



Assembly requirements

Technical information



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Structural requirements

In order to be able to start installing an underfloor duct system, the following requirements must be fulfilled and on hand:

- approved dimensioned installation plan, specifying the location of all assembly parts
- project piece list with the materials to be installed
- documents providing information on floor construction and floor covers
- an approved, clean and swept shell ceiling in the constructional tolerances based on DIN 18 202 (see appendix 2)
- the precise cutting check as a reference point for the corresponding screed height
- specifications regarding traffic loads, fire preventions and subsonic noise behaviour
- the mounting area must be free of construction waste and extraneous material
- protection against weather conditions and moisture must be guaranteed
- specifications regarding minimum installation depth and floor maintenance of installation units

Screed work

Ducts and accessory parts are construction parts that reach their complete loading capacity for the intended use only in firm combination with screed.

In detail the following requirements are indispensable for this purpose:

- The duct system must be sealed before applying the screed
- The system elements must be firmly fixed to the slab ceiling
- The mounted duct system must not be walked upon or strained in any other way
- A safe composite of the duct system and screed must be guaranteed
- Occurring hollow spaces must be lined with screed
- A good thickness and concision of screed must be guaranteed in the floor box areas and in the area of the screed flush duct, in order to prevent later irregularities and cracks in screed
- The duct system must be strained only after the hardening of the screed. Until then, access to the area must be denied
- Screed deformations and shrinkage must be observed

beforehand

The use of insulating strips for the decoupling of the duct system from the screed may lead to a damage of the screed, respectively duct, and to fissuring of the floor cover and must therefore be refrained from.

Expansion joints between the screed and the screed flush ducts can consequently result in deformations of the duct and impair the stability and load capacity of the entire system.

Complying to of the screed types and minimum screed thickness according to DIN 18 560-2 (see appendix 1) must be guaranteed. Thereby a nominal screed thickness of at least 40 mm above the duct for office and work space with a distributed load of up to 2 kN/m² must be observed.

Higher loads require correspondingly higher nominal screed thicknesses based on DIN EN 18560. The duct system itself will be strained with a single load of 750 N and inspected with accordance to the norm.

When using liquid screed, all openings of < 7 mm conforming to standards must be professionally masked.

Hot asphalt

When using hot asphalt, please note:

- The duct system must be protected from high installation temperatures by using suitable insulation layers
- If the insulation layers are > 2 mm, the insulation strip between the shuttering unit and asphalt must be removed after the hot asphalt has cooled off and the formed gap must be filled with suitable materials flush with the surface
- The shuttering unit must be removed after the hardening of the material

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The use of the duct system

The underfloor system must comply with the requirements of DIN EN 50085. The duct system must be mounted on the slab ceiling according to the mounting instructions and taking into account the technical information.

When using a hollow space floor box with a shuttering unit, the following aspects must be complied to:

- The components must be protected against moisture and mechanical damage
- solid and vertical pre-assembly in the floor box
- spray with formwork oil before applying screed
- To decouple floor box and screed, only separating foil of < 2 mm thickness may be used
- apply screed precisely
- use shuttering unit only once

The floor boxes must have the following minimum screed height in order to be applicable:

Article-Number	Duct Height	Minimum height	Use
UBDHB350/250 28	28 mm	65 mm	pultrusion cup
UBDHB350/250 38	38 mm	75 mm	pultrusion/installation cup
UBDHB350/250 48	48 mm	85 mm	pultrusion/installation cup

The screed flush duct system requires a minimum floor construction of 60 mm.

Including the duct system into protection measures

- All metallic parts of the entire duct system must be included in the protection measures
- According to VDE all conductive parts of the duct system must be included in the potential equalization. This is done at the transition points of the installation parts by welding, riveting, creating a firm pressure connection using bolted joints or by means of flexible earthing conductors
- The electric installation duct system may not be used as an equipotential bonding conductor
- The duct system must be connected to in the potential equalization of the entire system in the context of the electrical installation work

- When using light plastic-sheathed cable with protective insulation, it is sufficient to include only the floor boxes into the safety measures. For this purpose, each floor box body is equipped with a conductor clamp.
- In case of expansion gaps it must be ensured that the connections between the installation parts are performed in a flexible manner.

The declared linear impedance for electrical installation duct lengths UK is 0.001 ohm per metre and for the screed flush duct systems UEBS 0.0005 ohm per metre.

Floor covers

When selecting floor cover materials please mind that the underfloor installation systems are subject to the impact of payloads and are classified by means of test loads of 500 N to 15.000 N according to DIN EN 500 85. Thereby dynamic deflections of up to 6 mm and lasting distortions of up to 3 mm are not objectionable.

