

# Method Statement Sika® Wood Floor Bonding Substrates Requirements and Substrate Pre-treatment

Corporate Construction

Scope:

Description of the requirements and problems with different substrates and their different solutions from Sika®.



Construction



**Sika Services AG**, Tüffenwies 16, 8048 Zürich, Switzerland  
Phone: +41 44 436 42 45 / Fax: +41 44 436 46 86  
E-Mail: [buehler2.stephan@ch.sika.com](mailto:buehler2.stephan@ch.sika.com)  
[www.sika.com](http://www.sika.com)

## Table of Contents:

|            |  |           |
|------------|--|-----------|
| <b>1.</b>  | <b>Introduction .....</b>  | <b>4</b>  |
| <b>2.</b>  | <b>Requirements .....</b>  | <b>4</b>  |
| 2.1        | An overview of moisture problems and Sika solutions.....                                     | 4         |
| <b>3.</b>  | <b>Damage due to Screeds being too Damp.....</b>   | <b>5</b>  |
| 3.1        | Curling.....   | 5         |
| 3.2        | Unilateral action of swelling agents.....  | 6         |
| 3.2.1      | Convex curling .....   | 6         |
| 3.2.2      | Concave curling .....  | 7         |
| 3.3        | Lifting or 'blistering' .....  | 8         |
| 3.3.1      | Lifting due to missing edge gaps and expansion joints.....                                   | 8         |
| 3.3.2      | Lifting or 'blistering' due to the screed substrate not being ready for covering             | 9         |
| 3.3.3      | Swelling and lifting or 'blistering' due to the screed not being ready for covering<br>..... | 10        |
| 3.3.4      | Lifting or 'blistering' due to post-installation moisture from concrete floors.....          | 11        |
| 3.3.5      | Lifting or 'blistering' in rooms without a basement and wet rooms.....                       | 14        |
| 3.3.6      | Lifting of the subfloor.....   | 16        |
| 3.3.7      | Moisture meters and measurement .....  | 18        |
| 3.3.8      | Differences in moisture content .....  | 20        |
| <b>3.4</b> | <b>Sika solutions for moisture problems .....</b>  | <b>20</b> |
| 3.4.1      | Sikafloor-81 EpoCem and Sika Primer MB .....   | 20        |
| <b>4.</b>  | <b>Substrate Strength .....</b>  | <b>22</b> |
| 4.1        | 'Cross cut' scoring method.....  | 22        |
| 4.2        | Sanding-off.....   | 22        |
| 4.2.1      | Shear strength .....   | 23        |
| 4.2.2      | Pull off strength .....  | 24        |
| 4.3        | Evenness .....   | 25        |
| <b>4.4</b> | <b>Porosity and Roughness .....</b>  | <b>26</b> |
| <b>4.5</b> | <b>Cleanliness .....</b>   | <b>27</b> |
| <b>4.6</b> | <b>Cracks, movement and dummy joints.....</b>  | <b>28</b> |
| <b>4.7</b> | <b>Edge insulating strips.....</b>   | <b>29</b> |
| <b>4.8</b> | <b>Temperature and atmospheric conditions in the room .....</b>                              | <b>29</b> |
| <b>5.</b>  | <b>Special substrates .....</b>  | <b>30</b> |
| 5.1        | Dry screed systems .....   | 30        |
| 5.2        | Dry screeds/precast screeds .....  | 30        |
| 5.3        | Plasterboard/gypsum fibre board.....   | 30        |
| 5.4        | Cement fibre board .....   | 31        |
| 5.5        | Wood based panels .....  | 31        |



|            |   |           |
|------------|---|-----------|
| <b>6.</b>  | <b>Description of different substrates.....</b>           | <b>32</b> |
| 6.1        | Concrete floors.....                                      | 32        |
| 6.2        | Concrete .....  | 32        |
| 6.3        | Screed systems .....                                      | 33        |
| 6.4        | Cement screeds.....                                       | 33        |
| 6.4.1      | Conventional cement screeds.....                          | 33        |
| 6.4.2      | Cement self-levelling screeds .....                       | 33        |
| 6.4.3      | Accelerated cement screeds.....                           | 34        |
| <b>6.5</b> | <b>Anhydrate / Calcium sulphate screeds .....</b>         | <b>36</b> |
| 6.5.1      | Conventional anhydrite / calcium sulphate screeds.....    | 36        |
| 6.5.2      | Self-levelling anhydrite / calcium sulphate screeds ..... | 36        |
| 6.5.3      | Magnesite screeds.....                                    | 36        |
| 6.5.4      | Mastic asphalt screeds .....                              | 37        |
| 6.5.5      | Timber boarded floors.....                                | 38        |



## 1. Introduction

Before the application of bonded wood flooring can begin, the substrate must meet the appropriate standards. Wood floors can still be well bonded if the substrate is of poor quality but even the strongest bond and cleanest installation will not protect against future damage from an inadequate substrate.

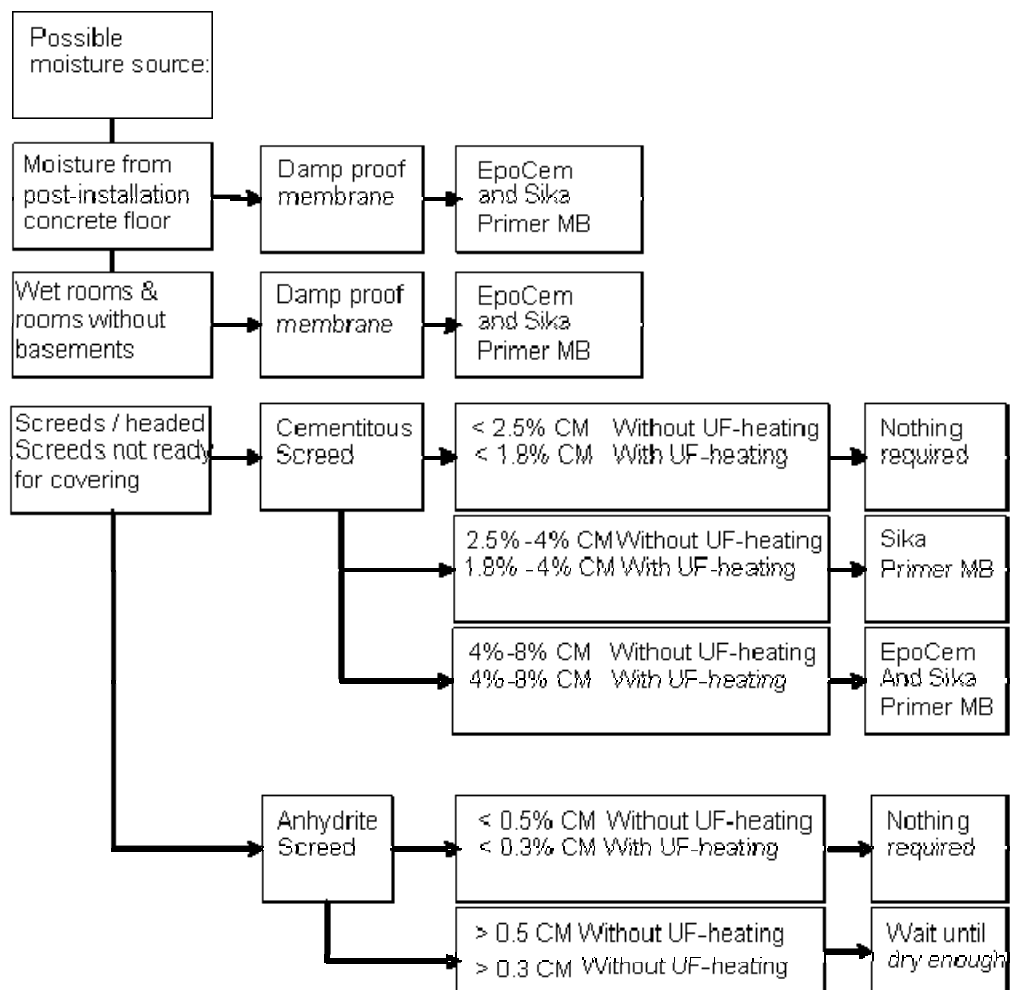
Practical experience has shown that by far the greatest percentage of damages are caused by poor quality and inadequately prepared substrates.

Statistics also show that 80% of all incidences of damage from all types of wood floor bonding result from excess moisture content in the substrate. Therefore very high importance must be given to the substrate moisture content.

In this document we want to provide an overview of different substrate requirements and problems. Different types of substrate are described at the end of the document.

## 2. Requirements

### 2.1 An overview of moisture problems and Sika solutions

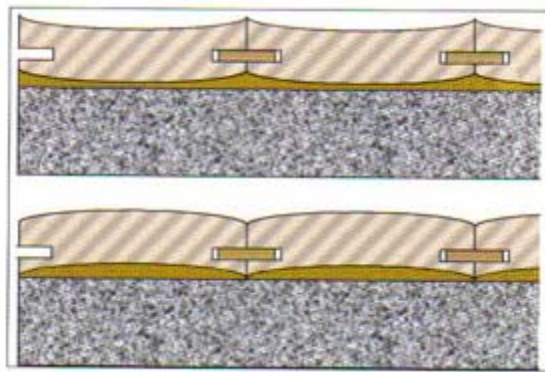


### 3. Damage due to Screeds being too Damp

#### 3.1 Curling

Damage symptoms:

The individual pieces of a wood floor have a curve in cross-section. This is known as curling or cupping and can be felt as waviness in the individual pieces of the wood floor when stroked with the hand. Dependent on the direction in which the pieces curve, a distinction is made between concave 'curling' also known as 'cupping' - curving in at the top - and convex 'curling' - curving in at the bottom. In normal day to day language both effects are referred to as 'curling', the direction of the curving movement should therefore also be clarified in each case.

