

Knauf Thin-Layer Screed Systems Heated and Unheated

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

	Usage instructions	
	Notes I Certificates of Usability	3
	Notes on the document	3
	References to other documents	3
	Intended use of Knauf systems	3
	General instructions	3
	Certificate of Usability	3
	Introduction	
	System overview	4
	Data for planning	
	Technical and physical building data	7
	Knauf thin-layer heating screed, unheated	7
	Knauf thin-layer heated screed on self-adhesive dimpled foil sheet (open dimples)	8
	Knauf thin-layer heating screed on hollow cavity board	11
	Knauf thin-layer heated screed on insulation board with Klett (hook and loop) coating	12
	Construction details	
	Knauf thin-layer heating screed systems	14
	Installation and application	
	Unheated constructions	16
	Bonded.....	16
	On a separating layer and insulating layer	16
	Heated constructions	17
	Bonded.....	17
	On a separating layer or insulation layer.....	18
	Application of equalization compounds	19
	Drying	20
	Drying – coverage ready heating	20
	Application of floor covering	22
	Application of floor covering	22
	Material requirement	
	Knauf Thin-Layer Screed Systems	23
	Material requirement	23
	Information on sustainability	
	Knauf Thin-Layer Screed Systems	24
	Information on sustainability.....	24

Notes on the document

Knauf system data sheets are the planning and application basis for planners and professional installers with the application of Knauf systems. The contained information and specifications, constructions, details and stated products are based, unless otherwise stated, on the certificates of usability (e.g. 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 construction 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

Product data sheets

- N 440, see Product data sheet [F422.de](#)
- N 340, see Product data sheet [F413.de](#)
- N 430, see Product data sheet [F423.de](#)
- Knauf Wood Fibre Insulation Board WF, see product data sheet [K439w.de](#)
- EPO-Leicht, see product data sheet [F441.de](#)
- Heavy-duty acoustic infill, see product data sheet [F475.de](#)
- S 400 Sprint, see product data sheet [F401.de](#)

Technical brochures

- For further information on the application and implementation of screed systems, see technical brochure [F20.de Knauf Floor Systems – Construction and application technology](#)

Pamphlet

- Further information, see also [F42.de Always on the straight and level - with Knauf leveller and equalization compounds](#)

Intended use of Knauf systems

Please observe the following:

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

Thin-layer (heating) screed systems can be applied as

- Bonded screed on solid ceilings or wood joist ceilings or on existing screeds
- Screed on a separating layer or
- Screed laid on an insulating layer

The (heated) screed systems presented here are matched to and tested with the characteristics of the respective Knauf products. Therefore, the stated information cannot be transferred to other products not specified here.

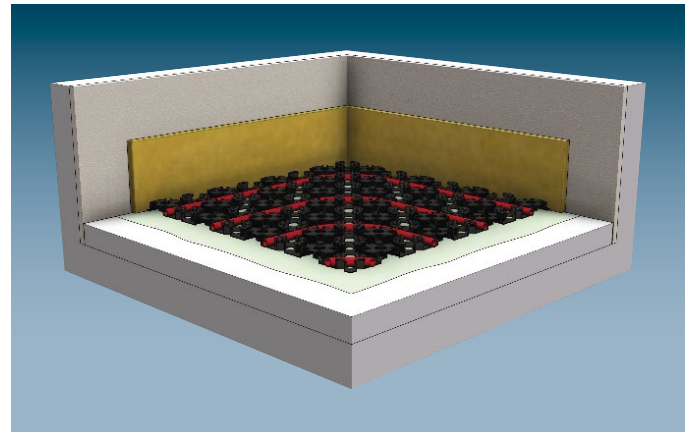
Insulation layer

When applied on an insulation layer, its stiffness and layer thickness influences the required screed thickness and the load-bearing capability of the construction. For this reason, the possible insulation layers under the (heated) screed construction are stated in the table.

Underfloor heating system design

Various thin-layer underfloor heating systems can be applied.

- Self-adhesive knobbed foil sheet (open knobs), e.g. Uponor minitec
- Knobbed plastic boards with Klett (hook and loop) surface, e.g. Uponor Klett Twinboard
- Insulation panels with Klett (hook and loop) surface, e.g. Uponor Klett Rollplatte, Klett Silent
- Other systems



Example Thin-layer underfloor heating system Uponor Minittec bonded

The Knauf products to be applied, the required screed thicknesses, the possible insulation materials and their layer thicknesses should be chosen in accordance with the carrying capacities in the tables. Information on the heating systems can be requested via the Uponor hotline. The technical hotline is free-of-charge from a German landline.



Uponor GmbH
 Technical Hotline Germany only
 Tel.: +49 (0)800 77 80030

www.uponor.de

Certificate of Usability

Knauf System	Sound insulation
F235.de on WF	T 012-01.11
F235.de on MW	On request
F235.de on MW on heavy-duty acoustic infill	On request

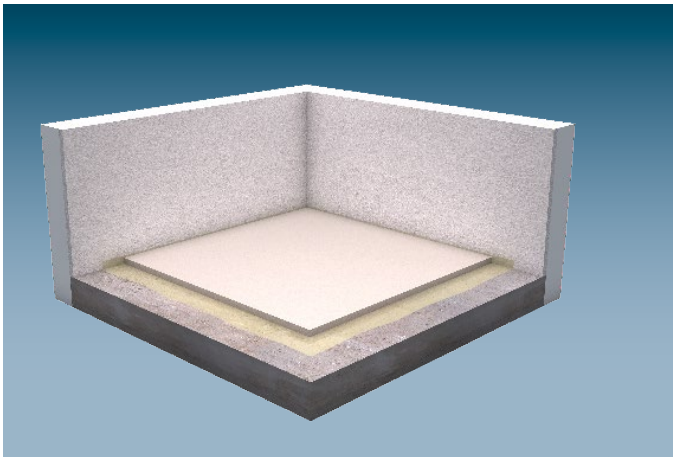
Notes	<p>The screed constructions described in this system data sheet are special designs as they are not included in the DIN 18560 German standard (with the exception of unheated bonded constructions).</p> <p>This is why we recommend prior contractual agreement with the client before application on the building site. If necessary, in this context it must be emphasized that the expected properties from this screed construction regarding sound insulation and fire resistance are not compliant with the values for screed constructions in accordance with the standard.</p>
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Knauf thin-layer heating screed, unheated

Unheated, thin-layer bonded screed constructions can be applied with Knauf leveller and equalization compounds on a separating or insulation layer using N 440

Note Technical and physical building data for unheated systems, see the table on page 7.

F219.de Knauf Thin-layer bonded screed



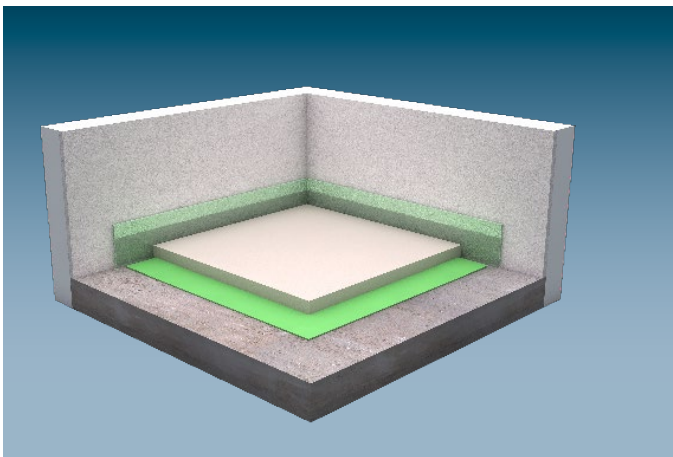
The equalization compound forms a solid and full surface bond with the pre-prepared substrate. Product-dependent layer thickness from 2 mm.

Equalization compounds

- All equalization compounds, see the pamphlet for application

[F42.de Always on the straight and level](#)

F229.de Knauf thin-layer screed on separating layer

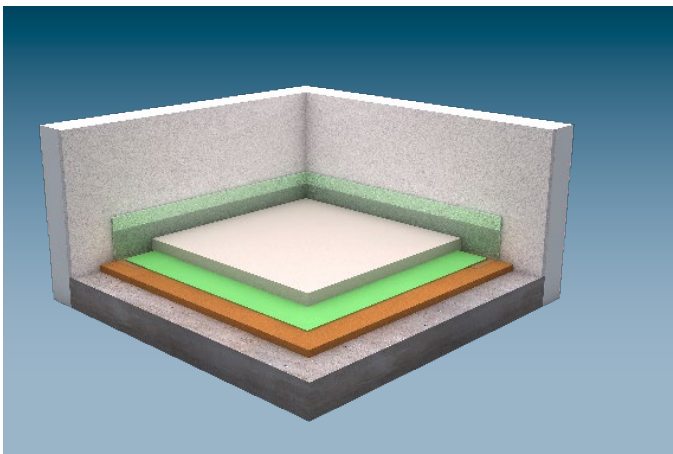


The equalization layer is separated from the substrate by a separating layer, e.g. Knauf Schrenzlage synthetic coated kraft paper.

