

**ALL-PURPOSE, PIGMENTED 2-COMPONENT EPOXY RESIN COATING AND TOP COAT FOR INDUSTRIAL FLOORS OR AS SURFACE PROTECTION SYSTEM IN ACCORDANCE WITH DAFSTB GUIDELINES OS 8**

**DESCRIPTION**

EP 216 UNIVERSAL is an all-purpose, solvent-free, pigmented, 2-component epoxy resin coating for hard-wearing industrial coatings and as surface protection system in accordance with DAfStb guidelines OS 8 "Chemically-resistant coatings for drivable, heavily loaded surfaces". EP 216 UNIVERSAL is high-quality adjusted, with very good coverage. Due to the low viscosity the product is suitable for rolled coatings, as well as top sealing coat for scattered, slip resistant coatings. The material is suitable for smooth coatings for 1 - 4 mm layers. The coating material may be mixed with fire-dried quartz sand, grain size 0.1/0.3 mm up to 0.7 parts by weight. Mixing with quartz sand is useful and economic for layers starting at 2 mm. The coating material has good processing, free-flow, and planar properties. EP 216 UNIVERSAL has well balanced properties and may be used all-purpose. Because the product is multi-purpose and has a wide range of application possibilities the amount of material to be stored may be reduced. The cured coatings are very resistant to mechanical load and different chemicals. The coating is resistant to water, salt, salt solutions, alkaline and bases, as well as diluted mineral acids, like salt- or sulphuric acid. There is also a good resistance to many solvents like benzene, fuel, grease, oil, and so on. Conditional resistance to concentrated mineral acid. Short-term resistance to concentrated and diluted organic acids like formic or acetic acid. Nondurable resistance to chlorinated hydrocarbon, ester, concentrated nitric acid, and others. For special demands to resistance obtain advice. EP 216 UNIVERSAL is available in different colors. Slight color alterations may be possible due to technical reasons. Pale color epoxy resin coatings may show slight color alterations, which may become visible. For an epoxy resin product EP 216 UNIVERSAL shows only slight color alterations though.

**RECOMMENDED FOR**

Typical areas of application are:

- ▶ Thin coatings 0.8 - 1.5 mm for light mechanical load.
- ▶ Smooth coatings for commercially used areas with medium mechanical load, e.g. production areas, stacking ground in many economic sectors (2 mm coating).
- ▶ Smooth coatings for commercially used areas with high demands on mechanical load, e.g. production areas, stacking ground in many economic sectors (3 - 4 mm coating).
- ▶ Plain-coloured top sealer for scattered coatings.
- ▶ Pigmented supporting level for decorative, colour-sand scattered coatings and subsequent sealing coats, e.g. with EP 175 Spezial, EP 174, or even EP 216 UNIVERSAL.
- ▶ Robust coating for drivable, heavily loaded coatings in accordance with DAfStb guidelines OS8.

**ADVANTAGES**

- ▶ Good self levelling properties
- ▶ Suitable even for thin coatings
- ▶ All-purpose use
- ▶ Coloured glossy surface
- ▶ Can be filled using quartz sand
- ▶ Water and chemical resistance
- ▶ Wear resistance
- ▶ Only slightly yellowing
- ▶ Solvent-free
- ▶ Free of deleterious substances against varnish

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## TECHNICAL CHARACTERISTICS

Characteristic	Test Result	Test Method
Viscosity (Components A+B)	1,800 mPa s	EN ISO 3219 at 73.4 °F (23 °C)
Density (Components A+B)	1.42 kg/lit	EN ISO 2811-2 at 68 °F (20 °C)
Color	See relevant color chart. Other colors upon request!	
Water absorption	< 0.2 weight %	DIN 53495
Tensile bending strength	> 45 N/mm <sup>2</sup>	DIN EN 196/1
Compressive strength	> 55 N/mm <sup>2</sup>	DIN EN 196/1
Shore hardness D	80	DIN 53505 (after 7 days)
Abrasion (Taber Abraser)	55 mg	ASTM D4060
Processing time at 50 °F (10 °C)	70 - 90 minutes	
Processing time at 68 °F (20 °C)	30 - 35 minutes	
Processing time at 86 °F (30 °C)	15 - 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 curing, 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. Please refer to the advice issued by 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 base coats, like EP 30, EP 50, EP 51 RAPID S, EP 52 Spezialgrund, and EP 52 RAPID. The surface strength must then be a minimum of 1.5 N/mm<sup>2</sup>. 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. Base coats may not rest longer than 2 days or have to be scattered with quartz sand. The surface to be coated should be prepared mechanically, preferably by shot-blasting. 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. It is recommended to apply a scratch coat. If the substrate hasn't been sealed completely, bubbles and pores may appear because of rising air. Conduct a trial if in doubt.

