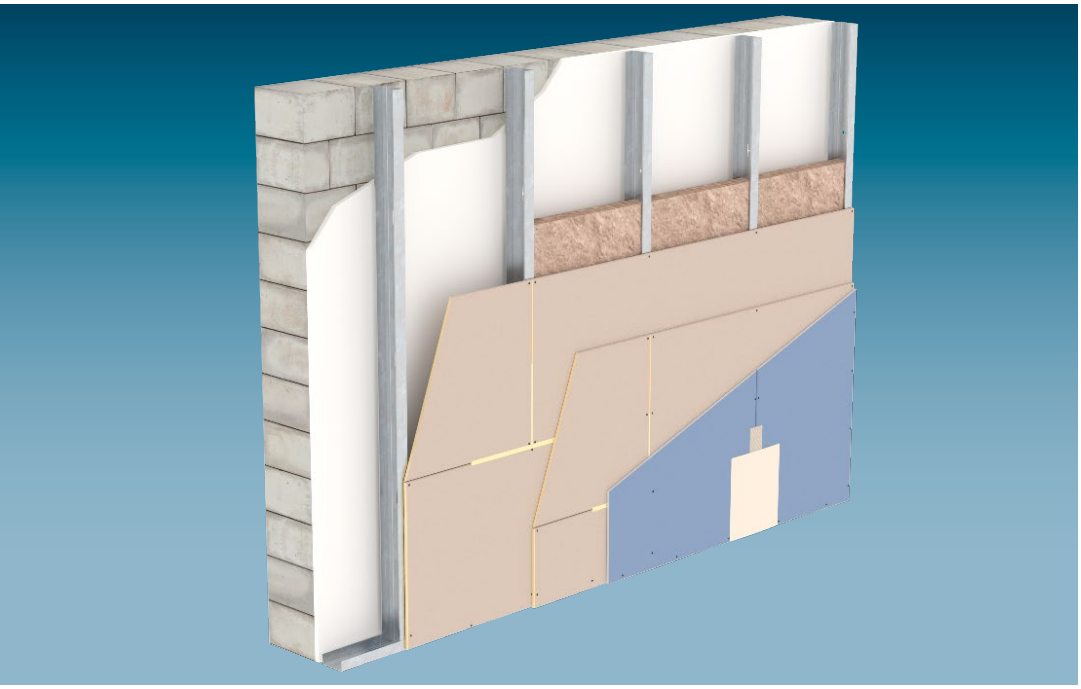


Drywall Systems

K15.de

System Data Sheet 2022-09

Knauf X-Ray Shielding Furring

K151.de – Knauf Safeboard X-Ray Shielding Furrings with CD 60/27, directly anchored
K152.de – Knauf Safeboard X-Ray Shielding Furrings with CW stud, detached
K155.de – Knauf X-Ray Shielding Furrings lead sheet with CD60/27, directly anchored

Note on English translation / Hinweise zur englischen Fassung

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

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

Contents

Notes on the document

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

References to other documents

System data sheets

- Knauf Furring W61.de
- Knauf X-Ray Shielding Partitions K13.de
- Knauf X-Ray Shielding Ceiling Systems K11.de

Folders

- Sound insulation and room acoustics with Knauf (only sections in English)

Technical Information

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

Product data sheets

- SYSTEM X-ray shielding Safeboard access panel E139.de
- Observe the product data sheets of the Knauf system components.

Pictograms in the system data sheet

The following pictograms are used in this document:

X-Ray shielding

With Knauf Safeboard X-Ray Shielding Boards (lead-free)

With lead sheet laminated gypsum boards

Symbols in the system data sheet

The following symbols are used in this document:

Insulation layers

G Mineral wool insulation layer acc. to EN 13162
Non-combustible
(insulating material, e.g. from Knauf Insulation)

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

Term definition

Lead equivalence (mm Pb)

An material of lead equivalence 1 mm Pb (Pb = chemical symbol for lead) provides the equivalent shielding effect of a 1 mm thick lead sheet.

Field of application

The specifications in this system data sheet apply for X-Ray shielding furring partitions in interiors. X-ray examination rooms require structural radiation shielding to adjacent rooms. Knauf X-ray Shielding Systems are applied in the fields of X-ray diagnostics and low-power X-ray therapy. Radiation protection is provided in the form of shielding, room-enclosing components with specific lead equivalences of the used materials.

Notes on X-ray shielding

The rules for the application of structural X-ray shielding are defined in the DIN 6812. The basis of all structural measures for X-ray protection is the radiation protection plan, which has to be created by the manufacturer of the X-ray unit.

The thickness of the required radiation shielding depends on the tube voltage of the device type used (depending on the medical application) and is stated for lead as the shielding material. The higher the tube voltage, the thicker the necessary layer of lead or the necessary Safeboard cladding thickness.

Note	Knauf Safeboard is designed for shielding against X-rays up to 150 kV.

Installation zones acc. to DIN 4103-1

Installation zone 1

Partitions in rooms where low numbers of persons gather, e.g. dwellings, hotels, office and hospital rooms including corridors and halls or similar.

Installation zone 2

Partitions in rooms where large numbers of persons gather, e.g. meeting halls, school classrooms, auditoria, exhibition halls and sales rooms as well as rooms with a similar use.

Unless otherwise stated, the value in the table is the maximum permissible partition height for installation zone 2.

Construction notes

Movement joints

Movement joints of the main structure should be integrated into the construction of the X-xay shielding furring. Movement joints are to be installed every 15 m on continuous furrings.

Notes on sound insulation

Requirements for the insulation layer: (Insulation materials, e.g. from Knauf Insulation)
Mineral wool insulation layer acc. to EN 13162; length-related flow resistance of 5 kPa·s/m^2 ≤ r ≤ 50 kPa·s/m^2

$\Delta R_{w,heavy}$ = Weighted sound reduction improvement index of the furring in conjunction with a basic wall as a solid wall with a mass per unit area of 350 ± 50 kg/A2 acc. to DIN EN ISO 10140-5:2010-12 appendix B

f_0 = Resonance frequency, determined acc. to EN 12354-1:2000 appendix D

Note	Avoid air leaks. For deflection heads, sealing with permanently elastic material (recommendation: Knauf Insulation LDS Solimur) required.

Proofs of Usability

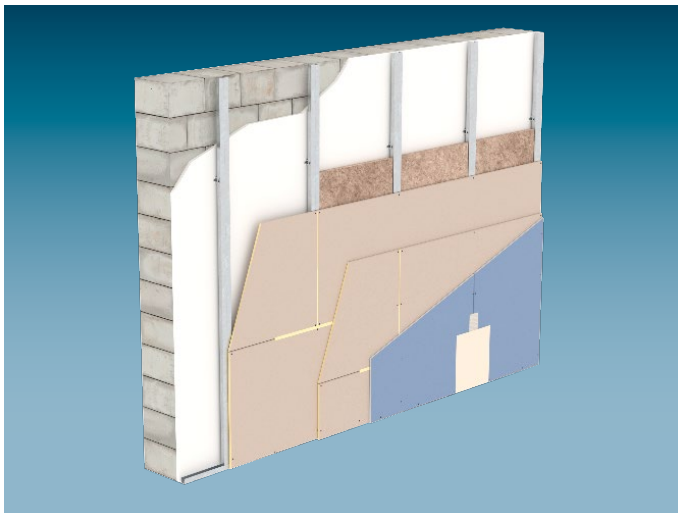
Knauf system	X-Ray shielding	Sound Insulation	Structural engineering grid spacings
K151.de	TÜV NORD Röntgentechnik, Technical report of 22.09.2008	Knauf sound insulation proof SWK 11 108	abP P-1403/355/12-MPA BS or alt Knauf dimensioning based on abP P-1403/355/12-MPA BS
K152.de			
K155.de	DIN 6812	–	–

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.

Safeboard X-Ray Shielding Furrings

Knauf Safeboard X-Ray Shielding Furrings consist of a metal substructure partition and single or multi-layer cladding made of Safeboard boards and, if necessary, a cover layer on both sides made of Diamant boards. Insulation materials for sound and thermal insulation as well as sanitary or electric built-ins can be installed into the metal frame construction. Knauf Safeboard X-Ray Shielding Furrings ensure the required structural radiation shielding to adjacent rooms. Here you will find your application in the fields of X-ray diagnostics and low-power X-ray therapy.

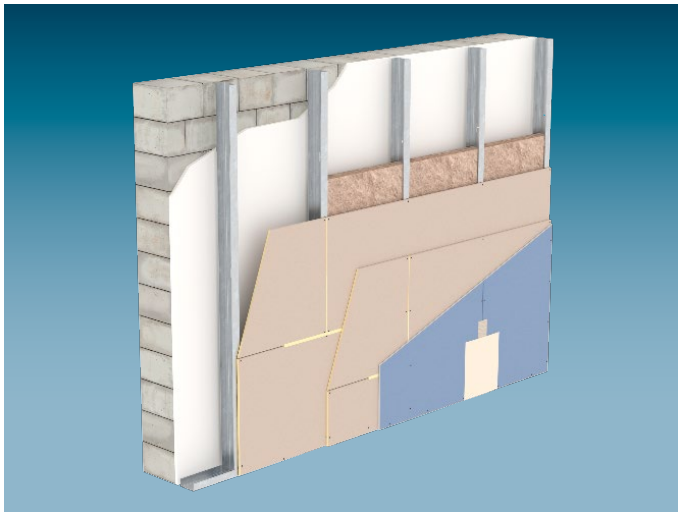
K151.de Safeboard X-Ray Shielding Furrings – directly anchored



The X-Ray shielding furring system **K151.de** is applied with a grid made of sheet metal profiles CD 60/27, which is fixed with Damping Universal Bracket / Universal Bracket to the basis wall. Thus a slim construction in conjunction with larger wall heights can be achieved. Multi-layer cladding is applied.
The low self-weight of Safeboard in comparison to the lead-laminated boards simplifies application.

- Without lead sheet
- Joint backing with lead strips not required
- Partition heights up to:
  10.00 m
- Weighted sound reduction improvement index $\Delta R_{w,heavy}$ up to: 16 dB

K152.de Safeboard X-Ray Shielding Furrings – detached



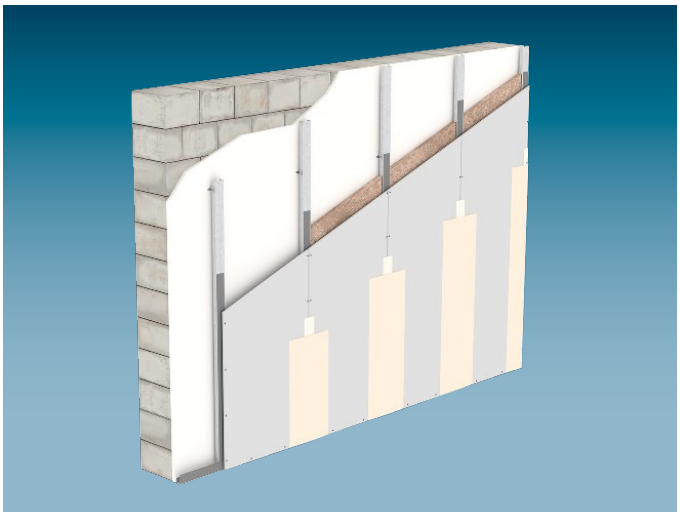
The X-Ray shielding furring / lining system **K152.de** is applied with a grid made of CW 50/75/100 sheet metal profiles as a single metal stud frame detached before the basic wall. Multi-layer cladding is applied. The detached design allows partition cavities of various sizes. There is no dependence on the strength of the basis wall.
The low self-weight of Safeboard in comparison to the lead-laminated boards simplifies application.

