MasterTop 514 QD

Polymer modified cementitious mortar with a plastic, fluid or self-leveling consistency, category R4, quick-drying, for the repair of industrial floors from 3 to 40 mm.

MATERIAL DESCRIPTION

MasterTop 514 QD is a modified polymer mortar based on hydraulic binders, fast drying, high resistance, multifunction, for applications from 3 to 40 mm. Above 20 mm it is necessary to load it with gravel in a maximum ratio of 1/1.

MasterTop 514 QD mixed with water only creates the modified polymer one-component base mortar (1K) while combined with specific water-based epoxy binders it becomes a three-component epoxy-modified (3K) self-levelling product with the same characteristics of the base system together with the function of primer barrier against osmotic pressure.

It can be applied to a plastic, fluid or self-levelling consistency simply by adjusting the amount of water.

FIELDS OF APPLICATION

MasterTop 514 QD has a high resistance to 24/48 hours together with a rapid drying which give it the ideal profile for applications in combination with Ucrete and MasterTop resin floors. It is in fact indicated for:

- "Fast" repairs and regularizations of reinforced concrete floors before applying the epoxy and polyurethane floors of the Mastertop and Ucrete lines;
- create the self-leveling base layer of the systems of the MasterTop line also on ceramic supports (3K version);
- quickly repair and put back into service the localized areas of industrial flooring such as logistics areas, commercial areas, etc., both internal and external.

Fields of application of MasterTop 514 QD Polymer Modified (PM 1k) and Epoxy Modified (EM 3k)

	MasterTop 514 QD 1K	3K
Repair of industrial concrete floors	☑	
Repair of concrete floors before the application of MasterTop and Ucrete	☑	
Levelling of ceramic floors before the application of MasterTop floors		☑
Repair of concrete with a function of barrier against the osmotic pressure before the application of MasterTop floors		☑

FEATURES AND BENEFITS

MasterTop 514 QD also has the additional peculiar characteristics:

- high compressive strength both initial (24 hours> 25 MPa) and final (> 45 MPa at 28 days);
- adhesion also on ceramic substrates (3K version);
- contains microfibres (almost 1 million fibers per liter of mortar) with a very high aspect ratio (L / D> 600) with high tensile strength (> 700 MPa) which effectively counteracts shrinkage cracks in the plastic phase;
- resistance to hygrometric shrinkage cracking.

In compliance with the European Regulation (EU No 305/2011 and EU No. 574/2014) the product is provided with the CE marking according to the following standards and the relative DoP (Declaration of Performance).

CE 1305
EN 1504-2
Concrete surface protection systems.
PI-MC-PR-IR category

CE 1308
EN 1504-3
CC mortar for restoring concrete structures based on hydraulic cement.
R4 category

CE 1305
UNI EN 13813
Screed materials: properties and requirements
Category B2-C45-F7-E5-IR20-A05

PACKAGING

MasterTop 514 QD: 25 kg bag.

MasterTop 514 QD 3K (84 kg) consists of:

- 4.5 kg can of MasterSeal P 385 component A;
- 4.5 kg can of MasterSeal P 385 component B;
- 3 x 25 kg bags of MasterTop 514 QD

COVERAGE

MasterTop 514 QD: 1.8 kg/m^2 per mm (3-40 mm).

MasterTop 514 QD 3K: 1.4 kg/m^2 (3-5 mm thickness)

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For thicknesses greater than 20 mm it is necessary to prepare a modified polymer concrete by loading MasterTop 514 QD with 5-10 mm / 8-15 mm small stone according to the thickness to be achieved, in a maximum ratio of 1/1.

- MasterTop 514 QD loaded as concrete: 11 kg / m^2 per cm;
- 5-10 mm or 8-15 mm aggregate: 11 kg / m^2 per cm of.

STORAGE

Store the product in a sheltered, dry place at a temperature anywhere between +5°C and +30°C.

