BUILDING TRUST

SYSTEM DATA SHEET

Sikafloor® MultiDur ES-47 ECF

Epoxy, Smooth, Conductive Flooring System

PRODUCT DESCRIPTION

Sikafloor® MultiDur ES-47 ECF is an epoxy based, smooth finish, electrostatically conductive flooring system. The System is designed to dissipate electrostatic charges in areas of high explosion risk.

USES

Sikafloor® MultiDur ES-47 ECF may only be used by experienced professionals.

Industrial resin flooring on cementitious substrates for:

- Medium up to heavy wear
- Flooring that needs to comply with the requirements of the standard VDE 100-600
- Automotive production plants
- Chemical production plants
- Laboratories
- Fireworks factories
- Pharmaceutical production areas
- Fibre and textile production
- Explosive storage and handling areas
- Explosive dust environments
- Aircraft maintenance hangars
- Workshops
- Battery-charging rooms
- Interior use only

CHARACTERISTICS / ADVANTAGES

- Thickness ~1,5–2,0 mm
- Electrostatic conductive
- Chemical resistant top layer
- Good mechanical resistance
- Easy to clean
- Waterproof
- Wearing layer available in various colours
- Smooth gloss surface finish
- Conforms to the requirements of VDE 100-610

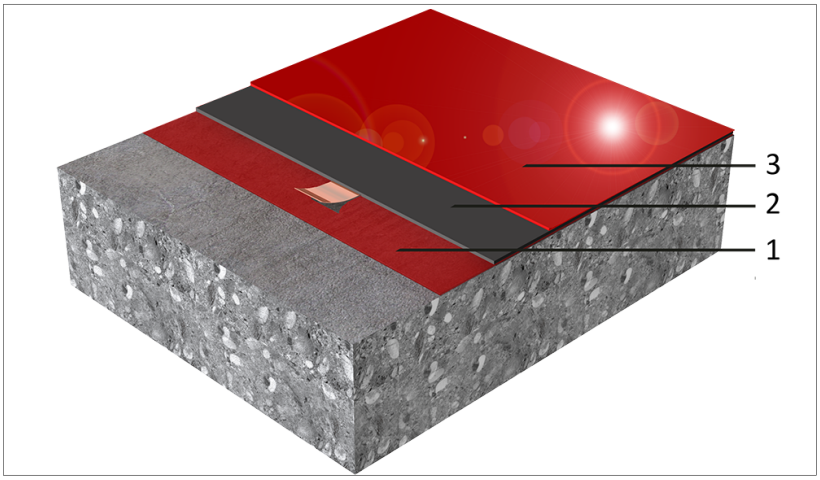
APPROVALS / STANDARDS

- CE Marking and Declaration of Performance to EN 1504-2 - Surface protection product for concrete - Coating.
- CE Marking and Declaration of Performance to EN 13813 - Resin screed material for internal use in buildings.
- Insulation Resistance DIN VDE 0100-600, Sikafloor® MultiDur ES-47 ECF, kiwa, Test report No. P 12174-4-E.

SYSTEM INFORMATION

System Structure

Sikafloor® MultiDur ES-47 ECF (~1,5–2,0 mm)



Layer	Product
1. Primer	Sikafloor®-150/-151
2. Conductive Primer & Earthing Connection	Sikafloor®-221 W Conductive + Sika® Earthing Kit
3. Conductive Wearing Layer	Sikafloor®-262 AS N

The system structure layers as described in table must not be changed.

Composition

Epoxy

Appearance

Smooth gloss finish

Colour

Conductive wearing layer available in many colours.
Applied colours selected from colour charts will be approximate.
Colour deviations may occur due to carbon fibre filaments.
For colour matching: Apply colour sample and confirm selected colour under real lighting conditions.
When 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 floor finish.

Nominal thickness

~1,5–2,0 mm

Volatile organic compound (VOC) content

Sikafloor®-262 AS N, is the finishing layer of the Sikafloor® MultiDur ES-47 ECF System. It has been awarded the Frauenhofer IPA CSM Certicate of Qualification (report number SI 1412-740). Outgassing tests were performed in accordance with CSM procedures. TVOC: ISO-AMC Class -8.0 (see ISO 14644-8). It fulfils the stringent AgBB demands for indoor air quality and low VOC emissions (refer to test report no. 392-2014-00286901A).

TECHNICAL INFORMATION

Compressive Strength	~80 N/mm² (resin filled)	(28 days / +23 °C)	(EN 196-1)
Tensile Strength	~40 N/mm² (resin filled)	(28 days / +23 °C)	(EN 196-1)

Chemical Resistance

Resistant to many chemicals. Contact Sika® Technical Services for additional information.

Thermal Resistance

Exposure*	Dry heat
Permanent	+50 °C
Short-term (maximum 7 days)	+80 °C

Short-term moist / wet heat* up to +80 °C where exposure is temporary (i.e. during steam cleaning etc.)
*No simultaneous chemical and mechanical exposure.

