BUILDING TRUST

SYSTEM DATA SHEET

Sikafloor® MultiDur ES-40 ESD

SMOOTH, UNICOLOUR EPOXY FLOOR COVERING WITH ELECTROSTATICALLY DISSIPATIVE ESD FLOOR SEAL COAT

PRODUCT DESCRIPTION

The Sikafloor® MultiDur ES-40 ESD system is a seamless, smooth, low voc, ESD epoxy floor covering. It consist out of the two part, self-smoothing, non conductive epoxy coating Sikafloor®-263 SL and the two part, water dispersed, coloured ESD epoxy roller coating Sikafloor®-230 ESD TopCoat. This system offers the opportunity to upgrad a normal epoxy floor covering to a floor covering which fulfils ESD requirements.

USES

Sikafloor® MultiDur ES-40 ESD may only be used by experienced professionals.
It is used as:
- Dissipative coloured indoor system for electrostatic protected areas (EPA).
- Particularly suitable for areas with requirements for the lowest electrostatic charge (low BVG (Body Voltage Generation)) and dissipative surface
- Typical applications include clean rooms in the electronics industry, microbiology/microchemistry sectors, production plants in the automobile industry etc.

CHARACTERISTICS / ADVANTAGES

- Body voltage generation < 10 V
- Conforms to the requirements of ANSI/ESD S20.20 and IEC 61340-5-1
- Fulfils ESD-requirements at > 12 % RH/+23°C*
- Water based Top Coat
- Easy to apply & easy to clean
- Easy to refurbish, can be overcoated directly with itself
- Low odour
- Matt surface

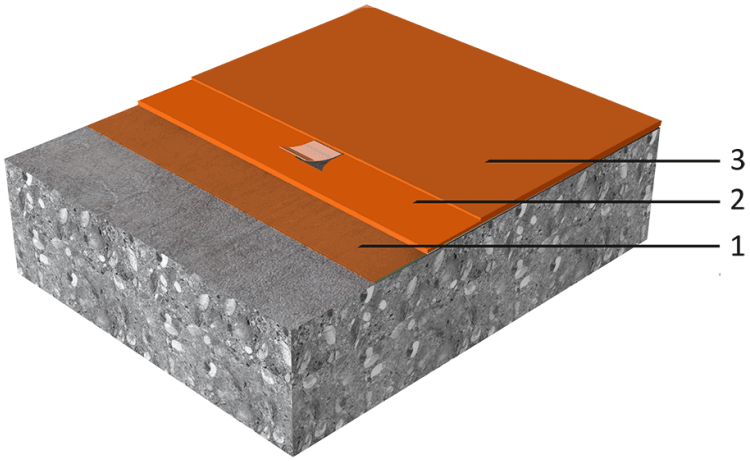
APPROVALS / STANDARDS

- 2-part epoxy self-smoothing according to EN 1504-2: 2004 and EN 13813:2002, DoP 02 08 01 02 05 00000002 1008, certified by Factory Production Control Body No. 0921, certificate 2017, and provided with the CE-mark
- Water dispersed, coloured, epoxy resin roller coat according to EN 1504-2: 2004 and EN 13813, DoP 02 08 01 02 037 0 000001 2017, certified by Factory Production Control Body No. 0921, certificate 2017, and provided with the CE-mark.
- *Testing of electrostatic properties in accordance to IEC 61340, SP Institute, Test Report 3F016806:D, rev 1, January 2014
- Approval for ESD protective productsacc. IEC 61340, SP Institute, DNo. 230-13-0277, rev 1, January 2014
- Spark resistance in accordance with UFGS-09 97 23 of coating systems, Test report P 8625-E, Kiwa Polymer Institut
- Slip resistance test acc. DIN 51130, Report No. 020143-13-13, Oktober 2013

SYSTEM INFORMATION

System Structure

Sikafloor® MultiDur ES-40 ESD:



1. Primer	Sikafloor®-156/-161
2. Base coating + Earthing	Sikafloor®-263 SL + Sika® Earthing Kit
3. Final ESD coating + Maintenance layer	Sikafloor®-230 ESD TopCoat + Ceradur (Kiehl)

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

Composition

Epoxy

Appearance

Smooth - matt surface

Colour

ca. RAL 1001, 1015, 7030, 7032, 7035, 7038, 7040, 7042, 7044, 7046, 9002. All colours are approximate. Under direct sun light there may be some discolouration and colour deviation; this has no influence on the function and performance of the coating.

Nominal Thickness

~1.5 - 2.0 mm

TECHNICAL INFORMATION

Abrasion Resistance

~ 95 mg (CS 10/1000/1000) (DIN 53109 Taber Abraser Test)

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

Sikafloor®-230 ESD TopCoat conforms to the requirements of LEED EQ Credit 4.2: Low-Emitting Materials: Paints & Coatings SCAQMD Method 304-91 VOC Content < 100 g/l

Skid / Slip Resistance

R 9 (DIN 51130)

Electrostatic Behaviour

Resistance to ground[1]	$R_g < 10^9\ \Omega$	(IEC 61340-4-1)
Typical average resistance to ground[2]	$R_g < 10^7 \Omega$	(DIN EN 1081)
Body voltage generation[2]	< 100 V	(IEC 61340-4-5)
System Resistance (Person/Floor/Shoe)[3]	<35 M Ω	(IEC 61340-4-5)

[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.
[3] Or < 10^9 Ω + body voltage generation of < 100 V, in case of readings > 35 M Ω.

