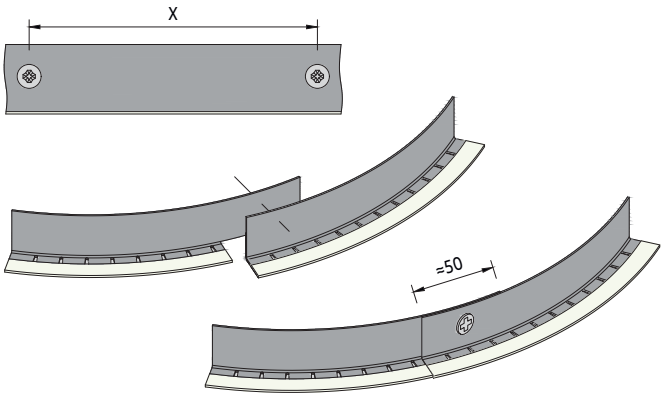
Bending radius (r) = min. 200 mm
Wall fixing centres (X) = max. 450 mm

Cut the visible horizontal leg to a length of approx. 50 mm and let the ends overlap.

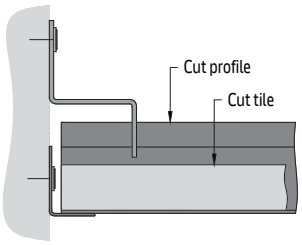
These trims are considered decorative elements therefore any grid laying on them will need to be suspended from the soffit or fixed to the wall. Use the accessory AWDN23 to support the load above the trim or suspend the grid with the closest possible distance (Y).

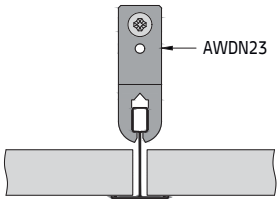
Environment temperature during the curving operation = min. 20ºC.

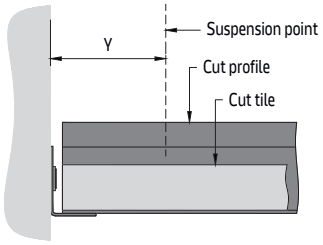
Wall fixing



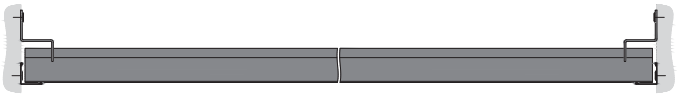
Grid fixing / suspension







General grid fixing for free-spann corridors



National regulations
Please take into account and inform yourself in advance about further national requirements. For free-spann corridor solutions it may be necessary to additionally secure profiles in the perimeter area, by using AWDN23 accessories. In this case, the support on a perimeter trim is not sufficient.

Perimeter trim loading

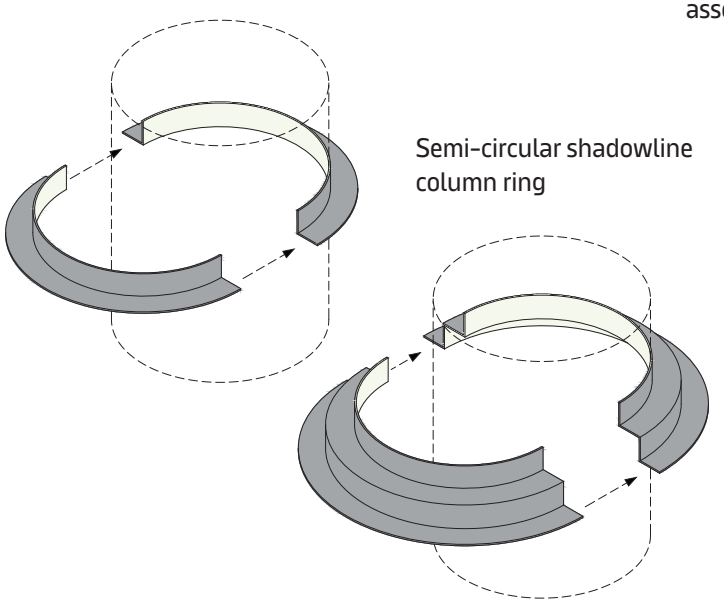
Perimeter trim	Galvanised steel [mm]	Dimensions [mm]	Max. panel length [mm], with a panel weight of		
			5.5 kg/m²	7.5 kg/m²	9.5 kg/m²
L-perimeter trim (horizontal leg of max. 30 mm)	0.5	19 x 24 20 x 20 21 x 21 24 x 24 24 x 30	1800	1500	1200
	1.0	30 x 30	2500	2500	2500
Shadowline perimeter trim	0.5	25 x 15 x 8 x 15 19 x 11 x 13 x 19	1450	1100	850
	0.7	20 x 20 x 20 x 20	2400	1900	1500

