BUILDING TRUST

SYSTEM DATA SHEET

Sikafloor® MultiDur ES-31 ECF

2-part, smooth, chemically highly resistant and electrostatic conductive epoxy floor covering

PRODUCT DESCRIPTION

Sikafloor® MultiDur ES-31 ECF is a two part, electrostatic conductive self-smoothing, coloured epoxy flooring system with high chemical resistance. "Total solid epoxy composition acc. to the test method Deutsche Bauchemie e.V. (German Association for construction chemicals)".

USES

Sikafloor® MultiDur ES-31 ECF installation works to be carried out only by Sika Approved Contractors. Please observe information given by Product Data Sheets.

It is used as:
- Chemically highly resistant coating for concrete and screed surfaces in bund areas for the protection against water contaminating liquids (contact Sika technical service for specific information)
- 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
- Electrostatically conductive

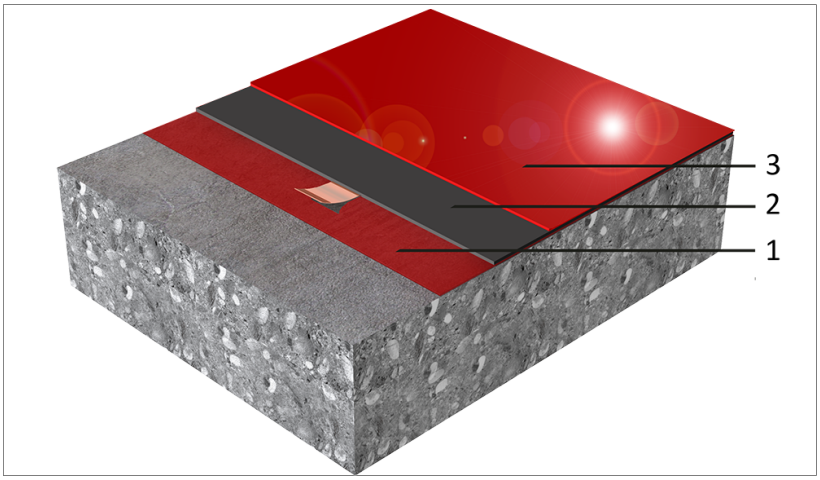
APPROVALS / STANDARDS

- Synthetic resin screed material according to EN 13813:2002, Declaration of Performance 02 08 01 02 019 0 000010 201, certified by notified factory production control certification body 0921, certificate of conformity of the factory production control 2017, and provided with the CE marking.
- Coating for surface protection of concrete according to EN 1504-2:2004, Declaration of Performance 02 08 01 02 019 0 000010 201, certified by notified factory production control certification body 0921, certificate of conformity of the factory production control 2017, and provided with the CE marking.
- Reaction to fire classification according to DIN EN 13301-1. Test report No.: 2013-B-1413/01.
- Particle emission certificate Sikafloor®-381 ECF CSM Statement of Qualification - ISO 14644-1, class 4 - Report No. SI 1312-681
- Spark resistance in accordance with UFGS-09 97 23 of coating systems, Test report P 8625-E, Kiwa Polymer Institut

SYSTEM INFORMATION

System Structure

Sikafloor® MultiDur ES-31 ECF:



1. Primer + Earthing connection	Sikafloor®-150/-151 + Sika® Earthing Kit
2. Conductive primer	Sikafloor®-220 W Conductive
3. Final conductive coating	Sikafloor®-381 ECF filled with quartz sand F34

The system configurations as described must be fully complied with and may not be changed.

Composition

Epoxy

Appearance

Self-smoothing system – gloss finish

Colour

Almost unlimited choice of colour shades.
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. Under direct sun light there may be some variations and colour variation, this has no influence on the function and performance of the coating.

Nominal thickness

~ 1.5 mm

TECHNICAL INFORMATION

Shore D Hardness	~ 82 (resin filled)	(7 days / +23 °C)	(DIN 53 505)
Abrasion Resistance	~ 40 mg (resin filled)	(CS 10/1000/1000) (8 days / +23 °C)	(DIN 53109 Taber Abraser Test)
Compressive Strength	~ 80 N/mm² (resin filled)	(14 days / +23 °C)	(EN 196-1)
Tensile Strength	~ 55 N/mm² (resin filled)	(14 days / +23 °C)	(EN 196-1)
Reaction to Fire	Bfl s1		(EN 13501-1)

Chemical Resistance

Resistant to many chemicals. Contact Sika technical service for specific information.