APPLICATION INFORMATION

Consumption

Coating	Product	Consumption
Primer	Sikafloor®-156/-161	1-2 x ~ 0.3 - 0.5 kg/m²
Levelling (if required)	Sikafloor®-156/-161 levelling mortar	Refer to PDS of Sikafloor®-156/-161
Base coat (1.0 - 1.5 mm)	Sikafloor®-263 SL	~ 1.9 - 2.7 kg/m² Binder + quartz sand F 34: 1 : 0.6 - 1:1 pbw (depending on the air temperature the filling grade varies)
Earthing connection	Sika® Earthing Kit	1 earthing point per approx. 200 -300 m², min. 2 per room.
Final ESD coating	Sikafloor®-230 ESD TopCoat	1-2 x 0.14 - 0.16 kg/m² per coat
Maintenace layer	Kiehl Ceradur	1-2 x 0.015 - 0.025 kg/m² per coat

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 of the conductive base coat. Generally, the lower the temperature the less the filling grade. When used in high wear conditions, e.g. castor chairs, a second layer with Sikafloor®-230 ESD TopCoat improves the mechanical properties of the floor covering. Lower consumption can cause roller marks, gloss differences and irregular surface structure.

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®-263 SL on Sikafloor®-156/161 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®-230 ESD TopCoat on Sikafloor®-263 SL allow:

Substrate temperature	Minimum	Maximum
+10°C	36 hours	7 days
+20°C	24 hours	5 days
+30°C	16 hours	3 days

Before applying Sikafloor®-230 ESD TopCoat on Sikafloor®-230 ESD Top-Coat allow:

Substrate temperature	Minimum	Maximum*
+10°C	36 hours	10 days
+20°C	36 hours	8 days
+30°C	36 hours	7 days

* If the maximum waiting time is exceed, Sikafloor-230 ESD Top Coat must to be slightly grinded by using a brown grinding pad.

Before applying Kiehl Ceradur on Sikafloor®-230 ESD TopCoat allow:

Substrate temperature	Minimum	Maximum
+10°C	36 hours	- **
+20°C	36 hours	- **
+30°C	36 hours	- **

**Kiehl Ceradur must be applied in cycles of approx. 3-4 month, depending on frequency of traffic.

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	~ 36 hours	~ 3 days	~ 10 days
+20°C	~ 24 hours	~ 2 days	~ 7 days
+30°C	~ 20 hours	~ 1 day	~ 5 days

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

PRODUCT INFORMATION

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

In order to ensure a long-lasting, high-quality finish and easy cleaning, the application of a floor care product (Kiehl Ceradur) is mandatory. The application of Ceradur can be executed by machine or by using a flat mob. Detailed information: KAW Kiehl - Werk und Zentralverwaltung, D-85235, Odelzhausen, Rudolf-Diesel-Straße 6, Tel.: +49 8134 9305-40, Fax: +49 81345145. http://www.kiehl-group.com. Possibly arising strips with application of CERADUR disappear usually after short service life. To maintain the appearance of the floor after application, Sikafloor®-230 ESD Top- Coat (polished with Ceradur) must have all spillages removed immediately and must be regularly cleaned using suitable detergents. The floor area must daily be cleaned using a mild alkaline cleaner such as TORVAN (Kiehl). Mixing ratio: < 0.6% in water. Method of and equipment for the cleaning of the area will depend upon size and manpower available. For large areas equipment such as a Taski (Diversey) or Kaercher scrubber drier are advantageous. Generally no undiluted cleaning agent should remain for longer time on the surface. Basic cleaning in the first 2 weeks is not permitted, only dry cleaning e.g. by broom. In the following 2 weeks only cleaning with a mop is recommended.

CLEANING

Please refer to the Sikafloor® Cleaning Regime.

FURTHER DOCUMENTS

Please refer to:

- Sika® Information Manual Mixing and Application of Flooring Systems
- Sika® Information Manual Surface Evaluation & Preparation

LIMITATIONS

- This system may only be used by experienced professionals.
- The freshly applied topcoat of the Sikafloor® MultiDur ES-40 ESD system must be protected from damp, condensation and water for at least 24 hours.
- Apply the conductive topcoat only onto tack free base coat.
- Ensure adequate ventilation during application and drying (especially at temperatures < 13°C). Otherwise the reaction and drying processes may be impaired.
- Possibly arising strips with application of CERADUR disappear usually after short service life.
- For possible changes in the composition of the recommended cleaning- and maintenance agents and their effects on the floor characteristics, Sika does not take over liability.
- If the floor is exposed to mechanical and / or chemical loads, the conductivity must be controlled regularly. In case of wear and tear, the conductive topcoat must be refreshed. This must be coordinated with the authorized ESD-representative or comparable.
- Under certain conditions, underfloor heating combined with high point loading, may lead to imprints in the resin.
- The incorrect assessment and treatment of cracks may lead to a reduced service life and reflective cracking - reducing or breaking conductivity.
- For exact color matching, ensure the top coat of the Sikafloor® MultiDur ES-40 ESD system in each area is applied from the same batch. Please control batch numbers.
- 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.
- ESD clothing, ambient conditions, measurement equipment, cleanliness of the floor and the test person have a substantial influence on the measurement results.
- ESD-footwear must fulfil the requirements of DIN EN 61340-4-3 (Climate zone 2, resistance < 5 M Ohm).

All measurement values for Sikafloor® MultiDur ES-40 ESD system stated in the system data sheet (apart from the ones referring to proof statements) were measured under the following conditions:

Size of ESD-footwear:	42 (EU) (UK: 8; US: 8,5)
Weight test person:	90 kg
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, Shore A 60 (± 10)
Measurement device for the System Resistance:	Metriso 2000 (Warmbier) or comparable
Measurement device for the Walking Test:	Walking Test Kit WT 5000 (Warmbier) or comparable

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”.
Numbers 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.

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.

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.

DIRECTIVE 2004/42/CE - LIMITATION OF EMISSIONS OF VOC

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 re-

serves 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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