Construction

Sikafloor®-21 N PurCem®

Medium to heavy duty self-smoothing polyurethane screed

Product Description	Sikafloor®-21N PurCem® is a three part, water dispersed medium to high strength coloured polyurethane modified, cement and aggregate screed with self-smoothing properties. It has an aesthetic, easy to clean, smooth textured aggregate surface providing medium slip resistance and is typically installed at 4.5 to 6 mm thick.
Uses	In areas of medium to heavy loading, abrasion and high chemical exposure, to provide a smooth, flat and decorative wearing surface, such as in: ■ Food processing plants, in wet or dry process areas, freezers and coolers, thermal shock areas ■ Chemical plants ■ Laboratories ■ Workshops
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) ■ 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. ■ High abrasion resistance resulting from its silica aggregate structure ■ 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	Conforms to the requirements of EN 13813: 2002 as CT - C50 - F10 - AR0.5 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 US - 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/98152/5, dated March 30th , 2007 Test reports from Warrington Fire Research Centre for Sikafloor® -21N PurCem®: WFRC No. 163875, dated xxx, 2007 (BS EN ISO 11925-2:2002) and WFRC No. 163878, dated xxx, 2007 (BS EN ISO 9239-1:2002) for Fire rating 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: 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:	20.0 kg ready to mix units
	Part A: Part B: Part C:	3.22 kg plastic drum 2.78 kg plastic jerrycan 14.00 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: 6 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) ~ 1.48 kg/l (at +20°C)	(EN ISO 2811-1) & (ASTM C 905)
	Part A+B+C mixed:	~ 1.93 kg/l ± 0.03 (at +20°C)	
Capillary Absorption	Permeability to water: 0.37 g/h/m^2 (3 mm)		(EN 1062-3)
Layer Thickness	4.5 mm min. / 6 mm max.		
Thermal Expansion Coefficient	$\alpha \approx 1.5 \times 10^{-5}$ per °C (temperature range: -20°C to +60°C)		(ASTM E 381, ASTM D-696, ISO 11359)
Water Absorption	0.18%		(ASTM C 413)

Permeability	To Water Vapour: 0.115 g/h/m^2 (4.8 mm)	(ASTM E-96)
Fire Rating	Class $B_{(fl)}$	(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	> 44 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	> 14.7 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	> 6.5 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	3500 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®-21 N PurCem®	70	60

TRL 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)
	2360 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 / 30 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 not designed to withstand thermal shock. Hot steam cleaning is not recommended. Use Sikafloor®-19 N PurCem® or Sikafloor®-20 N PurCem®.
Resistance to Thermal Shock	Pass (ASTM C 884)
Softening Point	130ºC (266ºF)

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:
  Sikafloor®-155 WN / Sikafloor®-80 Primer
- and Temporary Moisture barrier (TMB):
  Sikafloor®-81 EpoCem® or Sikafloor®-82 EpoCem®
  Layer thickness: from 2 to 3 mm or 3 to 7 mm respectively, and then apply System 3

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

- Primers:
  Sikafloor®-155 WN / Sikafloor®-80 Primer
  fully blinded with quartz sand 0.4 - 0.7 mm for the subsequent application of Sikafloor®-19 N / -20 N PurCem®.

System 3: Inadequate substrate and moisture content below 4%

- Primers:
  Sikafloor®-155 WN / Sikafloor®-80 Primer
  or Sikafloor®-156
  or Sikafloor®-157 for faster curing
  any of which must be fully blinded with quartz sand 0.4 - 0.7 mm for the subsequent application of Sikafloor®-19 N / -20 N PurCem®

On porous excessively absorbent substrates use Sikafloor®-155 WN / Sikafloor®-80 Primer, in two coats, the first thinned with 10% water.

