

Sikafloor®-81 EpoCem®

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

Positioning Description

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

Use

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

Aa 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 where a high aesthetic finish is not required.
- 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.

- Suitable for moisture control (Principle 2, method 2.3 of EN 1504-9)
- Suitable for physical resistance (Principle 5, method 5.1 of EN 1504-9)
- Suitable for restoration work (Principle 3, method 3.1 of EN 1504-9)
- Suitable for preserving or restoring passivity (Principle 7, method 7.1 and 7.2 of EN 1504-9)
- Suitable for increasing resistivity (Principle 8, method 8.3 of EN 1504-9)

* See Note on Application / Limitations

Advantages

- Can be overcoated with resin based coatings after 24 hours (+20°C, 75% r.h.)
- Prevents osmotic blistering of resin based coatings over damp substrates
- Economical and fast, easy application
- Class R4 of EN 1504-3
- 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

Approvals / Standards

- ITT reports for EN 1504-2 Ref. 09/349-963, dated May 6th 2009 and EN 1504-3 Ref. 09/351-965 dated May 4th 2009 by Applus Laboratory, Barcelona, Spain.
- Test report, Ref. 04 1706 dated 29/11/2004 byh MPA Dresden GmbH Fire rating.
- Conforms to the requirements of EN 13813: 2002 as CT – C50 – F10 – A9.
- Conforms to the requirements of EN 1504-2 for principles 2 (MC) and 5 (PR) and 8 (IR) as a coating © as well as to the requirements of EN 1504-3 for principles 3 (CR) and 7 (RP) as R4 mortar.

Construction



Product Data

Appearance	Part A - resin:	White liquid
	Part B - hardener:	Transparent Yellowish liquid
	Part C - filler:	Natural Grey aggregate powder
	Colour:	Light Grey
	Finish:	Matt
Packaging	Pre-batched 23kg units	
	Part A:	1.14kg plastic bottle
	Part B:	2.86kg plastic container
	Part C:	19.00kg plastic lined double paper bags
Storage & Shelf life	Part A, part B:	Twelve (12) months
	Part C:	Nine (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:	~ 1.05kg/l (at +20°C)	
	Part B:	~ 1.03kg/l (at +20°C)	
	Part C:	~ 1.72kg/l (at +20°C)	
	Parts A+B+C mixed:	~2.10kg/l (at +20°C)	
	Layer thickness:	1.5mm minimum, 3.0mm maximum. If Sikafloor®-81 EpoCem® is used as a Temporary Moisture Barrier, (TMB), a minimum of 2mm must be applied.	
Carbon Dioxide Diffusion Coefficient (μCO₂)	μCO ₂ ≈ 4168		(SN EN 1062-6)
	Carbonation resistance for 3 mm thickness: R ≈ 12.5 m		
Fire Rating	Class A2 _(fl) S1		(EN 13501-1)
Service Temperature	-30°C to +80°C for continuous exposure.		

Mechanical / Physical Properties

Requirements Requirements as per EN 1504-3 (Class R4)

	Results (ITT results)	Requirements (R4)	Test Method
Compressive Strength	66.2N/mm ² (MPa)	≥ 45N/mm ² (MPa)	EN 12190
Chloride Ion Content	0.01%	≤ 0.05%	EN 1015-17
Adhesive Bond	3.0N/mm ² (MPa)	≥ 2.0N/mm ² (MPa)	EN 1542
Carbonation Resistance	Pass	Lower than control	EN 13295
Thermal Compatibility Part 1: Freeze-Thaw	2.9N/mm ² (MPa)	≥ 2.0N/mm ² (MPa)	EN 13687-1
Skid resistance	Class III	Class I : > 40 units wet tested Class II : > 40 units dry tested Class III : > 55 units wet tested	EN 13036-4
Coefficient of Thermal Expansion	15.2 *10 ⁻⁶ m/m °C	Declared value	EN 1770
Capillary Absorption	0.07kg*m ⁻² *h ^{-0.5}	≤ 0.5kg*m ⁻² *h ^{-0.5}	EN 13057
Water-vapour transmission rate	S _D = 0.53m Class I	Class I: S _D < 5m Class II: S _D 5m – 50m Class III: S _D > 50m	EN 7783-2
Liquid water transmission rate	0.08kg.m ⁻² .h ^{-0.5}	< 0.1kg.m ⁻² .h ^{-0.5}	EN 1062-3
Impact resistance	24.5Nm	Class I: ≥ 4Nm Class II: ≥10Nm Class III: ≥20Nm	EN ISO 6272-1
Taber Abrasion Resistance	2286mg	< 3000mg	EN ISO 5470-1