Wall fixing centres (X) = max. 350 mm
Max. perimeter trim deflection of 1.0 mm with evenly distributed load, no point loads

Column rings

Semi-circular column ring

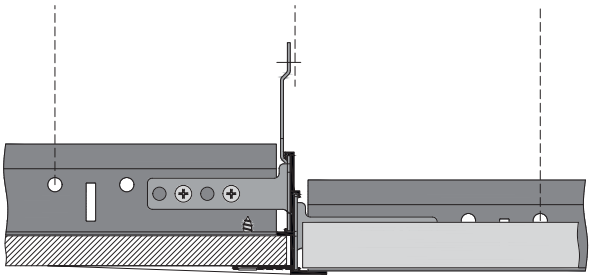
Column rings are delivered in two parts, which simplifies assembly. Available options on request



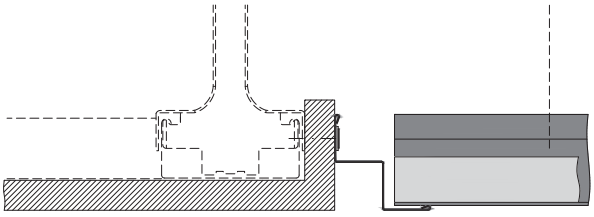
Semi-circular shadowline column ring

Plasterboard margin

Example with plasterboard margin with AXONIS transition



Example of plasterboard margin with shadowline perimeter



Plasterboard margin

Besides their visual appeal, plasterboard margins also offer practical advantages:

- wall irregularities can be easily compensated for
- projections or recesses can be easily integrated
- cut tiles can be avoided
- plasterboard margin width is adapted to full ceiling elements
- corridor widths over 2.50 m can be easily accommodated

Regardless of the perimeter option used, the perimeter trim should always be fixed to the metal substructure.

AXONIS transitions

AXONIS transitions create a seamless transition between plasterboard margins and all types of suspended grid systems. Various designs are available for compatibility with a variety of edge details. See separate document for more detailed information.

Margin with L-perimeter trim

A simple solution for a flush connection is to use L-perimeter trims. The angle must be fixed to the CD-profile.

Margin with shadowline perimeter trim

As an alternative to the flush connection, the ceiling surface can be accentuated by using a shadowline perimeter trim (shadow gap) possibly mounted with a height offset.
A layer of plasterboard should also be inserted vertically.

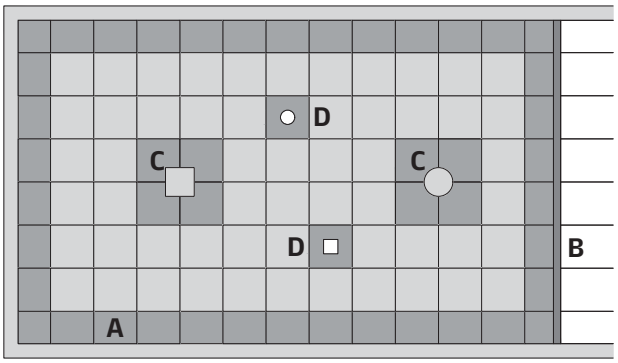
Iederz Groningen, Netherlands © Dion de Bakker

