

Sikafloor®-81 EpoCem®

3-part cement and epoxy combination mortar for self-smoothing floor screeds of 1.5 to 3 mm

Product Description

Sikafloor®-81 EpoCem® is a three part, epoxy modified cementitious, fine textured mortar for self smoothing floor screeds in thin layers of 1.5 to 3 mm.

Uses

As a Temporary Moisture Barrier (TMB) (min. 2 mm thick) under Epoxy, Polyurethane and PMMA resin floors, over high moisture content substrates, even green concrete.

As a self-smoothing screed for:

- Levelling or patching horizontal concrete surfaces, in new work or repairs, particularly in aggressive chemical environments
- Floor topping on non ventilated damp substrates without particular aesthetic requirements
- Levelling layer under Epoxy, Polyurethane and PMMA* floor coatings / screeds, tiles, sheet floors, carpets or wooden floors
- Repair and maintenance of monolithic and vacuum concrete floors

Extended with quartz sand, as a patching and repair mortar:

- Under Epoxy, Polyurethane and PMMA floor coatings / screeds

Designed for use on cementitious substrates.

* See Notes on Application / Limitations

Characteristics / Advantages

- Can be top coated with resin based floors after 24 hours (+20°C, 75% r.h.)
- Prevents osmotic blistering of resin based coatings over damp substrates
- Economical and fast, easy application
- Good levelling properties
- Impervious to liquids but permeable to water vapour
- Frost and de-icing salt resistant
- Good chemical resistance
- Thermal expansion properties similar to concrete
- Excellent bond to green or hardened concrete whether damp or dry
- Excellent early and final mechanical strengths
- Excellent resistance to water and oils
- Ideal preparation for smooth surface finishes
- For internal or external use
- Contains no solvents
- Will not corrode reinforcement steel

Construction



Tests

Approval / Standards

Test report A-27'625-1 dated 8/09/2004 by LPM AG, CH-5712 Beinwil am See. Abrasion Resistance.

Test report A-20'235-1E dated 12/05/2000 by LPM AG, CH-5712 Beinwil am See Thermal expansion coefficient, Carbon dioxide diffusion coefficient, Water vapour diffusion coefficient, Water absorption coefficient, Bond strength, Freeze / Thaw - De-icing salt resistance BE-II, E-Modulus.

Test report, Ref. 04 1706 dated 29/11/2004 by MPA Dresden GmbH Fire rating.

Conforms to the requirements of EN 13813: 2002 as CT - C50 - F10 - A9.

Product Data

Form

Appearance / Colours

Part A - resin: white liquid
Part B - hardener: transparent yellowish liquid
Part C - filler: natural grey aggregate powder

Colour: light grey
Finish: matt

Packaging

Prebatched 23 kg units.

Part A: 1.14 kg plastic bottle
Part B: 2.86 kg plastic jerrycan
Part C: 19.00 kg plastic lined double paper bags

Storage

Storage Conditions/ Shelf-Life

Part A, part B: 12 months
Part C: 9 months

From date of production if stored in original, unopened and undamaged sealed packaging, in dry conditions at temperatures between +5°C and +30°C.

Part A, part B: Protect from frost
Part C: Protect from humidity

Technical Data

Chemical Base

Epoxy modified cementitious mortar.

Density

Part A: ~ 1.05 kg/l (at +20°C)
Part B: ~ 1.03 kg/l (at +20°C)
Part C: ~ 1.72 kg/l (at +20°C)

Parts A+B+C mixed: ~ 2.10 kg/l (at +20°C)

Layer Thickness

1.5 mm min. / 3.0 mm max.

If Sikafloor®-81 EpoCem® is used as a Temporary Moisture Barrier (TMB), a minimum of 2 mm must be applied.

