WATERPROOFING OF AN ACCESSIBLE FLAT ROOF WITH A POLYURETHANE LIQUID MEMBRANE AND TILING

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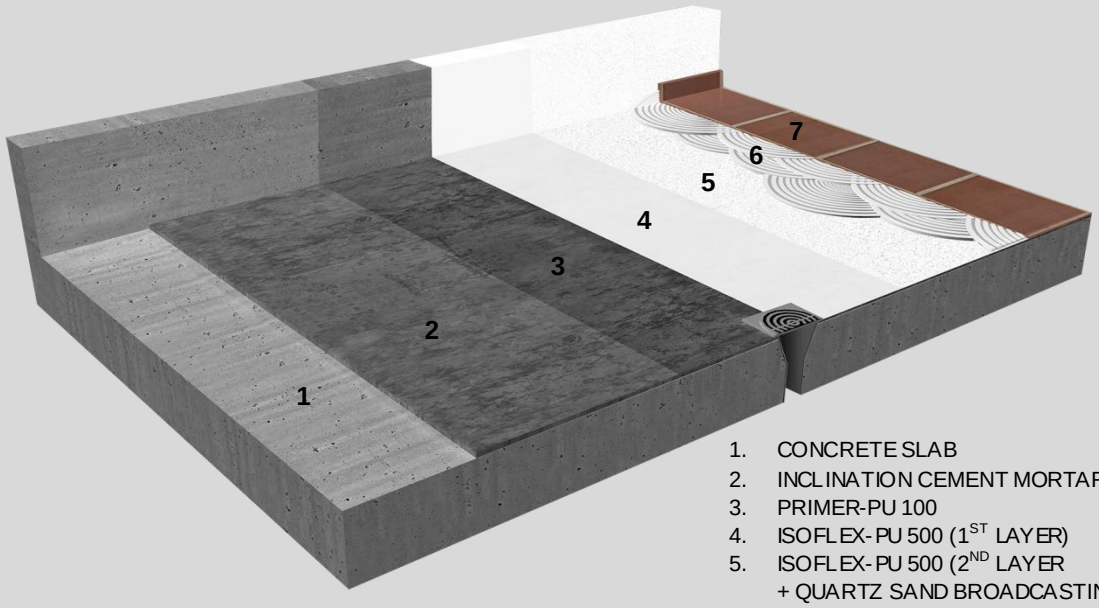

1. CONCRETE SLAB
2. INCLINATION CEMENT MORTAR
3. PRIMER-PU 100
4. ISOFLEX-PU 500 (1ST LAYER)
5. ISOFLEX-PU 500 (2ND LAYER + QUARTZ SAND BROADCASTING)

6-7. TILE ADHESIVE - TILES

Related Materials

ISOFLEX-PU 500	One-component polyurethane, waterproofing liquid membrane for flat roofs
PRIMER-PU 100	One-component polyurethane primer
PRIMER-PU 140	Two-component polyurethane primer for surfaces with high moisture content
DUROCRET-PLUS	Polymer-modified, fiber-reinforced repairing mortar
SCREED-100	Cementitious floor screed
POLYESTER FLEECE 60g/m^2	Polyester fleece for reinforcing waterproofing layers
FLEX PU-30 S/FLEX PU-50 S	Polyurethane sealants
ISOMAT AK-22	High-quality, flexible, polymer-modified tile adhesive
MULTIFILL SMALTO 1-8	Porcelain-texture, water-repellent grout
MULTIFILL RAPID 1-8	Fast-setting, porcelain-texture, water-repellent grout
ACCELERATOR-5000	Special set accelerator for ISOFLEX-PU 500

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I. NATURE OF PROBLEM - REQUIREMENTS

In addition to being compatible with the adhesion of tiles, the waterproofing of flat roofs to be covered with tiles should show flexibility, good adhesion, as well as reliability and durability, because the subsequent restorations are particularly costly and time consuming due to position.

II. SOLUTION

The above waterproofing requirements are completely covered by the one-component, polyurethane waterproofing liquid membrane, **ISOFLEX-PU 500**. By applying it on the roof, a strong and continuous elastic waterproofing layer is created, with excellent adhesion and resistance to permanent contact with moisture, able to successfully follow the expansion and contraction of the roof. Tiles may be directly fixed onto the waterproofing layer of the one-component, polyurethane waterproofing liquid membrane, ISOFLEX-PU 500, with the procedure described below.

