

MasterEmaco® T 1200 PG (Formerly known as Emaco® Fast Fluid)

Rapid Setting and Hardening, Extra High-Strength, Shrinkage Compensated, Fibre Reinforced, Flowable Traffic Repair Mortar

DESCRIPTION OF PRODUCT

MasterEmaco® T 1200 PG, is a single component, fast setting and hardening pourable repair and bedding mortar that meets the requirements of the new European Norm EN 1504 part 3 class R4.

MasterEmaco® T 1200 PG is a ready-to-use material that contains sulphate resistant Portland cement (HSR LA), hydraulic binders, well graded sands, 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, **MasterEmaco® T 1200 PG** forms a mortar with a fluid or flowable consistency which can be easily applied by hand or machine.

MasterEmaco® T 1200 PG can be used in thicknesses from 10 mm up to 150 mm.

FIELDS OF APPLICATION

MasterEmaco® T 1200 PG is used for:

- Bedding small to large size manhole frames, using formwork.
- Flowable or fluid horizontal repair.
- Grouting pavement stones.
- Fixing street furniture.
- 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.

FEATURES AND BENEFITS

- Ultra rapid strength build-up.
- **MasterEmaco® T 1200 PG** can be opened to all traffic in just 2 hours.
- Excellent application properties
- Higher thickness possible with the addition of gravel
- Flowable or fluid consistency for ease of application.
- Can be used at sub-zero temperatures as low as -10°C.
- Very high early and final strengths.
- Excellent adhesion and excellent durability.
- Extra low shrinkage for durability.
- Minimized cracking tendency due to constrained shrinkage by PAN fibres.
- 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.
- Very high resistance to hydrocarbons.

APPLICATION PROCEDURE

(a) Surface 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 water pressure blasting 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.

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 **MasterEmaco® T 1200 PG** can be applied at ambient temperatures as low as -10°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 **MasterEmaco® T 1200 PG**. 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.

(b) Mixing

It is strongly recommended that only full bags are mixed. Damaged or opened bags should not be used.

First pour the clean tap water in het mixing container and afterwards, while mixing, add approx. 2/3 of the **MasterEmaco® T 1200 PG** 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 **MasterEmaco® T 1200 PG** 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. Only use clean uncontaminated water.

Mixing water needed: 2.7 to 3.2 litres per 25 kg bag are required for fluid consistency.

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

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20°C. **MasterEmaco® T 1200 PG** 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.

(c) Application

Concrete substrates and any metal parts coming in contact **MasterEmaco® T 1200 PG** need to be defrosted. The prepared substrate should be pre-soaked, preferably for 24 hours, but at least 2 hours before applying **MasterEmaco® T 1200 PG**. The surface must be mat-damp, but without standing water.

For optimum curing of the product the temperatures during application of **MasterEmaco® T 1200 PG** are between -10°C and +30°C.

The material can be placed behind the formwork, or poured into the patch repair area. For better adhesion, the first part of the poured material should be applied into the roughness of the substrate with a stiff brush. The remaining material has to be poured immediately after brushing, while the mortar is still fresh.

MasterEmaco® T 1200 PG is basically selfcuring. Wet curing is not advised.

When working at sub-zero temperatures, cover **MasterEmaco® T 1200 PG** with insulation materials or dry cloths until sufficiently hardened, preferably 24 hours or until **MasterEmaco® T 1200 PG** is to be opened for traffic. Do not apply **MasterEmaco® T 1200 PG** if the temperature is expected to drop below -10°C during application or within 24 hours.

COVERAGE

Approx. 2.000 kg powder is needed to prepare 1 m³ of fresh mortar. 25 kg bag will yield approximately 12.4 litres of mortar.

WATCH POINTS

- Do not apply **MasterEmaco® T 1200 PG** at temperatures below -10°C nor above +30°C.
- Do not add cement, sand or other substances that could affect the properties of **MasterEmaco® T 1200 PG**.
- 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 **MasterEmaco® T 1200 PG** 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.
- 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 **MasterEmaco® T 1200 PG** powder.
- Do not wet cure the material. Prevent from rain.

CLEANING OF TOOLS

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

CURING

Full cure is reached in 28 days after the application at a constant temperature of 23°C.

WORKING TIME

20 minutes in 20°C ambient and substrate temperature.

PACKAGING

MasterEmaco® T 1200 PG is available in 25 kg paper bags.

STORAGE

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.

SHELF LIFE

12 months if stored at above mentioned storage conditions.

HEALTH AND SAFETY PRECAUTIONS

It is dangerous to approach the application sites. During the application, a protective apparel, protective gloves, goggles and masks which comply with the Occupational Health and Safety Rules should be used. Due to the irritation effect of the uncured materials, the mixtures should not come into contact with skin and eyes; in case of contact, the affected area should be washed with plenty of water and soap; in case of swallowing, a physician should be consulted immediately. No food or beverages should be brought to the application area. The product should be stored and kept out of reach of children. For detailed information please consult the Material Safety Data Sheet.

