TKB-Technical Briefing Note 8

Assessment and Preparation of Substrates for Installation of Floor Coverings and Parquet

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Table of Contents

1. Introduction

All references in this technical information sheet refer to assessment and preparation of substrates/sub floors before installation of textile and elastic floor coverings, laminates, cork, wood-block paving and parquet, referred to as "floor coverings" in this information sheet.

The information contained herein is based on state-of-the-art technology and level of knowledge at time of publication.

The information contained herein refers to general technical data; for reasons of clarity specific substrates, floor coverings and material types are omitted.

2. Sub Floor Constructions

The following section describes the structural specifics and characteristics of different sub floors/substrates.

2.1 Concrete Floors

A concrete floor is a monolithic, self-supporting construction element and is used as base plate or ceiling boarding in buildings and serves as substrate for screed constructions. In some cases, floor coverings can be directly installed on concrete floors. Concrete is suited for underfloor heating. If floor covering is installed directly on concrete, please note the following characteristics of concrete:

- Typical thickness in the 20 cm range
- Extremely long drying time (years) for unheated concrete floors
- Delayed shrinkage
- In some cases, concrete lacks thermal and sound insulation
- No moisture barrier, risk of ascending moisture.

2.2 Screed Constructions

With screed constructions, existing sub floors are levelled to achieve the required thickness level. Screed may be installed as a floating floor, on separation layers or as composite construction. The selected construction type depends on subsequent requirements for finished floor construction or tender requirements.

2.2.1 Composite Screeds

Composite screeds are directly installed on the load-bearing subfloor construction and compensate for unevenness in existing sub floors to achieve a required thickness level. They can bear high loads and these days are the typical choice in industrial construction.
Before start of any floor installation work, please note:

- No moisture barrier, risk of ascending moisture
- Lacks thermal and sound insulation.

2.2.2 Screeds on Separating Layers

These screeds are installed on an anti-stick intermediate layer, the separating layer, made from bituminous paper or cardboard, oil impregnated papers or films directly placed on load-bearing sub floors. Unlike composite screeds, no horizontal load transfer from screed to concrete floor takes place, otherwise range of application is the same. The intermediate layer can also be designed as moisture or vapour barrier.
Before start of any floor installation work, please note:

- Depending on type of intermediate layer, no moisture barrier, risk of ascending moisture
- Lacks thermal and sound insulation.

2.2.3 Screeds on Insulating Layer

These screeds, so-called "floating screeds", are installed on an insulating layer. They are a construction element and unlike aforementioned screeds must bear the static load. This type of screed construction guarantees good thermal and sound insulation and is typically used in residential construction.
The insulating layer consists of thermal and sound insulating materials such as glass or rock wool mats, foamed plastics, cork tiles and an intermediate film or suitable paper layer. In addition, vapour barriers/retarders made from PVC or polyethylene film or suitable bituminous cardboard can be installed. In order to ensure sound insulation, the self-supporting screed slab must be isolated from surrounding construction elements. For this purpose, insulating edge strips, mostly made from foamed plastics, are used.
Before start of any floor installation work, please note:

- Possibly no moisture barrier, risk of ascending moisture
- Missing or not sufficiently projecting insulating edge strip

2.2.4 Heated Screeds on Insulating Layer

Underfloor heating screeds are screeds on insulating layers with integrated heating elements subsequently used for heating or underfloor heating.
A distinction is made between electric heating and hot-water heating systems.
For electric underfloor heating systems, a heating-wire mesh is mostly installed or glued to the surface of the load-bearing layer (screed). Contact manufacturer regarding suitability of floor covering on underfloor heating before starting the installation.
For hot-water heating systems, construction may be different on account of position of water pipes in screed construction.
Before start of any floor installation work, please note:

- Possibly no moisture barrier, risk of ascending moisture
- Missing or not sufficiently projecting insulting edge strip
- Missing heat-up protocol and/or missing measuring points
- The overall thermal resistance of floor coverings and underlays shall not exceed 0.15 m² K/W.

2.3 Cavity Floors, raised Floors

Cavity floors are based on framework elements either installed on height-adjustable support feet or directly installed on concrete floor. A separating layer is placed on formwork structure and the screed is installed, usually a calciumsulfate flow screed or a reinforced cement screed. Cavity clearance for power, water, EDP installations etc. is approx. 200 mm.
Cavity floors can be found wherever immediate and easy access to installations and supply pipes is required. This offers advantages in offices, workshops, training and research facilities. Installations are easily accessible via inspection openings in formwork and screed. Ventilation openings and sockets can be installed in screed slab and formwork, the screed can also be designed as heating screed.
The term raised floors designates pre-fabricated floor elements placed on height-adjustable supports. Each individual element can be lifted to give access to the installation level. Raised floors are usually used for EDP facilities, control rooms and auditoriums etc. and offer clearances of up to 1250 mm for the installation cavity. Different floor elements can be used:

- Steel troughs filled with calciumsulfate-bonded mortar. Different floor coverings can then be installed on mortar. By installing heating coils with quick release in mortar, underfloor heating systems can be realized as well.
- Fibre-reinforced calciumsulfate-bonded mineral boards without steel trough.
- Highly-compacted wood composite boards or chipboards with aluminium backing or steel sheet with back-pull
- Steel plates

Floor coverings are usually factory-glued. When installing floor covering on raised floors, keep in mind that each element must be covered individually so that it can be removed if needed. This kind of construction puts special demands on floor covering material and quality of the bond in the edge areas. Self-laying carpet tiles are mostly installed by customer and do not follow the double floor joint system.

2.4 Prefabricated Screed Constructions

Prefabricated screed constructions (dry screeds) are board-type sub floors installed on a load-bearing floor. They do not require drying time and can immediately be covered with floor coverings.
Possible constructions depend on mechanical properties of the elements, defined by their chemical composition:

- Wood composite boards (chipboards, OSB)
- Minerally bonded boards (plaster boards, gypsum fibre boards, cement-bonded chipboards, cement fibre boards, concrete slabs, brick slabs, plaster boards).

Regarding installation constructions, we distinguish between force-fit and floating installation of prefabricated screed elements. Force-fit installation on sub floor is generally used only for wood composite boards:

- Bolting to wood support beams or floor beams (DIN 68771).
- Bolting and/or gluing on existing wood floors (boarded floors, parquet) (DIN 68771).
- Gluing (plus bolting/nailing down if necessary) on screeds, especially for renovation projects.

Floating constructions are carried out with wood composite boards or minerally bonded boards by:

- Placing prefabricated screed elements on hollow pot floors. The boards have a polystyrene, mineral wool or wood fibre insulation backing.
- Placing prefabricated screed elements on compacted insulating granules with cap. The insulating granules level the sub floor and serve as impact sound and thermal insulation (e.g. when working with timber beam floors in older buildings).
- Placing small-sized concrete, brick or plaster boards on pressure-resistant insulation (polystyrene or polyurethane foam, wood fibre insulation boards).

