Floor Systems

F20.de

Technical Brochure 2023-03

Knauf Floor Systems

Construction and Application Technology

Note on English translation / Hinweise zur englischen Fassung

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Introduction

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 screed
- Pre-fab floor screed
- Hollow floors for dry and wet application
- Raised access floors
- Levelling compounds
- Sealing
- Bonding layers, etc.

Flowing screeds are one of the most important components here. The special binding agent properties offer you almost shrinkage-free, high strength screeds: These are the decisive factors for a long and trouble-free service life.

As the manufacturer of the binders required for production, Knauf provides flowing screeds of the highest quality. They comply with the requirements of EN 13813 and bear the CE-mark. The sustainable production process protects the environment and conserves precious resources.

Important content

This technical brochure provides valuable information on the planning and application of:

- Screed constructions with flowing screeds
- Levelling compounds
- Equalization compounds and special screeds

It incorporates more than 40 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:
knauf.de
ausschreibungscenter.de
knauf-integral.de

The complete system for flooring

All Knauf flowing screeds are factory-mixed dry mortars, only requiring mixing with clean water on the building site.

They are flowing screeds on a calcium suplhate basis ($CaS0_4$ basis) and consist of anhydrite, special gypsums, superplasticizing admixtures and aggregates, such as particulate natural anhydrite, limestone or silica sand.

Knauf flowing screeds are subject to continuous and ongoing quality control in the factory as well as in the central laboratory of Knauf Gips KG to ensure their consistent high quality. The certified quality management system stipulates that company-internal quality control procedures and processes are continuously 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 heating floor screed ensures that the properties can be specifically targeted to the application.

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

Knauf flowing screeds feature good characteristics such as:

- Flexural and compressive strength, dimensionally stable during usage
- Ecologically highly recommended
- Suitable for common floor 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 to 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 walkable (short technological pauses)

► **Good to know**
Knauf provides a complete system from sealing right up to levelling and equalization compounds.. The materials required for floor design are presented in the product overviews at the end of this technical brochure.

Screed construction types

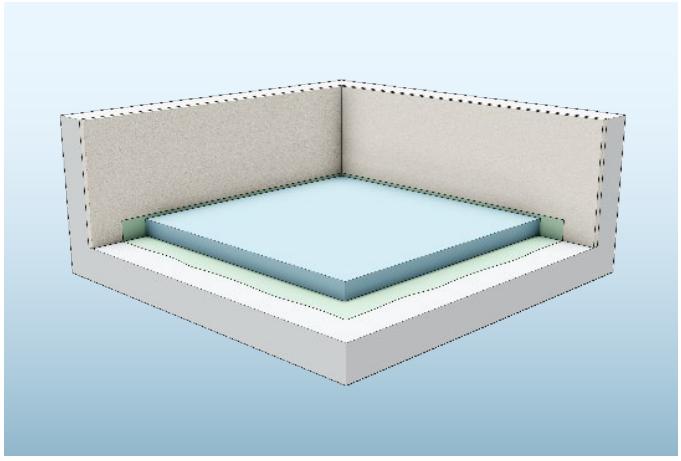
Overview of screed construction types

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

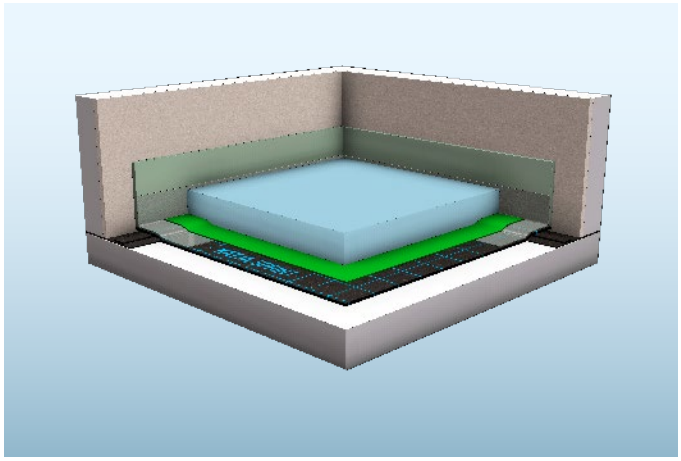
- Bonded screed
- Screed laid on a separating layer
- Screed on an insulating layer / heating floor screed
- Hollow raised access floors

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

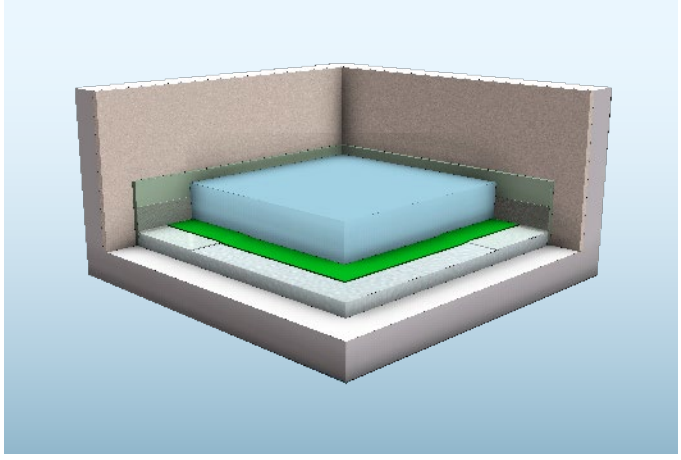
Bonded screed



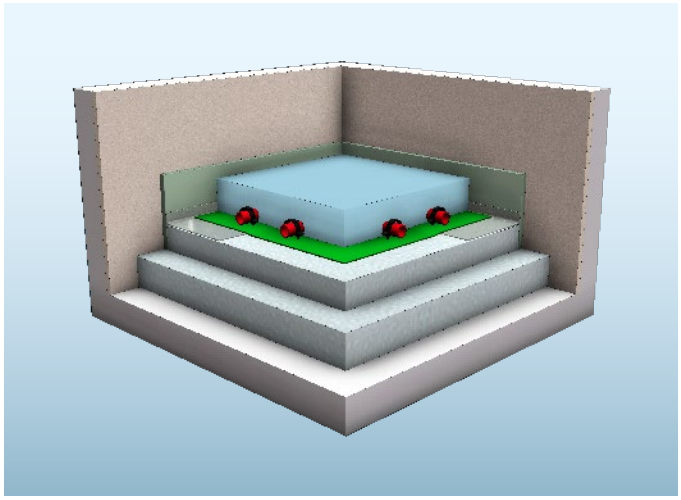
Screed laid on a separating layer



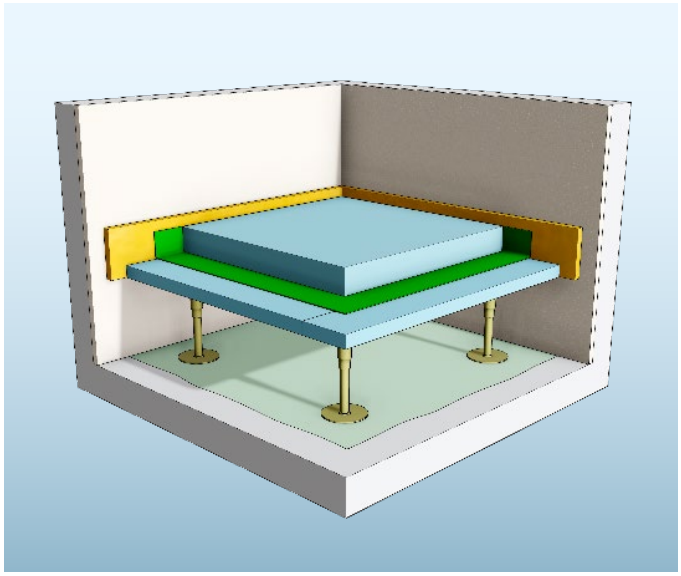
Screed on an insulating layer



Heating floor screed



Raised access floors



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 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 a renovation or an upgrade to a building.

In new buildings, the primary focus is on the comfort relating to footfall insulation, heat 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 loadbearing capacity
- Very uneven substrates
- Short construction time

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, Brio pre-fab floor screed, EPO Leicht as well as N 440 combined with thin layer underfloor heating.

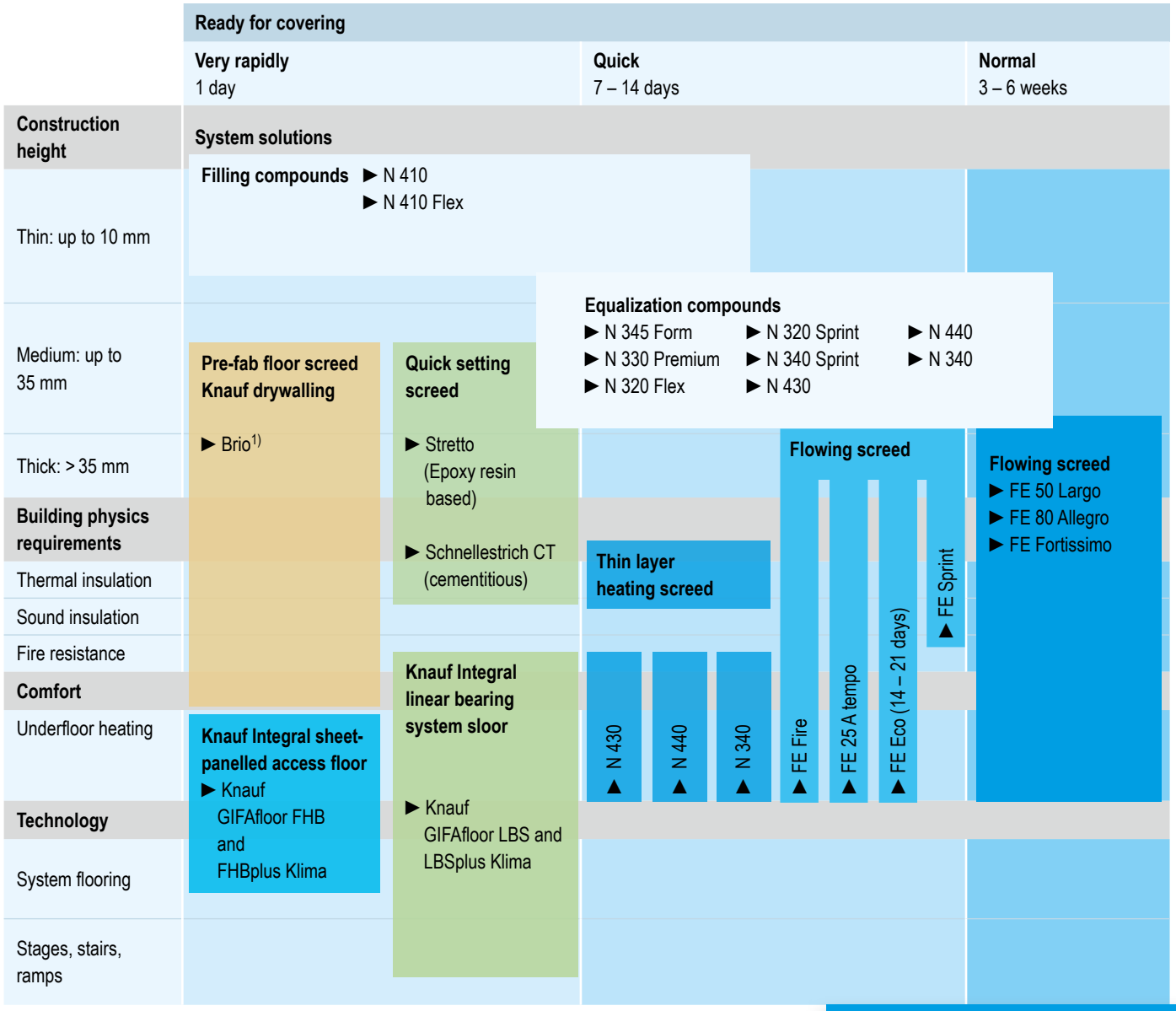
Table 1: Selection of the right Knauf screed system to suit your requirements

Requirement	Bonded screed Page 27	Screed laid on a separating layer Page 29	Screed on an insulating layer Page 32	Heating floor screed Page 38	Raised access floors Page 42	Pre-fab floor screed System data sheet F12.de
Substrate						
Solid ceiling, surface stable	●	●	●	●	●	●
Solid ceiling, surface not stable (e.g. crumbles or oily)	–	●	●	●	●	●
Wood joist ceiling with planks	○	●	●	●	○	●
Wood joist ceiling without planks	–	–	–	–	–	–
Building physics						
Fire resistance	–	●	●	●	●	●
With sealing	●	●	●	●	●	●
Sound insulation	–	–	●	●	●	●
Thermal insulation	–	–	●	●	○	●
Constructional						
Few joints	●	●	●	○	●	●
Installation level	–	–	○	○	●	○
Underfloor heating	●	●	–	●	○	●

● = *The ideal solution*
○ = *Suitable under certain circumstances*
– = *Not suitable*

Selection aid

Table 2: Selection of the right Knauf product to suit your applications



1) See Knauf system data sheet F12.de as well as application brochure F12LD.de

knauf.de

▶ Good to know

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

The rated 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.

The nominal thicknesses for the respective application are specified in dependence on the nominal or minimum thickness in this technical brochure. The designation layer thickness is understood to mean the minimum and/or maximum values.

Building physics

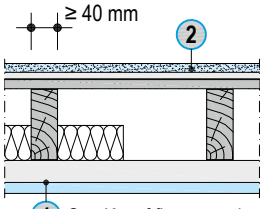
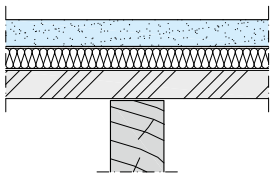
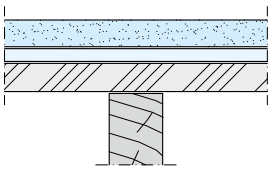
Fire exposure from above

Should fire resistance requirements with fire exposure from above exist for ceilings with a wooden panel ceiling design, they can be implemented with Knauf flowing screed. Depending on the requirements and layer thickness of the screed, an additional layer underneath the screed may be necessary.

Fire resistance acc. to DIN 4102-4

The necessary screed thicknesses for the required fire ratings
as well as the required substrate, if applicable, are shown in Table 3.

Table 3: Flowing screed floor design acc. to DIN 4102-4

 **DIN construction Fire resistance: From below and from above (1) + (2)**	Fire resistance class	(2) Flooring design Screed: Knauf flowing screed	Minimum thickness[1)] mm	Substrate required under screed required for fire resistance: Mineral wool insulation layer (S) Density ≥ 30 kg/m³ Minimum thickness mm	or Gypsum boards Minimum thickness mm
	F30	•	20	15	9.5
or 	F60	•	20	15	9.5

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

Excerpt from DIN 4102-4:2016-05, section 10.7, table 10.11:
Floors with a wood panel design with insulation layer necessary or unnecessary for fire protection.

► Good to know
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.

Fire resistance acc. to abP P-2101/351/18-MPA BS and abP P-2103/206/21-MPA BS with solid ceilings and trapezoid sheet metal ceilings

General notes on fire resistance

The maximum permissible load per unit area with demands on the fire resistance is 2 kN/m^2.

The sequence of the layers as listed in the table as required for fire protection is mandatory.

Layers required for fire protection must be laid tightly jointed.

Fire resistance permissible intermediate layers for screed without underfloor heating

The constructionally necessary separating layer between the screed and the insulation layer, is permissible as a ≥ 0.12 mm thick Knauf Schrenzlage synthetic coated kraft paper or ≥ 0.15 mm thick PE foil fire resistance layer.

Insulation layers

(S) Mineral wool insulation layer acc. to EN 13162
non-combustible
melting point ≥ 1000 °C acc. to DIN 4102-17
(insulating material, e.g. from Knauf Insulation)

Perimeter application

Edge insulation strips: Thickness ≥ 12mm, non-combustible, melting point ≥ 1000 °C (e.g. Knauf edge insulation strips made of mineral wool).

Layers above the base substrate

Standard floor coverings can be applied on screed constructions.

Fire resistance in conjunction with solid ceilings and trapezoid sheet metal ceiling

Table 4: Requirements on basic ceilings of type solid ceilings and trapezoid sheet metal ceilings

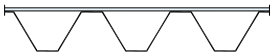
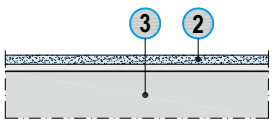
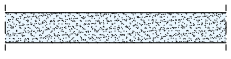
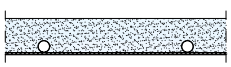
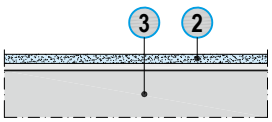
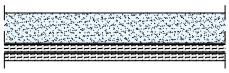
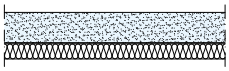
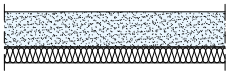
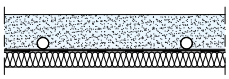
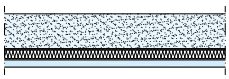
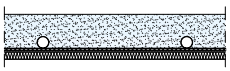
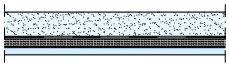
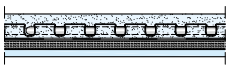
(3) Building type		Description
	Steel trapezoid profile ceiling	Structural rating of the steel trapezoid profile ceiling, with additional, tightly jointed layer between the ceiling and floor construction: Gypsum board GKF: ≥ 12.5 mm **or** Gypsum fibre board: ≥ 10 mm **or** Wooden composite boards: ≥ 16 mm, ρ ≥ 600 kg/m^3 with tongue and groove connection
	Solid ceiling	Normal-weight concrete, compressive strength category C 20/25 to C 50/60 Minimum thickness: F30 or F60 80 mm, F90 100 mm Larger thicknesses may be required for structural reasons.
	Steel girder ceiling	Structural rating of the steel girder Covering: Concrete or similar Minimum thickness of covering: F30 or F60 80 mm, F90 100 mm

Table 5: Floor construction flowing screed acc. to abP P-2101/351/18-MPA BS and abP P-2103/206/21-MPA BS on solid ceilings and trapezoid sheet metal ceilings

 **Fire resistance:** From above	Fire resistance class	(2) Knauf flowing screed floor construction **Screed**	**Required construction underneath screed required for fire resistance** (from above and from below)	
		Minimum thickness[1)] mm	Minimum thickness mm	Type
	F30	40 mm Knauf FE Fire	–	Knauf Schrenzlage
		45 mm Knauf FE Fire with 30 mm tube covering	3	Hollow cavity board[3)]
		32 mm Knauf N 440	–	Knauf Schrenzlage
		32 mm Knauf N 440 with 20 mm foil covering	12	Open laminated dimpled sheet[4)] + Knauf Schrenzlage

1) Greater screed thicknesses may be required for structural reasons.
3) Uponor Twinboard with ≥ 12 cm wall spacing or equivalent.
4) Uponor Minitec with ≥ 12 cm wall spacing or equivalent.

Fire resistance acc. to abP P-2101/351/18-MPA BS and abP P-2103/206/21-MPA BS with solid ceilings and trapezoid sheet metal ceilings (continued)

 **Fire resistance:** From above	Fire resistance class	(2) Knauf flowing screed floor construction		
		Screed Minimum thickness[1] mm	**Required construction underneath screed required for fire resistance** (from above and from below) Minimum thickness mm	Type
	F60	40 mm Knauf FE Fire	20	Knauf Schrenzlage + 2x Knauf Holzfaserdämmplatte WF wood fibre board 10 mm
		40 mm Knauf FE Fire	20	Knauf Schrenzlage + Mineral wool insulation layer (S) Knauf Insulation TPS or equivalent
		45 mm Knauf FE Fire	12	Knauf Schrenzlage + Mineral wool insulation layer (S) Knauf Insulation TPE or equivalent
		45 mm Knauf FE Fire with 30 mm tube covering	12	+ Mineral wool insulation layer (S) Knauf Insulation TPE or equivalent with Klett foil[2]
		32 mm Knauf N 440	10	Knauf Schrenzlage + Knauf Holzfaserdämmplatte WF wood fibre board
		32 mm Knauf N 440 with 20 mm foil covering	12 10	Open laminated dimpled sheet[4] + Knauf Schrenzlage + Knauf Holzfaserdämmplatte WF wood fibre board
	F90	45 mm Knauf FE Fire	12 9.5	Knauf Schrenzlage + Mineral wool insulation layer (S) Knauf Insulation TPE or equivalent + Knauf Wallboard[5]
		45 mm Knauf FE Fire with 30 mm tube covering	12 9.5	Mineral wool insulation layer (S) with Klett foil[2] + Knauf Wallboard[5]
		45 mm Knauf FE Fire with 30 mm tube covering	3 12	Hollow cavity board[3] + Mineral wool insulation layer (S) Knauf Insulation TPE or equivalent
		32 mm Knauf N 440	10 9.5	Knauf Schrenzlage + Knauf Holzfaserdämmplatte WF wood fibre board + Knauf Wallboard[5]
		32 mm Knauf N 440 with 20 mm foil covering	12 10 9.5	Open laminated dimpled sheet[4] + Knauf Schrenzlage + Knauf Holzfaserdämmplatte WF wood fibre board + Knauf Wallboard[5]

1) Greater screed thicknesses may be required for structural reasons.
2) e.g. 30 mm Uponor Klett Panel Silent
3) Uponor Twinboard with ≥ 12 cm wall spacing or equivalent
4) Uponor Minitec with ≥ 12 cm wall spacing or equivalent
5) Fill joints with Knauf Fugenspachtel or equivalent.

Fire resistance acc. to abP P-2101/351/18-MPA BS and abP P-2103/206/21-MPA BS on wood joist ceiling

Fire resistance in conjunction with wood joist ceiling

Table 6: Requirements on basic ceilings of type wood joist ceiling

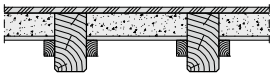
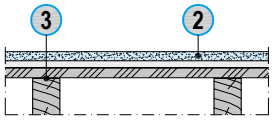
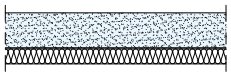
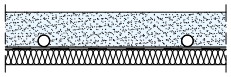
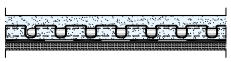
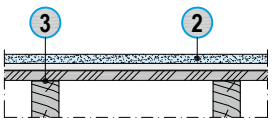
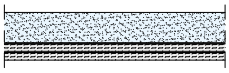
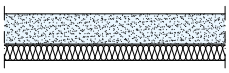
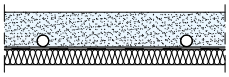
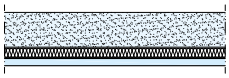
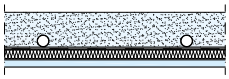
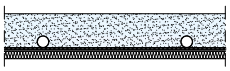
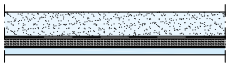
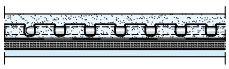
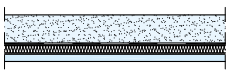
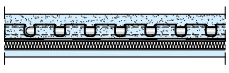
③ Building type		Description
	Wood joist ceiling Without sound boarding	**Sheathing** Wooden composite boards: ≥ 16 mm, ρ ≥ 600 kg/m³ or **Floorboards** ≥ 21 mm with tongue and groove **Joists** Width ≥ 40 mm, spacing ≤ 950 mm (strength class C24 acc. to DIN EN 338, sorting class S10 acc. to DIN 4074-1)
	Wood joist ceiling with sound boarding	

Table 7: Floor construction flowing screed acc. to abP P-2101/351/18-MPA BS and abP P-2103/206/21-MPA BS on wood joist ceilings

 **Fire resistance:** From above	Fire resistance class	② Knauf flowing screed floor construction		
		Screed	**Required construction underneath screed required for fire resistance** (from above and from below)	
		Minimum thickness[1] mm	Minimum thickness mm	Type
	F30	40 mm Knauf FE Fire	–	Knauf Schrenzlage
		45 mm Knauf FE Fire with 30 mm tube covering	3	Hollow cavity board[3]
		32 mm Knauf N 440	–	Knauf Schrenzlage
		32 mm Knauf N 440 with 20 mm foil covering	12	Open laminated dimpled sheet[4] + Knauf Schrenzlage
	F60	45 mm Knauf FE Fire	12	Knauf Schrenzlage + Mineral wool insulation layer Ⓢ Knauf Insulation TPE or equivalent
		45 mm Knauf FE Fire with 30 mm tube covering	12	+ Mineral wool insulation layer Ⓢ Knauf Insulation TPE or equivalent with Klett foil[2]
		32 mm Knauf N 440	10	Knauf Schrenzlage + Knauf Holzfaserdämmplatte WF wood fibre board
		32 mm Knauf N 440 with 20 mm foil covering	12 10	Open laminated dimpled sheet[4] + Knauf Schrenzlage + Knauf Holzfaserdämmplatte WF wood fibre board

1) Greater screed thicknesses may be required for structural reasons.
2) e.g. 30 mm Uponor Klett Panel Silent
3) Uponor Twinboard with ≥ 12 cm wall spacing or equivalent
4) Uponor Minitec with ≥ 12 cm wall spacing or equivalent

Fire resistance acc. to abP P-2101/351/18-MPA BS and abP P-2103/206/21-MPA BS on wood joist ceiling (continued)

 **Fire resistance:** From above	Fire resistance class	② Knauf flowing screed floor construction		
		Screed Minimum thickness[1] mm	**Required construction underneath screed required for fire resistance** (from above and from below) Minimum thickness mm	Type
	F90	40 mm Knauf FE Fire	20	Knauf Schrenzlage + 2x Knauf Holzfaserdämmplatte WF wood fibre board 10 mm
		40 mm Knauf FE Fire	20	Knauf Schrenzlage + Mineral wool insulation layer (S) Knauf Insulation TPS or equivalent
		45 mm Knauf FE Fire with 30 mm tube covering	20	+ Mineral wool insulation layer (S) Knauf Insulation TPE or equivalent with Klett foil[2]
		45 mm Knauf FE Fire	12 9.5	Knauf Schrenzlage + Mineral wool insulation layer (S) Knauf Insulation TPE or equivalent + Knauf Wallboard[5]
		45 mm Knauf FE Fire with 30 mm tube covering	12 9.5	Mineral wool insulation layer (S) Knauf Insulation TPE or equivalent with Klett foil[2] + Knauf wallboard[5]
		45 mm Knauf FE Fire with 30 mm tube covering	3 12	Hollow cavity board[3] + Mineral wool insulation layer (S) Knauf Insulation TPE or equivalent
		32 mm Knauf N 440	10 9.5	Knauf Schrenzlage + Knauf Holzfaserdämmplatte WF wood fibre insulation board + Knauf wallboard[5]
		32 mm Knauf N 440 with 20 mm foil covering	12 10 9.5	Open laminated dimpled sheet[4] + Knauf Schrenzlage + Knauf Holzfaserdämmplatte WF wood fibre board + Knauf wallboard[5]
		37 mm Knauf N 440	12 9.5	Knauf Schrenzlage + Mineral wool insulation layer (S) Knauf Insulation TP-GP or equivalent + Knauf wallboard[5]
		37 mm Knauf N 440 with 20 mm foil covering	12 12 9.5	Open laminated dimpled sheet[4] + Knauf Schrenzlage + Mineral wool insulation layer (S) Knauf Insulation TP-GP or equivalent + Knauf wallboard[5]

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

2) e.g. 30 mm Uponor Klett Panel Silent

3) Uponor Twinboard with ≥ 12 cm wall spacing or equivalent

4) Uponor Minitec with ≥ 12 cm wall spacing or equivalent.

5) Fill joints with Knauf Fugenspachtel or equivalent.

If the weight per unit area of the floor constructions listed above is increased, the maximum permissible load per unit area (2 kN/m²) in case of fire for wood joist ceilings is reduced by this amount.

Requirements and terms

New demands were introduced for sound insulation with the publication of the German DIN 4109:2018-01 standard. The validity of the DIN 4109:2018-01 is limited to German states who have enacted the Model Administrative Provisions – Technical Building Rules (MVV TB) into their state legislation. It is expected that the remaining German states will enact the legislation soon. Until the MVV-TB has been enacted into the respective state building codes for these Federal states, the DIN 4109:1989 will continue to apply.

In the following, the specifications from the DIN 4109:2018-01 are used. As it is only possible to offer a brief overview here, we will refer you to our technical brochures for further information.

- Sound insulation with Knauf, requirements on the constructional components, SS02.de
- Sound insulation with Knauf, calculations and input data for calculation, SS03.de

Airborne sound insulation

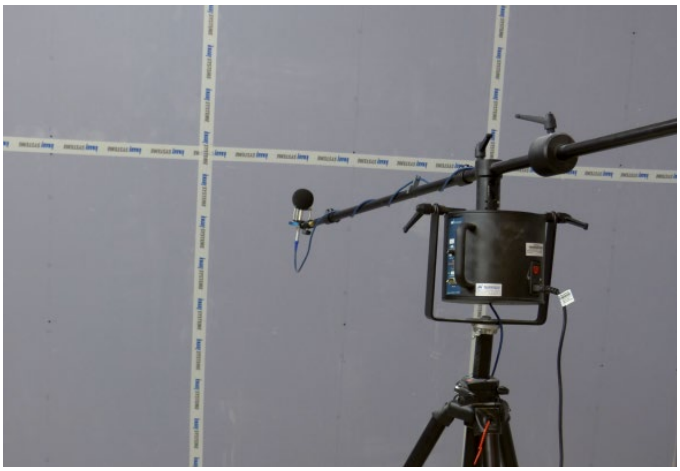


Figure 1: Airborne sound measurement

The sound insulation proof for the airborne sound insulation acc. to DIN 4109:2018-01 applies different calculation models to suit the construction method:

- Solid construction
- Building with double leaf party wall (building party wall)
- Timber, lightweight and drywall constructions
- Structural framing and combined construction methods

Thirteen different transmission paths must be taken into consideration. It is not possible to illustrate that more clearly here due to the complexity of the proof.

Impact sound insulation

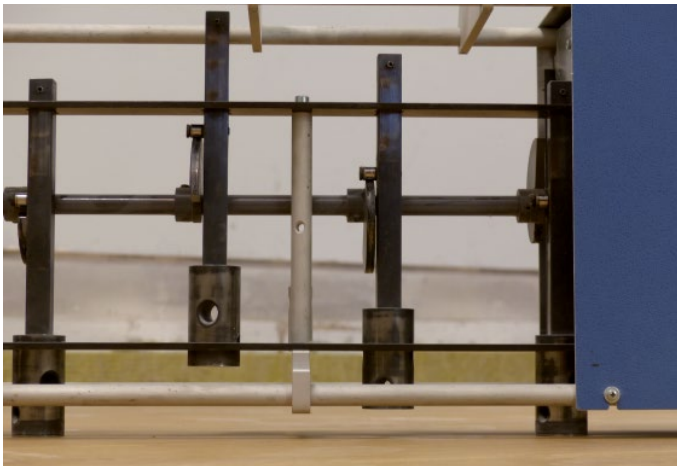


Figure 2: Test of the impact sound insulation of solid ceilings

Terms

$L_{n,eq,0,w}$ Equivalent weighted normalized impact sound level of a basic ceiling in dB

$L_{n,w}$ Weighted normalized impact sound pressure level in dB without flanking transmission

$L'_{n,w}$ Weighted normalized impact sound level in dB incl. flanking transmission
$L'_{n,w} = L_{n,eq,0,w} - \Delta L_w + K$

req. $L'_{n,w}$ Required weighted normalized impact sound level in dB
req. $L'_{n,w} \geq L'_{n,w} + 3$ dB

ΔL_w Weighted impact sound improvement index of the ceiling covering in dB

K The correction factor for the footfall sound transmission via the flanking constructional components in dB

R'_w Weighted apparent sound reduction index in dB

req. R'_w Required weighted apparent sound reduction index in dB

Solid ceilings

The weighted normalized impact sound level on buildings $L'_{n,w}$ with solid ceilings can be calculated as a solid basic wall from the equivalent weighted normalized impact sound level $L_{n,eq,0,w}$ of the basic ceiling and the weighted impact sound improvement index ΔL_w through a ceiling covering (floating screed).

Rooms located over each other are calculated using the following formula:

$L'_{n,w} = L_{n,eq,0,w} - \Delta L_w + K$

$L_{n,eq,0,w}$ results from the mass per unit area m´ in kg/m² of the solid ceiling and

$L_{n,eq,0,w} = 164 - 35 \lg(m')$

is the formula to calculate it.

The weighted impact sound reduction ΔL_w can be calculated with the formula

$\Delta L_w = 13 \lg(m') - 14{,}2 \lg(s') + 20{,}8$

where s' dynamic stiffness of the impact noise layer in MN/m³ (see Table 8 on page 18) determined by calculation or testing of the observed floor construction on a ceiling test stand.

The correction factor K takes the influence of the flanking transmission into consideration on whether the rooms are located above or below one another, and whether a suspended ceiling is or is not available.

The calculated proof that the impact sound level is observed results from the consideration of a safety factor (forecast uncertainty) of 3 dB:

$L'_{n,w} + 3$ dB ≤ req. $L'_{n,w}$

Wood joist ceilings

Separate consideration of ceiling and ceiling covering as is the case with solid ceilings acc. to DIN 4109 is not possible. The weighted normalized impact sound pressure level in the installed state is determined from

$L'_{n,w} = L_{n,w} + K_1 + K_2 + u_{prog}$

$L_{n,w}$ results from the tables in DIN 4109-33, 4.3 or from measurements. K_1 and K_2 are correction factors, which consider the influence of flanking transmission and u_{prog} is a safety factor of 3 dB.

With the wood joist ceiling there is also a calculated proof that the impact sound level is observed with:

$L'_{n,w} + 3$ dB ≤ req. $L'_{n,w}$

Note	For further information, see “Schallschutz und Raumakustik mit Knauf“ *Sound insulation and room acoustics with Knauf (partly German only).*

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 34).

Table 8: Suitable insulation materials (impact sound protection) for floating screeds, e.g. Knauf Insulation and EPS in general (selected)

Stiffness group s' MN/m³	**Material**	**Name**	**Insulation thickness and compressibility (d_L - c)** mm
70	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TP-GP[1)]	12 – 1
50	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TP-GP[1)]	20 – 1
40	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TPE[1)]	12 – 2
30	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TP[1)]	13 – 3
		Knauf Insulation Trittschall-Dämmplatte TPE[1)]	20 – 2; 25 – 2
	EPS	Trittschalldämmplatte 045 DES sm	15 – 2
		Trittschalldämmplatte 040 DES sg	20 – 2
25	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TP[1)]	15 – 5
		Knauf Insulation Trittschall-Dämmplatte TPS[1)]	20 – 3
		Knauf Insulation Trittschall-Dämmplatte TPE[1)]	30 – 2
20	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TP[1)]	20 – 5
		Knauf Insulation Trittschall-Dämmplatte TPS[1)]	30 – 3; 35 – 3; 40 – 3
		Knauf Insulation Trittschall-Dämmplatte TPE[1)]	40 – 2
	EPS	Trittschalldämmplatte 045 DES sm	20 – 2
		Trittschalldämmplatte 040 DES sg	30 – 2
15	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TP[1)]	25 – 5; 30 – 5; 35 – 5
		Knauf Insulation Trittschall-Dämmplatte TPS[1)]	50 – 3
	EPS	Trittschalldämmplatte 045 DES sm	30 – 3
		Trittschalldämmplatte 040 DES sg	50 – 2
12	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TP[1)]	40 – 5; 45 – 5; 50 – 5
10	EPS	Trittschalldämmplatte 045 DES sm	40 – 3
16	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TPT01	15 – 5
12	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TPT03	20 – 3
10	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TPT01	20 – 5; 25 – 5
9	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TPT03	30 – 3
8	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TPT01	30 – 5
7	Mineral wool	Knauf Insulation Trittschall-Dämmplatte TPT01	35 – 5; 40 – 5

1) Knauf Insulation GmbH

Requirements for airborne and impact sound insulation

Table 9: Requirements for airborne and impact sound insulation of ceiling constructions to DIN 4109:2018-01, Tab. 2 (extract)

Requirement	Weighted apparent sound reduction index R'_w in dB	Weighted normalized impact sound level incl. flanking transmission $L'_{n,w}$ in dB
Apartment buildings, office buildings and mixed-use buildings		
Ceilings under generally usable floors beneath attics	≥ 53	≤ 52
Apartment separation ceilings (incl. stairways)	≥ 54	≤ 50[1) 2)]
Floors above cellars, halls	≥ 52	≤ 50
Ceilings below/above playrooms or similar common rooms	≥ 55	≤ 46
Ceilings under hallways	–	≤ 50
Ceilings under bathrooms and WCs with/without floor drains	≥ 54	≤ 53
Hotels and overnight accommodation		
Ceilings, including ceilings under corridors	≥ 54	≤ 50
Ceilings below/above common rooms	≥ 55	≤ 46
Ceilings under bathrooms and WCs with/without floor drains	≥ 54	≤ 53
Hospitals and sanatoria		
Ceilings, including ceilings under corridors	≥ 54	≤ 53
Ceilings below/above common rooms	≥ 55	≤ 46
Ceilings under bathrooms and WCs with/without floor drains	≥ 54	≤ 53
Schools and buildings with comparable usage		
Floors between classrooms or similar rooms	≥ 55	≤ 53
Ceilings between classrooms and “noisy rooms”	≥ 55	≤ 46

1) In case of changes to an existing structure where construction was completed before 1 July 2016, the requirement is $L'_{n,w} \leq 53$ dB

2) In new construction of buildings with ceiling constructions, the DIN 4109-33:2016-07, Sound insulation in buildings - part 33: Data for the calculated proof of the sound insulation (component catalogue) that can be attributed to timber construction, lightweight construction or drywalling, the requirement for $L'_{n,w} \leq 53$ dB

NOTE At the current time it is not possible to certify a required value $L'_{n,w} \leq 50$ dB for all common ceiling constructions. Until suitable solutions are available as part of a planned revision of DIN 4109-33, the requirement stated in footnote 2) applies.

Table 10: Recommended sound insulation values of the class of sound insulation between rooms (SSt) in apartment houses acc. to VDI 4100:2012

Sound insulation criteria		Characteristic acoustical parameter	SSt I	SSt II	SSt III
Airborne noise protection	–	$D_{nT,w}$ in dB	≥ 56	≥ 59	≥ 64
Airborne noise protection	Staircase partition wall with a door	$D_{nT,w}$ in dB	≥ 45	≥ 50	≥ 55
Impact sound insulation	Vertical, horizontal or diagonal	$L'_{nT,w}$ in dB	≤ 51	≤ 44	≤ 37

Table 11: Recommended sound insulation between rooms (SSt) for dwellings in one-family terrace houses and one-family semi-detached houses acc. to VDI 4100:2012

Sound insulation criteria		Characteristic acoustical parameter	SSt I	SSt II	SSt III
Airborne noise protection	–	$D_{nT,w}$ in dB	≥ 65	≥ 69	≥ 73
Impact sound insulation	Horizontal or diagonal	$L'_{nT,w}$ in dB	≤ 46	≤ 39	≤ 32

$D_{nT,w}$ = weighted standardized level difference acc. to VDI 4100:2012

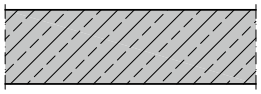
$L'_{nT,w}$ = weighted standardized impact sound pressure level acc. to VDI 4100:2012

Tested constructions

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

The impact sound reduction ΔL_w of the illustrated floor constructions with Knauf flowing screeds are results from the suitability tests, carried out by an independent test institute or in the acoustical test laboratory at Knauf. The values can be used for proof of the impact sound insulation to DIN 4109.

