

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

W145.de Knauf DIVA Sound Insulation Partition

Double frame, multi-layer cladding

Note on English translation / Hinweise zur englischen Fassung

This is a translation of the system catalogue valid in Germany.

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

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

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

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

W145.de Knauf DIVA Sound Insulation Partition



Knauf boards / installation schemes

Please observe the updated specifications for fire resistance, refer to the section "Metallständerwände / Wände – Ausführungsanweisung" in the Fire resistance folder (German only)

Knauf boards

Extract from Knauf product range

Board type	Short designation		Thickness t mm	Dimensions		Board edge Long edge
	DIN	DIN EN		Width mm	Length mm	

Gypsum boards acc. to DIN 18180 and DIN EN 520

Building material class A2 (DIN 4102-4) / Reaction to fire A2-s1,d0 (B)

Solid Board	GKF	DF	25	625	2000 / 2500 / 2600	HRAK	
	GKFI	DFH2		625	2000 / 2600		
Silentboard	GKF	DF	12.5	625	2000 / 2500	HRAK	
Diamant Hard gypsum board	GKFI	DFH2IR	12.5	1250	2000 / 2500	HRAK	

■ GKFI: Gypsum core with additional special impregnation against the absorption of moisture. Board suitable for high humidity areas.

■ Diamant

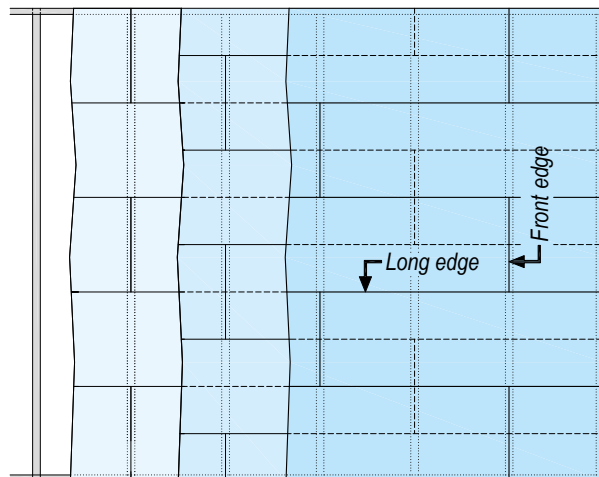
The outstanding gypsum board GKFI for premium drywalling. Diamant boards are used in all fields of interior works as cladding of premium drywall systems with enhanced requirements for sound insulation and fire protection, and in case of special requirements on mechanical resistance, in rooms with moderately high humidity.

■ Silentboard

Silentboard GKF for the highest level of sound protection in drywalling applications. Silentboard sound shield boards are used in all interior fitting areas as cladding and for retrofitting drywalling systems to fire protection standards and the highest sound protection specifications.

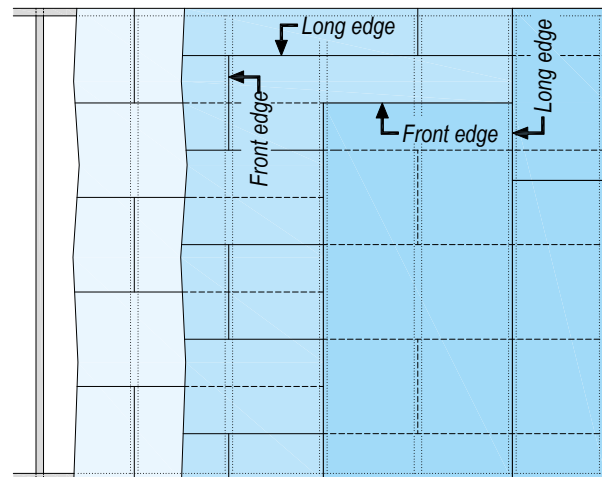
Installation scheme for two-layer or three-layer cladding

Board layers **horizontal**
Board width: **625 mm**
Stud spacing: 625 mm



- Front edge joints must be staggered by at least one stud spacing.
- With multi-layer cladding, stagger the long edges between the cladding layers by at least half a board width.
- Front and long edge joints of cladding on opposing sides must also be staggered to one another.

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



- Lower layer horizontal:
- Front edge joints must be staggered by at least one stud spacing.
 - With multi-layer cladding, stagger the long edges between the cladding layers by at least half a board width.
- Upper layer vertical:
- Long edge board joints must be staggered by at least one stud spacing.
 - If floor-to-ceiling boards are not used, stagger the front edge joints by at least 400 mm.
- Offset between lower and upper layer:
- Stagger the front edge joints of the upper layer by half a board width to the long edge joints of the lower layer.
 - Front and long edge joints of cladding on opposing sides must also be staggered to one another.

W145.de Knauf DIVA Sound Insulation Partition



Fastening / details and notes

Please observe the updated specifications for fire resistance, refer to the section "Metallständerwände / Wände – Ausführungshinweise" in the Fire resistance folder (German only)

Fastening of the cladding to the substructure with Knauf screws

Metal substructure cladding (mm)	(Penetration ≥ 10 mm), metal gauge s ≤ 0.7 mm		
	1st layer	2nd layer	3rd layer
2x 12.5	XTN 3.9x23 mm	XTN 3.9x38 mm	-
25 + 12.5 ¹⁾	TN 3.5x35 mm	HGP 3.9x55 mm	-
3x 12.5	XTN 3.9x23 mm	XTN 3.9x38 mm	HGP 3.9x55 mm
12.5 + 25 + 12.5 ¹⁾	XTN 3.9x23 mm	TN 3.5x55 mm	TN 4.5x70 mm

1) Combined cladding (Solid Board 25 + Diamant 12.5 or Silentboard)

■ Preferably use Diamant Screws XTN or HGP when cladding Diamant and Silentboard.

Dimensions in mm

Cladding	1st layer		2nd layer		3rd layer	
	Board layer →	Board width →	horizontal	vertical	horizontal	vertical
Board layer →	horizontal	horizontal	horizontal	vertical	horizontal	vertical
Board width →	625	625	625	1250	625	1250
2 layers	600 ²⁾	200 ⁴⁾	250	-	-	-
3 layers	600 ²⁾	300 ³⁾	-	200 ⁴⁾	250	-

Number of screws per board width and stud: ²⁾ min. 2 ³⁾ min. 3 ⁴⁾ min. 4

Details / notes (valid for page 4)

■ Requirements for the insulation layer

Sound insulation: Mineral wool insulation layer acc. to DIN EN 13162; length-related flow resistance acc. to DIN EN 29053: $r \geq 5 \text{ kPa} \cdot \text{s/m}^2$ (e.g. Knauf Insulation Trennwand-Dämmrolle TI 140 T)

■ $R_{w,R}$ = calculation value of the weighted apparent sound reduction index without flanking paths (frequency range 100 - 3150 Hz)

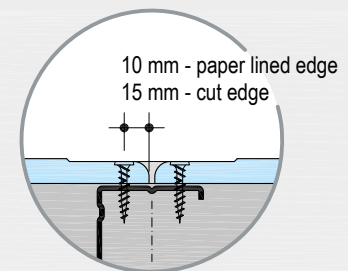
■ $C_{50-5000}$ = spectrum adaptation term

The sum $R_{w,R} + C_{50-5000}$ also considers, in contrast to R_w , the low frequencies 50 Hz, 63 Hz and 80 Hz. Consideration of this measured value is useful if the noise source has a pronounced low-frequency component. The index represents the frequency range from 50 - 5000 Hz (extended building acoustics relevant range).