Technical Information MasterTop 514 QD (1K)	
Mixing water per bag: - Plastic consistency - Fluid consistency - Self-levelling consistency	 12 % (3 litri) 15,5 % (3,9 litri) 19 % (4,75 litri)
Dough density, EN 1015-6	ca 2,1 kg/liter
Application temperature	- 5°C - + 40°C
Workability time at 20°C	20 min loss 30% 30 min loss 40%
Setting times at 20°C	Start setting: 70 minutes End of setting: 90 minutes
Residual humidity and overcoating times at 20°C (Carbide hygrometer)	24 h: < 6% 48 h< 4%
Overcoating time with resin systems at 20°C	Ucrete at 24 ore MasterTop at 48 ore
Restart time at 20°C	4 hours walkable 24 hours full service

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Essential characteristic in accordance to UNI EN 1504/3 (water 19%)			Limits and class	Performances
Compressive strength	20°C	UNI EN 12190	≥ 45 MPa 28 days	> 25 MPa 24 h > 45 MPa 28 days
	-5°C		-	> 5 MPa 24 h > 10 MPa 48 h
	0°C		-	> 10 MPa 24 h > 20 MPa 48 h
Adhesion		Before thermal cycles UNI EN 1542 on MC 0.40 type support (having a / c ratio = 0.40) UNI EN 1766	≥ 1,5 MPa	≥ 3,0 MPa
		After freeze-thaw cycles with immersion in de-icing salts UNI EN 13687/1	≥ 1,5 MPa	≥ 3,0 MPa
		After storm cycles (thermal shock) UNI EN 13687/2	≥ 1,5 MPa	≥ 3,0 MPa
		After thermal cycles without de-icing salts UNI EN 13687/4	≥ 1,5 MPa	≥ 3,0 MPa
Resistance to accelerated carbonation		UNI EN 13295	Carbonation depth <reference concrete MC 0.45 UNI EN 1766	Carbonation depth <reference concrete MC 0.45 UNI EN 1766
Capillary absorption		UNI EN 13057	≤ 0,5 $kg \cdot m^{-2} \cdot h^{-0,5}$	≤ 0,05 $kg \cdot m^{-2} \cdot h^{-0,5}$
Elastic module		UNI EN 13412	≥ 20.000 MPa	> 20.000 MPa
Linear thermal expansion		UNI EN1770	--	$1.46 \cdot 10^{-5}\ K^{-1}$
Reaction to fire		UNI EN 13501/1	--	A_{2fl} - S1
Slip / creep resistance		UNI EN 13036/4	Class I: wet test for internal surfaces: ≥ 40 units Class II: dry test for internal surfaces: ≥ 40 units	Class I Class II
Essential characteristic in accordance to ACI and ASTM (water 19%)			**Limits and class**	**Performances**
Tensile strength		ASTM C 307	> 2,8 MPa (ACI 546-B, Concrete Repair Guide)	24 h> 2 MPa 48 h > 3 MPa 28 days > 5 MPa
Hygrometric with drawal		UNI EN 12617-4	ACI American Concrete Institute: Guideline n° 03733	< 0,05 %
			Shrinkage: Rating	
			0,025-0,05 %: Low	
			0,05-0,1 %: Moderate	
			> 0,1 %: High	
Accelerated induction of cracking with contrasted shrinkage		O Ring test ASTM C 1581/C 1581M-09a	Cracks after days: Risk	No cracking after 150 days
			0 - 7: High	
			7 - 14: High / Mod.	
			14 - 28: Mod./ Low	
			> 28: Low	

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Essential characteristic according to UNI EN 1504/2 19% water			Limits and class	Performances
Adhesion		Before thermal cycle	> 1,5 MPa	> 3 MPa
		Before thermal cycles, UNI EN 1542 on MC 0.40 type support (having a / c ratio = 0.40) UNI EN 1766	> 1,5 MPa	> 3 MPa
		After freeze-thaw cycles with immersion in de-icing salts UNI EN 13687/1	> 1,5 MPa	> 3 MPa
		After storm cycles (thermal shock) UNI EN 13687/2	> 1,5 MPa	> 3 MPa
Permeability	To water vapour	UNI EN ISO 7783/1. Equivalent air thickness Sd, Sd = μ s, μ = coefficient Vapor diff. S = thickness	Class I: Sd < 5 m (Permeabile) Class II: Sd ≥ 5 e ≤ 50 m Class III: Sd > 50 m (Non Perm.)	Class I (Sd < 0,6 m / cm
	To water	For capillary absorption EN 1062/3	< 0,1 kg·m^{-2}·h$^{-0,5}$	< 0,1 kg·m^{-2}·h$^{-0,5}$
Mechanical resistance	Impact	UNI EN ISO 6272	Class I: 4 N·m, Class II: 10 N·m, Class III: 20 N·m	Classe III
	Abrasion	UNI EN ISO 5470/1 (load 1000 g of H22 wheel / 1000 cycles)	Weight loss <3000 mg	< 950 mg
	Compression	UNI EN 12190	Class I > 35 MPa (for traffic with polyamide wheels) Class II > 50 MPa (for traffic with steel wheels)	28 gg > 45 MPa
Fire reaction		UNI EN 13501/1	Euroclass	A_{fl}-S_1

