

SYSTEM DATA SHEET

Sikafloor® MultiDur ES-31 ECF

2-PART, SMOOTH, CHEMICALLY HIGHLY RESISTANT AND ELECTRO-STATIC CONDUCTIVE EPOXY FLOOR COVERING



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 may only be used by experienced professionals.

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

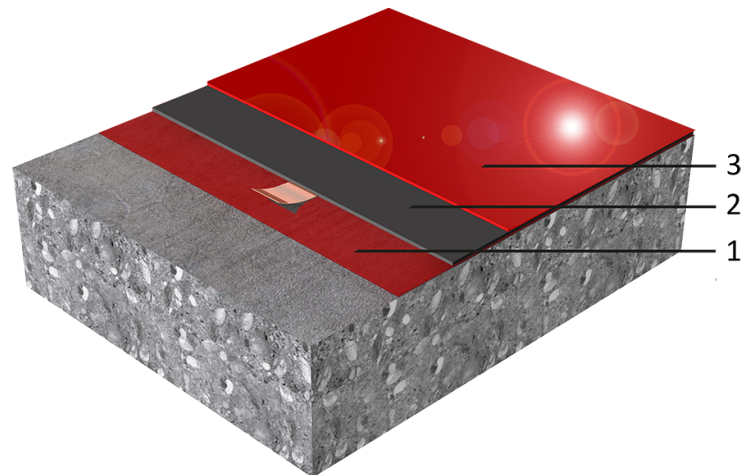
APPROVALS / STANDARDS

- 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®-156/-160/-161 + 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.

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|--------------------------|--|
| Chemical base | 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

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|-----------------------------|---|-------------------------------------|--------------------------------|
| 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/mm ² (resin filled) | (14 days / +23 °C) | (EN 196-1) |
| Tensile Strength | ~ 55 N/mm ² (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. | | |

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| USGBC LEED Rating | Conforms to the requirements of LEED EQ Credit 4.2: Low-Emitting Materials: Paints & Coatings SCAQMD Method 304-91 VOC Content <100 g/l. |
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Electrostatic BehaviourResistance to ground¹ $R_g < 10^9 \Omega$ (IEC 61340-4-1)Typical average resistance to ground² $R_g < 10^6 \Omega$ (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®-156/-160/-161 | 1-2 x ~ 0.3 - 0.5 kg/m ² |
| | Levelling (if required) | Sikafloor®-156/-160/-161 levelling mortar | Refer to PDS of Sikafloor®-156/-160/-161 |
| | Earthing connection | Sika® Earthing Kit | 1 earthing point per approx. 200 -300 m ² , min. 2 per room. |
| | Conductive primer | Sikafloor®-220 W Conductive | 1 x 0.08 - 0.10 kg/m ² |
| | Final conductive coating | Sikafloor®-381 ECF filled with quartz sand F34* | 2.5 kg/m ² 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.

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| Ambient Air Temperature | +10 °C min. / +30 °C max. |
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|------------------------------|----------------|
| Relative Air Humidity | 80 % r.h. max. |
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| 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. |
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|------------------------------|---------------------------|
| Substrate Temperature | +10 °C min. / +30 °C max. |
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|-----------------------------------|--|
| 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). |
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| Waiting Time / Overcoating | Before applying Sikafloor®-220 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 day |

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

PRODUCT INFORMATION

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|--------------------|--|
| Packaging | Please refer to individual Product Data Sheet. |
| Shelf life | Please refer to individual Product Data Sheet. |
| Storage conditions | Please refer to individual Product Data Sheet. |

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.

FURTHER DOCUMENTS

Please refer to:

- Sika® Method Statement Mixing and Application of Flooring Systems
- Sika® Method Statement 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 CO₂ and H₂O 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:

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| 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 m ² | 6 measurements |
| < 100 m ² | 10-20 measurements |
| <1000 m ² | 50 measurements |
| <5000 m ² | 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 Method Statement: "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.

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. 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.

ECOLOGY, HEALTH AND SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safety-related data.

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.

Sika Hellas ABEE
15 Protomagias Str.
14568 Kryoneri
Attica-Greece
Tel.: +30 210 8160 600
Fax: +30 210 8160 606
www.sika.gr | sika@gr.sika.com



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