Floor Systems | 06/2014

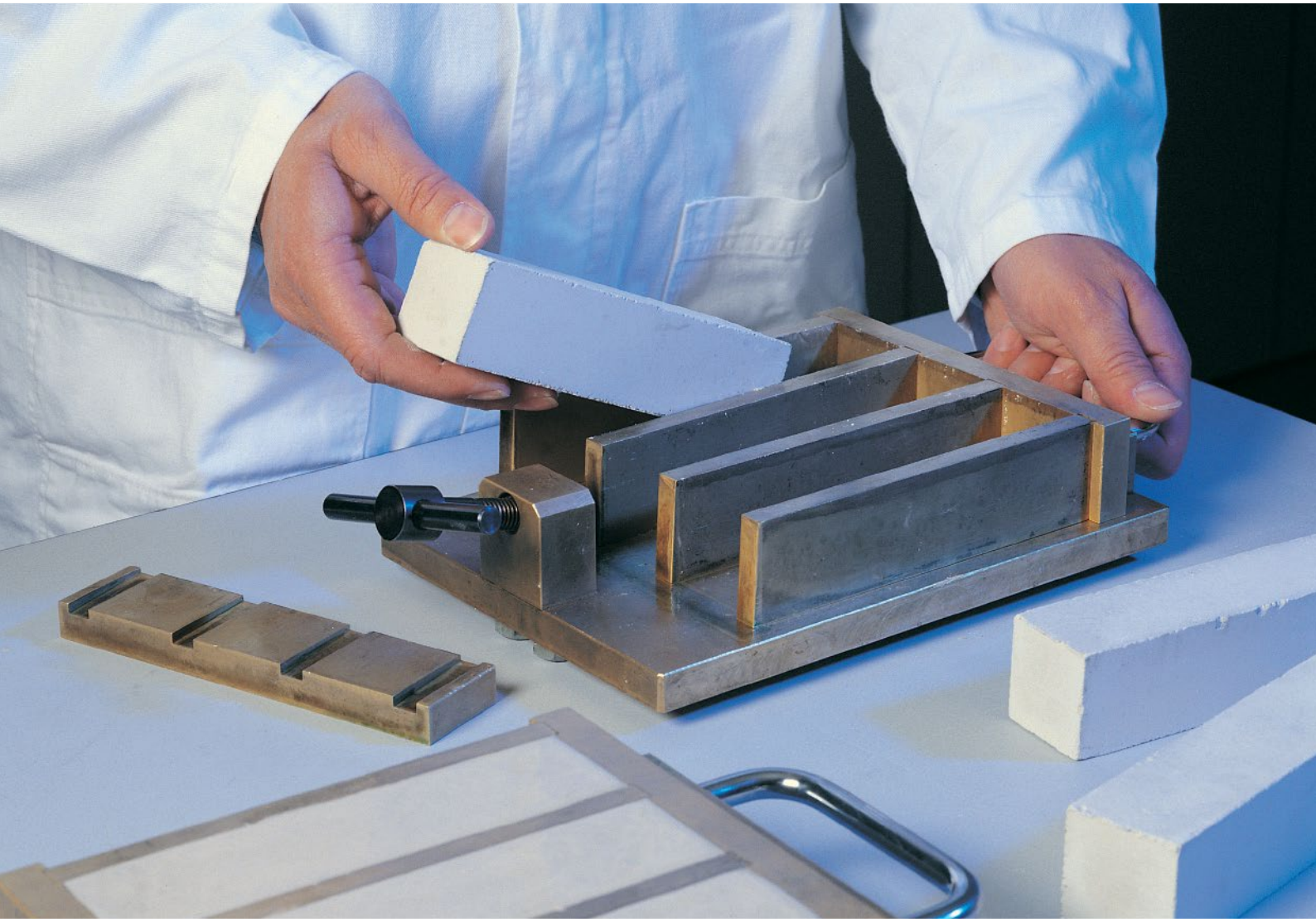
Knauf Floor Systems

Construction and application technology

Note on English translation / Hinweise zur englischen Fassung

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

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



Knauf screed know-how

The reference guide

The floor, as one of the most heavily stressed constructional components, requires careful planning and application. Difficult problem areas in flooring design can be permanently solved when state-of-the-art and innovative systems are used.
Knauf provides both premium building materials and smart systems, which always offer the optimum solution even in challenging cases and applications. The extensive product range, which is only offered by Knauf in flooring, provides the opportunity to ensure optimum design while considering the complex challenges involved with: Flowing screeds, pre-fab floor screeds, hollow floors for dry and wet application, raised access floors, levelling compounds, seals, bonding agents, etc.

Flowing screed is one of the most important components here. The special binding agent properties offer you almost shrinkage-free, high strength screeds: The decisive factors for a long and trouble-free service life.
As the manufacturer of the binders required for production, Knauf provides high-quality flowing screeds. They comply with the requirements of DIN EN 13813 and bear the CE-Mark. The sustainable production protects the environment and conserves precious resources.

This guide provides valuable information for the planning and application of screed constructions with flowing screeds, levelling compounds and special screeds. It incorporates more than 30 years of product experience and the associated raw materials, constructions and building physics.

Tender specifications and information on pre-fab floor screed and dry hollow floors can be found on the Internet (German only) at:
www.knauf.de
www.ausschreibungscenter.de
www.knauf-integral.de

Contents

Knauf flowing screeds feature good characteristics such as:

- Flexural and compressive strength, dimensionally stable during usage
- Ecologically highly recommended
- Suitable for common coverings and epoxy resin coatings
- High thermal conductivity (with heated floor screeds)
- Non-combustible

Technological properties such as:

- High pouring capacities with suitable machinery systems with low levels of physical effort (pouring capacity 60–120 l/min)
- Rapid, volume proven hardening (joint free or minimal joint requirement application)
- Surface ready to use (even, free from deposits and sinter layers)
- Quickly available for foot traffic (short technological pauses)

Product and system overview, selection aid

The complete system for flooring

Knauf flowing screeds FE 50 Largo, FE 80 Allegro, FE 25 A tempo, FE Fortissimo, FE Sprint and FE Eco are factory-mixed dry mortars, only requiring mixing with clean water on the building site. They are flowing screeds on a calcium sulphate basis ($CaSO_4$ basis) and consist of anhydrite, special gypsums, flow agents and aggregates, such as particulate natural anhydrite, limestone or silica sand.

Knauf flowing screeds are subject to continuous and ongoing control in the factory as well as in the central laboratory of Knauf Gips KG to ensure their consistent high quality. Furthermore, the quality of the flowing screed as well as the company-internal quality control procedures and processes are monitored by independent and recognized test institutes.

Knauf flowing screeds can easily fulfil more complex demands placed on flooring, whereby the constructional design of the screed as a bonded screed, screed on a separating layer, screed on insulating layers and heated floor screeds can be specifically targeted.

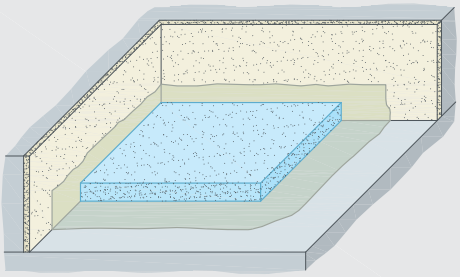
The properties of Knauf flowing screeds are designed for use in residential buildings, public buildings and commercial buildings (trade and light industry).

Knauf flowing screeds are not suitable for:

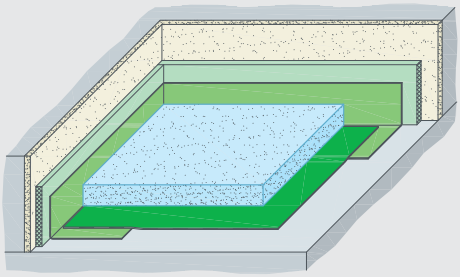
- Commercial or public wet areas (large-scale kitchens, public and private swimming pools and shower rooms)
- Outdoor application.

► Good to know

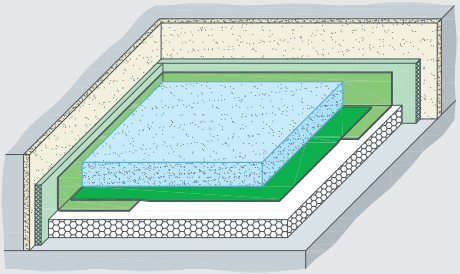
Knauf provides a complete system from sealing right up to the top covering. The materials required for floor design are presented in the product overviews at the end of this brochure.



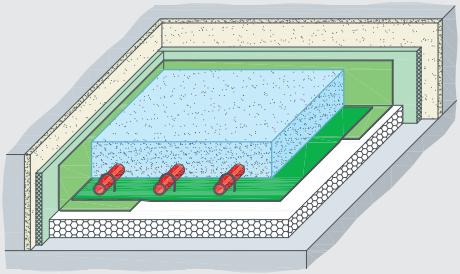
Bonded screed



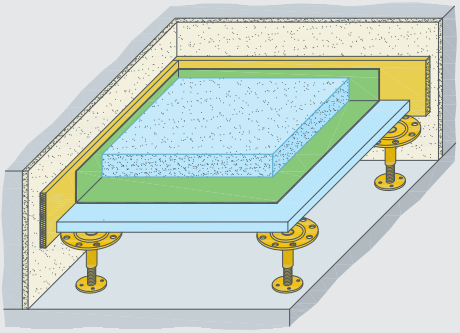
Screed on a separating layer



Screed on an insulating layer



Heating floor screed



Raised access floors

Screed construction types

Overview

Dependent on the constructional and building physical requirements as well as the corresponding application conditions, Knauf screeds can be applied as

- Bonded screed
- Screed on a separating layer
- Screed on an insulating layer

Knauf screeds can be applied in different variants. They are illustrated on this page.

Selection of the right Knauf screed system to suit your requirements

Requirement	Bonded screed- page 20	Screed on a separating layer page 22	Screed on an Insulation layer page 25	**Heating floor** screed page 32	Raised access **floors** page 36	Pre-fab **floor screed** DB F12.de
Substrate						
Solid ceiling, stable surface	+	+	+	+	+	+
Solid ceiling, surface not stable (e.g. crumbles or oily)	-	+	+	+	+	+
Wood joist ceiling with planks	o	+	+	+	o	+
Wood joist ceiling without planks	-	-	-	-	-	-
Building physics						
Fire resistance	-	-	o	-	+	+
With sealing	+	+	+	+	+	+
Sound insulation	-	-	+	+	+	+
Thermal insulation	-	-	+	+	o	+
Constructional						
Few joints	+	+	+	o	+	+
Installation level	-	-	o	o	+	o
Underfloor heating	+	+	-	+	o	+

+ = *the right solution*
o = *suitable under certain circumstances*
- = *not suitable*

Selection aid for screed constructions

New buildings / refurbishment

The selection of the correct Knauf screed system and its components depends on the stipulated requirements and constructional constraints.
The construction is generally determined by the requirements placed on the building physical and technical properties, such as such as sound insulation and fire resistance, thermal insulation and load capacity as well as the substrate properties and functional requirements (e.g. underfloor heating, built-ins, etc.)
When selecting an adequate material to suit the application at hand, there are also demands, such as the rapid progress of the building phase or moisture level in the building and minimization of the necessary constructional heights that require primary consideration.

The requirements posed by different systems and products must be considered depending on whether you are constructing a floor system in a new building, or whether you are engaged in renovation or an upgrade to a building.
In new buildings, the primary focus is on the comfort relating to footfall sound insulation, thermal insulation and underfloor heating as well as the problems associated with the high level of built-ins. The latter requires an equalization layer to encompass the ducting and tubing and a level surface on which to place the subsequent layers.

Old buildings also frequently present further challenging conditions: Limited heights, low ceiling loading capacity, very uneven substrates, a short construction period.
Should further demands be made on the sound insulation and fire resistance as well as the desire for underfloor heating, special constructions are required, which can be safely and permanently realized using state-of-the-art building materials. These building materials include, for example, Fertigteilestrich (pre-fab floor screed) Brio, light levelling mortar Schubo, EPO Leicht as well as Nivelliererstrich 425 (levelling screed) combined with thin layer underfloor heating.

Selection of the right Knauf product to suit your requirements

	Ready for covering		
	Very rapidly 1 day	Quickly 7-14 days	Normal 3-6 weeks
Thickness	**System solutions**		
Thin: up to 10 mm	LEVELLING COMPOUNDS ▶ Knauf Schnellspachtel 300 (fast leveller) ▶ Knauf Fließspachtel 315 (floor compound) ▶ Knauf Nivellierspachtel 415 (floor levelling compound) ▶ Knauf Alphadur 430 (up to 30 mm) ▶ Knauf Faserflex		
Medium: up to 35 mm	PRE-FAB FLOOR SCREED ▶ Knauf Brio * FAST DRYING SCREED ▶ Knauf Stretto (epoxy-resin based) ▶ Knauf Schnell-estrich CT (cementitious)	LEVELLING SCREEDS ▶ Knauf Nivellierestrich 425 (levelling screed) ▶ Knauf Dünnestrich 325 (thin layer screed)	
Thick: > 35 mm		FLOWING SCREED ▶ Knauf FE Sprint ▶ Knauf FE 25 A tempo ▶ Knauf FE Eco (14 - 21 days)	FLOWING SCREED ▶ Knauf FE 50 Largo ▶ Knauf FE 80 Allegro ▶ Knauf FE Fortissimo
Building physical requirements		THIN LAYER HEATING FLOOR SCREED ** ▶ Knauf Alphadur 430 ▶ Knauf Nivellierestrich 425 (levelling screed) ▶ Knauf Dünnestrich 325 (thin layer screed)	
Thermal insulation			
Sound insulation			
Fire resistance			
Comfort			
Underfloor heating	HOLLOW FLOOR (dry) * ▶ Knauf GIFAfloor FHBplus Klima LINEAR BEARING SYSTEM FLOOR * ▶ Knauf GIFAfloor LBSplus Klima		
Technology			
System flooring	▶ Knauf GIFAfloor FHB ▶ Knauf GIFAfloor LBS	HOLLOW FLOOR (wet) ▶ Knauf Camillo	
Stages, ramps, stairs			

** See*
Knauf System Data Sheet F12.de
Application brochure F12LD.de
Knauf System Data Sheet F22.de
Knauf Intergral System Data Sheets F18.de, F19.de, TI Klima
www.knauf.de
*** System does not meet fire protection requirements*

▶ Good to know

According to DIN 18560, a differentiation is made with screeds between nominal thickness and "minimum thickness" (smallest individual value).

The nominal thickness is the screed thickness specified by the planner. In practice, this can vary at some points of the screed down to the minimum thickness. However, the average thickness of the screed may not be below the nominal thickness.

Nominal thicknesses are specified in this brochure. Exception: In cases for rating with fire resistance, the required minimum thicknesses are stated.

► Proof
DIN 4102-4, section 5.2

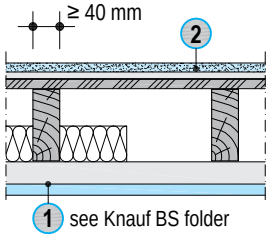
Fire resistance

Fire exposure from above in combination with a basic wood panel ceiling

Should fire resistance requirements with fire exposure from above exist for ceilings with a wooden panel ceiling design, they can be fulfilled with Knauf flowing screed.
Depending on the requirements and layer thickness of the screed, an additional layer underneath the screed may be necessary.
The necessary screed thicknesses for the required fire resistance classes as well as the required screed thickness, if applicable, are shown in the table on the opposite page.

The structurally necessary screed thicknesses must be considered. The stated values are minimum values and not nominal thicknesses.
Knauf flowing screeds are non-combustible and are rated to reaction to fire class A1 acc. to EN 13501-1.

Floor design flowing screed

DIN construction	Fire resistance class	Floor design: Knauf flowing screed	Floor design: Min. [1] thickness mm	Substrate required under screed (Required for fire protection): Mineral wool insulating layer (Acc. to DIN 4102-4, section 5.2.5.2, Melting point ≥ 1000 °C, Density ≥ 30 kg/m³) Min. thickness mm	or: Gypsum board Min. thickness mm
 **Fire protection:** from below and from above 1 + 2	F30	●	20	15	9.5
	F60	●	20	15	9.5

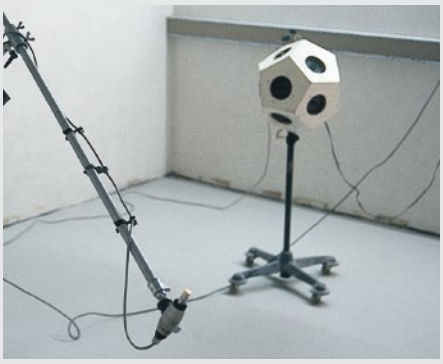
1) Greater screed thicknesses may be required for structural reasons.

Extract from the DIN 4102 part 4, section 5.2, table 56 or alternatively table 57:
Floors with a wood panel design with insulation layer necessary or unnecessary for fire protection

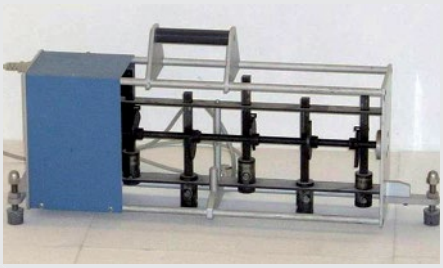
For further details see Knauf fire protection folder

Requirements for airborne and impact sound insulation

Requirements for airborne and impact sound insulation of ceiling constructions acc. to DIN 4109, table 3	req. R'_w dB	req. $L'_{n,w}$ dB
Multi-storey buildings with dwellings and workrooms		
Floors beneath attics	53	53
Intermediate floors	54	53
Floors above cellars	52	53
Floors under/over communal rooms	55	46
Floors under bathrooms/toilets	54	53
Accommodation, hospitals, sanatoria		
Floors	54	53
Floors under/over communal rooms	55	46
Floors under bathrooms/toilets	54	53
Schools and similar educational buildings		
Floors between classrooms or similar rooms	55	53
Floors between classrooms or similar rooms and very noisy rooms (e.g. sports halls, music rooms, workshops)	55	46



Airborne sound measurement



Footfall impact sound measurement

Acoustic building technical sound insulation characteristics in apartment houses - Class of sound insulation between rooms (SSt) acc. to VDI 4100						
Constructional components	SSt I (DIN 4109)		SSt II		SSt III	
	R'_w dB	$L'_{n,w}$ dB	R'_w dB	$L'_{n,w}$ dB	R'_w dB	$L'_{n,w}$ dB
Between common rooms and rooms in neighbouring dwellings	54	53	57	46	60	39
Between common rooms and rooms in neighbouring staircases	52	58	56	53	59	46

Sound insulation

Requirements and terms

The minimum requirements for airborne and impact sound insulation of ceiling constructions to DIN 4109 are listed in the table above. Please note that the more stringent sound insulation requirements, such as those acc. to VDI 4100, may be agreed.
The higher the value for airborne noise insulation (req. R'_w) and the lower the value for impact sound insulation, the higher the demands on the insulation.

Terms

Airborne sound insulation

- R'_w Weighted apparent sound reduction index in dB with sound transmission via flanking building components
- R_w Sound reduction index in dB without sound transmission via flanking building components
- erf. R'_w Required weighted sound reduction index in dB

Footfall impact sound insulation

- $L_{n,w,eq,R}$ Equivalent weighted normalized impact sound level of the solid ceiling without ceiling covering
- erf. $L'_{n,w}$ Required weighted normalized impact sound level
- erf. $\Delta L_{w,R}$ Required weighted impact sound improvement index of the ceiling covering
  req. $\Delta L_{w,R} = L_{n,w,eq,R} -$ req. $L'_{n,w} + 2$ dB
- s´ Dynamic stiffness of the impact sound layer

Weighted apparent sound reduction index $R'_{w,R}$ in dB [1] of solid ceilings (calculation value) acc. to DIN 4109

Mass per unit area of the ceiling [4] kg/m²	Single-shell solid ceiling		Solid ceiling with suspended ceiling [3]	
	Directly applied screed **and flooring**	Screed on insulation layer [2]	Directly applied screed and **flooring**	Screed on insulation layer
500	55	59	59	62
450	54	58	58	61
400	53	57	57	60
350	51	56	56	59
300	49	55	55	58
250	47	53	53	56
200	44	51	51	54
150	41	49	49	52

[1] Valid for flanking components with an average mass per unit area $m'_{L,average}$ of about 300 kg/m²
[2] And other ceiling coverings applied on an insulation layer, e.g. wooden floor, provided that the weighted impact sound improvement index ΔL_w = 24 dB.
[3] Flexurally ductile subceiling or similar constructions.
[4] The mass of applied bonded screed or screeds on separating layers must be considered

Airborne sound insulation

Rating

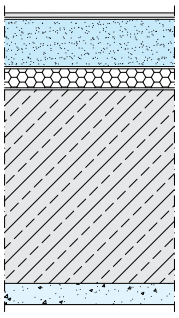
Solid ceilings

The airborne sound insulation of solid ceilings depends on the mass per unit area of the basic ceiling, on an existing suspended ceiling as well as on the ceiling covering.
If the flanking components, e.g. walls, have an average mass per unit area of at least 300 kg/m², the assignment of the table above applies.
With the selected construction (see the single shell solid ceiling with floating screed application on the following pages) for the following calculation example for the design of the impact sound insulation, a weighted apparent sound reduction index of 55 dB (> req. R´w = 54 dB according to table page 10) can be achieved for a ceiling mass of 337 kg/m².

Wood joist ceilings

When compared to solid ceilings, wood joist ceilings have some constructional technical sound related special properties.
The low mass per unit area, the resonance between the relatively light shells and the pronounced structure-borne noise bridges, results in a relatively poor performance of the sound insulation in the lower frequency range. As the frequency increases, so does the performance until very good values are achieved in the high-frequency range.
The perceived poor sound insulation in wood joist ceilings is due to the poor sound insulation in the low-frequency range (< 500 Hz).
Any improvements need to be effective, particularly in the low-frequency range.

For any approach in the improvement of sound insulation of wood joist ceilings,
it is important to note that the demands placed on impact sound insulation with wood joist ceilings are more difficult to achieve than the airborne noise insulation demands of the same category.
From experience, it can be largely assumed that with sufficient impact sound insulation, the airborne sound insulation of the ceiling is also generally achieved.
For this reason, the ceiling is usually designed according to the impact sound insulation and the airborne sound insulation is derived from this calculated value.

Calculation scheme	Example	Calculation example
Determine the required weighted normalized impact sound level for ceiling constructions (depending on the building usage) Table page 10 req. $L'_{n,w}$	Ceiling design according to drawing	Table page 10 e.g. Apartment separation ceiling req. $L'_{n,w}$ = 53 dB
↓		↓
Determine the equivalent weighted normalized impact sound level for the existing solid ceiling (with or without subceiling) table page 14. $L_{n,w,eq,R}$	Mass per unit area for solid ceilings Reinf.concrete 0.14 m x 2300 kg/m³ = 322 kg/m² Plaster 0.015 m x 1000 kg/m³ = 15 kg/m² Total = 337 kg/m²	Read off the table page 14 $L_{n,w,eq,R}$ = 77 dB
↓		↓
In the table page 14, search the same line of the previously determined value of req. $L'_{n,w}$ and read off the values for $\Delta L_{w,R}$ and s' at the top in this column.	**Ceiling between dwellings**  3 mm PVC top covering 35 mm Knauf flowing screed ..... **mm insulation layer** 140 mm reinforced concrete 15 mm Knauf gypsum plaster	Read off the table page 14 Line: $L_{n,w,eq,R}$ = 77 dB, column: $L'_{n,w}$ = 53 dB $\Delta L_{w,R}$ = 26 dB s' = 30 MN/m³
↓		↓
Select the system configuration that fulfils the value $\Delta L_{w,R}$ (approval) or Read off the dynamic stiffness s´ in the upper line and select the insulation material according to s´ – see table page 13.		Selected: stiffness group 30 Knauf Therm Trittschalldämmung 045 DES sg Thickness: 15 mm, Compressibility c: 2 mm

Impact sound insulation on solid ceilings

Calculation scheme for determination of the insulation material

On this page, the calculation scheme for determination of the impact sound insulation is described, which is based on the stipulations of the DIN 4109, supplement 1, tables 16 and 17, and our own measurement results.
The fundamental principles for design are stated on the following pages in conjunction with a calculation example.

► Calculation example

An impact sound reduction of 26 dB is achieved with the selected impact sound insulation in accordance with the table page 14.

As an alternative to selection of an insulation material, a system solution can be selected that achieves the required weighted impact sound improvement index req. $\Delta L_{w,R}$ = 26 dB in acc. with the technical approval (also refer to page 16).

Suitable insulation materials (impact sound protection) for floating screeds, e.g. Knauf Insulation and Knauf Dämstoffe (excerpt)

Stiffness group s` MN/m³	Material	Name	Insulation thickness and compressibility (d_L – c) mm
70	Mineral wool insulation material	Knauf Insulation Trittschall-Dämmplatte TP-GP [1)]	12 – 1
50	Mineral wool insulation material	Knauf Insulation Trittschall-Dämmplatte TP-GP [1)]	20 – 1; 30 – 1
40	Mineral wool insulation material	Knauf Insulation Trittschall-Dämmplatte TPE [1)]	12 – 2
30	Mineral wool insulation material EPS	Knauf Insulation Trittschall-Dämmplatte TP [1)] Knauf Insulation Trittschall-Dämmplatte TPE [1)] Knauf Therm Trittschalldämmplatte 045 DES sg [2)] Knauf Therm Trittschalldämmplatte 040 DES sg [2)]	13 – 3 20 – 2; 25 – 2 15 – 2 20 – 2
25	Mineral wool insulation material	Knauf Insulation Trittschall-Dämmplatte TP [1)] Knauf Insulation Trittschall-Dämmplatte TPS [1)] Knauf Insulation Trittschall-Dämmplatte TPE [1)]	15 – 5 20 – 3 30 – 2
20	Mineral wool insulation material EPS	Knauf Insulation Trittschall-Dämmplatte TP [1)] Knauf Insulation Trittschall-Dämmplatte TPS [1)] Knauf Insulation Trittschall-Dämmplatte TPE [1)] Knauf Therm Trittschalldämmplatte 045 DES sg [2)] Knauf Therm Trittschalldämmplatte 040 DES sg [2)]	20 – 5 30 – 3; 35 – 3; 40 – 3 40 – 2 20 – 2 30 – 2
15	Mineral wool insulation material EPS	Knauf Insulation Trittschall-Dämmplatte TP [1)] Knauf Insulation Trittschall-Dämmplatte TPS [1)] Knauf Therm Trittschalldämmplatte 045 DES sg [2)] Knauf Therm Trittschalldämmplatte 040 DES sg [2)]	25 – 5; 30 – 5; 35 – 5 50 – 3 30 – 3 50 – 2
10	Mineral wool insulation material EPS	Knauf Insulation Trittschall-Dämmplatte TP [1)] Knauf Therm Trittschalldämmplatte 045 DES sg [2)]	40 – 5; 45 – 5; 50 – 5 40 – 3

[1)] Knauf Insulation GmbH
[2)] Knauf Dämmstoffe GmbH

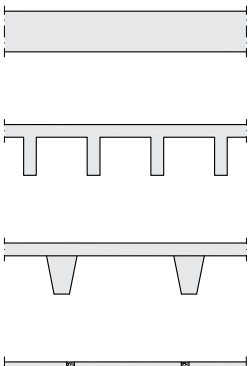
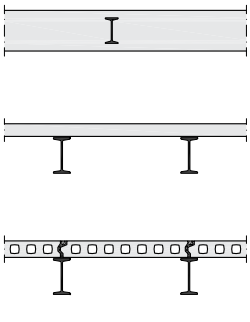
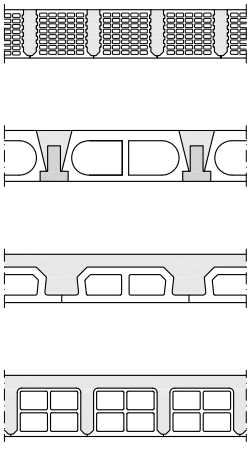
Impact sound insulation on solid ceilings

Design basics - insulation materials

The thickness designation is stated as the thickness on delivery d_L which applies as the rated value for the thickness.
The compressibility ($c = d_L - d_B$) is determined in the laboratory under a defined load and is not comparable with the compression of the insulating material under load in practical application. d_B is the thickness under a load of 2 kPa after removal of an additional load of 48 kPa.
With the compressibility c, the product is assigned to the application types sh/sm/sg acc. to DIN 4108-10 (see page 29).

The dynamic stiffness groups have been extended in the new European standards DIN EN 13163 or DIN EN 13162. However, no standardized values apply for the newly added dynamic stiffness groups for impact sound reduction, so that with the insulation materials of this group with impact sound rating, the next higher stiffness group must be assumed.

Design of the impact sound insulation of solid ceilings

	Dynamic stiffness of the insulation material (MN/m³)				
	Weighted impact sound improvement index $\Delta L_{w,R}$ (dB)				
	1 Mass per unit area of the solid basic ceiling including any bonded screed or screed on the separating layer and directly applied plaster		$L_{n,w,eq,R}$		4
	Knauf ceiling systems	kg/m²		dB	**Knauf flowing screed on** an insulating layer *
	without	135		86	
		160		85	
		190		84	
		225		82	
		270	1	79	1 + 4
		320		77	
		380		74	
		450		71	
		530		69	
	2 Flexurally ductile ceiling lining made of Knauf boards ■ Insulation layer made of mineral wool, 40 mm thick Knauf systems D111.de, D112.de applied as ceiling lining	135		77	
		160		76	
		190		76	
		225		75	
		270	1 + 2	75	1 + 2 + 4
		320		74	
		380		73	
		450		71	
		530		69	
	3 Flexurally ductile suspended ceiling made of Knauf boards ■ Suspension height 200 mm ■ Insulation layer made of mineral wool, 50 mm thick Knauf systems D111.de, D112.de, D113.de applied as Subceiling	135		77	
		160		76	
		190		76	
		225		74	
		270	1 + 3	71	1 + 3 + 4
		320		69	
		380		66	
		450		63	
		530		61	

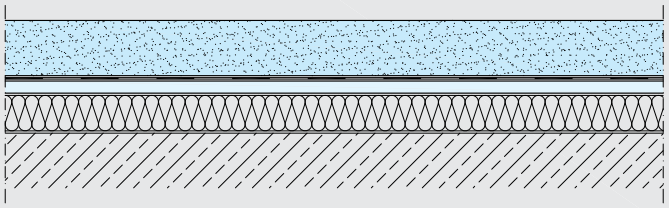
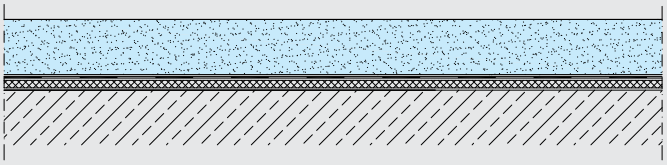
Weighted normalized impact sound level $L_{n,w,eq,R}$ of solid basic ceiling systems with/without flexurally ductile subceilings made of gypsum boards and screeds on insulation layer.

Applicable proof from DIN 4109 issued 11.89 supplement 1, tables 11, 16. Weighted impact sound improvement index, $\Delta L_{w,R}$ of screeds in insulating layer on solid ceilings (calculation value) (to DIN 4109, supplement 1, table 17).

* *Weight per unit area min. 70 kg/m² acc. to DIN 4109*

–	50	40	30	20	15	10	–
18	22	24	26	28	29	30	35
Weighted normalized impact sound level $L'_{n,w,R}$ of the overall construction including subtraction of a 2 dB safety margin							
70	66	64	62	60	59	58	53
69	65	63	61	59	58	57	52
68	64	62	60	58	57	56	51
66	62	60	58	56	55	54	49
63	59	57	55	53	52	51	46
61	57	55	53	51	50	49	44
58	54	52	50	48	47	46	41
55	51	49	47	45	44	43	38
53	49	47	45	43	42	41	36
61	57	55	53	51	50	49	45
60	56	54	52	50	49	48	43
60	56	54	52	50	49	48	43
59	55	53	51	49	48	47	42
59	55	53	51	49	48	47	42
58	54	52	50	48	47	46	41
57	53	51	49	47	46	45	40
55	51	49	47	45	44	43	38
53	49	47	45	43	42	41	36
61	57	55	53	51	50	49	44
60	56	54	52	50	49	48	43
60	56	54	52	50	49	48	43
58	54	52	50	48	47	46	41
55	51	49	47	45	44	43	38
53	49	47	45	43	42	41	36
50	46	43	42	40	39	38	33
47	43	41	39	37	36	35	30
45	41	39	37	35	34	32	28

Impact sound reduction of floor constructions with Knauf flowing screeds on reinforced concrete slabs

Example 1	Example 2
$\Delta L_{w,R}$ = 35 dB	$\Delta L_{w,R}$ = 18 dB
	
Screed: 40 mm Knauf flowing screed Separating layer: 0.2 mm Knauf Schrenzlage 9.5 mm Knauf board Insulating layer: 25 mm mineral wool impact sound insulation board DIN EN 13162, stiffness group 10, c = 5 mm Basic ceiling: 140 mm reinforced concrete slab (test stand)	Screed: 40 mm Knauf flowing screed Separating layer: 0.2 mm Knauf Schrenzlage Insulating layer: 6.5 mm PE impact sound insulation board Basic ceiling: 140 mm reinforced concrete slab (test stand)
Proof: Test report P-BA 154/1992	Proof: Test report P-BA 151/1992

Impact sound reduction on reinforced concrete slabs

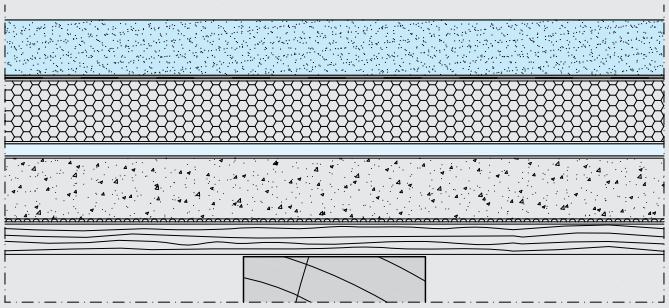
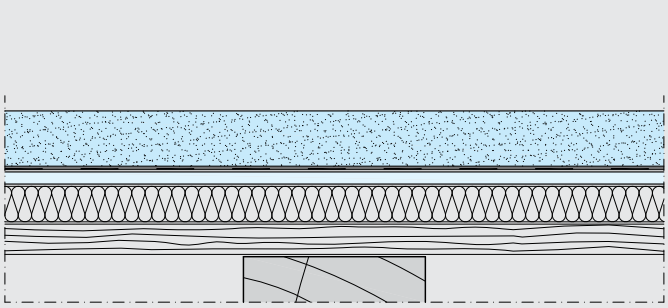
Impact sound reduction of floor constructions with Knauf flowing screeds on reinforced concrete slabs

The weighted impact sound improvement index $\Delta L_{w,R}$ of the floor constructions with Knauf flowing screed shown, are results from suitability tests carried out by an independent test institute. These values can be used for proof of the impact sound insulation to DIN 4109.

Example 1
shows a construction that has been used with a mineral wool impact sound insulation board covered with a gypsum board. The application of the gypsum board provides an additional sound insulation effect for the system, which is reflected in the very good $\Delta L_{w,R}$ value.

Example 2
is a special case. For particularly low construction heights thin-layer insulation materials are often required.

Impact sound reduction of floor constructions with Knauf flowing screeds on wood joist ceilings

Example 3		Example 4	
$\Delta L_{w,R}$ = 15 dB		$\Delta L_{w,R}$ = 15 dB	
			
Screed:	40 mm Knauf flowing screed	Screed:	40 mm Knauf flowing screed
Separating layer:	0.2 mm Knauf Schrenzlage	Separating layer:	0.2 mm Knauf Schrenzlage 9.5 mm Knauf board
Insulating layer:	40 mm EPS impact sound insulation board DIN EN 13163, stiffness group 10, c = 3 mm e.g. Knauf Therm impact sound insulation board 045 DES sg	Insulating layer:	25 mm mineral wool impact sound insulation board DIN EN 13162, stifness group 10, c = 5 mm
Equalization layer:	9.5 mm Knauf board (as cover board, optional) 40 mm Knauf Trockenschüttung PA		
Basic ceiling:	Wooden joist ceiling acc. to test configuration (see below)	Basic ceiling:	Wooden joist ceiling acc. to test configuration. (see below)
Proof: Test report P-BA 21/1993		Proof: Test report P-BA 22/1993	

Impact sound reduction on wood joist ceilings

Impact sound reduction of floor constructions with Knauf flowing screeds on wood joist ceilings

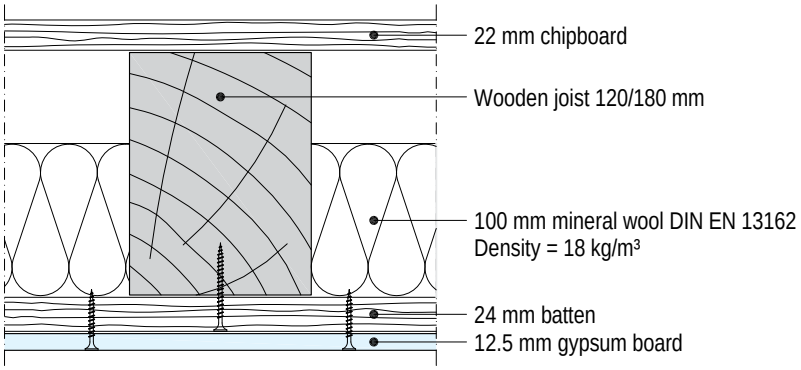
For wood joist ceilings, there is no standard calculation procedure similar to that used for solid ceilings in calculating the impact sound insulation. A prognosis method developed by Prof. Gösele is generally used in practice.

The impact sound reduction characteristics for the examples above are determined in accordance with this procedure in the test stand and can be applied for the calculation of the prognosis values of the impact sound insulation of wood joist ceilings.

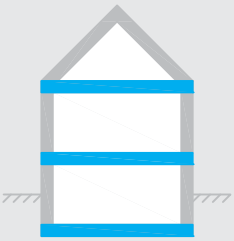
For further constructions and detailed calculation tables, see System Data Sheet D15 "Knauf wood joist ceiling systems".

Sound insulation values for complete ceiling structures (wood joist ceilings) of different ceiling structures are included in DIN 4109, amendment 1.

Wood joist ceiling for testing of floor constructions



► *System Data Sheet D15.de*
Wood joist ceiling systems



Highest values of the heat transfer coefficient with modernization measures (renovation of constructional components) by installation or renovation of flooring structures acc. to EnEV 2014

Constructional component	**Highest values of the heat transfer coefficient U_{max}**	
	Residential buildings and zones of non-residential buildings with internal **temperatures ≥ 19 °C**	Zones of non-residential buildings with **internal temperatures from 12 to < 19 °C**
Ceilings that border unheated attic spaces	0.24 W/m²K	0.35 W/m²K
Ceilings that border unheated rooms or the soil	0.30 W/m²K	no requirement
Floor structures	0.50 W/m²K	no requirement
Ceilings, that border rooms below against external air	0.24 W/m²K	0.35 W/m²K

Thermal insulation

Requirements of the German Energy Saving Ordinance (EnEV)

The amended German Energy Saving Ordinance (EnEV 2014) applies from 1 May 2014 and supercedes the pervious EnEV from 01.10.2009. According to the Energy Saving Ordinance, all new buildings must determine the annual primary energy requirement and consequently the heat loss, which may not exceed a determined threshold. Thus, the planner is responsible for rating of the thermal insulation.

For existing buildings, the rating of the heat insulation can be undertaken on the constructional component. If the floor structures on the heated side are rebuilt during modernisation, the floor structure must exhibit a heat transfer coefficient of U ≤ 0.50 W/m² K (previously k-value) when the new and old building component layers are considered.

With some modernisation measures, the heat transfer coefficient can not be achieved, as the lack of constructional height prevents application of the necessary insulation layer thickness. The requirements acc. to EnEV are considered to be fulfilled when the maximum possible insulation layer thickness is installed and the insulation material has a thermal conductivity of $\lambda_R \leq 0.035$ W/m K.
Calculation of the U value is described in the following.

Example calculation - ceiling above unheated cellar

Calculation of the existing thermal resistance			
Floor and ceiling construction (from top to bottom)			
Floor and ceiling design material	Layer thickness t_n in m	Thermal conductivity λ_R in W/m·K	Thermal resistance $R_n = \left(\frac{d_n}{\lambda_{R,n}}\right)$ in $\frac{m^2K}{W}$
Thermal resistance internal R_{si}	–	–	0.17
PVC covering	0.003	0.25	0.01
Screed FE 80 Allegro	0.035	1.87	0.02
Insulation layer	(sought)	0.035	(sought)
Reinforced concrete	0.14	2.30	0.06
Knauf gypsum plaster	0.015	0.35	0.04
Thermal resistance internal R_{si}	-	-	0.17
Thermal transmission resistance previously $R=\frac{1}{U}$			0.47

Determination of the necessary insulation material thickness to achieve the required heat transfer coefficient (U value) to EnEV 2014 for a ceiling above an unheated cellar in the course of a modernisation by renovation of the floor structure:

- U value of the planned ceiling structure without insulation layer calculated $R=\frac{1}{U}$ from existing U = 2.13 W/(m²·K)
- Required U value is ≤ 0.50 W/(m²·K), resulting in the inverse value the thermal transmission resistance R:
- reqd . $R=\frac{1}{U}=\frac{1}{0.50}=2.00\ \frac{m^2\cdot K}{W}$
- Required thermal resistance R_D of the insulation layer for improvement of the required thermal transmission resistance:
- req R = req R - exist R = 2.00 - 0.47 =1.53 $\frac{m^2\cdot K}{W}$
- Required insulation thickness reqd. d_D (WLG 035)

required $d_D = \lambda_{RD} \cdot$ required $R_D = 0.035 \cdot 1.53 = 0.054$ m

► Calculation check

Selected insulation material Knauf Therm 035 DES, WLG 035, thickness d_D 0.06 m

with $\frac{d_D}{\lambda}=\frac{0{,}06}{0{,}035}=1{,}71\ \frac{m^2\cdot K}{W}$

existing U value of the ceiling with insulation material

$\frac{1}{U}=0{,}47+1{,}71=2{,}18\ \frac{m^2\cdot K}{W}$

$U=0{,}46\ \frac{W}{m^2K}<0{,}50\ \frac{W}{m^2K}$

Rating of thermal insulation

Calculation

Calculation procedure

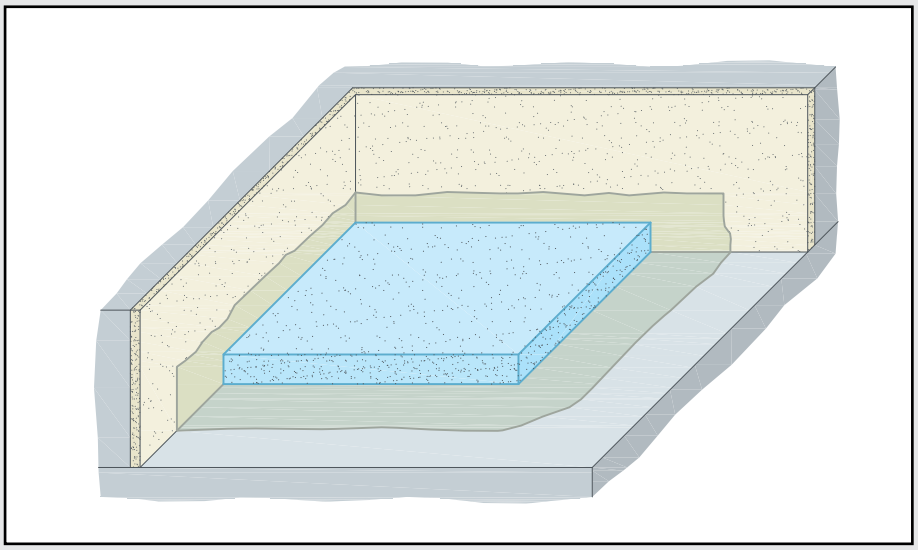
The thermal transmission coefficient U is determined by DIN EN ISO 6946 using the formula

R_{si} Thermal resistance internal
R_{se} or thermal resistance external (W/m²K)
t Component layer thickness (m)
λ_R Calculation value of the thermal conductivity (W/m·K)

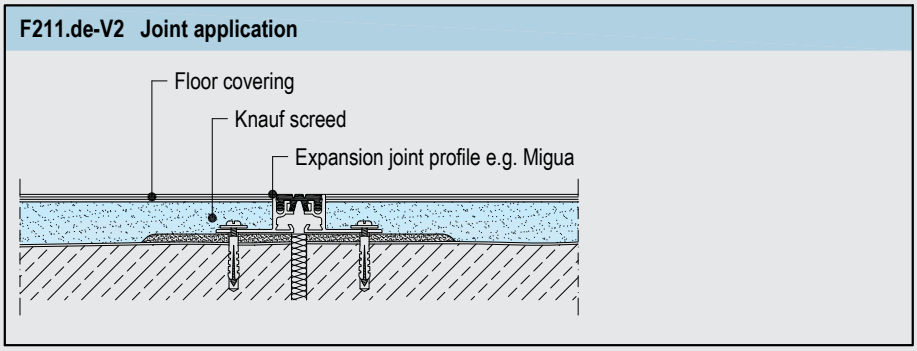
$$U=\frac{1}{R_{si}+\frac{d_1}{\lambda_{R1}}+\frac{d_2}{\lambda_{R2}}+\frac{d_3}{\lambda_{R3}}+\ldots+R_{se}}$$

The calculation value for the thermal conductivity of the materials used and the thermal transmittance resistances $1/R_s$ should be taken from the DIN 4108-4 and the manufacturers specifications.

With a combination of impact sound insulation boards and thermal insulation boards, the impact sound insulation boards can of course be included in the heat insulation calculation. The thickness of the impact sound insulation board (d_L) in the unloaded state is to be used as a calculation variable.



Details, scale 1:5 - Example



Flowing screed systems
Bonded screed

Construction and application

A bonded screed, is as the name suggests, a screed that is bonded to the supporting substrate. Bonded screeds must be fully frictionally bonded to the respective substrates. All forces that result from deformation, shrinkage processes, shear stresses due to live loads, are assumed by the overall system (bonded system) of substrate/screed.

Thus bonded screeds can be loaded even at thin layer thicknesses e.g. with transport loads (lift truck, forklift, truck or similar) providing that the supporting substrate permits it (see table page 21). The surface of the screed must be protected by a covering against a compressive load that is too high as well as against abrasion, e.g. by Polyamide wheels of lift trucks.

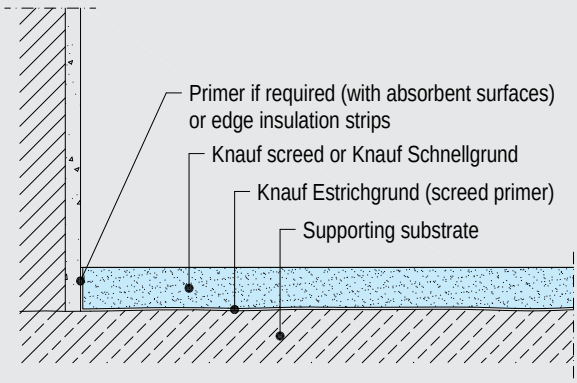
Bonded screeds when correctly applied (a good bond is essential) are particularly suitable for high loads (live loads). The screed thickness is not a criterion for the ability of the bonded screed to sustain a load.