Before start of any floor installation work, please note:

- For subsequent bonding of parquet, floating prefabricated screed elements must have sufficient thickness to prevent doming of the construction with changing ambient conditions depending on wood or parquet type.
- For chipboards and OSB with subsequent bonding of parquet, we recommend to glue together two boards with a nominal thickness of minimum 13 mm, better yet 16 mm. OSB boards are slightly more rigid than chipboards.
- For cement-bonded chipboards a minimum thickness of 20 mm is recommended.

- In most cases, parquet should not be glued down on plaster boards and gypsum fibre boards and requires approval of manufacturer. These boards as well as cement fibre boards are considerably less rigid than wood composite boards. Only parquet types with high dimensional stability should be glued down. In these instances the boards must have a minimum thickness of 25 mm.
- Prefabricated screed elements made of wood composite materials must always be ventilated from below. In order to ensure sufficient ventilation, install venting slots in skirt boards.
- Mineral prefabricated screed elements do not require such ventilation.

2.5 Timber Board Floors

For timber board floors there are different installation constructions:

- Timber boards directly screwed/nailed to floor beams
- Timber boards screwed/nailed to wood support beams.

Wooden support beams are normally placed on impact sound insulation strips. Concrete floors are covered with bitumen sheeting. Between the wooden support beams, thermal insulation is applied, sometimes as loose fill. In older buildings, slag, sand or pumice was used as fill material for these spaces.
Floor boards are mostly made from softwood, rarely from oak. In old buildings, they have butt joints and cover the whole length of the room.
Before start of any floor installation work, please note:

- Floor boards which give way, have a bounce or are loose must first be attached.
- Ventilation and back ventilation of the wood construction must be ensured, also subsequent to installation.

3. Substrate Types

In the following section, specific properties of materials and characteristics of different substrates are presented.

3.1 Concrete

Generally, concrete is composed of cement, gravel and water.
Compared with cement screed, concrete has a coarser aggregate.
Typical aggregates are:

- Round grain with grain size 0 to 32 mm (sand and gravel).
- In chip concrete, crushed grain is used (chip, grain size 4 to 32 mm)
- Ultrafine grains with a diameter of 0 to 0.125 mm

For concretes with high abrasion resistance, natural or artificial aggregates such as granite, quartzite, corundum or silicon carbide are used. Concretes used for applications other than floors or ceilings may contain a number of other aggregates (lightweight concrete, fibre concrete, heavy concrete).
Concrete properties are also defined by a number of additives. Such additives are designated as concrete admixtures or additives with chemical or physical properties (liquefiers, flow enhancers, air-entraining admixtures, density increasing additives, retarding agents, activators, injection agents, stabilizers, pigments). In some applications, additives are only applied to the surface of the freshly cast concrete (after-treatment agents).
With concrete, accumulation of additives at the surface is to be expected.
Vacuum concrete is produced by extracting excess water by means of applying an underpressure ("vacuum") to the surface of the freshly cast concrete. This then results in a very even and hard surface.
Before start of any floor installation work, please note:

- Usually, surface must be pre-treated before installing floor covering (mechanically, removing old layers).
- On account of higher thickness and more compact structure, concrete has considerably longer drying times than cement screed.

3.2 Cement Screeds

Generally, cement screeds are composed of cement, screed aggregates (sand, gravel, chips with grain sizes of 0 to 8 mm for screeds with a thickness of 40 mm), water and additives (see concrete) if required.
Hard screeds are cement screeds with added hard aggregates (granite, corundum, silicon carbide …), which are applied in one or two layers (one layer cement screed, one layer hard aggregate screed). They are used in heavy duty areas with high surface strength requirements, mostly in industrial construction.
Depending on wear requirements, the surface of construction elements can be engineered to become impervious, wear-resistant and have good grip.
One material-specific characteristic of cement screeds is shrinkage during setting, which may result in deformations and formation of cracks.
Cement screeds based on standardized cements are usually not moisture-sensitive and have good absorbency.

3.2.1 Conventional Cement Screeds

Conventional cement screeds, possess a plastic/earth-moist consistency. After screed is poured, it is levelled using well-balanced floats, preferably compacted using a machine, brushed and then smoothed – as soon as the surface shows only a slightly damp film. In order to prevent accumulation of water or fine mortar on the surface, keep down smoothing to an absolute minimum. Otherwise the surface might be dusting and will not be wear resistant. For the same reason, the surface shall not be sprayed with water or sprinkled with cement to facilitate floor seal.
Cement content of hard aggregate screed is always considerably higher as with conventional screed, consequently requiring a more careful and intensive after-treatment.

3.2.2 Cement Flow Screeds

Cement flow screeds are free-flowing and mostly self-levelling. This screed is then compacted and levelled by "buffing". Smoothing or brushing is not required. When installing this kind of screed, the correct mixing ratio is vital in order to prevent spread or settling of aggregate on surface.

3.2.3 Rapid Setting Cement Screeds

One characteristic of rapid setting cement screeds is the use of fast curing cement binders, which harden quickly and bind the tempering water. Consequently, these screeds are accessible and ready for installation after a short setting time (1 to 3 days). Earth-moist, plastic or free-flow (i.e. almost self-levelling) screed mortars can be used. Fast screed binding agents shall never be mixed with other cement types. Always observe manufacturer's instructions regarding processing, maturity for installation and checking of maturity.
Other systems, sometimes marketed as fast screed, are based on "regular" cements. By admixture of special additives to the mortar, they are ready for installation after 1 to 2 weeks. Provided additive manufacturer does not provide instructions to the contrary, they must be tested like regular cement screeds.

3.2.4 Bitumen Emulsion Screeds

Bitumen emulsion screeds are produced from bitumen emulsion, fillers, sand, chips, cement, water and additives if required, based on emulsion manufacturer's instructions. Generally, bitumen emulsion screeds are installed as composite screeds with layer thickness of 15-20 mm on concrete floors. They are mostly used in industrial heavy duty areas. After-treatment of the screed surface is not required, however a wax emulsion can be applied as initial treatment. Bitumen emulsion screeds are particularly suited for heavy duty areas in warehouses, workshops and machine shops, exhibition halls and parking garages etc. Loads may recompact the screed. One effect of the relatively high bitumen content is that small surface damages and cracks are mechanically re-sealed by load traffic.

Bitumen emulsion screeds are not suited for subsequent installation of floor coverings. When gluing down floor coverings, a number of critical factors must be considered, such as thermoplasticity and low screed thickness, bond to bituminous surface, existence of old wax layers from cleaning products and other contaminations resulting from prior use as industrial floor.

3.3 Calciumsulfate Screeds

Calciumsulfate-bonded screeds are made from a gypsum (calciumsulfate dihydrate) producing binding agent (natural anhydrite, synthetic anhydrite, REA anhydrite, alpha hemihydrate or mixtures thereof), aggregates (see cement screed), water and additives.
Calciumsulfate screeds are largely dimensionally stable when setting and are therefore suited for installation of large areas without joints. Calciumsulfate screeds are usually moisture-sensitive.