■ Sound insulation values only apply in conjunction with Knauf Profiles when the recommended screw fastening (see installation scheme) is observed.

■ Reinforcing and supporting components must at least feature the same fire resistance class.

Arrangement of the screws for optimum sound protection



Proofs: Fire protection: ABP P-3157/4012-MPA BS; Sound insulation: Knauf Sound Insulation Proof on request; Structural: PB 1105/773/13-MPA BS

Anchoring of the substructure with Knauf fasteners

Max. permissible fastener spacings in mm

■ Supporting fastening per perimeter runner (UW) connection on basic floor and ceiling

Partition height m	Knauf Ceiling Steel Dowels (w. reinf. concrete) mm	Knauf 1x Nailable Plug mm	Knauf Multi-purpose Screw FN	
			2x mm	1x mm
≤ 3	1000	1000	1000	500
> 3 to ≤ 6.50	1000	1000	1000	500
> 6.50 to ≤ 12	1000	500	500	250

■ Constructional anchoring of the wall connection profiles (MW) to the flanking walls at centres of 1000 mm (min. 3 anchoring points)

W145.de Knauf DIVA Sound Insulation Partition



Double frame with MW Profile 100, multi-layer cladding

Please observe the updated specifications for fire resistance, refer to the section "Metallständerwände / Wände – Ausführungsanweisung" in the Fire resistance folder (German only)

Technical and physical building data

Knauf System Scheme drawings 	 Fire rating	Cladding per partition side Min. thickness t mm	Insulation layer Required fire protection Min. thickness Min. density mm kg/m ³	Wall thickness D mm	Weight Without insulation layer approx. kg/m ²	 Sound insulation Sound reduction index $R_{w,R}$ Resonance frequency f_{res}
		$R_{w,R} + C_{50-5000}$ dB	dB	Hz		

W145.de Knauf DIVA Sound Insulation Partition

Double frame, multi-layer cladding

 ■ Insulation layer 2x 80 mm ■ Additional insulation material 80 mm behind the board strips ■ Additional insulation material 80 mm on the floor between UW runners Observe the details / notes on page 3	F90	12.5 Silentboard + 12.5 Diamant	without or with insulation min. B2	450	76	73 ¹⁾	-	22
		25 Solid Board + 12.5 Silentboard		475	92	76	67	19
		2x 12.5 Silentboard		450	87	77	68	20
		2x 12.5 Silentboard + 12.5 Diamant		475	112	78 ¹⁾	-	17
		3x 12.5 Silentboard		475	123	79	73	16
		12.5 Silentboard + 25 Solid Board + 12.5 Silentboard		500	128	81	74	16

1) interpolated values

The high level of sound insulation provided by Knauf DIVA constructions is caused by two effects:

In the low-frequency range, the resonance frequency f_{res} of the wall due to the high board weight and the large cavity depth is significantly outside the expected building acoustics relevant range (< 50 Hz) - see diagram 1. The use of Knauf Silentboard causes a favourable acoustic-relevant offset of the coincidence frequency f_{gr} towards the higher frequencies. Due to the combined cladding using boards of various depths, the coincidence dip has been attenuated significantly once again - see diagram 2.

Diagram 1

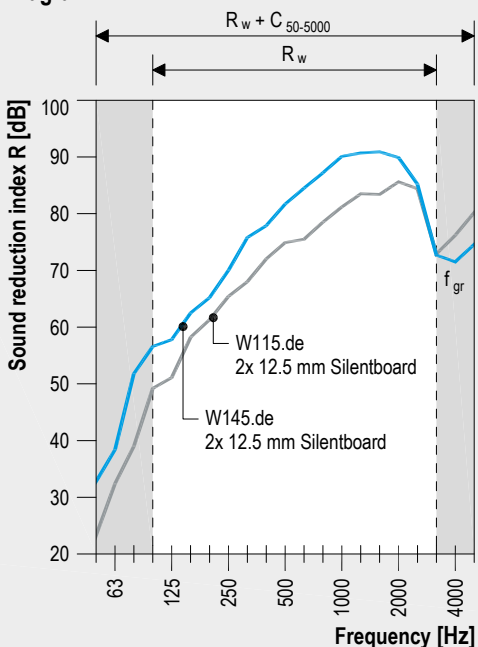
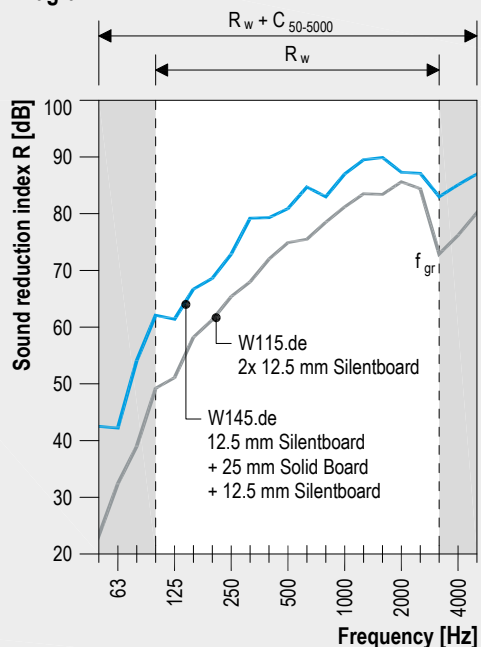


Diagram 2



W145.de Knauf DIVA Sound Insulation Partition



Double frame with MW Profile 100, multi-layer cladding

Please observe the updated specifications for fire resistance, refer to the section "Metallständerwände / Wände – Ausführungshinweise" in the Fire resistance folder (German only)