Substrate quality/preparation

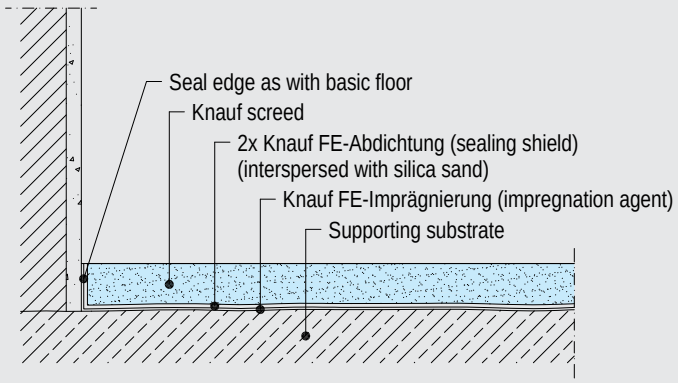
- Substrates must be dry; this also applies for any equalization layers of concrete that have been applied. They must fulfil the demands of the DIN 18560-3.
- Substrates must be clean and loose layers must be removed (adequate strength, textured surface, free of grease, free of cracks), depending on the state and loading, milling or surface shot blasting may be required.
- Apply one or two coats of Knauf Estrichgrund (screed primer) (diluted 1:1 with water) or prime with one or two coats of Knauf Schnellgrund (undiluted) depending on the absorbency of the substrate. Avoid the formation of pools of screed primer.
- On sealed substrates (tiles, Terazzo), for example, apply Knauf Spezialhaftgrund (bonding primer) or Knauf FE-Imprägnierung (epoxy resin) with interspersed silica sand.
- Prime the contact surfaces between the wall and screed, to avoid transfer of moisture to the wall.

Details, scale 1:5 - Examples

F211.de-V1 Edge design



F211.de-V3 Bonded seal with soil contacting areas



Substrate for bonded screed

Construction	Nominal screed thickness in mm for Knauf screeds								
	FE Sprint	FE 50 Largo	FE 80 Allegro	FE 25 A tempo	FE Fortissimo	Dünnestrich 325 (thin layer screed)	Nivelliérestrich 425 (leveling screed)	Stretto	Schnellstrich CT
Bonded screed	25 [1)]	25 [1)]	25 [1)]	25 [1)]	25 [1)]	10	15	15	25

[1)] 20 mm also possible with smaller areas

► Good to know

A bonded screed can be applied when there are special requirements for a quick building phase with the quick setting and water-free epoxy resin-based rapid screed Knauf Stretto or Knauf Schnellestrich CT. However, divergent measures are required for substrate preparation. See page 98ff.

Sealing

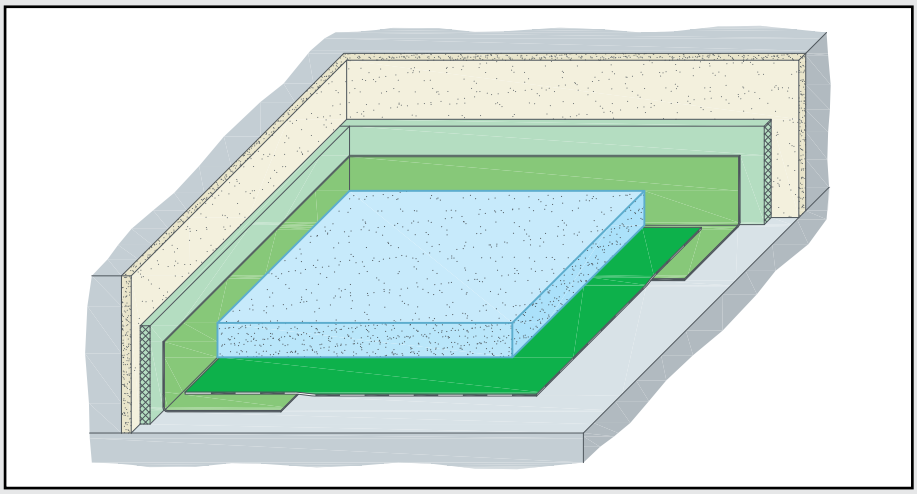
For constructional components coming in contact with the soil, a minimum ground moisture acc. to DIN 18195-4 must be assumed Any possible sealing measures required must be provided by the planers.

Bonded screeds cannot be applied with conventional seals as the respective sealing membranes and sealing foils do not facilitate a bond.

If a seal is required, a seal can be applied with the assistance of the Knauf FE-Abdichtung (sealing shield), which simultaneously represents a fully adequate bonding bridge between the screed and concrete substrate (see page 51).

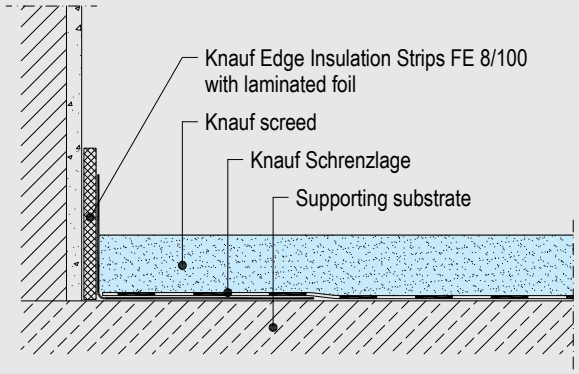
Joints

- Joints in the substrate (structural joints) must be applied to the screed and covering also.
- Otherwise, the screed slab can be applied without joints.

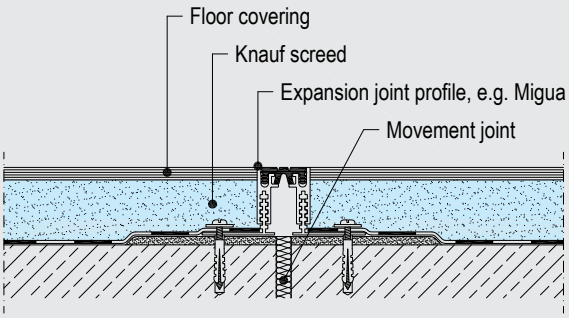


Details, scale 1:5 - Examples

F221.de-V1 Edge application on solid floor



F221.de-V2 Joint application in solid floor



Screed on a separating layer

Construction and application

► Good to know

A screed on a separating layer can be applied when there are special requirements for a quick building phase with the quick setting and water-free epoxy resin based rapid screed Knauf Stretto or Knauf Schnellestrich CT.

Screeds on a separating layer are separated from the supporting substrate by thin intermediate layers (Schrenzlage or similar). No friction bond results between the screed and the substrate. Screed and substrate can move independently of one another. There are movement joints arranged between the screed and the rising constructional components, such as elastic strips on walls, columns, pipes, etc., to prevent constraint forces.

As vertical loads are transferred directly to the substrate, and the screed is only loaded by pressure, a relatively thin layer can be applied.

On larger surfaces and higher static loads, tensile stresses can however occur at a temperature change, requiring screed thicknesses that are greater than those listed in the table page 23. The screed thickness shall also be selected at a larger thickness with transport loads. With lifting truck loads, the nominal screed thickness should be at least 40 mm and with forklift loads at least 50 mm.

Screed on a separating layer is suitable

- when the substrate is imperfect (e.g. crumbling surface, oily), or special sealing measures are required
- on wooden planking
- with high loads if a bonded screed is not possible (e.g. surface strength of the substrate too low)

Substrate preparation/separating layer

- Clean the substrate mechanically (mortar residues, loose components, that can destroy the Schrenzlage).
- Sealing of holes, cracks, or similar; and any existing bonded equalization layer with uneven surfaces, in order to obtain a uniform screed surface thickness.
- Attachment of edge sealing strips, $t \geq 8$ mm.
- Use Schrenzlage with at least 8 cm joint overlap as a separating layer, and do not use PE foil (formation of wrinkles) or bitumen felt (swelling due to water absorption through the screed).
- A Schrenzlage is also required as a separating layer with screed application on a moisture barrier.

Screed on a separating layer

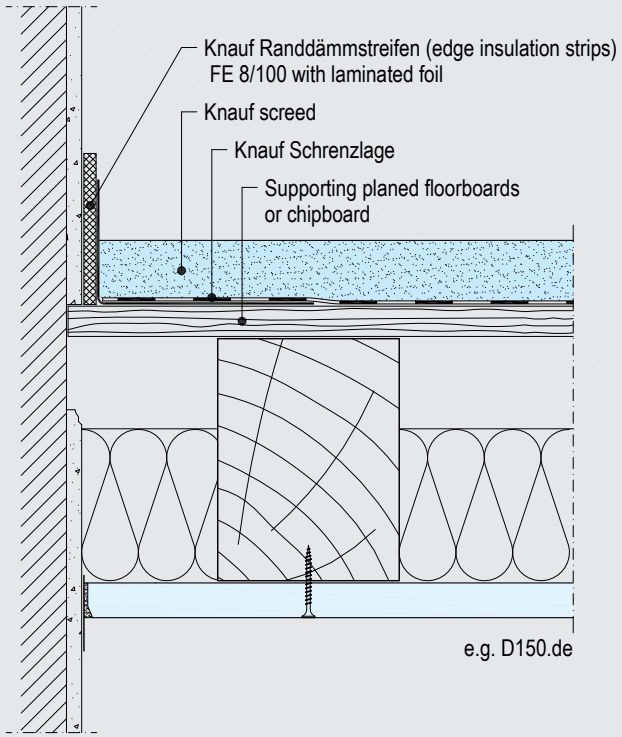
Usages and application areas	Imposed loads acc. to DIN 18560-4 and DIN 1055-3		Nominal screed thickness in mm for				
			FE Sprint FE 50 Largo	FE 80 Allegro FE 25 A tempo	FE Fortissimo	Stretto	Schnellestrich CT
	Area load kN/m²	Single load kN	Strength class to DIN 18560 CA-C30-F5/ CA-C25-F5	CAF-C30-F6	CAF-C35-F7	SR-B2,0-C25-F7	CT-C30-F5
Rooms and corridors in residential buildings, bedrooms in hospitals, hotel rooms incl. the corresponding kitchens and bathrooms	2	1	30	30	30	25	35
Corridors in office buildings, office areas, doctors practices, waiting rooms, lounges including the corridors, areas in sales rooms up to 50 m² in residential, office and comparable buildings	2	2	35	30	30	30	40
Office areas with higher loads	3	2	40	35	35	30	45
Corridors in hospitals, hotels, old peoples homes, boarding schools etc.; kitchens and treatment rooms incl. surgery rooms without heavy equipment.	3	3	45	40	40	40	55
Areas with tables, e.g. classrooms, cafes, restaurants, canteens, auditoria, reception rooms (assignment divergent to DIN 1055-3)	4	3	45	40	40	40	55
Areas with fixed seating, e.g. in churches, theatres, cinemas, congress rooms, auditoria, meeting halls, waiting rooms	4	4	50	50	45	45	60
Freely walkable areas, e.g. museum and exhibition areas, entrance areas in public buildings and hotels, areas where large groups of people meet, e.g. in buildings such as concert halls, terraces and entrance areas; areas in retail stores and department stores, areas in factories and light-duty workshops	5	4	50	50	45	45	60

► Knauf know-how

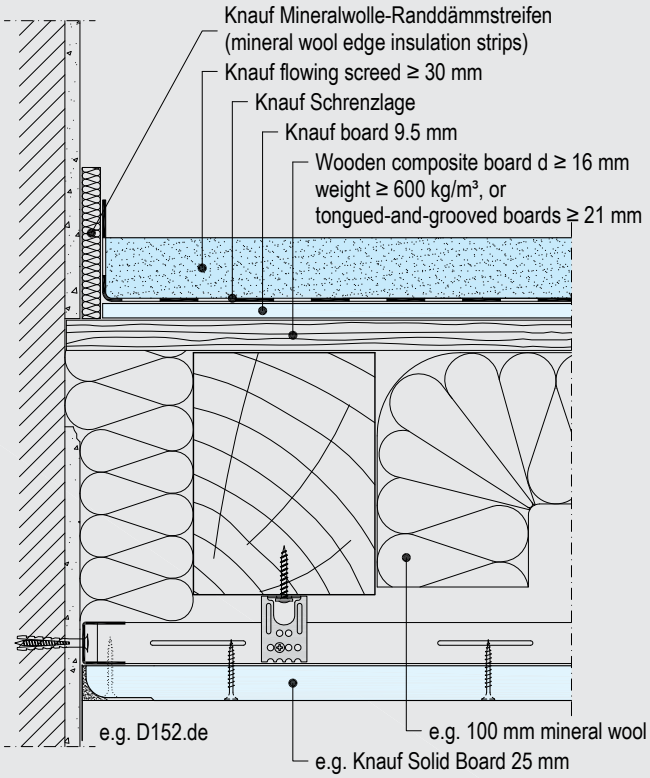
At higher static and dynamic loading, other specifications for the necessary screed thickness can be made in dependence on the load and insulation layer. These are available individually from Knauf on request.

Details, scale 1:5 - examples

F221.de-V3 Edge design with wood joist ceilings



F221.de-V4 On wood joist ceilings F90 from below and from above



Sealing

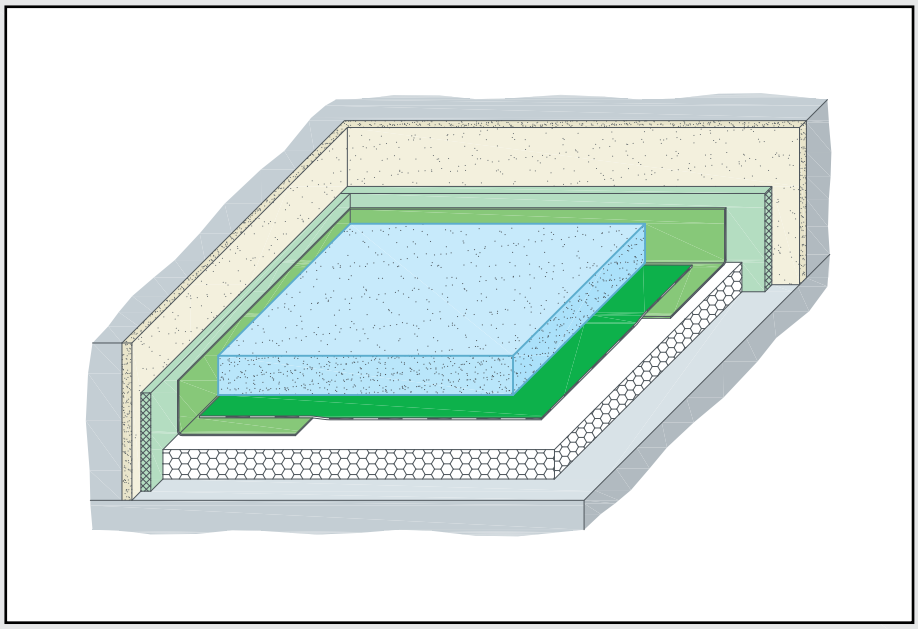
Knauf sealing membrane Katja Sprint can be used as sealing against ground moisture acc. to DIN 18195-4, see also page 52ff.

Screed slab

- Nominal thickness at least 30 mm (min. F4).
- Structural joints must be implemented with the same width in the screed.
- Otherwise, the screed slab can be applied without joints in the section with FE 80 Allegro, FE 50 Largo, FE Fortissimo and Stretto; with FE 25 A tempo there are generally movement joints required with screed sections exceeding 10 m diagonally, and for FE Sprint exceeding 100 m² screed surface or 10 m edge length, and with Schnellestrich CT exceeding 5 m edge length or alternatively in doorways or with protruding and constricting areas .

On wood joist ceilings

In order to avoid accumulation of moisture in the ceiling, no vapour barrier or foil should be applied on the wood joist ceiling. Knauf Schrenzlage can be used as a separating layer. If a vapour barrier is necessary, for example, because high levels of moisture can be found in the lower area, it should be applied underneath the wood joist ceiling.



Screed on an insulating layer

Construction

Screeds on the insulating layer are separated from the supporting substrate by an insulating layer (thermal and sound insulating materials). The rigid load distributing screed layer forms an anti-vibration system together with the elastic insulating layer (improving the impact sound insulation, airborne sound insulation, thermal insulation, see page 10ff); there is no direct connection to the flanking constructional components.

Substrate preparation

- Clean the substrate mechanically (mortar remnants, loose constituents).
- The screed must have a uniform thickness acc. to DIN 18560.
- Level unevenness using light levelling mortar (Knauf EPO-Leicht, Knauf Schubo) or Knauf Trockenschüttung PA (dry bulk leveller); possible is a combination of levelling/ polystyrene insulation boards to eliminate "sloping surfaces", to produce screed layers of uniform thickness (cover the bulk leveller with gypsum boards to distribute the load).
- Fixed pipes, installations and others: Level up to the top edge of the pipe; if insulation material is used there should be an overhang of approx. 10 mm above the pipe, e.g. fill pipe area with dry bulk leveller. Heating pipes must be thermally insulated.
- Adjacent walls must be plastered (prevents formation of sound bridges).
- Application of edge insulation strips to all rising components, thickness ≥ 8 mm.

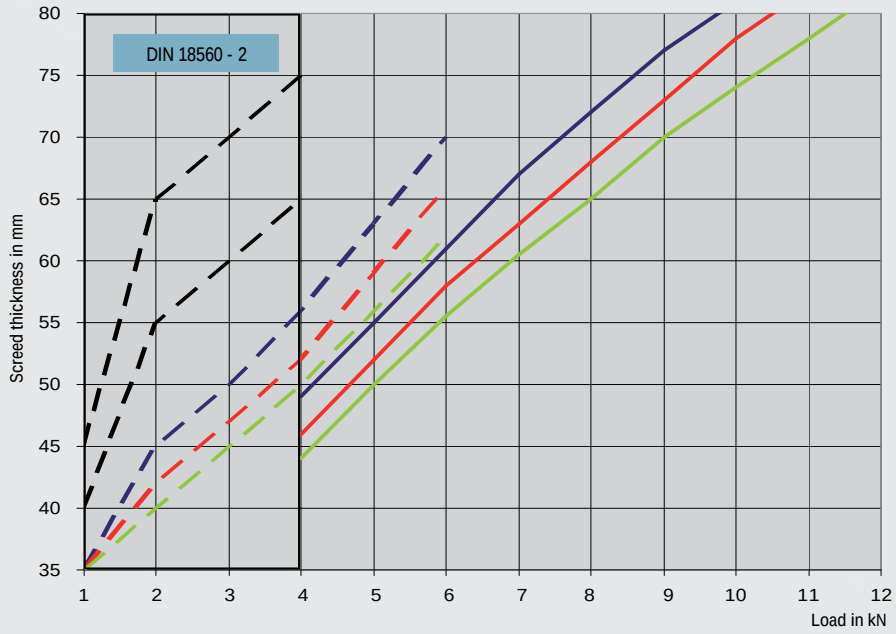
► Good to know

A screed on an insulating layer can be applied when there are special requirements for a quick building phase with the quick setting and water-free epoxy resin based rapid screed Knauf Stretto or Knauf Schnellestrich CT.

Screed on an insulating layer / heated screed (thickness above heating tube)

Usages and application areas	Imposed loads acc. to DIN 18560-2 and DIN EN 1991-1-1/NA-3		Nominal screed thickness in mm for					
			FE Sprint [1] FE 50 Largo FE Eco [2]	FE 80 Allegro FE 25 A tempo	FE Fortissimo	Stretto [1]		Schnell-strich CT CT-C30-F5
	Area load kN/m²	Single load kN	Strength class to DIN 18560 CAF-C30-F5 CAF-C25-F5	CAF-C30-F6	CAF-C35-F7	Compressibility c of the insulating layer c ≤ 1 mm	c ≤ 3 mm	
Rooms and corridors in residential buildings, bedrooms in hospitals, hotel rooms incl. the corresponding kitchens and bathrooms	2	-	35	35	35	40	50	40
Corridors in office buildings, office areas, doctors practices, waiting rooms, lounges including the corridors, areas in sales rooms up to 50 m² in residential, office and comparable buildings	2	2	40	35	35	45	55	45
Office areas with higher loads	3	2	45	45	40	55	65	55
Corridors in hospitals, hotels, old peoples homes, boarding schools etc.; kitchens and treatment rooms incl. surgery rooms without heavy equipment.	3	3	50	45	45	60	70	60
Areas with tables, e.g. classrooms, cafes, restaurants, canteens, auditoria, reception rooms (assignment divergent to DIN 1055-3)	4	3	50	45	45	60	70	60
Areas with fixed seating, e.g. in churches, theatres, cinemas, congress rooms, auditoria, meeting halls, waiting rooms	4	4	55	50	50	65	75	65
Freely walkable areas, e.g. museum and exhibition areas, entrance areas in public buildings and hotels, areas where large groups of people meet, e.g. in buildings such as concert halls, terraces and entrance areas; areas in retail stores and department stores, areas in factories and light-duty workshops	5	4	55	55	50	65	75	65

[1] cannot be used as a heated screed
[2] can only be used as a heated screed



► Knauf know-how

At higher static and dynamic loading, other specifications for the necessary screed thickness can be made in dependence on the load and insulation layer. These are available individually from Knauf on request.

Statically required screed thickness

The required thickness of the screed is dependent on the construction design, screed quality, load and possibly the insulation material properties.

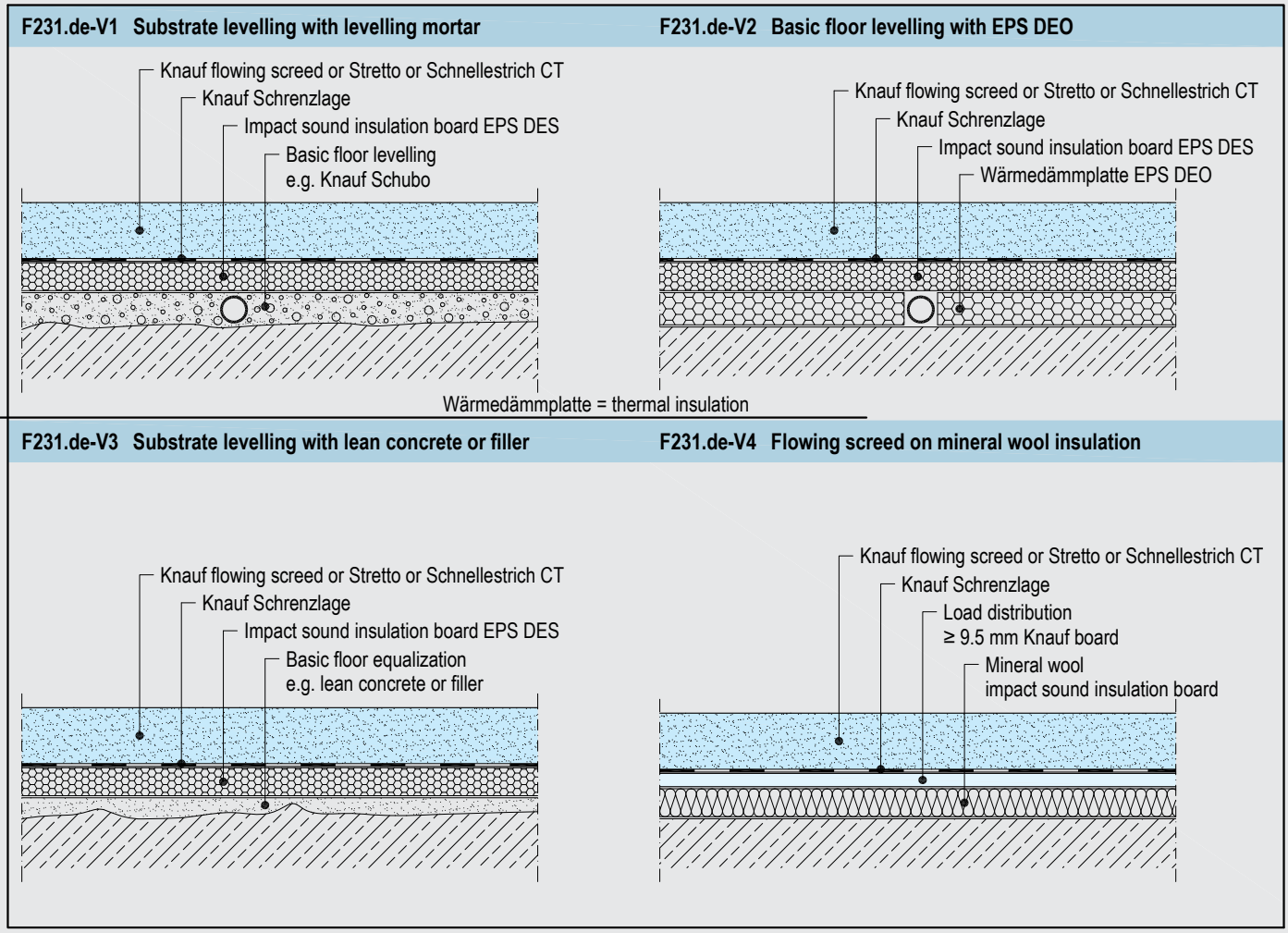
Taking this parameter into consideration, nominal value tables for floating screed have been added to impact noise insulation materials in the DIN 18560-2 (issue 09.2009).

Based on these tables and the DIN EN 1991-1-1/NA, the design table opposite for Knauf screeds on impact sound insulation has been created.

The following must be considered:

- With single loads up to 2 kN, the compressibility c of the insulating layer may be max. 5 mm, with a higher individual load it may be a max of 3 mm.
- With insulation layer thicknesses up to 40 mm, the nominal screed thickness of Knauf flowing screed is reduced by 5 mm, however it must be at least 35 mm or 40 mm.
- However, should an insulation layer EPS DEO (≤ 150 kPa) of 100–200 mm be installed in the attic because of the German Energy Saving Ordinance, the nominal screed thickness must be ≥ 40 mm.
- With heating floor screed, this screed nominal thickness means the screed thickness over the heating elements.
- Knauf Stretto is not suitable for underfloor heating.
- At higher loads or higher single loads, the screed thickness must be increased (observe the extended drying time), seek advice if necessary.
- To keep the drying time as short as possible, the nominal screed thickness should be limited to the structurally necessary dimension.
- Structural joints must be implemented in the screed.
- As unheated screed Knauf FE 80 Allegro, FE 50 Largo, FE Fortissimo and Stretto can be applied without joints; with FE 25 A tempo movement joints are required with screed sections exceeding 10 m diagonally, and for FE Sprint exceeding 100 m² screed surface or 10 m edge length., with Schnellestrich CT they are necessary with edge lengths exceeding 5 m or with doorways or in protruding areas or pinched off areas.
- With greater temperature changes, e.g. caused by exposure to strong direct sunlight, joints such as those with heating floor screed may be necessary.
- With heating floor screed, the arrangement of the movement joint in accordance with Code of Practice no. 5 (IGE/IWM) “Joints in flowing calcium sulphate screeds” is recommended.
- Because of their high flexural strengths, it is possible to do without reinforcement (e.g. screed mesh) with Knauf screeds Reinforcement mesh does not increase the load capacity of screeds.

Details, scale 1:5 - Examples



Screed on an insulating layer

Insulating layer - materials

The insulating layer under screed can consist of different materials depending on the area of application and requirements for sound insulation, fire protection, and thermal insulation.

- Requirements for airborne and impact sound insulation as well as thermal insulation of ceiling constructions in accordance with DIN 4109, DIN 4108 and German Energy Saving Ordinance EnEV (calculation of the insulating layers, see page 10ff).

Customary in the area of floating screeds is the use of insulation materials made of expanded polystyrene (EPS) in acc. to DIN EN 13163.

If there are demands made on the non-combustibility of the insulation layer, mineral wool in acc. with DIN EN 13162 is generally used.

Further materials are used in special applications, such as Knauf Holzfaserdämmplatte WF for the lowest construction heights.

With thicker insulation layers, a combination of impact noise and airborne noise insulation is recommended. The thermal insulating layer must always be arranged on top of the impact sound insulation board due to the better technical sound insulation behaviour and because of the improvement when applying the screed layer due to the harder base.

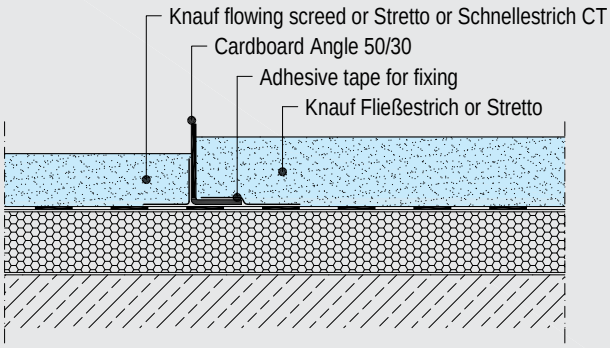
With pipes on the basic ceiling, the continuous impact sound insulation board, is however, always on top!

As a thermal insulation layer, only application type DEO can be used with a compressive stress > 100 kPa at 10 % compressive strain.

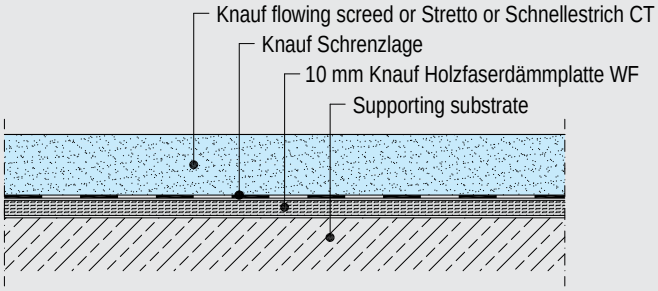
If the insulation boards have an aluminium coating, this must be protected with a foil or a further coating against direct contact with the screed mortar, as a chemical reaction will otherwise occur between the aluminium and the alkaline water of the screed mortar.

Details, scale 1:5 - Examples

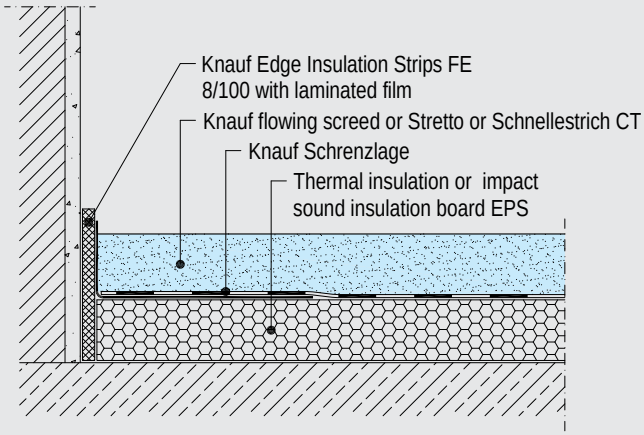
F231.de-V6 Formwork with height offset



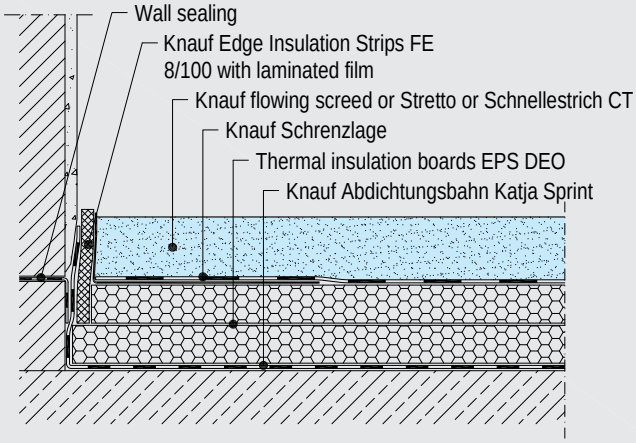
F231.de-V8 Flowing screed on Knauf Holzfaserdämmplatte WF



F231.de-V5 Flowing screed on thermal or footfall sound insulation



F231.de-V7 Flowing screed on surfaces contacting the soil



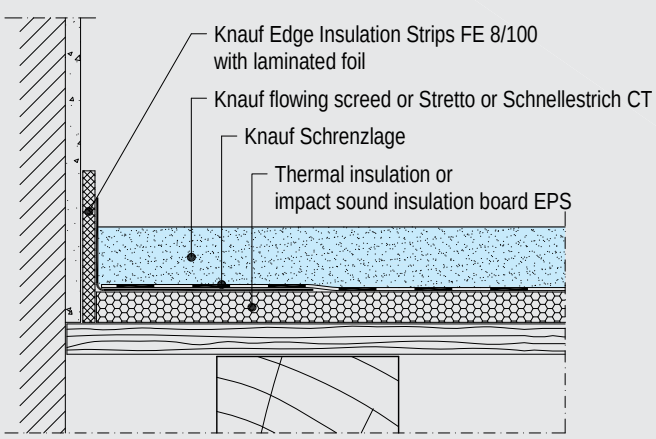
Explanation of the abbreviations

Ceiling application area acc. to DIN 4108-10 (excerpt)	
Abbreviation	Application examples
DEO	Internal insulation of the ceiling or floor slab (top side) under screed without sound insulation demands **floor insulation board**
DES	Internal insulation of the ceiling or floor slab (top side) under screed with sound insulation demands impact sound insulation board

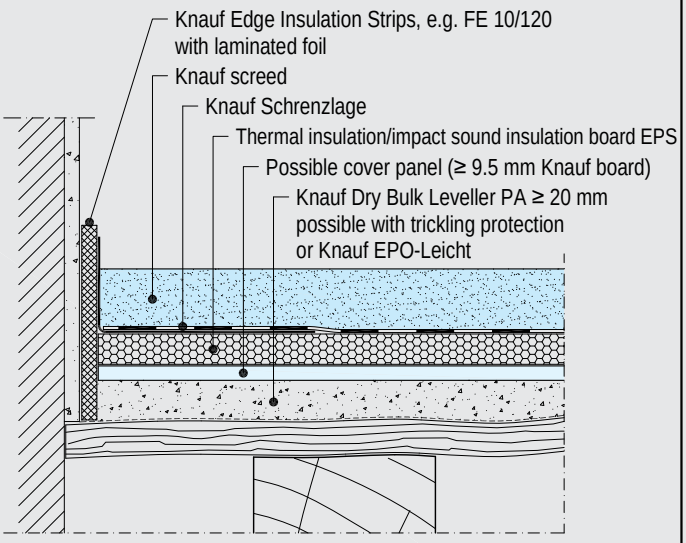
Technical sound properties to DIN 4108-10 (excerpt)	
Abbreviation	Description
sk	No demands on the sound insulation properties
sh	Impact noise insulation, increased compressibility
sm	Average compressibility
sg	Impact noise insulation, low compressibility

Details, scale 1:5 - examples

F231.de-V9 Flowing screed on thermal or footfall sound insulation



F231.de-V10 FE on thermal/sound insulation with height equalization



Screed on an insulating layer

Insulation layer - products

The large range of Knauf products on offer also features a range of premium products for the area of floor insulation materials.

Knauf Dämmstoffe GmbH

Knauf Dämmstoffe GmbH product range encompasses insulation materials made of expanded polystyrene (EPS). These insulation materials are offered internationally under the Knauf Therm brand.

Knauf Therm for impact sound insulation features a low dynamic stiffness and is therefore particularly suitable for the reduction of noise values of floating screed structures. Knauf Therm Trittschalldämmung (footfall sound insulation) is standardized acc. to DIN EN 13163 and approved for noise insulation on solid ceilings acc. to DIN 4108-10.

The boards are installed acc. to DIN 18560-2 and DIN 4109, page 4. The boards can serve simultaneously as thermal insulation and can be combined if necessary with Knauf Therm products for thermal insulation.

Products for floating screeds:

- Impact sound insulation:
  - Knauf Therm Trittschalldämmplatte 045 (DES sm)
  - Knauf Therm Trittschalldämmplatte 040 (DES sg)
  - Knauf Therm Trittschalldämmplatte 035 (DES sg)
- Thermal insulation:
  - Knauf Therm Sol 031 (DEO dh)

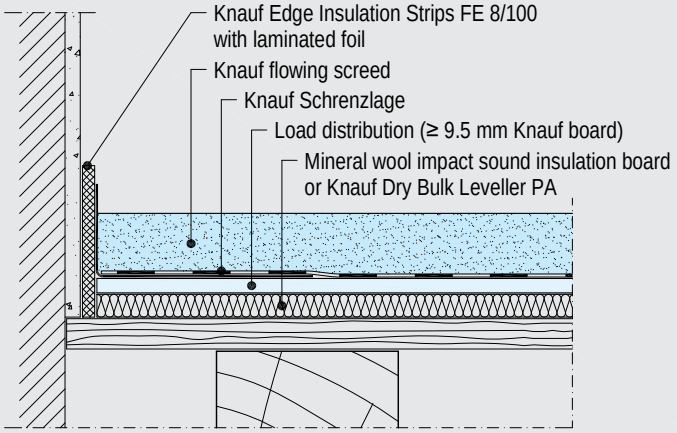
Further information:

www.knauf-daemmstoffe.de

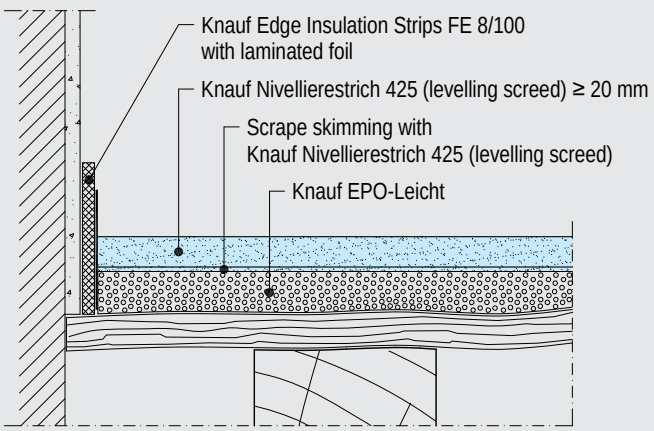
Details, scale 1:5 - Examples

All dimensions in mm

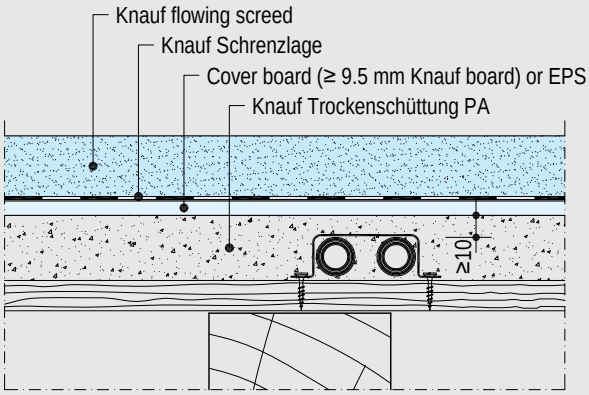
F231.de-V12 Flowing screed on mineral wool insulation



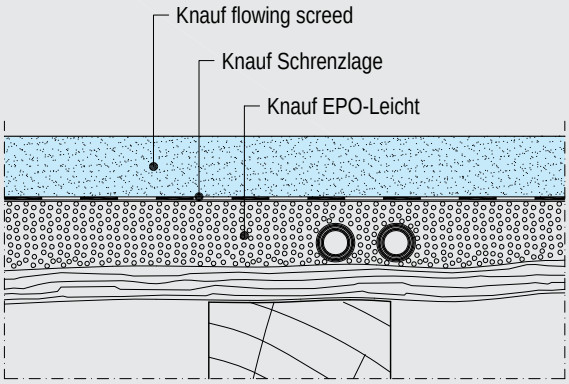
F231.de-V13 Light construction with Knauf EPO-Leicht



F231.de-V14 Basic floor levelling with Knauf Dry Bulk Leveller PA



F231.de-V15 Basic floor levelling with Knauf EPO-Leicht



Knauf Insulation GmbH

The product range from Knauf Insulation GmbH encompasses insulation materials made of mineral wool (glass wool and stone wool).

For the floor application areas, impact sound insulation boards made of stone wool as well as floor insulating boards made of stone wool or wood wool are available

Knauf Insulation stone wool insulation materials fulfil the highest demands for thermal, sound and fire protection in buildings.

Heraklith wood wool insulation boards consist of wood, water and magnesite or cement. They combine environmental compatibility and excellent insulating properties.

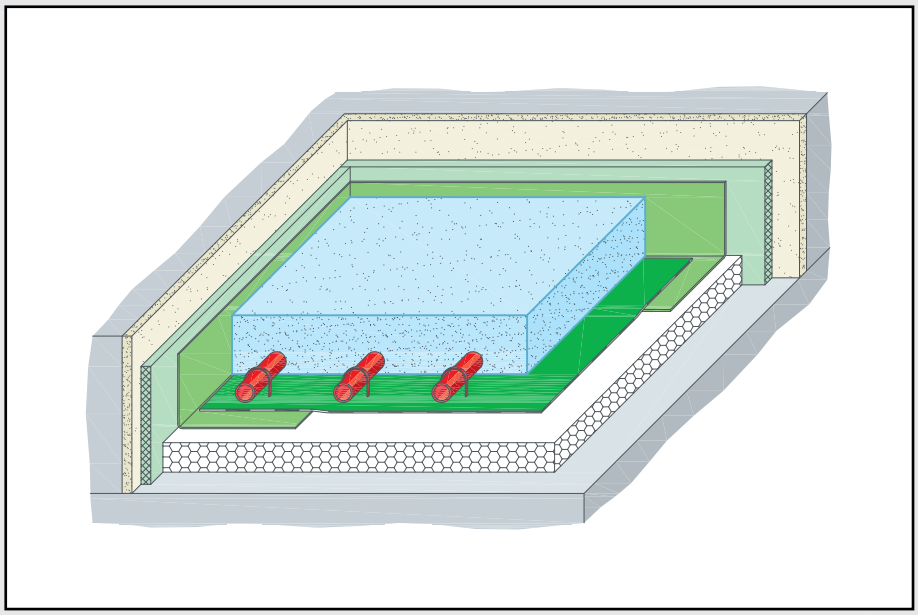
Products for floating screeds:

- Impact sound insulation:
  - Knauf Insulation Trittschall-Dämmplatte TP (DES-sh)
  - Knauf Insulation Trittschall-Dämmplatte TPE (DES-sg)
  - Knauf Insulation Trittschall-Dämmplatte TPS (DES-sm)
  - Knauf Insulation Trittschall-Dämmplatte TP-GP (DES-sg)
- Thermal insulation:
  - Knauf Insulation Boden-Dämmplatte TPD (DEO)
  - Knauf Heraklith BM (DEO-dm)

Further information:

www.knaufinsulation.de

Type A to DIN 18560-2



Heating elements of heated-water based underfloor heating in heating floor screed type A to DIN 18560 and electrical cable heating:
The heating elements are located on top of the insulation layer covering and kept in place on the insulation layer with staples or similar. They are fully embedded by the flowing screed when the screed is applied. They have direct contact with the screed.

Heating floor screed

Constructions and application

► Good to know

Calcium sulphate based floor screeds heat up more quickly than conventional cementitious screeds, because of the higher thermal conductivity, the optimum contact with the heating tube and the low coverage depths of the tubes. This increases the level of comfort and reduces energy consumption.

A heating floor screed is a heatable screed that is generally applied on an insulating layer. It must normally meet all demands made on a screed on an insulating layer such as impact noise and thermal insulation as well as stability. Furthermore, the further utilization of the heating screed (used for transferring heat and for heat storage) must consider special considerations of the construction during installation and in regular usage. The underfloor heating (tubing systems, plate-shaped elements, electrical resistance cabling) is embedded in the heating floor screed or under it with a heat conducting plate.

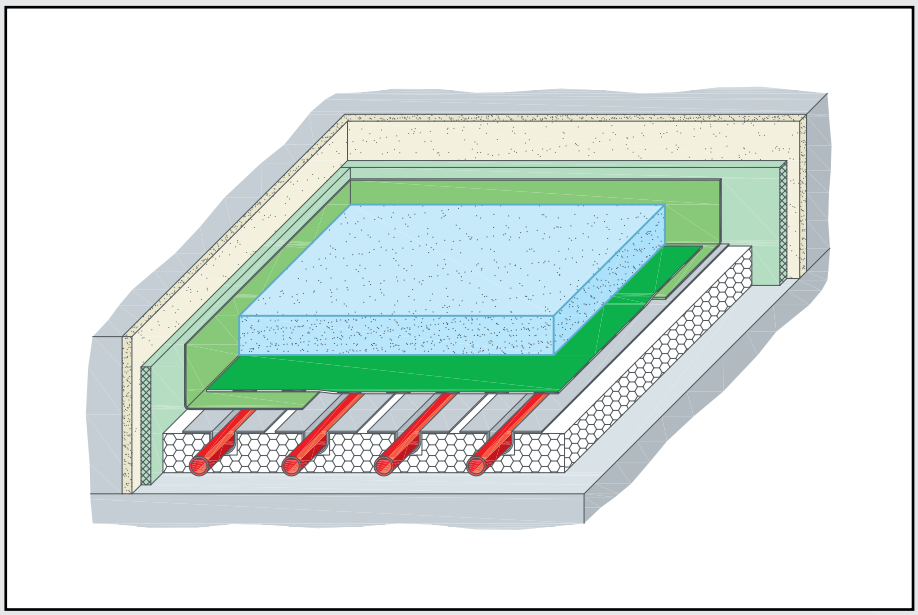
Heating floor screed, in contrast to convection radiators, has a large heating surface that extends over the entire floor layout. As a direct result, the heating can be operated with a low flow temperature. Furthermore, the room air can generally be 2K lower than rooms heated with convection radiators without any loss of comfort, because of the uniform heating of the room.
Advantages include:

- A more pleasant room climate
- Lower energy consumption

For application as heating floor screed, Knauf flowing screeds offer particular advantages:

- High thermal conductivity up to λ_z = 1.87 W/mK (with FE 80 Allegro),
- Good encasing of the tube and thus the best thermal conductivity with wet application
- Low screed thickness (tube coverage 35 mm for residential buildings)
- Short heating up times (see diagram)
- Heat until dry immediately after application without technological pauses with the use of Knauf Fließestrich FE 25 A tempo (floor screed).

Type B to DIN 18560-2



Heating elements of heated-water based underfloor heating in heating floor screed type B to DIN 18560 and electrical area heating

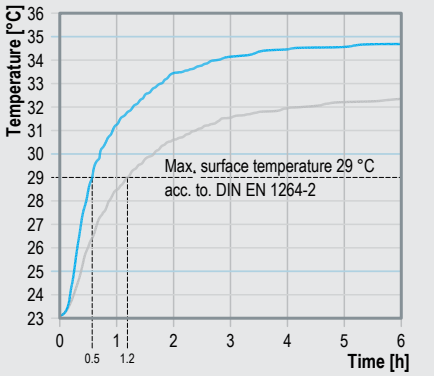
The heating elements are located underneath the insulation layer covering (separating layer). The heating tubes are located in the notches provided on the top side of the insulation layer. Area heating elements are also isolated from the screed by a separating layer.

Note: As the screed slab has to be an almost perfectly level surface, recesses and elevations, e.g. pipe bulges in the direction change areas must be avoided.

Development of the surface temperature on screed samples

Source: MPA Stuttgart, Examination of the control flexibility of heating floor screeds, September 2008

Double heating-up speed with calcium sulphate flowing screeds!



35 mm calcium sulphate flowing screed

45 mm cementitious screed

Planning of the heating floor screed

The basic rules similar to screed on an insulating layer apply with the construction and application. Observe the special considerations:

Insulation layers with high dynamic stiffness (e.g. polystyrene EPS DEO; extruded polystyrene foam XPS) are preferred; the compressibility of the insulation layer may not exceed 5 mm. If the insulation boards have an aluminium coating, this must be protected with a foil or a further coating against direct contact with the screed mortar, as a chemical reaction will otherwise occur between the aluminium and the alkaline water of the screed mortar.

- Application possible with FE 80 Allegro, FE 50 Largo, FE Fortissimo, FE 25 A tempo and FE Eco.
- The determining screed thickness (nominal thickness) is the thickness measurement over the highest point of the heating system (e.g. from the upper edge of the heating tube). The thickness is 35 mm.
- A reinforcement (e.g. steel grid) is not required.
- The largest thermally related changes in length of the heating floor screed caused by temperature differences must be considered during the usage conditions with the design of the joints (see Joint application page 65ff).
- The arrangement of the movement joints in accordance with Code of Practice no. 5 (IGE/IWM) “Joints in flowing calcium sulphate screeds” is recommended.

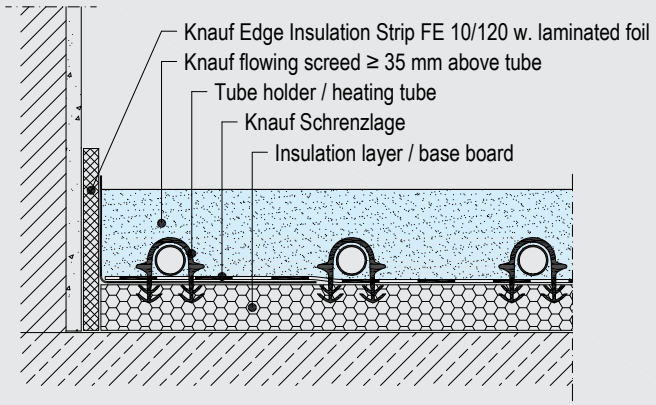
Tubing routing with warm water underfloor heating

In order to guarantee uniform heating of the screed slab, a helical application of the tubing has proven to be prudent. A meandering shaped application can cause cracks in the screed under unfavourable conditions in the heating up phase or with quick and large changes in temperature. Tubing routing with unprotected metal pipes in flowing screed is not recommended.