3.3.1 Conventional Calciumsulfate Screeds

Like conventional cement screeds (see above), conventional calciumsulfate screeds are installed and worked when they have an earth-moist to plastic consistency.
Conventional calciumsulfate screeds have a high absorbency.

3.3.2 Calciumsulfate Flow Screeds

Calciumsulfate flow screeds are free-flowing and mostly self-levelling. The screed is then compacted and levelled by "buffing". Smoothing or brushing is not required. When installing this kind of screed, the correct mixing ratio is vital in order to prevent washing up of ingredients to the screed surface or settling of aggregate.

When installing floor coverings, please take into account the low absorbency of flow screeds and the general moisture-sensitivity of this construction material. Typically, priming and application of an absorbent levelling compound is required.

3.4 Magnesia Screeds

Magnesia screeds are made from caustic magnesia, aggregate (sand, wood chips and wood fibres) and an aqueous solution of salts from bivalent alkaline earth metals – normally magnesiumchloride – as well as additives (colorants) if required.

Magnesia screeds are moisture-sensitive and shall not be exposed to moisture for prolonged periods. In particular, a vapour-tight floor covering shall never be installed on magnesia screeds in composite constructions without vapour barrier or foundation seal and when ascending moisture is to be expected.
Generally however, no vapour barrier is required under magnesia composite screeds.

Xylolite screeds (see 3.4.2) have a high absorbency. Magnesia screeds with inorganic fillers are also very absorbent provided no surface treatment (see below) is applied.

Magnesia screeds are mostly dimensionally stable during setting and are therefore ideal for installation of large areas without joints. On account of their high strength and low density, they are particularly suited for renovation projects in older buildings.

Depending on the type of construction, no vapour-tight floor coverings or constructional systems should be installed on this type of screed. Also the use of aqueous dispersion products may cause problems, often vapour-tight intermediate priming and levelling is required in these instances. Existing old coatings can have dehesive properties and must be removed if needed.

3.4.1 Magnesia screeds with inorganic filler material

Magnesia screeds with inorganic fillers are normally installed as composite screeds. Usually they receive an impregnation permeable to vapours on the day of installation in order to reduce soiling of the floor and to facilitate cleaning.

3.4.2 Xylolite Screeds

Magnesia screeds with a dry density of up to 1.6 kg/dm^3 to which wood chips are added, are called xylolite magnesite screeds.
These days, xylolite screeds are normally installed on an insulating layer.

3.5 Mastic Asphalt Screeds

Mastic asphalt is a dense (dry density approx. 2.6 kg/l), mixture of road construction, vacuum or hard bitumen, aggregates (mixture of chips and/or gravel, natural sand and/or quarry sand as well as rock flour, sorted by specific grain size and with low-voidage) plus additives (mineral pitch, plastics etc.), which can be poured and spread while hot (approx. 220 to 250 °C). It has a dense structure with low porosity. The surface of the freshly cast, still hot mastic asphalt screed is brushed with sand. This type of screed requires no further after-treatment, does not have a setting time. It must only cool down and then floor covering can be installed. On account of the low height of the floor construction and the resulting low weight per unit area, these screeds are often used for renovation projects.

Mastic asphalt screeds do not contain water and as long as no cracks are present, this type of screed is vapour-tight and non-absorbent. If an absorbent substrate is required for further installation work, a levelling compound must be applied. On account of their thermoplastic properties, mastic asphalt screeds require an extra wide edge joint ("double edge strip").

If sand coating on old mastic asphalt screeds is missing or was removed (especially in renovation projects), new sand coating must be applied (e.g. using a reaction-resin primer) or the floor must be levelled after priming. Cement-based levelling compounds must be applied with a thickness not exceeding 3 to 5 mm.

3.6 Rolled Asphalt Screeds/Fine Asphalt Concrete

Rolled asphalt floors have a composition similar to that of mastic asphalt screeds, but contain less and a softer type of bitumen and coarser aggregates (chips, gravel). Rolled asphalt is a non-absorbent substrate with a porous structure, therefore permeable.

The particular softness of the bitumen normally does not allow the use of cement-based levelling compounds on large areas, since setting tension might result in cracks in the rolled asphalt.

3.7 Dry Screeds/Prefabricated Screeds

Dry screeds or prefabricated screeds are sub floors which are installed on-site from prefabricated boards. The individual boards are joined by gluing of tongue and groove, bolting and gluing down an overlap if required or alternatively by offset installation of two or more board layers.
Frequently (see chapter 5.4.1), these boards are ready immediately after laying and floor coverings can be installed.

3.7.1 Wood-based Material Boards

Essentially, wood-based material boards are made from different sized wood chips or wood components and a binding agent. The Darr-test (drying test) is used for moisture measurement, electrical measurements are not very representative on account of the different binding agents.

3.7.1.1 Chipboards

For floor covering work, chipboards type V100 are recommended, use of chipboards type V20 only with considerable restrictions (see DIN 68771). The designation V100G-E1 stands for an antifungizide treated board type ("G") classified as "E1" on account of its comparably low formaldehyde emissions. Chipboards have an inhomogeneous structure with finer, more tightly packed chips in the two outer layers, coarser and less tightly packed chips in the middle.

Chipboards are well suited for floor covering work on account of their smoothness and absorbency. Before installation of floor coverings with migrating components ("plasticizers", e.g. in PVC coverings), it is recommended to apply a membrane in order to

seal the floor (if required: grinding, film-forming primer, dispersion or other levelling compounds) or the use of special adhesives.

3.7.1.2 OSB

For OSB ("oriented strand boards"), coarser chips are used than for chipboards. The external layers are aligned in a right angle to those of the middle layer. On account of the coarser chips, binding agent content is lower than with chipboards.
On account of the chip size, surface appearance is rougher and has better mechanical properties than that of chipboards.

3.7.1.3 Cement-bonded Wood Chipboards

Organic polymers are used as binding agents in chipboards and OSB, whereas in cement-bonded wood chipboards, the binding agent is cement.
When used for as floor installation, chipboards are polished and are equipped with tongue and grooves.

3.7.2 Plasterboards/Gypsum Fibre Boards

Plasterboard is made from gypsum plaster, fibres for reinforcement and a kraft paper outer lining, which gives the board its stability.
Gypsum fibre boards are made from gypsum plaster and a relatively high content of cellulose fibre for reinforcement.

Principally, these boards are sensitive to water, which negatively influences stability. However, this only causes problems for floor coverings that may build up stress (e.g. parquet).
Frequently, priming is required to bind existing plaster dust.

3.7.3 Cement Fibre Boards

Cement fibre boards are made from cement, fillers and fibres for reinforcement. Cement fibre boards have a higher weight per unit area than plasterboards or gypsum fibre boards.