Compressive strength: 23°C / 50% r.h.	(Internal test results according to EN 196-1) 1 day ~ 15N/mm ² 7 days ~ 50N/mm ² 28 days ~ 60N/mm ²	(EN 13892-2)						
Flexural strength: +23°C / 50% r.h.	(Internal test results according to EN 196-1) 1 day ~ 5.8N/mm ² 7 days ~ 11.1N/mm ² 28 days ~ 14N/mm ²	(EN 13892-2)						
Freeze/thaw de-icing salt resistance:	Resistance factor WFT-L 98% (High)	(SN / VSS 640 461)						
Slip resistance:	Slip Resistance Values (EN 13036-4)							
	<table border="1"> <thead> <tr> <th>Substrate</th> <th>SRV Dry</th> <th>SRV Wet</th> </tr> </thead> <tbody> <tr> <td>Sikafloor®-81 EpoCem®</td> <td>89</td> <td>65</td> </tr> </tbody> </table>		Substrate	SRV Dry	SRV Wet	Sikafloor®-81 EpoCem®	89	65
Substrate	SRV Dry	SRV Wet						
Sikafloor®-81 EpoCem®	89	65						
Abrasion resistance:	TRRL Pendulum, Rapra 4S Slider 11.9cm ³ / 50cm ² and 2.4mm (Böhme abrasion) (EN 13892-3)							
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.							

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 - 3mm
Primer: Sikafloor®-155 W
Topping: Sikafloor®-81 EpoCem®

Interlayer priming for Sikafloor®-81/82 EpoCem®:
Bonding bridge: Sikafloor®-155 WN

Application Details

Consumption/Dosage:

Primer

Sikafloor®-155 WN (parts A+B), thinned with 10% water: ~ 0.3 - 0.5kg/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 its self.

Self smoothing screed:

Sikafloor®-81 EpoCem®: ~ 2.25kg/m²/mm
~ 4.5kg/m² for a 2mm thick application (minimum for T.M.B.)

Extended mortar mix:

Sikafloor®-81 EpoCem®: ~2.4kgs/ m²/mm

These figures are theoretical and do not include for any additional material required 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 25N/mm²) with a minimum pull off strength of 1.5N/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. If in doubt apply a test area first.



Substrate Preparation	<ul style="list-style-type: none"> 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 Humidity	Can be applied on green or damp concrete, that is free of standing water.
Substrate Moisture Content	Can be applied on green or damp concrete, without any standing water. Although the product can be applied onto green concrete surfaces (>24 hours), it is advised to allow at least 3 days for early shrinkage of concrete to occur in order to prevent concrete shrinkage cracks from appearing on the screed surface.
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 : 19kg

Flooring Screed

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

1:2.5:17 (by weight)

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

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

The amount of part C can be reduced to 18kg 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 = 4kg : 18kg

Extended mortar mix. Repair mortar

To repair surface irregularities and holes 3 – 5cm in diameter and 3-9mm deep 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:

Sika Aggregate 500 (quartz sand 0.7 - 1.2 mm) 5 - 10kg and

Sika Aggregate 501 (quartz sand 2.0 - 3.0 mm) 5 - 10kg

Final mix will be: 33 - 43kg

For this application, to achieve a good bond of the mortar to the substrate, Sikadur-32 must be used as a primer. Apply the mortar wet on wet to the primer.

