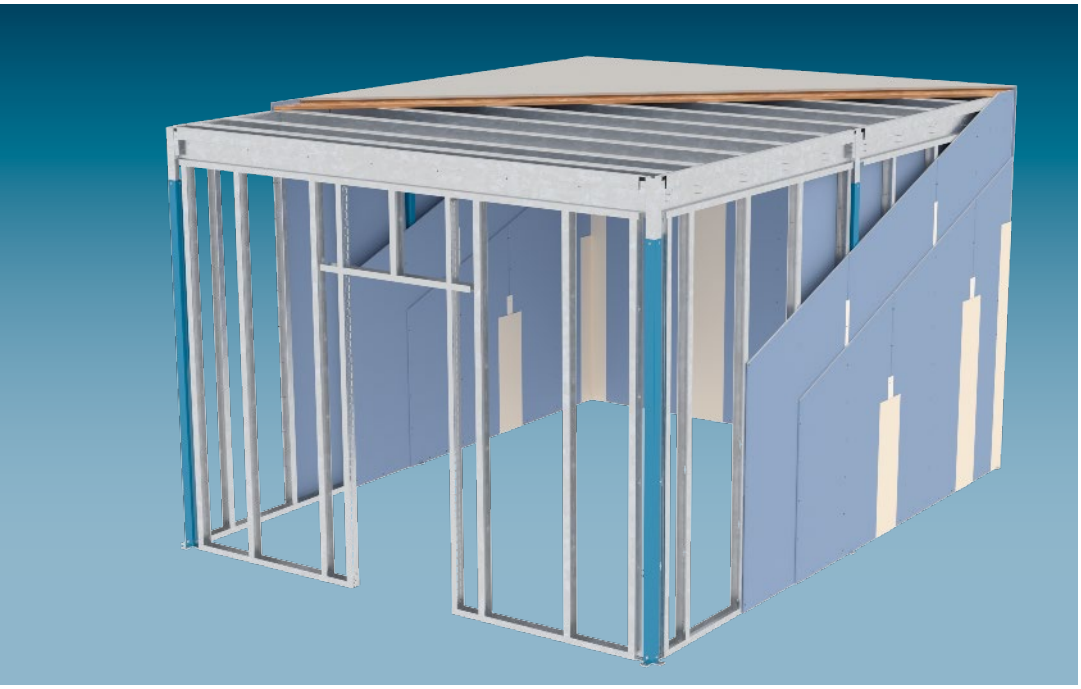


Drywall Systems

SL09.de

Technical Information 2024-02

Knauf Cubo Plus

Room-in-Room Systems

K375P.de Knauf Cubo Plus Basis

K376P.de Knauf Cubo Plus Empore

Contents

Usage instructions

Notes on the document

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

References to other documents

System data sheets

- Knauf Cubo Room in a Room Systems K37.de
- Knauf Metal Stud Partitions W11.de

Technical Information

- Knauf Fastening of Loads to Knauf Wall and Ceiling Systems VT03.de

Technical brochures

- Knauf Pre-fab Floor Screed F12.de
- Knauf Jointing Competence Tro89.de

Folders

- Fire Resistance with Knauf BS1.de (German only)
- Sound insulation and room acoustics with Knauf (only sections in English)

Product data sheets

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

Pictograms in technical information documents

The following pictograms are used in this document:


K375P.de Cubo Plus Basis


K376P.de Cubo Plus Empore

Symbols in the technical information documents

The following symbols are used in this document:

Spacings of ceiling grid

(b) Axial spacing SL-C double profile

Legend symbols

1 Legend number that will be explained when used

Intended use of Knauf Systems

Please observe the following:

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

General notes on Knauf systems

Field of application

The Knauf Cubo Plus Room-in-Room systems are used space-creating measures in a variety of ways. Demands on the fire resistance, sound insulation as well as structural loads are covered.
Application areas:

- Sanitary modules
- Sound insulated booths
- Meeting rooms
- Foreman's offices
- Encapsulation of industrial machinery
- Extension of living spaces / loft conversion
- Additional storage and floor space

Term definition

- Self-weight:
  The self-weight described in this document are the weights of the individual system components, e.g. Knauf boards, Knauf profiles.
- Rated weight
  The rated weight is used in this document for determining the necessary frame and results from the self-weights of the individual system components. It does not include any safety values.

Coatings and linings

Notes	After wallpapering or after application of plasters, quick drying must be ensured through adequate airing. Customary coatings or layers and vapour barriers up to about 0.5 mm thickness as well as claddings (with the exception of sheet steel), do not have any influence on the technical fire resistance classification of Knauf Cubo Plus.

Fire resistance effect

The specified fire resistance is provided both for interior and exterior exposure to fire. Knauf Cubo Plus systems are room-enclosing load-bearing or non-load bearing construction components with a self-bracing function. The following system solutions and cladding thickness's listed ensure that these properties are assured for the specified fire resistance. The basic ceilings above and below and the walls adjoining the structure must have at least the same fire resistance as the Knauf Cubo Plus system.
Non-combustible insulation layers in the wall cavity or plenum are permissible, but not required for fire resistance.

For Cubo Plus design with a fire protection requirement

A label stating the proof of applicability for fire resistance, the name of the manufacturer (specialist company carrying out the work) and the year of manufacture must be permanently attached to the interior of the Cubo on the wall underneath the ceiling by the specialist company who performed the work.

Note	The label and aBG can be obtained from Knauf Direkt Technical Advisory Service (see page 36).

Notes on sound insulation

As a Cubo Plus is a self-contained room and not a component, the noise reduction is dependent on the dimensions and is specified as the standardized level difference D_{nT}.
D_{nT} is the difference between the interior and exterior sound levels with generally prevailing room acoustic conditions (reverberation time T = 0.5 s).

- During airborne noise tests the ceiling and all walls are exposed to surrounding sound. The calculations are all based on the same suppositions. The specifications apply for a Cubo Plus with internal dimensions of 3.9 x 2.1 x 2.6 m (L x W x H). With unfavourable ratios of volume to surface area, e.g. with smaller dimensions, the $D_{nT,w}$ is reduced by up to 2 dB, and inversely the $D_{nT,w}$ can improve by up to 3 dB, e.g. with larger dimensions.
- A rule of thumb applies for a Cubo Plus of these dimension with a surface area of 2 m^2: “If the weighted sound reduction index R_w of the door is 1 dB greater than the weighted standardized level difference $D_{nT,w}$ of the Cubo Plus without a door, the $D_{nT,w}$ is reduced by the door by a maximum of 1 dB”. For more accurate evaluation, the frequency-dependent sound insulation of the Cubo Plus and door must be taken into consideration. The airborne sound specifications only consider the sound transmitted through the Cubo Plus walls and ceilings. Achieving the desired sound insulation may require improving the flanking transmission of the existing floor (e.g. by subsequent provision of separation joints in the screed).
- Mineral wool insulation layer acc. to EN 13162 with length-related flow resistance of 5 kPa·s/m^2 ≤ r ≤ 50 kPa·s/m^2 acc. to DIN 4109-33. Fill ratio in wall cavities and plenum at least 80 %.

Proofs of Usability

Knauf system	Fire resistance	Sound insulation	Structural engineering grid spacings proof
K375P.de	A self-supporting, free-standing room-in room system is not building authority regulated. For the structural and fire protection design of the Room-in-Room system K375P.de Cubo Plus Basis and K376P.de Cubo Plus Empore, Knauf has applied the higher requirements for an escape and access route (aBG Z-19.13-2032) .	–	Expert opinion G-601-I-12/Pf / G-601-II-12/Pf / G-16-18/1
K376P.de		Knauf sound insulation proof T 016-09.16	Expert opinion G-601-I-12/Pf / G-601-II-12/Pf / G-16-18/1

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

Notes on fire resistance

The aBG Z-19.13-2032 covers the application “fire resistant capable wall and ceiling constructions for corridors as a zoning measure for emergency access routes of fire ratings F30 or F90”. With reference to section 1.2.2, the use of the construction type can also ensure that the fire resistance demands for self-supporting, room-enclosing components (Cubo Plus Basis and Cubo Plus Empore) are fulfilled for 30 and 90 minutes outside the scope of the building regulation field of application.
This includes extended design options, evaluated on the basis of supplementary documents (e.g. expert opinions or technical assessments).
We recommend advance consultation between the persons responsible for fire resistance and/or the relevant authorities before starting the construction.

Fixing of loads to Cubo Plus ceilings

Additional loads, e.g. lamps, curtain rails and similar can be fixed to the ceiling of the Knauf Cubo Plus using cavity dowels, spring toggle dowels or Knauf Hartmut cavity dowels.
The additional loads must be considered with the rated weight of the ceiling system acc. to page 6.

Note	Heavy loads must be anchored on auxiliary constructions.

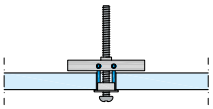
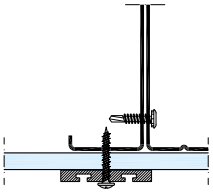
Each load introduction surface of the Cubo ceiling may not exceed the following weight threshold values with the fastened components:

Permissible weight per ceiling surface in kg/m²	
Without fire resistance	With fire resistance[1)]
15	6

1) In case of application as a fire resistance ceiling with exposed ceiling (multi-level ceiling system), 15 kg/m² as a total weight is permissible for the exposed ceiling (including insulation layer and attached loads) attached to the fire resistance ceiling.

Furthermore, the following conditions apply:
For every anchoring point, the following weights of components attached to the Cubo Plus ceiling may not be exceeded:

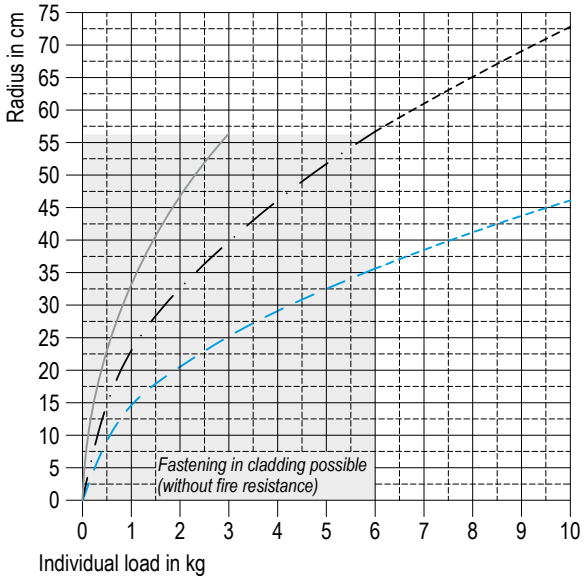
Fastening method	Permissible weight per anchoring point in kg	
	Without fire resistance	With fire resistance
Fastening in the cladding	6	0.5
Fastening to the grid	10	10

Fastening in the cladding	
	Knauf Hartmut cavity dowel M5 screw
Fastening to the grid	
	Knauf Multi-Purpose Screw FN (pre-bore 3 mm) e.g. curtain rail

Note	For further information on planning and application see Technical information Fastening of loads to Knauf Wall and Ceiling Systems VT03.de.

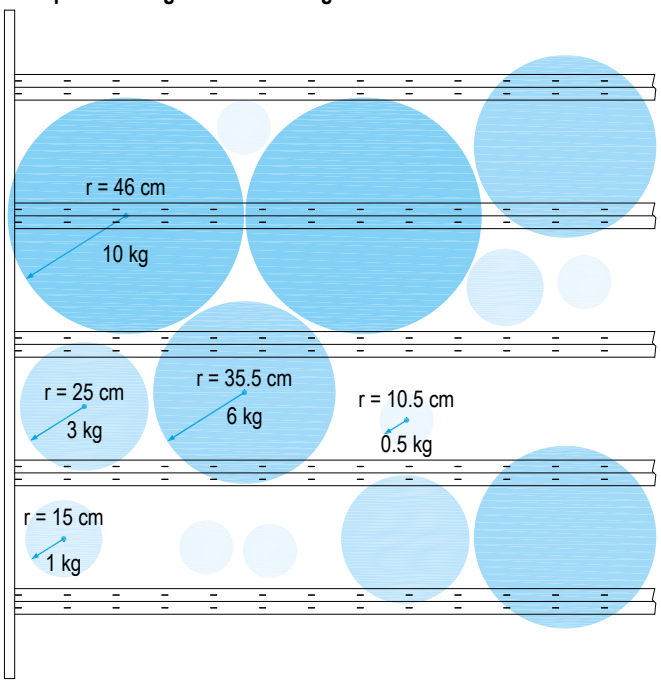
Minimum spacing of the anchoring points

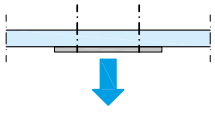
The minimum separation spacings between individual attached loads must be observed to avoid local overloading of the ceiling. The minimum spacing between two anchoring points is dependent on both effective radii of the individual loads. The effective radius of the individual load can be taken from the following diagram in dependence on the permissible weight per unit area for additional loads:



3 kg/m² additional loads
6 kg/m² additional loads
15 kg/m² additional loads (for Multi-level Ceiling System)

Example fastening scheme at 15 kg/m²



Note		The fastened loads can be transferred using several anchoring elements.

Determination of the self-weight of Cubo Plus ceilings

Cladding / construction variants Ceiling top	Ceiling bottom	Total cladding weight kg/m²
12.5 mm Diamant	12.5 mm Diamant	26.0
2x 12.5 mm Diamant	2x 12.5 mm Diamant	52.0
	2x 12.5 mm Silentboard	62.8
12.5 mm Diamant + 12.5 mm Silentboard	12.5 mm Diamant + 12.5 mm Silentboard	62.8
2x 20 mm Fireboard	2x 20 mm Fireboard	65.6
22 mm HWP[1)]	12.5 mm Diamant	29.5
	12.5 mm Silentboard	34.9
	2x 12.5 mm Diamant	42.5
	2x 12.5 mm Silentboard	53.3
22 mm wooden composite board [1)] + Brio 18 WF	12.5 mm Silentboard	61.4
	2x 12.5 mm Diamant	68.0
	2x 12.5 mm Silentboard	78.8
22 mm wooden composite board [1)] + Brio 23 WF	2x 20 mm Fireboard	80.4
22 mm wooden composite board [1)] + 12.5 mm Diamant	2x 12.5 mm Diamant	55.5
22 mm wooden composite board [1)] + 25 mm Fireboard	2x 20 mm Fireboard	69.8
GIFAfloor FHB 28	12.5 mm Diamant	55.0
	2x 12.5 mm Diamant	68.0
GIFAfloor FHB 28 + Brio 18 WF	12.5 mm Diamant	80.5
	2x 12.5 mm Diamant	93.5
	2x 12.5 mm Silentboard	104.3
GIFAfloor FHB 28 + 12 mm TPE 12-2 + Brio 23	2x 12.5 mm Silentboard	110.3
GIFAfloor FHB 38	2x 12.5 mm Diamant	83.0
	2x 20 mm Fireboard	89.8

1) Wooden composite board HWP: OSB/3 or equivalent, density ≤ 750 kg/m³

+

If applicable additional self-weight loads from ceiling structures
"Multi-level ceiling system": ≤ 0.15 kN/m² (corresponds to ≤ 15 kg/m²)
e.g. Insulation material
e.g. Floor construction
e.g. Curtain rails, lighting fixtures

- The self-weights of the ceiling beams are considered directly in the span width tables on pages 11 and 14.
- Consider additional loads when determining the nominal weight of the ceiling.

Example

Configuration		Weight kg/m²
Ceiling top	22 mm wooden composite board + Brio 18 WF	**77.8**
Ceiling bottom	2x 12.5 mm Silentboard	
	+	
Additional load	Insulation	**1.5**
	=	
Nominal weight		**79.3 kg/m² ≈ 0.8 kN/m²**

Cladding self-weight (without frame)

Cladding or configuration	Weight approx. kg/m²
Gypsum boards	
12.5 mm Diamant	13.0
12.5 mm Silentboard	18.4
20 mm Fireboard	16.4
25 mm Fireboard	20.5
Gypsum fibre boards	
Brio 18	23.0
Brio 18 WF	25.5
Brio 23 WF	31.1
GIFAfloor FHB 28	45.5
GIFAfloor FHB 38	61.8
Wooden composite board	
22 mm HWP[1)]	16.5

1) Wooden composite board HWP: OSB/3 or equivalent, density ≤ 750 kg/m³

Cubo System Column self weight

Cubo System Column Constructional room height mm	Basic support length mm	Weight approx. kg/pcs
1950 to 2500	1945	13.2
2450 to 3000	2450	15.1
2950 to 3500	2950	16.1
> 3500 mm on request		Depending on the actual length, on request

Profiles self weight

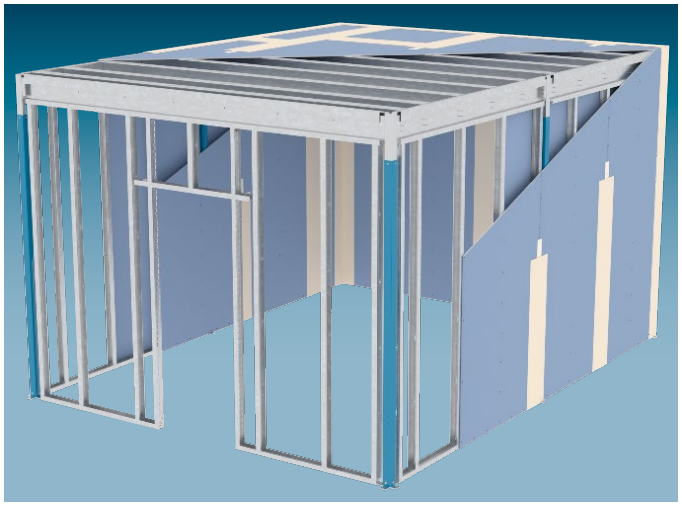
Knauf profiles	Weight approx. kg/m
2x SL-C profile 200	9.4
2x SL-C profile 250	11.0
2x SL-C profile 300	12.6
SL-U profile 200	3.2
SL-U profile 250	5.1
SL-U profile 300	5.8
CD 60/27	0.5
CW 75	0.8
CW 100	0.9
Resilient Channel 60/27	0.7
MW 75	1.0
MW 100	1.1
UW 75	0.8
UW 100	0.9

These weight specifications are the basis to determine the weight of the respective Cubo, if required.