Bukovac Elementary School, Zagreb, Croatia © Dražen Stojčić

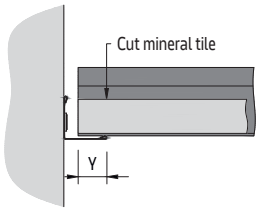
Cutting & Modifications

MINERAL Cutting & Modifications

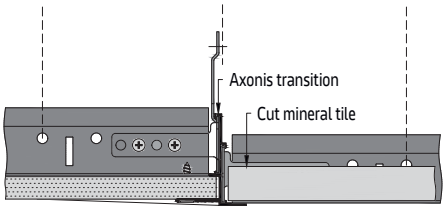
Cutting



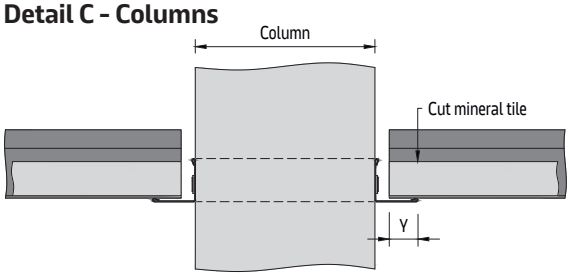
Detail A - Perimeter



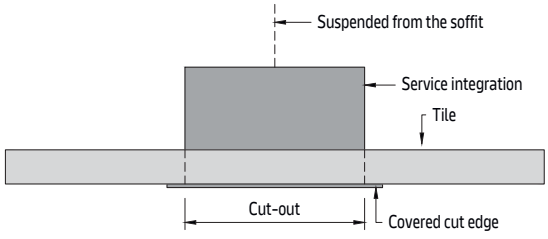
Detail B - Transitions (example with Axonis transition)



Detail C - Columns



Detail D - Service integrations



General

Cuts are usually required in the perimeter area (detail A), for transitions (detail B), columns (details C) and cut-outs (detail D) for service integrations. The cut edges are covered by a profile or trim and should not be exposed.
A little practice is required for clean and precise cuts, especially for delicate work and tight curves. It is best to try out a few practice pieces beforehand to avoid unnecessary waste. Wear white gloves to avoid leaving fingerprints on the surface of the tiles.

Tiles

When cutting, the visible side of the tiles should face up to avoid scratching. Measure the distances precisely and transfer the cutting line on the tile.
The minimum contact surface (Y) depends on the selected trim (see perimeter trims). It is imperative that this value is adhered to, as otherwise it is possible to fall down and cause personal injury.

Service integrations

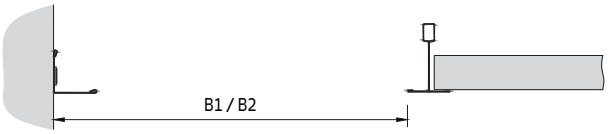
Generally, additional loads need to be supported with additional hangers from the soffit (detail D). Loading the tiles is not permitted. The service integrations should not affect the visual appearance of the tiles, i.e. no greater sag or stress on the surface. Fixtures such as spot lights and loud speakers etc. should be installed with reinforcement behind (sufficiently load-bearing, non-combustible board / pattress or element width profiles) which transfer the weight to the grid system. Loads less than 0.3 kg require no additional support. Round and square cut-outs are to be made in the dimensions specified by the supplier of the service integration. Cut edges on service integrations must always be covered and can not be exposed.

Ventilation components can leave residues on the surface by sucking in the air, which contaminate them.
See cleaning and maintenance chapter.

Perimeter tiles / panels

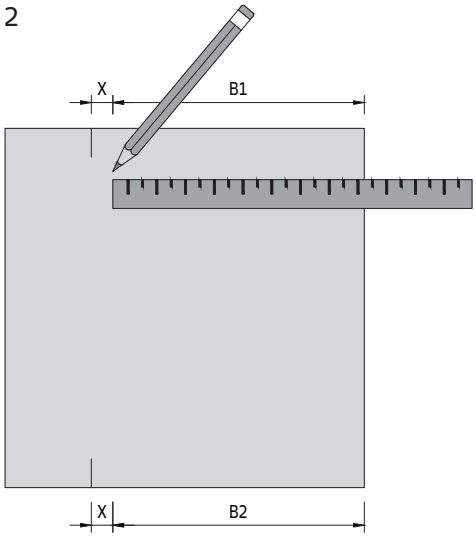
The following steps are an example for cutting the first row.
Only make cuts when the perpendicularity of the grid system is guaranteed and several complete elements have already been inserted.

1



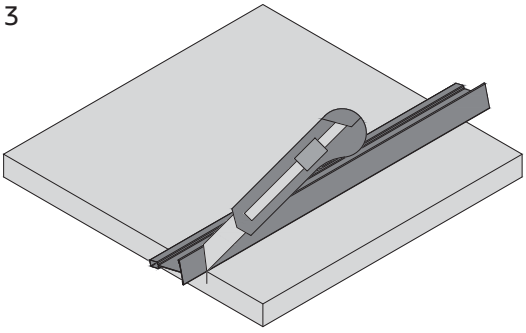
The dimensions between the profile and perimeter trim / wall should be measured before the installation. To avoid further work, this should always be done at the start (B1) and end (B2) of every element (to account for angled walls, unevenness, etc.).

