Construction

Sikafloor®-19N PurCem®

Heavy duty, high strength, polyurethane screed

Product Description

Sikafloor®-19N PurCem® is a three part, water dispersed, high strength, trowel grade, coloured polyurethane modified, cement and aggregate screed suitable for floors subject to heavy loading, abrasion and chemical exposure.

It has a slightly textured aggregate surface providing light slip resistance and is typically installed at 6 to 9 mm thick.

Uses

In concrete substrate areas subject to heavy loading, abrasion and high chemical exposure, hard wearing surface, such as in:

- Food processing plants, in wet or dry process areas, freezers and coolers, thermal shock areas
- Chemical plants
- Laboratories
- Workshops
- On properly prepared and supported steel surfaces, such as in:
- Steel decks
- Overpasses or platforms

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.
- Similar coefficient of thermal expansion to concrete, allowing movement with the substrate through normal thermal cycling. It will perform and retain its physical characteristics through a wide temperature range from -40ºC (-40ºF) up to +120ºC (239ºF)
- Steam cleanable at 9 mm thick
- Bond strength in excess of the tensile strength of concrete. Concrete will fail first
- Non taint, odourless
- VOC free
- High mechanical resistance. Behaves plastically subject to impact. Will deform but will not crack or debond.
- Slip resistance. Natural textured surface provides anti-slip traction
- High abrasion resistance resulting from its silica aggregate structure
- 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)
- Sikafloor®-PurCem® screeds (19N - 20N) and detailing mortar (-29N) can withstand moisture vapor transmission values of 12 lbs/1000 ft2 when tested in accordance with the ASTM F 1869 Anhydrous Calcium Chloride Test Method

- Fast curing will allow foot traffic after twelve hours and full service after two days. Production downtime is cut to an absolute minimum
- Jointless. Extra expansion joints are not necessary; simply maintain and extend existing expansion joints up through the Sikafloor® -PurCem® flooring system
- Easily maintained

Tests

Approval / Standards

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.
  (Tests performed on Sikafloor® -20N/21N and 31N PurCem®.)
- 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/98152/3, dated March 16th, 2007

Test reports from Warrington Fire Research Centre for Sikafloor®-20N PurCem®: WFRC No. 163876, dated 7th of July, 2008 (BS EN ISO 11925-2:2002) and WFRC No. 163877, dated 7th of July, 2008 (BS EN ISO 9239-1:2002) for Fire rating.

Fire classification report according to EN 13501-1 from Warrington Fire Research Centre for Sikafloor®-20N PurCem®: WFRC No.174965, dated 11th of July, 2008

All other values indicated are internal test results.

Product Data

Form

Appearance / Colours

Part A: coloured liquid
Part B: brown liquid
Part C: 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: 60.7 kg sets (See mix ratio)

Part A: 200 kg drum or 1000 kg IBC containers
Part B: 225 kg drums
Part C: 50.0 kg (2 x 25 kg), plastic lined, double paper bags

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: Water borne polyol
Part B: isocyanate
Part C: Aggregates, cement and active fillers

Density

Part A:	~ 1.07 kg/l (at +20°C)	(EN ISO 2811-1)
Part B:	~ 1.24 kg/l (at +20°C)	& (ASTM C 905)
Part C:	~ 1.XX kg/l (at +20°C)	
Part A+B+C mixed:	~ 2.XX kg/l ± 0.03 (at +20°C)	

Capillary Absorption

Permeability to water: 1.39 g/h/m^2 (4 mm) (EN 1062-3)

Layer Thickness	6 mm min. / 9 mm max.	
Thermal Expansion Coefficient	$\alpha \approx 2.0 \times 10^{-5}$ per °C (temperature range: -20°C to +60°C)	(ASTM E 381, ASTM D-696, ISO 11359)
Water Absorption	0.30%	(ASTM C 413)
Permeability	To Water Vapour: 0.126 g/h/m^2 (6.1 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. The minimum service temperature is -40ºC	