Knauf Cubo Plus Room-in-Room Systems

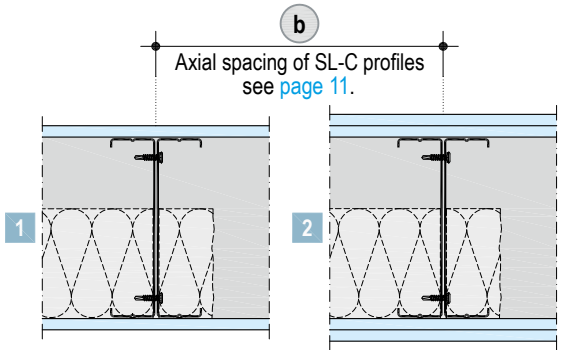
Knauf Cubo Plus Room-in-Room systems are self-supporting, erectable room systems for installation in existing rooms. They can be used as stand-alone solutions or can be attached to in-situ walls. The room systems are reinforced by cladding of the room enclosing walls and the self-supporting ceiling construction with Knauf Diamant, Silentboard or Fireboard. The length of Cubo Plus Room-in-Room systems is unlimited. However, additional measures are required for lateral reinforcement with larger room lengths as detailed on page 26. The width of Cubo Plus systems is limited by the maximum span width of the ceiling. Configure expansion joints with lengths > 15 m (Cubo Plus Basis).

K375P.de Cubo Plus Basis



The Cubo Plus Basis is the solution for simple space-creating measures with sound insulation and fire resistance requirements.

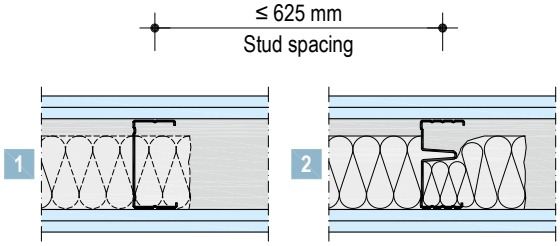
Ceiling K375P.de Cubo Plus Basis



Cladding

1	Single-layer
2	Double-layer

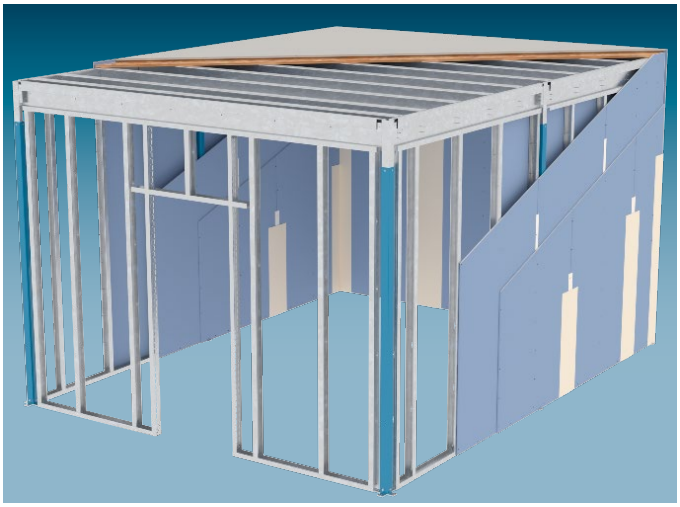
Walls K375P.de Cubo Plus Basis



Knauf profiles

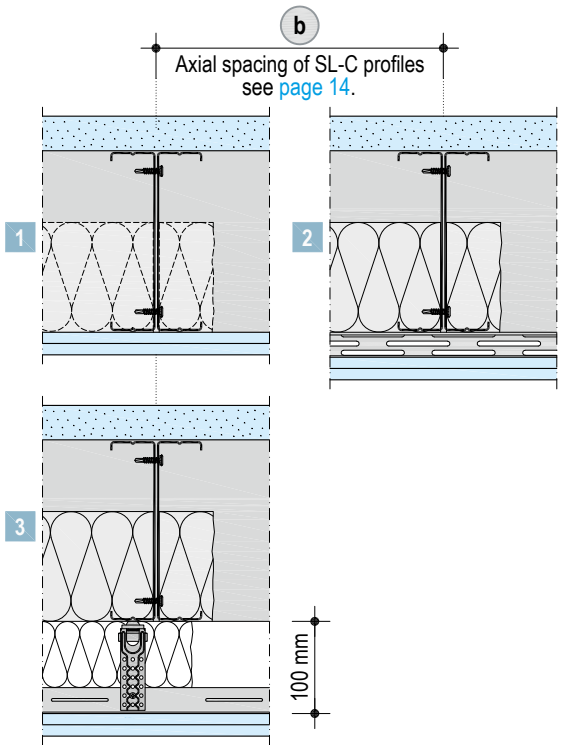
1	Profile CW 75/100
2	Profile MW 75/100

K376P.de Cubo Plus Empore



The Cubo Plus Empore is the solution for space-creating measures where the ceiling surface may also be used in addition to sound insulation and fire resistance requirements. This utilisation can be dimensioned from static superimposed loads up to conditionally walkable for maintenance purposes extending up to domestic living space.

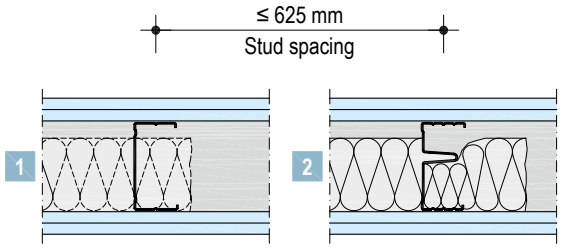
Ceiling K376P.de Cubo Plus Empore



Fastening of the lower side cladding

1	Direct cladding
2	With Resilient Channels
3	With profile CD 60/27 and Damping Universal Bracket

Wall K376P.de Cubo Plus Empore



Knauf profiles

1	Profile CW 75/100
2	Profile MW 75/100

Ceiling superimposed loads (not permanent superimposed loads)

Nominal weight + conditionally walkable:
The “conditional walkability” implies a temporary additional loading of the ceiling by two persons, who temporarily walk on the system for maintenance or inspection purposes (comparable to walking on glass roofs for cleaning purposes). Planned carrying capacity is not permissible.

Nominal weight + static superimposed loads ≤ 0.5 / ≤ 1.0 kN/m² (incl. conditional walkability):
Static superimposed loads can be understood to mean the imposed load of the ceiling. These include temporary loads such as commercial and industrial stored materials (e.g. lightweight materials on pallets). Even technical installation loads (e.g. ventilation ducts) can also be considered for the purpose of simplification as uniformly distributed imposed loads. To ensure that this is possible, individual loads (point loads on the ceiling) may not exceed 0.5 / 1.0 kN. Distributed over the surface loads of 0.5/1.0 kN/m² must be observed. The introduction of building loads (permanently superimposed loads) from supports, props, etc. into the ceiling is not permissible.

Nominal weight + carrying load capacity ≤ 2.0 kN/m²
By assuming load capacities, all planned, variable loads on ceilings with defined usage can be considered. These loads result from the presence of persons and furniture. Usage analogue to living space, common rooms, office spaces, work spaces and hallways in acc. with category A3 or B1 acc. to DIN EN 1991-1-1/NA is included. Usage in areas accessible to the public is not permitted.

System variants

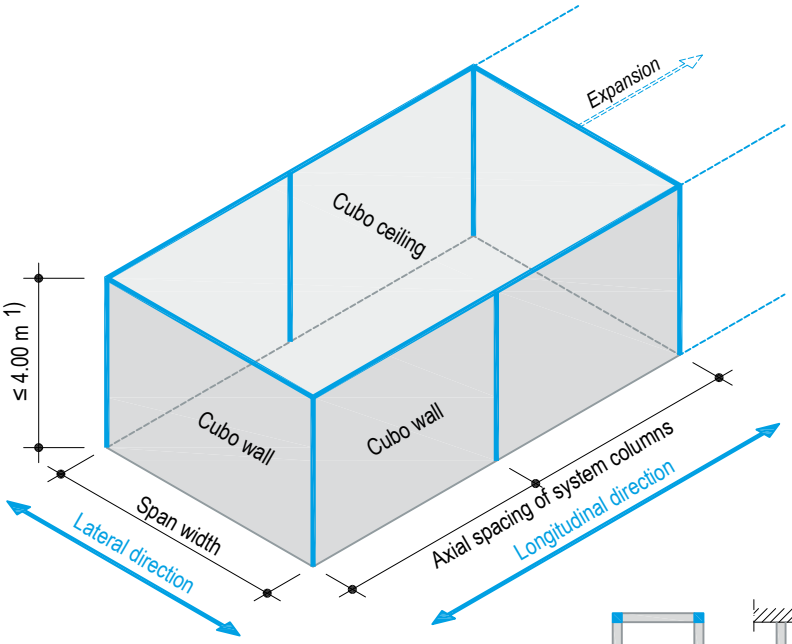
Fire resistance in minutes	Cladding/configuration **Ceiling top** 1st layer + 2nd layer	**Ceiling bottom** 1st layer + 2nd layer	**Wall** (both sides) 1st layer + 2nd layer
K375P.de Cubo Plus Basis			
–	**12.5 mm** Diamant	**12.5 mm** Diamant	**12.5 mm** Diamant
30	+ **12.5 mm** Diamant **12.5 mm** Silentboard	+ **12.5 mm** Diamant **12.5 mm** Silentboard	**2x 12.5 mm** Diamant
			+ **12.5 mm** Diamant **12.5 mm** Silentboard
	2x 12.5 mm Diamant	**2x 12.5 mm** Silentboard	+ **12.5 mm** Diamant **12.5 mm** Silentboard
	2x 12.5 mm Diamant	**2x 12.5 mm** Diamant	**2x 12.5 mm** Diamant
90	**2x 20 mm** Fireboard	**2x 20 mm** Fireboard	**2x 20 mm** Fireboard

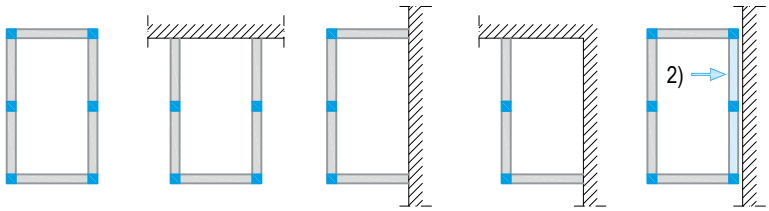
With combined cladding: Silentboard as a cover layer (2nd layer)

Note Observe the notes on pages 3 and 4.

Maximum span widths, room heights and axial spacings I Connection variants

- Minimum dimensions of the floorspace: 2 m x 2 m
- For any required bracing of the Cubo Plus see page 26





Axial clearances K375P.de Cubo Plus Basis

Cubo ceiling		Cubo wall
Maximum axial spacing Carrying channel (b) or SL-C profiles Screwed together back to back on site mm	**Maximum axial spacing Furring channel** (Profile CD 60/27or Resilient Channel) mm	**Maximum stud profile axial spacing Knauf profile CW/MW** mm
500 (with Silentboard 400 direct cladding)	500 (with Silentboard 400 cladding)	625

Span widths Cubo ceiling I System support axial spacings K375P.de Cubo Plus Basis **(without superimposed loads)**

SL-C profiles Bolted together back to back on site	**Axial spacing (b)** mm		**Maximum span width in m Maximum axial spacing system column in m Nominal weight of cladding/ceiling construction/additional loads in kN/m²** ≤ 0.2	≤ 0.3	≤ 0.4	≤ 0.5	≤ 0.6	≤ 0.7	≤ 0.8	≤ 0.9	≤ 1.0
2x SL-C profile 200	**500**[3)]	**Max. span width**	**10.00**	**9.50**	**8.95**	**8.50**	**8.10**	**7.80**	**7.55**	**7.30**	**7.10**
		Max. axial spacing system column	4.00	3.90	3.80	3.70	3.60	3.55	3.50	3.45	3.40
2x SL-C profile 250	**500**[3)]	**Max. span width**	**10.00**	**10.00**	**10.00**	**10.00**	**9.60**	**9.25**	**8.90**	**8.65**	**8.40**
		Max. axial spacing system column	4.00	4.00	4.00	4.00	3.90	3.85	3.80	3.60	3.35
2x SL-C profile 300	**500**[3)]	**Max. span width**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**9.70**
		Max. axial spacing system column	4.00	4.00	4.00	4.00	4.00	3.65	3.25	2.95	2.75

1) With room heights > 3.20 m: Cubo Plus System double-layer cladding

2) Application as furring is possible: Room side cladding at least 2-layers

3) Axial spacing ≤ 400 mm with Silentboard fastening or combined cladding fastened directly on the SL-C furring channel.

Free-spanning ceiling profiles may not be jointed or extended.

Note Observe the notes on pages 3 and 4.

System variants

Fire resistance in minutes	Cladding/configuration Ceiling top: 1st layer + 2nd layer + 3rd layer	Ceiling bottom: 1st layer + 2nd layer	Wall both sides: 1st layer + 2nd layer	$D_{nT,w}$ [1] in dB Ceiling bottom: Direct cladding	$D_{nT,w}$ [1] in dB Ceiling bottom: CD 60/27 with Damping Universal bracket	$D_{nT,w}$ [1] in dB Ceiling bottom: Resilient Channels	$L_{n,w}$ [2] in dB Ceiling bottom: Direct cladding	$L_{n,w}$ [2] in dB Ceiling bottom: CD 60/27 with Damping Universal bracket	$L_{n,w}$ [2] in dB Ceiling bottom: Resilient Channels
K376P.de Cubo Plus Empore									
–	**≥ 22 mm** wooden composite board HWP	**12.5 mm** Diamant	**12.5 mm** Diamant	–	–	–	–	–	–
		12.5 mm Diamant	**2x 12.5 mm** Diamant	42[3]	–	–	75.2[3]	–	–
		2x 12.5 mm Diamant	**2x 12.5 mm** Diamant	44[3]	54[4]	–	72.6[3]	57.5[4]	–
		12.5 mm Silentboard	**2x 12.5 mm** Diamant	–	–	55[4]	–	–	59.2[4]
		2x 12.5 mm Silentboard	**2x 12.5 mm** Diamant	47[3]	–	56[4]	69.6[3]	–	55.5[4]
	+ **≥ 22 mm** HWP **Brio 18** WF	**12.5 mm** Silentboard	**2x 12.5 mm** Diamant	–	–	57[4]	–	–	50.6[4]
	GIFAfloor **FHB 28**	**12.5 mm** Diamant	**2x 12.5 mm** Diamant	–	–	56[4]	–	–	69.9[4]
		2x 12.5 mm Diamant	**2x 12.5 mm** Diamant	–	57[4]	57[4]	–	60.3[4]	66.9[4]
	+ GIFAfloor **FHB 28** **Brio 18** WF	**12.5 mm** Diamant	**2x 12.5 mm** Diamant	49[3]	–	57[4]	65.7[3]	–	51.0[4]
30	+ **≥ 22 mm** HWP **Brio 18** WF	**2x 12.5 mm** Diamant	**2x 12.5 mm** Diamant	–	57[4]	–	–	49.0[4]	–
		2x 12.5 mm Diamant	+ **12.5 mm** Diamant **12.5 mm** Silentboard	–	60 [4]	–	–	49.0[4]	–
		2x 12.5 mm Silentboard	+ **12.5 mm** Diamant **12.5 mm** Silentboard	–	–	60[4]	–	–	48.4[4]
	+ **≥ 22 mm** HWP + **12 mm** TPE 12-2 + **Brio 23**	**2x 12.5 mm** Silentboard	+ **12.5 mm** Diamant **12.5 mm** Silentboard	–	–	60[4]	–	–	45.1[4]
	GIFAfloor **FHB 38**	**2x 12.5 mm** Diamant	**2x 12.5 mm** Diamant	–	*57* [4]	*57* [4]	–	*60.3* [4]	*66.9* [4]
	+ GIFAfloor **FHB 28** **Brio 18** WF	**2x 12.5 mm** Diamant	**2x 12.5 mm** Diamant	–	57[4]	57[4]	–	45.2[4]	47.6[4]
		2x 12.5 mm Silentboard	+ **12.5 mm** Diamant **12.5 mm** Silentboard	56[3]	–	–	59.7[3]	–	–
	+ **≥ 22 mm** HWP **12.5 mm** Diamant	**2x 12.5 mm** Diamant	**2x 12.5 mm** Diamant	–	–	–	–	–	–
90	+ **≥ 22 mm** HWP **25 mm** Fireboard	**2x 20 mm** Fireboard	**2x 20 mm** Fireboard	–	–	–	–	–	–
	+ **≥ 22 mm** HWP **Brio 23** WF	**2x 20 mm** Fireboard	**2x 20 mm** Fireboard	–	–	–	–	–	–
	GIFAfloor **FHB 38**	**2x 20 mm** Fireboard	**2x 20 mm** Fireboard	–	–	–	–	–	–

1) *Standardized sound level difference for free-standing Cubo Plus, wall construction with stud profiles MW 100 (values in blue: CW 100), 80 mm mineral wool in partition cavity, calculated values, as a prognosis uncertainty a deduction of 3 dB is recommended.*

2) *Normalized impact sound pressure level for free-standing Cubo Plus (measurement solely for ceiling).*

3) *Ceiling design supporting structure, furring channel SL-C double profile 100, 80 mm insulation layer between the free-spanning ceiling profiles.*