2



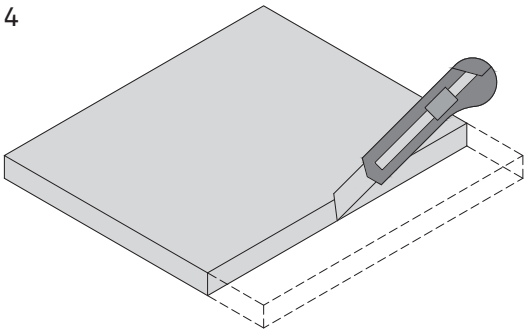
The dimensions are transferred to the tile. This can be done on the face side of the tile, but always ensure that you use clean tools. Depending on the edge detail, a correction factor X is necessary to ensure the tile fits exactly. This is especially important for the first tile.

3



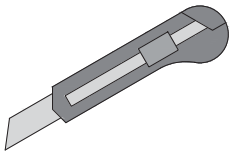
For an exact cut use a clean metal guide and a sharp cutter. The cut should only be scored a few millimeters deep and serves to mark the exact position of the cut. The metal guide is then no longer required.

4

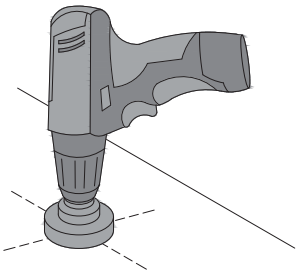


The tile is cut along the scored line to the required size and the off-cut disposed of.

Tools

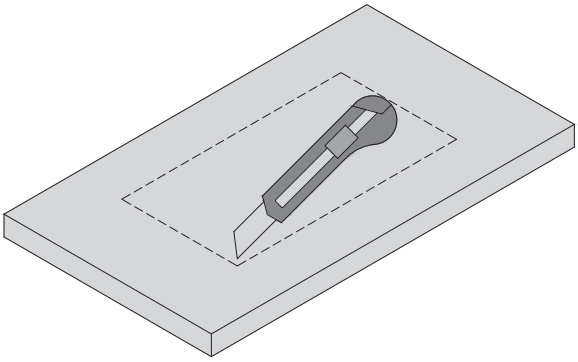


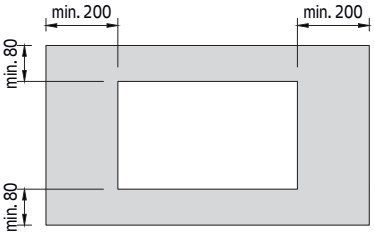
Cutter
Use a cutter to cut tiles to size and for cut-outs.



Drilling machine
A power drill can be used for small circular cutouts. Larger roundcutouts can be made with an hole saw attachment.

Cut-outs for service integrations





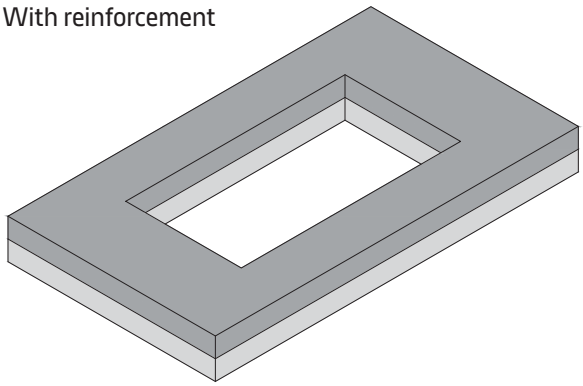
The maximum aperture size can not be exactly defined. We recommend, depending on the type of tile, to keep a residual width of minimum 80 mm and a residual length of minimum 200 mm.

The larger the aperture and the larger the tile, the more susceptible the tile will be to damage and breakage. Careful handling of the tiles is therefore essential.

It is recommended to reinforce large apertures. This can be done using a plaster board, gypsum fibre or wood composite board pattress. If there are no requirements for fire protection/building material classifications, this can also be done with wood-based panels. This should be fully bonded to the mineral tile. This also ensures stability for later maintenance work.