Mechanical / Physical Properties

Compressive Strength	> 41 MPa after 28 days at +23°C / 50% r.h.	(ASTM C 579)
	> 50 N/mm^2 after 28 days at +23°C / 50% r.h.	(BS EN 13892-2)
Flexural Strength	> 9 MPa after 28 days at +23°C / 50% r.h.	(ASTM C 580)
	>10 N/mm^2 after 28 days at +23°C / 50% r.h.	(BS EN 13892-2)
Tensile Strength	> 3.1 N/mm^2 after 28 days at +23°C / 50% r.h.	(ASTM C 307)
Bond Strength	> 1.75 N/mm^2 (failure in concrete) (1.5 N/mm^2 is the minimum pull off strength of the recommended concrete substrate)	(EN 1542)
Shore D Hardness	80 - 85	(ASTM D 2240)
Flexural Modulus	3900 MPa	(ASTM C 580)
Coefficient of Friction	Steel: 0.5 Rubber: 0.7	(ASTM D 1894-61T)
Slip Resistance	Slip Resistance Values	(BS 8204 Part 2)

Substrate	SRV Dry	SRV Wet
Sikafloor®-19N PurCem®	70	65

TRRL Pendulum, Rapra 4S Slider

Abrasion resistance	Class “Special” Severe abrasion resistance AR 0.5 (Less than 0.05 mm wear depth)	(BS 8204 Part 2) (-EN 13892-4)
	3180 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 / 25 inches (3 mm thick)	(ASTM D 2794)

Resistance

Chemical Resistance	Resistant to many chemicals. Please ask for a detailed chemical resistance chart.
Thermal Resistance	The product is designed to withstand thermal shock caused by steam cleaning when thickness is 9 mm.
Resistance to Thermal Shock	Pass (ASTM C 884)
Softening Point	130ºC (266ºF)
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 ~~1~~ 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	*Primer (If priming is necessary, see System Structure above and respective PDS)* *Screed 6 -9 mm:* Sikafloor®-19N PurCem® (part A+B+C) ~ 1.95 - 2.25 kg/m^2/mm layer thickness. This figure is theoretical and does 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/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. If in doubt, apply a test area first. Substrate priming is normally not required under typical circumstances. However due to variations in concrete quality, surface conditions, surface preparation and ambient conditions, reference test areas are recommended to determine whether priming is required to prevent the possibility of blisters, debonding pinholes and other aesthetic variations. 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.
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 3-6 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 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 and/or vacuum. Edge terminations. All free edges and working day joints of Sikafloor®-19N / -20N / -21N / -22N and -29N PurCem®, whether at the perimeter, along gutters or at drains require extra anchorage to distribute mechanical and thermal stresses. This is best achieved by forming or cutting grooves in the concrete. Grooves must have a depth and width of twice the thickness of the Sikafloor®- PurCem®. Refer to the edge details provided in the Method Statement. If necessary, protect all free edges with mechanically attached metal strips. Never featheredge, always turn into an anchor groove. Expansion joints. Expansion joints must be provided in the substrates at the intersection of dissimilar materials. Isolate areas subject to thermal stresses, vibration movements or around load-bearing columns and at vessels sealing rings. Refer to the edge details provided in the Method Statement.

