Technical Datasheet

VARNISH-PU 1K

One-component, solvent-free, transparent, UV-stable polyurethane varnish

Description

VARNISH-PU 1K is a transparent, aliphatic, one-component, solvent-free polyurethane varnish with satin-matt finish. It forms a watertight and UV-stable membrane featuring non-yellowing properties, high mechanical strength and chemical resistance. It offers the following advantages:

- Easy application
- Ideal for interior use – almost odorless
- Resistance to UV radiation and weather conditions (rain, frost)
- Resistance to detergents, oils, seawater, etc.
- Water vapor permeability
- Resistance to pedestrian traffic and light vehicular traffic

Certified according to EN 1504-2 and classified as a coating for surface protection of concrete.
CE marked.

Fields of application

VARNISH-PU 1K is a protective varnish suitable for:

- Decorative microcement coatings
- Concrete
- Natural stone
- Wood

VARNISH-PU 1K is also used as a resin binder in decorative stone carpet systems in combination with ISOMAT NATURAL COLORED STONES, indoors and outdoors.

Technical data

1. Properties of the product in liquid form

Form:	polyurethane prepolymer resin
Colors:	transparent (satin-matt)
Density:	1.12 kg/l
Viscosity:	640 mPa·sec (+23°C)

2. Properties of the cured membrane

Tensile strength: (ASTM D412)	> 50 N/mm^2
Elongation at break: (ASTM D 412)	20-22%
Hardness according to SHORE D:	74
Abrasion resistance: (CS17/1000/1000) (ASTM D 4060)	35 mg
Capillary absorption: (EN 1062-3, requirement of EN 1504-2: w < 0.1)	< 0.1 kg/m^2·h$^{0.5}$
Adhesion to concrete: (EN 1542)	> 2 N/mm^2
Permeability to CO_2: (EN 1062-6)	Sd > 50 m
Artificial weathering: (EN 1062-11, after 2000h)	Pass (no blistering, cracking or flaking)
Reaction to fire: (EN 13501-1)	Euroclass F

Directions for use

I. Application as protective varnish

1. Substrate preparation
The substrate must be dry, clean, and free of dust, grease, oil, loose particles, and other contaminants.

2. Application – Consumption
VARNISH-PU 1K should be slightly stirred before use. Prolonged stirring should be avoided to prevent air entrapment. VARNISH-PU 1K is applied with a roller, brush, or spray. Depending on the porosity and intended use of the substrate, 2-4 coats are required. Each new coat is applied within 24 hours after the previous one has dried, depending on the weather conditions.
Consumption: 100 g/m^2 per coat, depending on substrate absorbency.

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It should be noted that VARNISH-PU 1K generally darkens the application surface, e.g. the surface of the microcement. If this is not desired, it is recommended that the varnish should be applied in the following way:
First, the water-based polyurethane varnish VARNISH-PU 2KW is applied in one coat thinned 50% with water, with a consumption of 100 g/m^2. For highly porous substrates, a second coat of VARNISH-PU 2KW thinned 10% with water, with a consumption of 100 g/m^2, may be required.
After 24 hours, the polyurethane varnish VARNISH-PU 1K can be applied. Each new coat is applied 24 hours after the previous has sufficiently dried.
The use of VARNISH-PU 2KW prevents the intense darkening of the microcement surface, which can be caused by VARNISH-PU 1K.

Tools should be cleaned with SM-28 while VARNISH-PU 1K is still fresh.

II. Application as a resin binder in decorative stone carpet systems with ISOMAT NATURAL COLORED STONES

Exterior spaces

For application on flat roofs, balconies, etc., before the application of the stone carpet flooring, it is necessary that the substrate be previously waterproofed with one of the following polyurethane, liquid waterproofing membranes; ISOFLEX-PU 500, ISOFLEX-PU 510 or ISOFLEX-PU 550. In these cases, the stone carpet is applied 24 hours later without priming.
In case the decorative flooring is to be applied to concrete ground slabs, then DUROPRIMER-SG epoxy primer must be applied.
Consumption: 600-1000 g/m^2.

The decorative resin flooring must be applied within 14-24 hours from the application of DUROPRIMER-SG.

Preparation of the decorative resin flooring

Mixing ratio VARNISH-PU 1K: Natural stones	**Consumption of mixture** VARNISH-PU 1K + Natural stones
1:10 by weight	(1.5 kg + 15 kg) /m^2/cm
1:15 by weight	(1.0 kg + 15 kg) /m^2/cm
1:20 by weight	(0.75 kg + 15 kg) /m^2/cm

Specific weight of natural stones: 1.5 kg/l
Size of natural stones: 2-4 mm
Minimum stone carpet thickness: 8 mm

ISOMAT NATURAL COLORED STONES are gradually added to VARNISH-PU 1K while stirring continuously with a low-speed mixer for about 5 minutes. It is important to scrape the sides and bottom of the container regularly during mixing to ensure a homogeneous mixture. Consideration should also be given to the color uniformity of the natural aggregates (see remarks at the end of the technical datasheet).
For large-scale applications, mixing of the materials should be carried out in a cement mixer machine.
For the easy and correct application of the decorative flooring, it is recommended that NON-STICK AGENT be used during its installation. NON-STICK AGENT is used to improve the slip properties of the smooth metal trowel during the application of decorative stone carpet floorings.
Prior to the application of the decorative resin flooring, a clean cloth is soaked with NON-STICK AGENT and then applied on the surface of the smooth metal trowel.
The mixture of the stone carpet is poured over the prepared surface and applied in one layer using a smooth metal trowel. When the trowel starts to get sticky during the application, NON-STICK AGENT should be applied again.
After hardening of the stone carpet flooring, one coat of VARNISH-PU 1K could be optionally applied to enhance the mechanical properties of the system.
Consumption: 250-300 g/m^2.

