Construction

Sikafloor®-31N PurCem®

Solvent free polyurethane coating

Product Description

Sikafloor®-31N PurCem® is a three part, solvent free, high build, coloured, matt finish, polyurethane modified, cement and aggregate coating with excellent chemical resistance and very good resistance to abrasion and mechanical damage.

Typically applied in two coats for a total of 0.2 - 0.25 mm.

Uses

Sikafloor®-31N PurCem® is designed to be used as:

- Stand alone, high build coating or as a seal coat for covings and details performed with Sikafloor®-29N PurCem® or other products in the Sikafloor®-N PurCem® range
- To provide an improved aesthetic finish to the products in the broadcast texture range of Sikafloor®-PurCem®
- Suitable for physical resistance (Principle 5, method 5.1 of EN 1504-9)
- Suitable for chemical resistance (Principle 6, method 6.1 of EN 1504-9)
- As a chemical resistant concrete coating

in places such as:

- Food processing plants, in wet or dry process areas, freezers and coolers
- Pharmaceutical plants
- Containment areas
- Chemical process areas

Characteristics / Advantages

- Excellent chemical resistance. Resists a wide range of organic and inorganic acids, alkalis, amines, salts and solvents. Please refer to the Chemical Resistance Chart or consult your local Technical Dept.
- Non taint, odourless
- Excellent long term wear resistance from a two coat application
- Rapid one step application. Normally, no concrete primer or sealer required
- It is possible to apply on to 7 to 10 day old concrete after adequate preparation and with a tensile bond strength in excess of 1.5 MPa (218 psi)
- Economical and easy to apply

Tests

Approval / Standards	Conforms to the requirements of EN 13813: 2002 as SR – B 1.5 Conforms to the requirements of EN 1504-2 for principles 5 (PR) and 6 (CR) as a Coating (C) Concerning contact with foodstuffs, it conforms to the requirements of: - EN1186, EN 13130, and prCEN/TS 14234 standards, and the Decree on Consumer Goods, representing the conversion of directives 89/109/EEC, 90/128/EEC and 2002/72/EC for contact with food stuffs, according to test report by ISEGA, Registered Nº 24549 U 07, dated May 18th, 2007 - USDA. Acceptance for use in food plants in the USA - Canadian Food Inspection Agency acceptance for use in food plants in Canada. - British Standards Specifications (BSS) acceptance for use in the UK. Campden and Chorleywood Food Research Association, Ref. S/REP/98152/4, dated March 16th, 2007 Fire classification report according to EN 13501-1 from Warrington Fire Research Centre: WFRC No.178161, dated 24th of November, 2008 Capillary absorption and permeability to water report from Taylor Woodrow Construction, Ref. 11071, dated Nov. 28th, 2008 All other values indicated are internal test results.

Product Data

Form

Appearance / Colours	Part A: Part B: Part C:	coloured liquid brown liquid natural grey powder	
	Available colours (all are approximate): Beige (~ RAL 1001), Maize yellow (~ RAL 1006), Oxide red (~ RAL 3009), Sky blue (~ RAL 5015), Grass green (~ RAL 6010), Dusty grey (~ RAL 7037), Agate grey (~ RAL 7038), Telegrey2 (~ RAL 7046).		
Packaging	Part A+B+C:	4.70 kg ready to mix units	
	Part A: Part B: Part C:	1.60 kg plastic drum 1.40 kg plastic jerrycan 1.70 kg boxes	

Storage

Storage Conditions / Shelf-Life	If stored properly in original, unopened and undamaged sealed packaging, in dry conditions at temperatures between +10°C and +25°C. Parts A and B: 12 months from date of production. Must be protected from frost. Part C: 6 months from date of production. Must be protected from humidity	