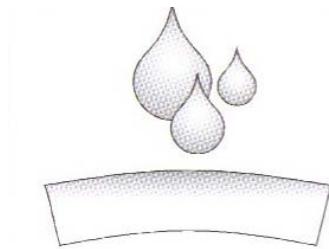


**Curling of wood floor pieces:**  
Top: concave curling or cupping  
Bottom: convex curling

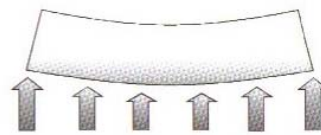
The top illustration shows that this curling is the consequence of variable expansion of the bottom and top sections of the woods cross section. The width of the concave side (side curved in) has shrunk from its original state while the convex side has increased in width. It is also possible for both sides to move in the same way, i.e. either both swell or both shrink, but to varying degrees.

## 3.2 Unilateral action of swelling agents

The main cause of curling and cupping is the unilateral action of swelling agents. Swelling is caused by swelling agents acting on the wood. Shrinkage is caused by swelling agents released from the wood. The swelling agent in wood is generally water, but certain organic solvents such as alcohols can also cause the wood to swell. The illustration below shows how curling is caused by unilateral action of swelling agents.



Left:  
Convex curling due to swelling agent action from above



Right:  
Concave curling or cupping due to swelling agent action from below

### 3.2.1 Convex curling

**Liquid water** due to a burst pipe or driving rain through an open window or flower pots standing directly on the wood floor generally lead to convex curling within *24 hours*, dependent on the permeability of the woods surface treatment. And if wood floors are cleaned by mopping with too much water, it penetrates through gaps and cracks into the top layer and can cause convex curling.

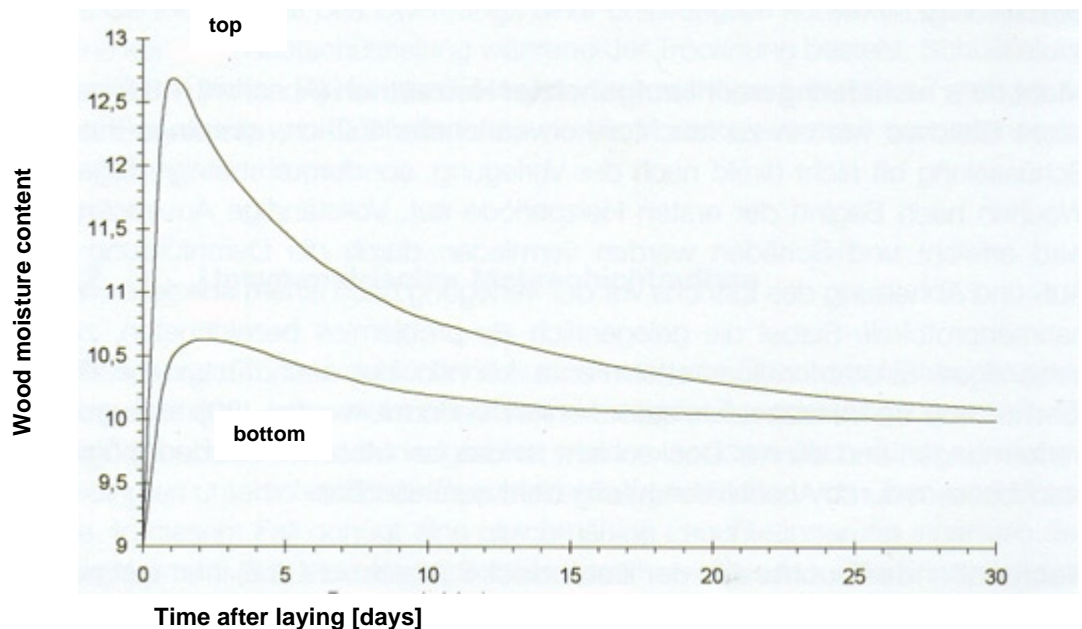
**Extremely high humidity** due to cooling of the air in basements, in ground floor rooms in humid summer weather or from construction and decoration in new buildings causes convex curling within a *few days*, particularly on floors yet to be surface treated / sealed.

**Highly underdried wood** reacts in normal atmospheric humidity in a similar way to correctly dried wood at extremely high humidity. The testing of the woods moisture content as part of the contractors responsibilities is therefore very important for preventing damage.

### 3.2.2 Concave curling

Water or solvents from dispersion adhesives (e.g. SikaBond-542 (W+)) or other synthetic resin adhesives penetrate and swell the underside of wood floor pieces and cause a swelling agent gradient in the thickness of the wood, particularly on **substrates with low absorbency** or with excess application of adhesive. This effect is more marked on wood floors without a tongued and grooved joint and on pieces which are wide in relation to their thickness. Concave curling occurs within *24 hours*. It takes days or even weeks before the moisture differences between the top and bottom of the wood pieces can be equalised again.

As the swelling agent contents at the top and bottom come closer, most of the curling subsides. Grinding cannot start until this reformation is complete, otherwise the floor will appear curled again later. Therefore the period defined as the 'waiting time' between laying and surface treatment should be at least 8 - 10 days for thinner 10 mm thick wood sections which are particularly susceptible to curling. By using reactive resin adhesives with no swelling agents, the waiting time can be reduced to between 12 and 24 hours (SikaBond-T54 FC).



Graphic illustration of wood moisture content over time at a distance of 3 mm from the top and the bottom in a 10 mm thick wood floor bonded with a dispersion adhesive.

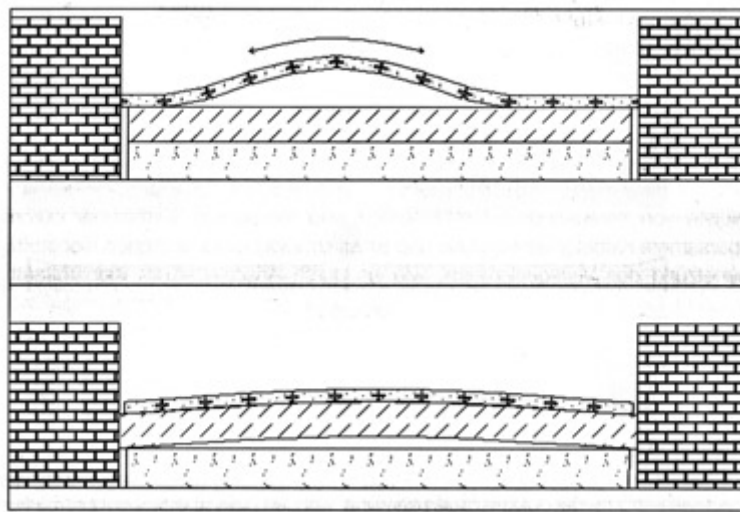
Other reasons for curling:

- Screed too damp, not yet ready for covering
- Underfloor heating screed not heated or incorrectly heated
- Post-installation moisture penetration from the concrete substrate

These reasons are discussed in more detail below because they can often result in more serious damage than just curling (i.e. lifting or blistering).

### 3.3 Lifting or 'blistering'

'Blistering' means the lifting of several elements of the wood floor. Wood floors can also 'blister' as a unit with their subfloor, i.e. lift together from the concrete floor slab. Wood swells when it absorbs swelling agents, i.e. it expands. If wood floors expanding in this way are constrained by adjacent elements such as walls, columns or door thresholds, the result is either plastic deformation of the wood or lifting or 'blistering' of the floor. With blistering, the floor escapes the swelling pressure acting in the horizontal plane by moving vertically upwards. This happens very quickly with floating floors because only their own weight has to be lifted. With a full surface bonded floor, blistering is synonymous with exceeding the transverse tensile strength of the wood to the adhesive subfloor bond.



The most common combination for this damage symptom is a wood block floor on a mastic asphalt screed. Mosaic parquet and lam parquet wood floors can also suffer blistering on a mastic asphalt screed abutting a wall.

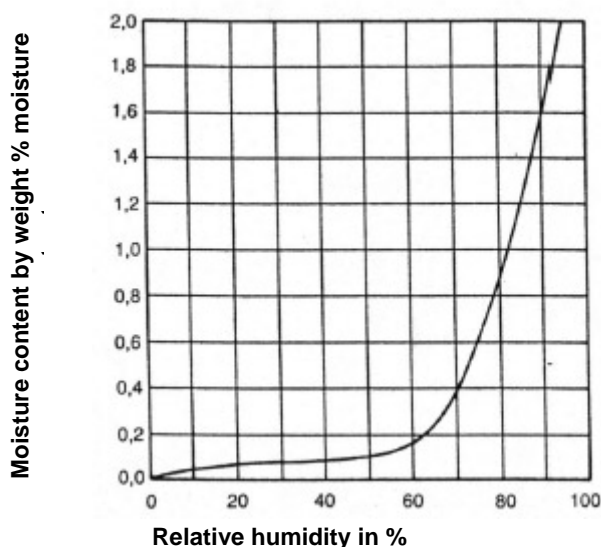
#### 3.3.1 Lifting due to missing edge gaps and expansion joints

Because wood swells when it absorbs moisture, it is extremely important to maintain adequate clearance between the wood floor and adjacent components so that the wood can expand if necessary without causing constraint. The slightest expansion of a wood floor can result in considerable lifting if there is lateral constraint. This is why various standards explicitly require adequate edge gaps and expansion joints to be installed. The wall clearance to be maintained during laying depends on the wood type, wood sizes, laying pattern, laying method, expected climatic variations and room size. As a rough rule of thumb, a wall clearance of 1 to 1.5 cm is considered adequate for wood floors of up to 6 m. When bonding with elastic adhesives then this edge gaps can be reduced.