Old cement fibre boards may contain asbestos fibres.

Cement fibre boards are non-moisture sensitive and provide an absorbent substrate.

3.8 Reaction-Resin Screeds

Reaction-resin screeds are a mixture of a reaction resins (epoxy resin (EP), polyurethane resins (PUR), polymethyl methacrylate resins (PMMA) or unsaturated polyester resins (UP) and fire-dried quartz sand.

All reaction-resin screeds offer the following benefits: quickly ready for installation, can be installed with low layer thickness, depending on resin type they only have limited resistance to solvents and chemicals and can be installed without joints and be coloured.

Reaction-resin screeds can be installed directly as coating or as industrial floor.
When installing floor coverings, usually a sanded substrate is required on account of the high smoothness of the screed. In some cases, special primers are required; when using dispersion adhesives, floor must possibly first be levelled.

3.9 Old finished Floors

Old finished floors are floors with used floor coverings, tiles or other coatings. Basically, these floors are no standardized substrates.

Generally, before any new floor covering work, all old coverings must be removed and the substrate must be prepared with additional methods.

Under special circumstances, an existing old finished floor may be suited for installation of a new floor covering. However, this requires special tests (see chapter 4.12).

Floor covering installations on old finished floors, particularly when using dispersion products, can generate odours. Installer must inform customer of this risk beforehand.

4. Assessment of Substrates

"In case installer has concerns regarding the type of work execution planned (..), regarding quality of the materials or components provided by customer or regarding performance of other contractors, he shall inform customer immediately – preferably before start of work – in writing…." (see VOB/B (DIN 1961) §4 No. 3). The general obligation of the installer (the contractor) to raise concerns is specifically mentioned by VOB/C by means of well-defined check points: in particular regarding "assessment of the substrate and indoor climate". It is also stipulated that concerns must be raised in written form if necessary.

Checking and assessment primarily include measures which installer himself can perform on-site by inspection (visual check) and use of customary tools and instruments on surface of the sub floor and through moisture measurements within the sub floor.

In particular, installer must raise concerns regarding:

- Insufficiently dry substrates
- Missing heat-up protocol for underfloor heating systems
- Absent marking of measuring points for underfloor heating systems
- Insufficiently stable surface of substrate
- Major unevenness

- Substrate surface which is too porous or too rough
- Contaminated substrate surface, e.g. oil, wax, lacquer, paint residues, cleaning product residues, adhesive and levelling compound residues, efflorescences and discoloration, fungus and mould formation
- Cracks in substrate
- Incorrect vertical position of substrate surface compared to vertical position of adjoining construction elements
- Request by customer for force-fit closing of movement joints in substrate
- Missing insulating edge strips or insufficient projecting
- Unsuitable temperature of substrate
- Unsuitable ambient condition in room (temperature and humidity)
- For mastic asphalt: surface insufficiently brushed with sand. Edge joints not wide enough (minimum 10 mm) when installing parquet or wood blocks.
- For wood block: missing (projected) bars, sole pieces or similar as back stop for wood blocks
- Substrate is an old finished floor

4.1 Moisture

Substrates that contain moisture or can absorb it – also old substrates – must be checked. Checking methods and assessment depend on type of substrate. In table below, generally accepted data for the most common substrates are compiled:

Table 1: Moisture index when ready for use

Substrate	Method	Value
Cement Screed	CM	≤ 2.0 CM-%
Calciumsulfate Screed	CM	≤ 0.5 CM-%

Mineral screeds are hygroscopic materials. Their moisture content adjusts to the relative ambient humidity and temperature. Without active drying measures (see chapter 5.3.), above values can be achieved at a substrate temperature of 20 °C and a relative humidity below 65 %. For heated screeds, varying lower CM values (see below) are required.

CM measurements shall be performed in the area where the highest degree of moisture is expected (plausibility considering sunlight exposure, air movements etc. If required, electronic devices shall be used).
The sample to be analyzed shall be taken from the lower third of the screed.

Note: The TKB – contrary to other Technical Information Sheets – does not distinguish between floor covering and parquet laying with respect to sample taking. Taking a sample from the lower third of the screed offers installers maximum security. For every 100 m² of screed surface, at least one measurement shall be performed. For larger surfaces, one measurement per 200 m² is sufficient.

Manufacturer's specifications regarding measurement methods and moisture assessment are required for:

- Concrete
- Rapid setting cement screeds
- Hard aggregate screeds
- Magnesia screeds
- Prefabricated screeds (plaster boards and gypsum fibre boards)
- Chipboards/OSB/cement-bonded chipboards
- Cement fibre boards
- Mineral boards
- Bitumen emulsion screeds

For some substrate types however, indices for regular moisture levels are available:

- Concrete: 3.0 to 3.5 CM-% for reinforced concrete
  (commentary to DIN 18367)
- Magnesia screed, depending on organic aggregate content:
  BEB-MB 02.2002: 1 - 3.5 CM-%
  Commentary to DIN 18365: 3 to 12 CM-%
- According to DIN 68763, moisture content of chipboards ex works must be 5 - 12 % by weight with reference to Darr mass. According to DIN 52361, measurement is based on Darr method (no standard commercial test).
  When used as false bottom, a moisture level of 9% per weight with relation to Darr mass should be targeted in order to prevent major dimensional changes.
- For OSB, the same recommended values as for chipboard apply.

Special note:
In the event of high temperature differences within a construction element (constructions in contact with soil, floors in contact with air, cold spots caused by steel beams, heating or cooling pipes in screed….), temperature might fall below dew point and condensation might occur, consequently wetting floor covering and substrate.

4.1.1 Panel heated Floor Constructions

On account of higher operating temperatures, the following moisture values for installation readiness (table 2, page 10) apply for cement and calciumsulfate screeds with panel heating:

Table 2: Moisture Values for Installation Readiness of Panel heated Constructions		
Substrate	**Method**	**Value**
Cement Screed	CM	≤ 1.8 CM-%
Calciumsulfate Screed	CM	≤ 0.3 CM-%

Before installation, EMC (equilibrium moisture content) is measured with CM device at measuring points determined by screed installer.

Checking and assessment of underfloor heating constructions is covered in the following Technical Information Sheets:

- Beurteilen und Vorbereiten von Untergründen, Verlegen von elastischen und textilen Bodenbelägen, Schichtstoffelementen (Laminat), Parkett und Holzpflaster, beheizte und unbeheizte Fußbodenkonstruktionen (Assessment and preparation of substrates, installation of elastic and textile floor coverings, laminated elements (laminate), parquet and wood blocks, heated and unheated floor constructions) (only in German); Bundesverband Estrich und Belag e.V, Troisdorf, Version 2.2002
- Protokoll zum Belegereifheizen des Estrichs (Heating protocol for preparation of screed for subsequent installation) (only in German) Zentralverband Sanitär, Heizung, Klima, St. Augustin, 1999
- Schnittstellenprotokoll bei beheizten Fußbodenkonstruktionen (Interface protocol for heated floor constructions) (only in German) Zentralverband Sanitär, Heizung, Klima, St. Augustin, 1999

4.2 Surface Stability

Strength of screed surface is tested by scoring, using a scriber, if necessary with pressure spring (e.g. Ri-Ri device). Scoring shall not leave deep scratches or large-area chipping, not even in areas where scratch lines cross.
Screed shall not sand or chalk, which is tested using a scratch brush.
Surface must form a stable structure with entire screed slab. By hammer tapping (hammer test), sinter layers are detected.

