Technical Information Sheet
Article No. 0720

KSE 300

Solvent-free stone strengthener on a silicic acid ethyl ester base. Gel deposit rate approx. 30%

Range of use

Remmers KSE 300 is suitable for strengthening medium pored, absorbent and friable cementitious building materials, preferably sandstone. It can also be used to strengthen historical renders and joints. Stone with pronounced swelling and shrinking properties caused by swelling capable clay materials should be pre-treated with Remmers Antihygro (Art. No. 0616) to reduce swelling. The stone should be examined in Remmers' laboratory.

Characteristic data of the product

Characteristic data of the product in the packaged state:

Active ingredient content:	approx. 99 % by mass
Catalyst system:	neutral
Density at 20°C:	1.0 g/cm³
Flash point:	13°C
Colour:	clear, slightly yellow
Odour:	typical

Characteristic data of the product after application

Deposited quantity of gel:	approx. 300 g/l
By-products caused by the reaction:	ethanol (escapes)

Property profile

Remmers KSE 300 reacts with water stored in the pore system or humidity. During this reaction, amorphous and hydrous silicon dioxide ($SiO_{2, aq,}$ "silica gel") is deposited as a binder. The mineral silica gel binder thus replaces the original binder lost through weathering.
The speed of the gel deposit reaction is very dependent on temperature and humidity. Under normal conditions (20°C, 50% relative humidity), the deposit of binder is concluded after approx. 3 weeks.
In the following, the most important property parameters of Remmers KSE 300 are given:

- Gel deposit rate approx. 30 %
- Single component system – no errors, easy to use
- Neutral catalyst
- Great penetration depth, possible all the way down to the sound core of the stone material
- No by-products that damage the building
- High weathering resistance and UV stability
- Partially strengthened natural stone can be worked over with Remmers Restoration Mortar

Directions

Preliminary examination, setting up trial areas:
The following characteristic data of the material should be determined (analysis of the state of the building):

1. Moisture content, content of damaging salts, hygroscopic water absorption
2. Absorbency, capillary water absorption
3. Strength profile, depth of weathering, degree of hygroscopic swelling
4. Application rate for each area, penetration depth of the stone strengthener, resulting strength profile

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5. Establishment of working operations
6. Setting up a representative trial surface which is necessary to see if there will be any changes in colour and to correlate laboratory results with the quantities and values achieved on the object.
7. Execution of treatment and application rates are to be controlled and documented.

Substrate pre-treatment:
The natural stone surfaces to be preserved often have a reduced absorption capacity caused by different types of soiling or a patina. The cleaning measures needed to restore the original absorption behaviour should be as gentle as possible, e.g. by spraying with cold or warm water or by steam cleaning. For stubborn soil, the Rotec Low Pressure Blasting Device or Remmers cleaning products can be used (see the respective Technical Information sheets).
In many cases the stone is already so friable that cleaning is not possible without a sensitive loss of substance. To avoid a loss of substance, pre-strengthening with Remmers KSE 300 or another suitable stone strengthener from the Remmers KSE family can be carried out prior to cleaning. After the cleaned surface has dried, the main strengthening measure is carried out.
In order to be able to saturate the entire weathered zone of the stone with Remmers KSE 300, the surfaces to be treated should have reached their compensation moisture balance, be absorbent and not be heated. When strengthening is carried out, the temperature of the stone strengthener as well as the temperature of the substrate and surrounding air should range between + 8 °C and + 25 °C. To avoid strong heating by the sun, use shading devices.
Protect the surfaces before, during and after strengthening from sun, rain and wind.

Application procedure:
An important prerequisite for optimal strengthening is complete saturation of the weathered zone of the stone with the stone strengthener all the way down to the sound core. To achieve this, Remmers KSE 300 is applied to the building material in a flow coating, dipping and/or compress procedure. When using a flow coating procedure, smaller areas (sometimes stone for stone) are treated with Remmers KSE 300, wet-on-wet, at one time until the applied stone strengthener is no longer absorbed. The application procedure selected depends on the object and task at hand.
So-called "fast hydrolysis" is not recommended since this has an uncontrolled influence on the gel formation reaction and therefore on the success of the strengthening measures.

Notes

If necessary, treatment can be repeated 2-3 weeks after initial treatment. Here as well, the weathered zones of the stone must be completely saturated. The application rate of Remmers KSE 300 should be determined in a laboratory during preliminary examination and on a trial surface. The rate depends on the absorbency of the substrate and on the selected application procedure.

Follow up treatment:
To avoid a change in the colour of the surface caused by oversaturation with Remmers KSE 300, the stone surface should be washed off with a dry solvent (e.g. V 101 Thinner) immediately after saturation has been achieved.

Applying stone substitution compounds, hydrophobizing impregnation agents and coats of paint:
After the deposit of gel has been concluded, Remmers Restoration Mortar, Funcosil impregnation agents and/or products from the Remmers Silicone Resin Paint System can be applied to surfaces that have been strengthened with Remmers KSE 300.
After application, the active ingredient "silicic acid ester" leads to a temporary water repelling effect that disappears during the course of gel formation. If strengthened surfaces still show an annoying water repelling effect when carrying out subsequent work with restoration mortar, this can be suppressed by wetting the surface with alcohol.

Adjoining surfaces:
Facade elements that should not come in contact with the stone strengthener such as e.g. windows, varnished surfaces and glass as well as plants should be protected by suitable measures (e.g. covered with plastic sheets).

Tools, cleaning

Depending on the task at hand, low pressure spraying equipment, airless equipment or hand sprayers can be used. Tools and equipment must be clean and dry. They should be cleaned after use and before longer work pauses with V 101 Thinner. Once the stone strengthener has reacted, it can only be removed mechanically.

Packaging, application rate, shelf-life

Packaging:
5 l, 30 l and 200 l tin containers

Application rate:
The quantity of Remmers KSE 300 required considerably depends on the type and condition of the substrate to be treated as well as the application procedure. The application rate may range accordingly between 0.1 l/m² and several litres per m². The application rate should be determined in a laboratory during preliminary examinations as well as on a trial surface.

Shelf-life:
At least 12 months in closed, original containers, stored cool but frost-free and dry. Remmers KSE 300 reacts with moisture (humid-

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ity), so close containers air tight each time material is removed.

Safety, ecology, disposal

Further information on safety when transporting, storing and handling as well as disposal and ecology is found in the latest Safety Data Sheet.

Personal protective equipment is required for spraying procedures. Use respiratory protection with a combination filter at least A/P2 (made by e.g. Dräger). For suitable protective gloves, see Safety Data Sheet. Wear closed work clothes.

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