Equalization compound

- N 440

F239.de Knauf thin-layer heating screed on insulation layer



Knauf equalization compound is applied on an insulation layer to improve the sound insulation and thermal insulation features.

Equalization compound

- N 440

Knauf thin-layer heated screed on self-adhesive knobbed foil sheet (open knobs)

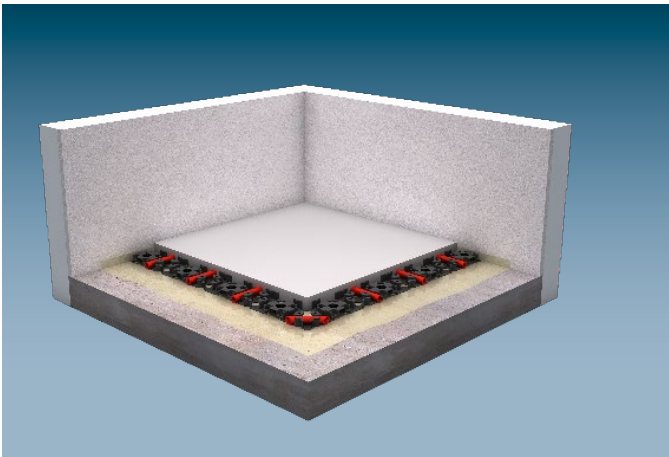
An existing stable screed or a basic floor can be upgraded easily using Knauf equalization compounds as a thin-layer heating floor screed with energy-efficient underfloor heating. A fast reacting heating screed with short heating time is created due to the low tube covering, high thermal conductivity, and the very good enclosing of heating pipes. The lowest achievable construction height is 16 mm as a bonded construction.

Common areas of application include, for example, residential buildings, office buildings and doctors practices up to a load of 3 kN/m² area load and 2 kN point load.

For these areas of application (including domestic bathrooms), systems are applied with gypsum-based equalization compounds N 430 or N 440. The system is applied with cementitious compound N 340 in wet areas such as those used in the renovation of swimming pools. N 430 and N 340 are only possible as a bonded screed.

Notes Technical and physical building data for heated systems, see tables on page 8 ff.

F215.de Knauf thin-layer heating screed as bonded screed

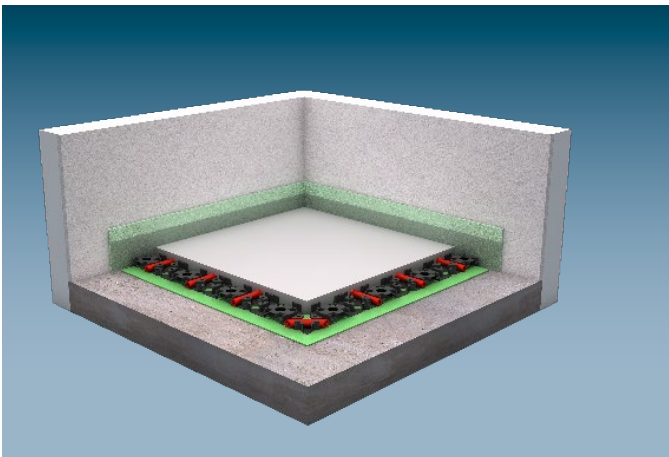


The equalization compound forms a solid and almost full surface screed bond with the thin-layer underfloor heating system on the prepared substrate with a particularly thin thickness from 16 or 20 mm.

Equalization compound

- N 430
- N 340
- N 440

F225.de Knauf thin-layer heating screed on separating layer

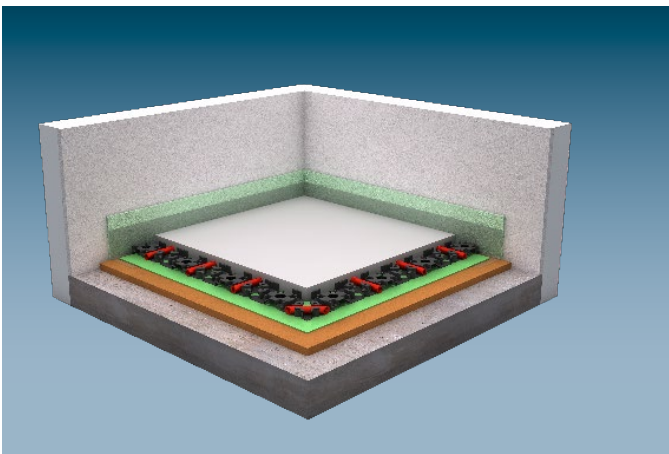


The equalization compound and the thin-layer underfloor heating system are separated from the substrate by application of a separating layer (e.g. Knauf Schrenzlage synthetic coated kraft paper)

Equalization compound

- N 440

F235.de Knauf thin-layer heating screed on insulation layer



The equalization compound and the thin-layer underfloor heating system are applied on an insulation layer, in order to achieve a thin construction design and additional sound insulation and thermal insulation features.

Equalization compound

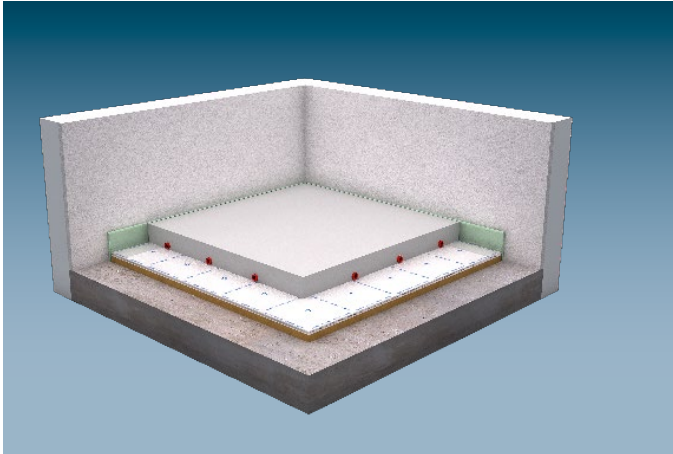
- N 440

Knauf thin-layer heating screed on hollow cavity board

Using hollow cavity board thin-layer heated screed can be applied as a separating layer system or on an insulation layer. The diameter of the heating tube can be selected to suit the requirement (heating circuit size, design height).

Note Technical and physical building data see the table on page 11.

F235.de Knauf thin-layer heating screed on hollow cavity board



The heating tube is fixed to the hollow cavity board that serves as a separating layer or insulation layer cover. The joints of the hollow cavity board are sealed with adhesive tape.

Equalization compound

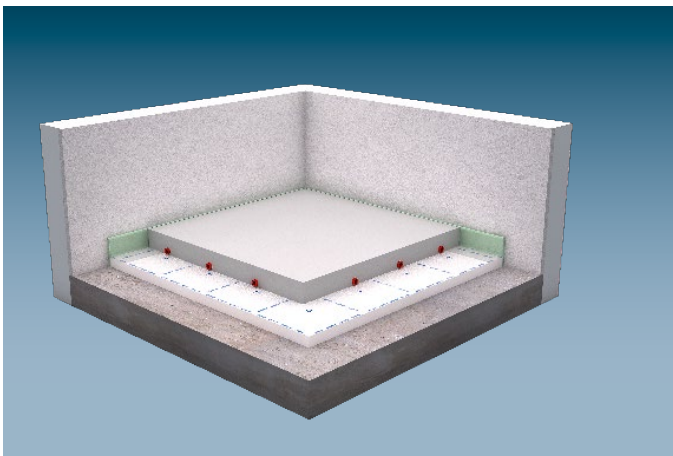
- N 440

Knauf thin-layer heated screed on insulation board with Klett (hook and loop) coating

On insulation board with Klett (hook and loop) coating heating screeds with a reduced thickness can be manufactured with Knauf N 440 or Knauf flowing screed (FE Eco, FE 25 A tempo). Insulation panels can be used as thermal insulation (EPS DEO) or as footfall sound insulation (EPS DES). The diameter of the heating tube can be selected to suit the requirement (heating circuit size, design height).

Note Technical and physical building data see the table on page 12 ff.

F235.de Knauf thin-layer heating screed on insulation board with Klett (hook and loop) coating

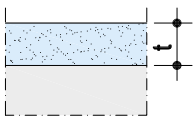
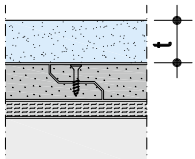
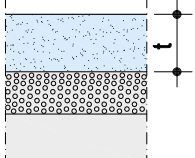
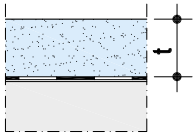
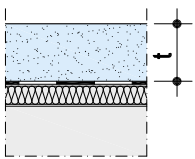


The insulation panel joints are adhesively sealed with the overlapping Klett (hook and loop) foil. The heating tube is fixed with the hook-and-loop fastener in the insulation panel.