- Without lead sheet
- Joint backing with lead strips not required
- Partition heights up to:
  7.50 m
- Weighted sound reduction improvement index $\Delta R_{w,heavy}$ up to: 18 dB

Safeboard X-Ray Shielding Furrings lead sheet

Knauf Safeboard X-Ray Shielding Furring lead sheet consist of a metal substructure and single or double-layer cladding made of Knauf X-Ray Shielding Board lead sheet and, if necessary, a cover layer on both sides made of Knauf Wallboard (GKB) or Diamant (GKFI). Insulation materials for sound and thermal insulation as well as sanitary or electric built-ins can be installed into the metal frame construction. Knauf X-Ray Shielding Furrings lead sheet ensure the required structural radiation shielding to adjacent rooms. Here you will find your application in the fields of X-ray diagnostics and low-power X-ray therapy.

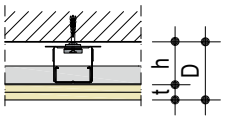
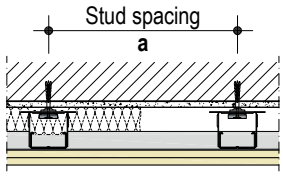
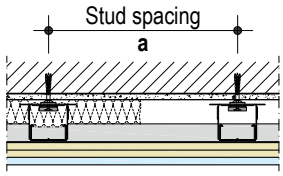
K155.de X-Ray Shielding Furrings lead sheet – directly anchored



The X-Ray shielding furring system **K155.de** is applied with a grid made of sheet metal profiles CD 60/27, which is fixed with Damping Universal Bracket / Universal Bracket to the basis wall. Thus a slim construction in conjunction with larger wall heights can be achieved. Single or double-layer cladding. In case of enhanced requirements on the X-ray shielding (higher lead equivalence), X-ray shielding furrings are clad with X-Ray Shielding Boards with 0.5 to 3 mm thick lead lamination.

- Partition heights up to: 10.00 m
- Weighted sound reduction improvement index $\Delta R_{w,heavy}$ up to: 16.4 dB

System variants

Knauf system	Cladding			Weight	Minimum thick-ness	Profiles Knauf CD	Cavity	Sound insulation[1]		
	Diamant	Safeboard	Minimum thickness	Without insulation layer				Insulation layer	Improve-ment index	Reso-nance frequency
			t mm	approx. kg/m²	**D** mm		**h** mm	mm	$\Delta R_{w,heavy}$ dB	f_0 Hz
K151.de Safeboard X-Ray Shield Furrings	Metal grid CD 60/27 directly anchored with Damping Universal Bracket / Universal Bracket									
		●	**2x 12.5**	39	≥ 65	60/27	≥ 40	≥ 30	16	40
	●	●	**2x 12.5 + 12.5**	52	≥ 72.5	60/27	≥ 40	≥ 30	*≥ 16*	*35*

1) Approach for the improvement index acc. to DIN 4109-34:2016-07 demands the use of Knauf Damping Universal Brackets.

■ With combined cladding always use Diamant as a cover layer.

Values in italics: Calculated sound reduction improvement index on the basis of the DIN 4109-34:2016-07 with a mass per unit area of the basic wall of 340 kg/m². Resonance frequencies calculated acc. to DIN 4109-34:2016-07 or derived from comparable constructions.

Demands on the insulation layer (Insulation materials, e.g. from Knauf Insulation):

■ Required for sound insulation: Mineral wool (G) length-related flow resistance of 5 kPa·s/m² ≤ r ≤ 50 kPa·s/m²

Notes	In order to protect the X-ray shielding layers made of Knauf Safeboard from damage caused by mechanical influences, it is recommended that you apply the X-ray shielding furring with a cover layer made of 12.5 mm Diamant. Observe the notes on page 4.

Partition heights

Multi-layer cladding

Knauf Profile Metal gauge 0.6 mm	**Maximum stud spacing** **a** mm	**Maximum partition height** m
CD 60/27	625	10.00

- Use Universal Brackets/Damping Universal Brackets 120 mm
- Maximum partition cavity 127 mm

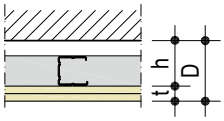
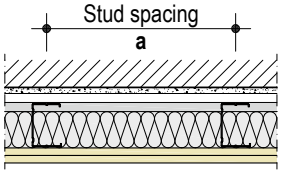
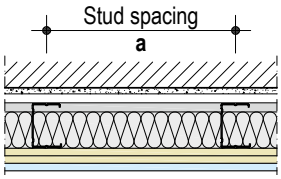
Lead equivalence values for Safeboard

Number of boards Safeboard	**Total thickness** mm	**Lead equivalence (mm Pb) depending on the tube voltage (kV)** **60** kV	**70** kV	**80** kV	**90** kV	**100** kV	**125** kV	**150** kV
1	12.5	0.45	0.60	0.75	0.70	0.70	0.50	0.40
2	25	0.90	1.20	1.50	1.40	1.40	1.00	0.80
3	37.5	1.35	1.80	2.20	2.10	2.10	1.50	1.10
4	50	1.80	2.30	2.90	2.80	2.80	2.00	1.40
5	62.5	–	–	–	–	3.40	2.40	1.70
6	75	–	–	–	–	4.00	2.80	2.00

- Intermediate values can be interpolated in linear fashion. Calculation of lead equivalence acc. to DIN 6812.
- One layer of Safeboard is sufficient for X-ray shielding in mammography screening (35 kV)
- Lead equivalence is increased by 0.05 mm Pb with a cover layer of 12.5 mm Diamant.

Notes	In order to protect the X-ray shielding layers made of Knauf Safeboard from damage caused by mechanical influences, it is recommended that you apply the X-ray shielding furring with a cover layer made of 12.5 mm Diamant. Observe the notes on page 4.

System variants

Knauf system	Cladding			Weight	Minimum thick-ness	Profiles Knauf CW	Cavity	Sound Insulation		
	Diamant	Safeboard	Minimum thickness t mm	Without Insulation layer approx. kg/m²	D mm		h mm	Insulation layer mm	Improve-ment index $\Delta R_{w,heavy}$ dB	Reso-nance frequency f_0 Hz
K152.de Safeboard X-Ray Shielding Furring										Metal grid CW
		•	**2x 12.5**	40	≥ 85	50	≥ 60	40	16	33
					≥ 110	75	≥ 85	60	*17*	*28*
					≥ 135	100	≥ 110	80	18	25
	•	•	**2x 12.5 + 12.5**	53	≥ 97.5	50	≥ 60	40	*17*	*29*
					≥ 122.5	75	≥ 85	60	≥ *17*	*24*
					≥ 147.5	100	≥ 110	80	≥ *18*	*21*

■ With combined cladding always use Diamant as a cover layer.

Values in italics: Calculated sound reduction improvement index on the basis of the DIN 4109-34:2016-07 with a mass per unit area of the basic wall of 340 kg/m².
Resonance frequencies calculated acc. to DIN 4109-34:2016-07 or derived from comparable constructions.

Demands on the insulation layer (Insulation materials, e.g. from Knauf Insulation):

■ Required for sound insulation: Mineral wool (G) length-related flow resistance of 5 kPa·s/m² ≤ r ≤ 50 kPa·s/m²

Notes	In order to protect the X-ray shielding layers made of Knauf Safeboard from damage caused by mechanical influences, it is recommended that you apply the X-ray shielding furring with a cover layer made of 12.5 mm Diamant. Observe the notes on page 4.

Partition heights

Multi-layer cladding

Knauf profile Metal gauge 0.6 mm	Maximum stud spacing a mm	Maximum partition height Double-layer m	Installation zone 1 and 2 Triple-layer m
CW 50	625	3.35[1] / 2.65	4.00
	312.5	4.00	4.10
CW 75	625	4.00	4.30
	312.5	4.95	5.75
CW 100	625	4.95	5.60
	312.5	6.65	7.50

1) only for installation zone 1

Lead equivalence values for Safeboard

Number of boards Safeboard	Total thickness mm	Lead equivalence (mm Pb) depending on the tube voltage (kV) 60 kV	70 kV	80 kV	90 kV	100 kV	125 kV	150 kV
1	12.5	0.45	0.60	0.75	0.70	0.70	0.50	0.40
2	25	0.90	1.20	1.50	1.40	1.40	1.00	0.80
3	37.5	1.35	1.80	2.20	2.10	2.10	1.50	1.10
4	50	1.80	2.30	2.90	2.80	2.80	2.00	1.40
5	62.5	–	–	–	–	3.40	2.40	1.70
6	75	–	–	–	–	4.00	2.80	2.00

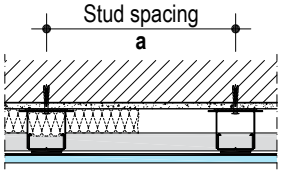
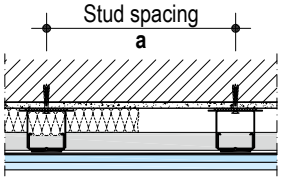
- Intermediate values can be interpolated in linear fashion. Calculation of lead equivalence acc. to DIN 6812.
- One layer of Safeboard is sufficient for X-ray shielding in mammography screening (35 kV)
- Lead equivalence is increased by 0.05 mm Pb with a cover layer of 12.5 mm Diamant.

Notes

In order to protect the X-ray shielding layers made of Knauf Safeboard from damage caused by mechanical influences, it is recommended that you apply the X-ray shielding furring with a cover layer made of 12.5 mm Diamant.

Observe the notes on page 4.

System variants

Knauf system	Cladding				Minimum thickness					Lead equivalence	Weight	Profiles Knauf CD	Cavity	Sound insulation[1]		
	Knauf Wallboard	Diamant	X-Ray Shielding Board GKF	Min. thickness	D	+	Lead sheet lining	+	Lead sheet strip		Without Insulation layer			Insulation layer	Improvement index	Resonance frequency
				t	D		Pb			Pb	approx.		h		$\Delta R_{w,heavy}$	f_0
				mm	mm		mm		mm	mm	kg/m²		mm	mm	dB	Hz
K155.de X-Ray Shielding Furring Metal grid CD 60/27 directly anchored with Damping Universal Bracket / Universal Bracket, single or double-layer cladding																
			•	**12.5**	≥ 53.5	+	0.5	+	0.5	**0.5**	22	60/27	≥ 40	≥ 30	*11.8*	*54*
							1.0	+	1.0	**1.0**	28				*12.9*	*47*
							1.5	+	2.0	**1.5**	36				*13.7*	*43*
							2.0	+	2.0	**2.0**	41				*14.4*	*40*
							2.5	+	3.0	**2.5**	49				*15.0*	*37*
							3.0	+	3.0	**3.0**	54				*15.5*	*35*
	•		•	**12.5 + 12.5**	≥ 66	+	0.5	+	0.5	**0.5**	32	60/27	≥ 40	≥ 30	*13.5*	*44*
							1.0	+	1.0	**1.0**	38				*14.2*	*41*
							1.5	+	2.0	**1.5**	45				*14.8*	*38*
							2.0	+	2.0	**2.0**	51				*15.3*	*36*
							2.5	+	3.0	**2.5**	59				*15.8*	*34*
							3.0	+	3.0	**3.0**	64				*16.2*	*32*
		•	•	**12.5 + 12.5**	≥ 66	+	0.5	+	0.5	**0.5**	35	60/27	≥ 40	≥ 30	*13.9*	*42*
							1.0	+	1.0	**1.0**	42				*14.5*	*39*
							1.5	+	2.0	**1.5**	49				*15.1*	*37*
							2.0	+	2.0	**2.0**	55				*15.6*	*35*
							2.5	+	3.0	**2.5**	62				*16.0*	*33*
							3.0	+	3.0	**3.0**	68				*16.4*	*32*

1) Approach for the improvement index acc. to DIN 4109-34:2016-07 demands the use of Knauf Damping Universal Brackets.

