



Concrete Restoration

UMAFLOW

One-component, pre-mixed, fluid, non-shrinking, fibre-reinforced, fast setting and hardening mortar with high mechanical strength. Type CC and class R4 according to EN 1504-3, for fixing manhole covers, localised repair of interior and exterior industrial floors and repair of reinforced concrete.



- Rapid hardening and development of mechanical strength
- Resistant to the penetration of CO₂
- Withstands freezing/thawing cycles



APPLICATION AREAS

- Fast fixing and levelling of manhole covers, chambers and drains.
- Fast fixing of poles, road signs and street furniture.
- Fast repair of interior and exterior concrete flooring (localised repairs must not exceed an area of 9 m² and the length of the longest side must not exceed 3 metres).

TYPES OF SUBSTRATE

Reinforced concrete in general.

MAXIMUM ATTAINABLE THICKNESSES

10 cm. For greater thicknesses, add washed gravel (3-7 mm).

FEATURES

Umaflow is a one-component cement mortar, pre-mixed, with fast setting and hardening, available in grey and anthracite colours, based on a mix of special cements, selected aggregates, fibres and specific additives. A fluid and cohesive mix is obtained after mixing with water. A slight expansion during both the plastic and the post-hardening phases compensates for hydraulic shrinkage, with a considerable improvement of the final adhesion characteristics, and at the same time preventing fracturing. The optimum water retention reduces the risk of "burning" when it applied in small thicknesses (which, in any case, must not be less than 2 cm) and, if suitable care is taken, even during critical weather conditions (summer temperatures and windy); however, in this case it is necessary to adopt suitable precautions (do not expose to direct sunlight, mix with cold water, apply the product preferably at coolest times of the day and in the shade, etc). Specific additives make the hardened mortar impermeable to water and resistant to the penetration of CO₂. Umaflow is a product for the structural repair of concrete structures using hydraulic mortar type CC and class R4 in accordance with EN 1504-3.

WARNINGS

- Do not mix with other binders such as cement, hydraulic lime, gypsum, etc.
- Do not add water once the mix has started to set.
- Do not use the mixed product when it has already started to set. Therefore, always prepare quantities of mix which can be used within the workability time.
- Do not use in temperatures which are too high or when it is very windy. Protect from direct sunlight. During the summer months wait for the coolest hours of the day before application, mix with cool water and protect the surface against strong winds, spraying the surface with water or covering it with polyethylene sheets.
- Do not apply Umaflow when the temperature is less than +5 °C or more than +30 °C.
- Attention: when laying horizontally, the surface of the substrate must be solid, strong, durable and stable with a roughness (roughness more than 5 mm deep) in order to achieve the necessary adhesion between the substrate and the Umaflow material.

INSTRUCTIONS FOR USE

Preparation

Remove all crumbling and loose parts from the substrate by careful hammering and chiselling, until a sound and strong substrate is reached. Scrape down to a depth of at least 2 cm. The scraped substrate must also be carefully roughened, with bumps of at least 5 mm, and then cleaned, so as to be free of dust, loose material and dirt of any kind. Any oil or grease residue must be carefully removed. In the case of repairs to flooring and other reinforced concrete elements, fully expose the reinforcement bars which can be seen and remove completely any concrete, cleaning them by wet or dry sandblasting. For effective anticorrosive protection, apply Restoration Irons to the reinforcing bars and allow it to harden so that subsequent applications do not damage it (see the appropriate data sheet for application methods). Wet the substrate well with pressurized water until refusal and allow excess water to evaporate or remove it with a sponge. Roughening and saturating the substrate with water is necessary to ensure adhesion and counteract the expansion of the expansive action of Umaflow.

Mixing the product

Mix Umaflow with approx. 13 – 15 % of water (which is equal to approx. 3,25 – 3,75 litres for a 25 kg bag), mixing it with a mechanical mixer (low-speed drill with mixer attachment or mortar mixing plant) until the mix is homogeneous and free from lumps. In the cases of small quantities of mixes, do not mix manually with a trowel, as the amount of water needed to prepare the mix would be greater, with consequent worsening of the mechanical performance and reduction of the resistance to carbonation (if the mixing water is much greater than that specified there can be the risk of cracking caused by excessive hydraulic shrinkage).

Application

The mix prepared in this way is workable for approx. 30 minutes under normal conditions (+20 °C). The workability time is shortened at higher temperatures and increased at lower ones. Place the Umaflow mix directly into the space to be filled. Smooth the surface using a trowel or palette knife. The minimum application thickness is approx. 2 cm, so do not smooth "flush". The maximum total thickness which can be applied is approx. 10 cm. For thicknesses greater than 10 cm, dilute Umaflow with up to a maximum of 30 % by weight of washed gravel (3 – 8 mm), that is, approx. 3 parts by weight of Umaflow and 1 part by weight of gravel; in practical terms, this corresponds to approx. 2 builder's buckets of 3 – 8 mm gravel for every 100 kg (four 25 kg bags) of Umaflow. This addition results in a modification of the mixing water, which changes from 13 – 15 % to 11 – 13 %, and a reduction by approx. 10 % in the mechanical strength, guaranteeing a compressive strength after 28 days of more than 55 MPa. Carry out any finishing with a plastering trowel when the mortar starts to set, that is, when it is only

possible to make a slight impression when pressing with a finger. The inserts and repairs carried out with Umaflow must be suitably protected during the summer months and in the presence of strong winds by spraying the surface with water or covering with polyethylene sheets, in order to avoid the formation of cracks in the mortar when it is still in the plastic state due to too fast an evaporation of the mixing water.