Equalization compound/flowing screed

- N 440
- FE Eco, FE 25 A tempo

Knauf thin-layer heating screed, unheated

System	Screed weight kg/m ²	Construction thickness		Insulation layer mm / kPa ²⁾ or product designation	Load capacity of screed kN/m ² / kN	Reduction of impact sound pressure level on solid ceiling $\Delta L_{w,p}$ dB	
		Screed thickness ^t ¹⁾ mm					
F219.de Knauf equalization compound as a bonded screed							
	20 – 80	10 – 40 ³⁾	–	–	≤ 5 / 4	–	
On pre-fab floor screed Brio	0 – 17	–	0 – 10	See F12.de	See F12.de	See F12.de	
	20 – 40	10 – 20	–				
On EPO-Leicht light levelling mortar	40 – 80 ⁴⁾	20 – 40 ⁴⁾	–	–	≤ 2 / 1	–	
							
F229.de Knauf equalization compound on separating layer							
	40 – 80	20 – 40	–	–	≤ 2 / 1	–	
	60 – 80	30 – 40			≤ 3 / 2		
	70 – 80	35 – 40			≤ 4 / 3		
	80	40			≤ 5 / 4		
F239.de Knauf equalization compound on insulation layer							
	40 – 80	20 – 40	–	10/100, 20/200, 30/300 or 10 mm WF	≤ 2 / 1	–	
	50 – 80	25 – 40		20/100, 30/150, 40/200, 60/300 or 20 mm WF		–	
	60 – 80	30 – 40		50/100, 80/150, 100/200 or 120/300		–	
				TP-GP 12-1		17 ⁵⁾	
	60 – 80	30 – 40		10/100, 20/200, 30/300 or 10 mm WF	≤ 3 / 2	–	
	70 – 80	35 – 40		20/100, 30/150, 40/200, 60/300 or 20 mm WF		–	
	70 – 80	35 – 40		10/100, 20/200, 30/300 or 10 mm WF		≤ 4 / 3	–
	80	40		10/100, 20/200, 30/300 or 10 mm WF		≤ 5 / 4	–

1) Absolute values, not nominal thicknesses acc. to DIN 18560, lowest value is minimum value, thickness t without insulation layer

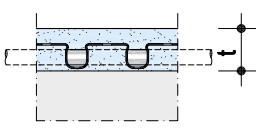
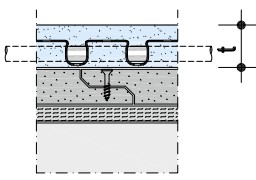
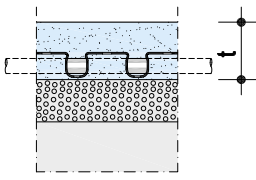
2) Compressive stress with 10 % compression (DEO)

3) Or other Knauf leveller and equalization compounds, see pamphlet F42.de for applications and layer thickness.

4) Plus scrape skimming with N 440, approx. 5 mm, 10 kg/m²

5) Values acc. to DIN 4109-34 07.2016

Knauf thin-layer heated screed on self-adhesive knobbed foil sheet (open knobs)

System	Pipe diameter mm	Screed weight kg/m ²	Construction thickness				Screed carrying capacity kN/m ² / kN	Reduction of impact sound level on solid ceiling Test value $\Delta L_{w,P}$ dB			
			Min. screed thickness t incl. heating system mm	Insulation layer under heating system mm / kPa ²⁾ or product description	Screed thickness ¹⁾ over heating system mm				System panel height mm (e.g. Uponor Minitec)		
					N 430	N 340 ⁹⁾	N 440				
F215.de Knauf thin-layer heating screed as bonded screed											
On basic floor 	10	≥ 28	≥ 16		≥ 4	-	-				
		≥ 36	≥ 20	-	-	≥ 8	-	12 ³⁾	≤ 3 / 2	-	
		≥ 40	≥ 20			-	-	≥ 8			
		≥ 54	≥ 27			-	-	≥ 15	12 ³⁾	≤ 4 / 3	-
		≥ 49	≥ 27			-	≥ 15	-			
		≥ 64	≥ 32			-	-	≥ 20	12 ³⁾	≤ 5 / 4	-
		≥ 58	≥ 32			-	≥ 20	-			
On pre-fab floor screed Brio ⁵⁾ 	10	≥ 40	≥ 20	See F12.de	-	-	≥ 8	12 ³⁾	See F12.de	See F12.de	
On EPO-Leicht light levelling mortar 	10	≥ 64 ⁴⁾	≥ 32 ⁴⁾	-	-	-	≥ 20	12 ³⁾	≤ 2 / 1	-	

1) Absolute values, not nominal thicknesses acc. to DIN 18560, lowest value is minimum value, thickness t without insulation layer

2) Compressive stress with 10 % compression (DEO)

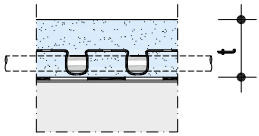
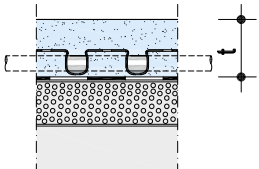
3) For other heights of the system board the total thickness details and weight of the screed must be adapted accordingly.

4) Plus scrape skimming with N 440, approx. 5 mm, 10 kg/m²

5) In principle all pre-fab screed constructions in F12.de can be implemented using N 440 and thin-layer underfloor heating.

6) Recommended maximum screed thickness including heating system 32 mm; hairline cracks can form on the surface at higher screed thickness.

Knauf thin-layer heated screed on self-adhesive knobbed foil sheet (open knobs)

System	Pipe diameter mm	Screed weight kg/m ²	Construction thickness				Screed carrying capacity kN/m ² / kN	Reduction of impact sound level on solid ceiling Test value $\Delta L_{w,P}$ dB
			Min. screed thickness t incl. heating system mm	Insulation layer under heating system mm / kPa ²⁾ or product description	Screed thickness ¹⁾ above heating system mm N 440	System panel height mm (e.g. Uponor Minitec)		
F225.de Knauf thin-layer heating screed on separating layer								
On basic floor 	10	≥ 64	≥ 32	–	≥ 20	12 ³⁾	≤ 3 / 2	–
		≥ 74	≥ 37	–	≥ 25	12 ³⁾	≤ 4 / 3	–
		≥ 84	≥ 42	–	≥ 30	12 ³⁾	≤ 5 / 4	–
On EPO-Leicht or S 400 Sprint 	10	≥ 64	≥ 32	–	≥ 20	12 ³⁾	≤ 2 / 1	–

1) Absolute values, not nominal thicknesses acc. to DIN 18560, lowest value is minimum value

2) Compressive stress with 10 % compression (DEO)

3) For other heights of the system board the total thickness details and weight of the screed must be adapted accordingly.

Knauf thin-layer heated screed on self-adhesive knobbed foil sheet (open knobs)

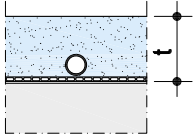
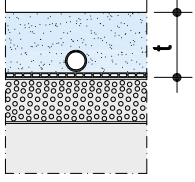
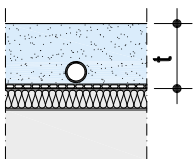
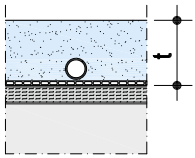
System	Pipe diameter mm	Screed weight kg/m ²	Construction thickness				Screed carrying capacity kN/m ² / kN	Reduction of impact sound level on solid ceiling Test value $\Delta L_{w,P}$ dB
			Min. screed thickness t incl. heating system mm	Insulation layer under heating system mm / kPa ² or product description	Screed thickness ¹⁾ over heating system mm N 440	System panel height mm (e.g. Uponor Minitec)		
F235.de Knauf thin-layer heating screed on insulation layer								
	10	≥ 64	≥ 32	10 or 20 mm WF	≥ 20	12 ³⁾	≤ 2 / 1	20 ⁴⁾
		≥ 64	≥ 32	20/100, 30/150, 40/200 or 60/300	≥ 20			-
		≥ 74	≥ 37	TP-GP 12-1 ⁵⁾	≥ 25			28 ⁴⁾
		≥ 74	≥ 37	60/100, 80/150, 120/200 or 160/300	≥ 25	-		
		≥ 84	≥ 42	80/100, 100/150, 160/200 or 200/300	≥ 30	-		
		≥ 64	≥ 32	10 or 20 mm WF	≥ 20	12 ³⁾	≤ 3 / 2	20 ⁴⁾
		≥ 64	≥ 32	20/100, 30/150, 40/200 or 60/300	≥ 20			-
		≥ 74	≥ 37	40/100, 50/150, 80/200 or 100/300	≥ 25			-
		≥ 84	≥ 42	60/100, 80/150, 120/200 or 160/300	≥ 30			-
		≥ 84	≥ 42	10 or 20 mm WF	≥ 30	12 ³⁾	≤ 4 / 3	20 ⁴⁾
≥ 84	≥ 42	20/100, 30/150, 40/200 or 60/300	≥ 30	-				
F235.de Knauf thin-layer heating screed on insulation layer on heavy-duty acoustic infill (30 mm) with covering board (9.5 mm GKB)								
	10	≥ 74	≥ 37	TP-GP 12-1	≥ 25	12 ³⁾	≤ 2 / 1	Footfall sound pressure level $L_{n,w,P}$ in dB 39.1 ⁶⁾

- 1) Absolute values, not nominal thicknesses acc. to DIN 18560, lowest value is minimum value
- 2) Compressive stress with 10 % compression (DEO)
- 3) For other heights of the system board the total thickness details and weight of the screed must be adapted accordingly.
- 4) Test values or derived from tests

- 5) Additional possible insulation layer under TP-GP 12-1: 20/100, 30/150 or 40/200
- 6) Tested with 240 mm insulation material between the joists of the wood joist ceiling as well as a subceiling consisting of 1x 12.5 mm Knauf Silent-board on wood frame with Damping Universal Brackets (see also flyer [Heavy-duty acoustic infill F47.de \(German only\)](#)).