Test set-up



Flooring construction	See representations in figures 3 to 7
Basic ceiling	Reinforced concrete ceiling 140 mm approx. 320 kg/m² (standard reference floor)

Knauf flowing screed on an insulating layer

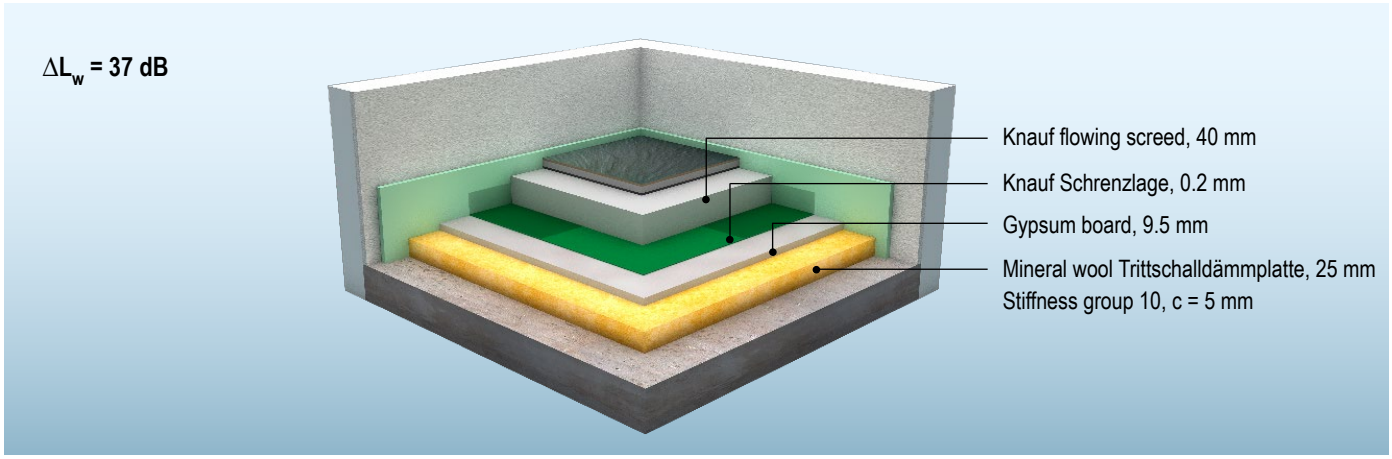


Figure 3: Flowing screed on 9.5 mm gypsum board and 25 mm mineral wool footfall sound insulation panel

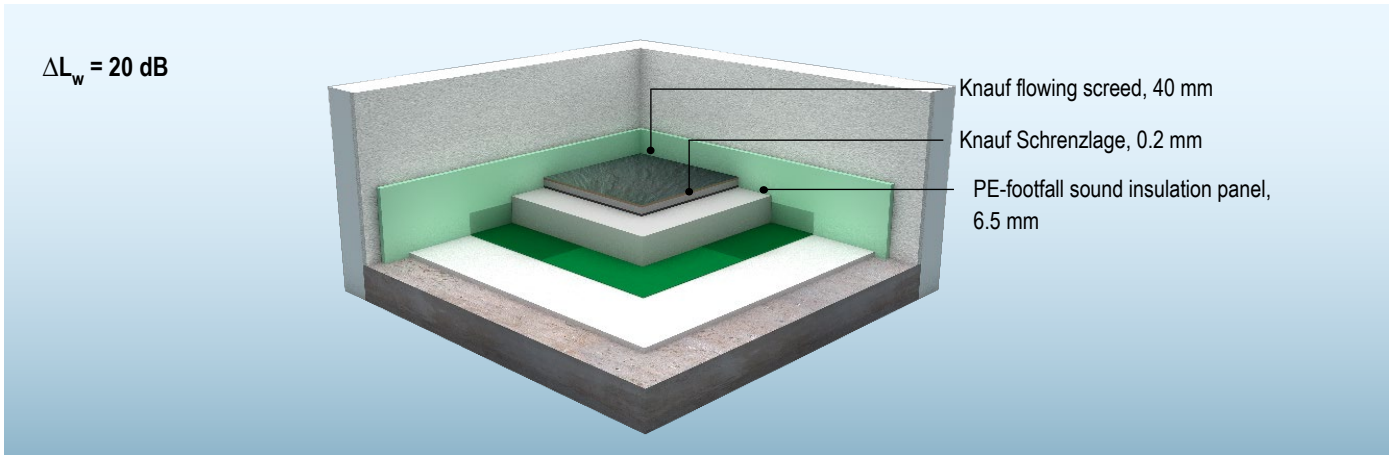


Figure 4: Flowing screed on 6.5 mm PE-footfall sound insulation panel

Knauf flowing screed as heated screed type A

ΔL_w = 29 dB

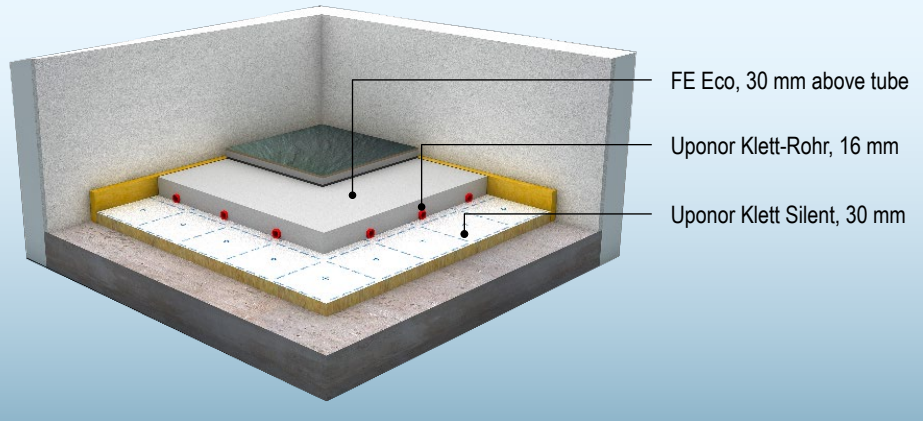


Figure 5: Heated floor screed with underfloor heating Uponor Klett Silent

ΔL_w = 30 dB

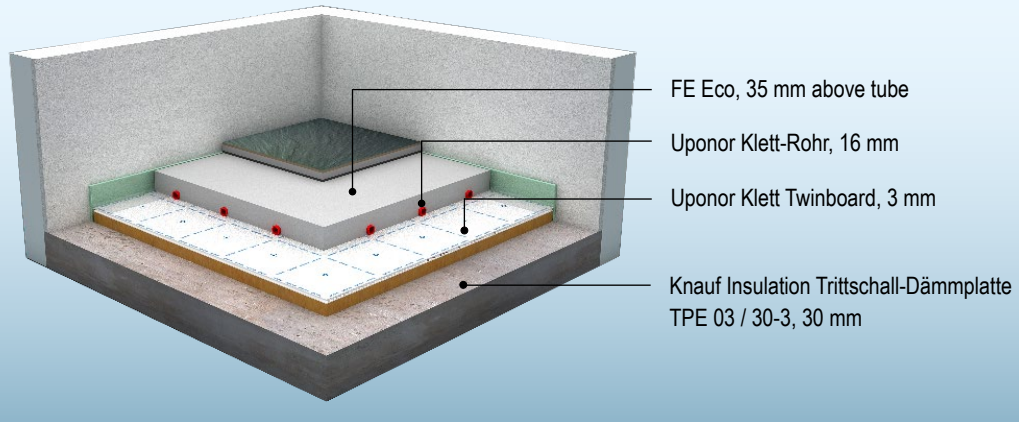


Figure 6: Heated floor screed with underfloor heating Uponor Klett Twinboard

ΔL_w = 28 dB

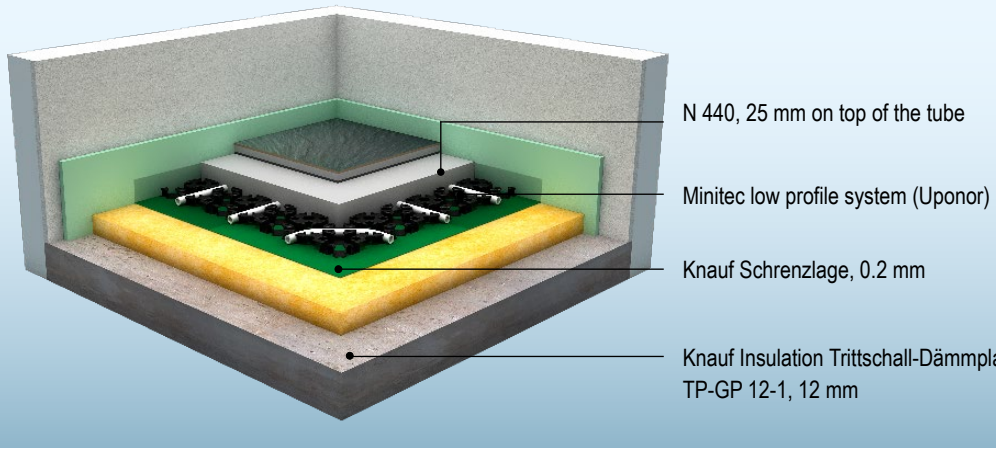


Figure 7: Thin layer heated floor screed with underfloor heating Minitec low profile system (Uponor)

Tested constructions (continued)

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

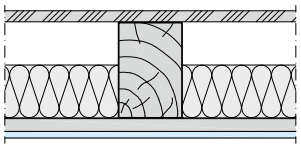
The impact sound reduction characteristics of the presented floor constructions can be used for the calculation of the prognosis values of the impact sound insulation of wood joist ceilings. The footfall sound insulation can be significantly improved with the extra weight of the ceiling when using Knauf Schwere Schüttung heavy-duty acoustic infill. The additional weight has to be considered in the structural calculations. Sound insulation values for complete ceiling structures (wood joist ceilings) of different ceiling structures are included in DIN 4109-33:2016-07.

Note For further information refer to the system data sheet Knauf Wood Joist Ceiling Systems, D15.de.

Knauf flowing screed on an insulating layer

Wood joist ceiling type B with suspended ceiling D151.de with Knauf gypsum board

Test set-up



Flooring construction	See Figure 8 and Figure 9
Chipboard	22 mm
Wooden joists	120 x 180 mm
Insulation between the joists	100 mm mineral wool EN 13162 density = 18 kg/m³
Type of grid	Timber batten 24 x 50 mm, axial spacing b = 500 mm
Cladding	12.5 mm gypsum board

$L_{n,w}$ = 49 dB

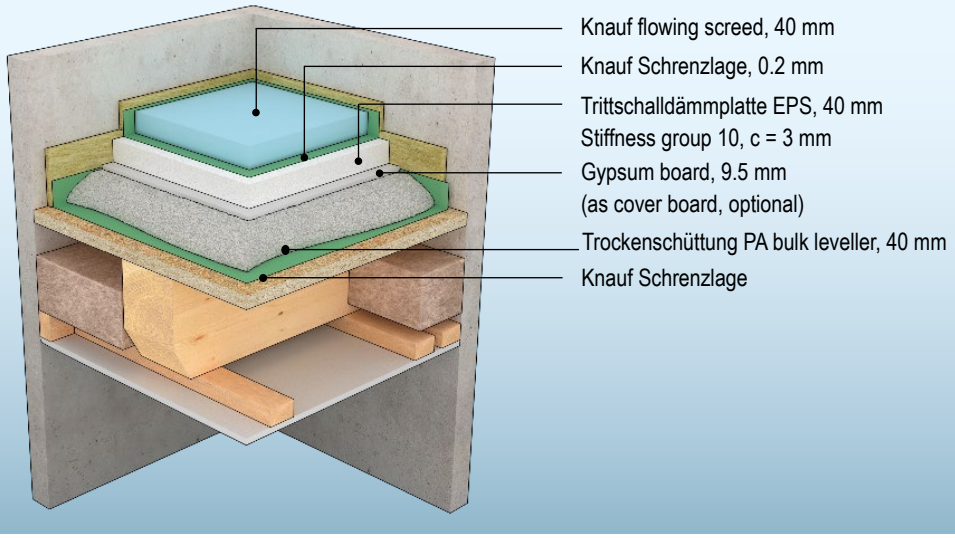


Figure 8: Flowing screed on 40 mm EPS footfall sound insulation panel and 9.5 mm gypsum board (as cover board, optional) as well as 40 mm Trockenschüttung PA dry bulk leveller

$L_{n,w}$ = 53 dB

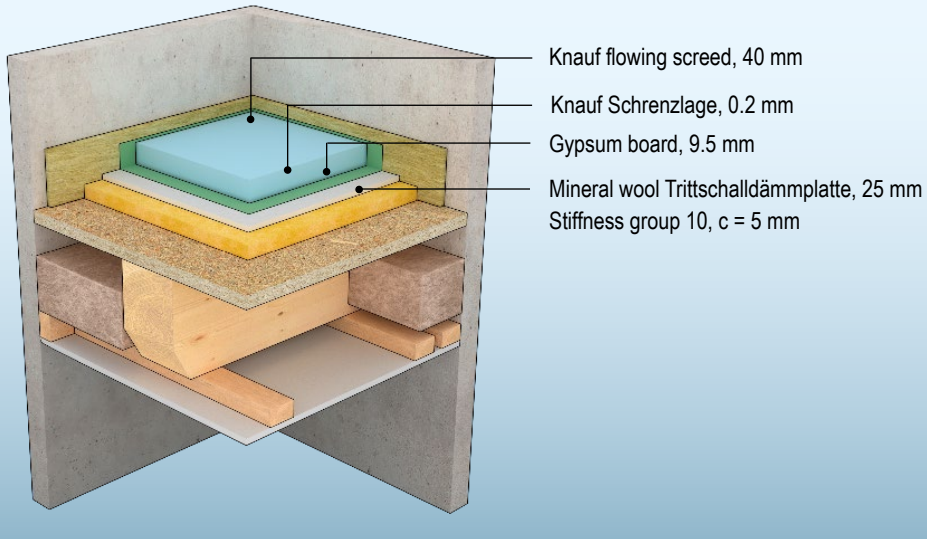
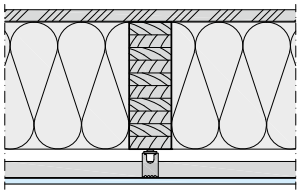


Figure 9: Flowing screed on 9.5 mm gypsum board and 25 mm mineral wool footfall sound insulation panel

Knauf flowing screed as heated screed on Schwere Schüttung heavy-duty acoustic infill

Wood joist ceiling type A with suspended ceiling D152.de with Silentboard

Test set-up



Flooring construction	See Figure 10 and Figure 11
Chipboard	22 mm
Wooden joists	80 x 240 mm, axial spacing 625 mm
Insulation between the joists	240 mm (Knauf Insulation UNIFIT TI 135U)
Suspender / type of grid	Damping Universal Bracket with wood joist 30 x 50 mm Axial spacing b = 400 mm
Suspension height	approx. 55 mm
Cladding	12.5 mm Silentboard

Without Schwere Schüttung heavy-duty acoustic infill
$L_{n,w}$ = 46 dB

With 30 mm Schwere Schüttung heavy-duty acoustic infill
$L_{n,w}$ = 38 dB

With 60 mm Schwere Schüttung heavy-duty acoustic infill
$L_{n,w}$ = 34 dB

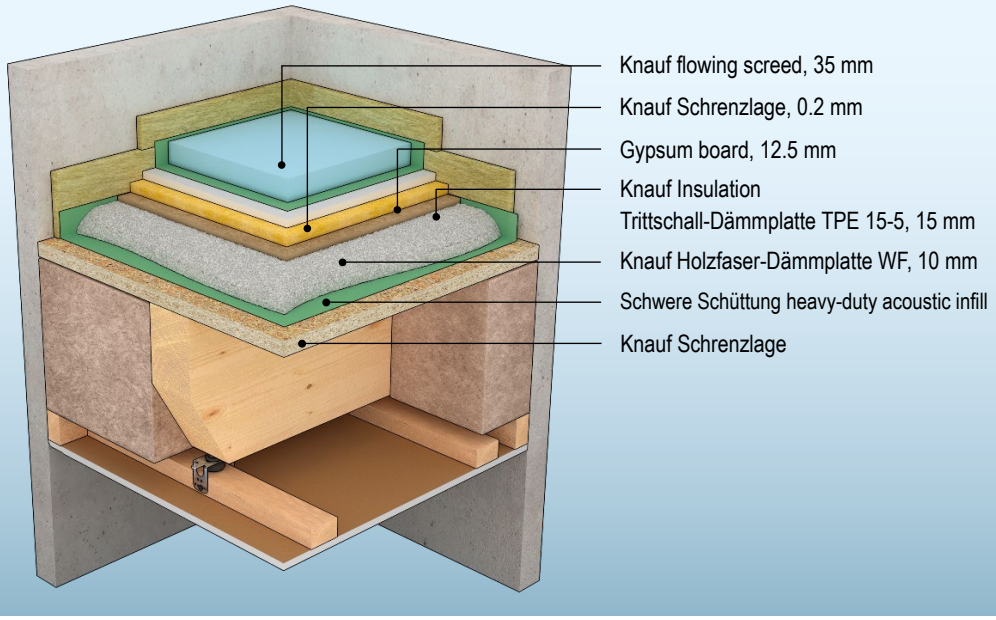


Figure 10: Flowing screed on 12.5 mm gypsum board, 15 mm Trittschall-Dämmplatte TP 15-5, 10 mm Holzfaserdämmplatte WF and Schwere Schüttung heavy-duty acoustic infill

With 30 mm Schwere Schüttung heavy-duty acoustic infill
$L_{n,w}$ = 40 dB

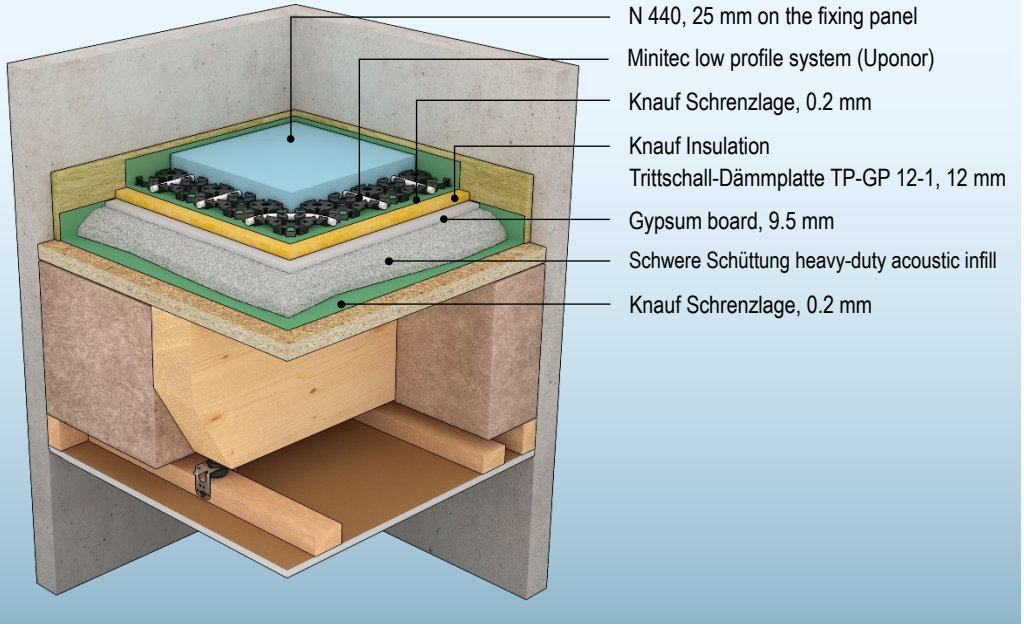


Figure 11: Thin layer heating screed on 15 mm Trittschall-Dämmplatte TP-GP 12-1, 9.5 mm gypsum board and Schwere Schüttung heavy-duty acoustic infill

Requirements according to the German energy saving ordinance (GEG)

On 1 November 2020, the German energy saving ordinance (GEG 2020) replaced the following regulations: the Energy Saving Ordinance (ENEV 2014/ from 2016), the Energy Saving Act (EnEG 2013) and the Renewable Energies Heat Act (EEWärmeG 2011).

The purpose of the GEG is to ensure the most economical use of energy in buildings, including the increasing use of renewable energies for the generation of heat, cooling and electricity for the operation of buildings, with regard to the interests of climate protection, the conservation of fossil resources and the reduction of dependence on energy imports.

Compliance with these legal requirements is essentially the responsibility of the builder or owner and, for their sphere of activity, the persons who act on behalf of the owner or builder when constructing or remodelling buildings or the systems engineering in buildings.

For new buildings, there is a requirement that they must be constructed as low-energy buildings. For residential buildings, the annual primary energy demand must not exceed factor 0.75 and the transmission heat loss must not exceed factor 1.0 times that of a corresponding reference building.

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 $U \leq 0.50$ W/(m^2·K) 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. the GEG 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.

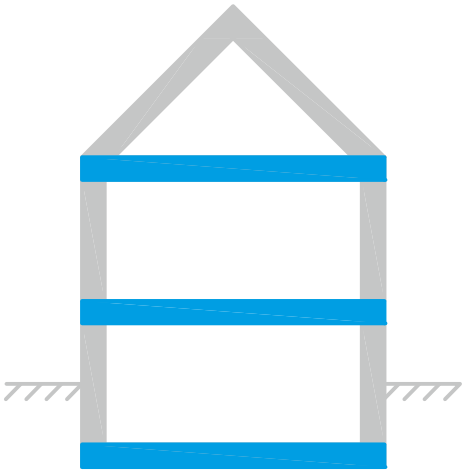


Table 12: Highest values of the heat transfer coefficient with modernization measures

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/(m^2·K)	0.35 W/(m^2·K)
Ceilings that border unheated rooms or the soil	0.30 W/(m^2·K)	No requirement
Floor structures	0.50 W/(m^2·K)	No requirement
Ceilings, that border rooms below against outdoor air	0.24 W/(m^2·K)	0.35 W/(m^2·K)

Rating of thermal insulation

Calculation procedure

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

R_{si} Thermal transfer resistance internal

R_{se} Thermal resistance external (W/(m²·K))

d 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 transfer 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.

Example calculation - ceiling above unheated cellar

Determination of the necessary insulation material thickness to achieve the required heat transfer coefficient (U value) acc. to the GEG 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 from existing $R = \frac{1}{U}$
  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:

$$\text{erf } R = \frac{1}{U} = \frac{1}{0{,}50} = 2{,}00 \ \frac{m^2 \cdot K}{W}$$

- Required thermal resistance R_D of the insulation layer for improvement of the required thermal transmission resistance:

$$\text{erf } R = \text{erf } R - \text{vorh } R = 2{,}00 - 0{,}47 = 1{,}53 \ \frac{m^2 \cdot K}{W}$$

- Required insulation thickness req. d_D (WLG 035)
  req $d_D = \lambda_{RD} \cdot$ req $R_D = 0.035 \cdot 1.53 = 0.054$ m

Table 13: Calculation of the existing thermal resistance

Floor and ceiling construction (from above and from below) **Material**	**Layer thickness** **d_n in m**	**Thermal conductivity** **λ_R in W/(m·K)**	**Thermal resistance** $R_n = \left(\frac{d_n}{\lambda_{R,n}}\right)$ in $\frac{m^2 \cdot K}{W}$
Thermal transfer interior 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 transfer interior R_{si}	–	–	0.17
Thermal transmission resistance previously	$R = \frac{1}{U}$		**0.47**

► **Calculation check**

Selected insulation material EPS DES 035, 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 ceiling with insulation material

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

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

Screed systems

Flowing screed system bonded screed

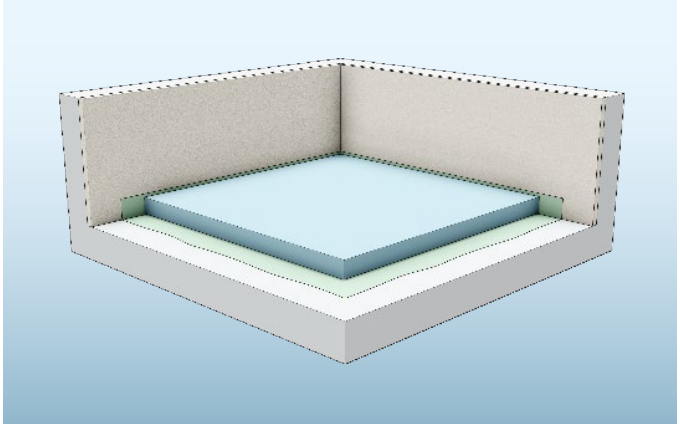


Figure 12: Floor construction bonded screed

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/imposed 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 foundation permits it (see Table 14). The surface of the screed must be protected by a covering against a compressive load that is too high as well as 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 may require a fine smoothing 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 Estrichgrund screed primer (diluted 1:1 with water) or prime with one or two coats of 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 Spezialhaftgrund bonding primer or 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.

Figure 13: Apply Estrichgrund screed primer

Sealing

For constructional components coming in contact with the soil, a minimum ground moisture acc. to DIN 18533-1 must be assumed. If necessary, 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 FE Sealing Shield, which simultaneously represents a fully adequate bonding bridge between the screed and concrete substrate (see “FE-Abdichtung sealing shield” on page 53).

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.

► 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 Stretto or Schnellestrich CT. However, divergent measures are required for substrate preparation with Stretto, see page 101 ff.

Substrate for bonded screed

Table 14: Substrate for bonded screed

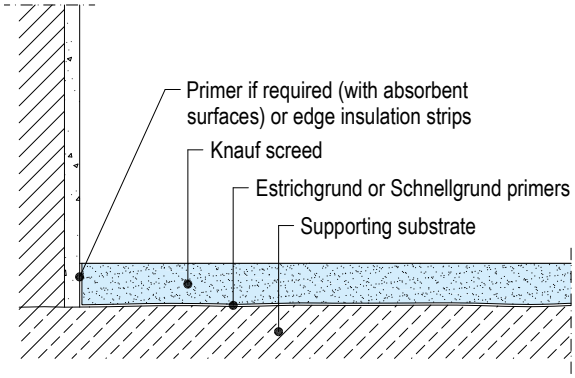
Construction design	Nominal screed thickness in mm for Knauf screeds								
	FE Sprint	FE 50 Largo	FE 80 Allegro	FE 25 A tempo	FE Fortissimo	N 340	N 440	Schnell-estrich CT	Stretto
Bonded screed	25[1)]	25[1)]	25[1)]	25[1)]	25[1)]	10	15	25	15

1) 20 mm also possible with smaller surfaces

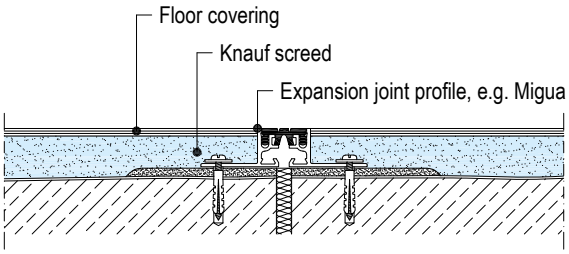
Details

Scale 1:5

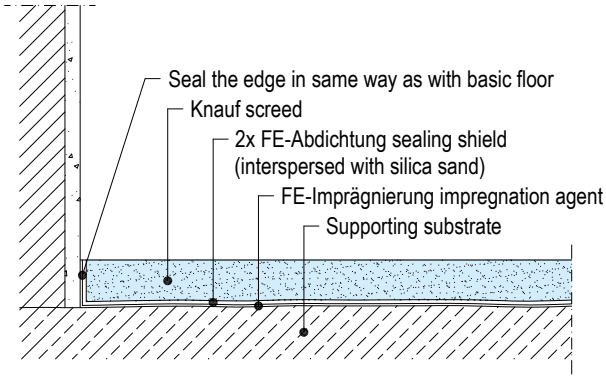
F211.de-V1 Edge design



F211.de-V2 Joint application



F211.de-V3 Bonded seal with soil contacting areas



Flowing screed systems on separating layer

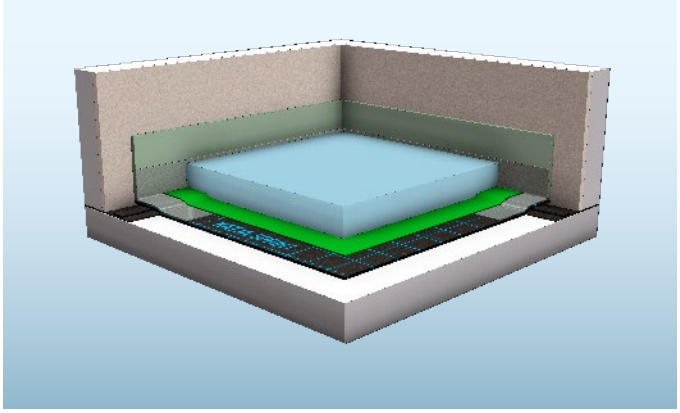


Figure 14: Floor construction screed on a separating layer

Construction and application

Screeds on a separating layer are separated from the supporting substrate by thin intermediate layers (Schrenzlage synthetic coated kraft paper 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 Table 15 on page 30. The screed thickness shall also be selected at a higher 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

- If 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 synthetic coated kraft paper).
- 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 ≥ 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.

Sealing

Sealing membrane Katja Sprint can be used as sealing against ground moisture acc. to DIN 18533-1, see also page 54 ff.

Screed slab

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

Figure 15: separating layer

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. Schrenzlage synthetic coated kraft paper 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.

► 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 Stretto or Schnellestrich CT.

Areas of application for screed on a separating layer

Table 15: Usage/application areas of screed on separating layer

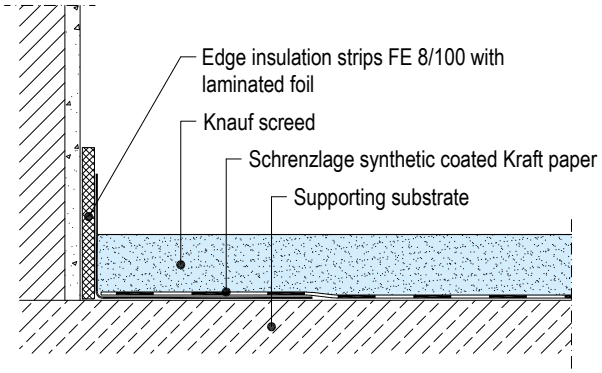
Usages and application areas	**Imposed loads** Acc. to DIN 18560-4 and EN 1991-1-1/NA		**Nominal screed thickness in mm for**					
			FE Fire FE Sprint FE 50 Largo	FE 80 Allegro FE 25 A tempo	FE Fortissimo	N 440	Quick setting screed CT	Stretto
	Area load	**Single load**	**Strength class to DIN 18560**					
	kN/m²	kN	CAF-C30-F5 alt. CAF-C25-F5	CAF-C30-F6	CAF-C35-F7	CAF-C25-F6	CT-C30-F5	SR-B2,0-C25-F7
Rooms and corridors in residential buildings, bedrooms in hospitals, hotel rooms incl. the corresponding kitchens and bathrooms	2	1	30	30	30	25	35	25
Corridors in office buildings, office areas, doctors surgeries without heavy equipment, 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	25	40	30
Office areas with higher loads	3	2	40	35	35	30	45	30
Corridors in hospitals, hotels, retirement homes, boarding schools etc.; kitchens and treatment rooms including surgery rooms without heavy equipment.	3	3	45	40	40	30	55	40
Areas with tables, e.g. day nurseries, classrooms, cafes, restaurants, refectory halls, reading rooms, reception rooms (assignment of loads divergent to EN NA1991)	4	3	45	40	40	35	55	40
Areas with fixed seating, e.g. in churches, theatres, cinemas, congress rooms, auditoria, meeting halls, waiting rooms	4	4	50	50	45	35	60	45
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	40	60	45

Note	At dynamic loading, other specifications for the necessary screed thickness can be made in dependence on the total load imposed by forklifts. These are available individually from Knauf on request.

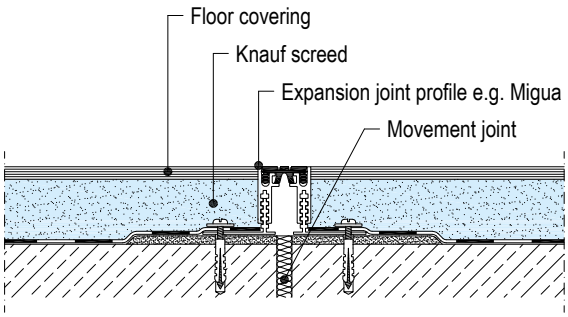
Details

Scale 1:5

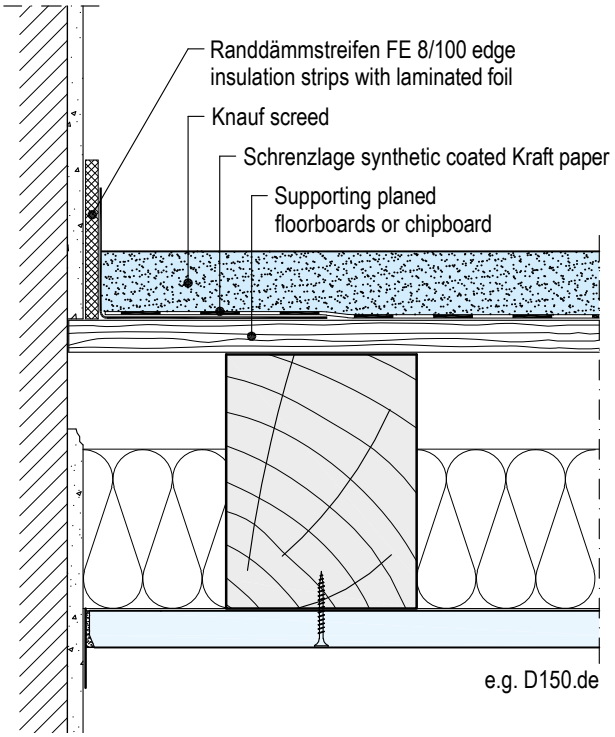
F221.de-V1 Perimeter application on a solid ceiling



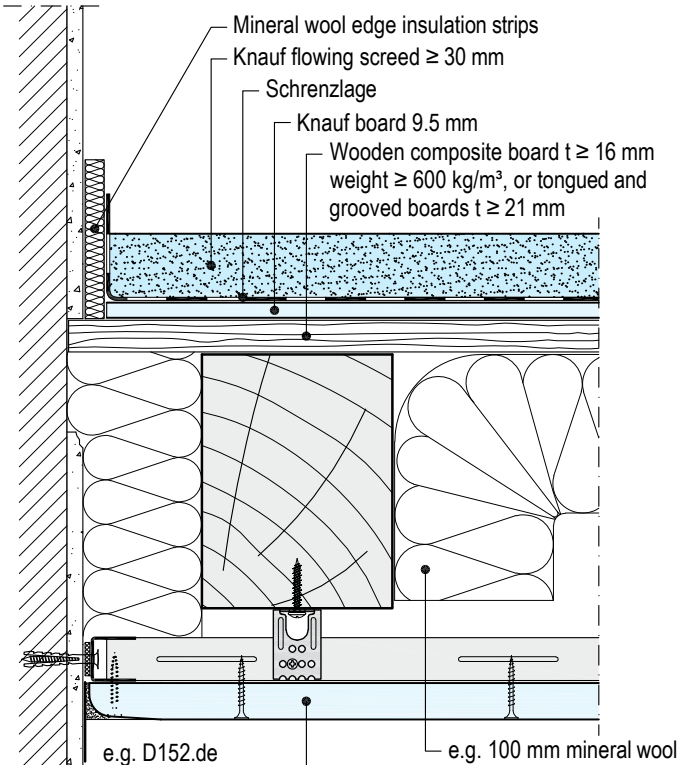
F221.de-V2 Joint application in solid ceiling



F221.de-V3 Perimeter application on a wood joist ceiling



F221.de-V4 On wood joist ceiling



Flowing screed systems on insulation layer

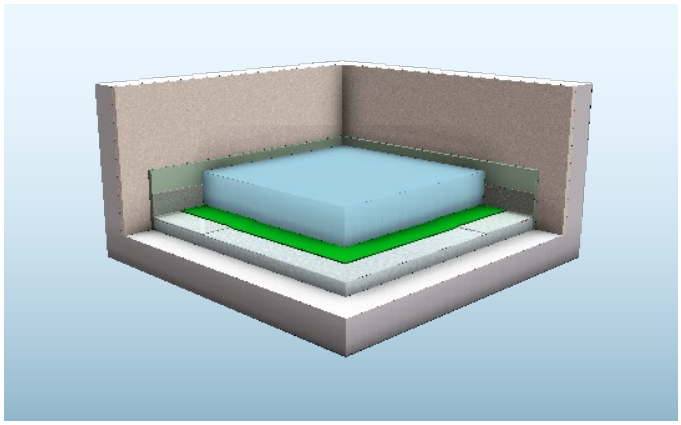


Figure 16: Floor construction screed on insulation layer

Construction and application

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 23 ff). 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
- Levelling of unevenness using light levelling mortar (EPO-Leicht) or Dry bulk leveller PA or alternatively a heavy-duty acoustic infill; 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 will be an overhang of approx. 10 mm above the pipe. Heating pipes must be thermally insulated
- Adjacent walls must be plastered (prevents formation of sound bridges)
- Attachment of edge insulation strips to all rising components, thickness ≥ 8 mm

Figure 17: Laying Knauf Schrenzlage synthetic coated kraft paper

Structurally 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.

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

The following must be considered:

- With single loads up to 2 kN, the compressibility c of the insulating layer may be maximum 5 mm, with a higher individual load it may be a maximum 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 of EPS DEO (≤ 150 kPa) of 100 to 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 nominal screed thickness over the heating elements.
- 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 statically required necessary dimension.
- Structural joints must be implemented in the screed.
- As unheated screed
  - FE 80 Allegro, FE 50 Largo, FE Fortissimo, FE Fire 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
  - and with Schnellestrich CT exceeding 5 m edge length or alternatively in doorways or with protruding and constricting 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/VDPM) “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.

Note	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.

► 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 Stretto or Schnellestrich CT.

Areas of application for screed on an insulating layer

Table 16: Usage / application fields of screed on 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		Nominal screed thickness in mm for					
			FE Fire FE Sprint[1] FE 50 Largo FE Eco[2]	FE 80 Allegro FE 25 A tempo	FE Fortissimo	Quick setting screed CT	Stretto[1]	
	Area load	Single load	Strength class acc to DIN 18560				Compressibility c of the insulating layer	
			CAF-C30-F5 alt. CAF-C25-F5	CAF-C30-F6	CAF-C35-F7	CT-C30-F5	c ≤ 1 mm	c ≤ 3 mm
	kN/m²	kN						
Rooms and corridors in residential buildings, bedrooms in hospitals, hotel rooms incl. the corresponding kitchens and bathrooms	2	1	35	35	35	40	40	50
Corridors in office buildings, office areas, doctors surgeries without heavy equipment, 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	45	55
Office areas with higher loads	3	2	45	45	40	55	55	65
Corridors in hospitals, hotels, retirement homes, boarding schools etc.; kitchens and treatment rooms including surgery rooms without heavy equipment.	3	3	50	45	45	60	60	70
Areas with tables, e.g. classrooms, cafes, restaurants, canteens, auditoria, reception rooms (assignment divergent to DIN EN 1991)	4	3	50	45	45	60	60	70
Areas with fixed seating, e.g. in churches, theatres, cinemas, congress rooms, auditoria, meeting halls, waiting rooms	4	4	55	50	50	65	65	75
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	65	75

1) cannot be used as a heated screed

2) can only be used as a heated screed

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 heat insulation of ceiling constructions in accordance with DIN 4109, DIN 4108 and German energy saving ordinance (GEG) (calculation of the insulating layers, see page 25).

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. to DIN EN 13162 is generally used.

Further materials are used in special application cases, such as Holzfaserdämmplatte WF for lower 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 heat insulation layer, only application type DEO can be used.

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.