Example: Horizontal cladding

Stud spacing ≤ 625 mm

Wall cavity 400 mm

Max. permissible wall heights
Installation zones 1 and 2

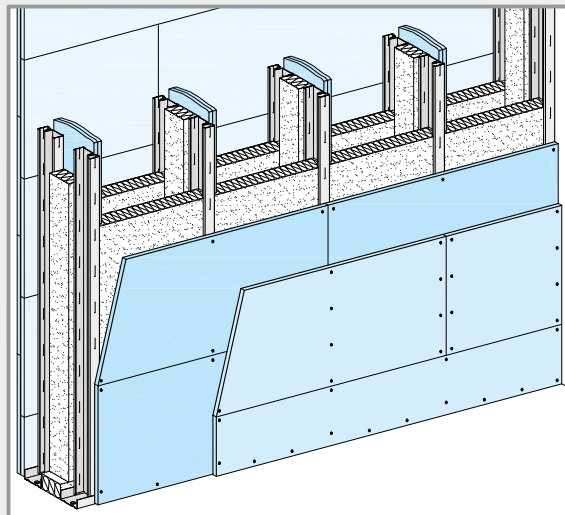
Without fire resistance	With fire resistance
12 m	7 m

Knauf profile

- MW Profile 100
- Arrange the longer webs of the MW Profile inwards

Cladding application

Board layer	Board width	Knauf boards
horizontal	625 mm	Solid Board (GKF) / Silentboard
vertical	1250 mm	Diamant



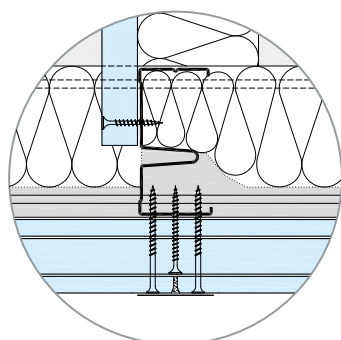
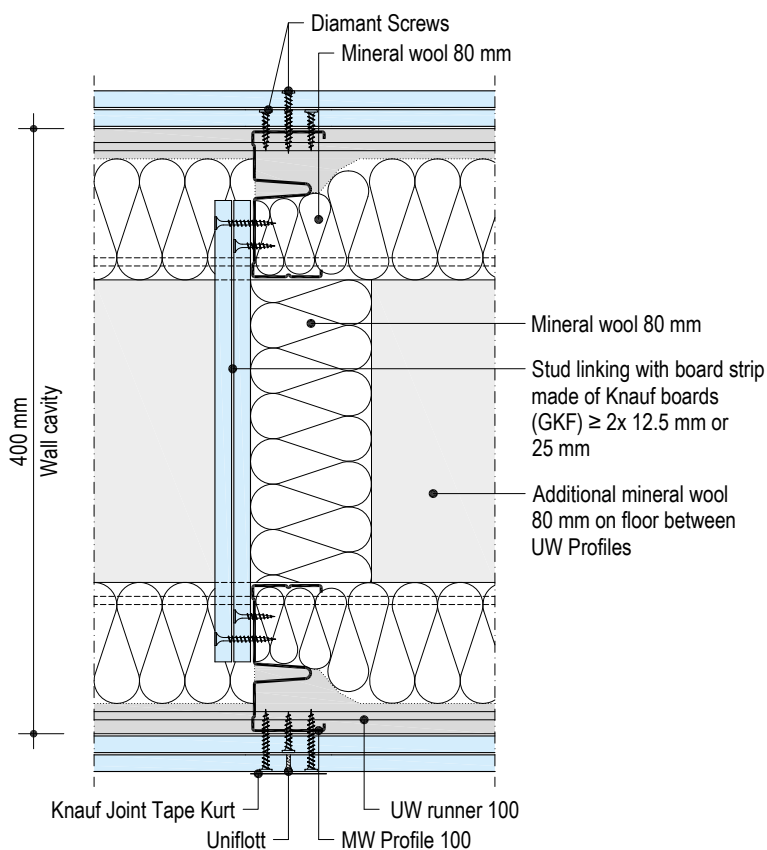
Details, scale 1:5

Horizontal section - example

Scheme drawings

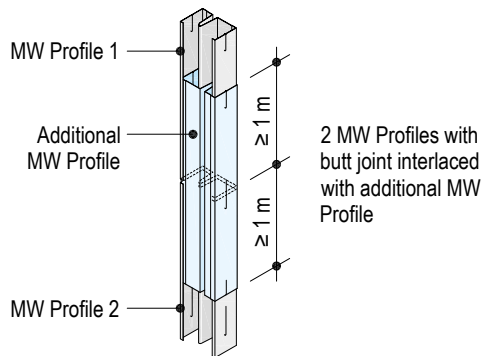
W145.de-B10 Board joint

■ 2x 12.5 mm Silentboard, horizontal cladding



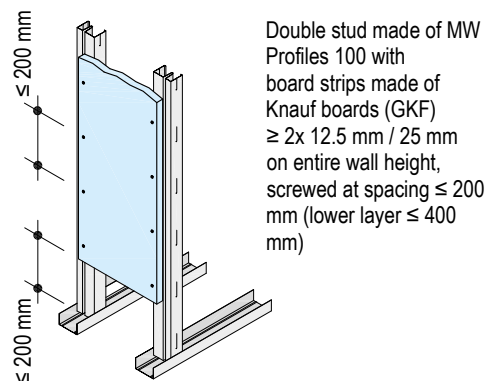
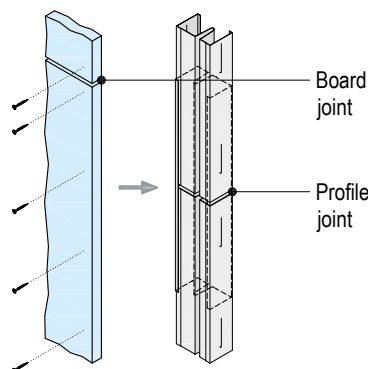
← 12.5 mm Silentboard + 25 mm Solid Board + 12.5 mm Silentboard

Vertical profile extension



Stud linking

- Continuous on entire wall height
- Do not butt joint the board strip in the profile joint area
- Offset between profile joint and board joint ≥ 400 mm



