Construction

Sikacem®-Gunite 133

Machine applied polymer modified repair mortar

Positioning

Description

Sikacem-Gunite 133 is a cementitious one component, high performance repair mortar. It contains polymers, microsilica and super plasticisers, which improve and enhance its application and performance properties. Sikacem-Gunite 133 is gun applied using the dry spray process.

Uses

- Sikacem-Gunite 133 is ideally suited for structural and large column concrete repair or restoration work in aggressive situations such as marine environments.
- Repair work can be carried out rapidly and effectively in areas where conventional concrete repair or wet spray methods are limited by access or location.

Typical applications for Sikacem-Gunite 133 are:

- Marine structures
- Water reservoirs and tanks
- Tunnels and culverts
- Bridges and carriageways
- Dams, Penstocks
- Sewage treatment plants
- Retaining structures for ground stabilisation

Advantages

- One component ready to use repair mortar.
- Polymer modified.
- Rapid strength development without use of accelerators.
- Layer thicknesses up to 150 mm overhead are possible in a single application.
- Low water absorption and chloride ion diffusion.
- High resistance to the diffusion of carbon dioxide.
- Good adhesion to existing concrete.
- Improved sulphate resistance.
- Greatly reduced labour, scaffolding and formwork costs.
- Increased speed and efficiency of repair work.
- Process can be stopped or started at any time.
- Low rebound, minimum waste, minimum dust.
- Ideal for use in conditions where access is difficult.
- Manufactured to give a consistent and assured level of performance.

Tests
Approvals / Standards

- LPM - Lab for Material Preparation and Methodology, Beinwil, Switzerland.
- EMPA - Swiss Institute for Material Testing, Dubendorf, Switzerland.

Product Data

Form:

Grey cementitious powder.

Packaging:

25 kg multiwall paper sacks - minimum order 1 tonne.

Storage & Shelf Life:

Six (6) months in unopened original packaging when stored in cool dry conditions below +25°C.

Technical Data

Density:	Dry powder	=	1.7 kg/litre approx.
	Sprayed mix	=	2.2 kg/litre approx.
Max. aggregate size:	3 mm		
Compressive strength: (at 20°C)	12 hours	=	5 - 10 MPa
	1 day	=	20 - 25 MPa
	28 days	=	60 - 70 MPa
	90 days	=	70 MPa approx.
Flexural strength:	10 MPa approx. at 28 days		
Bond strength to concrete:	2-3 MPa approx. (depending on condition of substrate)		
Elastic modulus:	24,000 MPa approx.		
Water vapour diffusion resistance (μ_{H_2O}):	1,000		

Carbon dioxide diffusion resistance (μ_{CO_2}):	60,000
Co-efficient of water absorption:	0.08 kg/m^2 x h $^{0.5}$
Application temperature:	Not below +5°C
Min. thickness/coat:	9 mm
Consumption:	25 kg of powder = approx. 11.5 litres of sprayed material.
Water/Cement ratio:	Approx. 0.35 - 0.40

Application Conditions

Surface Preparation

- All concrete, mortar and rock substrates must be sound, clean and free from oils, grease, dust and other surface contaminants. All loose material and surface laitance must be removed, preferably by grit blasting or scabbling.
- The prepared substrate should be thoroughly soaked with clean water until uniformly saturated, immediately before the application of Sikacem-Gunite 133.
- Corroded steel reinforcement should be cleaned and coated with Sika MonoTop 910 N. Refer to separate data sheet for further information.

Mixing

- Sikacem-Gunite 133 has been formulated to ensure that adequate spraying can only be achieved when using the correct water/cement ratio of 0.35 - 0.40. Too little water will result in excessive amounts of dust, whereas too much water will cause excessive slumping and non adhesion of the mortar.

Application

- Sikacem-Gunite 133 can be applied through most types of conventional dry spray equipment (rotor capacity up to 2.0 litres, hose diameter 24/40 or 32/52, nozzle diameter 25/15 or 32/18, 27).
- Tip the dry Sikacem-Gunite 133 mortar straight into the hopper of the machine. The required water is added at the nozzle.
- Application should be carried out by an experienced ‘nozzle man’ to ensure that satisfactory results are achieved.
- Immediately after application the mortar can be screeded and trowelled to the desired finish.

Cleaning

- Remove non hardened Gunite from tools and equipment with water. Hardened material can only be removed mechanically.
- To clean the dry spray machine simply blow through with compressed air.

Important Notes

- Any rebound material that falls to the floor during the spray process should not be reused.
- As with all concrete and mortars it is essential to protect Sikacem-Gunite 133 from water evaporation during the crucial early age curing period. We recommend the use of Antisol curing membranes for this purpose. Refer to Antisol Data Sheet for further information.
- In vertical applications layer thicknesses of Sikacem-Gunite 133 are only limited by heat of hydration and subsequent thermal contraction. Areas and layer thickness, both vertical and overhead should follow good concrete practice in this respect.
- A fairing coat of Sika MonoTop 723 N may be used to achieve a smooth, finer grade of surface finish, if required.