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). Sikafloor® - PurCem® screeds (19N, 20N) and detailing mortar (29N) can withstand moisture vapour transmission values of around 12 lbs/1000 ft^2 tested according to ASTM F 1869 Anhydrous Calcium Chloride test. 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 : 0.86 : 8.73 by weight. Dosage is 5.73 : 4.95 : 2 x 25 kg)
Mixing Time	Material and ambient temperature will affect the mixing process. If necessary, condition the materials for best use to 15ºC – 21ºC. Premix part A and B separately, make sure all pigment is uniformly distributed with a low speed electric stirrer. Start mixer and add parts A and then B and blend for 30 seconds. Gradually add part C (aggregate) to the mixed resin parts over a period of 15 seconds. DON'T DUMP! Allow part C to blend for further 2 minutes minimum, 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.
Mixing Tools	Use a low speed electric stirrer (300 - 400 rpm) for mixing parts A and B. For preparation of the mortar mix use a pan type revolving mixer.
Application Method / Tools	Prior to application, confirm substrate moisture content, r.h. and dew point. Proceed with placement of the material to facilitate the release of entrapped air from the mix and CO2 from the reaction. Do so in every batch mixed in a consistent manner in order to avoid colour differences due to increased temperatures in the reaction Pour the mixed Sikafloor®-19N PurCem® onto the substrate from the mixing pail along the wet edge. Using considerable top pressure on the trowel, spread evenly from side to side with a rake or trowel, push back into the previous mix (wet edge), pull forward to establish the required thickness, and then, with lighter pressure, trowel from side to side to close up, achieving a flat surface. Finish the material with a steel trowel, only in one direction, left to right or right to left, but never back and forth. A short pile roller can be used *once or twice*, and always in the same direction, to provide a more homogeneous finish to the surface. No excessive backrolling! Excessive backrolling or trowelling will bring up more resin to the surface, reducing the desired anti-lip surface texture which characterises this product. As a second texture option, selected mineral aggregates can be broadcast on the wet surface and sealed with a top coat of 1 x Sikafloor®-31N PurCem® to lock in the aggregate. Allow a minimum of 36 hours cure period at 20ºC before light traffic. Flow check (ASTM C 230-90 / EN 1015-3) Top internal diam: 70 mm Bottom internal diam.: 100 mm Height: 60 mm Flow = 185 mm ± 10 mm
Cleaning of Tools	Clean all tools and application equipment with Thinner C immediately after use. Hardened/cured Sikafloor®-19N PurCem® can only be mechanically removed.

Potlife

Temperature	Time
+10°C	~ 30 - 35 minutes
+20°C	~ 15 - 20 minutes
+30°C	~ 8 - 10 minutes

Waiting Time / Overcoating

If you have primed, before applying Sikafloor®-19N PurCem® on Sikafloor®-155W N or Sikafloor®-156 or Sikafloor®-157 or Sikafloor®-31 PurCem® (all fully blinded), allow:

	Waiting time	
Substrate temperature	Minimum	Maximum
+10°C	24 hours	12 days
+20°C	12 hours	7 days
+30°C	6 hours	4 days

Always make sure primer is fully cured before application.

Before any subsequent application on Sikafloor®-19N 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

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

Notes on Application / Limitations

A retaining groove must be placed at exposed edges along of the application area (perimeter, joints, connections, plinths, columns, covings and drains / gullies) as indicated in the application details of the Method Statement for Application, to prevent curling during curing. Width and depth must be twice the thickness of the floor finish.

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®-19N PurCem® in a confined space, to prevent excessive ambient humidity.

Sikafloor®-19N PurCem® shares the resin (part A) and hardener (part B) with Sikafloor®-20N, -21N and -22N PurCem®. Make sure the correct pack sizes of aggregate are used.

Freshly applied Sikafloor®-19 N PurCem® must be protected from damp, condensation and water for at least 24 hours.

Improved slip resistance can be obtained by broadcasting the surface with aggregate of suitable granulometry and back rolling with a short pile roller (1-2 passes only).

For the highest hygienic demands, a subsequent top coat of Sikafloor®-31 PurCem® may be required. This must be applied within 48 hours after the initial Sikafloor®-19 N PurCem® application.

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.

Construction

Curing Details

Applied Product ready for use

Substrate temperature	Foot traffic	Light traffic	Full cure
+10°C	~ 24 hours	~ 36 hours	~ 7 days
+20°C	~ 12 hours	~ 18 hours	~ 5 days
+30°C	~ 8 hours	~ 15 hours	~ 3-4 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®-19 N 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.

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