

# BS 66 MuCis

**Corrosion resistant , Non Shrink ,Rheoplastic ,High strength cementitious Microconcrete**

BS 66 MuCis 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 fillers, 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 BS 66 MuCis may be modified by the addition of 5mm to 12mm clean, graded, saturated surface dry aggregates at site. For exceptionally large repairs, the local Thermax office shall be consulted.

## Uses

BS 66 MuCis 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 etc.

## Benefits

- 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.

## Technical support

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

## Design criteria

BS 66 MuCis can be applied in sections upto 100mm deep. For larger sections, the addition of approved aggregates maybe required. This will depend on the specific configuration of the repair location. Thermax office shall be contacted for further information.

## Properties

The following results were obtained at a Water/Powder ratio of 0.16 @ 30 C.

Test	Typical results at 30 C			
<b>Compressive strength (N/mm<sup>2</sup>)</b> (Tested on 70.7mm cubes as per BS 4551-80)	1D	3D	7D	28D
	20-21	35-36	50-51	60-65
<b>Tensile strength</b>	2.0N/mm <sup>2</sup> @ 28 days			
<b>Flexural strength</b> (BS4551 - 80)	10N/mm <sup>2</sup> @ 28 days			
<b>Modulus of Elasticity</b> (In Compression)	28-30 kN/mm <sup>2</sup>			
<b>Expansion characteristics</b> (ASTM C827 - 1987)	Unrestrained expansion upto 4%.			
<b>Pressure to restrain</b>	Approx. 0.004N/mm <sup>2</sup> .			
<b>Plastic expansion</b>	10 - 12 x 10 <sup>-6</sup> / °C.			
<b>Coefficient of thermal expansion</b>	1.5 W/m °C			
<b>Thermal conductivity</b>	2200 - 2300 kg/m <sup>3</sup>			
<b>Fresh wet density</b> (Mixed density @27 C)	15-20%			
<b>Creep Strain Reduction</b>				

## Specification clauses

### Performance specification

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 microconcrete in flowable consistency shall achieve a compressive strength not less than 20 N/mm<sup>2</sup> at 24 hours , 36 N/mm<sup>2</sup> at 3 days , 51 N/mm<sup>2</sup> at 7 days and 60 N/mm<sup>2</sup> 28 days at 30 C. Most importantly, the cured micro concrete shall contain in 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<sup>2</sup> @ 28 days. The microconcrete shall have a coefficient of thermal expansion similar to that of the host concrete. The mixed density of microconcrete shall exceed 2100 kg/m<sup>3</sup> at 27 C.

### Supplier specification

All microcreting (specify details and areas of application) must be carried out using BS 66 MuCis, manufactured by Thermax, applied strictly in accordance with the manufacturer's technical datasheet.

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## Instructions for use

### 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 airventing. 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 anti corrosive coating **MuCis Protezione Ferro Mono** should be applied on the reinforcing steel. If any discontinuity in the applied film 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 TM Bond EP, a slow - setting epoxy bond aid. TM Bond EP shall be applied only on dry substrate.

### Mixing

Care should be taken to ensure that BS 66 MuCis is thoroughly mixed in a forced-action mixer of adequate capacity. Alternatively, mix in a suitably sized drum with a high torque (400/500 rpm) rotary drill fitted with a mixing paddle. It is essential that machine mixing capacity and labour availability is adequate to enable the placing operation to be carried out continuously. The quantity water required will generally be between 4.8 litres per 30 kg bag of BS 66 MuCis. The optimum water content should be determined and accurately measured into the mixer. However it should not exceed 4.8 litres/30 kg in any case. With the mixer running, slowly empty BS 66 MuCis bag into the mixer. Mix continuously for 5 minutes, ensuring a smooth even consistency of the mix. Where the addition of graded coarse aggregate has been specified it should be added after the water and BS 66 MuCis are properly mixed. Mixing should then continue for a further 1 minute to ensure proper dispersion.

### Formwork

Slurry tight form work that will not deform or leak when subjected to hydraulic pressure imposed by the micro concrete will be fabricated and erected where the material is gravity fed, provision in the formwork will be made for a suitable feed hopper at the highest point. Where necessary provision will be made for airvents to prevent air entrapment. Form work will be coated with Maxcure MRA 101 mould releasing agent prior to fixing.

### Placing

The mixed material should be placed immediately. If placed by pump, standard concrete pumping practice should be followed. The pump and pipeline must be primed with cement slurry. Pumping should be commenced immediately after priming. If poured in the form work, avoid air entrapment by pouring from one side only.

### Low temperature working

In cold conditions down to 15 °C, the use of warm water (upto 30 °C is advisable to accelerate strength development. Normal precautions for working with cementitious materials in winter should be adopted.

### High temperature working

At ambient temperature above 35 °C the material should be stored in the shade and cold water used for mixing.

**Curing**  
As BS 66 MuCis is a cement-based repair material, it should be cured immediately after stripping the formwork in accordance with good concrete practice. the use of any

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Thermax's Maxcure range of curing compounds, sprayed on the surface of the BS 66 MuCis. in a continuation film, is recommended so after tripping the formwork. In drying condition Polythene sheet must be used.

Note : For repair sections generally deeper than 100mm it may be necessary to mix the BS 66 MuCis 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.

Typical results of BS 66 MuCis with Sieved coarse aggregates of maximum size 12mm.

**BS 66 MuCis : Coarse aggregate (SSD) (By weight) - 1 :0.75**

**Water: Powder ratio - 0.16**

(By weight)

**Compressive strength (N/mm<sup>2</sup>)**

1 D	3 D	7 D	28D
25	45	55	65

**Workability** - Flowable

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

## Health and Safety Instructions

BS 66 MuCis should not be swallowed or allowed to come into contact with skin and eyes.

BS 66 MuCis is non flammable

## Storage

### 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.

## Packing

BS 66 MuCis is supplied in 30 kg moisture resistant bags.

### Yield

Approximately 15.8 litres per 30 kg bag. Actual yield per bag will depend on the consistency of BS 66 MuCis and quantity of coarse aggregate added.

## Other segments :

- Concrete Admixtures • Surface Treatments • Grouts & Anchors • Repair & Rehabilitation
- Protective Coatings • Industrial Flooring • Waterproofing • Sealants • Adhesives
- Cement Grinding Aids

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