Construction

Sikafloor®-381 AS

2-part epoxy coating, chemically highly resistant and electrostatic conductive

Product Description

Sikafloor®-381 AS is a two part, electrostatic conductive self-smoothing, coloured epoxy resin with very high chemical resistance.

"Total solid epoxy composition acc. to the test method Deutsche Bauchemie e.V. (German Association for construction chemicals)"

Uses

- Chemically highly resistant coating for concrete and screed surfaces in bund areas for the protection against water contaminating liquids (according to resistance table)
- Electrostatic conductive wearing layer for areas subject to chemical and mechanical exposure in production and storage facilities

Characteristics / Advantages

- Very high chemical resistance
- High mechanical resistance
- Impervious to liquids
- Abrasion resistant
- Electrostatic conductive
- Slip resistant surface possible

Test

Approval / Standards

Fire classification in accordance with EN 13501-1, Report-No. 306.211/1, OEFI, Wien, Austria, April 2001

Conforms to the requirements of DIN IEC 61340-4-1 (Internal Test)

Particle emission certificate Sikafloor-381 AS CSM Statement of Qualification - ISO 14644-1, class 1 - Report No. SI 1008-533 and GMP class A, Report No. SI 1008-533.

Outgassing emission certificate Sikafloor-381 AS: CSM Statement of Qualification - ISO 14644-8, class -9.6 - Report No. SI 1008-533.

Biological Resistance in accordance with ISO 846, CSM Report No. 1008-533

Product Data

Form

Appearance / Colours

Resin - part A: coloured, liquid
Hardener - part B: transparent, liquid

Almost unlimited choice of colour shades.

Due to the nature of the carbon fibers providing the conductivity, it is not possible to achieve exact colour matching. With very bright colours (such as yellow and

	orange), this effect is increased. Under direct sun radiation there may be some discolouration and colour deviation, this has no influence on the function and performance of the coating.
Packaging	Part A: 21.25 kg containers Part B: 3.75 kg containers Part A+B: 25 kg ready to mix units Bulk packaging: Part A: 250 kg drums Part B: 190 kg drums

Storage

Storage Conditions / Shelf-Life	24 months from date of production if stored properly in original, unopened and undamaged sealed packaging, in dry conditions at temperatures between +5°C and +30°C.

Technical Data

Chemical Base	Epoxy
Density	Part A: ~ 1.77 kg/l (DIN EN ISO 2811-1) Part B: ~ 1.04 kg/l Mixed resin: ~ 1.6 kg/l All Density values at +23°C.
Solid Content	~ 100% (by volume) / ~100% (by weight)
Electrostatic Behaviour	Resistance to ground[1]: $R_g < 10^9$ Ω (IEC 61340-4-1) Typical average resistance to ground[2]: $R_g \leq 10^6$ Ω (DIN EN 1081) [1] This product fulfils the requirements of ATEX 137 [2] Readings may vary, depending on ambient conditions (i.e. temperature, humidity) and measurement equipment.

Mechanical / Physical Properties

Compressive Strength	> 80 N/mm² (14 days / +23°C) (EN 196-1)
Flexural Strength	> 55 N/mm² (14 days / +23°C) (EN 196-1)
Bond Strength	> 1.5 N/mm² (failure in concrete) (ISO 4624)
Shore D Hardness	82 (7 days / +23°C) (DIN 53 505)
Abrasion Resistance	40 mg (CS 10 wheel / 1000 g / 1000 cycles) (8 days / +23°C) (DIN 53 109) (Taber Abraser Test)

Resistance

Chemical Resistance	Resistant to many chemicals. Please ask for a detailed chemical resistance table.
Thermal Resistance	

Exposure*	Dry heat
Permanent	+50°C
Short-term max. 7 d	+80°C
Short-term max. 12 h	+100°C

Short-term moist/wet heat* up to +80°C where exposure is only occasional (i.e. during steam cleaning etc.)

*No simultaneous chemical and mechanical exposure.

