Only to be applied by a Sika Approved Contractor

Construction

Sikafloor®-21 PurCem® FG

Medium to heavy duty self-smoothing polyurethane screed

Positioning

Description

Sikafloor-21 PurCem FG is a four 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 or textured aggregate surface providing medium slip resistance and is typically installed at 4.5 to 6mm 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
- EN1504 Principles
- Engineering processes
- Heavy duty traffic and plant areas
- Warehouses/logistic areas

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 Sales representative.
- 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, low odour
- 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
- 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 1.5MPa (218 psi)
- 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
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 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 7th of July, 2008 (BS EN ISO 11925-2:2002) and WFRC No. 163878, 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-21 N PurCem: WFRC No.174952, dated 11th of July, 2008 Capillary absorption and permeability to water report from Taylor Woodrow Construction, Ref. 11070, dated Nov. 28th, 2008.
All other values indicated are internal test results.

Product Data

Appearance / Colours

Part A: Milky liquid
Part B: Brown liquid
Part C: White powder
Part D: Colour pigment pack

Standard Colours:

Curtain Call	Oxide Red RAL 3009	Skye Blue RAL 5015
Dusty Grey RAL 7037	Traffic Grey RAL 7042	Pebble Grey RAL 7032
Slate Grey RAL 7015	Grass Green RAL 6010	Maize Yellow RAL 1006
Pastel Blue RAL 5024	Beige RAL 1001	

Packaging

Part A+B+C+D: 20.4kg ready to mix units

Part A: 3.00 kg plastic jerrycan
Part B: 3.00 kg plastic jerrycan
Part C: 14.00 kg plastic bags
Part D: 0.40 kg plastic pot

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: Twelve (12) months from date of production. Must be protected from frost.
Part C: Six (6) months from date of production. Must be protected from humidity.
Part D: 36 months from date of production.

Technical Data

Chemical Base

Part A: Water borne polyol
Part B: Isocyanate
Part C: Aggregates, cement, pigments and active fillers
Part D: Colour Pack

Density

Part A+B+C+D mixed: ~ 1.90kg/l ± 0.03 (at +20°C)

Capillary Absorption

Permeability to water: 0.016g /m^2 .$h^{0.5}$ (EN 1062-3)
Class Low

Layer Thickness

4.5mm min. / 6mm max.

Thermal Expansion Coefficient

$\alpha \approx 1.5 \times 10^{-5}$ per °C (ASTM E 381, ASTM D-696, ISO 11359)
(temperature range: -20°C to +60°C)

Water Absorption

0.18% (ASTM C 413)

Permeability

To Water Vapour: 0.115g/h/m^2 (ASTM E-96)
(4.8mm)

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

> 44MPa after 28 days at +23°C / 50% r.h. (ASTM C 579)
> 50N/mm^2 after 28 days at +23°C / 50% r.h. (BS EN 13892-2)

Flexural Strength

> 14.7MPa after 28 days at +23°C / 50% r.h. (ASTM C 580)
> 10N/mm^2 after 28 days at +23°C / 50% r.h. (BS EN 13892-2)

Tensile Strength

> 6.5N/mm^2 after 28 days at +23°C / 50% r.h. (ASTM C 307)

Bond Strength

> 1.75N/mm^2 (failure in concrete) (EN 1542)
(1.5N/mm^2 is the minimum pull off strength of the recommended concrete substrate)

Shore D Hardness

80 - 85 (ASTM D 2240)

Flexural Modulus

3500MPa (ASTM C 580)

Coefficient of Friction

Steel: 0.3 (ASTM D 1894-61T)
Rubber: 0.5

Slip Resistance (Textured surface)

Slip Resistance Values (BS 8204 Part 2)

Substrate	SRV Dry	SRV Wet
Sikafloor-21 PurCem FG	70	60

TRRL Pendulum, Rapra 4S Slider

Abrasion Resistance

Class “Special” Severe abrasion resistance (BS 8204 Part 2)
AR 0.5 (EN 13892-4)
(Less than 0.05 mm wear depth)

2360mg (ASTM D 4060-01)
Taber Abrader H-22 wheel / 1000gr / 1000 cycles

Indentation

≈ 0% (MIL - PFR 24613)

Impact Resistance

Class A (BS 8204 Part 1)
(Less than 1 mm indentation depth)

2 pounds / 30 inches (3mm thick) (ASTM D 2794)

Chemical Resistance

Resistant to many chemicals. Please ask for a detailed chemical resistance chart.

Resistance to Thermal Shock

Pass (ASTM C 884)

Softening Point

130ºC

System Information

USGBC LEED® Rating

Conforms Section EQ (Indoor Environmental Quality), Credit 4.2
Low-Emitting Materials Paints and Coatings
Calculated VOC content ≤ 50g/l

System Structure

Substrate Priming Systems

Self-smoothing system

Priming is always required

Broadcast System

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.

When necessary use the systems indicated below.

General priming, Priming Self Smoothing System, moisture control on green concrete:

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

Finish Systems

Medium to heavy duty broadcast screed:

- Layer thickness:
  4.5 - 6mm (including scratch coat if required)
- *Screed*
  Sikafloor-21 PurCem FG + selected Sika Aggregate broadcast to refusal
- Seal Coat
  1 - 2 coats of Sikafloor-31 N PurCem depending on the desired texture.