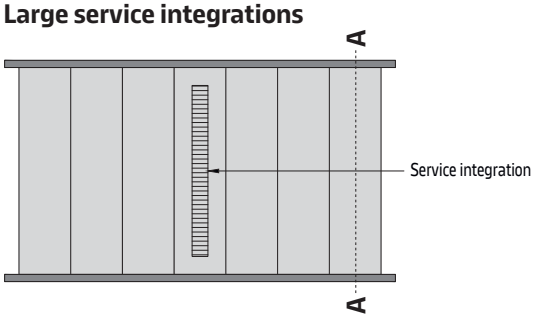
For the installation of spotlights etc. with round apertures, a drilling machine can be used. The maximum size and number of apertures per tile can vary, depending on the type of tile and the additional measures (reverse side reinforcement) used.

With reinforcement



Service integrations

Large service integrations

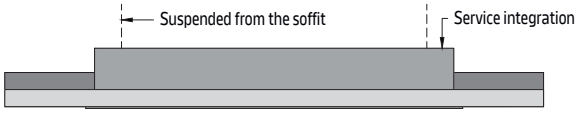


All recessed service integrations should be supported from the soffit by a minimum of two additional hangers to avoid any additional loading to the tiles or reinforcement profiles.

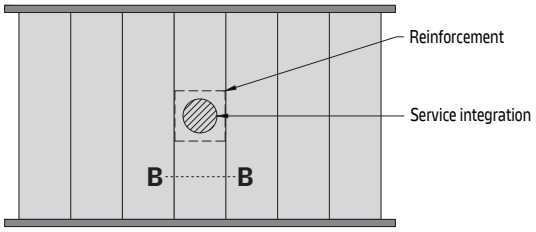
Depending on type, size and weight of fixtures, various fixing possibilities are available. Generally, all additional loads require further measures to support the load. For screw-mounted items always provide a patress (e.g. plaster board / plywood). Mineral tiles are not suitable as a screw base.

Various manufacturers offer suitable lights in the same format as the ceiling tiles. Please ensure that these are compatible with the selected edge configuration. Just as with recessed lights, additional hangers should be used. The only exception to this is self-supporting light systems.

Detail A



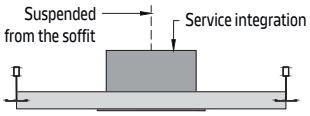
Smaller service integrations



As with the requirements for larger service integrations, smaller fixtures should also be suspended directly from the soffit. A single additional hanger per item is generally sufficient.

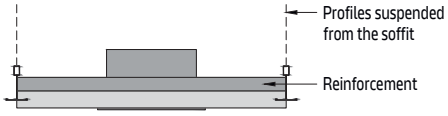
If services such as downlights or loudspeakers etc. are not directly supported from the soffit, then reinforcement is required behind the tile to transfer the weight to the grid system (depending on loading capacity of the profiles with additional hangers).

Detail B - option with direct suspended service integration

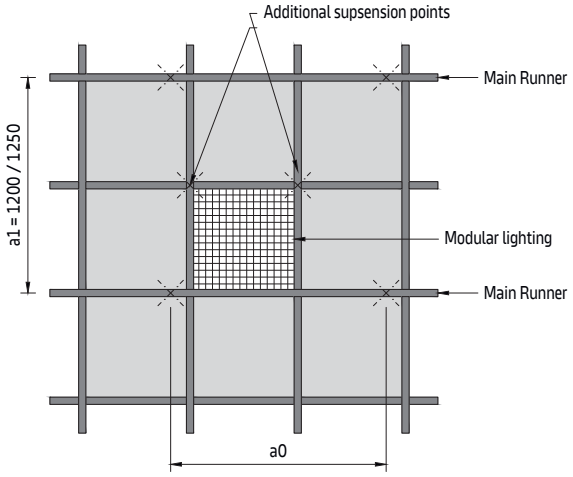


The principle applies:
A mineral tile is not suitable as a mounting surface for standard screws. If the tiles are supported with materials for fastening purposes, it must be ensured that the loads are transferred directly to the suspension system. Additionally, check the permissible load on the system and, if necessary, install additional hanger on the suspension system or directly on the respective additional weight. The suspension system cannot absorb horizontal forces.

Detail B - option with reinforcement



Modular lighting



When the Main Runners are at 1200 or 1250 mm centres, two additional hangers are required per light on the long Cross Tees. For Main Runners at 600 or 625 mm centres, no additional hangers are required providing the lights weigh no more than 6 kg.