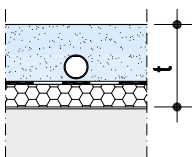
Note Requirements for the insulation layer see page 3.

Knauf thin-layer heating screed on hollow cavity board

System	Pipe diameter mm	Screed weight kg/m ²	Construction thickness				Screed carrying capacity kN/m ² / kN	Reduction of impact sound level on solid ceiling Test value $\Delta L_{w,P}$ dB
			Minimum screed thickness t incl. heating system mm	Insulation layer under the hollow cavity board mm / kPa ²⁾ or product designation	Screed thickness over the tube ¹⁾ mm N 440	System panel height mm e.g. Uponor Klett Twinboard		
F225.de Knauf thin-layer heating screed on hollow cavity board (separating layer)								
	14/16	≥ 68/72	≥ 37/39	-	≥ 20	3 ³⁾	≤ 3 / 2	-
		≥ 78/82	≥ 42/44		≥ 25		≤ 4 / 3	
On EPO-Leicht or S 400 Sprint 	14/16	≥ 68/72	≥ 37/39	-	≥ 20	3 ³⁾	≤ 2 / 1	-
F235.de Knauf thin-layer heating screed on hollow cavity board on insulation layer								
	14/16	≥ 78/82	≥ 42/44	TP-GP 12-1	≥ 25	3 ³⁾	≤ 2 / 1	28 ⁴⁾
	14/16	≥ 78/82	≥ 42/44	60/100, 80/150, 120/200 or 160/300	≥ 25			-
	14/16	≥ 68/72	≥ 37/39	10 or 20 mm WF	≥ 20	3 ³⁾	≤ 3 / 2	20 ⁴⁾
	14/16	≥ 68/72	≥ 37/39	20/100, 30/150, 40/200 or 60/300	≥ 20			-
	14/16	≥ 78/82	≥ 42/44	40/100, 50/150, 80/200 or 100/300	≥ 25			-

- 1) Absolute values, not nominal thicknesses acc. to DIN 18560, lowest value is minimum value
- 2) Compressive stress with 10 % compression (DEO)
- 3) For other heights of the system board the total thickness details must be adapted accordingly.
- 4) Test values or derived from tests

Knauf thin-layer heated screed on insulation board with Klett (hook and loop) coating

System	Pipe diameter mm	Screed weight kg/m ²	Construction thickness				Screed carrying capacity kN/m ² / kN	Reduction of impact sound level on solid ceiling Test value $\Delta L_{w,P}$ dB	
			Minimum screed thickness t incl. Klett (hook and loop) board mm	Possible additional insulation mm / kPa ²⁾ or product description	Thickness over the tube ¹⁾ mm				System board height mm
					FE Eco ³⁾	N 440			
F235.de Knauf thin-layer heating screed on insulation board with Klett (hook and loop) coating									
EPS DEO (100 kPa)  e.g. Uponor Klett board	14/16	≥ 68/72	≥ 49/51	10 or 20 mm WF	–	≥ 20	15	≤ 2 / 1	20 ⁴⁾
		≥ 68/72	≥ 49/51	40/100, 60/150, 80/200 or 120/300	–	≥ 20			–
		≥ 78/82	≥ 54/56	TP-GP 12-1	–	≥ 25	–	28 ⁴⁾	
		≥ 68/72	≥ 49/51	10 or 20 mm WF	–	≥ 20	15	≤ 3 / 2	20 ⁴⁾
		≥ 68/72	≥ 49/51	15/100, 25/150, 30/200 or 50/300	–	≥ 20			–
		≥ 68/72	≥ 49/51	–	–	≥ 20	15	≤ 4 / 3	–
		≥ 78/82	≥ 54/56	10 mm WF	≥ 25	≥ 25			20 ⁴⁾
		≥ 78/82	≥ 54/56	10/100, 20/200 or 30/300	≥ 25	≥ 25			–

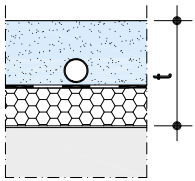
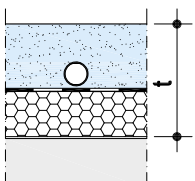
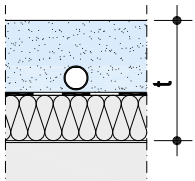
1) Absolute values, not nominal thicknesses acc. to DIN 18560, lowest value is minimum value

2) Compressive stress with 10 % compression (DEO)

3) FE 25 A can be used as alternative to FE Eco.

4) Test values or derived from tests

Knauf thin-layer heated screed on insulation board with Klett (hook and loop) coating

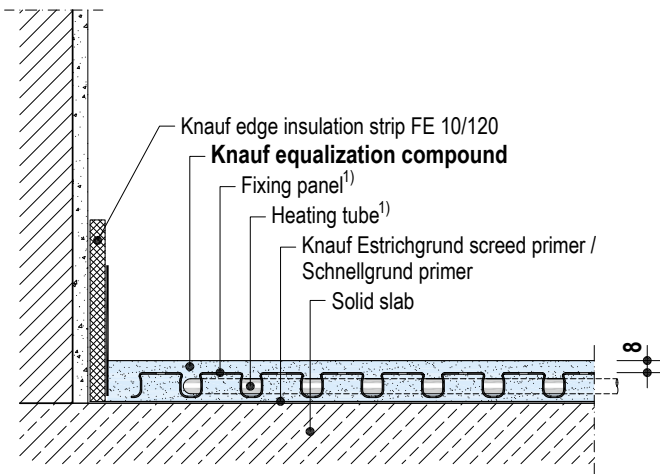
System	Pipe diameter mm	Screed weight kg/m ²	Construction thickness				Screed carrying capacity kN/m ² / kN	Reduction of impact sound level on solid ceiling Test value $\Delta L_{w,P}$ dB	
			Minimum screed thickness t incl. Klett (hook and loop) board mm	Possible additional insulation mm / kPa ²⁾ or product description	Thickness over the tube ¹⁾ mm	System board height mm			
F235.de Knauf thin-layer heating screed on insulation board with Klett (hook and loop) coating									
EPS DES 25-2 (30 MN/m ³)  e.g. Uponor Klett roll panel	14/16	≥ 78/82	≥ 64/66	40/100, 60/150, 80/200 or 120/300	≥ 25	–	25	≤ 2 / 1	22 ⁵⁾
EPS DES 30-2 (20 MN/m ³)  e.g. Uponor Klett roll panel	14/16	≥ 78/82	≥ 69/71	40/100, 60/150, 80/200 or 120/300	≥ 25	–	30	≤ 2 / 1	25 ⁵⁾
MW DES 30-3 (20 MN/m ³)  e.g. Uponor Klett Panel Silent	14/16	≥ 88/92	≥ 74/76	40/100, 60/150, 80/200 or 120/300	≥ 30	–	30	≤ 2 / 1	29 ⁴⁾

1) Absolute values, not nominal thicknesses acc. to DIN 18560, lowest value is minimum value
 2) Compressive stress with 10 % compression (DEO)
 3) FE 25 A can be used as alternative to FE Eco.
 4) Test values or derived from tests
 5) Values acc. to DIN 4109-34 07.2016