USGBC LEED Rating

Sikafloor®-262 AS N conforms to the requirements of LEED EQ Credit 4.2: Low-Emitting Materials: 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]	$R_g < \sim 10^5 - 10^6 \Omega$	(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
1. Primer	Sikafloor®-150/-151	1–2 × ~0,3–0,5 kg/m²
Levelling (if required)	Sikafloor®-150/-151 Levelling Mortar	Refer to PDS of Sikafloor®-150/-151
2. Conductive Primer & Earthing Connection	Sikafloor®-221 W Conductive Sika® Earthing Kit	1 × 0,08–0,10 kg/m² 1 earthing point per ~200–300 m². 2 per room minimum
3. Self-smoothing Wearing Layer for High Aesthetical Finish ~1,5 mm thickness	Sikafloor®-262 AS N filled with Sikafloor® Filler 1*[1]	Maximum 2,5 kg/m² Binder + Sikafloor® Filler 1. Filled: 0,1–0,2 parts by weight
Self-smoothing Wearing Layer ~1,5 mm thickness	Sikafloor®-262 AS N filled with quartz sand F34*[1]	Maximum 2,5 kg/m² Binder + quartz sand F 34. Filled: 0,1–0,3 parts by weight

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

*[1] All values have been determined using quartz sand F 34 (0,1–0,3 mm) from Quarzwerke GmbH Frechen and Sikafloor® Filler 1. Other quartz sand types will have an effect on the product, such as filling grade, levelling properties and aesthetics. Depending on the air temperature, the filling grade varies, generally, the lower the temperature the less the filling grade.

Product Temperature

+10 °C minimum / +30 °C maximum

Ambient Air Temperature

+10 °C minimum / +30 °C maximum

Relative Air Humidity

80 % maximum

Dew Point

Beware of condensation. The substrate and uncured applied floor materials must be at least +3 °C above dew point to reduce the risk of condensation or blooming on the surface of the applied product.

Substrate Temperature

+10 °C minimum / +30 °C maximum

Substrate Moisture Content

≤4 % parts by weight. The following test methods can be used: Sika®-Tramex Meter, CM-measurement or Oven-dry-method. No rising moisture according to ASTM (Polyethylene-sheet).

Waiting Time / Overcoating

Before applying Sikafloor®-221 W Conductive on Sikafloor®-156/160/161 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®-262 AS N on Sikafloor®-221 W Conductive allow:

Substrate Temperature	Minimum	Maximum
+10 °C	26 hours	7 days
+20 °C	17 hours	6 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	~30 hours	~5 days	~10 days
+20 °C	~24 hours	~3 days	~7 days
+30 °C	~16 hours	~2 days	~5 days

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

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.

FURTHER DOCUMENTS

- Sika® Method Statement: Sikafloor®-Cleaning Regime.
- Sika® Method Statement: Mixing and Applications of Flooring Systems.
- Sika® Method Statement: Evaluation and Preparation of Surfaces for Flooring Systems.
- Individual Product Data Sheets within the Flooring System.

LIMITATIONS

- In addition to the Sikafloor® MultiDur ES-47 ECF Flooring System, consideration must be given to providing employees working in an explosive atmosphere zoned area with anti-static clothing and footwear.
- Do not apply Sikafloor® MultiDur ES-47 ECF on substrates with rising moisture.
- The incorrect assessment and treatment of cracks may lead to a reduced service life, reflective cracking and reducing or breaking the conductivity.
- 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.
- After application, all the products must be protected from damp, condensation and water for at least 24 hours.
- Only start application of the Sikafloor® conductive primer after all the primer has dried tack-free. This prevents the risk of 'wrinkling' affecting the conductive properties.
- Do not blind the primer.
- Exceeding the recommended thickness of the wearing layer causes reduced conductivity.
- Under certain conditions, under floor heating or high ambient temperatures combined with high point loading, may lead to indentations in the resin.
- If temporary 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.
- For consistent colour matching of the final wearing layer, ensure the Sikafloor®-262 AS N in each area is applied from the same control batch numbers.
- Measurement results can be affected by ESD clothing, ambient conditions, measurement equipment, cleanliness of the floor and test personnel.
- After curing of the Sikafloor® conductive primer and before application of the subsequent conductive wearing layers. Conductivity testing of the conductive primer must be carried out. All readings must be below 10^4 Ohm. Measuring equipment must be the same or similar to the equipment stated in the following table:

All measurement values for the Sikafloor® MultiDur ES-47 ECF system stated in the System Data Sheet (except those referring to proof statements) were measured using the following equipment and ambient 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
< 100 m²	10-20
< 1000 m²	50
< 5000 m²	100

If values are lower / higher than required, additional measurements must be carried out, ~30 cm around the point where the faulty readings are located. If the re-measured values are in accordance with the requirements, the total area is acceptable.
Installation of earthing points: Refer to Sika® Method Statement: Mixing and Applications of Flooring Systems.

Numbers of earth connections per room: Minimum of 2 earthing points. The optimum number of earth connections depends on the local conditions and must be specified on available drawings or other contract documentation.

ECOLOGY, HEALTH AND SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

MAINTENANCE

CLEANING

Refer to Method Statement: Sikafloor®-Cleaning Regime.

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.

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