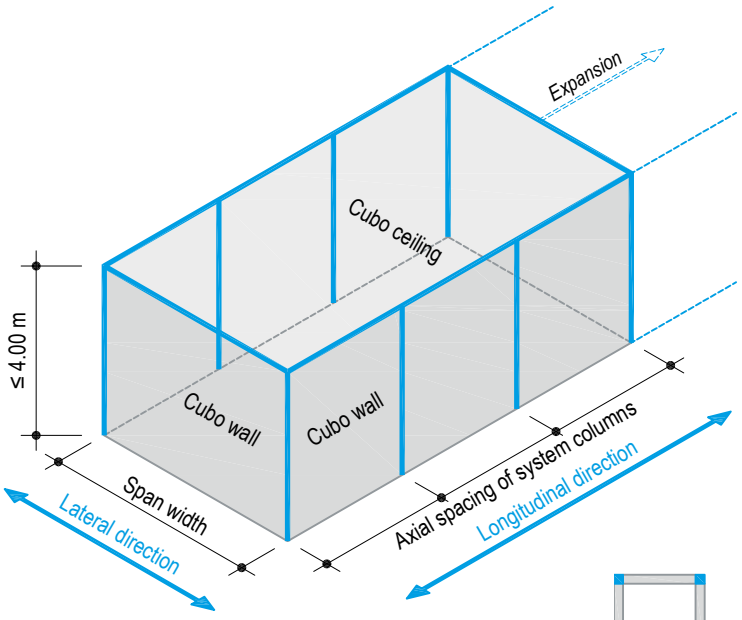
4) *Ceiling design supporting structure, furring channel SL-C double profile 200, 120 mm insulation layer between the free-spanning ceiling profiles.*

- ***Values represented in italics*** are derived values from measurements on divergent constructions.
- With combined cladding: Silentboard as a cover layer (2nd layer)
- **22 mm Wooden composite board HWP**
  - OSB/3 or equivalent, density ≤ 750 kg/m³
  - The board is used for lateral distribution of planned superimposed loads
  - As 1st or 2nd layer with “conditionally walkable”; only as the 1st layer possible with “static superimposed loads” or “load capacity” or fire resistance

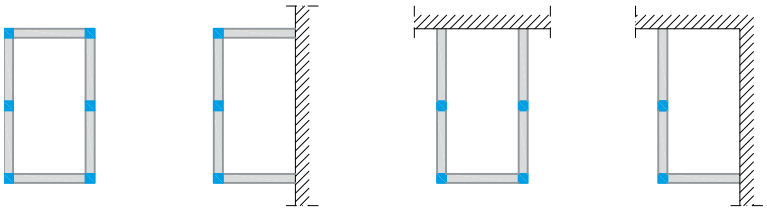
Required for sound insulation insulating layer: Mineral wool, length-related flow resistance 5 kPa·s/m² ≤ r ≤ 50 kPa·s/m² acc. to DIN 4109-33 (e.g. from Knauf Insulation)

Note Observe the notes on pages 3 and 4.

Maximum span widths, room heights and axial spacings I Connection variants



- Double-layer wall cladding
- Minimum dimensions of the floorspace: 2 m x 2 m
- For any required bracing of the Cubo Plus see page 26



Axial clearances K376P.de Cubo Plus Empore

Loading	Cubo ceiling		Cubo wall
	Maximum axial spacing Carrying channel (b) or SL-C profiles Screwed together back to back on site mm	**Maximum axial spacing Furring channel** (Profile CD 60/27or Resilient Channel) mm	**Maximum stud profile axial spacing Knauf profile CW/MW** mm
Conditionally walkable	500 (with Silentboard 400 direct cladding)	500 (with Silentboard 400 cladding)	625
Static superimposed loads	500 (with Silentboard 400 direct cladding)	500 (with Silentboard 400 cladding)	625
Carrying capacity	400	500 (with Silentboard 400 cladding)	625

Note Observe the notes on pages 3 and 4.

Maximum span widths, room heights and axial spacings I Connection variants (Continuation)

Span widths Cubo ceiling I System support axial spacings K376P.de Cubo Plus Empore **(with superimposed loads)**

Imposed loads kN/m²	SL-C profiles Bolted together back to back on site	Axial spacing (b) mm		Maximum span width in m / Maximum axial spacing system column in m / Nominal weight of cladding/ceiling construction/additional loads in kN/m²									
				≤ 0.3	≤ 0.4	≤ 0.5	≤ 0.6	≤ 0.7	≤ 0.8	≤ 0.9	≤ 1.0	≤ 1.1	≤ 1.2
Conditionally walkable	2x SL-C profile 200	500[1)]	**Max. span width**	**7.55**	**7.30**	**7.10**	**6.90**	**6.70**	**6.55**	**6.45**	**6.30**	**6.20**	**6.05**
			Max. axial spacing system column	3.50	3.45	3.35	3.25	3.15	3.10	3.00	2.95	2.85	2.80
	2x SL-C profile 250	500[1)]	**Max. span width**	**8.90**	**8.65**	**8.40**	**8.20**	**8.00**	**7.80**	**7.65**	**7.50**	**7.35**	**7.20**
			Max. axial spacing system column	3.65	3.40	3.20	3.00	2.85	2.70	2.60	2.50	2.40	2.30
	2x SL-C profile 300	500[1)]	**Max. span width**	**10.00**	**10.00**	**9.70**	**9.45**	**9.25**	**9.05**	**8.85**	**8.65**	**8.50**	**8.35**
			Max. axial spacing system column	3.05	2.75	2.60	2.50	2.35	2.25	2.15	2.05	2.00	1.90
Static superimposed loads ≤ 0.5	2x SL-C profile 200	500[1)]	**Max. span width**	**5.95**	**5.80**	**5.60**	**5.45**	**5.35**	**5.20**	**5.10**	**5.00**	**4.90**	**4.80**
			Max. axial spacing system column	3.70	3.65	3.60	3.55	3.50	3.45	3.40	3.40	3.30	3.25
	2x SL-C profile 250	500[1)]	**Max. span width**	**7.10**	**6.85**	**6.65**	**6.50**	**6.35**	**6.20**	**6.05**	**5.95**	**5.85**	**5.75**
			Max. axial spacing system column	4.00	3.95	3.90	3.85	3.75	3.55	3.40	3.25	3.10	3.00
	2x SL-C profile 300	500[1)]	**Max. span width**	**8.15**	**7.90**	**7.70**	**7.50**	**7.35**	**7.15**	**7.00**	**6.90**	**6.75**	**6.65**
			Max. axial spacing system column	3.90	3.65	3.45	3.25	3.05	2.95	2.80	2.65	2.55	2.45
Static superimposed loads ≤ 1.0	2x SL-C profile 200	500[1)]	**Max. span width**	**5.20**	**5.10**	**5.00**	**4.90**	**4.80**	**4.75**	**4.65**	**4.60**	**4.50**	**4.45**
			Max. axial spacing system column	3.45	3.40	3.30	3.25	3.20	3.10	3.05	3.00	2.95	2.90
	2x SL-C profile 250	500[1)]	**Max. span width**	**6.20**	**6.05**	**5.95**	**5.85**	**5.75**	**5.65**	**5.55**	**5.45**	**5.40**	**5.30**
			Max. axial spacing system column	3.40	3.30	3.15	3.00	2.90	2.80	2.70	2.60	2.50	2.45
	2x SL-C profile 300	500[1)]	**Max. span width**	**7.15**	**7.00**	**6.90**	**6.75**	**6.65**	**6.55**	**6.45**	**6.35**	**6.25**	**6.15**
			Max. axial spacing system column	2.80	2.70	2.60	2.50	2.40	2.30	2.25	2.15	2.10	2.05
Carrying capacity ≤ 2.0 [2)]	2x SL-C profile 200	400	**Max. span width**	**4.40**	**4.35**	**4.30**	**4.25**	**4.20**	**4.15**	**4.10**	**4.05**	**4.00**	**3.95**
			Max. axial spacing system column	2.80	2.75	2.65	2.60	2.55	2.50	2.45	2.40	2.35	2.30
	2x SL-C profile 250	400	**Max. span width**	**5.25**	**5.15**	**5.10**	**5.05**	**5.00**	**4.95**	**4.85**	**4.80**	**4.75**	**4.75**
			Max. axial spacing system column	2.25	2.20	2.15	2.10	2.05	2.00	2.00	1.95	1.90	1.85
	2x SL-C profile 300	400	**Max. span width**	**6.05**	**6.00**	**5.90**	**5.85**	**5.80**	**5.70**	**5.65**	**5.60**	**5.55**	**5.45**
			Max. axial spacing system column	1.90	1.85	1.80	1.75	1.70	1.70	1.65	1.60	1.60	1.55

1) Axial spacing ≤ 400 mm with Silentboard cladding fastened directly on the SL-C furring channel.

2) Non-public area.

Free-spanning ceiling profiles may not be jointed or extended.

Caution	For Cubo Plus Empore K376P.de with imposed loads ≤ 2.0 kN/m², the UC profile connectors are to be connected to the profiles with 4 SL construction bolts SX5/8-L12-5,5x31 each. Building authority stipulations on the safety due to collapse must be observed.

Geometric condition framework of the supporting structure

Cubo System Column axial spacing

- Refer to the corresponding system configuration
- Consider the arrangement of the system supports in the window and door opening floor plan (also refer to page 28).

Longitudinal direction

- Refer to the corresponding system configuration
- Can be extended as required

Lateral direction

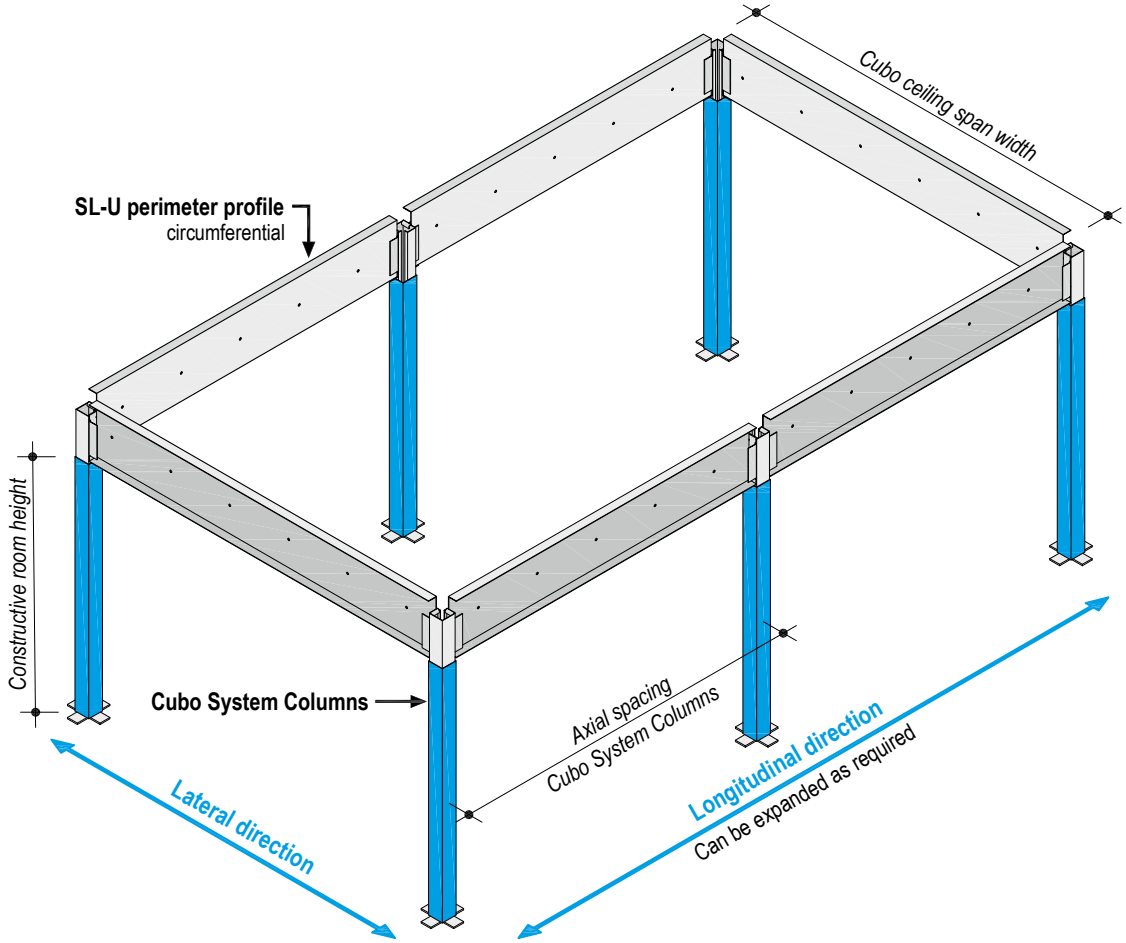
(= Cubo ceiling span width)

- Spanning direction of the Cubo ceiling
- Refer to the corresponding system configuration

Constructional room height: ≤ 4.00 m

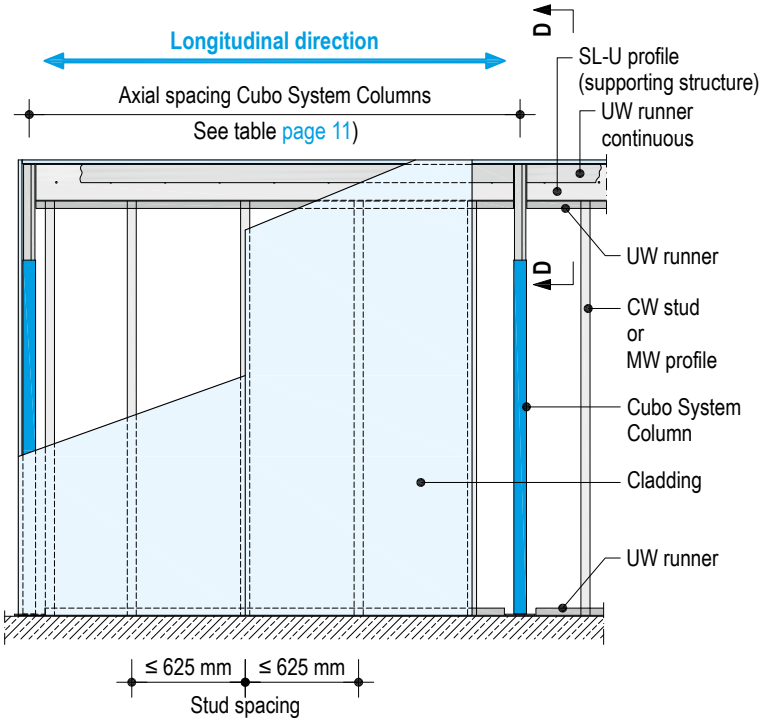
(= upper edge of basic floor to lower edge SL-U perimeter profile),
Larger room heights on request

- Adjustable via telescopic element
- With room height > 3.20 m:
  Cubo Plus System double-layer cladding