Mixing Time	<ul style="list-style-type: none"> Prior to mixing, shake part A (white liquid) briefly until homogenous, then pour into the can of part B and shake vigorously again for at least 30 seconds. 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 another 3 minutes until a uniform mix has been achieved.
--------------------	--

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

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



Application Method / Tools

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

Pot life (21kg set)

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

Waiting Time / Overcoatability

Before application of Sikafloor®-81 EpoCem® onto Sikafloor®-155 W allow:

Substrate temperature	Waiting Time	
	Minimum	Maximum
+10°C	12 hours	72 hours
+20°C	6 hours	48 hours
+30°C	4 hours	24 hours

Sikafloor®-81 EpoCem® can be overcoated with vapour tight surface sealers when the surface humidity falls below 4%, but 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. They assume 75% r.h. and will be affected by changing ambient conditions, particularly temperature and relative humidity.

Notes on Application / Limitations

- If Sikafloor®-81 EpoCem® is used as TMB (Temporary Moisture Barrier), a minimum 2 mm thick layer must be applied. (~ 4.5kg/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.
- Under no circumstances add water to the mix.
- Prevent premature drying by protecting from strong wind and do not expose to direct sun light while fresh.
- Apply primer and Sikafloor®-81 EpoCem® on a falling temperature. If applied during rising temperatures "pin holing" can occur.
- 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.
- The TMB effect in Sikafloor®-EpoCem® is limited in time, without additional preparation.
- Always verify the surface moisture content if more than 5-7 days have passed since application.
- Non moving construction joints require pre-treatment with a stripe of primer and Sikafloor®-81EpoCem®. Treat as follows:
 - Static Cracks - Prefill and level with Sikadur or Sikafloor epoxy resin.
 - Dynamic Cracks (> 0.4 mm) - 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 may lead to a reduced service life and reflective cracking.
- Colour deviations can occur on unsealed Sikafloor®-81 EpoCem® through direct sun radiation. 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 0.4-0.7mm.



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 conditions.

**Cleaning / Maintenance
Methods**

- Due to the texture of its surface, Sikafloor®-81 EpoCem® is not suitable to be used as a wearing layer where easy staining may occur. A sealer coat from the Sikafloor range with suitable cleaning capabilities is advisable.
- Remove dirt using a brush and/or vacuum. Do not use wet cleaning methods until product is fully cured.
- Do not use abrasive cleaning systems or equipment.
- Please refer to "Cleaning & Maintenance Recommendations for Sika Floor Installations" for detailed instructions.

Notes

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 Restriction

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 product uses.

Health & Safety Information

Protective Measures

- During application and curing in closed rooms, pits and shafts etc., sufficient ventilation must be provided. Keep away open light including welding.
- Use of basic principles of industrial hygiene, such as rubber gloves, goggles and protective clothing will enable this product to be used safely. Change soiled work clothes and wash hands before eating and after finishing work.
- Local regulations as well as health and safety advice on packaging labels must be observed.

Important Notes

- All technical data stated in this Product Data Sheet are based on laboratory tests.
- Actual data may vary due to changing conditions beyond our control.
- Residues of material must be removed according to local regulations. Fully cured material can be disposed of as household waste under agreement with the responsible local authorities.
- Detailed health and safety information as well as detailed precautionary measures e.g. physical, toxicological and ecological data can be obtained from the material safety data sheet.

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).

	
Sika (NZ) Ltd PO BOX 19192 Avondale Auckland 1746	
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) S1
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

EU Regulation VOC - Decopaint Directive

According EU-Directive 2004/42, the maximum allowed content of VOC (Product category IIA / Cat. C / Type wb) is, ready for use, 40g/l (limit 2010). The max. content of Sikafloor[®]-81 EpoCem[®], ready for use, is <40g/l VOC.



CE Labelling

The harmonized European Standard EN 1504-2 “Products and systems for the protection and repair of concrete structures – Definitions, requirements, quality control and evaluation of conformity – Part 2 : Surface protection systems for concrete” gives specifications for products and systems based on methods “hydrophobic impregnation”, “impregnation” and “coating” for the various principles presented under EN 1504-9.

Products which fall under this specification have to be CE-labelled as per Annex ZA. 1, Tables ZA1a to ZA 1g according to the scope and relevant clauses there indicated, and fulfil the requirements of the given mandate of the Construction Products Directive (89/106):

For flooring systems not dedicated to protect or reinstate the integrity of a concrete structure, EN 13813 applies. Products acc. EN 1504-2 used as flooring systems with mechanical loads also must fulfil EN 13813.