**Priming:** Recommended primers EP 28, EP 30, EP 50, EP 51 RAPID S, EP 52 Spezialgrund or EP 52 RAPID. For more information refer to the relevant Technical Product Data Sheet.

**Mixing:** EP 216 UNIVERSAL 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 2 - 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.

**Addition of quartz sand:** Add the additive after the components have been pre-mixed. Suitable is grain size 0.1/0.3 mm. Do not use quartz flour or sand blends. The amount to be added depends on the thickness of layer, temperature, and type of sand. 1 kg of EP 216 UNIVERSAL may usually be filled with up to 0.7 kg of quartz sand. Adding sand is not recommended for thin coatings because free-flow properties degrade.

**Adding suspending agent:** For coating concave moldings the material KLB-Stellmittel 3 S has to be added for a stable adjustment. After mixing components A and B add 3 - 5 % of

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the thixotropic agent for a material that is free of streaks and adequately stable. When coating floors with a decline, adding 0.1 - 1.0 % of KLB-Stellmittel 3 S may be necessary to keep the material in place. Scattering the area with sand is beneficiary.

### Mixing ratios:

A:B = 4:1 parts by weight

A:B = 100:38 parts by volume

### Application:

**Coatings:** Process the material immediately after mixing with a coating knife or trowel applying an even layer on the prepared surface. 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 10 - 20 minutes. Divide working areas before starting work and always work “fresh-in-fresh” to avoid any shoulders. Do not scatter too early – optimum point of time is after 10 - 30 minutes at 68 °F (20 °C). Scatter with sand until the area is completely covered. Scattering too late may cause an uneven surface and bald spots may appear later on.

**Top sealer for scattered coatings:** After the base coat has cured, sweep and vacuum off the surface until no more excess quartz sand is released. For a slight slip resistance or reduced depth of roughness subsequently grind the peaks slightly for flattening. Distribute the fresh mixture on the floor. Use a smooth rubber squeegee, trowel, or steel coating knife, depending on the desired amount. Pull off and distribute. Watch for an even application and avoid ponding. Using a coating knife rake results in a smooth surface, soft trowels result in a more coarse surface. For an even surface and to avoid bald spots re- roll with a velour roller. Using a roller for application results in an increased coarseness. Always work “fresh-in-fresh”.

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:

#### Smooth thin coatings:

- Apply a base coat with one of the recommended primers, like EP 28, EP 30, EP 50, EP 51 RAPID S, EP 52 Spezialgrund or EP 52 RAPID, consumption approx. 0.3 - 0.4 kg/m<sup>2</sup>, depending on the substrate.
- Apply a scratch coat for a planar substrate, e.g. with EP 28, EP 30, EP 50, EP 51 RAPID S, and KLB-Mischsand

2/1 (alternatively QUARTZ SAND MIX 0.10 – 0.45 MM) mixing ratio approx. 1 : 0.8 parts by weight, consumption approx. 0.8 - 1.3 kg/m<sup>2</sup>.

- Apply the coating EP 216 UNIVERSAL with a trowel, consumption approx.: 0.8 - 1.5 kg/m<sup>2</sup>.

#### Smooth coating medium layer (2 mm):

- Apply a base coat with one of the recommended primers, like EP 28, EP 30, EP 50, EP 51 RAPID S, EP 52 Spezialgrund or EP 52 RAPID, consumption approx. 0.3 - 0.4 kg/m<sup>2</sup>, depending on the substrate.
- Apply a scratch coat for a planar substrate, e.g. with EP 28, EP 30, EP 50, EP 51 RAPID S, and KLB-Mischsand 2/1 (alternatively QUARTZ SAND MIX 0.10 – 0.45 MM) mixing ratio approx. 1 : 0.8 parts by weight, consumption approx. 0.8 - 1.3 kg/m<sup>2</sup>.
- Apply the coating EP 216 UNIVERSAL with a trowel, consumption approx.: 2.6 – 3.0 kg/m<sup>2</sup> for approx.: 2 mm coating. Coating can be mixed with quartz sand (grain size 0.1/0.3 mm) up to 1:0.7.
- Optional: Scatter with silicium carbide, delustering agent or decorative flakes (chips).
- Optional: Seal the surface with a suitable silk gloss or matt-finished sealer EP 750 E, PU 805 E, PU 880 or PU 882.

#### Surface protection system in accordance with DAfStb guidelines OS 8:

##### Robust coating for drivable, heavily loaded surfaces

- Apply the primer EP 5520, consumption approx. 0.3 - 0.4 kg/m<sup>2</sup>
- Alternatively, apply EP 5530, as pre-filled primer, consumption approx. 0.3 - 0.6 kg/m<sup>2</sup>.
- Optional: scatter lightly with quartz sand, grain 0.3/0.8 mm, consumption approx. 0.5 - 1,0 kg/m<sup>2</sup>.
- The wear coat EP 216 Universal is filled with approx. 15 % quartz sand (0.3/0.8 mm) and mixed homogeneously. Apply EP 216 Universal with a trowel by pulling “over-grain”. Consumption mixing: approx. 1.0 - 1.2 kg/m<sup>2</sup>.