Explanation of the abbreviations

Table 17: 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 slab**
DES	Internal insulation of the ceiling or floor slab (top side) under screed with sound insulation demands **Impact sound insulation slab**

Table 18: 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

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 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 mineral 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

- Footfall impact sound Insulation
  - Knauf Insulation Trittschall-Dämmplatte TPT 01 (DES-sh)
  - Knauf Insulation Trittschall-Dämmplatte TPT 03 (DES-sm)
  - 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)

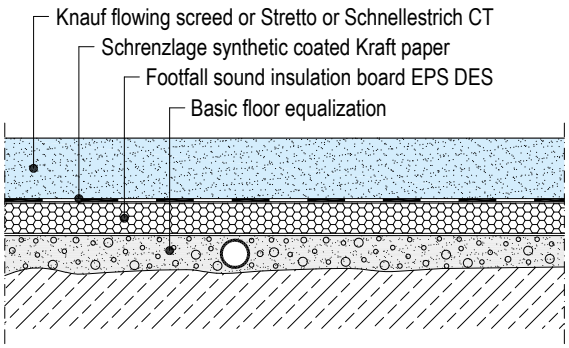
Further information

knaufinsulation.de

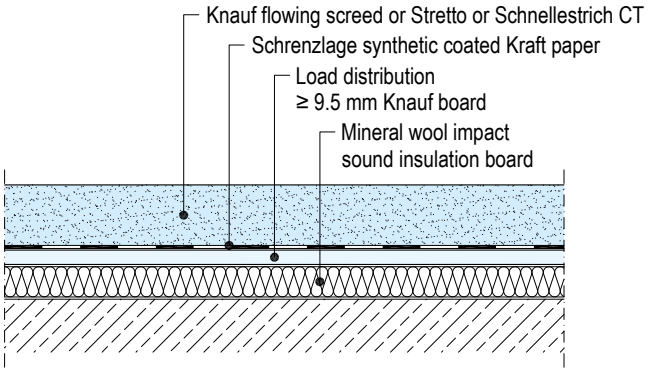
Details

Scale 1:5

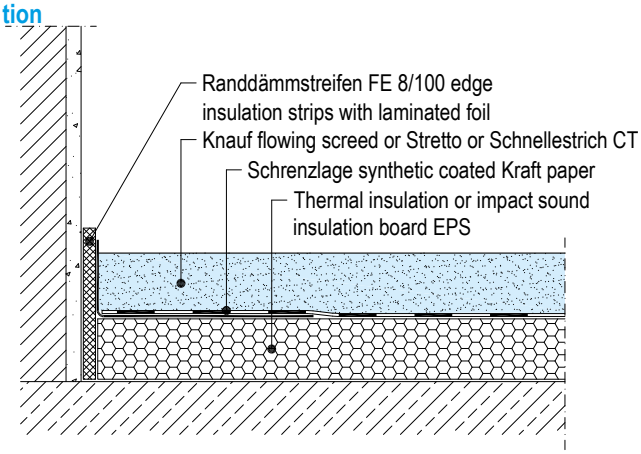
F231.de-V1 Substrate equalization with levelling mortar



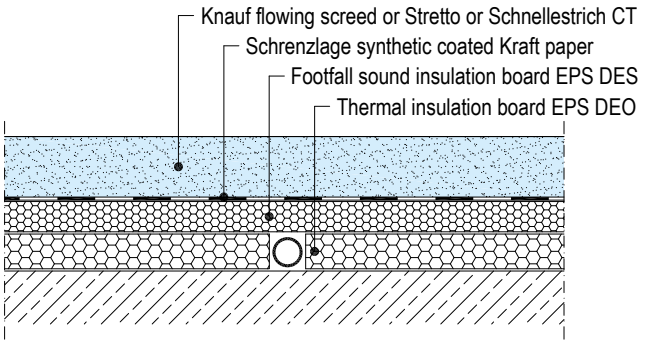
F231.de-V4 Flowing screed on mineral wool insulation



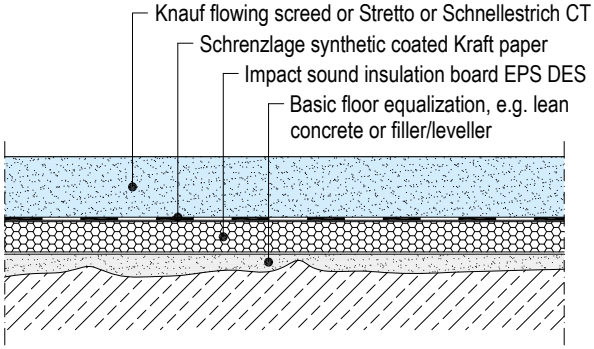
F231.de-V5 Flowing screed on thermal or footfall sound insulation



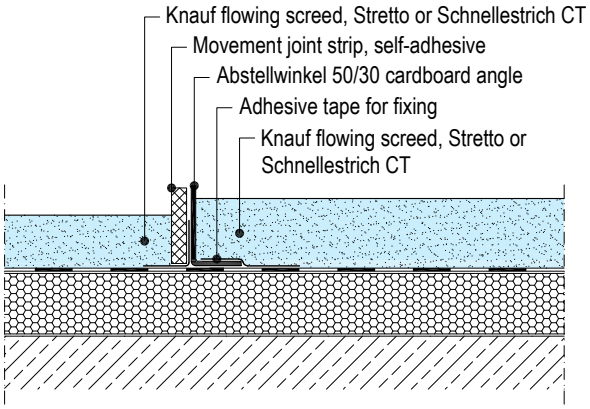
F231.de-V2 Basic floor equalization with EPS DEO



F231.de-V1 Substrate equalization with lean concrete or filling compound



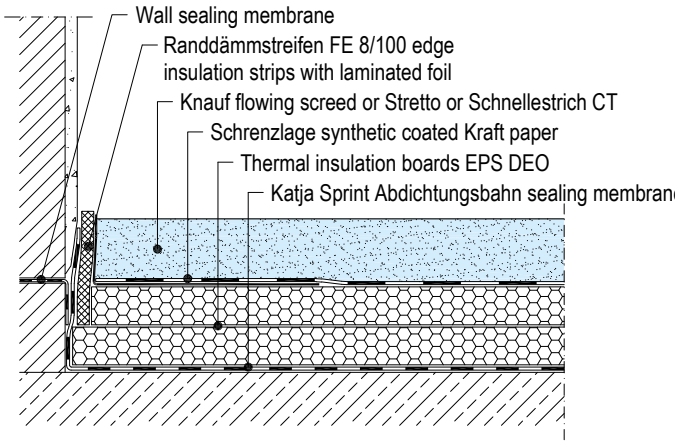
F231.de-V6 Edging with height offset



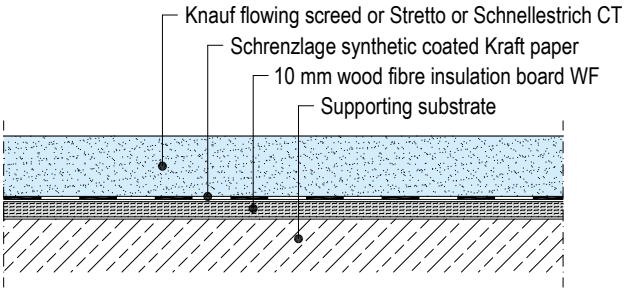
Details

Scale 1:5 I Dimensions in mm

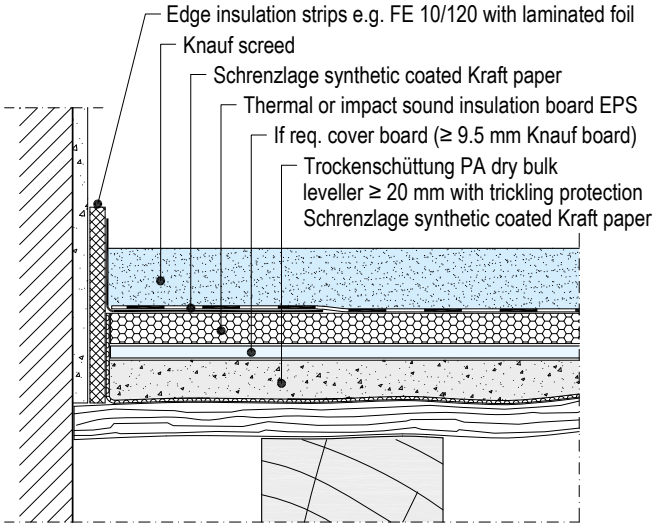
F231.de-V7 Flowing screed on areas contacting the soil



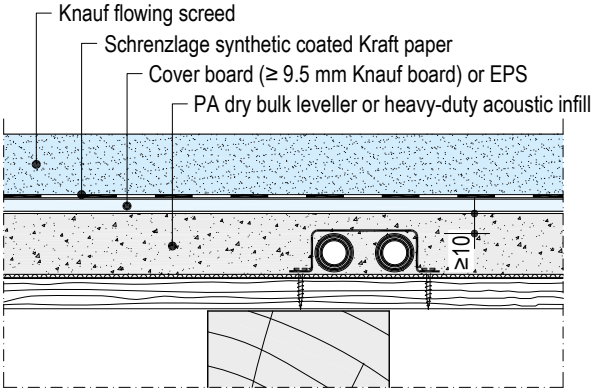
F231.de-V8 Flowing screed on Holzfaserdämmplatte WF



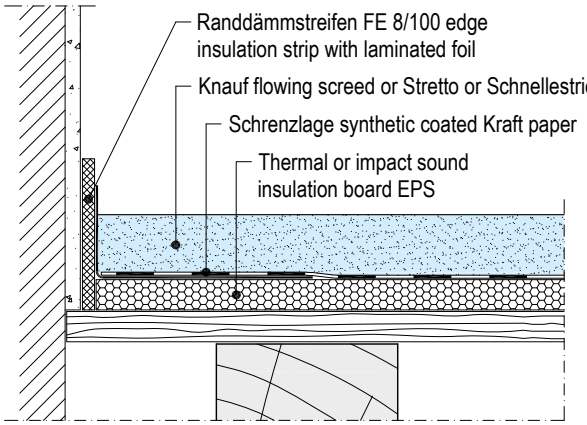
F231.de-V10 Flowing screed on thermal/footfall impact sound insulation with height equalization



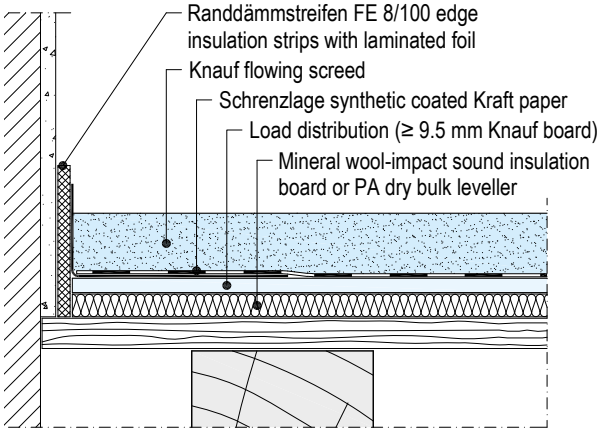
F231.de-V14 Basic floor equalization with bulk leveller



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



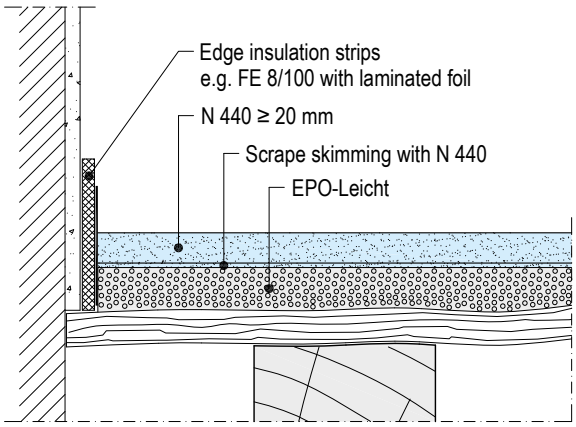
F231.de-V12 Flowing screed on mineral wool insulation



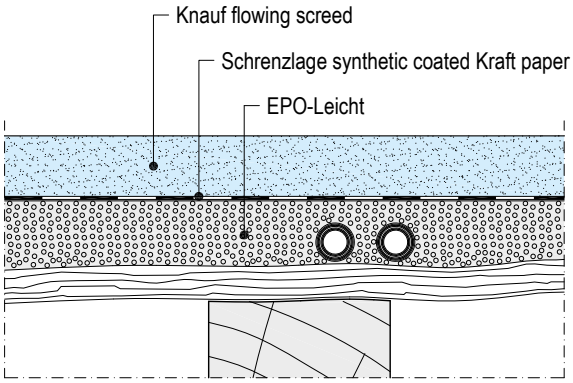
Details

Scale 1:5

F231.de-V13 Light construction with EPO-Leicht



F231.de-V15 Basic floor equalization with EPO-Leicht



Construction designs

Heating elements of heated-water based underfloor heating in heating floor screed type A acc. 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.

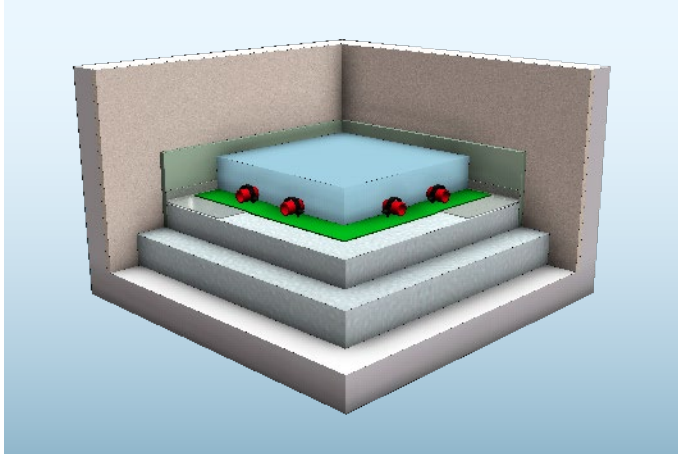


Figure 18: Type A to DIN 18560-2

Figure 19: Apply the heated screed

Note	Calcium sulphate based floor screeds can be heated 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.

Heating elements of heated-water based underfloor heating in heating floor screed type B acc. 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.

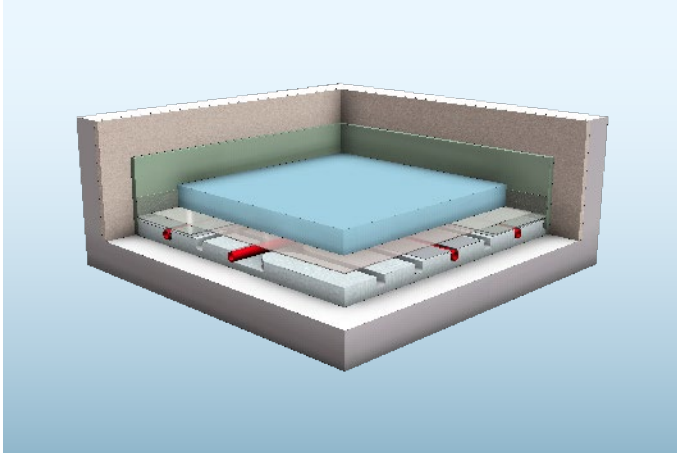


Figure 20: Type B to DIN 18560-2

Development of the surface temperature on screed samples

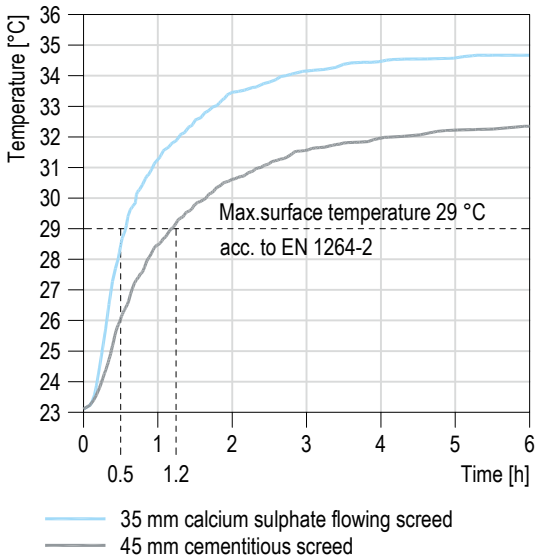


Figure 21: Double heating-up speed with calcium sulphate flowing screeds!

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

Construction and application

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 characteristics 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 2 K lower than rooms heated with convection radiators without any loss of comfort, because of the uniform heating of the room.

Benefits include:

- A more pleasant room climate
- Lower energy consumption

Knauf flowing screeds offer particular advantages for installation as heated screeds:

- High thermal conductivity up to λ_z = 1.87 W/(m·K) (with FE 80 Allegro)
- Good encasing of the tube and thus the best thermal conductivity with wet application
- Low screed nominal screed thickness (tube coverage 35 mm for residential buildings)
- Short heating up times (see diagram)
- Heat until dry after hard enough for foot traffic without technological pauses with the use of Knauf Fließestrich FE 25 A tempo floor 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 and possible with FE 80 Allegro, FE 50 Largo, FE Fortissimo, FE Fire, FE 25 A tempo and FE Eco.
- The determining nominal screed thickness is the thickness measurement over the highest point of the heating system (e.g. from the upper edge of the heating tube). The nominal 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” on page 67 ff).
- The arrangement of the movement joints in accordance with Code of Practice no. 5 (IGE/VDPM “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.

Routing a cable using unprotected metal pipes in flowing screed is not recommended in flowing screed.

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.
- After the initial pour is hard enough to be walked on (FE 80 Allegro, FE 50 Largo, FE Fortissimo, FE Fire and FE Eco after 12 to 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.

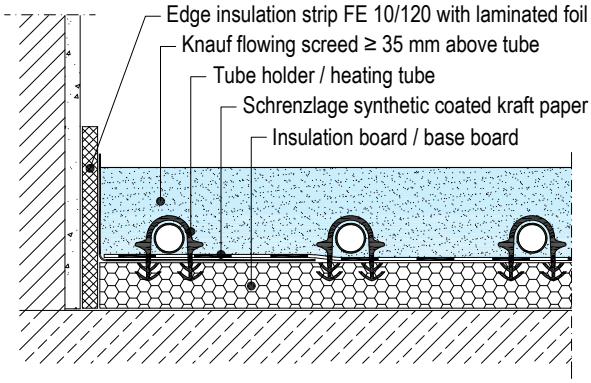
A heating floor screed must always be heated up and dried before the covering is applied. The procedure is described on “Heating of heating floor screed until dry” on page 84 ff.

Details

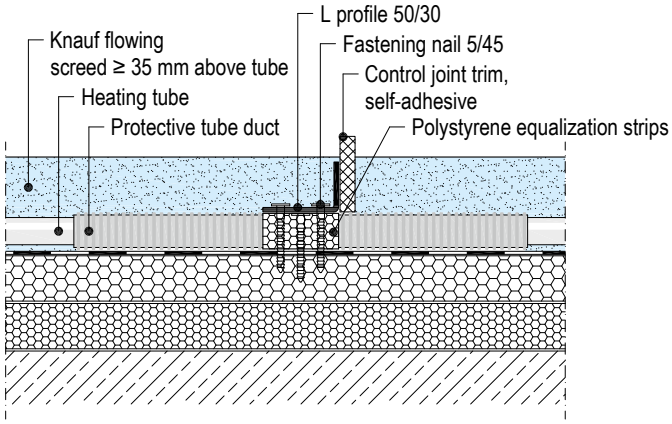
Scale 1:5

F233.de Heating floor screed type A

F233.de-V1 Perimeter application on a solid ceiling

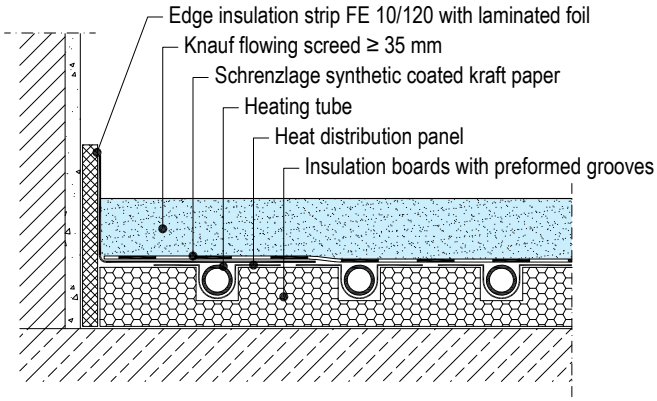


F233.de-V2 Joint application on solid ceiling

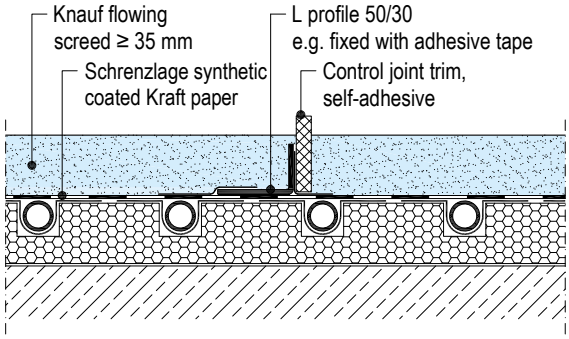


F234.de Heating floor screed type B

F234.de-V1 Perimeter application on a solid ceiling



F234.de-V2 Joint application on solid ceiling



With Knauf equalization 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 equalization compounds to a heating floor screed.

Using N 440, 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 heated 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. Then the N 440 is applied. The floor is ready for covering after a short period of being heated until dry.

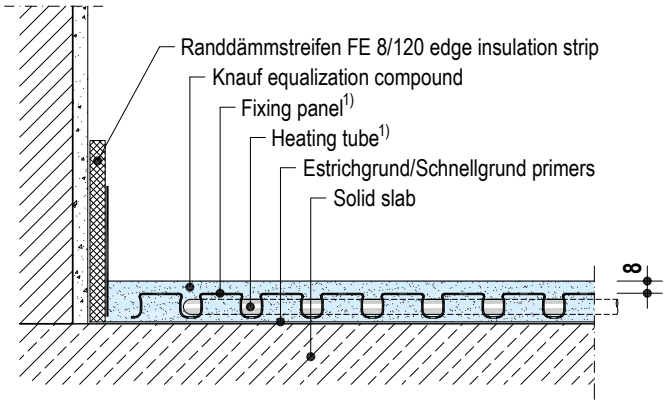
Note	The thin-layer heating screed systems are not covered by the DIN 18560 and are thus deemed to be special constructions. If, for example, there is insufficient height available during a modernization for a heating floor screed, a special thin layer heating screed construction can be used. See also system data sheet Thin-layer heating floor screed systems, FE22.de.

Details

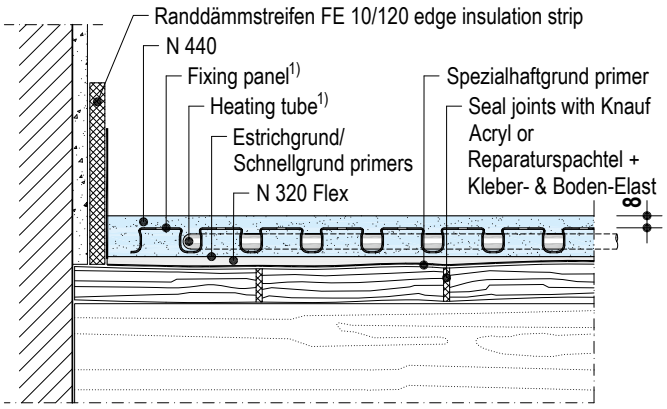
Scale 1:5 I Dimensions in mm

F215.de Thin-layer heated screed

Bonded – solid ceiling

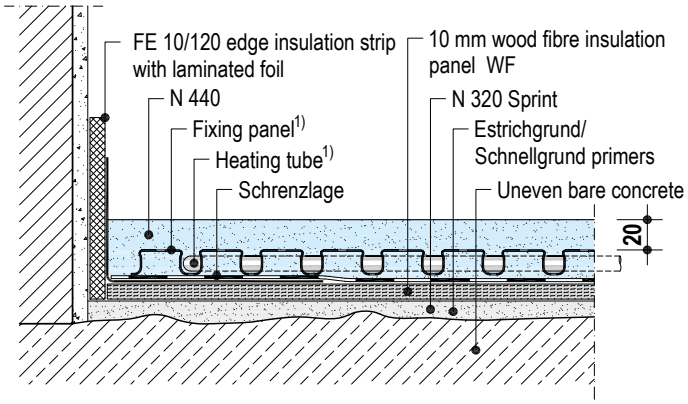


Bonded – wood joist ceiling

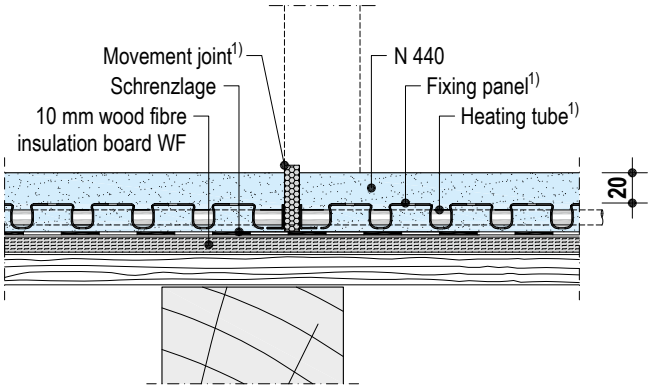


F235.de Thin layer heating floor screed on an insulation layer

On insulating layer – solid ceiling



Movement joint in the doorway



1) *System manufacturer of underfloor heating (Uponor Minitec)*

Flowing screed system raised access floor

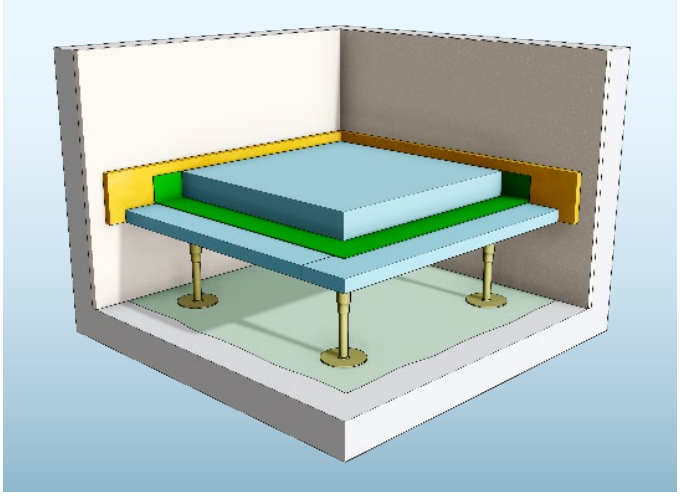


Figure 22: Raised access floor design

Design and 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 EN 13213.

Note	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.

Figure 23: Installation of pedestals and sheathing units

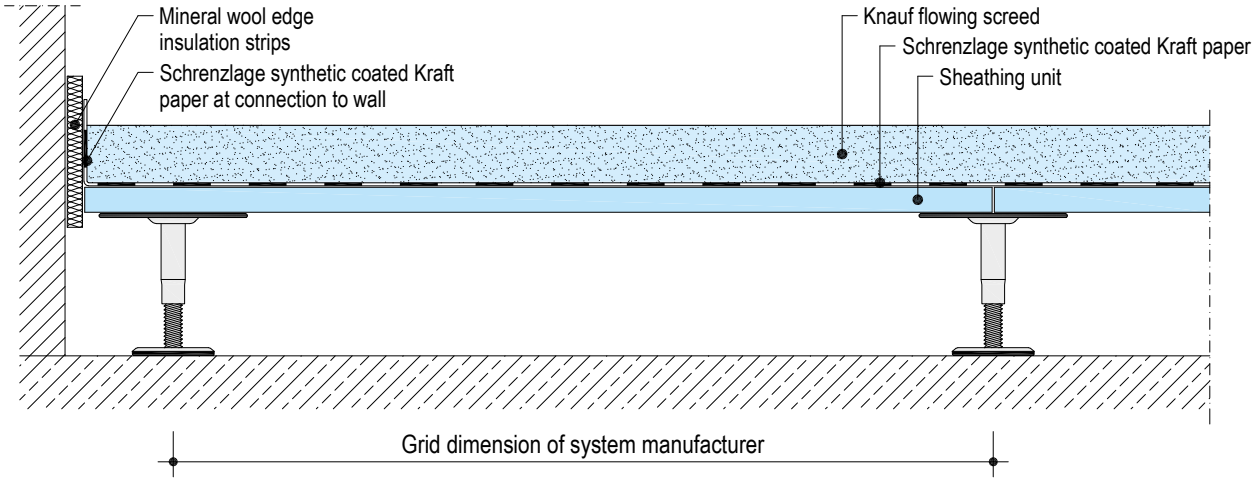
Figure 24: Installation of flowing screed on the prepared raised access floor construction

Figure 25: Completed screed surface as raised access floor with floor duct

Detail

Scale 1:5

F222.de-V4 Raised access floors with metal pedestal supports



Loading classification in acc. to EN 13213

Table 19: Load application via indentor 25 x 25 mm

Load class	Failure load kN	Point load (v = 2.0)[1] 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.

Note	For a particularly fast construction, the Knauf GIFAfloor FHB flooring system is used. Here high-strength gypsum fibre elements on a base substrate are mounted directly on support elements and glued together. Dry applied hollow flooring can be covered as soon as the following day. See also knauf-integral.de

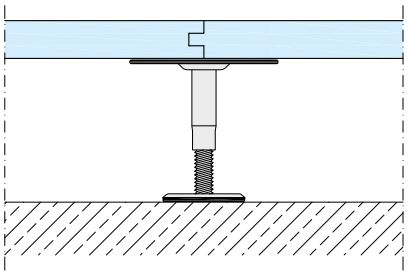


Figure 26: GIFAfloor pedestal

Special notes

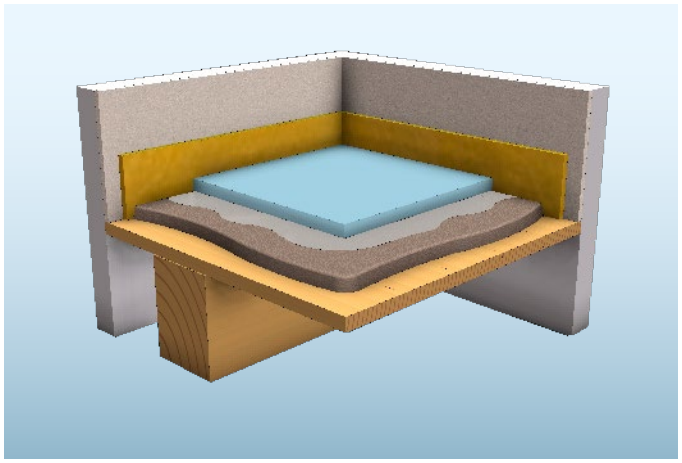


Figure 27: Screed on wood joist ceiling with EPO-Leicht:

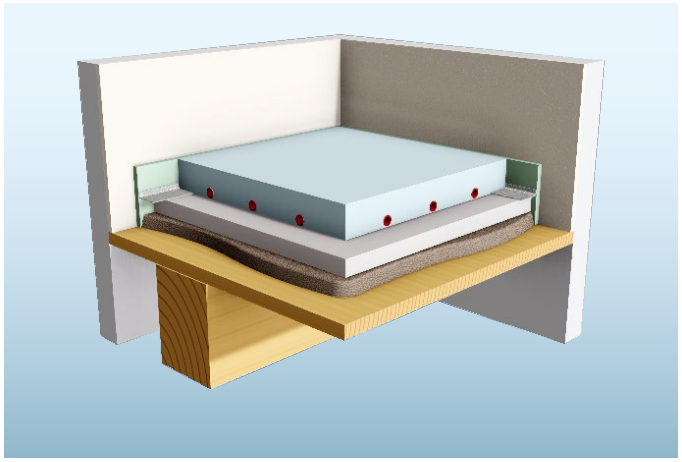


Figure 28: Screed on wood joist ceiling with underfloor heating

Note	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 system data sheet Knauf Pre-fab Floor Screed F12.de).

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 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 “EPO-Leicht” on page 56).

Configuration

In order to avoid accumulation of moisture in the ceiling, no vapour barrier or foil should be applied on the wood joist ceiling. Schrenzlage synthetic coated kraft paper 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 on “Impact sound reduction of floor constructions with Knauf flowing screeds on wood joist ceilings” on page 22. Wood joist ceilings can achieve a fire resistance class up to F90 (from below and from above) with Knauf flowing screed and the corresponding ceiling construction, see also “Fire resistance” on page 12 and following.

Application

Overview of the necessary steps

Table 20: 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 / keying)	Clean the substrate, remove crumbling layers	Clean the substrate, determine the loose floorboards	Clean the substrate, remove the loose parts	Clean the substrate, remove the loose parts
Substrate pre-treatment:	Flowing screed and N 340: Estrichgrund (diluted 1:1 with water) or Schnellgrund (undiluted) N 440 2x Estrichgrund (diluted 1:1 with water) or 1x Schnellgrund (undiluted)		Seal joints (Knauf Acryl), Spezialhaftgrund bonding primer (diluted 1:1 with water)	Flowing screed, N 440, N 340: 1x FE-Imprägnierung interspersed with silica sand	Flowing screed, N 440, N 340: 2x FE-Imprägnierung interspersed with silica sand
Sealing (if required)	FE-Abdichtung sealing	FE-Abdichtung sealing	–	FE-Abdichtung sealing	FE-Abdichtung sealing
Knauf flowing screed nominal thickness	≥ 25 mm	≥ 25 mm	–	≥ 25 mm	≥ 25 mm
N 340 layer thickness	5 – 40 mm	5 – 40 mm	–	5 – 40 mm	5 – 40 mm
N 440 layer thickness	10 – 40 mm	10 – 40 mm	–	10 – 40 mm	10 – 40 mm
N 320 Flex layer	–	–	3 – 20 mm	–	–
Screed laid 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 Schnellgrund (undiluted) N 320 Sprint / N 340	Estrichgrund screed primer (diluted 1:1 with water) or Schnellgrund undiluted) N 320 Sprint / N 340	–	Estrichgrund (diluted 1:1 with water) or Schnellgrund (undiluted) N 320 Sprint / N 340	Estrichgrund screed primer (diluted 1:1 with water) or Schnellgrund primer (undiluted) N 320 Sprint / N 340
Sealing (if required)	Katja Sprint Abdichtungsbahn sealing membrane	Katja Sprint Abdichtungsbahn sealing membrane	–	Katja Sprint Abdichtungsbahn sealing membrane	Katja Sprint Abdichtungsbahn sealing membrane
Separating layer	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper
Knauf flowing screed nominal thickness	≥ 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)	Katja Sprint Abdichtungsbahn sealing membrane	Katja Sprint Abdichtungsbahn sealing membrane	–	Katja Sprint Abdichtungsbahn sealing membrane	Katja Sprint Abdichtungsbahn sealing membrane
Equalization layer (if required)	EPO-Leicht, heavy-duty acoustic infill + cover board or Trockenschüttung PA dry bulk leveller + cover board	–	EPO-Leicht, heavy-duty acoustic infill + cover board or Trockenschüttung PA dry bulk leveller + 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 synthetic coated kraft paper + possible cover board	Schrenzlage synthetic coated kraft paper + possible cover board	Schrenzlage synthetic coated kraft paper + possible cover board	Schrenzlage synthetic coated kraft paper + possible cover board	Schrenzlage synthetic coated kraft paper + possible cover board
Flowing screed nominal thickness (with heated screed type A: thickness above heating elements)	≥ 35 mm	≥ 35 mm	≥ 35 mm	≥ 35 mm	≥ 35 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, see Table 21 (DIN 18202, table 3, line 2a).

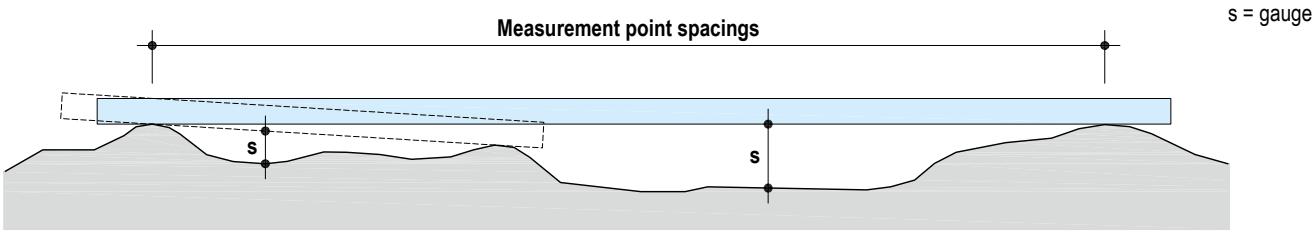
Furthermore, the substrate must be examined for the following defects and they must be repaired if found:

- 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 regulations of the German building trade association

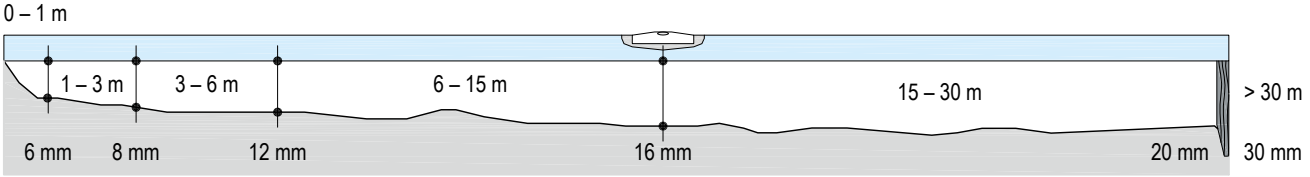
Table 21: Permissible evenness tolerances of basic floors for application of screeds to DIN 18202

Spacing of the measurement points	**Permissible evenness tolerances** (spot dimension)
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

Evenness



Angular tolerances



Substrate preparation

An overview of the necessary work stages for preparation of the substrate before screed application is provided in Table 22 in dependence on the selected screed construction.

To be assured with all screed variants:

- Functioning seals with ground moisture ("Katja Sprint Abdichtungsbahn sealing membrane" on page 54 ff. or FE-Abdichtung sealing shield with bonded screed, "FE-Abdichtung sealing shield" on page 53)
- 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 moisture 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, film of the edge insulation strip on the protruding corners, worn Schrenzlage synthetic coated kraft paper). 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.

Figure 29: Cleaning with an industrial vacuum cleaner

Figure 30: Shot-blasting of the concrete surface to accept a bonded screed

Table 22: Substrate preparation

		Bonded screeds[1)]	Screed on a separating layer[1)]	Raised access floors	Screed on an insulating layer / heating floor screed[1)]	Screed on wood joist ceilings[1)]
Check the substrate		●	●	●	●	●
alt.	Sanding	●	–	–	–	–
	Shot-blasting	●	–	–	–	–
	Grinding	●	–	–	–	–
Clean with an industrial vacuum cleaner		●	●	●	●	–
Fill holes and cracks		–	●	–	–	–
Fill joints		–	–	–	–	●

1) Also as a thin layer heating floor screed with N 440

Estrichgrund screed primer

Priming of absorbent floor surfaces

Estrichgrund screed primer is a modified, aqueous 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.

Estrichgrund screed primer is set to suit the required application by diluting it accordingly.

With non-absorbent substrates, suitable special primer such as Spezialhaftgrund must be used.

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 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 Estrichgrund screed primer 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.

Clean tools immediately after use with water.

Application temperature / climate

The temperature of the material, the substrate and the air should not be below +5 °C during application and until drying is completed.

Storage

In original sealed bucket can be stored for 18 months. Protect against frost.

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

Technical data

Description	Unit	Value
Material consumption (undiluted)		
On basic floor (depending on the level of absorbency)	g/m²	Approx. 150
On calcium sulphate screed	g/m²	Approx. 100
On gypsum fibre board	g/m²	Approx. 50
Drying time (with good ventilation)		
Depending on the substrate	h	Approx. 12

Note	See also product data sheet Estrichgrund primer F431.de

Substrate	Subsequent coating	Recommended dilution values Estrichgrund : Water
Basic concrete, cementitious screed	Bonded calcium sulphate screed, e.g. FE 80 Allegro, FE 50 Largo, FE 25 A tempo	1 : 1[1)]
	Thin-screed compound, e.g. N 340	1 : 1[1)]
	Equalization compound, e.g. N 320 Sprint	1 : 1[1)]
Calcium sulphate screed[2)] Flowing screed (e.g. FE 80 Allegro, FE 50 Largo, FE 25 A tempo, N 440)	Equalization compound, e.g. N 320 Sprint	1 : 1[1)]
	N 410	1 : 1
	Tile adhesive mortar, floor covering adhesive, carpet fixing	1 : 1
Pre-fab floor screed Brio	Filling compound, e. g. N 410	1 : 1
	Tile adhesive mortar, floor covering adhesive, carpet fixing	1 : 1

1) If required in case of highly absorbent substrate apply 2x primer

2) For N 440 (F422.de) on calcium sulphate screed use FE-Imprägnierung (F451.de) as a primer

Schnellgrund primer

Quick-drying priming of absorbent floor surfaces

Schnellgrund is a ready-to-use, aqueous 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.

With non-absorbent substrates, suitable special primer such as Spezialhaftgrund must be used.

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 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 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.

Clean tools immediately after use with water.

Application temperature / climate

The temperature of the material, the substrate and the air should not be below +5 °C during application and until drying is completed.

Storage

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

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

Technical data

Description		Unit	Value
Material consumption (undiluted)			
	On basic floor (depending on the level of absorbency)	g/m²	Approx. 150
	On calcium sulphate screed	g/m²	Approx. 110
	On gypsum fibre board	g/m²	Approx. 80
	On chipboard V100	g/m²	Approx. 90
Drying time (with good ventilation)			
	Depending on the substrate	h	Approx. 2

Note	See also product data sheet Schnellgrund primer F434.de

Substrate	Subsequent coating	Recommended dilution values
Basic concrete, cementitious screed	Bonded calcium sulphate screed, e.g. FE 80 Allegro, FE 50 Largo, FE 25 A tempo	Undiluted
	Thin-screed compound, e.g. N 340	Undiluted
	Equalization compound, e.g. N 320 Sprint	Undiluted
Calcium sulphate screed[1)] Flowing screed (e.g. FE 80 Allegro, FE 50 Largo, FE 25 A tempo, N 440)	Equalization compound, e.g. N 320 Sprint	Undiluted
	N 410	Undiluted
	Floor covering adhesive, carpet fixing	Undiluted
Pre-fab floor screed Brio	Filling compound, e. g. N 410	Undiluted
	Tile adhesive mortar, floor covering adhesive, carpet fixing	Undiluted

1) For N 440 (F422.de) on calcium sulphate screed use FE-Imprägnierung (F451.de) as a primer

Spezialhaftgrund bonding primer

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

Spezialhaftgrund is a modified, aqueous 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, water-proof chipboard, terrazzo and old tile coverings.
- Wooden substrates

Substrate

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 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 Spezialhaftgrund.

Clean tools immediately after use with water.

Application temperature / climatic conditions

Do not apply 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.

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.

Technical data

Description	Unit	Value
Material consumption (undiluted)		
Normally absorbent substrates	g/m²	50 – 100
Non-absorbent substrates	g/m²	40 – 60
Wooden substrate	g/m²	60 – 80
Old tile coverings, terrazzo	g/m²	70 – 100
Drying times (with good ventilation) with		
Absorbent substrates	h	Approx. 12
Non-absorbent substrates	h	Approx. 12
Wooden substrates	h	Approx. 6
Old tile coverings, terrazzo	h	Approx. 3

Note	See also product data sheet Spezialhaftgrund primer F433.de

Substrate	Subsequent coating	Recommended values for dilution Spezialhaftgrund : Water
Strong to weak or non-absorbent Calcium sulphate screed [1], normal and highly compressed cementitious screeds, cement boards, etc.	Equalization compound, e.g. N 320 Sprint	1 : 2
Smooth, non-absorbent Dense, mineral based substrates such as board coverings or Terrazzo, mastic asphalt screed	Equalization compound, e.g. N 320 Sprint	Undiluted
Wooden substrates	N 320 Flex	1 : 1

1) For N 440 (F422.de) on calcium sulphate screed use FE-Imprägnierung (F451.de) as a primer

FE-Imprägnierung impregnation agent

Impregnation Agent – Two-component low viscosity epoxy resin

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 Stretto
- As a component of the levelling mortar EPO-Leicht
- As a bonding primer on uneven substrates with bonded screeds
- As a bonding primer under N 440
- As a primer before application of FE-Abdichtung
- For filling cracks in screed

Both components of the 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.