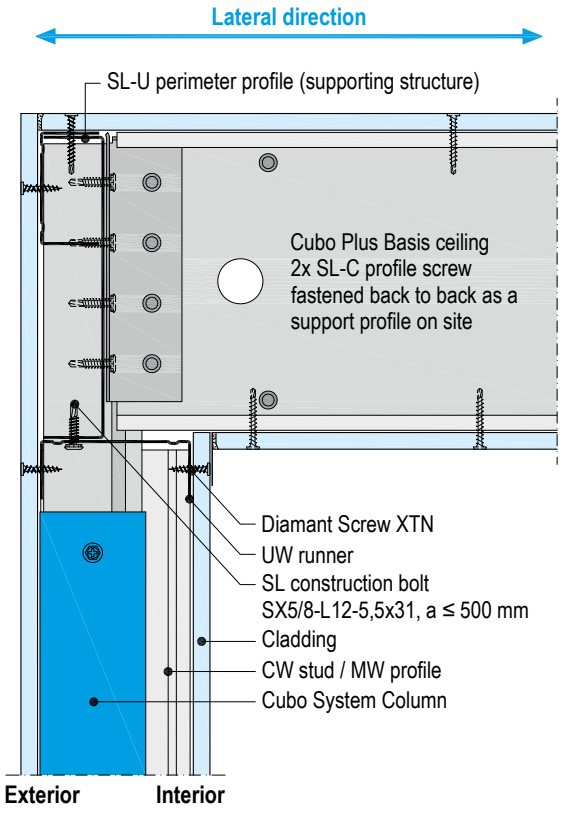
View

Scheme drawing



Section D-D

Scheme drawing I Without fire resistance

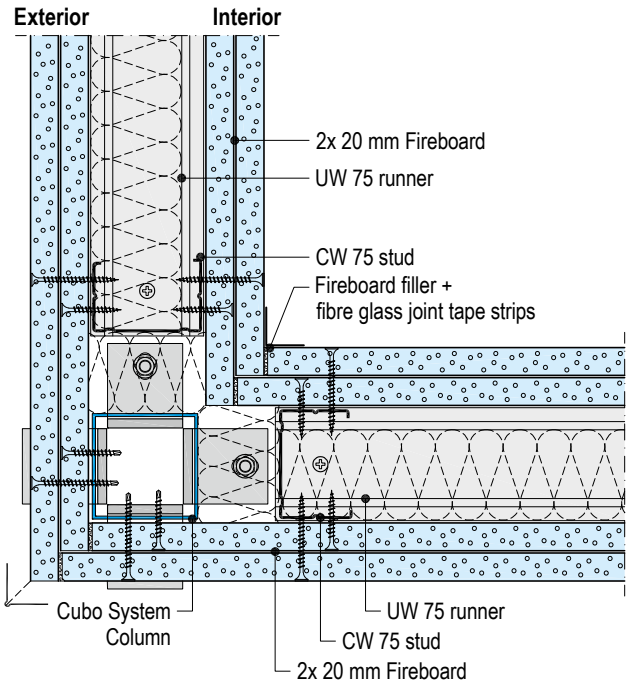


Details

Scale 1:5

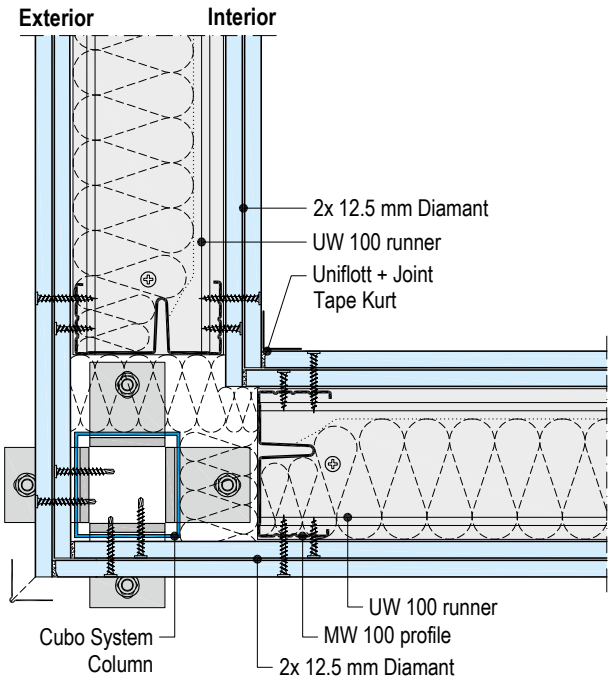
K375P.de-H1 Corner – CW stud

Horizontal section



K375P.de-H2 Corner – MW profile

Horizontal section

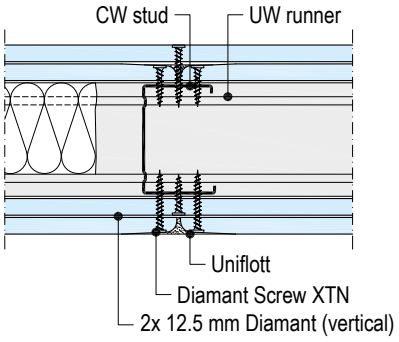


Details

Scale 1:5

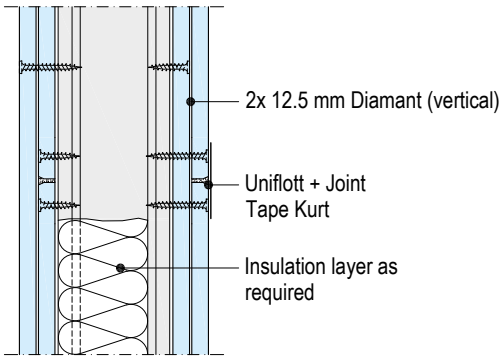
K375P.de-H5 board joint – CW stud

Horizontal section



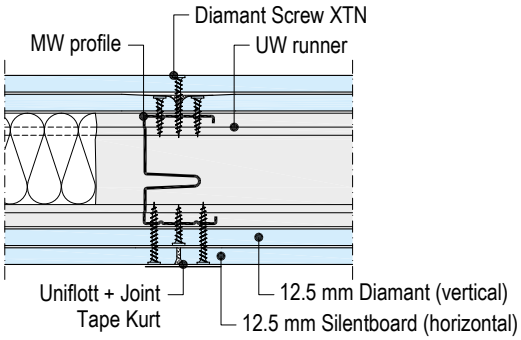
K375P.de-V3 Board joint – CW stud

Vertical section



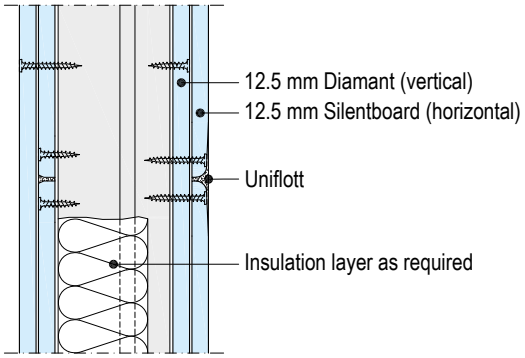
K375P.de-H6 board joint – MW profile

Horizontal section



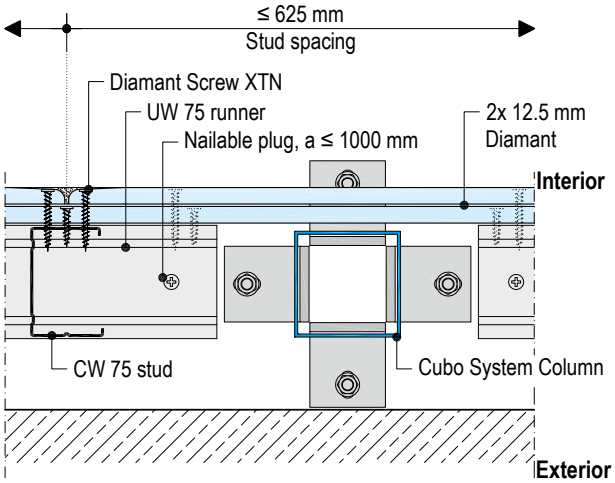
K375P.de-V4 board joint – MW profile

Vertical section



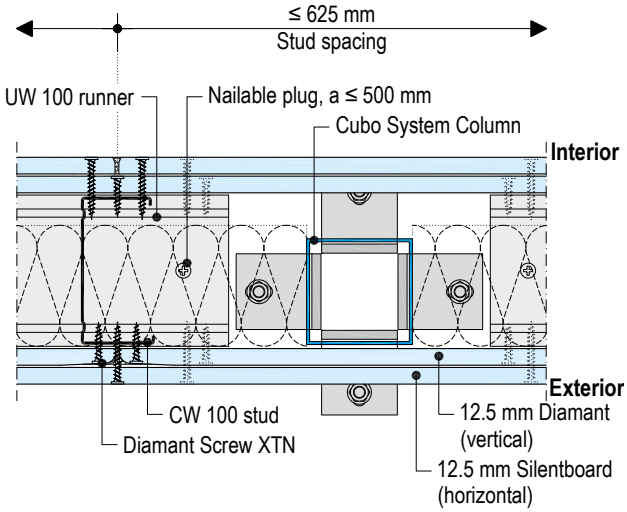
K375P.de-H11 Furring

Horizontal section I Without fire resistance



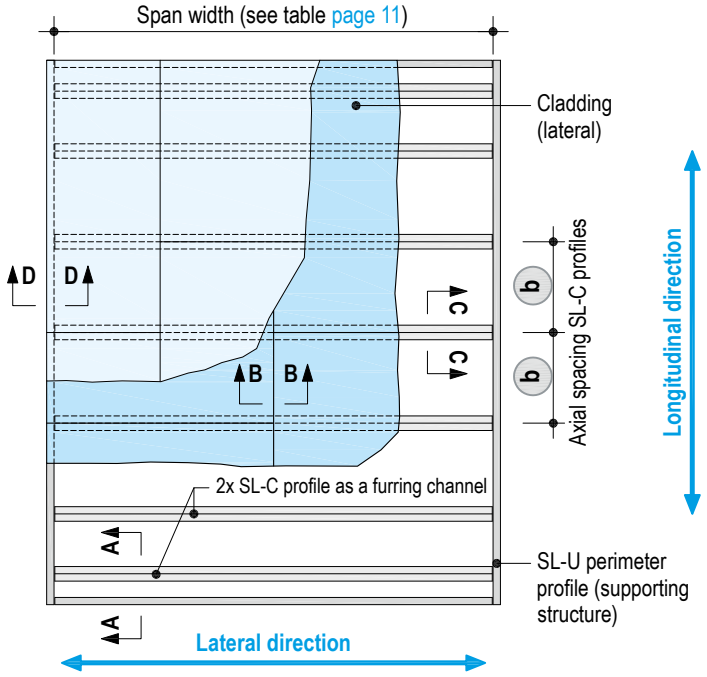
K375P.de-H3 Board joint

Horizontal section



Top view

Scheme drawing

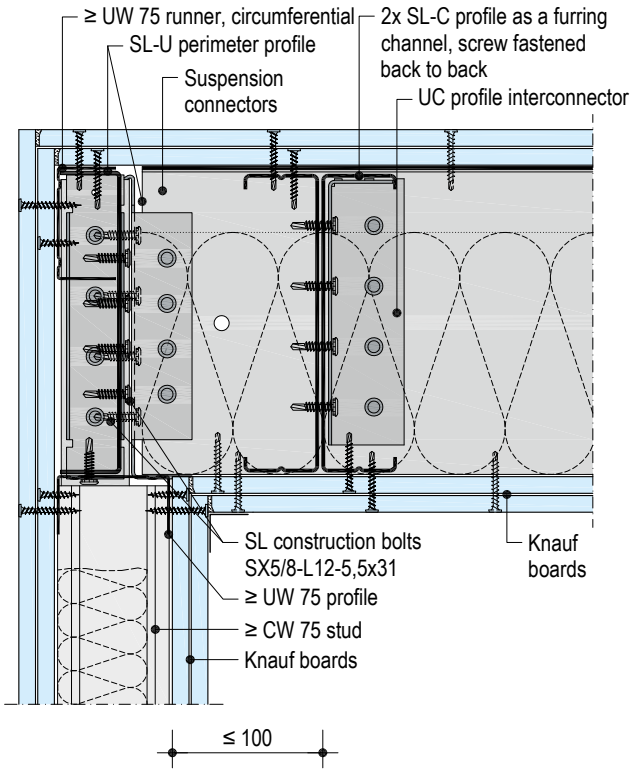


Details

Scale 1:5 I Dimensions in mm

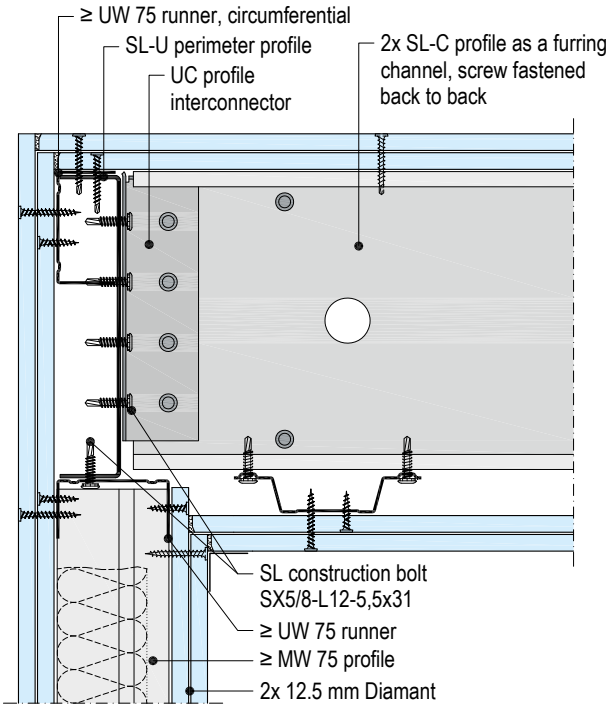
K375P.de-V6 Perimeter connection SL-U profile

Vertical section I Section A-A



K375P.de-V7 Perimeter connection SL-C profile

Vertical section I Section D-D

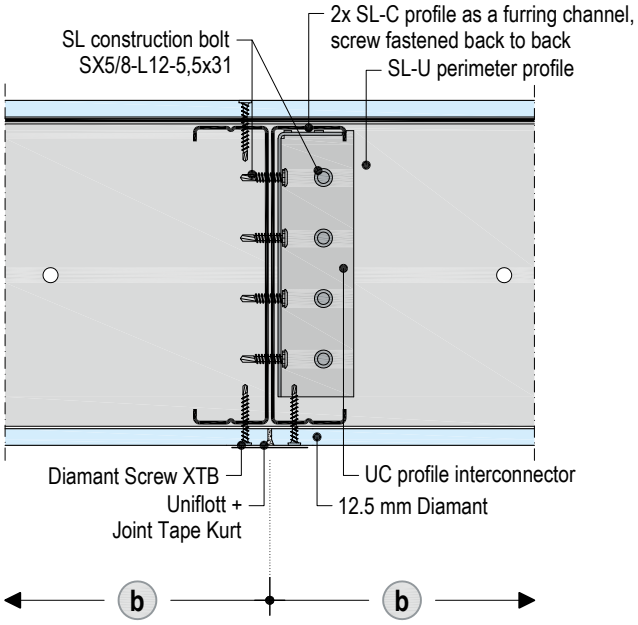


Details

Scale 1:5

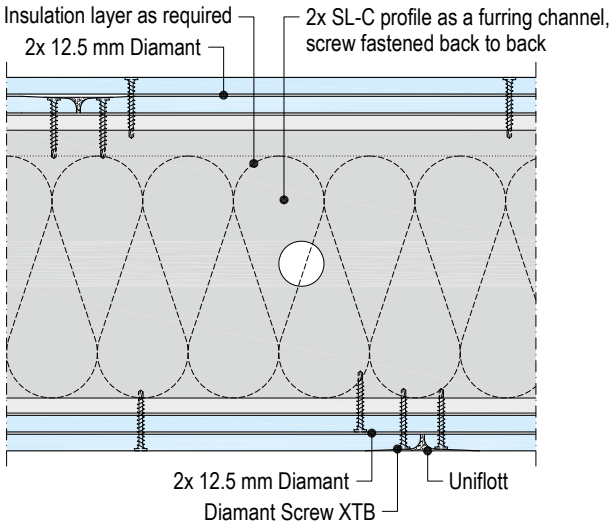
K375P.de-H12 Front edge

Vertical section I Section C-C I Without fire resistance



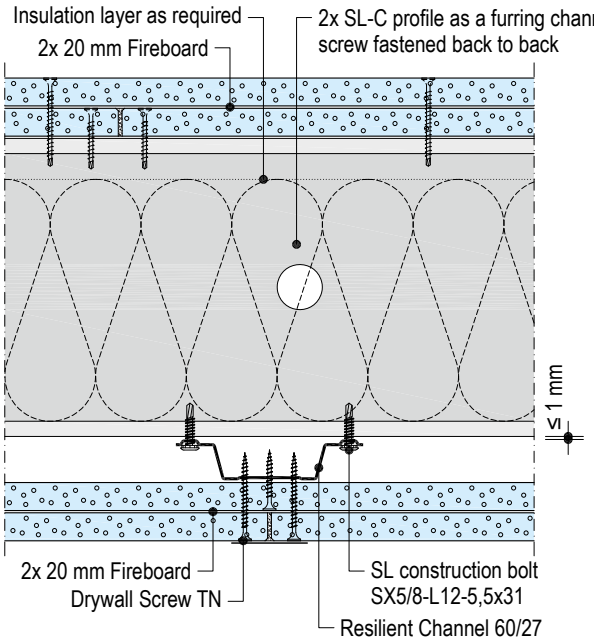
K375P.de-H15 Long edge

Vertical section I Section B-B



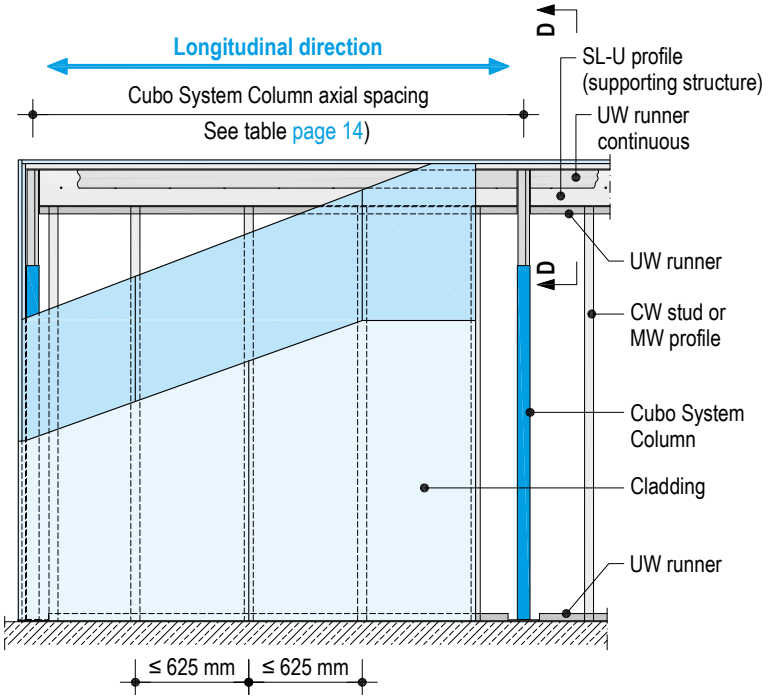
K375P.de-H14 Front edge – Resilient Channel