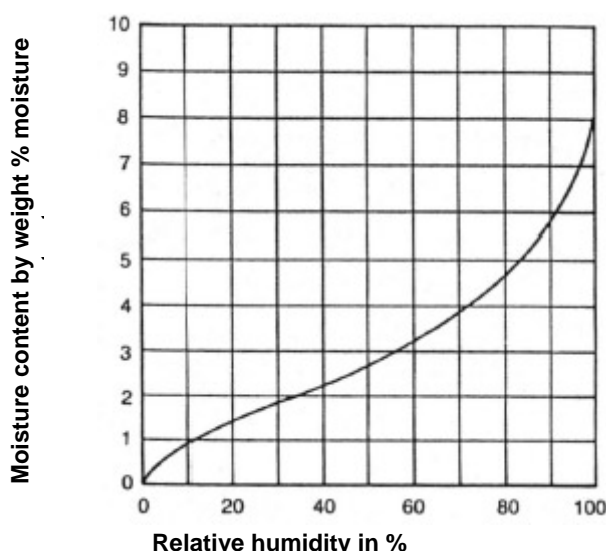


### 3.3.2 Lifting or 'blistering' due to the screed substrate not being ready for covering

A wood floor laid on an unheated, mineral bound screed is subjected shortly after installation to swelling stresses, which result in deformation and finally lifting or blistering of the floor. The screed has very high residual moisture. Post-installation moisture or water penetrating from the sides due to other causes or defects can be ruled out in this case. Screeds laid 'wet' dry out in the course of time to a level which depends on the temperature and particularly the relative humidity, as well as the screed mortar type and composition. The state of equilibrium in wood and other hygroscopic materials is described by means of their absorption isotherms. After several years' use in a living area climate, an average moisture level balance develops which only varies slightly as the seasons change.



Absorption therm of an anhydrite screed (water content determined by drying at 40°C to weight constancy = kiln dry)



Absorption therm of a cement screed (water content determined by drying at 105°C to weight constancy = kiln dry)

| Screed type  | Kiln dry | CM-Device                 |
|--------------|----------|---------------------------|
| Anhydrite    | $F_0$    | $F_{CM} \sim F_0$         |
| Cementitious | $F_0$    | $F_{CM} \sim F_0 - 1.5\%$ |



Permissible substrate moisture content **without** under floor heating):

- 2.5% CM for cement screeds (ca. 4% Tramex / Gravimetric weight percent)
- 0.5% CM for anhydrite screeds

Sika Primer MB can be applied as a moisture barrier (for cementitious screeds only) with up to 4% (CM) screed moisture. For more information please refer to the current Product Data Sheet for Sika Primer MB.

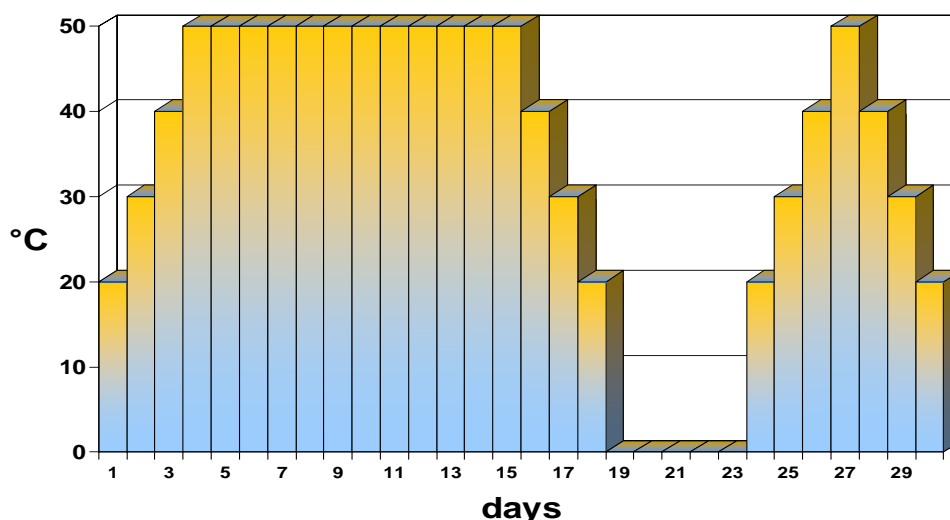
### 3.3.3 Swelling and lifting or 'blistering' due to the screed not being ready for covering

The screed moisture factors described in the previous section also apply to underfloor heating screeds. The maximum permissible moisture content for these screeds are lower than for non heated screeds. Whereas surplus moisture can migrate slowly from a non heated screed for years, it is forced rapidly out of a heating screed usually in the first full heating period (ie not during testing only).

DIN 18356 says: Underfloor heated systems must be heated for an adequate period before wood flooring is laid.

To avoid damage to the heating installation, moisture measurements must always be taken at defined predetermined measuring points. A preheating operation is often carried out to test the efficiency and integrity of the heating, but generally this is inadequate to obtain the required dryness of the screed. Further heating is necessary to make it ready for covering. A requirement for this should be prepared and included as part of the contractual documents. Strict attention to the coordination of all trades and particularly wet trades such as plastering and painting will prevent unnecessary damage due to excessive screed moisture.

The programme required for heating to ensure the screeds is ready for covering is as follows:



The preheating times shown should always be considered as the minimum periods. Longer preheating times provide extra security and should be provided, particularly if the type of wood is liable to swell.



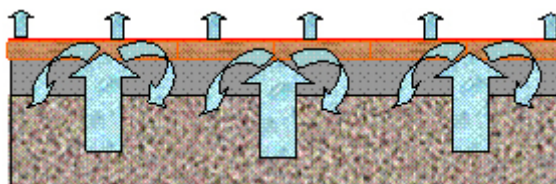
*Permissible substrate moisture content for use with underfloor heating:*

- 1.8% CM for cement screeds (ca. 3% Tramex / Gravimetric weight percent)
- 0.3% CM for anhydrite screeds

Sika Primer MB can be applied as a moisture barrier (for cementitious screeds only) with up to 4% (CM) screed moisture. For more information please refer to the current Product Data Sheet for Sika Primer MB.

### 3.3.4 Lifting or 'blistering' due to post-installation moisture from concrete floors

The symptoms of damage due to post-installation moisture from concrete floors are lifting or blistering and also gaps, curling or other surface waviness. One important way to distinguish lifting caused by the screed not being ready for covering or by excessive building moisture is the time when it occurs. If there is post-installation moisture from the concrete floor, *lifting does not occur just a few days or few weeks after laying; it does not occur for at least a month and frequently not for several months.*



**Wood floor (sealed on top)**

**Screed**

**Concrete slab (water reservoir)**

**Water is blocked under the wood floor varnish, not below the screed.**

The following characteristics are necessary for the problems due to the presence of post installation moisture:

- The uncovered screed was dry in the initial moisture test.
- It is laid with a sealed wood or with vapour proof flooring (PVC, linoleum, sealed cork etc).
- The typical features of moisture damage such as curling, swelling and lifting did not show up for at least a month and generally not for several months. When the floor is tested, the wood moisture content levels recorded of say  $u = 12\%$  to  $18\%$  are well above the original wood installation moisture of say  $u \sim 9\%$ . In a repeat moisture test, the screed is damp, i.e. no longer suitable for covering, although it was clearly dry and ready for covering before the flooring was laid.
- When the subfloor structure is exposed, there is found to be no vapour barrier (e.g. PE membrane) on top of the concrete.
- Measurement of the relative humidity in a hole drilled in the concrete floor gives typical values of over 95%.

There are two main routes for water to re-enter a screed which has dried out:

- A) There must be a moisture source or water with direct access to the screed.
- B) The moisture inflow into the screed must be greater than the outflow through the wood into the room. This can be the case if the layer under the screed has a less water vapour permeability than the layers above the screed. The water vapour flow caused by drying out can easily diffuse into the screed, but is then blocked by the sealed wood surface, can only diffuse out slowly and it is therefore trapped and damage will occur.

Requirement A is met if the concrete floor has not dried out completely due to the project timing when the floor screed is laid. With its great mass, it forms a large moisture reservoir and the water from this has to migrate as a vapour flow through the layers above as the concrete dries out. If the project timing is such that requirement A can occur, the specifier and the contractors must prevent B from occurring by incorporating a vapour barrier. For example, a 0.3 mm thick polythene membrane or a 0.5 mm thick PVC membrane on the concrete floor makes the moisture that is present diffuse so slowly into the screed, and then the wood floor, that moisture is not trapped in these layers because these small quantities of water are released quickly enough into the room. If a vapour barrier is not incorporated, or is forgotten on a concrete floor that has not dried out, the physical conditions for post-installation moisture penetration from the concrete floor are met and damage to the wood floor installation is inevitable.



Wood floor (sealed on top)

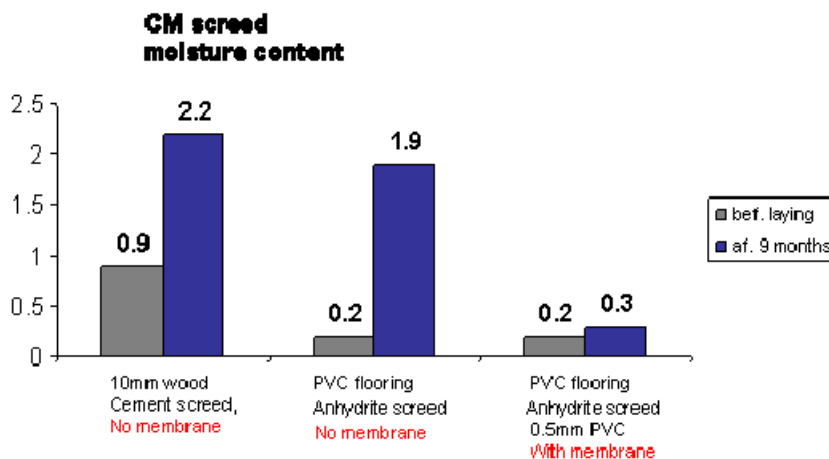
Screed

Concrete slab (water reservoir)

Water is blocked under the membrane  
- not below the varnish.

The problem with post-installation moisture is that it often cannot be detected by measuring the screed moisture content. **A screed open to the internal environment is largely dry, even though moisture is still passing through it from the structural concrete floor, because it can pass through the screed into the room without much resistance. It is only when the screed is covered with vapour-proof flooring that the moisture flow is blocked, causing condensation and moisture problems in the wood and the screed.**





The moisture content of screeds on a new structural concrete floor without and with a membrane immediately before, and 9 months after covering with sealed 10mm wood or PVC sheet floor.