Essential characteristic according to UNI EN 13813 (19 %water)	Limits and class	Performances
UNI EN 13892/8Adhesion to concrete on MC (0.40) support UNI EN 1766	Class (MPa): B0,5 …B2	B>2
UNI EN 13892/8 adhesion of MasterTop systems applied on MasterTop 514 QD (PM 1K) having 48 hours of curing laid on MC (0.40) support UNI EN 1766	Class (MPa): B0,5 …B2	B>2
UNI EN 13892/8 adhesion of Ucrete systems applied on MasterTop 514 QD having 24 hours of curing laid on MC (0.40) support UNI EN 1766	Class (MPa): B0,5 …B2	B>2
Compressive strength UNI EN 13892/2	Class (MPa) C5, C10 …. C80	C25 a 24 ore C45 a 28 giorni
Tensile strength for bending UNI EN ISO 178	Class (MPa) F1 ... F50	F10
Flexural modulus of elasticity UNI EN ISO 178	Class (MPa) E1 ... E20	E10
Abrasion resistance UNI EN 13892/4	Class A6, …….. A2, A1, A05	A05
Permeability to water vapor (diffusion to vapor expressed as equivalent air thickness Sd) UNI EN 12086	Sd = μ·s μ = coeff. diffusion s = thickness	Sd < 0,6 m / cm
Coefficient of linear thermal expansion UNI EN 1770	---	1,46·10^{-6} K^{-1}
Impact resistance UNI EN ISO 6272	Class IRJ (J in N·m)	IR20
Coefficient of capillary absorption UNI EN 1062/3	---	< 0,1 kg·m^{-2}·h$^{-0,5}$

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Essential characteristic MasterTop 514 QD loaded on site with 8-12 mm crushed stone as concrete according to UNI EN 206/1 (Concrete: Specification, performance, production and conformity)		
MasterTop 514 QD	1100 kg / m3	
Crushed stone cleaned and washed 8-12 mm	1100 kg / m3	
Water	158 l / m3 (14.5%)	
Slump without segregation or bleeding, UNI EN 12350/2	23 cm	
Incorporated air	<3%	
Density UNI EN 12350/6	About 2360 kg / m3	
With drawal UNI 11307	<0.02%	
Compressive strength UNI EN 12390/3	24 hours> 45 Mpa 48 hours> 55 MPa 28 days> 70 MPa	
Elastic modulous UNI EN 12390/13	35.000 MPa	
Residual humidity at 20°C (Carbide Hygrometer)	24 ore < 4%	
Essential characteristic MasterTop 514 QD 3k according to UNI EN 13813 (19% water)	**Limits and class**	**Performances**
Adhesion to concrete UNI EN 13892/8 on MC (0.40) support UNI EN 1766	Class (MPa): B0,5 …B2	B>2
UNI EN 13892/8 adhesion of MasterTop systems applied on MasterTop 514 QD (PM 1K) having 48 hours of curing laid on MC (0.40) support UNI EN 1766	Class (MPa): B0,5 …B2	B>2
Compressive strength UNI EN 13892/2	Class (MPa) C5, C10 …. C80	C15 a 24 h C40 a 28 days
Tensile strength for bending UNI EN ISO 178	Class (MPa) F1 ... F50	F10
Flexural modulus of elasticity UNI EN ISO 178	Class (GPa) E1 ... E20	E2
Abrasion resistance UNI EN 13892/4	Class A6, A5, A4, A3, A2, A1, A05	A05
Permeability to water vapor (diffusion to vapor expressed as equivalent air thickness Sd UNI EN 12086)	Sd = μ·s μ = coeff. diffusion s = thickness	Sd < 1,2 m / cm
Coefficient of linear thermal expansion UNI EN 1770	---	$1{,}49 \cdot 10^{-6}\ K^{-1}$
Impact resistance UNI EN ISO 6272	Class IRJ (J in N·m)	IR20
Coefficient of capillary absorption UNI EN 1062/3	---	$< 0{,}1\ kg \cdot m^{-2} \cdot h^{-0,5}$
Essential characteristic MasterTop 514 QD 1k and 3k related to hydraulic pressure (thickness ≥3 mm)	**Limits and class**	**Performances**
Resistance to negative hydraulic pressure UNI 8298/8	Da 0 a 2,5 bar	2,5 bar