Technical Data

Chemical Base	Part A: Part B: Part C:	Water borne polyol Isocyanate Aggregates, cement and active fillers	
Density	Part A: Part B: Part C:	~ 1.07 kg/l (at +20°C) ~ 1.24 kg/l (at +20°C) ~ 1.05 kg/l (at +20°C)	(EN ISO 2811-1) & (ASTM C 905)
	Part A+B+C mixed:	~ 1.43 kg/l ± 0.03(at +20°C)	
Capillary Absorption	Permeability to water: 0.36 g/h/m^2 (4 mm)		(EN 1062-3)
Layer Thickness	As Top Coat: As stand alone coating:	70 microns min. / 140 microns max. 140 microns min. / 275 microns max	
Water Absorption	0.10%		(ASTM C 413)

Permeability	To Water Vapour: 0.260 g/h/m^2 (1.2 mm)	(ASTM E-96)
Fire Rating	Class $B_{(fl)}$ S1	(BS EN 13501-1)
Service Temperature	The product is suitable for use when exposed to continuous temperatures, wet or dry, of up to +120°C when applied over Sikafloor®-20 N PurCem® in 9.0 mm thickness within the recommended open time. When applied over Sikafloor®-20N PurCem® or Sikafloor®-21N PurCem®, within the recommended open time, Sikafloor®-31N PurCem® will withstand a minimum service temperature of -40ºC. As stand alone coating the continuous service temperature is between -10ºC and +90ºC Not suitable for steam cleaning as stand alone coating or thermal shock.	

Mechanical / Physical Properties

Bond Strength	> 1.75 N/mm^2 (failure in concrete) (1.5 N/mm^2 is the minimum pull out strength of the recommended concrete substrate)	(EN 13892-8)
Shore D Hardness	80	(ASTM D 2240)
Flexural Modulus	1380 MPa	(ASTM C 580)
Coefficient of Friction	Steel: 0.3 Rubber: 0.5	(ASTM D 1894-61T)
Slip Resistance	Slip Resistance Values	(BS 8204 Part 2)

Substrate	SRV Dry	SRV Wet
Sikafloor®-31N PurCem® over Sikafloor®-21N PurCem®	60 – 65	35 - 40

TRRL Pendulum, Rapra 4S Slider

Abrasion Resistance	Class “Special” Severe abrasion resistance AR 2 (Less than 0.2 mm wear depth)	(BS 8204 Part 2) (EN 13892-4)
	1630 mg Taber Abrader H-22 wheel / 1000 gr / 1000 cycles	(ASTM D 4060-01)
Indentation	≈ 0%	(MIL – PFR 24613)
Impact Resistance	Class A (Less than 1 mm indentation depth)	(BS 8204 Part 1)
	2 pounds / 10 inches (1 mm thick)	(ASTM D 2794)
	Class III (≥ 20Nm) (applied over Sikafloor® -29N PurCem®)	(EN ISO 6272-1)

Resistance

Chemical Resistance	Resistant to many chemicals. Please ask for a detailed chemical resistance table.	
Thermal Resistance	When applied over Sikafloor®-19N or -20N PurCem® in 9 mm thickness, Sikafloor®-31N PurCem® will withstand thermal shock caused by steam cleaning if application is done within 12 hours of application of the screed layer. Not suitable for steam cleaning or thermal shock exposure as stand alone coating.	
Resistance to Thermal Shock	Pass	(ASTM C 884)
Softening Point	130ºC (266ºF)	(ASTM D-1525 ISO 306)
USGBC LEED® Rating	Conforms Section EQ (Indoor Environmental Quality), Credit 4.2 Low-Emitting Materials Paints and Coatings Calculated VOC content ≤ 50 g / l	

System Information

System Structure

Use the products mentioned below as indicated in their respective Product Data Sheets.

Substrate Priming Systems

Substrate priming is normally not required under typical circumstances.
(See Substrate Quality). When necessary use the systems indicated below.

System 1: moisture control on green concrete:

- Primer:
  Scratch coat of Sikafloor®-21N PurCem® 1.5 mm thick, lightly broadcast with quartz sand 0.4 – 0.7 mm.

System 2: Inadequate substrate and moisture content between 4% and 6%

- Primers:
  Sikafloor®-155W N
  fully blinded with quartz sand 0.4 – 0.7 mm for the subsequent application of Sikafloor®-19N / 20N PurCem®.