**Prevention:**

As illustrated above, the cause of the increased moisture content of the screed and wood flooring is the blockage in the wood of the moisture flow from the drying structure, when this flow is too great. It is the specifier and the contractor's responsibility to keep this low, either by allowing time for thorough drying of the concrete subfloor or, more generally today, by incorporating a vapour barrier.

It is impossible to obtain a conclusive reading for the moisture content of concrete floors, with or without a monolithic screed, using standard commercial measuring instruments. The levels measured in the upper zone of the substrate give no indication of the moisture content of the concrete subfloor below in the cross section.

**Because drying times of six months or more can be necessary for concrete floors,** defects or damage to all types of flooring due to residual moisture in these substrates cannot be ruled out. The responsible specifiers and contractors must therefore take appropriate action to ensure that moisture from the substrate is kept away from the adhesive and the wood.

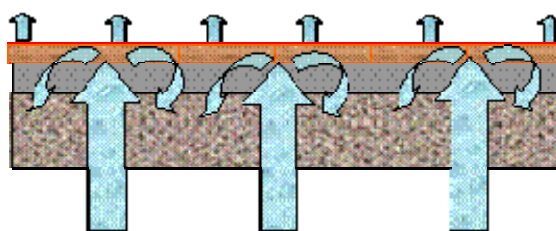


### 3.3.5 Lifting or 'blistering' in rooms without a basement and wet rooms

The damage symptoms of lifting, gaps, curling or other surface waviness in wet rooms and rooms without a basement are the same as for post-installation moisture from new concrete subfloors. Here again, the moisture damage on a floor initially ready for covering (dry) does not occur for several weeks or months after the wood flooring has been laid.

There are three possible causes:

- A) Moisture from below because there is no seal to prevent moisture ingress (in rooms without a basement)
- B) Moisture from below because there is no vapour barrier to prevent water vapour diffusion (if an upward water vapour pressure gradient is present).



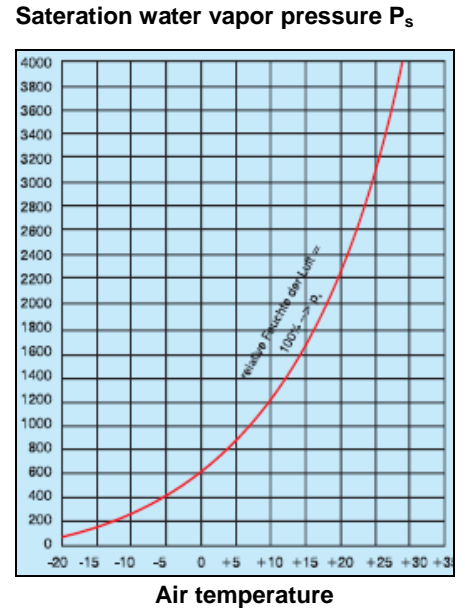
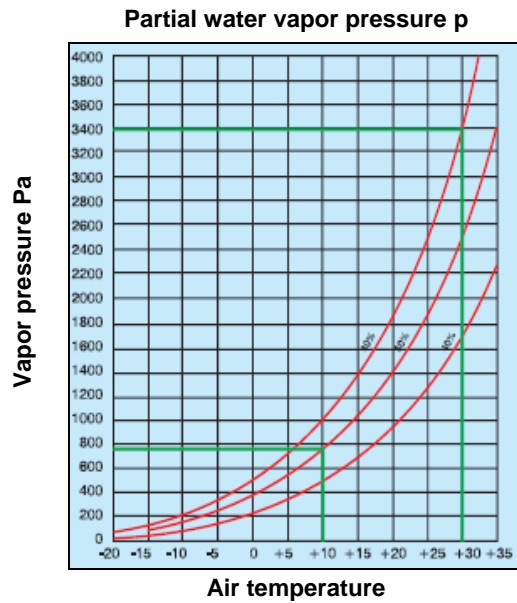
Earth/soil or "wet room"

- C) Moisture from the internal atmosphere because there is no downward thermal insulation.

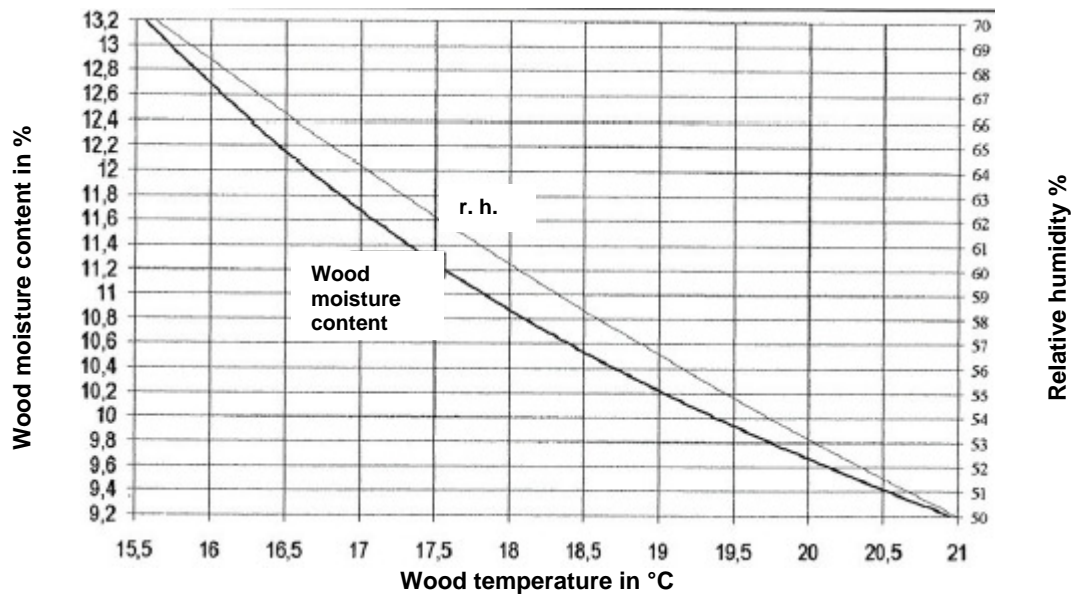
The behaviour in cause **A)** is the same as for post-installation moisture from new concrete floors, but the source of the moisture is *earth-moist* rather than the new concrete floor.

In cause **B)** the moisture comes from the *air in the area underneath*. If it has higher atmospheric humidity and a higher temperature, as is the case with *internal swimming pools, bathrooms, saunas, bakeries, large kitchens* etc., there is a high upward vapour pressure gradient from those areas. If there is no vapour barrier, a large quantity of water vapour diffuses from below into the wood floor, and is then trapped by the surface seal.

In cause **C)** the reverse is the case. If the *temperature is much higher above* the wood than below and the thermal insulation is inadequate, the air cools by a few degrees on the cold wood surface, causing the relative humidity to rise in the immediate vicinity of the wood and increasing its moisture content. This is the exact opposite of the effect of wood over underfloor heating. For example, if the room air at 21°C and 50% relative humidity cools on the 16°C surface of a parquet floor laid on a cold floor slab, the wood moisture content increases to 12.7% compared with 9.2% on parquet at 21°C. This is explained by the fact that the relative humidity rises on the cool parquet surface from 50% to 68.4% and the wood adapts to this relative humidity in line with its absorption isotherm. The figure of 68.4% for relative humidity is obtained by dividing the partial water vapour pressure at 21°C and 50% relative humidity, 1244 Pa, by the water vapour saturation pressure at 16°C, 1818 Pa.



As a general rule:  
 The moisture content of wood increases by 1% for each 1.5°C temperature drop from the room air temperature, but the correlation is not completely linear.  
 In different marginal conditions, the wood moisture content can be determined for more precise calculations from the partial and saturation vapour pressures by this arithmetical calculation method outlined above.



Relative humidity on the wood surface and the wood equalising moisture as a factor of parquet temperature at 21°C room air temperature and 50% relative humidity in the room.



Prevention:

Causes **A)** and **B)** can be prevented by a correctly installed or vapour barrier. For the installation of a wood floor in a basement, the application of Sikafloor EpoCem System and SikaPrimer MB is mandatory. Nevertheless they do not replace in any case the waterproofing seal of the construction / building.

Cause **C)** is prevented by adequate thermal insulation under the wood or screed. The physical correlation between the thermal insulation, relative humidity and corresponding wood moisture content should also be considered during renovations.

Repairs:

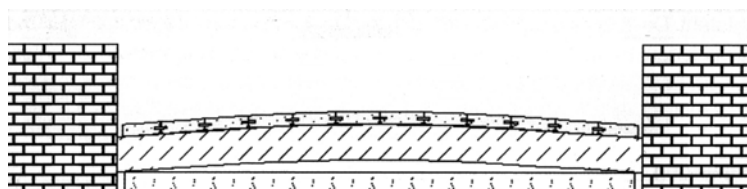
Repairs are carried out by first eliminating the cause. The damaged wood floor and its subfloor should be removed and the necessary waterproofing seals, vapour barriers and/or adequate thermal insulation installed. The wood floor can only then be safely renewed.

The Sikafloor EpoCem system with Sika Primer MB can be used as a vapour control. For more information please consult the current Product Data Sheet of the Sikafloor EpoCem system and Sika Primer MB

### 3.3.6 Lifting of the subfloor

Damage symptoms:

The wood floor has lifted as a whole or in parts without separating from the substrate on which it was bonded. The lifting therefore consists of two bonded layers. The possible substrates with this problem are those with different types of floating/load distribution layers bonded to the wood.

