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MAPEFIX PE WALL

Chemical anchor for masonry and light loads

Benestare Tecnico Europeo
ETAG 029

Fast Track Ready

WHERE TO USE

Mapefix PE Wall is an adhesive for chemically anchoring metal bars in holes made in brick, stone and mixed masonry. It is a two-component, styrene-free product made from polyester resins. Specifically formulated for anchoring steel and zinc-plated stainless steel threaded elements which transmit light loads to solid, semi-solid and perforated masonry.
It is also an ideal solution for anchoring close to edges or when there is a limited pitch between each anchor, in that no stress is generated as with conventional mechanical expansion fasteners.
Mapefix PE Wall is recommended for anchoring elements in internal and external substrates with a horizontal, vertical, inclined or overhead axis, and is particularly recommended for anchors in perforated substrates or substrates subject to light stress.
Mapefix PE Wall is recommended for anchoring elements in place, such as:
· plant equipment;
· sanitary fittings;
· aerials;
· signs;
· window and door fittings.

TECHNICAL CHARACTERISTICS

Mapefix PE Wall is a two-component chemical anchoring product supplied in 400 ml cartridges with two separate compartments containing component A (resin) and component B (catalyser) at the correct mixing ratio by volume. The two components are mixed together when they are extruded via the static mixer supplied with the cartridge. The mixer is screwed to the end of the cartridge, and no preliminary mixing of the two components is required. If only part of the cartridge is used, the remaining product may be used, even after a number of days, by replacing the original static mixer clogged by hardened resin with a clean, new one.
Mapefix PE Wall does not contain styrene which makes it suitable for use in areas with poor ventilation.
Mapefix PE Wall is a chemical anchor made from styrene-free resins, suitable for application on solid and perforated building materials, such as:
· masonry;
· bricks;
· stone.

It may only be used in concrete if there is no capillary rising damp.
Mapefix PE Wall is applied in holes made with a drill or hammer drill. We recommend using the drill feature only on perforated substrates.
Mapefix PE Wall is certified according to European Standard ETAG 029 (anchors in solid, semi-solid and perforated masonry).
Mapefix PE Wall 400 ml cartridges need to be used with a special extrusion gun for 60 mm diameter cartridges.

RECOMMENDATIONS

· Do not apply on dusty or crumbly surfaces.

MAPEI

· Do not apply on wet substrates or substrates with continuous capillary rising damp; in such cases, use **Mapefix VE SF** or **Mapefix EP**. The product may also be used on substrates which are temporarily damp.
· Do not use on surfaces with traces of oil, grease and stripping compound, otherwise the bond may be compromised.
· Do not apply if the temperature is lower than 0°C.
· When used on natural stone, check beforehand that it does not cause staining to the stone.
· Do not apply loads until it has completely hardened (T_{cure}) (see table 1).
· Do not use the product in holes made with a diamond-tipped bit (cored holes).
· Do not use for anchors in tension zones: in these cases, use **Mapefix EP**.
· Only use the product on the substrates recommended in this technical data sheet; for other substrates use **Mapefix PE SF**, **Mapefix VE SF** or **Mapefix EP**.
· The mechanical characteristics are not certified for use in concrete, in that the European standard only considers masonry substrates. To obtain certified mechanical characteristics in concrete, use **Mapefix PE SF**, **Mapefix VE SF** or **Mapefix EP**.

APPLICATION PROCEDURE

Anchor design

The size of the hole in the substrate, the anchoring depth, the diameter of the anchoring element and the maximum permitted loads must be calculated by a qualified design engineer. The tables in this Technical Data Sheet contain a practical summary of some of our suggestions based on experience and testing carried out within the company.

Preparation of solid substrates

Make holes in the substrate with a drill or a hammer drill, according to the type of material to be drilled.
Remove all traces of dust and loose material from inside the holes with compressed air.
Clean the surface inside the holes with a long-bristled bottlebrush.
Remove all traces of dust and loose material from inside the holes again with compressed air.

Preparation of perforated substrates

Drill holes in the substrate using the drill feature only.
Clean the surface inside the holes with a long-bristled bottlebrush or with compressed air.
Place a mesh bush in the hole, with a diameter and length suitable for the size of the hole.

Preparation of the metal bar

Clean and degrease the bar before anchoring it in the substrate.

Preparation of the resin for the chemical anchor

Remove the upper cap and screw the static mixer to the end of the cartridge.
Insert the cartridge in the extrusion gun.
Discard the first three shots of resin, they may not be mixed correctly.
Starting from the bottom of the hole, extrude the product in the hole until it is full.
Insert the metal bar in the hole using a rotary movement to expel all air until the excess resin comes out of the hole. The metal bar must be inserted in the hole within the start setting time (T_{gel}). Only apply loads to the bar once the resin has completely hardened (T_{cure}), as indicated in table 1.

CONSUMPTION

According to the size of hole to be filled.

CLEANING

Use normal solvent-based paint thinners to clean all work tools and equipment. Once hardened, the product can only be removed mechanically.

PACKAGING

Boxes of 12 400 ml cartridges with 12 static mixers.

COLOURS

Grey.