Values in italics: Calculated sound reduction improvement index on the basis of the DIN 4109-34:2016-07 with a mass per unit area of the basic wall of 340 kg/m².

Resonance frequencies calculated acc. to DIN 4109-34:2016-07 or derived from comparable constructions.

Demands on the insulation layer (Insulation materials, e.g. from Knauf Insulation):

- Required for sound insulation: Mineral wool (G) length-related flow resistance of 5 kPa·s/m² ≤ r ≤ 50 kPa·s/m²

Wall heights

Single or double-layer cladding

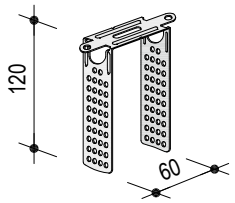
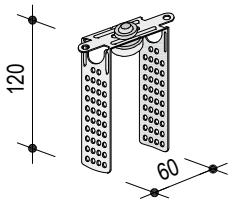
Knauf profile Metal gauge 0.6 mm	Maximum stud spacing a mm	Maximum partition height m
CD 60/27	625	10.00

- Use Universal Brackets/Damping Universal Brackets 120 mm
- Maximum partition cavity 127 mm

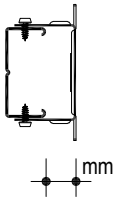
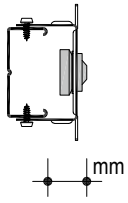
Note Observe the notes on page 4.

Direct lining/fastening systems K151.de/K155.de

Dimensions in mm

Fastening	Drawing	Comment
Universal Bracket For CD 60/27, 120 mm		Anchoring to existing wall with 1x suitable fastener at centre (observe anchoring depth) e.g. Knauf Drehstiftdübel nailable plug for masonry ■ Maximum axial spacing ▪ K151.de 1500 mm ▪ K155.de 1000 mm
Damping Universal Brackets For CD 60/27, 120 mm		Bend or cut the universal bracket / damping universal bracket according to the required cavity depth, screw fix to CD 60/27 (2x Metal Screws LN 3.9 x 11).

Spacing of CD Channel to the existing wall Systems K151.de/K155.de

System	Direct suspension	
	Universal Bracket	Damping Universal Brackets
		
K151.de	5 – 100	15 – 110
K155.de	5 – 100	15 – 110

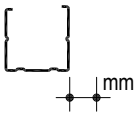
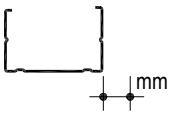
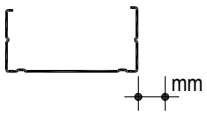
Calculation example K151.de Safeboard X-Ray Shielding Furrings - determination of the thickness of the furring

Steps			Dimensions mm
1	**Spacing of stud to wall**		5
2	**Flange width of the studs** CD channel	+	27
3	**Sub-total cavity depth**	=	**32**
4	**Cladding** 2x 12.5 mm Safeboard	+	25
5	**Sum**	=	**57**

Calculation example K155.de Safeboard X-Ray Shielding Furring lead sheet - determination of the thickness of the furring

Steps			Dimensions mm
1	**Spacing of stud to wall**		5
2	**Flange width of the studs** CD channel	+	27
3	**Sub-total cavity depth**	=	**32**
4	**Cladding** X-Ray Shielding Board GKF with lead sheet lamination Knauf Wallboard	 +	12.5 + 2.5 12.5
5	**Lead sheet strip**	+	3.0
6	**Sum**	=	**62.5**

Minimum spacing CW profile to the existing wall System K152.de

System	Profile		
	CW 50	CW 75	CW 100
			
K152.de	≥ 10	≥ 10	≥ 10

Calculation example K152.de Safeboard X-Ray Shielding Furrings – determination of the thickness of the furring

Steps			Dimensions in mm
1	**Spacing of stud to wall**		10
2	**Lap width of the studs** CW profile	+	75
3	**Sub-total cavity depth**	=	**85**
4	**Cladding** 2x 12.5 mm Safeboard	+	25
5	**Sum**	=	**110**

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Fixing loads

Up to 40 kg – Knauf multi-purpose screws FN

With direct screw fastening in the cladding

Cladding thickness	Knauf Multi-purpose screws	Maximum screw load capacity	
		Knauf GKF	Diamant
mm		kg	kg
12.5	FN 4.3 x 35	**10**	**12**
2x 12.5	FN 4.3 x 35 / FN 4.3 x 65	**20**	**40**
3x 12.5	FN 4.3 x 35 / FN 4.3 x 65	**20**	**40**

Up to 75 kg cavity dowels

For fixing of cantilever loads up to 0.4 kN/m or 0.7 kN/m

Cladding thickness	Maximum dowel load capacity Knauf Cavity Dowel Hartmut M5 screw	
	Knauf GKF	Diamant / Safeboard
mm	kg	kg
12.5	**30**	**40**
2x 12.5	**60**	**75**
3x 12.5	**60**	**75**

Caution	On the X-Ray Shielding Board GKF, the drill holes must be covered by lead circular blanks or suitable measures

- Dowel load capacity of other fasteners acc. to manufacturer`s specifications.

Cantilever loads

- According to DIN 18183-1, partitions can be loaded at any position by cantilever loads (e.g. TVs, wall cupboards) in accordance with the specifications on page 15.
- Consideration of the cantilever arm (cabinet height ≥ 300 mm) and eccentricity (≤ 300 mm at cabinet depth ≤ 600 mm) is required.
- Attach the cantilever loads with at least 2 cavity dowels made of plastic or metal, e.g. Knauf Hartmut Hohlraumdübel cavity dowels.
- Determine the minimum number of dowels using the cabinet weight and loading of the selected dowel type in dependence on the cladding thickness (see calculation examples on page 15).
- Fixing spacing of the dowels according to DIN 18183-1: ≥ 75 mm; (Knauf recommendation for approach to the full loadbearing capacity at ≥ 250 mm).
- Observe the permissible cantilever load of the furring system.

Up to 1.5 kN/m – Sanistands / traverses

Cantilever loads < 0.4 or 0.7 kN/m up to 1.5 kN/m wall length must be transferred to the substructure using sanistands or traverses.

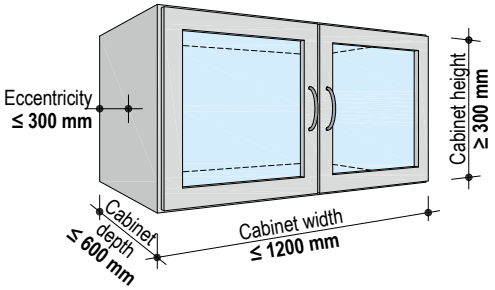
Steel anchoring traverse – Loads up to 1.0 kN/m wall length

Wall gypsum fibre 18 insert – Loads up to 1.5 kN/m wall length

Steel anchoring traverse with gypsum fibre insert – Loads up to 1.5 kN/m wall length

Multi-purpose traverse – Loads up to 1.5 kN/m wall length

Wall mounted cabinet:



Type and usage of the fastners

Light objects:

- e.g. picture frames and mirrors up to 12 kg (12.5 mm Diamant) or up to 20 kg (2x 12.5 mm Knauf GKF) per screw using Knauf multi-purpose screws FN.

Higher loads:

- e.g. cupboards up to 60 kg per dowel (2x 12.5 mm Knauf GKF) using Knauf cavity dowels Hartmut.

Note	Further details for planning and application see Technical Information Fastening of loads to Knauf Wall and Ceiling Systems VT03.de

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Up to 0.4 kN/m (40 kg/m) wall length: Cladding thickness ≥ 12.5 mm Knauf Boards and Diamant

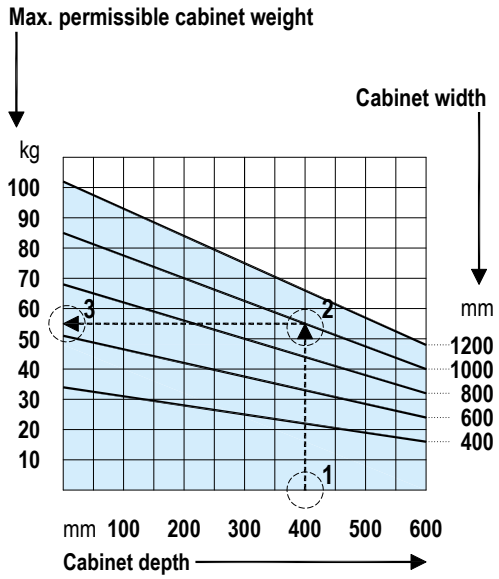
Maximum permissible cabinet weight (kg) acc. to table

Cabinet width mm	Cabinet depth mm					
	100	200	300	400	500	600
400	31	28	25	22	19	16
600	46.5	42	37.5	33	28.5	24
800	62	56	50	44	38	32
1000	77.5	70	62.5	55	47.5	40
1200	93	84	75	66	57	48

Assume the worst-case value with intermediate values or use the diagram procedure

or

Max. permissible cabinet weight (kg) according to diagram



Up to 0.7 kN/m (70 kg/m) wall length: Cladding thickness ≥ 2x 12.5 mm Knauf boards

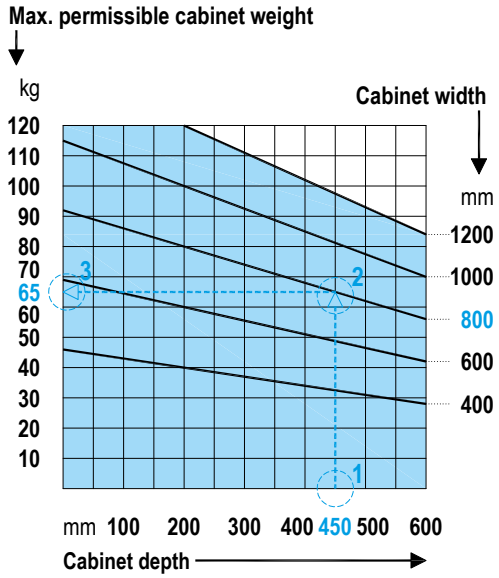
Maximum permissible cabinet weight (kg) acc. to table

Cabinet width mm	Cabinet depth mm					
	100	200	300	400	500	600
400	43	40	37	34	31	28
600	64.5	60	55.5	51	46.5	42
800	86	80	74	68	62	56
1000	107.5	100	92.5	85	77.5	70
1200	129	120	111	102	93	84

Assume the worst-case value with intermediate values or use the diagram procedure

or

Max. permissible cabinet weight (kg) according to diagram



Calculation examples – Determination of the permissible cabinet weight as well as the necessary minimum number of dowels (always ≥ 2)

According to table

- 0.4 kN/m permissible cantilever load
- Cabinet depth 400 mm, cabinet width 1000 mm → Maximum cabinet weight: **55 kg** (See table above)
- Cladding thickness 12.5 mm, Knauf Cavity Dowel Hartmut → Maximum dowel load: **30 kg** (See table page 14)

Required number of dowels (rounded up) **55 kg : 30 kg = 1.83** → **2 dowels** are the minimum requirement