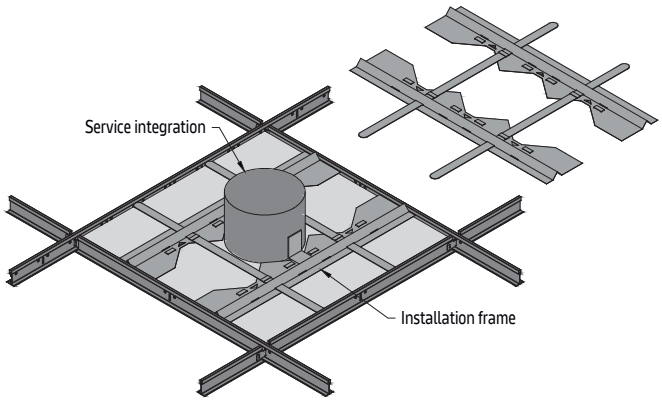
Light fittings, ventilation grilles etc. should not have more than a 5 mm upstand adjacent to the grid. Otherwise, this can lead to problems with side engaging connectors.

For classic T-Grid systems e.g. T15, T24: Max. size of service integrations = module size -5 mm.

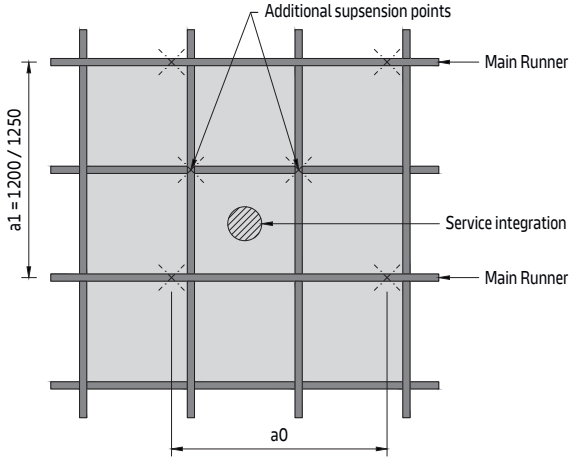
Non-standard grid solusions (e.g. Meridian) may require different dimensions of service integrations.

For louvre luminaires, additional measures can be omitted as long as the luminaire weight does not correspond to more than the permissible load / max. permissible tile weight of the system configuration. This applies generally to all Main Runner spacings. Structures / point loads must be assessed / treated separately.

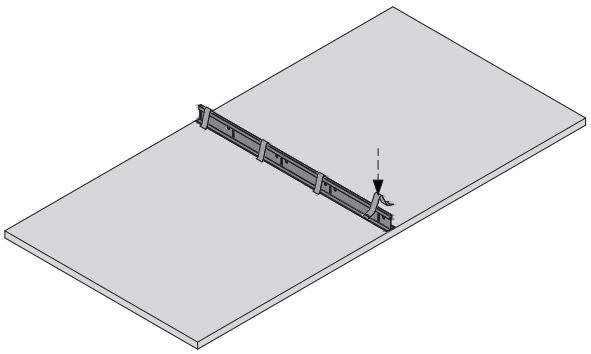
Installation frames

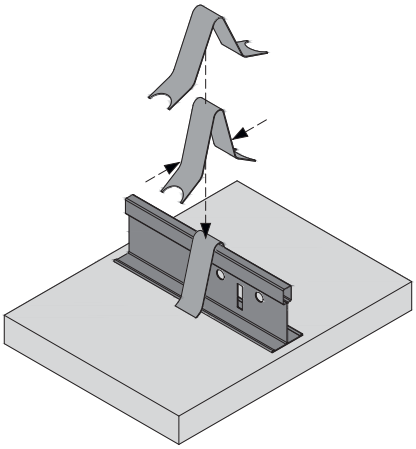


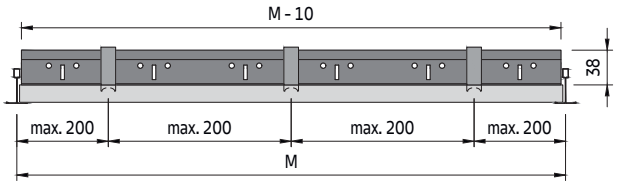
A versatile installation frame is available and can be used for all common fixtures and fittings. The frame ensures that the additional load is carried by the grid system and is not supported on the tiles. Two additional hangers are required, if the system configuration is exceeded (max. tile weight from the max. permissible load of the system).



Panel reinforcement







The reinforcement profile is a 24 mm T-Grid, and serves to support the panels centrally and thus reduce the deflection.

General remark
No reinforcements are required for panel widths up to 400 mm.