Notes

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

Local Restrictions

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

Safety Instructions

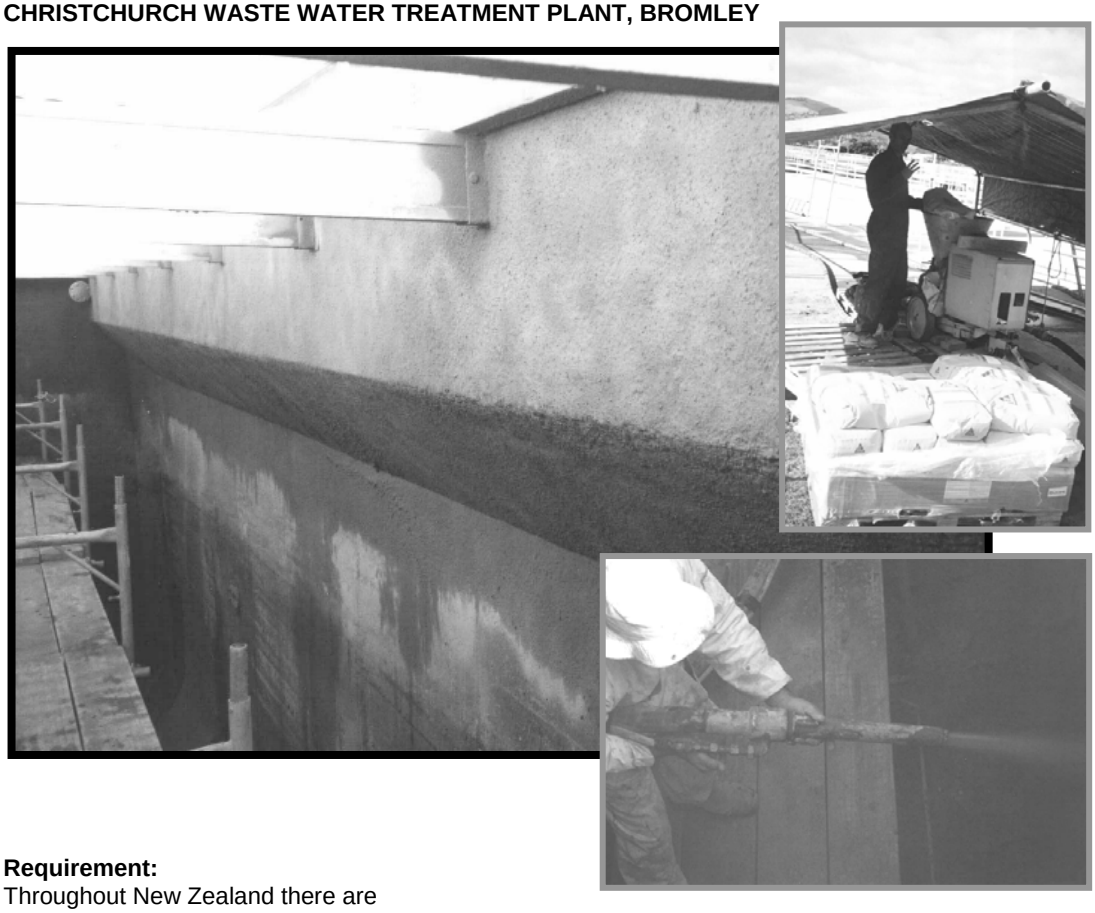
Protective Measures

- To avoid rare allergic reactions, we recommend the use of protective gloves. Change soiled work clothes and wash hands before breaks and after finishing work.
- Local regulations as well as health and safety advice on packaging labels must be observed.
- For further information refer to the Sika Material Safety Data Sheet which is available on request.
- If in doubt always follow the directions given on the pack or label.

Important Notes	• Residues of material must be removed according to local regulations. Fully cured material can be disposed of as household waste under agreement with the responsible local authorities. • Detailed health and safety information as well as detailed precautionary measures e.g. physical, toxicological and ecological data can be obtained from the safety data sheet.
Legal Notes	The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

Construction

Project Reference
CHRISTCHURCH WASTE WATER TREATMENT PLANT, BROMLEY



Requirement:
Throughout New Zealand there are many waste water plants nearing the end of their useful life. Chemical attack has in many situations eaten away at the concrete and threatened the integrity of the structure. At the Bromley Plant in Christchurch the Christchurch City Coucil are carrying out a major refurbishment programme that will greatly enchnace the life of this plant.

Solution:
Areas that have been scoured have been cleaned and then sprayed with SikaCem-Gunite 133. This system will provide a higly resistant layer against sulphur attack and extend the long term use of the treatment plant. Sika was also able to supply the application equipment, the Sika Aliva machine.

Products Used:
Sikacem-Gunite 133 Machine applied polymer modified repair mortar

Reference: CHC125

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