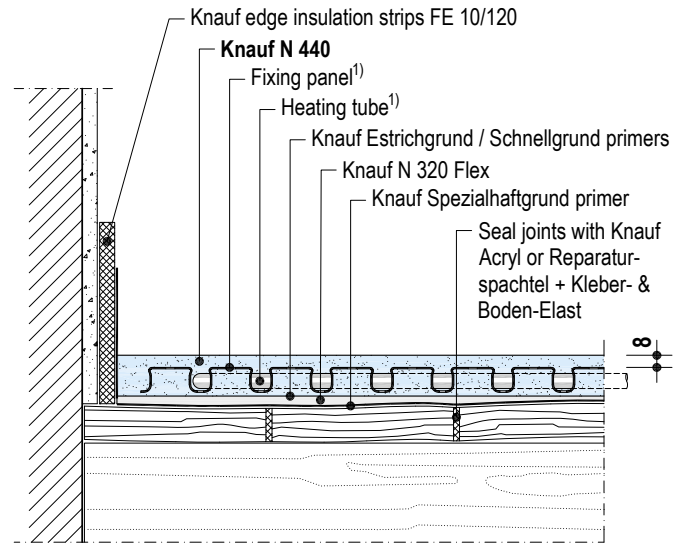
Details

Scale 1:5 | Dimensions in mm

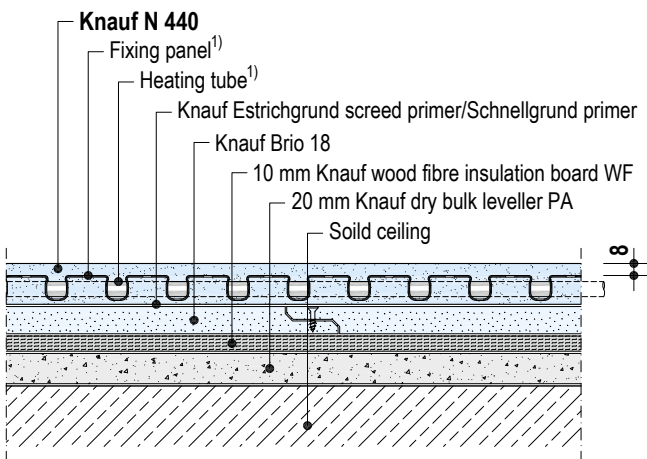
F215.de-V1 Bonded – solid slab



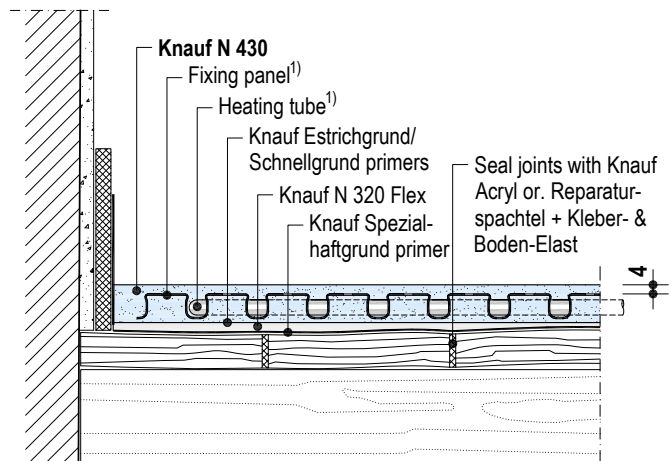
F215.de-V2 Bonded – wood joist ceiling



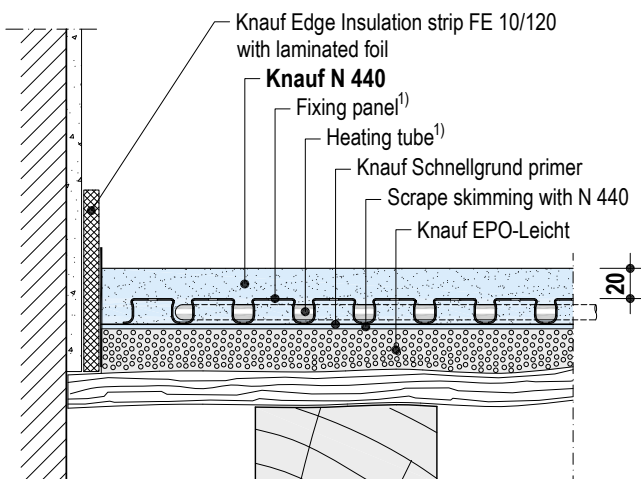
F215.de-V4 Bonded – on pre-fab floor screed Knauf Brio



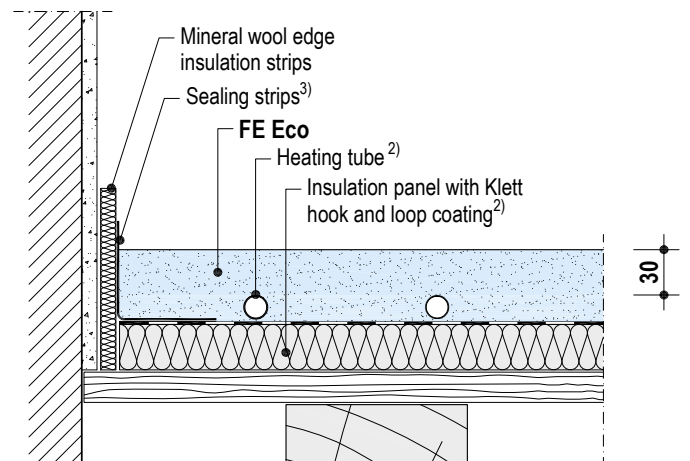
F215.de-V5 Bonded – wood joist ceiling



F215.de-V6 Bonded – on EPO Leicht light levelling mortar



F235.de-V10 On insulation panel with Klett (hook and loop) coating – wood joist ceiling



1) e.g. Uponor Minitec

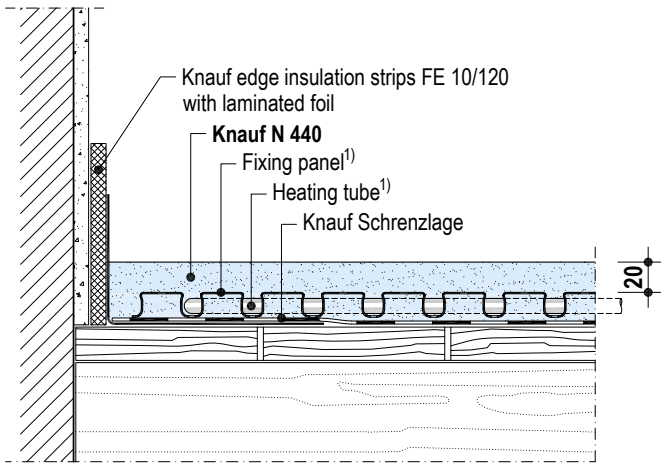
2) e.g. Uponor Klett Panel Silent incl. heating tube

3) e.g. Uponor

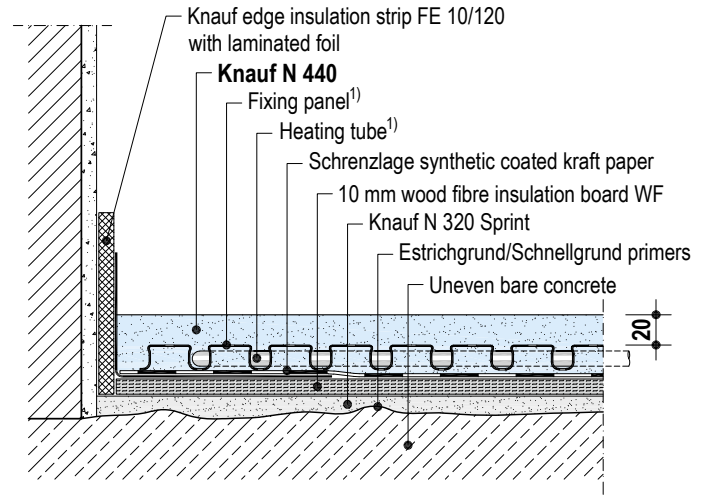
Details

Scale 1:5 | Dimensions in mm

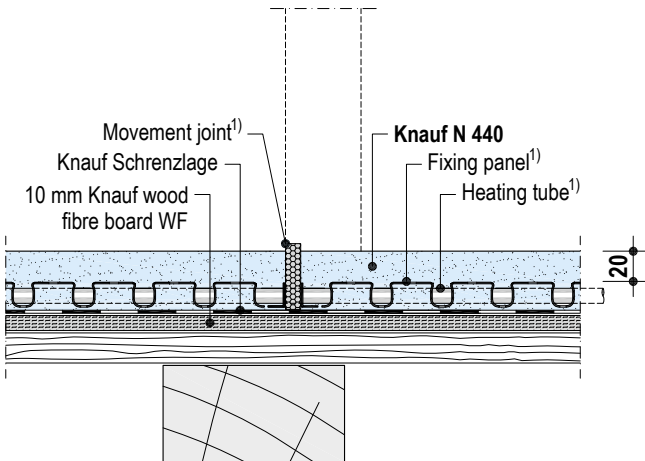
F225.de-V2 On separating layer – wood joist ceiling



