

## PRODUCT DATA SHEET

# Sikafloor®-381 ECF

2-part epoxy electrostatic conductive chemically resistant floor covering

## DESCRIPTION

Sikafloor®-381 ECF 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

Sikafloor®-381 ECF may only be used by experienced professionals.

The Product is used as a:

- Smooth electrostatically conductive floor covering
- Broadcast electrostatically conductive floor covering

The Product is used for the following application areas:

- Automotive facilities
- Bunding areas
- Storage areas
- Warehouses
- Aircraft hangars
- Battery-charging rooms
- Areas with a high explosion risk

## CHARACTERISTICS / ADVANTAGES

- High chemical resistance
- High mechanical resistance
- Impermeable to liquids
- Abrasion resistant
- Electrostatically conductive
- Optional surface profiles slip resistant or smooth

## ENVIRONMENTAL INFORMATION

- Contributes towards satisfying Materials and Resources (MR) Credit: Building product disclosure and optimization — Environmental Product Declarations under LEED® v4
- Environmental Product Declaration (EPD) in accordance with EN 15804. EPD independently verified by Institut für Bauen und Umwelt e.V. (IBU)

## APPROVALS / STANDARDS

- CE marking and declaration of performance based on EN 1504-2:2004 Products and systems for the protection and repair of concrete structures — Surface protection systems for concrete — Coating
- CE marking and declaration of performance based on EN 13813:2002 Screed material and floor screeds — Screed material — Properties and requirements — Synthetic resin screed material
- Conforms to the requirements of DIN IEC 61340-4-1 (Internal Test)
- Fire testing EN 13501-1:2012-01, Sikafloor®-381 ECF, MPA, Report No. 2013-B-1412
- Particle Emission ISO 14644-1, Sikafloor®-381 ECF, CSM Fraunhofer, Test report No. SI 1709-952
- Outgassing VOC ISO 14644-8, Sikafloor®-381 ECF, CSM Fraunhofer, Test report No. SI 1709-952
- Spark resistance UFGS-09 97 23, Sikafloor®-381 ECF, kiwa, Test report No. P 8625-E

# PRODUCT INFORMATION

<b>Chemical Base</b>	Epoxy		
<b>Packaging</b>	Container Part A	21.25 kg containers	
	Container Part B	3.75 kg containers	
	Container Part A + Part B	25 kg containers	
	Bulk packaging:		
	Container Part A	250 kg drums	
Container Part B	190 kg drums		
	Refer to the current price list for available packaging variations.		
<b>Shelf Life</b>	24 months from date of production		
<b>Storage Conditions</b>	The Product must be stored in original, unopened and undamaged sealed packaging in dry conditions at temperatures between +5 °C and +30 °C. Always refer to packaging. Refer to the current Safety Data Sheet for information on safe handling and storage.		
<b>Appearance / Colour</b>	IMPORTANT		
	<b>Ensuring consistent colour matching</b>		
	For consistent colour matching, make sure the Product in each area is applied from the same control batch numbers.		
	Part A	coloured liquid	
	Part B	transparent liquid	
	Available in a wide range of colours. Please contact Sika customer service for availability.		
	<b>Exact colour matching</b>		
	Note: Due to the nature of carbon fibres 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.		
	Note: When the Product is exposed to direct sunlight, there may be some discolouration and colour variation. This has no influence on the function and performance of the Product.		
<b>Density</b>	<b>Resin</b>	<b>Density at +23°C</b>	(EN ISO 2811-1)
	Part A	1.77 kg/L	
	Part B	1.04 kg/L	
	Mixed resin unfilled	1.60 kg/L	
<b>Solid content by weight</b>	100 %		
<b>Solid content by volume</b>	100 %		

## TECHNICAL INFORMATION

<b>Shore D Hardness</b>	Cured 7 days at +23 °C	~82	(DIN 53505)
<b>Abrasion Resistance</b>	~40 mg, resin filled 1 : 0.3 with F34 sand (CS10 /1000 g /1000 cycles) (after 8 days at +23°C)		(DIN 53109)
<b>Compressive Strength</b>	Cured 14 days at +23 °C (filled 1:0.3 with F34 sand)	~80 MPa	(EN 196-1)
<b>Tensile Strength in Flexure</b>	Cured 14 days at +23 °C (filled 1:0.3 with F34 sand)	~55 MPa	(EN 196-1)
<b>Tensile Adhesion Strength</b>	> 1,5 N/mm <sup>2</sup> (failure in concrete)		(EN ISO 4624)

**Electrostatic Behaviour**Resistance to ground  $R_g < 10^9 \Omega$  (IEC 61340-4-1)Typical average resistance to ground  $R_g < 10^6 \Omega$  (EN 1081)

This product fulfils the requirements of ATEX 153.  
Readings may vary, depending on ambient conditions (i.e. temperature, humidity) and measurement equipment.