Heavy duty screed

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

Medium to heavy duty screed:

- Layer thickness:
  4.5 - 6 mm (including scratch coat)
- Scratch coat:
  A scratch coat 1.5 mm thick will seal the surface and fill irregularities and improve appearance of the final layer.
- Body coat:
  Sikafloor®-21 N PurCem® or
- High slip resistance screed:
  (Scratch coat typically not required)
  Sikafloor®-22 N PurCem® broadcast with quartz sand sealed with 1 - 2 coats of Sikafloor®-31 N PurCem® depending on the desired texture.
  (See build up Slip Resistance in Sikafloor®-22 N PurCem® PDS)

Coving and detailing and vertical applications:

- Primer:
  Sikafloor®-10 N PurCem® Primer or Sikafloor®-155 WN / Sikafloor®-80 Primer
  Reprime if no longer tacky.
- Coving Mortar:
  Sikafloor®-29 N PurCem®
- Seal coat:
  1 x Sikafloor®-31 N PurCem®

Seal Coat:

- Base coat:
  Sikafloor®-20 N or Sikafloor®-21 N or Sikafloor®-22 N or Sikafloor®-29 N PurCem®
- Seal Coat:
  1 x Sikafloor®-31 N 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)* *Scratch coat:* Sikafloor®-21 N PurCem® (partA+B+C) ~ 2.9 kg/m² for a 1.5 mm layer. *Self-smoothing screed 3 - 6 mm:* Sikafloor®-21 N PurCem® (partA+B+C) ~ 1.9 kg/m² / 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/mm²) with a minimum pull off strength of 1.5 N/mm². The substrate must be clean, dry 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 days old or onto old damp concrete (up to 10%) 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®-19 N / -20 N / -21 N / -22 N and -29 N 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 Moisture Content	≤ 10% pbw Test method: Sika®-Tramex meter (< 6%), CM - measurement or Oven-dry-method. No rising moisture according to ASTM D 4263 (Polyethylene sheet test). Always confirm substrate moisture content prior to the application. 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 : 4.35 (packaging size = 3.22 : 2.78 : 14) by weight
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. **Mix full units only.**
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. If moisture content is > 10% pbw, Sikafloor®- EpoCem® can be applied as T.M.B. (temporary moisture barrier) system. Scratch coat. Priming of concrete substrates is usually not required under typical circumstances. (See Substrate Quality). Mix and apply a scratch coat of Sikafloor®-21 N PurCem® using steel trowels to spread the materials to approximately 1.5 mm thickness, (approximately 2.9 kg/m^2). This application will seal the concrete surface, fill the surface irregularities including pock marks, non-moving control joints and cracks. Allow overnight cure (16 hours at +20ºC) before application of the body coat. Body coat. Pour the mixed Sikafloor®-21 N PurCem® onto the substrate and work with a toothed trowel or pin screed to the desired thickness, achieving a flat surface. Take care to spread newly placed materials across the transition of previously applied mixes before the surface begins to set. Remove air with a spike roller immediately (less than two minutes after placing). Roller spikes must be at least three times longer than the product thickness applied. Allow a minimum 14 hour 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 = 310 mm ± 10 mm
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

If you have primed, before applying Sikafloor®-21 N PurCem® on Sikafloor®-155 WN / Sikafloor®-80 Primer or -156 or -157 (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.

For application of the body coat of Sikafloor®-21 N PurCem® over the scratch coat 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

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

Notes on Application / Limitations

Construction joints require pre-treatment with a stripe coat to verify and seal loss of material through the joint.

It is advisable to perform a groove along the perimeter of the application area particularly if there are columns or gullies in the floor surface, as indicated in the application details of the System Data Sheet, to prevent curling during curing. Large areas do not require perimeter groove. Width and depth must be twice the thickness of the floor finish.

Do not featheredge,

Do not apply Sikafloor®-21 N PurCem® on substrates where significant vapour pressure may occur.

Both Sikafloor®-21 N PurCem® and Sika® Thinner C are flammable.
NO NAKED FLAMES

Always ensure good ventilation when using Sikafloor®-21 N PurCem® in a confined space.

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

After application, Sikafloor®-21 N PurCem® must be protected from damp, condensation and direct water contact (rain) for 24 hours.

Hot steam cleaning may lead to delamination due to thermal shock.

For consistent results it is advised to always use the scratch coat prior to placing Sikafloor®-21 N PurCem® on any substrate.

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.

Construction

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.

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

Curing Details

Applied Product ready for use

Substrate temperature	Foot traffic	Light traffic	Full cure
+10°C	~ 20 hours	~ 34 hours	~ 7 days
+20°C	~ 12 hours	~ 16 hours	~ 4 days
+30°C	~ 8 hours	~ 14 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® -21N 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.

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.

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