KLB-SYSTEM POLYURETHAN
PU 413 EL+

Low-emission, electrically conductive, elastic 2-component polyurethane self-levelling coating

Packaging units



Article no.	Packaging	Content (kg)	Units/pallet
AK6007-50	Bucket combo	10.00 kg	30
AK6007-30	Hobbock combo	30.00 kg	12

Product characteristics

Mixing ratio parts by weight	A : B = 4 : 1
Mixing ratio parts by volume	A : B = 100 : 30
Processing time	10 °C / 50 °F : 45 min. 20 °C / 68 °F : 25 min. 30 °C / 86 °F : 15 min.
Processing temperature	Minimum 10 °C / 50 °F (room and floor temperature)
Curing time (accessibility)	10 °C / 50 °F : 24 - 36 hrs. 20 °C / 68 °F : 18 - 24 hrs. 30 °C / 86 °F : 12 - 14 hrs.
Curing	2 - 3 days until mechancial load at 20 °C / 68 °F 7 days until chemical load at 20 °C / 68 °F
Further coatings	After 18 - 24 hours, but after 48 hours at the latest at 20 °C / 68 °F
Consumption	2.0 - 2.3 kg/m² (total consumption for 1.4 - 1.6 kg/m²)
Layer thickness	1.4 - 2.0 mm
Addition of quartz sand	Not permissible
Packaging	Bucket combo 10 kg, Hobbock combo 30 kg
Colours	KLB standard colours – see chart. Other colours upon request!
Shelf life	6 months (originally sealed)

Product description

KLB-SYSTEM POLYURETHAN PU 413 EL+ is a low-emission, electrically conductive self-levelling coating based on a 2-component polyurethane resin.

The coating has good flow and smoothing properties and cures with almost no shrinkage. The cured surface is hard and tough, but also flexible and very resistant to mechanical load.

KLB-SYSTEM POLYURETHAN PU 413 EL+ is certified according to the “Indoor Air Comfort Gold” and EMICODE® EC 1^{PLUS} and meets the requirements for a sustainable construction certification according to DGNB (Germany), LEED (United States) or BREEAM (Great Britain). “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.

The cured coating is especially suitable for commercially or industrially used areas where an antistatic or electrically conductive coating is required. Typical application areas are many industrially and commercially used surfaces like warehouse areas with fork lift traffic, for the prevention of static charge of equipment and personnel, for

floors with requirements to explosion protection, e.g. in areas with flammable material like laboratories, as well as for flooring applications in the electronics and electro technical industry. Electronic engineering (ESD areas) require special additional procedures and an additional sealing with **KLB-SYSTEM POLYURETHAN PU 813 EL+/ESD** or **KLB-SYSTEM POLYURETHAN PU 881 EL+**.

KLB-SYSTEM POLYURETHAN PU 413 EL+ offers special advantages where the substrate calls for increased flexibility, e.g. formable substrate like mastic asphalt, chipboards or metal substrates.

The material offers sufficient resistance to chemicals such as water, saline solutions, diluted acids and alkalis, mineral oils, diesel. Polyurethane coatings offer special advantages with organic acids. For solvents, epoxy resin coatings are more suitable.

KLB-SYSTEM POLYURETHAN PU 413 EL+ can be supplied in various colours but, due to its chemical structure, it is not resistant to yellowing. Where resistance to yellowing is required, the photostable sealer **KLB-SYSTEM POLYURETHAN PU 881 EL+** should be applied. Due to the conductive adjustment and for technical reasons, colour tone irregularities may appear.

Area of application

- Conductive coatings, especially on formable substrates like mastic asphalt, chipboard and metal substrates.
- Electrically conductive, commercially used areas with medium mechanical load, e.g. production and storage areas in many economical sectors.
- In the electronic and electro-technical industry also for ESD areas, when used in combination with special sealers.
- In areas with special requirements to explosion protection and to avoid any electrostatic charge.

Product features

- electrically conductive
- in combination also for ESD coverings
- tested, low-emission quality
- EMICODE® EC 1PLUS certified
- good resistance range
- free of deleterious substances against varnish
- elastic and deformable
- Total Solid according to GISCODE (Test method "Deutsche Bauchemie")

Technical data

Viscosity - Component A+B	3300	mPas	DIN EN ISO 3219 (23 °C / 73.4 °F)
Solid content	100	%	KLB method
Density - Component A+B	1.43	kg/l	DIN EN ISO 2811-2 (20 °C / 68 °F)
Weight loss	0.3	weight-%	after 28 days
Water absorption	< 0.2	weight-%	DIN 53495
max. tear resistance	50	kN/m	DIN ISO 347-1
Elongation at break	41	%	DIN EN ISO 527-3
Shore-hardness D	70	-	DIN 53505 (after 7 days)
Abrasion (Taber Abraser)	60	mg	ASTM D4060 (CS10/1000)
Electrical resistance	(in combination with EP 799 Ableitgrund) approx. 10^6	Ohm	DIN EN 61340-4-1 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

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Tests

The following external test certificates are available:

- Slip resistance grade R9 possible, according to DIN 51130 and BGR 181.
- Certified low-emission according to “Eurofins Indoor Air Comfort Gold” and EMICODE® EC 1^{PLUS}. Compliant with AgBB and suitable for recreation rooms.
- Chair castor test according to DIN EN 425:2002-08
- LABS-compliant according to PV 3.10.7. (VW test)
- Classification of the fire behaviour according to DIN EN 13501-01:2018-01: B_{fl}-s1
- Product is compliant with DIN EN 13813: 2003-01

Note:
Please ask for the tested system build-up!