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

The application temperature of FE-Imprägnierung is in a range between 10 °C and 25 °C. If 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. FE-Imprägnierung will not harden in conjunction with water.

The setting speed and accordingly the application time depends on the temperature. At 20 °C, the application time for material in its pure form is approx. 15 minutes, as Stretto approx. 60 minutes and as 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 FE-Imprägnierung within a few minutes of mixing due to heat build up in the container that will shorten the setting time.

Apply FE-Imprägnierung in two work steps:
Step 1: Apply approx. 250 g/m^2
Step 2: Apply approx. 100 g/m² with interspersion of coarse, dry sand (1 to 2 mm, 1.5 kg/m²). The required hardening time between impregnating coats and the following screed application is 24 hours.

Wear protective clothing, also refer to note “Pictograms and symbols” on page 150

Wear protective goggles and gloves, see also note “Pictograms and symbols” on page 150

Storage

Store in a cool and dry place. Storage temperature -5 °C to +35 °C
Storage time: 24 months

Technical data

Description	Unit	Value
Material requirement		
Stretto 1 kg FE-Imprägnierung : 25 kg Stretto-Sand		
EPO-Leicht light levelling mortar 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 (0.5 – 2 mm)		
As a primer before FE-Abdichtung: approx. 400 g/m² FE-Imprägnierung		
Mixing ratio (Component A: B	–	2 : 1
Application time at 20 °C	min	Approx. 15
Application temperature	°C	10 – 25
Walkable after	h	Approx. 24
Mechanical loading after	d	Approx. 3
Chemical resistance after	d	Approx. 7
German Ordinance on Hazardous Substances	Component A irritant, component B corrosive	

Notes	See also product data sheet FE-Imprägnierung impregnation agent primer F451.de

FE-Abdichtung sealing shield

Sealing adhesive bridge for bonded screed

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.

FE-Abdichtung is a sealing bonding layer, for the manufacture of bonded screed on concrete substrates.
Used as water-proofing against ground moisture on floor slabs with soil contact (DIN 18533-1, load case W1-E) or as a sealing membrane against residual moisture of concrete slabs.

Sealing materials in liquid form made of epoxy resin are not included in the DIN 18533. The sealing constructions described in this technical brochure are thus a special construction. This is why we recommend prior contractual agreement with the client before application on the building site.

FE-Abdichtung sealing shield is a liquid film on the basis of a two-component epoxy resin. Both components of the FE-Abdichtung must always be combined in the correct mixing ratio. This is why they are supplied in the correct mixing ratio in a 10 kg combo pack.

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 FE-Abdichtung, apply 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 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. Sealing must provide a closed film.

Sealing against ground moisture on concrete floor slabs

1. Apply FE-Imprägnierung (approx. 350 g/m^2)
2. On 2nd day apply first layer of FE-Abdichtung (approx. 600 g/m^2)
3. On the 3rd day apply second layer of FE-Abdichtung (approx. 200 g/m^2) and intersperse with 0.5 to 2 mm silica sand (approx. 1.5 kg/m^2)
4. On the 4th day apply the screed

Barrier layer against residual moisture from the concrete cover

1. Apply FE-Imprägnierung (approx. 350 g/m^2)
2. On 2nd day apply second layer of FE-Abdichtung (approx. 200 g/m^2) and intersperse with 0.5 to 2 mm silica sand (approx. 1.5 kg/m^2)
3. On the 3rd day apply the screed

Note	With concrete covers over rooms with higher levels of air humidity (e.g. industrial kitchens, swimming pools, communal showers), other sealing measures (e.g. Katja Sprint Abdichtungsbahn sealing membrane) should be applied.

Wear protective clothing, also refer to note "Pictograms and symbols" on page 150

Wear protective goggles and gloves, see also note "Pictograms and symbols" on page 150

Storage

Store in a cool and dry place. Storage temperature -5 °C to +35 °C
Storage time: 24 months

Technical data

Description	Unit	Value
Material requirement		
As sealing against for ground moisture		
FE-Imprägnierung	g/m²	Approx. 350
FE-Abdichtung sealing shield	g/m²	approx. 600 – 1000
Silica sand (0.5 – 2 mm)	kg/m²	Approx. 1.5
As a sealing layer against residual moisture		
FE-Imprägnierung	g/m²	Approx. 350
FE-Abdichtung sealing shield	g/m²	Approx. 200
Silica sand (0.5 – 2 mm)	kg/m²	Approx. 1.5
Mixing ratio (Component A: B	–	3 : 1
Water vapour diffusion equivalent Air layer thickness, s_d	m	Approx. 200
Water vapour diffusion-resistance value, μ	–	Approx. 40 000
Application time at 20 °C	min	Approx. 30
Application temperature	°C	≥ 10
Walkable after	h	Approx. 24
German Ordinance on Hazardous Substances	Component A irritant, component B corrosive	

Notes	Seer also product data sheet FE-Abdichtung sealing shield F455.de

Katja Sprint Abdichtungsbahn sealing membrane

Sealing membrane with self-adhesive seam against ground moisture

Katja Sprint Abdichtungsbahn sealing membrane is a sealing membrane made of polymer bitumen with glass fleece and aluminium layer, coated with polyethylene on both surfaces. It is building authority certified and is used as water-proofing against ground moisture on floor slabs with soil contact (DIN 18533-1: W1.1-E and W1.2-E), as water-proofing of floor slabs between storeys (no wood joist ceilings) above rooms with high levels of 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.

Figure 31: Katja Sprint Abdichtungsbahn sealing membrane: Quick to lay with a high yield

Properties

Katja Sprint Abdichtungsbahn 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 Katja Sprint connector tape strips 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 Abdichtungsbahn sealing membrane.

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. Glue long joints by removing both protective strips and firmly pressing both membranes together at the joint.
Seal front joints by applying self-adhesive Katja Sprint 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 Katja Sprint Anschlussstreifen connector tape.

Figure 32: Sealing the long joints by removing the protective film

Figure 33: Sealing of front end joints with Katja Sprint connector tape

Figure 34: Connections to rising components with Katja Sprint Anschlussstreifen connector tape

Application in the wall area

The sealing membrane is applied with an overlap to the moisture barrier of the masonry wall. acc. to DIN 18533-1 so that there is a tight seal without moisture bridges (e.g. plaster bridges). The following examples are proven options:

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

Figure 35: Katja Sprint Anschlussfix adhesive / Katja Sprint Anschlussstreifen connector tape

Table 23: Technical data Katja Sprint Anschlussstreifen connector tape

Description	Unit	Value
Roll weight	kg	Approx. 4.3
Roll width	m	Approx. 0.20
Roll length	m	15

Radon tightness

Katja Sprint Abdichtungsbahn sealing membrane is radon tight. In order to meet the requirements for radon tight sealing, e.g. for a cellar, the connections to the wall moisture barrier or other components have to be air tight. For this purpose and depending on the component you can use Katja Sprint Anschlussstreifen connector tape or Katja Sprint Anschlussfix adhesive.

Note	DIN 18533-1 and Expert Report No. GS 5.1 21-359.

Storage

Store rolls upright and protect them from direct sun light and high temperatures.

Technical data Katja Sprint Abdichtungsbahn sealing membrane

Description	Unit	Value
Roll weight	kg	Approx. 36 – 39
Weight per unit area	kg/m²	Approx. 0.9
Thickness	mm	Approx. 0.9
Roll width	m	Approx. 1.25
Roll length	m	Approx. 32
1 roll	m²	40
Yield, one roll for	m²	Approx. 37
Storage time	M	9
Physical building properties		
Water vapour diffusion equivalent Air layer thickness, s_d value	m	≥ 1500
Water vapour diffusion resistance μ	–	1 600 000
Water vapour permeability Water vapour diffusion flow density Average value	g/m² · d	≤ 0.025
Building material class (DIN EN 13501-1)	–	E

Note	See also the product data sheets F457.de Katja Sprint Abdichtungsbahn sealing membrane, membrane, F458.de Katja Sprint Anschlussfix adhesive and F459.de Katja Sprint Anschlussstreifen connector tape

EPO-Leicht

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

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 FE-Imprägnierung (2 component epoxy resin, "FE-Imprägnierung impregnation agent" on page 52) and 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 composite bulk leveller. Its low weight of about 0.2 kg/l is ideal during renovation work when used on ceilings with low load-bearing capacity. At the same time, the thermal insulation layer depth can be reduced due to the good thermal insulation properties.

EPO-Leicht has its final strength 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 EPO-Leicht.

EPO-Leicht is used in interior applications. It is water-resistant and can therefore be used in areas subject to moisture.

Installation of EPO-Leicht on insulation material is not possible.

It can be installed in layer thicknesses between 15 and 800 mm. For application bonded to the substrate, the layer thickness's may be less than 15 mm at elevated points of the substrate. On EPO-Leicht, the general floor construction can be undertaken with floating (heated) screed or screed on a separating layer.

As a particularly slim version, floor equalization compound N 440 can be applied on EPO-Leicht as a bonded screed. For this purpose, the surface of the EPO-Leicht must first of all have a thin layer of stiffly mixed N 440 applied, so that the pores are sealed and the loose EPO-Perl is bonded.

After about 5 hours when the filled layer can be walked on, the N 440 can be applied in a layer thickness of 20 mm. The construction is sufficiently stable for the requirements of residential applications.

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

Application

Figure 36: Ideal on old wood joist ceilings: EPO-Leicht

Note	Only persons that are familiar with chemically setting substances are allowed to apply these products. The rooms must be ventilated sufficiently (preferably with lateral ventilation). Wear protective goggles (e.g. during mixing), suitable protective gloves and working clothes to prevent contact with skin. (Further information "FE-Imprägnierung impregnation agent" on page 52)

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

Figure 37: Mixing in the tub is quick and does not require any great effort.

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 using a levelling rod or similar tool. After levelling, the mortar can be compressed by light impacts applied using a float. Compress the mortar occasionally in case of large heights or thick mortar layers.

The application temperature of EPO-Leicht is between 10 °C and 25 °C. The setting speed and the available application times are dependent 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 FE-Imprägnierung impregnation agent, 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.

Storage

Store Knauf EPO-Perl dry on pallets. It can be stored indefinitely.
Store Knauf FE-Imprägnierung impregnation agent dry. It can be stored for up to 24 months.

Technical data

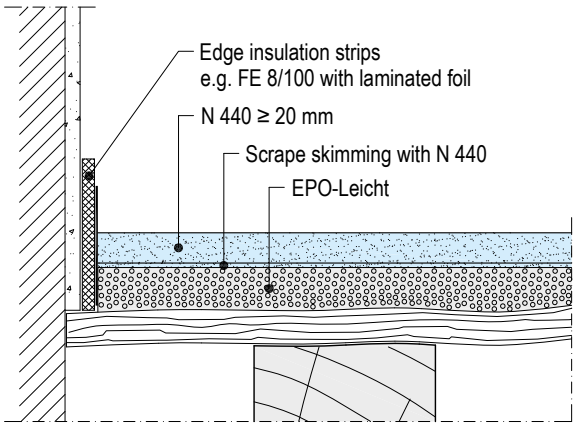
Description	Unit	Value
Layer thickness	mm	15 – 800
Density	kg/m³	Approx. 200
Compressive strength (after 1 day, at 20 °C)	N/mm²	Approx. 0.3
Thermal conductivity λ_Z	W/(m·K)	Approx. 0.07
Building material class	–	B-s2,d0
Yield from 60 l EPO-Perl and 1 kg FE-Imprägnierung impregnation agent	l Mortar	Approx. 60
Material consumption per cm layer thickness		
EPO-Perl	l/m²	Approx. 10
FE-Imprägnierung impregnation agent	kg/m²	Approx. 0.17
Application time at 20 °C	min	Approx. 45
Conditionally walkable at 20 °C after	h	Approx. 24
Subsequent work possible after	h	Approx. 24

Note See also product data sheet EPO-Leicht F441.de

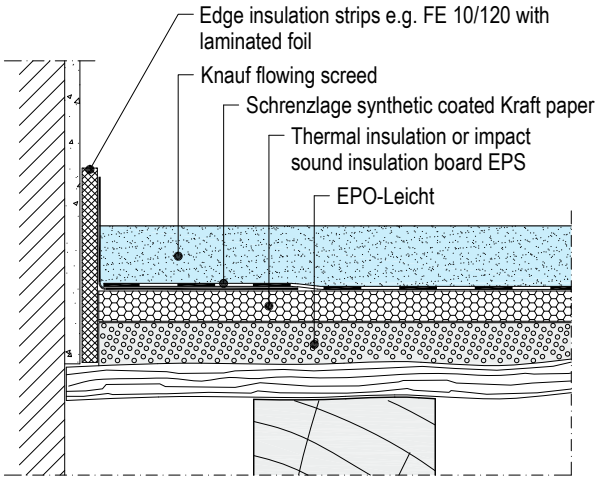
Details

Scale 1:5

F231.de-V13 Light construction with EPO-Leicht



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



Heavy-duty acoustic infill

Infill for improvement of the sound insulation with wood joist ceilings

Schwere Schüttung heavy-duty acoustic infill is a grainy material made of natural anhydrite (grain size 0.5 mm to 4 mm, residual moisture ≤ 0.3 %). It features a high density of 1.65 kg/liter and is used as a ceiling ballast to improve the sound insulation characteristics of wood joist ceilings under screeds. The special grain structure allows the gains to interlock ensuring that they are capable of high loads.

Heavy-duty acoustic infill can be applied in layer thicknesses of 15 to 150 mm. Thus the respective uneveness in the substrate and in installation pipes and cables can be equalized.

Application

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 false ceilings and levelling with bulk leveller only if sufficient bearing capacity of the false ceiling is assured. For wood joist ceilings, use permeable material (Schrenzlage synthetic coated kraft paper) as trickling protection and apply on the walls and other rising components. Avoid hollow channels. To obtain clean straight edges, fold the Schrenzlage synthetic coated kraft paper beforehand if necessary. Do not use heavy-duty acoustic infill on wooden plank stack slab ceilings.

Figure 38: Installation of Schwere Schüttung heavy-duty acoustic infill

Application

As a connection to the wall for flowing screed without fire protection requirements, 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 requirements.

Distribute Schwere Schüttung heavy-duty acoustic infill with a minimum infill height ≥ 15 mm on the basic floor and level using alignment rails or with an even, horizontal substrate using a surface rake (e.g. squeegee with pins or guides). Compaction is only necessary under pre-fab floor screed in the corners.

In order to make application of EPS insulation layers easier on Schwerer Schüttung heavy duty acoustic infill, a cover board (Knauf board GKB) is recommended to distribute the load. A board cover (Knauf board GKB) to distribute the load is obligatory below mineral wool insulation layers as well as with direct application of flowing screed on Schwerer Schüttung heavy duty acoustic infill.

Fix pipes, cables, etc. on the basic floor and cover with a layer of at least 10 mm of Schwerer Schüttung heavy-duty acoustic infill.

Machine conveying

Knauf Schwere Schüttung heavy duty acoustic infill can also be conveyed with a compressed air conveyor to higher floors. There are special considerations here. Please consult your Knauf consultant.

Note	Schwere Schüttung heavy-duty acoustic infill may not be installed in wet rooms (slopes, drains).

Storage

Can be stored for an unlimited period when stored in a dry place.

Technical data

Description	Unit	Value
Layer thickness	mm	15 – 150
Building material class acc. to DIN 4102	–	A1
Graining	mm	0.5 – 4
Bulk density	kg/m³	Approx. 1650
Area weight and material requirement per cm height	kg/m²	Approx. 16.5
Compressive strength (compressive stress with 10 % compression)	N/mm²	≥ 0.3
Thermal conductivity λ_{10}	W/m·K	0.241

Note	See also product data sheet Schwere Schüttung heavy duty acoustic infill, F475.de

S 400 Sprint

Quick-drying cementitious light levelling mortar under screed

S 400 Sprint is a quick-drying light levelling mortar made of EPS aggregate and a cement-based special binder. Due to its short drying time and high compressive strength, the S 400 Sprint is loadable and dry after just 24 hours, so that subsequent work can commence.

S 400 Sprint is used for the creation of a levelling layer under screed acc. to DIN 18560-2 in interiors. It is used to level unevenness and sloping of the basic floor and for filling out hollow spaces with cables, installation conduits and other pipes. S 400 Sprint is used in interior applications. It is water-resistant and can therefore be used in areas subject to moisture. It can be applied as a bonded construction from a layer thickness of 10 mm or as a separating layer from 30 mm. The maximum installation height in as single work step is 150 mm. Apply several layers in case of larger thicknesses.

Due to its high stability, S 400 can also be applied under Knauf thin-layer heated screeds and under Knauf Brio Pre-fab Floor Screed.. Direct application of a floor covering on S 400 Sprint is not possible. Furthermore, walls, including drywall partitions, cannot be installed directly on top of S 400 Sprint.

It can be applied as a bonded construction from a layer thickness of 10 mm or as a separating layer from 30 mm. The maximum installation height in as single work step is 150 mm. Apply several layers in case of larger thicknesses.

Due to its high stability, S 400 Sprint can also be used under Knauf thin-layer heating floor screeds (see system data sheet Knauf Thin-Layer Heating Floor Screed Systems FE22.de) and under Knauf Brio Pre-fab Floor Screed. Direct application of a floor covering on S 400 Sprint is not possible. Furthermore, walls, including drywall partitions, cannot be installed directly on top of S 400 Sprint.

Application

Manual application: S 400 Sprint is mixed in a tub using an agitator.

Machine application: S 400 Sprint is mixed and pumped with a compressed air conveyor. Add 5 to 6 l of clean water with a 60 liter bag of S 400 Sprint and mix until all the material is included in the mix. Only mix as much material as you can apply within the application time. If you determine a reduction in the working time of the material after mixing several batches, wash the tools occasionally with water. Do not add additional water.

Application

The mortar is to be spread uniformly in a semi-dry consistence on the substrate so that walking on the mortar when levelling is unnecessary. The mortar is levelled using a levelling rod or similar tool.

In case of special demands on the surface evenness or strength (e.g. subsequent laying of the pre-fab screed), after levelling the mortar, compress and compact by light impacts applied using a float. Compress the mortar occasionally in case of large heights (from approx. 10 cm) or thick mortar layers.

The application time of S 400 Sprint at 20 °C is approx. 60 min. At higher temperatures the application time is reduced.

Drying

S 400 Sprint is conditionally walkable after setting and can be prepared for the following screed application. The subsequent screed is applied to a separating layer or insulating layer (mastix asphalt screed only on an insulation layer).

Further floor construction can be applied as soon as the residual moisture level is ≤ 10 CM %. The samples are taken across the entire cross-section, e.g. by drilling a small diameter tube (diameter 50 mm) into the floor and removing the S 400 Sprint core. When professionally applied the S 400 Sprint is sufficiently dry after 24 h.

Avoid rapid drying within the first 12 h for layer thicknesses under 15 mm (no draughts, when necessary, cover with foil).

Note	Installation of S 400 Sprint on insulation material is not possible.

Storage

Can be stored for an unlimited period when stored in a dry place.

Technical data

Description	Unit	Value
Reaction to fire	–	A2
Layer thickness on a separating layer	mm	30 – 150
Bonded layer thickness	mm	10 – 150
Density, drying	kg/m³	Approx. 400
Area weight per cm height	kg/m²	Approx. 4
Compressive strength (compressive stress with 10 % compression)	N/mm²	≥ 0.5
Thermal conductivity $\lambda_{10,dry,90/90}$	W/m·K	Approx. 0.1014
Water vapour diffusion resistance μ	–	Approx. 5

Note	See also: Product data sheet S 400 Sprint System data sheet Thin-layer screed systems FE22.de

Estroperl®

Pressure-resistant bulk leveller made of expanded perlite, non water-absorbent

Estroperl® is a mechanically bonded bulk dry leveller made of perlite expanded volcanic rock for height equalization and for thermal insulation under wet and mastic asphalt screeds in acc. to DIN 18560-2.

Application

Substrate preparation

The substrate must be stable, clean and the surface must be dry.

Ensure that there is a fully stable, load-bearing substrate made of planks or wooden composite boards in case of wood joist ceilings.

Apply permeable trickling protection on wooden substrates (e.g. Knauf Schrenzlage synthetic coated kraft paper) and apply on the walls and other rising constructional components.

In case of application over dead floor, level with Estroperl® only if sufficient load bearing capacity of the dead floor is assured.

On reinforced concrete coverings, lay an approx. 0.2 mm thick PE foil (as protection against any possible rising residual moisture) overlapped by at least 20 cm and apply up to the construction height on the walls.

In case of concrete slabs contacting the soil, apply sealing acc. to DIN 18533, e.g. apply Katja Sprint sealing membrane underneath Estroperl®.

Note	Estroperl® is suitable for all conventional ceiling types. Do not use on wooden plank stack slab ceilings.

Application

Estroperl® is installed and levelled with the levelling rule until a flat surface is achieved. The is covered with Fasoperl-A8 boards and subsequently compacted. Please note that the Estroperl® bulk leveller must be applied with about 20 % excess height (when compacted by walking) to allow for the subsequent compaction and thus achieve the required installation height.

Storage

Store dry on pallets. It can be stored indefinitely.

Technical data

Description	Unit	Value
Graining	mm	0 – 6
Bulk density ρ_S in non-compressed state	kg/m³	Approx. 90
Leveller height per layer	mm	10 – 200
Rated value of thermal conductivity λ_B	W/(m·K)	0.052
Rated value of thermal conductivity λ_D	W/(m·K)	0.050
Building material class	–	Non-combustible
Reaction to fire	–	A1
Compressive strength (compressive stress with 10 % compression)	kPa	≥ 130
Water vapour diffusion resistance μ	–	3
Application	–	DEO
European Technical Assessment (approval)	–	ETA-18/0452

Note	See also product data sheet Estroperl® F473c.de.

Staubex®

Pressure-resistant bulk leveller made of expanded perlite

Staubex® is a mechanically bonded bulk dry leveller made of perlite expanded volcanic rock for height equalization and for thermal insulation under wet and mastic asphalt screeds in acc. to DIN 18560-2. Staubex® is an application-friendly and very light dry bulk leveller.

Application

Substrate preparation

The substrate must be stable, clean and the surface must be dry.

Ensure that there is a fully stable, load-bearing substrate made of planks or wooden composite boards in case of wood joist ceilings.

Apply permeable trickling protection on wooden substrates (e.g. Knauf Schrenzlage synthetic coated kraft paper) and apply on the walls and other rising constructional components.

In case of application over dead floor, level with Staubex® only if sufficient load bearing capacity of the dead floor is assured.

On reinforced concrete coverings, lay an approx. 0.2 mm thick PE foil (as protection against any possible rising residual moisture) overlapped by at least 20 cm and apply up to the construction height on the walls.

In case of concrete slabs contacting the soil, apply sealing acc. to DIN 18533, e.g. apply Katja Sprint sealing membrane underneath Staubex®.

Note	Staubex® is suitable for all conventional ceiling types. Do not use on wooden plank stack slab ceilings.

Application

Staubex® is installed and levelled with the levelling rule until a flat surface is achieved. The is covered with Fasoperl-A8 boards and subsequently compacted. Please note that the Estroperl® bulk leveller must be applied with about 20 % excess height (when compacted by walking) to allow for the subsequent compaction and thus achieve the required installation height.

Storage

Store dry on pallets. It can be stored indefinitely.

Technical data

Description	Unit	Value
Graining	mm	0 – 6
Bulk density ρ_S in non-compressed state	kg/m³	Approx. 90
Leveller height per layer	mm	10 – 200
Rated value of thermal conductivity λ_B	W/(m·K)	0.052
Rated value of thermal conductivity λ_D	W/(m·K)	0.050
Building material class	–	Non-combustible
Reaction to fire	–	A1
Compressive strength (compressive stress with 10 % compression)	kPa	≥ 130
Water vapour diffusion resistance μ	–	3
Application	–	DEO
European Technical Assessment (approval)	–	ETA-20/0792

Note	See also product data sheet Staubex® F473a.de.

Staubex® Plus

High load capable bulk leveller

Staubex® plus is a high load capable mechanically bonded bulk leveller made of perlite expanded volcanic rock for application under wet and mastic asphalt screeds. The Staubex® plus bonds to a stable and load bearing equalization layer thanks to the partial bitumen encasement layer. Staubex® plus is an application-friendly and very light dry bulk leveller.

Application

Substrate preparation

The substrate must be stable, clean and the surface must be dry.

Ensure that there is a fully stable, load-bearing substrate made of planks or wooden composite boards with wood joist ceilings. Apply permeable trickling protection on wooden substrates (e.g. Knauf Schrenzlage synthetic coated kraft paper) and apply on the walls and other rising constructional components.

In case of application over dead floor, level with Staubex® plus only if sufficient load bearing capacity of the dead floor is assured.

On reinforced concrete coverings, lay an approx. 0.2 mm thick PE foil (as protection against any possible rising residual moisture) overlapped by at least 20 cm and apply up to the construction height on the walls.

In case of concrete slabs contacting the soil, apply sealing acc. to DIN 18533, e.g. apply Katja Sprint sealing membrane underneath Staubex® plus.

Note	Staubex® plus is suitable for all conventional ceiling types. Do not use on wooden plank stack slab ceilings.

Application

Staubex® plus is installed and levelled with the levelling rule until a flat surface is achieved. The is covered with Fasoperl-A8 boards and subsequently compacted. Please note that the Staubex® plus bulk leveller must be applied with about 10 % excess height (to allow for the subsequent compaction by walking) or 15 % (with mechanical compaction) to compensate for subsequent compaction and thus achieve the required installation height.

Storage

Store dry on pallets. It can be stored indefinitely.

Technical data

Description	Unit	Value
Graining	mm	0 – 6
Bulk density ρ_S in non-compressed state	kg/m³	Approx. 140
Leveller height per layer	mm	10 – 200
Rated value of thermal conductivity λ_B	W/(m·K)	0.063
Rated value of thermal conductivity λ_D	W/(m·K)	0.061
Building material class	–	Flammable
Reaction to fire	–	E
Compressive strength (compressive stress with 10 % compression)	kPa	≥ 70
Water vapour diffusion resistance μ	–	3
Application	–	DEO
European Technical Assessment (approval)	–	ETA-17/0500

Note	See also product data sheet Staubex® F473b.de.

Edge insulation strips

Figure 39: Apply edge insulation strips with foil (also on pipes, radiators, etc.). Do not staple at screed height.

Figure 40: Application of mineral wool edge insulation strips with fire protection requirements

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

Stable edge strips made of special PE foam with laminated foil strips. Very easy to apply, particularly in inside corners. Installation considering the planned 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 glue (FE 10/120) them instead. 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 Schrenzlage synthetic coated kraft paper 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) after the floor covering is applied.

Note	Randdämmstreifen FE 10/120 edge insulation strips 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

Note	See also product data sheet K436a.de Edge insulation strips FE

Important information for application of the insulation layer

Application

- Apply the insulation materials joint on joint and apply as an entire layer. Avoid cavities. Insulation material type and thickness are dependent on the function of the screed. Insulation materials must comply with the valid standards (EN 13162 - EN 13171).
- It is recommended that you do not install footfall sound insulation panels in several layers, as it will not significantly improve the noise insulating effect, but will reduce the stability of the screed construction. (Addition of the compressibility).
- When applying EPS insulation layers on heavy-duty acoustic infill, application of a load distribution board, e.g. Knauf gypsum board 9.5 mm, is recommended. When applying mineral wool insulation layer or underfloor heating, this covering 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 for use underneath the mineral wool when mineral wool insulation layers are applied.
- 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 synthetic coated kraft paper with an overlap of ≥ 8 cm.
- In order to avoid seeping through the Schrenzlage synthetic coated kraft paper (screed will flow through a damaged Schrenzlage synthetic coated kraft paper 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 synthetic coated kraft paper is applied directly on the impact sound insulation, it is useful to glue or seal the joint of the Schrenzlage synthetic coated kraft paper to exclude mortar from getting underneath it.

It is essential to pay careful attention when preparing the substrate 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 figures shown on the opposite page, you will see the correct application compared to the most frequent errors made in practice.

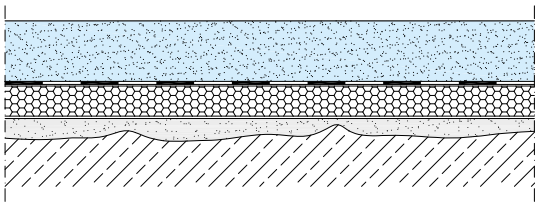
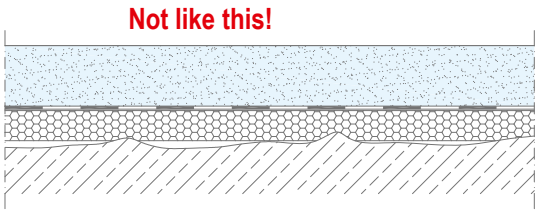
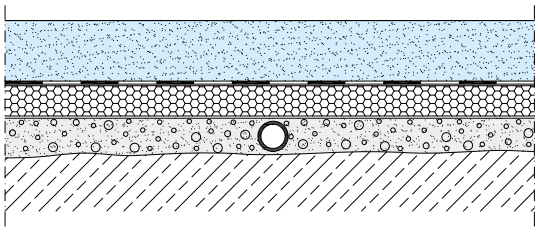
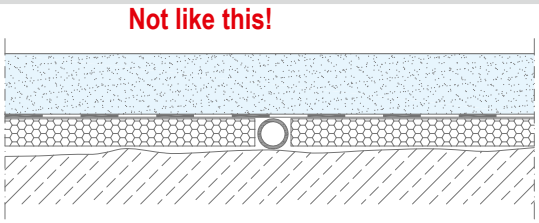
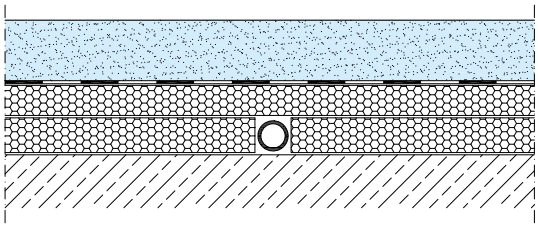
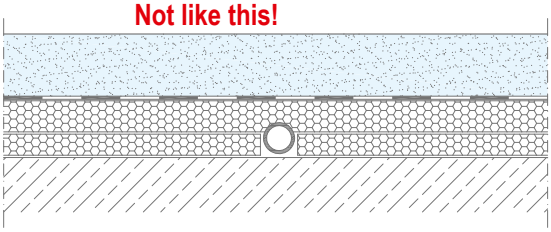
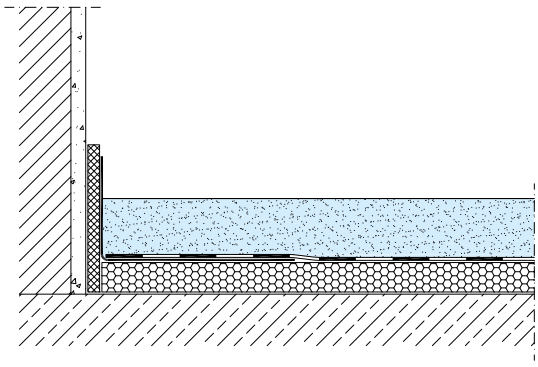
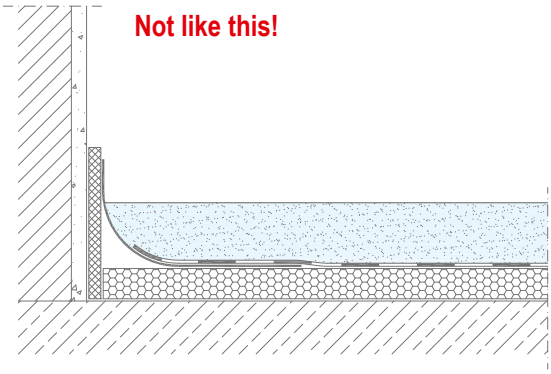
Figure 41: EPS insulation

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

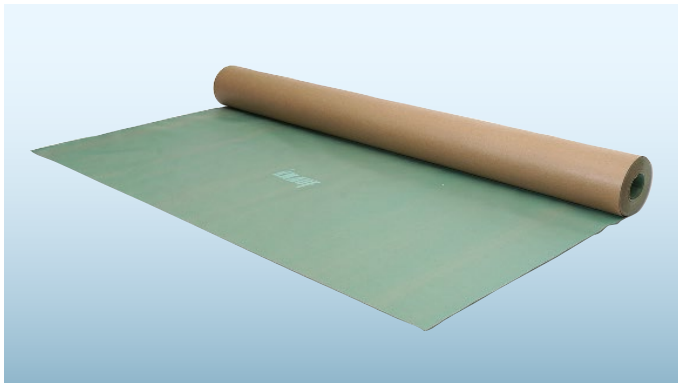
Figure 42: Mineral wool insulation

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

Application comparison

Correct application	Incorrect application
Substrate equalization with large levels of unevenness	Equalization absent, impact noise insulation not fully effective
	
Substrate equalization up to top of pipe	Impact noise insulation interrupted, screed - substrate contact
	
Full surface application of impact noise insulation	Weakened impact noise insulation
	
Precise edge application, uniform screed thickness	Weakening of the screed in the edge area
	

Schrenzlage synthetic coated kraft paper



Schrenzlage synthetic coated kraft paper is a premium quality Soda Kraft paper used for various applications. It is coated on both sides with polyethylene.

The following applications are possible:

- 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 N 440 (see system data sheet Knauf thin layer heating screed systems FE22.de)
- As a separating layer on hollow partial access floor sheathing units under flowing screeds

Schrenzlage synthetic coated kraft paper is not a seal or a vapour brake.

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

Application

Schrenzlage synthetic coated kraft paper 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 on the insulation layer, e.g. Knauf gypsum board, t = 9.5 mm. If the Schrenzlage synthetic coated kraft paper is applied directly on the impact sound insulation, it is useful to glue or seal the joint of the Schrenzlage synthetic coated kraft paper, to exclude mortar from getting underneath it.

If screed without an insulation layer is applied over a seal (e.g. Katja Sprint Abdichtungsbahn sealing membrane), apply the Schrenzlage synthetic coated kraft paper between the seal and screed.

Technical data

Description	Unit	Value
Weight per unit area	g/m²	Approx. 100
Material thickness	µm	Approx. 110 – 130
Consumption	m²/m²	Approx. 1.07
Melting range/melting point	°C	80 – 120
Water vapour permeability	g/m²d	Approx. 4.2
Diffusion resistance coefficient µ	–	Approx. 77 000
Water vapour diffusion-equivalent air layer thickness s_d value	m	Approx. 9

In the area connecting to the wall, apply Schrenzlage synthetic coated kraft paper on the foil of the edge insulation strip (do not allow to stand up at the edge).

Figure 43: Connection to wall

A Application direction of the Schrenzlage synthetic coated kraft paper

B Pouring direction of the flowing screed towards the Schrenzlage synthetic coated kraft paper overlap

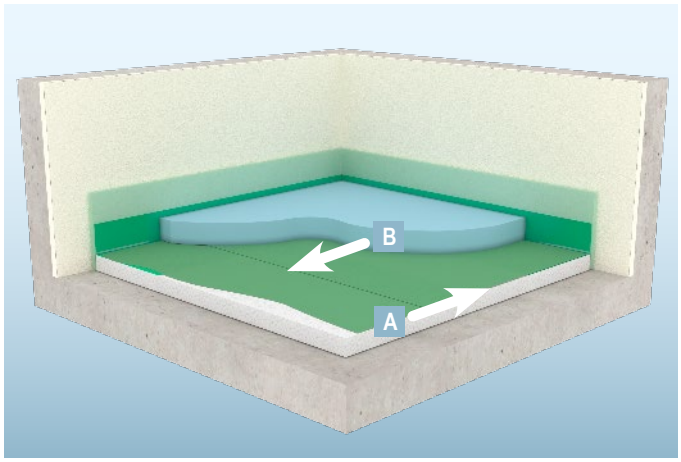
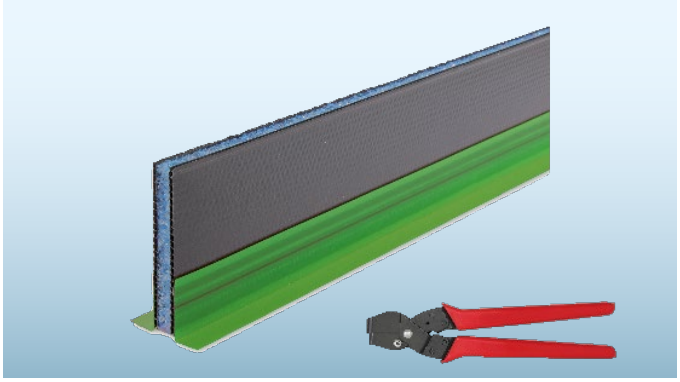


Figure 44: Application direction of Schrenzlage and pouring direction of flowing screed

Note	See also product data sheet K438.de Schrenzlage synthetic coated kraft paper

Joint application



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

Fundamentals

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

As heating floor screeds, flowing screeds are subjected to changes in length resulting from temperature changes. For this reason, joints may be necessary in heated 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 IGE/VDPM).

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 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" on page 94).

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

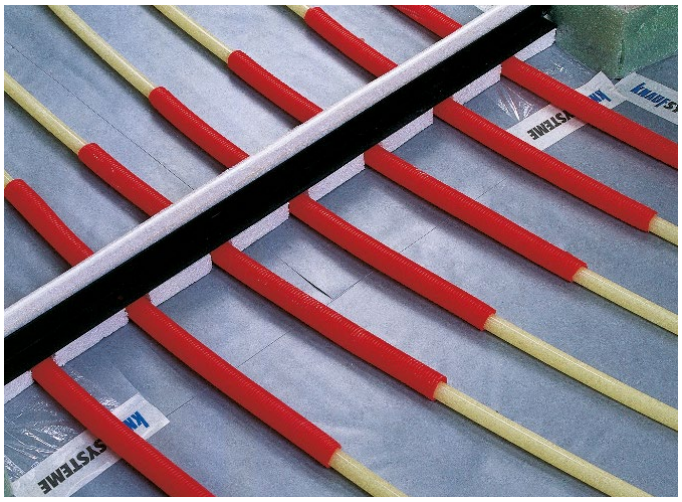


Figure 45: Movement joint in a heating floor screed, type A on door passageways

Note	See also the technical information Knauf movement joints for flowing screed Bo16.de and product data sheet Movement joint 12/80 K431F.de

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 and movement joints

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

Structural joints

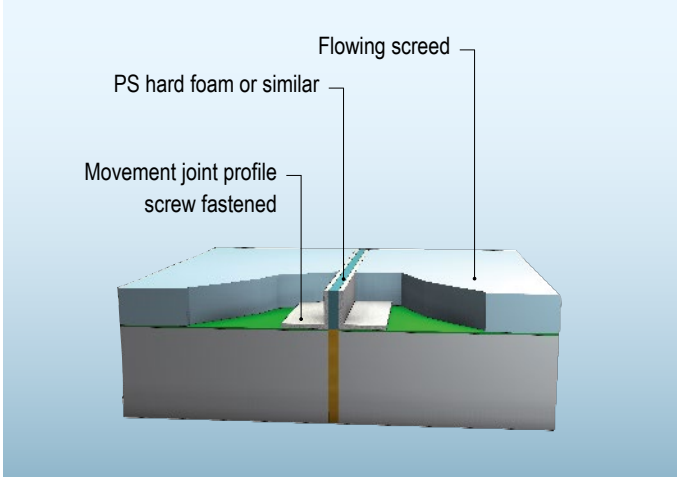


Figure 46: Structural joint (movement joint)

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/VDPM) 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 separation of heated and unheated areas. Movement joints should not lead through heating circuits.

Non-expanding or working 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).

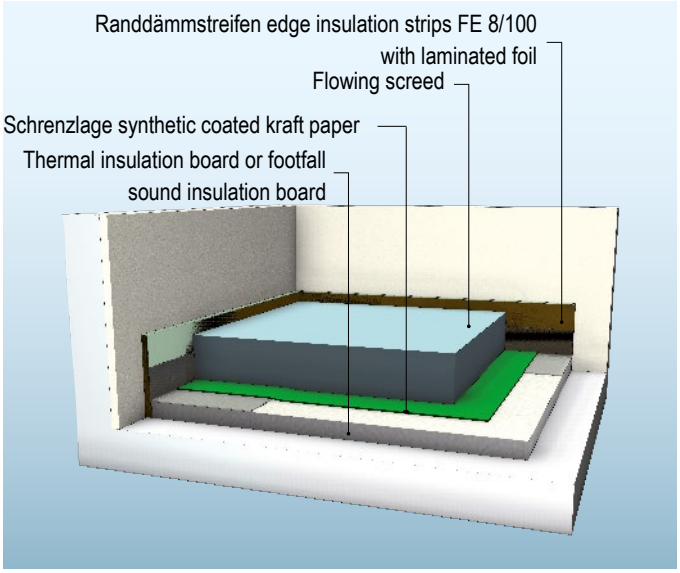


Figure 47: Edge joint

Dummy joints

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

Stoppage joint

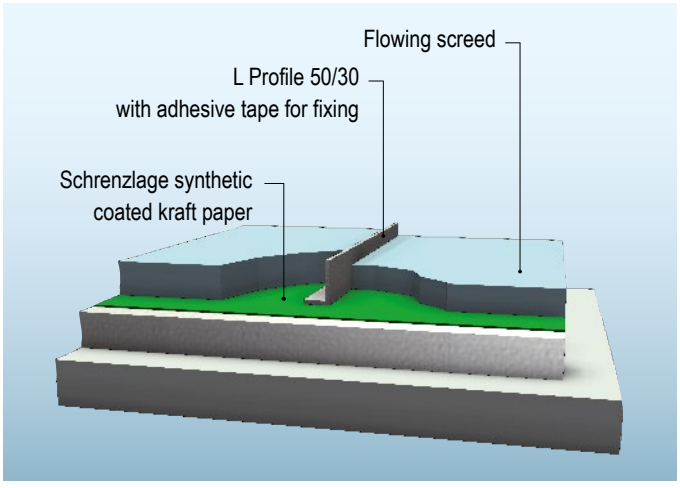


Figure 48: Stoppage joint with height offset

Joint application

L Profile

Proper joints can also be created with the L Profile 50/30 in conjunction with 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 figures Figure 47 to Figure 50.
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 fixed.