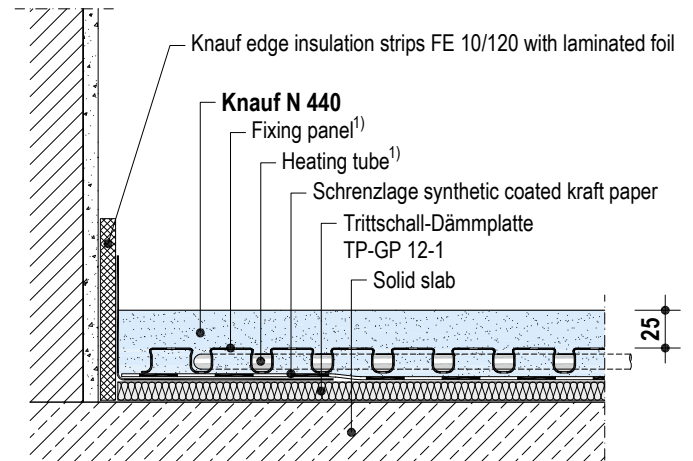
F235.de-V1 On insulation layer WF – solid slab



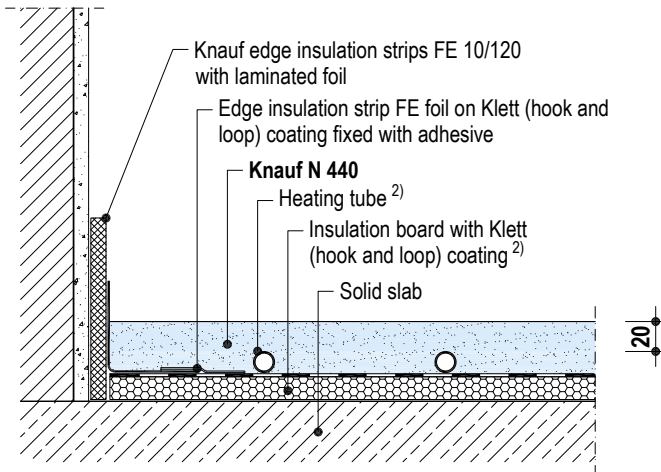
F235.de-V3 On insulation layer WF – movement joint in the doorway



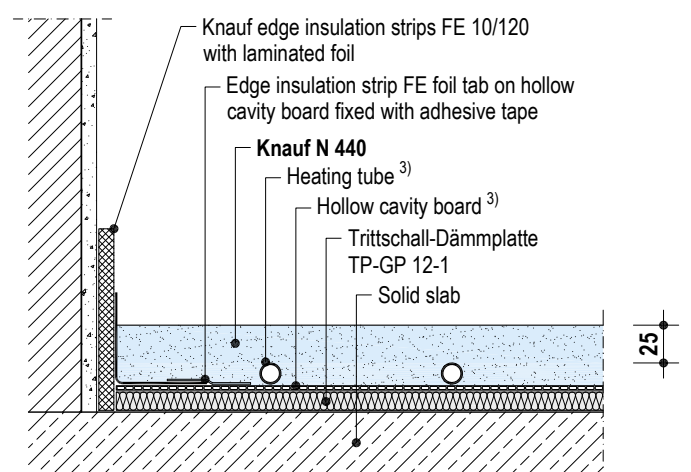
F235.de-V4 On insulation layer MW – solid slab



F235.de-V6 On insulation board with Klett (hook and loop) coating – solid ceiling



F235.de-V5 On hollow cavity board on insulation layer – solid ceiling



1) e.g. Uponor minitec

2) e.g. Uponor Klett board EPS DEO incl. heating tube

3) e.g. Uponor Klett Twinboard incl. heating tube

Bonded

For the application of thin-layer bonded constructions without integrated underfloor heating systems, the specifications of the respective product data sheets and the brochure [F42.de Always on the straight and level](#) apply.

EPO-Leicht light levelling mortar as a substrate

The surface of the Knauf EPO-Leicht light levelling mortar must have a thin layer of stiffly mixed N 440 applied, so that the pores are sealed and the loose Knauf EPO-Perl is bonded. After about 5 hours when the filled layer can be walked on, apply N 440 in a layer thickness of ≥ 20 mm.

Knauf pre-fab floor screed Brio as a substrate

Apply Knauf Brio acc. to field of application, see system data sheet [F12.de Knauf Pre-fab Floor Screed](#). Prime the Knauf Brio surface with Knauf Estrichgrund (diluted 1:1 with water) or Knauf Schnellgrund (undiluted).

On a separating layer and insulating layer

Substrate

The substrate must be stable and dry and exhibit a firm, clean surface. The insulation panels should make full contact with the substrate along the entire area (evenness acc. to DIN 18202:2019-07, table 3, line 3).

If the substrate does not offer the required evenness, level as required. Knauf filling compounds or Knauf equalization compounds can be used to equalize the substrate. Rigid light levelling mortars such as EPO-Leicht or S 400 Sprint can be used as substrate equalizers if the application of screed on an insulation layer is intended. (System "F239.de Knauf equalization compound on insulation layer" on page 7).

In case of rising damp (e.g. for concrete slabs making contact with the soil) acc. to DIN 18533-1, use Knauf Katja Sprint Abdichtungsbahn sealing membrane. In case of application as a separating layer, apply (Knauf Schrenzlage) between damp-proof membrane and screed.

Edge and movement joints

Connect the edge insulation strips to the wall and rising constructional components to ensure safe separation and sealing. Arrange the foil strips of the edge insulation strip under the Knauf Schrenzlage synthetic coated kraft paper.

The arrangement of movement joints in doorways is recommended.

Insulation layer

Apply the insulation materials joint on joint and apply as a bonded layer. Avoid cavities. Insulation material type and thickness are dependent on the function of the screed and must be selected in accordance with the tables (see page 7).

Insulation materials must comply with the valid standards (EN 13162 to EN 13171). Cover the insulation layer or the substrate with Knauf Schrenzlage synthetic coated kraft paper with an overlap (joint overlap) of ≥ 8 cm.

Equalization layer

N 440 can be used for application on separating and insulating layers. Take the minimum thicknesses of the screed from the tables (see page 7).

Bonded

Note

Application as a bonded construction is not possible on mastic asphalt screed. Application on OSB boards only on request.

Substrate

The substrate must be stable and crack-free and exhibit a firm, clean surface (free of grease and cleaning agents). Apply synthetic resin to seal the cracks if required. If the substrate does not offer the required evenness, level as required. For larger unevenness, the substrate can be levelled with Knauf EPO-Leicht, see drawing F215.de-V6.

The residual moisture of existing substrates may not exceed the following values:

- Cementitious screed 2.0 CM %
- Calcium sulphate screed 0.5 CM %

Substrate preparation

Normally absorbent substrates

Prime by applying a double coating of Knauf Estrichgrund screed primer (diluted 1:1 with water) or Knauf Schnellgrund rapid primer (undiluted). Allow sufficient drying time for the primer between the working steps and adhesive bonding of the fixing panels (at least 12 hours with Knauf Estrichgrund screed primer and at least 2 hours with Knauf Schnellgrund rapid primer).

Highly absorbent substrates (e.g. calcium sulphate screeds, calcium sulphate flowing screed), on non-absorbent substrates (e.g. tiles) and mixed substrates

The substrate is primed twice with Knauf FE-Imprägnierung impregnation primer.

- 1st coat approx. 250 g/m²
- 2nd coat approx. 100 g/m² with interspersing of coarse, dry sand (e.g. 0.5 – 1.2 mm grain), approx. 1.5 kg/m².

The required hardening time between impregnating coats and equalization compound application is approx. 24 hours respectively.

In case of rising damp as with soil-contacted concrete slabs, apply Knauf FE-Abdichtung sealing primer as a bonding agent.

Wooden substrates

Wooden substrates must be dimensionally stable and firmly bonded to the substrate. They must be protected against moisture and must be free of vermin, wax, lacquers, care products or similar. Seal smaller joints with Knauf Acryl¹⁾, larger joints with Knauf Reparaturspachtel¹⁾ (mixed with Knauf Kleber- & Boden-Elast¹⁾). Subsequently prime the wooden substrate with Knauf Spezialhaftgrund primer and fill with N 320 Flex or N 410 Flex up to a thickness of at least 3 mm.

Prime the dried filler twice with Knauf Estrichgrund screed primer (diluted 1:1 with water) or once with Knauf Schnellgrund primer (undiluted).

EPO-Leicht light levelling mortar as a substrate

The surface of the Knauf EPO-Leicht light levelling mortar must have a thin layer of stiffly mixed N 440 applied, so that the pores are sealed and the loose Knauf EPO-Perl is bonded.

Apply a primer coat of Knauf Schnellgrund after the scrape skimming has dried and it is hard enough to walk on. After a further 2 hours, the fixing panel (e.g. Uponor Minitec) can be glued on and a layer thickness of at least 20 mm of N 440 can be poured on over the fixing panel. The fixing panel must be adequately adhesively bonded to the scrape skimming to prevent it from floating after the equalization compound is poured.

Knauf pre-fab floor screed Brio as a substrate

Apply Knauf Brio to suit the field of application, see system data sheet [F12.de Knauf Pre-fab Floor Screed](#). Prime the Knauf Brio surface with Knauf Estrichgrund (diluted 1:1 with water) or Knauf Schnellgrund (undiluted).