Thermal Resistance

Exposure*	Dry heat
Permanent	+50 °C
Short-term max. 7 d	+80 °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 LEED Rating

Conforms to the requirements of LEED EQ Credit 4.2: Low-Emitting Materi-

als: Paints & Coatings SCAQMD Method 304-91 VOC Content <100 g/l.

Electrostatic Behaviour

Resistance to ground[1]	$R_g < 10^9\ \Omega$	(IEC 61340-4-1)
Typical average resistance to ground[2]	$R_g < 10^6\ \Omega$	(DIN EN 1081)

[1] In accordance with IEC 61340-5-1 and ANSI/ESD S20.20.
[2] Readings may vary, depending on ambient conditions (i.e. temperature, humidity) and measurement equipment.

APPLICATION INFORMATION

Consumption

Coating	Product	Consumption
Primer	Sikafloor®-150/-151	1-2 x ~ 0.3 - 0.5 kg/m²
Levelling (if required)	Sikafloor®-150/-151 levelling mortar	Refer to PDS of Sikafloor®-150/-151
Earthing connection	Sika® Earthing Kit	1 earthing point per approx. 200 -300 m², min. 2 per room.
Conductive primer	Sikafloor®-220 W Conductive	1 x 0.08 - 0.10 kg/m²
Final conductive coating	Sikafloor®-381 ECF filled with quartz sand F34*	2.5 kg/m² Binder + quartz sand 10-15°C: without filling 15-20°C: 1 : 0.1 pbw; 20-30°C: 1 : 0.2 pbw

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 F 34 (0.1-0.3 mm) from Quarzwerke GmbH Frechen. 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.

Ambient Air Temperature

+10 °C min. / +30 °C max.

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.

Substrate Temperature

+10 °C min. / +30 °C max.

Substrate Moisture Content

<4 % pbw moisture content.
Test method: Sika Tramex Meter, CM-measurement or Oven-Dry-Method.
No rising moisture according to ASTM (Polyethylene-sheet).

Waiting Time / Overcoating

Before applying Sikafloor®-220 W Conductive on Sikafloor®-150/151 allow:

Substrate temperature	Minimum	Maximum
+10 °C	24 hours	4 days
+20 °C	12 hours	2 days
+30 °C	8 hours	1 days

Before applying Sikafloor®-381 ECF 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.

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 days	~ 5 days

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

VALUE BASE

All technical data stated in this Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

FURTHER DOCUMENTS

Please refer to:
- Sika® Information Manual Mixing and Application of Flooring Systems
- Sika® Information Manual Surface Evaluation & Preparation

LIMITATIONS

- 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.
- Do not apply the Sikafloor® MultiDur ES-31 ECF System on substrates in which significant vapour pressure may occur.
- Do not blind the primer.
- The freshly applied final conductive coating of the Sikafloor® MultiDur ES-31 ECF system 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.
- Maximum layer thickness of final conductive coating: ~ 1.5 mm. Excessive thickness (more than 2.5 kg/m²) causes reduced conductivity.
- Under certain conditions, underfloor heating 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.
- 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 the final conductive coating of the Sikafloor® MultiDur ES-31 ECF system in each area is applied from the same control batch numbers.
- ESD clothing, ambient conditions, measurement equipment, cleanliness of the floor and the test person have a substantial influence on the measurement results.

All measurement values for the Sikafloor® MultiDur ES-31 ECF system stated in the system data sheet (apart from the ones referring to proof statements) were measured under the following conditions:

Ambient conditions:	+23 °C/50%
Measurement device for the Resistance to Ground:	Metriso 2000 (Warmbier) or comparable
Surface resistance probe:	Carbon Rubber electrode. Weight: 2.50 kg / Tripod electrode acc. DIN EN 1081
Rubber pad hardness:	Shore A 60 (± 10)

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.
Installation of earthing points: Please refer to the Information Manual: “MIXING & APPLICATION OF FLOORING SYSTEMS”.
Number of earth connections: Per room at least 2 earthing points. The optimum number of earth connections depends on the local conditions and should be specified using available drawings.

ECOLOGY, HEALTH AND SAFETY

Local safety regulations must be observed and it advisable to wear PPI when working with this product with particular attention paid to cutting and handling. Transportation Class: The product is not classified as hazardous good for transport. Disposal: The material is recyclable. Disposal must be according to local regulations. Please contact your local Sika sales organisation for more information.

MAINTENANCE

To maintain the appearance of the floor after application, Sikafloor®-381 ECF 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.

CLEANING

Please refer to the Sikafloor® Cleaning Regime.

LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for the exact product data and uses.

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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