Distance between brackets = max. 200 mm
Reinforcement profile length = module width (M) – 10 mm

It is important that the brackets are arranged from the centre of the panel.

Installation
The panel is placed on an even and clean surface.

The reinforcement profile is placed in the middle of the panel length on the back of the panel.

The reinforcement profile is fixed to the panel by using brackets. To do this, guide the brackets over the reinforcement profile from above, press them together and press them carefully into the panel.

SUSPENSION CUTTING & MODIFICATIONS

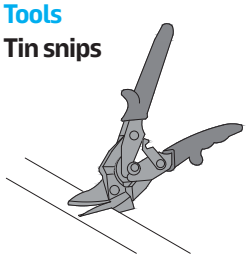
Cutting

General

Cuts are usually required in the perimeter area and for transitions. A little practice is required for clean and precise cuts, especially for delicate work and tight curves. It is best to try out a few practice pieces beforehand to avoid unnecessary waste. Wear white gloves to avoid leaving fingerprints on the surface of the tiles. Be careful when cutting profiles, as there is a risk of injury from the sharp cutting edges. Profiles can be cut with a saw. Visible components, as with tiles, care should be taken not to scratch or damage the visible side.

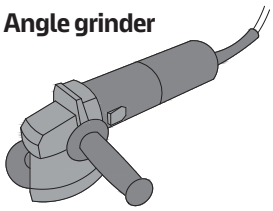
Tools

Tin snips



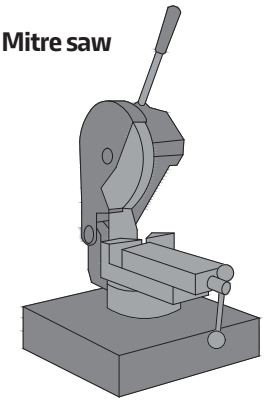
Tin snips can be used for cutting thin-walled profiles (T-Grid, perimeter trims, etc.) to length. It is used primarily for butt cuts, but only suitable for mitre cuts to a limited extent. Generally, use is limited to tiles, panels and profiles with a gauge of max. 0.7 mm. There are different types of tin snips, for different applications. For an optimal result, the sheet metal must be placed on the cutting jaw of the tin snips, otherwise it will warp. The tin snips should be opened wide and the sheet metal should be pushed deep into the mouth. It is important not to close the scissors completely when cutting, but to open them again after ¾ of the cutting length and push the material further.
Otherwise unsightly transverse cracks will appear.

Angle grinder



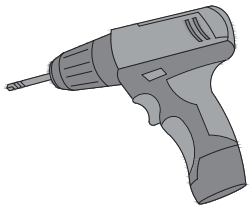
This is only suitable to a limited extent due to the heat development and the resultant discolouration of the metal. When using angle grinders, particularly for large material thicknesses of ≥1.0 mm, the heat development can be educed by using suitable thin separation sheets, 1.0 mm thick. Even then, proceed with care. Please make sure that this form of processing (flying sparks) is permitted on site.

Mitre saw



The use of a metal-mitre saw delivers by far the best results for butt and mitre cuts. Proceeding with care (low cutting speed) is also essential. Avoid damaging the surface with metal cuttings. When cutting shadow trims it is advantageous to use a suitable wooden batten underlay.

Drilling machine



A power drill can be used for small circular cutouts. Larger round cutouts can be made with an hole saw attachment.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Maintenance & Cleaning

MINERAL Maintenance & Cleaning

Maintenance

Access to the ceiling void

In general, all products can be removed individually. This is necessary to ensure maintenance work on the building services.
Extract the elements with care and store them in a place where they will not be damaged during the maintenance work. Elements can be extracted without tools. The products should be stored reclined. No additional weight should be placed on it.

Corrections

Small defects can be repaired using standard chalk. There is suitable repair paint for cuts.
Subsequent coating / spraying of entire elements or ceilings is not recommended, as the sound-absorbing properties of fleece-coated / micro-perforated surfaces are lost and the specified building material class cannot be guaranteed.

Replacement

In the case of a large-scale replacement, it is recommended to use elements from adjacent rooms and then re-cover them.

Mixing elements from different production batches or usage periods is not recommended (visual difference can be seen).

Cleaning

General

Knauf Ceiling Solutions mineral ceilings are available with different surface finishes, of which the visible face can be cleaned using a variety of types and methods.
The types of cleaning shown here may not be applicable to all products.