4.3 Levelness

Requirements for levelness of substrate as well as test specifications are described in DIN 18202 "Toleranzen im Hochbau, Bauwerke". Test is performed using batten and V-head.

Complying with tolerances stipulated in DIN 18202 in itself does not guarantee adequate levelness of substrate for selected floor covering. Always follow manufacturer's instructions (floor coverings, installation materials).

Table 3: Levelness Tolerances (acc. to DIN 18202)			
Line	3	4	
With Measuring Point Clearance in m	Prepared Floors	Prepared Floors with increased Require-ments	Supporting Point (S) or Inter-polation (I)
	Actual Dimension as Limit (in mm)		
0.1	2	1	S
0.6	3	2	I
1.0	4	3	S
1.5	5	4	I
2.0	6	5	I
2.5	7	6	I
3.0	8	7	I
3.5	9	8	I
4.0	10	9	S
6.0	11	10	I
8.0	11	11	I
10.0	12	12	S
15.0	15	15	S

4.4 Porosity, Roughness and Grip of Surface

Check surface condition through visual inspection. A very rough, heavily structured surface may show through thin elastic floor coverings and always results in a very high adhesive consumption.

At the same time, surface shall not be too smooth, but must have a certain grip and roughness to ensure good adhesion of primers, levelling compounds and adhesives (see chapter 5.1.4).

4.5 Cleanliness

Check cleanliness of screed surface through visual inspection. Remove all dust, paint, plaster, mortar, adhesive and levelling compound residues.
(see chapter 5.1).

4.6 Crack-free Condition

Check for cracks in substrate surface. Repair existing cracks (see chapter 5.2.1).

4.7 Vertical Position to adjoining Construction Elements

Vertical position of installation surface must be checked to make sure that after installation of floor covering no height differences occur between floor and adjoining construction elements – e.g. adjoining rooms with carpet or tile floors, stop bars of doors etc.
Height differences shall be compensated, e.g. with levelling compound (see chapter 5.2.4)

4.8 Movement Joints and "False Joints"

Movement joints are design-related joints which extend through the screed. They are designed to absorb movements of adjoining construction elements or to isolate construction elements. They must be installed in straight lines and with even width. For example, movement joints are placed on structural joints, in heated floor constructions, in large areas as panel partitions and as edge joints for screeds. In order to allow movement of adjoining construction elements, movement joints shall never be covered but must be repeated in floor covering with the same width.

"False joints", "bevelled joints", "construction joints" or "trowel cuts" shall be treated like cracks (see chapter 5.2.1). These cuts over approx. 1/3 of the screed thickness are intended to reduce shrinkage stress during drying of the screed through planned crack formation. Bevelled joints therefore serve as predetermined breaking points.

4.9 Insulating Edge Strips

Check existence of the insulating edge strip protruding the screed which ensures that edge joint is respected.

4.10 Substrate Temperature

The substrate temperature shall not fall below 15 °C (wood blocks GE: 12 °C). For heated sub floor constructions, substrate temperature must range between 18 and 22 °C 3 days prior to and 7 days after installation.

4.11 Temperature and ambient Conditions in Rooms

Room temperature and relative humidity shall be checked using appropriate instruments.
Indoor rooms must have a minimum temperature of 18 °C, the relative humidity must not exceed 75 %, preferably be 65 % or below.
Lower temperatures and high humidity reduce setting speed of installation materials, in critical applications even reversing their functional properties. Consequently, above mentioned conditions shall be complied with even after installation.
In the event of unsuitable temperature and humidity conditions, install heaters or dehumidifiers on-site well before start of installation. In winter, unheated rooms must be heated for at least 3 days prior to installation.

4.12 Old finished Floors

Old finished floors are non-standardized sub floors and concerns must be raised. In the event that despite objections floor covering is installed, considerable risks exist and the installer has a special responsibility. Generally, special tests are required, e.g.

- The old finished floor and its adhesion to the sub floor must be adequately stable and suited for projected use.
- Surface must be clean, free of separating layers or cleaning product residues.
- Surface must be ready for application of adhesives (not dehesive).
- Adhesion of installation materials must be guaranteed. Especially coatings (EP and PUR resins), certain surface treatment agents (waxes), polyolefine coverings, glass mosaics etc. are problematic. If required, perform test installation in a small area.
- Make sure that depending on projected type of structure, ascending moisture or condensation shall not damage the construction.
- Make sure that efficiency of existing subfloor heating systems is not impaired.
- and that the industrial floor has a structure which does not impair the mechanical properties (suited for castor chairs, impression property) of the new floor covering.
- Old finished floors covered with new floor coverings may cause complaints regarding offensive smells. This can only be avoided by test installation in sufficiently large areas.

4.13 Special Features of certain Substrates and Floor Coverings

For mastic asphalt it must be checked if surface has been sufficiently brushed with sand and has adequate grip.
When parquet or wood block is installed on mastic asphalt, make sure width of edge joint is adequate (minimum 10 mm).
When installing wood blocks, check if bars and sole pieces as back stop for wood blocks are in place.

5. Preparation of Substrate

5.1 Stripping Techniques

By stripping techniques, possible separating layers and instable areas (dust, sand, sinter layers etc.) are removed from substrate.

5.1.1 Vacuuming

Each mechanical substrate treatment (especially with sweeping and sand coating) leaves fine dust particles. They must be removed by thorough vacuuming with an industrial vacuum cleaner. Residual dust must be bound with a primer coat.

5.1.2 Sweeping

Coarse grain, loose, non-stick dust, sand or contaminations must be removed by sweeping (subsequently vacuum the floor, see above).

5.1.3 Brushing

Contaminations adhering to the floor which can not be removed by sweeping must be brushed off. Use one- or multiple disk brushing machines with brush attachment.
Brushing does not replace the required general sanding of mineral substrates before start of floor covering or parquet installation.

5.1.4 Grinding/Abrading

Mineral substrates (cement, calciumsulfate and magnesite screeds) must be sanded in preparation for floor covering and parquet installation and before application of a primer. This removes contaminations, sinter layers, aggregates rising from the surface and other contaminants and roughens the surface slightly.
By sanding a substrate, more or less persistent separating layer or unstable zones (old adhesives, thick sinter layers are removed).
For sanding and abrading, disk or roll sanding machines with coarse abrasive particles, eg. with grain size 16, are used.
Sanding of a substrate might be required to achieve an adequate grip of the substrate surface when working with tiles, coatings etc. With levelling compounds, excessive sanding might result in a problematic surface without absorptive capacity which is too dense, too polished and often no longer accepts adhesives.