W145.de Knauf DIVA Sound Insulation Partition



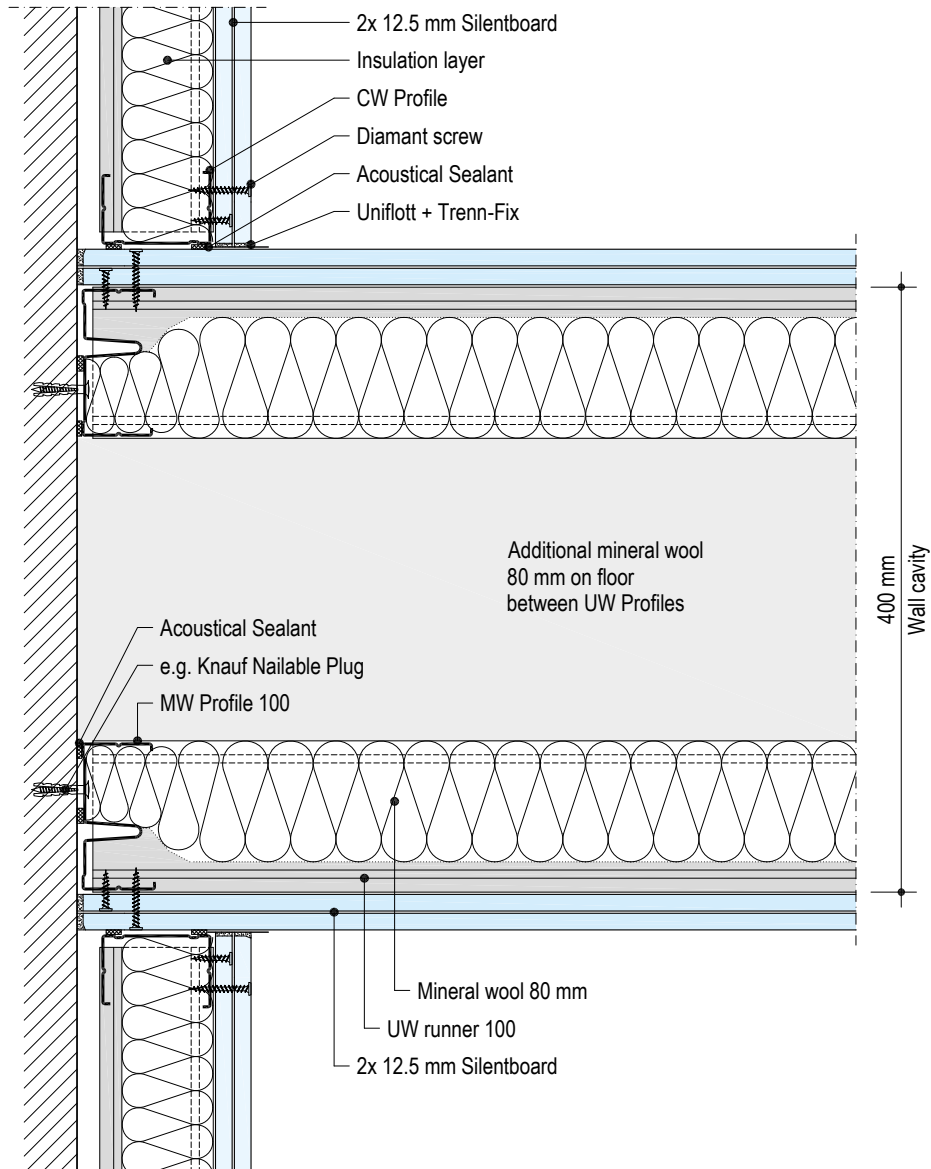
Double frame with MW Profile 100, multi-layer cladding

Please observe the updated specifications for fire resistance, refer to the section "Metallständerwände / Wände – Ausführungsanweisung" in the Fire resistance folder (German only)

Details, scale 1:5

Horizontal section - example

W145.de-A11 Connection to solid wall with furring W626.de



W145.de Knauf DIVA Sound Insulation Partition



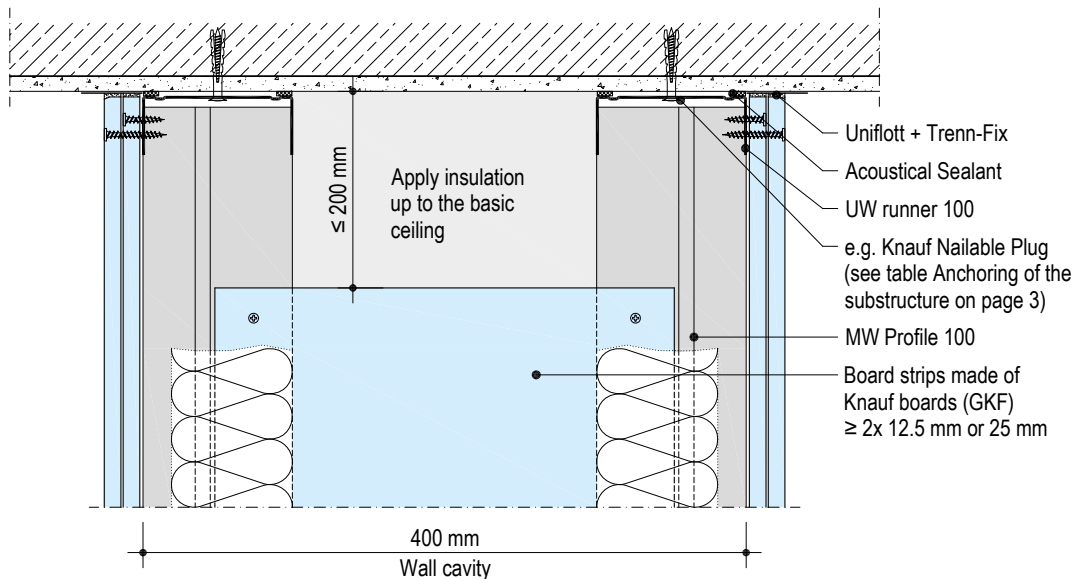
Double frame with MW Profile 100, multi-layer cladding

Please observe the updated specifications for fire resistance, refer to the section "Metallständerwände / Wände – Ausführungshinweise" in the Fire resistance folder (German only)