Whenever the elements are touched, this should always be done with soft white gloves, otherwise fingerprints will be left on the surface, which makes cleaning more time consuming.

Normally, ceiling and wall components do not need to be cleaned for the duration of their use in most standard applications. Nevertheless, it may be necessary to clean local soiling frequently to maintain their appearance. This is not necessary for functional reasons to maintain the fitness for use over the entire service life.

The frequency of cleaning will depend on the efficiency of the heating, ventilation and air conditioning system within the building and the type of occupancy. This can only be determined after the building is occupied.

The mechanical stresses of cleaning (scrubbing) may lead to changes to the surface. Do not apply excessive pressure to the surface as this may deform it.

Highly adhesive dirt (grease, oils, acids and bases) can be resistant to cleaning and can affect the surface permanently. It is recommended to test the proposed cleaning method on a sample piece or a non-visible part of the ceiling. The cleaning should also be carried out over a large area and not limited to individual tiles or small areas.

High levels of moisture exposure due to regular cleaning or room climate conditions may cause increased corrosion protection requirements with regard to the substructure and the attachment.

Additional measures must be taken into account if the suspended ceiling is subject to pressure.

For some types of cleaning it may be necessary / helpful to secure the elements against lifting (hold down springs)

MINERAL Maintenance & Cleaning

V01

Dry cleaning

- Daily cleaning

For standard cleaning of dust, loose dirt or deposit, a softbrush, a clean, dry, soft white cloth, a normal vacuum cleaner with a soft brush can be used.

Damp cleaning

- Weekly cleaning

For more intensive cleaning, the surfaces can be damp cleaned. This should be carried out with a wrung-out soft cloth or sponge. After cleaning, the surface should be dried with a soft cloth.

Wet cleaning

- Weekly cleaning

Wet cleaning should be carried out with lukewarm water (up to 40°C), using a sponge and mild cleaning agent (with a pH value between 7 and 9). It is important that the edges and the reverse side of the tile do not come into contact with moisture. After cleaning the surface should be dried with a soft cloth.

Pressure cleaning

- Twice yearly cleaning

Pressure cleaning (no steam) is carried out with the following technical restrictions:
- Water temperature: max. 40°C
- Working pressure: max. 80 bar, flow rate max. 500 l/h
- Minimum distance to surface: 1.0 m

Penetration of water into the suspension system should be, avoided. Following cleaning, the surface should be dried.

Resistance to popular disinfectants

- Daily cleaning

Due to large number of types of disinfectants, always test a small area first.

Cleaning cycles

Surface		Cleaning method			
		Dry	Damp	Wet	Pressure
Paint coated	Plain and textured	Daily	Daily	-	-
Fleece coated	Wet-felt e.g. THERMATEX	Daily	Daily	-	-
	Softboard e.g. TOPIQ	Daily	Daily	1x weekly	-
	THERMATEX Aquatec 19 mm	Daily	Daily	1x weekly	1x weekly
Laminated	Vinyl foil e.g. Thermaclean	Daily	Daily	1x weekly	-

Overview of disinfectant resistance

Disinfectants	Coating			Substructure
	Paint	Fleece	Laminated	T-Grid
(A) Biguacid S (active agents: didecyldimethylammonium chloride, polyhexanide)	-	ok	ok	ok
(B) Incidin Active (active agent: peracetic acid)	-	ok	ok	ok
(C) Kohrsolin FF (active agents: glutaral, Benzyl-C12-18- alkyldimethylammonium chloride)	-	ok	ok	ok
(D) Mikrozid AF (active agents: ethanol, 1-propanol)	ok	ok	ok	ok
(E) Disinfect Surface (Active agent: sodium hypochlorite)	-	ok	ok	ok
(F) Reference agent didecyldimethylammonium chloride	-	-	ok	ok
(G) Reference agent caroat	-	ok	ok	ok
(H) Reference agent glutaral	-	ok	ok	ok
(I) Reference agent ethanol and n-propanol	ok	ok	ok	ok
(J) Reference agent Hydrogen peroxide	-	ok	ok	ok
Isopropanol	-	ok	ok	not tested
Acetone	-	ok	-	not tested
Formalin	-	-	ok	not tested
Ultrapure water	-	-	ok	not tested
Hydrochloric acid (5%)	-	-	ok	not tested
Caustic soda	-	-	ok	not tested

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Board of Directors: Lars Klodwig, Karl Wenig, Daniel Wolf

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EN - 12/2025