System 3: Inadequate substrate and moisture content below 4%

- Primers:
  Sikafloor®-155W N or Sikafloor®-156 or Sikafloor®-161
  or Sikafloor®-159 for faster curing
  any of which must be fully blinded with quartz sand 0.4 - 0.7 mm for the subsequent application of Sikafloor®-19N / -20N PurCem®.

On porous excessively absorbent substrates use Sikafloor®-155W N, in two coats, the first thinned with 10% water and the second broadcast to refusal.

Heavy duty screed

- Layer thickness:
  6 - 9 mm
- Screed:
  Sikafloor®-19N PurCem® or Sikafloor®-20N PurCem®

Medium to heavy duty screed:

- Layer thickness:
  4.5 – 6 mm (including scratch coat)
- Priming for Sikafloor®-21N PurCem®:
  Epoxy primer Sikafloor -156 / 161 lightly broadcast with quartz sand 0.4 – 0.7 mm, or
  Scratch coat:
  A scratch coat 1.5 mm thick, lightly broadcast with quartz sand 0.4 – 0.7 mm. will seal the surface and fill irregularities and improve appearance of the final layer.
- Standard screed:
  Sikafloor®-21N PurCem® or
- High slip resistance screed:
  Sikafloor®-22N PurCem® broadcast with quartz sand sealed with 2 coats of Sikafloor®-31N PurCem® depending on the desired texture.
  (See build up Slip Resistance in Sikafloor®-22N PurCem® PDS)
  Sikafloor®-22N PurCem® does not normally require any priming.

Coving and detailing and vertical applications:

- Primer:
  Sikafloor®-10N PurCem® Primer or Sikafloor®-156 / -161
  Reprime if no longer tacky.
- Coving Mortar:
  Sikafloor®-29N PurCem®
- Seal coat:
  1 x Sikafloor®-31N PurCem®

Seal Coat:

- Base coat:
  Sikafloor®-20N or Sikafloor®-21N or Sikafloor®-29N PurCem®
- Seal Coat:
  1 x Sikafloor®-31N PurCem®
- Base coat:
  Sikafloor®-22 N PurCem®
- Seal Coat:
  1 – 2 x Sikafloor®-31N PurCem®

Note: These system configurations must be fully complied with as described and may not be changed

Application Details

Consumption / Dosage

As seal coat:
Over Sikafloor®-19N/20N/21N/29NPurCem®, 0.1 - 0.2 kg/m^2 in one coat.

As seal coat on broadcast quartz sand:
Over Sikafloor®-22N PurCem®, 0.4 - 0.6 kg/m^2 for the first coat and 0.3 – 0.35 kg/m^2 for the second coat, depending on the aggregate used..

As stand alone coating:
Over an adequately prepared mineral substrate, 0.1 - 0.2 kg/m^2 per coat in two coats.

This figure is theoretical and does not allow for any additional material due to surface porosity, surface profile, variations in level or wastage etc.

Make sure the substrate is trowelled smooth to prevent any pores from appearing on the surface of Sikafloor®-31 N PurCem®.

Substrate Quality

The concrete substrate must be sound and of sufficient compressive strength (minimum 25 N/mm^2) with a minimum pull off strength of 1.5 N/mm^2.

The substrate must be clean, dry , or saturated surface dry (SSD) and free of all contaminants such as oil, grease, coatings and surface treatments, etc.

Sikafloor®-PurCem® can be applied onto recent concrete over 7 to 10 days old or onto old damp concrete (SSD) without having to prime first, as long as the substrate fulfils the above requirements.

If in doubt, apply a test area first.

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 to achieve CSP 3 according to the International Concrete Repair Institute.

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

Repairs to 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 and/or vacuum.

For best results, applications as seal coat over recent Sikafloor® PurCem® substrates must be carried out within the recommended overcoat time of the product concerned. (See respective PDS for limitations.)