Thermal Expansion Coefficient

$\alpha \approx 15.1 \cdot 10^{-6}$ per °C (EN 1770)
(Temperature range: -20°C to +60°C)

Carbon Dioxide Diffusion Coefficient (μCO_2)

$\mu\text{CO}_2 \approx 4168$ (Klopfer / Engelfried Method)
Carbonation resistance for 3 mm thickness: $R \approx 12.5$ m

Water Vapour Diffusion Coefficient ($\mu\text{H}_2\text{O}$)

$\mu\text{H}_2\text{O} \approx 252$ (DIN 52 615)
Equivalent Air layer depth for 3 mm thickness: $S_d \approx 0.75$ m

Water Absorption Coefficient W

$W \approx 0.02 \text{ kg/m}^2 \times \text{h}^{0.5}$ (DIN 52 617)

Fire Rating

Class A2_(fl) (EN 13501-1)

Service Temperature

-30°C to +80°C for continuous exposure.

Mechanical / Physical Properties

Compressive Strength

(EN 13892-2)

	+23°C / 50% r.h.
1 day	~ 15 N/mm ²
7 days	~ 50 N/mm ²
28 days	~ 60 N/mm ²

Flexural Strength

(EN 13892-2)

	+23°C / 50% r.h.
1 day	~ 5.8 N/mm ²
7 days	~ 11.1 N/mm ²
28 days	~ 14 N/mm ²

Bond Strength

4.1 N/mm² after 28 days at +20°C and 50% r.h.
(100% concrete failure)

(EN 13892-8)

Freeze / Thaw / De-Icing Salt Resistance BE II

Resistance factor WFT-L 98% (High)

D-R (SN / VSS 640 461)

E-Modulus

Static:

~ 19.9 kN/mm² (at +20°C)
~ 23.2 kN/m² (at -20°C)

(SIA 162/1 Test n° 3)

Abrasion Resistance

11.9 cm³ / 50 cm² and 2.4 mm
(Böhme abrasion)

(EN 13892-3)

Resistance

Chemical Resistance

The Sikafloor® EpoCem® product range has improved chemical resistance over plain concrete in aggressive environments, but is not designed as a chemical protection. For specific chemical resistance, always overcoat with a suitable product of the Sikafloor® range. For occasional exposure or spillages, please consult.

System Information

System Structure

The system configuration as described must be fully complied with and may not be changed.

Primer indicated below is suitable for each of these substrates:

Green concrete (as soon as mechanical preparation is possible)

Damp concrete (> 14 days old)

Damp aged concrete (rising moisture)

Levelling screed for medium substrate roughness:

Layer thickness: 1.5 - 3 mm

Primer: Sikafloor®-155 WN

Topping: Sikafloor®-81 EpoCem®

Application Details

Consumption / Dosage

Primer:

Sikafloor®-155 WN (parts A+B), thinned with 10% water, ~ 0.3 - 0.5 kg/m² dependent on the substrate conditions, when repairing monolithic or vacuum concrete, or without a broadcast finish or when Sikafloor®-81 EpoCem® is over coated with itself.

Self smoothing screed:

Sikafloor®-81 EpoCem® ~ 2.25 kg/m²/mm

~ 4.5 kg/ m² for a 2 mm thick application (minimum for T.M.B)

These figures are theoretical and do not allow for any additional material due to surface porosity, surface profile, variations in level or wastage, etc.

Substrate Quality

The concrete substrate must be sound and of sufficient compressive strength (minimum 25 N/mm²) with a minimum pull off strength of 1.5 N/mm².

The substrate can be damp but must be free of standing water and free of all contaminants such as oil, grease, coatings and surface treatments etc.

Substrate Preparation

Concrete substrates must be prepared mechanically using abrasive blast cleaning or scarifying equipment to remove cement laitance and achieve an open textured surface.

Weak concrete must be removed and surface defects such as blow holes and voids must be fully exposed.

Repairs to the substrate, filling of blowholes/voids and surface levelling must be carried out using appropriate products from the Sikafloor®, Sikadur® and Sikagard® range of materials.

High spots can be removed by grinding.

All dust, loose and friable material must be completely removed from all surfaces before application of the product, preferably by brush or vacuum.