Edge and movement joints

Generally, the joints in the substrate should be continued through the entire construction.

Subsequently, no further joints are required with bonded constructions on concrete slabs or on bonded screeds. Connections to walls must be protected against the absorption of moisture from the equalization compound by edge insulation strips, sealing with tape or application of primer (possible with solid walls).

Intended in case of a bonded construction on floating screed, on screed laid on a separating layer or on wooden substrate edge insulation strips as well as movement joints in door openings and in long or angled rooms (unfavourable room geometry). If there are no dummy joints in the existing screed they need to be cut.

Further recommendations can be found in the Code of Practice No. 5 "Joints in flowing calcium sulphate screeds" (IGE/VDPM).

The manufacturers of thin layer underfloor heating systems offer system-relevant edge insulating strips and control joints.

Installation of the underfloor heating

The underfloor heating system must provide a sufficient bond between the equalization compound and the substrate (e.g. Uponor Minitec). The installation of the underfloor heating is applied in accordance with the manufacturer's instructions.

It is recommended that the underfloor heating is applied to the entire area (no cold zones).

Suitable equalization compounds

Substrate	Equalization compound		
	N 440	N 340 ²⁾	N 430
Concrete	●	●	●
Wooden substrates	●	–	●
Calcium sulphate screed	●	●	●
Cementitious screed	●	●	●
Pre-fab floor screed Brio	●	–	–
Tiling surface	●	●	●
EPO-Leicht light levelling mortar	●	–	–

Application of equalization compounds, see page 19

1) *Knauf Bauprodukte GmbH & Co. KG*

2) *Recommended maximum screed thickness including heating system 32 mm; hairline cracks can form on the surface at higher screed thickness.*

On a separating layer or insulation layer

Note	Only application on an insulation layer and not a separating layer is possible on mastic asphalt screed.
-------------	---

Substrate

The substrate must be stable and dry and exhibit a firm, clean surface. Full contact with the underfloor heating system fixing panels or insulation must be guaranteed along the entire area (evenness acc. to DIN 18202:2019-07, table 3, line 3).

If the substrate does not offer the required evenness, level as required. Levelling compounds, equalization compounds, rigid light levelling mortars such as Knauf EPO-Leicht or S 400 Sprint can be used for this purpose. With rising damp (e.g. for concrete slabs making contact with the soil) acc. to DIN 18533-1, use Knauf Katja Sprint Abdichtungsbahn sealing membrane.

Edge joints

Connect the edge insulation strips to the wall and rising constructional components to ensure safe separation and sealing.

Insulation layer

Apply the insulation materials joint on joint and apply as a bonded layer. Avoid cavities. Insulation material type and thickness are dependent on the function of the screed and must be selected in accordance with the tables (see from page 8).

Insulation materials must comply with the valid standards (EN 13162 to EN 13171).

In case of the use of knobbed foil sheet (open knobs, e.g. Unopor Minitec), lay on the insulation layer or on the Knauf Schrenzlage substrate with an overlap between sheets (joint overlap) ≥ 8 cm onto which the underfloor heating element is glued. Pull out the foil on the edge insulation strip onto the insulation beforehand.

For the other heating systems listed in the tables the system element is placed on the substrate or the insulation layer. The foil of the edge insulation strips has to be sealed so that none of the mortar can contact the substrate of the wall.

Movement joints

Movement joints are required at door openings. Further recommendations can be found in the Code of Practice No. 5 "Joints in flowing calcium sulphate screeds" (IGE/VDPM).

Installation of the underfloor heating

The installation of the underfloor heating is applied in accordance with the manufacturer's instructions. When applying the heating tubes on self-adhesive knobbed foil sheet, the fixing panel including the Schrenzlage synthetic coated kraft paper may lift up in the corners.

When screed is applied, the fixing panel is pushed back downwards due to the weight of the equalization compound. The underfloor heating should be applied to the entire area (no cold zones). Screed bays with several heating zones must be heated uniformly.

Equalization compounds

The following equalization compounds can be used acc. to the specifications in the table from page 9 onwards.

- N 440
- FE Eco or FE 25 A tempo (on insulation panels with Klett (hook and loop) coating (from page 12 and page 13))

Application of equalization compounds

Note The tubes for the underfloor heating system must be filled with water and pushed down.

After the substrate has been prepared according to the previous descriptions, apply Knauf equalization compound at the required layer thickness acc. to the table (see from page 7 and following).

Mixing

Use a clean mixing vessel. Mix Knauf equalization compound into clear water with a putty mixer, avoiding air inclusion as far as possible, until a lump-free, uniform and flowing consistence is achieved.

Consistence for machine application

Adjust a suitable consistence using the flow test determined with a 1.3 l checking tin, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time. With larger layer thickness's the slump-flow or the water quantity should be reduced if permitted by the levelling characteristics.

Equalization compound	Machine
N 440	PFT G 4 mixing pump + ROTOMIX D pump or FERRO 50
N 340	
N 430	PFT G 4 mixing pump + ROTOMIX disc or agitator PFT RITMO L plus mixing pump + agitator PFT LOTUS XS

Application

Evenly spread small amounts of mortar mixed with a putty mixer directly out of the mixing vessel. In case of machine application, spread material meandering with the hosepipe until the desired height is achieved. Avoid long machine stops and observe the filling of the funnel, while ensuring continuous material flow and constant mortar consistence.

In order to ensure in case of self-adhesive knobbed foil sheet (open knobs, e.g. Unopor Minitec) that the mortar can flow well into the small clip knobs on the fixing panel, it is recommended that the corresponding Knauf equalization compound is worked intensively during or immediately after screed application with a screed broom and subsequently levelled with a dappling bar.

Application temperature / climate

Do not apply at room or substrate temperatures below approx. +5°C (with N 340 below +10 °C).

Protect equalization compound surfaces for 24 hours against direct sunlight and draughts. Low temperatures delay setting, higher temperatures speed it up (take the temperature of the mixing water into account).

Application time

The mixed equalization compound must be applied within approx. 30 minutes, the introduced mortar must be levelled within approx. 10 minutes. With machine application, the machine and hoses must be cleaned within 30 minutes (for N 430 within 20 minutes) at the latest after machine standstill.

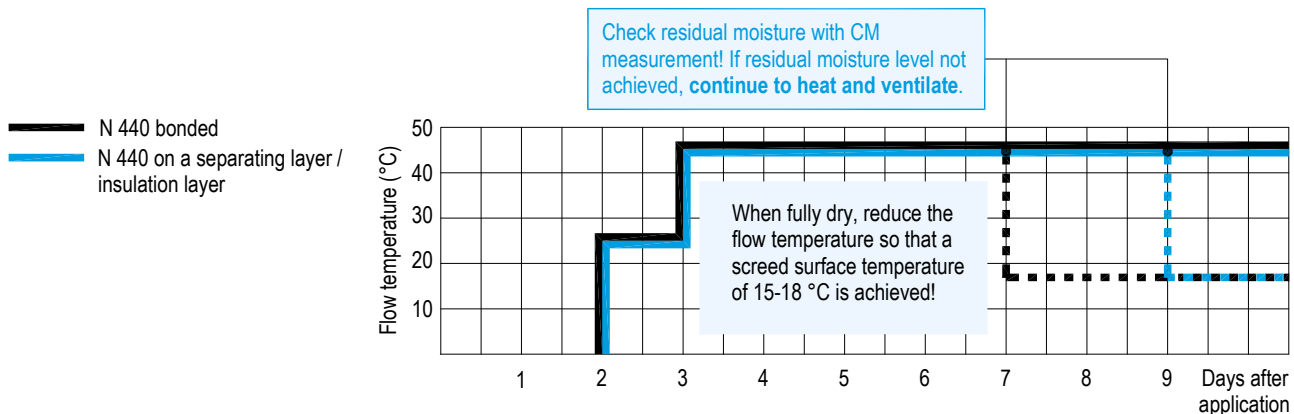
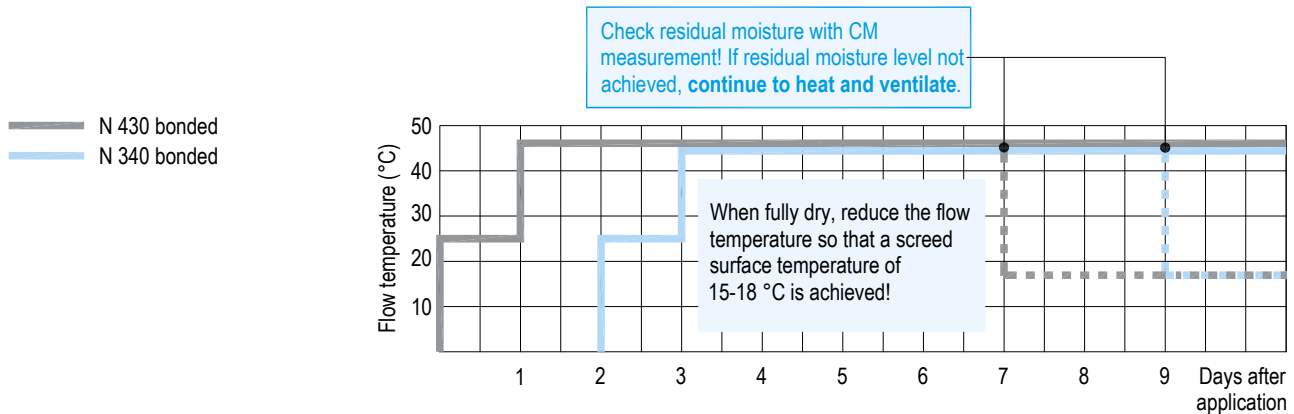
Drying – coverage ready heating

Prior to further floor covering being applied, Knauf equalization compound requires dry heating (ready for coverage).