Build-up of coats

- Apply a base and scratch coat for an even substrate, using **EP 57, EP 58 or, EP 53 Spezialgrund AgBB,** consumption 0.3 - 0.4 kg/m².
- If necessary: scratch coat application with **EP 57, EP 58** or **EP 53 Spezialgrund AgBB** and mixed sand **KLB-Mischsand 2/1**, mixing ratio 1 : 0.8 parts by weight, consumption approx. 0.8 - 1.2 kg/m² of the mixture.
- Glue copper bands **KLB-Kupferbänder** for discharge in an imagined grid-pattern (every 6 - 8 m, up to approx. 1 - 2 m into the room) in place. Earth-connection by an electrician according to VDE-regulations.
- Apply a cross-conductive coating with approx. 0.150 kg/m² of **EP 799 Ableitgrund**.
- Apply the conductive wearing layer **PU 413 EL+** with a toothed trowel (**Toothed blade RS4** or Pajarito 48), consumption approx. 2.8 kg/m², or **Toothed blade S3** (alternatively Pajarito 95), consumption 2.0 - 2.3 kg/m².
- Optional: sealing with **PU 881 EL+, PU 813 EL+/ESD** or **EP 790 EL+** for producing a colour-stable top coat or ESD suitable surfaces.

Substrate

The substrate to be coated must be even, dry, free of dust, sufficiently resistant to tension and compression as well as be free from weakly-bonded components or surfaces. Materials impairing adhesion such as grease, oil and paint residues should be removed with suitable measures. Observe the information issued by the trade associations, e.g. the most recent versions of BEB worksheets KH-0/U and KH-0/S as well as the notes provided in the product information for the recommended base coats, like **EP 57, EP 58** and **EP 53 Spezialgrund AgBB**. The substrates to be coated should be prepared mechanically, preferably by shot blasting. The prepared area must be saturated, pore-free and primed carefully. It is often difficult to judge the necessary pore-free condition of substrates. It is therefore recommended that a scratch coat be applied to smooth the surface. Conductive coatings must be applied in the required layer thickness, it is thus mandatory to prepare the substrate thoroughly. If the substrate has not been primed to be pore-free, bubbles and pores can develop in the coating due to air rising from the substrate. If in doubt, we recommend processing a sample area.

Mixing

Combo-packaging will be supplied in the correctly measured mixing ratio. The package of Component A has sufficient volume to contain the entire packaging unit. Empty all of the hardener compound B into the resin. 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 resin/hardener mixture into a clean container and mix it once again briefly.

Processing

Process the material immediately after mixing and spread it over the prepared surface with a toothed trowel with toothing **Toothed blade RS4** or Pajarito 48 in an evenly thick layer. The layer thickness must be strictly adhered to in order to achieve uniform conductivity. The product is adjusted for optimum deaeration, however, for conductive coatings, rolling with a spiked roller is mandatory to optimise the conductivity. This should be carried out time-delayed after approx. 10 minutes. In order to work seamlessly, always work “fresh-in-fresh” and define work areas before starting. Scattering is not recommended for conductive coatings as the conductivity is reduced.

Check consumption during application, as it may be reduced by wear of the teeth on the toothed blade. If the blade is worn, it must be replaced by the applicator in order to maintain the recommended consumption quantities

Floor and air temperature must not fall below 10 °C / 50 °F and humidity should not exceed 75 %. 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 will not be possible with hardening problems to occur. The specified hardening 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, also the conductivity.

Cleaning

To remove fresh contamination and to clean tools, use thinner **VR 28** or **VR 33** immediately. Hardened material can only be removed mechanically.

Separate cleaning and care recommendations are available for cleaning floors produced with KLB coatings and sealers.

Storage

Store in dry and if possible, at frost-free conditions. Ideal storage temperature is 10 - 20 °C / 50 - 68 °F. Before application, bring to a suitable working temperature. Tightly reseal opened containers and use the contents as soon as possible.

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: PU40

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.

CE marking

CE
KLB Kötztal Lacke + Beschichtungen GmbH Günztalstraße 25 FRG-89335 Ichenhausen
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PU413EL+-V1-022013
DIN EN 13813:2003-01
Synthetic resin screed mortar DIN EN 13813: SR-B1.5-AR0.5-IR16

Fire behaviour	E_{fl}-s1
Emission of corrosive substances	SR
Wear resistance BCA	AR 0.5
Adhesive tensile strength	B 1.5
Impact resistance	IR 16

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	< 500	1	g/l
Decopaint Directive 2004/42/EG - Component B	< 500	0	g/l
DGNB - Components A + B	GISCODE	PU40, EC 1PLUS	
klima:aktiv – Components A + B	< 3	0.05	%
LEED - Components A + B	< 100 g/l	0,8	g/l
Minergie ECO ® - Components A + B	< 1 (< 2)	0.05	%

(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.

All stated information is based on our experience and technical preparation. We guarantee the correct and proper quality of our products. We do not assume any responsibility for the work not carried out by us, since we have no influence on the processing or processing conditions. We recommend on-site trials to be conducted in individual cases. With the publication of this new KLB product information, all prior information loses validity. The latest version is available electronically on our website www.klb-koetztal.com. In addition, our "General Terms and Conditions“ apply.

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