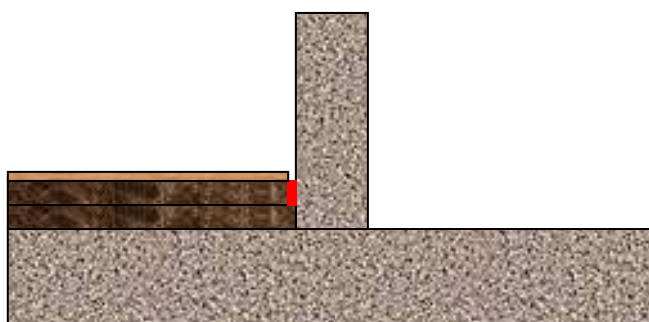


Principles, causes:

An essential condition for lifting is swelling of the wood floor. The substrate does not have the same high swelling expansion properties as the wood, which transmits the lateral shear forces downwards through the adhesive bond. The forces acting on the substrate can expand or tear it. If the substrate is strong enough, the shear forces become swelling stress directed upwards, which it can absorb given sufficient transverse tensile strength. If the flexural strength is inadequate, the bonding layer is deflected upwards. *This is the case with floating chipboard or plasterboard subfloors.*



Other mechanisms are possible on mastic asphalt and cement screeds. Mastic asphalt is subject to plastic deformation. The bonded, expanding wood floor pushes the mastic asphalt against the wall, further shear stresses generate bending stresses and the floor lifts. The gap around the edge of the wood floor is generally still open. A damage symptom initially hidden has sometimes been revealed on mastic asphalt screeds applied in two layers. The lower layer was installed without an edge gap and the system lifts despite the correct edge gaps in the upper mastic asphalt layer and wood floor.



- Wood floor
- 2<sup>nd</sup> layer broadcasted asphalt
- 1<sup>st</sup> layer without edge insulation strip!!  
(Both layers must have an edge insulation strip)
- Concrete slab

#### Prevention:

Lifting of wood floors together with the bonded substrate usually has several causes and various preventive measures are listed below:

A large enough edge gap must be maintained around mastic asphalt screeds. A minimum gap width of 10mm for rooms with an area of 35m<sup>2</sup> and 15-20mm for larger rooms is appropriate.

Mastic asphalt screeds  $\geq 40$  mm thick should be laid in two layers. In this case both layers must have the necessary edge gap.

The installation moisture content of the wood floor should correspond to the anticipated service moisture levels (acclimatized). This is particularly important for wood block floors and parquet systems.

The minimum thickness for floating installation with chipboard is 16mm as this is susceptible to damage when fully bonded with solid wood flooring. Two diagonally glued and screwed layers of chipboard are generally preferable to a single layer system; the thickness should be designed to withstand the anticipated stress.

#### Repairs:

The repair method for lifting damage depends on the specific problem. For example, if the source or cause of the excessive moisture is a defective or missing waterproof seal, the entire floor structure has to be replaced. With mastic asphalt screeds abutting a wall the edges must all be cut free so that the two-layer floor structure can settle again.



### 3.3.7 Moisture meters and measurement



CM device



Tramex Gravimetric weight

#### Carbide method:

The calcium carbide method uses the reactivity of calcium carbide with water. A typical sample is taken from the bottom layer of the screed or concrete and crushed. The crushed sample is weighed and placed in a pressure vessel. A glass ampoule filled with carbide and several steel balls are added. The vessel is then shaken and the glass ampoule is crushed and the contents mixed with the test material. Diffused water reacts with the calcium carbide to form calcium hydroxide and acetylene. This gas generates a pressure which is used as a measure of the reacting water quantity. The relevant moisture content can be read off from tables. The carbide method is a very accurate way of measuring the moisture content of cementitious and gypsum based (anhydrite) floor substrates.

#### Electrical conductivity:

As the water content increases, so does the electrical conductivity of the screed and this can be utilised for its moisture content measurement. To do this, two holes are drilled, electrodes are inserted into them and the electrical resistance between them is measured. The relevant moisture content can be read off on a specific table.

The water content based dielectric properties of a material also can allow non destructive measurement with an electrode pressed onto the surface of the screed. Measuring instruments such as "Tramex" are very useful to determine readiness for covering because they can indicate quickly and simply whether the moisture content measured means that a comprehensive CM measurement can be expected to be successful. Tramex is too inaccurate as a final measurement for cementitious screeds and is not suitable for anhydrite screeds because there are a great many different mixes available.

### Plastic sheet test (ASTM D4263-83):

Information on the moisture content can also be obtained non destructively by the 'mat test'. A rubber or PVC sheet / mat is laid on the screed surface and sealed at the edges. If condensation or discolouration of the screed (due to moisture) is found after 72 hours, it is not ready for covering. This method is used for the verification whether Sika PrimerMB can be applied or not. In case the mat does not show any condensation, then the Sika Primer MB must be applied immediately and not waited any longer.

### Measuring of the relative humidity:

An other method to verify whether the wood floor can be installed or not is the measuring of the relative humidity. This is conducted with different devices. The relative humidity should not be **over 55%** for unheated screeds or **over 50%** for heated screeds (Central European Climate).

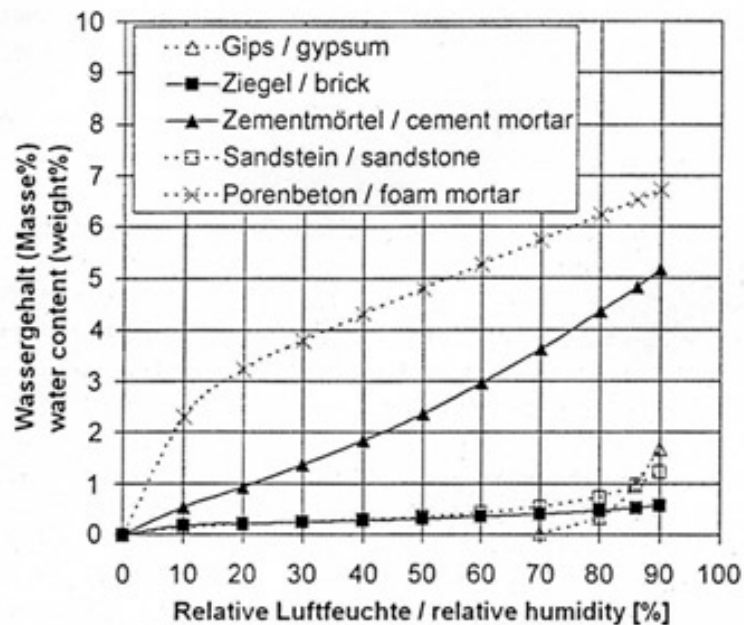
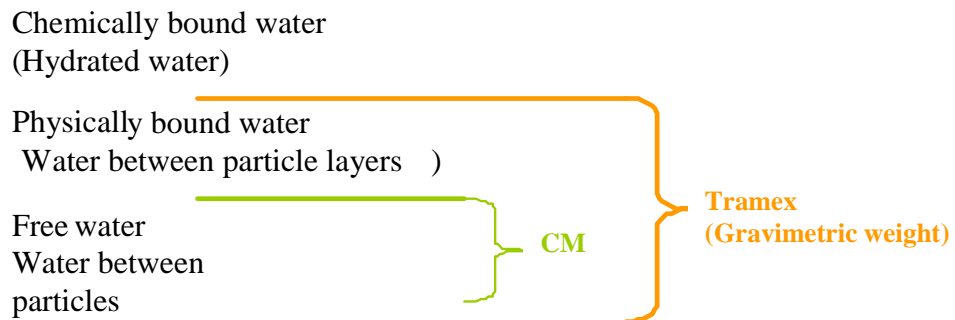


Bild 1. Beispiele für Sorptionsisothermen mineralischer Baustoffe [2]  
Fig. 1. Examples of sorption isotherms of mineral materials [2]



### 3.3.8 Differences in moisture content

Tramex / Gravimetric weight shows a different moisture content in screeds. This is mainly because the Tramex/Gravimetric weight measures free water and some of the physically bound water in the constituents of the screed. Whereas the Calcium Carbide Method measures only the free water content.

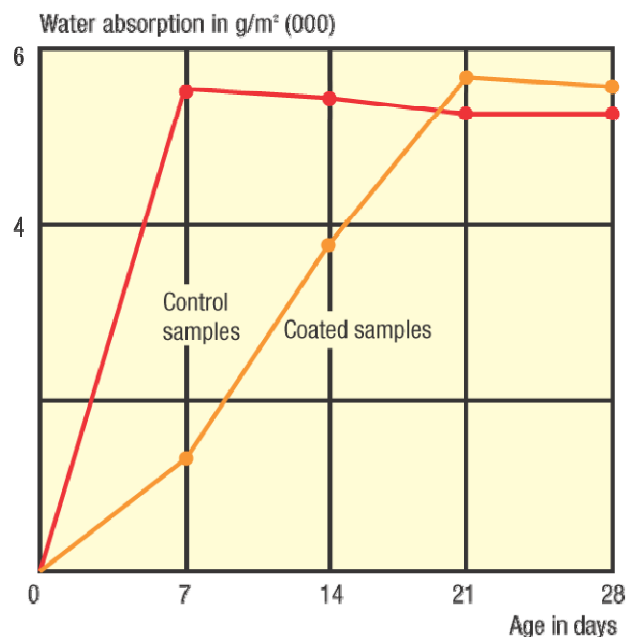


### 3.4 Sika solutions for moisture problems

#### 3.4.1 Sikafloor-81 EpoCem and Sika Primer MB

Moisture control for cementitious substrates:

Sikafloor®-81 EpoCem® is a three part, epoxy modified, cementitious and fine textured mortar for self smoothing floor screeds used in thin layers of 1.5 to 3 mm. It provides a Temporary Moisture Barrier (TMB) (**min. 2 mm thick**) under Epoxy, Polyurethane and PMMA resin floors, over high moisture content cementitious substrates.