Application Conditions / Limitations

Substrate Temperature +8°C min. / +30°C max.

Ambient Temperature +8°C min. / +30°C max.

Substrate Moisture Content Can be applied on green or damp concrete, without any standing water.

Relative Air Humidity 20% min. / 80% max.

Dew Point Beware of condensation!

The substrate and uncured floor temperature must be at least 3°C above the dew point to reduce the risk of condensation or blooming on the floor finish.

Application Instructions

Mixing

Part A : part B : part C - packing size : 1.14 : 2.86 : 19 kg

Flooring Screed:

At temperatures between +12°C to +25°C:

1 : 2.5 : 17 (by weight)

Parts (A+B) : C = 4 kg : 19 kg

At temperatures between +8°C to +12°C and +25°C to +30°C:

The amount of Part C can be reduced to 18 kg in order to improve workability.

Never reduce Part C by more than this amount.

1 : 2.5 : 15.8 (by weight)

Parts (A+B) : C = 4 kg : 18 kg

Extended mortar mix. Repair mortar:

To repair surface irregularities and holes 3 to 5 cm in diameter and deeper than 3 mm and up to 9 mm the standard Sikafloor®-81 EpoCem® mix can be extended with dry quartz sand.

For each 23 kg unit of Sikafloor®-81 EpoCem® prepared as indicated below, add:

Sikadur®-509 (quartz sand 0.7 - 1.2 mm) 5 - 10 kg and

Sikadur®-510 (quartz sand 2.0 - 3.0 mm) 5 - 10 kg

Final mix will be : 33 - 43 kg

For this application, to achieve a good bond of the mortar to the substrate, SikaTop®-Armatec®-110 EpoCem® must be used as bonding bridge. Apply the mortar wet on wet to the primer.

Mixing Time

Prior to mixing, shake part A (white liquid) briefly until homogenous, then pour into container of part B and shake vigorously again for at least 30 seconds. When dosing out of drums, stir and homogenise first.

Pour the mixed binder mixture (A+B) into a suitable mixing container (capacity of about 30 litres) and gradually add part C to the mixer while stirring with a power mixer. Mix thoroughly for 3 minutes until a uniform mix has been achieved.

When dosing with additional aggregates, add them after adding part C to the mix.

Mix thoroughly for 3 minutes until a uniform mix has been achieved.

Mixing Tools

Mix using a slow speed electric mixer (300 - 400 rpm) with helical paddle or other suitable equipment.

Recommended are single or counter rotating double mortar (basket type) and forced action (pan type) mixers. Free fall mixers must not be used.

Application Method / Tools

Place mixed Sikafloor®-81 EpoCem® onto the primed substrate and spread evenly to the required thickness uniformly with a rubber or metal trowel or spatula and immediately roll with a spike roller to remove entrapped air and obtain an even thickness layer.

Workability can be adjusted by varying slightly the amount of part C. See "Mixing" above.

Do not use additional water, which would disturb the surface finish and cause discolouration.

A seamless finish can be achieved if a 'wet' edge is maintained during application.

Cleaning of Tools

Clean all tools and application equipment with water immediately after use. Hardened / cured material can only be removed mechanically.

Potlife

23 kg unit

Temperature / r.h. 75%	Time
+10°C	~ 40 minutes
+20°C	~ 20 minutes
+30°C	~ 10 minutes

**Waiting Time /
Overcoating**

Before applying Sikafloor®-81 EpoCem® on Sikafloor®-155 WN allow:

Substrate temperature	Waiting time	
	Minimum	Maximum
+10 °C	24 hours	48 hours
+20 °C	12 hours	24 hours
+30 °C	8 hours	12 hours

Sikafloor®-81 EpoCem® can be overcoated with vapour tight coatings when the surface humidity falls below 4%! Not earlier than :

Substrate temperature	Waiting time
+10 °C	2 days
+20 °C	1 day
+30 °C	1 day

Note: Successive coats of Sikafloor®-81 EpoCem® must be applied after priming with Sikafloor®-155 WN and allowing at least the minimum times indicated above between applications.

