

LIGHT-COLOURED HOMOGENOUS ELECTRICALLY CONDUCTIVE 2-COMPONENT EPOXY RESIN FLOOR COATING FOR INCREASED DEMANDS TO ESD-AREAS AND TO THE TRANSFER RESISTANCE

DESCRIPTION

EP 211 ESD is an electrically conductive, pigmented flow-coating based on a 2-component epoxy resin for production and storage areas with an increased demand to ESD-protection. A homogenous almost layer thickness-independent product can be produced in light colours with a high-quality aligned conductive solid agent technology. The coating is suitable for commercially and industrially used areas. Especially for electronic and electro-technical areas with ESD-requirements, as well as for other areas with environmental protection agency range requirements. EP 211 ESD meets the demands according to DIN EN 61340-5-1, human-shoe-floor, as well the walking-test with maximum charge of < 100 V. Furthermore the coating system is suitable for requirements to operator protection. EP 211 ESD meets the transfer resistance requirements according to VDE 0100-600 (2008), electrode 1 (tripod) of > 50.000 Ohm according to the maximum permissible value of VDE 0100-410. To meet the value it is necessary to use the defined electrically conductive coat EP 799 ESD. Use for all areas where static discharge on equipment and persons has to be avoided, especially for ESD-areas of the electronic and electro-technology, according to DIN EN 61340-4-1/-4-5/-5-1/2. EP 211 ESD offers a very good resistance to mechanical load and good resistance to chemicals, e.g. oil, grease, water, salt solutions, and different acids and bases. EP 211 ESD is also suitable for slip resistant scattered coatings. Electrical conductive properties may vary due to the thickness of layers. EP 211 ESD can be supplied in different colour tones. Note: Due to the conductive adjustment colour tone deviations may appear. Observe the consumption rates, higher thickness of the layers results in higher resistances. Throughout the curing process a light film may appear on the surface due to the surrounding circumstances. The film is easily removed by cleaning with water. In case of ground cooling combined with a high air humidity condensate formation may appear. By air conditioning this phenomenon can't be excluded. The resistance can increase reversible from a relative air humidity of less than 25 %, by moistening the electrical resistance can be reduced.

RECOMMENDED FOR

Typical areas of application are:

- ▶ Especially for production and storage areas in the electronic and electro-technical industry for electrically conductive coatings with increased demands to the ESD-protection (EPA-areas).
- ▶ For commercially used areas with medium mechanical load, e.g. production areas, storage areas in many economic sectors, electrically conductive.

ADVANTAGES

- ▶ Electrically conductive
- ▶ For increased demand to ESD-protection
- ▶ Complies with demand human-shoe-floor
- ▶ Complies with walking-test
- ▶ Complies with transfer resistance as indicated
- ▶ Light-coloured surface
- ▶ Solvent-free
- ▶ Balanced resistance
- ▶ Resistant to hydrolysis and saponification

