

Technical Information Sheet Article No. 0625

KSE 510

Solvent-free stone strengthener on a silicid acid ethyl ester base. Gel deposit rate > 40%

Range of use

Remmers KSE 510 is suitable for strengthening coarse-pored, absorbent, highly friable building materials, preferably sandstone. It can also be used to strengthen historical renders and joints. In case of stone with pronounced swelling and shrinking properties caused by swelling capable clay minerals, we recommend pre-treating with Remmers Antihygro (Art. No. 0616) to reduce swelling. The stone should be examined in Remmers' laboratory.

Property profile

Remmers KSE 510 reacts with the water or humidity stored in the pore system. During this reaction, amorphous and hydrous silicon dioxide ($\text{Si O}_2, \text{aq}$, "silica gel") is deposited as a binder. The binder silica gel replaces the original binder lost through weathering. The speed of the gel deposit reaction is highly dependent on temperature and humidity. Under normal conditions (20 °C, 50% relative humidity), the deposit of binder is concluded after approx. 3 weeks.

The most important property parameters of Remmers KSE 510 are listed in the following:

- Gel deposit rate approx. > 40 %

Characteristic data of the product

Characteristic data of the product in the packaged state

Active ingredient content:	> 99% (m/m)
Catalyst system:	neutral
Density at 25 °C:	1.1 g/cm ³
Colour:	clear, slight yellowish tinge
Odour:	typical

Characteristic data after application:

Quantity of gel deposited:	approx. 420 g/l
By-products caused by the reaction:	ethanol (escapes)

- Single component system – reliable and easy to use
 - Neutral catalyst
 - High penetration depth, possible all the way down to the sound core of the stone material
 - No by-products that damage the building
 - High weather resistance and UV stability
 - Partially strengthened natural stone can be worked over with Remmers Restoration Mortar.
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
 5. Establishment of working operations
 6. Set-up of a representative trial area which is necessary to see if there will be changes in colour and the correlation between laboratory results and the quantities and values achieved on the object.

Directions

Preliminary examination, setting up trial areas:

The following characteristic properties of the material should be determined (analysis of the state of the building):

7. Execution of treatment and application rates should be controlled and documented.

Preparing the substrate:

Surfaces (natural stone) to be restored often show reduced absorption capacity due to a crust of soil or different types of "patina". The cleaning measures necessary 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. In case of stubborn soil, the Rotec Low Pressure Blasting Device should be preferably used or Remmers cleaning products (see the respective Technical Information Sheets).

In many cases the stone is already so friable that cleaning cannot take place without a sensitive loss of substance. To avoid this, pre-strengthening with Remmers KSE 510 or another suitable stone strengthener from the Remmers KSE family can be carried out prior to cleaning. The main strengthening measure is then carried out after the cleaned surface has dried.

In order to achieve complete saturation of the weathered zone of the stone with Remmers KSE 510, the surface to be treated must have reached compensation moisture balance, be absorbent and should not have been heated by the sun. 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, use shading devices. The surfaces should be protected from sun, rain and wind before, during and after strengthening.

Application procedures:

An essential prerequisite for optimal strengthening is that the weathered zone is completely saturated all the way down to the sound core.

To achieve this, Remmers KSE 510 is applied to the building material in a flow coating, dipping and/or compress procedure. When using a flow coating procedure, smaller areas (if necessary, stone by stone) are treated, wet-on-wet, with KSE 510 until the material is no longer absorbed. The procedure selected for application always depends on the task at hand. So-called "fast hydrolysis" is not recommended since this represents an uncontrolled influence on the gel formation reaction and therefore the success of the strengthening measure.

Notes

If necessary, treatment can be repeated 2-3 weeks after initial treatment. In this case as well, saturation of the complete weathered zone must be achieved. The application rate of Remmers KSE 510 should be determined in the laboratory during preliminary examinations and on a trial surface and will depend not only on the absorbency of the substrate but also on the application procedure selected.

Follow up treatment:

To avoid a change in the colour of the surface caused by over-saturation with Remmers KSE 510, the stone surface should be washed off with a dry solvent (e.g. Thinner V 101) immediately after saturation has been achieved.

Application of stone substitution compounds, hydrophobizing impregnation agents and coats of paint:

Surfaces that have been strengthened with Remmers KSE 510 can be worked over – after the deposit of gel has been concluded – with Remmers Restoration Mortar, Funcosil impregnation agents and/or products in the Remmers Silicone Resin Paint System.

After application, the "silicic acid ester" chemical system leads to a temporary water repelling effect which disappears during the course of gel formation. If strengthened surfaces still show an annoying water repelling effect when restoration mortar is subsequently applied, this can be suppressed by wetting the surface with alcohol.

Adjoining surfaces:

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

Tools, cleaning

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

Packaging, application rate, shelf-life

Packaging:

5 l and 30 l tin containers

Application rate:

The application rate of Remmers KSE 510 depends to a considerable degree on the type and state of the substrate to be treated as well as the task at hand and the application technique used. The quantity required may vary accordingly and can range between 0.1 l/m² to several litres per m². The rate should be determined in the laboratory during preliminary examination as well as on a trial surface.

Shelf-life:

At least 12 months stored cool but frost-free and dry in closed, original containers. Remmers KSE 510 reacts with humidity/moisture, 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.

The statements above are compiled from our field of production and according to the latest technological developments and application techniques.

Since application and working are beyond our control, no liability of the producer can be derived from the contents of this information sheet. Any statements made beyond the contents of this information must be confirmed in writing by the producer.

In all cases, our general conditions of sale are valid. With the publication of this Technical Information Sheet all previous editions are no longer valid.

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Remmers (UK) Limited Crawley
United Kingdom
Tel: +44(0) 845 373 0103
Fax: +44(0)845 373 0104
www.remmers.co.uk

Remmers (Far East) Pte. Ltd.
Singapore
Tel: +65 6 7410277
Fax: +65 6 7417158