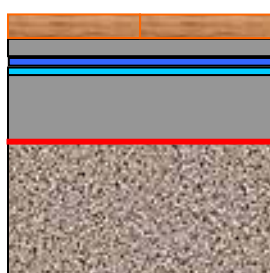


**Sika Services AG**, Tüffenwies 16, 8048 Zürich, Switzerland  
 Phone: +41 44 436 42 45 / Fax: +41 44 436 46 86  
 E-Mail: buehler2.stephan@ch.sika.com  
 www.sika.com

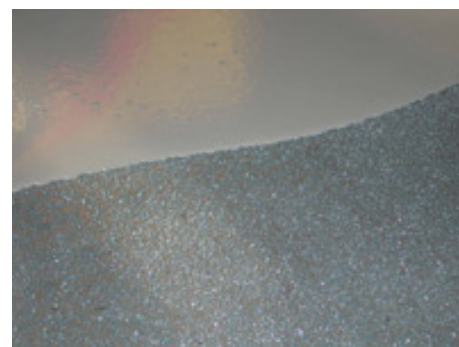
Sikafloor-81 EpoCem used in conjunction with Wood floor bonding is applied on a max. screed humidity of 8%. Sikafloor-81 EpoCem is not a replacement for any waterproofing of the building, it is only a Temporary Moisture Barrier to improve the adhesion and allow the application of Sika Primer MB.

As soon as the moisture content is below 4% CM the Sika Primer MB is applied as a moisture regulator.

If Sika Primer MB is used as a moisture regulator and fillers or levelling products have to be applied on top, two layers must be applied. The top layer must be broadcast with sand. An absorbent layer must be applied for the use of dispersion adhesives (SikaBond-542 W+), otherwise there is not enough adhesion and all the water from the adhesive is absorbed by the wood, which can lead to excessive shrinkage, swelling and disbonding.



Wood Floor  
Dispersion Adhesive  
Sika Level 25  
Sika Primer MB broadcasted  
Sika Primer MB (moisture barrier)  
Screed  
Moisture barrier (PVC / PE-foil)  
Concrete slab



Level and broadcasted Sika Primer MB

#### **Moisture control for anhydrite substrates:**

There is no moisture barrier available for anhydrite screeds. If the moisture content is too high then you have to wait until the screed is dry enough. A moisture barrier could create damage because the moisture is trapped and the gypsum based screeds can start to rot. Anhydrite floors must always be ground shortly before the wood floor bonding takes place.

The drying process can be accelerated by using dehumidifiers and increasing the internal air temperature.

**For more information about these products refer to the current Product Data Sheets and or the current Method Statements.**



**Sika Services AG**, Tüffenwies 16, 8048 Zürich, Switzerland  
Phone: +41 44 436 42 45 / Fax: +41 44 436 46 86  
E-Mail: [buehler2.stephan@ch.sika.com](mailto:buehler2.stephan@ch.sika.com)  
[www.sika.com](http://www.sika.com)

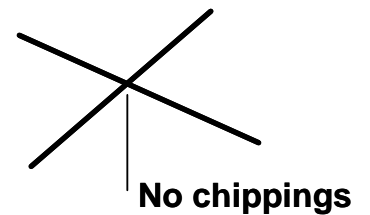
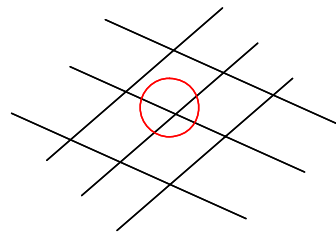
## 4. Substrate Strength

### 4.1 'Cross cut' scoring method

The strength of the screed surface is tested by 'cross cut' scoring. A steel test spike with a compression spring is used for determination. The scoring must not leave deep scratch marks or extensive flaking, even at the points where the score lines intersect.



Cross cut device to test the surface strength



Weak substrate

### 4.2 Sanding-off

The screed must not chalk or sand off. This can be tested with a wire brush. The surface must form a sound structure with the screed as a whole. Disbonded or fractured layers can be detected by tapping with a hammer (hammer blow test).



#### 4.2.1 Shear strength



The Press-o-Mess device measures the surface strength of the screed. Two defined wood pieces are bonded in a given distance apart on the floor. After the adhesive is properly cured, the device is set between them. Whilst turning the handle, the device spreads apart and the pressure against the two wood pieces is shown on a gauge. For more information please consult the manufacturers operating manual. For testing of the surface strength (in  $\text{N}/\text{mm}^2$ ) a rigid adhesive with higher mechanical values than the screed must be used (cohesion failure in screed).

- *Minimum shear strength:*
  - >  $1.5 \text{ N}/\text{mm}^2$  for wood floor bonding (determined with rigid adhesive)
  - >  $2.0 \text{ N}/\text{mm}^2$  for wood block paving (determined with rigid adhesive)



Cohesive failure in adhesive



Adhesion failure



Cohesive failure in substrate

If there are no such devices to make these tests then a piece of wood can be bonded (with an elastic Sika-PU adh.) onto the screed and cured for 3 days. Remove it and if there is **cohesion failure in the adhesive** then the substrate is strong enough.



**Substrate is too weak.**  
**Cohesion failure in substrate.**  
**Cohesion break in adhesive desirable.**

#### 4.2.2 Pull off strength



| Type of subfloor | Parquet        | Wood paving |
|------------------|----------------|-------------|
|                  | Classification |             |
| Cementitious     | ZE 20 - 30     | ZE 30       |
| Anhydrite        | AE 20 - 30     | AE 30       |

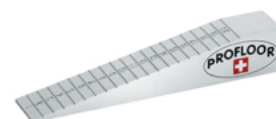
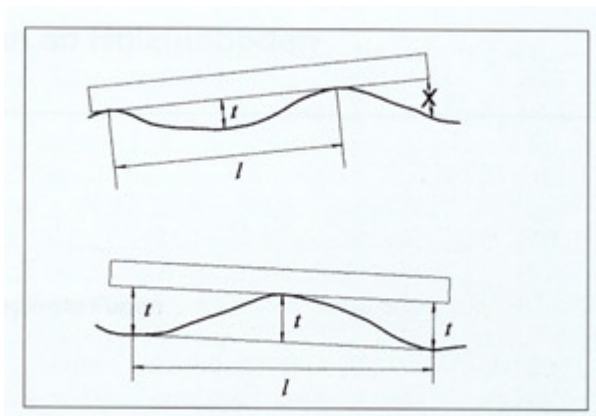
- *Minimum pull off strength:*  
> 1.0 N/mm<sup>2</sup> for wood floor bonding (determined with rigid adhesive)  
> 1.2 N/mm<sup>2</sup> for wood block paving (determined with rigid adhesive)

**Sika Primer MB is used to improve the surface strength. In case the substrate strength is inadequate then Sika Primer MB is used as substrate strengthener.**

- *Minimum requirements for substrate if strengthened with SikaPrimer MB:*  
0.8 N/mm<sup>2</sup> (pull off) or if not measurable > 8N/mm<sup>2</sup> compressive strength  
for Sika elastic wood floor bonding

### 4.3 Evenness

The evenness is tested with a straight edge laid across two points, the distance between them being measured. The straight edge can be positioned anywhere within the area. The support points must be at least 1 metre away from the corners and 0.5 metres from the edges. The gap between the straight edge and the substrate gives the negative out-of-evenness in mm. The measurement can be taken with a V-head.



Evenness tolerances according to DIN 18202.

| Measuring point distances in metres                                | 0.1 | 1 | 4  | 10 | 15 |
|--|-----|---|----|----|----|
| Tolerance in mm for finished floors                                | 2   | 4 | 10 | 12 | 15 |
| Tolerance in mm for higher specification i.e. Dispersion adhesives | 1   | 3 | 9  | 12 | 15 |

The danger of unevenness in the substrate is that cavities can be formed which are acoustically undesirable and can also cause the individual wood pieces or planks to come loose.

There is also a danger that excess adhesive will be applied to compensate for the unevenness. Dispersion adhesives contain water, an excess therefore giving an increased risk that the wood floor will locally shrink and swell. This is why improved evenness is necessary when working with dispersion adhesives.

Sikafloor-Level-25 is used to level out any unevenness. Sikafloor-Level-25 is a one part, polymer modified, self smoothing cementitious screed. Its application thickness is between 5 - 25 mm.

**For more information please refer to the current Product Data Sheets and the current Method Statements.**



## 4.4 Porosity and Roughness

The surface characteristics of the screed should be visually inspected. A very rough, highly textured surface can cause thin points in elastic bonded flooring and will always require a very high consumption of adhesive. The quantity of adhesive applied again requires additional care when working with dispersion adhesives because additional water is being added. At the same time, the surface must not be too smooth for these dispersion adhesives but must have some grip and therefore roughness to ensure good adhesion of the necessary primers, any fillers and the adhesives themselves.

Construction



**Sika Services AG**, Tüffenwies 16, 8048 Zürich, Switzerland  
Phone: +41 44 436 42 45 / Fax: +41 44 436 46 86  
E-Mail: [buehler2.stephan@ch.sika.com](mailto:buehler2.stephan@ch.sika.com)  
[www.sika.com](http://www.sika.com)

## 4.5 Cleanliness

The cleanliness of the screed surface must be visually inspected. In particular, dust, paint, plaster and mortar residues and any adhesive or filler residues must be removed.

Concrete / cement screeds must be ground and thoroughly cleaned with an industrial vacuum.

Anhydrite screeds / Anhydrite floating screeds must be ground and thoroughly cleaned with an industrial vacuum shortly before wood floor bonding starts.



Full surface grinding



Removing dust with an industrial vacuum

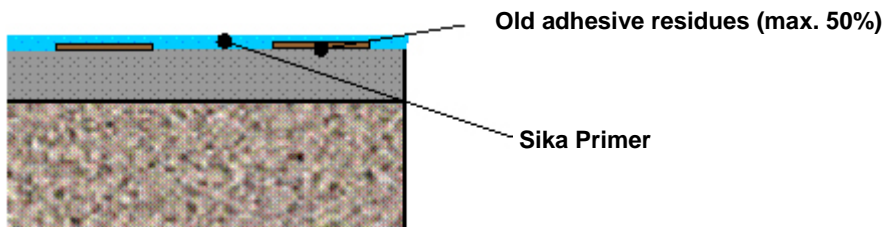


### Dustproof:

If the substrate is still dusty after grinding and vacuum cleaning then SikaGrund P-plus can be applied. SikaGrund P-plus is a one component primer based on a silicate and is diluted with water 1 : 1 for application. Therefore this must then also be allowed to fully dry out.

