KLB KÖTZTAL
Lacke+Beschichtungen GmbH

KLB-SYSTEM POLYURETHANE
PU 413 EL+

Electrically conductive flexible 2-comp. Polyurethane Flow Coating

Mixing Ratio	Parts by weight	A : B =	4 : 1	
	Parts by volume	A : B =	100 : 30	
Processing Time	Temperature	10 °C / 50 °F	20 °C / 68 °F	30 °C / 86 °F
	Time	45 minutes	25 minutes	15 minutes
Processing Temperature		Minimum 10°C / 50 °F (room- and floor-temperature)		
Curing	Temperature	10 °C / 50 °F	20 °C / 68 °F	30 °C / 86 °F
(Accessibility)	Time	24 - 36 hrs.	18 - 24 hrs.	12 - 14 hrs.
Curing		2 - 3 days at 20 °C / 68 °F for mechancial load		
		7 days at 20 °C / 68°F for chemical resistance		
Further coatings		After 18 - 24 hours, but not longer than 48 hours at 20 °C / 68 °F		
Consumption		1.9 - 2.3 kg/m² (total consumption)		
Electrical conductivity		Approx. 10^6 Ohm (in combination with EP 799 Highly Conductive Base Coat)		
Test Standards		DIN EN 61340-4-1, DIN EN 61340-5-1/2		
Layers		1.4 - 2.0 mm		
Quartz sand addition		Not permissible		
Packaging		Bucket-Combi 10 kg, Hobbock-Combi 30 kg		
Colours		KLB-Standard Colours – see chart. Other colours upon request!		
Colour deviations		Due to the conductive properties, colour deviation is possible		
Shelf life		6 months (originally sealed)		

Usage and Properties

KLB-SYSTEM POLYURETHANE PU 413 EL+ is a solvent-free, electrically conductive, flow coating based on a 2-component polyurethane resin.

Due to the special conductive fibre technology, the product can be manufactured in a wide range of colours instead of the otherwise usual anthracite colours.

The cured coating is especially suitable for commercially and industrially used areas where an antistatic or electrically conductive coating is required. Suitable for many industrially and commercially used areas, like e.g. storage areas with fork lift traffic, avoiding electrostatic charge on equipment and persons, requirements to the explosion protection, e.g. for areas with flammable materials, like laboratories as well as for coatings in electronic and electrical engineering and so on. Electronic engineering production areas require additional sealing. Use **KLB-SYSTEM POLYURETHANE PU 881 EL+.**

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

The material offers sufficient resistance to chemicals such as water, salt 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 POLYURETHANE PU 413 EL+ can be supplied in various colours but, due to its chemical structure, it is not resistant to yellowing though. Where resistance to yellowing is required, the photo-stable sealer, **KLB-SYSTEM POLYURETHANE PU 881 EL+** should be applied. Due to the conductive properties, some deviation in colour is possible for technical reasons.

Product Features

- electrically conductive
- bright, pigmented surface finish
- solvent free
- good range of resistance
- flexible
- accommodates movement and deflection
- also suitable for ESD areas when used in combination with other products

Area of Application

- Conductive coatings, especially on formable surfaces like e.g. mastic asphalt, chipboard and metal substrates.
- Electrically conductive, commercially used areas with medium mechanical wear, e.g. production areas, storage areas in many economical sectors.
- Electro / electronics industries; 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.

Build-up of Coat

- Apply a base and scratch coat for a planar substrate, using **EP 50.**
- Glue **Copper Band** 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 laterally conductive coating with approx. 0.150 kg/m² of **EP 799 Highly Conductive Base Coat.**
- Trowel-apply the conductive wear-layer of **PU 413 EL+** with a notched trowel (Pajarito 48), consumption 1.9 - 2.3 kg/m².
- Optional sealing with **PU 881 EL+** for a coulour-stable top-coat or ESD suitable surfaces.

Substrate

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. Please refer to the advice issued by the trade association, e.g. the current edition of BEB-worksheets KH-O/U and KH-O/S as well as the product information for the recommended KLB-Base Coats, like e.g. **EP 50, EP 51 RAPID S** and **EP 52 Special.** The substrate to be coated should be prepared mechanically, preferably by shot-blasting. The surface has to be prepared 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. Conductive coatings have to be applied in the recommended thickness of layers. Therefore an accurate preparation of the substrate is mandatory. If the substrate hasn't been sealed completely bubbles and pores may appear because of rising air. Conduct a trial if in doubt.

Mixing

Combi-trading units will be supplied in the correctly measured mixing ratio. Component A has sufficient volume for the entire trading unit. Decant the hardener B into the resin completely. Blend with a slow speed mixer (200 - 400 r/pm) for at least 2 - 3 minutes, for a material that is homogeneous and 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.

Processing / Handling

After mixing, process immediately with a trowel, Pajarito 48, by pulling out an even layer on the prepared surface. For an even electrical conductivity it is mandatory to apply the recommended thickness of layers. 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 mandatory to roll with a spiked roller. Using the spiked roller should be carried out time-delayed, after approx. 10 minutes. Divide working areas before starting work and always work "fresh-in-fresh" to avoid any shoulders. Scatterings are not recommended for conductive coatings because the electrical conductivity will be reduced.

Floor- and air-temperature must not fall below 10 °C / 50 °F and/or humidity must not exceed 75 %. The difference in floor- and room-temperature must be less than 3 °C / 37.4 °F so the curing will not be disturbed. If a dew-point situation occurs adhesion may malfunction, curing and adhesion may be disturbed. Curing time applies to 20 °C / 68 °F. 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, even conductivity may occur in the end product.

Cleaning

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

Storage

Store in dry and 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 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: PU 40

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

CE

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13

PU413EL+-V1-022013

DIN EN 13813:2003-01

Synthetic resin screed mortar
DIN EN 13813: SR-B1.5-AR0.5-IR16

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

Technical Data*

Viscosity	Components A + B	3300	mPas	DIN EN ISO 3219 (23 °C / 73.4 °F)
Solid content		100	%	KLB-Method
Density	Components 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
Breaking elongation		41	%	DIN EN ISO 527-3
Tear growth resistance		55	kN/m	DIN ISO 34-1
Shore-Hardness D		70	-	DIN 53505 (after 7 days)
Abrasion (Taber Abraser)		60	mg	ASTM D4060
Bleeder resistance		10^6	Ohm	DIN EN 61340-4-1 / -5-1/2

(* Values achieved in sampling are average values. Variation in product specification is possible.)

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to ISO 9001.