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APPLICATION SHEET

PREPARATION OF THE SUPPORT

Degraded concrete
Remove the degraded concrete by milling the entire thickness affected by the degradation.
Non-degraded concrete
In case of non-degraded substrate, prepare the substrate by deep shot blasting or milling.
Contraction and expansion joints
MasterTop 514 QD should be considered in the same way as an industrial floor. Therefore, the contraction and expansion joints must be foreseen, designed, plugged and then sealed with MasterSeal NP 474. The joints must be cut within 24 hours from the laying of MasterTop 514 QD.
Ceramic support
Before laying the MasterTop resin systems, remove the vitrified surface layer by sanding or shot peening. The choice must be evaluated on the basis of actual site conditions.
On this support always use modified MasterTop 514 QD Epoxy (3K).

TEMPERATURE

MasterTop 514 QD can be applied when the ambient temperature is above +5°C. When the temperature is between 5 and 20°C, the development of mechanical strengths and related drying times proceed more slowly than the performances indicated in the tables.
Under these conditions it is recommended to store the bags of MasterTop 514 QD and the related components A and B in a heated environment and to use heated mixing water (30 ÷ 50°C).

APPLICATION MasterTop 514 QD (1K) Polymer Modified

Saturation
Saturate the surface with water. Before laying MasterTop 514 QD, the substrate must be “saturated with dry surface”.
Saturation is essential to ensure maximum adhesion to the substrate and to avoid the formation of blowholes on MasterTop 514 QD.
Replenishing of holes
For highly absorbent substrates it is also possible to apply MasterSeal 600 (mixed with water in a maximum ratio of 2 parts of water and 1 part of MasterSeal 600) as a sealant (after the saturation phase) applied by roller in the ratio of 0.1 - 0, 2 liters / m^2 of mixture equal to approximately 0.05-0.08 liters / m^2 of MasterSeal 600 only. Consumption can vary considerably depending on the porosity of the substrate.
MasterTop 514 QD must then be poured fresh on fresh on the surface treated with MasterSeal 600.
Installation of MasterTop 514 QD
Pour about 80% of the mixing water into the mixer. Then add MasterTop 514 QD, mixing with a whisk drill (or in a glass mixer) until a homogeneous and lump-free mixture is obtained. Then add the remaining mixing water until the desired consistency is reached. It is always necessary to mix the entire contents of each bag.
Repair with quick-drying mortar
Provide for the removal of the incoherent and degraded concrete layer or contaminated by oils, greases or other substances and then restore it to quick drying with MasterSeal P 385 D mixed with water only.

	Consistence	% (weight/powder)
Mixing water	Plastic	12 (3 liters / bag)
	Fluid	15.5 (3.9 liters / bag)
	Self-levelling	19 (4.75 liters / bag)

Example of procedure for mixing in a glass concrete mixer for a mixture of 4 bags.
This procedure allows you to prevent the formation of lumps in the dough.

- Add 9.5 liters of water, half of the total amount (4.75 liters of water per bag)
- Add two bags, one at a time and mix;
- Add the third bag and mix;
- Add 4.75 liters of water and mix;
- Add the fourth bag and mix;
- Fill in the final water content (4.75 liters and mix).

Mix for 5 minutes. Pour the contents into the first wheelbarrow or into the hopper of the auger pump. The

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material left in the mixer must still turn before being completely removed.
MasterTop 514 QD can also be pumped with dry mix mortar pumps.
For this particular application it is necessary to pay the utmost attention in order not to exceed the maximum amount of dough provided. For this purpose, use the spreading control tool provided by Technical Assistance.

Pour MasterTop 514 QD on the support and spread it:
- with a trowel or spatula in the case of a fluid consistency;
- with toothed blade (V-shaped teeth or trowel) in the case of self-leveling material.

To then facilitate the escape of air bubbles that may be incorporated into the product, pass the surface of the material with a spiked roller with metal needles within 5 minutes and no later than after applying the product.
It is possible to color the product by adding a 0.5 kg pack of MasterTop 1700 PGM to each bag. For color availability and further details relating to this particular application, please contact Technical Service.