USGBC	Sikafloor®-381 AS conforms to the requirements of LEED
LEED Rating	EQ Credit 4.2: Low-Emitting Materials: Paints & Coatings SCAQMD Method 304-91 VOC Content < 100 g/l

System Information

System Structure

Self-smoothing system (horizontal areas):

Primer:	1 x Sikafloor®-156ZA / -161
Earthing connection:	Sikafloor® Earthing Kit
Conductive primer:	1 x Sikafloor®-220 W Conductive
Conductive wearing course:	1 x Sikafloor®-381 AS filled with quartz sand

Smooth wearing course (vertical areas):

Primer:	1 x Sikafloor®-156ZA / -161
Wall coating:	1 x Sikafloor®-381 AS + TEX
Earthing connection:	Sikafloor® Earthing Kit
Conductive primer:	1 x Sikafloor®-220 W Conductive
Conductive wearing course:	1 x Sikafloor®-381 AS + TEX

Broadcast system with slip resistance:

Primer:	1 x Sikafloor®-156ZA / -161
Earthing connection:	Sika® Earthing Kit
Conductive primer:	1 x Sikafloor®-220 W Conductive
Conductive wearing course:	1 x Sikafloor®-381 AS broadcast to excess with silicon carbide 0.5 - 1.0 mm
Seal coat:	1 x Sikafloor®-381 + 5 wt.-% Thinner C

Note: The system configurations as described must be fully complied with and may not be changed. Due to the nature of carbon fibres providing the conductivity, surface irregularities might be possible. This has no influence on the function and performance of the coating.

Application Details

Consumption / Dosage

Coating System	Product	Consumption
Primer	Sikafloor®-156ZA / -161	0.3 - 0.5 kg/m²
Levelling (optional)	Sikafloor®-156ZA / -161 mortar	Refer to PDS of Sikafloor®-156 ZA/ -161
Conductive primer	Sikafloor®-220 W Conductive	0.08 - 0.10 kg/m²
Wearing course horizontal areas (Film thickness ~ 1.5 mm)	Sikafloor®-381 AS filled with quartz sand 0.1 - 0.3	2.5 kg/m² Binder + quartz sand 10 - 15°C: without filling 15 - 20°C: 1 : 0.1 pbw (2.3 + 0.2 kg/m²) 20 - 30°C: 1 : 0.2 pbw (2.1 + 0.4 kg/m²)
Wearing course vertical areas (Film thickness ~ 1.5 mm)	Sikafloor®-381 AS + 2.5 - 4 wt.-% TEX	2 x 1.25 kg/m²
Broadcast system with slip resistance (Film thickness ~ 2.5 mm)	Sikafloor®-381 AS, broadcast to excess with Silicon Carbide 0.5 - 1.0 mm	1.6 kg/m² Binder without filling Silicon Carbide 0.5 - 1.0 mm (5 - 6 kg/m²)
Seal coat (on broadcast areas only)	Sikafloor®-381 + 5 wt.-% Thinner C	0.75 - 0.85 kg/m²

These figures are theoretical and do not allow for any additional material due to surface porosity, surface profile, variations in level or wastage etc.

*All values have been determined using quartz sand 0.1-0.3 mm from Quarzwerke GmbH Frechen sand. Other quartz sand type will have an effect on the product, such as filling grade, levelling properties and aesthetics.

Generally, the lower the temperature the less the filling grade.

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 and free of all contaminants such as dirt, oil, grease, coatings and surface treatments, etc. 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. Weak concrete must be removed and surface defects such as blowholes 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. The concrete or screed substrate has to be primed or levelled in order to achieve an even surface. High spots must be removed by e.g. 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.

Application Conditions / Limitations

Substrate Temperature	+10°C min. / +30°C max.
Ambient Temperature	+10°C min. / +30°C max.
Substrate Moisture Content	$\leq$ 4% pbw moisture content. Test method: Sika®-Tramex meter, CM - measurement or Oven-dry-method. No rising moisture according to ASTM (Polyethylene-sheet).
Relative Air Humidity	80% r.h. 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 : part B = 85 : 15 (by weight)
Mixing Time	Prior to mixing, stir part A mechanically. When all of part B has been added to part A, mix continuously for 2 minutes until a uniform mix has been achieved. When parts A and B have been mixed, add the quartz sand 0.1 - 0.3 mm and mix for a further 2 minutes until a uniform mix has been achieved. To ensure thorough mixing pour materials into another container and mix again to achieve a consistent mix. Over mixing must be avoided to minimise air entrainment.
Mixing Tools	Sikafloor®-381 AS must be thoroughly mixed using a low speed electric stirrer (300 - 400 rpm) or other suitable equipment.

Application Method / Tools

Prior to application, confirm substrate moisture content, relative humidity and dew point.

If > 4% pbw moisture content, Sikafloor® EpoCem® should be applied as a T.M.B. (temporary moisture barrier) system.

Levelling:
Rough surfaces need to be levelled first because varying thickness of the Sikafloor®-381 AS wearing course will influence the conductivity. Therefore use Sikafloor®-156 levelling mortar (see PDS).

Placing of earthing plates:
See below “Notes on Application / Limits”.

Application of Sikafloor® conductive primer:
See PDS of Sikafloor®-220 W conductive.