5.1.5 Milling

When thick separating layers must be removed, milling of the substrate is in most cases preferable to sanding. For milling, single- or multi-disk milling machines with special milling plates, hand milling cutters with horizontally rotating milling tool and ride-on milling machines with vertically rotating milling tools are used. Especially with the latter type, the loose mounting of the milling stars on the shafts results in very effective removal result when working with mineral substrates, however at the same time screed is exposed to extreme stress (risk of crack formation with floating screeds). Surface removal depth can normally be set on ride-on milling machines. After milling, you have a rough subfloor which must be further prepared through vacuuming, priming and levelling.

5.1.6 Shot Blasting

As an alternative to milling, substrate can also be treated using a shot blasting device. With shot blasting, a surface is impacted with pellets in a circulation system with high speed, thus removing the upper, particularly unstable layers. Removal depth can be adjusted. After shot blasting, you have a rough subfloor which must be further prepared through vacuuming, priming and levelling.

5.2 Build up Techniques

With build up techniques, substrate is prepared for installation of floor coverings by application or incorporation of certain materials.

5.2.1 Crack Repair

Cracks and false joints in substrate must be repaired.

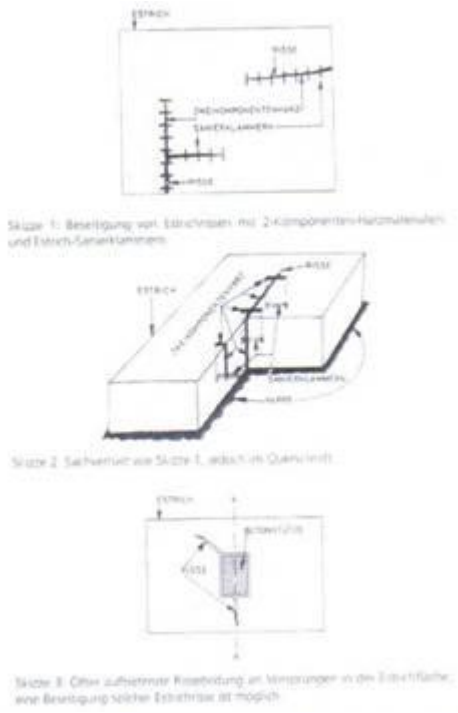

Figure 1 – Crack repair (Source: Rosenbaum/ Kaulen/Hahn, Erläuterungen zur DIN 18365, Bauverlag GmbH, Wiesbaden 1989)

The crack is first enlarged by cuts (careful with underfloor heating constructions), in addition cuts (with lengths of approx. 10 cm and a clearance of approx. 30 cm) are made to insert so-called screed clips at a right angle to crack direction. Cutting depth shall be approx. 1/2 to 2/3 of screed thickness. After vacuuming and insertion of the screed clips, crack can be closed with a casting

resin (depending on manufacturer on polyester, methyl methacrylate, polyurethane or epoxy-resin basis). For wide cracks, the resin can be thinned down with dry sand to obtain a synthetic resin mortar.

5.2.2 Vapour Barriers

Cement-based substrates too damp for installation of floor coverings but having a moisture content not exceeding 5.0 CM-% (observe manufacturer's instructions!) and sufficient strength (setting period > 28 days), can be made ready for installation with application of a primer acting as vapour barrier.

The checked and prepared substrate must receive a minimum of two layers of a reactive primer, applied as cross coat. To achieve sufficient functionality, the correct amount of primer is required (manufacturer instructions). Usually, the priming coat must be sprinkled with a generous quantity (approx. 2 kg/m²) of quartz sand (grain size 0.3 ... 0.8 mm) immediately after last application. After curing of resin, excess sand can be removed by sweeping, brushing and subsequent vacuuming.

The vapour barrier achieved with this type of treatment is adequate for safe installation of floor coverings.

5.2.3 Priming

Mineral substrates (cement, calciumsulfate screeds) must be primed in preparation for installation of floor coverings or parquet, other substrates might require the same treatment.

Purpose of primers:

- To reduce absorbency
- To bind residual dust particles
- To protect substrate against moisture contained in installation materials
- To improve wetting process
- To act as adhesion promoter
- To strengthen the top screed edge area (with special products)

The selection of the primer depends on type and condition of the substrate, type of adhesive and levelling compound, if required. Please observe manufacturer's recommendations

5.2.4 Levelling

Levelling of substrates is or might be required:

- To achieve required absorbency when using dispersion adhesives on dense substrates, e.g. old sub floors, mastic asphalt screeds or similar types of substrates.
- To achieve a watertight buffer layer when using dispersion adhesives on moisture-sensitive substrates, e.g. on calciumsulfate flow screeds
- To achieve a level substrate

Inquire with manufacturer whether a levelling compound is suited for use with a certain floor covering or parquet. Cement-based levelling compounds for installation under parquet must have a minimum thickness of 2 mm.

5.2.5 Underlays, Decoupling Plates and Fleeces

Underlays are used for:

- Mechanical decoupling
- Compensation of height differences
- Impact sound and sound insulation
- Creating or increasing point elasticity of a floor.

Usually, they are glued on substrate. During planning, take into account that underlays can change characteristics of floor covering.

5.2.6 Preparations for Electrically Conductive Floor Coverings

Before installing electrically conductive floor coverings with conductive adhesives, a copper tape mesh and/or a conductive primer/levelling compound must be installed to achieve transverse conductivity. Before carrying out this work, agreed procedures and measuring methods must be established.

5.3 Drying

Dryers can be used for damp screeds and when room climate is too humid.

Damp screeds are dried by drying humid ambient air or contact with "dried" indoor air. If required, supporting measures need to be taken such as drilling holes or introduction of dried air. For drying of indoor air, the following devices can be used:

- Condensation drier (humidity is extracted by cooling down below dew point temperature),
- Adsorber drier (adsorption of humidity by a drying agent)
- Ventilating fan (drying by introduction of large volumes of adsorbent (warm) air through holes drilled in screed).

Note: Gas or oil burners are not suited for indoor drying.

5.4 Special Preparation Information for particular Substrates

5.4.1 Prefabricated Screeds

For chipboards and OSB as well as cement-bonded chipboards, overhangs in joint area must be removed, especially before installation of elastic floor coverings, either by grinding and/or by applying an appropriate levelling compound.
Prior to installation of floor covering or parquet, joints of plaster board and gypsum fibre boards as well as cement fibre boards must be smoothed with a joint filler. Prior to installation of thin elastic

coverings, the prefabricated screed must be levelled over the entire area in order to prevent board joints showing through.
The glued joints of small-format concrete, plaster or brick boards must be smoothed with a levelling compound prior to gluing down floor coverings. Generally, after priming, a levelling compound covering the entire substrate area should be applied. For thin elastic floor coverings, levelling is required in any case.