Self-smoothing screed

- Layer thickness:
  3 - 6mm
- *Primer*
  1.5mm scratch coat of Sikafloor-21 PurCem FG
- *Screed*
  Sikafloor-21 PurCem FG

Coving and detailing and vertical applications:

- Primer:
  Sikafloor-156 thickened to a butter consistency using Extender T
  Reprime if no longer tacky.
- Coving Mortar:
  Sikafloor-29 N PurCem
  Or Sikafloor-156 Mortar
- 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

For primers, see System Structure above and respective PDS)

Primer:
Scratch coat:
Sikafloor-21 PurCem FG (part A+B+C) ~ 2.9kg/m² for a 1.5mm layer/m².

Self-smoothing screed 3 - 6mm:
Sikafloor-21 PurCem FG (part A+B+C) ~ 1.9kg/m² / mm layer thickness/m².

Broadcast Screed:
Sikafloor-21 PurCem 1.2 kg (per mm of the thickness/m²)
Sika Aggregate-501 0.8 kg (per mm of the thickness/m²)

Top Coat (textured system)
Sikafloor-31 PurCem ~0.5 – 0.9 kg/m² (depending on texture)

Light Textured System
1st Coat: Primer Sikafloor-21 PurCem FG scratch coat ~ 2.9kg/m²
2nd Coat: Self Smoothening Screed 3.6mm 1.9kg/m²/mm thickness

Sikafloor-31 PurCem + 5% 60 grit Aluminium Oxide 0.3 – 0.5 kg/m²

Sikafloor-31 PurCem 0.3 – 0.5 kg/m²

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 25N/mm²) with a minimum pull off strength of 1.5N/mm².

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.

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.

<u>Edge terminations.</u>
All free edges, control joints, penetrations, and working day joints of Sikafloor-21 PurCe FG, 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.

<u>Expansion joints</u>.
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). If any moisture is detectable according to ASTM D 4263 (Polyethylene sheet test) for the thin screeds (-21) 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 : D = 14.7 : 14.7 : 68.6 : 2.0 (packaging size = 3 : 3 : 14 : 0.4 kg) by weight

Mix full kits only (do not part mix). Premix Part A and Part D (colour pack) into a clean mixing container - mix for one (1) minute.

Add Part B and mix to a uniform blend - mix for one (1) minute.

Gradually add (do not dump) Part C (powder) to the mixed resin parts and mix for a further one (1) minute until a uniform wet mix is obtained.

Material and ambient temperature will affect the mixing process.
If necessary, condition the materials for best use to 15ºC - 21ºC.

Mixing Tools

Use a low speed electric stirrer (300 - 400rpm) 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.

Priming of concrete substrates is usually not required under typical circumstances. (See Substrate Quality), but given the thinness and fluidity of Sikafloor-21 PurCem FG it is highly recommended.

Priming if required:

Scratch coat.
Mix and apply a scratch coat of Sikafloor-21 PurCem FG using steel trowels to spread the materials to approximately 1.5 mm thickness, (approximately 2.9kg/m^2) lightly broadcast with quartz sand Sika Aggregate-501. This application will seal the concrete surface, fill the surface irregularities including pock marks, non-moving control joints and cracks. Allow overnight cure (24 hours at +20ºC) before application of the body coat.

Body coat.
Pour the mixed Sikafloor-21 PurCem FG onto the substrate and work with a toothed trowel or pin screed to the desired thickness, achieving a flat surface. A straight edge trowel can also be used to smooth out the marks of the tooth trowel or instead of it. 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:	70mm
Bottom internal diam.:	100mm
Height:	60mm
Flow =	310mm ± 10mm

Broadcast Systems:
Apply body coat (refer above). Evenly broadcast Sika Kiln dried aggregate to full refusal into the wet body coat.

Top Coats (Broadcast Systems only):
Apply 1-2 coats of Sikafloor-31 N PurCem by brush and/or roller.

Cleaning of Tools

Clean all tools and application equipment with Sika 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

For application of the body coat of Sikafloor-21 PurCem FG over the scratch coat allow:

Substrate temperature	Waiting time	
+10°C	Minimum	Maximum
+20°C	24 hours	72 hours
+30°C	24 hours	48 hours
Note: Times are approximate and will be affected be changing ambient and substrate conditions, particularly temperature and relative humidity.	12 hours	24 hours

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 Method Statement for Application, to prevent curling during curing. Large areas do not require perimeter groove. Width and depth must be twice the thickness of the floor finish.

If an added aggregate screed layer is applied, retaining grooves must also be created for this screed.

In cases where thermal stress is expected the information of retaining grooves is a must also on the layer of standard mix of Sikafloor-21 N Purcem.

Do not featheredge.

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.

SL systems are not recommended for falls greater than 1:80 gradient.

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-21 PurCem FG in a confined space, to prevent excessive ambient humidity.

After application, Sikafloor-21 PurCem FG 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 PurCem FG 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.

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 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			
+10°C	Foot traffic	Light traffic	Full cure
+20°C	~ 20 hours	~ 34 hours	~ 7 days
+30°C	~ 12 hours	~ 16 hours	~ 4 days
Note: Times are approximate and will be affected by changing ambient and substrate conditions.	~ 8 hours	~ 14 hours	~ 3 - 4 days

Refer to Sika “Cleaning and Maintenance Recommendations for Sika Flooring Installations”.

Cleaning / Maintenance

To maintain the appearance of the floor after application, Sikafloor-21 PurCem FG 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.

Methods

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	• To avoid rare allergic reactions, we recommend the use of protective gloves. Change soiled work clothes and wash hands before breaks and after finishing work. • Local regulations as well as health and safety advice on packaging labels must be observed. • For further information refer to the Sika Safety Data Sheet which is available on request. • If in doubt always follow the directions given on the pack or label.
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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