According to the diagram

- 0.7 kN/m permissible cantilever load
- Cabinet depth 450 mm, cabinet width 800 mm
- With cabinet depth 450 mm (1) vertically upwards, up to the cabinet width line 800 mm (2) at the intersection point horizontal to the left read off value (3) : → Maximum cabinet weight: **65 kg** (See diagram above)
- Cladding thickness 2x 12.5 mm, Knauf Cavity Dowel Hartmut → Maximum dowel load: **60 kg** (See table page 14)

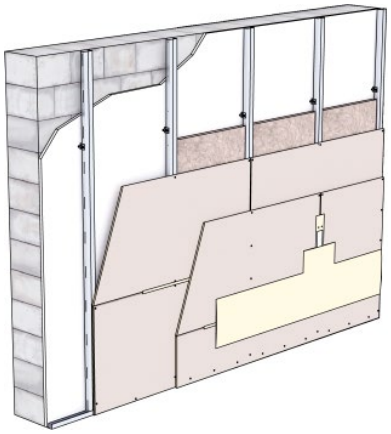
Required number of dowels (rounded up) **65 kg : 60 kg = 1.08** → **2 dowels** are the minimum requirement

Details

Scale 1:5

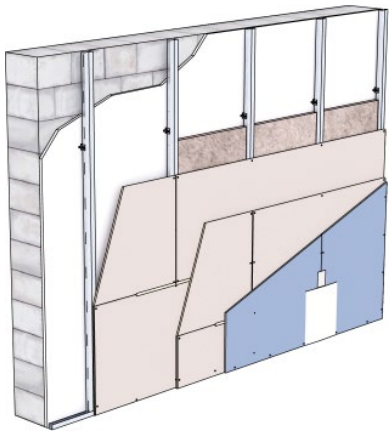
K151.de-P100 Horizontal board layer

2x 12.5 mm Safeboard



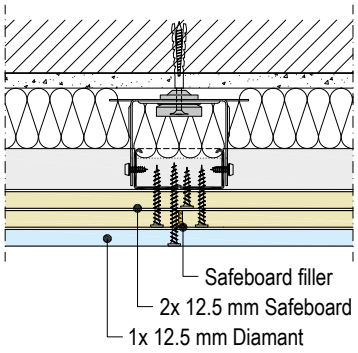
K151.de-P101 Board layer 1 and 2 horizontal, board layer 3 vertical

2x 12.5 mm Safeboard + 12.5 mm Diamant



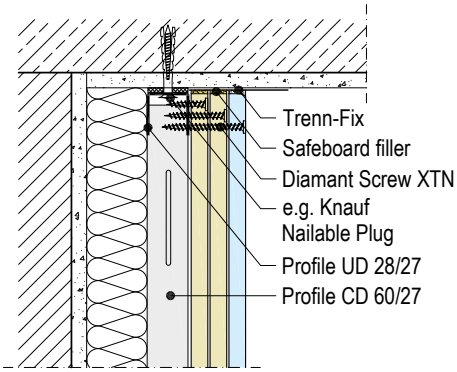
K151.de-B100 Board joint

Horizontal section



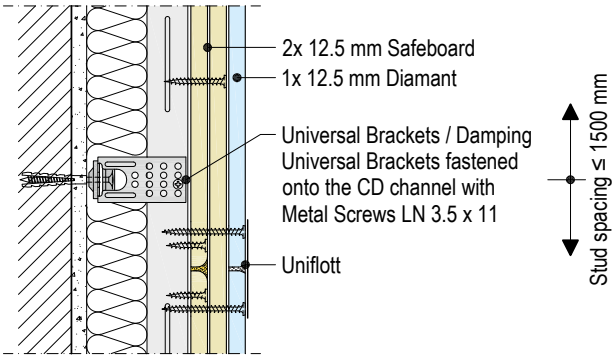
K151.de VO100 Connection to ceiling

Vertical section



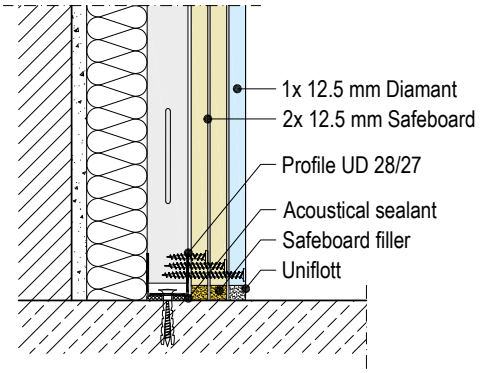
K151.de-VM100 Board joint

Vertical section



K151.de-VU100 Connection to floor

Vertical section



Note The system shown is a preferred variant. Planning of individual solutions for X-Ray shielding is possible with the assistance of the table “Lead equivalence values for Safeboard” on page 9.

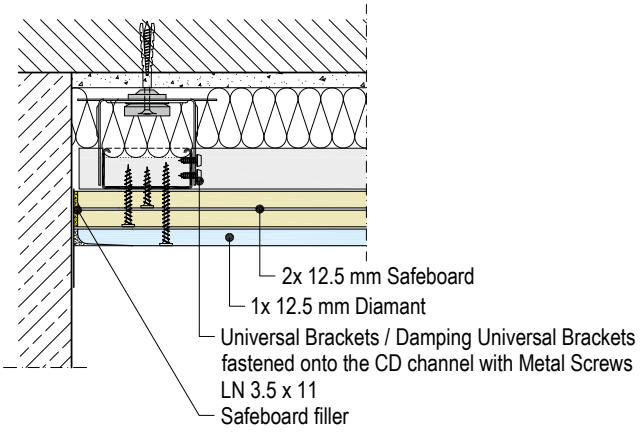
K151.de Safeboard X-Ray Shielding Furrings – directly anchored

Details

Scale 1:5

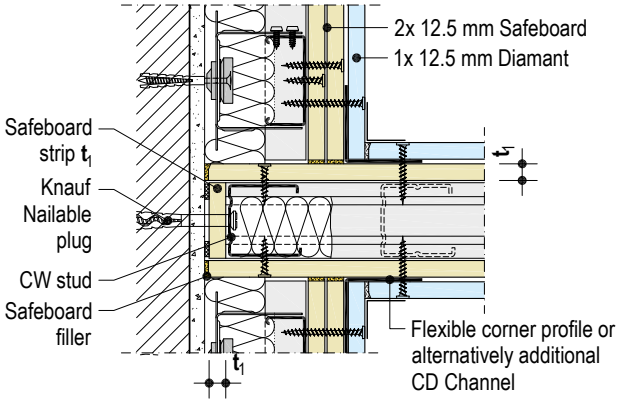
K151.de-A100 Connection to solid wall

Horizontal section



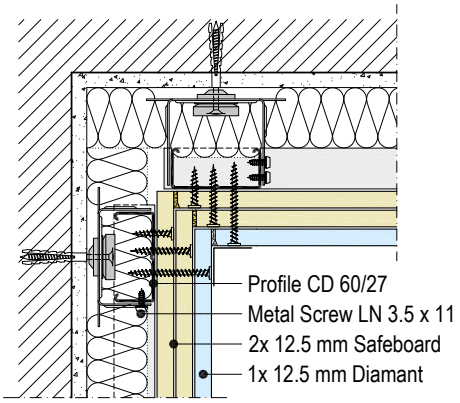
K151.de-C100 Connection to X-Ray shielding partition

Horizontal section



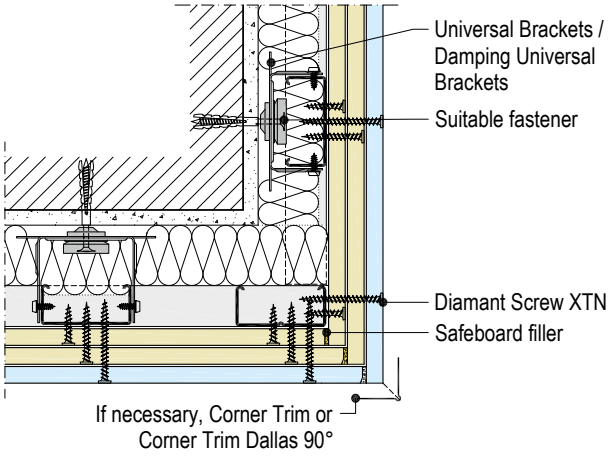
K151.de-E100 Inside corner

Horizontal section



K151.de-D100 Outside corner

Horizontal section



Notes

The system shown is a preferred variant. Planning of individual solutions for X-Ray shielding is possible with the assistance of the table “Lead equivalence values for Safeboard” on page 9.

Installation sequence in the connection areas

The X-ray shielding layer must also be applied continuously in the connection areas.

- Complete a continuous X-ray shielding layer made of Safeboard.
- Subsequently install a Diamant cover layer.

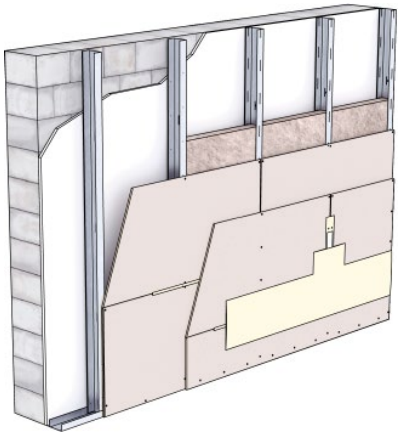
K152.de Safeboard X-Ray Shielding Furrings – detached

Details

Scale 1:5

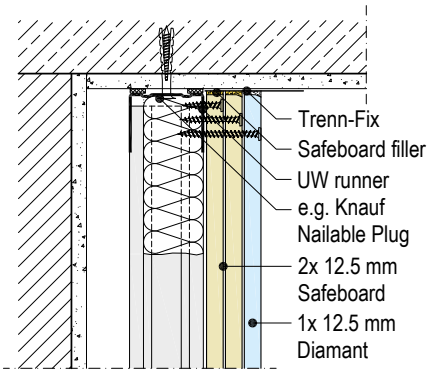
K152.de-P100 Horizontal board layer

2x 12.5 mm Safeboard



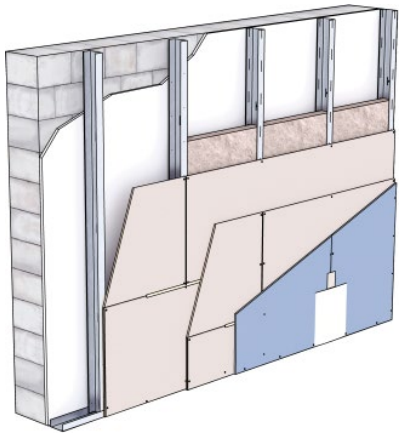
K152.de VO100 Connection to ceiling

Vertical section



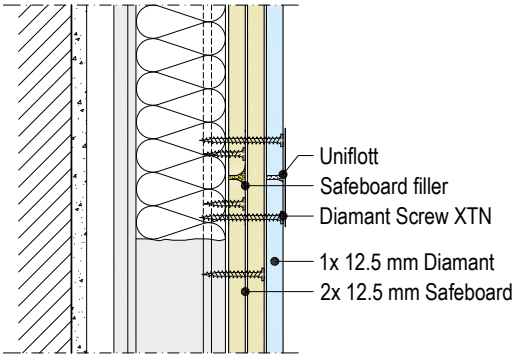
K152.de-P101 Board layer 1 and 2 horizontal, board layer 3 vertical

2x 12.5 mm Safeboard + 12.5 mm Diamant



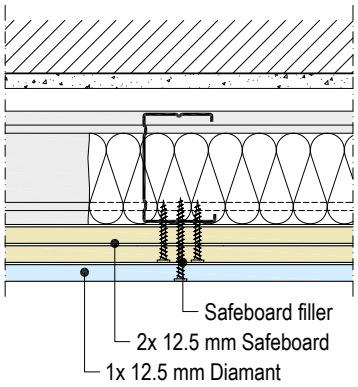
K152.de-VM100 Board joint

Vertical section



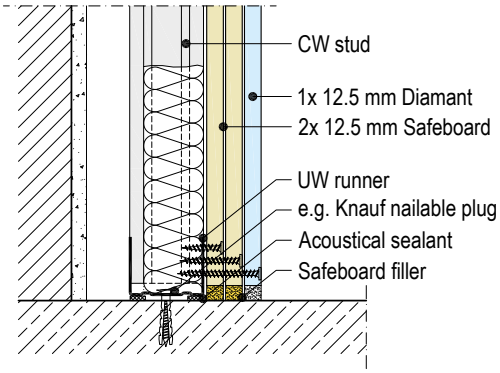
K152.de-B100 Board joint

Horizontal section



K152.de-VU100 Connection to floor

Vertical section



Note The system shown is a preferred variant. Planning of individual solutions for X-Ray shielding is possible with the assistance of the table “Lead equivalence values for Safeboard” on page 11.