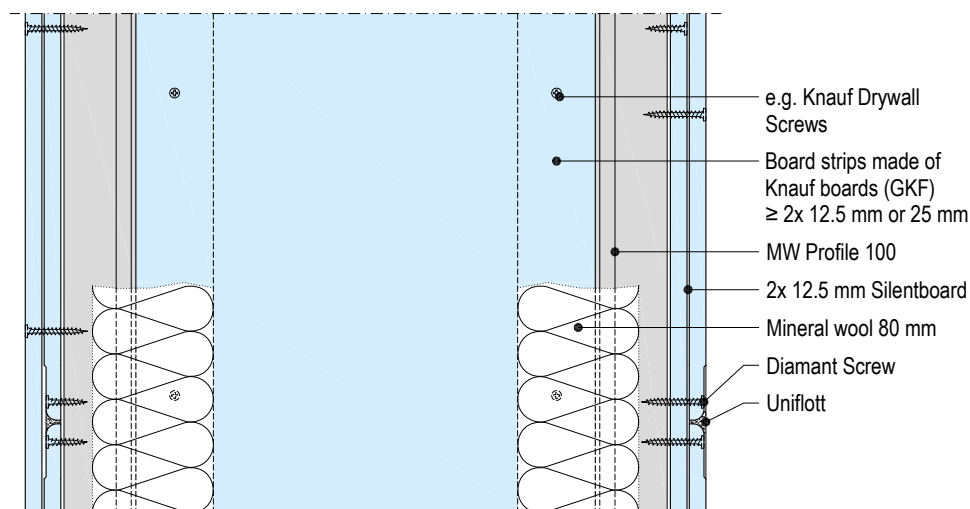
Details, scale 1:5

Vertical sections, examples

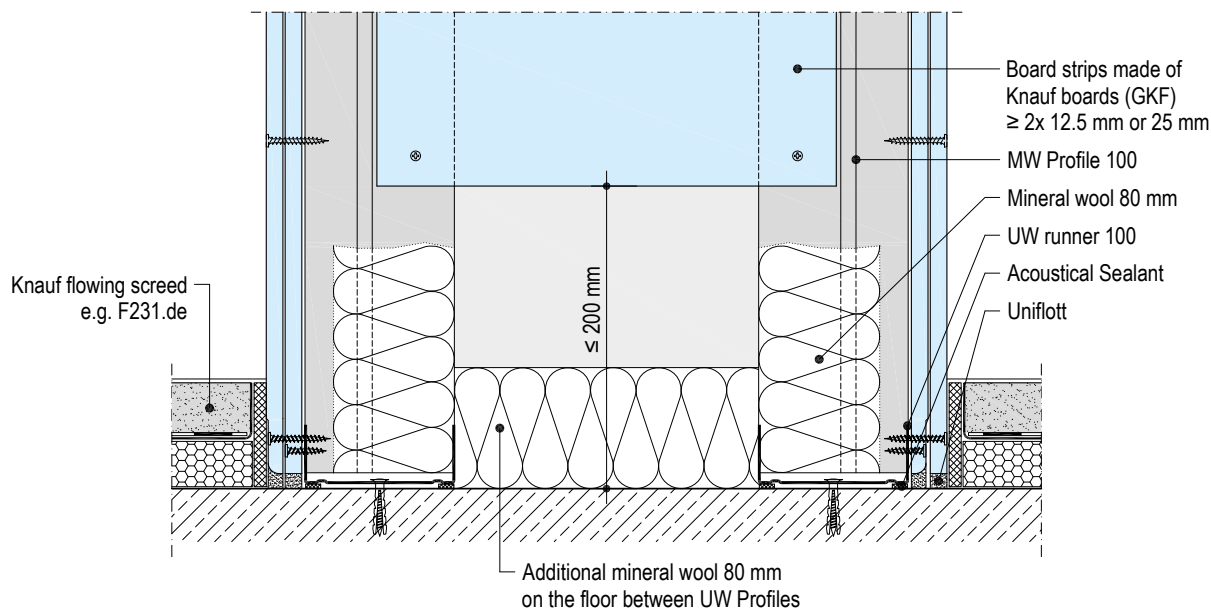
W145.de-VO10 Connection to ceiling



W145.de-VM10 Board joint



W145.de-VU10 Connection to floor



W145.de Knauf DIVA Sound Insulation Partition



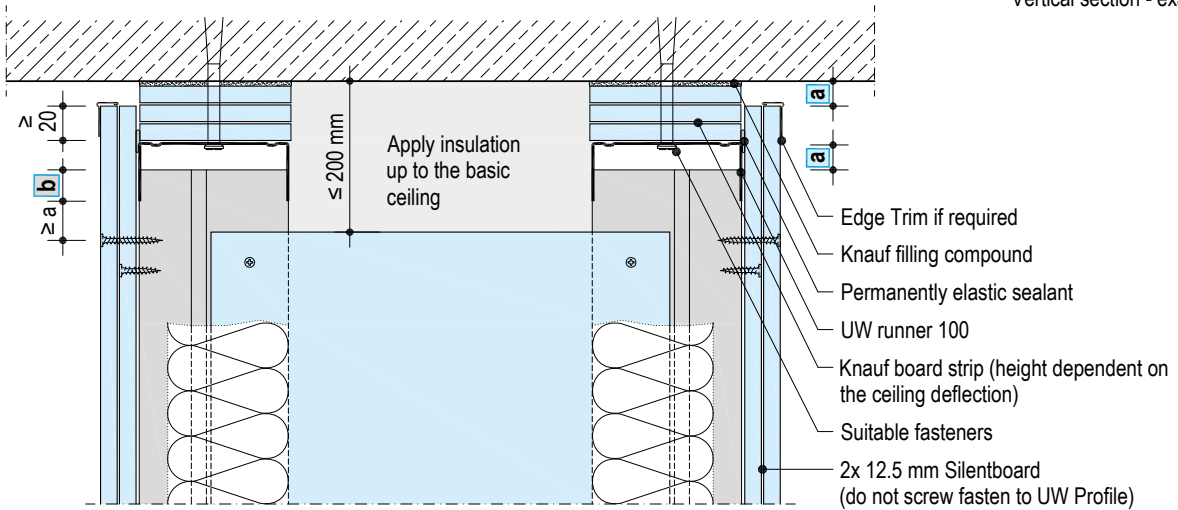
Double frame with MW Profile 100, multi-layer cladding

Please observe the updated specifications for fire resistance, refer to the section "Metallständerwände / Wände – Ausführungsanweisung" in the Fire resistance folder (German only)