Wearing course (horizontal areas):
Sikafloor®-381 AS is poured, spread evenly by means of a serrated trowel. Roll immediately in two directions with a spiked roller to ensure even thickness.

Wearing course (vertical areas):
The first layer of Sikafloor®-381 AS, mixed with 2.5 - 4 wt.-% TEX, has to be applied by trowel. After placing of the earthing plates and application of the conductivity layer, apply the second layer of Sikafloor®-381 AS, mixed with 2.5 - 4 wt.-% TEX, by trowel.

Wearing course with slip resistance:
Sikafloor®-381 AS is poured, spread evenly by means of a serrated trowel and the fresh layer is broadcasted to excess with silicon carbide 0.5 - 1.0 mm. After final drying the surplus silicon carbide must be swept off and the surface must be vacuumed. The seal coat (Sikafloor®-381 AS + 5 wt.-% Thinner C) has to be applied evenly by short-piled roller or squeegee.

Cleaning of Tools

Clean all tools and application equipment with Thinner C immediately after use. Hardened and/or cured material can only be mechanically removed.

Potlife

Temperatures	Time
+10°C	~ 60 minutes
+20°C	~ 30 minutes
+30°C	~ 15 minutes

Waiting Time / Overcoating

Before applying Sikafloor®-220 W Conductive on Sikafloor®-381 AS allow:

Substrate temperature	Minimum	Maximum
+10°C	48 hours	3 days
+20°C	24 hours	2 day
+30°C	12 hours	1 day

Before applying Sikafloor®-381 on Sikafloor®-156ZA allow:

Substrate temperature	Minimum	Maximum
+10°C	24 hours	4 days
+20°C	12 hours	2 days
+30°C	6 hours	1 day

Before applying Sikafloor®-381 AS on Sikafloor®-220 W Conductive allow:

Substrate temperature	Minimum	Maximum
+10°C	26 hours	7 days
+20°C	17 hours	5 days
+30°C	12 hours	4 days

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

Notes on Application / Limitations

This product may only be used by experienced professionals.

Do not apply Sikafloor®-381 AS on substrates with rising moisture.

Do not blind the primer.

Freshly applied Sikafloor® -381 AS must be protected from damp, condensation and water for at least 24 hours.

Only start application of Sikafloor® conductive primer after the priming coat has dried tack-free all over. Otherwise there is a risk of wrinkling or impairing of the conductive properties.

Layer thickness of wearing course: approx. 1.5 mm. Excessive thickness (more than 2.5 kg/m²) causes reduced conductivity.

Before the application of a conductive flooring system, a reference area has to be applied. This reference area must be assessed and accepted from the contractor/client. The desired result and method of conductivity measurement must be stated in the Specification and Method Statement. The number of conductivity measurements is strongly recommended to be as shown in the table below:

Ready applied area	Number of measurements
< 10 m²	6 measurements
< 100 m²	10-20 measurements
< 1000 m²	50 measurements
< 5000 m²	100 measurements

In case of values lower/higher as required, additional measurements has to be carried out, approx. 30 cm around the point with insufficient readings. If the newly measured values are in accordance with the requirements, the total area is acceptable

Placing of earthing points:
Please make sure to only use the original Sikafloor® Earthing Kit in order to connect the earthing points. Every earthing point is able to conduct approx. 300 m², The earthing points have to be connected to the ring-mains, which has to be carried out and approved by an electrical engineer and in accordance with any relevant regulations or standards

Numbers of earth connections:
Per room al least 2 earthing points. The optimum number of earth connections depends on the local conditions and should be specified with documents.

The incorrect assessment and treatment of cracks may lead to a reduced service life and reflective cracking - reducing or breaking conductivity.

For exact colour matching, ensure Sikafloor®-381 AS in each area is applied from the same control batch numbers.

Under certain conditions, underfloor heating or high ambient temperatures combined with high point loading, may lead to imprints in the resin.

If heating is required do not use gas, oil, paraffin or other fossil fuel heaters, these produce large quantities of both CO_2 and H_2O water vapour, which may adversely affect the finish. For heating use only electric powered warm air blower systems.

Construction

Curing Details

Applied Product ready for use

Temperature	Foot traffic	Light traffic	Full cure
+10°C	~ 24 hours	~ 3 days	~ 10 days
+20°C	~ 18 hours	~ 2 days	~ 7 days
+30°C	~ 12 hours	~ 1 day	~ 5 days

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

Cleaning / Maintenance

Methods

To maintain the appearance of the floor after application, Sikafloor®-381 AS must have all spillages removed immediately and must be regularly cleaned using rotary brush, mechanical scrubbers, scrubber dryer, high pressure washer, 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

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