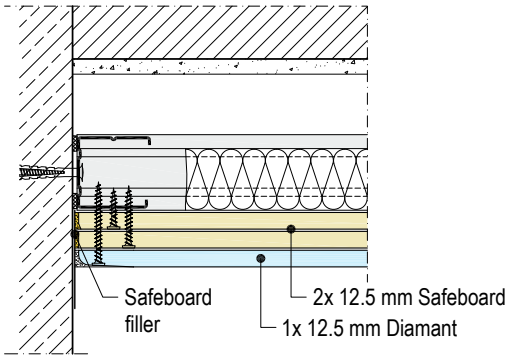
K152.de Safeboard X-Ray Shielding Furrings – detached

Details

Scale 1:5

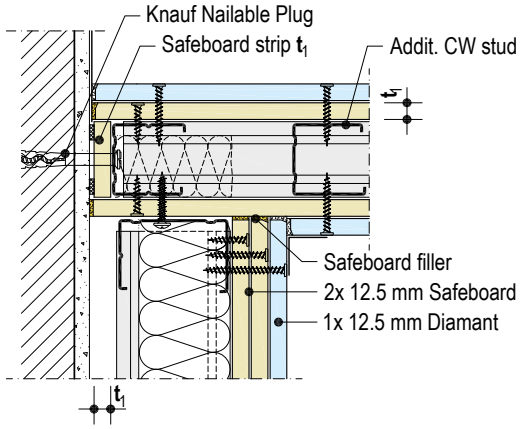
K152.de-A100 Connection to solid wall

Horizontal section



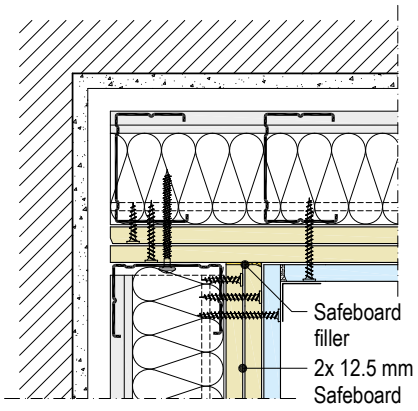
K152.de-C100 Connection to X-Ray shielding partition

Horizontal section



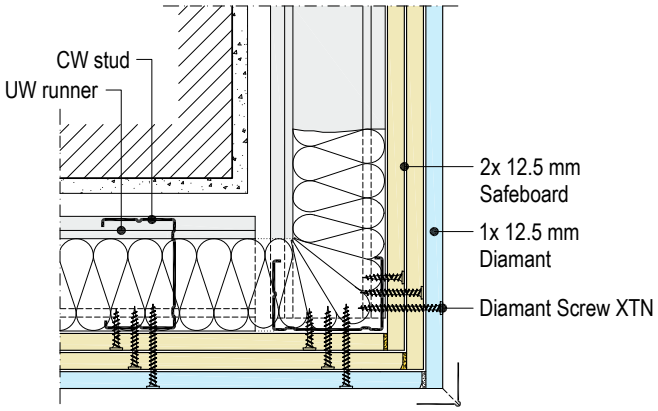
K152.de-E101 Inside corner

Horizontal section



K152.de-D100 Outside corner

Horizontal section



Notes

The system shown is a preferred variant. Planning of individual solutions for X-Ray shielding is possible with the assistance of the table “Lead equivalence values for Safeboard” on page 11.

Installation sequence in the connection areas

The X-ray shielding layer must also be applied continuously in the connection areas.

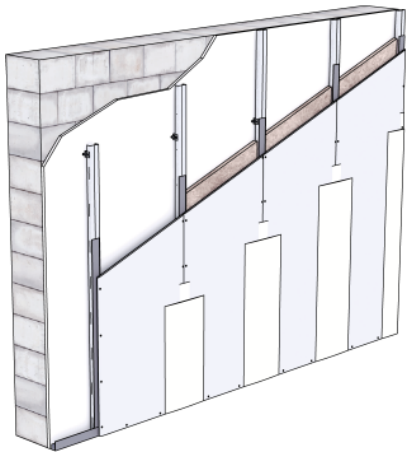
- Complete a continuous X-ray shielding layer made of Safeboard.
- Subsequently install a Diamant cover layer.

Details

Scale 1:5

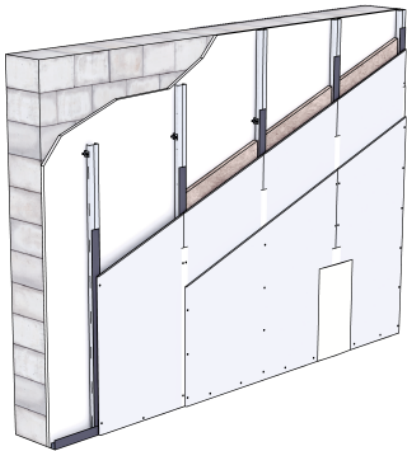
K155.de-P1 Vertical board layer

Single layer X-Ray Shielding Board GKF



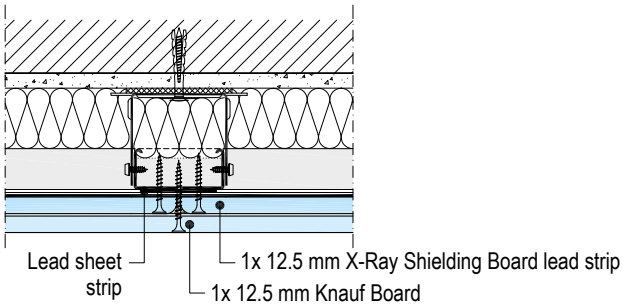
K155.de-P2 Vertical board layer

Double-layer X-Ray Shielding Board GKF + 12.5 mm Knauf Wall Board



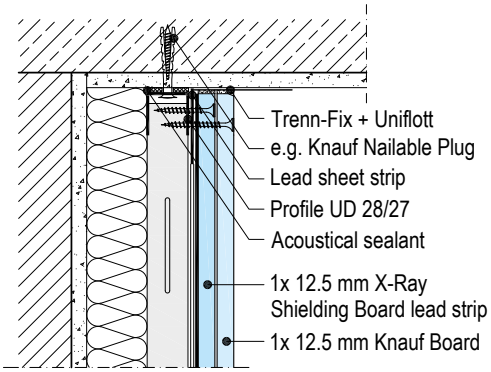
K155.de-B1 Board joint

Horizontal section



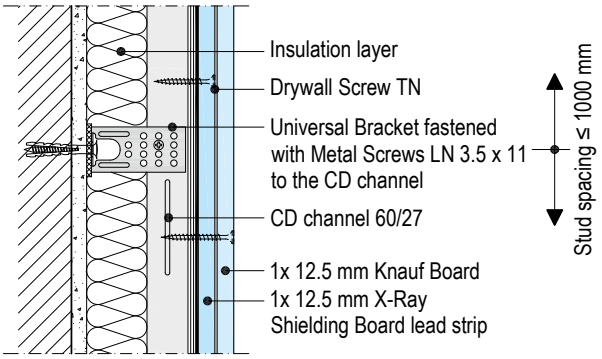
K155.de VO1 Connection to ceiling

Vertical section



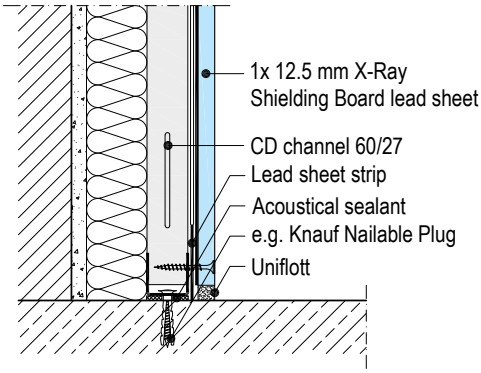
K155.de-VM1 Board joint

Vertical section



K155.de-VU1 Connection to floor

Vertical section



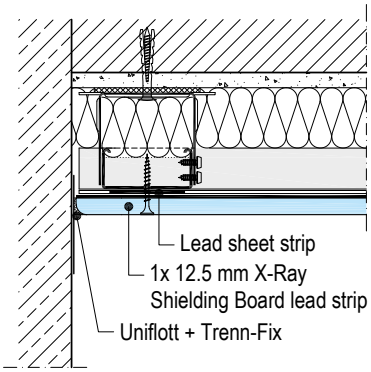
K155.de X-Ray Shielding Furrings lead sheet – directly anchored

Details

Scale 1:5

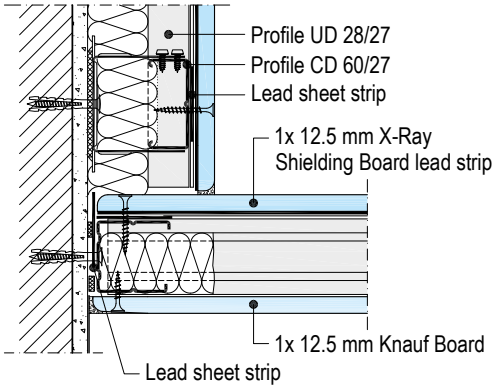
K155.de-A1 Connection to solid wall

Horizontal section



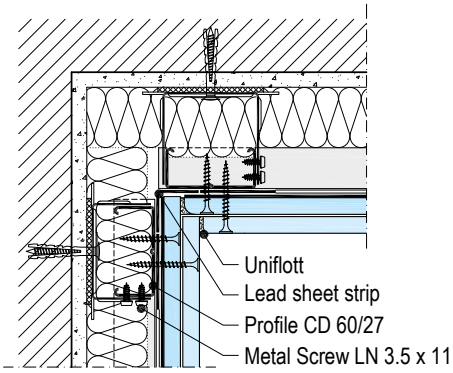
K155.de-C1 Connection to X-Ray shielding partition