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 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 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 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.

Examples for movement joints with heating floor screed, type A

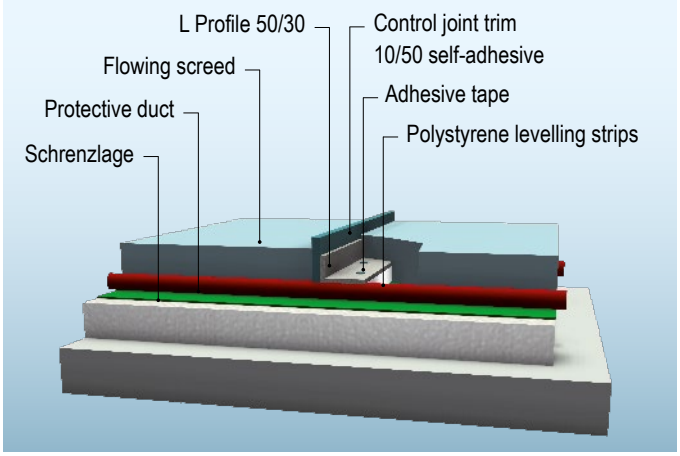


Figure 49: Application variant 1: Joints with L profile

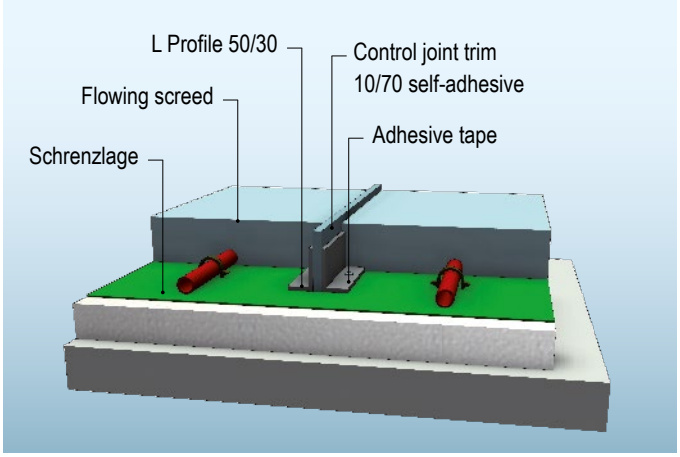


Figure 51: Application variant 3: Joints with L profile

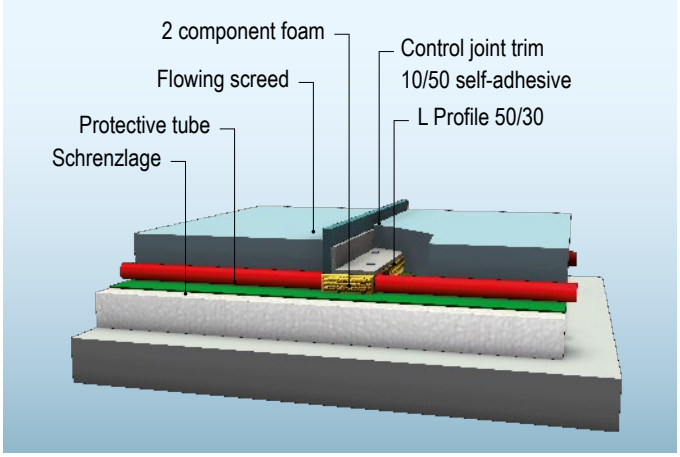


Figure 50: Application variant 2: Joints with L profile

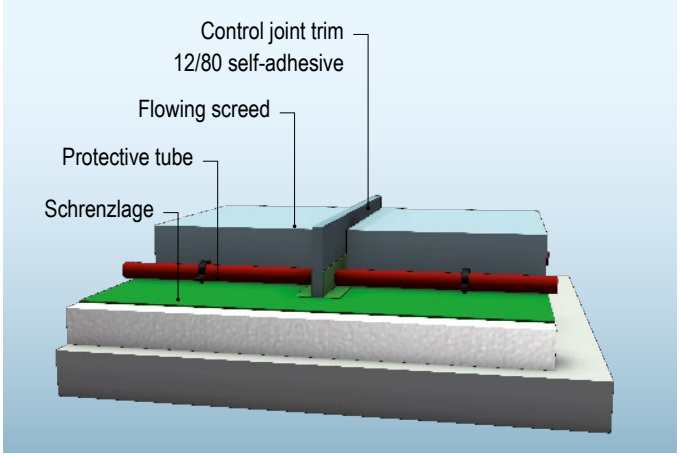


Figure 52: Application variant 4: Joints with L profile

Application of flowing screeds and equalization compounds

Application temperature

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

Knauf flowing screeds and N 440 can be applied even at external temperatures under 0 °C (prerequisite: Water supply is assured and the interior temperature and mortar temperature are above 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 (antifreeze, heating at low temperature in operation). For N 340 and FE Sprint, an ambient and mortar temperature of least +10 °C applies.

Depending on the material, certain mortar application temperatures should not be exceeded (Table 24 on page 72).

Ventilation should commence after 1 day with 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).

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 (Table 24 on page 72).

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).

N 440 and N 340 should be levelled within 10 minutes of application.

Application consistence

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, 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 consistence*. The slump flow is used as a method for setting the consistence. The slump flow is determined using a 1.3 l PFT consistence checking tin, by placing the tin filled with mortar on the Schrenzlage synthetic coated kraft paper, releasing the base and then 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 consistence* Table 24 on page 72. These values are only reference values (not strictly defined for application), as the ideal consistence 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.

Note	The application consistence of the mortar is determined by the water quantity added. The consistence should be set so that the mortar flows but no *watery slurry* separates during pouring.

Note	After coordination of trades with area heating and area cooling systems of the BVF in conjunction with heated screeds, the measurement points for CM measurement must be arranged.

Table 24: Data on application consistence

Material	Max. mortar temperatures at application	Open times for application	Dry mortar requirement per cm screed and m²	per m³ wet mortar	Slump-flow – the ideal consistence (empirical values)	Product data sheet
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
FE Fire	25 °C	approx. 40 min	approx. 19 kg	approx. 1.9 t	38 – 43 cm[1)]	F323f.de
N 340	32 °C	approx. 30 min	approx. 16 kg	approx. 1.6 t	max. 57 cm[2)]	F413.de
N 440	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 federal states of Bremen, Nordrhein-Westfalen, parts of Niedersachsen, Rheinland-Pfalz.*

The screed may not lose water during application.

Determination of the slump flow

Figure 53: Tools

Figure 55: Lift the consistence checking tin

Figure 54: Fill the consistence checking tin with mortar

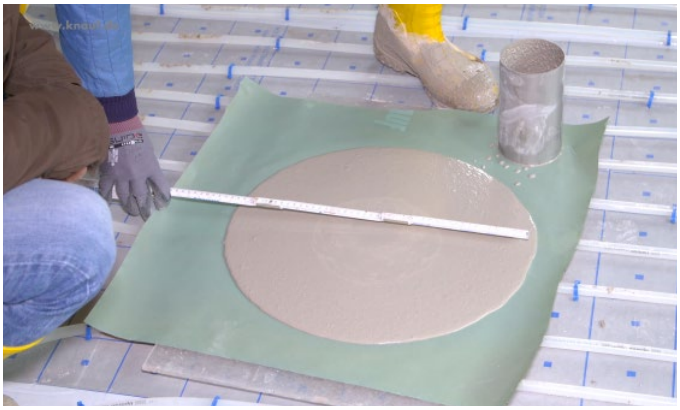


Figure 56: Measurement of the diameter

Installation of the screed

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 down to the basic floor 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 specifications (machine equipment "Machines for Knauf flowing screeds" on page 75 ff).

If the edges of the Schrenzlage are not glued, it is important to ensure that the mortar does not penetrate underneath the Schrenzlage. The mortar should be poured in the room so that it always flows from the upper Schrenzlage synthetic coated kraft paper 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. This work process ensures that smaller irregularities are eliminated (levelled) and the mortar is de-aired.

Note	With heated 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.

Figure 57: Setting the height with PFT levelling sensors

Figure 58: Pouring the screed

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.

Figure 59: Working with a 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.

Figure 60: Working with a screed broom

Application of N 440 with thin-layer heated screed

In order to ensure that the mortar can flow well into the small clip knobs on the fixing panel, it is recommended that N 440 is worked intensively during or immediately after screed application with a screed broom and subsequently levelled with a dappling bar.

Machines for Knauf flowing screeds

Figure 61: Knauf complete logistical service FERRO 100 with star wheel

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 bagged materials. In the table “Recommended machine systems for the application of flowing screeds” on page 77, 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, consistence 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, PFT FERRO neXt or MAI Pumpe HiComp are used. These machines are permanently fixed to the silo. They have the advantage that the mixing and pumping sections are separate from one another and matched to one another (complete logistics).

The PFT G 4 is loaded using 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 considered and applied.

PFT FERRO 50

In principle, this mixing and conveying pump is almost identical to the PFT FERRO 100, but it has an output capacity of approx. 50 l/min. It is used especially for Knauf leveller and equalization compounds which require a lower output capacity.

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 silo on a rental basis as a complete Knauf logistical service.

Tips for application with PFT FERRO 100 / 50

Water supply

The PFT FERRO 100 is designed for an output capacity of approx. 90 to 100 l/min, the PFT FERRO 50 correspondingly for 50 l/min. A prerequisite for high mixing and conveying capacity is an adequate supply of water.

Please note:

- If the water quantity is insufficient, interruptions in the conveyed screed supply must be expected.
- Before commencing work, check the water quantity on the water gauge.
- If necessary, connect an independent water connection using a second water hose.
- If a mobile water pump is used to assure the water quantity, connect it to the start of the water hose.

Supply hose

The pump capacity is reduced by long hoses, large feed heights and narrow hose diameters, as they offer a greater resistance to the pump. This is why the pump distances should be kept as short as possible and hoses with an internal diameter of at least 40 mm should be used. For longer pump distances, it has proven effective to use hoses with an internal diameter of 50 mm and to use a pouring hose at the end with a 40 mm internal diameter. If the pump distance is reduced as work progresses, it may be useful to remove the hose sections to improve the pouring capacity.

Table 25: Supply hose data

Internal diameter	Cross-sectional area	Volume at 1 m hose length
50 mm	approx. 20 cm²	2 l
40 mm	approx. 13 cm²	1.3 l
35 mm	approx. 10 cm²	1 l

Frost temperatures

Switch on the heating for the fittings on the FERRO and wait about 30 min (dependent on the temperature), before the water flows and the machine is switched on.

After work is complete clean the machine and drain off the water in the machine and water reservoir.

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.

Figure 62: PFT G 4 mixing pump

Figure 63: PFT RITMO L plus mixing pump

Figure 64: Mixing and feed pump PFT FERRO neXt

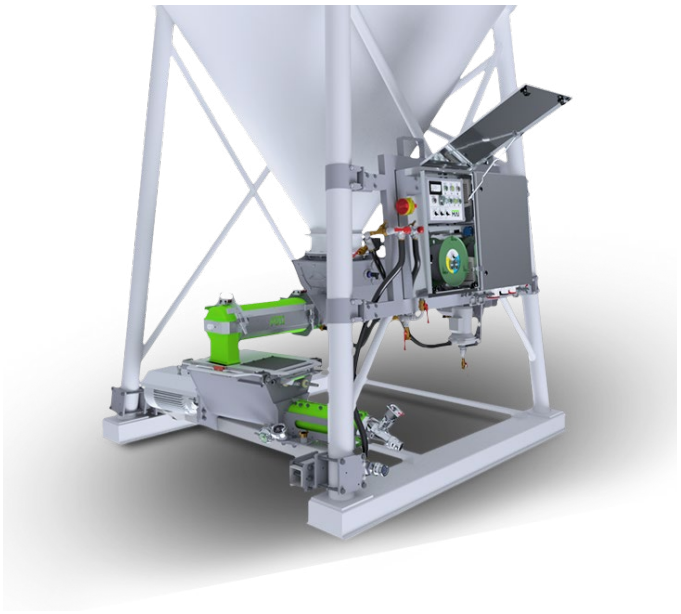


Figure 65: MAI® pump HiComp

Recommended machine systems for the application of flowing screeds

Table 26: Recommended machine systems for the application of flowing screeds

Machine system	Equipment variants	Mortar capacity (approx.)				Pumping distance / supply height[2]	Building site requirements	
				m²/h screed thickness[3]				
		l/min	m³/h	35 mm	55 mm		Water connection[1]	Electrical connection
PFT FERRO 100	Horizontal mixer with screw pump, size 50 and 40 mortar hoses	100	6.0	171	109	Up to 100 m at DN50 with approx. 50 m supply height	At least ¾ " with 3 bar at 2300 - 2500 l/h	400 V three-phase 50 Hz, 5-phase 5 x 6 mm² to 75 m cable length 32 A fuse[4]
PFT FERRO NeXt	Horizontal mixer with screw pump, size 50 and 40 mortar hoses	90 – 140	5.4 –8.4	154 – 240	98 – 152	Up to 110 m at DN50 with approx. 50 m supply height	1 " with 3 bar at 2800 – 3000 l/h	400 V three-phase 50 Hz, 5-phase 5 x 6 mm² to 75 m cable length 32 A fuse[4]
PFT G 4	Screw pump R 8-1.5 size 35 mortar hoses	85	5.1	137	87	Approx 80 m with approx. 10 m supply height	At least ¾ " 1500 – 1750 l/h	400 V three-phase 5 x 4 mm² 32 A fuse
MAI® HiComp	Horizontal mixer with screw pump sizes 50 and 40 mortar hoses	100 – 150	6.0 – 9.0	171 – 257	109 – 163	Up to 110 m at DN50 with approx. 50 m supply height	1 " with 4 bar at 3300 – 3500 l/h	400 V three-phase 50 Hz, 5-phase 5 x 6 mm² to 75 m cable length 32 A fuse[4]

1) *Water pressure ≥ 3.0 bar with operating machine*
Water requirement 1st value – FE 50 Largo, FE Sprint, FE Eco, FE Fire
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, consistence, pump state, hose diameter.*

3) *Further reference values for other screed thicknesses see "Table 28: Recommended values for output capacity" on page 80.*

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

Note	See also www.pft.net

PFT machine for application of Knauf leveller and equalization compounds

Table 27: PFT machines – Basic settings for leveller and equalization compounds

Material	Slump flow Ø cm PFT consistence check tin	Feed mixing pump	Rotor equipment	Agitator	Water l/h approx. basic setting	Output l/min
N 320 Sprint	63	LOTUS XS (compound design)	–	–	220	13
	63	RITMO L plus (Stage 10)	B 4-2	Agitator	200	14
	63	G 4	D 6-3 PIN	ROTOMIX disc[1)] or static mixer	350	20
	63	G 4	D 8-1.5 PIN	ROTOMIX disc[1)] or static mixer	450	36
N 320 Flex	63	LOTUS XS (compound design)	–	–	280	13
	63	RITMO L plus (Stage 10)	B 4-2	Agitator	250	14
	63	G 4	D 6-3 PIN	ROTOMIX disc[1)] or static mixer	350	22
	63	G 4	D 8-1.5 PIN	ROTOMIX disc[1)] or static mixer	580	36
N 330 Premium	66	LOTUS XS (compound design)	–	–	340	13
	66	RITMO L plus (Stage 10)	B 4-2	Agitator	280	14
	66	G 4	D 6-3 PIN	Agitator	550	20
	66	G 4	D 8-1.5 PIN	Agitator	850	36
N 340	55 (application 20 – 40 mm)	G 4	D 8-1.5 PIN	ROTOMIX D pump	600	36
	57 (application 5 – 20 mm)	G 4	D 8-1.5 PIN	ROTOMIX D pump	650	36
	55 (application 20 – 40 mm)	FERRO 50	–	–	1400	45
	57 (application 5 – 20 mm)	FERRO 50	–	–	1500	45
N 340 Sprint	64	LOTUS XS (compound design)	–	–	220	13
	64	RITMO L plus (Stage 10)	B 4-2	Agitator	200	14
	64	G 4	D 6-3 PIN	ROTOMIX disc[1)] or static mixer	450	20
	64	G 4	D 8-1.5 PIN	ROTOMIX disc[1)] or static mixer	650	36

1) preferred equipment

Note	See also www.pft.net

Machines for Knauf flowing screeds and equalization compounds

Material	Slump flow Ø cm PFT consistence check tin	Feed mixing pump	Rotor equipment	Agitator	Water l/h approx. basic setting	Output l/min
N 410	67	LOTUS XS (compound design)	–	–	420	13
	67	RITMO L plus (Stage 10)	B 4-2	Agitator	300	14
	67	G 4	D 6-3 PIN	ROTOMIX disc[1)] or static mixer	500	20
	67	G 4	D 8-1.5 PIN	ROTOMIX disc[1)] or static mixer	800	36
N 410 Flex	67	LOTUS XS (compound design)	–	–	420	13
	67	RITMO L plus (Stage 10)	B 4-2	Agitator	300	14
	67	G 4	D 6-3 PIN	ROTOMIX disc[1)] or static mixer	500	20
	67	G 4	D 8-1.5 PIN	ROTOMIX disc[1)] or static mixer	800	36
N 430	66	LOTUS XS (compound design)	–	–	300	13
	66	RITMO L plus (Stage 10)	B 4-2	Agitator	250	14
	66	G 4	D 6-3 PIN	ROTOMIX disc[1)] or static mixer	450	20
	66	G 4	D 8-1.5 PIN	ROTOMIX disc[1)] or static mixer	700	36
N 440	56	G 4	D 6-3 PIN	ROTOMIX D pump	440	20
	56	G 4	D 8-1.5 PIN	ROTOMIX D pump	700	36
	56	G 4	R 7-1.5	ROTOMIX D pump	1200	60
	56	RITMO L plus	B 4-2	ROTOMIX for RITMO L plus	300	14

1) preferred equipment

Note	See also www.pft.net

Machines for Knauf flowing screeds and equalization compounds

Recommended for the installation of screeds

Table 28: Recommended values for output capacity

Technical data		Machine type PFT G 4 (R 7-1,5)		PFT G 4 (new version with R 8-1,5)		e.g. PFT FERRO 100	
Mortar quantity per l/min		60		80		100	
Power connection V A		 400 32					
Water connection	ø	3/4 inch					
Dry mortar consumption tonnes/hour	(t/h)	Approx. 6		Approx. 9		Approx. 11	
Logistics		Bag		Bag		Bulk (Silo)	
Thickness	**Material requirement** Approx. 19 kg/(cm·m²)	**Output capacity and pouring time per m² related to screed thickness**					
mm	kg/m²	m²/h	min/m²	m²/h	min/m²	m²/h	min/m²
25	48	144	0.42	192	0.31	240	0.26
30	57	120	0.50	160	0.38	200	0.31
35	67	103	0.58	137	0.44	170	0.36
40	76	90	0.67	120	0.55	150	0.41
45	86	80	0.75	107	0.56	133	0.46
50	95	72	0.83	96	0.62	120	0.52
55	105	65	0.92	87	0.69	108	0.57
60	114	60	1.00	80	0.75	100	0.62

Knauf flowing screeds complete logistics system

Logistics

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

Table 29: Container for flowing screed

Technical data	Values
Container type	Round silo C 20000
Max. load	Approx. 20 m³, approx. 32 t
Container weight	Approx. 2.4 t
Max. load, transport quantity	Approx. 9 – 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 engaging 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 e.g. 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, only the power, water and mortar hoses need to be connected to the logistical unit so that the usual 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 screed machine 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.

Note	Observe the rental conditions for flowing screed mixing pumps.

Note	Code of Practice No. 1 “Safe handing of transportable building site silos“ (German only) of the BVG

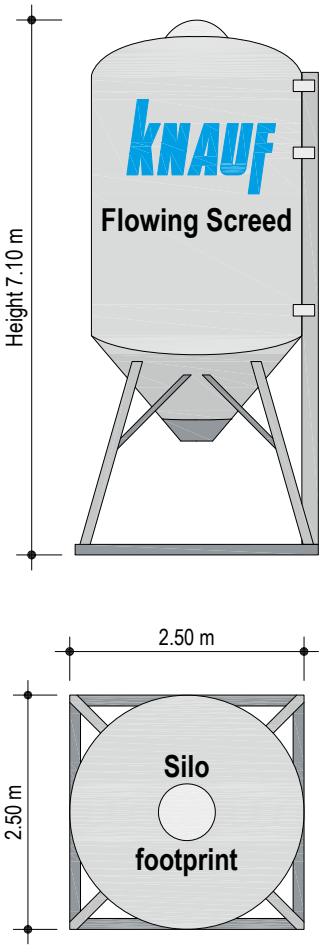


Figure 66: Silo footprint

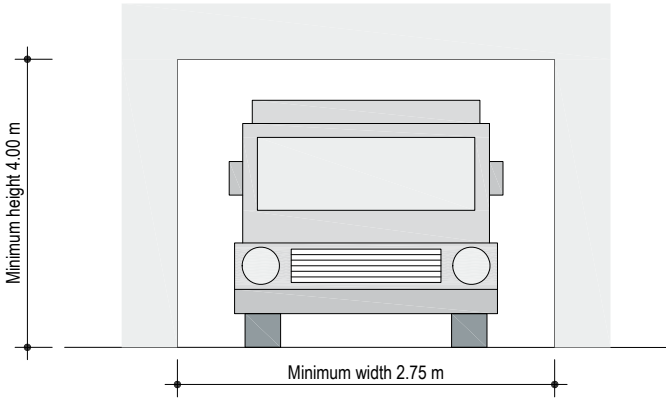


Figure 67: Clearance dimensions

Drying

Drying of calcium sulphate flowing 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 to accept floor covering.

The special pore structure of calcium sulphate screed enables rapid dissipation of the moisture to the ambient air. The screed can only dry quickly 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 30 on page 83).

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

For 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.

In practice this means:

- When hard enough for foot traffic (after about 24 hours, FE 25 A tempo 3 hours after screed installation) tilt the windows to reduce the formation of condensed water on the windows.
- From 2 days (FE 25 A tempo when hard enough for foot traffic) after screed installation, open the doors and windows fully to assure the exchange of air (draught). In contrast to cementitious screeds, draughts are not damaging for Knauf flowing screeds 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.
- With FE Eco after the 2nd day it is preferable to extract the air with a fan (installed in the window) to support air removal 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.
- Drying of the screed surface should not be hindered by storing building materials on the surface

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, see Figure 63. 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.

Table 30: 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	0 – 0.5
Windows tilted, blinds closed	0.3 – 1.5
Windows tilted, no roller shutters	0.8 – 4.0
Windows half open	5 – 10
Windows fully open	9 – 15
Windows and French doors fully open (opposite one another)	Approx. 40

Note	
	Whereas 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). See also IGE/VDPM Code of Practice No. 2

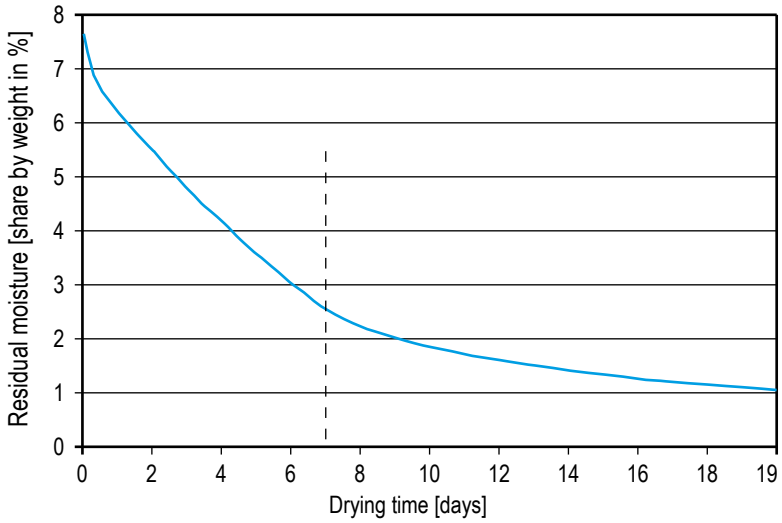


Figure 68: Knauf flowing screed drying curve

Drying of heating floor screed

Heating of heating floor screed until dry

The heating floor screed must be heated up before floor covering is applied. 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 84).

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 floor 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.

For 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 constant 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 be implemented in steps of 5 K per day. The highest temperature must be retained without temperature reductions resulting from night-time operation mode while assuring 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 up uniformly.

This also concerns areas, such as corridors through which the connections lead to other rooms.
Subsequently, the flow temperature is reduced until a surface temperature of 15 to 18 °C is achieved. At very low external temperatures (≤ 0 °C), ensure that during heating up of the screed surface that 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.

On the other hand for flowing screed FE 25 A tempo, directly after it is hard enough for foot traffic (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.

For flowing screed FE Eco and FE Fire, heat up can only commence after 2 days at the earliest. The flow temperatures of max. 40 °C for FE Eco and max. 55 °C for FE Fire may not be exceeded.
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 x 50 cm) as an initial test, by applying the foil in a ventilated room at a maximum flow temperature (max. 55 °C or 45 °C with N 440 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 replace the need for a CM measurement before floor covering application, see page 91.

Note	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 86).

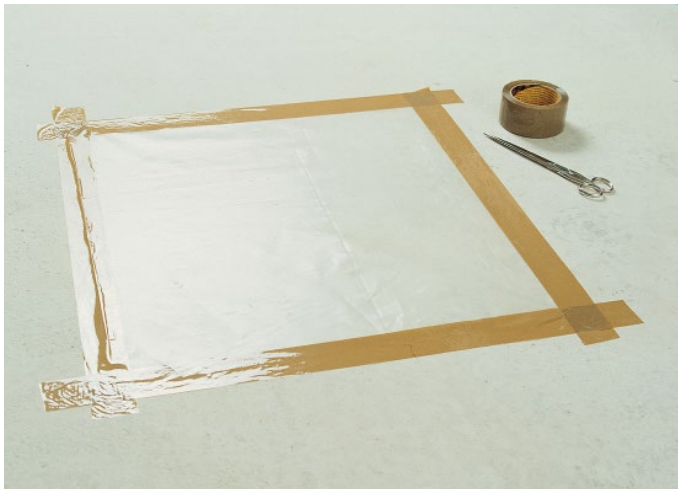


Figure 69: Initial inspection of drying with foil on the heating floor screed

Figure 70: Check for the formation of condensation under the foil

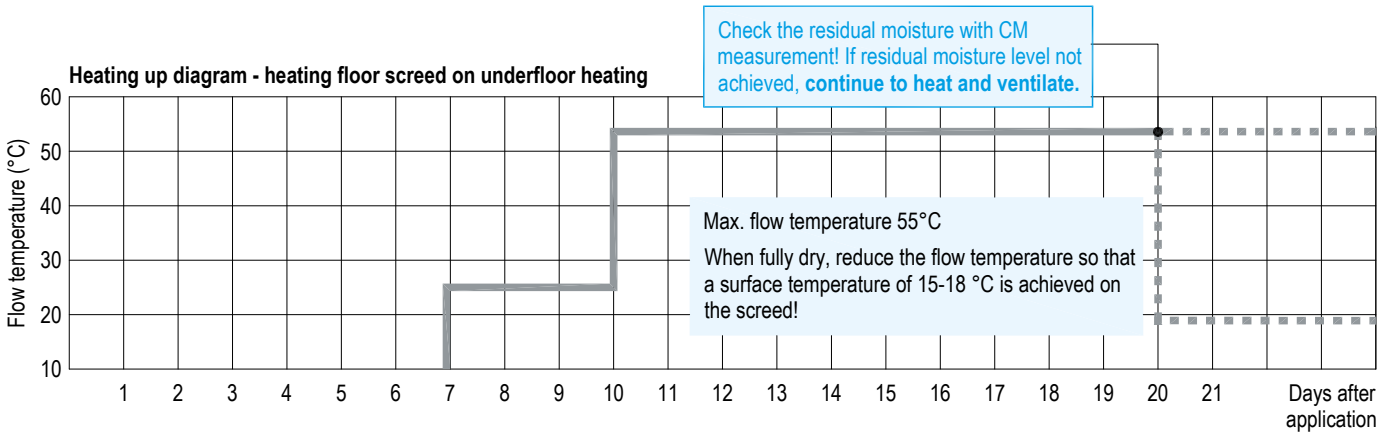
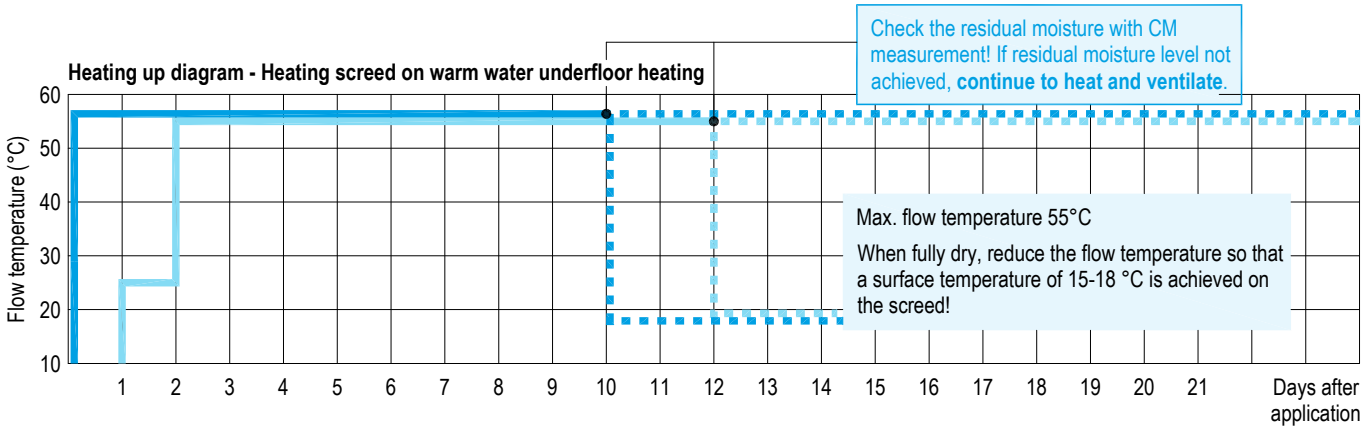


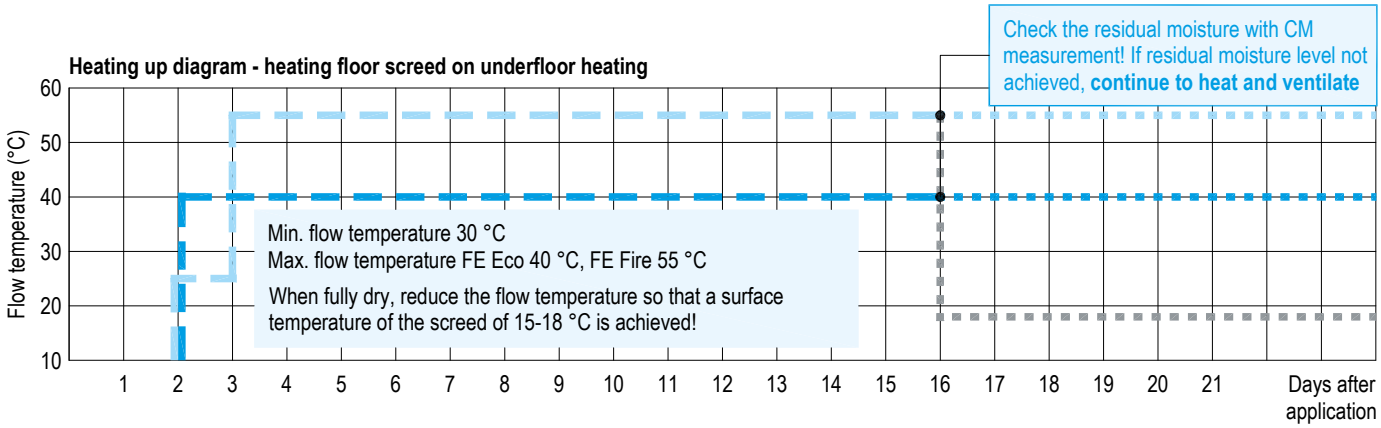
Figure 71: Heating up diagram for FE 80 Allegro, FE 50 Largo and FE Fortissimo



FE 25 A tempo, after hard enough for foot traffic (after approx. 3 h)

FE 25 A tempo, heat up after hardened

Figure 72: Heating up diagram for FE 25 A tempo



FE Eco, heat up after 2 days

FE Fire, heat up after 2 days

Figure 73: Heating up diagram for FE Eco and FE Fire

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/VDPM).

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, acc. to EN 1264-4.
- For FE 25 A tempo, provide good ventilation after it is hard enough to be walked on (after approx. 3 h) and then start heating it up.
- Commence heating up and ventilation of FE Eco and FE Fire 2 days after installation. Ventilation using a fan (installed in window) is preferable, which transports the air out of the building.
- Functional heating must be performed on a heated floor screed acc. to EN 1264-4 before the floor 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 to 3 days after cooling down. If you wait for longer than 3 days with application of the floor covering, the heated floor screed must be heated up yet again directly before the floor 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. Estrichgrund screed primer. Use an adhesive for the covering that is suitable for underfloor heating. Use an elasticized adhesive with a rigid covering (tiles, natural stone).

Note	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)

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

Heat up can start: 7 days after application in acc. with 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 be implemented in steps of 5 K per day.
   Reference values for drying at max. flow temperature and good ventilation:
   Thickness ≈ 35 mm (construction type B): approx. 10 days,
   Thickness ≈ 55 mm (construction 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 to 18 °C.
4. The screed will now be ready for floor coverings.

Heat up regulations for FE Eco and FE Fire

Start possible 48 h after application

1. For FE Eco set the highest temperature max. 40°C and retain it (without nighttime operation reduction) until the screed is dry.
   Set the FE Fire flow temperature to 25 °C, and retain it for 1 day and then increase to max. 55°C (without nighttime operation reduction) until the screed is dry. Reference values for drying at max. flow temperature and ventilation:
   Thickness ≈ 55 mm (construction type A): approx. 14 to 21 days
   Check the residual moisture.
2. After drying, reduce the flow temperature so that the surface temperature of the screed achieves 15 to 18 °C.
3. The screed will now be ready for floor coverings.

Heat up regulations for FE 25 A tempo

Heat up after hard enough for foot traffic

1. Operate the heating 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 and good ventilation:
   Thickness ≈ 35 mm (construction type B): approx. 7 days,
   Thickness ≈ 55 mm (construction type A): approx. 10 days
   Check the residual moisture.
3. Switch off heating after drying or reduce the flow temperature to 15 to 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 that 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 x 50 cm) on the heating screed surface, tape down the edges with adhesive tape.

At maximum 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 the need for CM measurement immediately before covering application. According to DIN 18560-1 the measured value may not exceed 0.5 %.

Flow temperature

Max. 55 °C, for FE Eco max. 40 °C

Edge insulation strips

To be suitable for flowing screed they must be compressible by at least 5 mm (only cut off after the floor 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, technical brochures and product data sheets.

Knauf flowing screed - warm water underfloor heating

Heating protocol for coverage ready heating

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

Investor:	**Heating engineer:**
Building site:	**Site manager:**

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

Heating system:	**Average screed thickness:** mm
Screed applied on:	**Coverage of heating element:**
	Min.: mm **Max.:** mm

Heat up (coverage ready heating)

Date	Flow temperature in °C	Signature

☐ Ventilation
☐ Window ventilation

Date from	to	Ø h per day

Preliminary drying test
(e.g. foil test[1])

Date	Dry yes/no	Signature

Drying test
(CM measurement)

Date	Residual moisture in %	Signature

Reduction of the flow temperature

Date	Flow temperature in °C	Signature

Coverage ready heating completed

Date	Outdoor temperature in °C	Signature

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

Please keep this document!

Place / Date

Signature (Site manager)

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 2 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 walked on (after approx. 3 h) and then start heating it up.
- 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 heated floor screed before the floor 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 to 3 days after cooling down. If you wait for longer than 3 days with application of the floor covering, the heated floor screed must be heated up yet again directly before the floor 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. Estrichgrund screed primer. Use an adhesive for the covering that is suitable for underfloor heating. Use an elasticized adhesive with a rigid covering (tiles, natural stone).

Note	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)

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

Heat up can start: 7 days after application

1. Set the floor thermostat to 25 °C and retain the value for 3 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 maximum floor thermostat temperature and good ventilation:
   Thickness ≈ 40 mm: approx. 12 days
   Check the residual moisture.
   Alternatively, heating up can be implemented in steps of 5 K per day.
3. After drying, reduce the floor thermostat temperature setting so that the surface temperature of the screed achieves 15 to 18 °C.
4. The screed will now be ready for floor coverings.

Heat up regulations for FE 25 A tempo

Heat up after hard enough for foot traffic

1. When hard enough for foot traffic (after approx. 3 h) operate the heating with a floor thermostat setting of max. 50 °C.
2. Retain the temperature until the screed is dry.
   Reference values for drying at maximum floor thermostat temperature and good ventilation:
   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 maintained 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 limit 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 that 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 x 50 cm) on the heating screed surface, tape down the edges with adhesive tape.

At heating with the maximum flow 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 the need for CM measurement immediately before covering application. According to DIN 18560-1 the measured value may not exceed 0.5 %.

Heating temperature

Max. 50 °C on heating element

Edge insulation strips

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

Nominal screed thickness

≥ 35 mm over 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/VDPM).

Note	Further notes in the brochures, technical brochures and product data sheets.

Knauf flowing screed on electrical underfloor heating

Heating protocol for coverage ready heating

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

Investor:	**Heating engineer:**
Building site:	**Site manager:**

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

Heating system:	**Average screed thickness:** mm
Screed applied on:	**Coverage of heating element:**
	Min.: mm **Max.:** mm

Heat up (coverage ready heating)

Date	Floor thermostat setting in °C	Signature

☐ Ventilation
☐ Window ventilation

Date from	to	Ø h per day

Preliminary drying test
(e.g. foil test[1])

Date	Dry yes/no	Signature

Drying test
(CM measurement)

Date	Residual moisture in %	Signature

Reduction of the floor thermostat temperature

Date	Floor thermostat setting in °C	Signature

Coverage ready heating completed

Date	Outdoor temperature in °C	Signature

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

Please keep this document!

Place / Date

Signature (Site manager)

Application of covering

Evenness

The screed surface must comply with the evenness tolerances acc. to DIN 18202. See Table 31 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 6.5).

Table 31: Permissible evenness tolerances of the screed surface to DIN 18202

Spacing of the measurement points m	**Permissible evenness tolerances** mm
Up to 0.1	2
Up to 1.0	4
Up to 4.0	10
Up to 10.0	12
Up to 15.0	15

Determination of the residual moisture

Knauf flowing screed in conjunction with further floor covering work may not exceed the moisture content listed above on the entire screed surface in dependence on the type of floor covering to be used.

If the surface is sealed with a suitable primer (Knauf FE-Imprägnierung impregnation agent), the screed can be covered with a slightly higher residual moisture level in dependence on the floor covering, see Table 33. 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 from the entire layer thickness. As the screed dries from the top downwards, this should avoid that the sample taken at the surface has too little moisture and 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 32. 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.

Notes	Knauf flowing screeds used as heated screed must be heated until dry. The foil test (see "Inspecting the foil, see photos" on page 84) does not replace CM measurement. According to DIN 18560-1 the measured value may not exceed 0.5 %.