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Interior spaces

Substrate

In general, the substrate must be dry (moisture content < 4%), clean, free of grease, loose particles, dust, etc.
Any existing cavities in concrete should be filled in advance with the appropriate repair materials.

1.1 Porous surfaces (e.g. concrete, cement screed, etc.) should be primed with either DUROFLOOR-PSF or PRIMER-PU 140.
Consumption: 200-300 g/m^2.
The decorative resin flooring should be applied within 14-24 h after priming with DUROFLOOR-PSF and 3-4 hours after priming with PRIMER-PU 140.

1.2 Non-porous surfaces (e.g. glazed tiles) should be treated with the special adhesion promoter PRIMER-S 165. The surface is cleaned with a clean cloth been soaked with the promoter. The cloth must be frequently changed. The stone carpet is applied 20-30 min after the application of PRIMER-S 165. The adhesion promoter cleans the surface and increases the bond strength of the stone carpet.
Consumption: 30-70 g/m^2.

Preparation of the decorative resin flooring

Mixing ratio VARNISH-PU 1K: Natural stones	**Consumption of mixture** VARNISH-PU 1K + Natural stones
1:10 by weight	(1.5 kg + 15 kg) /m^2/cm
1:15 by weight	(1.0 kg + 15 kg) /m^2/cm
1:20 by weight	(0.75 kg + 15 kg) /m^2/cm

Specific weight of natural stones: 1.5 kg/l
Size of natural stones: 2-4 mm
Minimum stone carpet thickness: 8 mm

ISOMAT NATURAL COLORED STONES are gradually added to VARNISH-PU 1K while stirring continuously with a low-speed mixer for about 5 minutes. It is important to scrape the sides and bottom of the container regularly during mixing to ensure a homogeneous mixture.

Consideration should also be given to the color uniformity of the natural aggregates (see remarks at the end of the technical datasheet).
For large-scale applications, mixing of the materials should be carried out in a cement mixer machine.
For the easy and correct application of the decorative flooring, it is recommended to use NON-STICK AGENT during its installation. NON-STICK AGENT is used to improve the slip properties of the smooth metal trowel during the application of decorative stone carpet floorings.
Prior to the application of the decorative resin flooring, a clean cloth is soaked with NON-STICK AGENT and then applied on the surface of the smooth metal trowel.
The mixture of the stone carpet is poured over the prepared surface and applied in one layer using a smooth metal trowel. When the trowel starts to get sticky during the application, NON-STICK AGENT should be applied again.
After hardening of the stone carpet flooring, one coat of VARNISH-PU 1K could be optionally applied to enhance the mechanical properties of the system.
Consumption: 250-300 g/m^2.

Packaging

1 kg and 5 kg containers.

Shelf life – Storage

9 months from production date if stored in original, sealed packaging, in areas protected from moisture, frost and direct sunlight.
Recommended storage temperature: between +5°C and +35°C.

Remarks

- Surfaces with entrapped moisture must be completely dry, prior to the application of VARNISH-PU 1K.
- Surfaces that have been treated in the past with hydrophobic impregnations might cause adhesion problems. It is recommended to first perform a test application to check the compatibility of the substrate.

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- The temperature during the application and hardening of the product should be between +8°C and +35°C.
- The substrate moisture content must be below 4% and the ambient moisture below 65%. High ambient moisture can negatively affect the curing of VARNISH-PU 1K.
- If the temperature is expected to be lower than +8°C or there is a chance of rain in the next 48 h, the application must be postponed.
- Please note that ISOMAT NATURAL COLORED STONES are naturally occurring aggregates, meaning that batch-to-batch color variation may occur. To ensure color consistency in the finished floor, it is recommended that same-batch products be used throughout the project. In case products from two different batches are used, equal parts of both batches should be mixed together to achieve a uniform result.
- VARNISH-PU 1K is intended for professional use only.

Volatile Organic Compounds (VOCs)

According to Directive 2004/42/EC (Annex II, table A), the maximum allowed VOC content for the product subcategory i, type SB, is 500 g/l (2010) for the ready-to-use product.
The ready-to-use product VARNISH-PU 1K contains a maximum of 500 g/l VOC.

CE

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2032-CPR-10.11

EN 1504-02

DoP No.: VARNISH-PU 1K /1878

Surface protection products

Coating

Permeability to CO_2: Sd > 50m

Water vapor permeability: Class I (permeable)

Capillary absorption: w < 0.1 kg/m^2·h$^{0.5}$

Adhesion strength by pull off test: ≥ 2.0 N/mm^2

Artificial weathering: No visual defects

Reaction to fire: Euroclass F

Dangerous substances comply with 5.3

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