Horizontal section



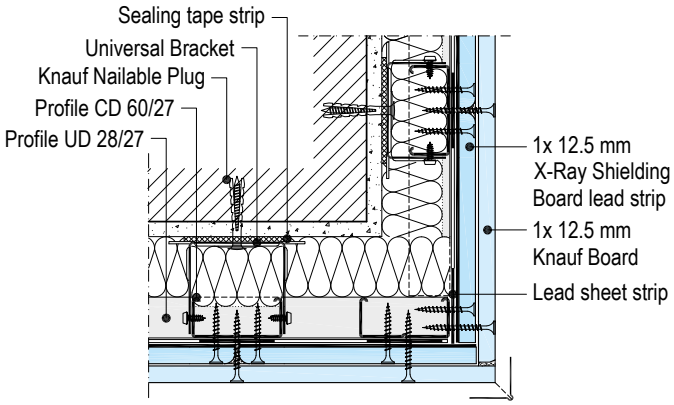
K155.de-E1 Inside corner

Horizontal section



K155.de-D1 Outside corner

Horizontal section



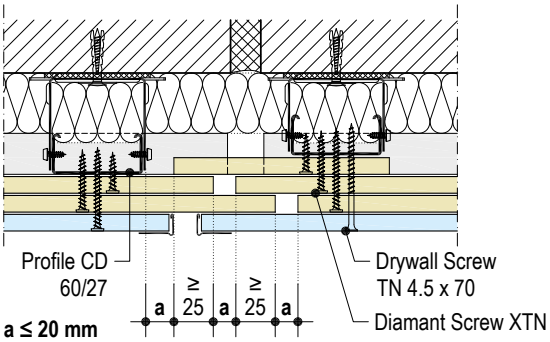
Movement joints

Scale 1:5 I Dimensions in mm

K151.de-BFU100 Movement joint

Horizontal section

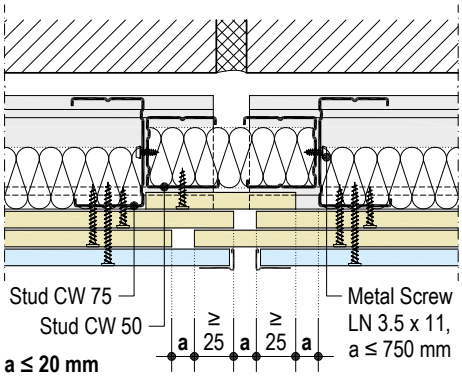
Preferred variant with 2x 12.5 mm Safeboard + 1x 12.5 mm Diamant



K152.de-BFU100 Movement joint

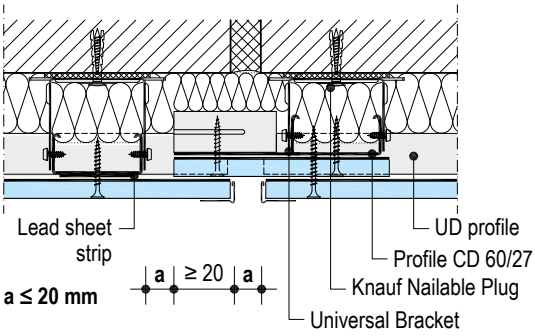
Horizontal section

Preferred variant with 2x 12.5 mm Safeboard + 1x 12.5 mm Diamant



K155.de-BFU1 Movement joint

Horizontal section

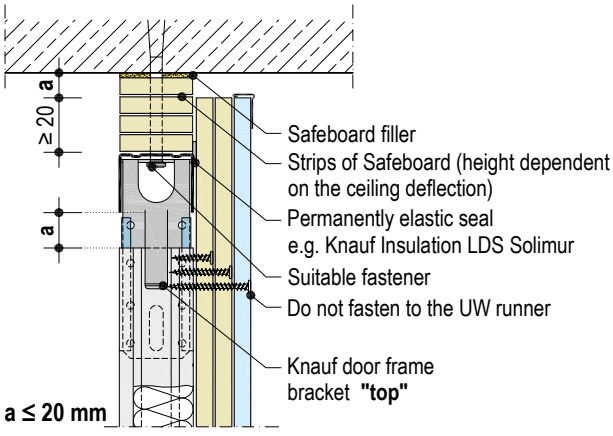


Deflection head

K152.de VO101 Connection to deflection head

Vertical section

Preferred variant with 2x 12.5 mm Safeboard + 1x 12.5 mm Diamant



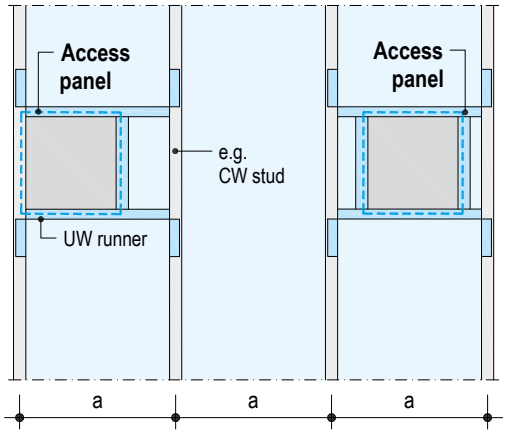
Notes

- Apply a deflection head in case of ceiling deflection ≥ 10 mm.
- See also Knauf YouTube Channel

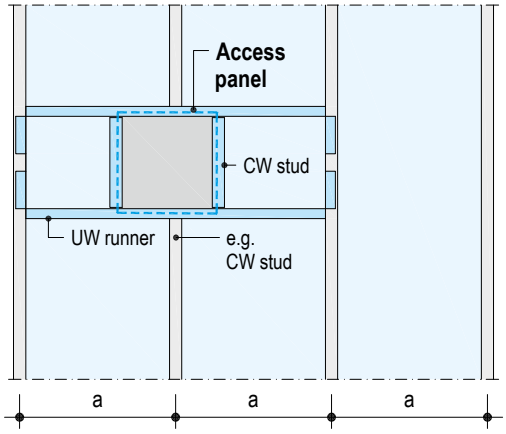
Access panel – SYSTEM X-Ray Shielding Safeboard

Views

Stud spacing a continuous



Stud spacing a with cut stud and trimmer profiles

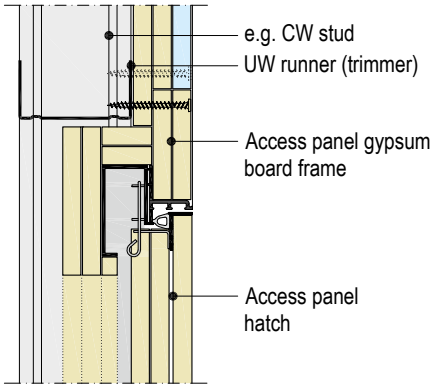


Additional grid

Scheme drawings

Vertical section

Preferred variant with 2x 12.5 mm Safeboard + 1x 12.5 mm Diamant



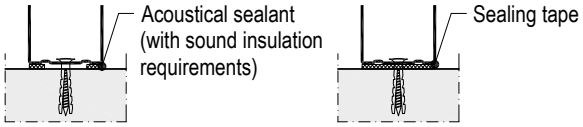
Notes	Further details for planning, application, cladding thickness, dimensions and available options see SYSTEM X-ray shielding Safeboard E139.de Observe the enclosed installation instructions of the access panels.

K151.de
K152.de
K155.de

General

Scheme drawings I Dimensions in mm

Apply a suitable sealant to the rear side of runners for the connection to flanking constructional components. 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 (Recommendation: Trennwandkitt acoustical sealant).



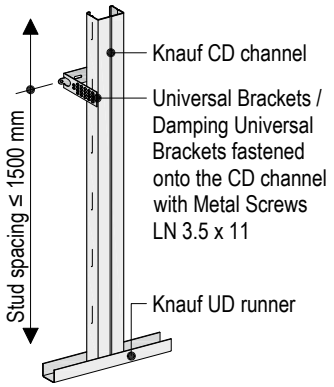
Fix wall perimeter runners to the floor and ceiling. Anchor wall perimeter runners with suitable dowels to flanking walls.

Fasten perimeter runners using suitable anchors on the flanking constructional components. Fasteners for solid flanking constructional components: Drehstiftdübel nailable plugs, ceiling steel dowel / other substrates: Anchors especially suitable for the building material.

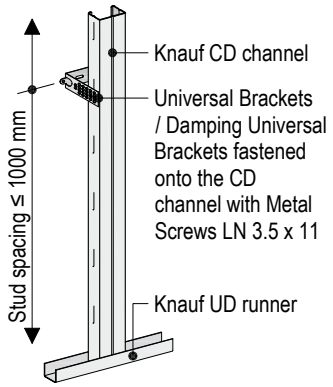
K151.de/K155.de Directly anchored

Maximum distance between fastener centres UD Profile 1000 mm. Install cut-to-length CD channels at 625 mm stud spacing into the UD runners and align. Anchoring of the CD channels on the existing partition with Universal Brackets/Damping Universal Brackets and suitable anchors at max. 1500 mm spacing for K151.de / 1000 mm for K155.de Fastening of brackets on CD channels with metal screws LN 3.5x11.

K151.de

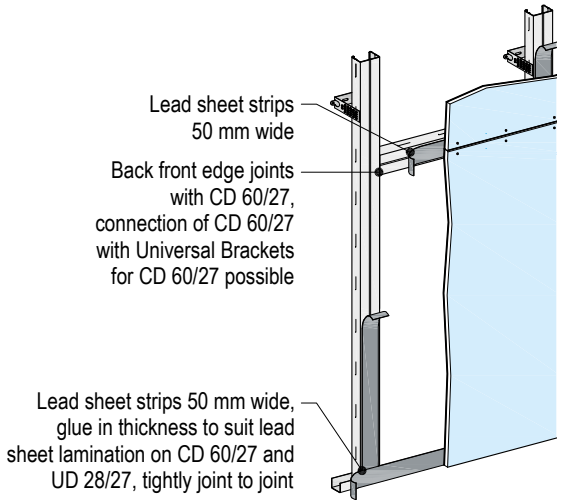


K155.de

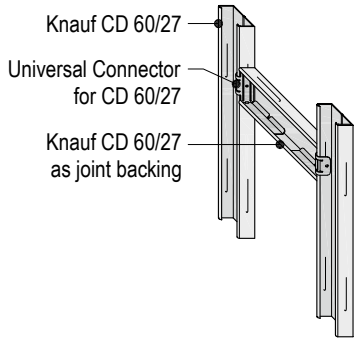


Installation of lead sheet on studs (K155.de)

Glue lead sheet strip to all profiles (studs profiles and perimeter profiles) on the grid. Self-adhesive lead sheet strip, 50 mm wide, thickness depending on the lead lamination of the Knauf X-Ray Shielding boards.



Connection of stud profile CD 60/27 with joint backing CD 60/27



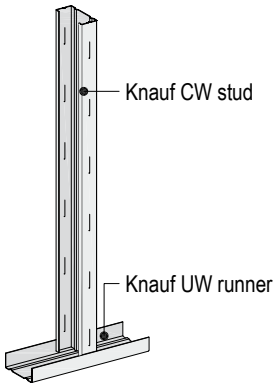
K152.de Detached

Maximum permissible fastener spacings

Supporting fastening perimeter runner (UW) connection to basic floor and basic ceiling		
Partition height m	Knauf Ceiling Steel Dowels (with reinforced concrete) **1x** mm	Knauf Drehstiftdübel nailable plugs **1x** mm
≤ 3.00	1000	1000
> 3.00 to ≤ 6.50	1000	500
> 6.50 to ≤ 7.50	500	–

- Constructional anchoring of the wall connection profiles (CW) to the flanking walls at centres of 1000 mm (at least 3 anchoring points).

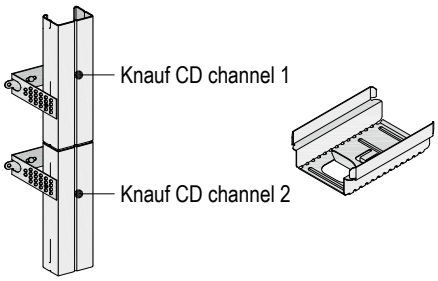
Place the CW stud profile into the UW runners arranged along the length at the required axial spacing and align them.