Vertical section I Section B-B



View

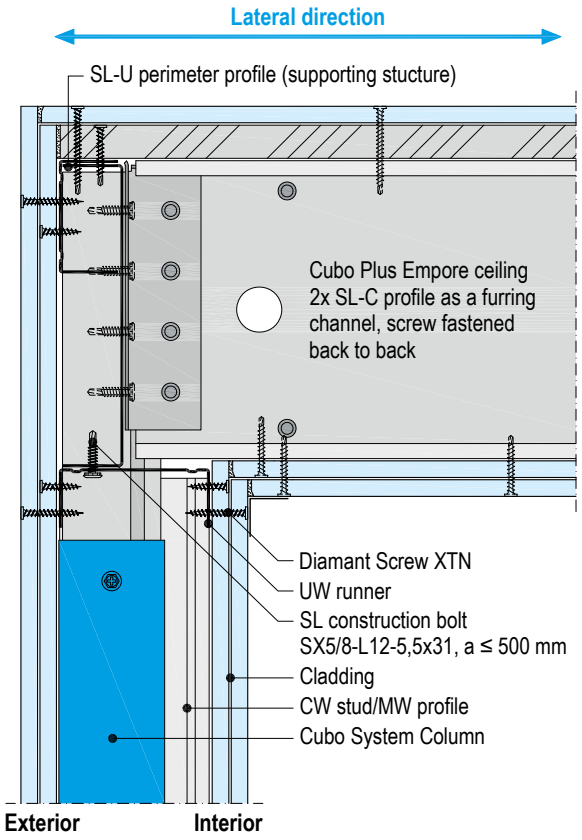
Scheme drawing



■ Outer screw fastening of the cladding to the system column also

Section D-D

Scheme drawing

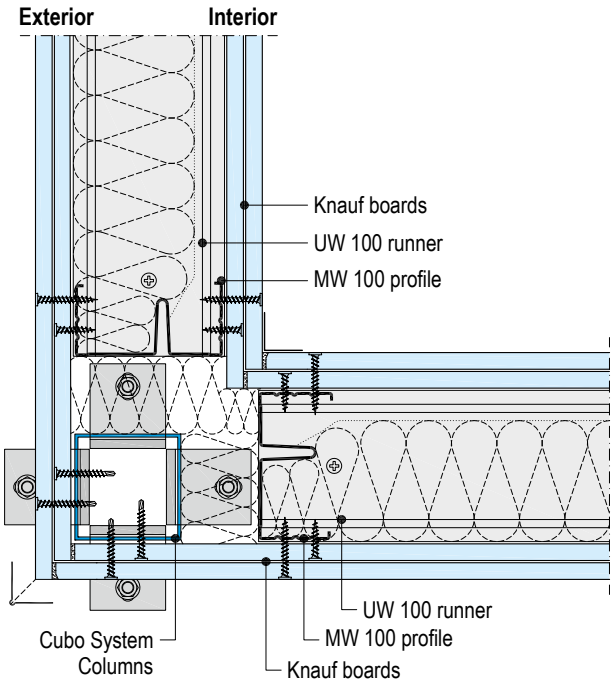


Details

Scale 1:5

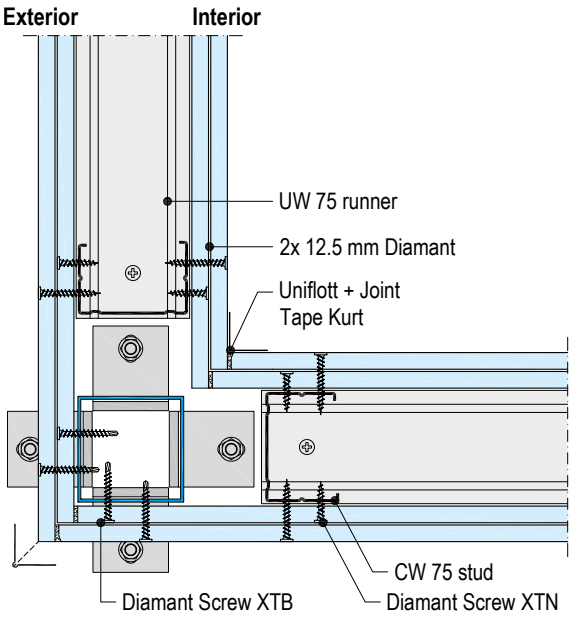
K376P.de-H2 Corner – MW profile

Horizontal section



K376P.de-H3 Corner – CW stud

Horizontal section

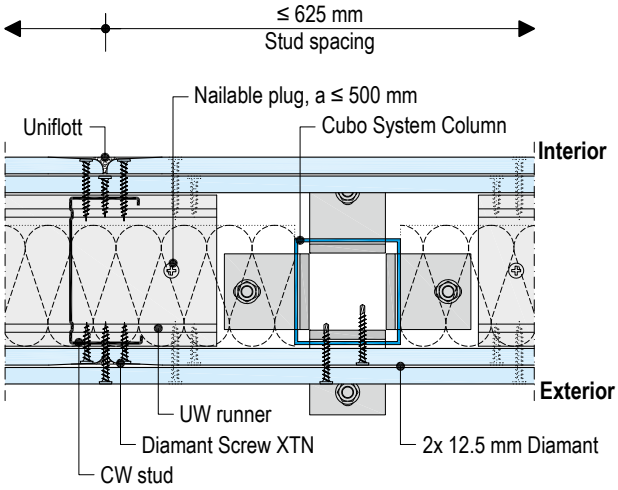


Details

Scale 1:5

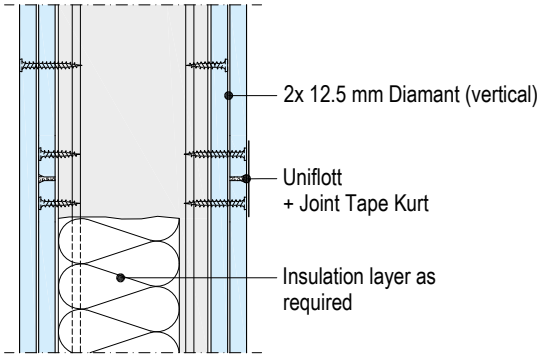
K376P.de-H5 Board joint – CW stud

Horizontal section



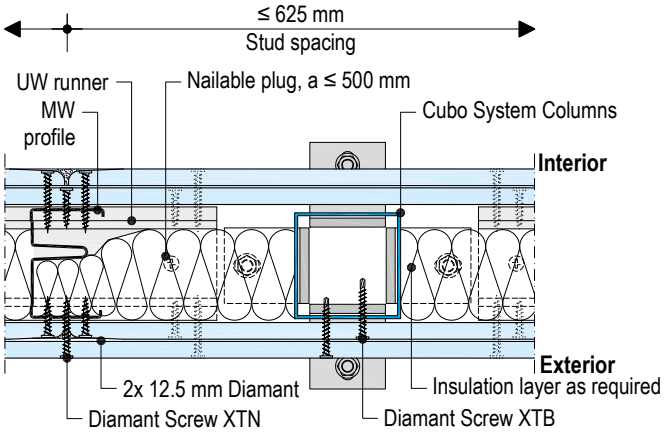
K376P.de-V2 Board joint – CW stud

Vertical section



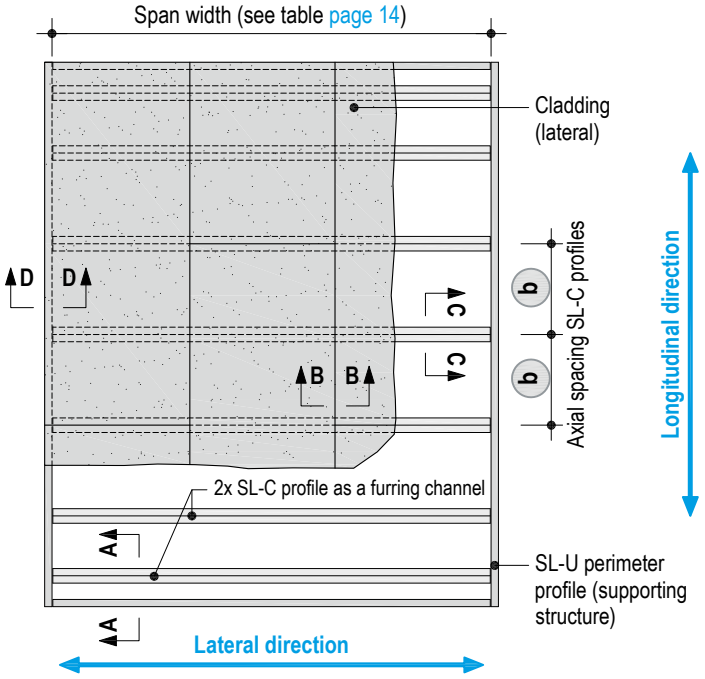
K376P.de-H4 Board joint – MW profile

Horizontal section



Top view

Scheme drawing

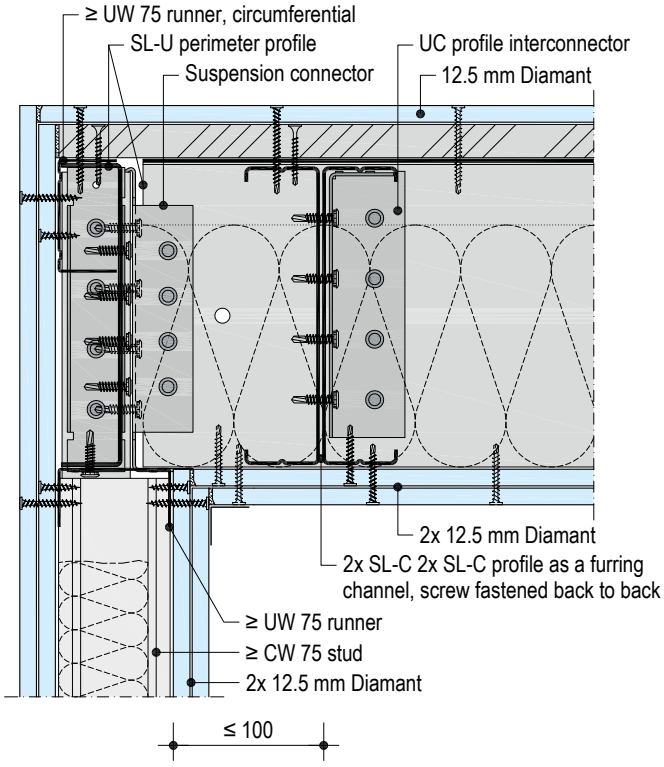


Details

Scale 1:5 I Dimensions in mm

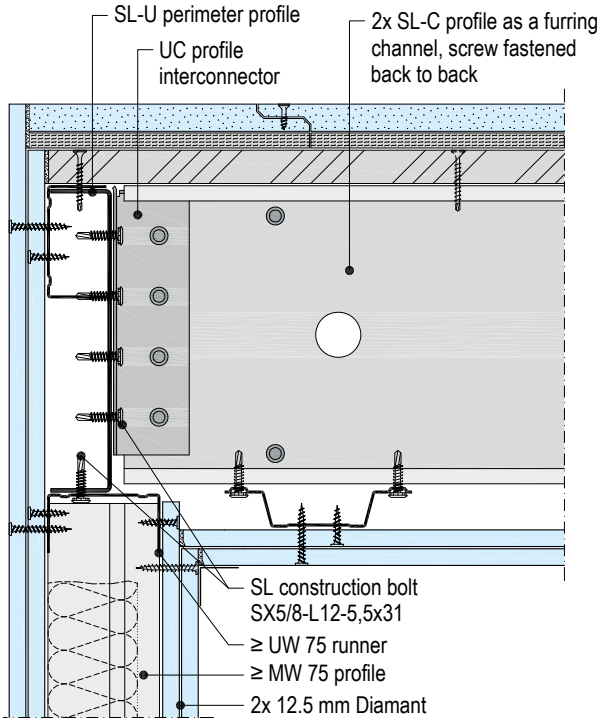
K376P.de-V3 Perimeter connection SL-U profile

Vertical section I Section A-A



K376P.de-V4 Perimeter connection SL-C profile

Vertical section I Section D-D

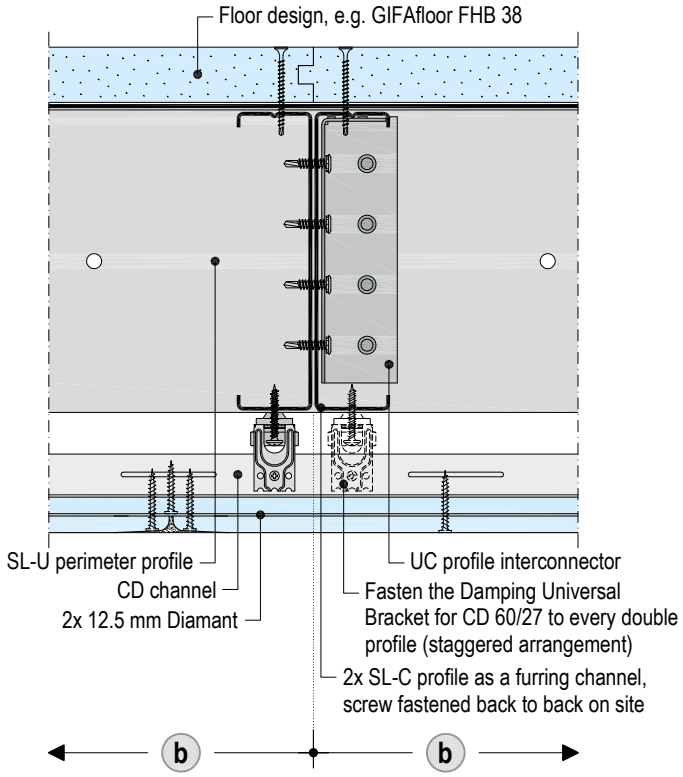


Details

Scale 1:5

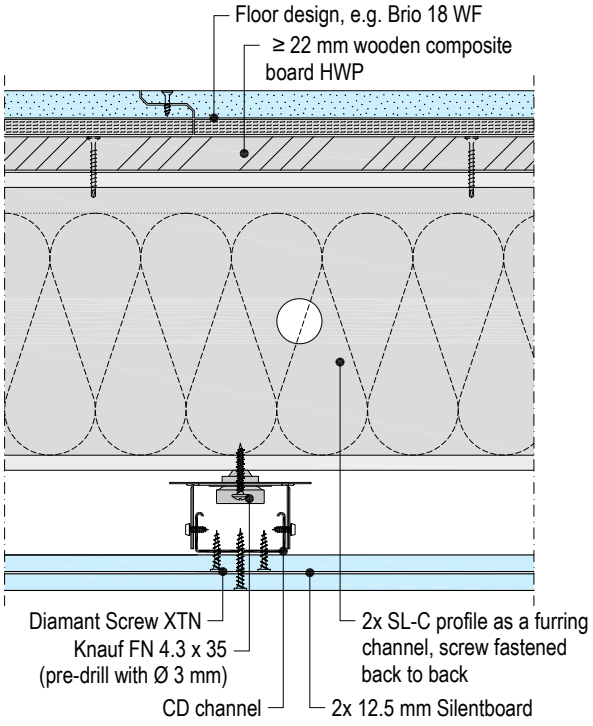
K376P.de-V5 Long edge

Vertical section I Section C-C



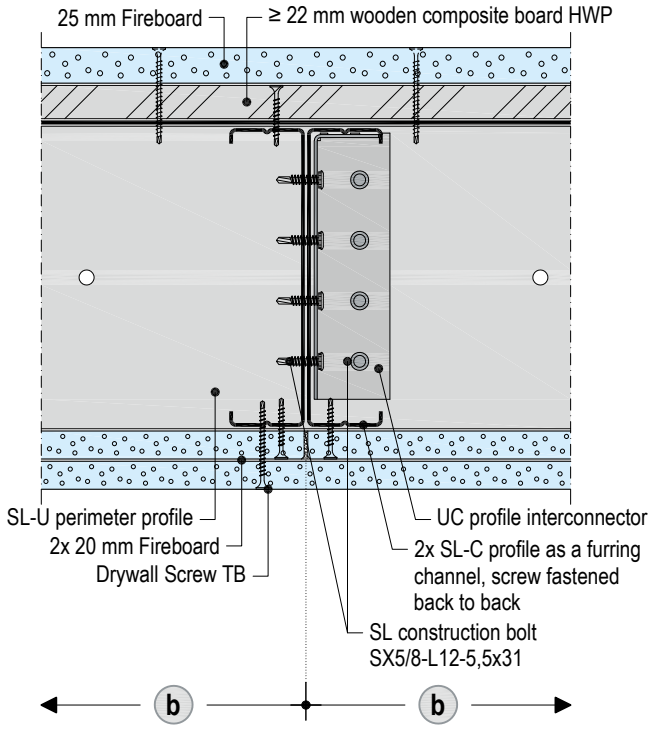
K376P.de-V6 Front edge

Vertical section I Section B-B



K376P.de-V7 Front edge

Vertical section I Section C-C

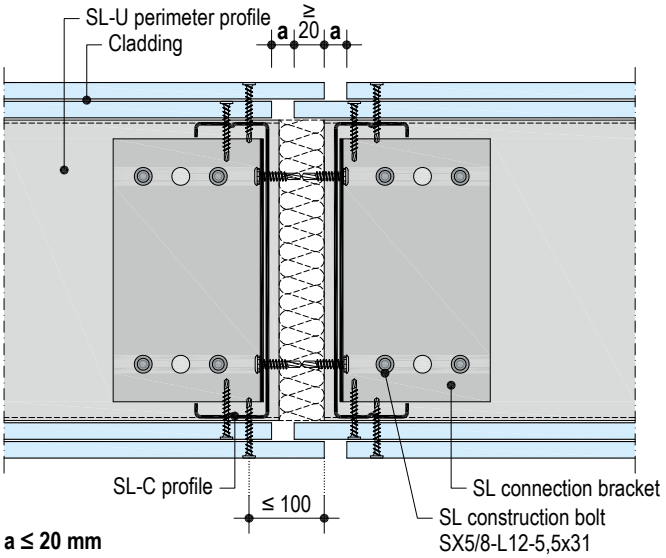


Details

Scale 1:5 I Dimensions in mm

K375P.de-V15 Movement joint – Cubo Plus ceiling

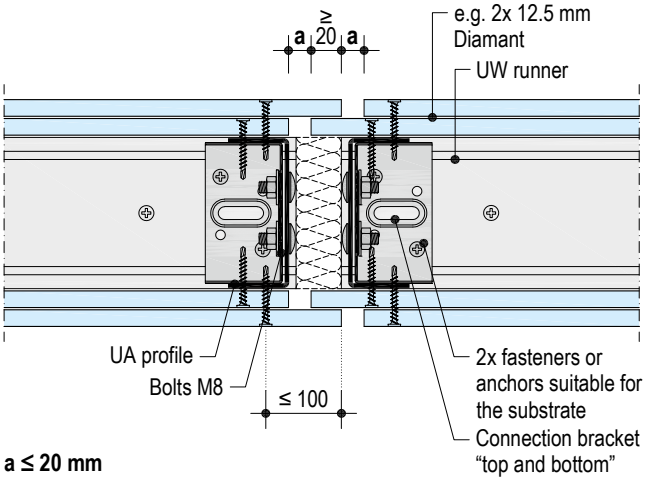
Vertical section I Without fire resistance



a ≤ 20 mm

K375P.de-H16 Movement joint – Cubo Plus Wall

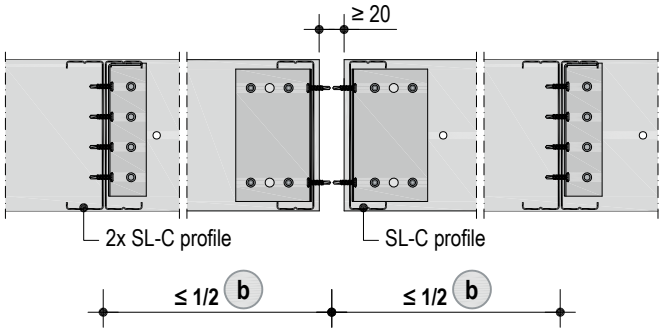
Horizontal section I Without fire resistance



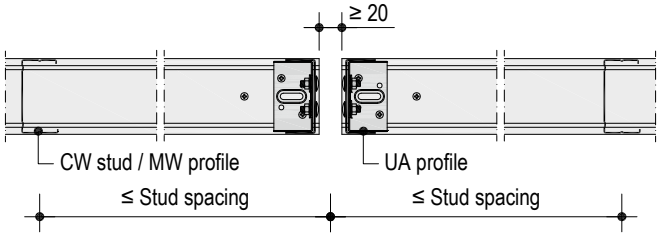
a ≤ 20 mm

Scheme drawings I Dimensions in mm

Cubo Plus ceiling Vertical section



Cubo Plus wall Horizontal section



Connect the UA profiles on basic floors and perimeter supports with a frictional bond to the connection brackets.

