

HYDROPHILIC STRENGTHENING AGENT BASED ON ESTERS OF ORTHOSILICIC ACID

MINERALIT CONSOLID 100

Hydrophilic strengthening agent



MAIN ADVANTAGES

- Strengthens the substrate mineral structure
- Optimum depth of penetration into weak substrate with a smaller amount of silicate binder precipitated
- Even level of resistance of the whole strengthening layer
- Does not reduce the substrate vapour permeability
- High resistance of binder formed to ageing processes caused by atmospheric conditions and UV radiation
- Possibility of application of subsequent materials of mineral nature
- Mild course of reaction without the disadvantageous tensions
- Neutral catalyst
- Easy and safe use (one-component product without toxicological hazards)

AREAS OF APPLICATIONS

Product based on ethyl esters of orthosilicic acid intended for strengthening (consolidation) of disintegrated mineral construction substrates outside and inside buildings. It is especially recommended for surface reinforcement of narrow porous construction materials deteriorated by ageing processes caused by atmospheric conditions. The strengthening function of the product involves formation of silica in the construction material structure which is a strengthening binder for it. The process of silica formation is connected with hydrolytic polycondensation of ethyl esters of orthosilicic acid with water contained in the construction material capillaries and/or with water vapour present in the air. The described process takes place under the influence of a neutral catalyst which is included in the product. The product characterizes with very high ability to penetrate narrow porous capillaries of construction materials (such as natural stones, terracotta, brick and renders). **Note:** Before use to strengthen stones which contain swelling loamy minerals, it is necessary to perform initial tests.

TECHNICAL SPECIFICATION

Base binder: ethyl esters of orthosilicic acid with standard level of polycondensation;

Diluent: does not dilute;

Colour: colourless liquid;

Average coverage: it is always necessary to determine it during initial laboratory tests as the coverage may range from 0.4 kg/m² to even 16 kg/m² depending on the properties of construction material.

Temperature of application (air and substrate): from +10°C to +20°C. With the temperature above 20°C product may evaporate too quickly what might not allow for achieving applicable saturation depth. The procedure to not be performed if temperature is below +10°C.

Packaging: Single-use plastic packaging of 4 kg.

Storage: The product should be stored in its sealed packaging in a cool room protected against frost and direct sunlight. Protect against humidity!

Note: Highly flammable product. Product storage to take place with special account of conditions for storage of flammable materials. The product must be kept out of the reach of children.

Shelf life: Unopened products have a 12-month shelf life from the date of production.

APPLICATION METHOD

SUBSTRATE PREPARATION: In order to properly soak the whole deteriorated layer of construction material, the surface planned for the procedure has to be dry, absorbent and clean. If the surface is covered with a thick layer of contamination, then it is recommended to perform its gentle cleaning (e.g. by means of washing with dispersed water jet or application of gentle cleaning paste). In the event of very high disintegration of construction material, it may be beneficial to perform initial strengthening, which would allow for cleaning the surface before the proper strengthening procedure. Directly before the procedure, the surface to be protected from excessive heating by solar radiation. **Note:** The elements which are not planned for strengthening (such as windows, roofings, metal fixings, etc.) should be protected with polyethylene film. Additionally, if during conservation work it is planned to make castings from silicone rubber, the strengthened surfaces should be anti-adhesion protected by means of wetting them with soap solution or suitable detergents.

APPLICATION: The saturation technique should be selected depending on the object type. Saturation may be performed by means of pouring, spraying, application with a brush, using immersion or continuous flow method. It is beneficial to immerse smaller elements such as sculptures and other architectonic details which may be disassembled in the impregnation bath tightly covered in order to limit reaction of the product with air humidity. The saturation procedure should be performed in the way which assures that the whole disintegrated layer is impregnated and strengthened. With small saturation depth, it is possible that the strengthened layer will separate from the disintegrated layer which did not undergo strengthening. It is necessary to avoid the formation of external layer stronger than the substrate. In order to assure applicable saturation depth, the procedure should be repeated by means of a 'wet on wet' method, until the construction material no longer absorbs the product. The saturated surface should be protected from precipitation within 3-4 days after impregnation. If supersaturation was observed, then after the finish of the construction material saturation, it is beneficial to wash it with white spirit or acetone. It allows for avoiding the change of the surface colour shade. **Note:** All work with hydrophilic consolidating agents should be performed using goggles, rubber gloves, protective clothing, and head protection. Nose and mouth masks should be worn when spraying method is applied. While working with hydrophilic consolidating agents it is necessary to remain extremely careful as while dealing with flammable solvents. Observe general industrial safety principles and other referred to on the label.

DRYING: Because of the fact that the speed of hydrophilic polycondensation depends highly on humidity and temperature, it is necessary to season the saturated construction material in the following conditions:

- at relative humidity of 50% and temperature of 20°C until complete strengthening is achieved, the material has to undergo curing for the period of 4 weeks.
- at relative humidity of 75% and temperature of 20°C until complete strengthening is achieved, the material has to undergo curing for the period of 3 weeks.

USEFUL HINTS: According to the best conservation practice in order to exclude mistakes in application, it is necessary to perform chemical and physical tests on the construction material planned for protection before the consolidation procedure.

The following properties have to be determined:

- saturation, porosity;
- chemical composition of the construction material;
- disintegrated layer depth;
- product coverage until the saturation of 1 m² of surface;
- colour of construction material after the end of consolidation.