Table 32: Determination of residual moisture with the CM device, original sample weight in dependence on the expected water content

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

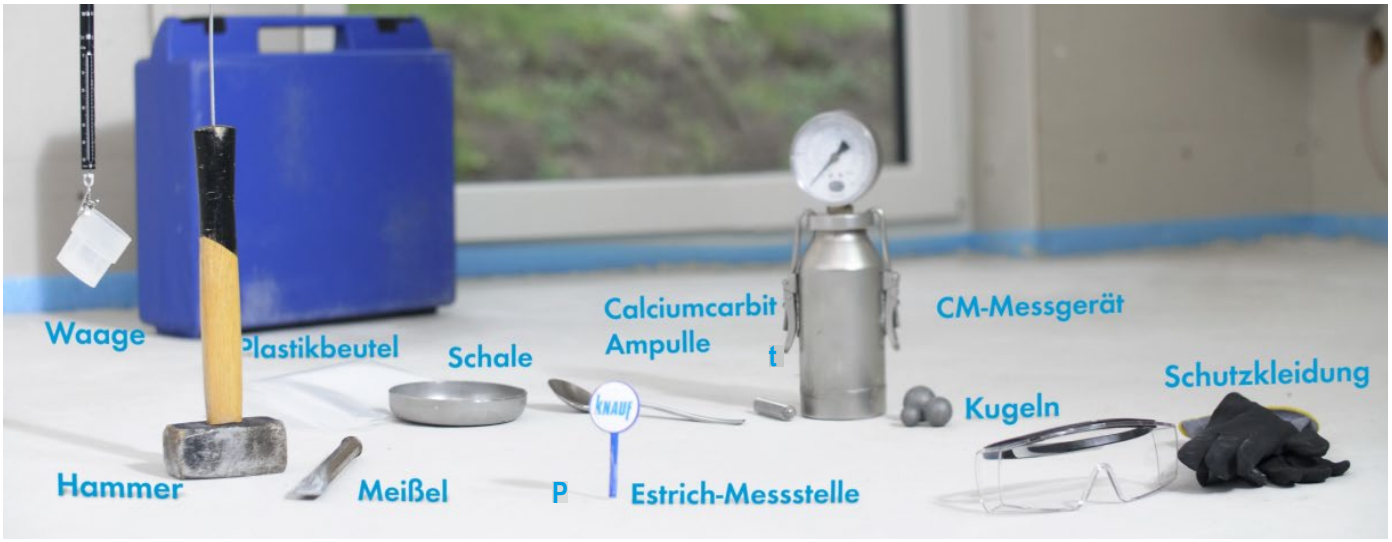


Figure 74: Testing the readiness for floor covering with the CM tester

Table 33: Residual moisture with readiness for covering of Knauf flowing screeds (not FE Sprint, see "Knauf self-levelling floor screeds" on page 134)

Covering	**Vapour-proof coverings** (PVC) as well as parquet etc.	**Vapour-retardant, rigid floor coverings** Tiles, natural stone	**Vapour permeable floor coverings** (textile, etc.)
Knauf flowing screed unheated, not sealed	0.5 CM %	1.0 CM %	1.0 CM %
Knauf flowing screed unheated, surface sealed	1.0 CM %	1.0 CM %	1.0 CM %
Knauf flowing screed heated, not sealed	0.5 CM %	0.5 CM %	0.5 CM %
Knauf flowing screed heated, surface sealed	0.7 CM %	0.5 CM %	0.7 CM %

Checking of the flowing screed for covering application

Surface strength

Figure 75: Knauf flowing screed cross-section, magnified by 4

Knauf flowing screeds have a solid surface when they have been correctly applied (mortar consistence). The aggregate particle is evenly distributed over the cross-section.

When correctly applied, Knauf flowing screeds have a surface adequate for the respective function. Product related 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 to clean surface) directly before cover application.

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

Scratch test

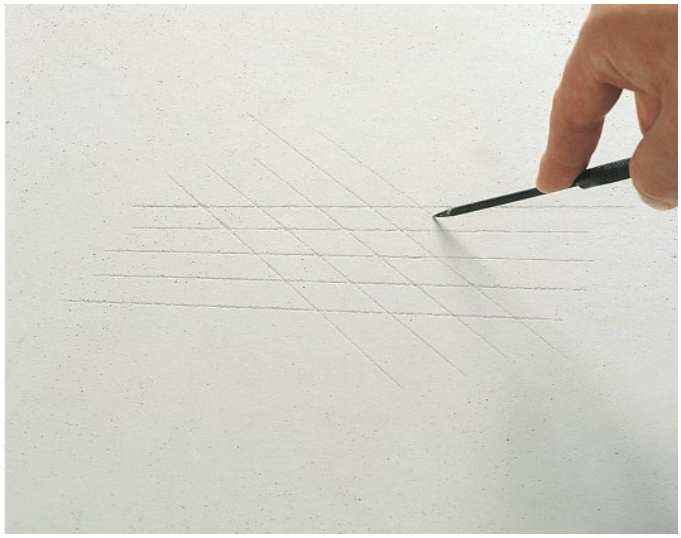


Figure 76: Scratch test

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.

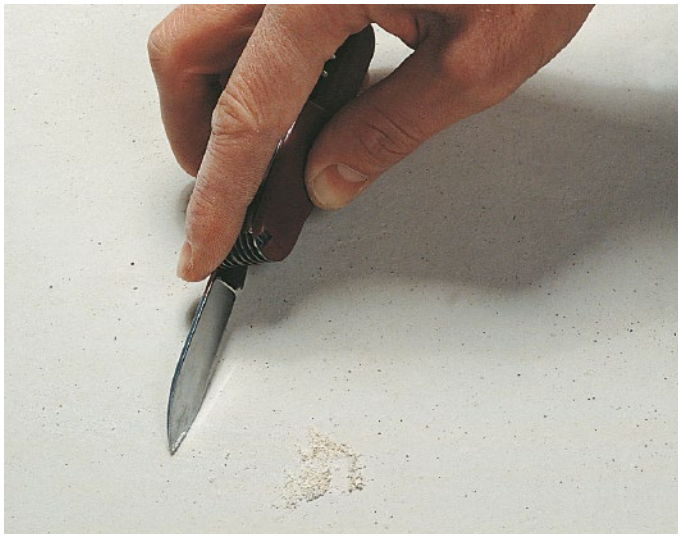


Figure 77: Inspection of the grain structure

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

Bonding test and test of the resistance to peeling

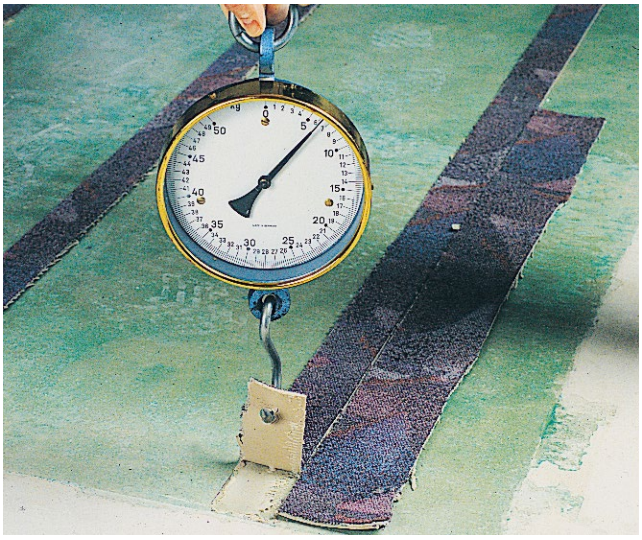


Figure 78: Bonding test and test of the resistance to peeling

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

Figure 79: Test of the bond strength

Metal discs with a diameter of 50 mm are applied with adhesive in order to measure the bond strength (surface tensile strength). We recommend Silikal RI/21 (two-component adhesive) 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 common coverings (minimum requirement for adhesive bonds acc. to DIN 18156: bond strength 0.5 N/mm^2). 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

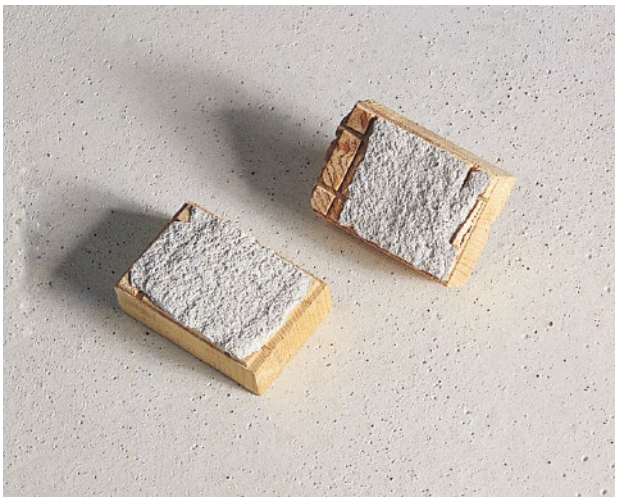


Figure 80: Parquet and screed failure patterns

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.

Note	See also IGE/VDPM Code of Practice No. 4

Surface perparation

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 and vacuumed off. 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 transformed to an even surface as follows.

- By grinding them down (suitable abrasive sanding disc, grain size 16) or
- By filling, e.g. with N 410

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

Surfaces too soft

Soft, unstable surfaces should be ground down (suitable: abrasive sanding disc, grain size 16) until a sufficiently stable layer (visible grain) is achieved. The ground surfaces should be cleaned with an industrial vacuum cleaner.

Depending on the states of the ground surfaces, double coats of Knauf Estrichgrund primer (dilute with water 1:2 + 1:1) or Knauf FE-Imprägnierung impregnation agent (+ silica sand) should be applied. 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
  Pour a thin-bodied injection resin into cracks, e.g. FE-Imprägnierung impregnation agent.
- Cracks 0.2 to 1.0 mm
  Pour epoxy resin into cracks (FE-Imprägnierung impregnation agent); depending on the crack width, add material such as ground anhydrite or gypsum and fill the crack with this mix.
- Cracks 1.0 to 5.0 mm
  Similar to option 2; dilute depending on the crack width with 1:2 ratio (resin : added material).

Figure 81: Filling cracks with epoxy resin

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 floor covering.

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

Priming

Figure 82: Application of Estrichgrund screed primer

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. Estrichgrund screed primer (acrylic dispersion), should be applied once (diluted 1:1 with water) or twice depending on the level of absorbency, or alternatively Schnellgrund primer (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 compound. It regulates the absorbency of the substrate and prevents suction related problems with filler materials and adhesive.

Estrichgrund screed primer or Schnellgrund primer 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 required second primer coat with Estrichgrund screed primer should only be applied after the first screed coat has dried.

Filling

Figure 83: Manual application of N 410

Figure 84: Machine application of N 410

For levelling of Knauf flowing screed, e.g. as a substrate for PVC coverings or for levelling underlay, N 410 or N 430 gypsum based compound should be preferred (low-stress hardening and advantageous thermal expansion properties (heating screed)). The flowing screed should be dry before the leveller is applied. The maximum leveller thickness is 10 mm.

N 440 is the ideal equalization compound for thicknesses ranging from 10 to 40 mm. N 410 or N 430 when applied do not generally require a primer before a floor covering is applied. Should equalization be applied twice, as in exceptional cases, a primer will be required before the second layer is applied. Should the applied and set equalization material exhibit cracks giving the appearance of a map or even small holes, this is an indication of absent or insufficient primer.

The structural strength of the equalization compound 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 abrasive sanding disc, grain size 16. Do not shot blast. The ground 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 and heating floor screed.

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 screeds and insulation layers are protected by suitable sealing against moisture from above. Detailed recommendations can be found in the Code of Practice No. 1 "Calcium sulphate flowing screed in wet rooms" (IGE/VDPM).

Sealing options

There are two suggested options for sealing:

- An approx. 2 mm layer of Knauf Flex-Dicht[1)] is applied to the primed screed. The connection to the wall is sealed with Knauf Flächendichtband sealing tape[1)], which is embedded on the screed and on the wall in Knauf Flex-Dicht[1)].
- The screed is coated three times with Knauf Flächendicht sealing primer[1)] using a brush or plastic roller. The layers should be applied crosswise. The Knauf Flächendichtband sealing tape[1)] 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 EN 12004.

Note	Dispersion tile adhesives are not recommended for applying tiles on Knauf Flächendicht sealing primer[1)] and Knauf Flex-Dicht[1)] (very long setting and hardening duration)!

1) Knauf Bauprodukte GmbH

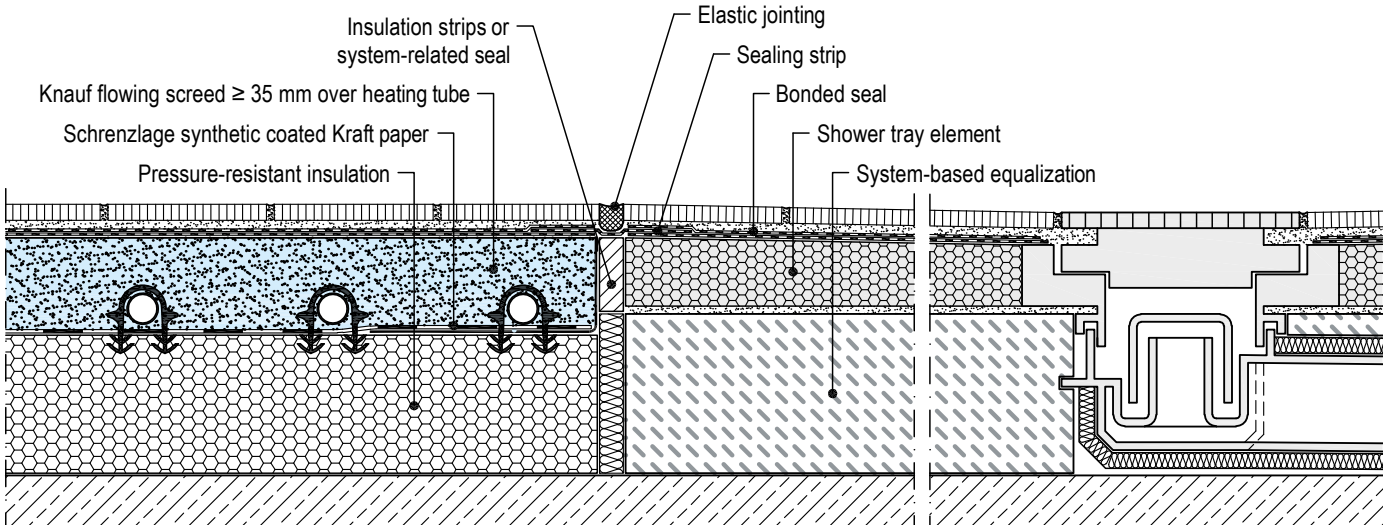
Wet rooms and areas

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.

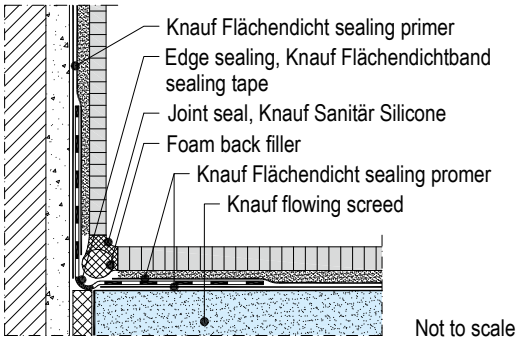
Details

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

Scale 1:5



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



Not to scale

Knauf flowing screed can be covered with all conventional floor coverings: carpets, PVC, linoleum, tiles, parquet, laminate flooring, coatings. Joints in the screed should generally be implemented in the floor 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. In general, it is important to ensure that a sufficient bed thickness is available.

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. For translucent tiles or tiles subject to discolouration, white adhesive mortar with a high water retention capacity (e.g. Knauf Marmor- und Natursteinkleber - marble and natural stone adhesive) 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 and linoleum

Figure 85: Example of carpet

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.

► 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.

Application of large tiles and slabs

Figure 86: Example of tiles

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 on heating floor screed. This may also be the case for other surfaces with higher temperature loads, 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 the declared quick drying adhesive mortar.

Note	With heated screed An elasticized adhesive should be used for the application of rigid coverings (tiles) on heating floor screed. The elasticized adhesive bed should reduce 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.

Table 34: 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

Parquet

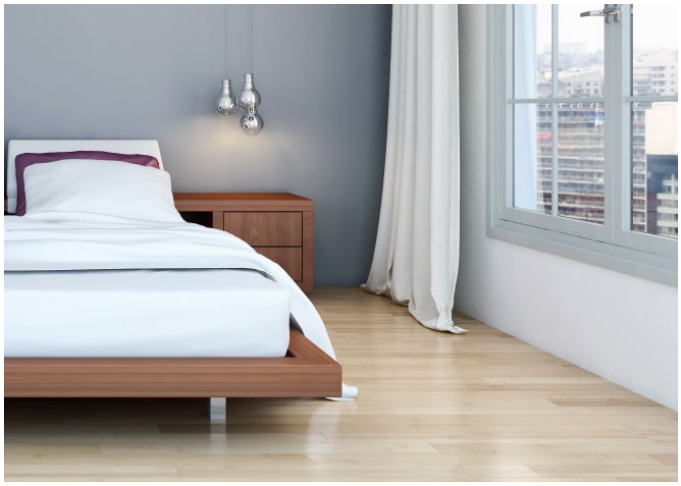


Figure 87: Example of parquet

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 to be 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.

Application recommendation

Table 35: Application recommendation on Knauf flowing screeds, N 440 and N 340

Covering	Pretreatment	Consumption per m²	Adhesive	Approx. consumption per m²
Floor tiles in thin and medium bed	Acrylate dispersion primer e.g. Estrichgrund screed primer (diluted 1:1 with water) or Schnellgrund (undiluted)	0.1 kg	Resin-modified application mortar	Dependent on the tile format and trowel notch size
Floor tiles on heating floor screed	Acrylate dispersion primer e.g. Estrichgrund screed primer (diluted 1:1 with water) or Schnellgrund (undiluted)	0.1 kg	Resin-modified application mortar	Dependent on the tile format and trowel notch size
Non-translucent natural stone slabs	Acrylate dispersion primer e.g. Estrichgrund screed primer (diluted 1:1 with water) or Schnellgrund (undiluted)	0.1 kg	Application mortar with optimized water retention	Dependent on the tile format and trowel notch size
Carpet	Acrylate dispersion primer e.g. Estrichgrund screed primer or Schnellgrund primer	0.1 kg	Resin dispersion adhesive	0.3 kg
PVC coverings	Acrylate dispersion primer e.g. Estrichgrund screed primer or Schnellgrund primer N 410 or N 320 Sprint	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 or dispersion adhesive	0.3 kg
Floor screed (without covering)	With limited loading: Apply Estrichgrund screed primer 2x or Schnellgrund primer 1x. Otherwise impregnation, sealing or coating must be undertaken to suit usage.	0.2 kg		

Floor systems for special applications

Stretto

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

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. Stretto consists of the components FE-Imprägnierung (2 component epoxy resin, see "FE-Imprägnierung impregnation agent" on page 52) and Stretto-Sand (special sand), which are mixed on site. Stretto is used in interior applications. No water is required for the setting process. As a result, drying times are not a concern.

Stretto can be walked on and is ready for a covering after just 24 hours. It can be applied without joints. Quality properties to EN 13813: SR-B2,0-C25-F7

Floor constructions with Stretto (nominal thicknesses)

- 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.

Stretto is not suitable for underfloor heating. It can however be used as a repair mortar for small patching repairs with heated screed. Stretto can be installed up to a maximum layer thickness of 100 mm.

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, FE-Imprägnierung impregnation agent is used as a bonding primer. Stretto is then applied on the freshly applied FE-Imprägnierung impregnation agent and worked (wet on wet).

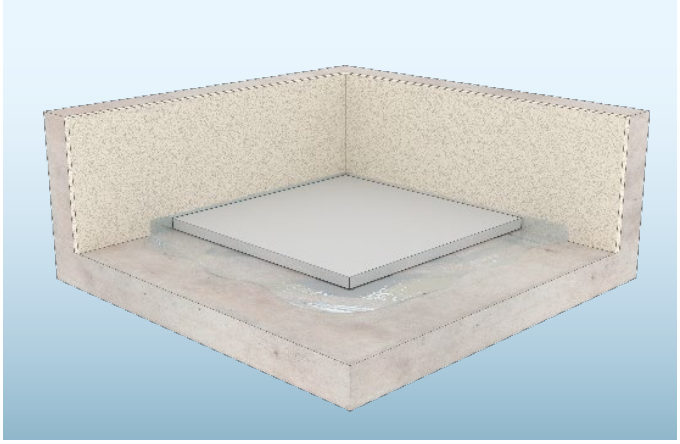


Figure 88: Stretto as a bonded screed

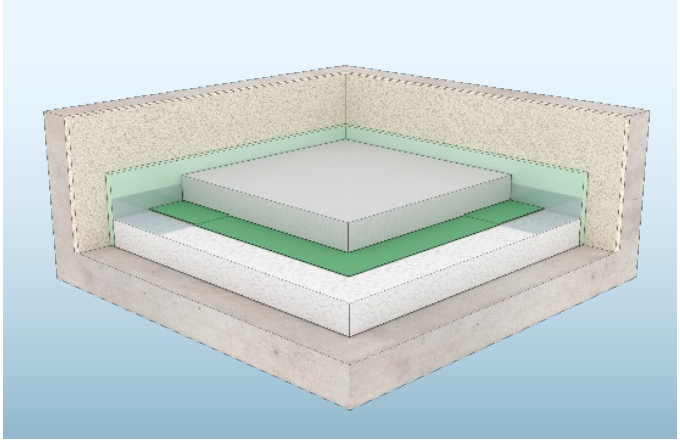


Figure 89: Stretto as a floating screed

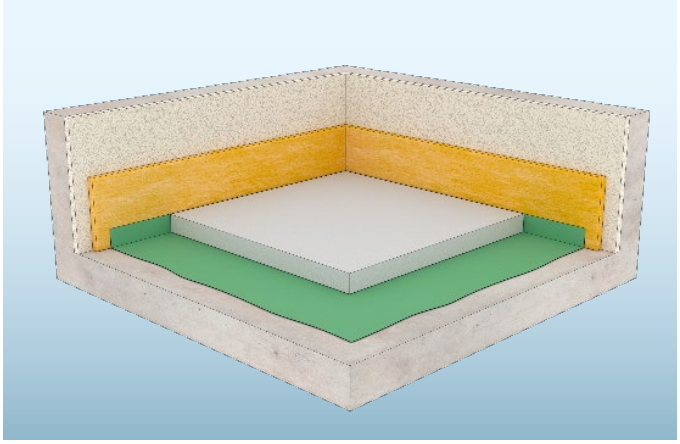


Figure 90: Stretto on a separating layer

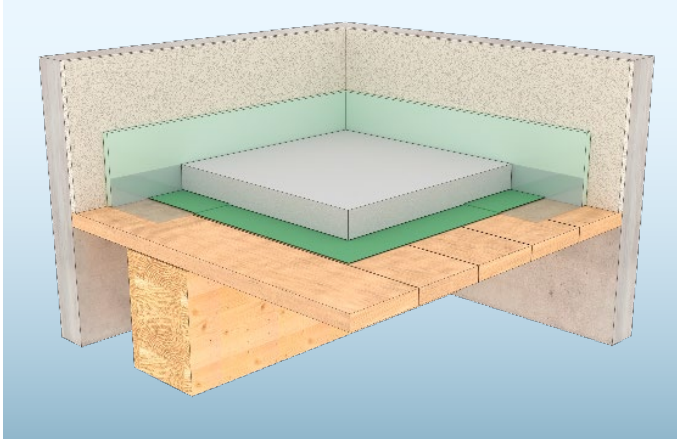


Figure 91: Stretto on floorboards

Table 36: 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 floor-boards and secure them	Clean the substrate, remove loose parts	Clean the substrate, remove loose parts
Substrate pretreatment	1x FE-Imprägnierung impregnation agent wet on wet	1x FE-Imprägnierung impregnation agent wet on wet	Seal joints (Knauf Acryl), Spezialhaftgrund bonding primer (diluted 1:1 with water)	1x FE-Imprägnierung impregnation agent wet on wet	1x FE-Imprägnierung impregnation agent wet on wet
Sealing (if required)	FE-Abdichtung sealing shield	FE-Abdichtung sealing shield	–	FE-Abdichtung sealing shield	FE-Abdichtung sealing shield
Stretto (nominal thickness)	≥ 15 mm	≥ 15 mm	≥ 15 mm	≥ 15 mm	≥ 15 mm
Screed laid 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 Schnellgrund primer (undiluted) N 320 Sprint / N 340	Estrichgrund screed primer (diluted 1:1 with water) or Schnellgrund primer (undiluted) N 320 Sprint / N 340	–	Estrichgrund screed primer (diluted 1:1 with water) or Schnellgrund primer (undiluted) N 320 Sprint / N 340	Estrichgrund screed primer (diluted 1:1 with water) or Schnellgrund primer (undiluted) N 320 Sprint / N 340
Sealing (if required)	Katja Sprint Abdichtungsbahn sealing membrane	Katja Sprint Abdichtungsbahn sealing membrane	–	Katja Sprint Abdichtungsbahn sealing membrane	Katja Sprint Abdichtungsbahn sealing membrane
Separating layer	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper
Stretto (nominal thickness)	≥ 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)	Katja Sprint Abdichtungsbahn sealing membrane	Katja Sprint Abdichtungsbahn sealing membrane	–	Katja Sprint Abdichtungsbahn sealing membrane	Katja Sprint Abdichtungsbahn sealing membrane
Equalization layer (if required)	Heavy-duty acoustic infill + cover EPO-Leicht or Trockenschüttung PA dry bulk leveller + cover board	–	Heavy-duty acoustic infill + cover EPO-Leicht, or Trockenschüttung PA dry bulk leveller + cover board	–	–
Insulation layer	If required	If required	If required	If required	If required
Insulation layer covering	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper
Stretto (nominal thickness)	On DEO ≥ 35 mm On DES c = 1 mm ≥ 40 mm On DES c ≤ 3mm ≥ 50 mm	On DEO ≥ 35 mm On DES c = 1 mm ≥ 40 mm On DES c ≤ 3mm ≥ 50 mm	On DEO ≥ 35 mm On DES c = 1 mm ≥ 40 mm On DES c ≤ 3mm ≥ 50 mm	On DEO ≥ 35 mm On DES c = 1 mm ≥ 40 mm On DES c ≤ 3mm ≥ 50 mm	On DEO ≥ 35 mm On DES c = 1 mm ≥ 40 mm On DES c ≤ 3mm ≥ 50 mm

Note See also product data sheet Stretto, F331.de

Application

Application

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 FE-Imprägnierung impregnation agent with Stretto-Sand is 1:25 (by weight). When creating a mix using an agitator, 25 kg of Stretto Sand are mixed with 1 kg of FE-Imprägnierung impregnation agent. 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 Knauf Stretto F331.de for conveying 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 Stretto does not contain moisture.

Priming the screed surface is generally unnecessary.

Filling

(Filling is necessary with dispersion adhesives). Cementitious filler (N 320 Sprint) with a layer thickness of at least 2 mm is applied on dust-free, clean Stretto.

Note	Only persons that are familiar with chemically setting substances are allowed to apply these products. The rooms must be ventilated sufficiently (preferably with lateral ventilation). Wear protective goggles (e.g. during mixing), suitable gloves and working clothes to prevent contact with skin. (For further information refer to “FE-Imprägnierung impregnation agent” on page 52).

Figure 92: Mixing of the epoxy resin with a mixer

Figure 93: Application with a compressed air conveyor

Figure 94: Ideal for quick repairs: Stretto ready to cover after just one day

Figure 95: Easy to level

Figure 96: Easy to smoothen

Textiles and thick coverings

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 Stretto with cementitious, elasticised tile adhesive (C2 in acc. to EN 12004 and S1 in acc. to EN 12002).

Parquet

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

Note	Primers or adhesives containing a solvent should not be used.

Areas of high humidity

In areas of high humidity, 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 Flächendichtband sealing tape and push it in firmly onto 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.

Storage

Stretto Sand: unlimited
FE-Imprägnierung impregnation agent: 24 months

Technical data

Description	Unit	Value
Density	kg/m³	Approx. 1800
Reaction to fire acc. to EN 13501-1	–	E
Strengths (after 7 days at 20 °C)		
Compressive strength	N/mm²	≥ 25
Bending tensile strength	N/mm²	≥ 7
Early strength (after 24 h, at 20 °C)	%	40
Yield from 25 kg Stretto-Sand and 1 kg FE-Imprägnierung impregnation agent	l Mortar	Approx. 14
Material consumption per cm layer thickness		
Stretto Sand	kg/m²	Approx. 17
FE-Imprägnierung impregnation agent	kg/m²	Approx. 0.7
Application / mortar temperature		
10 °C	h	Approx. 2
20 °C	h	Approx. 1
25 °C	min	Approx. 45
Walkable after	h	Approx. 24
Ready for covering with mortar / ambient temperature		
≥ 20 °C	h	Approx. 24
10 °C	h	Approx. 48
Full load possible after	t	Approx. 3

Note	See also product data sheet Stretto, F331.de

Schnellestrich CT

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

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. Schnellestrich CT is used in small interior areas and is also suitable for use in wet areas.

Schnellestrich CT features a high early strength and can be trafficked after approx. 3 hours.

Quality properties to EN 13813: CT-C30-F5.

Floor constructions with Schnellestrich CT (nominal thickness)

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

Substrate pre-treatment for bonded screed

Absorbent substrates such as cementitious screeds and bare concrete must be primed with diluted Estrichgrund screed primer - (1 part Estrichgrund screed primer : 1 part water) or Schnellgrund primer (undiluted) and may need to be primed with two coats on highly absorbent substrates. A suitable special primer coat may be required on non-absorbent substrates (e.g. Spezialhaftgrund bonding primer or FE Imprägnierung impregnation agent).

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 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 consistence is achieved.

Application temperature/climate

The room and substrate temperature should not be below +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 floor plan shape. It has proven effective to provide joints in doorways, on surfaces exceeding 5 m in length, in protruding areas and narrow spaces.

Storage

Dry: 9 months

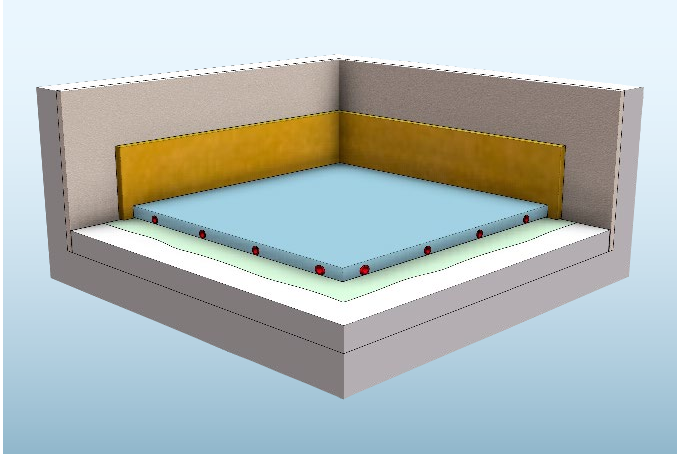
Technical data

Description	Unit	Value
Density		
Dry	kg/l	Approx. 1.8
Wet	kg/l	Approx. 1.9
Bulk density	kg/l	Approx. 1.8
Reaction to fire acc. to EN 13501-1	–	A1
Strengths (after 7 days at 20 °C)		
Compressive strength	N/mm²	≥ 30
Bending tensile strength	N/mm²	≥ 5
Yield from 100 kg dry mortar	l Mortar	Approx. 54
Material consumption per cm layer thickness	kg/m²	Approx. 20
Application time at 20 °C	min	Approx. 50
Application temperature	°C	+10 – +25
Walkable after	h	Approx. 3
Full load possible after	t	Approx. 7
Drying Layer thickness of 40 mm ready for floor covering after	t	Approx. 1
Ready for coverage for all floor coverings At residual moisture (check with CM tester)	% by weight	< 2.5

Note	Protect Schnellestrich CT after application against drying too quickly. It must be covered as soon as it is ready to accept floor coverings. If it is not possible to cover it with this time, seal the Schnellestrich CT with FE-Imprägnierung impregnation agent. If the above mentioned instructions are not observed, deformations may occur (e.g. curling) of the screed. 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).

Note	See also product data sheet Schnellestrich CT, F468.de

Thin layer heating screed



With Knauf equalization compound

An existing stable screed or a basic floor can be upgraded easily with Knauf equalization compound and a thin-layer energy-efficient underfloor heating.

Thin-layer heating floor screed systems are special constructions and can be applied as

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

Various thin-layer underfloor heating systems can be applied.

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

The system is applied with cementitious compound N 340 in wet areas such as those used in the renovation of swimming pools. Applications with N 430 and N 340 are only possible as a bonded screed.

In Table 37 you will find possible constructional solutions as well as the technical data relating to construction heights, sound insulation as well as their weights. Further construction designs can be taken from the system data sheet Knauf Thin-Layer Heating Floor Screed Systems, FE22.de.

Table 37: System variants

System	Impact sound reduction		Con-struction weight	Construction thickness					Floor heating element depending on the system manufacturer (e.g. Uponor minitec)
	Calcula-tion value	Test value		Total	Insula-tion layer	Equalization compound above foil element (Minimum thickness) mm			
	$\Delta L_{w,R}$	$\Delta L_{w,P}$				N 430	N 340[1)]	N 440	
	dB	dB	kg/m²	mm	mm				mm
F215.de - Bonded	–	–	≥ 28	≥ 16	–	4	–	–	From 12
			≥ 36	≥ 20		–	≥ 8	–	
			≥ 40	≥ 20		–	–	≥ 8	
F225.de - On a separating layer	–	–	≥ 64	≥ 32	–	–	–	≥ 20	From 12
F235.de - On an insulating layer *(wood fibre insulation board WF)*	18	20	≥ 67	≥ 42	10	–	–	≥ 20	From 12
			≥ 69	≥ 52	20	–	–	≥ 20	From 12
F235.de - On an insulating layer *(mineral wool MW TP-GP 12-1)*	26	28	≥ 76	≥ 49	12	–	–	≥ 25	From 12

1) Not possible on wooden substrates

Note	Thin layer heating floor screed with N 440 can be applied as a bonded screen, screed laid on a separating layer as well as screed on an insulating layer.

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

Table 38: 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 pretreatment	2x Estrichgrund screed primer (diluted 1:1 with water) or Schnellgrund primer (undiluted)	2x Estrichgrund (diluted 1:1 with water) or Schnellgrund (undiluted) or 2x FE-Imprägnierung impregnation agent interspersed with silica sand	Seal joints Knauf Acryl), Spezialhaftgrund bonding primer (diluted 1:1 with water), ≥ 3 mm N 320 Flex, 2x Estrichgrund screed primer (diluted 1:1 with water) or Schnellgrund primer (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
N 430 N 340 N 440 Minimum 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 N 440					
Preparation	Clean the substrate	Clean the substrate	Clean the substrate	Clean the substrate	Clean the substrate
Sealing (if required)	Katja Sprint Abdichtungsbahn sealing membrane	Katja Sprint Abdichtungsbahn sealing membrane	–	Katja Sprint Abdichtungsbahn sealing membrane	Katja Sprint Abdichtungsbahn sealing membrane
Equalization layer (if required)	Heavy-duty acoustic infill + cover or EPO-Leicht or Knauf leveller and equalization compounds	–	Heavy-duty acoustic infill + cover board or EPO-Leicht or N 320 Flex	–	–
Insulation layer (if required)	■ Wooden fibreboard WF ▪ 10 to 20 mm (density ≥ 200 kg/m³) ■ EPO DEO ▪ Up to 20 mm (100 kPa) ▪ Up to 30 mm (150 kPa) ▪ Up to 40 mm (200 kPa) ■ Mineral wool Trittschall Dämmplatte TP-GP 12-1				
Insulation layer covering	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper	Schrenzlage synthetic coated kraft paper
Underfloor heating	Fixing panel system-dependent	Fixing panel system-dependent	Fixing panel system-dependent	Fixing panel system-dependent	Fixing panel system-dependent
Minimum thickness above heating system on separating layer, wooden fibreboard WF and EPS DEO	≥ 20 mm	≥ 20 mm	≥ 20 mm	≥ 20 mm	≥ 20 mm
Min. thickness above heating system on mineral wool	≥ 25 mm	≥ 25 mm	≥ 25 mm	≥ 25 mm	≥ 25 mm

Note See also the system data sheet Knauf Thin-layer screed systems FE22.de

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 exceed 0.5 CM %.

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

In case of *highly absorbent substrates* (e.g. calcium sulphate screed, calcium sulphate flowing screeds), on *non-absorbent substrates* (e.g. tiles) and mixed substrates:

The substrate is primed twice with FE-Imprägnierung impregnation agent. Apply approx. 250 g/m^2
Apply approx. 100 g/m^2 and intersperse coarse sand (e.g. 0.5 to 1.2 mm), sprinkle approx. 1.5 kg/m^2.

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

In case of rising damp as with soil-contacted concrete slabs, apply FE-Abdichtung sealing shield as a sealing adhesive bonding layer.

On *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 Acryl[1)], larger joints with Knauf Reparaturspachtel[1)] (mixed with Knauf Kleber- & Boden-Elast[1)]). Subsequently prime the wooden substrate with Spezialhaftgrund and fill with N 320 Flex up to a thickness of at least 3 mm. Prime the dried filler twice with Knauf Estrichgrund screed primer (diluted 1:1 with water) or Knauf Schnellgrund primer (undiluted).

Application bonded on OSB boards only on request.

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).

1) Knauf Bauprodukte GmbH

Figure 97: Gluing on the fixing panel onto the prepared substrate

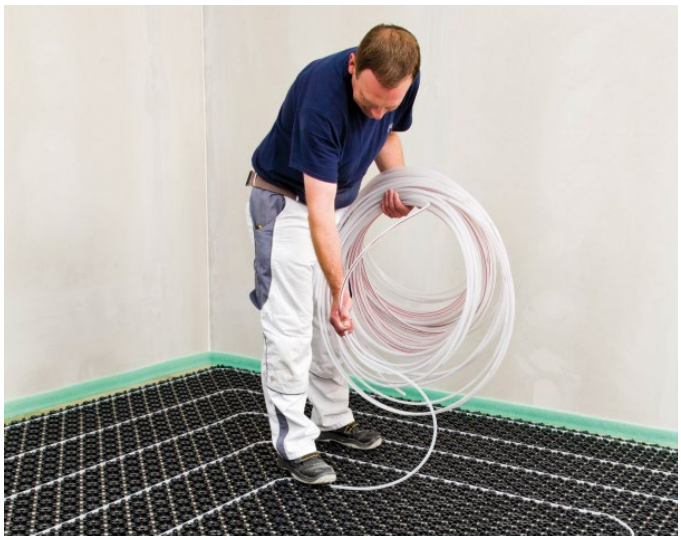


Figure 98: Installation of the heating tube

Figure 99: Pouring the N 440 mortar

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, equalization screed or a non-yielding light levelling mortar such as EPO-Leicht.

Wooden fibre, polystyrene or mineral wool insulation can be applied under the system N 440 on thin layer underfloor heating.

Schrenzlage synthetic coated kraft paper 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. for concrete slabs making contact with the soil) acc. to DIN 18533-1, use Katja Sprint Abdichtungsbahn sealing membrane.

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 synthetic coated kraft paper 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 N 440

After application of the fixing panel and installation of the heating tubes (filled with water and pushed down), apply equalization compound at the required layer thickness over the fixing panel (observe the slump flow acc. to “Knauf leveller and equalization compounds” on page 136 ff). Clean the machine and the hoses after machine standstill.

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

Application temperature / climatic conditions

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

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

Application time

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

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/VDPM). In so far as the thin heating floor screed 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

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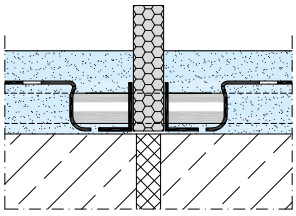


Note	See also the system data sheet Knauf Thin-layer screed systems FE22.de

Figure 100: Dappling the screed

Figure 101: Working with a screed brush

Figure 102: Better surfaces when worked with the screed brush

Drying - coverage ready heating

Prior to further flooring application, Knauf equalization compound requires dry heating. Heat until dry to suit the equalization compound and the constructional design in accordance with the heating up diagram.

With N 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 0.5 % (N 430 / N 440) or 2.0°% (N 340). Residual moisture must be determined with the CM device over the entire cross-section by sampling. A heating up protocol (template page 113) must be documented.

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 N 410 when a primer (Estrichgrund screed primer, diluted 1:1 with water or undiluted Schnellgrund primer) is applied beforehand.

If Knauf equalization compound is bonded to the substrate, it can be covered by all conventional coverings (tiles, natural stone, parquet, elastic and textile coverings). For constructions entailing N 440 on separating layers as well as on insulating layer WF, ceramic coverings with an edge length up to 120 cm and natural stone with edge lengths up to 80 cm can be applied.

For constructions entailing N 440 on insulating layers EPS DEO, ceramic coverings with an edge length up to 90 cm and natural stone with edge lengths up to 60 cm can be applied.

For constructions entailing N 440 on insulating layers MW (TP GP 12-1), 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 (chequered design) or multi-level parquet. Other parquet types on request. There are no limitations for conventional textile and elastic coverings.

