

PRODUCT DATA SHEET

SikaEmaco® T 1400 FR

(formerly MEmaco T 1400FR)

Rapid setting and hardening, extra high-strength, shrinkage compensated, metallic fibre reinforced, flowable traffic repair mortar

PRODUCT DESCRIPTION

SikaEmaco® T 1400 FR is a single component, fast setting and hardening pourable repair and bedding mortar with metallic fibre reinforcement that meets the requirements of class R4 according to EN 1504 part 3. SikaEmaco® T 1400 FR is a ready-to-use material that contains sulphate resistant Portland cement (HSR LA), hydraulic binders, well graded sands, galvanised steel fibres, specially selected polymer fibres (PAN – polyacrylonitril) and special additives provide rapid strength build-up even at sub-zero temperatures, improved durability and unmatched low drying shrinkage.

When mixed with water, SikaEmaco® T 1400 FR forms a mortar with flowable consistency which can be easily applied by hand from 10 mm up to 150 mm thickness.

USES

- Flowable large size horizontal repair exposed to extreme traffic loads.
- Repairing defective joints.
- Bedding small to large size manhole frames, using formwork.
- Optimizing traffic management.
- Both internal and external use.
- Use in cold conditions or cold store rooms.
- Applications under the most difficult jobsite conditions, where very short traffic disruption periods are required.

CHARACTERISTICS / ADVANTAGES

- Ultra rapid strength build-up, SikaEmaco® T 1400 FR can be opened to all traffic in just 2 hours at +20 °C
- Excellent application properties
- Higher thickness possible with the addition of gravel

- Flowable consistency for ease of application.
- Can be used at sub-zero temperatures as low as -5°C.
- Ultra high ductility due to the special metallic fibres.
- Resists high dynamic loads or impact.
- Very high early and final strengths.
- Two to three times higher flexural strength than ordinary repair mortars
- Excellent adhesion and excellent durability.
- Extra low shrinkage and minimized cracking tendency
- Excellent freeze-thaw resistance.
- Very good reinforcement protection due to very low water absorption and good carbonation resistance.
- Very good skid resistance, even in wet conditions.
- High resistance to hydrocarbons.
- CE-certified according to EN 1504-3 class R4

PRODUCT INFORMATION

Packaging	SikaEmaco® T 1400 FR is available in 25 kg paper bags.
Shelf Life	9 months if stored at mentioned storage conditions.
Storage Conditions	Store at ambient temperatures, out of direct sunlight, in cool, dry warehouse conditions and clear of the ground on pallets protected from rainfall prior to application.
Appearance / Colour	Grey powder with metallic fibres
Maximum Grain Size	4.0 mm
Total Chloride Ion Content	≤ 0.05 % (EN 1015-17)

TECHNICAL INFORMATION

Compressive Strength	Age	at +20 °C ¹⁾	at +5 °C ²⁾	at -5 °C ³⁾	(EN 12190)
	2 hours	≥ 30 N/mm ²	-	-	
	3 hours	-	≥ 15 N/mm ²	≥ 8 N/mm ²	
	4 hours	≥ 50 N/mm ²	≥ 20 N/mm ²	≥ 12 N/mm ²	
	1 day	≥ 70 N/mm ²	≥ 55 N/mm ²	≥ 50 N/mm ²	
	7 days	≥ 85 N/mm ²	≥ 65 N/mm ²	≥ 70 N/mm ²	
	28 days	≥ 100N/mm ²	≥ 85 N/mm ²	≥ 90 N/mm ²	

¹⁾ Curing, water and powder temperature: +20 °C

²⁾ Curing, water and powder temperature: +5 °C

³⁾ Curing at -5°C; water and powder temperature: +20 °C

Modulus of Elasticity in Compression	40,000 N/mm ²	(EN 13412)
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Flexural Strength	1 day	≥ 15 N/mm ²
	7 days	≥ 20 N/mm ²
	28 days	≥ 25 N/mm ²
	(EN 196-1)	

Pull-Out Resistance	Concrete	28 days	≥ 3.0 N/mm ²
	Concrete after Freeze-Thaw (50 cycles with salt)	28 days	≥ 3.0 N/mm ²
	(EN 1542) (EN 13687-1)		

Shrinkage	28 days	≤ 0.300 mm/m
(EN 12617-4)		

Ring test	Coutinho Ring	no cracking up to 180 days
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Service Temperature	-30 °C to +80 °C	
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Capillary Absorption	28 days	≤ 0.1 kg·m ⁻² ·h ^{-0.5}
(EN 13057)		

Carbonation Resistance	28 days	dk ≤ Reference Concrete
(EN 13295)		

Reaction to Fire	Class A1	(EN 13501-1)
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APPLICATION INFORMATION

Fresh mortar density	approx. 2.28 g/cm ³
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Consumption	Approx. 2,035 kg powder is needed to prepare 1 m ³ of fresh mortar.
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A 25 kg bag will yield approximately 12.3 litres of mortar if mixed with 3 l of water.

Layer Thickness	10 to 150 mm	
Product Temperature	+5 °C to +30 °C	
Ambient Air Temperature	-5 °C to +35 °C	
Mixing Ratio	2.7 – 3.2 l water per 25kg bag	
Substrate Temperature	0°C to +30 °C	
Pot Life	approx. 20 minutes at +20 °C	
Applied Product Ready for Use	<u>Open to light traffic (at +20 °C)</u>	<u>60 Minutes</u>
	<u>Open to heavy traffic (at +20 °C)</u>	<u>120 Minutes</u>

VALUE BASE

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.