Details, scale 1:5

W145.de-VO11 Deflection head

Vertical section - example



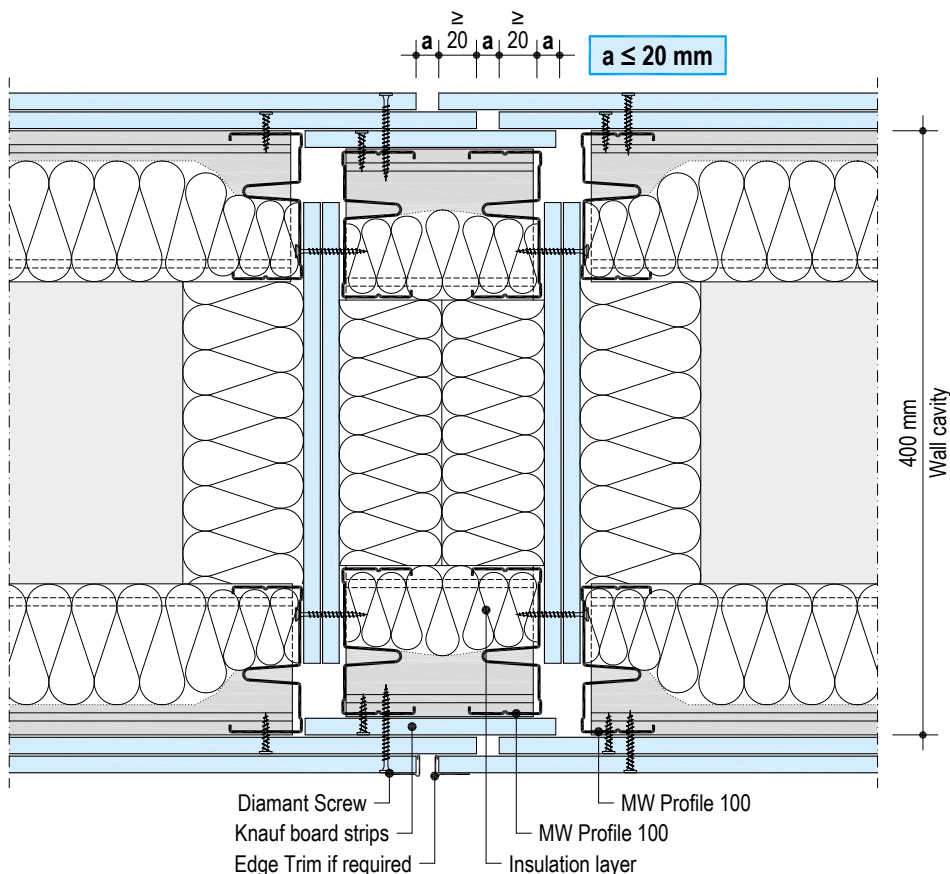
Details for deflection heads

Knauf System	Max. permissible partition height m	Without fire resistance		With fire resistance	
		a	b	a	b
		mm	mm	mm	mm
W145.de	6.50	≤ 30	≥ 10	≤ 20	≥ 20

■ Larger ceiling deflections / larger partition heights on request

W145.de-BFU10 Movement joint

Horizontal section - example



W145.de Knauf DIVA Sound Insulation Partition



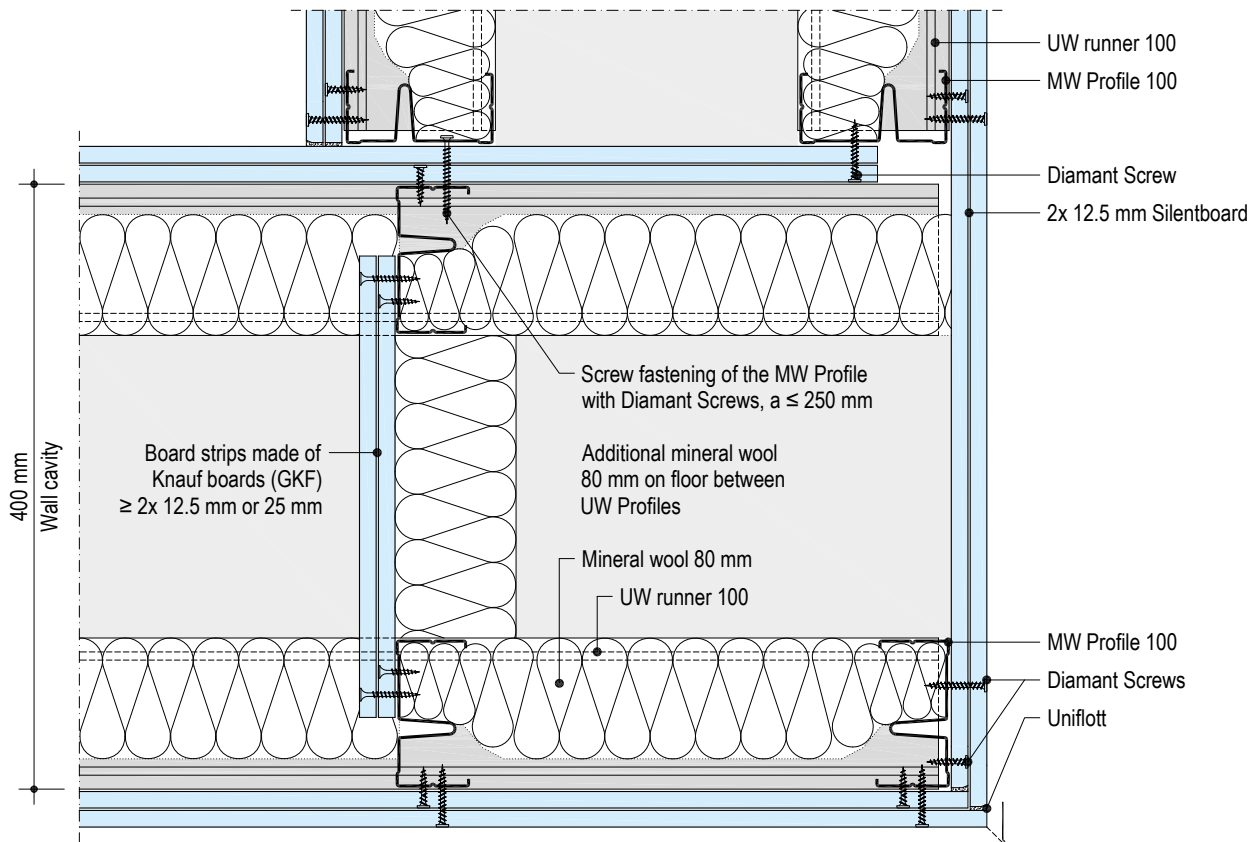
Double frame with MW Profile 100, multi-layer cladding

Please observe the updated specifications for fire resistance, refer to the section "Metallständerwände / Wände – Ausführungshinweise" in the Fire resistance folder (German only)