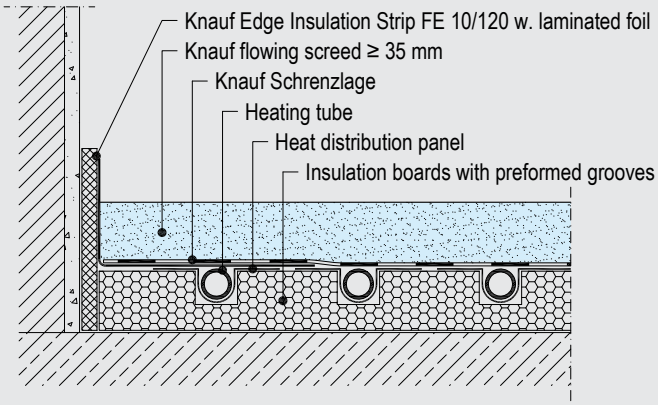
F233.de - Heating floor screed type A

F234.de - Heating floor screed type B Details, scale 1:5 - Examples

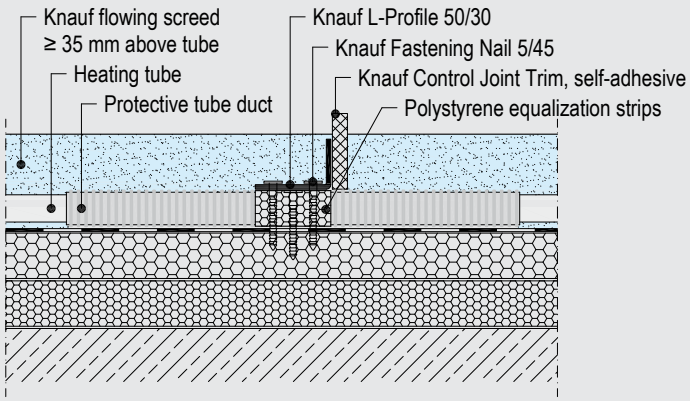
F233.de-V1 Edge configuration on solid ceiling



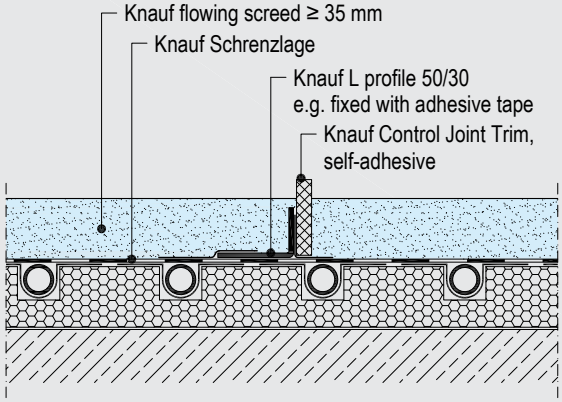
F234.de-V1 Edge configuration on solid ceiling



F233.de-V2 Joint configuration on solid ceiling



F234.de-V2 Joint configuration on solid ceiling



Heating floor screed

Constructions and application

Application of the screed layer

For installation of screed of type A (warm water underfloor heating), the heating tubes must be at operating pressure. If there is a danger of frost, the heating can be operated at the low flow temperature (max. 20 °C). Application of the screed in a single work step is preferred.

According to DIN EN 1264-4, the planned position of the heating tubes must be horizontally and vertically secured.

If this is not the case, with type A and with electrical cable heating, application of the screed is recommended in two stages.

Double-layer installation

- First of all the initial pour is introduced up to about 2/3 of the heating tube or cable height. The pipes or cables may not float on the screed and it should be prevented if this possibility exists by loading.
- After the initial pour is hard enough to be walked on (FE 80 Allegro, FE 50 Largo, FE Fortissimo and FE Eco after 12–24 hours, FE 25 A tempo after approx. 3 hours), the subsequent covering pour is undertaken.

If you wait with the application of the covering pour for longer than stated above, the initial pour must be wetted before the covering layer is applied to avoid suction related problems. If the waiting time requires several days, it is recommended that the initial pour is heated until dry and then primed.

The covering pour is then applied as a bonded screed on a dry substrate.

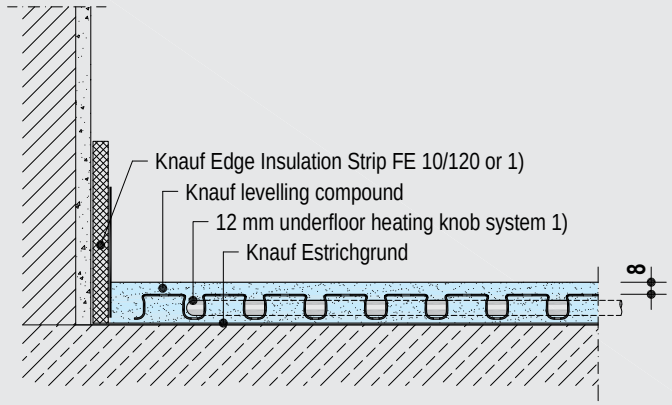
Measurement points

In order to avoid damaging a tube when removing a sample to determine the residual humidity at a later date, measurement points must be marked before the screed is applied.

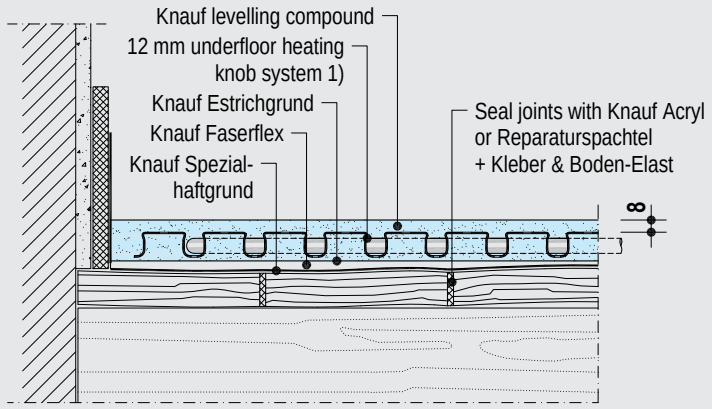
A heating floor screed must always be heated up and dried before the covering is applied. The procedure is described on page 80ff.

F215.de - Thin layer bonded heating floor screed

Bonded - solid ceiling

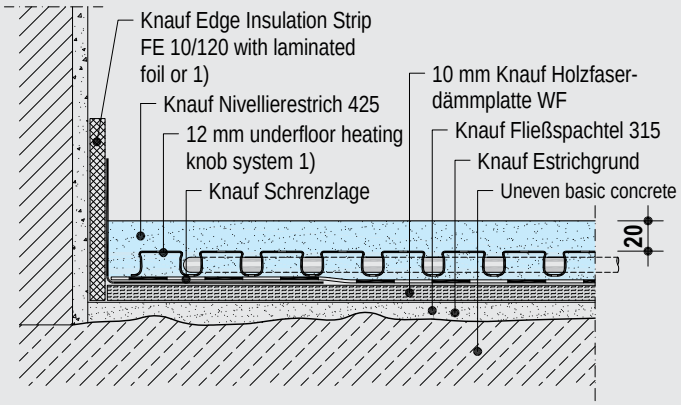


Bonded - wooden joist ceiling

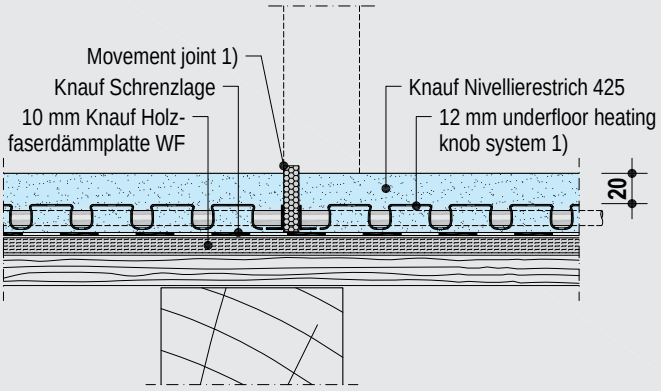


F235.de - Thin layer heating floor screed on an insulating layer

On insulating layer - solid ceiling



Movement joint in doorway



[1] System manufacturer of underfloor heating (Uponor Minitec)

Thin-layer heating screed

With Knauf levelling compound

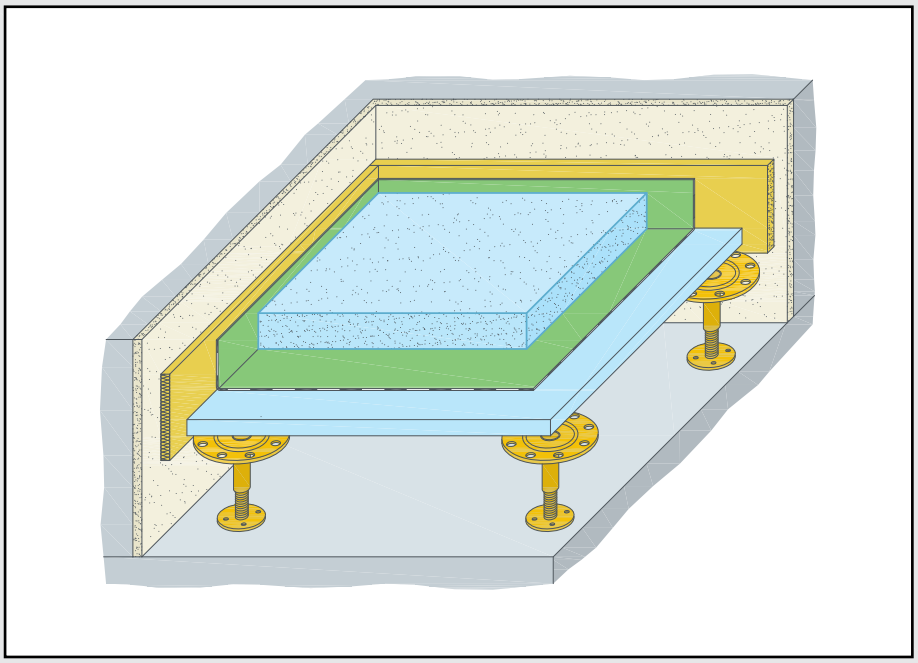
Thin-layer heating floor screed systems are increasing in significance, particularly for modernizations. They are generally manufactured bonded with the substrate, e.g. whereby an existing, stable screed can be converted with very little effort using Knauf levelling compounds to a heating floor screed.
Using Knauf Nivellierestrich 425, it is also possible to arrange a separating layer or an insulation layer as thermal or sound insulation under the thin-layer heating screed. The design is particularly dependent on whether a bonded construction or a heating floor screed on a separating or insulating layer is required.

With thin-layer underfloor heating consisting of a self-adhesive fixing panel (height ≥ 12 mm with Uponor Minitec), which depending on the selected construction, is glued to the primed substrate or onto a separating layer. The heating tube is inserted into the fixing panel, filled with water and pressure tested. Knauf Nivellierestrich 425 (levelling screed) is subsequently applied. The floor is ready for covering after a short period of being heated until dry.

Note
The thin-layer heating screed systems are not covered by the DIN 18560 and are thus deemed to be special constructions.

► Good to know
If, for example, there is insufficient height available during a modernization for a heating floor screed, a special thin-layer heating screed construcion can be used.

► *System Data Sheet FE22.de*
Thin-layer heating floor screed systems



Hollow raised access floors

Construction

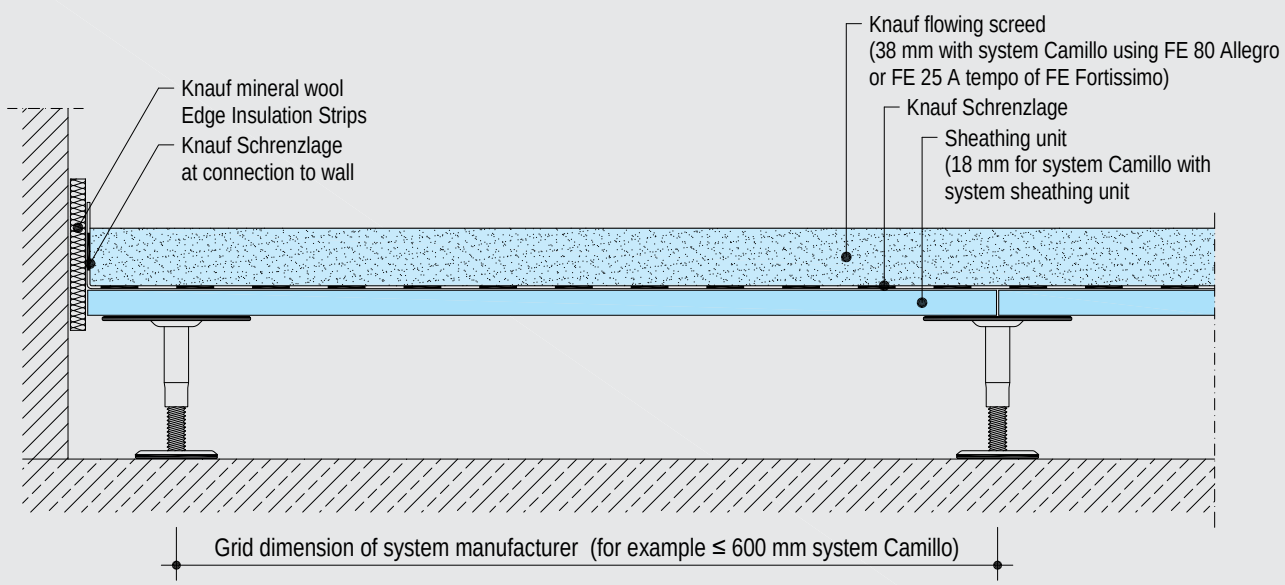
The raised access floor is a floor construction forming a cavity between the basic floor and screed layer intended for installations (cables, tubes). The cavity and the corresponding access panels in the screed construction facilitate very flexible changes in usage, even when required much later in the usage phase.
Raised access floors are preferred for applications in office and administration buildings. They are also used frequently in data centres, schools and research facilities as well as in workshops and manufacturing areas. They can support high point loads and linear distributed loads.

Demands and requirements in terms of sound, thermal and fire protection can be implemented with the corresponding variants. It is also possible to ventilate, heat or cool the building using the hollow partial access floor space.
Flowing screeds are self-sealing and accordingly feature a uniform, high-level of flexural strength. This is particularly important for a screed slab placed on supports, as flowing screed on a calcium sulphate basis is used almost exclusively for the manufacture of hollow or cavity floors. Knauf flowing screeds can be applied to large hollow partial access floor areas without joints (with the exception of structural joints). They can be walked on and loaded very quickly facilitating quick progress during a building phase.

They dry very quickly because of the low layer thickness. The surface can be covered with all conventional coverings.
All hollow floor requirements across Europe are defined in the DIN EN 13213.
Further information on hollow partial-access floors can be found in the Codes of Practice as well as the "Anwendungsrichtlinien zur DIN EN 13213 Hohlböden" issued by the German Bundesverband Systemböden e.V.

Details, scale 1:5 - Examples

F222.de-V4 Raised access floors with metal supports (e.g. Knauf raised-access floor system Camillo)



Loading classification in acc. to DIN EN 13213
(load application via metal stamp 25 x 25 mm)

Class	Failure load in kN	Point load (v = 2.0)[1] in kN	Application examples / usage categories
1	> 4.0	2.0	Offices with low frequency of usage
2	> 6.0	3.0	Standard office areas
3	> 8.0	4.0	Office areas with increased static loads, auditoria, training and lecture halls, treatment rooms
5	> 10.0	5.0	Industrial flooring surfaces for light-duty operation, storage rooms, workshops with light-duty usage
6	> 12.0	6.0 [2]	Floors intended for operation of industrial trucks, industrial and workshop floors

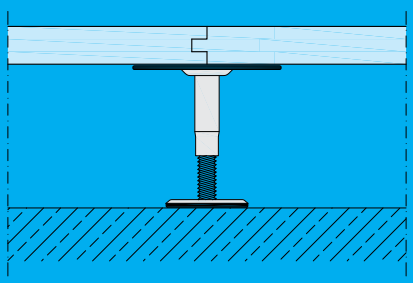
[1] *The value for the point load results from the failure load divided by the safety factor v = 2.0.*

[2] *For raised access floors of element class 6 with the higher usage related demands specified in individual cases, further load classes (≥ 6.0 kN) must be defined accordingly.*

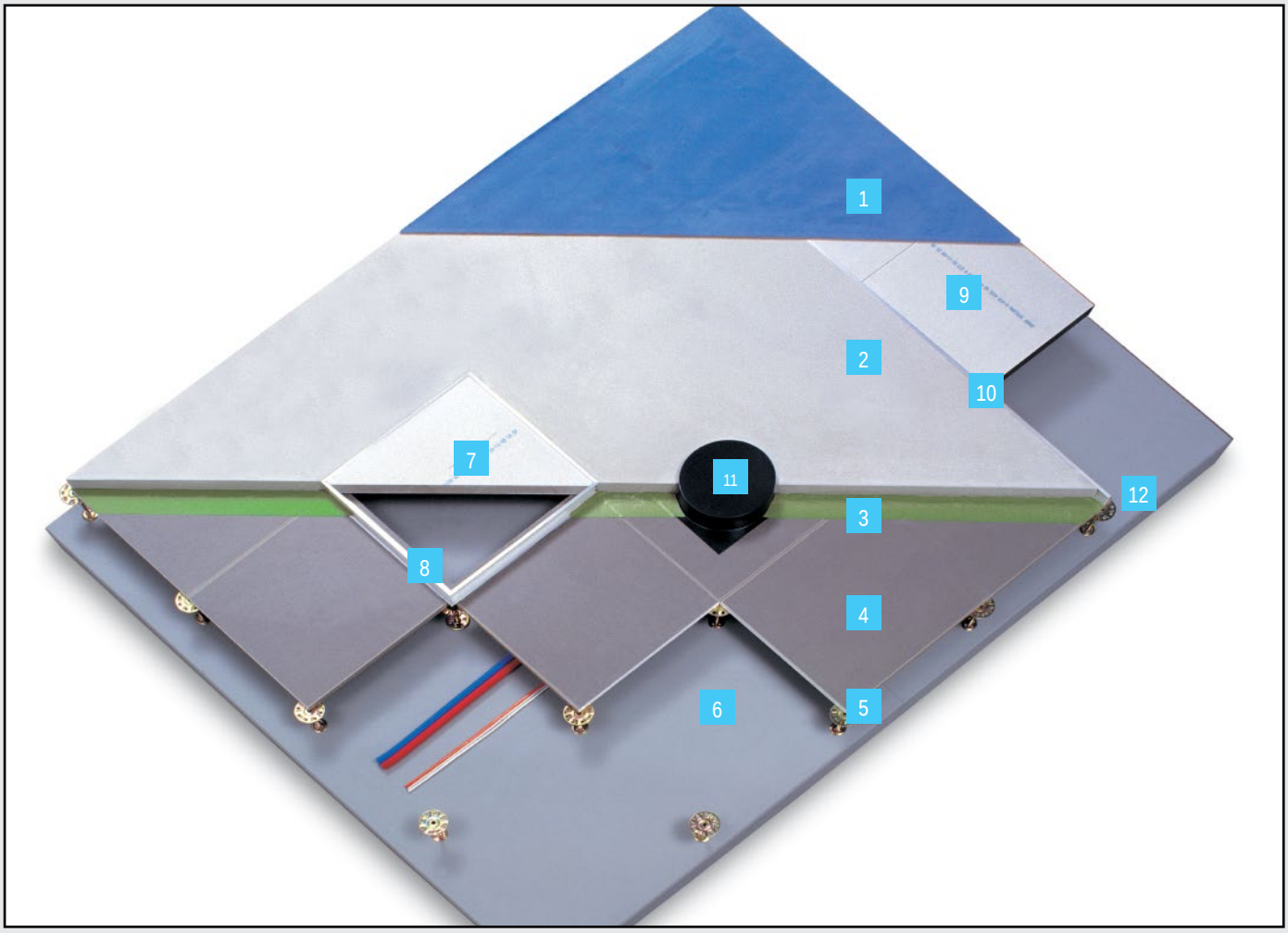
► Good to know

For a particularly fast construction, the Knauf GIFAfloor FHB flooring system is used. Here highly-stable gypsum-fibre elements on a base substrate are mounted directly on support elements and glued together. Dry applied hollow floors can be covered as soon as the following day.

See www.knauf.de



System design



► Good to know

The system properties in acc. with the table are certified with National technical Approvals.

The Knauf raised access floor system Camillo may not be used in wet areas.

Knauf raised access floor system Camillo

Construction and properties

Building services are gaining in significance from year to year with modern interior fittings. There are an increasing number of pipes for water heating and energy as well as an increasing number of cables for communication by telephone, computer, etc. The electrical building services, in particular, must be capable of a continuous upgrade to facilitate the rapid technical development or adaptation to new usages.

The Knauf hollow floor system Camillo has a wide area of applications in the field of interior fittings due to its excellent system properties. The system is used, for example, in offices, counter rooms, halls, training and lecture rooms, etc. It provides a high volume of installations with the minimum possible space requirement.

The clearance of the cavity space can be adapted individually by the selection of the support height to suit the requirements.

Height adjustable supports compensate for unevenness of the basic floor. The screed construction supported on it guarantees a uniform screed thickness as well as uniform properties with respect to drying, mechanical loading capacity, sound insulation and fire protection.

Because of the high impact sound improvement index, it is ideally suitable for use in multi-storey buildings without further additional impact sound measures.

The fi re resistance requirements with F30 from below and from above are fulfilled.

The Knauf raised access floor system Camillo is assigned to class 2 or 3 to DIN EN 13213 depending on the version.

The Knauf raised access floor system Camillo has the following design elements:

- Height adjustable supports on the basic floor, height up to 200 mm, grid 600 mm x 600 mm,
- Knauf System sheathing units applied to supports,
- Dimensions 600 mm x 1200 mm, thickness 18 mm
- Knauf edge insulation strips on all rising constructional components
- Covering of the sheathing units with Knauf Schrenzlage
- Knauf flowing screed as a base substrate, thickness 38 mm

1 Covering
Knauf hollow floor Camillo can be covered with all floor coverings.

Knauf flowing screed
Premium screed on a calcium sulphate basis with a high-level of flexural and compressive strength.
Screed thickness 38 mm.
Efficient application as a bulk product with PFT FERRO 100 for high area coverage.

3 **Knauf Schrenzlage**
Soda kraft paper with a film layer as a covering for sheathing units before application of the screed layer.

4 Knauf sheathing units
Rigid, robust gypsum boards with a high load capacity, fibre-glass reinforced on both sides.
Dimensions: 600 mm x 1200 mm x 18 mm

5 **Hollow partial access floor supports**
Screw-in supports with M12 thread up to 200 mm support height. Fixed above and below with PU support adhesive. Support grid: 600 mm x 600 mm

6 **Basic floor**
Prime the cleaned basic floor with Knauf Estrichgrund or Knauf Schnellgrund.

7 Access panel
GIFAfloor access board DB36R (36 mm thick)

8 Access panel frames
Metal frame for seating of a raised access board.
Situated on a sheathing unit, fixed with PU adhesive and sealed with adhesive tape.
Glued on the screed side with joint tape.

9 Access channel
GIFAfloor access board DB36R (36 mm thick).

10 **Junction profile**
Metal profile for the transition from a hollow partial access floor to an access channel.
Situated on a sheathing unit, fixed with PU adhesive and sealed with adhesive tape.
Glued on the screed side with joint tape.

11 Hollow body
Plastic hollow body for later installation of electrical components.

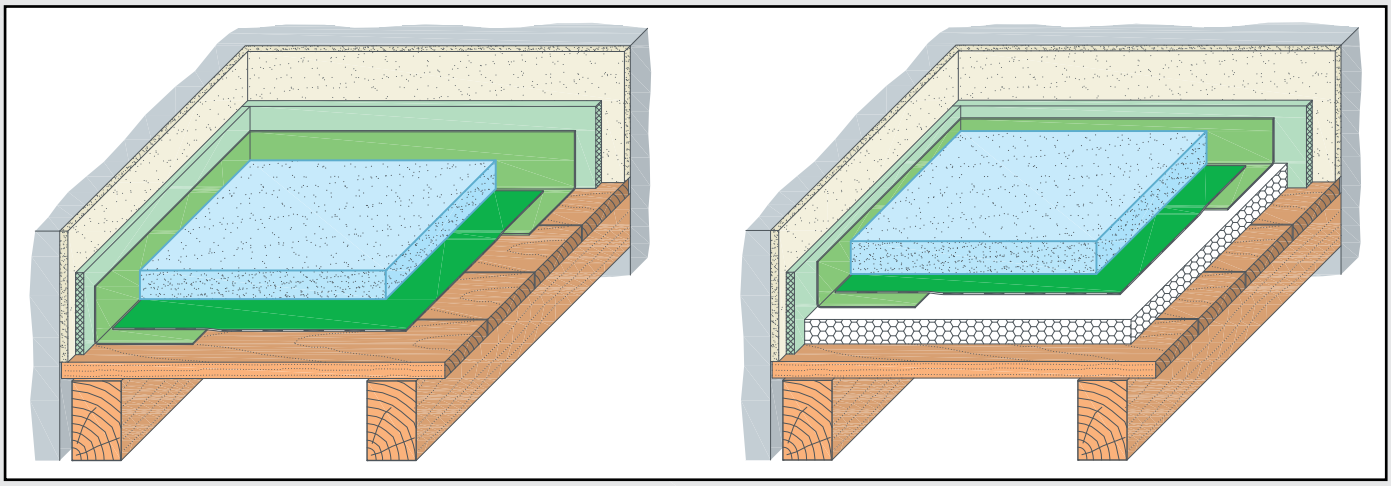
12 **Raised-access floor support**
Screw-in support with M16 thread for enhanced loading under the access panel frame and junction profile for access channels.
Fixed above and below with PU support adhesive.

Sound insulation	
Flanking impact sound level (weighted normalized impact sound level)	$L_{n,f,w,R}$ ($L_{n,w,R}$)
Without separation joint	
Without covering	72 dB
With covering (textile, made by Heuga)	52 dB
With separation joint	
Without covering	43 dB
With covering (textile, manufacturer Heuga)	32 dB
Standard flanking level difference (weighted linear sound reduction index)	$D_{n,f,w,R}$ ($R_{L,w,R}$)
Without separation joint	51 dB
With separation joint	59 dB
Impact sound reduction	**Δ** $L_{w,R}$
Without covering	24 dB
With covering (textile, made by DLW Strong)	26 dB
With covering (textile, made by Heuga)	34 dB

Technical data and system properties	
Load class to DIN EN 13213 (see page 35)	2 and 3 *
Impact resistant acc. to DIN EN 13213	yes
Weight per unit area	Approx. 100 kg/m²
Hollow area height	23 - 200 mm **
Free installation cross-section	> 95 %
Installation height up to upper edge	79 - 256 mm**
Building material class	A 1 / A 2
Fire resistance class from below and from above	F30

* *For load class 3 in the edge area, place an additional support between the grid points, and in the corners place an additional support with a clearance to both walls of 30 cm each.*
** *Larger heights on request*

► *Product Data Sheet F175.de Knauf Camillo*



► Good to know

If the loading of the ceiling or the installation height of the screed construction is so limited, so that a conventional screed construction cannot be used, the Knauf Fertigteilestrich Brio (pre-fab floor screed) is an ideal solution: Supporting layer thickness from 18 mm, area weight from 23 kg/m² .

(see Knauf System Data Sheet F12.de "Knauf Fertigteilestrich")

Screed on wood joist ceilings

Special notes

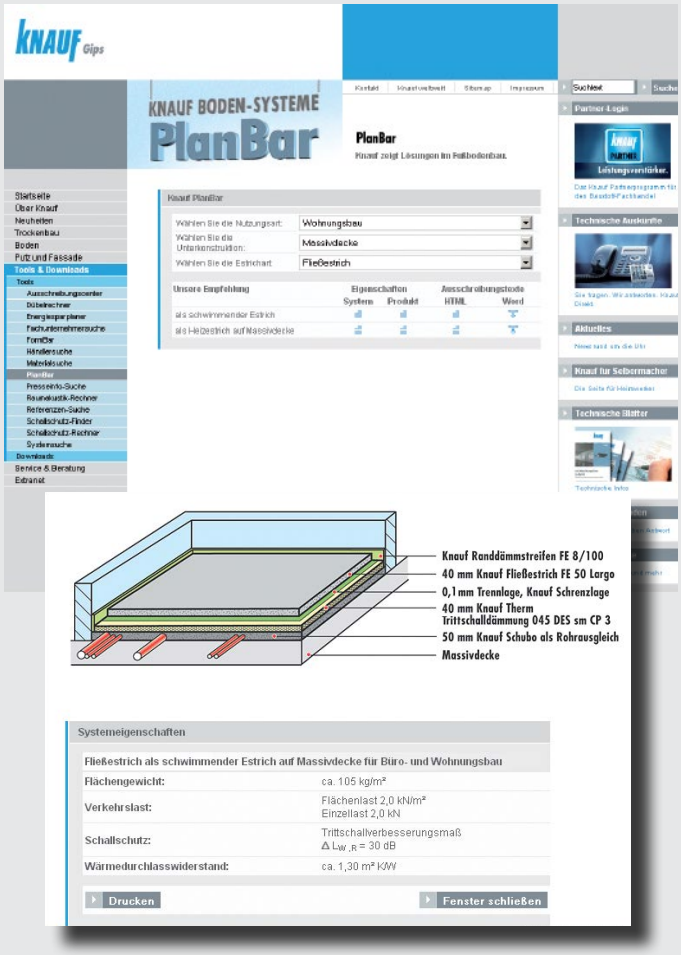
Knauf flowing screeds can be applied as a floating screed on wood joist ceilings or as a screed on a separating layer. For these ceilings, the substrate is generally a wooden plank floor.
The ceiling deflection due to live loads and self-weight including the additional load due to the screed (approx. 70 kg/m²) may not exceed 1/300 of the span width.

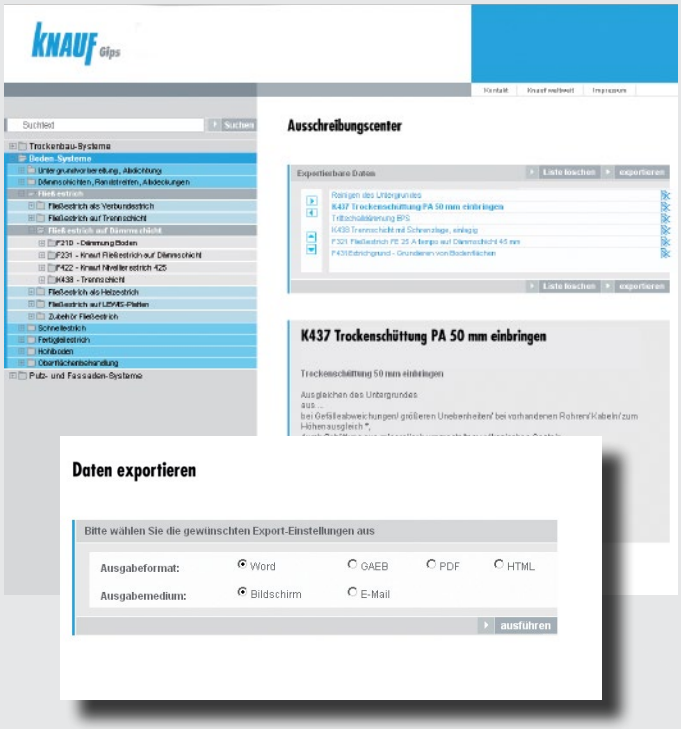
Renovation

If, for example, in the renovation area, the planking above the beams is to be eliminated, the dead floor must be fully capable of supporting the loads from the self-weight of the floor and the imposed loads in the area between the beams. The filling between the beams may not be compressed due to the loads. Above the beam layer and the filling, a layer with a pliable insulating layer at least 8 mm thick must be provided The light levelling mortar Knauf EPO-Leicht is the ideal solution for filling purposes between the beams and for levelling of sloping surfaces. It can be walked on after 24 hours and does not contain any moisture. It features a very low weight and good thermal insulation properties. In conjunction with a bonded screed very low heights are possible (see Knauf EPO-Leicht page 58).

Design

In order to avoid accumulation of moisture in the ceiling, no vapour barrier or foil should be applied on the wood joist ceiling. Knauf Schrenzlage can be used as a separating layer. If a vapour barrier is necessary, for example, because high levels of moisture can be found in the lower area, it should be applied underneath the wood joist ceiling.
Impact noise insulation materials are used to improve the impact noise protection on floating screeds. Reference values for impact noise reduction are stated page 16.
Wood joist ceilings can achieve a fire resistance class up to F60 (from below to above) with Knauf flowing screed and the corresponding ceiling construction (page 9).





Application – Substrate/foundation
Online planning aids

Planning and tendering with www.knauf.de

Comfortable tools are available in German only to support the planners and investors during the selection and tendering of Knauf flowing screed systems and all other products for the flooring area:
www.knauf.de

Plannable

Here you will find the right system for your requirements in a few steps.

Tendering centre

A comfortable, simple to operate tool that can be used to compile the specifications and export them to the common formats GAEB, MS Word as well as PDF.

► Good to know

Tips for screed appliers with unsuitable substrates or additional work required, see page 121.

Application

Work stage overview

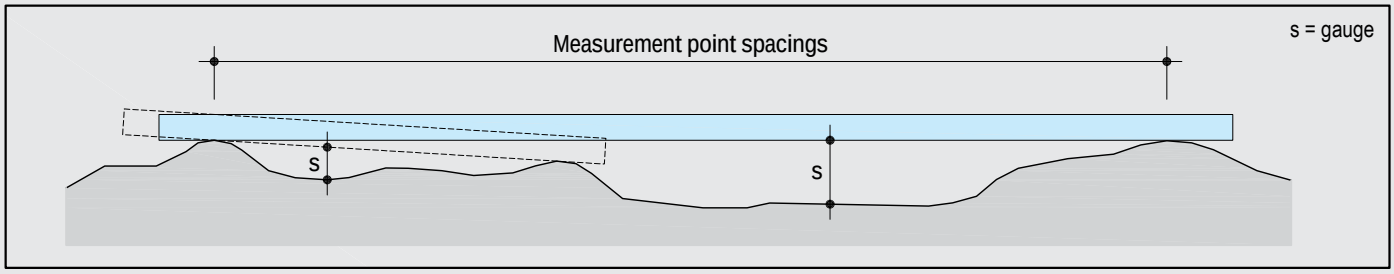
The list opposite provides an overview of the most important work stages in the application of different screed constructions.
They are described in detail on the following pages.

The application is described at the end for the following special constructions and special applications.

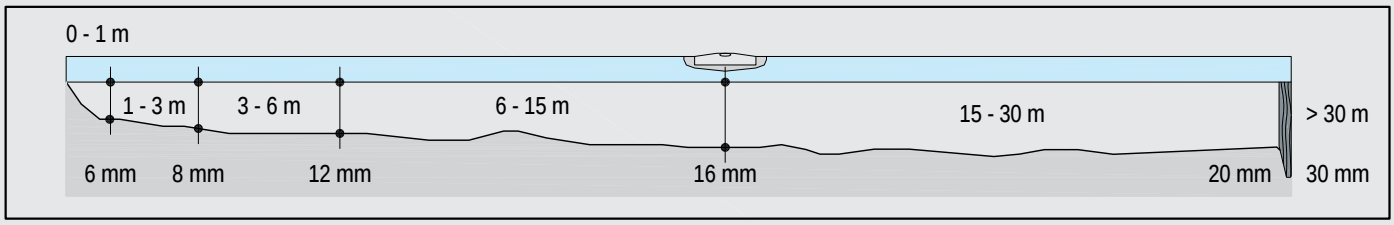
Overview of the necessary steps for screed constructions in dependence on the substrate

Application	Substrate				
	Concrete	Old screed	**Wooden floorboards**	Tiles or natural stone	Mixed substrates
Bonded screed					
Preparation	Clean the substrate, remove crumbling layers (brushing / shot-blasting / milling)	Clean the substrate, remove crumbling layers	Clean the substrate, identify loose floorboards	Clean the substrate, remove loose parts	Clean the substrate, remove loose parts
Substrate pre-treatment	Flowing screed and Dünnestrich 325 (thin layer screed): Estrichgrund (diluted 1:1 with water) or Schnellgrund (undiluted) Nivellierestrich 425 (levelling screed): 2x Estrichgrund (1:1 mit Wasser vedünnt) oder 1x Schnellgrund (unverdünnt)		Seal joints (Knauf Acrylic), Spezialhaftgrund (diluted 1:1 with water)	Flowing screed, Nivellierestrich 425, Dünnestrich 325: 1x FE-Imprägnierung interspersed with silica sand	Flowing screed, Nivellierestrich 425, Dünnestrich 325: 2x FE-Imprägnierung interspersed with silica sand
Sealing (if required)	Knauf FE-Abdichtung (sealing shield)	Knauf FE-Abdichtung (sealing shield)	-	Knauf FE-Abdichtung (sealing shield)	Knauf FE-Abdichtung (sealing shield)
Knauf flowing screed	≥ 25 mm	≥ 25 mm	-	≥ 25 mm	≥ 25 mm
Dünnestrich 325	5 - 30 mm	5 - 30 mm	-	5 - 30 mm	5 - 30 mm
Nivellierestrich 425	10 - 35 mm	10 - 35 mm	-	10 - 35 mm	10 - 35 mm
Faserflex			2 - 15 mm	-	-
Screed on a separating layer					
Preparation	Clean the substrate	Clean the substrate	Clean the substrate	Clean the substrate	Clean the substrate
Equalization layer (if required)	Estrichgrund screed primer (diluted 1:1 with water) or Knauf Schnellgrund (undiluted) Fließspachtel 315 / Dünnestrich 325	Estrichgrund screed primer (diluted 1:1 with water) or Knauf Schnellgrund (undiluted) Fließspachtel 315 / Dünnestrich 325	-	Estrichgrund screed primer (diluted 1:1 with water) or Knauf Schnellgrund (undiluted) Fließspachtel 315 / Dünnestrich 325	Estrichgrund screed primer (diluted 1:1 with water) or Knauf Schnellgrund (undiluted) Fließspachtel 315 / Dünnestrich 325
Sealing (if required)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	-	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)
Separating layer	Schrenzlage	Schrenzlage	Schrenzlage	Schrenzlage	Schrenzlage
Knauf flowing screed	≥ 30 mm	≥ 30 mm	≥ 30 mm	≥ 30 mm	≥ 30 mm
Screed on insulation layer, heating floor screed type A or B					
Preparation	Clean the substrate	Clean the substrate	Clean the substrate	Clean the substrate	Clean the substrate
Sealing (if required)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	-	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)
Equalization layer (if required)	Schubo or EPO-Leicht or Trockenschüttung PA + cover board	-	EPO-Leicht or Trockenschüttung PA + cover board	-	-
Insulation layer	if required	if required	if required	if required	if required
Underfloor heating	if required	if required	if required	if required	if required
Insulation layer covering	Schrenzlage + possible cover board	Schrenzlage + possible cover board	Schrenzlage + possible cover board	Schrenzlage + possible cover board	Schrenzlage + possible cover board
Flowing screed (with heated screed type A: thickness above heating elements)	≥ 35 mm	≥ 35 mm	≥ 35 mm	≥ 35 mm	≥ 35 mm

Evenness



Angular tolerances



Permissible evenness tolerances of basic floors
for application of screeds to DIN 18202

Spacing of the measurement points	Permissible evenness tolerances (gauge)
up to 0.1 m	5 mm
up to 1.0 m	8 mm
up to 4.0 m	12 mm
up to 10.0 m	15 mm
up to 15.0 m	20 mm

Preparation

Substrate examination

One of the most important preparation stages for the screed applier is the examination of the substrate to determine the suitability for the application of screed. When suitable, the substrate must be prepared in accordance with the requirements.
The DIN 18202 must be used to evaluate unevenness. Values for unevenness tolerances for the application substrate can be found in the table (DIN 18202, tab. 3, line 2a).

Furthermore, the substrate must be examined for the following defects:

- Cracks in the substrate

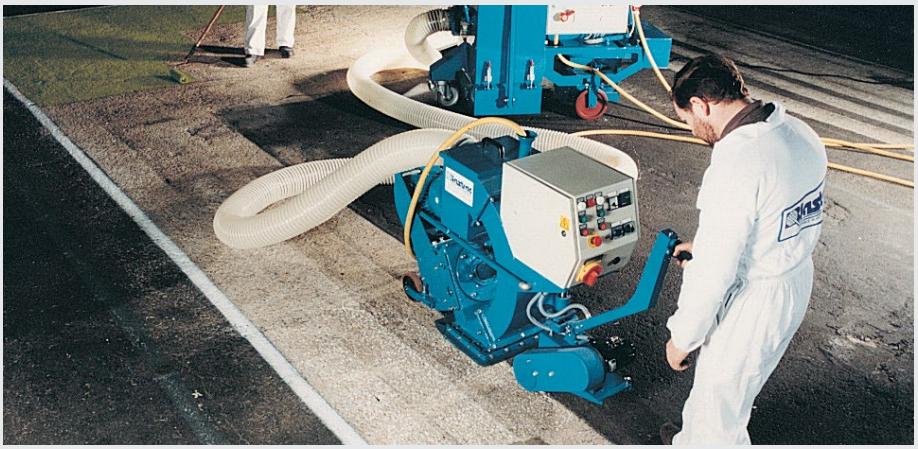
Insufficient substrate stability
(e.g. with bonded screed)

- Substrate with blooming and efflorescence
- Heavily soiled substrate
- Frozen substrate
- Substrate too damp
- Non-aligned or unsuitable joints in the substrate
- Missing or defective seals
- Existing pipes on the substrate
- Heating circuits not matched to the arrangement of the movement joints
- Missing or insufficient plaster connections to flanking walls
- Missing height reference point

Unsuitable application climate
(temperature, humidity)

- Non-closed door and window openings
- Insufficient ventilation after screed application (drying endangered)
- Insufficient protection devices in accordance with the health and safety regulations of the German building trade association

Cleaning with an industrial vacuum cleaner



Shot-blasting of the concrete surface to accept a bonded screed

		Bonded screed [1]	Screed on a separating layer [1]	Raised access floors	Screed on insulation layer / **heating floor screed** [1]	Screed on wood joist ceilings [1]
Check the substrate		x	x	x	x	x
alt.	Sweeping	x	x	x	x	x
	Brushing	x	x		x	
	Shot-blasting	x				
	Milling	x				
Clean with an industrial vacuum cleaner		x	x	x	x	
Fill holes and cracks			x			
Fill joints						x

[1] *also as a thin-layer heating floor screed with Nivelliérestrich 425 (levelling screed)*

Preparation

Substrate preparation

An overview of the necessary work stages for preparation of the substrate before screed application is provided in the table above in dependence on the selected screed construction.

To be assured with all screed variants:

- Functioning seals with ground moisture (Knauf Abdichtungsbahn Katja Sprint (sealing membrane Katja Sprint) see page 52ff or FE-Abdichtung (FE sealing shield) with bonded screed, see page 51),
- Possible vapour barrier in multi-storey building, particularly with vapour-proof floor coverings.

Screed on fresh concrete covers

On freshly applied concrete covers, the application of a steam barrier or brake is recommended if the use of moisture-sensitive coverings (e.g. parquet) is intended. This should prevent that the residual moisture from the concrete cover rises and damages the covering. In practice, a PE foil (0.2 mm) double layer is generally used as a moisture barrier.

With large area, seamless screed application (e.g. on raised access floors) on newly applied concrete covers, it may be necessary that the subsequent shrinkage of the concrete cover is considered with the provision of wide edge joints or movement joints in the screed and covering during the planning stage.

Insulation layers

With screed on an insulation layer, any possible faults in the insulation layer covering must be sealed off to prevent the material or water from passing through (e.g. impacts in the edge insulation strips, fi lm of the edge insulation strip on the protruding corners, worn Schrenzlage). Spreading drying material on unsealed locations as an alternative must be avoided, to exclude faults in the screed slab, which can act as frangible joints causing cracks later on.

Metal parts made of aluminium

Metal parts made of aluminium must be masked off or covered as they will be affected by the flowing screed mortar.

Knauf products for substrate preparation

Product overview and technical data

Knauf Estrichgrund is a modified, watery resin based dispersion and serves for regulating the absorptivity, improving bonding properties and moisture protection of mineral-based substrates in the floor area (interior and exterior), e.g. with a basic floor to accept bonded screed, as a primer before application of fillers or before surface coverings are applied. Knauf Estrichgrund is set to suit the required application by diluting it accordingly.

Technical data

Material consumption (undiluted)
- On basic floor approx. 150 g/m² (depending on the absorbency)
- On calcium sulphate screed approx. 100 g/m²
- On gypsum fibre boards approx. 50 g/m²

Drying times (with good ventilation)
- Depending on the substrate approx. 12 h

Storage
In original sealed bucket can be stored for 18 months - protect against frost.

Substrate	Subsequent coating	Recommendations for dilution **Knauf Estrichgrund : water**
Basic concrete, cementitious screed	Bonded calcium sulphate screed e.g. Knauf FE 80 Allegro, FE 50 Largo, FE 25 A tempo Thin-screed compound, e.g. Knauf Dünnestrich 325 (Thin Layer Screed) Filler materials, e.g. Knauf Fließspachtel 315	1 : 1 * 1 : 1 * 1 : 1 *
Calcium sulphate screed Knauf flowing screed (e.g. Knauf FE 80 Allegro, FE 50 Largo, FE 25 A tempo, Nivellierestrich 425**)	Filler materials, e.g. Knauf Fließspachtel 315 Knauf Nivellierspachtel (floor levelling filler) 415 Floor covering adhesive, carpet fixing, Knauf Flexkleber Multi	1 : 1 * 1 : 1 1 : 1 1 : 1
Pre-fab floor screed Knauf Brio	Filler materials, e.g. Knauf Nivellierspachtel (floor levelling filler) 415 Tile adhesive mortar, floor covering adhesive, carpet fixing	1 : 1 1 : 1

* *If required apply 2x primer with Knauf Estrichgrund with highly absorbent substrate: Water 1 : 1 + 1 : 1, on non-absorbing substrates suitable special primer, e.g. Knauf Spezialhaftgrund is to be used*

** *With Knauf Nivellierestrich 425, apply primer 2x Knauf Estrichgrund (1:1)*

Note:
If products for coating from other manufacturers are to be used, please consult the manufacturer beforehand.

Knauf Estrichgrund

Priming of absorbent floor surfaces

Substrate

The substrate should be dry (even when outdoors), firm and sufficiently dimensionally stable and clean (free of dust, wax, grease, paint layers, formwork release agents, etc.).

Application

Apply diluted Knauf Estrichgrund (screed primer) (see table) evenly using floor coater, painter's brush, prime brush or roller while paying attention to a uniform and fully covering application (avoid ponding).

Wait with subsequent work until the Knauf Estrichgrund is no longer adhesive and has fully dried (min 12 hours at 20 °C and 65% rel. humidity). The drying time is dependent on the climatic and building site conditions as well as on the substrate. Good ventilation and dry, warmed air assist drying while poor ventilation and damp air prevent drying.

The temperature of the material, the substrate and the air should not be below +5 °C during application and until drying is completed. Clean tools immediately after use with water.

Disposal of residual material

- Waste code no. (AVV) 080120
  - untreated: special waste incineration
  - chemically-physically treated: e.g. dried or solidified by addition to cement. Building rubble landfill/building material landfill
- Containers are simple to empty and can be recycled after cleaning. Recommended cleaning agent: water

GISCODE: M-GP01

► *Product Data Sheet F431.de*

Knauf Schnellgrund is a ready-to-use, watery primer on a synthetic resin emulsion basis and serves for regulating the absorptivity, improving bonding properties and moisture protection of mineral-based substrates in the floor area (interior and exterior), e.g. with a basic floor to accept bonded screed, as a primer before application of fillers or before surface coverings are applied.