Application

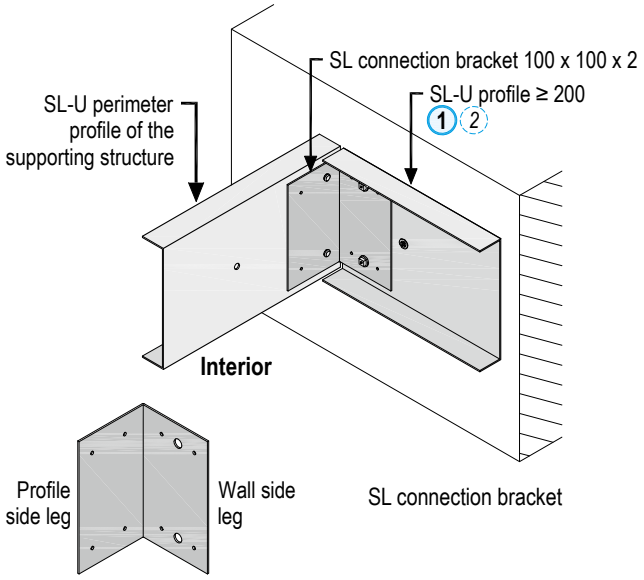
- The movement joints can be arranged as required between the system supports.
- They must be configured to be fully encompassing (horizontal and vertical) without any projections.
- Fill the joints in the ceiling and wall when required with mineral wool.

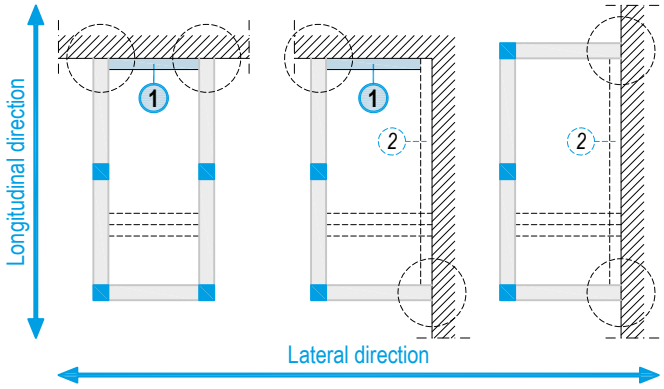
Supporting structure

Scheme drawings

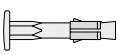
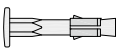
Connection of SL-U perimeter profile to solid walls

Connection of SL-U perimeter profile of the supporting structure to the solid component with SL connection bracket h x 100 x 100 x 2, height h corresponds to size of SL-U profile.





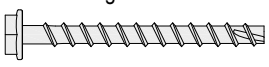
- Connection of SL-U perimeter profile (1) to solid component using suitable fasteners

Substrate	Fasteners and anchors	
Reinforced concrete walls	Knauf Deckennagel ceiling steel dowel	
Stable masonry without cavities	Knauf Deckennagel ceiling steel dowel	

Fastening spacing ≤ 625 mm

This profile is only intended to attach the cladding and has no additional supporting function.

- Connection of the connection bracket to the solid wall with suitable fasteners e.g. for concrete 2x Hilti HUS3-H6



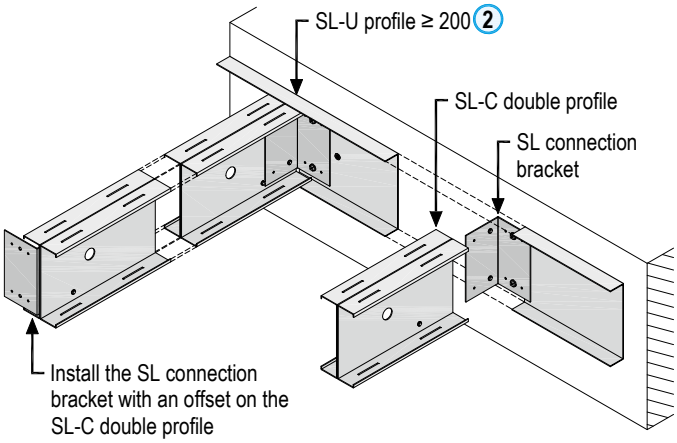
- Fastening of the SL-U perimeter profile of the supporting structure to the connection bracket with at least 2x SL construction bolts SX5/8-L12-5,5x31

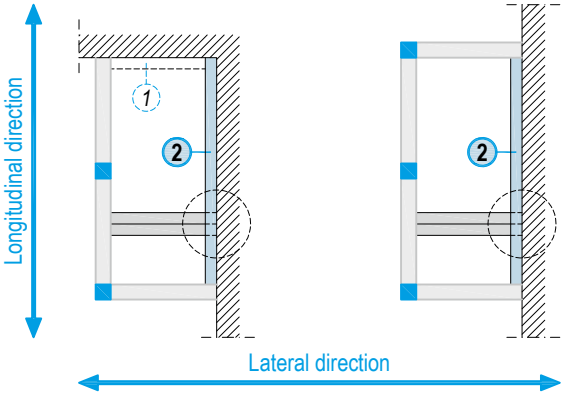
Cubo Plus ceiling

Scheme drawings

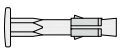
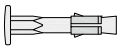
Connection SL-C profile double profile to solid walls

Connection SL-C profile double profile to solid component with SL connection bracket h x 100 x 100 x 2, height h corresponding to size SL-C-/U profiles.





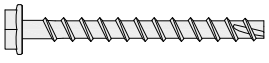
- Fastening SL-U perimeter profile (2) to solid component with suitable fasteners

Substrate	Fasteners and anchors	
Reinforced concrete walls	Knauf Deckennagel ceiling steel dowel	
Stable masonry without cavities	Knauf Deckennagel ceiling steel dowel	

Fastening spacing ≤ 625 mm

This profile is only intended to attach the cladding and has no additional supporting function.

- Connection of the connection bracket to the solid wall with suitable fasteners e.g. for concrete 2x Hilti HUS3-H6



- Fastening of the SL-C profile ceiling profile to the connection bracket with at least 2x SL construction bolts SX5/8-L12-5,5x31

Principles

Scheme drawings

Ceiling, lateral and longitudinal walls are bracing elements of Cubo Plus systems.

For system lengths ≤ 8 m:

The lateral bracing is only required on the system ends.

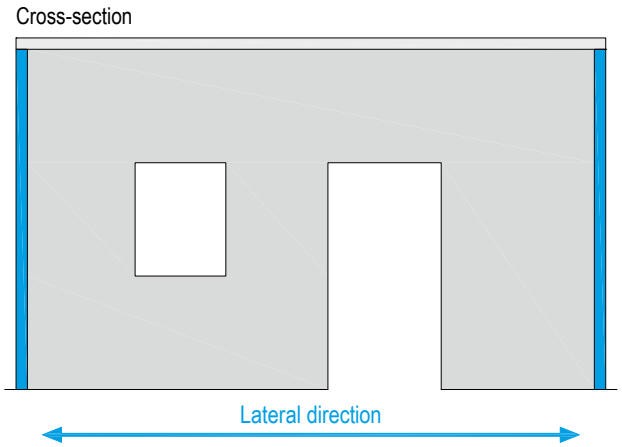
- On closed systems this function is assumed by the front side lateral walls.
- Open systems require external bracing in accordance with alternatives 2 to 4.

For system lengths > 8 m

Furthermore, every ≤ 8 m intermediate bracing is to be arranged acc. to alternative 1 to 4, in the area of the Cubo System Column an additional SL-U profile should be installed in the ceiling.

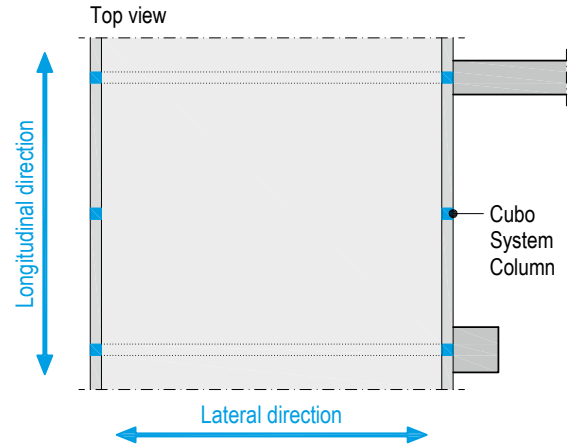
Bracing options

Variant 1 – Inside Cubo Plus walls



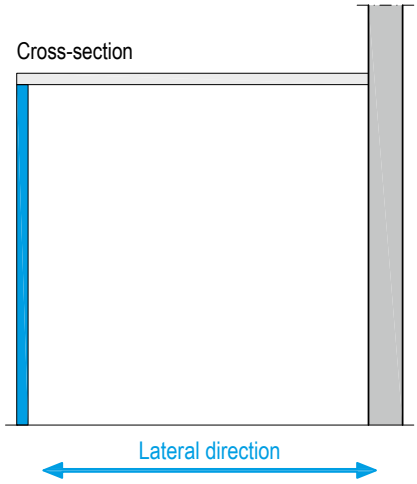
- Design Cubo Plus inside wall like Cubo Plus outside walls
- Connection to longitudinal wall (T-joint) see page 27.
- Connection of the UW runner of the wall to the SL-U profile of the Cubo Plus ceiling with SL construction bolt SX5/8-L12-5,5x31
- For possible wall openings, see page 28.

Variant 2 – Single side with outside walls/columns



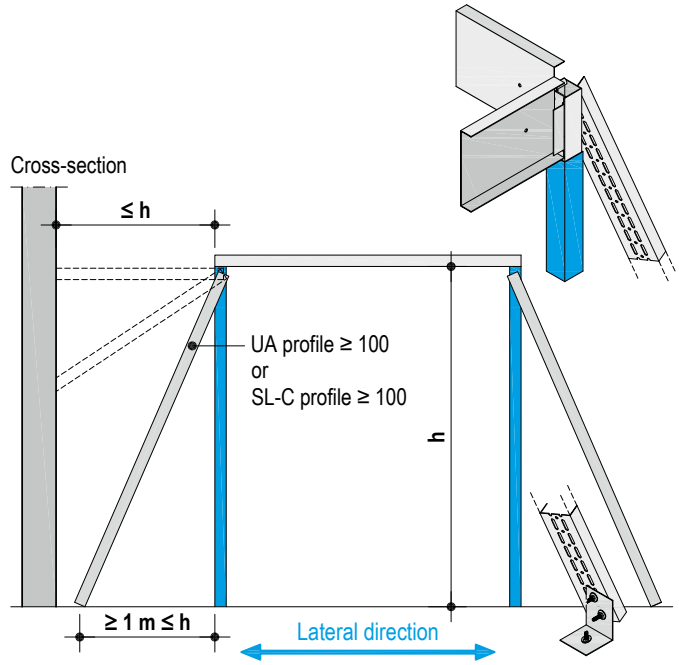
- Possible components flanking the exterior: masonry walls, reinforced concrete walls, stud partitions (metal / wood), reinforced steel bracing. With fire protection requirements: Same fire resistance.
- Cubo system supports must be connected using suitable fasteners with a frictional connection to solid walls/supports. Rating for 4.2 kN horizontal force.
- Exterior walls / supports must support additional loads.

Variant 3 – Single side connection to a continuous wall



- Continuous walls have a bracing effect.
- Possible flanking walls: Masonry walls, reinforced concrete walls
- For connection application see page 25.

Variant 4 – Double side with exterior UA or SL-C profile



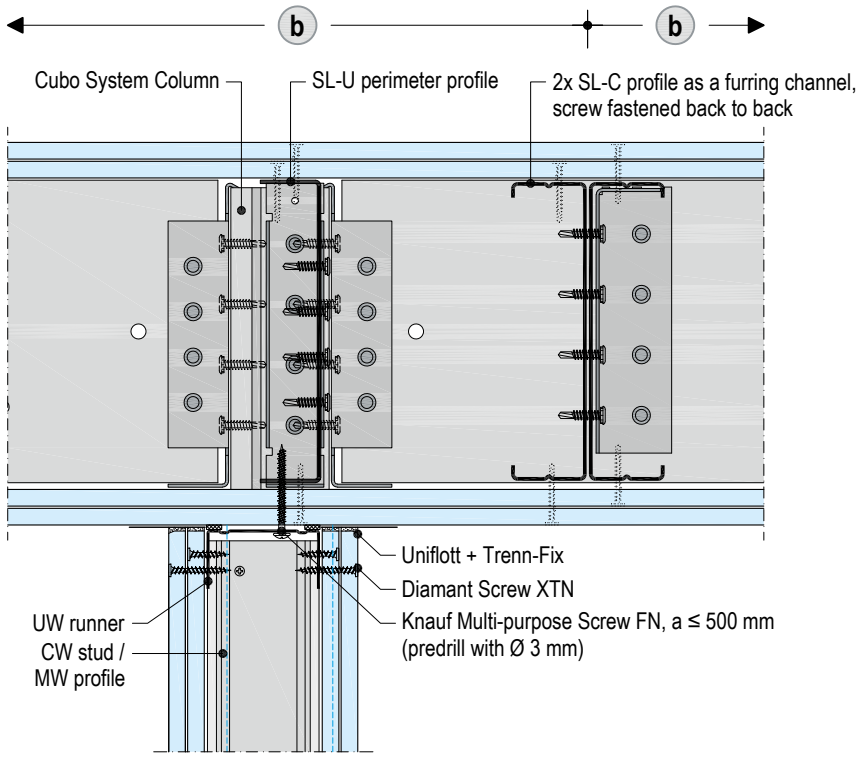
- Screw fastening in oblong holes of UA Profiles not permissible. Use the circular holes or predrill holes.
- Attachment of the UA profile / SL-C-profile with 2 threaded rods + nuts M8 to the telescopic element of the system supports (pre-bore with Ø 8.5 - 9 mm).
- Threaded rod: In the centre of the telescopic element, edge clearance from above ≥ 50 mm / ≤ 100 mm, mutual clearance ≥ 100 mm.
- Anchor the metal bracket or similar to the basic floor with suitable dowels. Attachment of the UA/C profile with 2 threaded rods / suitable bolt M8 + nuts M8 on metal brackets (pre-bore with Ø 8.5 - 9 mm).
- Brackets and the connection of the brackets to the basic floor rated for tension and shear of 4.2 kN (application on request).
- With fire resistance:
  Protect the diagonal bracing all-round from fire.
  - F30: 2x 12.5 mm Diamant
  - F90: 2x 20 mm Fireboard

Details

Scale 1:5

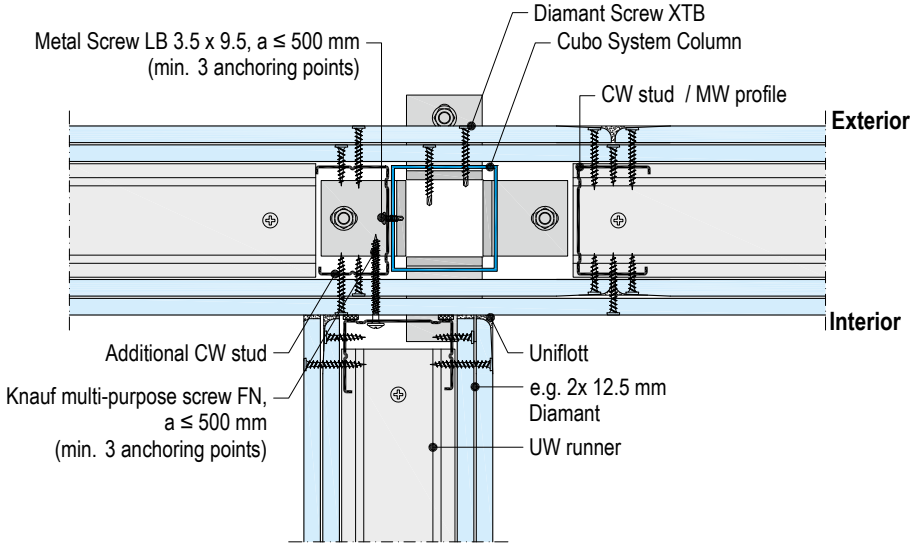
K375P.de-V23 Reinforcing intermediate walls on Cubo ceiling