**Service Temperature****IMPORTANT: Exposure to moist or wet heat**

Sikafloor® broadcast systems with a minimum thickness of ~3–4 mm, that use this Product, can resist short-term moist or wet heat of up to +80 °C if the exposure is only temporary (less than 1 hour). While the Product is exposed to temperatures up to +80 °C, simultaneous mechanical or chemical strain may cause damage to the Product.

- Do not expose the Product to chemical or mechanical strain at elevated temperatures

Exposure	Dry heat
Permanent	+50 °C
Short-term max. 7 days	+80 °C
Short-term max. 12 hours	+100 °C

**Chemical Resistance**

Laboratory defined resistance to many individual chemicals. Before proceeding, contact Sika Technical Services for specific information.

**SYSTEM INFORMATION****Systems**

Refer to the System Data Sheets:

Sikafloor® Multidur ES-31 ECF	Smooth, epoxy floor covering, Chemically resistant conductive epoxy floor covering
Sikafloor® Multidur ET-31 ECF/V	Textured, electrostatically conductive, chemically resistant epoxy coating for vertical surfaces
Sikafloor® Multidur EB-31 ECF	Broadcast, unicolour conductive epoxy floor covering with high chemical resistance and slip resistance

**APPLICATION INFORMATION****Mixing Ratio**

Part A : Part B (by weight)

85 : 15 (by weight)

**Consumption**

Coating system	Product	Consumption
Wearing course horizontal areas (Film thickness ~ 1.5 mm)	Sikafloor®-381 ECF filled with quartz sand F34 (0.1 - 0.3 mm)	2.5 kg/m <sup>2</sup> Binder + quartz sand
Wearing course vertical areas (Film thickness ~ 1.5 mm)	Sikafloor®-381 ECF + 2.5 - 4 wt.-% Extender T	2 x 1.25 kg/m <sup>2</sup>
Broadcast system with slip resistance (Film thickness ~ 2.5 mm)	Sikafloor®-381 ECF, broadcast to excess with Silicon Carbide 0.5-1.0 mm	1.6 kg/m <sup>2</sup> Binder without filling Silicon Carbide 0.5 - 1.0 mm (5 - 6 kg/m <sup>2</sup> )

The wearing course for horizontal areas filling ratio is dependent on the substrate temperature.

Temperature	Parts A+B : Filler (by weight)	Consumption (kg/m <sup>2</sup> at 1.5 mm)
+10 °C to +15 °C	1 : 0	2.5 kg binder only
+15 °C to +20 °C	1 : 0.1	2.3 kg binder + 0.2 kg quartz sand
+20 °C to +30 °C	1 : 0.2	2.1 kg binder + 0.4 kg quartz sand

Note: Consumption data is theoretical and does not allow for any additional material due to surface porosity, surface profile, variations in level, wastage or any other variations. Apply product to a test area to calculate the exact consumption for the specific substrate conditions and proposed application equipment.

#### Excessive layer thickness

Note: Applying the Product in excess of the stated thickness causes reduced conductivity.

Product Temperature	Maximum	+30 °C
	Minimum	+10 °C

Ambient Air Temperature	Maximum	+30 °C
	Minimum	+10 °C

Relative Air Humidity	80 % r.h. max
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Dew Point	Beware of condensation. The substrate and uncured applied product must be at least +3 °C above dew point to reduce the risk of condensation or blooming on the surface of the applied product. Low temperatures and high humidity conditions increase the probability of blooming.
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Substrate Temperature	Maximum	+30 °C
	Minimum	+10 °C

Substrate Moisture Content	Substrate	Test method	Moisture content
	Cementitious substrates	Sika® Tramex moisture metre	≤ 4%
Cementitious substrates	Calcium carbide method (CM-method)	≤ 4%	
No rising moisture (ASTM D4263, polyethylene sheet)			

Pot Life	Temperature	Time
	+10 °C	~60 minutes
+20 °C	~30 minutes	
+30 °C	~15 minutes	

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

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

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, particularly temperature and relative humidity.

## BASIS OF PRODUCT DATA

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.

## FURTHER DOCUMENTS

- Sika® Method Statement: Evaluation and preparation of surfaces for flooring systems
- Sika® Method Statement: Mixing and application of flooring systems

## ECOLOGY HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887

## APPLICATION INSTRUCTIONS

### EQUIPMENT

Select the most appropriate equipment required for the project:

#### MIXING

- Electric single paddle mixer (300-400 rpm)
- Electric double paddle mixer (> 700 W, 300-400 rpm)
- Scraper
- Clean mixing containers

#### APPLICATION

- Mixed material carrier
- Large-Surface Scraper No. 656, Toothed blades No. 25 ([www.polyplan.com](http://www.polyplan.com))
- Steel spike rollers

### SUBSTRATE QUALITY

#### IMPORTANT

##### **Incorrect treatment of cracks**

The incorrect assessment and treatment of cracks may lead to a reduced service life and reflective cracking.