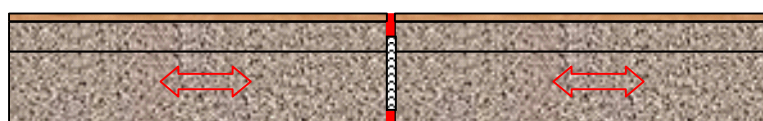
### Adhesion promotion:

It often happens during renovation work that unknown old adhesive residues are present on the screed. At least 50% of these must be removed. Their removal should be done in patches so that they can be sealed in with Sika Primer MB. This is to prevent any plasticizer migration and the new adhesive has a defined substrate to bond to which provides optimum adhesion.



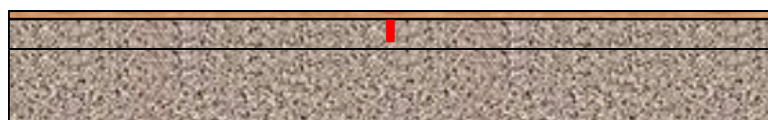
## 4.6 Cracks, movement and dummy joints

The substrate surface should be visually inspected for the presence of cracks. Any cracks should be repaired. *Movement joints* are design joints *through the full thickness of the screed and or subfloor*. Their function is to absorb movement in adjacent structures or to isolate components from each other and they must be of constant width and run straight. Movement joints are installed, for example, over building joints, in underfloor heated flooring systems, and in large areas to divide spans and as the edge joints for screeds. To allow for movement in the adjacent structures, **movement joints must not be closed off but must continue in the same width in the screed and the wood floor.**



**Movement joint**  
(Goes through the structure)

“Construction joints” or “day joints” should be treated like shrinkage cracks. The depth of these cuts is usually about 1/3 the thickness of the screed and their function is to reduce the shrinkage stress that can occur when the screed is drying out, by design cracking. These joints therefore act as a predetermined breaking point. Construction joints are normally filled and sealed after the subfloor has hardened and cured. Cuts are made at right angles to the joint and then these are grouted with Sikadur-31 epoxy mortar.



**Construction joint**  
(Cuts about 1/3 of the screeds thickness)



Joint with filler material



Sealing with Sikadur-31 / 33



For more information please refer to the current Product Data Sheets.

## 4.7 Edge insulating strips



Check for the presence of an edge insulating strip overlapping the edge of the screed which ensures that the edge gap is maintained.

## 4.8 Temperature and atmospheric conditions in the room

The room temperature and relative humidity of the room should be checked with suitable instruments. The **air temperature** should be **15°C minimum** (~+20°C with subfloor heating) and the relative humidity not more than 75%, preferably 65% or less. Wood surface temperature must not exceed +27°C. Low temperatures and high humidity reduce the setting rate of installation materials when dispersion adhesives are used and in extreme cases can totally prevent their operation. Therefore the above conditions must also be maintained after laying. Unsuitable temperature and atmospheric conditions must be remedied by the prompt installation of suitable heaters and/or dehumidifiers. Unheated rooms should be heated for at least three days in winter before starting to lay the floor.

Unlike dispersion adhesives, Sika polyurethane elastic adhesives need moisture to cure. The humidity should be between 40% and about 70%. The lower figure is to ensure sufficiently rapid curing and the higher figure prevents excessive moisture absorption and swelling of the wood floor.

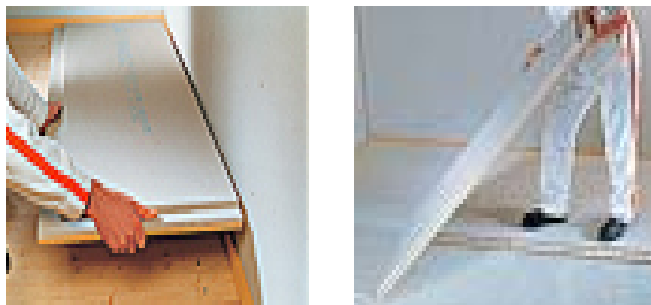
Wood floor has to be protected from negative moisture influences (e. g. wall papering, painting etc....)

Before wood floor installation the room should have the final climate!

Wood has to be acclimated to the final climate in the room before installation

## 5. Special substrates

### 5.1 Dry screed systems



### 5.2 Dry screeds/precast screeds

Dry screeds and precast screeds are subfloors which are assembled and constructed on site from precast slab sections. The sections are fixed together by tongued and grooved gluing, screw fixing and if necessary bonding through a stepped rebate or staggered bond of two or more slab layers. These slabs can often be used and covered immediately after laying.

In terms of the installation system, a distinction is made between bonded or floating installation of the precast screed elements.

Only wood based panels are normally bonded to the substrate by screw fixing to floor battens or joists.

For wood floor bonding the floating precast screed systems must be thick enough to prevent the structure lifting during climatic variations, and according to the type and size of the wood.

### 5.3 Plasterboard/gypsum fibre board

Plasterboard consists of gypsum, fibre for reinforcement and a shell of cardboard or paper which is mainly responsible for the stability of the board. Gypsum fibre board consists of gypsum and a comparatively high cellulose fibre content for reinforcement. These boards are *water-sensitive and their strength is reduced by water*. This is a *problem when they are combined with flooring systems which develop high stresses (e.g. wood flooring)*. A primer is often necessary to bind existing gypsum dust. Plasterboard and gypsum fibre board are not particularly suitable for use with wood flooring systems and *must be approved by their manufacturer for this purpose*. These boards and cement fibre boards have a much lower flexural rigidity than wood based panels. *Only highly dimensionally stable woods should ever be full surface bonded. In this case the minimum fibre board thickness must also be 25 mm.*

## 5.4 Cement fibre board

Cement fibre boards consists of cement, fillers and fibres for reinforcement. Cement fibre boards have a higher weight per unit area than plasterboard or gypsum fibre board. Old cement fibre board may contain asbestos fibre. Cement fibre board *is not moisture sensitive and forms an absorbent substrate.*



Structure of cement fibre board

## 5.5 Wood based panels

Wood based panels consist mainly of wood chips or wood components of various sizes and a binder. The moisture content must be measured by the Darr method, as electrical measurements are not usually conclusive due to the different binders used.

### Chipboard:

Chipboard of the V100 type is recommended for flooring works, and the use of type V20 chipboard is subject to considerable constraints. The designation V100G-E1 stands for a type of panel protected against mould growth ("G") and classified for comparatively low formaldehyde emissions ("E1"). Chipboard has a non-homogeneous structure – in the two outer layers are finer chips packed more densely and in the middle are coarser chips packed quite loosely. Chipboard is suitable for flooring works due to its evenness and absorbency.

### OSB:

OSB (Oriented Strand Boards) has coarser chips than chipboard and the chips in the top layers are at right angles to those in the middle layer. The binder content is lower than in chipboard due to the coarser chips. The size of the chips produces a rougher surface texture and better *mechanical characteristics than chipboard*. **Gluing of two boards with a minimum nominal thickness of 13 mm and preferably 16 mm is recommended for chipboard and OSB on which wood flooring is to be bonded.** OSB is rather more flexurally rigid than chipboard.

### Cementitious chipboard:

In contrast to the organic polymers in chipboard and OSB, cement is the binder in cementitious chipboard. For use as a floor board, the cementitious chipboard is ground and tongued and grooved. A minimum thickness **of 20 mm** is recommended for cementitious chipboard.

## 6. Description of different substrates

### 6.1 Concrete floors

A concrete floor is a monolithic, self-supporting building element. It acts as a floor slab or ceiling slab in the building and is used as the substrate for the screed. In some cases it can support flooring systems directly. If it is to be covered directly, the following points should be considered:

- Typical thickness around 20 cm
- Extremely long drying times
- Retarded shrinkage behavior
- No thermal or acoustic insulation in some cases
- **No moisture barriers, risk of post-installation moisture**

### 6.2 Concrete

Concrete consists mainly of cement, aggregate and water. Concrete is characterised by coarser aggregates than a cement screed.

Typical aggregates are:

- Round aggregate with a particle diameter of 0 to 32 mm (sand and gravel)
- Crushed aggregate is used in some concretes (diameter 4 to 32 mm).
- Finest grain with 0 to 0.125 mm diameter. For concrete with high wear resistance, natural or synthetic granular materials are used for the aggregate, e.g. granite, quartzite, corundum, silicon carbide. Concrete for areas other than floors or ceilings may contain a variety of other aggregates (lightweight concrete, fibre-reinforced concrete, heavyweight concrete). The concrete properties are also influenced by a range of additives. These are called concrete admixtures or concrete additives and have a chemical or physical action (plasticizers, flow agents, air entrainers, retarders, accelerators, stabilisers, pigments). Some additives are only added to the surface of the fresh concrete (curing agents). Concrete can be expected to have an accumulation of additives and salts on the surface. Vacuum concrete is produced by extracting surplus water by applying a vacuum to the surface of the fresh concrete.

The following points should be considered before flooring works:

- The surface must generally be separately pretreated (mechanically) beforehand.
- Concrete dries much more slowly than a cement screed because it is thicker and its structure is denser.



## 6.3 Screed systems

The purpose of screed systems is to level existing subfloors and raise them to the necessary height. Screeds can be laid floating, on an underlay or as a monolith. The right type depends on the subsequent requirements for the finished floor system.