##### In accordance with the maintenance guidelines, corresponding layer thickness allowances are required when there is roughness.

- Scatter completely with quartz sand 0.3/0.8 mm, consumption approx. 3.0 - 4.0 kg/m<sup>2</sup>.
- After curing sweep off excess sand, chip off or vacuum thoroughly until no more grain of sand is being released.
- EP 216 Universal as a top sealer with a rubber squeegee, distribute with a velour roller using criss-cross strokes and roll off evenly. Consumption approx. 0.55 - 0.7 kg/m<sup>2</sup>.

**Note:** The maintenance guidelines require the compliance with the recommended thickness. For OS 8 a minimum thickness of 2.5 mm, in addition to the aggregate thickness in case of roughness, is required. In accordance with the maintenance guidelines the total thickness, including the primer and top sealer thicknesses, can be reduced to a minimum thickness of 1.5 mm in case of mere protective measures on behalf of DIN EN 13813. According to RiLi-SIB, the standard OS 8 structure includes the application of a primer coat. Notwithstanding, it is also possible to work

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without priming, as far as a total thickness of 2.5 mm is complied with. Please refer to the maintenance guidelines for further requirements.

### COVERAGE

Top coat: 0.550 – 0.900 kg/m<sup>2</sup>  
Thin coat: 0.8 – 1.5 kg/m<sup>2</sup>  
Standard coat: 1.3 – 1.5 kg/m<sup>2</sup>/mm

### 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.

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 (05/2018 modification): RE 30

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 216 UNIVERSAL is available in 8+2 kg and 24+6 kg containers (A+B).

### 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-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 12 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<sub>fl-s1</sub>.

Scattered coatings with slip resistance grade R11/V4, R11/V6, R11/V8, R12/V4, R12/V6, R13/V8 possible, according to DIN 51130 and BGR 181.

Slip resistance grade R9 and R10 possible, according to DIN 51130 and BGR 181.

Suitable for use in foodstuffs according § 31 para. 1, German Food and Feed Code (German law LFGB).

Ease of decontamination according DIN 25415-1: excellent. Tested according to DIN EN 1504-2 in consideration of DIN V 18026 "Surface protection systems for concrete from products according to DIN EN 1504-2", according to the test class OS 8 "Chemically-resistant coatings for drivable, heavily loaded surfaces".

In system, with usability proof as industrial kitchen.

To receive the test results, reports and statements of performance of the relevant system please contact PENETRON HELLAS S.A.



KLB Kötztal Lacke + Beschichtungen GmbH  
Günztalstraße 25

FRG-89335 Ichenhausen

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EP216-V1-022013

DIN EN 13813:2003-01

Synthetic resin screed mortar

DIN EN 13813: SR-B1.5-AR0.5-IR7

Fire behavior: B<sub>fl-s1</sub>

Emission of corrosive substances: SR

Wear resistance BCA: AR 0.5

Adhesive tensile strength B 1.5

Impact resistance: IR 7

1119

KLB Kötztal Lacke + Beschichtungen GmbH

Günztalstraße 25

FRG-89335 Ichenhausen

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EP216-V1-022013

DIN EN 1504-2:2004

Surface protection products coating

DIN EN 1504-2:ZA.1d, ZA.1f, ZA.1g

Linear shrinkage: < 0.3 %

Compressive strength: Class I

Abrasion resistance: Mass loss < 3000 g

CO<sub>2</sub>-permeability: SD > 50 m

Water vapour permeability: Class III

Capillary water absorption and water permeability: < 0.1 kg/m<sup>2</sup>·h<sup>0.5</sup>

Compatibility to temperature change: ≥ 2.0 (1.5) N/mm<sup>2</sup>. The value in brackets is the smallest permissible value per reading.

Resistance to increased chemical excavation: Loss of durability < 50%

Resistance to impact: Class I.

Tear-test for adhesive strength evaluation: ≥ 2.0 (1.5) N/mm<sup>2</sup>. The value in brackets is the smallest permissible value per reading.

Fire behavior: B<sub>fl-s1</sub>

Grip: Class III

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PENETRON HELLAS S.A.  
G.E.MH. No: 07278001000  
Athens Headquarters - Greece  
50 - 52, Thrakomakedonon Av.  
136 79 Acharnes, Greece  
T: +30 210 2448250  
F: +30 210 2476803  
info@penetron.gr, www.penetron.gr