Technical data
Material consumption (undiluted)
■ On basic floor approx. 150 g/m² (depending on the absorbency)
■ On calcium sulphate screed approx. 110 g/m²
■ On gypsum fibre boards approx. 80 g/m²
■ Chipboard V100 approx. 90 g/m²
Drying times (with good ventilation)
■ Depending on the substrate approx. 2 h
Storage
In original sealed bucket can be stored for 18 months - protect against frost.

Substrate	Subsequent coating	Recommended dilution values
Basic concrete, cementitious screed	Bonded calcium sulphate screed e.g. Knauf FE 80 Allegro, FE 50 Largo, FE 25 A tempo Thin-screed compound, e.g. Knauf Dünnestrich 325 (Thin Layer Screed) Filler materials, e.g. Knauf Fließspachtel 315	undiluted undiluted undiluted
Calcium sulphate screed Knauf flowing screed (e.g. Knauf FE 80 Allegro, FE 50 Largo, FE 25 A tempo, Nivelliererstrich 425)	Filler materials, e.g. Knauf Fließspachtel 315 Knauf Nivellierspachtel (floor levelling filler) 415 Floor covering adhesive, carpet fixing,	undiluted undiluted undiluted
Pre-fab floor screed Knauf Brio	Filler materials, e.g. Knauf Nivellierspachtel (floor levelling filler) 415 Tile adhesive mortar, floor covering adhesive, carpet fixing	undiluted undiluted
With non-absorbent substrates, suitable special primer, e.g. Knauf Spezialhaftgrund is to be used		

Note:
If products for coating from other manufacturers are to be used, please consult the manufacturer beforehand.

Knauf Schnellgrund

Quick-drying priming of absorbent floor surfaces

Substrate

The substrate should be dry (even when outdoors), firm and sufficiently dimensionally stable and clean (free of dust, wax, grease, paint layers, formwork release agents, etc.).

Application

Apply undiluted Knauf Schnellgrund evenly and to the entire surface in a crosswise action with a floor coater, painter's brush, prime brush or roller. Remove excess material so that no glossy spots or pools occur. The rooms should be well ventilated immediately after application.

Wait with subsequent work until the Knauf Schnellgrund is dry (min. 2 hours at 20°C and 65 % rel. humidity). The drying time is dependent on the climatic and building site conditions as well as on the substrate. Good ventilation and dry, warmed air assist drying. Poor ventilation and damp air prevent drying. The temperature of the material, the substrate and the air should not be below +5 °C during application and until drying is completed. Clean tools immediately after use with water.

Disposal of residual material

- Waste code no. (AVV) 080120
  - untreated: special waste incineration
  - chemically-physically treated: e.g. dried or solidified by addition to cement. Building rubble landfill/building material landfill
- Containers are simple to empty and can be recycled after cleaning.
  Recommended cleaning agent: water

GISCODE: M-GP01

► *Product Data Sheet F434.de*

Knauf Spezialhaftgrund is a modified, watery resin based dispersion and serves for regulating the absorptivity, improving bonding properties and moisture protection of

- Normal, low or non-absorbent substrates, e.g. Calcium sulphate screed, mastic asphalt screed, normal and highly compressed cementitious screed, cement boards, waterproof chipboard, Terrazzo and old ceramic tile coverings
- Wooden substrates

Technical data

Material consumption (undiluted)

- Normally absorbent substrates 50–100 g/m²
- Non-absorbent substrates 40–60 g/m²
- Wooden substrates 60–80 g/m²
- Old tile coverings, Terrazzo 70-100 g/m²

Drying times (with good ventilation) with

- Absorbent substrates approx. 12 h
- Non-absorbent substrates approx. 12 h
- Wooden substrates approx. 6 h
- Old tiles, Terrazzo approx. 3 h

Storage

Can be stored for at least 18 months in the original sealed bucket. Store frost-free and protect against direct sunlight or heat.

Note:
If products for coating from other manufacturers are to be used, please consult the manufacturer beforehand.

Substrate	Subsequent coating	Recommendations for dilution **Knauf Spezialhaftgrund : water**
Normal, low or non-absorbent Calcium sulphate screed, normal and highly compressed cementitious screeds, cement boards, etc.	Knauf Flexkleber Multi Filler materials, e.g. Knauf Fließspachtel 315	1 : 2 1 : 2
Smooth, non-absorbent Dense, mineral-based substrates such as board coverings or Terrazzo, mastic asphalt screed	Knauf Flexkleber Multi Filler materials, e.g. Knauf Fließspachtel 315	undiluted undiluted
Wooden substrate	Knauf Faserflex	1 : 1

Knauf Spezialhaftgrund

Priming of normal, low or non-absorbent substrates and wooden substrates

The substrate should be stable, dry, firm, clean, free of dust and release agents. Non waterproof coatings and other remnants that can affect bonding must be removed, waterproof coatings must be roughened considerably.
Wooden substrates must be free of vermin, mould, wax, paints, care products or similar to guarantee smooth subsequent operations Wooden floor planking must be sanded down, the sanding dust must be thoroughly removed. Loose planks must be anchored firmly with screws. Chipboard must be screwed on firmly, be free of distortion and glued in the notches and grooves. Joints and thin cracks on wooden flooring must be treated with Knauf Acrylic.

Application

Spezialhaftgrund should be stirred thoroughly and diluted with water should the substrate require it, see table. Diluted or undiluted Knauf Spezialhaftgrund must be applied in a crosswise action using a using floor coater, painter's brush, prime brush or roller while paying attention to a uniform and fully covering application Remove excess material so that no glossy spots or pools occur. Overhangs must be well covered. Subsequent work may only be performed after drying is complete. No other materials except water may be added to Knauf Spezialhaftgrund. Clean tools immediately after use with water.

Application temperature / climatic conditions

Do not apply Knauf Spezialhaftgrund if the temperature of substrate and the air are below +5 °C.
High ambient temperatures or heated substrates shorten the application time; low temperatures or high levels of humidity increase the application time.

Disposal of residual material

- Waste code no. (AVV) 080120
  - untreated: special waste incineration
  - chemically-physically treated: e.g. dried or solidifi ed by addition to cement Building rubble landfill/building material landfill
- Containers are simple to empty and can be recycled after cleaning.
  Recommended cleaning agent:: water

GISCODE: M-GP01

► *Product Data Sheet F433.de*

Knauf FE-Imprägnierung is a solvent free, two-component low viscosity epoxy resin and is used for the following:

- As a component for quick-setting screed Knauf Stretto
- As a component of the levelling mortar Knauf EPO-Leicht
- As a bonding primer on uneven substrates with bonded screeds
- As a bonding primer under Knauf Nivellierestrich 425
- As a primer for Knauf FE-Abdichtung
- As a binding compound for Knauf Stretto-Reparaturset (repair set)
- For filling cracks in screed

Both components of the Knauf FE-Imprägnierung must always be combined in the correct mixing ratio. This is why it is supplied in the correct mixing ratio in the combo pack. Combo packs are supplied in 1 kg, 5 kg and 10 kg sizes. This facilitates the respective quantity to be ordered and processed to suit the application at hand.

Technical data	
Mixing ratio (Comp. A:B)	2:1
Application time at 20 °C	approx. 15 min
Application temperature	10–25 °C
Walkable	after approx. 24 h
Mech. loading	after approx. 3 days
Chemically stressable	after approx. 7 days
Storage	cool and dry
Storage temperature	-5 °C to +35 °C
Storage time	12 months

Material consumption

- Knauf Stretto:
  1 kg FE-Imprägnierung : 25 kg Stretto sand
- Knauf EPO-Leicht:
  1 kg FE-Imprägnierung : 60 l EPO-Perl
- As a bonding primer approx.
  350 (250+100) g/m² + intersperse with approx. 1.5 kg/m² dry silica sand (1–2 mm)
- As a primer before FE-Abdichtung:
  approx. 400 g/m² FE-Imprägnierung

German Ordinance on Hazardous Substances:
Component A irritant, component B corrosive

► Please note

Only persons that are familiar with chemically setting substances are allowed to apply these products. Ventilate rooms properly (preferably lateral ventilation). Wear protective goggles (e.g. during mixing), suitable gloves and working clothes to prevent contact with skin. Accident prevention regulations of the commercial employer's liability insurance associations (e.g. handling of epoxy resin or HVBG - BGR 227 Working with epoxy resin) have to

Knauf FE-Imprägnierung

Impregnation Agent – Two-component low viscosity epoxy resin

Application

Add component B (hardener) to component A (resin) and mix properly with a mixer (approx. 400 RPM). Ensure that the material sticking to the sides of the mixing container is blended in as well. Transfer the compound to a suitable clean container. Scrape out all remaining material and add it to the compound while stirring again.

Refilling is necessary to collect all material, especially at the bottom of the mixing container, which might not have been blended and that could leave unhardened areas after application.

For the preparation of Knauf Stretto and Knauf EPO-Leicht, both components have to be mixed properly before adding the supplement (Knauf Stretto-Sand, Knauf EPO-Perl). Refilling to another container can be neglected in this case.

Apply Knauf FE-Imprägnierung at temperatures between 10 °C and 25 °C. If Knauf FE-Imprägnierung is used as a bonding primer, the substrate surface temperature must be above 10 °C. Ensure that the surface temperature is not below the dew point if air humidity is high. Knauf FE-Imprägnierung will not harden in conjunction with water.

The setting speed and accordingly the application time depends on the temperature. At 20 °C, application time for material in its pure form is approx. 15 minutes, as Knauf Stretto approx. 60 minutes and as Knauf EPO-Leicht approx. 45 minutes. At low temperatures, a longer application time can be expected, while at high temperatures a shorter application time can be expected. Apply the Knauf FE-Imprägnierung within a few minutes of mixing due to heat build up in the container that will shorten the setting time.

Apply Knauf FE-Imprägnierung in two work steps:

Step 1: layer approx. 250 g/m²

Step 2: layer approx. 100 g/m² and interspersion of coarse, dry sand (1–2 mm, 1.5 kg/m²).

The required hardening time between impregnating coats and the following screed application is 24 hours.

► *Product Data Sheet F451.de*

The decisive advantage of bonded screeds compared to other screed constructions is the very high loading capacity at very low layer thicknesses.
Frequently, this benefit cannot be used when a moisture barrier is required under the screed, which is generally applied with sealing membranes.
Knauf FE-Abdichtung is a sealing bonding primer, which seals the substrate against ground moisture (DIN 18195-4) and against residual moisture from the concrete cover, and at the same time provides a fixed bond between the substrate and the screed.
It is a liquid film on the basis of a two-component epoxy resin. Both components of the Knauf FE-Abdichtung must always be combined in the correct mixing ratio. This is whey they are supplied in the correct mixing ratio in a 10 kg combo pack.

be complied with at all times. Additionally, the instructions and guidelines of the BEB Information Sheets KH-O/U, KH-1 and KH-3 apply. Moreover, the safety-related information of the Knauf Safety Data Sheets for Knauf FE-Abdichtung and Knauf FE-Imprägnierung must be observed.

Technical data	
Mixing ratio (Comp. A:B)	3 : 1
Water vapour diffusion equivalent air layer thickness	s_d = approx. 30 m
Water vapour diffusion **coefficient**	μ = approx. 40,000
Application time at 20 °C	approx. 30 min
Application temperature	≥ 10 °C
Walkable	after approx. 24 h
Storage	cool and dry
Storage temperature	-5 °C to +35 °C
Storage time	24 months

Material consumption
- As sealing against ground moisture:
  FE-Imprägnierung approx. 350 g/m²
  FE-Abdichtung approx. 600 to 1000 g/m²
  Silica sand (1-2 mm) approx. 1.5 kg/m²
- As a sealing layer against residual moisture:
  FE-Imprägnierung approx. 350 g/m²
  FE-Abdichtung approx. 200 g/m²
  Silica sand (1-2 mm) approx. 1.5 kg/m²

German Ordinance on Hazardous Substances:
Component A irritant, component B corrosive

Knauf FE-Abdichtung

Sealing adhesive bridge for bonded screed

Application

The substrate must be dry, clean, porous and free of soft and loose components. It must comply with the requirements acc. to DIN 18560-3 and be sufficiently firm for the expected loads. Smoothed surfaces or surfaces with soft and loose components (e.g. cement slurry, mortar remnants, old sealants, etc.) must be improved by milling or shot-blasting. Repair any cracks or recesses. About 24 hours before applying Knauf FE-Abdichtung, apply Knauf FE-Imprägnierung to the substrate.
Seals on rising components must be applied to at least the height of the planned screed upper edge. Seal the joints appropriately.
Add component B (hardener) to component A resin) and mix properly with a mixer (approx. 400 RPM). Ensure that the material sticking to the sides of the mixing container is blended in as well. Transfer the compound to a suitable clean container. Scrape out all remaining material with a spatula and add it to the compound while stirring again. Apply the liquid film with a lambskin roller or floor coater. The pores of the concrete substrate must be sealed after application. The sealing must provide a closed film.

Sealing against ground moisture on **concrete floor slabs**

1. Apply FE-Imprägnierung (approx. 350 g/m²)
2. On 2nd day apply first layer of FE-Abdichtung (approx. 600 g/m²)
3. On the 3rd day apply second layer of FE-Abdichtung (approx. 200 g/m²) and intersperse with 1-2 mm silica sand (approx. 1.5 kg/m²)
4. On the 4th day apply screed

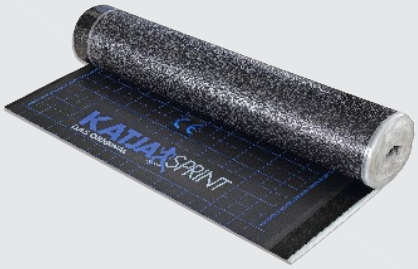
Barrier layer against residual moisture from the concrete cover

1. Apply FE-Imprägnierung (approx. 350 g/m²)
2. On the 2nd day apply layer of FE-Abdichtung (approx. 200 g/m²) and intersperse with 1-2 mm silica sand (approx. 1.5 kg/m²)
3. On the 3rd day apply screed

Note

With concrete covers over rooms with increased air humidity (e.g. industrial kitchens, swimming pools, communal showers), other sealing measures (e.g. Knauf Abdichtungsbahn Katja Sprint sealing membrane) should be provided.

► *Product Data Sheet F455.de*



Knauf Abdichtungsbahn Katja Sprint: Quick to apply, with a high yield

Knauf Abdichtungsbahn Katja Sprint

Sealing membrane with self-adhesive seam against ground moisture

Knauf Abdichtungsbahn Katja Sprint is a sealing membrane made of polymer bitumen with glass fleece and aluminium layer, coated with polyethylene on both surfaces.
It is building authority approved and used as water-proofing against ground moisture on floor slabs with soil contact (DIN 18195-4), water-proofing of floor slabs between storeys (no wood joist ceilings) above rooms with high air humidity, and as a sealing membrane against residual moisture of concrete slabs.
It is only suitable for interior floor applications and not for sealing against fluids applied from above.

Properties and added value

Knauf Abdichtungsbahn Katja Sprint (sealing membrane) features a very high density (s_d value ≥ 1500 m) and very economic application with a high application yield. It is 32 m long and 1.25 m wide with a roll weight of approx. 36 kg. Transport and storage are thus simplified by the high yield. There is an adhesive strip on the top and bottom on the long edges. Accordingly, application requires neither a naked flame nor a solvent-welding agent.
Due to the low thickness of just 0.9 mm, it is quick and easy to apply and still mechanically stable. It can be easily adapted to the substrate. Overlaps on the joints only barely occur in comparison with conventional welding membranes. This is of significance for the application of full surface insulation layers. In particular with screed constructions subject to high loading with stiff insulation layers, the cavity free application of the insulation layer is very important, which is usually not possible with conventional welding membranes.
For sealing front end joints or for the manufacture of connections to rising constructional components, the corresponding Knauf Abdichtungsbahn (connector tape) can be used It is a fully self-adhesive bitumen sealing tape with a length of 15 m and 0.20 m width. It consists of polymer bitumen just like Katja Sprint.

Application

The application temperature may not be below +5 °C. The substrate must be swept clean and be free of unevenness. The unrolled strips are applied with overlaps of 10 cm on the long and front edges.

Sealing the long joints by removing the protective film

Sealing of front end joints with Knauf Anschlussstreifen (connector tape)

Connections to rising components with Knauf Anschlussstreifen (connector tape)

Technical data - Knauf Abdichtungsbahn Katja Sprint (sealing membrane)			
Roll weight	approx. 36-39 kg	**Mechanical properties (DIN 52123):**	
Weight per unit area	approx. 0.9 kg/m²	Flexibility at low temperature	-15 °C
Thickness	approx. 0.9 mm	Heat stability	+100 °C
Roll width	approx. 1.25 m	Tensile strength	longitudinal ≥ 400 N
Roll length	approx. 32 m		lateral ≥ 300 N
1 roll	40 m²	Extension at tensile strength average values	
Yield	one roll for approx. 37 m²		longitudinal approx. 3.0 %
Storage	Store rolls upright and protect them from direct sunlight and high temperatures		lateral approx. 2.5 %
		Shear strength of joint connection	
		DIN EN 12317-1	approx. 160 N
Storage time	9 months		

Physical building properties:	
Water vapour diffusion equivalent	
Air layer thickness	sd value ≥ 1500 m
Water vapour diffusion resistance	
	μ ≥ 1,600,000
Water vapour diffusion flow density DIN 52615	
Water vapour diffusion flow density	
	Average value ≤ 0.025 g/m²·d
Building material class:	B2

► Proof
National Technical Approval, No.:
P-SAC 02/5.1/14-101

Glue long joints by removing both protective strips and firmly pressing both membranes together at the joint. Seal front joints by applying Knauf Abdichtungsbahn (connector tape).
In case of low temperatures, the adhesion development can be accelerated by the usage of a hot air gun.
Connections to rising constructional components can also be established with the Knauf Abdichtungsbahn (connector tape).

Application in the wall area

The sealing membrane is applied to the moisture barrier of the masonry wall. acc. to DIN 18195-4 so that there is a tight seal without moisture bridges (e.g. plaster bridges). The following examples are proven options:

- In case of moisture barrier on the first brick layer: Apply sealing membrane up to the upper edge of the flooring,
- In case of moisture barrier on the floor slab: Glue the sealing membrane to the moisture barrier with Knauf Katja Sprint Anschlussfix or Knauf Anschlussstreifen.
  Alternatively: Pull up the sealing membrane up to the upper edge of the floor, as described above.

Knauf Katja Sprint Anschlussfix

Knauf Anschlussstreifen (connector tape)

Technical data Knauf Anschlussstreifen (connector tape)	
Roll weight	approx. 4.3 kg
Roll width	approx. 0.20 m
Roll length	15 m

► *Product Data Sheet F457.de*

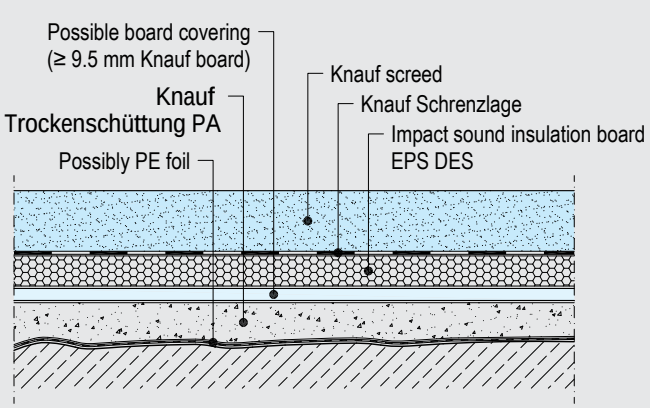
Knauf Trockenschüttung PA (dry bulk leveller) is a grainy natural material made of volcanic stone expanded at temperatures of over 1000 °C. The dry bulk leveller intermeshes to a stable and load bearing equalization layer thanks to the special mineral-based covering layer.

Technical data	
Layer thickness	20 to 100 mm
Building material class acc. to DIN 4102	A1
Grain size	1-6 mm
Bulk density	approx. 550 kg/m³
Area weight	approx. 5.5 kg/m² per cm height
Thermal coefficient λ	approx. 0.23 W/(m•K)
Compressive strength (compressive stress with 10 % compression)	≥ 0.31 N/mm²
Material requirement	10 l per 10 mm/m²

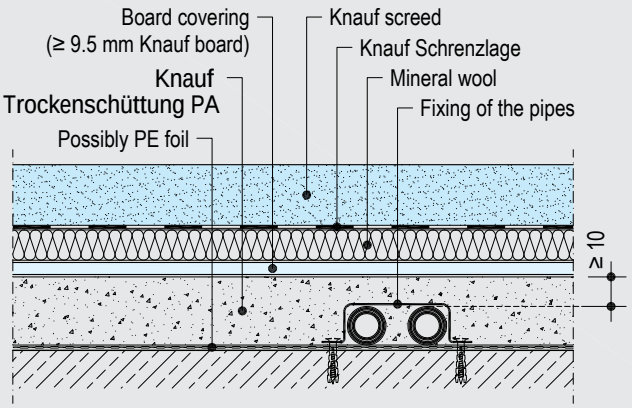
Details, scale 1:5 - Examples

All dimensions in mm

F231.de-V16 Substrate equalization on a solid ceiling



F231.de-V17 Embedded pipes on a solid ceiling



Knauf Trockenschüttung PA

Leveling of large unevennesses, existing pipes/cables, slopes and gradients – layer thickness 20 to 100 mm

Every uneven basic floor can be permanently leveled with Knauf Trockenschüttung PA (dry bulk leveller). Installation pipes laid on the floor disappear into the equalization layer. All Knauf Pre-fab Floor Screeds or flowing screeds can be applied on Knauf Trockenschüttung PA.

Substrate preparation

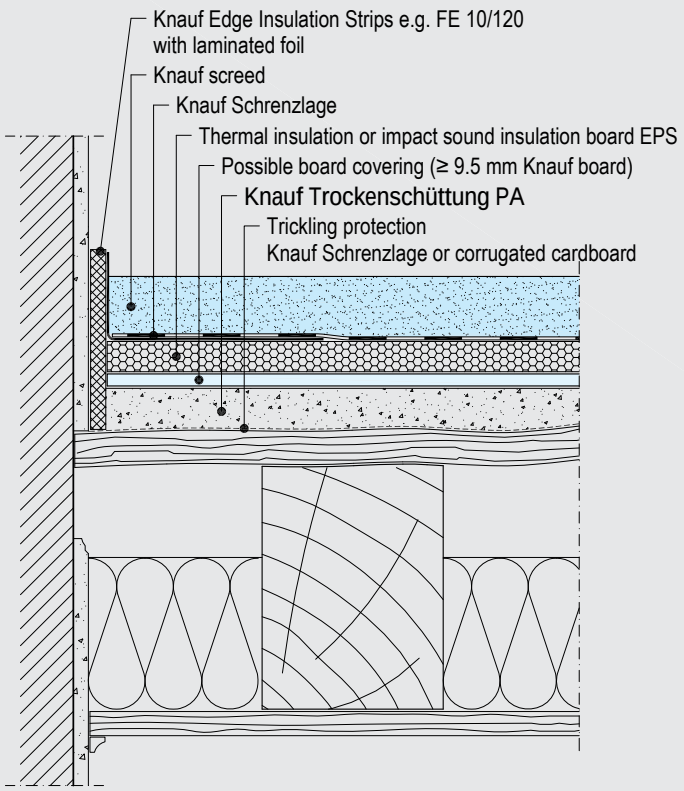
Ensure that there is a fully stable, load-bearing substrate made of planks or wooden composite boards with wood joist ceilings. Application over dead floor and levelling with bulk leveller only if sufficient bearing capacity of the dead floor is assured.

On reinforced concrete coverings, lay a PE foil 0.2 mm thick (as protection against any possible rising residual moisture) overlapped by at least 20 cm and apply up to the construction height on the walls. For wood joist ceilings use permeable material (e.g. Knauf Schrenzlage) as a trickling protection, but do not apply on the walls and other rising components. Avoid hollow channels. To obtain cleant straight edges, fold the Schrenzlage beforehand if necessary. Do not use Dry Bulk Leveller PA on wooden plank stack slab ceilings.

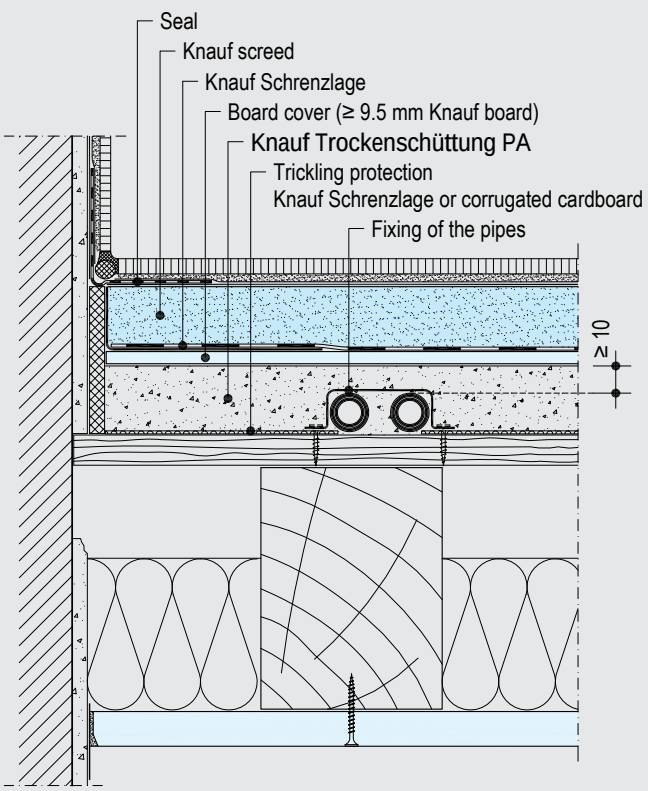
Details, scale 1:5 - Examples

All dimensions in mm

F231.de-V10 Height equalization on wooden joist ceiling



F231.de-V18 Embedded pipes on wooden joist ceiling



► Note

Knauf Trockenschüttung PA may not be used in wet rooms (slopes, drains) as well as in rooms where dynamic loads (washing machines, driers, etc.) occur.

Installation

As a connection to the wall, apply FE Randdämmstreifen (edge insulation strips) with foil (8/100 or 10/120) or 12 mm thick mineral wool edge insulation strips for fire protection applications.

Knauf Trockenschüttung PA (particle size 1 – 6 mm, residual moisture ≤ 1 %) with a bulk height ≥ 20 mm should be distributed on the basic ceiling and levelled using alignment rails.

Compact additionally with a bulk leveller height exceeding approx. 50 mm.

In order to make application of EPS insulation layers easier, cover Trockenschüttung PA with gypsum board (Knauf board GKB) to distribute the load. Below mineral wool insulation layers as well as with direct application of flowing screed on Knauf Trockenschüttung PA, a board cover (Knauf board GKB) to distribute the load is obligatory.

Fix pipes, cables, etc. on the basic floor and cover with a layer of at least 10 mm of Trockenschüttung PA (dry bulk leveller).

► *Product Data Sheet K437.de*

Knauf Schubo now flows and seals cavities where previously polystyrene was cut and applied meticulously

After material application simply level with the dappling bar

Technical data					
Layer thickness	30 to 300 mm	Thermal conductivity λ_R	0.12 W/mK	Material consumption	
Density Wet:	approx. 500 kg/m³	Building material class acc. to		per cm layer thickness	approx. 3.3 kg/m²
Dry:	approx. 400 kg/m³	DIN 4102-4	A1	Application time at 20 °C	approx. 30 min
Strengths (reference values, after 28 days)		Water vapour diffusion-resistance value μ	6	**Walkable at 20 °C**	after approx. 2 days
■ Compressive strength	≥ 0.5 N/mm²			(trafficking can be delayed at lower temperatures)	
■ Flexural strength	≥ 0.3 N/mm²				

Knauf Schubo

Light levelling mortar with high yield - layer thickness 30 to 300 mm

Knauf Schubo is used for levelling unevenness and tilting of the basic floor and for filling out spaces with cables, installation pipes and other pipes on the basic floor. It is a walkable equalization of the floor made of special cement and air pores with a low weight and good thermal insulation. Thanks to its flowing consistency, Knauf Schubo fully fills out cavities and provides the best prerequisites for professional, subsequent floor construction. It can be applied in layer thicknesses of 30 to 300 mm Knauf Schubo can be trafficked about 2 days after application. Direct application of a covering on Knauf Schubo is not possible. The subsequent screed is applied to a separating layer or insulating layer. This applies also for mastix asphalt screed.

Application

Knauf Schubo can be applied both as a bonded as well as a separating layer.

Bonded construction

The substrate must be swept clean and must be free of grease or oils (e.g. built-ins made of steel). Highly absorbing substrates must be primed (e.g. brick ceilings). Brick walls or other highly absorbing walls should also be primed on the contact areas or should be isolated from Schubo by edge insulation strips. Knauf Estrichgrund can be used as a primer.

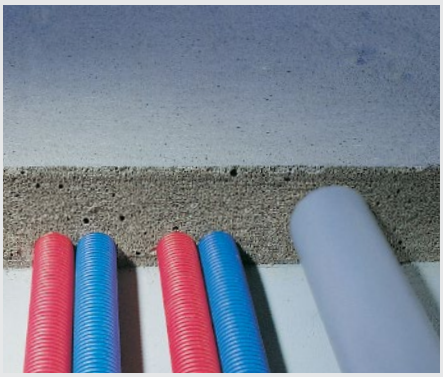
Construction on a separating layer:

If Knauf Schubo is applied on a separating layer, on the walls and rising constructional components, edge insulation strips of min. 10 mm thickness must be arranged. Knauf Schrenzlage should be used as an insulating layer on wood joist ceilings. An application on the insulating layer is not possible.

Independently of the constructions mentioned previously, walls sensitive to moisture (e.g. drywall partitions) must be protected from Schubo by edge insulation strips. Installations enclosed in Schubo must be protected against corrosion. If rising moisture is to be expected, a moisture barrier should be installed above and below the Schubo. Walls, including drywall partitions, cannot be installed directly on Knauf Schubo.

Further floor construction (e.g. floating screeds) can be undertaken on Knauf Schubo as soon as the residual moisture is ≤ 10 CM %.

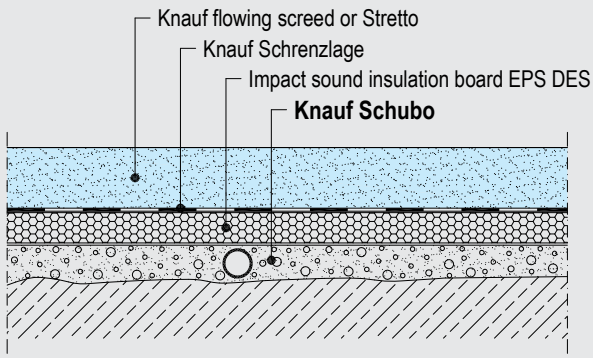
Fastest application at 6 m³ per hour. Schubo can be applied directly from the silo via the Porenjet



All cavities are fully filled by Schubo.

Details, scale 1:5 - Example

F231.de-V1 Substrate equalization with levelling mortar



► Note

Knauf Schubo may only be applied by specially qualified companies, who have been trained in the application of Knauf Schubo and in the operation of the machine by Knauf Gips KG.

With strong drying, particularly at high temperatures, cracks can form in Knauf Schubo, which do not affect the usage properties as an equalization for the floor base.

It is not necessary to wait until the drying time is completed, if Knauf Schubo is applied to moisture insensitive basic floors or ceilings. For this purpose, a seal against rising moisture acc. to DIN 18195-4 (e.g. Knauf Abdichtungsbahn Katja Sprint) must be applied after Knauf Schubo becomes walkable. Further screed works, can be thus undertaken immediately. It is important to ensure that built-ins are protected against corrosion and that other components are not endangered by the moisture that is prevented from rising.

Application

The mortar is mixed with water by machine, blended with foam and pumped to the location of use as a pourable levelling compound. Large area coverage is achieved due to the high pumping capacities of approx. 6 m³ per hour. The mortar can flow, but is not self-levelling and must therefore be levelled with suitable tools (e.g. dappling bar). Knauf Schubo may not be applied under +5 °C.

The application time of Knauf Schubo at 20 °C is approx. 30 minutes. Lower temperatures delay setting and higher temperatures speed it up. After machine standstill, the hoses and machine must be cleaned within 20 minutes. Machine parts and tools that make contact with the mortar should not be oiled, as the air voids in the mortar will be destroyed.

Only clean hoses may be used to avoid the formation of blockages. If several hoses are coupled to one another, the couplings may not narrow the cross-section. A reduction in the pouring hose from the machine in the direction of the pouring hose is not permitted with Knauf Schubo. It is also not permitted to connect a supply hose of 50 mm diameter.

► *Product Data Sheet F416.de*

Ideal on old wood joist ceilings: Knauf EPO-Leicht.

Mixing in the tub is quick and does not require any great effort.

► Please note

Only persons that are familiar with chemically setting substances are allowed to apply these products. Ventilate rooms properly (preferably lateral ventilation). Wear protective goggles (e.g. during mixing), suitable gloves and working clothes to prevent contact with skin. (For further information see page 50, Knauf FE-Imprägnierung)

Knauf EPO-Leicht

24 h light levelling mortar – layer thickness 15 to 800 mm

Knauf EPO-Leicht is a levelling mortar for construction sites subject to tight deadlines in new buildings, old buildings and for renovations. It consists of the components Knauf FE-Imprägnierung (2 component epoxy resin, see page 50) and Knauf EPO-Perl (expanded glass granulate), which are mixed on the building site. It is ideal for levelling all inclined and uneven basic floors, for filling cavities and for height equalization. It is ideal for use on wood joist ceilings thanks to its water-free basis. It is excellent for use under Pre-fab Floor Screed as a bonded bulk leveller.

Its low weight of about 0.2 kg/l is ideal during renovation work when used on ceilings with low bearing capacity. At the same time, the thermal insulation layer can be reduced due to the good thermal insulation properties.

Knauf EPO-Leicht has its final consistency just 24 hours after application, facilitating further flooring work at an early stage. It is not necessary to wait for the drying times. Any required moisture barrier can be installed underneath or above Knauf EPO-Leicht. Knauf EPO-Leicht is used in interior applications. It is water-resistant and can therefore be used in areas subject to moisture.

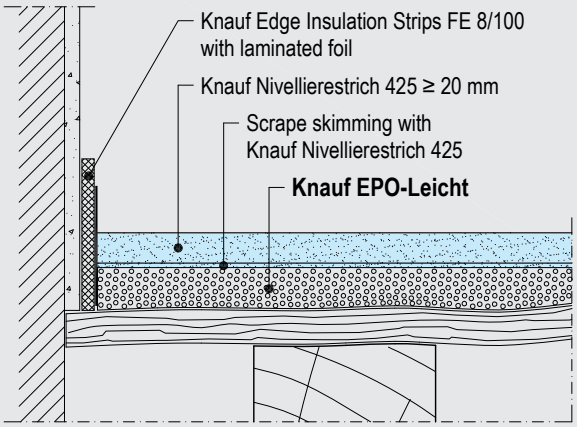
Installation of Knauf EPO-Leicht on insulation material is not possible. It can be installed in layer thickness's between 15 and 800 mm. When application bonded to the substrate, the layer thickness's may be less than 15 mm at high points of the substrate. On Knauf EPO-Leicht, the general floor construction can be undertaken with floating (heated) screed or screed on a separating layer.

As a particularly slim version, Knauf Nivelliere-strich 425 can be applied on Knauf EPO-Leicht as a bonded screed. For this purpose, the surface of the Knauf EPO-Leicht must first of all have a thin layer of stiffly mixed Knauf Nivellierestrich 425 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, the Knauf Nivellierestrich 425 can be applied in a layer thickness of 20 mm. The construction is sufficiently stable for the requirements with domestic applications.

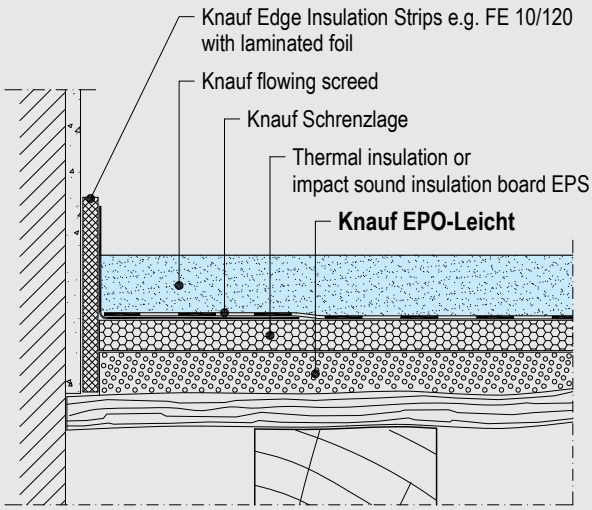
For particularly fast construction, after just one day Knauf Stretto can be applied (in domestic applications) on Knauf EPO-Leicht with a layer thickness of 25 mm.

Details, scale 1:5 - Examples

F231.de-V13 Light construction with Knauf EPO-Leicht



F231.de-V19 Flowing screed on insulating layer with height equalization



Technical data					
Layer thickness	15 to 800 mm	Yield		Application time at 20 °C	approx. 45 min
Density	approx. 200 kg/m³	From 60 litres of EPO-Perl and 1 kg		Walkable	after approx. 24 h
Strengths (after 1 day, at 20 °C)		FE-Imprägnierung approx. 60 l mortar		Subsequent work possible	after approx. 24 h
■ Compressive strength	≥ 0.5 N/mm²	Material consumption per cm layer			
Thermal conductivity λ_z	approx. 0.07 W/mK	thickness			
Building material class	B2	approx. 10 l/m² EPO-Perl and			
		approx. 0.17 kg/m² FE-Imprägnierung			

Application

Knauf EPO-Perl and tools must be dry.

The 2 components of 1 kg Knauf FE-Imprägnierung (1 kg combo pack) are mixed together with an agitator. 1 Bag (60 litres) of Knauf EPO-Perl is added to a tub. The prepared Knauf FE-Imprägnierung is added to the Knauf EPO-Perl and mixed well with an agitator (mix slowly at 300 RPM with an infinitely variable agitator). After mixing for 1 minute, the mortar must be repotted to a second tub and mixed again for a further minute.

Application

The mortar is to be spread uniformly on the substrate so that walking on the mortar when levelling is unnecessary The mortar is levelled with an alignment board or similar. After levelling, the mortar can be compressed by light impacts applied with a float. Compress the mortar occasionally in case of large heights or thick mortar layers.

Apply Knauf EPO-Leicht at temperatures between 10 °C and 25 °C. The setting speed and accordingly the application time depends on the temperature. The application time at 20 °C is approx. 45 minutes. At low temperatures, a longer application time can be expected, while at high temperatures a shorter application time can be expected.

After mixing Knauf FE-Imprägnierung, it should be applied within a few minutes as it has a much shorter setting time in the container.

With extended stand times, the tools must be cleaned with dry sand. After completion of work, clean the tools with sand and water.

► *Product Data Sheet F441.de*

Apply edge insulation strips with foil (also on pipes, radiators, etc.), do not staple at screed height.

Application of mineral wool edge insulation strips with fire protection requirements

► **Notes for the Randdämmstreifen (edge insulation strips) FE 10/120**

In order to guarantee the self-adhesive properties, pay particular attention to:

- Dust-free substrates
- Push on sufficiently firmly
- Store in dry rooms with a normal temperature range

Knauf Randdämmstreifen

Randdämmstreifen FE (edge insulation strips) and mineral wool edge insulation strips

Randdämmstreifen (edge insulation strips) are, with the exception of bonded screed, attached to all rising constructional components, to avoid sound bridges and contacts that can impair the insulation properties.

Randdämmstreifen (edge insulation strips)
FE 8/100
Staple edge strips made of special polystyrene and PE foam with laminated foil strips. Very easy to apply, particularly in inside corners. Installation in accordance with the ready screed height using staples (also on pipes, radiators, etc.). Do not staple at screed height!

Randdämmstreifen (edge insulation strips)
FE 10/120
Edge strips with insulating properties made of polyethylene foam with laminated foil strips, self-adhesive on the rear for fast and simple attachment. The upper section has slots to ensure ease of separation.

Mineral wool edge insulation strips

For use with screed constructions where fire resistance class requirements apply.

Application

Mark the completed height of the screed on all rising constructional components and fix the edge insulation strips with upper edge at least 5 mm higher than the completed height using staples (FE 8/100 and mineral wool edge insulation strips) or rather glue (FE 10/120) them. The edge strips must protrude over the upper edge of the screed, at least up to the surface of the covering. Ensure that there are no gaps. If required, arrange two strips above one another.

Slide the edge insulation strips FE Dämmung under the foil of the edge insulation strip and loosen the foil by pulling the edge insulation strip smooth and lay it on the insulation. In the area connecting to the wall, apply Knauf Schrenzlage on the foil of the edge insulation strip (do not allow to stand up on the edge), then pour the flowing screed. With mineral wool edge insulation strips, pull up the separating layer or foil on the edge. Ensure that no hollows can be created.
With several insulation material layers, apply the edge insulation strips with the uppermost insulation layer.
Caution! Only remove the protruding part of the edge insulation strip (in acc. with DIN 18560-2) when the covering is applied.

► *Product Data Sheet K436a.de*

Knauf insulation materials

Product overview and technical data

Slide EPS insulation underneath the foil of the edge insulation strip and apply row by row

Apply the mineral wool insulation directly against the edge insulation strips and apply row for row

Insulation layer

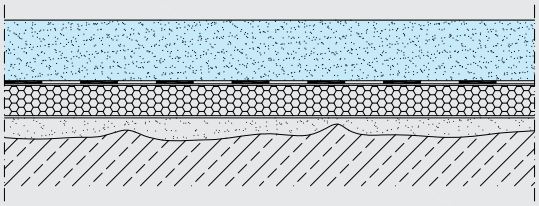
Application

- Apply the insulation materials joint on joint and apply as an entire layer. Avoid cavities. Insulation material type and thickness dependent on the function of the screed. Insulation materials must comply with the valid standards (DIN EN 13162 - DIN EN 13171).
- Do not apply impact sound insulation boards in several layers (compressibility!).
- When applying EPS insulation layers on dry bulk leveller, application of a load distribution board, e.g. Knauf gypsum board 9.5 mm, is recommended. When applying the dry bulk leveller under the mineral wool insulation layer or underfloor heating, this cover is required.
- If there is a danger that residual moisture from a freshly applied concrete cover or levelling mortar may rise, the application of a PE foil as a vapour retarder is recommended to be used underneath the mineral wool when mineral wool insulation layers are used.
- Pull out the foil from the edge insulation strip onto the insulation.
- Cover the insulation layer and foil of the edge insulation strip with Schrenzlage with an overlap of ≥ 8 cm.
- In order to avoid "seeping through" the Schrenzlage (screed will fow through a damaged Schrenzlage onto the insulation layer and will impair the impact sound insulation), a compressibility of the insulation layer of c > 3 mm is recommended, e.g. mineral wool CP 5, as well as the application of a load distribution board on the insulating layer, e.g. Knauf gypsum board 9.5 mm..
- If the Schrenzlage is applied directly on the impact sound insulation, it is useful to glue or seal the joint of the Schrenzlage, to exclude mortar from getting under it.

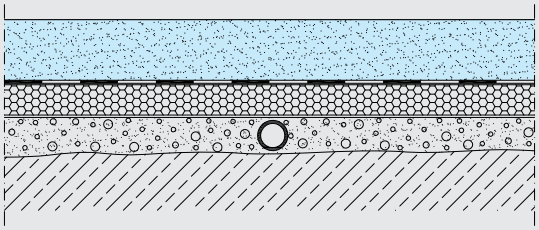
It is essential to pay particular attention in preparing the substrate in order to guarantee a functional, error-free screed construction. Incorrect applications can lead to reduced impact noise insulation on the screed insulation layer and cause cracks in the screed.
In the images shown above, you will see the correct application compared to the most frequent errors made in practice.

Correct application

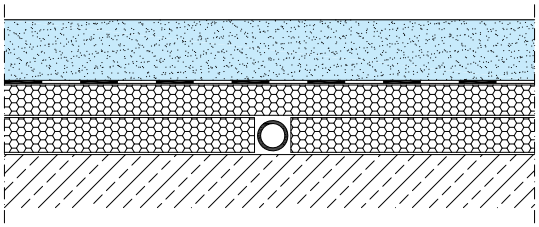
Substrate equalization with large levels of unevenness



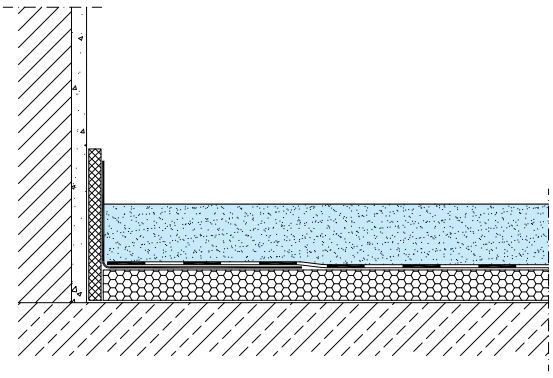
Substrate equalization up to top of pipe



Full surface application of impact noise insulation

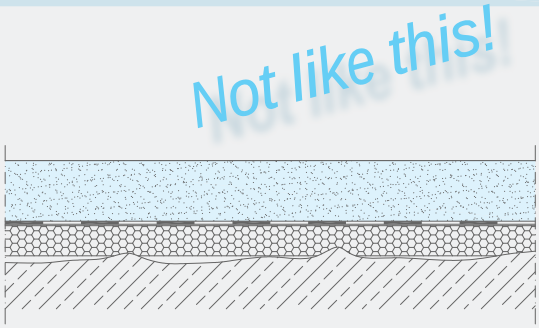


Precise edge application, uniform screed thickness

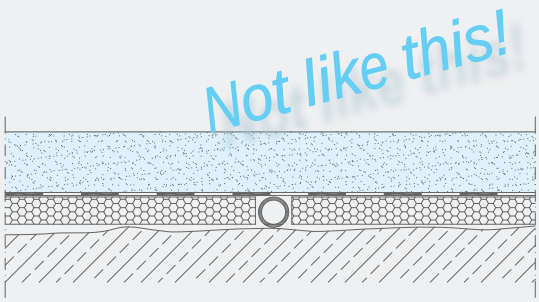


Incorrect application

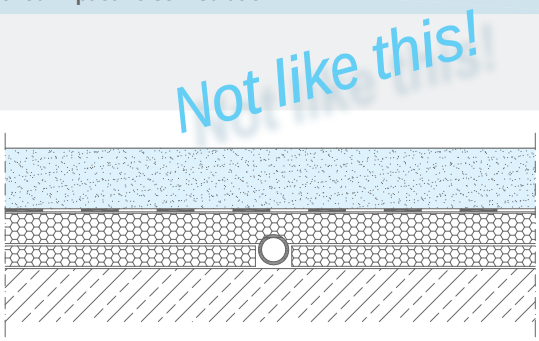
Equalization absent, impact noise insulation not fully effective



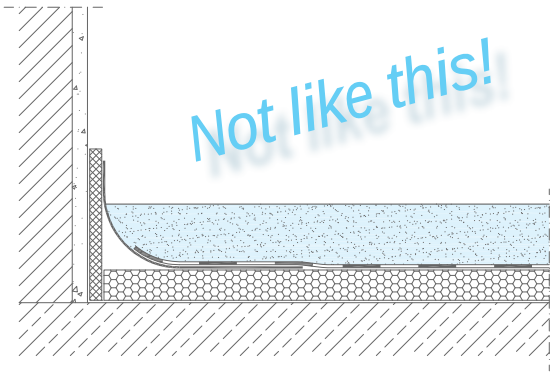
Impact noise insulation interrupted, screed - substrate contact

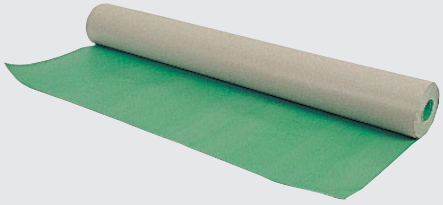


Weakened impact noise insulation



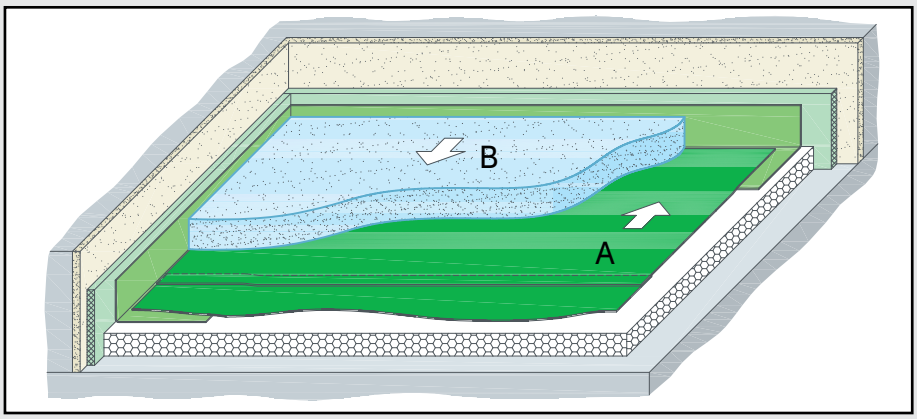
Weakening of the screed in the edge area





Technical data			
Weight per unit area	approx. 100 g/m²	**Water vapour diffusion flow**	
Material thickness	approx. 110-130 µm	density	approx. 4.2 g/m²d
Consumption	approx. 1.07 m²/m²	Diffusion resistance	
Melting range/melting point	80-120 °C	**coefficient µ**	approx. 77000
		Water vapour diffusion equivalent	
		air layer thickness	s_d value approx. 9 m

Apply the Knauf Schrenzlage on the foil of the edge insulation strip in the wall connection area (do not allow to remain standing up at the edge)



A Application direction of the Knauf Schrenzlage
B Pouring direction of the flowing screed towards the Schrenzlage overlap

Knauf Schrenzlage

As a separating layer

Knauf Schrenzlage is a premium quality Soda Kraft paper with a polyethylene film layer on both sides and is used for various applications.