DISCLAIMER

The technical information given in this publication is based on the present state of our best scientific and practical knowledge. **Master Builders Solutions Yapı Kimyasalları Sanayi ve Ticaret Ltd. Şti.** is only responsible for the quality of the product **Master Builders Solutions Yapı Kimyasalları Sanayi ve Ticaret Ltd. Şti.** is not responsible for results that may occur because the product is used other than advised and/or out of instructions regarding the place and the method of use. This technical form is valid only till a new version is implemented and nullifies the old ones.

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TECHNICAL DATA

Property	Standard	Data	Unit																		
Chemical Base	-	Cement	-																		
Color	-	Grey	-																		
Grain Size	EN 1015-17	3,15	mm																		
Chloride Ion Content	-	≤0.05	%																		
Layer Thickness Minimum Maximum	-	10 ¹ – 25 ² 100 ¹ - 150 ²	Mm																		
Fresh Mortar Density	-	Approx. 2,25	g/cm ³																		
Mixing Water for 25 kg Bag	-	2,7 – 3,2	l																		
Working Time ³	-	20	Minute																		
Open to Traffic (at 20°C) light traffic Heavy traffic	-	60 120	Minute																		
Application Temperature (ambient and substrate)	-	-10 - +30	°C																		
Moduls of Elasticity	EN 13412	≥ 30.000	N/mm ²																		
Compressive Strength 2 hours 4 hours 1 day 7 days 28 days	EN 12190	<table border="1"> <thead> <tr> <th>+20°C⁴</th> <th>+5°C⁵</th> <th>+5°C⁶</th> </tr> </thead> <tbody> <tr> <td>45</td> <td>3</td> <td>9</td> </tr> <tr> <td>55</td> <td>30</td> <td>25</td> </tr> <tr> <td>70</td> <td>60</td> <td>55</td> </tr> <tr> <td>90</td> <td>80</td> <td>75</td> </tr> <tr> <td>100</td> <td>95</td> <td>85</td> </tr> </tbody> </table>	+20°C ⁴	+5°C ⁵	+5°C ⁶	45	3	9	55	30	25	70	60	55	90	80	75	100	95	85	N/mm ²
+20°C ⁴	+5°C ⁵	+5°C ⁶																			
45	3	9																			
55	30	25																			
70	60	55																			
90	80	75																			
100	95	85																			
Flexural Strength 1 day 7 days 28 days	EN 196-1	<table border="1"> <tbody> <tr> <td>≥ 7</td> </tr> <tr> <td>≥ 8</td> </tr> <tr> <td>≥ 10</td> </tr> </tbody> </table>	≥ 7	≥ 8	≥ 10	N/mm ²															
≥ 7																					
≥ 8																					
≥ 10																					
Adhesion to Concrete 28 days	EN 1542	≥ 3,0	N/mm ²																		
Adhesion to Concrete After Freeze-Thaw (50 cycles with salt) 28 days	EN 13687-1	≥ 3,0	N/mm ²																		
Carbonation resistance 28 days	EN 13295	dk ≤ Ref. Concrete	mm																		
Skid Resistance 28 days	EN 13036-4	Class III – tested wet																			
Capillary Absorption 28 days	EN 13057	≤ 0,1	kg.m ⁻² . h ^{0.5}																		
Cracking Tendency (I)	Coutinho Ring	No Cracking	Up to 180 days																		
Drying Shrinkage 28 days	EN 12617-4	≤ 0,300	mm/m																		
Pull out strength of steel rebar 28 days	Rilem-CEB- FIP RC6-78)	≥ 25	N/mm ²																		

Note: 1 Used as repair mortar
 2 Used as bedding mortar
 3 Hardening times are measured at 21°C ± 2°C and %60 ± %10 relative humidity. Higher temperatures will reduce these times and lower temperatures will extend them. Technical data shown are statistical results and do not correspond to guaranteed minima. Tolerances are those described appropriate performance standards.
 4 Curing, water and powder temperature: 20°C
 5 Curing; water and powder temperature: +5°C

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CONTACT INFORMATION

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MasterEmaco® T 1200 PG Technical Data Sheet -
Revision Date: 12/2020

	
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EN 1504-3:2005 MASTEREMACO T 1200 PG Yapısal olan ve yapısal olmayan tamir (Structural and Non-Structural Repair Mortar) Sınıf R4 (Class R4)	
3.1 Elle harç uygulaması (Concrete restoration by applying mortar by hand)	
3.2 Yeniden beton dökülmesi (Concrete restoration by recasting with concrete)	
4.4 Harç veya beton ilavesi (structural strengthening by adding mortar or concrete)	
7.2 Bozunmuş betonun yenilenmesi (Replacing contaminated or carbonated concrete)	
Basınç Dayanımı (Compressive Strength)	≥ 45 N/mm ²
Klorür içeriği (Chloride ion Content)	≤ % 0,05
Adezyon Dayanımı (Adhesive bond)	≥ 2,0 N/mm ²
Kontrollü Büzülme / Genleşme (Restrained shrinkage/expansion)	≥ 2,0 N/mm ²
Karbonatlaşma Direnci (Carbonation resistance)	sağlıyor (passes)
Elastisite Modülü (Elastic Modulus)	≥ 20 Gpa
Yangına tepki (Reaction to fire)	A1
Tehlikeli maddeler (Dangerous substances)	Madde 5.4'e uygun (Comply with clause 5.4)