Here below indicated are the minimum performance requirements set by the standard. For the specific performance results of the product to the particular tests, please see the actual values above in the PDS.

CE	
Sika (NZ) Ltd PO BOX 19192 Avondale Auckland 1746	
09	
EN 1504-2	
Surface protection system for concrete, rigid coating	
Abrasion resistance (Taber Test)	Weight loss < 3000mg H22, 1000c, 1000gr
Permeability to water vapour	Class I: $S_D < 5 \text{ m}$ (permeable to water vapour)
Capillary absorption and permeability to water	$< 0.1 \text{ kg} \cdot \text{m}^{-2} \cdot \text{h}^{-0.5}$
Impact resistance	After loading no cracks or delamination Class III: $\geq 20 \text{ Nm}$
Adhesion strength by pull-off test	(horizontal with trafficking) $\geq 2.0 \text{ N/mm}^2$

1) Last two digits of the year in which the marking was affixed.
2) No performance determined
3) Tested as part of a full system



CE Labelling

The harmonized European Standard EN 1504-3 Products and systems for the protection and repair of concrete structures – Definitions, requirements, quality control and evaluation of conformity – Part 3 : Structural and non-structural repair specifies the identification, performance (including durability) and safety of products and systems to be used to repair concrete surfaces (either building or civil engineering structures).

Products which fall under this specification have to be CE-labelled as per Annex ZA. 1, Tables ZA1, according to the scope and relevant clauses there indicated, and fulfil the requirements of the given mandate of the Construction Products Directive (89/106):

For flooring systems not dedicated to protect or reinstate the integrity of a concrete structure, EN 13813 applies. Products acc. EN 1504-3 used as flooring systems with mechanical loads also must fulfil EN 13813.

Here below indicated are the performance classes achieved according to the standard. For the specific performance results of the product to the particular tests, please see the actual values above in the PDS

CE	
Sika (NZ) Ltd PO BOX 19192 Avondale Auckland 1746	
09	
EN 1504-2	
Concrete repair product for non-structural repair PCC mortar (based on polymer hydraulic cement mortar)	
Compressive strength	Class R4
Chloride ion content	≤ 0.05%
Adhesive bond	≥ 2.0MPa
Elastic Modulus	NPD
Restrained shrinkage / expansion	≥ 2.0MPa (bond str. after test)
Durability Carbonation resistance	Pass
Durability Thermal compatibility	≥ 2.0MPa (bond str. after test)
Skid resistance	Class III : > 55 units wet tested
Coefficient of thermal expansion	13.1 µm / m °C
Capillary absorption (water permeability)	≤ 0.5kg/m ² * h 0.5
Reaction to fire	A2(fl) S1
Dangerous substances comply with 5.4	

- 1) Last two digits of the year in which the marking was affixed.
2) No performance determined
3) Tested as part of a full system



Project Reference SUTTON GROUP LIMITED



Substrate prepared

Coving ready and substrate primed

Sikafloor 81 EpoCem – Temporary Moisture Barrier

Requirement:

Sutton Group Limited had built a new complex for the manufacture of pharmaceutical and health food type products. The new concrete floors in a series of rooms required a floor coating to comply with their 'clean room' standards. Because the concrete moisture content was well above the required 4%, a temporary moisture barrier was needed to allow the early application of a floor coating without having to wait an unknown length of time for the moisture content to drop.

Solution:

A 3mm layer of Sikafloor 81 EpoCem was applied as a temporary moisture barrier over a combined area of approximately 2000m². This enabled a finishing coat of Sikafloor 261 self smoothing to be applied without any further delay.

Products Used:

- Sikafloor 91 (For coves)
- Sikaloor 156 (Primer)
- Sikafloor 81 EpoCem
- Sikafloor 261 Self Smoothing

Reference: AKL312



Sikafloor 261



Sikafloor 261, being applied



Sika (NZ) Limited
 PO Box 19192, Auckland 1746, NZ.
 0800 745 269 | www.sika.co.nz

Innovation & Consistency | since 1910