KLB KÖTZTAL
Lacke + Beschichtungen GmbH

KLB-SYSTEM POLYURETHAN
PU 813 EL+/ESD

Electrically conductive, pigmented, low-emission and environmentally friendly 2-component sealer on the basis of polyurethane, suitable for requirements in ESD, personal and EX protection areas.

Packaging units

Article no.	Packaging	Content (kg)	Units/pallet
AK6530-92	Combo can	1.00 kg	240
AK6530-40	Combo packaging	10.00 kg	30

Product characteristics

Mixing ratio parts by weight	A : B = 5 : 1
Mixing ratio parts by volume	A : B = 100 : 19
Processing time	10 °C / 50 °F: 120 min. 20 °C / 68 °F: 60 - 90 min. 30 °C / 86 °F: 30 - 45 min.
Processing temperature	Minimum 10 °C / 50 °F (floor and air temperature)
Curing time (accessibility)	10 °C / 50 °F: 20 - 26 hrs 20 °C / 68 °F: 16 - 24 hrs 30 °C / 86 °F: 12 - 18 hrs
Curing	2 - 3 days until mechanical load at 20 °C / 68 °F 7 days until chemical load at 20 °C / 68 °F
Further coatings	After 16 - 24 hours, but after 48 hours at the latest at 20 °C / 68 °F
Consumption	0.180 - 0.220 kg/m²
Colours	RAL colour shades (lightest colour shades RAL 7035 and RAL 1001), other colour shades on request (due to the conductive adjustment, colour tone irregularities may appear)
Shelf life	6 months (originally sealed) - Prevent from frost and sunlight!

Product description

KLB-SYSTEM POLYURETHAN PU 813 EL+/ESD is a high-quality, low-emission 2-component matt sealer on the basis of polyurethane for top sealing of certain recommended electrically conductive epoxy and polyurethane resin coatings. **KLB-SYSTEM POLYURETHAN PU 813 EL+/ESD** is suitable for use in EX and personal protection or ESD areas.

KLB-SYSTEM POLYURETHAN PU 813 EL+/ESD is certified by EMICODE EC1 Plus and “Indoor Air Comfort Gold”; thus meets the requirements for a sustainable building certification according to DGNB, LEED or BREEAM. “Indoor Comfort Gold” fulfills the highest requirements in regards to the emission of volatile organic compounds and respects not only the German limits of AgBB or ABG, but also of the emissions regulations of many other European countries.

KLB-SYSTEM POLYURETHAN PU 813 EL+/ESD can be used in combination with the products **KLB-SYSTEM POLYURETHAN PU 413 EL+, KLB-SYSTEM EPOXID EP 200 EL+, KLB-SYSTEM EPOXID EP 202 EL+, KLB-SYSTEM EPOXID EP 211 ESD** and **KLB-SYSTEM EPOXID EP 212 ESD.** By sealing, ESD properties can also be set for normally conductive coatings. The sealing results in uniform, matt surfaces.

KLB-SYSTEM POLYURETHAN PU 813 EL+/ESD is volume-conductive. This makes it possible to subsequently convert existing, insulating epoxy and polyurethane resin floorings into electrically conductive floors. All that is required is the installation of copper strips in accordance with VDE regulations.

KLB-SYSTEM POLYURETHAN PU 813 EL+/ESD cures by drying and chemical cross-linking to form a robust film with good adhesion. The hardened **KLB-SYSTEM POLYURETHAN PU 813 EL+/ESD** is resistant to many chemicals, particularly to water, salts, diluted acids and bases, oils as well as different solvents. The sealer offers good staining resistance. Seek advice if necessary!

Area of application

- Suitable for sealing certain recommended conductive coatings in areas with light to medium mechanical loads.
- Suitable for light driving and rolling traffic, only conditionally suitable for forklift trucks.
- Compliles with ESD requirements and protection against personal charging.
- Complies with EX requirements in combination with conductive coatings.
- Also suitable for subsequently converting isolating epoxy and polyurethane resin coatings into creation of dissipative floors.

Product features

- electrically conductive for explosion protection
- for increased demands on ESD protection
- tested, low-emission quality
- EMICODE EC 1 plus certified
- environmentally friendly
- easy application
- good interlayer adhesion
- matt
- even surface

Technical data

Viscosity - Component A+B	300 - 500	mPas	DIN EN ISO 3219 (23 °C / 73.4 °F)
Solid content	> 40	%	KLB method
Density - Component A+B	1.19	kg/l	DIN EN ISO 2811-2 (20 °C / 68 °F)
Abrasion (Taber Abraser)	< 13	mg	ASTM D4060 (CS10/1000)
Gloss level	Approx. 10	-	DIN 67530
Electrical resistance to ground	(when combined with EP 799 Ableitgrund / EP 202 EL+) <10^6	Ohm	DIN EN 61340-5-1
Walking Body Model	(when combined with EP 799 Ableitgrund / EP 202 EL+) <100	V	DIN EN 61340-5-1
Person/footwear/flooring system	(when combined with EP 799 Ableitgrund / EP 202 EL+) <10^9	Ohm	DIN EN 61340-5-1

The values established in tests are average values. Deviations from the product specification may occur.