Application Conditions / Limitations

Substrate Temperature

+10°C min. / +30°C max.

Ambient Temperature

+10°C min. / +30°C max.

Substrate Humidity

The substrate can be dry or damp with no free standing water (saturated surface dry or SSD).

If any moisture is detectable according to ASTM D 4263 (Polyethylene sheet test) for the thin screeds (-21N, -22N) and the coating (-31N), additional tests must be done to quantify actual relative moisture content amount or vapour drive.

	Refer to System Structure and options for substrate priming.
Relative Air Humidity	85% max.
Dew Point	Beware of condensation! The substrate and uncured floor must be at least 3°C above dew point to reduce the risk of condensation or blooming on the floor finish.

Application Instructions

Mixing	Part A : B : C = 1 : 0.88 : 1.06 (packaging size = 1.60 : 1.40 : 1.70) by weight
Mixing Time	Material and ambient temperature will affect the mixing process. If necessary, condition the materials for best use to 15ºC to 21ºC. Premix part A and B separately, make sure all pigment is uniformly distributed with a low speed electric stirrer. Add part A into a clean container and then gradually add **part C**. Mix for at least 1 minute until all powders are wetted out. Gradually add part B (hardener) to the mixed A and C parts and mix all ingredients continuously and thoroughly for further 3 minutes, to ensure complete mixing and a uniform moist mix is obtained. During the operations, scrape down the sides and bottom of the container with a flat or straight edge trowel at least once (parts A+B+C) to ensure complete mixing. **Mix full units only.**
Mixing Tools	A low speed electric stirrer (300-400 r.p.m.) and an Exomixer-type mixing paddle (recommended) suited to the size of the mixing container to minimise the air entrapment.
Application Method / Tools	Prior to application, confirm substrate moisture content, r.h. and dew point. Apply the mixed Sikafloor®-31N PurCem® onto the substrate using a short or medium nap roller directly from a paint tray. Push the resin well into the surface, making sure that the coating fully wets the surface, and then pulling back lightly with the roler to the required thickness. A slip resistant texture can be attained by seeding the first coat of Sikafloor®-31N PurCem® with selected mineral aggregates and then sealing with a second coat. Apply at least two coats when using as stand alone coating. When overcoating previously laid Sikafloor®- PurCem® screeds a single coat application generally provides sufficient coverage.
Cleaning of Tools	Clean all tools and application equipment with Thinner C immediately after use. Hardened / cured material can only be mechanically removed.

Potlife

Temperature	Time
+10°C	~ 40 - 45 minutes
+20°C	~ 20 – 25minutes
+30°C	~ 10 - 15 minutes

Waiting Time / Overcoating

Before applying Sikafloor®-31N PurCem® on Sikafloor®-19N or -20N or -21N or 22N -29N PurCem® allow:

	Waiting time	
Substrate temperature	Minimum	Maximum
+10°C	16 hours	72 hours
+20°C	8 hours	48 hours
+30°C	4 hours	24 hours

Before any second coat application on Sikafloor®-31N PurCem® allow:

	Waiting time	
Substrate temperature	Minimum	Maximum
+10°C	24 hours	72 hours
+20°C	16 hours	48 hours
+30°C	8 hours	24 hours

Times are approximate and will be affected be changing ambient and substrate conditions, particularly temperature and relative humidity.

Notes on Application / Limitations

Do not apply to PCC (polymer modified cement mortars) that may expand due to moisture when sealed with an impervious resin.

Do not apply to water soaked, glistening wet concrete substrates.

Do not apply to porous surfaces where significant moisture vapour transmission (out-gassing) will occur during application.

Sika® Thinner C is flammable. NO NAKED FLAMES.

Always ensure good ventilation when using Sikafloor®-31N PurCem® in a confined space, to prevent excessive ambient humidity.

Freshly applied Sikafloor®-31N PurCem®, must be protected from damp, condensation and direct water contact (rain) for at least 24 hours.

Avoid puddles on the surface.

Steam cleaning of Sikafloor®-31N PurCem® as stand alone coating may lead to delamination due to thermal shock.