- As a covering on the insulation layer under flowing screeds or screeds that can be applied conventionally acc. to DIN 18560-2
- As a separating layer under screed on a separating layer acc. to DIN 18560-4
- As trickling protection for dry bulk leveller above wood joist ceilings
- As a separating layer or cover on the insulation layer for gluing nobbed foil elements of thin-layer underfloor heating systems and subsequent application of Knauf Nivellierestrich 425 (see Product Data Sheet FE22.de)
- As a separating layer on hollow partial access floor sheathing units under flowing screeds

Knauf Schrenzlage is not a seal or a vapour brake.

With the low s_d value it can be applied to wood joist ceilings.

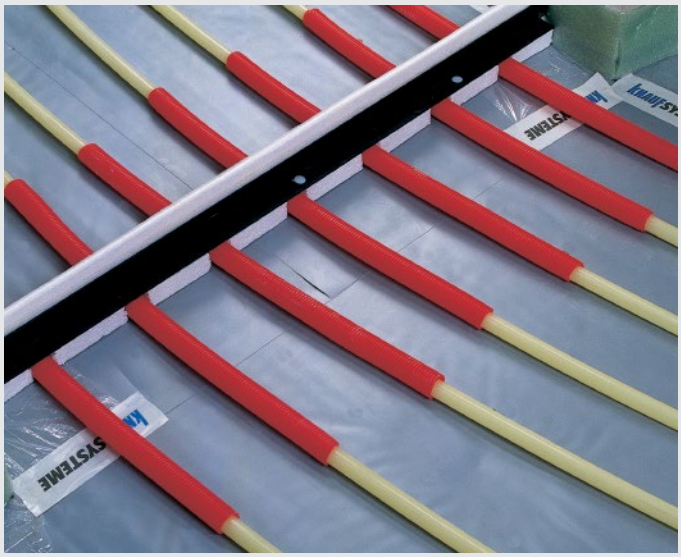
Application

Knauf Schrenzlage must be applied with an overlap of at least 80 mm on the joints. On the connection to the walls, it is applied to the installed foil strips of the edge insulation strip.

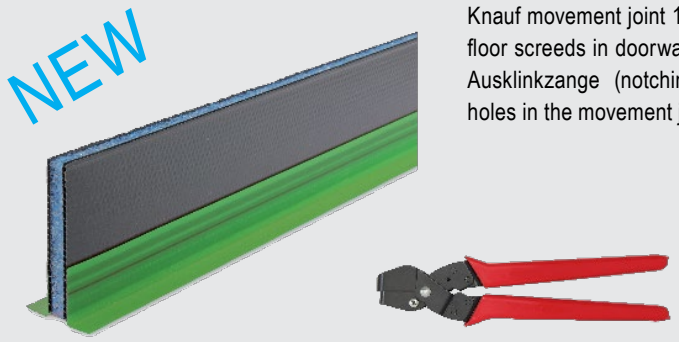
With screed on mineral wool layers with a compressibility exceeding 3 mm, it is recommended that a load distribution board is applied to the insulation layer, e.g. Knauf gypsum board, t = 9.5 mm. If the Schrenzlage is applied directly on the impact sound insulation, it is useful to glue or seal the joint of the Schrenzlage, to exclude mortar from getting under it.

If screed without an insulation layer is applied over a seal (e.g. Knauf Sealing Membrane Katja Sprint), apply Knauf Schrenzlage between seal and screed.

► *Product Data Sheet K438.de*



Movement joint in a heating floor screed, type A on door passageways



Knauf movement joint 12/80 for use with heated floor screeds in doorways. Matching tool: Knauf Ausklinkzange (notching pliers) for punching holes in the movement joint

► Good to know

Knauf offers constructive solutions for implementing movement joints, where very precise joints are possible.

Joint application

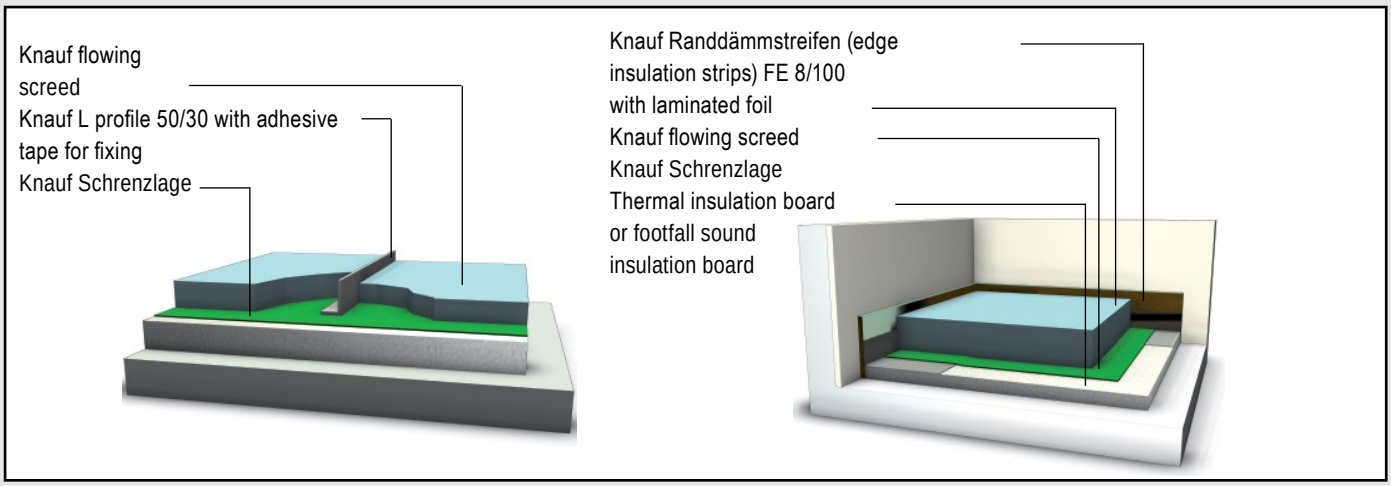
Basics

Knauf flowing screeds are very space neutral in comparison with cementitious screeds (with the exception of Knauf FE 25 A tempo). The expansion during setting is about 0.1 mm/m so that this flowing screed can be used without joints.

As heating floor screeds, flowing screeds are subjected to changes in length due to temperature changes. For this reason, joints may be necessary in heated flowing screeds.
This may also affect unheated screeds, if they, for example, are subjected to large changes in temperature due to the action of direct sunshine (also refer to Code of Practice No. 5 of the IWM/IGE).

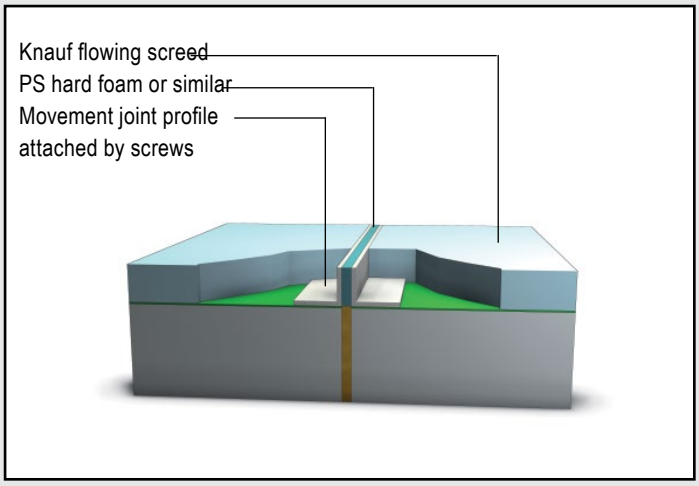
Dummy joints in flowing screeds may be useful, if large screed areas (edge length > 25 m), remain open over extended periods and can dry out to a very low level of residual moisture. The application of dummy joints can act against the uncontrolled formation of cracks.
The screed slab should be cut into at about half the screed thickness for this purpose. Dummy joints should generally be sealed with a frictional bond before the covering is applied (resin application, see surface preparation page 91).

Stoppage joint with height offset



Edge joint

Structural joint (movement joint)



Joint application

Joint types acc. to DIN 18560-2

In the DIN 18560-2 "Floor screeds in building construction", a differentiation is made between the following joint types:

Structural joints

These are in the bearing substrate of the building and must be carried through all screeds and in the covering at the same location and in the full width.

Movement joints

These joints must be applied to accept movements and deformation caused by shrinkage and temperature effects.

For the arrangement of movement joints there is Code of Practice No. 5 "Joints in flowing calcium sulphate screeds" (IGE/IWM) providing detailed recommendations.

Movement joints must encompass all building disciplines. A joint plan must be prepared to indicate the arrangement of the joints.

The joints shall be applied so that compact bays (ideally square) result. Joints have been particularly well proven in protruding areas, in large areas, in door areas and for seperation of heated and unheated areas. Movement joints should not lead through heating circuits.

Non-expanding joints

Non-expanding joints result in the creation of adjacent bays, which are poured at different times. They are necessary when larger areas are not created in a single pour. On the non-expanding joint (technological joint), a hairline crack can result, which must be subsequently sealed with a frictional bond using epoxy resin.

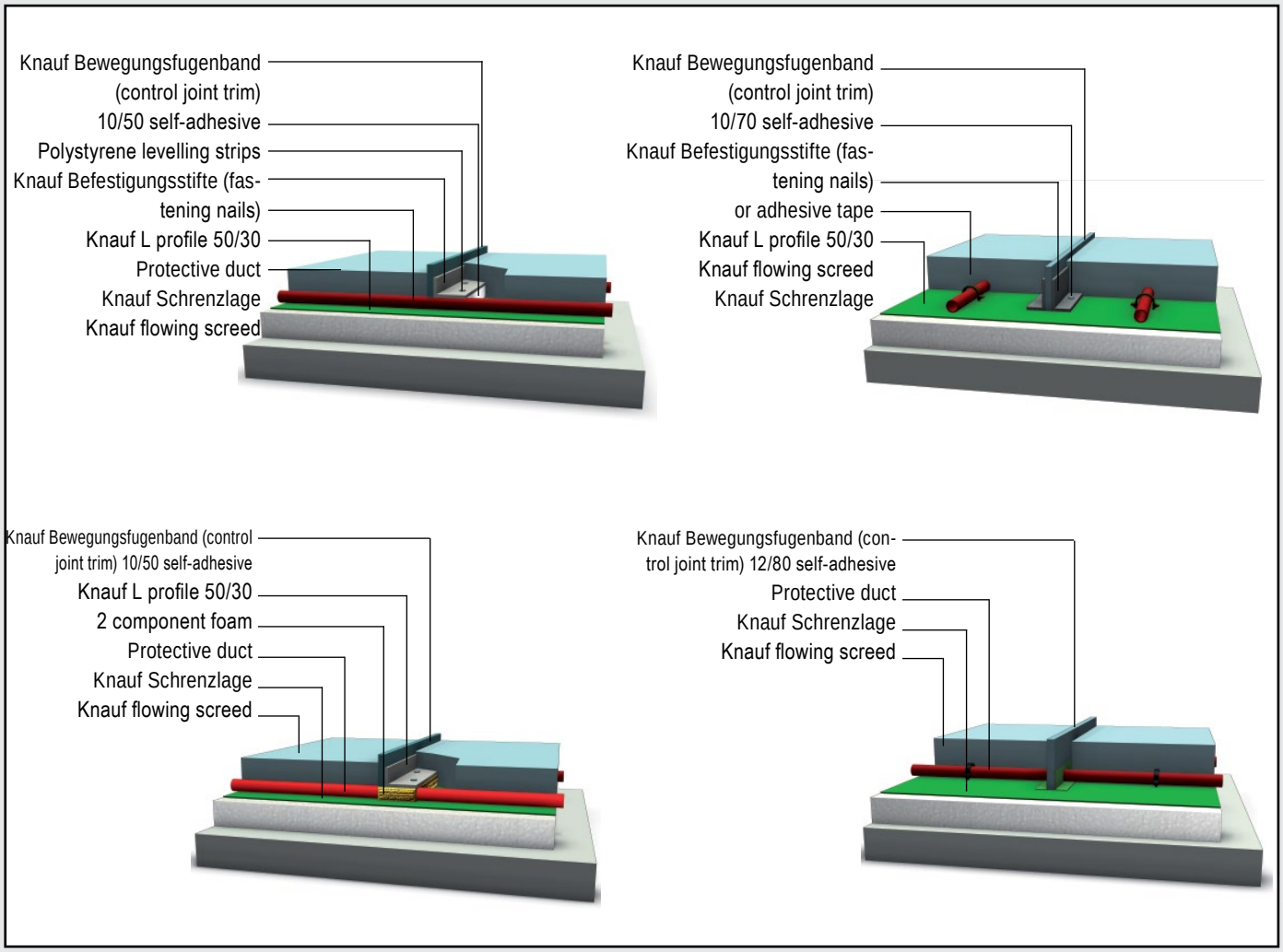
Edge joints

They must be applied on all screeds on insulating layers and on separating layers on rising components (on pipework, console feet, door frames).

Dummy joints

They are required, especially with cementitious screeds, to facilitate shrinkage.

Examples for movement joint with heating floor screed, type A



Joint application

Application

Knauf L Profile

Proper joints can be created with the Knauf L Profile 50/30 in conjunction with Knauf Control Joint Trim 10/70.

The differing arm lengths of the profile and the Bewegungsfugenbands (control joint trims) facilitate individual joint solutions. Design variants are shown in the images above.

For particularly long, straight and stable joint design, a second profile can be glued to the other side of the Control Joint Trim.

Heating floor screed

If underfloor heating tubes pass through the movement joints, levelling up to the upper edge of the tube is required in the joint area, e.g. by the application of installation foam or polystyrene strips onto which the profile is placed and attached with Fastening Nails.

In order to avoid a step between the screed slabs, it is recommended that you cut the protruding Control Joint Trim to the height of the planned screed surface "window".

Alternatively, leading pipes through movement joints even with Knauf Bewegungsfuge 12/80 (movement joint) is possible. The stable hollow cavity profile with PE foam features a self-adhesive base, facilitating simple attachment to the substrate.

In addition to the movement joint, the Knauf Ausklingzange (notching pliers) is available. With this accessory, holes can simply be notched in the foot area of the movement joint.

Application

Cut the movement joint to suit the door width. Notch holes in the movement joint foot area with the Knauf Ausklinkzange (notching pliers) suitable for the applied heating tubing. Subsequently remove the protective foil from the adhesive base and stick it to a clean and stable substrate, and seal the side connections to the edge insulation strips, e.g. with adhesive tape.

Data on application consistency

Material	Max. mortar temperatures at application	Application time (open times)	Dry mortar requirement		**Slump flow - the** ideal consistency (empirical values)	Product Data Sheet www.knauf.de
			per cm screed and m²	pro m³ wet mortar		
FE Sprint	25 °C	approx. 30 min	approx. 19 kg	approx. 1.9 t	39–42 cm [1]	F327.de
FE Eco	25 °C	approx.. 40 min	approx. 19 kg	approx. 1.9 t	38–43 cm [1]	F328.de
FE 50 Largo	25 °C	approx. 60 (40 [3]) min	approx. 19 kg	approx. 1.9 t	38–43 cm [1]	F322.de
FE 80 Allegro	32 °C	approx. 60 (40 [3]) min	approx. 19 kg	approx. 1.9 t	40–45 cm [1]	F325.de
FE 25 A tempo	40 °C	approx.. 40 min	approx. 19 kg	approx. 1.9 t	40–45 cm [1]	F321.de
FE Fortissimo	25 °C	approx.. 60 min	approx. 19 kg	approx. 1.9 t	37–40 cm [1]	F326.de
Dünnestrich 325	32 °C	approx. 30 min	approx. 16 kg	approx. 1.6 t	max. 52 cm [2]	F413.de
Nivelliererstrich 425	32 °C	approx. 30 min	approx. 18 kg	approx. 1.8 t	52–56 cm [2]	F422.de

[1] *With larger screed thicknesses (exceeding 50 mm) as well as with the initial pour of a heating layer screed, the mortar should be a little thicker, i.e. when compared to the normal setting (ideal slump-flow at 35 mm screed thickness) the slump-flow can be reduced by about 5 cm.*

[2] *With larger layer thicknesses the slump-flow or the water quantity should be reduced if permitted by the levelling characteristics.*

[3] *Applies primarily for the German states of Bremen, Nordrhein-Westfalen, parts of Niedersachsen and Rheinland-Pfalz*

Flowing screed application

Application temperature, application time, application consistency

Application temperature

The ambient temperature and the mortar temperature are decisive factors for professional application of flowing screeds.

Knauf flowing screeds and Nivelliererstrich 425 can be applied even at external temperatures under 0 °C (prerequisite: water supply is assured and the indoor temperature and mortar temperature exceeds 0 °C!).

A subsequent, short-term freezing of the screed bay does not damage the screed. The setting process is simply suspended for this time. With heated floor screeds, it is important to prevent water freezing in the heating tubes (frost prevention agent, heating at low temperature in operation). For Dünnestrich 325 and FE Sprint an ambient and mortar temperature of at least +10 °C applies.

Depending on the material, certain mortar application temperatures should not be exceeded (see the table).

Airing should commence after 1 day with Knauf FE Sprint. Do not undertake forced drying. Permanent airing is necessary for rapid drying (tilted windows). However, draughts directly on the screed surface should be avoided (do not keep the windows and doors permanently fully open).

Knauf FE 50 Largo, FE 80 Allegro and FE Fortissimo should be protected for the first two days against drying too quickly due to draughts and radiated heat (strong sunlight in window areas - danger of crack formation).

Furthermore, general experience with flowing screed technology at external temperatures from approx. 35 °C has shown that even when correctly applied taking all precautionary measures, consequential damage cannot be ruled out.

Open time

The open time, i.e. the time in which the mortar is poured and distributed and worked with the brush or dappling bar is material dependent (see the table).

This open time must be considered when determining the size of the screed bays.

The open time may be slightly reduced at higher temperatures and with smaller screed thicknesses (evenness with bonded screeds, 20 mm). Nivelliererstrich 425 and Dünnestrich 325 should be levelled within 10 minutes of application.

Determination of the slump-flow:
Fill the consistency checking tin with mortar and lift it

Stay within the defined flow-slump value. The screed may not lose water during application.

► Good to know

The application consistency of the mortar is determined by the water quantity added. The consistency should be set so that the mortar flows but no "watery slurry" separates when pouring.

Application consistency

The correct water quantity must be added to the mortar for professional screed application. Addition of excessive water leads to a surface of the hardened screed that is too soft and generally results in complaints from the contractor or the following trades (floor covering specialists). On the other hand, adding too little water does not negatively affect the quality of the screed, however, the application and levelling is made more difficult and the required evenness may not be achievable.

Considering this aspect (assurance of the quality of the screed bay by avoidance of excessive water), the screed mortar should initially be set to a thick flowing mass (lowest limit of the slump flow) and when necessary more water can be added to set the "ideal consistency". A slump flow is used as a method for setting the consistency. The slump flow is determined using a 1.3 l PFT consistency checking tin, by placing the tin filled with mortar on the Schrenzlage, releasing the base and lifting the tin. The diameter of the spreading material is the slump flow. It is measured, at the earliest, 10 seconds after lifting the tin. For the “ideal consistency” see table page 68.

These values are only reference values (not strictly defined for application), as the ideal consistency depends on the age of the material, on the intensity of the mixing of the mortar (dependent on the machine technology used) and is also influenced by the screed thickness.

Setting the height with PFT Levelling Sensors

Flowing screed application

Pouring

> ► Note for heating floor screed
>
> To check the residual moisture with a CM device by the floor covering specialists, positions must be marked for measurement before the screed is applied to avoid damage to tubes when samples are taken.

In order to achieve a uniform and sufficiently good surface quality of the screed bay, the area levelling sensors are distributed and set to the correct height with a levelling device (recommended: PFT Levelling Sensors). With floating screeds, the feet of the levelling sensors can be pushed through the insulating layer up to the basic ceiling so long as a moisture barrier is not damaged as a result. The levelling sensors then have a secure base.
The screed machine including accessories must be set up and connected correctly in accordance with the manufacturers specifi cations (machine equipment see page 72ff).
If the edges of the Schrenzlage are not glued, it is important to ensure that the Schrenzlage is not swamped with mortar. The mortar should be poured in the room so that it always flows from the upper Schrenzlage to the lower.

The material should be distributed uniformly using the pouring hose. The path of flow of the mortar should be kept to a minimum to avoid separation of the fine particles, additives and water. This is why it is incorrect to place the hose in the centre of the room and to wait until a level screed with a uniform surface quality results. The size of the area to be poured in a single pass is dependent on the application time of the mortar, the capacity of the screed machine as well as the thickness of the screed. Narrow, large surfaces can be created in a single pour when you work progressively. During application of the screed, work with the broom or dappling bar is undertaken where the nominal screed thickness is achieved and the surface is horizontal. The possible width of the surface is also determined by the application time, machine capacity and screed thickness. At a mortar capacity of 100 l/minute and a screed thickness of 35 mm, this is a width of approx. 12 m.
After the screed has been poured to the correct level and the levelling sensors have been removed, the screed is worked with a dappling bar or a screed broom. With this work, smaller irregularities are eliminated (levelled) and the mortar is de-aired.

If the screed mortar is to be worked exclusively with a dappling bar after application, the lower slump flow value should be aspired to.

Screed broom application

Flowing screed application

Application

Application with a dappling bar

The screed is worked initially with a dappling bar in a single direction. The dappling bar dips right down to the base. The second step is performed at right angles to the first step, whereby the screed is only worked on the surface with the dappling bar.

Application with a screed broom

Initially, the broom work is performed along the edges. Subsequently, the screed surface is worked so that every point on the screed has been worked with the broom. The broom is held slightly sloped to the direction of motion.
When the broom is raised, the bristles should be lifted completely away from the screed.

The combined working method has also proven to be effective in practice. This involves the initial work step with the dappling bar and the second work step with the screed broom.

Application of Knauf Nivellierestrich 425 **with thin layer heating floor screed**

In order to ensure that the mortar can flow well into the small knobs on the fixing panel, it is recommended that the Knauf Nivellierestrich 425 is worked intensively during or immediately after screed application with a screed broom and subsequently levelled with a dappling bar.

Knauf complete logistical service FERRO 100 with star wheel

PFT RITMO family mixing pumps

PFT G 4 neXt generation mixing pump

Machines for Knauf flowing screeds

PFT machines for Knauf flowing screeds

For efficient application

Knauf flowing screeds are mixed by machine, pumped into the structure and supplied to the pouring machinery on-site. The preparation of the screed occurs using a continuously operating mixing pump for dry mortar.

Knauf recommends the use of specially designed PFT machines for the application of flowing screeds as bulk and bag supplied materials. In the table, the most important parameters (mortar capacity, pumping distance, supply height) as well as the building site conditions for their application are shown. The pumping distances/heights are reference values from field use, and in addition to the choice of pump, are dependent on the type of material, consistency of the mortar, pump state and mortar hose diameter. The pumping distances/heights can be increased by incorporating further PFT feed pumps into the feed system.

For processing bulk material, particularly for manufacturing jointless large screed bays, the machine system PFT FERRO 100 (complete logistical service) is used. These machines are permanently installed on the container. They have the advantage that the mixing and pumping sections are separate from one another and matched to one another.

PFT G 4 is loaded with bagged material. Other mixing pumps for dry mortar available on the market are also suitable for processing Knauf flowing screeds when the manufacturers specifications are also taken into consideration.

PFT FERRO 100

Robust, user-friendly mixing and conveying pump with star wheel rotary feeder and PLC control. High continuous conveying output capacity of approx. 100 l/min. Provided with the container on a rental basis as a complete Knauf logistical service.

PFT G 4

Continuously mixes and pumps fully automatically all machine workable factory-mixed dry mortar. Ideal for material supplied in bags. Capacity up to 85 l/min.

Recommended machine systems for the application of flowing screeds

Machine system	Equipment variants	Mortar capacity (approx.) l/min	m³/h	m²/h with screed thickness[3] 35 mm	55 mm	Pumping distance / supply height [2]	Building site requirements Water connection[1]	Electrical connection
PFT FERRO 100	Horizontal mixer with screw pump, size 50 and 40 mortar hoses	100	6.0	171	109	approx 100 m with approx. 50 m supply height	at least 3/4 inch 2400-2600 l/h	400 V three-phase current 5x4 mm² 32 A fuse [4]
PFT G 4	Screw pump R8-1,5 size 35 mortar hoses	85	5.1	137	87	approx 80 m with approx. 10 m supply height	at least 3/4 inch 1500-1750 l/h	400 V three-phase current 5x4 mm² 32 A fuse

[1] *Water pressure: ≥ 3.0 bar with operating machine*
Water requirement: 1st value - FE 50 Largo, FE Sprint, FE Eco
2nd value - FE 80 Allegro / FE 25 A tempo / FE Fortissimo

[2] *Pumping distance = mortar hose lengths are reference values for the stated mortar delivery capacity, dependent on the material type, consistency, pump state, hose diameter*

[3] *Further reference values for other screed thicknesses see page 74*

[4] *Slow-blow fuse (c rated circuit breaker)*

PFT machines – Basic settings for Knauf levelling compounds

Material	**Slump-flow** Ø cm PFT consistency checking tin	Feed mixing pump	Equipment rotor	Agitator	Water [5] l/h approx. basic setting	Output l/min
Alphadur 430	62 (max. 66)	G4	D 4–3	yes [8]	250	12
		RITMO (max. speed)	D 4–1,5 L	yes	350	14
Nivellierestrich 425	52 (max. 56)	G4 [7]	D 6–3	yes	440	22
			D 8–1,5		700	34
			R 7–1,5		1200	60
Dünnestrich 325	50 (max. 52)	RITMO (max. speed)	B 4–1,5	no	200	16
		G4	D 6–3	yes [8]	350	22
			D 8–1,5		600	34
Nivellierspachtel 415 (leveling screed)	62 (max. 68)	RITMO (max. speed)	B 4–1,5 L	no	250	16
		G4	D 6–3	yes	450	22
			D 8–1,5		650	35
Knauf Fließspachtel 315	58 (max. 62)	RITMO (max. speed)	B 4–1,5 L	no	250	17
		G4	D 6–3	yes	450	22
			D 8–1,5		650	35
Faserflex [6]	58 (max. 62)	RITMO (max. speed)	D 4–1,5 L	no	300	17
		G4	D 6–3	yes	450	23
			D 8–1,5		650	34
Schnellspachtel 300	61 (max. 63)	RITMO (max. speed)	D 4–1,5 L	yes [9]	310	14

[5] *The specifications for the water settings are normally basic values that are generally achieved with new screw pumps. The water settings are reduced by wear. This is why a check of the consistency with a slump-flow is absolutely necessary.*

[6] *Use a hose without coupling or taper.*

[7] *PFT RITMO for smaller quantities (1-2 to)*

[8] *Agitator PFT ROTOMIX DISC*

[9] *If necessary, use the PFT mixer*

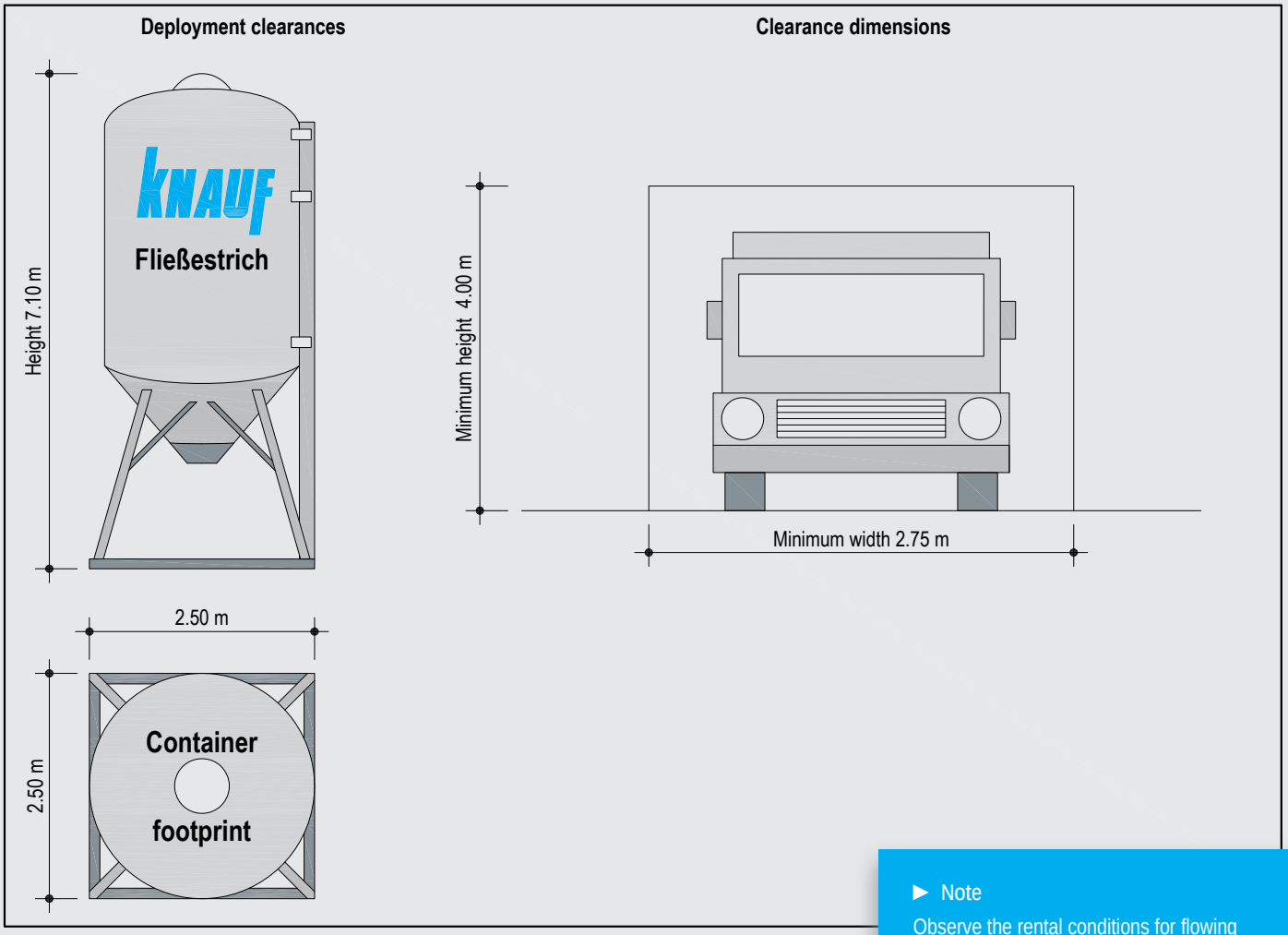
► *www.pft.eu*

Technical data		Machine type PFT G4 (R 7-1,5)		PFT G 4 neXt generation (R8-1,5)		PFT FERRO 100	
Mortar quantity per l/min		55		80		100	
Power connection V A		 380 32					
Water connection ø		3/4 inch		3/4 inch		3/4 inch	
Dry mortar consumption tonnes/hour (t/h)		Approx. 6		Approx. 9		Approx. 11	
Logistics		Bag		Bag		Bulk (silo)	
Thickness mm	Material requirement Approx. 19 kg/(cm·m²) kg/m²	Output capacity and pouring time per m² related to screed thickness m²/h	min/m²	m²/h	min/m²	m²/h	min/m²
25	48	132	0.46	192	0.31	240	0.26
30	57	110	0.55	160	0.38	200	0.31
35	67	94	0.64	137	0.44	170	0.36
40	76	83	0.72	120	0.50	150	0.41
45	86	73	0.82	107	0.56	133	0.46
50	95	66	0.91	96	0.62	120	0.52
55	105	60	1.00	87	0.69	108	0.57
60	114	55	1.09	80	0.75	100	0.62

Machines for Knauf flowing screeds

Recommended values for output capacity

Site conditions for the container logistics service



► Note
Observe the rental conditions for flowing screed mixing pump FERRO 100.

Knauf flowing screeds complete logistics system

Logistics

Knauf flowing screeds are supplied as bulk material for application from containers and as bagged goods in 40 kg bags. The technical data of a standard container can be seen in the following table:

Container for flowing screed	
Container type	Round silo C 20000
Max. capacity	Approx. 20 m³, approx. 32 t
Container weight	approx. 2.4 t
Max. load, transport quantity	Approx. 9 to 18 t [1]
Shape	Round

[1] *dependent on the vehicle type*

The highest level of logistical support with Knauf flowing screed application is achieved by the use of the Knauf flowing screed complete logistical service. It consists of a 20 m³ large container (round silo) with a flange-connected, high-capacity screed machine of type PFT FERRO 100 with star wheel and integrated accessories. The entire logistical unit is transported with a purpose-built vehicle and erected on the building site.
On the building site, the power, water and mortar hoses just need to be connected to the logistical unit so that the otherwise common machine equipment preparation work is minimized.

The logistics unit operates with an intelligent system solution – good material flow from the container C 20000, open mortar preparation system of the PFT FERRO 100 with star wheel rotary feeder and the separate drives for the mixing unit and conveying pump – with a high-level of operational safety.
The star wheel rotary feeder provides a continuous, fluctuation-free supply of dry mortar from the silo. The central control panel with programmable logic controller (PLC) automatically controls the interaction of the system components.

► *Code of Practice No. 1 "Safe handing of transportable building site silos" (German only) of the BVG*

Drying

Of flowing calcium sulphate screeds

According to DIN 18560-1, calcium sulphate screeds should be allowed to dry unhindered. The drying of the screed is mainly dependent on the temperature, the air humidity and the air speed of the ambient air as well as the screed thickness. The lower the air humidity, the higher the air speed and temperature and the quicker the screed dries until it is ready for covering.

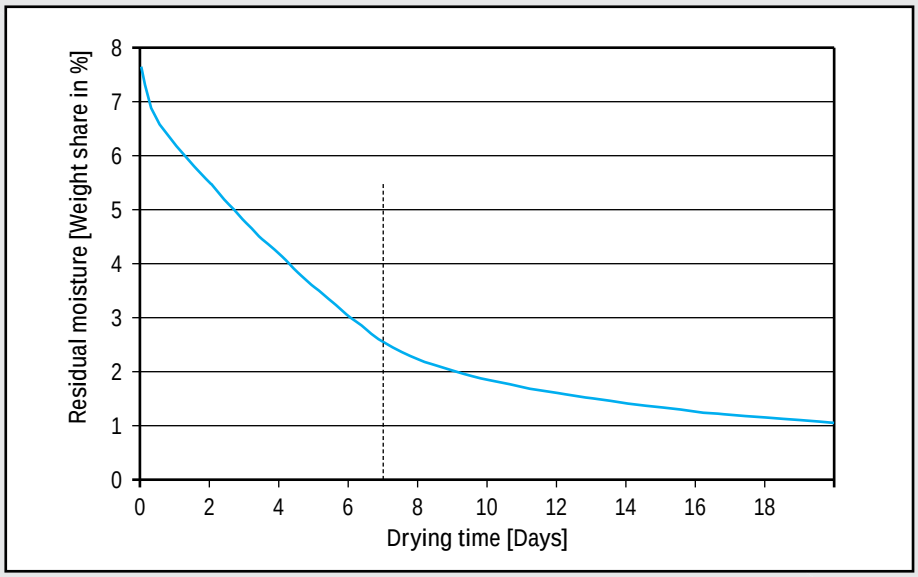
The screed can only dry when the used, moist air is continuously replaced by fresh, dry air. The optimum situation is when the screed is exposed to draughts with wide open windows and doors (ensure that it is protected against rain). Thus, a quick exchange of the air, i.e. an exchange of the moisture-enriched room air is achieved by fresh external air (see table).

Tilting the windows is not sufficient to ensure quick drying as the number of air exchanges is too low.

For Knauf FE Sprint, however, continuous ventilation with tilted windows is required for quick drying, as draughts directly on the screed surface must be avoided here (windows and doors may not be kept wide open continuously).

If the drying of the screed is prevented with cold internal temperatures, the setting expansion can exceed 0.1 mm/m. Under these special conditions, additional measures relating to the joint arrangement may be necessary with large area application. In particular for raised access floors with double floor tracks, this may be necessary to avoid the restraints of the double floor boards.

Knauf flowing screed drying curve



Drying of the flowing screed is very quick in the first 7 days as can be seen by the steep slope of the drying curve. This is down to the typical capillary water transport for flowing screeds in the initial phase. This phase can be used to accelerate drying by an intensive exchange of air.
Subsequent drying occurs due to diffusion. Now a particularly low level of air humidity supports quick drying.
Quick drying for flowing screeds is generally not damaging due to the unique properties of calcium sulphate as a binder.

Number of air exchanges in dependence on the window position according to Gertis and Hauser

Window position	Number of air exchanges per hour
Windows closed, doors closed, windows tilted	0 to 0.5
Roller shutters closed	0.3 to 1.5
Windows tilted, no roller shutters	0.8 to 4.0
Windows half open	5 to 10
Windows fully open	9 to 15
Windows and French doors fully open (directly opposite each other)	Approx. 40

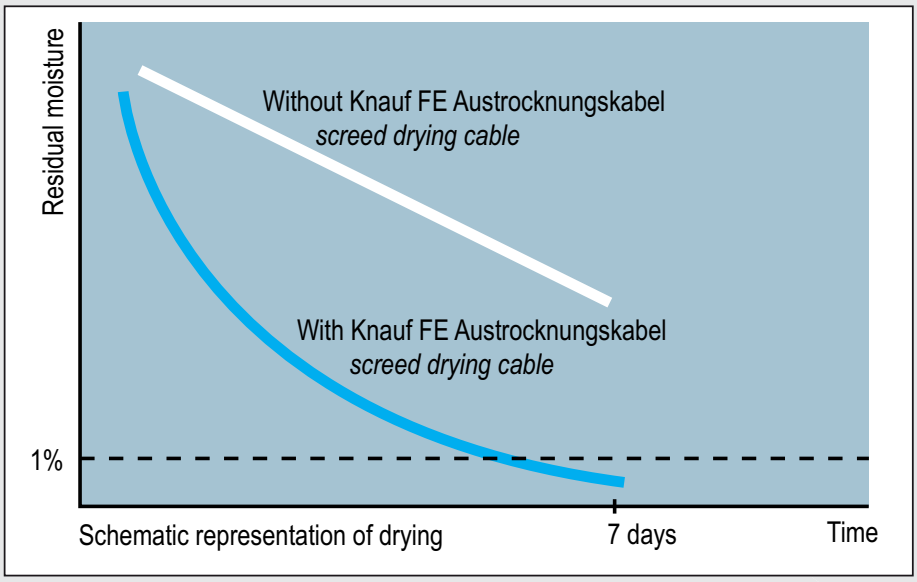
► Good to know

Where as FE 80 Allegro and the FE 50 Largo feature practically the same drying behaviour, the FE 25 A tempo dries faster when the instructions are observed (construction sites with tight deadlines).

In practice this means:

- Windows and doors must be opened fully to ensure exchange of the air (draughts).
  In contrast to cementitious screeds, draughts are not damaging for FE 25 A tempo after it has achieved walkability (after approx. 3 h), and with FE 80 Allegro, FE 50 Largo and FE Fortissimo from 2 days after installation of the screed, and are in fact desirable to ensure quick drying
- If the ventilation openings are not sufficient, e.g. too few window areas, the damp air should be exhausted externally using fans.
- Commence ventilation two days after installation for Knauf FE Eco 2. Preferably by a fan (installed in window), extracting the air from the building.
- If a sufficient exchange of air is not possible, room air dehumidifiers should be used in conjunction with fans that ensure sufficient air circulation.
- Additional heating supports the drying process whereby continuous airing is required here.
- The screed thickness should be limited to the statically necessary dimension, as the drying time rises disproportionately with larger screed thicknesses.
- By using the Knauf Screed Drying Cable, the drying time can be reduced with larger screed thicknesses (see page 78ff.).
- Drying of the screed surface should not be hindered by storing building materials on the surface.

► *IGE/IWM Code of Practice No. 2*



Knauf FE-Austrocknungskabel (screed drying cable)

Drying

With Knauf FE-Austrocknungskabel (screed drying cable)

The Knauf FE-Austrocknungskabel (screed drying cable) can be used to shorten the drying time of Knauf flowing screeds (e.g. on building sites on tight deadlines). Drying of the screed is accelerated by heating it simultaneously when airing it. The heating is supplied by the Knauf FE Austrocknungskabel, which is positioned on the base of the screed (e.g. insulation material covering of a floating screed) and that warms the screed from below. The Knauf FE Austrocknungskabel is an electrical resistance cable that is simply connected to a normal domestic power socket.

The Knauf FE Austrocknungskabel is only used to shorten the drying time. After achieving the appropriate level of residual moisture, the Knauf FE Austrocknungskabel must be taken out of operation. Unplug the power connector from the socket, cut off the cable flush with the flowing screed.

As this is not an underfloor heating element, temperature sensor, thermostat controller as well as other special measures are not required, which makes the construction costs attractive.

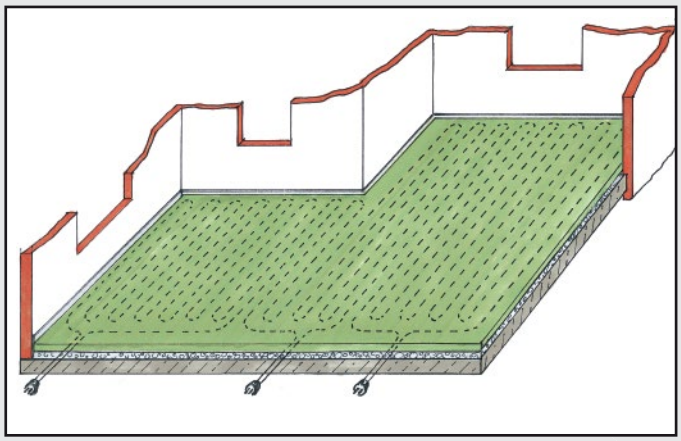
The screed construction with Knauf FE Austrocknungskabel is proven in particular with two applications:

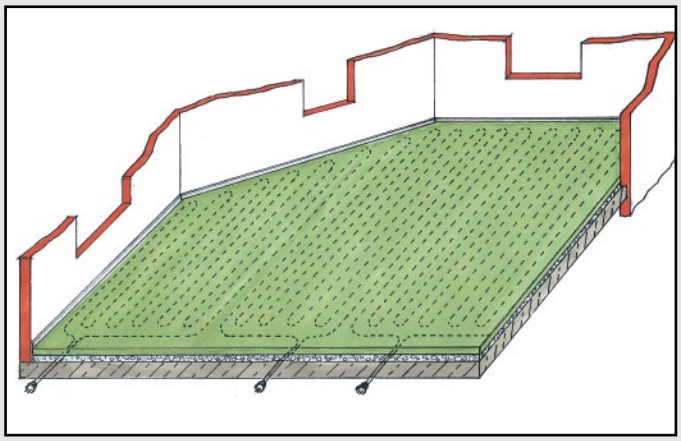
- When an early drying screed Knauf FE 25 A tempo is used, heating and airing of the screed can commence directly after the screed is hard enough to be trafficked (walkable). In this way, the time period between screed application and readiness for covering can be reduced to a few days.
- The drying time increases disproportionately with increasing screed thickness. The drying time of screeds with larger layer thicknesses can be reduced with the Knauf FE-Austrocknungskabel (screed drying cable), e.g. from several months to approx. four weeks.

Cable type and output capacity

A heating capacity of approx. 50 to 120 W/m² is desirable. In order to achieve the desired heating capacity and to prevent overheating of the screed and Knauf FE-Austrocknungskabel (screed drying cable), the cable must be matched to the surface size. Three Knauf FE FE-Austrocknungskabel with differing lengths and resistivity's (resistance per unit length) are available.

- FE-Austrocknungskabel type 30 (0.4 kW) with 30 m length for 4-7 m², corresponds to 110–65 W/m²
- FE-Austrocknungskabel type 65 (0.8 kW) with 65 m length for 8-14 m²,





Application examples with different room geometries

corresponds to 100-60 W/m²

- FE-Austrocknungskabel type 110 (1.9 kW) with 110 m length for 20-30 m², corresponds to 100-60 W/m²

The Knauf FE-Austrocknungskabel has a connection cable on both ends (blue and black) A two-pin plug (Schuko) is supplied with each cable.

Installation and operation

The cable type is selected to suit the area size. If a single cable length is insufficient, several cables can be combined with one another. Every cable requires its own power connection (socket).

The cable is installed with a clearance between cable loops of 12 to 28 cm in a meandering configuration.

The clearance results from the size of the area and the length of the cable (size of the surface in m² / length of the cable in m = cable clearance in m). It is recommended that the cable is rolled out during laying to avoid the cable becoming twisted during installation. The cable is fixed either with clips through the insulation layer covering (e.g. Knauf Schrenzlage) on the insulation layer on steel mats that have been attached beforehand or glued to the substrate with adhesive tape.

The Knauf FE-Austrocknungskabel must be fully embedded in the screed so that only the connection cable protrudes out of the screed. Shortening or extending the Knauf FE-Austrocknungskabel is not permitted.

The Knauf FE-Austrocknungskabel tends to float on flowing screed. It is therefore essential that the cable is carefully connected to the substrate. Otherwise pouring in two layers is recommended. The cable diameter must be considered when dimensioning the screed thickness.

The Knauf FE-Austrocknungskabel can be put into operation immediately after the Knauf FE 25 A tempo is hard enough to be trafficked (walkable). With Knauf FE 80 Allegro, FE 50 Largo and FE Fortissimo, it is necessary to wait 7 days.

The plug is connected to the connection cables by a qualified specialist or by a person who has been instructed by a specialist. If several cables are connected simultaneously, ensure that the power supply rating is sufficient for the load.

During operation of the Knauf FE-Austrocknungskabel, the rooms should be well ventilated (draught). The screed may not be covered, e.g. by storing building materials on it.

The residual moisture is determined with the CM device.