5.4.2 Timber Board Floors

For timber board floors it must be made sure that the timber boards are solidly bolted or nailed to wood support beams or floor beams (re-bolt if necessary). In case timber boards bend heavily on account of large gaps between supports and/or insufficient thickness, dimensional stability of substrate must be achieved by bolting or gluing down chipboards or OSB. With heavy cupping of individual boards or high deviations in surface levelness, compensation levelling is required. Prior to applying adhesives or levelling compounds, the timber board surface must be mechanically freed from lacquers, paints and other separating layers. Usually, timber board floors must be primed and levelled prior to installation of elastic and textile floor coverings. Parquet can be installed directly after sanding of timber board surface, using larger-format parquet, e.g. solid strip parquet or planks.
Frequently, floating prefabricated screed elements are installed on timber board floors, increasing thermal and impact sound insulation.
Under all circumstances, adequate ventilation of the wood construction must be ensured.

5.4.3 Reaction-Resin Screeds

Reaction-resin screeds are suited for floor covering installations under certain conditions.

Depending on type of screed, substrate preparation might be required:

- Priming with reaction resin to prevent reaction with other installation materials or to provide a surface with grip that can be glued on.
- Levelling to achieve an absorbent substrate.

5.4.4 Old finished Floors

When preparing old finished floors, all contaminations and especially cleaning agent residues, must be removed from surface. Next, the surface must be slightly roughened by sanding. Even through sanding, some surface treatment products on wax or oil basis can sometimes not completely be removed from certain coverings (parquet, cork).
Vapour-tight coverings can only be installed on vapour-tight old finished floors using pressure-sensitive adhesives or 2-component adhesives, which do not set physically.
Surface preparation with subsequent levelling can make old finished floors absorbent to allow installation using dispersion adhesives.
Priming products with vapour retarding properties can protect a water-sensitive old finished floor from water contained in installation materials.
In some cases, old finished floors are not permanently dry; after installation of vapour retardent floor coverings, sometimes moisture accumulations occur which may subsequently cause damage.

5.4.4.1 Coatings

Coatings have a smooth surface, so that adhesion of installation material may be insufficient. Test installation in small areas is always recommended.

5.4.4.2 Elastic Floor Coverings

On account of the elastic floor covering's elasticity, the use of mineral levelling compounds is often problematic.

5.4.4.3 Cork

On account of the cork's elasticity, the use of mineral levelling compounds is often problematic. Joint, patterns and profiles must be levelled using suitable elastic compounds over the entire surface area.

5.4.4.4 Parquet

Usually, all surface treatment agents must be removed. Levelness must be achieved through sanding, joints must be closed if necessary. Parquet reacts to moisture and may detach from substrate.

5.4.4.5 Ceramic Materials, natural Stone, Terrazzo

These substrates are usually impervious and non-absorbent. Surface treatment and cleaning agents must be removed.

5.4.4.6. Industrial screeds

Industrial screeds are to be treated like screeds once surface treatment agents have been removed.

6. Installation Materials

Installation materials must be suited for the intended purpose and shall be selected with consideration of industrial safety and consumer protection issues. The respective technical regulations (TRGS 610, TRGS 613, TRGS 430, TRGS 440, TRGS 540, TRGS 900) as well as GISCODE and EMICODE classifications are helpful tools for selection.

7. Relevant Standards and Technical Information Sheets

Below, you will find a list of all current, relevant standards and information sheets available at the time of issue of this information sheet. This list of documents contains references to the relevant chapter of this information sheet.

7.1 Industrial Safety

Title: Gefahrstoffverordnung (vom 26.08.1986)
Verordnung zum Schutz vor gefährlichen Stoffen in der gültigen Fassung vom 01.November 1993
Publication date/Publisher:
12-1993
Deutscher Bundesverlag Bonn

Title: GISCODE für Verlegewerkstoffe
Publication date/Publisher:
aktuelle Fassung
Gefahrstoff Informationssystem der Berufsgenossenschaften der Bauindustrie; Frankfurt

Title: EMICODE
Publication date/Publisher:
aktuelle Fassung
Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.; Düsseldorf

Title: TRGS 430
Isocyanate - Exposition und Überwachung
Publication date/Publisher:
03-2002
Ausschuß für Gefahrstoffe (AGS)
Bekanntgegeben durch Bundesministerium für Arbeit und Sozialordnung

Title: TRGS 440
Ermitteln und Beurteilen der Gefährdungen durch Gefahrstoffe am Arbeitsplatz:
Ermitteln von Gefahrstoffen und Methoden zur Ersatzstoffprüfung
Publication date/Publisher:
03-2001/03-2002
Ausschuß für Gefahrstoffe (AGS)
Bekanntgegeben durch Bundesministerium für Arbeit und Sozialordnung

Title: TRGS 540 - Sensibilisierende Stoffe
Publication date/Publisher:
02-2000
Ausschuß für Gefahrstoffe (AGS)
Bekanntgegeben durch Bundesministerium für Arbeit und Sozialordnung

Title: TRGS 610
Technische Regeln für Gefahrstoffe
Ersatzstoffe und Ersatzverfahren für stark lösemittelhaltige Vorstriche und Klebstoffe für den Bodenbereich
Publication date/Publisher:
03-1998
Ausschuß für Gefahrstoffe (AGS)
Bekanntgegeben durch Bundesministerium für Arbeit und Sozialordnung

Title: TRGS 613
Ersatzstoffe, Ersatzverfahren und Verwendungs-beschränkungen für chromathaltige Zemente, chromathaltige zementhaltige Zubereitungen
Publication date/Publisher:
07-1999/08-2000
Ausschuß für Gefahrstoffe (AGS)
Bekanntgegeben durch Bundesministerium für Arbeit und Sozialordnung

Title: TRGS 900
Grenzwerte in der Luft am Arbeitsplatz
Publication date/Publisher:
10-2000/03-2002
Ausschuß für Gefahrstoffe (AGS)
Bekanntgegeben durch Bundesministerium für Arbeit und Sozialordnung

Title: TRGS 907
Verzeichnis sensibilisierender Stoffe
Publication date/Publisher:
12-1997/02-2000
Ausschuß für Gefahrstoffe (AGS)
Bekanntgegeben durch Bundesministerium für Arbeit und Sozialordnung

7.2 Standards for Substrates

Title: DIN 18560 - Teil 1
Estriche im Bauwesen - Begriffe, Allgemeine Anforderungen, Prüfung
Publication date/Publisher:
04-2004

Title: DIN 18560 - Teil 2
Estriche im Bauwesen - Estriche und Heizestriche auf Dämmschichten (schwimmende Estriche)
Publication date/Publisher:
04-2004

Title: DIN 18560 - Teil 3
Estriche im Bauwesen -Verbundestriche
Publication date/Publisher:
04-2004