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TECHNICAL CHARACTERISTICS

Characteristic	Test Result	Test Method
Viscosity (Components A+B)	1,100 – 1,500 mPa s	EN ISO 3219 at 73.4 °F (23 °C)
Density (Components A+B)	1.37 kg/lit	EN ISO 2811-2 at 68 °F (20 °C)
Color	Approx. RAL 7030, 7032, 7035, 7038, 7040, other colours upon request! Due to the conductive adjustment and technical reasons deviations in colour tones may occur!	
Solid content	Approx. 100 %	KLB-Method
Weight loss	0.3 % after 28 days	
Water absorption	< 0.2 weight %	DIN 53495
Tensile bending strength	35 N/mm ²	DIN EN 196/1
Compressive strength	55 N/mm ²	DIN EN 196/1
Shore hardness D	76	DIN 53505 (after 7 days)
Abrasion (Taber Abraser)	45 mg	ASTM D4060
Recommended layer thickness	1.0 – 1.4 mm	
Electrical conductivity	Adjusted for ESD-areas as well as VDE 0100-410	
Bleeder resistance to earth	10 ⁶ – 10 ⁹ Ohm	DIN EN 61340-5-1
Walking-Test	< 100 V	DIN EN 61340-5-1
Human-Shoe-Floor	< 35 MOhm	DIN EN 61340-5-1
VDE 0100-600 (2008) Transfer resistance	> 50 KOhm measure with 1 electrode (tripod), combine with EP 799 ESD-special adjustment	
Additives/Filler	Not recommended	
Processing time at 50 °F (10 °C)	50 minutes	
Processing time at 68 °F (20 °C)	30 minutes	
Processing time at 86 °F (30 °C)	20 minutes	
Processing temperature	50 °F (10 °C) minimum room and floor temperature	
Curing time at 50 °F (10 °C)	24-36 hrs (Accessibility)	
Curing time at 68 °F (20 °C)	14-18 hrs (Accessibility)	
Curing time at 86 °F (30 °C)	10-14 hrs (Accessibility)	
Curing	2-3 days for mechanical load at 68 °F (20 °C) 7 days for chemical resistance at 68 °F (20 °C)	
Further coatings	After 10-14 hours, but not longer than 48 hours at 68 °F (20 °C)	

The aforementioned results are related to average laboratory test results. In reality the climate changes, such as temperature, moisture and surface porosity may change these results.

DIRECTIONS FOR USE

Surface Preparation: The substrate to be coated has to be levelled, dry, free of dust, has to have adequate tensile and compressive strength, and be free from weakly-bonded components or surfaces. Materials impairing adhesion, such

as grease, oil and paint residues must be removed using suitable methods. The surface strength must then be a minimum of 1.5 N/mm². For concrete, moisture content must not exceed 4.5 CM-%, remaining residual moisture. The possibility of moisture ingress from the rear must be permanently excluded. Please refer to the advice issued by

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the trade associations, e.g. the current edition of BEB-worksheets KH-0/U and KH- 0/S, as well as the product information for the recommended KLB-Base Coats, like e.g. EP 30, EP 50, EP 51 RAPID S, and EP 52 Spezialgrund. The prepared surface has to be primed accurately, saturated, and free of pores. Estimating the substrate according to the necessary sealed state may be difficult, so a scratch coat is recommended for smoothing the surface. The conductive coating must be applied in an even thickness that is why it is mandatory to prepare the substrate thoroughly. If the substrate hasn't been sealed completely bubbles and pores may appear because of rising air. Existing irregularities may appear on the surface. Conduct a trial if in doubt.

Mixing: EP 211 ESD will be supplied in the correctly measured mixing ratio. Component A has sufficient volume for the entire trading unit. Decant the hardener component B into the resin completely. Blend with a slow speed mixer (200 - 400 r/pm) for at least 3 minutes, for a homogeneous mixture, free of streaks. To avoid mixing errors, it is recommended to principally empty the resin/hardener-mixture into a clean container and mix briefly once again.

Mixing ratios:

A:B = 5:1 parts by weight

Application:

Apply the material immediately after mixing with a trowel by pulling out an even layer on the prepared surface. Guide the trowel for an even application. Control the thickness of layers. Exchange worn out notched ledgers. The product is adjusted with an optimum of air venting. To upgrade the moistening of the substrate, optimizing the flow-properties, and removing any air blows, it is recommended to roll with a spiked roller. Using the spiked roller should be carried out time-delayed, after 15 - 20 minutes. Divide working areas before starting work and always work "fresh-in-fresh" to avoid any shoulders.

Floor- and air-temperature must not fall below 50 °F (10 °C) and/or humidity must not exceed 75 %. The difference in floor- and room-temperature must be less than 37.4 °F (3 °C) so the curing will not be disturbed. If a dew- point situation occurs adhesion may malfunction, curing may be disturbed, and spotting may occur. Exposure to water should be avoided within the first 7 days. Curing time applies to 68 °F (20 °C). Lower temperature may increase, higher temperature may decrease the curing and processing time.