Included in systems

- System F6 - KLB CONDUCTIVE LOW-VOC PU ESD Elastic

Please visit our website to get more information about our KLB systems: www.klb-koetztal.com

Suitable coatings

The following self-levelling coatings can be sealed with **PU 813 EL+/ESD**:

Low-emission coatings:

EP 202 EL+, PU 413 EL+

Conductive coatings:

EP 200 EL+

ESD coatings:

EP 211 ESD, EP 212 ESD

With other coatings, such as old coverings made of polyurethane or epoxy resin, a trial surface must be applied to check adhesion. The substrates must be sufficiently clean and lightly ground with a diamond pad.

Tests

The following external and internal test certificates are available:

- Slip-resistance grade R9 according to DIN EN 16165.
- Chair castor test according to DIN EN 425:2002-08
- LABS-compliant according to PV 3.10.7. (VW test)
- Certified as low-emission according to EMICODE with the EC1 Plus label.
- Product is compliant with DIN EN 13813: 2003-01

Note:

Please ask for the tested system build-up!

Build-up of coats

Top sealing of conductive coatings

- Prime with recommended KLB priming resins, such as **EP 50, EP 51 RAPID S, EP 52 Spezialgrund** or low-emission products like **EP 57, EP 58** and **EP 53 Spezialgrund AgBB**, consumption approx. 0.3 - 0.4 kg/m² depending on the substrate.
- Scratch coat to produce an even substrate e.g. with **EP 50, EP 51 RAPID S, EP 52 Spezialgrund, EP 57, EP 58** or **EP 53 Spezialgrund AgBB** and mixed sand **KLB-Mischsand 2/1**, mixing ratio 1.0 : 0.8 parts by weight, consumption approx. 0.8 - 1.3 kg/m².
- Glue copper bands for discharge in an imagined grid-pattern in place into the room – every 6 - 8 m, up to 1 - 2 m. Earth connection by an electrician based on VDE regulations.
- Apply the conductive coat **EP 799 Ableitgrund**, consumption approx. 0,100 to 0,140 kg/m².
- Filling/squeegeeing of the dissipative coating, with the consumption quantities specified in the product information, using a toothed trowel. Suitable coatings are **EP 202 EL+** and **PU 413 EL+** for low-emission build-ups as well as **EP 200 EL+. PU 813 EL+/ESD** can also be applied onto the ESD coatings **EP 211 ESD** and **EP 212 ESD**.
- Apply the sealer **PU 813 EL+/ESD** using a velour roller or a squeegee with toothed rubber (toothing 2 mm), please check consumption. Spread promptly with the velour roller (**micro-mixed fibre roller**, 6 mm pile height) in crosswise motion, consumption approx. 0.180 to 0.220 kg/m².

Conversion of non-conductive old coatings

- Existing old coatings based on epoxy or polyurethane resin must be cleaned thoroughly. If necessary, carry out basic cleaning.
- Mechanical preparation, e.g. fine grinding with diamond pad (KLB special floor pad P 100).

- Glue earthing points onto the existing covering in mechanically protected areas, approx. 30 to 50 cm at the edges of the room. Two in an imagined grid-pattern – every 7 - 10 m, covering a surface of 60 to 100 m². Earth connection by an electrician based on VDE regulations.
- Apply the sealer **PU 813 EL+/ESD** using a velour roller or a squeegee with toothed rubber (toothing 2 mm), please check consumption. Spread promptly with the velour roller (**micro-mixed fibre roller,** 6 mm pile height) in crosswise motion, consumption approx. 0.180 to 0.220 kg/m². Colour changes may require a double application to ensure sufficient opacity. The limit values of the electrical conductivity are thereby complied with.

Substrate

The substrate to be coated must be dry and free from any dirt. The sealer is typically applied as the last layer when creating a floor covering. It is therefore necessary to ensure that the previous layer is not already soiled. The optimum time for sealing is reached when the previously applied layer has sufficient strength and can be walked on, but is not yet cured completely. In standard systems, this is the case after 18 hours at the earliest and after 72 hours at the latest at 20 °C / 68 °F.

Hardened layers may be sealed afterwards because of the good adhesion of **PU 813 EL+/ESD**. In general, the renovation of old coverings with new sealants must be checked for suitability in advance. The coatings must be sufficiently firm and prepared according to the descriptions in the build-up of coats. If necessary, create test areas.

Mixing

Combo-packaging will be supplied in the correctly measured mixing ratio. The package of Component A has sufficient volume for the entire packaging unit. Empty all of the hardener compound B into the previously briefly stirred resin A package. Blend with a slow speed mixer (200 - 400 r/pm) for at least 2 - 3 minutes until a homogeneous, streak-free compound forms. To prevent mixing errors, empty ("repot") the entire resin/hardener mixture into a clean container and mix it once again briefly to ensure complete homogenisation. Withdrawing partial units calls for particularly accurate handling. Deviations will lead to an altered electrical conductivity.