Cleaning

The tools used can be cleaned with water before the mortar hardens. Once hardened, the mortar must be scraped off.

WAITING TIMES

At 20 °C, Umaflow can be walked on 1 hour after placing. If the product is used at approx. 20 °C the road may be re-opened to traffic after 2 hours in the case of lightweight traffic (motorcycles and cars), but it is necessary to wait at least 4 hours from its application in the case of heavy traffic (lorries, HGV and industrial vehicles).

TECHNICAL SPECIFICATIONS

PARAMETER AND METHOD	EN 1504-3 REQUIREMENT	VALUE
MEASURED ON POWDER PRODUCT		
Consistency		powder
Apparent density (MIT 13 *)		1,350 kg/litre
Grain size (EN 12192-1)		0 – 2,5 mm
Content of chlorine ions (EN 1015-17)	≤ 0,05 %	< 0,01 %
Hazardous substances (EN 1504-3)		Compliant with point 5.4
MEASURED ON FRESH MIX		
Mixing water		13 – 15 % (3,25 – 3,75 litres per 25 kg bag)
Mix consistency (visual)		fluid
Mix pH		> 12
Mix density (EN 1015-6)	Range of declared values	2,200 kg/l
Mix pot life (EN 13395)		≥ 20 minutes
Setting times: start of setting (EN 196-3)		40 minutes
Setting times: end of setting (EN 196-3)		50 minutes
Application temperature		from + 5 °C to + 30 °C
Coverage		approx. 21 kg/m ² per cm of thickness
MEASURED ON HARDENED PRODUCT		
Operating temperature		from -20 °C to +90 °C
Bending strength: after 1 day (EN 12190)		> 3,0 MPa
Bending strength: after 3 days (EN 12190)		> 6,0 MPa
Bending strength: after 7 days (EN 12190)		> 6,0 MPa
Bending strength: after 28 days (EN 12190)		> 8,0 MPa

Compressive strength: after 2 hours (EN 12190)		> 8,0 MPa
Compressive strength: after 8 hours (EN 12190)		> 16,0 MPa
Compressive strength: after 1 day (EN 12190)		> 18,0 MPa
Compressive strength: after 3 days (EN 12190)		> 35,0 MPa
Compressive strength: after 7 days (EN 12190)		> 40,0 MPa
Compressive strength: after 28 days (EN 12190)	≥ 45,0 MPa (after 28 days)	> 45,0 MPa
Compressive elastic modulus (EN 13412)	≥ 20,0 GPa (after 28 days)	8,0 MPa > 6,0 MPa
Capillary absorption (EN 13057)	≤ 0,5 kg/(m ² ·min ^{0,5})	0,1 kg/(m ² ·min ^{0,5})
Adhesion on concrete (EN 1542).	≥ 2,0 MPa	11,0 MPa > 8,0 MPa
Resistenza alla carbonatazione (EN 13295)	dk ≤ calcestruzzo di controllo	Test passed
Thermal compatibility (freezing/thawing cycles with de-icing salts) (EN 13687-1)	≥ 2,0 MPa (after 50 cycles)	≥ 2,0 MPa
Fire reaction (EN 13501-1)	Value declared by manufacturer	Class A1
Product classification (EN 1504-3)		R4 CC

* Torggler Internal Methods (MIT) are available on request.

Pallet	50 bags
Packaging	bag
Packaging size	25 kg
Color	Anthracite, Grey

CONSUMPTION

The coverage of Umaflow is approx. 21 kg/m² per cm of thickness.

STORAGE

Store Umaflow in a dry, protected place. Unopened in its original bags, the product can be stored for at least 9 months.

CERTIFICATIONS

Product classified as R4 CC according to EN 1504-3. CE Declaration of Performance (DoP) of the product, with copy of official test reports, is available on request.

Additional certifications and tests conducted:

- The product can be applied for exposures XC 1-4, XF 1-4, XW 1-2, XD 1-3, XS 1-3, XM 1, XA 1-2 and X0 according to EN 13396 "Products and systems for the protection and repair of concrete structures – Test methods – Measurement of chloride ion penetration."
- High resistance to freezing-thawing salts – detection by CDF method

- High resistance to chloride penetration – detection by chloride migration coefficient test (test according to EN 13396)
- Complies with water resistance under pressure according to DIN 12390-8
- Factory production verifications according to DIN EN 1504-3
- Company certification according to DIN EN ISO 9001: 2015
- Meets the requirements of building material class A1 (non-combustible) according to European Commission Decision 2000/605 / EG of September 26, 2000 (published in Official Journal L258)
- Cements: according to DIN EN 197-1
- Aggregates: according to DIN EN 12620

The information contained in this document is reported on the basis of our experience and knowledge; therefore, any recommendations and suggestions made are without any guarantee and must be verified before using the product by those who intend to use it, who assume all responsibility that may result from its use since the conditions of use are not under our direct control. In case of doubt, it is always advisable to make preliminary tests and/or ask for the intervention of our technicians. Torggler reserves the right to modify, replace and/or delete the items, as well as to change the product data in this document without prior notice; in this case the indications given here may no longer be valid. Always refer to the latest version of the data sheet, available at www.torggler.com. Version 12.07.2021.