

General Application Process for StenCare® Brand Repair and Maintenance Materials for Concrete Pavements

Application Principles

For maintenance and repair mortars to provide desired results, current situation and application objective must be reviewed in all aspects and system components must be correctly selected.

First the area to be repaired must be thoroughly examined and correct material and application method must be selected depending on the load it shall bear, depth and structure of the patch area. Correct preparation of the patch area is the most important matter. Required cleaning and surface preparation processes must be carried out with care and attention.

Preparation of the Area to be Patched

a. General If the repair depth exceeds half ($1/3$ according to some references) of the pavement, the pavement must be broken down to the ground and the patch application must be carried out after that. Recommended patch depth is minimum 5 cm for heavy traffic bearing floors, minimum 3 cm for medium traffic bearing floors, minimum 2 cm for light traffic bearing floors. Minimum application thickness is 5 mm for superficial coatings.

Before the patching process, patch area must be prepared. There are several methods that can be used for this purpose. The method is selected by considering cost, equipment, expert personnel and time given for the completion of the process. No matter which method is used, sandblasting and cleaning with compressed air is recommended before the application. These processes are briefly explained below.

1. Cut and patch process: First step in this process is cutting the borders by a diamond blade cutter. Concrete inside the cutting area is removed by a 7 kg light jackhammer or maximum 15 kg jackhammer provided that well built concrete is not damaged. Finally damaged parts at patch borders are removed by jackhammer or hand tools. Processes are always carried out from inside out.

2. Break and patch process: Borders are not cut in this process. Patch area is removed by a light jackhammer or maximum 15 kg jackhammer provided that well built concrete is not damaged. Finally damaged parts at patch borders are removed by jackhammer or hand tools. Processes are always carried out from inside out.

3. Mill and patch process: Carbide tipped mills with 30 and 50 cm wide cutting heads are used in an effective and economic manner especially in wide area repair works. Turning radius of the machine to be selected must be 1 m or less, scraping width must be 30 cm or less.

4. Scrape with water jet and patch process: In this method high pressure water jet is used for removing the concrete. Water jet system robotic pump and filter unit must have the capacity of producing water flow with 1000 to 2000 bar pressure by remote control. Sound level must not exceed 90 decibels in 15 meters distance from the power unit or the robotic unit.

5. Clean and patch process: This process is applied just in emergency cases and for temporary repair when weather conditions are not suitable for patch. All these methods have certain

advantages and disadvantages. Fastest and most suitable method must be determined according to the capacity and job.

b. Determining the Dimensions of the Repair Area

Repairs at partial depths must not exceed 1/3 of the concrete thickness; it must not reach dowel bars. If dowel bars are reached, full depth repair must be carried out. Repair depth must be minimum 50 mm for weight and volume stability.

Patches must cover minimum 50 to 150 mm outside the broken area from all directions and the patch size must be minimum 100 mm by 250 mm. In the table below, patch sizes in partial depth repair application are provided.

Broken Area	Minimum Repair Dimensions		
	Depth (mm)	Length (mm)	Width (mm)
Adjacent To Single Joint	50	250 or Length of the broken area + 100 Whichever is greater	100 or Length of the broken area + 50 Whichever is greater
Adjacent To Two Joints	50	200 or Length of the broken area + 50 Whichever is greater	100 or Length of the broken area + 50 Whichever is greater
No Adjacent Joint	50	250 or Length of the broken area + 100 Whichever is greater	150 or Length of the broken area + 100 Whichever is greater



Picture 1 – Determination of the repair area



Picture 2 – Determination of the borders of the repair area



Picture 3 – Cutting the edges of the repair area



Picture 4 – Clearing out the repair area



Picture 5 – Adjusting the depth of the repair area

Surface Preparation

It is very important to prepare the surface in a correct and proper manner. No grease, dirt, asphalt or old patch materials must be left on the surface. Dust and loose materials must be removed. During usual application processes, ambient and floor temperature must be between 15°C and 30°C, relative humidity of the floor must be maximum 75%.

Note: Detailed information on surface preparation is provided in “Surface Preparation: Floor Surfaces to be Coated” document.



Picture 6 – Cleaning of the repair area

a. Primer The application of selected **StenAst®** brand primer depending on the repair material is explained in the user manual of relevant primer.

Only the general guidelines will be mentioned here.

1. Before the primer application, cleanness of the surfaces and suitability of weather forecast must be checked and primer application must be carried out only if the weather is suitable.
2. Specified mixing, application and waiting times for primers must be observed.



Picture 7 – Primer application

Application Methods

Various application methods can be used depending on the area to be patched and the conditions. Coating application with broadcast aggregate is recommended in superficial applications or small manual repair works and volume aggregate coating application is recommended for deeper or wider applications which are generally larger than 50 liters. Also additional aggregate can be broadcast on the surface in order to increase surface granulation after patching. Aggregates must be selected among high hardness, abrasion resistant materials.

Moist sand from rivers or sea must never be used. These types of sands are not dried sufficiently under sun. **StenSilica** brand aggregates are suitable for this purpose.

Incompatible aggregate use may cause deterioration, swelling or foaming of the material. **STENKİM**[®] is not responsible for problems that may be experienced in such cases.

Size of the aggregate is determined according to desired surface roughness and patch depth. Maximum aggregate size must not exceed 25 mm or the minimum application depth.

a. Coating Application with Aggregate Broadcasting In this method, components A and B of **StenCare**[®] brand maintenance and repair mortar are mixed and applied as specified in technical documents of the product. Properly sized aggregate is broadcast on the surface before the material cures and after the material cures extra aggregate not adhered to the surface is swept away.

This application can be carried out in one or more layers. Aggregate to be used at top layer is selected according to the surface roughness desired.

b. Repair Application with Aggregate Mixture Heavy duty cement mixers must be used in these applications. As specified in the technical documents of the product, component A is placed in the container and stir for 1- 2 minutes. The whole of component B is added into the container and mixed for a minimum of 2 minutes. Then aggregate (component C) is added onto the mixture slowly, and continue to mix until a homogeneous mixture is obtained at least for 3-4 minutes. After mixing without delay it is poured on the application area primed and prepared before; first it is roughly spread and then leveled with a screed rail. (Picture 8). If desired, additional aggregate can be broadcast on the surface before the material cures. Loose aggregates on sufficiently cured material can be swept away.



Picture 8 – Concrete floor repaired with StenCare®

Important: During emergency repairs, application process must be modified according to the conditions. Therefore it is beneficial if trained and experienced persons carry out the applications. For drying wet floors, it is possible to obtain satisfactory results even in most unfavorable conditions by washing with solvents like MEK or drying by means of a LPG blowtorch.

Warnings

- There must be no unmixed material left at the bottom of and around the container during mixing.
- Stated mixing times must not be exceeded.
- Mixed materials must not be kept in the container and they must be poured on the surface as soon as possible after a homogeneous mixture is obtained. Otherwise the material left in the container starts to get hot and it may cure very fast. Since the material poured on the floor will be cooled by the floor, time required for the application is saved.

Storage

The materials must be kept at temperature controlled storages away from sunlight, frost, heat sources and moisture. Products in containers opened but not closed well or in containers with damaged seals may be deteriorated. They must be kept away from open fire and sources that may create fire hazard.

Maintenance

Damaged parts can be repaired with the same material.

Technical Service

For complete utilization of **StenCare**[®] products, product selection and application must be correct. Therefore it is our company policy to help especially the users who will use our products for the first time, as much as possible. A good result is possible with a proper application. And a proper application may be conducted only by personnel with sufficient training and expertise. Our company is always ready to assist. Therefore users can contact our technical service for assistance.