USES

- Do not apply SikaEmaco® T 1400 FR at temperatures below -5°C nor above +30°C.
- For applications over 100 mm, 7.5 kg of clean gravel (4-8 mm or 8-16 mm depending on the thickness) may be added to 25 kg of SikaEmaco® T 1400 FR powder.
- Other additions like cement or other substances that could affect the properties of SikaEmaco® T 1400 FR are not allowed.
- Do not use vibrator for placing the mortar.
- Never add water or fresh mortar to a mortar mix which has already begun to set.
- Keep the mixing water ratio between the recommended limits.
- When applying SikaEmaco® T 1400 FR at cold or sub-zero temperatures, we advise to use warm mixing water in order not to delay the hardening of the mortar too much.
- Do not wet cure the material. Prevent from rain

ECOLOGY, HEALTH AND SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

SUBSTRATE PREPARATION

Concrete must be fully cured, clean and sound to ensure good adhesion. All loose traces of concrete or mortar, dust, grease oil, etc. must be removed. Damaged or contaminated concrete should be removed to obtain a keyed surface. Non-impact/vibrating cleaning methods, e.g. shot blasting, sandblasting or high-pres-

sure water jetting are recommended. Aggregate should be clearly visible on the surface of the concrete structure after surface preparation.

Cut the edges of the repair vertically to a minimum depth of 10 mm.

If reinforcing steel is visible, clean to a minimum grade of Sa 2 according to ISO 8501-1 / ISO 12944-4. Ensure back of rebar is also clean. Heavily damaged reinforcement, or when rebar sections have decreased below the safety level, need to be replaced for structural reasons. Ensure a 2 cm rebar cover when installing additional reinforcement.

Although SikaEmaco® T 1400 FR can be applied at ambient temperatures as low as -5°C, the temperature of the substrate should be minimum > 0°C and maximum +30°C. Frozen substrates need to be defrosted just prior to the application of SikaEmaco® T 1400 FR. Make sure that any metal parts, e.g. reinforcement and manhole frames are defrosted with a temperature above the freezing point. Try to keep the temperature uniform during application and hardening.

In case of fixing manhole frames, set the frames to the required level and install watertight formwork before the application of the material. Inflatable formwork can be used. Fill the formwork with water to test for tightness and pre-soak substrate. Provision must be made for draining of pre-soaking water and air venting during placement. The concrete substrate shall be water saturated, without free standing water, at the moment of application.

MIXING

Mix full bags only! Damaged or opened bags should not be used.

First pour the clean tap water in the mixing container and afterwards, while mixing, add approx. 2/3 of the SikaEmaco® T 1400 FR powder slowly and without interruptions to the water. Continue mixing for at least 1 minute. After 1 minute, add the rest of the powder and mix continuously until a homogeneous mortar is obtained.

Mix SikaEmaco® T 1400 FR with a suitable paddle attached to a powerful, slow speed electric drill (max 400 rpm). The total mixing time is 3 to 4 minutes until a homogenous, plastic to fluid consistency is obtained.

Mixing water needed: 2.7 to 3.2 litres per 25 kg bag

are required for fluid consistency. Only use clean un-contaminated water.

Note: It is strongly recommended to comply the mixing times before adjusting or not the consistency by adding extra water! Do not mix more material as can be applied within the pot life of approximately 20 to 30 minutes at 20°C. Do not mix SikaEmaco® T 1400 FR with any other material. Only the addition of maximum 30% of clean, well sized gravel is permitted for applications with a thickness over 100 mm.

The steel fibres are bundled with a water-soluble glue. This glue helps avoiding fibre balling during mixing and ensures a homogeneous distribution of fibres throughout the mortar mix.

APPLICATION

Concrete substrates and any metal parts coming in contact with SikaEmaco® T 1400 FR need to be defrosted.

The prepared substrate should be pre-soaked, preferably for 24 hours, but at least 2 hours before applying SikaEmaco® T 1400 FR. The surface must be mat-damp, but without standing water.

For optimum curing of the product the temperatures during application of SikaEmaco® T 1400 FR are between -5 °C and +30 °C. Do not apply SikaEmaco® T 1400 FR if the temperature is expected to drop below -5 °C during application or within 24 hours.

Set manhole frames or road / bridge joint to the required level and install watertight formwork when necessary before the application of the material.

SikaEmaco® T 1400 FR is cast in situ with flowable consistency inside the formwork and underneath the manhole frame or in the gap between the road surface and the bridge / road joint.

For basic repair applications, pour SikaEmaco® T 1400 FR with flowable consistency directly onto the pre-dampened substrate up to the required thickness.

CURING TREATMENT

SikaEmaco® T 1400 FR is basically self-curing. Wet curing is not advised.

When working at sub-zero temperatures, cover SikaEmaco® T 1400 FR with insulation materials or dry cloths until sufficiently hardened, preferably 24 hours or until SikaEmaco® T 1400 FR is to be opened for traffic.

CLEANING OF TOOLS

Tools and mixer must be cleaned immediately after use with water. Cured material can only be removed mechanically.

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.

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.

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Product Data Sheet
SikaEmaco® T 1400 FR
September 2024, Version 02.01
02030200000002150

SikaEmacoT1400FR-en-GB-(09-2024)-2-1.pdf