Vertical section



K376P.de-H6 Reinforcing intermediate walls on Cubo wall

Horizontal section



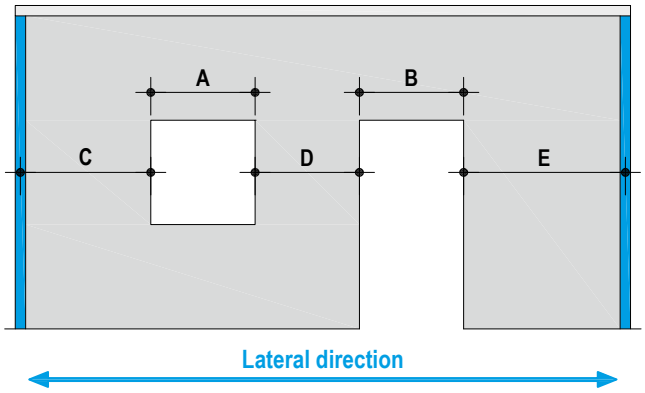
Knauf Multi-purpose screws:

- Cladding ≤ 20 mm: FN 4.3 x 35
- Cladding > 20 mm: FN 4.3 x 65

Permissible openings in reinforcing Cubo Plus walls

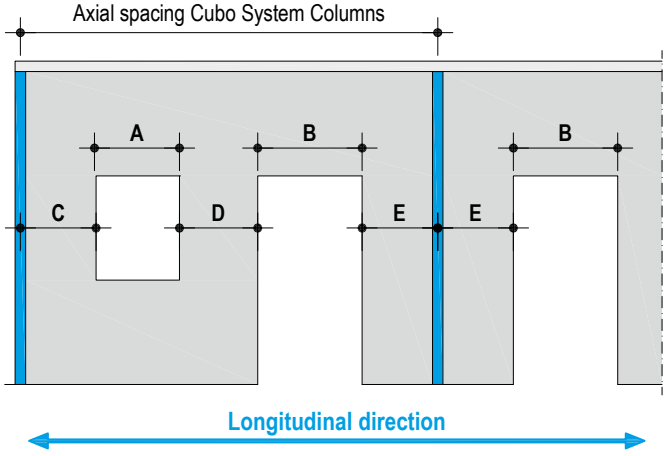
Scheme drawings

Openings in lateral direction



- Dimensions A + B ≤ 40 % of the width in the lateral direction
- Individual opening A or B ≤ 2000 mm wide
- Dimension C ≥ A/2, but at least 625 mm
- Dimension D largest dimension of A/2 or B/2, but at least 625 mm
- Dimension E ≥ B/2, but at least 625 mm

Openings in longitudinal direction

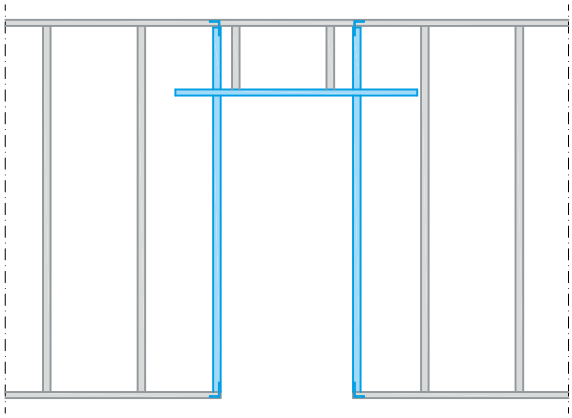


- Dimensions A + B ≤ 40 % system column axial spacing
- Dimension C ≥ A/2, but at least 625 mm
- Dimension D largest dimension of A/2 or B/2, but at least 625 mm
- Dimension E ≥ B/2, but at least 625 mm

Larger openings on request.

Door openings

Grid

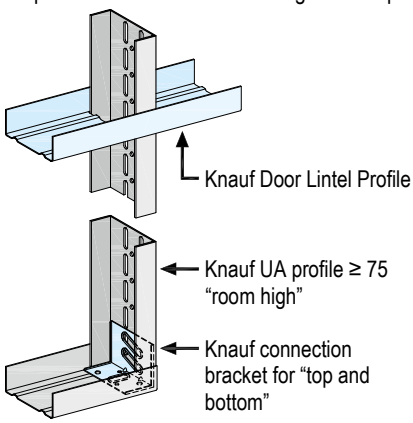


Maximum door leaf weights

Door leaf width	UA 75	UA 100
≤ 885 mm	≤ 75 kg	≤ 100 kg
≤ 1010 mm	≤ 75 kg	≤ 100 kg
≤ 1260 mm	≤ 60 kg	≤ 80 kg
≤ 1510 mm	≤ 50 kg	≤ 65 kg

Door opening profiles

UA profile + Knauf Connection Angle for UA profiles:

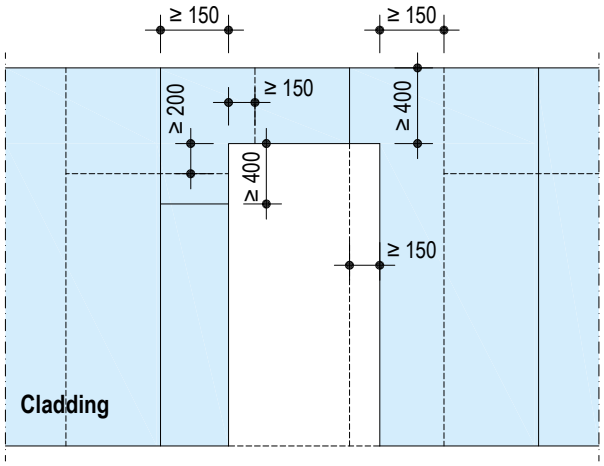


- For further details on application see details "K375P.de-H8 Door opening" and "K375P.de-H9 Door opening" (page 29).
- Furthermore, the details of the door manufacturers are to be observed (e.g. fire protection approval, additional constructional measures, etc.)

Cladding

- Arrange the long joints on the door lintel and not along the door opening, rather offset it to the door lintel centre.
- Arrange the horizontal joints on the door lintel and not along the door opening, rather offset it to the door opening centre.
- Cladding above the door lintel < 400 mm is only permissible in case of floor-to-ceiling boards.

e.g. Vertical board layer — All dimensions in mm



Legend

- - - - - - Lower layer
——— Upper layer

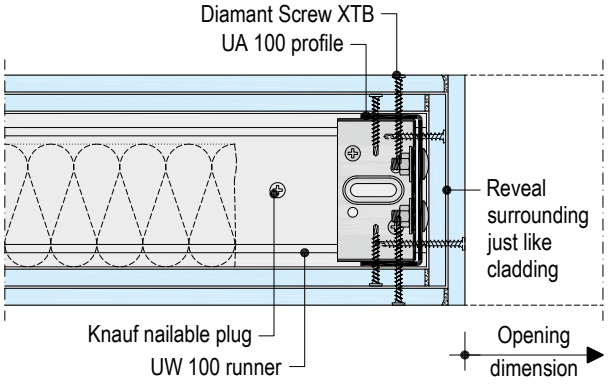
Caution	Do not apply board joints to door opening profiles.
Note	For further information on planning and application see system data sheet Knauf Metal Stud Partitions W11.de

Details

Scale 1:5

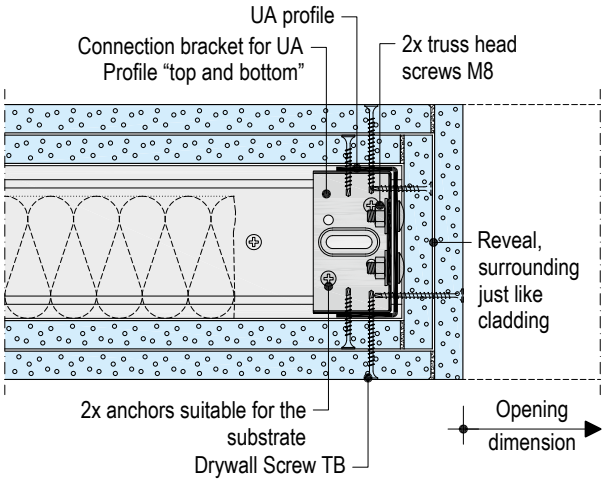
K375P.de-H8 Door opening

Horizontal section



K375P.de-H9 Door opening

Horizontal section



Notes	Furthermore, the details of the door manufacturers are to be observed (e.g. fire protection approval, additional constructional measures, etc.) Fire protection only in conjunction with a corresponding fire protection connection.

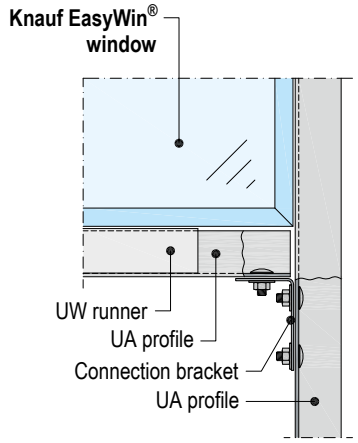
Window openings

Scheme drawing

Without fire resistance

Knauf EasyWin® window installation

- Apply window openings in the same way page 28 with UA Profiles + connection brackets for UA profiles.
- Install the horizontal UA profiles with the open side towards the window opening and seal off using a pushed on UW runner. Connect the connection brackets and the truss head screws with the perpendicular UA profiles.



- No screw heads or brackets can protrude into the opening.

Note	For further information on planning and application see technical brochure Knauf Ready-Made Windows W454.de.

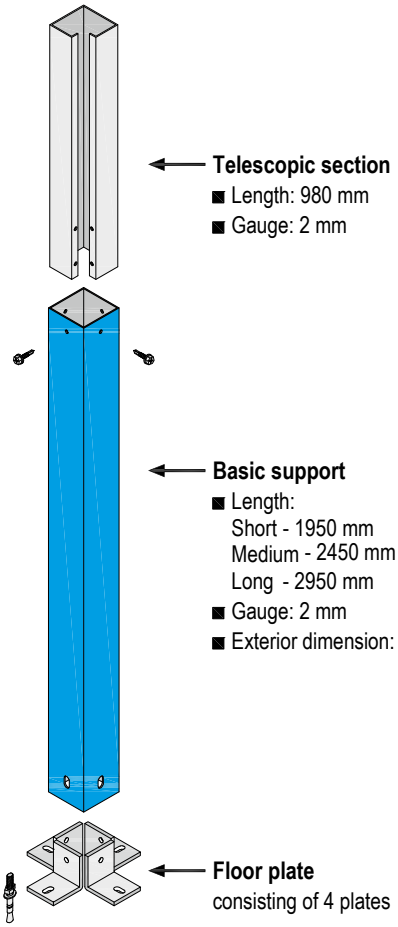
Supporting structure

Scheme drawings

The supporting structure consists of the Cubo System Column and a surrounding frame made of SL-U profiles.

Cubo System Column

- Anchor the props on the floor plate to the load-bearing substrate with 4x Ø 8 mm heavy-duty dowels and align by loosening and re-tightening the corresponding opposite adjustment screws.
  Anchoring solely to screed/pre-fab screed only after consultation with Knauf.
- Set the required height of each telescopic head and fix them with 4x Ø 5.5 mm self-tapping screws.
- All required anchoring and connection equipment is included in the scope of delivery of the Cubo System Columns. The header section included in the scope of delivery is not required for the Cubo Plus and must be removed on site.



Telescopic section
- Length: 980 mm
- Gauge: 2 mm

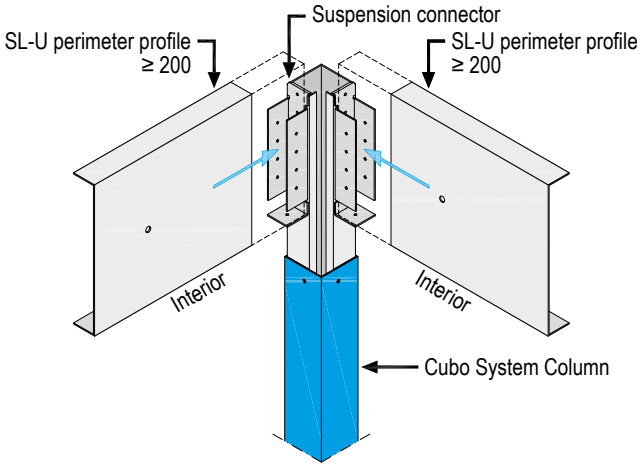
Basic support
- Length:
  Short - 1950 mm
  Medium - 2450 mm
  Long - 2950 mm
- Gauge: 2 mm
- Exterior dimension: 70 x 70 mm

Floor plate
consisting of 4 plates

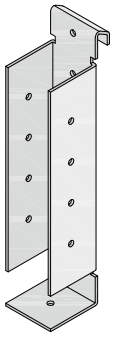
Note	After application of the reinforcing ceiling and wall cladding, the protruding bracket of the floor plates can be cut off flush if required.

SL-U perimeter profile

- Insert the suspension connectors into the telescopic element of the system column and screw fix it with at least 4x SL construction bolts SX5/8-L12-5,5x31 to the telescopic element.
- Lay the SL-U perimeter profile on the suspension connector and screw fasten it with at least 4x SL construction bolts SX5/8-L12-5,5x31.



Suspension connector



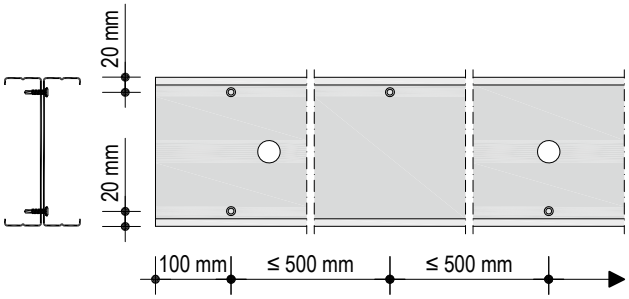
SL construction bolt
SX5/8-L12-5,5x31

Note	The SL screw bit holder E420 is necessary for screw fastening the SL construction bolt SX.

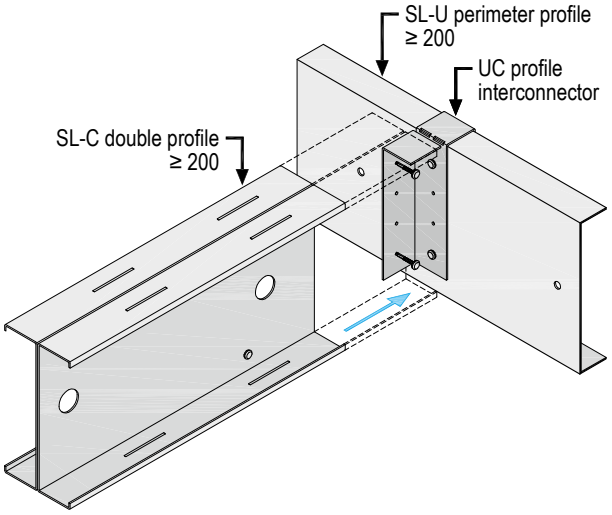
Caution	The supporting structure must be fully assembled and aligned before the Cubo ceiling and walls are installed.

Cubo Plus ceiling

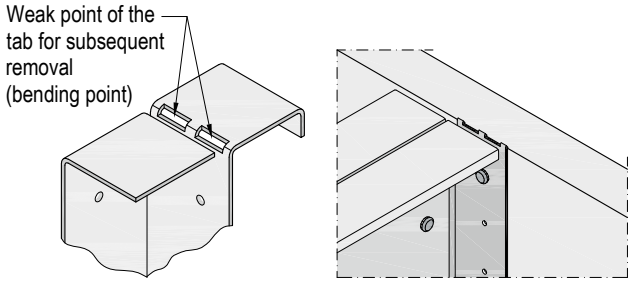
1. SL-C profiles are delivered already cut to length. They have to be connected to form double profiles on site. For this purpose screw fasten the SL-C profiles using SL construction bolts SX5/8-L12-5,5x31 at a spacing of ≤ 500 mm alternating in the in the lap to the SL-C double profiles.



2. Screw fasten a UC profile interconnector on the SL-C double profile with at least 2 SL construction bolts SX5/8-L12-5,5x31. Suspend the UC profile interconnector at the other end of the SL-C double profile into the SL-U perimeter profile of the supporting structure and screw fasten with at least 2 SL construction bolts SX5/8-L12-5,5x31. Subsequently attach the SL-C double profile with the UC profile interconnector to the SL-U profile profile, place it on the UC profile interconnector on the other side and screw fasten each with at least 2 SL construction bolts SX5/8-L12-5,5x31.
   For the variant applied as a K376P.de with 2.0 kN/m^2, use 4x SL construction bolts SX5/8-L12-5,5x31.



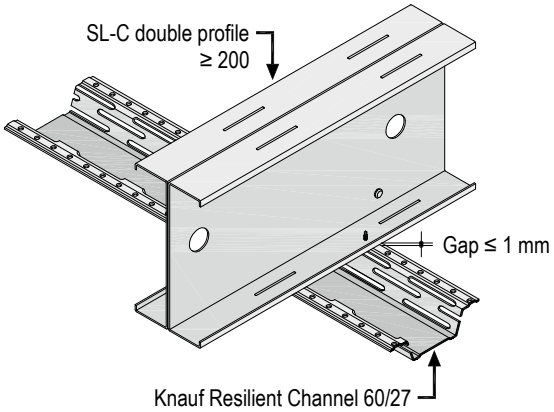
3. After screwing fastening, remove the tongue of the UC profile interconnector by bending it at the weak point.



Variant with Resilient Channel 60/27

Attach Resilient Channels with SL construction bolts SX5/8-L12-5,5x31 alternately below the SL-C double profiles at right angles to their spanning direction in the longitudinal direction of the room. The Resilient Channels are suspended in the screw heads.

Spacing ≤ 500 mm, in case of cladding with Silentboard ≤ 400 mm.



