BUILDING TRUST

SYSTEM DATA SHEET

Sikafloor® MultiDur ES-25 ESD

SMOOTH, UNICOLOUR HIGH PERFORMANCE ESD EPOXY FLOOR COVERING

DESCRIPTION

Sikafloor® MultiDur ES-25 ESD is a tough elastic, decorative and protective dissipative self-smoothing flooring system for concrete or cement screeds with normal up to medium heavy wear.
Particularly suitable for areas with requirements for a low electrostatic charge and dissipative surface.

USES

Sikafloor® MultiDur ES-25 ESD may only be used by experienced professionals.
It is used as:
Dissipative coloured indoor system for electrostatic protected areas (EPA). Typical applications include industries that want to reduce ESD events and assemble, install, test or transport electrostatic sensitive devices such as:
- Semiconductors and clean rooms
- Pharmaceutical industries
- Automotive industries

CHARACTERISTICS / ADVANTAGES

- Body voltage generation < 30 V*
- Good mechanical and chemical resistance
- Easy application & easy to clean
- Tough elastic
- Conforms to the requirements of ANSI/ESD S20.20 and IEC 61340-5-1
- Low VOC and particle emission
- Fulfils ESD-requirements at > 25 % RH/+23 °C**

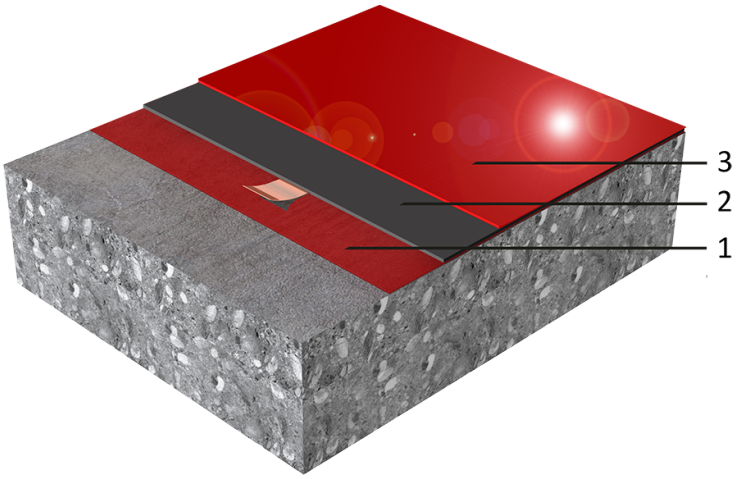
APPROVALS / STANDARDS

- *Testing of electrostatic properties in accordance to IEC 61340-5-1, Polymer Institute, Test Report P 4956-1-E, November 2007
- **Testing of electrostatic properties in accordance to IEC 61340-5-1, SP Institute, Test Report F900355:B, February 2009
- Fire classification in accordance with EN 13501-1, Report-No. 2007-B-0181/18, MPA Dresden, Germany, May 2007
- Particle emission certificate Sikafloor-235 ESD CSM Statement of Qualification - ISO 14644-1, class 4 - Report No. SI 0706-406 and GMP class A, Report No. SI1008-533.
- Outgassing emission certificate Sikafloor-235 ESD: CSM Statement of Qualification - ISO 14644-8, class - 6.8 - Report No. SI 0706-406.
- Biological Resistance in accordance with ISO 846, CSM Report No. SI 1008-533.
- Testing of Paint Compatibility in acc. to BMW-Standard 09-09-132-5, Polymer Institute, Test Report P 5541, August 2008
- Varnishability test according to Mercedes Benz-standard PBODC380/PBVCE380 (paint wetting impairment substances (PWIS)) like silicones, Test Report VPT-Nr. 07LL165, 04.2008
- Spark resistance in accordance with UFGS-09 97 23 of coating systems, Test report P 8625-E, Kiwa Polymer Institut, March 2014

SYSTEM INFORMATION

System Structure

Sikafloor® MultiDur ES-25 ESD:



1. Primer + Earthing connection	Sikafloor®-161 HC + Sika® Earthing Kit
2. Conductive primer	Sikafloor®-220 W Conductive
3. Final ESD coating	Sikafloor®-235 ESD filled with Sikafloor® Filler 1

Note: Alternatively quartz sand F34* can be used as a filler, which will result in a gloss finish with a slight change of the aesthetical appearance.
The system configuration as described must be fully complied with and may not be changed.