Heated constructions have to be heated until dry to suit the applied equalization compound and the construction type in accordance with the heating up graph with a max. flow temperature of 45 °C. With Knauf N 430, heat up can commence as soon as it is hard enough for foot traffic. Heat and ventilate until coverage readiness is achieved. Residual moisture must be determined with the CM device over the entire cross-section by sampling.

A heating up protocol must be filled out (see template page 21).

Heating up graph



Coverage ready values	Cover type	Unheated CM-%	Heated CM-%
N 440 / N 430	Vapour permeable / vapour-retardant	1.0	0.5
	Vapour-proof as well as parquet	0.5	0.5
N 340	Vapour permeable / vapour-retardant	3.0	2.0
	Vapour-proof as well as parquet	2.5	2.0

Note For details on coverage ready heating with FE Eco and FE 25 A tempo, refer to the technical brochure [F20.de Knauf Floor Systems](https://www.knauf-floor.com/F20.de), chapter Drying.

Knauf thin layer heating floor screed system, underfloor heating, manufactured by
Heating protocol for coverage ready heating

- N 430
- N 440
- N 340

Investor:

Building site:

Heating engineer:

Site manager:

Fill in every change of flow temperature (warm water heating) during the heating up process and during reduction of temperature exactly to 5 °C. Every drying test should be documented.

Heating system:

Screed applied on:

Average screed thickness: mm

Coverage of heating element:

Min.: mm **Max.:** mm

Heat up (coverage ready heating):

Date	Flow temperature in °C	Signature

Preliminary drying test
(e.g. foil test¹⁾)

Date	Dry yes/no	Signature

Drying test
(CM measurement)

Date	Residual moisture in %	Signature

Reduction of the flow temperature

Date	Flow temperature in °C	Signature

Coverage ready heating completed

Date	Outdoor temperature in °C	Signature

1) Does not replace CM measurement before laying floor covering.

Please keep this document!

Place / Date

Signature (Site manager)

Application of floor covering

In case of self-adhesive knobbed foil sheet (open knobs, e.g. Unopor Minitec), it is not possible to exclude that holes or recesses are formed on the screed surface over the knobs, particularly with a low coverage of the fixing panel (bonded construction). Should they interfere with the subsequent covering application, e.g. with textiles or elastic covering, they can be eliminated by filling them with Knauf N 410 when a primer (e.g. Knauf Estrichgrund, diluted 1:1 with water) is applied beforehand.

Bonded construction (heated or unheated)

If Knauf equalization compound is bonded to the substrate, it can be covered by all conventional coverings (tiles, natural stone, parquet, elastic and textile coverings).

Construction on a separating layer / insulation layer (heated or unheated)

Ceramic tiles can be laid with the application of N 440 on a separating layer/ insulation layer. Permissible tile formats according to the table below.

Parquet can be applied as a mosaic parquet (chequered design) or multi-level parquet. Other parquet types on request. There are no limitations for conventional textile and elastic coverings.

Further details are available in the Code of Practice from the ZDB "Fliesen und Platten, Naturwerkstein und Betonwerkstein aus calciumsulfatgebundenen Estrichen" (Available in German only - Tiles and boards, natural stone and artificial stone on calcium sulphate bound screeds).

Unheated and heated constructions with Knauf equalization compounds	Maximum permissible tile formats ²⁾	
	Ceramic tiles	Natural stone tiles
Bonded	Unrestricted ¹⁾	Unrestricted ¹⁾
On separating layer	≤ 1200 mm	≤ 800 mm
On insulation layer WF or EPS DEO	≤ 1200 mm	≤ 800 mm
On insulation layer MW (TP GP 12-1)	≤ 600 mm	≤ 400 mm

1) Unrestricted tile size or dependent on the deformation behaviour of the substrate

2) According to the German ZDB code of practice "Großformatige keramische Fliesen und Platten - Large format tiles and boards" (German only), stress reduction measures may be necessary with these formats (Decoupling systems, joints between bays, etc.) e.g. Knauf Bauprodukte: Abdichtungs- und Entkopplungsbahn. Furthermore, with calcium sulphate substrates (N 440, N 430, FE Eco, FE 25 A tempo) a barrier preliminary coating or a declared quick drying adhesive mortar should be used for this purpose.

Note	For details on laying the floor covering with FE Eco and FE 25 A tempo, refer to the technical brochure F20.de Knauf Floor Systems , chapter Application of floor covering.
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Material requirement

Description		Unit	Quantity as average value		
			Application Bonded	On separating layer	On insulation layer
<i>Material not provided by Knauf = printed in italics</i>					
Preparation of substrate per m ² floor without addition for waste					
<i>Alternative</i>	Normally absorbent substrates Estrichgrund (dilute 1:1 with water), apply a double coat	g	approx. 250	–	–
	Schnellgrund (undiluted), apply a double coat	g	approx. 250	–	–
	Highly absorbent substrates FE-Imprägnierung, apply a double coat	g	approx. 350	–	–
	+ silica sand (1 – 2 mm)	kg	approx. 1.5	–	–
	Wooden substrate Knauf Acryl ¹⁾	g	as required	–	–
	Knauf Reparaturspachtel ¹⁾	g	as required	–	–
	+ Knauf Kleber- & Boden-Elast ¹⁾	g	as required	–	–
	Knauf Spezialhaftgrund floor dispersion primer	g	approx. 70	–	–
	+ Knauf N 320 Flex	kg	approx. 5	–	–
	Schrenzlage (synthetic coated kraft paper)	m ²	–	1.1	1.1
Substrate levelling per m ² floor without addition for waste					
Per cm layer thickness					
	EPO-Leicht light levelling mortar				
	▪ EPO-Perl	l	10	10	10
	▪ FE-Imprägnierung impregnation agent	kg	0.17	0.17	0.17
	Heavy-duty acoustic infill	kg	–	–	approx. 16.5
	S 400 Sprint	l	–	approx. 10	approx. 10
Insulation layer per m ² floor without addition for waste					
	Knauf Holzfaserdämmplatte WF wood fibre board 10 mm	m ²	–	–	1.0
	Knauf Insulation Trittschalldämmplatte TP-GP 12-1 ²⁾	m ²	–	–	1.0
	<i>Other insulation panels acc. to table</i>	m ²	–	–	1.0
Edge and movement joints per m joint without addition for waste					
	Edge insulation strips FE 10/120 or system component	m	1	–	–
<i>Alternative</i>	Mineral wool edge insulation strips	m	–	1	1
	Movement joints L profile 50/30 or system component	m	1	1	1
	Movement joint tape 10/70 or system component	m	1	1	1
Equalization compounds per cm layer thickness and m ² floor without addition for waste					
	N 430 (dry mortar)	kg	approx. 16	–	–
	N 340 (dry mortar)	kg	approx. 16	–	–
	N 440 (dry mortar)	kg	approx. 18	approx. 18	approx. 18

1) Knauf Bauprodukte GmbH & Co. KG

2) Knauf Insulation GmbH

Information on sustainability

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

In Germany the following certification systems are of particular relevance:

- DGNB System
German seal of approval for environmentally sustainable building from the DGNB (German association for environmentally sustainable building)
- BNB
(Bewertungssystem Nachhaltiges Bauen - Quality rating system for environmentally sustainable building)
- LEED
(Leadership in Energy and Environmental Design).

Knauf products and Knauf Thin-Layer Screed Systems can positively influence many of these criteria.

DGNB/BNB

Ecological quality

- Criterion: Risks for the local environment
Gypsum as an ecological material. 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: Building related life-cycle costs
Reduction of application costs with a cost-efficient retrofitting solution

Sociocultural and functional quality

- Criterion: Thermal comfort
Comfortable room climate with energy efficient underfloor heating

LEED

Materials and resources

- Credit: Regional Materials
Short transport routes provided by the extensive network of Knauf manufacturing facilities

Detailed information on request



Videos for Knauf systems and products can be found under the following link:

youtube.com/knauf



The iPad App Knauf Infothek 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

Knauf Direct

Technical Advisory Service:

▶ knauf-direkt@knauf.de

▶ www.knauf.de

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