Due to the very high resistance of the polyurethane, waterproofing liquid membrane for flat roofs, ISOFLEX-PU 500, in permanent contact with water, ISOFLEX-PU 500 offers full waterproofing and protection of the flat roof, even in the case that water has penetrated the layer of tiles, being trapped between the tiles and the waterproofing layer. In this case, the damage must be restored because other problems, such as tile detachments, etc., may appear.

III. APPLICATION

Substrate preparation

The substrate must be dry (moisture content <4%) and free from loose particles, dust, grease, etc.

Local restorations or repairs of the roof elements (concrete, cement, etc.) are done using the polymer-modified, fiber-reinforced, PCC R3 type cement mortar **DUROCRET-PLUS.**

In case there is a need for filling or creating a total inclination layer, the ready-to-use, cementitious floor screed **SCREED-100** may be used**.**

Surface priming

As soon as the materials that may have been used for smoothing the substrate have dried, the one-component polyurethane primer, **PRIMER-PU 100** is applied on the clean and dry concrete surface (moisture content <4%). The primer is evenly applied across the surface with a brush, roller or by spraying.

Consumption of polyurethane primer PRIMER - PU 100: 200-300 g/m^2.

In case the substrate has moisture content >4%, the PRIMER-PU 140 which is a polyurethane, two-component primer for surfaces with high moisture content is applied instead of the polyurethane primer PRIMER-PU 100.

Consumption of PRIMER-PU 140: 200-250 g/m^2.

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Application of the polyurethane, waterproofing, liquid membrane ISOFLEX-PU 500

Total waterproofing of the surface

Before the application, it is recommended to slightly stir ISOFLEX-PU 500, until it becomes homogeneous. Extensive stirring should be avoided, in order to prevent air entrapment in the material.
ISOFLEX-PU 500 is applied by brush or roller in 2 layers. The first layer is applied 2-3 hours after priming and while PRIMER-PU 100 is still tacky. The second layer should be applied crosswise after 8-24 hours, depending on the weather conditions.
Consumption: approx. 1.0-1.5 kg/m^2, depending on the substrate.

It is recommended to reinforce ISOFLEX-PU 500 with the polyester fleece along the edges at the junction of the flat roof with vertical elements (parapet, stairwell termination, etc.), pipe joints, ventilation joints, metal element joints, etc. As soon as the polyurethane primer PRIMER-PU 100 has set (approx. 2-3 hours), a coat of the polyurethane waterproofing liquid membrane ISOFLEX-PU 500 is applied along the junctions and, while it is still fresh, a 10 cm wide strip of polyester fleece (60 g/m^2) is embedded. After 8-24 hours, depending on weather conditions, a second coat of the polyurethane waterproofing liquid membrane ISOFLEX-PU 500 is applied. After 8-24 hours, depending on the weather conditions, a third layer is applied in the spots where reinforcement has been used for its full coverage.

Total consumption of the polyurethane, waterproofing liquid membrane in combination with the polyester fleece ISOFLEX- PU 500: 2.0-2.5 kg/m^2, depending on the substrate.

A) In cases there are individual cracks in the substrate:

As soon as the polyurethane primer PRIMER-PU 100 has set (approx. 2-3 hours), a coat of the polyurethane waterproofing liquid membrane ISOFLEX-PU 500 is applied along the cracks and, while it is still fresh, a 10 cm wide strip of polyester fleece (60 g/m^2) is embedded. ISOFLEX-PU 500 is totally applied on the remaining surface in a single layer. After 8-24 hours, depending on weather conditions, a total second coat of the polyurethane waterproofing liquid membrane ISOFLEX-PU 500 is applied. After 8-24 hours, depending on the weather conditions, a third layer is applied in the spots where reinforcement has been used for its full coverage.

Cracks on the substrate (wider than 1 mm) have to be initially primed locally and sealed with the polyurethane sealants FLEX PU-30 S or FLEX PU-50 S. In case of cracks < 1 mm, no sealing is required.

It is recommended to reinforce ISOFLEX-PU 500 with the polyester fleece along the edges at the junction of the flat roof with vertical elements (parapet, stairwell termination, etc.), pipe joints, ventilation joints, metal element joints, etc.