Times are approximate at 75% r.h. and will be affected by changing ambient and substrate conditions, particularly temperature and relative humidity.

**Notes on Application /
Limitations**

If Sikafloor®-81 EpoCem® is used as TMB (Temporary Moisture Barrier), a layer of a minimum 2 mm thick must be applied. (~ 4.5 kg/m²)

Always ensure good ventilation when using Sikafloor®-81 EpoCem® in a confined space to remove excess moisture.

Freshly applied Sikafloor®-81 EpoCem® must be protected from damp, condensation and water for at least 24 hours.

For external applications, apply primer and Sikafloor®-81 EpoCem® on a falling temperature. If applied during rising temperatures "pin holing" can occur.

External applications under extreme conditions (high temperature and low humidity) which can cause fast drying of the product must be avoided as the product does not allow the use of curing compounds.

Under no circumstances add water to the mix.

Non moving construction joints require pre-treatment with a stripe of primer and Sikafloor®-81 EpoCem®. Treat as follows:

Static Cracks: Prefill and level with Sikadur® or Sikafloor® epoxy resin.

Dynamic Cracks (> 0.4mm): To be assessed on site and if necessary apply a stripe coat of elastomeric material or design as a movement joint.

The incorrect assessment and treatment of cracks can lead to a reduced service life and reflective cracking.

Colour variations can occur on unsealed Sikafloor®-81 EpoCem® through exposure to direct sun light. This however, will not adversely influence the mechanical properties.

When overlaying with PMMA screeds, the surface of Sikafloor®-81 EpoCem® must be fully broadcast with sand 0.4 - 0.7 mm

Curing Details**Applied Product ready
for use**

Temperature	Foot traffic	Light traffic	Full cure
+10 °C	~ 24 hours	~ 3 days	~ 14 days
+20 °C	~ 15 hours	~ 2 days	~ 7 days
+30 °C	~ 7 hours	~ 1 day	~ 4 days

Note: Times are approximate and will be affected by changing ambient and substrate conditions.

**Cleaning /
Maintenance**

Methods

Due to the texture of its surface, Sikafloor®-81 EpoCem® is not suitable to be used as wearing layer where easy staining can occur. A seal coat of the Sikafloor® range with suitable cleaning capabilities is advisable.

Remove dirt using a brush and/or vacuum. Do not use wet cleaning methods until the product is fully cured.

Do not use abrasive methods or cleaners.

Value Base

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

Local Restrictions

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

**Health and Safety
Information**

For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

Legal Notes

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

CE Labelling

The harmonized European Standard EN 13 813 „Screed material and floor screeds - Screed materials - Properties and requirements“ specifies requirements for screed materials for use in floor construction internally.

Structural screeds or coatings, i.e. those that contribute to the load bearing capacity of the structure, are excluded from this standard.

Resin floor systems as well as cementitious screeds fall under this specification. They have to be CE-labelled as per Annex ZA. 3, Tables ZA. 1.1 or 1.5 and Z.A. 3.3 and fulfil the requirements of the given mandate of the Construction Products Directive (89/106):

CE	
Sika Limited Watchmead Welwyn Garden City Hertfordshire AL7 1BQ United Kingdom	
05 ¹⁾	
EN 13813 CT - C50 - F10 - A9	
Cementitious screed material for indoors in buildings (systems as per Product Data Sheet)	
Reaction to fire:	A2 _(fl)
Release of corrosive substances (Cementitious Screed):	CT
Water permeability:	NPD ²⁾
Water vapour permeability	NPD
Compressive strength	C50
Flexural strength	F10
Abrasion:	A9
Sound insulation:	NPD
Sound absorption:	NPD
Thermal resistance:	NPD
Chemical resistance:	NPD

¹⁾ Last two digits of the year in which the marking was affixed.

²⁾ No performance determined



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