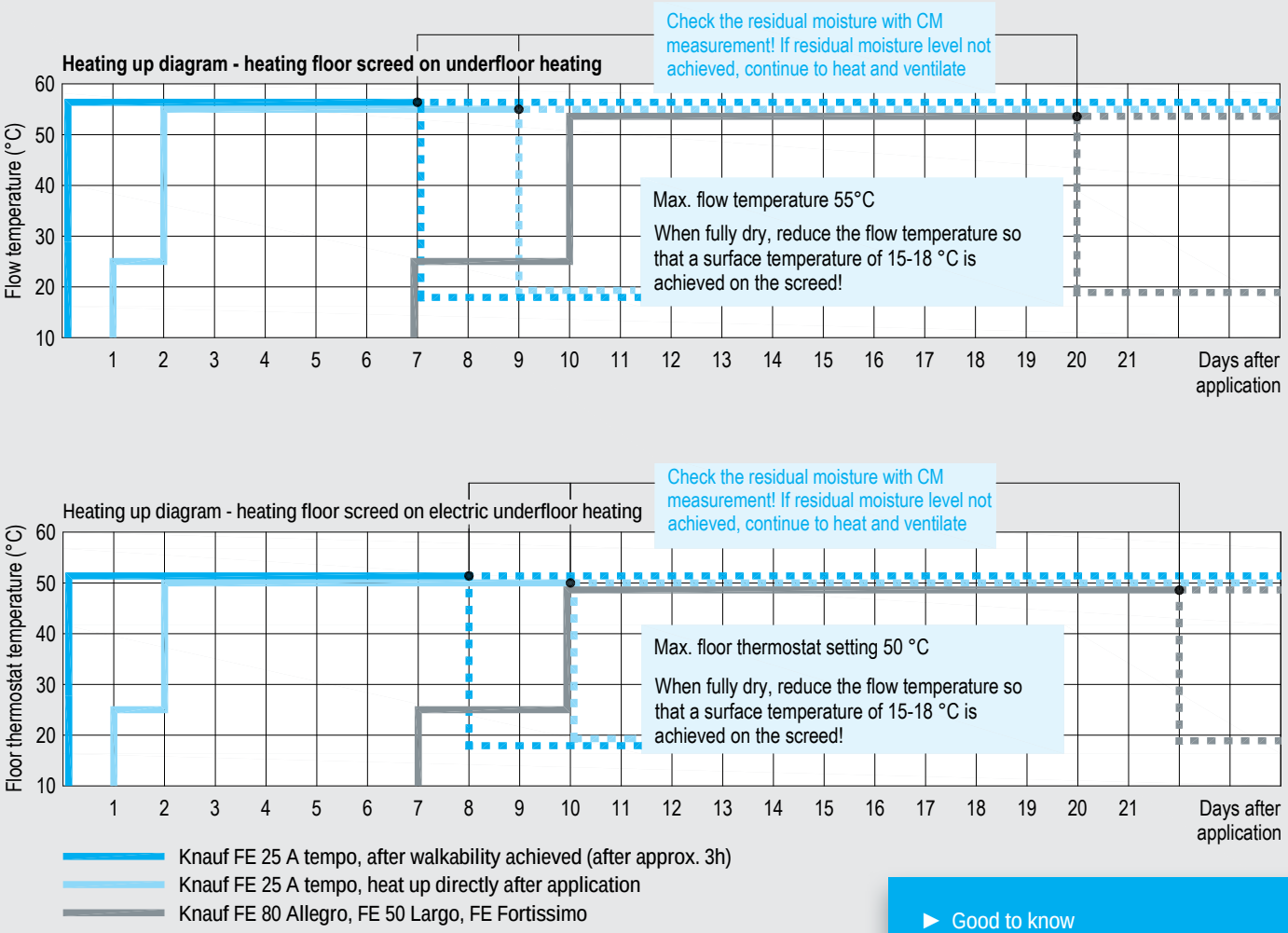
The surface is ready for accepting a covering with a residual moisture

- with coverings open to vapours (textile, etc.) of ≤ 1.0 %,
- vapour-retardant coverings (tiles) ≤ 1.0 %,
- vapour-proof coverings (PVC) as well as parquet or similar. ≤ 0.5 %

After the surface is ready to accept a covering, the plug is removed from the socket and the connection cable is then cut off flush with the screed.

► Product Data Sheet *F501.de*
Knauf FE Austrocknungskabel

Heating up diagram for FE 25 A tempo, FE 80 Allegro, FE 50 Largo, FE Fortissimo



Drying of heating floor screed

Heat up

► Good to know

With electrical underfloor heating, the heat up is controlled by the floor thermostat instead of the flow temperature. The maximum floor thermostat setting is 50 °C. For later operation of the underfloor heating with a room thermostat control, the temperature limitation of the floor thermostat must be set to max. 45 °C (see page 85).

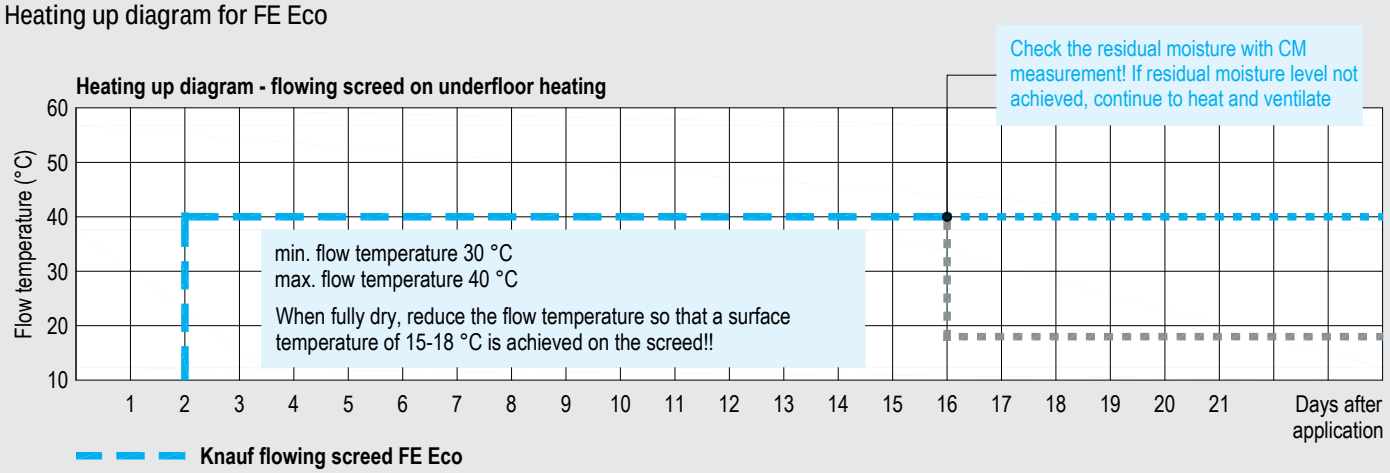
The heating floor screed must be heated up before it is covered. Furthermore, a heating protocol must be documented and provided to the floor covering installer (in accordance with the requirements of the German VOB part C, "Flooring work"). Heating protocol templates for Knauf flowing screed with a detailed description of the heating up phase is available from Knauf Gips KG (see from page 83).

Heat up dries the screed and reduces the build up of stresses in the screed bay. If a heating screed is not heated up sufficiently before the floor covering is applied, this can lead to subsequent damage of the screed and the covering. Even a screed that has dried naturally must be heated up before the covering is applied!

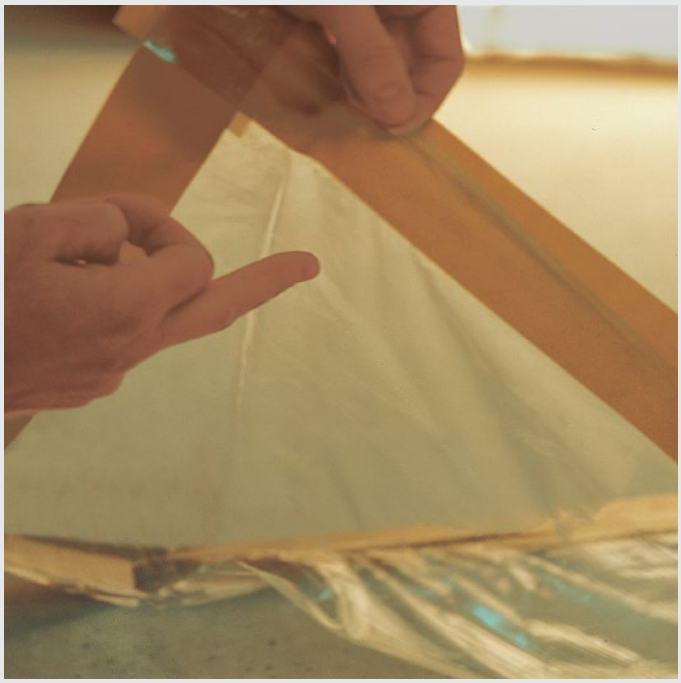
The start of heating up of the screed and the duration of the heating up phase or drying is dependent on the screed type, screed thickness, ventilation, flow temperature and weather conditions. Also for heating floor screed, the screed thickness should be limited to the statically necessary dimension as the drying time rises disproportionately with larger screed thickness's.

With Knauf flowing screed FE 80 Allegro and FE 50 Largo, heat up can only commence at least 7 days after application of the screed The flow temperature should be set to 25 °C and kept at this temperature for three days. The flow temperature is then set to the highest temperature (dependent on the heating system, max. 55 °C - at low flow temperature you must expect a longer heating up phase). Alternatively, heating up can occur in steps of 5 K per day. The highest temperature must be retained without reductions in night-time operation with simultaneous ventilation, until the screed is fully dry (see "Checking the surface for readiness to accept coverings"). The heating screed bays in a building must be heated up simultaneously and with the same temperature. All heating circuits within the screed bay must be heated

Heating up diagram for FE Eco



Initial inspection of drying with foil on the heating floor screed



Check for the formation of condensation under the foil

up uniformly. This also concerns areas, such as corridors through which the connections lead to other rooms.

Subsequently, the flow temperature is reduced again until a surface temperature of 15–18 °C is achieved. At very low external temperatures (≤ 0 °C), ensure that during heating up of the screed surface the temperature fluctuations are not too large (caution with windows at floor level) or that the screed does not cool too quickly with a reduction of the flow temperature of the screed. With Knauf Fließestrich FE 25 A tempo on the other hand, directly after it is hard enough to be trafficked (walkable, after approx. 3 hours) heating at a flow temperature of max. 55 °C can be put into operation or quick heat up in stages can be undertaken. In this way, the duration between the screed application and covering application is reduced considerably when compared to FE 80 Allegro and FE 50 Largo.

With Knauf flowing screed FE Eco heat up can only commence after 2 days at the earliest.

The flow temperature of max. 40 °C may not be exceeded.

Knauf FE Eco is used as a heat-pump screed on underfloor heating systems, which cannot generate high flow temperatures (e.g. when heat pumps are used).

Inspecting the foil, see photos

The required drying of the screed as a prerequisite for application of the covering can be examined with a PE foil (dimensions 50 cm x 50 cm) as an initial test, by applying the foil in a ventilated room at a max. flow temperature (max. 55 °C or 45 °C with Nivellierestrich 425 and 40 °C with FE Eco) and on the heating screed and taping down the edges with adhesive tape. No condensation may form under the foil within 12 hours. Otherwise, continued heating and ventilation is necessary. The foil test does not eliminate the need for CM measurement before covering application, see page 87.

Heat up regulations for FE 80 Allegro, **FE 50 Largo and FE Fortissimo:**

Commencement possible: 7 days after application in acc. with DIN EN 1264-4.

1. Set the flow temperature to 25 °C and retain it for three days.
2. Then set the highest temperature (max. 55 °C) and retain it (without night-time operation reduction) until the screed is dry.
   Alternatively, heating up can occur in steps of 5 K* per day.
   Reference values for drying at max. flow temperature:
   Thickness ≈ 35 mm (type B): approx. 10 days,
   Thickness ≈ 55 mm (type A): approx. 14 days.
   Check the residual moisture.
3. After drying, reduce the flow temperature so that the surface temperature of the screed achieves 15–18 °C.
4. Hereafter, the screed is now ready to be covered.

Heat up regulations for FE Eco:

It is possible to commence 48h after application

1. Set the flow temperature without steps to the highest temperature (min. 30 °C / max. 40 °C) and retain it (without night-time operation reduction) until the screed is dry.
   Reference values for drying at max. flow temperature and ventilation:
   Thickness ≈ 55 mm (type A): approx. 14-21 days
   Check the residual moisture.
2. After drying, reduce the flow temperature so that the surface temperature of the screed achieves 15–18 °C.
3. Hereafter, the screed is now ready to be covered.

Heat up regulations for FE 25 A tempo

- Heat up after hard enough for foot traffic:

1. Put the heating into operation with a water flow temperature of max. 55 °C.
2. Retain the highest temperature until the screed is dry.
   Reference values for drying at max. flow temperature:
   Thickness ≈ 35 mm (type B): approx. 7 days,
   Thickness ≈ 55 mm (type A): approx. 10 days
   Check the residual moisture.
3. Switch off after drying or reduce the flow temperature to 15-18 °C.

- Heat up of the hardened screed:

If the screed is heated up only after one or more days, heat up as with FE 80 Allegro / FE 50 Largo / FE Fortissimo is required However, the flow temperature of 25 °C only needs to be retained for a day.

At very low external temperatures (≤ 0 °C), ensure that during heating up of the screed surface the temperature fluctuations are not too large (caution with windows at floor level) or that the screed does not cool too quickly with a reduction of the flow temperature of the screed.

Check drying in acc. with item 2 of the heat **up regulations:**

Place PE foil (dimensions approx. 50 cm x 50 cm) on the heating screed surface, tape down the edges with adhesive tape.

At max. flow temperature, no condensation may form within 12 hours in ventilated rooms under the foil - otherwise heat and ventilate further.

The foil test does not replace CM measurement immediately before covering application. According to the information of the German Zentralverbandes Sanitär Heizung Klima Coordination of trades with heated underfloor constructions", the measured value may not exceed 0.3 %.

Flow temperature

max. 55 °C, for FE Eco max. 40 °C

Edge insulation strips

For suitability for flowing screed they must be compressible by at least 5 mm (only cut off after the covering has been laid).

Heater coil

Must be filled with water and under pressure when the screed is applied.

▶ Note

Further notes in the brochures and technical data sheets.

The heating up protocol must be documented and must be provided to the floor covering specialist! (in accordance with the requirements of the German VOB part C, "Flooring work" DIN 18365, issue 2006, items 3.1.1 and 3.1.2)

Heat up regulations and heating protocol

Warm water underfloor heating

Nominal screed thickness

≥ 35 mm over the heating system (tube including attachment).

Movement joints

With area offsets and steps, in larger areas, in doorways and for separation of heated and unheated areas. Detailed recommendations can be found in the Code of Practice No. 5 "Joints in flowing calcium sulphate screeds" (IGE/IWM).

Drying

The screed must be heated until dry. The drying time is dependent on the temperature, air humidity and air speed. Drying is accelerated significantly by heating up the screed using underfloor heating. Adequate ventialtion should be provided during heating.

Please note

- With FE 80 Allegro / FE 50 Largo / FE Fortissimo avoid draughts for the first two days after application, then provide good ventilation. Heat up at the earliest after 7 days, acc. to DIN EN 1264-4.
- For FE 25 A tempo, provide good ventilation after it is hard enough to be trafficked (after approx. 3 h). Heat up after hard enough for foot traffic possible (after approx. 3 h).
- Commence ventilation and heat up two days after installation for Knauf FE Eco. Ventilation using a fan (installed in window) is preferable, which transports the air out of the building.
- Functional heating must be performed on a heating floor screed acc. to DIN EN 1264-4 before the covering is applied. Furthermore, the screed must be heated until dry (heat to ensure covering suitability). With the heating regulations provided, functional heating is combined with coverage ready heating.

Covering of the screed:

Apply hard and vapour-proof coverings about 1-3 days after cooling down. If you wait for longer than 3 days with application of the covering, the heating floor screed must be heated up again directly before the covering is applied, and the foil test described above must be performed to ensure that the surface is dry. Mechanically clean the screeds before covering with an industrial vacuum cleaner and prime with an acrylic dispersion primer, e.g. Knauf Estrichgrund. Use an adhesive for the covering that is suitable for underfloor heating. Use an elasticized adhesive with a rigid covering (tiles, natural stone) (e.g. Knauf Flexkleber Multi).

Knauf flowing screed with warm water underfloor heating

Heating protocol for coverage ready heating

☐ FE 50 Largo
☐ FE 80 Allegro
☐ FE 25 A tempo
☐ FE Fortissimo
☐ FE Eco

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

Investor: Building site:	Heating engineer: Site manager:
Heating system: Screed applied on	Average screed thickness: mm Coverage of heating element: min.: mm max.: mm

Heating (coverage ready heating):

Date	**Flow temperature in °C**	Signature

☐ Ventilation
☐ Window ventilation

Date from	to	Ø h per day

Drying test
(foil test) *:

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

*** Does not replace CM measuring before covering*

Please keep this document!

Place / Date

Signature (Site manager)

Heat up regulations for FE 80 Allegro, FE 50 Largo and FE Fortissimo:

Commencement possible 7 days after application.

1. Set the floor thermostat to 25 °C and retain the value for three days
2. Then set the underfloor thermostat to max. 50 °C and retain the temperature until the screed is dry.
   Reference values for drying at max. floor thermostat temperature:
   Thickness ≈ 40 mm: approx. 12 days
   Check the residual moisture.
   Alternatively, heating up can occur in steps of 5 K per day.
3. After drying, reduce the floor thermostat setting so that the surface temperature of the screed is 15–18 °C.
4. Hereafter, the screed is now ready to be covered.

Heat up regulations for FE 25 A tempo

- Heat up after hard enough for foot traffic:

1. After hard enough for foot traffic possible (after approx. 3 h) put the heating into operation with a floor thermostat setting of max. 50 °C.
2. Retain the temperature until the screed is dry.
   Reference values for drying at max. floor thermostat temperature:
   Thickness ≈ 40 mm: approx. 8 days
   Check the residual moisture.
3. Switch off the heating after drying.

- Heat up of the hardened screed:

If the screed is heated up only after one or more days, heat up as with FE 80 Allegro / FE 50 Largo / FE Fortissimo is required. The floor thermostat setting of 25 °C only needs to be retained for one day.
With thicker screed layers (80 mm, heating storage screed), the drying time is extended.
For later operation of the underfloor heating with room thermostat control, the temperature limitation of the floor thermostat must be set to max. 45 °C.
At very low external temperatures (≤ 0 °C), ensure that during heating up of the screed surface the temperature fluctuations are not too large (caution with windows at floor level) or that the screed does not cool too quickly with a reduction of the flow temperature of the screed.

Checking for residual moisture acc. to point 2 of the heating up regulations

Place PE foil (dimensions approx. 50 cm x 50 cm) on the heating screed surface, tape down the edges with adhesive tape.
At heating with the max. floor thermostat setting (50 °C), no condensation may form within 12 hours in ventilated rooms under the foil - otherwise heat and ventilate further.
The foil test does not replace CM measurement immediately before covering application. According to the information of the German Zentralverbandes Sanitär Heizung Klima "Coordination of trades with heated underfloor constructions", the measured value may not exceed 0.3 %.

Heating temperature max. 50 °C on heating elements

Edge insulation strips

For suitability for flowing screed they must be compressible by at least 5 mm (only cut off after the covering has been laid).

Nominal screed thickness

≥ 35 mm via electrical underfloor heating.

Movement joints

With area offsets and steps, in larger areas, in doorways and for separation of heated and unheated areas. Detailed recommendations can be found in the Code of Practice No. 5 "Joints in flowing calcium sulphate screeds" (IGE/IWM).

► Note

Further notes in the brochures and technical data sheets.

The heating up protocol must be documented and must be provided to the floor covering specialist! (in accordance with the requirements of the German VOB part C, "Flooring work" DIN 18365, issue 2006, items 3.1.1 and 3.1.2)

Heat up regulations and heating protocol

Electrical underfloor heating

Drying

The screed must be heated until dry. The drying time is dependent on the temperature, air humidity and air speed. Drying is accelerated significantly by heating up the screed using underfloor heating. Adequate ventilation should be provided during heating.

Please note

- With FE 80 Allegro / FE 50 Largo / FE Fortissimo avoid draughts for the first two days after application, then provide good ventilation. Heat up at the earliest after 7 days.
- For FE 25 A tempo, provide good ventilation after it is hard enough to be trafficked (after approx. 3 h). Heat up after hard enough for foot traffic possible (after approx. 3 h).
- Temperature control occurs during the heating up phase via the floor thermostat, the room thermostat is out of service at this time! The floor thermostat should be placed on the bottom of the screed on the heating elements.
- Functional heating must be performed on a heating floor screed before the covering is applied. Furthermore, the screed must be heated until dry (heat to ensure covering suitability). With the heating regulations provided, functional heating is combined with coverage ready heating.

Covering of the screed

Apply hard and vapour-proof coverings 1-3 days after cooling down If you wait for longer than 3 days with application of the covering, the heating floor screed must be heated up again directly before the covering is applied, and the foil test described above must be performed to ensure that the surface is dry. Mechanically clean the screeds before covering with an industrial vacuum cleaner and prime with an acrylic-dispersion primer, e.g. Knauf Estrichgrund. Use an adhesive for the covering that is suitable for underfloor heating. Use an elasticized adhesive with a rigid covering (tiles, natural stone) (e.g. Knauf Flexkleber Multi).

Knauf flowing screed with electrical underfloor heating
Heating protocol for coverage ready heating

☐ FE 50 Largo
☐ FE 80 Allegro
☐ FE 25 A tempo
☐ FE Fortissimo

Fill in every change of floor thermostat setting during the heating up process and during reduction of temperature exactly to 5 °C. Every drying test should be documented.

Investor: Building site:	Heating engineer: Site manager:
Heating system: Screed applied on	Average screed thickness: mm Coverage of heating element: min.: mm max.: mm

Heating (coverage ready heating):

Date	**Flow temperature in °C**	Signature

☐ Ventilation
☐ Window ventilation

Date from	to	Ø h per day

Drying test
(foil test) *:

Date	Dry yes/no	Signature

Drying test (CM measurement):

Date	Residual moisture in %	Signature

Reduction of the floor thermostat setting:

Date	**Flow temperature in °C**	Signature

Coverage ready heating completed:

Date	**Outdoor temperature in °C**	Signature

*** Does not replace CM measuring before covering*

Please keep this document!

Place / Date

Signature (Site manager)

Application of covering

Checking of the flowing screed for covering application - evenness

Evenness

The screed surface must comply with the evenness tolerances acc. to DIN 18202. See the table for permissible tolerances.

The corresponding tests must be performed using area levelling elements or by using a browning rod and measuring wedge (measurement acc. to DIN 18202, section 6.2).

Permissible evenness tolerances of the screed surface to DIN 18202

Spacing of the measurement points in m	Permissible evenness tolerances in mm
up to 0.1	2
up to 1.0	4
up to 4.0	10
up to 10	12
up to 15	15

Determination of residual moisture with the CM device, original sample weight in dependence on the expected water content

Assumed water content in %	Necessary original sample weight in g
1	100
2	50
5	20
10	10

Residual moisture with readiness for covering of Knauf flowing screeds

Covering	Unheated screeds	**Heating floor** screeds
Coverings open to vapours (textile, etc.)	≤ 1.0%	≤ 0.3%
Vapour-retardant coverings (tiles)	≤ 1.0%	
Vapour-proof coverings (PVC), as well as parquet etc.	≤ 0.5%	

Testing the readiness for covering with the CM tester

► Heating floor screeds

Knauf flowing screeds as heating floor screeds must be heated until dry. In practice, this generally corresponds to a residual moisture of about 0.1%.

The foil test (see page 81) does not replace CM measurement. According to the information of the German Zentralverbandes Sanitär Heizung Klima "Coordination of trades with heated underfloor constructions", the measured value may not exceed 0.3 %.

Application of covering

Checking of the flowing screed for covering application - residual moisture

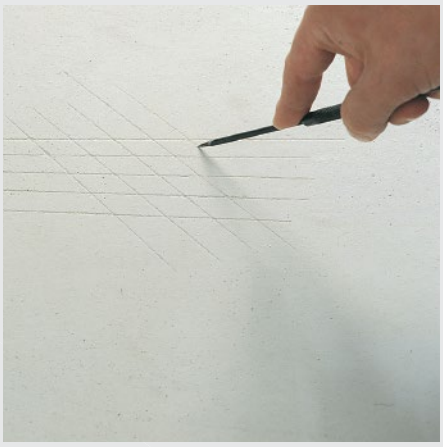
Determination of the residual moisture

Knauf flowing screed in conjunction with further covering work may not exceed the moisture content listed above on the entire screed surface in dependence on the type of covering to be used. Large format tiles and board coverings, which are vapour-proof when applied with the conventional cementitious adhesives may also be applied with a residual moisture of 1.0% on unheated Knauf flowing screeds, as damage to the screed is not to be expected with professional application. The CM device (carbide method) must be used for residual moisture testing on the building site.

Samples are taken using a chisel and hammer. The sample material is taken uniformly over the entire thickness. As the screed dries from the top downwards, this should prevent that the sample taken at the surface has too little moisture and the sample taken at the bottom has too much moisture. The value should be read off after about 10 minutes as otherwise the crystallized water content will be measured (value will be incorrect) should the sample remain any longer in the CM device. The sample material should be crushed with a hammer and placed into the pressure bottle.

The original sample weight is dependent on the expected residual moisture, see table. When determining the measuring points, the most unfavourable drying areas must be considered! Electrical measuring devices are not suitable for reliable measurement of the residual moisture. They can be used at best to make a rough estimate of the moisture content, but generally produce non-reproducible values.

Knauf flowing screed cross-section, magnified by 4



Scratch test

Inspection of the grain structure

► Note on the test methods

The test methods for surface strength must be performed on dry screed (residual moisture ≤ 1 %).

Application of covering

Checking of the flowing screed for covering application - surface strength

Surface strength

Knauf flowing screeds have a solid surface when they have been correctly applied (mortar consistency). The aggregate particle is evenly distributed over the cross-section. In accordance with Code of Practice No. 4 "Assessment and treatment of the surfaces of flowing calcium sulphate screeds" (IGE/IWM), it is possible to eliminate the requirement for roughening/ milling the surface if the surface of the screed is adequate for the intended purpose.

When correctly applied, Knauf flowing screeds have a surface adequate for the respective function. Milling of the screed surface is therefore not necessary.

The above mentioned statement does not apply to the necessary cleaning work (e.g. mechanical brushing or milling clean) directly before cover application.

Test and evaluation of whether the screed has been applied correctly and whether the surface quality is sufficient can be established using the following methods.

Scratch test

Scratch the screed surface with a knife or scratching device so that a grid pattern is created. It is possible to determine whether the screed has a soft surface layer by the force applied, the depth of the scratches and the type of breakline.

However, this test method requires practical experience and should always be combined with the examination of the grain structure to provide a better estimation of the result.

Please note: Knauf flowing screeds can be scratched because of the small aggregate particles. During the scratch test, they behave completely differently when compared to cementitious screeds (aggregate particle up to 8 mm).

Particle composition

A characteristic for a well applied flowing screed is a homogeneous particle composition. Whether the homogeneous particle composition reaches right up to the surface can be determined at best by the removal of a piece of the cross-section. By lightly scraping the surface, e.g. with a knife, it is possible to determine whether the homogeneous particle composition extends to the uppermost zone. The particle composition is more visible when the scraped surface is slightly dampened. If the scratch test and the test of the particle composition does not produce a clear result, further tests determining the resistance to peeling and the bond strength can be used to test the surface quality.

Bonding test and test of the resistance to peeling

Test of the bond strength

Parquet and screed failure patterns

Bonding test and test of the resistance to peeling

This procedure is used when carpets, PVC or similar are intended as the covering. For this purpose, a 50 mm wide covering strip of the planned application layer (primer or filler, adhesive) is applied on the dry and cleaned screed surface. After the adhesive layer has set and dried, the resistance to peeling is determined by peeling it off using a dynamometer (force applied perpendicular to the surface). The minimum peeling force of 50 N (= 1 N/mm covering width) may not be undercut (requirement on the adhesive acc. to DIN EN 14259 minimum resistance to peeling for textile coverings 0.5 N/mm, for PVC coverings 1 N/mm, for elastomeric coverings 1.2 or 2.0 N/mm). If the peeling force is less than 50 N and the rupture occurs in the covering, adhesive or in the filler, this means that the screed surface has a higher tensile strength then the subsequent flooring covering. In this case, the test result cannot be used for evaluation of the screed surface strength.

Bond strength

Metal discs with a diameter of 50 mm are applied with adhesive in order to measure the bond strength (surface tensile strength). Silikal RI/21 (two-component adhesive) is recommended as an adhesive. After the adhesive has set (approx. 30–60 minutes, depending on the temperature and added curing agent) the metal discs are pulled out with a force measuring device, e.g. System SATTEC or DYNA ESTRICH, with a uniform increase in the tractive force. If the bond strength is at least 1 N/mm², the screed surface is sufficiently strong enough for the application of all coverings (minimum requirement for adhesive bonds acc. to DIN 18156: bond strength 0.5 N/mm²). For parquet, a value of 1.2 N/mm² is required occasionally, for reaction resin coatings with commercially used floors a value of 1.5 N/mm² should be achieved. With lower values, a decision must be taken on whether the surface strength is sufficient based on the individual case depending on the adhesive bonding value and the load expected. If the rupture occurs in the adhesive, the measurement must be repeated. Conclusions with regard to the surface quality can be made based on the failure pattern of the rupture.

Bonding sample and failure pattern

A relatively simple test is the evaluation of the failure pattern. A tile or section of parquet to be applied later is glued onto the screed. After the adhesive or filler has set, the tile or parquet is broken off using a hammer. If the fracture is 1 to 2 mm deep or even deeper in the screed, where the aggregate particle is clearly visible, the screed has a sufficient or good surface quality.

► *IGE/IWM Code of Practice No. 4*

Application of covering

Surface preparation

Screed surfaces that comply with the test criteria should be cleaned of any loose or adhering dirt. The screed should be ground to remove stubborn dirt or soiling. After this preparation work, the screed should be primed and filled if necessary. If the screed surface does not meet the quality requirement for covering, it should be treated as such before covering:

Uneven surfaces

Uneven surfaces can be set to an even surface. as follows

- Ground down (suitable grinding disc, grain 16) or
- Filled with Knauf Nivellierspachtel 415

Please note: Remodelling should be undertaken after the screed has dried as the filler will significantly delay the drying speed.

Surfaces too soft

Soft, unstable surfaces should be ground down (suitable: 16 grain grinding disc) to the sufficiently stable layers (visible grain). The ground surfaces should be cleaned with an industrial vacuum cleaner.

Then twin priming should be applied (dilute with water 1:2 + 1:1) with Knauf Estrichgrund, and if necessary, a levelling filler layer up to the planned height should be applied.

Cracks

Open cracks are not permissible in the screed. Even when the screed substrate has been correctly applied (particularly when standard-compliant insulation materials are used with floating screed) and the minimum thickness has been observed but cracks have still occurred (e.g. due to unfavourable curing conditions, uneven drying), they should be sealed with a frictional bond using epoxy resin before the covering is applied.

The crack areas should be cleaned with an industrial vacuum cleaner before pouring. A preceding widening of the crack on the surface particularly with thin cracks helps the resin to penetrate the crack. Depending on the width of the crack, the following is recommended for pouring:

- Hairline cracks up to 0.2 mm
  Pouring with a thin-bodied injection resin, e.g. Knauf FE-Imprägnierung

Filling cracks with epoxy resin

Application of Knauf Estrichgrund

- Cracks 0.2–1.0 mm
  Pouring with epoxy resin (Knauf FE-Imprägnierung); depending on the crack width addition of material such as ground anhydrite or gypsum and filling of the crack with this mix.
- Cracks 1.0–5.0 mm
  Similar to option 2; dilute depending on the crack width as 1:2 possible (ratio of resin: added material).

Resin and screed should have a temperature of approx. 20 °C (room air temperature). Pouring should continue with all cracks until the cracks are filled (filling can no longer be determined). Excessive overflowing epoxy resin should be removed with a spatula and the resin surface should have dry sand or similar applied (as a result the adhesion for the surface covering should be improved in the repaired area). With heated screed constructions, the dry heated screed should be subsequently briefly heated up again to the maximum flow temperature (max. 55 °C). If no new cracks become evident, the heating floor screed is technically free of defects and is ready for covering.

Additional nailing of the crack transverse to the crack by applied dowels is also possible, but not necessary. Knauf FE-Imprägnierung is not aggressive when it comes in contact with insulation materials and heating tube materials.

Priming

The screed must be primed before covering work is performed. Suitable primers must be applied that suit the adhesive and covering material systems in use. Knauf Estrichgrund (acrylic dispersion), should be applied once (diluted 1:1 with water) or twice depending on the level of absorbency, or alternatively Knauf Schnellgrund (undiluted) e.g. an ideal primer for resin-modified Knauf thin-bed mortars (tiles, natural stone slabs) or floor covering adhesives (carpets, PVC coverings). The primer is used to improve the bond between the screed and adhesive or filler. It regulates the absorbency of the substrate and prevents suction related problems with filler materials and adhesive.

Knauf Estrichgrund (screed primer) or Knauf Schnellgrund should be poured in portions onto the screed and then evenly distributed with a floor coater, painter's brush, prime brush or roller and worked into the screed surface. Avoid ponding (danger of film formation). Any possible necessary 2nd primer coat with Knauf Estrichgrund should only be applied after the first screed layer has dried.

Filling of the screed with Knauf Nivellierspachtel 415

Machine application of Knauf Nivellierspachtel 415

Application of covering

Surface preparation

Filling

For levelling of Knauf flowing screed, e.g. as a primer for PVC coverings or for levelling passages, Knauf Nivellierspachtel 415 made on a gypsum basis should be preferred (low-stress hardening and advantageous thermal expansion properties (heating screed). The flowing screed should be dry before filler is applied. The max. filler thickness is 15 mm. With larger filler thicknesses up to 25 mm, the levelling mortar must be made lean by adding washed, coarse sand (2 parts Nivellierspachtel 415 : 1 part sand). The lean levelling mortar has reduced flow properties.

Knauf Nivellierestrich 425 is the ideal levelling mortar for thickness's of 10–35 mm (see page 114ff.). Applied Knauf Nivellierspachtel 415 generally does not require a primer before a covering is applied. Should filler be applied twice, as in exceptional cases, a primer will be required before the 2nd filler layer. Should the applied and set filler material exhibit cracks giving the appearance of a map or even small holes, this is a sign of the lack of or insufficient primer. The structural strength of the filler material as well as the adhesion to the screed can suffer as a result.

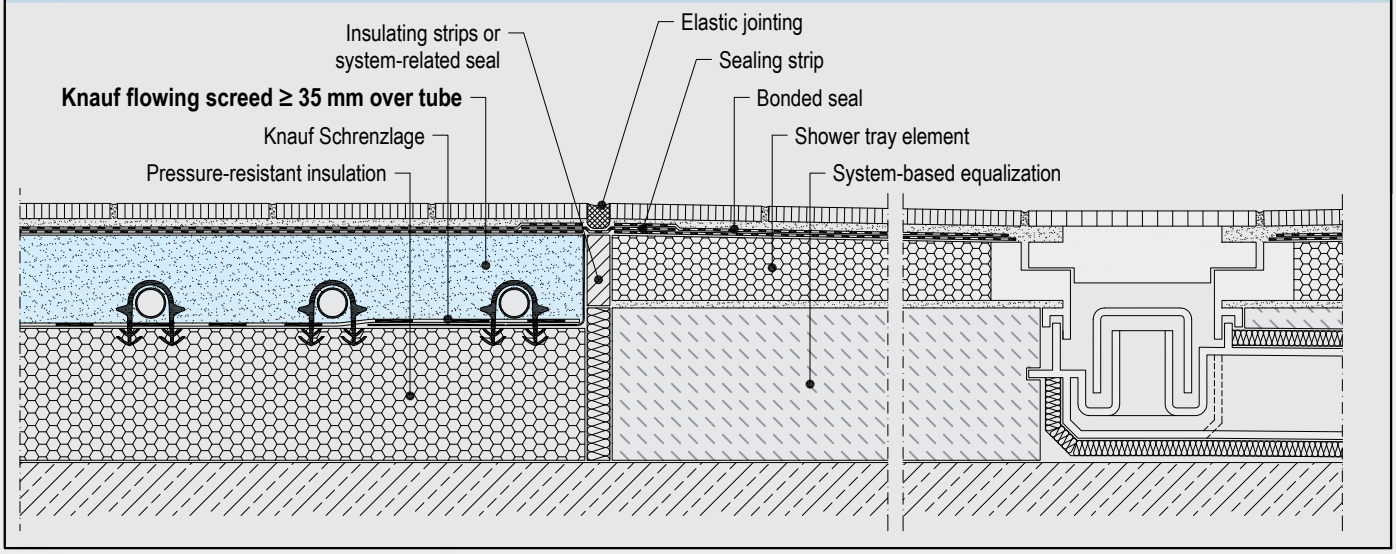
Coating

Two component epoxy resin coatings have proven to be useful on Knauf flowing screeds. The screed surface should first of all be ground with a suitable milling disc (16 grain). Do not shot blast. The milling dust is subsequently removed, the surface vacuumed with an industrial vacuum cleaner and a low-viscosity epoxy resin primer suitable for the following layer applied.

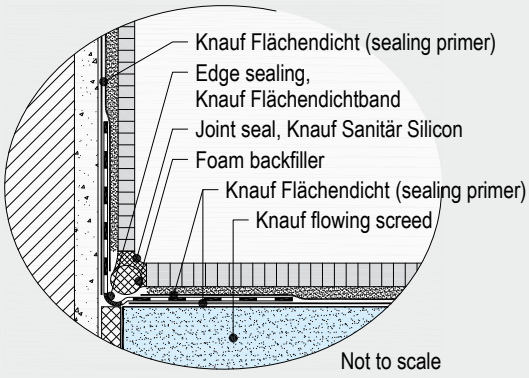
The residual moisture of the screed should also be ≤ 0.5 % with coatings open to vapour, or ≤ 0.3 % with heating floor screed.

Details, scale 1:5 - Example

F233.de-V4 Floor connection of shower tray with Knauf flowing screed



F231.de-V11 Flowing screed in residential areas subject to moisture



Application of covering

Sealing in wet areas

Knauf flowing screeds can also be used in domestic bathrooms and kitchens. If water is expected on the floor, it is recommended that screed and insulation layers are protected by suitable sealing against moisture from above (also refer to the Code of Practice from the IGE/IWM "Flowing calcium sulphate screeds in areas of high humidity").

Sealing options

There are two suggested options for sealing:

- An approx. 2 mm layer of Knauf Flex-Dicht is applied to the primed screed. The connection to the wall is sealed with Knauf Flächendichtband, which is embedded on the screed and on the wall in Flex-Dicht.
- The screed is coated three times with Knauf Flächendicht using a brush or plastic roller. The layers should be applied crosswise. The Knauf Flächendichtband is applied to the fresh second layer and the third coat is applied after drying. The drying time between coats is at least 4 hours (reference value) and is dependent on the ambient climatic conditions.

The application of tiles is undertaken after these preliminary steps using a thin bed method with hydraulic setting thin bed mortars acc. to DIN EN 12004 or alternatively with Knauf Flexkleber Multi (see page 97)

Please note: Dispersion tile adhesives are not recommended for applying tiles on Knauf Flächendicht and Knauf Flex-Dicht (very long setting and hardening duration)!

Wet rooms and areas

Flowing screed is not suitable for wet areas where slopes and drains are intended, (e.g. commercial kitchens, communal showers, swimming pools). Knauf flowing screeds may not be exposed to permanent moisture penetration. A temporary penetration of moisture, e.g. from water damage, does not damage the screed if it is allowed to dry unhindered afterwards.

Application recommendation on Knauf flowing screeds, Nivellierestrich 425 and Dünnestrich 325

Covering	Pre-treatment	Consumption per m²	Adhesive	Approx. consumption per m²
Floor tiles in thin and medium bed	Acrylate dispersion primer e.g. Knauf Estrichgrund (1:1 with water) or Knauf Schnellgrund (undiluted)	0.1 kg	Resin-modified application mortar e.g. Knauf Flexkleber Multi	Dependent on the tile format and trowel notch size, see page 97
Floor tiles on heating floor screed	Acrylate dispersion primer e.g. Knauf Estrichgrund (1:1 with water) or Knauf Schnellgrund (undiluted)	0.1 kg	Resin-modified application mortar e.g. Knauf Flexkleber Multi	Dependent on the tile format and trowel notch size, see page 97
Non-translucent natural stone slabs	Acrylate dispersion primer e.g. Knauf Estrichgrund (1:1 with water) or Knauf Schnellgrund (undiluted)	0.1 kg	Application mortar with optimized water retention, e.g. Knauf Flexkleber Multi	Dependent on the tile format and trowel notch size, see page 97
Carpet	Acrylate dispersion primer e.g. Knauf Estrichgrund or Knauf Schnellgrund	0.1 kg	Resin dispersion adhesive	0.3 kg
PVC coverings	Acrylate dispersion primer e.g. Knauf Estrichgrund or Knauf Schnellgrund Knauf Nivellierspachtel 415 or Knauf Fließspachtel 315	0.1 kg 1.6 kg per mm layer thickness	Resin dispersion adhesive	0.3 kg
Linoleum Cork covering Wood parquet	see PVC coverings see PVC coverings System specific adhesive primer	see PVC coverings	Linoleum adhesive Cork adhesive Resin-based of dispersion adhesive	0.3 kg
Floor screed (without covering)	With limited loading: Apply Knauf Estrichgrund 2x or Knauf Schnellgrund 1x. Otherwise impregnation, sealing or coating must be undertaken after use.	0.2 kg		

Application of covering

Application

► Good to know

The overhang of the edge insulation strips must be cut off once the covering work has been completed. This is intended to avoid that the filler, adhesive or joint mortar from the covering work does not create a sound bridge between the screed and wall.

Knauf flowing screeds can be covered with all common coverings: carpets, PVC linoleum, tiles, parquet, laminate, coatings. Joints in the screed should generally be implemented in the covering.

Floor tiles, natural stone slabs

Tiles are laid using the thin bed method on Knauf flowing screed. Suitable adhesives are hydraulic setting thin bed mortars acc. to DIN EN 12004 or alternatively Knauf Flexkleber Multi. In general, it is important to ensure that a sufficient bed thickness is available. Recommended values for the trowel to be used can be found in the table.
With natural stone slabs, differences in the slab thickness must be compensated for in the mortar bed. This is undertaken with the medium bed method, e.g. with Knauf Flexkleber Multi. For translucent tiles or tiles subject to discolouration, white adhesive mortar with a high water retention capacity (e.g. Knauf Marmor- und Natursteinkleber) must be used.
When applied with the thick bed method, the screed surface must be sealed with synthetic resin (e.g. 2 coats of epoxy resin with sand applied) or a separating layer should be provided between the screed and mortar bed.

Carpet, PVC, linoleum

Suitable adhesives must be used with carpets (needle felt, foam backed, etc.), PVC and linoleum coverings. Subsequent application of a filler on the primed screed with thin coverings (e.g. PVC) is standard practice.

Application of large tiles and slabs

Large format tiles and boards can be applied on Knauf flowing screeds. Joints relieve stresses in bonded tile - screed systems. This is why special measures may be necessary on larger surfaces with a lower share of joints. The application of cross joints is recommended on heated screeds in accordance with the German ZDB Code of Practice (Ceramic tiles and boards, natural stone work and artificial stonework on heated cementitiious floor constructions). Should it not be desirable to forego the offset application or if the edge lengths exceed 60 cm, special adhesive systems and decoupled intermediate layers must be used after consultation with the adhesive manufacturer or apply Knauf Flexkleber Multi on heating floor screed. This may also be the case for other surfaces with higher temperature loads,

Notch depths of trowel in dependence on the tile edge length.

Tile edge length	Notch depth
Up to 50 mm	3 mm
From 50 to 108 mm	4 mm
From 108 to 200 mm	6 mm
More than 200 mm	8 mm

e.g. areas subjected to direct sunshine.
If leaktight, non-absorbent tiles (e.g. stoneware) are applied to large areas, the adhesive properties of normal adhesive systems to the substrate may be affected due to the long exposure to moisture. This can be avoided by the application of a sealing preliminary coating (2 layer epoxy resin with sanding) or by using Knauf Flexkleber Multi.

Parquet
All common parquet types can generally by applied on Knauf flowing screeds. The adhesives generally used are 1 or 2 component polyurethane adhesives (PUR), silane-terminated adhesives or powder adhesives. A precoating adapted to the adhesive is to be used. For application, the parquet must exhibit the moisture content prescribed for the corresponding type of wood.
Joints can occur in the parquet, that can widen on the heating floor screeds, particularly during heating periods. They must be acceptable in their appearance. Joints up to 1 mm in width are not considered as a defect.
Special adhesives are used with wood blocks due to the large swelling value. To keep the swelling pressure low, ensure that there are no large deviations in the humidity levels with wooden blocks, for example, during the building phase. This applies in particular to wood blocks with low layer thickness's, as the change in humidity occurs quickly over the entire cross-section.

Notes for heating floor screed
An elasticized adhesive should be used for the application of rigid coverings (tiles) on heating floor screed, e.g. Knauf Flexkleber Multi. The elasticized adhesive bed should prevent stresses resulting from the different thermal rates of expansion of screed and covering, and thus avoid detachment of the screed and covering and formation of cracks in the tiles and screed.

Knauf floor systems for special applications

Product overview and technical data

NEW

Knauf Flexkleber Multi is a cement-based, synthetically-enhanced, flexible and quick-setting thin-bed, middle-bed and pourable bed adhesive. It is used in interiors on common mineral substrates, such as concrete, cement, calcium sulphate and calcium sulphate flowing screeds, gypsum and gypsum fibre boards, waterproofing, old tile coverings, cement fibreboard, etc.
Knauf Flexkleber Multi is suitable for laying uncalibrated and large format floor tiles as well as with non-absorbent tiles and/or substrates. It can be used for laying, e.g. ceramic floor coverings, stoneware, cotta, non-translucent natural stone. Knauf Flexkleber Multi is not used for walls.

Material consumption/Consumption with max. water added		
Tile format in cm	Notch depth in mm	Consumption in kg/m²
< 20	min. 6	Approx. 2.5
20–30	8	Approx. 3.2
30–40	10	Approx. 3.9
40–50	12	Approx. 4.6
50–60	15	Approx. 5.7
> 60 max.	15/20	Approx. 7.5

Technical data

Dry layer thickness 2 to 10 mm
Storage
Dry up to 12 months
Application and substrate temperature
+5 °C to +25 °C
Bulk density (dry) approx. 1.5 kg/l
Maturing time 5 minutes
Open times (approx. 45 minutes*)
- Working time approx. 20–25 min*
- Correction time approx. 15–20 min*

Walkable after approx. 3 h*
Available after ≥ 3 days*
(on pre-fab screeds and covering edge lengths ≥ 400 mm)
Available after approx. 3 hours*
(on all other substrates, on pre-fab screeds and covering edge lengths < 400 mm)
Full loading after approx. 4 days*

Mixing ratio (25 kg powder)
Thin and medium bed 5.0–7.0 l water
Flow bed 7.5–8-0 l water
For "S 2" ** 5.0 l Elast** + 2.75 l water
(Adhesive & floor-Elast*** plus water)

* *At +23 °C room temperature and 50 % relative humidity*
** *Deformability ≥ 5 mm acc. to DIN EN 12004*
***see at:
www.knauf-bauprodukte.de

Knauf Flexkleber Multi

Fast, flexible, fast thin-bed, middle-bed and pourable bed adhesive for floor applications.

Mixing

Use a clean mixing bucket. Mix Knauf Flexkleber Multi in cold and clean water with an agitator at low speed (max. 600 RPM), until a lump-free, uniform, paste-like or flowing consistency has been achieved.
When required, the consistency of the adhesive can be regulated by adding water or powder. Allow the mix to mature for 5 minutes and then mix again. Only mix as much material as you can use in approx. 45 minutes. Clean the tools with clear water.