ISOFLEX-PU 500 could be applied also with the addition of ACCELERATOR-5000. ACCELERATOR-5000 is a special set accelerator for ISOFLEX-PU 500 that enables its application at low temperatures or in thicker layers. It also increases the thixotropy and mechanical strength of ISOFLEX-PU 500.

Total consumption of the polyurethane, waterproofing liquid membrane, ISOFLEX-PU 500: 1.0-1.5 kg/m^2, depending on the substrate.

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B) In cases there are dense, multiple cracks in the substrate:

As soon as the polyurethane primer PRIMER-PU 100 has dried (approx. 2-3 hours), the polyurethane waterproofing liquid membrane ISOFLEX-PU 500 is totally reinforced with 100 cm wide strips of polyester fleece (60 g/m^2), which overlap one other by 10 cm. The first layer of the polyurethane waterproofing liquid membrane ISOFLEX-PU 500 is applied in order to cover the reinforcement (to a width of 100 cm), and while it is still fresh, the strip of polyester fleece is embedded. The same application procedure is followed in the remaining surface. As soon as this layer has set, after 8-24 hours depending on weather conditions, two extra layers of the polyurethane waterproofing liquid membrane ISOFLEX-PU 500 are applied on the entire surface of the roof, fully covering the reinforcement. The second coat can be applied as soon as the first one has dried, after 8-24 hours, depending on the weather conditions.

ISOFLEX-500 could be applied also with the addition of ACCELERATOR-5000. ACCELERATOR-5000 is a special set accelerator for ISOFLEX-PU 500 that enables its application at low temperatures or in thicker layers. It also increases the thixotropy and mechanical strength of ISOFLEX-PU 500.

Total consumption of the polyurethane, waterproofing liquid membrane, ISOFLEX- PU 500: 2.0-2.5 kg/m^2, depending on the substrate.

Waterproofing extends to the vertical surfaces (parapet, stairwell termination, etc.) to a minimum height of 15-20 cm, in order for a watertight basin to be formed.

Cracks on the substrate (wider than 1 mm) have to be initially primed locally and sealed with the polyurethane sealants FLEX PU-30 S or FLEX PU-50 S. In case of cracks < 1 mm, no sealing is required.

It is recommended to reinforce ISOFLEX-PU 500 with the polyester fleece along the edges at the junction of the flat roof with vertical elements (parapet, stairwell termination, etc.), pipe joints, ventilation joints, metal element joints, etc.

Surface preparation for tiling

After applying the final universal layer of the polyurethane, waterproofing liquid membrane for flat roofs, ISOFLEX-PU 500 and while it is fresh, quartz sand (grain size 0.3-0.8 mm**)** is broadcast. The quartz sand should be completely dry. As soon as ISOFLEX-PU 500 has cured, any loose grains are removed using a high-suction vacuum cleaner.

Quartz sand consumption: approx. 2.5-3.0 kg/m^2.

Fixing - grouting of ceramic tiles

As long as the last layer of the polyurethane, waterproofing liquid membrane for flat roofs, ISOFLEX-PU 500 has dried and the loose grains of quartz sand have been removed, it is recommended that the tiles are fixed with high-quality, polymer-modified adhesives, such as **ISOMAT AK 22, ISOMAT AK 25, ISOMAT AK-ELASTIC, ISOMAT AK-MEGARAPID**.

It is recommended that the tiles are grouted with the cementitious tile grout, reinforced with polymer components (resins), **MULTIFILL SMALTO 1-8**. Alternatively, where fast work is required, the fast-setting, porcelain-texture, water-repellent grout, **MULTIFILL RAPID 1-8** may be used.

IV. NOTES

- ISOFLEX-PU 500 may be applied when the ambient temperature is 5°C and rising, and the temperature of the substrate is a minimum of 3 degrees above the dew point. The maximum application temperature is approximately 35°C. Low temperatures retard curing while high temperature accelerates curing. High values of humidity may affect the final finish of the membrane.
- Maximum consumption of ISOFLEX-PU 500 per layer should not exceed 750 g/m^2. With the addition of ACCELERATOR-5000 each layer should not exceed the 1.25 kg/m^2.
- Intense cracks in the substrate must be sealed with the polyurethane sealants **FLEX PU-30 S** or **FLEX PU-50 S.**
- Tools are cleaned with the special polyurethane solvent SM-16**,** while the polyurethane waterproofing liquid membrane ISOFLEX-PU 500 is still fresh.

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