Processing time max. 60 minutes (see chart “Processing time”).
Note: end of pot life is not visible!

Processing

As with all reactive resin systems, processing should take place immediately after mixing. First apply with a light grey rubber with pointed toothing 2 mm, then re-roll with a lint-free velour sealing roller (micro mixed fibre roller, pile height 6 mm). Typically, work areas are divided up beforehand to avoid duplicate application and haphazard overlapping. For larger areas, it is recommended that 2 or more people carry out the application. One or more persons apply the material in one direction, while another person takes over the re-rolling of the freshly applied sealing material from wall to wall in crosswise motion (90° angle). It must be ensured that after rolling in a crosswise direction, the final sealing process is always done in one direction, depending on the incidence of light. Use a 50 cm wide roller on larger surfaces. The distribution roller should be saturated/wetted with material and only be used for distribution, never for application. Always work “fresh-in-fresh” and ensure optimum distribution of the material. Adhere exactly to the application quantity, as deviations in consumption or uneven application lead to altered conductivities of the sealing layer. Make sure that e.g. puddles running off plinths are spread with the velour roller. Too thick an application (puddle formation) can lead to foaming during curing.

Floor and air temperature must not fall below 10 °C / 50 °F and humidity must not exceed 75 %. The adhesion of water-based sealers decreases significantly at relative humidity levels above 75%. Therefore, a maximum humidity level of 75% must be maintained during the curing and drying process. Do not apply in high

humidity, stormy or wet weather conditions, to ensure that the humidity does not exceed 75% during this time. Humidity levels must be controled and, if necessary, measures must be taken to improve ventilation, e.g. using fans. Optimal adhesion is not achieved within 72 hours of application. The difference in floor and room temperature must remain less than 3 °C / 3 K / 5.4 °F so as not to impede the curing process. If a dew-point situation arises, regular drying and cross-linking will not be possible with hardening problems and spotting to occur. Exposure to water and chemicals should be avoided during the first 7 days. The specified curing times apply for 20 °C / 68 °F; temperatures below this require longer processing and curing times, while higher temperatures require shorter times. If working conditions are not complied with, the technical properties of the end product may deviate from those specified, especially the conductivity of the whole system.

Special remarks: Long or improper (e.g. too hot or too cold) storage can lead to film formation inside the bucket, which in turn can cause skin flakes in the sealing material during mixing. In this case, we recommend sieving the sealer. The bucket sieve KLB-Eimersieb 15L (Art. N. WZ7050-01) is ideal for this purpose, as it enables quick sieving and thus a good sealing result.

Cleaning

To remove fresh contamination and to clean tools, use water immediately. Hardened material can only be removed mechanically.

Separate cleaning and care recommendations are available for cleaning floors produced with KLB coatings and sealers. To ensure intercoat adhesion, water-based sealers may be grouted with KLB products after 7 days at the earliest (at 20 °C / 68 °F).

Storage

Store in dry and frost-free conditions. Ideal storage temperature is between 10 - 20 °C / 50 - 68 °F. Do not store over 30 °C / 86 °F. Prevent from direct sunlight. Bring to a suitable processing temperature before application.

Special remarks

The product is regulated by the German Ordinance on Hazardous Substances (GefStoffV), the German Ordinance on Industrial Safety and Health (BetrSichV), and transport regulations for hazardous goods. The necessary information is contained in the DIN Safety Data Sheet. Observe all identification information on the container label!

GISCODE: W1/DD

Indication of VOC-content:
(EG-Regulation 2004/42) Maximum Permissible Value 140 g/l (2010,II,j/wb): Ready-for-use product contains < 140 g/l VOC.

CE marking

CE

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PU813EL+/ESD-V1-122020

DIN EN 13813:2003-01

Synthetic resin screed mortar
DIN EN 13813: SR-B2.0-AR0.5-IR18

Fire behaviour	E_{fl}-s1
Emission of corrosive substances	SR
Wear resistance BCA	AR 0.5
Adhesive tensile strength	B 2.0
Impact resistance	IR 18

VOC content

The product complies with the high requirements to low VOC contents, as required for sustainable construction. Therefore, these values are well below the limits set by the European Union directive 2004/42/EG (Decopaint Directive).

	Limit value	Actual content	
Decopaint Directive 2004/42/EG - Component A	< 140	0	g/l
Decopaint Directive 2004/42/EG - Component B	< 140	0	g/l
DGNB - Components A + B	< 3	0	%
Klima:aktiv - Components A + B	< 3	0	%
LEED - Components A + B	< 100	0	g/l
Minergie ECO ® - Components A + B	< 1 (< 2)	0	%

(According to the Decopaint directive, single components are used for calculation. In the sustainable building rating systems, the mixture of both components in the correct mixing ratio is the determining factor.)

Please consider the latest version of this product information on our website.

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