Grid (continued)

Vertical profile extensions CD channel

Butt join 2x CD channels and connect with additional CD longitudinal connector.

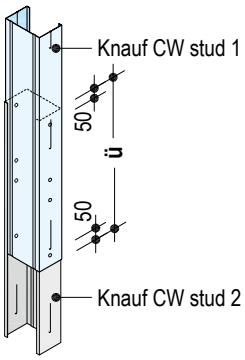


- Fasten two Universal Brackets / Damping Universal Brackets onto the existing wall per profile end / start.
- Stagger the heights of the profile joints (alternating upper and lower wall half).

Vertical profile extensions CW stud

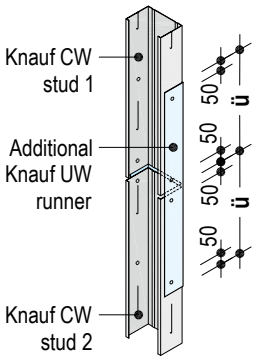
Alternative 1

2 CW profiles nested to form a box.



Alternative 2

2 CW profiles butt jointed, connected with additional UW runner.



Profile extensions	
Knauf profiles	Overlap **ü**
CW 50	≥ 500 mm
CW 75	≥ 750 mm
CW 100	≥ 1000 mm

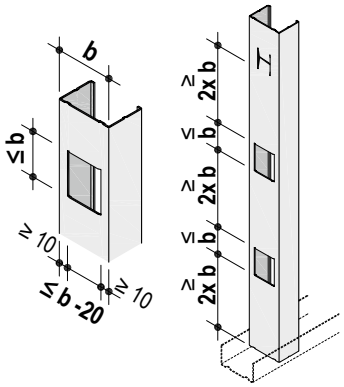
- Stagger the heights of the profile joints (alternating upper and lower wall half).
- Rivet, screw fix or, if possible, crimp the profiles in the overlapping area.

Web cut-out / H punches

Web cut-out – on-site

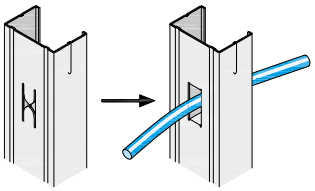
- Maximum **2** web cut-outs per metal stud (for CW 50 maximum 1 web cut-out)
- Observe the dimensions in acc. with the drawing
- Knauf CW studs / UA profiles **50/75/100/125/150**
- Cladding thickness: **≥ 12.5 mm**

- Large number of smaller openings possible on request
- The openings can be provided in addition to the usual factory made H punches.
- Additional web cut-outs in the local load introduction area (cantilever loads / beam loads / dynamic loads) are not permissible.



H punches – factory-made

For **cable penetrations** in Knauf CW studs

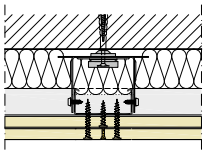


Insulation layer

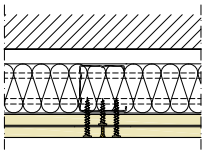
General

Depending on the requirements for sound insulation and thermal insulation, arrange the insulation material between the furring and the existing wall. Secure the insulation against sliding out.

CD Channel with Universal Brackets/ Damping Universal Brackets
(K151.de/K155.de)



CW profile detached
(K152.de)

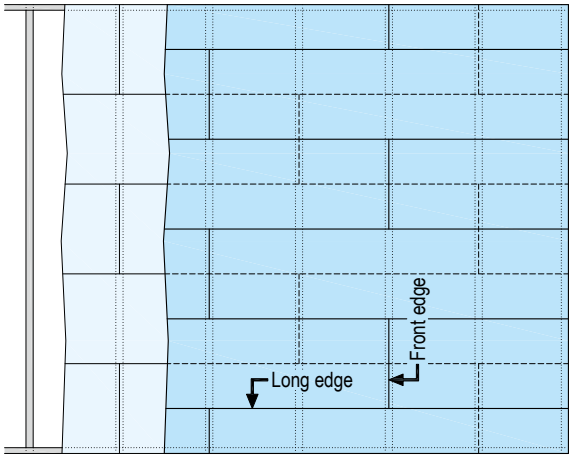


Installation schemes

Safeboard X-Ray Shielding Furring

K151.de/K152.de Horizontal board layer

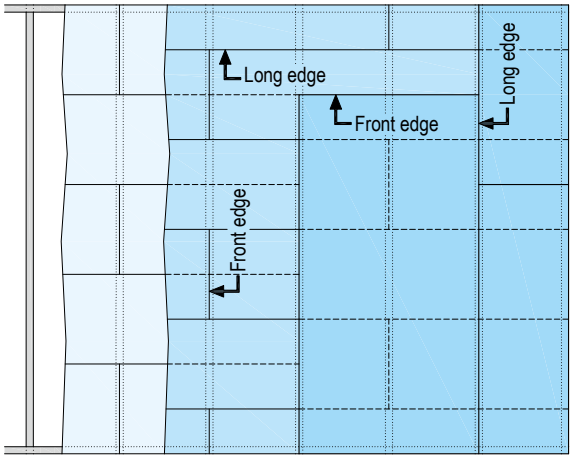
- Board width: **625** mm
- Stud spacing: 625 mm



- 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.

K151.de/K152.de Board layer 1 and 2 horizontal, board layer 3 vertical

- Board width: **625** mm (1st and 2nd layer horizontal)
- Board width: **1250** mm (3rd layer vertical)
- Stud spacing: 625 mm



Lower layers:

- Front edge joints must be staggered by at least one stud spacing.

Upper layer:

- If floor-to-ceiling boards are not used, stagger the front edge joints by ≥ 400 mm.

Offset between lower and upper layer:

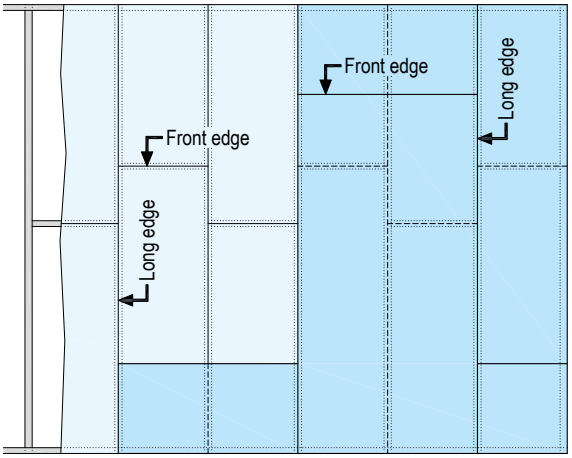
- Stagger the board joints of the upper layer by approx 312.5 mm to the board joints of the lower layer.

Note	In order to avoid dust formation, it is preferable to break the boards (score board liner with knife and break board along the edge, cut rear side board). Rework and bevel the edges with a rasp. When working with Knauf Safeboard, particularly when sanding and sawing (e.g. using a keyhole saw), a dust mask (P2 respiratory filter rating) must be worn.

Safeboard X-Ray Shielding Furring lead sheet

K155.de Vertical board layer

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



Lower/upper layers:

- Arrange the long edge joints on the studs.
- If floor-to-ceiling boards are not used, stagger the front edge joints by ≥ 400 mm and apply backing of profiles and lead sheet strip.
- Stagger the front edge joints between board layers in case of multi-level cladding (approx. 200 mm).

Fastening of the cladding to the stud frame with Knauf drywall screws

Fasteners to be used with Safeboard X-Ray Shielding Furring

Dimensions in mm

Cladding thickness mm	**Metal stud frame** (penetration ≥ 10 mm) Metal gauge **s ≤ 0.7 mm** Diamant Screws **XTN**	Metal gauge **0.7 mm < s ≤ 2.25 mm** Diamant Screws **XTB**
12.5	XTN 3.9 x 23	XTB 3.9 x 38
2x 12.5	XTN 3.9 x 23 + 3.9 x 38	XTB 3.9 x 38 + 3.9 x 55
3x 12.5	XTN 3.9 x 23 + 3.9 x 38 + 3.9 x 55	XTB 3.9 x 38 + 3.9 x 55 + 3.9 x 55

Maximum fastener spacings, all board layers fastened to frame with screws

Cladding	**1st layer** Horizontal Board width 625	**2nd layer** Vertical Board width 1250	**2nd layer** Horizontal Board width 625	**3rd layer** Vertical Board width 1250	**3rd layer** Horizontal Board width 625
1-layer	200	–	–	–	–
2-layer	600	250	200	–	–
3-layer	600	300	300	250	200

Fasteners to be used with X-Ray Shielding Furring lead sheet

Dimensions in mm

Cladding thickness mm	**Metal stud frame** (penetration ≥ 10 mm) Metal gauge **s ≤ 0.7 mm** Drywall Screws **TN**	Diamant Screws **XTN**	Metal gauge **0.7 mm < s ≤ 2.25 mm** Drywall Screws **TB**	Diamant Screws **XTB**
12.5 X-Ray Shielding Board lead sheet	TN 3.5 x 35 mm	–	TB 3.5 x 35 mm	–
12.5 X-Ray Shielding Board lead sheet + 12.5 Knauf Wallboard	TN 3.5 x 35 mm + TN 3.5 x 45 mm	–	TB 3.5 x 35 mm + TB 3.5 x 55 mm	–
12.5 X-Ray Shielding Board lead sheet + 12.5 Diamant	TN 3.5 x 35 mm +	XTN 3.9 x 55 mm[1)]	TB 3.5 x 35 mm +	XTB 3.9 x 55 mm[1)]

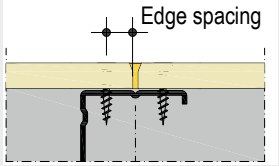
1) Combined cladding (Knauf X-Ray Shielding Board lead sheet + Diamant)

Maximum fastener spacings, all board layers fastened to frame with screws

Cladding	**1st layer** Vertical Board width 625	**2nd layer** Vertical Board width 1250
1-layer	250	–
2-layer	750	250

Note

For optimum sound insulation arrange the screws as far as possible from the profile lap, i.e. with minimum spacing from edge (10 mm edge covered with board liner, 15 mm cut edge).

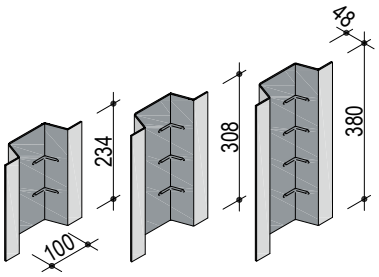


Arrange board joint on centre of profile flange.

Power socket installation

Installation with X-Ray Shielding Caps

Dimensions in mm



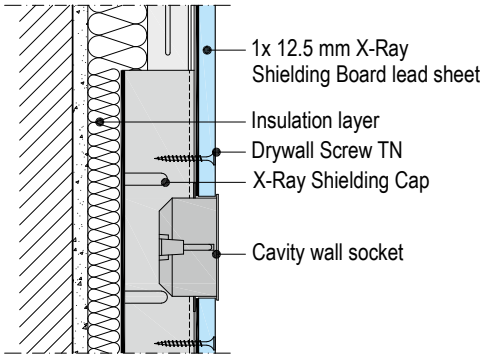
Cut-outs for electrical cavity wall sockets and other applications are fully shielded to ensure provision of a full X-ray shield. The X-ray shielding caps are attached using Drywall Screws TN or Diamant Screws XTN. Knauf X-ray shielding caps are available for single, double and triple cavity wall sockets.