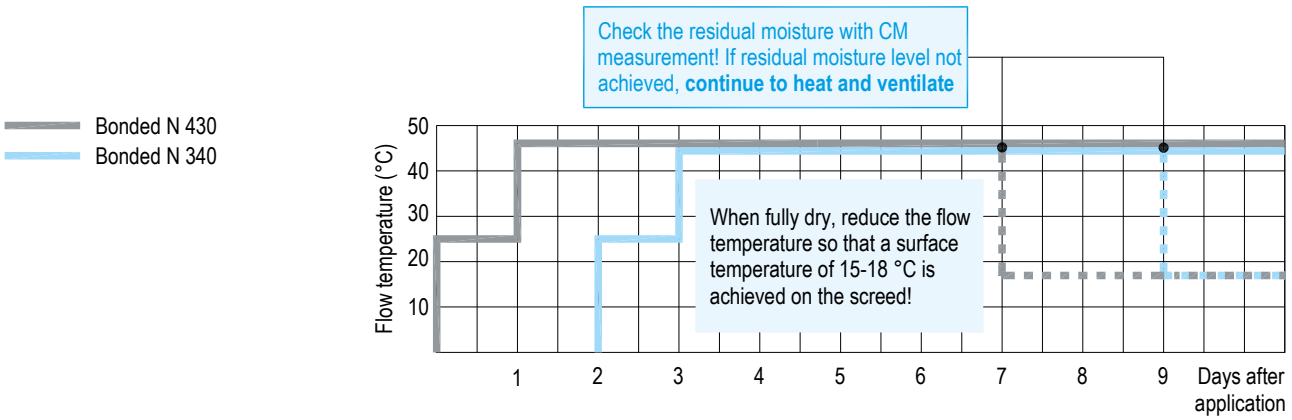


Figure 103: Heating up diagram for N 430 and N 340

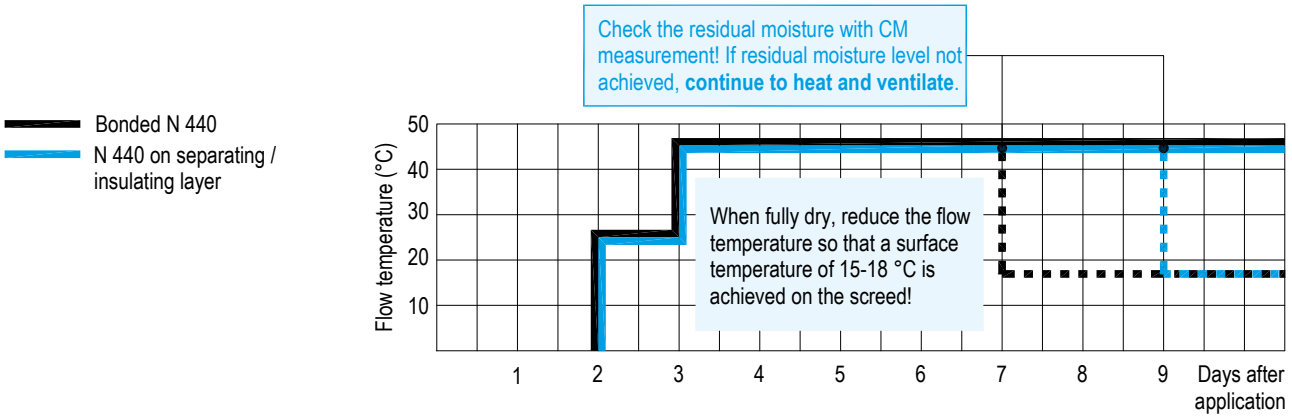


Figure 104: Heating up diagram for N 440.

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

Heating protocol for coverage ready heating

☐ **N 430**
☐ **N 440**
☐ **N 340**

Investor:	**Heating engineer:**
Building site:	**Site manager:**

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

Heating system:	**Average screed thickness:** mm
Screed applied on:	**Fixing panel coverage:**
	Min.: mm **Max.:** mm

Heat up (coverage ready heating)

Date	Flow temperature in °C	Signature

Preliminary drying test
(e.g. foil test[1])

Date	Dry yes/no	Signature

Drying test
(CM measurement)

Date	Residual moisture in %	Signature

Reduction of the flow temperature

Date	Flow temperature in °C	Signature

Coverage ready heating completed

Date	Outdoor temperature in °C	Signature

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

Please keep this document!

Place / Date

Signature (Site manager)

Renovation of old substrates/surface

With Knauf leveller and equalization compounds

Knauf levelling and equalization 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 “Table 39: Professional renovation of floors” on page 118 are an aid to decision-making for the determination of the necessary measures in substrate preparation with typical old sub-flooring.

Knauf levelling and equalization compounds are low-stress equalization compounds. 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:

N 345 Form (cement-based)	1 to 45 mm
N 320 Sprint (cement-based)	0 to 20 mm
N 320 Form (cement-based)	3 to 20 mm
N 330 Premium (cement-based)	0 to 30 mm
N 340 (cement-based)	5 to 40 mm
N 340 Sprint (cement-based)	2 to 40 mm
N 410 (calcium sulphate)	0 to 10 mm
N 410 Form (calcium sulphate)	3 to 10 mm
N 430 (calcium sulphate)	2 to 30 mm
N 440 (calcium sulphate)	10 to 40 mm

In special cases, the use of the non-flowing screed mortar Stretto for levelling purposes may be prudent (see “Stretto” on page 101 ff.)
Stretto (epoxy resin) ≥ 15 mm

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 measures: FE-Abdichtung sealing shield (see “FE-Abdichtung sealing shield” on page 53).
- Are existing cracks "dead" or does motion still occur (cause)? Possible measures: Application of synthetic resin to cracks with FE-Imprägnierung impregnation agent 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 leveller and equalization compounds to the old sub-flooring?
- Is a sealed covering required? This will require a moisture barrier underneath the leveller and equalization compounds (see “FE-Abdichtung sealing shield” on page 53).

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 leveller and equalization compounds used. The “Table 39: Professional renovation of floors” on page 118 assists in making the right selection.

Figure 105: Check the substrate

Figure 107: e.g. Prime with Estrichgrund screed primer

Figure 106: e.g. Bonding layer interspersed with silica sand

Figure 108: e.g. Machine application of N 440

Table 39: Professional renovation of floors

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!** Mastic 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 and equalization compound is not permitted. Otherwise, application of levelling and equalization compound only possible with high levels of hardness (IC 10, IC 15) taking special consideration of later usage (low loading only).
Magnesite screed / magnesium oxychloride 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 and equalization compounds is not permissible if there is a danger of rising damp and no moisture barrier is available under the magnesite screed. Well-known brands from the former GDR: Kieserit, Mahag, Papyrolith
Old flooring with floor covering 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 and equalization 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 soil, etc. with or without cementitious bonded screed.

Note	Required curing time between the coatings with FE-Imprägnierung impregnation agent and the leveller and equalization compound application is about 24 hours.

Substrate pretreatment	Priming
■ Removal of the upper layer by shot-blasting or milling.	**Under N 440** Double application of FE-Imprägnierung impregnation agent (also as a vapour retarder with residual moisture in the concrete cover): 1st layer approx. 250 g/m^2 2nd layer approx. 100 g/m² + approx. 1.5 kg/m^2 with interspersion of coarse sand (e.g. 0.5 to 1.2 mm grain size). *Alternative* One coating with Schnellgrund primer (undiluted) or two coatings of Estrichgrund screed primer (diluted 1:1); required drying time between the primer coats and the levelling screed application is about 24 hours in each case (primer coat must be dry). Test the application suitability of the project concerned. **Under all other levelling and equalization compounds** Single coating of Estrichgrund screed primer (diluted 1:1 with water) or alternatively a single coat of Schnellgrund primer (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 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 Stretto repair mortar.	
■ Remove grease and cleaning agent remnants by intensive cleaning with Knauf Intensivreiniger cleaning agent. ■ Hollow bonded tiles/slabs should be removed, deep spalling must be levelled with Stretto repair mortar.	**Under all Knauf levelling and equalization compounds** Single application of FE-Imprägnierung impregnation agent: Layer approx. 90 g/m² + approx. 1.2 kg/m^2 with interspersion of coarse sand (e.g. 0.6 to 1.2 mm grain size). *Alternative* under N 340 / N 320 Sprint / N 320 Flex / N 410 / N 330 Premium Single coat of Spezialhaftgrund bonding primer, undiluted.
■ Remove oiled and soiled layers by milling them, or intensive cleaning treatment with Knauf Intensivreiniger cleaning agent if soiling is low. ■ Hollow bonded screed surfaces should be removed, deep spalling must be levelled with Stretto repair mortar.	
■ Removal of loose and soiled layers as well as loose filled layers by sanding or brushing.	**Under Knauf leveller and equalization compounds** Exception: Do not use N 320 Sprint and N 340 on mastic asphalt screed. Double application with FE-Imprägnierung impregnation agent: Layer approx. 250 g/m^2 Layer approx. 100 g/m² + approx. 1.5 kg/m^2 with interspersion of coarse sand (e.g. 0.5 to 1.2 mm grain size).
■ 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 Stretto repair mortar.	**Under all Knauf levelling and equalization compounds** Double application with FE-Imprägnierung impregnation agent: 1st layer approx. 250 g/m^2 2nd layer approx. 100 g/m² + approx. 1.5 kg/m^2 with interspersion of coarse sand (e.g. 0.5 to 1.2 mm grain size).
■ Removal of the upper layer by shot-blasting or milling. ■ Hollow bonded screed surfaces should be removed, deep spalling must be levelled with Stretto repair mortar.	**Under all Knauf levelling and equalization compounds** Application of FE-Imprägnierung impregnation agent approx. 400 g/m², subsequently with double-layer application of FE-Abdichtung sealing shield: 1st layer approx. 600 g/m^2 2nd layer approx. 200 g/m² + approx. 1.5 kg/m^2 with interspersion of coarse sand (e.g. 0.5 to 1.2 mm grain size). On substrates not resistant to moisture without moisture barrier available on lower side, levelling with Knauf levelling and equalization compounds is not permissible.

N 345 Form

Quick-drying, stable (sag resistant) floor equalization compound from 1 to 45 mm

N 345 Form is a factory-mixed dry mortar made of special cements, selected aggregates and additives to improve the application properties, ready to be mixed with water.

N 345 Form is used as a floor equalization compound for:

- Filling of holes and unevenness in cementitious and calcium sulphate screeds, plasters, concrete elements and masonry
- Filling of flaws, holes and cracks
- Levelling and repair of worn steps and damaged step edges
- Bedding of renovation mesh and floor profiles

Substrate pretreatment

See page 118 ff.

Mixing

Mix to a lump-free and application-ready consistence in a clean bucket with clean and cold water (5.5 l per 25 kg bag). A mixer with a speed of 600 RPM with a corkscrew, double-disk agitator or agitating basket is recommended.

If N 345 Form is set for larger layer thicknesses by the addition of silica sand, the quantity of added water should not be increased.

Application

Work in the mixed mortar with a filling knife, compress it and rub it down. After the mortar has started to stiffen, it can be smoothed, scraped or sponged. Apply at least 1.5 mm on non-absorbent surfaces. Material that has already started to harden should not be mixed with additional water or stirred again.

Application temperature / climatic conditions

Do not apply at room or substrate temperatures below 10 °C and exceeding 30 °C.

Storage

Bag material can be stored for up to 9 months when dry.

Technical data

Description	Unit	Value
Layer thickness		
Without silica sand	mm	1 – 20
With 30 % fire-dried silica sand 0.7 – 1.2 mm added	mm	20 – 45
Chair roll resistance from thickness	mm	2
Strengths after 28 days (reference values)		
Compressive strength	N/mm²	> 50
Bending tensile strength	N/mm²	> 8
Density		
Mortar (wet)	kg/l	Approx. 1.9
Mortar (dry)	kg/l	Approx. 1.8
Agitator application		
Water ratio for 25 kg sack	l	Approx. 5.5
Application times		
Pot life	min	Approx. 10
Material requirement		
Per mm layer thickness	kg/m²	Approx. 1.5
Can be trafficked (depending on the thickness and temperature)	h	Approx. 0.5
Ready to cover at residual moisture (check with CM tester)		
For vapour-tight coverings	CM-%	≤ 2.5
For vapour permeable coverings / tiles	CM-%	≤ 3.0
Ready for floor covering (20 °C, 65 % relative humidity)		
For floor coverings	min	Approx. 45

Product data sheet N 345 Form F417a.de

N 320 Sprint

Quick drying, cementitious floor equalization compound from 0 to 20 mm

N 320 Sprint is a factory-mixed dry mortar made of special cements, selected aggregates and additives to improve the application properties, ready to be mixed with water. As a composite leveller on bare concrete slabs and concrete bases and stable calcium sulphate and cement based screeds. For manufacturing smooth, offset free floor surfaces, equalization of unevenness in the floor and divergences in dimension tolerance acc. to DIN 18202 before laying of ceramic tiles and floor slabs, marble and natural stone coverings, elastic floor coverings, carpets as well as parquet and laminate flooring. With full surface filler application under parquet, the layer thickness must be at least 3 mm. As a leveller on professionally sanded mastic asphalt screed surfaces of hardness classes IC10 and IC15 up to 5 mm layer thickness.
In areas subject to moisture (max. water action class W2-I) apply suitable composite sealing in acc. with DIN 18534-1.

Substrate pretreatment

See page 118 ff.

Mixing

Mix to a lump-free and application-ready consistence in a clean bucket with clean and cold water (5.75 l per 25 kg bag) using an agitator. A mixer with a speed of 600 RPM with a corkscrew, double-disk agitator or agitating basket is recommended.
If N 320 Sprint is set for larger layer thicknesses by the addition of silica sand, the quantity of added water should not be increased.

Consistence for machine application
Adjust a suitable consistence using the flow test: max. flow diameter Ø 63 cm (determined with a 1.3 l checking tin, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time). With larger layer thickness's the slump flow or the water quantity should be reduced if permitted by the levelling characteristics. During application, the material is self-levelling so that when the consistence of the floor equalization compound is set to flow, subsequent finishing or grinding of the surface is unnecessary. Optimum extraction of trapped air and levelling of the material is achieved by working the surface with a spiked roller.
Observe the slurry spread rate when applied using a mixing pump.

Application

Pour the fresh mortar onto the prepared substrate and distribute using a finishing trowel or dappling bar to the required layer thickness. For the application on large areas, mix and pump N 320 Sprint continuously with PFT mixing pump G 4 with attached PFT ROTOMIX Disc or PFT agitator. Observe the machine manufacturer's specifications. Material that has already started to harden should not be mixed with additional water or stirred again.

Application temperature / climatic conditions

Do not apply at room or substrate temperatures below 10 °C and exceeding 30 °C.

Note	Machine application only possible when no additional silica sand is added.

Storage

Bag material can be stored for up to 9 months when dry.

Technical data

Description	Unit	Value
Layer thickness		
Without silica sand	mm	0 – 10
With 30 % fire-dried silica sand 0.7 – 1.2 mm added	mm	10 – 20
Chair roll resistance from thickness	mm	2
Strengths after 28 days (reference values)		
Compressive strength	N/mm²	> 30
Bending tensile strength	N/mm²	> 7
Density		
Mortar (wet)	kg/l	Approx. 2.0
Mortar (dry)	kg/l	Approx. 1.8
Agitator application		
Water ratio for 25 kg sack	l	Approx. 5.75
Machine application		
Slump flow 1.3 l PFT checking tin	cm	≤ 63
Application times		
Pot life	min	Approx. 30
Work life on the surface	min	Approx. 20
Material requirement		
Per mm layer thickness	kg/m²	Approx. 1.6
Can be trafficked (depending on the thickness and temperature)	h	Approx. 1.5
Ready to cover at residual moisture (check with CM tester)		
For vapour-tight coverings	CM-%	≤ 2.5
For vapour permeable coverings/tiles	CM-%	≤ 3.0
Ready for floor covering (20 °C, 65 % relative humidity)		
Tiles	h	4
Vapour-tight coverings		
■ Up to 3 mm layer thickness	h	Approx. 3 – 4
■ Up to 5 mm layer thickness	h	Approx. 12
■ Up to 10 mm layer thickness	h	Approx. 24
■ Up to 20 mm layer thickness	h	Approx. 48

Product data sheet N 320 Sprint F411.de

N 320 Flex

Fibre-reinforced, cementitious floor filler compound from 3 to 20 mm

N 320 Flex is a fibre-reinforced factory-mixed dry mortar made of special cements, selected aggregates and additives to improve the application properties, ready to be mixed with water. As a composite leveller on stable wooden substrates, such as wooden flooring, parquet, wood chipboard (V 100 etc.), bare concrete slabs, calcium sulphate and cement based screeds.

For manufacturing smooth, offset free floor surfaces, equalization of unevenness in the floor and divergences in dimension tolerance acc. to DIN 18202 before laying of ceramic tiles and floor slabs, marble and natural stone coverings, elastic floor coverings, carpets as well as parquet and laminate flooring. With full surface filler application under parquet, the layer thickness must be at least 3 mm. As a leveller on professionally sanded mastic asphalt screed surfaces of hardness classes IC10 and IC15 up to 5 mm layer thickness.

In areas subject to moisture (max. water action class W2-I) apply suitable composite sealing in acc. with DIN 18534-1.

Substrate pretreatment

See page 118 ff.

Mixing

Mix to a lump-free and application-ready consistence in a clean bucket with clean and cold water (5.75 l per 25 kg bag). A mixer with a speed of 600 RPM with a corkscrew, double-disk agitator or agitating basket is recommended.

Consistence for machine application

Adjust a suitable consistence using the flow test: max. flow diameter Ø 64 cm (determined with a 1.3 l checking tin, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time). With larger layer thickness's the slump flow or the water quantity should be reduced if permitted by the levelling characteristics. During application, the material is self-levelling so that when the consistence of the floor equalization compound is set to flow, subsequent finishing or grinding of the surface is unnecessary. Optimum extraction of trapped air and levelling of the material is achieved by working the surface with a spiked roller. Observe the slurry spread rate when applied using a mixing pump.

Application

Pour the fresh mortar onto the prepared substrate and distribute using a finishing trowel or dappling bar to the required layer thickness. For the application on large areas, mix and pump N 320 Flex continuously with PFT mixing pump G 4 with attached PFT ROTOMIX Disc or PFT agitator. Observe the machine manufacturer's specifications. Material that has already started to harden should not be mixed with additional water or stirred again.

Application temperature / climatic conditions

Do not apply at room or substrate temperatures below 10 °C and exceeding 30 °C.

Storage

Bag material can be stored for up to 9 months when dry.

Technical data

Description	Unit	Value
Layer thickness	mm	3 – 20
Chair roll resistance from thickness	mm	3
Strengths after 28 days (reference values)		
Compressive strength	N/mm²	> 25
Bending tensile strength	N/mm²	> 5
Density		
Mortar (wet)	kg/l	Approx. 2.0
Mortar (dry)	kg/l	Approx. 1.8
Agitator application		
Water ratio for 25 kg sack	l	Approx. 5.75
Machine application		
Slump flow 1.3 l PFT checking tin	cm	≤ 64
Application times		
Pot life	min	Approx. 30
Work life on the surface	min	Approx. 20
Material requirement		
Per mm layer thickness	kg/m²	Approx. 1.6
Can be trafficked (depending on the thickness and temperature)	h	Approx. 3
Ready to cover at residual moisture (check with CM tester)		
For vapour-tight coverings	CM-%	≤ 2.5
For vapour permeable coverings/tiles	CM-%	≤ 3.0
Ready for floor covering (20 °C, 65 % relative humidity)		
Tiles	h	4
Vapour-tight coverings		
■ Up to 3 mm layer thickness	h	Approx. 3 – 4
■ Up to 5 mm layer thickness	h	Approx. 12
■ Up to 10 mm layer thickness	h	Approx. 24
■ Up to 20 mm layer thickness	h	Approx. 48

Product data sheet N 320 Flex F415.de

N 330 Premium

Quick drying, cementitious floor equalization compound from 0 to 30 mm

N 330 Premium is a factory-mixed dry mortar made of special cements, selected aggregates and additives to improve the application properties, ready to be mixed with water. N 330 Premium is used as a composite leveller on bare concrete slabs and concrete bases and stable calcium sulphate and cement based screeds.

For manufacturing smooth, offset free floor surfaces, equalization of unevenness in the floor and divergences in dimension tolerance acc. to DIN 18202 before laying of ceramic tiles and floor slabs, marble and natural stone coverings, elastic floor coverings, carpets as well as parquet and laminate flooring. With full surface filler application under parquet, the layer thickness must be at least 3 mm. As a leveller on professionally sanded mastic asphalt screed surfaces of hardness classes IC10 and IC15 up to 5 mm layer thickness.

In areas subject to moisture (maximum water action class W2-I) apply suitable composite sealing in acc. with DIN 18534-1.

Substrate pretreatment

See page 118 ff.

Mixing

Mix to a lump-free and application-ready consistence in a clean bucket with clean and cold water (6.0 l per 25 kg bag). A mixer with a speed of 600 RPM with a corkscrew, double-disk agitator or agitating basket is recommended. If N 330 Premium is set for larger layer thicknesses by the addition of silica sand, the quantity of added water should not be increased.

Consistence for machine application

Adjust a suitable consistence using the flow test: max. flow diameter Ø 66 cm (determined with a 1.3 l checking tin, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time). With larger layer thickness's the slump flow or the water quantity should be reduced if permitted by the levelling characteristics. During application, the material is self-levelling so that when the consistence of the floor equalization compound is set to flow, subsequent finishing or grinding of the surface is unnecessary. Optimum extraction of trapped air and levelling of the material is achieved by working the surface with a spiked roller.

Observe the slurry spread rate when applied using a mixing pump.

Application

Pour the fresh mortar onto the prepared substrate and distribute using a finishing trowel or dappling bar to the required layer thickness. For the application on large areas, mix and pump N 330 Premium continuously with PFT mixing pump G 4 with attached PFT agitator. Observe the machine manufacturer's specifications. Material that has already started to harden should not be mixed with additional water or stirred again.

Application temperature / climatic conditions

Do not apply at room or substrate temperatures below 10 °C and exceeding 30 °C.

Note	Machine application only possible when no additional silica sand is added

Storage

Bag material can be stored for up to 18 months when dry.

Technical data

Description	Unit	Value
Layer thickness		
Without silica sand	mm	0 – 10
With 30 % fire-dried silica sand 0.7 – 1.2 mm added	mm	10 – 30
Chair roll resistance from thickness	mm	2
Strengths after 28 days (reference values)		
Compressive strength	N/mm²	> 35
Bending tensile strength	N/mm²	> 7
Density		
Mortar (wet)	kg/l	Approx. 2.0
Mortar (dry)	kg/l	Approx. 1.8
Agitator application		
Water ratio for 25 kg sack	l	Approx. 6.0
Machine application		
Slump flow 1.3 l PFT checking tin	cm	≤ 66
Application times		
Pot life	min	Approx. 20
Work life on the surface	min	Approx. 10
Material requirement		
Per mm layer thickness	kg/m²	Approx. 1.5
Can be trafficked (depending on the thickness and temperature)	h	Approx. 1.5 – 2
Ready to cover at residual moisture (check with CM tester)		
For vapour-tight coverings	CM-%	≤ 2.5
For vapour permeable coverings/tiles	CM-%	≤ 3.0
Ready for floor covering (20 °C, 65 % relative humidity)		
Tiles	h	2
Textile floor coverings	h	3 – 4
PVC / linoleum	h	12
Rubber / parquet	h	24

Product data sheet N 330 Premium F412b.de

N 340

Cementitious floor equalization compound from 5 to 40 mm

N 340 is a factory-mixed dry mortar made of special cements, selected aggregates and additives to improve the application properties, ready to be mixed with water. N 340 can be used as a composite leveller on bare concrete slabs, concrete bases and stable cementitious screed for indoor and outdoor applications.

For manufacturing smooth, offset free floor surfaces, equalization of unevenness in the floor and divergences in dimension tolerance acc. to DIN 18202 before laying of ceramic tiles and floor slabs, marble and natural stone coverings, elastic floor coverings, carpets as well as parquet and laminate flooring. With full surface filler application under parquet, the layer thickness must be at least 5 mm. It can also be applied in connection with a thin layer underfloor heating as bonded screed, see system data sheet Knauf Thin layer Heating Screed Systems FE22.de.

In areas subject to moisture (maximum water action class W2-I) apply suitable composite sealing in acc. with DIN 18534-1.

Substrate pretreatment

See page 118 ff.

Mixing

Mix thoroughly to a lump-free and application-ready consistence in a clean bucket with clean and cold water (4.75 l for 5 to 20 mm or 4.50 l for 20 to 40 mm layer thickness). A mixer with a speed of 600 RPM with a corkscrew, double-disk agitator or agitating basket is recommended.

Consistence for machine application

Set a suitable consistence using the flow test in dependence on the layer thickness:

- Max. Ø 57 cm for 5 to 20 mm layer thickness
- Max. Ø 55 cm for 20 to 40 mm layer thickness

(determined with a 1.3 l test can, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time). Optimum extraction of trapped air and levelling of the material is achieved by working the surface with a spiked roller and/or dappling bar or screed broom. Observe the slurry spread rate when applied using a mixing pump.

Application

Pour the fresh mortar onto the prepared substrate and distribute using a finishing trowel or dappling bar to the required layer thickness. For the application on large areas, mix and pump N 340 continuously with PFT mixing pump G 4 with attached PFT ROTOMIX D pumps. Observe the machine manufacturer's specifications. Material that has already started to harden should not be mixed with additional water or stirred again.

Application temperature / climatic conditions

Do not apply at room or substrate temperatures below 10 °C and exceeding 30 °C.

Note	Application as bulk material with efficient complete logistical service.

Storage

Bag material can be stored for up to 18 months when dry.
Bulk material can be stored for up to 6 months when dry.

Technical data

Description	Unit	Value
Layer thickness	mm	5 – 40
Chair roll resistance from thickness	mm	5
Strengths after 28 days (reference values)		
Compressive strength	N/mm²	> 25
Bending tensile strength	N/mm²	> 7
Density		
Mortar (wet)	kg/l	Approx. 2.0
Mortar (dry)	kg/l	Approx. 1.8
Agitator application		
Water ratio for 25 kg sack		
■ 5 – 20 mm screed thickness	l	Approx. 4.75
■ 20 – 40 mm screed thickness	l	Approx. 4.5
Machine application		
Slump flow 1.3 l PFT checking tin		
■ 5 – 25 mm screed thickness	cm	≤ 57
■ 20 – 40 mm screed thickness	cm	≤ 55
Application times		
Pot life	min	Approx. 30
Work life on the surface	min	Approx. 20
Material requirement		
Per mm layer thickness	kg/m²	Approx. 1.6
Can be trafficked (depending on the thickness and temperature)	h	Approx. 3
Ready to cover at residual moisture (check with CM tester)		
For vapour-tight coverings	CM-%	≤ 2.5
For vapour permeable coverings/tiles	CM-%	≤ 3.0
Ready for floor covering (20 °C, 65 % relative humidity)		
Tiles		
■ Up to 20 mm layer thickness	t	Approx. 3
■ Up to 40 mm layer thickness	t	Approx. 10
Vapour-tight coverings		
■ Up to 20 mm layer thickness	t	Approx. 6
■ Up to 40 mm layer thickness	t	Approx. 16

Product data sheet N 340 F413.de

N 340 Sprint

Quick drying, cementitious floor equalization compound from 2 to 40 mm

N 340 Sprint is a factory-mixed dry mortar made of special cements, selected aggregates and additives to improve the application properties, ready to be mixed with water. N 340 Sprint can be used as a composite leveller on bare concrete slabs, concrete bases and stable cementitious screed.

For manufacturing smooth, offset free floor surfaces, equalization of unevenness in the floor and divergences in dimension tolerance acc. to DIN 18202 before laying of ceramic tiles and floor slabs, marble and natural stone coverings, elastic floor coverings, carpets as well as parquet and laminate flooring. With full surface filler application under parquet, the layer thickness must be at least 3 mm. As a leveller on professionally sanded mastic asphalt screed surfaces of hardness classes IC10 and IC15 up to 5 mm layer thickness.

In areas subject to moisture (maximum water action class W2-I) apply suitable composite sealing in acc. with DIN 18534-1.

Substrate pretreatment

See page 118 ff.

Mixing

Mix to a lump-free and application-ready consistence in a clean bucket with clean and cold water (4.75 l per 25 kg bag). A mixer with a speed of 600 RPM with a corkscrew, double-disk agitator or agitating basket is recommended.

Consistence for machine application

Adjust a suitable consistence using the flow test: max. flow diameter Ø 64 cm (determined with a 1.3 l checking tin, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time). With larger layer thickness's the slump flow or the water quantity should be reduced if permitted by the levelling characteristics. During application, the material is self-levelling so that when the consistence of the floor equalization compound is set to flow, subsequent finishing or grinding of the surface is unnecessary. Optimum extraction of trapped air and levelling of the material is achieved by working the surface with a spiked roller and/or dappling bar. Observe the slurry spread rate when applied using a mixing pump.

Application

Pour the fresh mortar onto the prepared substrate and distribute using a finishing trowel or dappling bar to the required layer thickness. For the application on large areas, mix and pump N 340 Sprint continuously with PFT mixing pump G 4 with attached PFT ROTOMIX Disc or PFT agitator. Observe the machine manufacturer's specifications. Material that has already started to harden should not be mixed with additional water or stirred again.

Application temperature / climatic conditions

Do not apply at room or substrate temperatures below 10 °C and exceeding 30 °C.

Storage

Bagged material as well as bulk material can be stored for up to 9 months when dry.

Technical data

Description	Unit	Value
Layer thickness	mm	2 – 40
Chair roll resistance from thickness	mm	2
Strengths after 28 days (reference values)		
Compressive strength	N/mm²	> 35
Bending tensile strength	N/mm²	> 7
Density		
Mortar (wet)	kg/l	Approx. 2.0
Mortar (dry)	kg/l	Approx. 1.8
Agitator application		
Water ratio for 25 kg sack	l	Approx. 4.75
Machine application		
Slump flow 1.3 l PFT checking tin	cm	≤ 64
Application times		
Pot life	min	Approx. 30
Work life on the surface	min	Approx. 20
Material requirement		
Per mm layer thickness	kg/m²	Approx. 1.7
Can be trafficked (depending on the thickness and temperature)	h	Approx. 3
Ready to cover at residual moisture (check with CM tester)		
For vapour-tight coverings	CM-%	≤ 2.5
For vapour permeable coverings/tiles	CM-%	≤ 3.0
Ready for floor covering (20 °C, 65 % relative humidity)		
Tiles	h	4
Vapour-tight coverings		
■ Up to 3 mm layer thickness	h	Approx. 3 – 4
■ Up to 5 mm layer thickness	h	Approx. 12
■ Up to 10 mm layer thickness	h	Approx. 24
■ Up to 20 mm layer thickness	h	Approx. 48
■ Up to 30 mm layer thickness	h	Approx. 72

Product data sheet N 340 Sprint F413a.de

N 410

Gypsum-based floor filling compound from 0 to 10 mm

N 410 is a factory-mixed dry mortar made of calcium sulphate, selected aggregates and additives to improve the application properties, ready to be mixed with water. N 410 is used as a composite leveller on bare concrete slabs, stable calcium sulphate and cementitious screeds and pre-fab floor screeds.

For manufacturing smooth, offset free floor surfaces, equalization of unevenness in the floor and divergences in dimension tolerance acc. to DIN 18202 before laying of ceramic tiles and floor slabs, marble and natural stone coverings, elastic floor coverings, carpets as well as parquet and laminate flooring. With full surface filler application under parquet, the layer thickness must be at least 3 mm. As a leveller on professionally sanded mastic asphalt screed surfaces of hardness classes IC10 and IC15 up to 5 mm layer thickness.

In areas subject to moisture (maximum water action class W1-I) apply suitable composite sealing in acc. with DIN 18534-1. Do not use in wet rooms.

Substrate pretreatment

See page 118 ff.

Mixing

Mix to a lump-free and application-ready consistence in a clean bucket with clean and cold water (6.0 l per 25 kg bag). A mixer with a speed of 600 RPM with a corkscrew, double-disk agitator or agitating basket is recommended.

Consistence for machine application

Adjust a suitable consistence using the flow test: max. flow diameter Ø 67 cm (determined with a 1.3 l checking tin, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time). With larger layer thickness's the slump flow or the water quantity should be reduced if permitted by the levelling characteristics. During application, the material is self-levelling so that when the consistence of the floor filler is set to flow, subsequent finishing or grinding of the surface is unnecessary. Optimum extraction of trapped air and levelling of the material is achieved by working the surface with a spiked roller.

Observe the slurry spread rate when applied using a mixing pump.

Application

Pour the fresh mortar onto the prepared substrate and distribute using a finishing trowel or dappling bar to the required layer thickness. For the application on large areas, mix and pump N 410 continuously with PFT mixing pump G 4 with attached PFT ROTOMIX disc or PFT agitator. Observe the machine manufacturer's specifications. Material that has already started to harden should not be mixed with additional water or stirred again.

Application temperature / climatic conditions

Do not apply at room or substrate temperatures below 10 °C and exceeding 30 °C.

Storage

Bag material can be stored for up to 18 months when dry.

Technical data

Description	Unit	Value
Layer thickness	mm	0 – 10
Chair roll resistance from thickness	mm	2
Strengths after 28 days (reference values)		
Compressive strength	N/mm²	> 25
Bending tensile strength	N/mm²	> 7
Density		
Mortar (wet)	kg/l	Approx. 1.9
Mortar (dry)	kg/l	Approx. 1.7
Agitator application		
Water ratio for 25 kg sack	l	Approx. 6.0
Machine application		
Slump flow 1.3 l PFT checking tin	cm	≤ 67
Application times		
Pot life	min	Approx. 30
Work life on the surface	min	Approx. 20
Material requirement		
Per mm layer thickness	kg/m²	Approx. 1.6
Can be trafficked (depending on the thickness and temperature)	h	Approx. 2
Ready to cover at residual moisture (check with CM tester)		
For vapour-tight coverings	CM-%	≤ 0.5
For vapour permeable coverings/tiles	CM-%	≤ 1.0
Ready for floor covering (20 °C, 65 % relative humidity)		
Tiles		
■ Up to 2 mm layer thickness	t	Approx. 1
■ Up to 10 mm layer thickness	t	Approx. 5
Vapour-tight coverings		
■ Up to 2 mm layer thickness	t	Approx. 2
■ Up to 10 mm layer thickness	t	Approx. 8

Product data sheet N 410 F421.de

N 410 Flex

Gypsum-based fibre-reinforced floor filler compound from 3 to 10 mm

N 410 Flex is a fibre-reinforced factory-mixed dry mortar made of calcium sulphate, selected aggregates and additives to improve the application properties, ready to be mixed with water. N 410 Flex is used as a composite leveller on stable wooden substrates, such as wooden flooring, parquet, wood chipboard (V 100 etc.), bare concrete slabs, calcium sulphate and cementitious screeds and pre-fab floor screed.

For manufacturing smooth, offset free floor surfaces, equalization of unevenness in the floor and divergences in dimension tolerance acc. to DIN 18202 before laying of ceramic tiles and floor slabs, marble and natural stone coverings, elastic floor coverings, carpets as well as parquet and laminate flooring. With full surface filler application under parquet, the layer thickness must be at least 3 mm. As a leveller on professionally sanded mastic asphalt screed surfaces of hardness classes IC10 and IC15 up to 5 mm layer thickness.

In areas subject to moisture (maximum water action class W1-I) apply suitable composite sealing in acc. with DIN 18534-1. Do not use in wet rooms.

Substrate pretreatment

See page 118 ff.

Mixing

Mix to a lump-free and application-ready consistence in a clean bucket with clean and cold water (6.0 l per 25 kg bag). A mixer with a speed of 600 RPM with a corkscrew, double-disk agitator or agitating basket is recommended.

Consistence for machine application

Adjust a suitable consistence using the flow test: max. flow diameter Ø 67 cm (determined with a 1.3 l checking tin, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time). With larger layer thickness's the slump flow or the water quantity should be reduced if permitted by the levelling characteristics. During application, the material is self-levelling so that when the consistence of the floor filler is set to flow, subsequent finishing or grinding of the surface is unnecessary. Optimum extraction of trapped air and levelling of the material is achieved by working the surface with a spiked roller. Observe the slurry spread rate when applied using a mixing pump.

Application

Pour the fresh mortar onto the prepared substrate and distribute using a finishing trowel or dappling bar to the required layer thickness. For the application on large areas, mix and pump N 410 Flex continuously with PFT mixing pump G 4 with attached PFT ROTOMIX disc or PFT agitator. Observe the machine manufacturer's specifications. Material that has already started to harden should not be mixed with additional water or stirred again.

Application temperature / climatic conditions

Do not apply at room or substrate temperatures below 5 °C and exceeding 30 °C.

Storage

Bag material can be stored for up to 18 months when dry.

Technical data

Description	Unit	Value
Layer thickness	mm	3 – 10
Chair roll resistance from thickness	mm	3
Strengths after 28 days (reference values)		
Compressive strength	N/mm²	> 25
Bending tensile strength	N/mm²	> 7
Density		
Mortar (wet)	kg/l	Approx. 1.9
Mortar (dry)	kg/l	Approx. 1.7
Agitator application		
Water ratio for 25 kg sack	l	Approx. 6.0
Machine application		
Slump flow 1.3 l PFT checking tin	cm	≤ 67
Application times		
Pot life	min	Approx. 30
Work life on the surface	min	Approx. 20
Material requirement		
Per mm layer thickness	kg/m²	Approx. 1.6
Can be trafficked (depending on the thickness and temperature)	h	Approx. 2
Ready to cover at residual moisture (check with CM tester)		
For vapour-tight coverings	CM-%	≤ 0.5
For vapour permeable coverings/tiles	CM-%	≤ 1.0
Ready for floor covering (20 °C, 65 % relative humidity)		
Tiles		
■ Up to 3 mm layer thickness	t	Approx. 1
■ Up to 10 mm layer thickness	t	Approx. 5
Vapour-tight coverings		
■ Up to 3 mm layer thickness	t	Approx. 3
■ Up to 10 mm layer thickness	t	Approx. 8

Product data sheet N 410 Flex F421a.de

N 430

Gypsum-based floor equalization compound from 2 to 30 mm

N 430 is a factory-mixed dry mortar made of calcium sulphate, selected aggregates and additives to improve the application properties, ready to be mixed with water. N 430 is used as a composite leveller on bare concrete slabs, stable calcium sulphate and cementitious screeds.

For manufacturing smooth, offset-free floor surfaces, equalization of unevenness in the floor and divergences in dimension tolerance acc. to DIN 18202 before laying of ceramic tiles and floor slabs, marble and natural stone coverings, elastic floor coverings, carpets as well as parquet and laminate flooring. With full surface filler application under parquet, the layer thickness must be at least 3 mm. It can also be applied in connection with a thin layer underfloor heating as bonded screed, see system data sheet Knauf Thin Layer Heating Screed Systems FE22.de. As a leveller on professionally sanded mastic asphalt screed surfaces of hardness classes IC10 and IC15 up to 5 mm layer thickness.

In areas subject to moisture (maximum water action class W1-I) apply suitable composite sealing in acc. with DIN 18534-1.

Do not use in wet rooms.

Substrate pretreatment

See page 118 ff.

Mixing

Mix to a lump-free and application-ready consistence in a clean bucket with clean and cold water (6.5 l per 25 kg bag). A mixer with a speed of 600 RPM with a corkscrew, double-disk agitator or agitating basket is recommended.

Consistence for machine application

Adjust a suitable consistence using the flow test: max. flow diameter Ø 66 cm (determined with a 1.3 l checking tin, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time). With larger layer thickness's the slump flow or the water quantity should be reduced if permitted by the levelling characteristics. During application, the material is self-levelling so that when the consistence of the floor equalization compound is set to flow, subsequent finishing or grinding of the surface is unnecessary. Optimum extraction of trapped air and levelling of the material is achieved by working the surface with a spiked roller. Observe the slurry spread rate when applied using a mixing pump.

Application

Pour the fresh mortar onto the prepared substrate and distribute using a finishing trowel or dappling bar to the required layer thickness. For the application on large areas, mix and pump N 430 continuously with PFT mixing pump G 4 with attached PFT ROTOMIX disc agitator. Observe the machine manufacturer's specifications. Material that has already started to harden should not be mixed with additional water or stirred again.

Application temperature / climatic conditions

Do not apply at room, mortar or substrate temperatures below 5 °C and exceeding 30 °C.

Storage

Bagged material as well as bulk material can be stored for up to 6 months when dry.

Technical data

Description	Unit	Value
Layer thickness	mm	2 – 30
Chair roll resistance from thickness	mm	2
Strengths after 28 days (reference values)		
Compressive strength	N/mm²	> 20
Bending tensile strength	N/mm²	> 6
Density		
Mortar (wet)	kg/l	Approx. 1.9
Mortar (dry)	kg/l	Approx. 1.7
Agitator application		
Water ratio for 25 kg sack	l	Approx. 6.5
Machine application		
Slump flow 1.3 l PFT checking tin	cm	≤ 66
Application times		
Pot life	min	Approx. 30
Work life on the surface	min	Approx. 20
Material requirement		
Per mm layer thickness	kg/m²	Approx. 1.6
Can be trafficked (depending on the thickness and temperature)	h	Approx. 3
Ready to cover at residual moisture (check with CM tester)		
For vapour-tight coverings	CM-%	≤ 0.5
For vapour-permeable coverings	CM-%	≤ 1.0
For tiles	CM-%	≤ 0.5
Ready for floor covering (20 °C, 65 % relative humidity)		
Tiles		
■ Up to 2 mm layer thickness	t	Approx. 1
■ Up to 10 mm layer thickness	t	Approx. 5
Vapour-tight coverings		
■ Up to 2 mm layer thickness	t	Approx. 2
■ Up to 10 mm layer thickness	t	Approx. 8

Product data sheet N 430 F423.de

N 440

Gypsum-based floor equalization compound from 10 to 40 mm

N 440 factory-mixed dry mortar made of calcium sulphate, ready to be mixed with water. N 440 is used as a bonded screed, as a screed on a separating layer (nominal screed thickness at least 25 mm), as a self-levelling layer in layer thicknesses of 10 to 40 mm on basic floors and is ideal on calcium sulphate substrates (including heating screed) in interiors. It can also be applied in connection with a thin layer underfloor heating, as a separating layer and on an insulation layer, see system data sheet Knauf Thin Layer Heating Screed Systems FE22.de. As a leveller on professionally sanded mastic asphalt screed surfaces of hardness classes IC10 and IC15.

