Construction

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 (+20ºC, 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

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.

Product Data

Form

Appearance / Colours	Part A - resin: Part B - hardener: Part C - filler:	white liquid translucent yellowish liquid natural grey aggregate powder
	Colour:	light grey
	Finish:	matt
Packaging	Prebatched 20.5 kg x 4units.	
	Part A: Part B: Part C:	1 kg x 4 plastic bottle 2.5 kg x 4 plastic jerrycan 17.0 kg x 4 bags

Storage

Storage Conditions/ Shelf-Life	Part A, Part B: Part C:	6 months 6 months
	From date of production if stored in original, unopened and undamaged sealed packaging, in dry conditions at temperatures between +5°C and +35°C.	
	Part A, part B: Part C:	Protect from frost Protect from humidity

Technical Data

Chemical Base	Epoxy modified cementitious mortar.	
Density	Part A: Part B: Part C:	~ 1.08 kg/l (at +27°C) ~ 1.04 kg/l (at +27°C) ~ 1.49 kg/l (bulk density)(at +27ºC)
	Parts A+B+C mixed:	~ 2.18 kg/l (at +27°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	$\alpha \approx 15.1*10^{-6}$ per °C (Temperature range: -20°C to +60°C)	(According to EN 1770)
Carbon Dioxide Diffusion Coefficient ($\mu C0_2$)	$\mu C0_2 \approx 4168$ Carbonation resistance for 3 mm thickness: R ≈ 12.5 m	(According to Klopfer / Engelfried Method)
Water Vapour Diffusion Coefficient (μH_20)	$\mu H_20 \approx 252$ Equivalent Air layer depth for 3 mm thickness: Sd ≈ 0.75 m	(According to DIN 52 615)
Water Absorption Coefficient W	$W \approx 0.02$ kg/m^2 x h$^{0.5}$	(According to DIN 52 617)
Fire Rating	Class $A2_{(fl)}$	(According to EN 13501-1)
Service Temperature	0°C to +80°C for continuous exposure.	

Mechanical / Physical Properties

Compressive Strength (According to IS 9162 - 1979)

	+27ºC / 85 % r.h.
1 day	~ 25 N/mm^2
7 days	~ 40 N/mm^2
28 days	~ 60 N/mm^2

Flexural Strength (According to IS 9162 - 1979)

	+27ºC / 85 % r.h.
1 day	~ 8.6 N/mm^2
7 days	~ 14.8 N/mm^2
28 days	~ 18 N/mm^2

Bond Strength
4.1 N/mm^2 after 28 days at +20ºC and 50% r.h. (According to EN 13892-8)
(100% concrete failure)

E-Modulus
Static:
~ 19.9 kN/mm^2 (at +20ºC) (According to SIA 162/1 Test nº 3)
~ 23.2 kN/mm^2 (at -20ºC)

Abrasion Resistance
~ 0.7mm thickness loss (According to IS 1237 – 1980 and IS 9162 - 1979)

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 Sika® representative.

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 / Sikafloor®-80 Primer
Topping: Sikafloor®-81 EpoCem®

Application Details

Consumption / Dosage
Primer:
Sikafloor®-155 WN / Sikafloor®-80 Primer (parts A+B)~ 0.3 - 0.5 kg/m^2 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/m^2/mm
~ 4.5 kg/ m^2 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 20 N/mm^2) with a minimum pull off strength of 1.5 N/mm^2. 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. If in doubt, apply a test area first.
Substrate Preparation	Concrete substrates must be prepared mechanically using abrasive blast cleaning,, scarifying or grinding 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. / +35°C max.
Ambient Temperature	+8°C min. / +35°C max.
Substrate Moisture Content	Can be applied on green or damp concrete, without any standing water.
Relative Air Humidity	30% 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 =1: 2.5 : 17(by weight)
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

20.5 kg mass

Temperature / r.h. 75%	Time
+15°C	~ 60 minutes
+25°C	~ 35 minutes
+35°C	~ 20 minutes

Waiting Time / Overcoating

Before applying Sikafloor®-81 EpoCem® on Sikafloor®-155 WN / Sikafloor®-80 Primer allow:

	Waiting time	
Substrate temperature	Minimum	Maximum
+10°C	12 hours	24 hours
+20°C	6 hours	12 hours
+30°C	4 hours	6 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 / Sikafloor®-80 Primer 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/m^2)

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.

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

Static : Prefill and level with Sikadur® or Sikafloor® epoxy resin.
Dynamic (> 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

Construction

Applied Product ready for use

Temperature	Foot traffic	Light traffic	Full cure
+30°C	~ 24 hours	~ 2 days	~7 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.

Health and Safety Information

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

Legal Notes

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