Note	For optimum effectiveness install the Resilient Channel with about 1 mm spacing. For this purpose, unscrew the screws by about half a turn after they have been screwed in flush, to ensure that the Resilient Channel is hanging by the screw heads.

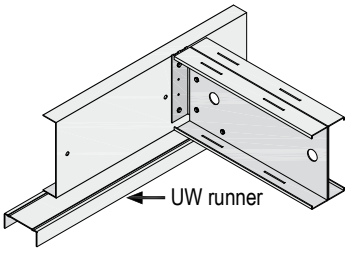
Variant with profile CD 60/27 and Damping Universal Bracket

Attach the CD channels with Dampening Universal Brackets and Knauf multi-purpose screw FN 4.3 x 35 (pre-drill with Ø 3 mm) below the SL-C double profiles at right angles to their spanning direction in the longitudinal direction of the room.

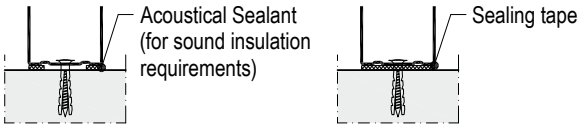
Spacing ≤ 500 mm, in case of cladding with Silentboard ≤ 400 mm.

Cubo Plus walls

1. Screw fasten the upper UW perimeter connection profile with SL construction bolts SX5/8-L12-5,5x31 every ≤ 500 mm to the SL-U perimeter profiles of the supporting structure.

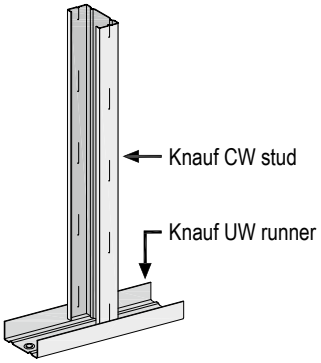


2. Apply a suitable sealant as backing to the rear side of UW Profile for the connection to the floor area. Ensure a carefully applied seal for sound insulation requirements analogue to the specifications of the DIN 4109-33:2016-07 section 4.1.1.3 (e.g. Trennwandkitt acoustical sealant) (Recommendation: always with Acoustical Sealant). Fasten the UW profile to the basic floor with Knauf nailable plugs at a distance of ≤ 500 mm or ≤ 1000 mm (without fire resistance).

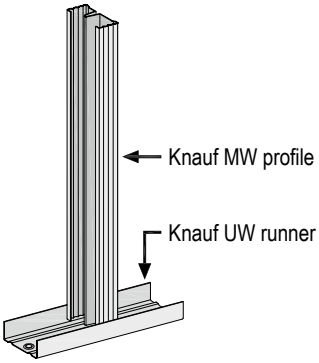


Place the CW or MW Studs into the UW runners arranged along the length at the required axial spacing and align them.

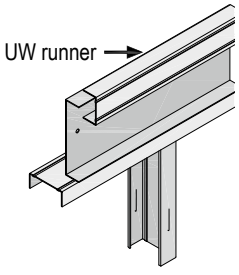
Knauf CW stud



Knauf MW profile
in case of sound insulation requirements



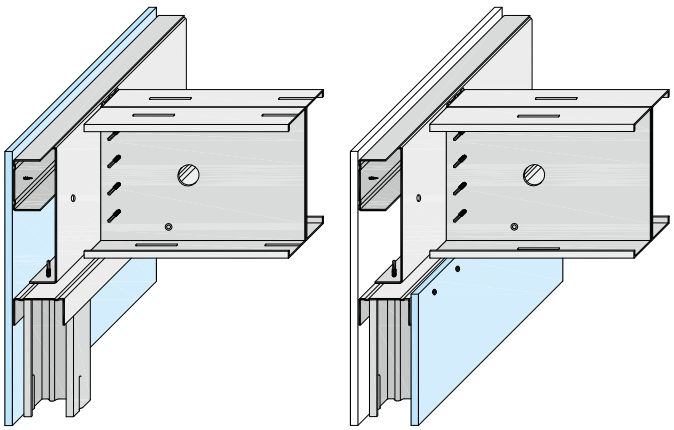
3. Attach the UW profile for fastening the outer wall cladding all the way round to the SL-U perimeter profile of the supporting structure in the head area and fasten together with the cladding.



Cubo Plus walls

Scheme drawings

1. Wall exterior cladding
2. Wall interior cladding

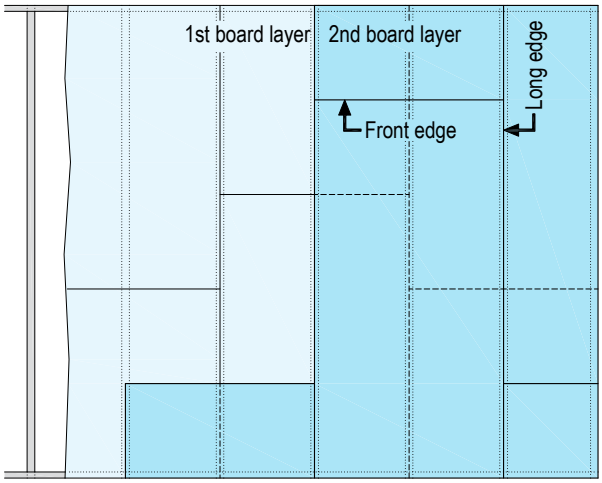


Screw fastening of the cladding in acc. with the tables page 34.
Board layers of the wall exterior side should be screw fastened additionally at the top onto the attached UW runner.
Apply the cladding on the wall interior right up to the ceiling profile.
Screw the exterior cladding into the support in the wall corner areas. When required, screw fasten the inner cladding in the corner area with a Flex Profile.
With the **K376P.de Cubo Plus Empore**, screw fasten the cladding additionally to the intermediate supports using Drywall Screws TB / XTB.

Installation schemes

Board layers vertical

- Board width: **1250 mm**
- Stud spacing: 625 mm

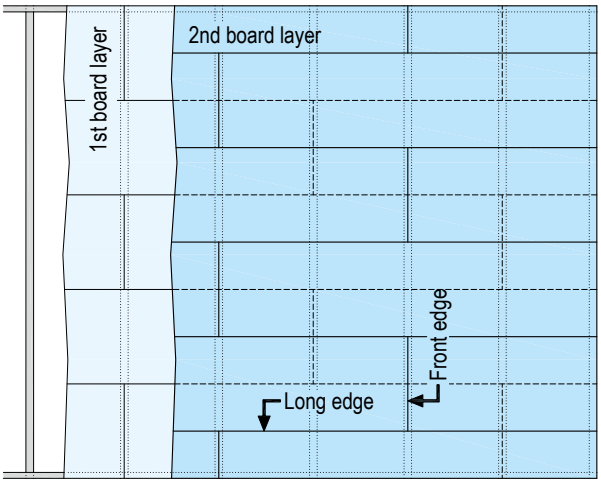


Lower/upper layer:

- Stagger the long edge joints by at least one stud axial spacing and arrange on the studs.
- If floor-to-ceiling boards are not used, stagger the front edge joints ≥ 400 mm in a cladding layer.
- Stagger the front edge joints between board cladding layers in case of multi-level cladding (approx. 250 mm)
- Front and long edge joints of cladding on opposing sides must also be staggered to one another.

Horizontal board layer

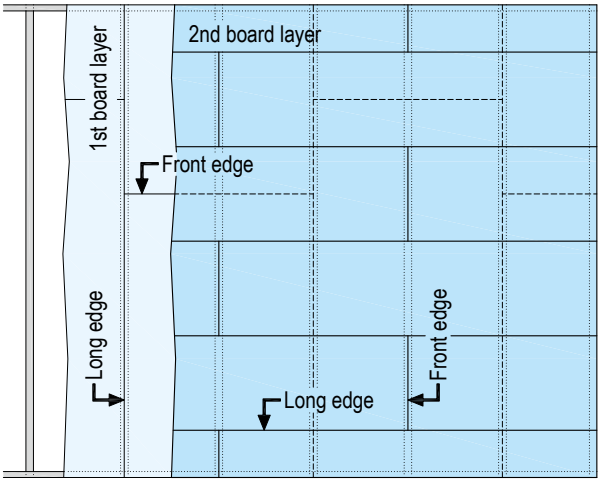
- Board width: **625 mm**
- Stud spacing: 625 mm



- Recommendation: Board length 2500 mm
- Front edge joints must be staggered by at least one stud spacing.
- Stagger the long joints between the cladding layers by at least half a board width.
- Board joints of cladding on opposing sides must also be staggered to one another.

Board layer 1 vertical, board layer 2 horizontal

- Board width: **1250 mm** (lower vertical layer))
- Board width: **625 mm** (upper horizontal layer)
- Stud spacing: 625 mm



Lower layer:

- Arrange the long edge joints on the studs.
- If floor-to-ceiling boards are not used, stagger the front edge joints approx. 625 mm in a cladding layer.

Offset between lower and upper layer:

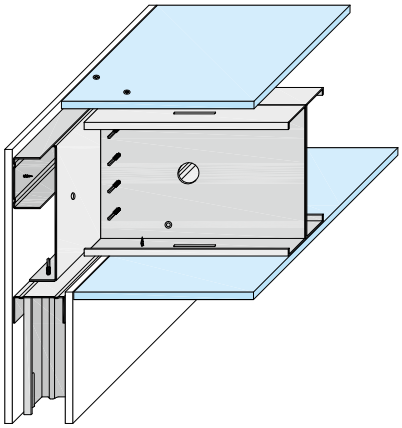
- Arrange vertical cladding butt joints between the cladding layers offset by 625 mm (stud spacing) and arrange on the studs.
- If floor-to-ceiling boards are not used in the lower layer, stagger the long edge joints of the upper layer by approx 312.5 mm to the front edge joints of the lower layer.
- Front and long edge joints of cladding on opposing sides must also be staggered to one another.

Upper layer:

- Stagger the front edge joints by at least one stud axial spacing and arrange on the studs.

Cubo Plus ceiling

Scheme drawings I Dimensions in mm



Screw fastening of the cladding in acc. with the table page 34.

- Apply Knauf boards / wooden composite boards transverse to the double profiles / Resilient Channels / CD Channels.
- When screw fixing boards, push firmly onto the substructure and fasten them alternately to the double profiles or Resilient Channels / CD channels using Drywall Screws / Diamant screws. (Pre-drill with wooden composite board).
- Lay Brio units as a floating system on GIFAfloor or wooden composite boards (only on the top side of the ceiling).
- Arrange the front edge joints on double profiles or Resilient Channels / CD profiles (offset by at least 400 mm).
- Stagger the front edge joints between board layers with multi-level cladding.
- Stagger the long joints between the board layers by at least half a board width.
- Commence with the fixing of the boards in the board centre or on the board corner to avoid buckling.
- Every board layer should be pushed firmly onto the grid and attached as an independent layer.

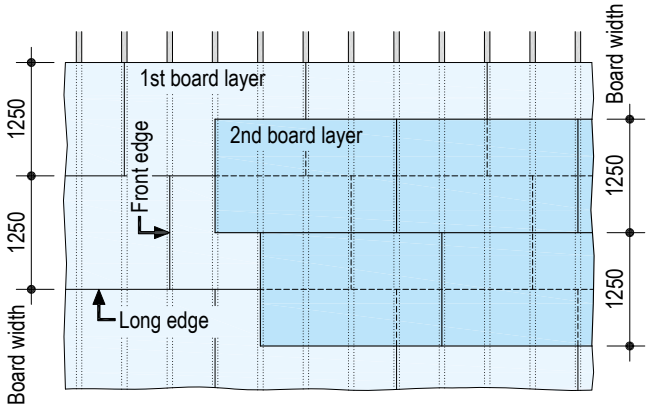
Installation schemes

Lateral application – ceiling bottom

Board width

1st layer: **1250 mm** e.g. Fireboard

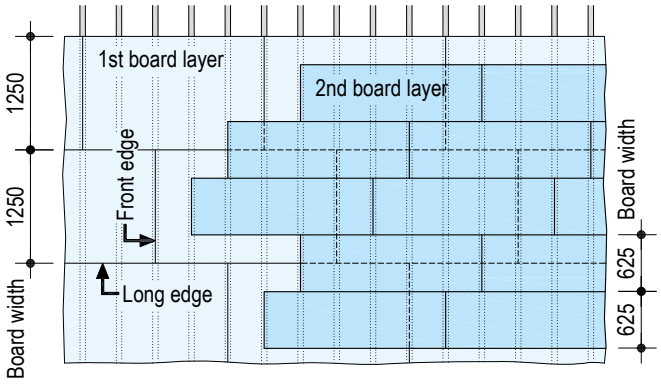
2nd layer: **1250 mm** e.g. Fireboard



Board width

1st layer: **1250 mm** Diamant

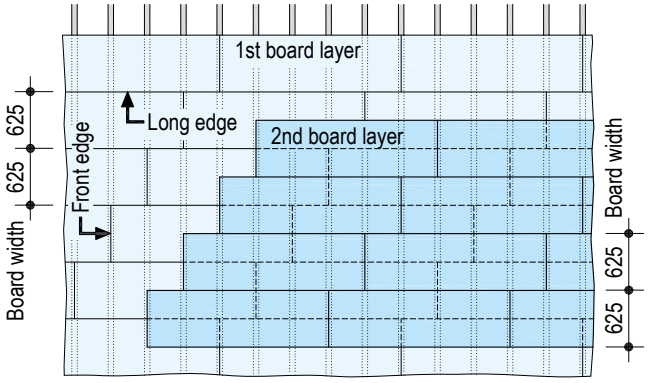
2nd layer: **625 mm** Silentboard



Board width

1st layer: **625 mm** Silentboard

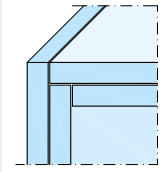
2nd layer: **625 mm** Silentboard



Notes

With combined Diamant / Silentboard cladding:
Diamant is always the 1st layer as a bracing cladding.

With fire resistance:
Rebated edge design with the cladding.



Fastening of the cladding

Fasteners to be used

Dimensions in mm

Cladding Thickness in mm	Metal stud frame (penetration ≥ 10 mm) Metal gauge **s ≤ 0.7 mm** Drywall Screws **TN**	Diamant Screws **XTN**	Metal gauge **0.7 < s ≤ 2.0 mm** Drywall Screws **TB**	Diamant Screws **XTB**
12.5 Knauf gypsum boards[1)]	–	XTN 3.9 x 23	–	XTB 3.9 x 38
22 Wooden composite board HWP	–	–	TB 3.5 x 35	–
GIFAfloor FHB 28	–	–	TB 3.5 x 55	–
GIFAfloor FHB 38	–	–	TB 3.5 x 55	–
2x 12.5 Knauf gypsum boards[1)]	–	XTN 3.9 x 23 + XTN 3.9 x 38	–	XTB 3.9 x 38 + XTB 3.9 x 38
2x 20 Fireboard	TN 3.5 x 35 + TN 3.5 x 55	–	TB 3.5 x 35 + TB 3.5 x 55	–
22 Wooden composite board HWP + 12.5 Knauf gypsum boards	–	–	TB 3.5 x 35	XTB 3.9 x 55
22 Wooden composite board HWP + 25 Fireboard	–	–	TB 3.5 x 35 + TB 3.5 x 55	–

1) Knauf gypsum boards: Diamant or Silentboard, in combination as well

- For the combination Diamant with Silentboard, always use Silentboard as the 2nd layer.
- Lay Brio units as a floating system on GIFAfloor or wooden composite boards (only on the top side of the ceiling).
- Pre-drill with wooden composite board

Maximum fastener spacings

Dimensions in mm

Cladding	Single-layer Board width 1250 mm	625 mm	Double-layer 1st layer Board width 1250 mm	625 mm	2nd layer[2)] board width 1250 mm	625 mm
Ceiling bottom	170	150	500	300	170	150
Ceiling top	250	–	750	600	250	200
Wall	250	–	750	600	250	200

2) On the ceiling bottom fasten the second board layer within a working day, otherwise the spacing of the first layer for fastening of single layer cladding must be used.

Note For details on jointing as well as coating and claddings, see brochure Knauf Jointing Competence Tro89.de

Information on Sustainability

Knauf Cubo Plus

Information on sustainability in lightweight steel construction

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

In Germany the following certification systems are of particular relevance:

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

Knauf products and lightweight steel construction systems can positively influence many of these criteria.

DGNB/BNB/QNG

Ecological quality

- Ecological performance evaluation of the building:
  Relevant environmental data are contained in the EPD for gypsum boards and fillers.
- Risks for the local environment:
  - Gypsum as an ecological material
  - Profiles are hot-dip galvanized and free of Chromium VI.
- Responsible resource extraction:
  20% recycling share in the GREENSTEEL lightweight steel profiles

Economic quality

- Building related life-cycle costs:
  Cost-effective Knauf lightweight steel construction
- Flexibility and suitability for conversion:
  Flexible Knauf lightweight steel construction

Technical quality

- Sound insulation:
  Exceeding the demands of the standard with Knauf sound installation
- Decommissioning, ease of dismantling and recycling:
  Possible with Knauf lightweight steel construction

LEED

Materials and Resources

- Building Life-Cycle Impact Reduction:
  Relevant ecological performance evaluation data are contained in the EPDs for gypsum boards and filler.
  GREENSTEEL is a CO^2 reduced steel
- Environmental Product Declarations:
  Relevant data are contained in the EPD for gypsum boards and fillers.
- Sourcing of Raw Materials:
  Recycling share in Knauf gypsum boards, e.g. Board liner
  20% recycling share in the GREENSTEEL lightweight steel profiles

Indoor Environmental Quality

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

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

The Knauf Infothek App now provides all the current information and documents from Knauf Gips KG at any time and in every location in a clear and comfortable way.
knauf.de/infothek

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The stated constructional and structural design specifications and characteristics of building physics of Knauf systems can only be ensured with the exclusive use of Knauf system components, or other products expressly recommended by Knauf.