Silplast R15

Silplast R15 is general purpose, non-shrink, cementitious micro concrete which is used for repairs to damaged reinforced concrete elements, particularly where access is restricted and where vibration of the placed material is difficult or impossible. It is suitable for various structural strengthening measures such as encasement build-ups, jacketing, piletop encapsulation resin system, etc.
Silplast R15 is supplied as a ready to use blend of dry powders which requires only the site addition of clean water to produce a free flowing non-shrink repair micro concrete. The material is based on Portland cements, graded aggregates and fi llers, and additives which impart controlled expansion characteristics in the plastic state, while minimising water demand. The low water requirement ensures high early strength and long-term durability. For larger repairs, the mixed Silplast R15 may be modified by the addition of 5mm to 12mm clean, graded, saturated surface dry aggregates at site in ratio of 50-100 %. can be applied in sections up to 100mm deep. For larger sections, the addition of approved aggregates may be required. This will depend on the specific configuration of the repair location For exceptionally large repairs contact with Silkon technical team.

Usages and Advantages

- Gaseous expansion system compensates for shrinkage and settlement in the plastic state.
- Can be pumped or poured into restricted locations.
- Highly fluid to allow for placement without vibration.
- Pre-packed to overcome site-batched variations.
- Rapid strength gain to facilitate early reinstatement.
- High ultimate strengths and low permeability of cured repair.
- Contains no chloride admixture.
- Ensures piletop integrity as part of a waterproofing system

Technical support

Silkon offers a technical support package to specifiers, end users and contractors as well as technical on-site assistance in locations all over the country.

Properties

These result are obtained at a water:Powder ratio of 0.16 @ 30^0C under controlled laboratory conditions.

Test Typical result at 30^0C Compressive strength (N/mm^2)
(Tested on 70.7mm cubes as per BS 4551-80)

1D	3D	7D	28D
11	32	42	53

Tensile strength	2.0N/mm^2 @ 28 days
Flexural strength (BS4551 - 80)	5N/mm^2 @ 28 days
Young's Modulus	25 kN/mm^2
Expansion characteristics Unrestrained expansion (ASTM C827 - 1987)	1 to 4%.
Pressure to restrain Plastic expansion Approx.	0.004N/mm^2
Coefficient of thermal expansion	10 - 12 x 10^{-6}/ $_0$C.
Thermal conductivity	1.5 W/m^{0}C
Fresh wet density (Mixed density @27^0C)	2100 - 2200 kg/m^3

Application Methodology

The fluid micro-concrete repair material shall be a single component, cement based, micro-concrete to which only the site-addition of clean water (and approved graded coarse aggregates where specified) shall be permitted. The micro concrete shall contain no metallic aggregates, or chlorides and shall be shrinkage compensated in the plastic state. The micro concrete in the flowable consistency should achieve a compressive strength of not less than 11N/mm$_2$ after 24 hours, 42N/ mm^2 after 7 days and 52 N/mm^2 after 28 day s at 30^0C. Most importantly, the cured microconcrete shall contain no metallic aggregates, or chlorides and shall be shrinkage compensated in the plastic state. The unrestrained expansion shall be between 1 - 4%. The flexural strength shall not be less than 5 N/mm^2@ 28 days. The microconcrete shall have a coeffi cient of thermal expansion similar to that of the host concrete. The mixed density of microconcrete shall exceed 2100 kg/m^3 at 27^0C.

SILKON ADDITIVES (INDIA) PVT LTD

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Silplast R15

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Preparation

The unrestrained surface area of the repair must be kept to a minimum. The formwork should include drainage outlets for pre-soaking and, if beneath a soffit, provision for air venting. Provision must also be made for suitable access points to pour or pump the mixed micro-concrete in place.
Defective concrete surfaces must be cut back to a sound base. Smooth surfaces should be mechanically roughened. Corroded reinforcing steel should be exposed around its full circumference and cleaned to remove all loose scale and corrosion deposits. It is important to clean the steel to a bright condition. Grit-blasting is recommended.
One coat of Zinkrich Primer should be applied on the reinforcing steel. If any discontinuity in the applied fi lm is noticed, one more coat has to be applied.
Several hours prior to placing, the concrete substrates should be saturated with clean water. Immediately prior to placing, any free water should be removed.
Alternatively, all prepared concrete substrates should be primed using Silbond BA, a slow - setting epoxy bond aid. Silbond BA be applied only on dry substrate.

Cautions

For repair sections generally deeper than 100mm it may be necessary to mix the Silplast R15 with properly graded 5mm to 12mm silt-free aggregate to minimise temperature rise. The quantity of aggregate required may vary depending on the nature and configuration of the repair location. The typical results with a few aggregate proportions, for various applications are furnished below for guidelines.

These results are obtained with using graded aggregate (SSD) under controlled laboratory conditions

W/P Ratio : 1 : 0.75 (By weight)

Water: Powder ratio : 0.16 (By weight)

Compressive strength (N/mm^2)

1 D	3 D	7 D	28D
16	38	48	58

Workability : Flowable

Note : W/P shall not be increased under any circumstances.

Packaging

Silplast R15 is supplied in 25 kg moisture resistant bags.

Yield

Approximately 13.0 litres per 25 kg bag. Actual yield per bag will depend on the consistency of Silplast R15 and quantity of coarse aggregate added.

Shelf Life

6 months if kept in a dry store in the original, unopened bags. If stored at high temperatures and/or high humidity conditions the shelf life may be reduced.

Health & Safety

Silplast R15 contains cement powders which, during normal use, have no harmful effect on dry skin. However, when Silplast R15 is mixed, or becomes damp, alkali is released which can be harmful to the skin. During use, avoid inhalation of dust and contact with skin and eyes. Suitable gloves, eye protection and dust masks shall be worn. The use of barrier creams is recommended. In case of contact with skin, it shall be washed with clean water. In case of contact with eyes, it shall be rinsed immediately with plenty of clean water and medical advice shall be sought. If swallowed, medical attention shall be sought immediately - Vomiting should not be induced.

Fire

Silplast R15 is non-flammable.

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