APPLICATION MasterTop 514 QD (3K) Epoxy Modified

Saturation
Saturate the surface with water. Before laying MasterTop 514 QD (3K), the substrate must be “saturated with dry surface”.
Saturation is essential to ensure maximum adhesion to the substrate and to avoid the formation of blowholes on MasterTop 514 QD (3K).
Pore sealing
For very absorbent substrates or if it is not possible to saturate with water, it is also possible to apply as a sealant the product MasterSeal P 385 (component A mixed with component B only) laid with a roller in one or two coats depending on the type of substrate, at the rate of approximately 0.2 kg / m^2.
MasterSeal P 385 (component A mixed with component B only) can be diluted with water up to 30%.
The cap must then be covered fresh on fresh with MasterTop 514 QD (3K) after about 30-45 minutes at 20°C.
Never exceed this recoating time.
Installation of MasterTop 514 QD (EM 3K)
Pour MasterSeal P 385 component B (hardener) into MasterSeal P 385 component A (base) by adding about 80% of the mixing water.
Mix thoroughly until completely homogenized.
Then add MasterTop 514 QD, mixing with a whisk drill (or in a glass mixer) until a homogeneous and lump-free mixture is obtained. Then add the remaining mixing water until the desired consistency is reached.
It is always necessary to mix the entire contents of each bag.

Packaging (3K EM)	
MasterTop 514 QD	3 bags 25 kg
MasterSeal P 385 comp. A	Pail 4,5 kg
MasterSeal P 385 comp. B	Pail 4,5 kg

Mixing ratio	
MasterTop 514 QD	18
MasterSeal P 385 comp. A	1
MasterSeal P 385 comp. B	1

	Consistence	% on MasterTop 514 QD
Mixing water	Fluid	17 (4.5 liters / bag)
	Self-levelling	19 (4.5 liters / bag)

Mix for another two minutes until the complete dispersion of the epoxy part.

Technical Information	
Density	1.7 kg / liter
Workability time at 20°C	20 minutes loss of workability 30% 30 minutes loss of workability 40%
Setting times at 20°C	Beginning of setting: 80 minutes End of setting: 100 minutes

Pour MasterTop 514 QD (3K) on the substrate by distributing it with a toothed doctor blade (V-shaped teeth or spatula). To facilitate the escape of air bubbles that may be incorporated into the product, pass the surface of the material with a spiked roller with metal needles within 5 minutes and no later than after applying the product.
MasterTop 514 QD (3K) can also be pumped with a screw pump.

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TOOL CLEANING

The tools used for mixing and applying MasterTop 514 QD can be cleaned with water.

TIME FOR SERVICE (AT 20°C)

Trafficability	
MasterTop 514 QD (1K)	4 hours, walkable 24 hours full service
MasterTop 514 QD (3K)	At 18 hours walkable

COVERAGE TIMES

Respect the overcoating times according to the indications in the table.

Residual humidity and overcoating times at 20°C (Carbide Hygrometer)

	hours	humidity	Recovering	
MasterTop 514 QD (1k)	24	< 6 %	Ucrete	☺
			MasterTop	☹
	48	< 4 %	MasterTop	☺
MasterTop 514 QD (3k)	48	< 4 %	MasterTop	☺

PREPARATION OF MASTERTOP 514 QD BEFORE INSTALLING MASTERTOP AND UCRETE

Sandblast MasterTop 514 QD before laying the MasterTop and Ucrete resin systems

SAFETY INSTRUCTION

For information on the correct and safe use, transport, storage and disposal of the product, consult the most recent Safety Data Sheet.

OTHER SERVICES

For price analysis, specifications, supplementary brochures, references, reports and technical assistance, visit the website www.master-builders-solutions.com/it-it or contact infomac@mbcc-group.com.

Scan the QR code to visit the product page and download the latest version of this datasheet.

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Since 16/12/1992, Master Builders Solutions Italia Spa has been operating under a Certified Quality System compliant with the UNI EN ISO 9001 Standard. Furthermore, the Environmental Management System is certified according to the UNI EN ISO 14001 Standard and the Safety Management System is certified according to the UNI ISO 45001 Standard.

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For further information, please consult the local Technician of Master Builders Solutions. The technical advice on how to use our products, either written or verbally given, are based on the current state of our scientific and practical expertise, and does not imply the assumption of any guarantee and/or responsibility for the final results of works executed using our products.

Therefore, the customer is not exempted from the exclusive task and responsibility of verifying the suitability of our products for the intended use and purposes.

This version supersedes all the previous ones.