In areas subject to moisture (maximum water action class W1-I) apply suitable composite sealing in acc. with DIN 18534-1.

Do not use in wet rooms

Substrate pretreatment

See page 118 ff.

Mixing

Mix to a lump-free and application-ready consistence in a clean bucket with clean and cold water (4.4 – 5.0 l per 25 kg bag). A mixer with a speed of 600 RPM with a corkscrew, double-disk agitator or agitating basket is recommended.

Consistence for machine application
Adjust a suitable consistence using the flow test: max. flow diameter Ø 56 cm (determined with a 1.3 l checking tin, on an even, non-absorbent surface, e.g. foil, after 2 minutes flowing time). With larger layer thickness's the slump flow or the water quantity should be reduced if permitted by the levelling characteristics. During application, the material is self-levelling so that when the consistence of the floor equalization compound is set to flow, subsequent finishing or grinding of the surface is unnecessary. Optimum extraction of trapped air and levelling of the material is achieved by working the surface with a spiked roller. Observe the slurry spread rate when applied using a mixing pump.

Application

Pour the fresh mortar onto the prepared substrate and distribute using a finishing trowel or dappling bar to the required layer thickness. 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 broom or with a dappling bar. Smoothing the surface with a trowel is another option.

For the application on large areas, mix and pump N 440 continuously with PFT mixing pump G 4 with attached PFT ROTOMIX D pumps. Observe the machine manufacturer's specifications.
Material that has already started to harden should not be mixed with additional water or stirred again.

Note	Application as bulk material with efficient Knauf complete logistical service.

Storage

Bagged material as well as bulk material can be stored for up to 6 months when dry.

Technical data

Description	Unit	Value
Layer thickness	mm	10 – 40
Chair roll resistance from thickness	mm	From 10
Strengths after 28 days (reference values)		
Compressive strength	N/mm²	> 25
Bending tensile strength	N/mm²	> 6
Density		
Mortar (wet)	kg/l	Approx. 2.2
Mortar (dry)	kg/l	Approx. 2.0
Agitator application		
Water ratio for 25 kg sack	l	Approx. 4.4 – 5.0
Machine application		
Slump flow 1.3 l PFT checking tin	cm	≤ 56
Application times		
Pot life	min	Approx. 30
Work life on the surface	min	Approx. 10
Material requirement		
Per mm layer thickness	kg/m²	Approx. 1.8
Can be trafficked (depending on the thickness and temperature)	h	Approx. 5
Ready to cover at residual moisture (check with CM tester)		
For vapour-tight coverings	CM-%	≤ 0.5
For vapour permeable coverings/tiles	CM-%	≤ 1.0
As a heated screed	CM-%	≤ 0.5
Ready for floor covering (20 °C, 65 % relative humidity) layer thickness 20 mm		
For vapour-tight coverings	t	Approx. 14
For vapour-retardant covering	t	Approx. 7
For vapour permeable coverings/tiles	t	Approx. 7
As a heated screed	t	Approx. 7

Product data sheet N 440 F422.de

Tips for newcomers

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 46.

Extensive testing requiring significant effort and expense (e.g. chemical testing) cannot be demanded 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 % 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.

Note	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.

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).

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 18533 Waterproofing of elements in contact with soil
- DIN 18534-1 Waterproofing for indoor applications
- 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 (Industrial group screed materials) (IGE) / Verband für Dämmsysteme, Putz und Mörtel e.V. (association for insulation systems, plaster and mortar) (VDPM)

- 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 in areas of high humidity”
- No. 4 “Assessment and treatment of the surfaces of flowing calcium sulphate screeds”
- No. 5 “Joints in flowing calcium sulphate screeds”
- No. 7 “Flowing calcium sulphate screeds for remodeling, renovation and modernization”
- No. 8 “Light levelling mortar under flowing screed”
- No. 9 "Flowing calcium sulphate screeds as a substrate for large format tiles”

Code of Practice 4 BVG, Industriegruppe Baugipse (IGB)

- 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].
- [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].

Technical information from the Association for Screed and Floor Covering (BEB)

- Instructions for planning, application and evaluation as well as surface preparation of calcium sulphate screeds
- Instructions for laying large-format ceramic tiles and slabs, concrete, natural and artificial stone on calcium sulphate-bonded 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.
- Information on the planning and application of floor constructions with pipes, wiring and fittings on basic ceilings
- Equalization layers made of light mortar
- Accelerated drying of calcium sulphate screeds
- Calcium sulphate flowing screeds in highly trafficked areas
- Realization of floors with drains not used systematically (Emergency drainage)
- Evaluation and preparation of substrates in old and new buildings

Informationsdienst Flächenheizung vom Bundesverband Flächenheizung und Flächenkühlung e.V. (BVF) in German only

- [Coordination of trades with area heating and area cooling in existing buildings]
- Coordination of trades with area heating and area cooling in existing buildings

Knauf product overview

Knauf self-levelling floor screeds

Table 40: Knauf self-levelling floor screeds

Properties	**FE Fire** (F323f.de)	**FE Sprint** (F327.de)	**FE 50 Largo** (F322.de)
	 New		
Field of application	Floor screed for use with fire protection requirements	Sites with tight deadlines. Quick drying and can be covered after a short time	Cost-effective flowing screed for building construction and large projects
Quality properties to EN 13813	CAF-C25-F5	CA-C30-F5	CA-C25-F5
Compressive strength Flexural strength	≥ 25 N/mm² ≥ 5 N/mm²	≥ 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	approx. 19 kg/m²
Density wet dry	approx. 2.2 – 2.3 kg/l approx. 2.0 – 2.1 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
Machine application Bagged material Silo	 – e.g. PFT FERRO 100	 – e.g. PFT FERRO 100	 PFT G 4 e.g. PFT FERRO 100
Slump flow (1.3 l checking tin)	< 43 cm	< 42 cm	< 43 cm
Application time	approx. 40 min	approx. 30 min	approx. 60 (approx. 40[1)]) min
Walkable after	approx. 12 hours	approx. 24 hours	approx. 24 hours
Loadable after	approx. 3 days	approx. 3 days	approx. 3 days
Drying Reference values, unheated at 35 mm Reference values, heated at 35 mm tube coverage	 approx. 3 – 4 W approx. 14 - 21 days	 approx. 7 days –	 approx. 3 – 6 W approx. 3 – 4 W
	Depending on site 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 coverings (tiles or similar) ■ as a heated screed	 ≤ 0.5 CM-% ≤ 1.0 CM-% ≤ 1.0 CM-% ≤ 0.5 CM-%	 ≤ 1.5 CM-% ≤ 1.8 CM-% ≤ 1.8 CM-% –	 ≤ 0.5 CM-% ≤ 1.0 CM-% ≤ 1.0 CM-% ≤ 0.5 CM-%
Heating commences	After 48 hours	–	After 7 days
Max. flow temperature with underfloor heating	55 °C	–	55 °C
Expansion during setting	approx. 0.1 mm/m	approx. 0.3 mm/m	approx. 0.1 mm/m
Thermal expansion coefficient	approx. 0.014 mm/(m·K)	approx. 0.014 mm/(m·K)	approx. 0.016 mm/(m·K) (approx. 0.014 mm/(m·K)[1)])
Thermal conductivity λ_z	approx. 1.4 W/(m·K)	approx. 1.4 W/(m·K)	approx. 1.66 W/(m·K) (approx. 1.4 W/(m·K)[1)])
Supplied in bags Silo	– Bulk	– Bulk	40 kg bag Bulk
Storage (dry)	Up to 6 months	Up to 3 months	Up to 6 months

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

	FE 80 Allegro (F325.de)	**FE 25 A tempo** (F321.de)	**FE Fortissimo** (F326.de)	**FE Eco** (F328.de)
				
	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	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 G 4 e.g. PFT FERRO 100	PFT G 4 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[1]) min	approx. 40 min	approx. 60 (approx. 40[1]) min	approx. 40 min
	approx. 24 hours	approx. 3 hours	approx. 24 hours	approx. 12 hours
	approx. 3 days	approx. 8 hours	approx. 3 days	approx. 3 days
	approx. 3 – 6 W approx. 3 – 4 W	approx. 2 – 4 W approx. 8 - 14 days (provide additional ventilation)	approx. 3 – 6 W approx. 3 – 4 W	– approx. 14 - 21 days
	≤ 0.5 CM-% ≤ 1.0 CM-% ≤ 1.0 CM-% ≤ 0.5 CM-%	≤ 0.5 CM-% ≤ 1.0 CM-% ≤ 1.0 CM-% ≤ 0.5 CM-%	≤ 0.5 CM-% ≤ 1.0 CM-% ≤ 1.0 CM-% ≤ 0.5 CM-%	– – – ≤ 0.5 CM-%
	After 7 days	When hard enough for foot traffic (after approx. 3 hours).	After 7 days	After 48 hours
	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)[1])	approx. 0.011 mm/(m·K)	approx. 0.016 mm/(m·K) (approx. 0.014 mm/(m·K)[1])	approx. 0.014 mm/(m·K)
	approx. 1.87 W/(m·K) (approx. 1.4 W/(m·K)[1])	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	30 kg bag Bulk
	Up to 6 months	Up to 6 months	Up to 6 months	Up to 6 months

Knauf leveller and equalization compounds

Table 41: Knauf leveller and equalization compounds

Properties	**N 345 Form** (F417a.de)	**N 320 Sprint** (F411.de)	**N 320 Flex** (F415.de)
			
Field of application	Stable (sag resistant) levelling compound	Ideal for cementitious substrates	Ideal on wooden and critical substrates
Layer thickness	1 – 45 mm	0 – 20 mm	3 – 20 mm
Quality properties to EN 13813	CT-C50-F8	CT-C30-F7	CT-C25-F5
Tensile strength (ref. value) after 28 days: Compressive strength Flexural strength	 ≥ 50 N/mm² ≥ 8 N/mm²	 ≥ 30 N/mm² ≥ 7 N/mm²	 ≥ 25 N/mm² ≥ 5 N/mm²
Material consumption per mm layer thickness	approx. 1.5 kg/m²	approx. 1.6 kg/m²	approx. 1.6 kg/m²
Density wet dry	 approx. 1.9 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
■ Machine application bags ■ Machine application silo ■ Manual application	– – Agitator	PFT G 4 + PFT ROTOMIX disc or agitator – Agitator	PFT G 4 + PFT ROTOMIX disc or agitator – Agitator
Agitator application: Water quantity	25 kg bag approx. 5.5 l	25 kg bag approx. 5.75 l	25 kg bag approx. 5.75 l
Machine application: Slump flow (1.3 l PFT checking tin)	–	< 63 cm	≤ 64 cm
Application time ("Pot life") Work life on the surface	–	approx. 30 min approx. 20 min	approx. 30 min approx. 20 min
Walkable (depending on the thickness and temperature)	after approx. 0.5 h	after approx. 1.5 h	after approx. 3 h
Ready to cover for floor covering (20 °C, 65% relative humidity) ■ Vapour-tight coverings ■ Vapour retardant coverings ■ Vapour permeable coverings ■ Tiles ■ As a heated screed	 approx. 45 min	 3 mm ca. 3 – 4 h, 5 mm ca. 12 h, 10 mm ca. 24 h, 20 mm ca. 48 h – – approx. 4 hours –	 3 mm ca. 3 – 4 h, 5 mm ca. 12 h, 10 mm ca. 24 h, 20 mm ca. 48 h – – approx. 4 hours –
Ready for covering with residual moisture (test with CM tester) ■ For vapour-tight coverings ■ For vapour-retardant covering ■ For vapour-permeable coverings ■ For tiles ■ As a heated screed	 ≤ 2.5 CM-% – ≤ 3.0 CM-% ≤ 3.0 CM-% –	 ≤ 2.5 CM-% – ≤ 3.0 CM-% ≤ 3.0 CM-% –	 ≤ 2.5 CM-% – ≤ 3.0 CM-% ≤ 3.0 CM-% –
Chair roll resistance from layer thickness	2 mm	2 mm	3 mm
Application on heated screed	Yes	Yes	Yes
Supplied in bags Silo Storage (dry)	25 kg bag – Original pack. up to 9 months	25 kg bag Bulk (on request) Original pack. up to 9 months, bulk 9 months	25 kg bag – Up to 9 months in original packaging

	N 330 Premium (F412b.de)	**N 340** (F413.de)	**N 340 Sprint** (F413a.de)
			
	Easy to sand premium equalization compound	Ideal for exterior and wet areas	Quick layer thickness allrounder
	0 – 30 mm	5 – 40 mm	2 – 40 mm
	CT-C35-F7	CT-C25-F7	CT-C35-F7
	≥ 35 N/mm² ≥ 7 N/mm²	≥ 25 N/mm² ≥ 7 N/mm²	≥ 35 N/mm² ≥ 7 N/mm²
	approx. 1.5 kg/m²	approx. 1.6 kg/m²	approx. 1.7 kg/m²
	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 G 4 + agitator – Agitator	PFT G 4 + PFT ROTOMIX D-pumps PFT FERRO 50 Agitator	PFT G 4 + PFT ROTOMIX disc or agitator – Agitator
	25 kg bag approx. 6.0 l	25 kg bag 5 – 20 mm approx. 4.75 l 20 – 40 mm approx. 4.50 l	25 kg bag approx. 4.75 l
	≤ 66 cm	5 – 20 mm ≤ 57 cm 20 – 40 mm ≤ 55 cm	≤ 64 cm
	approx. 20 min approx. 10 min	approx. 30 min approx. 20 min	approx. 30 min approx. 20 min
	after approx. 1.5 – 2.0 h	after approx. 3 h	after approx. 3 h
	Textile coverings approx. 3 – 4 hours, PVC/linoleum approx. 12 hours, Rubber/parquet approx. 24 h – – approx. 2 hours –	20 mm approx. 6 days, 40 mm approx. 16 days – – 20 mm approx. 3 days, 40 mm approx. 10 days –	3 mm ca. 3 – 4 h, 5 mm ca. 12 h, 10 mm ca. 24 h 20 mm ca. 48 h, 30 mm ca. 72 h – – approx. 4 hours –
	≤ 2.5 CM-% – ≤ 3.0 CM-% ≤ 3.0 CM-% –	≤ 2.5 CM-% – ≤ 3.0 CM-% ≤ 3.0 CM-% –	≤ 2.5 CM-% – ≤ 3.0 CM-% ≤ 3.0 CM-% –
	2 mm	5 mm	2 mm
	Yes	Yes	Yes
	25 kg bag –	25 kg bag Bulk	25 kg bag Bulk (on request)
	Up to 18 months in original packaging	Original packaging up to 18 months, bulk 9 months	Original packaging up to 9 months, bulk 9 months

Knauf leveller and equalization compounds (continued)

Properties	**N 410** (F421.de)	**N 410 Flex** (F421a.de)	
			
Field of application	Ideal on pre-fab floor screed	Ideal on wooden and critical substrates	
Layer thickness	0 – 10 mm	3 – 10 mm	
Quality properties to EN 13813	CA-C25-F7	CA-C25-F7	
Tensile strength (reference values) after 28 days: Compressive strength Flexural strength	 ≥ 25 N/mm² ≥ 7 N/mm²	 ≥ 25 N/mm² ≥ 7 N/mm²	
Material consumption per mm layer thickness	approx. 1.6 kg/m²	approx. 1.6 kg/m²	
Weight (Density) wet dry	 approx. 1.9 kg/l approx. 1.7 kg/l	 approx. 1.9 kg/l approx. 1.7 kg/l	
■ Machine application bags ■ Machine application Silo ■ Manual application	PFT G 4 + PFT ROTOMIX disc or agitator – Agitator	PFT G 4 + PFT ROTOMIX disc or agitator – Agitator	
Agitator application: Water quantity	25 kg bag approx. 6.0 l	25 kg bag approx. 6.0 l	
Machine application: Slump flow (1.3 l PFT checking tin)	≤ 67 cm	≤ 67 cm	
Application time ("Pot life") Work life on the surface	approx. 30 min approx. 20 min	approx. 30 min approx. 20 min	
Walkable (depending on the thickness and temperature)	after approx. 2 h	after approx. 2 h	
Ready to cover for floor covering (20 °C, 65% relative humidity) ■ Vapour-tight coverings ■ Vapour retardant coverings ■ Vapour permeable coverings ■ Tiles ■ As a heated screed	 2 mm approx. 2 days, 10 mm approx. 8 days – – 2 mm approx. 1 days, 10 mm approx. 5 days –	 3 mm approx. 3 days, 10 mm approx. 8 days – – 3 mm approx. 1 days, 10 mm approx. 5 days –	
Ready for covering at residual moisture (check with CM tester) ■ For vapour-tight coverings ■ For vapour-retardant covering ■ For vapour-permeable coverings ■ For tiles ■ As a heated screed	 ≤ 0.5 CM-% – ≤ 1.0 CM-% ≤ 1.0 CM-% –	 ≤ 0.5 CM-% – ≤ 1.0 CM-% ≤ 1.0 CM-% –	
Chair roll resistance from layer thickness	2 mm	3 mm	
Application on heated screed	Yes	Yes	
Supplied in bags Silo	25 kg bag –	25 kg bag –	
Storage (dry)	Up to 18 months in original packaging	Up to 18 months in original packaging	

	N 430 (F423.de)	**N 440** (F422.de)
		
	Layer thickness allrounder	Ideal for thin layer underfloor heating
	2 – 30 mm	10 – 40 mm
	CA-C20-F6	CA-C25-F6
	≥ 20 N/mm² ≥ 6 N/mm²	≥ 25 N/mm² ≥ 6 N/mm²
	approx. 1.6 kg/m²	approx. 1.8 kg/m²
	approx. 1.9 kg/l approx. 1.7 kg/l	approx. 2.2 kg/l approx. 2.0 kg/l
	PFT G 4 + PFT ROTOMIX disc or agitator – Agitator	PFT G 4 + PFT ROTOMIX D-pumps PFT FERRO 50 Agitator
	25 kg bag approx. 6.5 l	25 kg bag approx. 4.4 – 5.0 l
	≤ 66 cm	< 56 cm
	approx. 30 min approx. 20 min	approx. 30 min approx. 10 min
	after approx. 3 h	after approx. 5 h
	2 mm approx. 2 days, 10 mm approx. 8 days – – 2 mm approx. 1 days, 10 mm approx. 5 days –	20 mm approx. 14 days 20 mm approx. 7 days 20 mm approx. 7 days 20 mm approx. 7 days 20 mm approx. 7 days
	≤ 0.5 CM-% – ≤ 1.0 CM-% ≤ 0.5 CM-% –	≤ 0.5 CM-% ≤ 1.0 CM-% ≤ 1.0 CM-% ≤ 1.0 CM-% ≤ 0.5 CM-%
	2 mm	10 mm
	Yes	Yes
	25 kg bag Bulk (on request)	25 kg bag Bulk
	Up to 6 months in original packaging Bulk material up to 6 months	Up to 6 months in original packaging Bulk material up to 6 months

Knauf special products

Table 42: Knauf special products

Products	Application	Consumption	Order information	Images
Stretto Quick setting screed mortar consisting of Stretto Sand and FE-Imprägnierung impregnation agent, water-free, ready for covering after 24 hours.	By machine with a compressed air conveyor or batch mixer	approx. 17 kg Stretto-Sand and 0.7 kg FE-Imprägnierung impregnation agent per 1 cm thickness and m²	Stretto Sand Bag 25 kg FE-Imprägnierung Bucket 1 kg Bucket 5 kg Bucket 10 kg (combo pack)	
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, Schnellestrich CT is ready for covering after 24 hours.	By machine or by hand	approx. 20 kg/m² per cm screed thickness	Bag 25 kg	
FE-Imprägnierung Two component epoxy resin as a bonding primer under bonded screed, as a component for quick-setting screed Stretto, as a component of the quick setting levelling mortar EPO-Leicht	Agitator, lambskin roller	approx. 150 – 400 g/m² depending on area of application	Bucket 1 kg Bucket 5 kg Bucket 10 kg (combo pack)	

Basic floor levelling

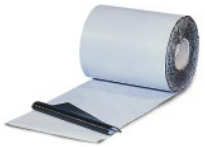
Table 43: Basic floor levelling

Products	Application	Consumption	Order information	Images
Heavy-duty acoustic infill Infill for improvement of the sound insulation with wood joist ceilings and for levelling uneven substrates. Min. leveller height 1.5 cm. Under mineral wool insulation layer and flowing screed with cover board. Also for levelling under thin-layer underfloor heating and pre-fab floor screeds.	By hand, with levelling board and height gauges	16.5 kg per 10 mm/m² height adjustment	Bag approx. 25 kg	
EPO-Leicht Quick setting light levelling mortar consisting of EPO-Perl and FE-Imprägnierung impregnation agent , low weight, water-free.	Agitator	10 litres EPO-Perl and 0.17 kg FE-Imprägnierung per 1 cm thickness and m²	EPO-Perl Bag approx. 60 litres FE-Imprägnierung Bucket 1 kg Bucket 5 kg Bucket 10 kg (combo pack)	
S 400 Sprint Quick-drying light levelling mortar made of EPS aggregate and a cement-based special binder. The high compressive strength and quick drying ensures that S 400 Sprint can be subjected to high loads after just one day.	By machine or by hand	approx. 10 l for each 1 cm per m²	Bag 60 l	

Products	Application	Consumption	Order information	Images
Estroperl® Estroperl® is a mechanically bonded, non-water-absorbent bulk dry leveller made of perlite expanded volcanic rock for height equalization and for thermal insulation under wet and mastic asphalt screeds in acc. to DIN 18560-2.	By hand	approx. 12 l per m² and 1 cm levelling	Bag 100 l	
Staubex® Staubex® is a mechanically bonded bulk dry leveller made of perlite expanded volcanic rock for height equalization and for thermal insulation under wet and mastic asphalt screeds in acc. to DIN 18560-2. Staubex® is an application-friendly and very light dry bulk leveller.	By hand	approx. 12 l per m² and 1 cm levelling	Bag 100 l 150 l	
Staubex® plus Staubex® plus is a high load capable mechanically bonded bulk leveller made of perlite expanded volcanic rock for application under wet and mastic asphalt screeds. The Staubex® plus bonds to a stable and load bearing equalization layer thanks to the partial bitumen encasement layer. Staubex® plus is an application-friendly and very light dry bulk leveller.	By hand	approx. 11 – 11.5 l per m² and 1 cm levelling	Bag 150 l	

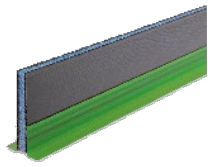
Sealing

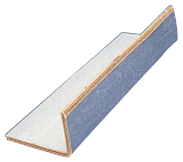
Table 44: Sealing

Products	Application	Consumption	Order information	Images
Katja Sprint Abdichtungsbahn sealing membrane 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 18533-1: W 1.1-E and W 1.2-E.	Roll out and bond by hand	1:08 m^2 per m^2	Roll 32 x 1.25 m (40 m^2)	
Katja Sprint Anschlussstreifen connector tape Self-adhesive 200 mm wide polymer bitumen strips. For establishing connections between Katja Sprint Abdichtungsbahn sealing membrane and rising constructional components. Sealing of front end joints with Katja Sprint Abdichtungsbahn sealing membrane	By hand, if required with hot air gun	1 m per m connection length	Roll 15 x 0.2 m	
Katja Sprint Anschlussfix adhesive High-quality, plastic and permanently sticky surface adhesive on the basis of a hybrid polymer. For connection of the Katja Sprint Abdichtungsbahn sealing membrane to the moisture barrier in interiors	By machine or by hand	approx. 62 ml per m	Cartridge	
FE-Abdichtung sealing shield A "liquid foil" on the basis of a two component epoxy resin. On basic concrete substrates, as sealing bonding primer under bonded screeds, against ground moisture (water exposure W1-E nach DIN 18533).	Agitator, lambskin roller, floor coater	approx. 600 – 1000 g/m^2	Bucket 10 kg (combo pack)	

Knauf accessories

Table 45: Knauf accessories

Products	Application	Consumption	Order information	Images
Holzfaserdämmplatte WF wood fibre insulation board ■ As an impact noise layer under screeds such as N 440 on thin layer underfloor heating ■ As a covering board on Trockenschüttung PA dry bulk levelling 10 mm thick, 598 mm wide, 1198 mm long Thermal conductivity λ_R 0.07 W/(m·K)	1 m^2 per m^2 screed surface	–	Pallet: 226 pieces	
Schrenzlage synthetic coated kraft paper 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 m^2 per m^2 Screed surface (overlap)	–	Roll 80 x 1.25 m (approx. 100 m^2)	
Mineral wool edge insulation strips 12 mm thick, 100 mm wide	1 m per m connection length	–	Package 100 pieces	
Edge Insulation Strip 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 strip on rear	1 m per m connection length	–	Roll 40 m	
Movement joint 12/80 As a movement joint, e.g. in doorways, made of elastic foam and self-adhesive base. The 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 attached with adhesive tape to the insulation layer: A: Control joint trim 10/70 B: L Profile 50/30	Per m joint length 1 m 1 m	–	Application see page 67. Roll 25 m Unit 3 m	 

Products	Application	Consumption	Order information	Images
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	1 m per m joint length	–	Unit 3 m	
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/m^2 Non-absorbent substrates: 40 – 60 g/m^2 Old tile coverings, terrazzo: 70 – 100 g/m^2 Wooden substrates: 60 – 80 g/m^2 On pre-fab floor screed: approx. 50 g/m	Bucket 5 kg	
Estrichgrund screed primer 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/m^2 ■ On flowing screed: approx. 100 g/m^2 ■ On pre-fab floor screed approx. 50 g/m²	Bucket 5 kg Bucket 10 kg	
Schnellgrund primer 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/m^2 On flowing screed: approx. 110 g/m^2 On chipboard V100: approx. 90 g/m² On pre-fab floor screed: approx. 80 g/m^2	Bucket 5 kg Bucket 10 kg	

Further products for flooring

Sealing products range

Knauf Flex-Dicht

- For wall and floor
- For interior and exterior application
- For the watertight, elastic sealing of substrates prior to the setting and laying of ceramic coverings and natural stones (in conjunction with Knauf Flächendichtband sealing tape).
- For flexible sealing under tiles and board coverings when the substrate is subject to excessive thermal loads (e.g. underfloor heating systems, balconies and terraces)
- For waterproofing wet rooms such as showers and rooms with drains in the floor.
- For the classes 0, A01, A02, B0 acc. to the ZDB Code of Practice “Hinweise für die Ausführung von Abdichtungen im Verbund mit Bekleidungen und Belägen aus Fliesen und Platten für den Innen- und Außenbereich - *Instructions for application of sealings with linings and coverings made of tiles and ceramic panels for interiors and exteriors*” dated January 2005 (German only).
- Crack-bridging and fibre reinforcement offers a high level of assurance even with subsequent substrate cracks that occur.
- High water barrier capacity prevents the ingress of water in concrete and masonry.
- Adheres optimally to almost all common building substrates. Accordingly, application of a primer is unnecessary.
- Pliable and supple to apply. Can be applied with a trowel or by painting depending on the mixing ratio with water.
- Water-proof and frost-resistant and thus suitable for indoors and outdoors.
- Single component and solvent-free; only for mixing with water.

Knauf Flächendicht

- For wall and floor
- Intended for indoor application
- For waterproofing damp and wet rooms such as bathrooms and showers and other facilities with moisture-resistance classes I to II.
- On moisture sensitive substrates: Gypsum plaster, gypsum boards, gypsum fibre boards, calcium sulfate screeds, etc.
- On absorbent mineral substrates, e.g. lime plasters, lime-cement plaster and cementitious plasters, cement boards, cementitious screed, concrete, aerated concrete, etc.
- For the watertight, elastic sealing of substrates prior to the setting and laying of ceramic coverings and natural stones.(in conjunction with Knauf Flächendichtband sealing tape and cementitious tile adhesives, e.g. Knauf Flexkleber).
- For flexible sealing under tiles and board coverings when the substrate is subject to excessive thermal loads (e.g. underfloor heating systems and wall heating sysems)
- High water barrier capacity prevents the ingress of water in the substrate.
- Easy to apply: Apply with plastic roller, Lambskin Roller, paintbrush or wide brush.
- Ready-to-use and solvent-free. Silicone compatible.

Knauf Flächendichtband sealing tape

- For corner configuration as well as for bridging joints in composite sealing in conjunction with Knauf Flächendicht and/or Knauf Flex-Dicht.
- For moisture-resistance classes 0, A01, A02 and B0 acc. to ZDB Code of Practice and A1 and A2 acc. to National Technical Test Certificate (abP).
- Mesh reinforced elastic sealing tape on an NBR rubber basis with protruding mesh edge.
- The sealing tape features a good resilience and is fully silicone compatible.
- Layer thicknesses of only 0.6 mm and is universally applicable for the seamless and assured reinforcement of areas at risk of cracking.
- The Knauf Flächendichtband togehter with Knauf Flächendicht / Knauf Flex-Dicht forms such a firm bond that it cannot be removed without causing damage to the complete waterproofing system.

Adhesive mortar range

Knauf Bau & Fliesenkleber (building and tile adhesive)

- For wall and floor
- For interior and exterior application
- Substrates: All mineral basecoats, calcium sulfate and cementitious screeds, composite sealing. Functionally added with Knauf Kleber- & Boden-Elast: Suitable for use on water-proofed particleboards (V100), underfloor heating systems, on balconies and terraces subject to high levels of sunshine, old tile coverings as well as insulating boards and panels and lightweight panels made of mineral fibres / polystyrene.
- Tiles and building materials: Absorbent ceramic wall and floor coverings, earthenware, building materials such as aerated concrete and masonry. Functionally added with Knauf Kleber- & Boden-Elast: Suitable for non-absorbent tiles, earthenware, stoneware
- Powerful synthetically enhanced cementitious thin-bed mortar
- Very stable and optimized water retention
- With official test certificate: exceeds the requirements of C1TE (cementitious mortar for normal requirements with reduced slippage and extended open time) according to EN 12004

Knauf Flexkleber Extra

- For wall and floor
- For interior and exterior application
- Substrates: All mineral basecoats, concrete, aerated concrete, all mineral screeds, heated screeds, cement boards, gypsum boards, gypsum fibre boards, system boards, composite seals, etc.
- Specially for surfaces with higher thermal loads (heated screed, balconies, terraces) and for critical substrates.
- Tiles: All ceramic tiles, large format porcelain stoneware, stoneware and earthenware
- Highly flexible, extra strong and synthetically-enhanced, hydraulic setting thin bed mortar
- Premium quality 90 % dust reduced
- High yield, particularly strong adhesion, high stability and good water retention
- With official test certificate: exceeds the requirements of C2TE S1 (cementitious mortar for enhanced requirements with reduced slippage and extended open time) according to EN 12004.

Knauf Flexkleber schnell

- For wall and floor
- For interior and exterior application
- Suitable for areas of application where quick availability for foot traffic or grouting is required, e.g. stairs, corridors, sanitary rooms, etc. and for repair work, e.g. when individual tiles need to be replaced
- Substrates: all mineral renders, old tiles, concrete, aerated concrete, all mineral screed types, heated screeds, cement, gypsum boards and gypsum fibre boards, composite sealing, underfloor heating, etc.Enhanced with Knauf Kleber- & Boden-Elast: waterproof chipboard (V100), mastic asphalt screeds
- Tiles: All ceramic tiles, porcelain stoneware, stoneware, earthenware, cotta, non-translucent natural stone. Functionally added with Knauf Kleber- & Boden Elast: Tiles ≥ 60 x 60 cm large format tiles, etc.
- Highly flexible, quick-setting, highly synthetically-enhanced, hydraulic setting thin bed mortar
- Quick setting, walkable and ready for grouting after 3 hours
- Very stable and good water retention
- With official test certificate: exceeds the requirements of C2FT S1 (fast setting, cementitious mortar for enhanced requirements with reduced slippage) according to EN 12004

Knauf Flexkleber Großformat

- Especially for the floor area
- For interior and exterior application
- Substrates: All mineral screed types, heated screeds, dry screeds, concrete, cement boards, gypsum boards and gypsum fibre boards, composite seals, old tiles etc. Functionally added with Knauf Kleber- & Boden-Elast: Mastic asphalt, water resistant chipboard (V100)
- Construction materials and tiles: All ceramic floor tiles, porcelain stoneware, stoneware, cotto, non-translucent natural stone slabs, stairs and window sills etc. Functionally added with Knauf Kleber- & Boden Elast: Tiles ≥ 60 x 60 cm
- For floor surfaces subject to high wear
- Levelling (from 2 mm to 10 mm) and bonding in one step, ccordingly also suitable for laying uncalibrated tiles
- Synthetically enhanced, flexible, fast thin bed, medium bed and pourable bed adhesive for notched trowels from 4 mm to 20 mm
- Can be set from stable to flowable, for a secure, fully saturated and thus pressure-safe and absolutely frost-proof embedding of large floor tiles and slabs
- High application reliability by optimised water retention of the mortar
- With official test certificate: Exceeds the requirements of C2FE (fast setting, cementitious mortar for enhanced requirements) according to EN 12004

Knauf Flexkleber Naturstein

- For wall and floor
- For interior and exterior application
- Specially for laying marble, granite and natural stones that are susceptible to discolouration, glass mosaic and glass tiles as well as other translucent tiles and slabs
- Also for bonding natural stone window sills (with a notch size between 6 mm and a maximum of 10 mm)
- For all mineral renders, concrete, aerated concrete, calcium sulphate and cementitious screeds, heated screeds, cement boards, gypsum boards and gypsum fibre boards, composite sealing, old tiles etc., enhanced with Knauf Kleber- & Boden-Elast: waterproof chipboard (V100), mastic asphalt screeds
- Also for laying natural stone on heated surfaces, e.g. underfloor heating, wall panel heating, exteriors, etc.
- White, highly flexible special cement-based thin-bed mortar
- Quick setting, walkable and ready for grouting after 3 hours
- Prevents translucence and discolouration of sensitive slabs and tiles
- Particularly strong adhesion: even large (heavy) tiles can be laid on the wall with pinpoint accuracy
- Very stable and optimized water retention
- With official test certificate: exceeds the requirements of C2FT (fast setting, cementitious mortar for enhanced requirements with reduced slippage) according to EN 12004

Knauf Flexkleber Leicht

- For wall and floor
- For interior and exterior application
- Substrates: All mineral basecoats, concrete, aerated concrete, all mineral screeds, heated screeds, cement boards, gypsum boards, gypsum fibre boards, system boards, composite seals, etc.
- Specially for surfaces with higher thermal loads (heated screed, balconies, terraces) and for critical substrates
- Tiles: All ceramic tiles, large format porcelain stoneware, stoneware and earthenware
- Highly flexible, extra strong, hydraulic setting thin bed mortar with lightweight fillers
- Very stable and good water retention
- With official test certificate: exceeds the requirements of C2TE S1 (cementitious mortar for enhanced requirements with reduced slippage and extended open time) according to EN 12004

Grouting mortar portfolio

Knauf Flexfuge Bodenspezial

- For the floor area
- Flexible and quick setting. Ready for foot traffic after 3 hours
- For interior and exterior application
- Optimum in conjunction with Knauf Flexkleber Großformat
- For joint widths from 2 to 50 mm and joint depths from 4 to 100 mm
- For grouting all ceramic tiles, cotto, porcelain stoneware, all scratch-resistant natural stone, quarry slabs, e.g. porphyry, quartzite, etc.
- Optimal for irregular joint widths and geometries, as the self-levelling grout fills the joint with virtually no voids and is therefore frost-proof
- Self-levelling, cementitious pourable and joint mortar
- With flowing formulation: For optimum, cavity-free, frost-safe joint grouting and optimum heat transfer with underfloor heating
- Can be poured directly into the joint: Reduces cleaning effort on rough, sensitive surfaces to a minimum (e.g. porphyry, quartzite)
- Exceeds CG2WA acc. to DIN EN 13888
- Soiling resistant (due to pearl effect): Ensures non-penetration of dirt
- Impermeable to water (acc. to DIN 1048) and frost-resistant

Knauf Flexfuge Universal

- For wall and floor, interiors and exteriors
- For joint widths from 1 to 20 mm
- Free of silica sand and fine-grained: For a particularly smooth joint pattern
- For universal use: Ceramic tiles, earthenware, stoneware, porcelain stoneware, all natural stones (e.g. Carrara marble, travertine, granite, Solnhofen slabs, etc.), glass mosaic, glass tiles
- Ideal for surfaces with strong temperature fluctuations (e.g. heated screeds, terraces, balconies, etc.) as well as surfaces exposed to moisture (bathrooms, showers, etc.)
- Quick hardening, flexible special cement-based grout
- Quick setting: For efficient working. Walkable after approx. 3 hours
- Highly synthetically enhanced with extra adhesive formulation: For particularly enhanced, safe edge adhesion
- Also ideal for jointing on sophisticated substrates, e.g. suitable for underfloor heating, exterior application
- The excellent pliability of the mixed material makes it particularly pleasant and easy to apply
- Exceeds CG2WA acc. to EN 13888
- Soiling resistant (due to pearl effect): Ensures non-penetration of dirt
- Impermeable to water (acc. to DIN 1048) and frost-resistant

Knauf Flexfuge Smart grout

- Ready-to-use special dispersion-based jointing grout
- For wall and floor
- Interior and exterior
- For joint widths from 2 to 20 mm
- For all tile types: Ceramic tiles, earthenware, stoneware, porcelain stoneware, all natural stones such as marble, travertine, granite, Solnhofen slabs and glass mosaic, glass tiles
- Ideal for large format tile covering
- Particularly suitable for critical substrates as very flexible
- The excellent pliability of the material makes it particularly pleasant and easy to apply
- Immediately washable
- Permanently colour fast
- No colour differences between different lots
- Resistant to soiling and mould
- Resealable and remaining material can be used later
- Suitable as a repair grout from 2 mm joint depth
- Easy cleaning
- No solvent

Note	See also www.knauf-bauprodukte.de

Notes

Notes on the document

Knauf technical brochures are the information documents on special topics as well as on the specialist competence from Knauf. The contained information and specifications, constructions, details and stated products are based, unless otherwise stated, on the certificates of usability (e.g. National Technical Test Certificate (abP) valid at the date they are published as well as on the applicable standards. Furthermore, design and structural requirements and those regarding building physics (fire protection and sound insulation) are considered.

The contained construction details are examples and can be used in a similar way for various cladding variants of the respective system. At the same time, the demands made on fire resistance and/or sound insulation as well as any necessary additional measures and/or limitations must be observed.

References to other documents

System data sheets

- D15.de Knauf Wood Joist Ceiling Systems
- FE22.de Knauf thin-layer heating screed systems
- **Folders**
- Fire resistance with Knauf BS1.de (German only)
- Sound insulation and room acoustics with Knauf (only sections in English)

Product data sheets

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

Symbols in this technical brochure

The following symbols are used in this document:

Insulation layers

S Mineral wool insulation layer acc. to EN 13162 non-combustible melting point ≥ 1000 °C acc. to DIN 4102-17 (insulating material, e.g. from Knauf Insulation)

Legend symbols

1 Legend number that will be explained when used

Pictograms and symbols

Wear protective clothing

Wear protective goggles and gloves

Note	Only persons that are familiar with chemically setting substances are allowed to apply these products. The rooms must be ventilated sufficiently (preferably with lateral ventilation). Wear protective goggles (e.g. during mixing), suitable protective gloves and working clothes to prevent contact with skin. The accident prevention regulations of the German commercial employer's liability insurance associations (e.g. BG Bau - Practice guideline for the handling of epoxy resin or HVBG - BGR 227 Working with epoxy resin - *German only*) have to 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 Safety Data Sheets for FE-Abdichtung and FE-Imprägnierung must be observed.

Very low emission, EMICODE EC 1 PLUS, for details see **emicode.com**

Intended use of Knauf systems

Please observe the following:

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

Certificate of Usability

Contents	Fire resistance	Sound insulation	Other proofs
Page 12	DIN 4102-4	–	–
Pages 13 to 16	abP P-2101/351/18-MPA BS and abP P-2103/206/21-MPA BS	–	–
Figure 3 on page 20	–	Test report P-BA 154/1992	–
Figure 4 on page 20	–	Test report P-BA 151/1992	–
Figure 5 on page 21	–	Test report SDM 17064	–
Figure 6 on page 21	–	DIN 4109-32	–
Figure 7 on page 21	–	Test Report SDM 13025-1	–
Figure 8 on page 22	–	Test report P-BA 21/1993	–
Figure 9 on page 22	–	Test report P-BA 22/1993	–
Figure 10 on page 23	–	Proof T 019-05.19	–
Figure 11 on page 23	–	Proof T 019-05.19	–
Page 54, Katja Sprint	–	–	P-SAC 02/5.1/14-101/1.
Page 106, F235.de WF	–	Test report T 012-01.11	–
Page 106, F235.de MW	–	Test Report SDM 13025-1	–

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

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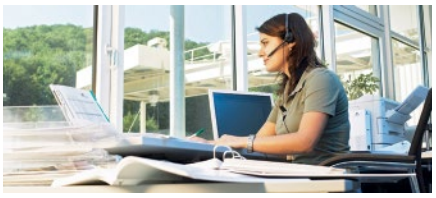

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F20.de/eng/03.23/1/TBr

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Plaster and façade systems
Floor systems

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Knauf PFT
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Marbos
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Sakret Bausysteme
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