Application

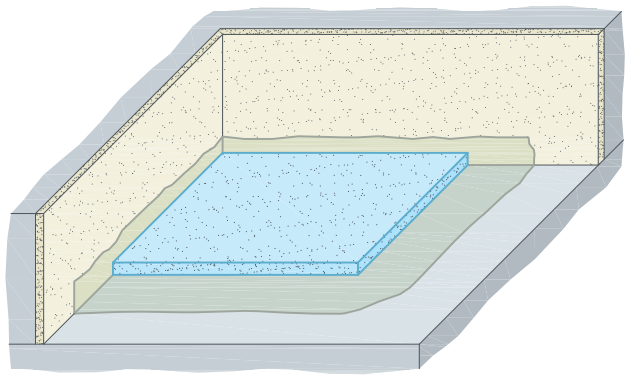
Apply the mixed Knauf Flexkleber Multi with a spatula or finishing trowel to the entire surface (contact layer). Spread the mortar in the required layer thickness using a middle bed trowel or notched trowel. The size of the notched trowel required to achieve the best fully embedded application depends on the levelness of the existing substrate, the profile on the back of the tile and the dimensional format of the tile. Push the tile with a light twisting motion into the adhesive bed and press it in.
A thin contact adhesive layer must be applied to the rear of the tile or slab to ensure optimum bonding when laying natural stone and tiles exceeding 0.25 m². On floors subject to high wear, the adhesive must be set to flow to ensure the greatest cavity-free application – or alternatively, the stiffer adhesive setting (more viscous) is applied in the buttering-floating method (with notching on both the substrate as well as on the rear of the tile). Remove spatters of adhesive immediately with a damp sponge. Should a skin form (finger test), remove the adhesive and apply fresh adhesive. Allow the adhesive to dry fully before grouting.

Application temperature/climate

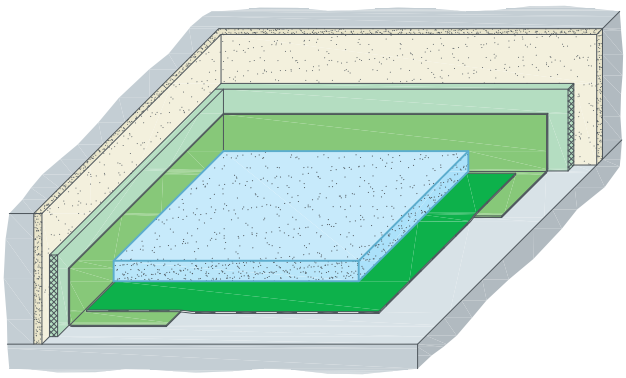
Do not apply at room or substrate temperatures below approx. +5°C. Protect fresh adhesive from sunlight and draughts.
Low temperatures delay setting, higher temperatures speed it up (take the temperature of the mixing water into account).

► *Product Data Sheet K512m.de*

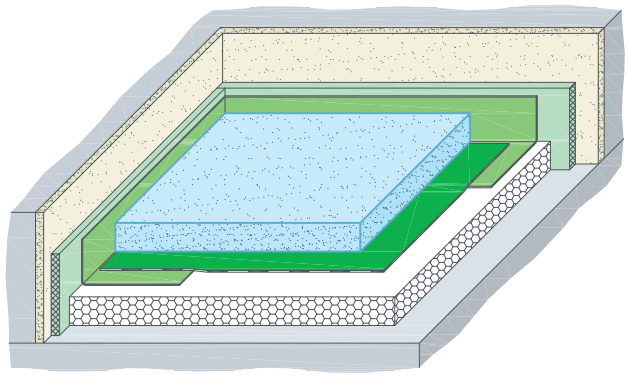
Knauf Stretto as a bonded screed



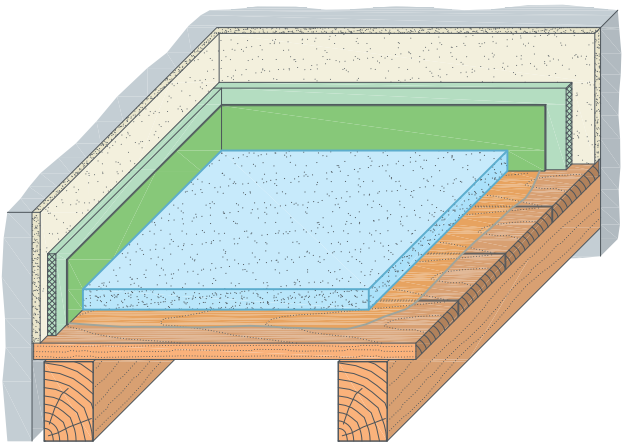
Knauf Stretto on a separating layer



Knauf Stretto as a floating screed



Knauf Stretto on floorboards



Knauf Stretto

Machine applicable rapid screed on a two-component epoxy resin basis SR-B2.0-C25-F7

Knauf Stretto is a fast setting screed mortar that can be covered just 24 hours after application.
It is a special mortar intended for repairs, remodelling and for construction sites with tight deadlines in new construction projects and old buildings. Knauf Stretto consists of the components Knauf FE-Imprägnierung (2 component epoxy resin, see page 50) and Knauf Stretto sand (special sand), which are mixed on site.
Knauf Stretto is used in interior applications. No water is required for the setting process. As a result, drying times are not a concern.
Knauf Stretto can be walked on and is ready for a covering after just 24 hours. It can be applied without joints.
Quality properties to DIN EN 13813:
SR-B2.0-C25-F7

Floor constructions with Knauf Stretto

- Bonded screed ≥ 15 mm
- Screed on a separating layer ≥ 25 mm
- Screed on a thermal insulation layer ≥ 35 mm
- Screed on an impact noise layer
  Compressibility
  - c up to 1 mm ≥ 40 mm
  - c 1 to 3 mm ≥ 50 mm

When used as an impact noise layer, the nominal screed thickness is dependent on the compressibility of the insulation layer.
Knauf Stretto is not suitable for underfloor heating.

Knauf Stretto can be applied directly on wood joist ceilings in a layer thickness of 25 mm. Accordingly, a screed configuration with a low thickness and low weight is possible.
When used as a bonded screed, Knauf FE-Imprägnierung is used as a bonding primer. Knauf Stretto is then applied on the freshly applied Knauf FE-Imprägnierung and worked (wet on wet).

Overview of the necessary steps for screed constructions in dependence on the substrate

Application	Substrate				
	Concrete	Old screed	Wooden **floorboards**	Tiles or natural stone	Mixed substrates
Bonded screed					
Preparation	Clean the substrate, remove crumbling layers (brushing / shot-blasting / milling)	Clean the substrate, remove crumbling layers	Clean the substrate, identify loose floorboards	Clean the substrate, remove loose parts	Clean the substrate, remove loose parts
Substrate pre-treatment	1x FE-Imprägnierung wet on wet	1x FE-Imprägnierung wet on wet	Seal joints (Knauf Acrylic), Spezialhaftgrund (diluted 1:1 with water)	1x FE-Imprägnierung wet on wet	1x FE-Imprägnierung wet on wet
Sealing (if required)	Knauf FE-Abdichtung (sealing shield)	Knauf FE-Abdichtung (sealing shield)	-	Knauf FE-Abdichtung (sealing shield)	Knauf FE-Abdichtung (sealing shield)
Stretto	≥ 15 mm	≥ 15 mm	≥ 25 mm	≥ 15 mm	≥ 15 mm
Screed on a separating layer					
Preparation	Clean the substrate	Clean the substrate	Clean the substrate	Clean the substrate	Clean the substrate
Equalization layer (if required)	Estrichgrund screed primer (diluted 1:1 with water), or Knauf Schnellgrund (undiluted), Fließspachtel 315 / Dünnestrich 325	Estrichgrund screed primer (diluted 1:1 with water), or Knauf Schnellgrund (undiluted), Fließspachtel 315 / Dünnestrich 325	-	Estrichgrund screed primer (diluted 1:1 with water), or Knauf Schnellgrund (undiluted), Fließspachtel 315 / Dünnestrich 325	Estrichgrund screed primer (diluted 1:1 with water), or Knauf Schnellgrund (undiluted), Fließspachtel 315 / Dünnestrich 325
Sealing (if required)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	-	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)
Separating layer	Schrenzlage	Schrenzlage	Schrenzlage	Schrenzlage	Schrenzlage
Stretto	≥ 25 mm	≥ 25 mm	≥ 25 mm	≥ 25 mm	≥ 25 mm
Screed on an insulating layer					
Preparation	Clean the substrate	Clean the substrate	Clean the substrate	Clean the substrate	Clean the substrate
Sealing (if required)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	-	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)	Knauf Abdichtungsbahn Katja Sprint (sealing membrane)
Equalization layer (if required)	Schubo or EPO-Leicht or Trockenschüttung PA + cover board	-	EPO-Leicht or Trockenschüttung PA + cover board	-	-
Insulation layer	if required	if required	if required	if required	if required
Insulation layer covering	Schrenzlage	Schrenzlage	Schrenzlage	Schrenzlage	Schrenzlage
Stretto	≥ 40 mm	≥ 40 mm	≥ 40 mm	≥ 40 mm	≥ 40 mm

► *Product Data Sheet F331.de*

Mixing of the epoxy resin with a mixer

Application with a compressed air conveyor

Ideal for quick repairs:
Knauf Stretto ready to cover after just one day

Easy to level and smoothen

► Please note

Only persons that are familiar with chemically setting substances are allowed to apply these products. Ventilate rooms properly (preferably lateral ventilation). Wear protective goggles (e.g. during mixing), suitable gloves and working clothes to prevent contact with skin. (For further information see page 50, Knauf FE-Imprägnierung)

Knauf Stretto

Application

Application

Knauf Stretto can be prepared and/or delivered with a compressed air conveyor (e.g. Estrich-Boy, Estromat, Mixokret), with batch mixer or agitator and tub.

The mixing ratio of Knauf FE-Imprägnierung with Knauf Stretto-Sand is 1:25 (by weight).

When creating a mix using an agitator, 25 kg of Knauf Stretto Sand are mixed with 1 kg of Knauf FE-Imprägnierung. Then the mix is transferred to a second tub and mixed again.

With extended stand times, the tools must be cleaned with dry sand. After completion of work, clean the tools with sand and water.

Refer to Product Data Sheet F331.de for processing with a compressed air conveyor.

The mortar temperature must be at least 10 °C and may not exceed 25 °C. It is important to consider that the mortar temperature may not be at air temperature depending on the storage conditions of the components (direct sunshine, storage in a cellar).

Application of covering

A CM measurement test to establish the readiness for covering application is unnecessary as Knauf Stretto does not contain moisture. Priming the screed surface is generally unnecessary.

Filling

(Filling is necessary with dispersion adhesives). Cementitious filler (Knauf Fließspachtel 315) with a layer thickness of at least 2 mm is applied on dust-free, clean Stretto.

Technical data

Density approx. 1800 kg/m³

Reaction to fire DIN EN 13501-1 E

Strengths (after 7 days, at 20 °C)

- Compressive strength ≥ 25 N/mm²
- Flexural strength ≥ 7 N/mm²
- Early strength (at 20°C) 40 % after 24 h

Yield

The yield from 25 kg of Knauf Stretto sand and 1 kg of FE-Imprägnierung is approx 14 l of mortar

Material consumption per cm layer thickness

approx. 17 kg/m² Knauf Stretto sand and approx. 0.7 kg/m² FE-Imprägnierung

Application time

Mortar temperature

10 °C	approx. 2 h
20 °C	approx. 1 h
25 °C	approx. 45 min

Walkable after approx. 24 h

Ready for covering with mortar / ambient temperature

- ≥ 20 °C approx. 24 h
- 10 °C approx. 48 h

Full loading after approx. 3 days

Storage

Stretto-Sand	unlimited
FE-Imprägnierung	24 months

Knauf Stretto-Reparaturset

The Knauf Stretto-Reparaturset (repair set) is the quickest solution for smaller corrections or repairs on screeds or other substrates:

- for filling holes
- for levelling unevenness
- for other corrections to floors after alterations.

The Knauf Stretto-Reparaturset offers all the benefits of Knauf Stretto. It sets quickly, does not require a drying time and is versatile.

The Knauf Stretto-Reparaturset (repair set) contains approx. 16 kg of special sand as well as a 1 kg tin of Knauf FE-Imprägnierung.

The two components of the Knauf FE-Imprägnierung are mixed thoroughly with one another. The cleaned and improved surfaces in the substrate are coated with Knauf FE-Imprägnierung using a brush. The mixed Knauf FE-Imprägnierung is added to the sand and the whole mixture is mixed together using a mechanical agitator. Before the addition of the Knauf FE-Imprägnierung about a hand full of the special sand is put aside. This is scattered on the surface of the corrected/repaired area. The repaired area can be covered after 24 hours.

Textiles and thick coverings

Knauf Stretto is applied with a spatula and adhesive is applied in the usual way. Should the surface evenness be sufficient, direct bonding with a solvent-free and water-free 2-component adhesive is possible.

Tile application

Tiles are applied on dust-free, clean Knauf Stretto with cementitious, elasticised tile adhesive (C2 in acc. to DIN EN 12004 and S1 in acc. to DIN EN 12002, e.g. Knauf Flexkleber Multi).

Parquet

Bonding of parquet with adhesive may only be undertaken 3 days after Knauf Stretto has been applied. Preparation such as the application of filler can be implemented beforehand.

Primers or adhesives containing a solvent should not be used.

Areas of high humidity

In areas of high humidity, Knauf Flächendicht can be applied as the top-side seal. In the process, the first (undiluted) application is applied with a spatula on the dust-free, clean Stretto.

Apply Knauf Flächendichtband and push it in firmly in the areas along the wall and in the corners. After the first layer is fully dry, the second and third layers can be applied with a brush or roller.

► *Product Data Sheet F331.de*

Knauf Schnellestrich CT is a conventional, fast-setting cementitious screed that is ready to be trafficked after approx. 24 hours as an unheated construction at a layer thickness of 40 mm. It is a factory-mixed dry mortar made of special cement for remodelling and for construction sites with tight deadlines in new construction projects and old buildings. Knauf Schnellestrich CT is used in small interior areas and is also suitable for use in wet areas.
Knauf Schnellestrich CT features a high early strength and can be trafficked after approx. 3 hours.
Quality classification acc. to DIN EN 13813: CT-C30-F5
Floor constructions with Knauf Schnellestrich CT

- Bonded screed 25 mm
- Screed on a separating layer 35 mm
- Screed on a thermal insulation layer 40 mm

Technical data					
Storage (dry)	up to 9 months	Material consumption		Drying	
Density		per cm layer thickness	approx. 20 kg/m²	Layer thickness of 40 mm after approx. 1 day (24 h) ready to cover	
■ dry	approx. 1.8 kg/l	Yield		Ready for covering	
■ wet	approx. 1.9 kg/l	from 100 kg of dry mortar	approx. 54 l mortar	with residual moisture (check with CM device)	
Bulk density	approx. 1.8 kg/l	Application time		for all coverings	< 2.5 % by weight
Reaction to fire DIN EN 13501-1	A1 non-combustible	at 20 °C	approx. 50 min		
Strengths		Application temperature	+10 °C to +25 °C		
(after 7 days, at 20 °C)		Walkable	after approx. 3 h		
■ Compressive strength	≥ 30 N/mm²	Full loading	after approx. 7 days		
■ Flexural strength	≥ 5 N/mm²				

► Note

Protect Knauf Schnellestrich CT after application against drying too quickly. It must be covered as soo as it is ready for coverage. If it is not possible to cover it with this time, seal the Schnellestrich CT with Knauf FE-Imprägnierung. If the above mentioned instructions are not observed, deformations may occur e.g. for after-treatment of screed surfaces see the BEB Code of Practice "Hinweise für den Auftraggeber für die Zeit nach der Verlegung von Zementestrichen auf Trenn- und/oder Dämmschichten" (German only).

Knauf Schnellestrich CT

Quick-setting, early coverage ready cementitious screed CT-C30-F5

Substrate pre-treatment bonded screed

Absorbent substrates such as cementitious screeds and bare concrete must be primed with diluted Knauf Estrichgrund (1 part Estrichgrund : 1 part water) or Knauf Schnellgrund (undiluted) and may need to be primed with two coats on highly absorbent substrates. Non-absorbent substrates: Suitable special primer (e.g. Knauf Spezialhaftgrund or Knauf FE Imprägnierung).

Application

The prepared surfaces may only be so large that they can be completed within the application time. With any work stoppages, immediately clean the mixers, pumps and hoses.

Mixing

By machine: With machine application, common compressed air conveyors are used.
By hand: Use clean mixing buckets, mix 1 bag (25 kg) of Knauf Schnellestrich CT in approx. 1.8 to 2.0 l of clear, cold water using an agitator or batch mixer, until a lump-free uniform consistency is achieved.

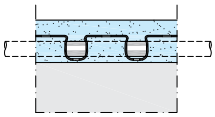
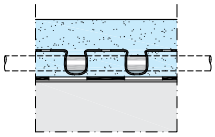
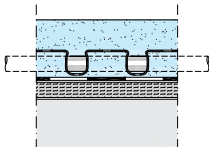
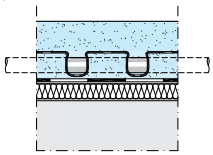
Application temperature/climate

Do not apply at room or substrate temperatures below approx. +10°C. Protect freshly applied screed from direct exposure to sunlight, draughts, frost as well as driving rain. Low temperatures slow the hardening time while high temperatures speed up the hardening process (take temperature of the mixing water into account as well).

Movement joints

Structural joints must be implemented with the same position and across the full width in the screed. Further joints may be necessary depending on the bay size and floorplan shape. It has proven effective to provide joints in doorways, on surfaces exceeding 5 m in length, in protruding areas and narrow spaces.

► *Product Data Sheet F468.de*

System	Impact sound reduction		Construction weight	Construction thickness					
	Calculation value $\Delta L_{w,R}$ dB	Test value $\Delta L_{w,P}$ dB	kg/m²	Total mm	Insulation layer mm	Levelling material above foil element mm A	B[1]	C	Floor heating element depending on the system manufacturer mm
F215.de - Bonded 	–	–	≥ 28	≥ 16	–	4	–	–	from 12[2]
			≥ 36	≥ 20		–	≥ 8	–	
			≥ 40	≥ 20		–	–	≥ 8	
F225.de - On a separating layer 	–	–	64	≥ 32	–	–	–	≥ 20	from 12[2]
F235.de - On an insulating layer (wood fibre insulation board WF) 	18	20	64-66	≥ 42	10	–	–	≥ 20	from 12[2]
			64-68	≥ 52	20	–	–	≥ 20	from 12[2]
F235.de - On an insulating layer (mineral wool impact noise insulating layer)  NEW	26	28	74–76	≥ 49	12	–	–	≥ 25	from 12[2]

A = Alphadur 430 / B = Dünnestrich 325 / C = Nivellierestrich 425

[1] *Not on wooden substrates* [2] *Uponor minitec*

► Good to know

Thin-layer Heating Floor Screed with Nivellierestrich 425 can be applied as a

- Bonded screed
- Screed on a separating layer
- Screed on an insulating layer

Dünnschichtiger Heizestrich (Thin-layer heating screed)

With Knauf levelling compound

An existing, stable screed or a basic floor can be modified with little effort with Knauf levelling compounds and a thin-layer energy-efficient underfloor heating.

Areas of application include, e.g. residential buildings, office buildings and doctors practices up to a load of 3 kN/m² area load and 2 kN point load.

Exception:

On mineral wool impact sound insulation layer only a load of up to 2 kN/m² area load and 1 kN point load is permissible.

In the residential building area (including domestic bathrooms), systems are applied with gypsum-based levelling materials Alphadur 430 or Nivellierestrich 425.

The system is applied with cementitious screed Knauf Dünnestrich 325 in wet areas such as those used in the renovation of swimming pools.

In the table above, you will find possible constructional solutions as well as the technical data relating to construction heights, sound insulation as well as their weights.

Overview of the necessary steps for screed constructions in dependence on the substrate

Application	Substrate				
	Concrete	Old screed	Wooden **floorboards**	Tiles or natural stone	Mixed substrates
Thin-layer heating screed bonded					
Preparation	Clean the substrate, remove crumbling layers (brushing, shot-blasting or milling)	Clean the substrate, remove crumbling layers	Clean the substrate, identify loose floorboards	Clean the substrate, remove loose parts	Clean the substrate, remove loose parts
Substrate pre-treatment	2x Estrichgrund (diluted 1:1 with water) or Knauf Schnellgrund (undiluted)	2x Estrichgrund (diluted 1:1 with water) or Knauf Schnellgrund (undiluted) or 2x FE-Imprägnierung interspersed with silica sand	Seal joints (Knauf Acrylic), Spezialhaftgrund (diluted 1:1 with water), ≥ 2 mm Faserflex 15, 2x Estrichgrund (diluted 1:1 with water) or Knauf Schnellgrund (undiluted)	2x FE-Imprägnierung interspersed with silica sand	2x FE-Imprägnierung interspersed with silica sand
Underfloor heating	Fixing panel system-dependent	Fixing panel system-dependent	Fixing panel system-dependent	Fixing panel system-dependent	Fixing panel system-dependent
Alphadur 430 Dünnestrich 325 Nivellierestrich 425 Thickness above heating system	≥ 4 mm ≥ 8 mm ≥ 8 mm	≥ 4 mm ≥ 8 mm ≥ 8 mm	≥ 4 mm ≥ 8 mm ≥ 8 mm	≥ 4 mm ≥ 8 mm ≥ 8 mm	≥ 4 mm ≥ 8 mm ≥ 8 mm
Thin-layer heating screed on a separating layer / insulating layer with Nivellierestrich 425					
Preparation	Clean the substrate				
Sealing (if required)	Abdichtungsbahn Katja Sprint	Abdichtungsbahn Katja Sprint		Abdichtungsbahn Katja Sprint	Abdichtungsbahn Katja Sprint
Equalization layer (if required)	Schubo or EPO-Leicht or Knauf levelling compounds		EPO-Leicht or Faserflex		
Insulation layer (if required)	■ Wooden fibreboard WF ▪ 10 to 20 mm (density ≥ 200 kg/m³) ■ EPS DEO ▪ up to 20 mm (100 kPa) ▪ up to 30 mm (150 kPa) ▪ up to 40 mm (200 kPa) ■ Mineralwolle Trittschall Dämmplatte TP-GP 12-1				
Insulation layer covering	Knauf Schrenzlage	Knauf Schrenzlage	Knauf Schrenzlage	Knauf Schrenzlage	Knauf Schrenzlage
Underfloor heating	Fixing panel system-dependent	Fixing panel system-dependent	Fixing panel system-dependent	Fixing panel system-dependent	Fixing panel system-dependent
Thickness above heating system on separating layer, wooden fibreboard WF and EPS DEO	≥ 20 mm	≥ 20 mm	≥ 20 mm	≥ 20 mm	≥ 20 mm
Thickness above heating system on mineral wool	≥ 25 mm	≥ 25 mm	≥ 25 mm	≥ 25 mm	≥ 25 mm

► *System Data Sheet FE22.de*

Dünnschichtiger Heizestrich (Thin-layer heating screed)

With Knauf levelling compound

Bonded application

The substrate must be stable and crack-free and exhibit a firm, clean surface (free of grease and cleaning agents). Apply synthetic resin to the cracks if required. The residual moisture of a cementitious screed may not exceed 2.0 CM %; a calcium sulphate screed may not 0.5 CM %.

With normally absorbent substrates:

Prime by applying a double coating of Knauf Estrichgrund (diluted 1:1 with water) or Knauf Schnellgrund (undiluted). Wait until the applied primer dries between work steps and gluing on the fixing panels (generally min. 12 hours with Knauf Estrichgrund and min. 2 hours with Knauf Schnellgrund).

With highly absorbent substrates (e. g. calcium sulphate screeds, calcium sulphate flowing screeds), with non-absorbent substrates (e.g. tiled surface) and mixed surfaces.

The substrate is primed twice with Knauf FE-Imprägnierung.

1. layer approx. 250 g/m²
2. layer approx. 100 g/m² and intersperse coarse sand (e.g. 0.5-1.2 mm) approx. 1.5 kg/m².

Required curing time between the impregnation coats and the levelling screed application is approx. 24 hours.

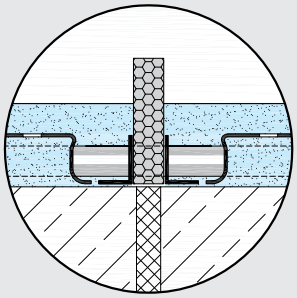
With rising damp (e.g with concrete slabs making contact with the soil), Knauf FE-Abdichtung must be applied as a sealing primer.

With 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, lacquer, care products or similar. Seal smaller joints with Knauf Acrylic*, larger joints with Knauf Reparaturspachtel* (mixed with Knauf Kleber- & Boden-Elast*). Subsequently prime the wooden substrate with Knauf Spezialhaftgrund and fill with Knauf Faserflex that is at least 2 mm thick. Prime the dried filler twice with Knauf Estrichgrund (diluted 1:1 with water) or Knauf Schnellgrund (undiluted).

Bonded construction is not possible on OSB boards.

Connect the edge insulation strips to the wall to ensure safe separation and sealing. Install underfloor heating in accordance with the manufacturers instructions. It is recommended that the underfloor heating is applied to the entire area (no cold zones).

* *Knauf Bauprodukte GmbH*



Joints

Movement joints in doorways and in long angular rooms must be provided (unfavourable room geometries) when applied as a screed on an insulating layer or on a separating layer, see Code of Practice No. 5 "Joints in flowing calcium sulphate screeds" (IGE/IWM). In so far as the thin-layer heating floor screed is bonded with an existing floating screed or screed on a separating layer, movement joints must be cut into the existing screed if required. Generally, the joints in the substrate should be implemented in the construction. The manufacturers of thin-layer underfloor heating systems offer system-relevant edge insulating strips and control joint channels.

Application on a separating layer/insulating layer

The specifications made in the previous chapters relating to separating layer and heating screed (e.g. joints) apply. Furthermore, an increased evenness (evenness acc. to DIN 18202 table 3 line 3) and a limited angular tolerance of the substrate is required so that the heating floor screed does not receive thickness tolerances above 15 mm. Otherwise the substrate must be levelled beforehand using filler material, levelling screed or a non-yielding light levelling mortar such as Knauf EPO-Leicht or Knauf Schubo.

Wooden fibre, polystyrene or mineral wool insulation can be applied under the system Knauf Nivellierestrich 425 on thin-layer underfloor heating.

Knauf Schrenzlage is applied on the insulation layer or the substrate and the underfloor heating element is glued on for this purpose.

With rising damp (e.g. with concrete slabs making contact with the soil) acc. to DIN 18195-4, use Knauf Abdichtungsbahn Katja Sprint.

Heating system

The installation of the underfloor heating is applied in accordance with the manufacturers instructions. When applying the heating tubes, the fixing panel including the Schrenzlage can lift up in the corners. When screed is applied, the fixing panel is pushed back downwards due to the weight of the screed. Underfloor heating should be applied to the entire area (no cold zones). Screed bays with several heating zones must be heated uniformly.

Application of Knauf Nivellierestrich 425

After application of the fixing panel and installation of the heating tubes (filled with water and pushed down), apply Knauf levelling compound at the required layer thickness over the fixing panel. Clean the machine and the hoses after machine standstill.

In order to ensure that the mortar can flow well into the small knobs on the fixing panel, it is recommended that the corresponding Knauf levelling compound is worked intensively during or immediately after screed application with a screed broom and subsequently levelled with a dappling bar.

Application temperature / climatic conditions

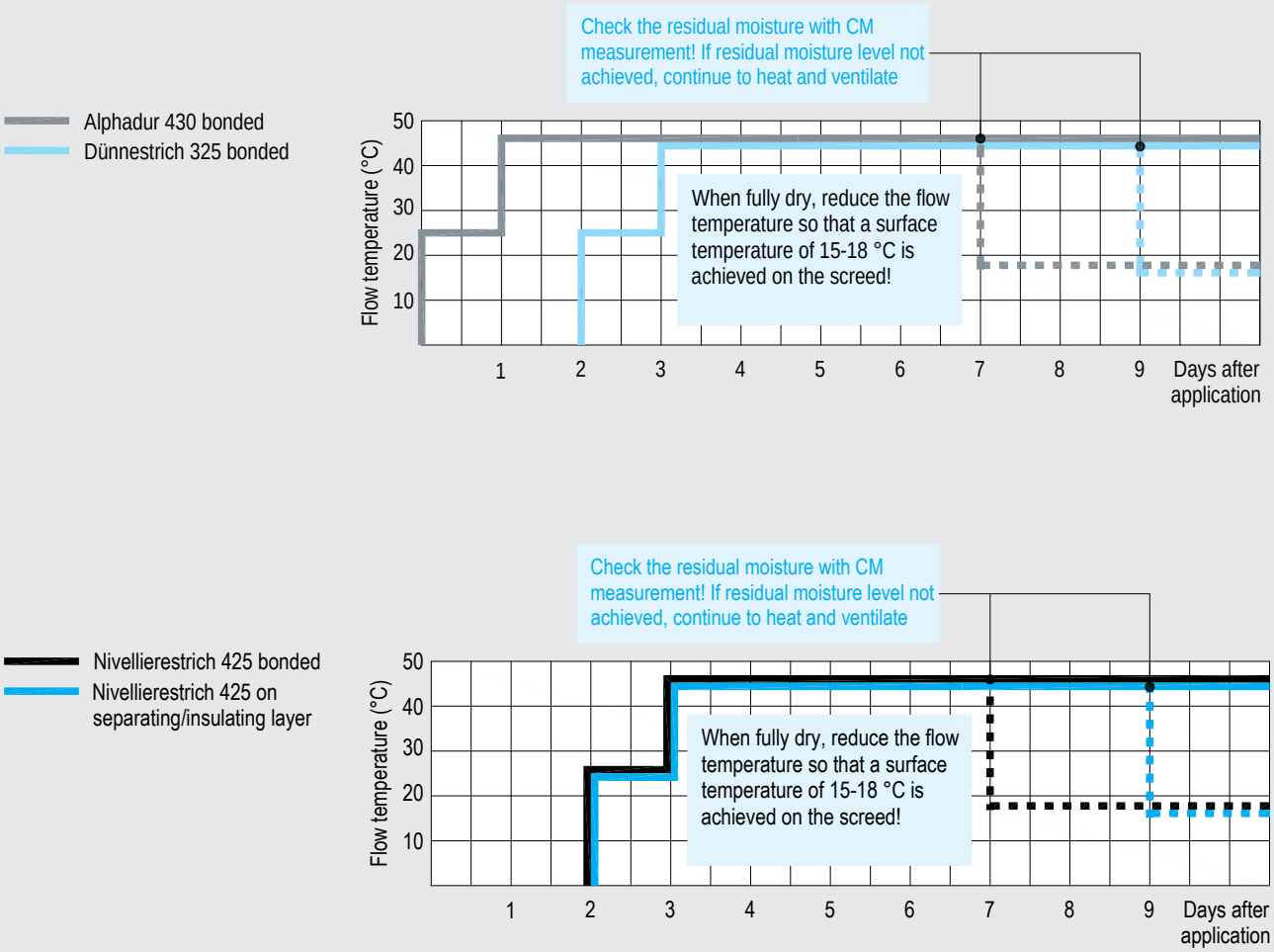
Do not apply at room or substrate temperatures below approx. +5°C (with Dünnestrich 325 below +10°C).

Protect levelling material surfaces for 24 hours agains 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 levelling material 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 at the latest after machine standstill.

► *System Data Sheet FE22.de*



Thin-layer heating screed

With Knauf Nivelliererstrich 425 (levelling screed)

Drying - coverage ready heating

Heat up the Knauf leveling material until dry before applying a cover. Heat until dry to suit the levelling material and the constructional design in accordance with the heating up diagram.

With Knauf Alphadur 430, heat up can commence as soon as it is hard enough for foot traffic. Readiness for covering is achieved with a residual moisture of 0.3 % (Knauf Alphadur 430 / Knauf Nivelliererstrich 425) or 2.0 % (Knauf Dünnestrich 325). Residual moisture must be determined with the CM device over the entire cross-section by sampling. A heating up protocol (template page 108).

Application of covering

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 of elastic covering, they can be eliminated by filling them with Knauf Nivellierspachtel 415 when a primer (Knauf Estrichgrund, diluted 1:1 with water or undiluted Knauf Schnellgrund) is applied beforehand

If Knauf levelling material is bonded to the substrate, it can be covered by all conventional coverings (tiles, natural stone, parquet, elastic and textile coverings). For constructions entailing Nivelliererstrich 425 on separating layers / insulating layers, ceramic coverings with an edge length up to 60 cm and natural stone with edge lengths up to 40 cm can be applied.

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).

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

Knauf thin-layer heating floor screed system, underfloor heating, manufactured by _____

Heating protocol for coverage ready heating

☐ Alphadur 430
☐ Nivellierestrich 425
☐ Dünnestrich 325

Every change in the flow temperature (warm water heating) or floor thermostat setting (electrical heating) during heat up and cooling must be documented exactly to 5 °C.
Every drying test should be documented.

Investor: Building site:	Heating engineer: Site manager:
Heating system: Screed applied on	Average screed thickness: mm Fixing panel coverage: min: mm max: mm

Heating (coverage ready heating):

Date	Flow temperature **in °C**	Signature

Preliminary drying test **(e.g. foil test*):**

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

** Does not replace CM measuring before covering*

Please keep this document!

Place / Date

Signature (Site manager)

Knauf – Professional renovation of floors

Product overview and technical data

Check the substrate

e.g. Bonding primer interspersed with silica sand

Renovation of old floor substrates/surface levelling

With Knauf levelling compound

Knauf levelling compounds create a bonded surface with the old sub-flooring. A bonded screed, is as the name suggests, a screed that is bonded to the supporting substrate.
Bonded screeds must therefore be fully frictionally bonded to the respective substrates. All forces that result from deformation, shrinkage processes, shear stresses due to live loads, are assumed by the overall system of substrate/screed.

Substrate

The substrate must be firm and stable, free of cracks, solid, free of vibration, dry and clean (dust-free, free of wax, oil, paint layers, release agents, etc.). With filling or equalization on surfaces with underfloor heating, the heating may not be switched on and the substrate should have normal room temperature.
Heat the heating floor screed until dry before the equalization layer is applied.
Edge and movement joints in the substrate must of course also be applied in the equalization layer.
The following remarks as well as the table on page 112 are an aid to decision-making for the determination of the necessary measures in substrate preparation with typical old sub-flooring.
Knauf levelling materials are stress-free equalization materials. They flow easily and can be easily levelled with low layer thickness's. In this way, low layer thicknesses are possible and cost-effective construction solutions can be offered.

Different products can be applied depending on the required equalization height and field of application:

Alphadur 430 (calcium sulphate)	0-30 mm
Nivellierestrich 425 (calcium sulphate)	10–35 mm
Dünnestrich 325 (cementitious)	5–30 mm
Nivellierspachtel 415 (calcium sulphate)	0–15 mm
Fließspachtel 315 (cementitious)	0–10 mm
Schnellspachtel 300 (cementitious)	0–10 mm
Faserflex (cementitious)	2–15 mm

In special cases, the use of non-flowing screed mortar Knauf Stretto may be prudent (see page 98ff.):

Stretto (epoxy resin)	≥ 15 mm

e.g. Prime with screed primer

e.g. Machine application of Knauf Nivellierestrich 425

What should be observed when preparing for application?

The following applies:

- Renovation of old substrates has an increased risk potential

This is why the assessment of the substrate is of particular importance.

In principle, the following problem definition should be clarified:

- Does the old substrate have an adequate moisture barrier?
  Possible measure: Knauf FE-Abdichtung (see page 51).
- Are existing cracks "dead" or does motion still occur (cause)?
  Possible measure: Application of synthetic resin to cracks with Knauf FE-Imprägnierung or application of movement joints.
- Does the load capacity suit the planned usage?
- How should the surface be treated to achieve an adequate bond between the levelling material and old sub-flooring?
- Is a sealed covering required? This will require a moisture barrier underneath the levelling material (see page 51).

If there is doubt concerning the suitability of the existing substrate for the creation of an adequate bond, the suitability must be examined by a test application of the covering in the application.

The substrate may no longer be absorbent when the bonding primer is applied. Check the absorbency with a water test.

The type of bonding primer to be used depends on the type of substrate and the levelling material used. The following table assists in making the right selection.

Renovation of old substrates with Knauf levelling compounds

Substrate	Existing types of application
Concrete slabs without rising damp	Concrete covers
Calcium sulphate screed without rising damp	Bonded screed, screed on a separating layer and floating screed; made of anhydrite and gypsum binder as a flowing screed or conventional screed with aggregate made of gravel, sand, sawdust, wood shavings and air-entraining agents; also known as a base for multi-level bonded screeds with sub-layer (shortened e.g. with wood shavings) and wearing layer (anhydrite pure, often coloured). Caution! Coloured wearing layers made of anhydrite binder are generally waxed, even with filler layers as a wearing layer (PVC, PVA as a binding agent with mineral powder or wood powder, with an adhering filler layer, see old floorings with floor coverings). Well-known brands from the former GDR: Leuna-Estrich (Leuna-Binder in the lower layer; Leunit-Nutzschicht with Leuna-Spezialbinder), Rowid- and Porenrowid screeds, Pyramit screed, Leunit flowing screed
Cementitious screed without rising damp	Bonded screed, screed on separating layers and floating screed; mixes of cement and aggregate gravel, sand, light aggregates (slate chippings, slag or similar).
Tiling surface without rising damp	Ceramic tiles applied with the thin and thick bed process; natural stone slabs with sealed surfaces. Caution! Generally soiled with grease and cleaning agent remnants.
Terrazzo flooring without rising damp	Rich cementitious screed with a stone aggregate that can be ground; implemented as a wearing screed; ground surface, generally bonded to cementitious screed. Caution! Surfaces can be fluosilicate treated (impregnated); generally they are oiled surfaces.
Mastic asphalt screed without rising damp	Bonded screed, screed on a separating layer and floating screed, compounds made of bitumen and mineral aggregates; products in hardness classes (higher classes are softer), IC 10 (floating screed), ICH 10 (heating floor screed), IC 15 (screed on a separating layer), IC 40 and IC 100 (unheated rooms). Caution! Mastix asphalt screeds feature plastic formability and are therefore problematic for layers with rigid screeds; with visible plastic deformation and with any planned higher loads (e.g. vehicle traffic) a layer with levelling screed is not permitted. Otherwise, application of a levelling screed is only possible with high levels of hardness (IC 10, IC 15) taking special consideration of later usage (low loading only).
Magnesite screed / magnesium oxy-**chloride flooring** without rising damp	Bonded screed, screed on a separating layer and floating screed; magnesite screeds are manufactured from caustic magnesia, magnesium chloride and aggregates of sand or wooden shavings, etc. Old flooring is generally known under the name magnesium oxychloride flooring, which has usually been applied as a bonded screed (often on a concrete substrate) in an approx. 20 mm thick double layer where the top layer is used as the wearing layer (colour beige without colouring; usually dark grey when coloured). Caution! Magnesite screeds are not resistant to moisture; high level of free chloride content (corrosive to metal), top layers of magnesite screed are generally waxed and oiled. Renovation with Knauf levelling screeds is not permissible if there is a danger of rising damp and no moisture barrier available for the magnesite screed. Well-known brands from the former GDR: Kieserit, Mahag, Papyrolith
Old floors with floor coverings without rising damp	Floor coverings (textile, PVC, linoleum, etc.) and poorly adhering filler layers must be generally removed. Adhesive remnants bonded to the substrate are not critical for coating with Knauf levelling compounds. Loosely bonded adhesive should be removed by chipping it off, brushing or grinding (grade 16). With large adhesive remnant/filler areas, the primer must be coordinated to these materials.
Concrete slabs, cementitious bonded screeds with rising damp	Concrete covers, concrete slabs contacting, etc. with or without cementitious bonded screed.

Note: Required curing time between the coatings with FE-Imprägnierung and the levelling material application is about 24 hours in each case.

Substrate pre-treatment	Priming
■ Removal of the upper layer by shot-blasting or milling.	Under Nivellierestrich 425 (levelling screed) Double application of Knauf FE-Imprägnierung (also as a vapour retarder with residual moisture in the concrete cover): 1. layer approx. 250 g/m² 2. layer approx. 100 g/m² and intersperse approx. 1.5 kg/m² of coarse sand (e.g. 0.5-1.2 mm) Alternative One coating with Knauf Schnellgrund (undiluted) or two coatings of Knauf Estrichgrund (diluted 1:1); required drying time between the primer coats and the leveling screed application is about 24 hours in each case (primer coat must be dry). Test the suitability of the application. **Under Alphadur 430/ Dünnestrich 325 / Fließspachtel 315 / Faserflex /** Nivellierspachtel 415 Single coating of Knauf Estrichgrund (diluted 1:1 with water) or alternatively a single coat of Knauf Schnellgrund (undiluted). Schnellspachtel 300 Single coating of Knauf Schnellgrund (undiluted).
■ Removal of sanded, oiled, waxed and soiled layers as well as loose filled layers by sanding or brushing. ■ Hollow bonded screed surfaces should be removed, deep spalling must be levelled with Knauf Stretto repair mortar.	
■ Removal of sanded, oiled and soiled layers as well as loose filled layers by sanding or brushing; with high loading (e.g. industrial screeds) shot-blasting or milling; vacuum-cleaning. ■ Hollow bonded screed surfaces should be removed, deep spalling must be levelled with Knauf Stretto repair mortar.	
■ Remove grease and cleaning agent remnants by intensive cleaning with Knauf Intensivreiniger. ■ Hollow bonded tiles/slabs should be removed, deep spalling must be levelled with Knauf Stretto repair mortar.	Under all Knauf levelling compounds Single application with Knauf FE-Imprägnierung: layer approx. 90 g/m² and intersperse approx. 1.2 kg/m² of coarse sand (e.g. 0.6–1.2 mm) sand Alternative under Alphadur 430/Fließspachtel 315/Faserflex/Nivellierspachtel 415/Schnellspachtel 300 Single coat of Knauf Spezialhaftgrund, undiluted.
■ Remove oiled and soiled layers by milling them, or intensive cleaning treatment with Knauf Intensivreiniger if soiling is low. ■ Hollow bonded screed surfaces should be removed, deep spalling must be levelled with Knauf Stretto repair mortar.	
■ Removal of loose and soiled layers as well as loose filled layers by sanding or brushing.	Under Knauf levelling compounds Exception: Fließspachtel 315 and Dünnestrich 325 should no be used on mastix asphalt screeds. Double application with Knauf FE-Imprägnierung: 1. Layer approx. 250 g/m² 2. Layer approx. 100 g/m² and intersperse approx. 1.5 kg/m² of coarse sand (e.g. 0.5-1.2 mm)
■ Removal of sanded, oiled, waxed and soiled layers as well as loose filled layers by sanding or brushing. ■ Hollow bonded screed surfaces should be removed, deep spalling must be levelled with Knauf Stretto repair mortar.	Under all Knauf levelling compounds Double application with Knauf FE-Imprägnierung: 1. Layer approx. 250 g/m² 2. Layer approx. 100 g/m² and intersperse approx. 1.5 kg/m² of coarse sand (e.g. 0.5-1.2 mm)
■ Removal of the upper layer by shot-blasting or milling. ■ Hollow bonded screed surfaces should be removed, deep spalling must be levelled with Knauf Stretto repair mortar.	Under all Knauf levelling compounds Application of Knauf FE-Imprägnierung approx. 400 g/m², subsequently with double-layer application of FE-Abdichtung: 1st layer approx. 600 g/m² 2nd layer approx. 200 g/m² and intersperse approx 1.5 kg/m² of coarse 0.5-1.2 mm) sand On substrates not resistant to moisture without moisture barrier available on lower side, levelling with Knauf levelling compounds is not permissible.

Knauf Nivelliererestrich 425 (levelling screed) is a factory-mixed dry mortar intended as a bonded screed self-levelling leveller with a layer thickness of 10 to 35 mm. It is the cost-effective alternative to cementitious thin-layer or levelling screeds. The attractive material price is facilitated by the pure mineral-based composition of the product.

The area of application of Knauf Nivelliererestrich 425 is very diverse:

- Levelling of uneven substrates as a leveller on concrete floors for application of top coverings and for renovation of unevenly applied cementitious or calcium sulphate screeds
- Height compensation of existing floors with planning changes, e.g. with reduction of the covering thickness or on incorrectly levelled substrates
- Creation of smooth surfaces after removal of old coverings or on old tiled surfaces
- Efficient retrofitting of stable screeds with thin-layer underfloor heating (page 103ff.)

Knauf Nivelliererestrich 425 is used exclusively as a bonded screed in interior applications. As a calcium sulphate screed it can be applied in residential areas of high humidity but is not suitable for wet areas. Knauf Nivelliererestrich 425 can also be used in thin-layer underfloor heating, see FE22.de Knauf Thin Layer Heating Screed Systems.

Technical data			
Layer thickness	10 to 35 mm	**Agitator application:**	**Can be trafficked** after approx. 5 h (depending on the thickness and temperature)
Chair roll resistance	from 10 mm thickness	■ Water ratio for 40 kg bag approx. 7–8 l	Ready for covering with residual moisture (test with CM tester)
Storage		Machine application	■ with vapour tight covering ≤ 0.5 weight %
■ Dry	up to 6 months	Slump flow 1.3 l PFT checking tin < 56 cm	■ with vapour retardant covering ≤ 1.0 weight %
Strength after 28 days (reference values)		Application times	■ with vapour permeable covering ≤ 1.0 weight %
■ Compressive strength	≥ 25 N/mm²	■ Pot life: approx. 30 min	Drying time
■ Flexural strength	≥ 6 N/mm²	■ Work life on the surface: approx. 10 min	(20°C, 65 % relative humidity)
Thermal expansion coefficient	approx. 0.011 mm/(m•K)	Material requirement	Layer thickness 20 mm approx. 7 days
Density		■ Per mm layer thickness approx. 1.8 kg/m²	
■ Mortar (wet)	approx. 2.2 kg/l		
■ Mortar (dry)	approx. 2.0 kg/l		

Knauf Nivelliererestrich 425 (levelling screed)

Calcium sulphate - layer thickness 10 to 35 mm

Knauf Nivelliererestrich 425 does not contain synthetic materials, thus facilitating short drying times, particularly with low screed thickness's. The binder is a calcium sulphate based binder. This provides the high early strengths required for this application. Knauf Nivelliererestrich 425 can be trafficked after about 5 hours. As a calcium sulphate flowing screed is dries practically without deformations. Prerequisite for safe application of bonded screeds.

Substrate pre-treatment

See page 110ff.

Application

The application of Knauf Nivelliererestrich 425 is implemented just like other Knauf flowing screeds (see work methods from page 68ff.).

The slump flow with an ideal consistency is 52 cm (max. 56 cm). With larger layer thickness's the slump-flow or the water quantity should be reduced if permitted by the levelling characteristics.

Wearing shoes with spike soles is recommended while walking on the freshly spread screed.

Apply with a screed brush or with a dappling bar. A suitable spiked roller can be used with small layer thicknesses. The mixed screed must be applied within approx. 30 minutes, the introduced mortar must be levelled within approx. 10 minutes.

Top coverings

As a calcium sulphate flowing screed, Knauf Nivelliererestrich 425 can be covered just like all other Knauf flowing screeds and must be prepared accordingly before application of the covering (see page 87ff.).

► Good to know

Knauf Nivelliererestrich 425 is available as a bulk or bagged material. Application as a bulk material utilizing the efficient Knauf complete logistical service (FERRO 50) offers particular advantages with large area application.

► *Product Data Sheet F422.de*

Knauf Dünnestrich 325 (thin layer screed) can be applied as a bonded screed on bare concrete or as a leveller on cement screeds in interior and exterior areas with a coating thickness of 5 to 30 mm. It can also be applied on thin layer screed in connection with a thin layer underfloor heating as bonded screed, see FE22.de Knauf Thin Layer Heating Screed Systems.
Also available as a wearing layer for high loads in residential and for a limited range of commercially used areas, e.g. private garages, hobby rooms in the basement, work rooms, etc. On calcium sulphate screed Knauf Nivellierspachtel 415 or Nivellierestrich 425 are particularly suitable.