#### TREATMENT OF JOINTS AND CRACKS

Construction joints and existing static surface cracks in substrate require pre-treating before full layer application. Use Sikadur® or Sikafloor® resins.

#### SUBSTRATE CONDITION

Cementitious substrates (concrete / screed) must be structurally sound and of sufficient compressive strength (minimum 25 N/mm<sup>2</sup>) with a minimum tensile strength of 1.5 N/mm<sup>2</sup>. Substrates must be clean, dry and free of all contaminants such as dirt, oil, grease, coatings, laitance, surface treatments and loose friable material.

### SUBSTRATE PREPARATION

#### MECHANICAL SUBSTRATE PREPARATION

#### IMPORTANT

##### **Exposing blow holes and voids**

When mechanically preparing the surface, make sure to fully expose blow holes and voids.

1. Remove weak cementitious substrates.
2. Prepare cementitious substrates mechanically using abrasive blast cleaning or planing / scarifying equipment to remove cement laitance.
3. Before applying thin layer resins, remove high spots by grinding.
4. Use industrial vacuuming equipment to remove all dust, loose and friable material from the application surface before applying the Product.
5. Use products from the Sikafloor®, Sikadur® and Sikagard® range of materials to level the surface or fill cracks, blow holes and voids.

#### **Substrate levelling for conductive floors**

Note: The concrete or screed substrate has to be primed or levelled in order to achieve an even surface. Unevenness influences the film thickness and thus the conductivity.

Contact Sika® Technical Services for additional information on products for levelling and repairing defects. SUBSTRATE PREPARATION OF NON-CEMENTITIOUS SUBSTRATES

For information on substrate preparation of non-cementitious substrates, contact Sika technical services.

### MIXING

1. Mix Part A (resin) for ~10 seconds with a single paddle mixer (300–400 rpm).
2. Add Part B (hardener) to Part A. Switch to an electric double paddle mixer (300–400 rpm, > 700 W).
3. While mixing Parts A + B, gradually add the required filler or aggregates. Note Avoid over mixing to minimise air entrainment.
4. Mix for a further 2 minutes until a uniform mix is achieved.
5. To ensure thorough mixing pour materials into a clean container and mix again for at least 1 minute to achieve a smooth consistent mix.
6. During the final mixing stage, scrape down the sides and bottom of the mixing container with a straight edge trowel or spatula.

### APPLICATION

#### IMPORTANT

##### **Protect from moisture**

After application, protect the Product from damp, condensation and direct water contact for at least 24 hours.

#### IMPORTANT

##### **No application on rising moisture**

Do not apply on substrates with rising moisture.

#### IMPORTANT

##### **Temporary heating**

If temporary heating is required, do not use gas, oil, paraffin or other fossil fuel heaters. These produce large quantities of both carbon dioxide and water vapour, which may adversely affect the finish.

1. For heating, use only electric powered warm air blower systems.

#### IMPORTANT

##### **Indentations**

Under certain conditions, underfloor heating or high ambient temperatures combined with high point load-

ing may lead to indentations in the resin.

#### IMPORTANT

#### Temporary moisture barrier

If the substrate moisture content measured with the CM-method is > 4% by weight, apply a temporary moisture barrier consisting of Sikafloor® EpoCem®.

1. Contact Sika technical services for more information.

#### WEARING COURSE (HORIZONTAL AREAS)

##### Preconditions

**IMPORTANT** Do not blind the primer. The conductive priming coat has been applied and has dried tack-free all over.

1. Pour the mixed Product onto the surface. Note The consumption is specified in Application Information.
2. Apply the Product evenly over the surface with a serrated trowel.
3. Turn the serrated trowel and smooth the surface for an aesthetically higher grade of finish.
4. Back roll the surface in two directions at right angles with a spike roller.

#### WEARING COURSE (VERTICAL AREAS)

1. Apply the Product evenly over the surface with a trowel.
2. Place the earthing plates.
3. Apply the conductivity layer.
4. Apply a second layer of the Product evenly over the surface with a trowel.

#### WEARING COURSE WITH SLIP RESISTANCE

##### Preconditions

**IMPORTANT** Do not blind the primer. The conductive priming coat has been applied and has dried tack-free all over.

1. Pour the mixed Product onto the surface. Note The consumption is specified in Application Information.
2. Apply the Product evenly over the surface with a serrated trowel.
3. Broadcast the surface to excess with silicon carbide as specified in consumption.
4. After final drying sweep off the surplus silicon carbide. Note The surface must be vacuumed.

#### CLEANING OF TOOLS

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

#### MAINTENANCE

To maintain the appearance of the floor after application, the Product 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. Refer to Sika Method Statement: Sikafloor®-Cleaning Regime.

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##### Product Data Sheet

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#### 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.

#### 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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