Composition	Epoxy
Appearance	Self-smoothing system – semi-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 sunlight there may be some variations and colour variation, this has no influence on the function and performance of the coating.
Nominal Thickness	~ 1.0 - 1.5 mm
Volatile organic compound (VOC) content	Very low content of volatile organic compounds. Sikafloor®-235 ESD, the finishing layer of the Sikafloor® MultiDur ES-25 ESD System has been awarded the Frauenhofer IPA CSM Certicate of Qualification with the report number SI 0706-406. The outgassing test was performed in accordance with CSM procedures. TVOC: ISO-AMC Class -6.8 (see ISO 14644-8).

TECHNICAL INFORMATION

Shore D Hardness	~ 58 (resin filled)	(7 days / +23 °C)	(DIN 53 505)
Abrasion Resistance	~ 60 mg (CS 10/1000/1000)	(28 days / +23 °C)	(DIN 53109 Taber Abraser Test)
Compressive Strength	~ 44 N/mm² (resin filled)	(28 days / +23 °C)	(EN 196-1)
Tensile Strength	~ 20 N/mm² (resin filled)	(28 days / +23 °C)	(EN 196-1)
Reaction to Fire	Cfl-s1		(EN 13501-1)
Chemical Resistance	Resistant to many chemicals. Contact Sika technical service for specific information.		

Temperature Resistance

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

*No simultaneous chemical and mechanical exposure.

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

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)
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®-161 HC	1-2 x ~ 0.3 - 0.5 kg/m²
Levelling (if required)	Sikafloor®-161 HC levelling mortar	Refer to PDS of Sikafloor®-161 HC
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 ESD Coating, film thickness ~1.0 mm	Sikafloor®-235 ESD filled with Sikafloor® Filler 1*	Maximum 1.6 kg/m² Binder + Sikafloor® Filler 1. Filling grade: 1 : 0.1 pbw to 1 : 0.2 pbw (Depending on the air temperature the filling grade varies)
Final ESD Coating, film thickness ~1.5 mm	Sikafloor®-235 ESD filled with quartz sand F34*	Maximum 2.5 kg/m² Binder + quartz sand F 34: 1 : 0.1 pbw to 1 : 0.3 pbw (Depending on the air temperature the filling grade varies)

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 and Sikafloor® Filler 1. 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®-161 HC 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®-235 ESD 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	~ 4 days	~ 8 days	~ 10 days
+20°C	~ 3 days	~ 6 days	~ 7 days
+30°C	~ 2 days	~ 5 days	~ 6 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

To maintain the appearance of the floor after application, Sikafloor®-235 ESD 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

IMPORTANT CONSIDERATIONS

- This system may only be used by experienced professionals.
- 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 use Sikafloor®-230 ESD TopCoat to overcoat
- Do not apply the Sikafloor® MultiDur ES-25 ESD system on substrates in which significant vapour pressure may occur.
- Do not blind the primer.
- Freshly applied final ESD coating of the Sikafloor® MultiDur ES-25 ESD 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 ESD 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.
- Due to the elasticity of the Sikafloor® MultiDur ES-25 ESD system high point loads may lead to imprints.
- 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 ESD coating of the Sikafloor® MultiDur ES-25 ESD system in each area is applied from the same control batch numbers.
- The Sikafloor® MultiDur ES-25 ESD system is not suitable for permanent water load.
- 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 2, resistance < 5 M Ohm).

All measurement values for the Sikafloor® MultiDur

ES-25 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
Rubber pad hardness:	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 Method Statement: “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.

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.

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 Kimia Sdn. Bhd.
Lot 689, Nilai Industrial Estate, 71800 Nilai
Negeri Sembilan D.K., Malaysia
Phone: +606-7991762
Fax: +606-7991980
e-mail: info@my.sika.com
Website: www.sika.com.my