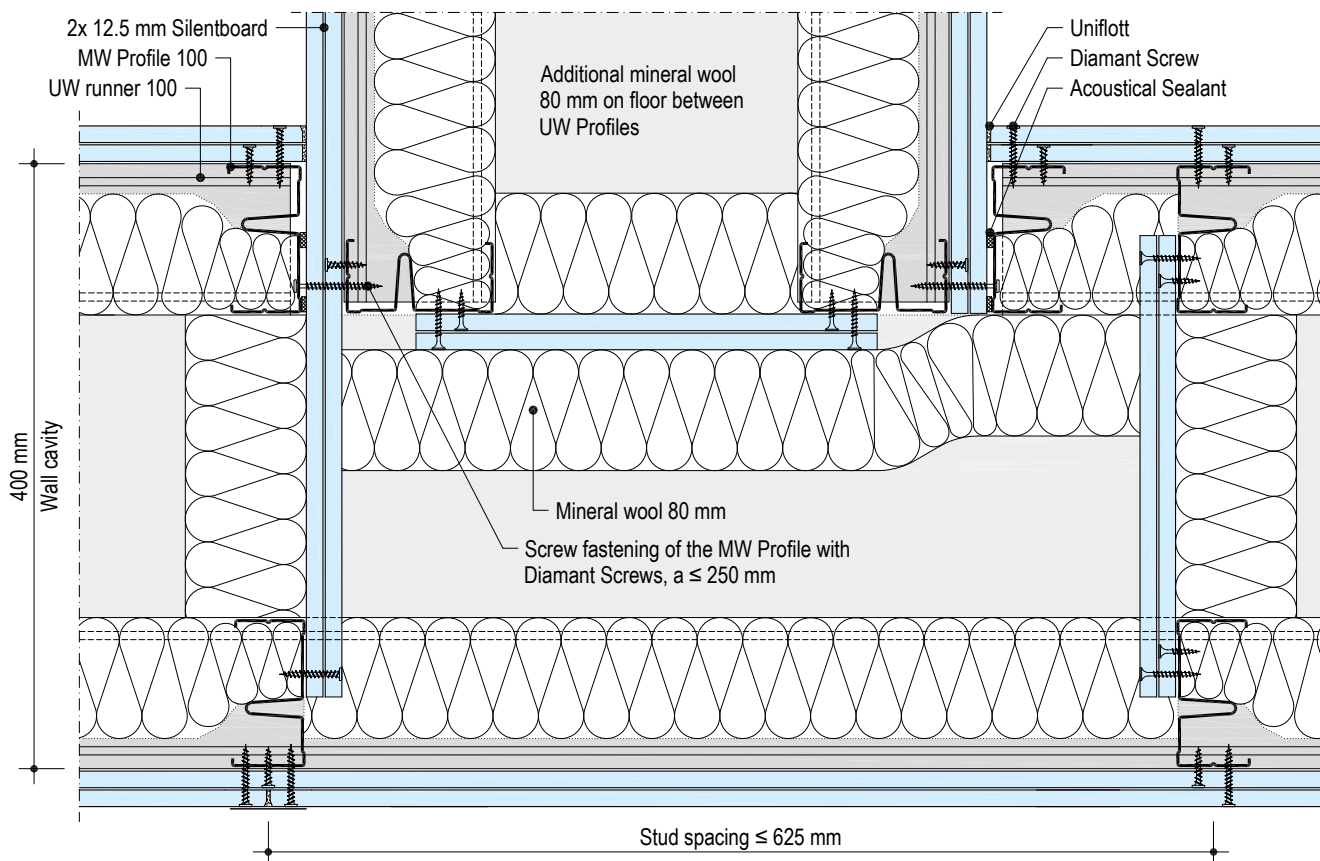
Details, scale 1:5

Horizontal section - examples

W145.de-D10 Corner



W145.de-C10 T junction



W145.de Knauf DIVA Sound Insulation Partition



Construction / application / door openings

Please observe the updated specifications for fire resistance, refer to the section "Metallständerwände / Wände – Ausführungsanweisung" in the Fire resistance folder (German only)

Construction

Knauf DIVA Sound Insulation Partitions consist of a metal substructure as a double frame with sound-decoupled MW studs and multi-layer cladding on both sides made of Knauf Silentboard, Knauf Solid Board GKF or Knauf Diamant.

The stud construction is connected all around to the flanking constructional components. Reinforcement of the double frame with board strips.

Insulation material for building physical requirements as well as electrical built-ins can be fitted in the partition cavities.

Movement joints

Movement joints of the main structure should be integrated into the construction of the stud partitions. Movement joints are to be installed every 15 m on continuous partitions.

Ball impact safety

Ball impact safety is provided with multi-layer cladding.

Notes

Sound Insulation

- Avoid air leaks.
- For deflection heads, sealing with permanently elastic sealant material (recommendation: Knauf Insulation LDS Solimur) is necessary (see detail drawings W145.de-VO11).

Fire resistance

- When installing walls, where there are demands made on the fire resistance, the reinforcing and supporting flanking components must at least feature the same fire resistance class.

Installation

Substructure

- Apply Acoustical Sealant (two strings) or Sealing Tape to rear side of runners acc. to DIN 4109, supplement 1, chapter 5.2; porous sealant strips such as Sealing Tape are usually not suitable in this case.

- If a deflection of the ceiling ≥ 10 mm can be expected, install deflection heads.

- Fix wall perimeter runners to the floor and ceiling.

Fix wall perimeter runners with suitable dowels to flanking walls. Anchor spacing on ceiling and floor to suit wall height and anchors in accordance with the table on page 3. Spacing of dowels at wall max. 1000 mm with at least 3 fixing points.

Use suitable fasteners:

Anchors for solid flanking components: Knauf Nailable Plugs for masonry or Knauf Ceiling Steel Dowels (European Technical Approval ETA -07/0049) with reinforced concrete.

Anchors for non-solid flanking components: Use fixing elements specially suited to the materials, e.g. Knauf Multi-purpose Screw with wooden substrates and metal stud partitions.

- Insert the MW 100 studs at axial spacings of 62.5 cm arranged along the length into the UW runners and align them.

- Arrange the longer webs of the MW runners on the inner edge and from there connect the double frame using screwed board strips made of Knauf boards (GKF) $\geq 2 \times 12.5$ mm or 25 mm along the entire wall height to the "frame studs".

Cladding

- Fasten the cladding in accordance with the table on page 3.

- Apply the cladding vertically or horizontally to suit board type.

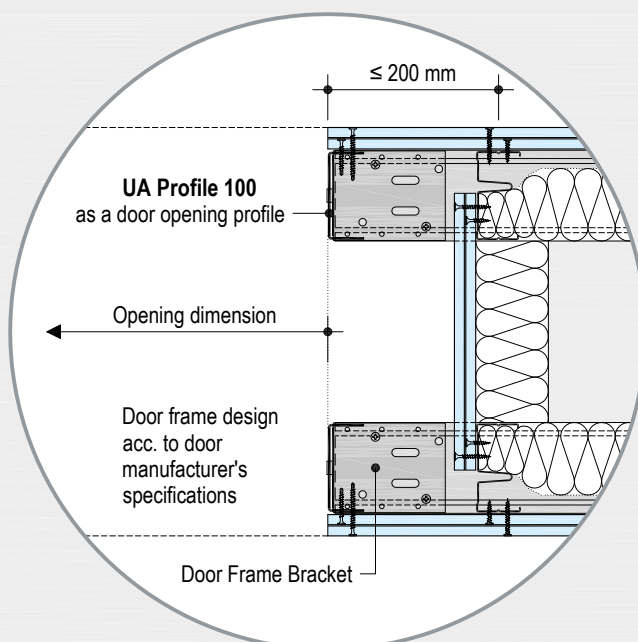
- Stagger the board joints of adjacent boards, between the cladding layers and between opposite cladding layers according to the cladding scheme on page 2.

- Do not apply board joints to door opening profiles (danger of cracking).

- Cladding must be applied to the entire construction height.