Flatness measures for full-area floors must be observed in accordance with DIN 18202 Table 3, line 3.

Self-supporting layer thickness for exposed concrete floor covers, synthetic resin covers, melted asphalt covers as well as tiles or dressed stone therefore prevent later fissuring of the cover with changing dynamic pressure.

Already minor deflections cause damage of thin, hard floor covers such as tiles. Solid floor covers such as granite slabs increase the load capacity of the underfloor installation system and allow for a better load spreading.

Appendix 1: Excerpt from DIN 18560-2:2009-09

Table 1 – Nominal thicknesses and bending tensile strength or hardness of unheated screed on insulation layers for vertical loading capacities $\leq 2 \text{ kN/m}^2$

Screed type	Bending stress class / hardness class according to DIN EN 13813	Nominal screed thickness ^a [mm] with a compressibility of the insulation layer ^c $\leq 5 \text{ mm}^b$	Confirmatory test Bending tensile strength βBZ [N/mm ²]		Depth of penetration [mm]	
			Lowest single value	Medium value	at $(22 \pm 1) \text{ }^\circ\text{C}$	at $(40 \pm 1) \text{ }^\circ\text{C}$
Calcium sulphate floating screed CAF	F4	≥ 35	$\geq 3,5$	$\geq 4,0$	–	–
	F5	≥ 35	$\geq 4,5$	$\geq 5,0$	–	–
	F7	≥ 35	$\geq 6,5$	$\geq 7,0$	–	–
Calcium sulphate screed CA	F4	≥ 45	$\geq 2,0$	$\geq 2,5$	–	–
	F5	≥ 40	$\geq 2,5$	$\geq 3,5$	–	–
	F7	≥ 35	$\geq 3,5$	$\geq 4,5$	–	–
Melted asphalt screed AS	IC10	≥ 25	–	–	$\leq 1,0$	$\leq 4,0$
	ICH10	≥ 35	–	–	$\leq 1,0$	$\leq 2,0$
Synthetic resin screed SR	F7	≥ 35	$\geq 4,5$	$\geq 5,5$	–	–
	F10	≥ 30	$\geq 6,5$	$\geq 7,0$	–	–
Magnesia screed MA	F4 ^c	≥ 45	$\geq 2,0$	$\geq 2,5$	–	–
	F5	≥ 40	$\geq 2,5$	$\geq 3,5$	–	–
	F7	≥ 35	$\geq 3,5$	$\geq 4,5$	–	–
Cement screed CT	F4	≥ 45	$\geq 2,0$	$\geq 2,5$	–	–
	F5	≥ 40	$\geq 2,5$	$\geq 3,5$	–	–

a For insulation layers of $\leq 40 \text{ mm}$ with calcium sulphate, synthetic resin, magnesia and cement screed, the nominal screed thickness may be reduced by 5 mm. The minimum thickness of 30 mm may not be under cut (except with melted asphalt).

b When using melted asphalt screed, the compressibility of the insulation layers may not be above 3 mm.

c The surface hardness of stone-wood screeds must correspond with at least SH 30 according to DIN EN 13813.

d In case of a higher compressibility ($\leq 10 \text{ mm}$), the nominal screed thickness must be increased by 5 mm.

Appendix 2: Excerpt from DIN 18202

Table 3 – Flatness tolerances

Column	1	2	3	4	5	6
Line	Subject	Depth gauge as critical values in mm for measurement point distances in m up to				
		0,1	1 ¹⁾	4 ¹⁾	10 ¹⁾	15 ¹⁾²⁾
1	Unfinished topsides of ceilings, subconcrete and under-floors	10	15	20	25	30
2	Unfinished topsides of ceilings, subconcrete and under-floor, with higher requirements, e.g. for the installation of floating screed, industrial floors, tiles, flagging and bonded screed. Finished topsides for secondary purposes, e.g. in storage rooms, cellars.	5	8	12	15	20
3	Exposed flooring, e.g. screed as finished screed, screed as a basis for floor covers; floor covers, tiles covers, primed and glued covers	2	4	10	12	15
4	Like line 3, however with higher requirements	1	3	9	12	15
5	Unfinished walls and undersides of slab ceilings	5	10	15	25	30
6	Exposed walls and undersides of slabs, e.g. plastered walls, paneling, suspended ceiling	3	5	10	20	25
7	Like line 6, however with higher requirements	2	3	8	15	20

1) For interim values please see image 1 and 2 and round to whole mm.

2) The flatness tolerances in column 6 are also valid for measure point distances of above 15 m.

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