Title: DIN 18560 - Teil 4
Estriche im Bauwesen - Estriche auf Trennschicht
Publication date/Publisher:
04-2004

Title: DIN 18560 - Teil 7
Estriche im Bauwesen - Hochbeanspruchbare Estriche (Industrieestriche)
Publication date/Publisher:
04-2004

Title: DIN 18353 - Estricharbeiten
Publication date/Publisher:
12-2000

Title: DIN 18354 - Gussasphaltarbeiten
Publication date/Publisher:
12-2000

Title: DIN 18202 - Toleranzen im Hochbau
Publication date/Publisher:
04-1997

Title: DIN 68771
Unterböden aus Holzspanplatten
Publication date/Publisher:
09-1973

Title: DIN 68763
Spanplatten - Flachpressplatten für das Bauwesen
Publication date/Publisher:
09-1990

Title: DIN 1045-2
Tragwerke aus Beton, Stahlbeton und Spannbeton - Teil 2: Beton; Festlegung, Eigenschaften, Herstellung und Konformität
Publication date/Publisher:
07-2001

Title: DIN EN 206-1
Beton - Teil 1. Festlegung, Eigenschaften, Herstellung und Konformität
Deutsche Fassung EN 206-1 (Concrete – Part 1: Specification , performance, producktion and conformity)
Publication date/Publisher:
07-2001

Title: DIN 1164-11
Zement mit besonderen Eigenschaften - Zusammensetzung, Anforderungen, Übereinstimmungsnachweis
Publication date/Publisher:
11-2003

Title: DIN EN 13454-1
Calciumsulfat-Binder, Calciumsulfat-Compositbinder und Calciumsulfat-Werkmörtel für Estriche,
Teil 1 : Definitionen und Anforderungen
Deutsche Fassung EN 13454-1 (Binders, composite binders and factory made mixtures for floor screeds based on calcium sulfate – Part 1: Definitions and requirements)
Publication date/Publisher:
03-1999

Title: DIN EN 14016-1
Bindemittel für Magnesiaestriche - Kaustische Magnesia und Magnesiumchlorid, Teil 1: Definitionen, Anforderungen
Deutsche Fassung EN 14016-1 (Binders for magnesite screeds – Caustic magnesia and magnesium chloride – Part 1: Definitions, requirements)
Publication date/Publisher:
04-2004

Title: DIN EN 13813
Estrichmörtel, Estrichmassen und Estriche - Estrichmörtel und Estrichmassen - Eigenschaften und Anforderungen
Deutsche Fassung EN 13813 (Screed material and floor screeds – Screed materials – Properties and requirements)
Publication date/Publisher:
01-2003

Title: DIN EN 13318
Estrichmörtel und Estriche - Begriffe
Deutsche Fassung EN 13318 (Screed material and floor screeds – Definitions)
Publication date/Publisher:
12-2000

7.3 Standards for Floor Covering Installation Work

Title: DIN 18356 - Parkettarbeiten
Publication date/Publisher:
12-2002

Title: DIN 18365 - Bodenbelagarbeiten
Publication date/Publisher:
12-2002

Title: DIN 18367 - Holzpflasterarbeiten
Publication date/Publisher:
12-2002

7.4 Technical Information Sheets published by TKB

Title: Technical Information Sheet TKB-1 - Kleben von Parkett
Publication date/Publisher:
2007-03
Technische Kommission Bauklebstoffe im Industrieverband Klebstoffe; Düsseldorf

Title: Technical Information Sheet TKB-2 - Kleben von Laminatböden
Publication date/Publisher:
12-1997
Technische Kommission Bauklebstoffe im Industrieverband Klebstoffe; Düsseldorf

Title: Technical Information Sheet TKB-3
Kleben von Elastomerbelägen
Publication date/Publisher:
05-1998
Technische Kommission Bauklebstoffe im Industrieverband Klebstoffe; Düsseldorf

Title: Technical Information Sheet TKB-4 - Kleben von Linoleum
Publication date/Publisher:
07-1998
Technische Kommission Bauklebstoffe im Industrieverband Klebstoffe; Düsseldorf

Title: Technical Information Sheet TKB-5
Kleben von Kork-Bodenbelägen
Publication date/Publisher:
07-1999
Technische Kommission Bauklebstoffe im Industrieverband Klebstoffe; Düsseldorf

Title: Technical Information Sheet TKB-7 Kleben von PVC-Bodenbelägen
Publication date/Publisher:
12-2001
Technische Kommission Bauklebstoffe im Industrieverband Klebstoffe; Düsseldorf

7.5 Technical Information Sheets published by Associations

Title: Dokumentation FBH-D1
Ablaufprotokoll für die Herstellung beheizter Fußbodenkonstruktionen
Publication date/Publisher:
05-1999
Zentralverband Sanitär-Heizung-Klima; St. Augustin

Title: Dokumentation FBH-D4
Protokoll zum Belegereifheizen des Estrichs
Publication date/Publisher:
05-1999
Zentralverband Sanitär-Heizung-Klima; St. Augustin

Title: Technical Information Sheet FBH-M2
Vorbereitende Maßnahmen zur Verlegung von Oberbodenbelägen auf Zement- und Calciumsulfatheizestrichen
Publication date/Publisher:
11-1998
Zentralverband Sanitär-Heizung-Klima; St. Augustin

Title: Arbeitsanweisung CM-Messung
Arbeitsanweisung und Dokumentationsprotokoll für die Durchführung von CM-Messungen bei ZE, CSE, ME
Publication date/Publisher:
11-1998
Zentralverband Sanitär-Heizung-Klima; St. Augustin

Title: Beurteilen und Vorbereiten von Untergründen, Verlegen von elastischen und textilen Bodenbelägen, Schichtstoffelementen (Laminat), Parkett und Holzpflaster, Beheizte und unbeheizte Fußbodenkonstruktionen;
Publication date/Publisher:
02-2002
Bundesverband Estrich und Belag e.V., Troisdorf

Title: Technical Information Sheet Hinweise zur Verlegung von Fließestrichen auf Calciumsulfatbasis
Publication date/Publisher:
03-1996
Zentralverband Sanitär-Heizung-Klima; St. Augustin

Title: Technical Information Sheet Vorbereitung von Estrichen für Bodenbelagarbeiten
Publication date/Publisher:
02-1998
Zentralverband Sanitär-Heizung-Klima; St. Augustin

7.6 Other Standards

Title: DIN 18299
Allgemeine Regeln für Bauarbeiten jeder Art
Publication date/Publisher:
12-2002

Title: DIN EN 1264-4
Fußboden-Heizung - Systeme und Komponenten - Teil 4: Installation
Deutsche Fassung EN 1264-4 (Floor heating – Systems and components – Part 4: Installation)
Publication date/Publisher:
12-2001

The comments and specifications in this data sheet are given to the best of our knowledge and comply with state-of-the-art standards. They are of a non-obligatory advisory nature only and do not constitute an expressed or implied warranty of any kind.