If working conditions are not complied with, deviations in the described technical properties may occur in the end product.

Build-up of Coats:

- Test and prepare the substrate according to the demand, e.g. with shot-blasting.
- Apply a base coat using e.g. EP 50, consumption 0.250 - 0.350 kg/m² or other recommended base coats.
- Apply a scratch coat using EP 50 and KLB- Mischsand 2/1 (alternatively QUARTZ SAND MIX 0.10 – 0.45 MM). Mixing ratio 1.0 : 0.5 up to 0.8 parts by weight. Make sure

that by applying the scratch coat a smooth surface is achieved without any depth of roughness.

- Apply copperbands for earthing in an imagined grid pattern of 6 - 8 m, approx. 1 - 2 m into the room. Earth-connection needs to be carried out according to VDE-directives by an electrician.
- Apply a defined cross-conductive coating with EP 799 ESD (special adjustment for EP 211 ESD), consumption approx. 0.100 - 0.140 kg/m².
- Apply the coating EP 211 ESD with a notched trowel, suitable are Multitool S6, consumption approx. 1.5 - 1.8 kg/m². Do not exceed the consumption rate!

Tool recommendation:

Notched trowel with toothing S6 depending on the consumption.

COVERAGE

1.5 – 1.8 kg/m² Consumption rate must be strictly adhered to!

SPECIAL CONSIDERATIONS

To remove fresh contamination and to clean tools, use thinners VR 24 or VR 33 immediately. Hardened material can only be removed mechanically.

Please note the special cleansing recommendations for electrically conductive coatings.

The stated value for electrical conductivity are valid for 20 - 90 % of relative humidity. Apply the product at 30 to 75 % of relative humidity. In some single cases the human-shoe-floor value is above 35 MOhm. According to norm DIN EN 61340-5-1 the product possesses sufficient ESD-properties if the resistance to earth value is < 109 Ohm and the walking-test value is < 100 V.

The product is subject to the hazardous material-, operational safety-, and transport-regulations for hazardous goods. Refer to the DIN-Safety Data Sheet and the information on the labelled containers!

GISCODE: RE 1

Indication of VOC-Content: (EG-Regulation 2004/42), Maximum Permissible Value 500 g/l (2010,II,j/lb): Ready-for-use product contains < 500 g/l VOC.

Contact PENETRON HELLAS S.A. for additional information, regarding your project.

PACKAGING

EP 211 ESD is available in 25+5 kg containers.

STORAGE / SHELF LIFE

Store in dry and frost-free conditions. Ideal storage temperature is between 50 - 68 °F (10 - 20 °C). Bring to a suitable working temperature before application. Tightly re-

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seal opened containers and use the content as soon as possible. When properly stored in a dry place in unopened and undamaged original packaging, shelf life is 6 months.

SAFE HANDLING INFORMATION

Avoid skin and eye contact. If contact is made, flush areas with lots of water and seek medical advice. Protective gloves, mask and goggles should be worn. For further information please refer to Safety Data Sheet. PENETRON HELLAS S.A. has recently updated Safety Data Sheet on the safe use of PENETRON® products. Each Safety Data Sheet contains health and safety information for the protection of your employees and your customers. KEEP OUT OF REACH OF CHILDREN.

CERTIFICATION

Classification of the fire behaviour according DIN EN 13501-01:2010-01: B_{fl-s1}.

Slip resistance grade R9 possible, according to DIN 51130 and BGR 181.

Please ask for the tested system structure.



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EP211ESD-V1-022013
DIN EN 13813:2003-01
Synthetic resin screed mortar
DIN EN 13813: SR-B1.5-AR0.5-IR10
Fire behavior: B_{fl-s1}
Emission of corrosive substances: SR
Wear resistance BCA: AR 0.5
Adhesive tensile strength B 1.5

Impact resistance: IR 10

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