Do not apply below 9ºC or above 31ºC or a maximum relative humidity above 85%.

Do not apply to un-reinforced sand cement screeds, asphaltic or bituminous substrate, glazed tile or non-porous brick, tile and magnesite, copper, aluminium, soft wood or urethane composition, elastomeric membrane and fibre reinforced polyester (FRP) composites.

Do not apply to wet or green concrete or polymer modified patches if the moisture content is above 10%.

Do not apply to concrete if the air or substrate temperature is within 3ºC of the dew point.

Protect the substrate during application from condensation from pipes or any overhead leaks.

Do not mix Sikafloor®-PurCem® products by hand. Use only mechanical means.

Do not apply to cracked or unsound substrates.

Avoid puddles during application.

Colour uniformity can not be completely guaranteed from batch to batch (numbered). Take care when using Sikafloor®-PurCem® products to draw from inventory in ba

tch number sequence. Do not mix batch numbers in a single floor area.

Always allow a minimum of 48 hours after product application prior to placing into service in proximity with food stuffs.

Products of the Sikafloor® -PurCem® product range are subject to yellowing when exposed to UV radiation. There are no measurable losses of other properties when this occurs and it is a purely aesthetical matter. Products can be used outside provided the change in appearance is acceptable by the customer.

Curing Details

Applied Product ready for use

Substrate temperature	Foot traffic	Light traffic	Full cure
+10°C	36 hours	72 hours	7 days
+20°C	12 hours	48 hours	5 days
+30°C	7 hours	36-48 hours	3 days

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

Cleaning / Maintenance

Methods

To maintain the appearance of the floor after application, Sikafloor® -31N PurCem® must have all spillages removed immediately and must be regularly cleaned using rotary brushes, mechanical scrubbers, scrubber dryers, high pressure washers, wash and vacuum techniques, etc., using suitable detergents and waxes.

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 shall 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.

It may be necessary to adapt the above disclaimer to specific local laws and regulations. Any changes to this disclaimer may only be implemented with permission of Sika® Corporate Legal in Baar.

Note	**The following chapter is only mandatory for European countries.**
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 Herts. AL7 1BQ England	⇐ *)
07 [1)]	
EN 13813 SR – B1.5	
Cementitious screed material for indoors in buildings (systems as per Product Data Sheet)	
Reaction to fire:	$B_{(fl)}$ S1
Release of corrosive substances (Cementitious Screed):	SR
Water permeability:	NPD[2)]
Abrasion resistance	NPD
Bond strength	B1.5
Impact resistance:	NPD
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

	***) Please fill in your relevant producer address**
EU Regulation 2004/42 **VOC - Decopaint Directive**	According to the EU-Directive 2004/42, the maximum allowed content of VOC Product category IIA / **j** type **wb**) is140 g/l (Limit 2010), for the ready to use product. **Sikafloor®-31N PurCem**, is VOC free for the ready to use product.

Construction

Note	The following chapter is only mandatory for European countries.

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 performance classes achieve 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		
0086		
Sika Limited Watchmead Welwyn Garden City Herts. AL7 1BQ England		⇐ *)
09 [1)]		[1)]
0086 CPD - 541325		
EN 1504-2		
Surface Protection Systems for Concrete Physical Resistance / Chemical Resistance		
Abrasion resistance	Class AR 2	
Capillary absorption and permeability to water	$w < 0,1\ kg/m^2 \cdot h^{0,5}$	
Resistance to severe chemical attack	Class 2	
Impact resistance	Class III: ≥ 20Nm	
Adhesion strength by pull-off test	≥ 2.00 N/mm2	
Reaction to fire	B_{fl} S1	

[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

***) Please fill in your relevant producer address**

Sika Near East s.a.l. / Sector 5, road 70 / Beirut / Lebanon / P.O. Box: 55163
Tel: +961 1 510270 / Fax: +961 1 510271 / E-mail: sikareg@cyberia.net.lb
www.sikaneareast.com