Door opening with UA Profiles

Scheme drawing - example



Cantilever loads

- ▶ See System Data Sheet W11.de Knauf Metal Stud Partitions

Door openings

- ▶ Observe further details and notes in System Data Sheet W11.de Knauf Metal Stud Partitions as well as the specifications of the door manufacturer

Jointing

Surface quality

- Jointing of the boards in the required quality level Q1 to Q4 in accordance with Code of Practice no. 2 "Verspachtelung von Gipsplatten, Oberflächengüten" *

Filling materials

Suitable filling compounds:

- TRIAS: Hand filling without board tape in the long joint edges; easy blending, very smooth application and easy to sand, with high strength and suitable for areas of high humidity, reduced absorption for surfaces with uniform appearance, the ideal filler particularly for systems with Diamant boards
- Uniflott: Hand filling without joint tape in the long joint edges
- Uniflott impregnated: Hand filling of impregnated (green) boards without joint tape in the long joint edges; water-repellent, green colour for easy identification
- Fugenfüller Leicht: Hand filling with Knauf Joint Tape Kurt

Finishing filler to achieve the desired surface quality:

- Q2, hand application: Finish-Pastös, Sheetrock® Fill&Finish Light

- Q3/Q4, hand application: Readygips, Sheetrock® SuperFinish
- Q3/Q4, machine application: Readygips, Sheetrock® ProSpray products

Gypsum board joints

- For multi-layer cladding, fill the lower layers with filler; fill the joints of the visible layer. Filling the joints of covered cladding layers with multi-layer cladding is necessary to provide technical fire protection and sound insulation properties as well as the structural properties!
- Recommendation: Front edge and cut edge joints as well as mixed joints (e.g. HRAK + cut edge) of the visible cladding layers filled using Uniflott or TRIAS, will require the application of Knauf Joint Tape Kurt as well. With lateral cladding, e.g. for narrow format boards, also apply Knauf Joint Tape in the long edges (horizontal edges) of the upper board layer.
- Fill in visible screw heads.
- Lightly sand visible surfaces after drying of the filler material, if required.

Connection joints

- Apply connections to the flanking drywall construction (ceiling/wall), dependent on

the conditions and the demands on crack resistance with Trenn-Fix or Knauf Joint Tape Kurt.

- Observe code of practice no. 3 "Gipsplattenkonstruktionen - Fugen und Anschlüsse" *.
- Apply connections to solid components with Trenn-Fix.
- With fire protection demands seal the connection to the floor with joint filler, for sound insulation demands only acrylate or Acoustical Sealant must be used.

Application temperature/climate

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

Coatings and linings

For direct application of a coating or wallpaper, the surface must at least have quality level Q2 and must be dust free.

Pretreatment

Before further coatings or linings (wallpaper) are applied, the filled surface must be free of dust and the surface of the gypsum boards should always be pre-treated and primed, acc. to code of practice no. 6 of the BVG "Vorbehandlung von Trockenbauflächen aus Gipsplatten zur weitergehenden Oberflächenbeschichtung bzw. -bekleidung" *.

Ensure that the primer and the coating or paint or lining are compatible.

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

Where a wallpaper lining is used, a primer that facilitates easier removal of wallpaper for redecoration is recommended.

A sealing primer of Knauf Flächendicht is required for covering splash water areas with tiles.

Suitable coatings and linings

The following coatings/linings can be applied to Knauf boards:

- Wallpapers
 - Paper, fleece, textile and synthetic wallpapers
 - Use only adhesives made of methyl cellulose according to Code of Practice no. 16 "Technische Richtlinien für Tapezier- und Klebearbeiten" released by the Bundesausschuss Farbe und Sachwertschutz.
- Ceramic tiles
- Plasters
 - Finishing plasters (e.g. Knauf Noblo, Diamant Spray Plaster, Rotkalk Filz) or full surface plaster (e.g. Knauf Readygips, Multi-Finish).
 - Application of plaster layers may only be used in conjunction with Knauf Joint Tape Kurt.
- Coatings
 - Dispersion paints (e.g. Knauf Intol E.L.F., Malerweiss E.L.F.), multicoloured (rainbow) emulsion, silicate-based emulsion paints with suitable primer.

Unsuitable are:

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

Notes

After wallpapering with paper or fibre glass wallpapers or after application of resin / cellulose plasters, quick drying must be ensured through adequate airing.

Gypsum board surfaces that have constantly been exposed to light without any protection can cause yellowing after coating. Therefore, a trial coat is recommended that will extend across several boards including all joints. Yellowing can, however, be successfully avoided only by using a special primer, e.g. Knauf Aton Sperrgrund for finishing plasters, Knauf Atonol for coatings.

Other 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 DIVA Sound Insulation Partition system.

Information on sustainability of Knauf Products and DIVA Sound Insulation Partition Systems

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

Knauf products and DIVA Sound Insulation Partition systems can positively influence many of these criteria.

DGNB

Ecological quality

- Criteria: Global warming potential, ozone depletion potential, ozone creation potential, acidification potential, over-fertilisation potential and waste
→ The relevant environmental data are contained in the EPD for gypsum products

Economic quality

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

Sociocultural and functional quality

- Criterion: Space efficiency
→ Slim, floor-space enhancing Knauf partition systems
- Criterion: Suitability for conversion
→ Flexible Knauf Drywalling

Technical quality

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

LEED

Materials and resources

- Credit: Recycled content
→ Recycled content in Knauf boards (e.g. FGD gypsum)
- Credit: Regional materials
→ Short transport routes provided by the extensive network of Knauf manufacturing facilities

Detailed information on request

Special notes

It is certified herewith, that the constructions, details and stated products, contained in the **W145.de Knauf DIVA Sound Installation Partition - edition 2014/01**, fully comply with the proofs acc. to German building legislation, valid at the time of issue. In addition, design and structural requirements and those regarding building physics (fire protection and sound insulation) are considered.

The stated constructional and structural properties, and characteristic building physics of Knauf systems can solely be ensured with the exclusive use of Knauf system components, or other products expressly recommended by Knauf.

The validity and up-to-datedness of the stated proofs have to be considered.

Knauf Direct
Technical Advisory Service:

▶ knauf-direkt@knauf.de

▶ www.knauf.de

Knauf Gips KG Am Bahnhof 7, 97346 Iphofen, Germany

All technical changes reserved. Only the current printed instructions are valid. The stated information represents current state-of-the-art Knauf technology. The entire state of approved engineering rules, appropriate standards, guidelines, and rules of craftsmanship are not included herewith. These and all application instructions have to be adhered to separately by the installer. Our warranty is expressly limited to our products in flawless condition. All application quantities and delivery amounts are based on empirical data that are not easily transferable to other deviating areas.

All rights reserved. All amendments, reprints and photocopies, including those of excerpts, require our expressed permission.