Details

Scale 1:5

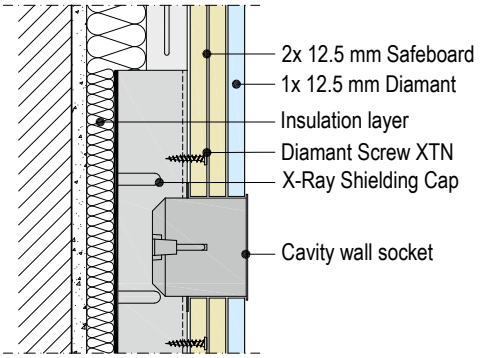
K155.de-SO1 Cavity wall socket

Vertical section



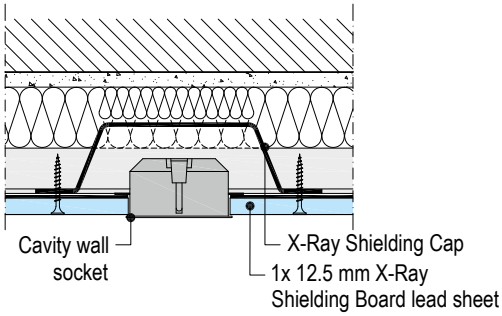
K151.de-SO100 Cavity wall socket

Vertical section



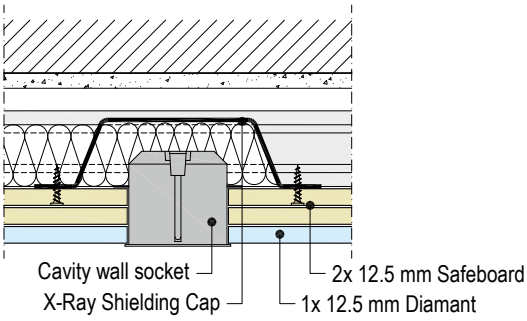
K155.de-SO2 Cavity wall socket

Horizontal section



K152.de-SO100 Cavity wall socket

Horizontal section



Installation of X-Ray shielding sockets

Alternatively, the installation of Kaiser X-ray shielding sockets in Safeboard X-Ray Shielding Furring is possible. Installation without additional shielding measures. Retrofitting is possible:
www.kaiser-elektro.de

Jointing

Jointing of the boards in the required quality level Q1 to Q4 in accordance with Code of Practice no. 2 “Verspachtelung von Gipsplatten, Oberflächengüten”[1)].

Fill in visible screw heads.

Suitable jointing materials

Safeboards

- Safeboard Filler
  (Powder jointing compound pigmented in yellow for purposes of easy identification)
  Hand filling without joint tape strips in the long joint edges

Caution	Wear a dust mask (P2 respiratory filter rating) when sprinkling the powder compound.

Gypsum boards

- Uniflott
  Hand filling without joint tape strips in the long joint edges
- Fugenfüller Leicht
  Hand filling with joint tape, preferably with Knauf Fugendeckstreifen Kurt joint tape

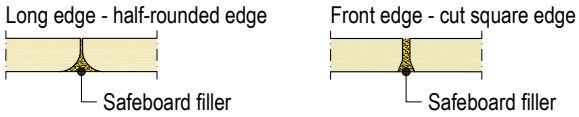
Suitable finish filling compounds

- Q2, application by hand
  Uniflott, Fill & Finish Light, Super Finish
- Q3/Q4, application by hand
  Spritzspachtel Plus, Super Finish, Fill & Finish Light
- Q3/Q4, machine application
  Spritzspachtel Plus

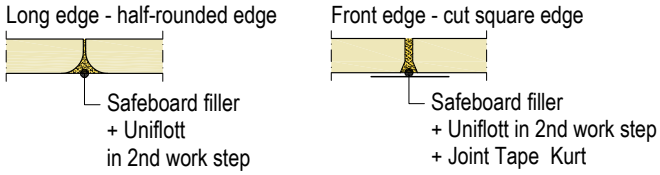
Safeboard jointing

- Fill all joints (board joints and connections) fully, i.e. uniformly and over the entire cladding thickness of all Safeboard layers with Safeboard filler.
- With visible cladding layers for manufacture of surface quality Q2, create a level transition to the board surface in the second step with Knauf Uniflott.

Board joints – hidden cladding layers



Board joints – visible cladding layers



Jointing of the 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 ensure technical X-ray shielding, fire protection and sound insulation properties as well as the structural properties.

Recommended

Front edge and cut edge joints as well as mixed joints (e.g. half-rounded tapered edge / half-rounded edge + cut edge) of the visible cladding layers filled using Uniflott or Knauf Safeboard filler with Fugendeckstreifen Kurt joint tape as well.

Joint filling of the connection joints

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

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

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

Sanding

Lightly sand visible surfaces after drying of the filler material, if required.

Caution	Wear a dust mask (P2 respiratory filter rating) when sanding Safeboard Filler.

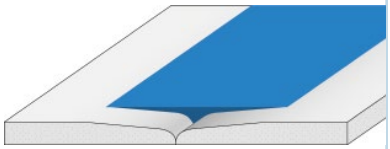
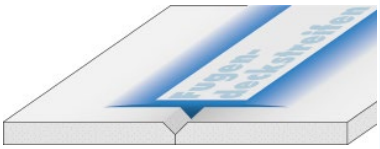
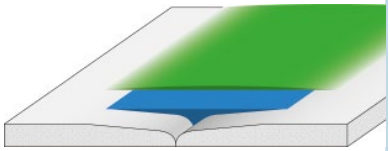
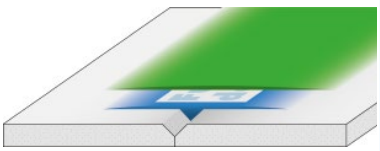
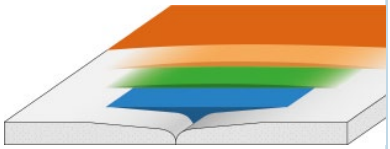
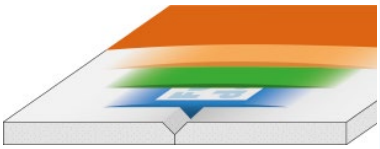
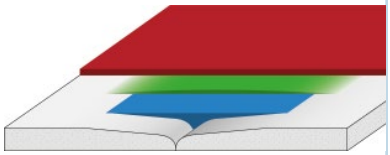
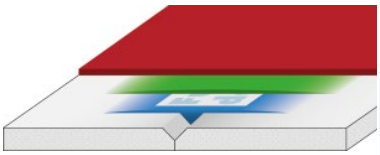
Application temperature/climate

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

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

K151.de
K152.de
K155.de

Jointing (continued)

Quality levels	Joint implementation Long edges half-rounded tapered edge or half-rounded edge	Joint implementation Front edge bevelled cut edge	Description Working steps
Q1			■ Fill the Safeboard joints with Safeboard Filler or gypsum board joints with Uniflott ■ Fill the visible parts of the fasteners for Safeboard with Safeboard Filler or those for gypsum boards with Uniflott
Q2			■ Preliminary jointing in acc. with quality level Q1 ■ Finish (fine finish compound) to achieve a smooth transition to the board surface e.g. with Uniflott, Spritzspachtel Plus, Fill & Finish Light or Super Finish No application marks or ridges may remain visible. Sand off the areas concerned if necessary.
Q3			■ Jointing in acc. with quality level Q2 ■ Wide jointing of the joints as well as clean and accurate removal of the remaining board liner filling the pores, e.g. with Fill & Finish Light, Super Finish or Spritzspachtel Plus If necessary, i.e. physical ridges and grooves are not acceptable and must be sanded.
Q4			■ Jointing in acc. with quality level Q2 ■ Complete surface covering of skim coat with a layer thickness of at least 1 mm, e.g. with Fill & Finish Light, Super Finish or Spritzspachtel Plus

Coatings and linings

Coating / lining	Recommended finish Gypsum boards EN 520[1)]
Tiles etc.	Q1
Coarsely structured wallpaper (e.g. wood-chip wallpaper)	Q2
Finely structured wallpaper	Q3/Q4
Matt textured coats	Q3/Q4
Glossy, smooth coats	Q4
Plasters (grain size < 1 mm)	Q3/Q4
Plasters (grain size ≥ 1 mm)	Q2

Pretreatment

Before a further coating or lining is applied, the filled surface must be free of dust. Prime acc. to code of practice no. 6 of the BVG "Vorbehandlung von Trockenbauflächen aus Gipsplatten zur weitergehenden Oberflächenbeschichtung bzw -bekleidung" [2)].

The primer must suit the subsequent coating compound/coatings/linings.

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

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

Sealing primer Flächendicht is required for covering splash water areas with tiles. Observe the DIN 18534.

Note	Gypsum board surfaces that have constantly been exposed to light without any protection can result in yellowing. 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. Aton Sperrgrund for finishing plasters, Knauf Sperrgrund for coatings.

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 Spannarbeiten innen" [3)] released by the Bundesausschuss Farbe und Sachwertschutz.
- Plaster and filler materials
  - Top coats (e.g. Noblo, Raumklima Spritzputz spray plaster, Rotkalk Filz)
  - Full surface plaster (e.g. Spritzspachtel Plus).
    Application of plaster layers only in conjunction with Fugendeckstreifen Kurt joint tape.
- Coatings
  - Dispersion paints (e.g. Intol E.L.F., Malerweiss E.L.F.)
  - Silicate-based emulsion paints with suitable primer.
  - Others on request
- Ceramic coverings (e.g. tiles)
  - Minimum cladding thickness 18 mm (Diamant: 15 mm), e.g. 2x 12.5 mm with stud spacing 625 mm
  - With narrower cladding thickness, reduce the stud spacing to max. 500 mm (417 mm with vertical cladding).
  - Tile weights up to 25 kg/m^2 (one-sided) with a max. surface per tile of 1800 cm^2 (e. g. 60 x 30 cm) have proven to be uncritical (compare to Code of Practice 8:2019-12 Partition heights of lightweight partitions[2)]).

Unsuitable coatings and linings

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

Notes	After wallpapering or after application of plasters, quick drying must be ensured through adequate airing. 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 the Knauf X-Ray Shielding Furring.

1) *In accordance with Code of Practice No. 2 "Verspacheltung von Gipsplatten, Oberflächengüten" (German only), Issued by the German Bundesverband der Gipsindustrie e. V.*
2) *Issued by the German Bundesverband der Gipsindustrie e. V.*
3) *Issued by the German Bundesausschuss Farbe und Sachwertschutz*

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Information on sustainability

Knauf X-Ray Shielding Furring

Information on sustainability of Knauf X-Ray Shielding Furring

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
  Deutsches Gütesiegel Nachhaltiges Bauen
- BNB
  Bewertungssystem Nachhaltiges Bauen - Quality rating system for environmentally sustainable building)
- LEED
  Leadership in Energy and Environmental Design.

Knauf products and Knauf X-Ray Shielding Furring can positively influence many of these criteria.

DGNB/BNB

Ecological quality

- Ecological performance evaluation of the building:
  Relevant environmental data are contained in the EPD for Safeboard , gypsum boards and filler
- Risks for the local environment:
  - Safeboard is a lead-free X-Ray Shielding Board
  - Gypsum as an ecological material
  - Profiles are hot-dip galvanized and free of Chromium VI

Economic quality

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

Technical quality

- Sound insulation:
  Exceeding the demands of the standard with Knauf sound installation
- Ease of dismantling and recycling:
  Knauf Drywalling is fully compliant

LEED

Materials and Resources

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

Indoor Environmental Quality

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

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

Find the right system for your requirements!
knauf.de/systemfinder

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.