Technical data			
Layer thickness	5 to 30 mm	**Agitator application:**	**Can be trafficked** after approx. 3 h (depending on the thickness and temperature)
Chair roll resistance	from 5 mm thickness	■ Water ratio for 25 kg bag approx. 4.2 l	Ready for covering with residual moisture (test with CM tester)
Storage		Machine application	■ with vapour tight covering ≤ 2.5 weight %
■ Dry	up to 18 months	Slump flow 1.3 l PFT checking tin < 52 cm	■ with vapour permeable covering ≤ 3.0 weight %
Strength after 28 days (reference values)		Application times (at 20 °C)	Drying time (20°C, 65 % relative humidity)
■ Compressive strength	≥ 25 N/mm²	■ Pot life: approx. 30 min	■ Layer thickness 15 mm approx. 6 days
■ Flexural strength	≥ 5 N/mm²	■ Work life on the surface: approx. 10 min	■ Layer thickness 30 mm approx. 16 days
Thermal expansion coefficient	approx. 0.01 mm/(m•K)	Material requirement	
Density		■ Per mm layer thickness approx. 1.6 kg/m²	
■ Mortar (wet)	approx. 2.0 kg/l		
■ Mortar (dry)	approx. 1.8 kg/l		

► Good to know

Wearing shoes with spike soles is recommended while walking on the freshly spread screed.

Knauf Dünnestrich 325 (thin layer screed)

Cementitious layer thickness 5 to 30 mm

Substrate pre-treatment

See page 110ff.

Mixing

Use a clean mixing vessel. Mix 1 bag (25 kg) of Knauf Dünnestrich 325 into approx. 4.2 l of clear water with an agitator, avoiding air inclusion as far as possible, until a lump-free, uniform and flowing consistency is achieved.
For the application on large areas, mix and pump Knauf Dünnestrich 325 continuously with PFT mixing pump G4 with attached PFT ROTOMIX DISC, RITMO or FERRO 50.

Consistency for machine application

Adjust a suitable consistency using the flow test 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.

Application

Spread small agitator mixed amounts of mortar directly out of the mixing vessel.
In case of machine application, spread the 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 consistency. The optimal surface and best levelling can be achieved, for example, at a thickness of around 10 mm by careful treatment with a spike roller, at higher thickness's by slight pitching with a screed brush or with a dappling bar. Smoothing the surface with a trowel is another option.

Application climate

Do not apply at room or substrate temperatures below approx. +10°C. Protect fresh areas of thin layer screed from sunlight and draughts.
Low temperatures delay setting, higher temperatures speed it up (take the temperature of the mixing water into account).

► *Product Data Sheet F413.de*

Knauf Alphadur 430 is a factory-mixed dry mortar made of gypsum, synthetic and mineral fillers.
Knauf Alphadur 430 is used as a self-levelling filler with a layer thickness of up to 5 mm and as leveller up to approx. 20 mm for levelling uneven floors. Small sections can be levelled up to 30 mm thickness.
Knauf Alphadur 430 is suitable as flooring on thin layer underfloor heatings (e.g. Uponor Minitec), applied as bonding screed with approx. 4 mm covering of the fixing panels and for filling of calcium sulphate screed such as Knauf floor screed and cement screed.
The filling coat is suitable to be covered with common interior flooring, with the exception of commercial areas with high humidity or wet areas.

Technical data			
Layer thickness	up to 30 mm	**Agitator application:**	**Can be trafficked** after approx. 3 h
Chair roll resistance	from 2 mm thickness	■ Water ratio for 25 kg bag approx. 6.5–7 l	(depending on the thickness and temperature)
Storage		Machine application	Ready for covering with residual moisture
■ Dry	up to 6 months	Slump flow 1.3 l PFT checking tin < 66 cm	(test with CM tester)
Strength after 28 days (reference values)		Application times	■ with vapour tight covering ≤ 0.5 weight %
■ Compressive strength	≥ 25 N/mm²	■ Pot life: approx. 30 min	■ with vapour retardant covering ≤ 1.0 weight %
■ Flexural strength	≥ 6.5 N/mm²	■ Work life on the surface: approx. 10 min	■ with vapour permeable covering ≤ 1.0 weight %
Thermal expansion coefficient	approx. 0.01 mm/(m•K)	Material requirement	■ as a thin-layer heating screed ≤ 0.3 weight %
Density		■ Per mm layer thickness approx. 1.6 kg/m²	Drying time
■ Mortar (wet)	approx. 1.9 kg/l	pH value 7-8 (skin-friendly)	(20°C, 65 % relative humidity)
■ Mortar (dry)	approx. 1.7 kg/l		■ Layer thickness 2 mm: after 2 days
			■ Layer thickness 10 mm: after 8 days

Knauf Alphadur 430

Calcium sulphate - layer thickness 0 to 30 mm

Substrate pre-treatment
See page 110ff.

Mixing
Use a clean mixing vessel. Mix 1 bag (25 kg) of Knauf Alphadur 430 into approx. 6.5 to 7.0 l of clear water with an agitator, avoiding air inclusion as far as possible, until a lump-free, uniform and flowing consistency is achieved.
The amount of added water depends on the layer thickness. For fine filling (≤ 5 mm) use the greater water value, for higher layer thickness's add less water.
For the application on large areas, mix and pump Knauf Alphadur 430 continuously with PFT mixing pump G4 with attached PFT ROTOMIX DISC, RITMO or FERRO 50.
On large areas and with layer thickness of more than > 15 mm apply screed always with machine.

Consistency for machine application
Set a suitable consistency using the flow test: max. flow diameter 66 cm Ø, determined with a 1.3 l checking tin, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time. Adjust flow diameter to approx. 70 cm for fine filler (≤ 5 mm).

Application
Spread small agitator mixed amounts of mortar directly out of the mixing vessel.
In case of machine application, spread the 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 consistency.
Aid the flow of the compound by using a trowel, float or a spiked roller. Two runs of screed brush pitching or dappling are required from approx. 15 mm layer thickness.

Application time
The mixed filler 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 at the latest after machine standstill.

Application temperature/climate
Do not apply at room or substrate temperatures below approx. +5°C.

► *Product Data Sheet F423.de*

Knauf Nivellierspachtel 415 (floor levelling filler) is used as a fine self levelling filler with a coating thickness of up to 5 mm and as a leveller with a layer thickness of up to 15 mm for levelling uneven floors It is chair roll resistant from 2 mm layer thickness.
Knauf Floor Nivellierspachtel 415 is particularly suitable for filling pre-fab screed such as Knauf Brio or Knauf TUB (floorboards), and calcium sulphate screed such as Knauf flowing screed and cementitious screeds. The filling coat is suitable to be covered with common interior flooring, with the exception of commercial areas with high humidity or wet areas.
For economic reasons, Knauf Nivellierestrich 425 is recommended to be used in case of average layer thickness' exceeding 15 mm.

Technical data			
Layer thickness	up to 15 mm	**Agitator application:**	**Can be trafficked** after approx. 3 h
Chair roll resistance	from 2 mm thickness	■ Water ratio for 25 kg bag approx. 6.5 l	(depending on the thickness and temperature)
Storage		Machine application	Ready for covering with residual moisture
■ Dry	up to 18 months	Slump flow 1.3 l PFT checking tin	(test with CM tester)
Strength after 28 days (reference values)		■ up to 5 mm layer thickness < 68 cm	■ with vapour tight covering ≤ 0.5 weight %
■ Compressive strength	≥ 22 N/mm²	■ 5 to 15 mm layer thickness < 62 cm	■ with vapour retardant covering ≤ 1.0 weight %
■ Flexural strength	≥ 7 N/mm²	Application times	■ with vapour permeable covering ≤ 1.0 weight %
Thermal expansion coefficient	approx. 0.01 mm/(m•K)	■ Pot life: approx. 30 min	Drying time
Density		■ Work life on the surface approx. 10 min.	(20°C, 65 % relative humidity)
■ Mortar (wet)	approx. 1.9 kg/l	Material requirement	■ Layer thickness 2 mm approx. 2 days
■ Mortar (dry)	approx. 1.7 kg/l	■ Per mm layer thickness approx. 1.6 kg/m²	■ Layer thickness 10 mm approx. 8 days

Knauf Nivellierspachtel (floor levelling filler) 415

Calcium sulphate - layer thickness up to 15 mm

Substrate pre-treatment
See page 110ff.

Mixing
Use a clean mixing vessel. Mix 1 bag (25 kg) of Knauf Nivellierspachtel 415 (floor levelling filler) into approx. 6.5 l of clear water with an agitator, avoiding air inclusion as far as possible, until a lump-free, uniform and flowing consistency is achieved.
For higher filling thickness's it is recommended to reduce the amount of water (approx. 6.2 l from 5 mm).
For the application on large areas, mix and pump Knauf Nivellierspachtel 415 continuously with PFT mixing pump G4, RITMO or FERRO 50.

Consistency for machine application
Adjust a suitable consistency using the flow test on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time. Reduce flow diameter to approx. 62 cm with increasing filling thickness.

Application
Spread small agitator mixed amounts of mortar directly out of the mixing vessel.
In case of machine application, spread the 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 consistency.
Aid the flow of the compound by using a trowel, float or a spiked roller.

Application temperature/climate
Do not apply at room or substrate temperatures below approx. +5°C.

► *Product Data Sheet F421.de*

Knauf Schnellspachtel 300 is a cementitious factory-mixed dry mortar and can be used as a good dispersing levelling filler in layer thicknesses up to approx 5 mm and as a self levelling filler up to approx. 10 mm for levelling uneven floors.
Knauf Schnellspachtel 300 is low-stress filler featuring high strength and is particularly easy to sand. Knauf Schnellspachtel 300 can be used in all interior building substrates, e.g. calcium sulphate screeds, cement and bare concrete floors, mastix asphalt screed as well as old substrates with firmly bonded mortar and adhesive remnants.
The filler layer serves as a substrate for the standard floor coverings or coatings, but not as a loadable wearing layer.
With layer thicknesses greater than 10 mm use Knauf Dünnestrich 325.

Technical data			
Layer thickness	0 – 10 mm	**Agitator application:**	**Can be trafficked** after approx. 1.5 – 2 h
Chair roll resistance	from 2 mm thickness	■ Water ratio for 25 kg bag approx. 6 l	(depending on the thickness and temperature)
Storage		Machine application	Ready to cover for floor covering
■ Dry	up to 12 months	Slump flow 1.3 l PFT checking tin < 63 cm	(20°C, 65 % relative humidity)
Strength after 28 days (reference values)		Application times	■ Tiles 2 h
■ Compressive strength	≥ 30 N/mm²	■ Pot life: approx. 20 min	■ Textile coverings 3–4 h
■ Flexural strength	≥ 7 N/mm²	■ Work life on surface: approx. 10 min	■ PVC/Linoleum 12 h
Thermal expansion coefficient	approx. 0.01 mm/(m•K)	Material requirement	■ Rubber, parquet 24 h
Density		■ Per mm layer thickness approx. 1.5 kg/m²	
■ Mortar (wet)	approx. 2.0 kg/l		
■ Mortar (dry)	approx. 1.8 kg/l		

Knauf Schnellspachtel 300

Quick-setting and drying fine filling and levelling compound for levelling floors

Substrate pre-treatment
See page 110ff.

Mixing
Use a clean mixing vessel. Mix 1 bag (25 kg) of Knauf Schnellspachtel 300 into approx. 6 l of clear water with an agitator, avoiding air inclusion as far as possible, until a lump-free, uniform and flowing consistency is achieved.
For the application on large areas mix and pump Schnellspachtel 300 continuously with PFT mixing pump RITMO.
Consistency with machine application: Set a suitable consistency using the flow test on an even, non-absorbent surface, e.g. on 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.

Application
Pour the mortar uniformly from the mixing vessel. Aid the flow of the compound by using a trowel, dappling bar or a spiked roller. Ensure a 2 mm minimum layer thickness as the lower limit for sufficient levelling and normal strength setting.
The mixed leveller must be applied within approx. 20 minutes, the introduced mortar must be levelled within approx. 10 minutes. Clean the tools with clear water. With machine application, the machine and hoses must be cleaned within 15 minutes at the latest after machine standstill.

Application temperature/climate
Do not apply at room or substrate temperatures below approx. +10°C. Protect fresh areas of the filler from sunlight and draughts. Low temperatures delay setting, higher temperatures speed it up (take the temperature of the mixing water into account).

► *Product Data Sheet F412b.de*

Knauf Fließspachtel 315 (flowing screed) can be applied as a self-levelling filler with a layer thickness of up to 5 mm and as a leveller up to max. 10 mm for levelling uneven floors.
Knauf Fließspachtel 315 can be used in all interior building substrates, e.g. cement and bare concrete floors.
The filler layer is a surface for the standard floor coverings or coatings, but not a loadable wearing layer.

Technical data

Layer thickness up to 10 mm
Chair roll resistance from 2 mm thickness
Storage
- Dry up to 18 months

Strength after 28 days (reference values)
- Compressive strength ≥ 28 N/mm²
- Flexural strength ≥ 6 N/mm²

Thermal expansion **coefficient** approx. 0.01 mm/(m•K)
Density
- Mortar (wet) approx. 2.0 kg/l
- Mortar (dry) approx. 1.8 kg/l

Agitator application:
- Water ratio for 25 kg bag approx. 6.5 l

Machine application
Slump flow 1.3 l PFT checking tin
- up to 5 mm layer thickness < 62 cm
- 5 to 10 mm layer thickness < 58 cm

Application times (at 20 °C)
- Pot life: approx. 30 min
- Work life on the surface approx. 10 min

Material requirement
- Per mm layer thickness approx. 1.6 kg/m²

Can be trafficked after approx. 3 h
(depending on the thickness and temperature)
Ready for covering with residual moisture
(test with CM tester)
- with vapour tight covering ≤ 2.5 weight %
- with vapour permeable covering ≤ 3.0 weight %

Drying time
(20°C, 65 % relative humidity)
- Layer thickness 2 mm approx. 1 day (24 h)
- Layer thickness 10 mm approx. 6 days

Knauf Fließspachtel 315

Cementitious – layer thickness up to 10 mm

► Good to know
In order to achieve an additional elastification of the filler material (recommended on heating screed), use diluted Knauf Kleber- & Boden-Elast (ratio 1:3 by volume with water).

Substrate pre-treatment
See page 110ff.

Mixing
Use a clean mixing vessel. Mix 1 bag (25 kg) of Knauf Fließspachtel 315 into approx. 6.5 l of clear water with an agitator, avoiding air inclusion as far as possible, until a lump-free, uniform and flowing consistency is achieved. For the application on large areas mix and pump Knauf Fließspachtel 315 continuously with PFT mixing pump G4, RITMO or FERRO 50.

Consistency for machine application
Adjust a suitable consistency using the flow test 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.

Application
Spread small agitator mixed amounts of mortar directly out of the mixing vessel. In case of machine application, spread the 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 consistency. Aid the flow of the compound by using a trowel, float or a spiked roller. A minimum filling thickness of 2 mm should be kept in order to ensure appropriate levelling and normal strength setting. Use Knauf Dünnestrich 325 with layer thickness's greater than 10 mm. With machine application, the machine and hoses must be cleaned within 30 minutes at the latest after machine standstill.

Application temperature/climate
Do not apply at room or substrate temperatures below approx. +10°C. Protect fresh areas of the filler from sunlight and draughts.
Low temperatures delay setting, higher temperatures speed it up (take the temperature of the mixing water into account).

► *Product Data Sheet F411.de*

Self levelling, fibrous reinforced, flexible high performance filler for smooth interior and exterior floor surfaces of low porosity, ready to be covered with flooring.
Ideal as a leveller on

- Wooden substrates (e.g. floor boards, water resistant chipboards V100, etc.) e.g. for the retrofitting with a thin-layer underfloor heating with Knauf Nivellierestrich 425 as bonded screed (see Product Data Sheet FE22.de)
- Thermally highly stressed surfaces, e.g. with underfloor heating
- All common substrates, e.g. concrete, calcium sulphate, cement or asphalt mastix screed, old tiling, cement fibre boards

Also available as a wearing layer for high loads in residential and for a limited range of commercially used areas, e.g. private garages, hobby rooms in the basement, work rooms, etc.
It is the ideal substrate for parquet, cork, linoleum, textile flooring, PVC flooring, laminate, ceramic tiles and natural stone.

Technical data			
Layer thickness	2 to 15 mm	**Agitator application:**	**Can be trafficked** after approx. 4 h
(on mastix asphalt max. 5 mm)		■ Water ratio for 25 kg bag approx. 6.5 l	(depending on the thickness and temperature)
Chair roll resistance	from 2 mm thickness	Machine application	Ready for covering with residual moisture
Storage		Slump flow 1.3 l PFT checking tin	(test with CM tester)
■ Dry	up to 18 months	■ up to 5 mm layer thickness < 62 cm	■ with vapour tight covering ≤ 2.5 weight %
Strength after 28 days (reference values)		■ 5 to 15 mm layer thickness < 58 cm	■ with vapour permeable covering ≤ 3.0 weight %
■ Compressive strength	≥ 28 N/mm²	Application times (at 20 °C)	Drying time
■ Flexural strength	≥ 6.5 N/mm²	■ Pot life: approx. 20 min.	(20°C, 65 % relative humidity)
Thermal expansion coefficient	approx. 0.01 mm/(m•K)	■ Work life on the surface approx. 10 min.	■ Layer thickness 2 mm approx. 1 day (24 h)
Density		Material requirement	■ Layer thickness 15 mm approx. 6 days
■ Mortar (wet)	approx. 2.0 kg/l	■ Per mm layer thickness approx. 1.5 kg/m²	
■ Mortar (dry)	approx. 1.8 kg/l		

Knauf Faserflex

Cementitious – layer thickness 2 to 15 mm

Substrate pre-treatment

See page 110ff.

Mixing

Use a clean mixing vessel. Mix 1 bag (25 kg) of Knauf Faserflex into approx. 6.5 l of clear water with an agitator at a low speed, avoiding air inclusion as far as possible, until a lump-free, uniform and flowing consistency is achieved.
For the application on large areas mix and pump Faserflex continuously with PFT mixing pump G4 or RITMO.

Consistency for machine application

Adjust a suitable consistency using the flow test 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.

Application

Spread small agitator mixed amounts of mortar directly out of the mixing vessel. In case of machine application, spread the 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 consistency.
Aid the flow of the compound by using a trowel, float or a spiked roller. A minimum filling thickness of 2 mm should be kept in order to ensure appropriate levelling and normal strength setting.

Application temperature / climatic conditions

Do not apply at room or substrate temperatures below approx. +10°C. Protect fresh areas of the filler from sunlight and draughts. Low temperatures delay setting, higher temperatures speed it up (take the temperature of the mixing water into account).

► *Product Data Sheet F415.de*

Standards and regulations		
■ BGB German Civil Code ■ VOB Part A – General provisions relating to the award of construction contracts ■ VOB Part B – General conditions of contract relating to the execution of construction work ■ DIN 4108 Thermal protection and energy economy in buildings ■ DIN 4109 Sound insulation in buildings ■ DIN 18157 Application of ceramic tiling by the thin bed method ■ DIN 18195 Water-proofing of buildings ■ DIN 18202 Tolerances in building construction ■ DIN 18336 Waterproofing ■ DIN 18352 Wall and floor tiling ■ DIN 18353 Laying of floor screed ■ DIN 18356 Laying of parquet flooring ■ DIN 18365 Flooring work ■ DIN 18560 Floor screeds in building construction ■ DIN V 44576 Electric room heating - Storage heating ■ DIN EN 1991-1-1 General actions - Densities, self-weight, imposed loads for buildings ■ DIN EN 1991-1-1/NA National Annex - Nationally determined parameters EN 1991-1-1 ■ DIN EN 1264 Water based surface embedded heating and cooling systems	■ DIN EN 12004 Adhesives for tiles ■ DIN EN 13162 to 13171 Thermal insulation products for buildings ■ DIN EN 13213 Hollow floors ■ DIN EN 13813 Screed material and floor screeds ■ TRGS 610, Annex to German Ordinance on Hazardous Substances BVG Codes of Practice, Industriegruppe Estrichstoffe / Industrieverband WerkMörtel ■ No. 1 “Flowing calcium sulphate screeds in areas of high humidity” ■ No. 2 “Drying of flowing calcium sulphate screeds” ■ No. 3 “Flowing calcium sulphate screeds on underfloor heating” ■ No. 4 “Assessment and treatment of the surfaces of flowing calcium sulphate screeds” ■ No. 5 “Joints in flowing calcium sulphate screeds” ■ No. 6 “Coloured flowing screeds” ■ No. 7 “Flowing calcium sulphate screeds for remodeling, renovation and modernization” ■ No. 8 “Light levelling mortar under flowing screed” Code of Practice 4 BVG, Industriegruppe Baugipse ■ No. 1 “Safe handing of transportable building site silos” (German only) of the BVG	Codes of Practice of the Zentralverbandes des Deutschen Baugewerbes (ZDB) (German only): ■ [Assessment and preparation of substrates, application of elastic coverings, textile coverings and parquet]. ■ [Elastic coverings, textile coverings and parquet on heated floor constructions]. ■ [Ceramic tiles and panels, natural stone and artificial stone for floor constructions and insulation layers]. ■ [Movement joints in linings and coverings made of tiles and ceramic panels]. ■ [Instructions for application of seals with linings and coverings made of tiles and ceramic panels for interiors]. ■ [Ceramic tiles and panels, natural stone work and artificial stonework on heated cementitious floor constructions]. ■ [Costing principles for calculations in the screed application trade]. ■ [Ceramic tiles and panels, natural stone work and artificial stonework on calcium sulphate screeds].

Further information

Tips for screed appliers

Of particular significance for the floor quality and the duty to provide information is the proof of the substrate regarding its suitability for the application of screed (VOB part C, DIN 18353, point 3). See page 44.

Extensive testing requiring significant effort and expense (e.g. chemical testing) cannot be required of the screed applier. In principle, it is sufficient to undertake testing using the means and equipment generally available to the trade.

If the substrate does not meet requirements, the concerns should be made known.

If, irrespective of compliance with these tolerances for the substrate, the screed surface quality stipulated by the contract requires more than 20% of additional material to produce the stipulated nominal screed thickness, these concerns should also be made known.

The document outlining the concerns should be sent by registered mail with advice of receipt. It should be addressed to the investor/client (copy to the architect's)

The applier of the screed is obliged to provide information relating to any features or anomalies of the screed that are of relevance to the subsequent trades. This concerns, for example, application of screed with excessive thickness in partial areas, as the applier of the floor coverings must assume that these locations are unfavourable measurement points for the determination of the level of residual moisture. In this case, it is also recommended to provide the information in writing to the investor/client.

Standards and regulations		
Technical information of the German Federal Association of Screed and Floor Covering (BEB) in German only ■ Information on the evaluation and preparation of the anhydrite flowing screed surfaces. ■ Information on the application of calcium sulphate based flowing screeds ■ Surface tensile strength and adhesive pull strength of floors ■ Information on joints in screeds parts 1 + 2 ■ Climatic building conditions for drying screeds ■ Instructions for clients for the time preceding the application of calcium sulphate screeds. ■ Evaluation and preparation of substrates.	■ Sealing compliant to DIN 18195 – Parts 4 and 5; guidelines ■ Pipes, cables and cable ducts on basic ceilings ■ Equalization layers made of light mortar ■ Sealant materials in combination with floor coverings ■ Accelerated drying of calcium sulphate screeds ■ Calcium sulphate flowing screeds in highly trafficed areas ■ Realization of floors with drains not used systematically (Emergency drainage) ■ Interface between individual trades	Code of Practice of the BEB ■ Evaluation and preparation of substrates/Adhesive application of elastic and textile coverings. **Informationsdienst Flächenheizung vom Bundesverband Flächenheizung und Flächenkühlung** e.V. (BVF) in German only ■ Coordination of trades with heated underfloor constructions ■ Coordination of trades with area heating and area cooling in existing buildings

► Good to know

In accordance with VOB, part B, DIN 1961 § 4, No. 3 "the contractor is required to inform the company without delay and in writing if they have any concerns about the quality of the materials or components supplied or if they have concerns with the intended way in which the work is to be carried out – when possible before commencement of work". Strict compliance with this undertaking should serve as the basis for every screed applier to ensure that unjustified warranty claims are excluded from the outset.

The DIN 18202 is also a standard for determining the quality of the applied screed. The screed complies with the evenness tolerances if the evenness tolerances as specified in table 3, line 3 are observed in conjunction with the angular tolerances as specified in DIN 18202, table 2. Demands by the investor for tolerances exceeding the evenness and angular tolerances must be agreed in a written contract (e.g. acc. to DIN 18202, table 3, line 4).

Knauf product overview

Product overviews and technical data

Knauf self-levelling floor screeds

Properties	FE Sprint	FE 50 Largo	
			
Field of application	Sites with tight deadlines. Quick drying and can be covered after a short time	Cost-effective flowing screed for public and commercial buildings	
Quality properties to EN 13813	CA-C30-F5	CA-C25-F5	
Compressive strength Flexural strength	≥ 30 N/mm² ≥ 5 N/mm²	≥ 25 N/mm² ≥ 5 N/mm²	
Material consumption per 1 cm screed thickness	approx. 19 kg/m²	approx. 19 kg/m²	
Density wet dry	approx. 2.2 kg/l approx. 2.0 kg/l	approx. 2.3/2.2* kg/l approx. 2.1/2.0* kg/l	
Machine application Bagged material Silo	 – e.g. PFT FERRO 100	 PFT G4 e.g. PFT FERRO 100	
Slump flow (1.3 l checking tin)	< 42 cm	< 43 cm	
Application time	approx. 30 min	approx. 60 (approx. 40 **) min	
Walkable after	approx. 24 h	approx. 24 h	
Loadable after	approx. 3 days	approx. 3 days	
Drying (reference values at 35 mm)	approx. 7 days	approx. 3-6 weeks***	
	depending on stie conditions, application thickness and drying options (e.g. ventilation and airing)		
Ready for covering with residual moisture ■ for vapour-proof coverings (PVC) and parquet ■ for vapour permeable coverings (carpets, etc.) ■ for vapour retardant covering (tiles or similar) ■ as a heating floor screed	 ≤ 1.5 % by weight ≤ 1.8 % by weight ≤ 1.8 % by weight –	 ≤ 0.5 % by weight ≤ 1.0 % by weight ≤ 1.0 % by weight ≤ 0.3 % by weight	
Heating commences	–	after 7 days	
Max. flow temperature with underfloor heating	–	55 °C	
Expansion during setting	approx. 0.3 mm/m	approx. 0.1 mm/m	
Thermal expansion coefficient	approx. 0.014 mm/(m·K)	approx. 0.016 mm/(m•K) approx. 0.014 mm/(m•K*)	
Thermal conductivity λ_z	approx. 1.4 W/(m•K)	approx. 1.66 W/(m•K) (approx. 1.4 W/m•K*)	
Supplied in bags in silos	– bulk	40 kg bag bulk	
Storage (dry)	up to 3 months	up to 6 months	

** applies primarily for Federal German states: Berlin, Brandenburg, Bremen, Mecklenburg-Vorpommern, Nordrhein-Westfalen, Sachsen, and parts of Niedersachsen and Rheinland-Pfalz*
*** Applies primarily for the German states of Bremen, Nordrhein-Westfalen, parts of Niedersachsen, Rheinland-Pfalz*
**** unheated*

	FE 80 Allegro	FE 25 A tempo	FE Fortissimo	FE Eco
				 NEW
	High compressive and flexural strengths, especially suited for commercial buildings	Sites with tight deadlines. As a heated screed it is quick drying and can be covered after a short time	Exceptionally high strengths. Ideal with high mechanical loading	Heat-pump screed ideal for energy-saving residential and prefabricated house construction
	CA-C30-F6	CA-C30-F6	CA-C35-F7	CAF C25-F5
	≥ 30 N/mm² ≥ 6 N/mm²	≥ 30 N/mm² ≥ 6 N/mm²	≥ 35 N/mm² ≥ 7 N/mm²	≥ 25 N/mm² ≥ 5 N/mm²
	approx. 19 kg/m²	approx. 19 kg/m²	approx. 19 kg/m²	approx. 19 kg/m²
	approx. 2.2 kg/l approx. 2.0 kg /l	approx. 2.1 kg/l approx. 1.9 kg/l	approx. 2.2 kg/l approx. 2.0 kg/l	approx. 2.2–2.3 kg/l approx. 2.0–2.1 kg/l
	PFT G4 e.g. PFT FERRO 100	PFT G4 e.g. PFT FERRO 100	– e.g. PFT FERRO 100	– e.g. PFT FERRO 100
	< 45 cm	< 45 cm	< 40 cm	< 43 cm
	approx. 60 (approx. 40 **) min	approx.. 40 min	approx. 60 (approx. 40 **) min	approx.. 40 min
	approx. 24 h	approx. 3 h	approx. 24 h	approx. 12 h
	approx. 3 days	approx. 8 h	approx. 3 days	approx. 3 days
	approx. 3-6 weeks***	approx. 8-14 days (additional ventilation and heating)	approx. 3-6 weeks***	approx. 14–21 days
	≤ 0.5 % by weight ≤ 1.0 % by weight ≤ 1.0 % by weight ≤ 0.3 % by weight	≤ 0.5 % by weight ≤ 1.0 % by weight ≤ 1.0 % by weight ≤ 0.3 % by weight	≤ 0.5 % by weight ≤ 1.0 % by weight ≤ 1.0 % by weight ≤ 0.3 % by weight	– – – ≤ 0.3 % by weight
	after 7 days	when hard enough for foot traffic (after approx. 3 h).	after 7 days	after 48 h
	55 °C	55 °C	55 °C	40 °C
	approx. 0.1 mm/m	approx. 0.5 mm/m	approx. 0.1 mm/m	approx. 0.1 mm/m
	approx. 0.016 mm/(m•K) approx. 0.014 mm/(m•K*)	approx. 0.011 mm/(m•K)	approx. 0.016 mm/(m•K) approx. 0.014 mm/(m•K*)	approx. 0.014 mm/(m•K)
	approx. 1.87 W/m•K (approx. 1.4 W/m•K*)	approx. 1.38 W/m•K	approx. 1.6 W/m·K	approx. 1.4 W/m•K
	40 kg bag bulk	40 kg bag bulk	– bulk	– bulk
	up to 6 months	up to 6 months	up to 6 months	up to 6 months

Knauf levelling compounds

Properties	Nivellierestrich 425	Dünnestrich 325	Alphadur 430	
				
Material (factory-mixed dry mortar, pre-mixed ready to use)	made of calcium sulphate and mineral fillers.	made of special cement, synthetics and various fillers.	made of calcium sulphate, synthetics and mineral fillers.	
Layer thickness	10-35 mm	5-30 mm	0-30 mm	
Quality properties to DIN EN 13813	CA-C25-F6	CT-C25-F5	–	
Tensile strength (reference values) after 28 days: Compressive strength Flexural strength	 ≥ 25 N/mm² ≥ 6 N/mm²	 ≥ 25 N/mm² ≥ 5 N/mm²	 ≥ 25 N/mm² ≥ 6.5 N/mm²	
Material consumption per mm layer thickness	approx. 1.8 kg/m²	approx. 1.6 kg/m²	approx. 1.6 kg/m²	
Specific weight (Density) wet dry	 approx. 2.2 kg/l approx. 2.0 kg/l	 approx. 2.0 kg/l approx. 1.8 kg/l	 approx. 1.9 kg/l approx. 1.7 kg/l	
Application ■ machine in bags in silos ■ manual	 PFT G4 e.g. PFT FERRO 50 or 100 –	 PFT G4 e.g. PFT FERRO 50 or 100 Agitator	 PFT RITMO PFT FERRO 50 or 100 Agitator	
Agitator application: Water quantity	40 kg bag approx. 7-8 l	25 kg bag approx. 4.2 l	25 kg bag approx. 6.5-7 l	
Machine application: Slump flow (1.3 l PFT checking tin)	< 56 cm	< 52 cm	< 66 cm	
Application time ("Pot life") work life on the surface	approx. 30 min approx. 10 min	approx. 30 min approx. 10 min	approx. 30 min approx. 10 min	
Walkable (depending on the thickness and temperature)	after approx. 5 h	after approx. 3 h	after approx. 3 h	
Loadable after	approx. 2 days	approx. 1 day	approx. 2 days	
Drying	20 mm – 7 days	15 mm – 6 days 30 mm – 16 days	2 mm – 2 days 10 mm – 8 days	
Ready for covering at residual moisture (check with CM tester) ■ for vapour-proof coverings (PVC) and parquet ■ for vapour permeable coverings (carpets, etc.)	 ≤ 0.5 % by weight ≤ 1.0 % by weight	 ≤ 2.5 % by weight ≤ 3.0 % by weight	 ≤ 0.5 % by weight ≤ 1.0 % by weight	
Chair roll resistance from layer thickness	10 mm	5 mm	2 mm	
Application on heating floor screed	yes	–	up to 10 mm	
Thermal expansion coefficient	approx. 0.011 mm/(m·K)	approx. 0.01 mm/(m·K)	approx. 0.01 mm/(m·K)	
Supplied in bags in silos	40 kg bag bulk	25 kg bag bulk	25 kg bag	
Storage (dry)	up to 6 months	up to 18 months	up to 6 months	

	Nivellierspachtel 415	Knauf Fließspachtel 315	**Faserflex**	Schnellspachtel 300
				
	made of calcium sulphate, synthetics and mineral fillers.	made of special cement, synthetics and mineral-based fillers.	made of special cement, synthetics, various fillers and fibre-reinforcement.	made of special cement, synthetics and fillers
	up to 15 mm	up to 10 mm	2-15 mm	0–10 mm
	–	–	–	–
	≥ 22 N/mm² ≥ 7 N/mm²	≥ 28 N/mm² ≥ 6 N/mm²	≥ 28 N/mm² ≥ 6.5 N/mm²	≥ 30 N/mm² ≥ 7 N/mm²
	approx. 1.6 kg/m²	approx. 1.6 kg/m²	approx. 1.5 kg/m²	approx. 1.5 kg/m²
	approx. 1.9 kg/l approx. 1.7 kg/l	approx. 2.0 kg/l approx. 1.8 kg/l	approx. 2.0 kg/l approx. 1.8 kg/l	approx. 2.0 kg/l approx. 1.8 kg/l
	PFT G4 e.g. PFT FERRO 50 or 100 Agitator	PFT G4 e.g. PFT FERRO 50 or 100 Agitator	PFT G4 - Agitator	PFT RITMO – Agitator
	25 kg bag approx. 6.5 l	25 kg bag approx. 6.5 l	25 kg bag approx. 6.5 l	25 kg bag approx. 6.0 l
	< 68 cm	< 62 cm	Up to 5 mm: < 62 cm 5-15 mm: < 58 cm	< 63 cm
	approx. 30 min approx. 10 min	approx. 30 min approx. 10 min	approx. 20 min approx. 10 min	approx. 20 min approx. 10 min
	after approx. 3 h	after approx. 3 h	after approx. 4 h	after approx. 1.5–2 h
	approx. 2 days	approx. 1 day	approx. 1 day	approx. 12 h
	2 mm – 2 days 10 mm – 8 days	2 mm – 1 day 10 mm – 6 days	2 mm – 1 day 15 mm – 6 days	**Ready for floor covering** Tiles 2 h Textile coverings 3–4 h PVC/Linoleum 12 h Rubber, parquet: 24 h
	≤ 0.5 % by weight ≤ 1.0 % by weight	≤ 2.5 % by weight ≤ 3.0 % by weight	≤ 2.5 % by weight ≤ 3.0 % by weight	≤ 2.5 % by weight ≤ 3.0 % by weight
	2 mm	2 mm	2 mm	2 mm
	yes	up to 5 mm	up to 5 mm	no
	approx. 0.01 mm/(m·K)	approx. 0.01 mm/(m·K)	approx. 0.01 mm/(m·K)	approx. 0.01 mm/(m·K)
	25 kg bag bulk	25 kg bag bulk	25 kg bag –	25 kg bag –
	up to 18 months	up to 18 months	up to 18 months	up to 12 months

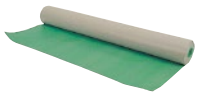
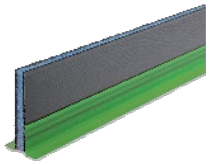
Knauf special products

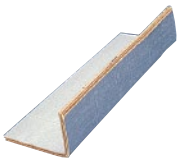
Special products	Application	Consumption	Order information	Images
Knauf Stretto Quick setting screed mortar consisting of Knauf Stretto Sand and Knauf FE-Imprägnierung, water-free, ready for covering after 24 hours.	By machine with a compressed air conveyor or batch mixer	Approx. 17 kg Knauf Stretto Sand and 0.7 kg Knauf FE-Imprägnierung per 1 cm thickness and m²	Stretto Sand Bag: 25 kg FE-Imprägnierung: Bucket: 1 kg Bucket: 5 kg Bucket: 10 kg (combo pack)	
Knauf Stretto repair set Quick setting screed mortar consisting of Knauf Stretto Sand and Knauf FE-Imprägnierung, water-free, ready for covering after 24 hours.	By hand	As required	Bucket with approx. 16 kg of special sand as well as a 1 kg tin of FE-Imprägnierung	
Knauf Schnellestrich CT Conventional, fast-setting cementitious screed that can be used as a bonded screed, on a separating layer or on an insulating layer. At a layer thickness of 40 mm, Knauf Schnellestrich CT is ready for covering after 24 hours.	By machine or hand	approx. 20 kg/ m² per cm screed thickness	Bag 25 kg	
Knauf FE-Imprägnierung 2 component epoxy resin as a bonding primer under bonded screed, as a component for quick-setting screed Knauf Stretto, as a component of the quick setting levelling mortar Knauf EPO-Leicht.	Agitator, Lambskin Roller	approx. 150-400 g/m² depending on the area of application	Bucket: 1 kg Bucket: 5 kg Bucket: 10 kg (combo pack)	

Basic floor levelling	Application	Consumption	Order information	Images
Knauf Trockenschüttung PA For levelling uneven substrates. Min. leveller height 2 cm. Apply under flowing screed with cover boards. Also for levelling under pre-fab floor screeds.	By hand, with levelling board and height gauges	10 l per 10 mm/m² levelling	Bag: approx. 28 kg = 50 l	
Knauf EPO-Leicht Quick setting light levelling mortar consisting of Knauf EPO-Perl and Knauf FE-Imprägnierung, low weight, water-free.	Agitator	10 litres Knauf EPO-Perl and 0.17 kg Knauf FE-Imprägnierung per 1 cm thickness and m²	EPO-Perl: Bag: 60 litres FE-Imprägnierung: Bucket: 1 kg Bucket: 5 kg Bucket: 10 kg (combo pack)	
Schubo Walkable equalization of the floor made of special elements and air pores with a low weight and good thermal insulation.	By machine with Knauf complete logistical service	3.3 kg per 1 cm thickness and m²	Silo/container: bulk	

Sealing	Application	Consumption	Order information	Images
Knauf Abdichtungsbahn Katja Sprint Sealing membrane made of polymer bitumen with glass fleece and aluminium layer, self-adhesive on long edge, 1.25 m wide. For sealing against ground moisture acc. to DIN 18195-4.	Roll out and bond by hand	1.08 m² per m²	Roll: 32 m x 1.25 m (40 m²)	
Knauf Anschlussstreifen Self-adhesive 200 mm wide polymer bitumen strips. For establishing connections between Knauf Abdichtungsbahn Katja Sprint (sealing membrane) and rising constructional components. Sealing of front edge joints of the Knauf Abdichtungsbahn Katja Sprint.	By hand, if required with hot air gun	1 m per m connection length	Roll: 15 m x 0.2 m	
Knauf Katja Sprint Anschlussfix High-quality, plastic and permanently sticky surface adhesive on the basis of a hybrid polymer. For connection of the Katja Sprint Abdichtungsbahn to the wall moisture barrier in the interior.	By machine or hand	approx. 62 ml per m	Cartridge	
Knauf FE-Abdichtung A "liquid foil" on the basis of a 2-component epoxy resin. On basic concrete substrates, as sealing bonding primer under bonded screeds, against ground moisture to DIN 18195-4.	Agitator, Lambskin Roller floor coater	approx. 600 - 1000 g/m²	Bucket: 10 kg (combo pack)	

Knauf accessories

Flowing screed accessories	Application	Consumption	Order information	
Knauf Holzfaserdämmplatte WF ■ As an impact noise layer under screeds such as Nivellierestrich 425 on thin layer underfloor heating ■ As a covering board on Knauf Trockenschüttung PA 10 mm thick, 598 mm wide, 1198 mm long Thermal conductivity λ_R: 0.07 W/mK	1 m² per m² screed area		Pallet: 226 pieces	
Knauf Schrenzlage Foil coated Soda Kraft paper acc. to DIN 18560 1.25 m wide For covering the insulation layer or for screed on the separating layer	Approx. 1.1 m² per m² Screed surface (overlapping)		Roll: 80 m x 1.25 m (approx. 100 m²)	
Knauf mineral wool edge insulation strips 12 mm thick, 100 mm wide	1 m per m connection length		Package: 100 pieces	
Knauf Randdämmstreifen FE 8/100 8 mm thick, 100 mm wide with laminated foil 10/120 10 mm thick, 120 mm wide with laminated foil and adhesive strips on rear	1 m per m connection length		Roll: 40 m	
Knauf Movement Joint 12/80 As a movement joint, e.g. in doorways, made of elastic foam and self-adhesive base. The Knauf notching pliers is used to make holes in the movement joint to facilitate heating tubes	1 m per m joint		Unit: 2 m	
Movement joint made of Knauf individual components As a movement joint, e.g. in doorways. Joint tape (A) is placed against profile (B), which it then fastened with the nails (C) in the insulation layer A: Control Joint Trim 10/70 B: L Profile 50/30 C: Fastening Nail 5/45	Per m joint length 1 m 1 m 9 pieces		Design see page 65. Roll: 25 m Unit: 3 m Package: 200 pieces	 

Flowing screed accessories	Application	Consumption	Order information	
Knauf Abstellwinkel 30/60 Cardboard angle made of multi-layer paper, both arms can be used to suit height. For manufacturing movement joints with heating floor screed in doorways or with different screed heights (levels), as a construction joint. Size: 30/60 mm, length: 3 m	1 m per m joint length	–	Unit: 3 m	
Knauf Spezialhaftgrund Primer concentrate on the basis of a synthetic resin emulsion. For regulating the absorptivity, improving bonding properties and moisture protection before the application of floor levelling compound or tiles.	Floor coater, painter's brush, prime brush or roller	■ normally absorbent substrates 50-100 g/m² ■ non-absorbent substrates 40-60 g/m² ■ old ceramic tile coverings, Terrazzo 70-100 g/m² ■ wooden substrates 60-80 g/m² ■ on pre-fab floor screed: approx. 50 g/m	Bucket: 5 kg	
Knauf Estrichgrund Solvent-free primer and bonding primer For regulating the absorptivity and improving bonding properties on basic floor, as a surface treatment on flowing screeds and with pre-fab floor screed	Floor coater, painter's brush, prime brush or roller	Undiluted ■ on basic floor: approx. 150 g/m² ■ on flowing screed: approx. 100 g/m² ■ on pre-fab floor screed: approx. 50 g/m	Bucket: 5 kg Bucket: 10 kg	
Knauf Schnellgrund Quick-drying, solvent-free primer and bonding primer For regulating the absorptivity and improving bonding properties on basic floor, as a surface treatment on flowing screeds and with pre-fab floor screed	Floor coater, painter's brush prime brush or roller	■ on basic floor: approx. 150 g/m² ■ on flowing screed: approx. 110 g/m² ■ on chipboard V100 approx. 90 g/m² ■ on pre-fab floor screed: approx. 80 g/m	Bucket: 5 kg Bucket: 10 kg	
Knauf FE-Austrocknungskabel Screed drying cable for reduction of the drying time of Knauf flowing screeds.	approx. 4-8 m/m²	–	Electrical resistance cable Type 30 30 m roll Type 65 65 m roll Type 110 110 m roll each with included two-pin plug	
Knauf Flexkleber Multi Cement-based, synthetically-enhanced, flexible and quick-setting thin-bed, middle-bed and pourable bed adhesive. Used for laying, e.g. ceramic floor coverings, stoneware, cotta, non-translucent natural stone as well as for laying uncalibrated and large format floor tiles.	By hand	Tile format, trowel notch size, consumption, see page 97	Bag: 25 kg	

Further products for flooring

Products from Knauf Bauprodukte

Sealing product area

Knauf Flex-Dicht

Highly-flexible fibre-reinforced sealing materials on a cementitious basis. Also covers subsequently appearing cracks. For sealing areas subject to moisture, rooms with drains in the floor, areas subjected to high changes in temperature (heating floor screeds, balconies, terraces).

Knauf Flächendicht

Ready-to-use solvent-free and bitumen-free emulsion for sealing areas of high humidity (e.g. bathrooms, showers).

Knauf Flächendichtband

For corners and edges. For use in conjunction with Knauf Flex-Dicht or Knauf Flächendicht.

Adhesive mortar area

All Knauf powder adhesives are tested acc. to DIN EN 12004!

Knauf Bau & Fliesenkleber (building and tile adhesive)

Cementitious powder-adhesive for thin-bed application of ceramic tiles, mosaics, and similar. Exceeds C1TE

Knauf Flexkleber extra

Extra strong, highly-flexible thin-bed adhesive in premium quality: 90 percent dust reduced and high yield. Suitable for all common substrates. Also for tile-on-tile. Precision application of large format wall tiles. For all ceramic tiles, porcelain, stoneware, earthenware and non-translucent natural stone. Also perfect for thermally stressed substrates such as underfloor heatings, terraces and balconies. Exceeds C2TE S1 acc. to DIN EN 12004.

Knauf Mittelbettkleber XXL

Flexible, fast thin-bed, middle-bed and pourable bed adhesive. Levelling and adhesive application in a single step. Ideal for large format and uncalibrated floor tiles made of ceramic, stoneware, earthenware, cotto and non-translucent natural stone. Can be set from firm to flowable - for rust-free application. Also perfect for highly stressed and thermally stressed substrates such as underfloor heating, terraces, balconies, steps, etc. Walkable and ready for grouting after just 3 hours. Exceeds C2FE acc. to DIN EN 12004.

Knauf Flexkleber schnell
Quickly loadable thin bed mortars for ceramic coverings and stoneware. Walkable and ready for grouting after 3 hours. Exceeds C2FT S1.

Knauf Marmor- and Granitkleber
White thin-bed mortar for natural stone slabs, marble, glass mosaic and other translucent tiles and slabs. Exceeds C1FT.

Grouting mortar area

Knauf Deco-Flexfuge
Grouting mortar for absorbent ceramic tiles. Joint width 2 to 8 mm.

Knauf Flex-Fugenbreit
Slurry-lile and pourable consistency, self-levelling grout for grouting floors with 5 to 50 mm gap between tiles. For cavity-free grouting. Ideal for irregular joint widths and difficult to clean covering materials.

Knauf Marmor- and Granit-Flexfuge
Flexible, quick-setting special grouting mortar for marble and natural stone coverings with joint gaps from 2 to 15 mm.

Knauf Flexfuge schnell
Flexible, quick setting special grouting mortar for non-absorbent tiles and stoneware. With Knauf pearl effect. Ideal for areas of high humidity, pre-fab floor screed, heating floor screed, gypsum boards, gypsum fibre boards, balconies and terraces. For joint widths from 2 to 15 mm.

F20.de/engl./06.14/RO/D

Knauf Direct
Technical Advisory Service:
e-mail: knauf-direkt@knauf.de

www.knauf.de

Floor Systems

Knauf Gips KG
Am Bahnhof 7,
97346 Iphofen, Germany

Knauf AMF
Ceiling Systems

Knauf Bauprodukte
Professional DIY Solutions

Knauf Dämmstoffe
Insulation materials made of polystyrene solid foam

Knauf Gips
Drywall Systems
Plaster and Façade Systems
Floor Systems

Knauf Insulation
Insulation materials made of glass wool and stone wool

Knauf Integral
Gypsum fibre technology for floors, walls and ceilings

Knauf AQUAPANEL
AQUAPANEL® Cement Board
TecTem®, insulation bulk levellers

Knauf PFT
Machine Technology and Plant Engineering

Knauf riessler
Competence in surfaces

Marbos
Mortar systems for cobblestone paving

Sakret Bausysteme
Dry mortars for new projects and renovations