## 6.4 Cement screeds

Cement screeds consist mainly of cement, screed aggregate (sand, gravel, chippings, with a particle diameter of 0 to 8 mm for screeds up to 40 mm thick), water and additives if required (see concrete). Granolithic screeds are cement screeds with aggregates from granular materials (granite, corundum, silicon carbide, etc) which are formed in one or two layers (one layer of cement screed and one of granolithic screed). They are used for very high wear and surface strength specifications in industrial buildings – as are the Sikafloor range of dryhakes. The finish of these systems can be impermeable, wear resistant and/or non slip dependent on their intended exposure and use. *A material characteristic of cement screeds is shrinkage during setting and hardening.* This can be followed by deformation and cracking. Cement screeds based on standard cements are *not normally moisture sensitive and have good absorbency.*

### 6.4.1 Conventional cement screeds

A plastic/semi-dry screed mortar is installed for a conventional cement screed. After spreading, the surface is fully compacted by machine if possible, floated and then smoothed as soon as the screed surface is just slightly moist. To prevent water or mortar fines accumulating on the surface, smoothing should be kept to an absolute minimum, otherwise a powdery surface with poor wear resistance will be obtained. For the same reason the surface must not be sprayed with water or sprinkled with cement to make floor slab finishing easier.

### 6.4.2 Cement self-levelling screeds

A flowable, largely self-levelling screed mortar is installed for a cement self-levelling screed. This screed is compacted and levelled with a trowel or squeegee. It is not smoothed or floated. When applying, it is particularly important have the correct mixing ratio to prevent material leaching from the screed surface and the aggregate settling.



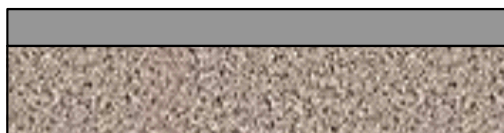
### 6.4.3 Accelerated cement screeds

Accelerated cement screeds use special quick-setting cement binders. These set very quickly and integrate the mixing water quantitatively. The result is that these screeds are walkable and also ready for covering within a very short time (1 to 3 days). The screed mortars can be semi-dry, plastic or flowable, i.e. largely self-levelling. Quick-setting cement binders must not be mixed with other cements. The manufacturer's information on installation, readiness for covering and testing of the readiness must be strictly followed. Other systems sometimes marketed as accelerated screeds are based on "standard" cements. By adding special additives to the mortar, they can be ready for covering after 1 to 2 weeks. Unless otherwise stated in the additive manufacturer's instructions, they should be tested like standard cement screeds.

#### Installation of screeds:

##### Monolithic screeds:

Monolithic screeds are bonded directly to the load-bearing substructure and are used to level existing subfloors and raise them to a specific height. They are capable of taking heavy loads and are standard nowadays for industrial use.



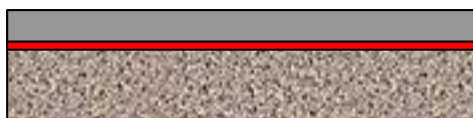
Screed  
Concrete slab

The following points should be considered before flooring works:

- No moisture barrier, so post-installation moisture from the substrate is possible
- No thermal and impact sound insulation

##### Screeds on underlay:

Screeds on an underlay are applied onto the load-bearing substrate on an adhesion-inhibiting intermediate layer - the underlay - of bitumen paper or board, oiled paper or plastic film. The difference from a monolithic screed is that this method prevents the horizontal transfer of force from the screed to the concrete floor, otherwise it has the same properties and applications. The underlay can also act as a moisture or vapour barrier.



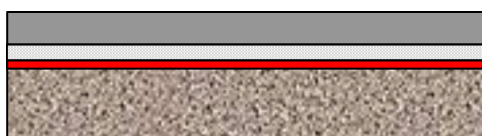
Screed  
Underlay  
Concrete slab

The following points should be considered before flooring works:

- Dependent on the type of underlay, there may be no moisture barrier, in which case post-installation moisture from the substrate is possible
- No thermal and impact sound insulation

### **Screeds on a layer of insulation:**

Screeds on a layer of insulation are also called “floating screeds” and are applied on top of insulation. Unlike the screeds described above, they must be a unit capable of withstanding the static load. This screed system guarantees good acoustic and thermal insulation and is typically used in housing. The insulating layer consists of materials providing thermal and acoustic insulation such as glass or rock wool mats, plastic foam or cork tiles and an underlay of plastic sheet or suitable paper on top. Vapour barriers made of PVC or polythene sheet or suitable bitumen board can also be installed. To provide noise protection, the self-supporting screed system must be isolated from the surrounding components. Edge insulating strips, usually made of plastic foam, are used for this.



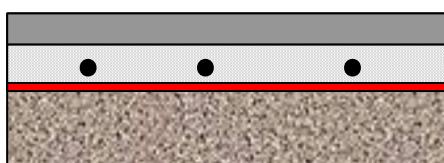
**Screed  
Insulation  
Underlay  
Concrete slab**

The following points should be considered before flooring works:

- In situations with no moisture barrier, post-installation moisture from the substrate is possible
- Edge insulating strip missing or not overlapping enough

### **Heating screeds on layer of insulation:**

Heating screeds on a layer of insulation also have heating elements built into the structure. These screeds therefore provide heating or underfloor heating. The different systems available are electric heating and hot water heating. With electric underfloor heating, wire mesh is generally built into or bonded to the surface of the load spreading layer (screed). The manufacturers must be asked in advance about the suitability of flooring systems for laying on electrically heated floors. Hot water heating systems are differentiated by the position of the water pipes in the screed structure.



**Insulation underlay con. slab**

The following points should be considered before flooring works:

- In situations with no moisture barrier, post-installation moisture from the substrate is possible
- Edge insulating strip missing or not overlapping enough
- No preheating specification or periods and/or missing measuring points



## 6.5 Anhydrate / Calcium sulphate screeds

Calcium sulphate based screeds consist of a gypsum (calcium sulphate dihydrate) forming binder (natural anhydrite, synthetic anhydrite, thermal anhydrite, REA anhydrite, alpha semi hydrate or mixtures of these), aggregate (see above for cement screed), water and additives. When calcium sulphate screeds set, they **remain largely dimensionally stable and therefore enable large jointless areas to be installed. Calcium sulphate screeds are generally moisture sensitive.**

### 6.5.1 Conventional anhydrite / calcium sulphate screeds

Conventional calcium sulphate screeds are laid and worked in a semi-dry or plastic consistency like conventional cement screeds (see above). Conventional calcium sulphate screeds have good absorbency.

### 6.5.2 Self-levelling anhydrite / calcium sulphate screeds

A flowable, largely self levelling screed mortar is used for these calcium sulphate screeds. This screed is compacted and levelled with a squeegee. It is not smoothed or floated. Special care must be taken to ensure the correct mixing ratio to prevent leaching to the screed surface and settling of the aggregate. The absorbency of poured screeds and the general moisture sensitivity of this material must be taken into account when laying flooring systems.

### 6.5.3 Magnesite screeds

Magnesite screeds consist of caustic magnesite, aggregate (sand, wood chips, wood fibre) and an aqueous solution of salts of bivalent alkaline-earth metals - generally magnesium chloride – with the addition of suitable additives (pigments) if required. Magnesite screeds are moisture sensitive and must not be exposed to permanent moisture stress. Therefore a magnesite screed, particularly the monolithic type, must not be sealed with vapour-proof flooring if there is no vapour barrier or seal in the substrate and rising damp can be expected. A vapour barrier is not normally necessary under a monolithic magnesite screed. Xylolite screeds have good absorbency. Inorganic filled magnesite screeds are also very absorbent if there is no surface treatment.

Magnesite screeds remain largely dimensionally stable when setting, enabling large jointless areas to be laid. Due to their high strength and low density, they are frequently used for renovations in old buildings. Depending on the structure, vapour-proof flooring or surface installations must not be used when laying flooring. Direct use of aqueous dispersion products can also cause problems and an intermediate vapour-proof primer and filler is often necessary. Existing coatings may reduce adhesion and should be removed.



#### 6.5.4 Mastic asphalt screeds

Mastic asphalt is a dense mixture (density approx. 2.6 kg/l) - pourable and coatable when hot (ca. 220 to 250°C) - of bitumen (road surfacing, high vacuum or solid grade), aggregate (mixture of chippings and/or gravel, natural sand and/or quarry sand and rock dust, particle size graded and low in voids) and additives (natural asphalt, polymers etc.). The structure is dense and without voids. The surface of the fresh, **still hot mastic asphalt screed is sanded off** and does not require a curing time, it only needs to cool and can then be used or laid with flooring. Mastic asphalt screeds are often used in renovation because of their low thickness and resultant low weight per unit area. Mastic asphalt screeds do not contain water and unless cracks are present they are vapour-proof and non-absorbent. **To improve the adhesion and prevent migration, Sika Primer MB must be used.** If an absorbent substrate is required for follow-on works, filling is necessary. Due to the thermoplastic characteristics of mastic asphalt screeds, they need a very wide edge gap ("double edge strip"). If old mastic asphalt screeds have no sanding off or it has been removed (particularly during repairs), further sanding off must be applied (e.g. with Sika Primer MB, a reactive resin primer) or a filler must be used after the keying primer. Cementitious fillers should not be more than 3 to 5 mm thick.

## 6.5.5 Timber boarded floors

Timber boarded floors have various structures:



• Boards screwed/nailed directly to floor joists



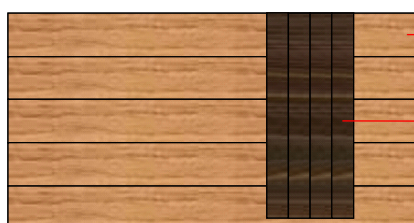
• Boards screwed /nailed to floor battens.



The battens sit typically on impact sound insulating strips. Concrete floors are covered with bitumen sheets. Thermal insulation is installed between the floor battens, sometimes in bulk filler form. Slag, sand, pumice etc. are sometimes used as fillers for these gaps in old buildings. The boards are generally of softwood or more rarely of oak. In old buildings they are butt jointed and are generally the length of the room.

The following points should be considered before flooring works:

- Boards which give under load, bounce or are loose must be firmly fixed.
- Venting and back ventilation of the timber structure must be guaranteed after the floor laying works.
- The new wood floor should be laid at a 90° direction to that of the existing floor.



Existing floor

New floor installed 90° to ex. floor