STORAGE

12 months in its original packaging at a temperature of between +5°C and +30°C.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the Safety Data Sheet, available from our website www.mapei.com.
PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)	
PRODUCT IDENTITY	
Appearance:	thixotropic paste
Colour:	grey
Density (A+B) (g/cm³):	1.69
APPLICATION DATA (at +23°C and 50% R.H.)	
Application temperature range:	from 0°C to +30°C
Start setting time T_{gel}:	see table 1
Final hardening time T_{cure}:	see table 1
PERFORMANCE CHARACTERISTICS	
Compressive strength (N/mm²):	68
Flexural strength (N/mm²):	30
Flexural dynamic modulus of elasticity (N/mm²):	4025
Compressive modulus of elasticity (N/mm²):	6105
Resistance to UV rays:	good
Chemical resistance:	good
Resistance to water:	excellent
In-service temperature range:	from -40°C to +50°C
Size of anchor:	see tables 2, 3 and 4
Recommended loads:	see tables 5 and 6
Design suggestions:	see tables 7 and 8

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure

beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.
Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

LEGAL NOTICE

Reaction time of product		
Substrate temperature	**Start setting time T_{gel}**	**Final hardening time T_{cure}**
°C	minutes	minutes/hours
0*	25'	3 h
+5	15'	2 h
+10	12'	1 h 30'
+20	6'	45'
+30	3'	20'

Table 1: reaction time of product ** temperature of product +5°C*

Design parameters for threaded bar anchored in solid brick according to ETAG 029 (anchors in masonry)			
threaded bar	**M8**	**M10**	**M12**
minimum thickness of substrate (mm)	200	250	300
recommended distance from edge (mm)	80	100	120
minimum distance from edge (mm)	50	50	50
recommended pitch between anchors (mm)	160	200	240
minimum pitch between anchors (mm)	50	50	50
depth of threaded bar (mm)	80	85	95
depth of anchor hole (mm)	85	90	100
diameter of threaded bar (mm)	8	10	12
diameter of anchor hole (mm)	10	12	14
thickness anchored (mm)	10	20	30
tightening torque (Nm)	5	8	10

Table 2: design parameters for anchors with threaded bar in solid brick
Type of bar: 5.8 steel minimum class

Design parameters for threaded bar anchored in perforated brick according to ETAG 029 (anchors in masonry)

threaded bar	M8	M10	M12
mesh bush	12x80	15x85	20x85
minimum thickness of substrate (mm)	100	100	100
recommended distance from edge (mm)	0.5 x longest side of brick	0.5 x longest side of brick	0.5 x longest side of brick
minimum distance from edge (mm)	100	100	120
recommended pitch between anchors (mm)	equal to longest side of brick	equal to longest side of brick	equal to longest side of brick
minimum pitch between anchors (mm)	100	100	120
depth of threaded bar (mm)	80	85	85
depth of anchor hole (mm)	85	90	90
diameter of threaded bar (mm)	8	10	12
diameter of anchor hole (mm)	12	16	20
thickness anchored (mm)	10	20	30
tightening torque (Nm)	3	4	6

Table 3: design parameters for anchors with threaded bar in perforated brick
Type of bar: 5.8 steel minimum class

Design parameters for threaded bar anchored in concrete						
threaded bar	**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
minimum thickness of substrate (mm)	115	120	140	161	218	266
recommended distance from edge (mm)	85	90	110	125	170	210
minimum distance from edge (mm)	42.5	45	55	62.5	85	105
recommended pitch between anchors (mm)	170	180	220	250	340	420
minimum pitch between anchors (mm)	42.5	45	55	62.5	85	105
depth of threaded bar (mm)	85	90	110	125	170	210
depth of anchor hole (mm)	90	95	115	130	175	215
diameter of threaded bar (mm)	8	10	12	16	20	24
diameter of anchor hole (mm)	10	12	14	18	24	28
thickness anchored (mm)	15	20	30	40	50	55
tightening torque (Nm)	10	25	45	90	150	200

Table 4: design parameters for anchors with threaded bar in perforated concrete
Type of bar: 5.8 steel minimum class

Recommended loads for threaded bar anchored in masonry according to ETAG 029 (anchors in masonry)						
	M8		**M10**		**M12**	
	tensile	shear	tensile	shear	tensile	shear
Solid brick 120x240x60 mm high density brick according to EN 771-1, compressive strength 73 N/mm², density 1700 kg/m³ (values in kN)	0.7	1.3	1.0	2.5	1.2	2.6
UNI double-perforated brick* 240x120x120 mm high density brick according to EN 771-1, compressive strength 18.3 N/mm², density 810 kg/m³ (values in kN)	1.5	1.7	1.8	2.0	2.1	2.9

Perforated brick* 120x250x250 mm low density brick according to EN 771-1, compressive strength 5.3 N/mm², density 550 kg/m³ (values in kN)	0.3	0.9	0.7	0.9	0.8	0.9
RC40 perforated brick* 555x195x275 mm low density brick according to EN 771-1, compressive strength 4.0 N/mm², density 600 kg/m³ (values in kN)	0.3	0.4	0.3	0.4	0.3	0.4
Porotherm 25 P+W* 373x238x250 mm low density brick according to EN 771-1, compressive strength 15 N/mm², density 800 kg/m³ (values in kN)	0.9	0.8	0.9	1.0	1.0	1.0
Hlz B 1.0 1NF 12-1* 115x240x71 mm low density brick according to EN 771-1, compressive strength 12 N/mm², density 900 kg/m³ (values in kN)	1.2	1.3	1.7	1.7	1.8	1.7

Table 5: recommended loads for 5.8 steel minimum class threaded bar in various types of masonry
**** with special mesh sleeve: M8 = φ12x80 mm, M10 = φ15x85 mm, M12 = φ20x85 mm***

Recommended loads for threaded bar anchored in concrete						
threaded bar	**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
maximum recommended tensile load (kN) temperature 30°C	3.7	6.3	9.3	12.7	18.0	27.0
maximum recommended shear load (kN) temperatura 30°C	5.4	8.6	12.5	23.3	36.3	52.5

Table 6: recommended loads for 5.8 steel minimum class threaded bar in class C 20/25 uncracked concrete

Design suggestions for threaded bar anchored in masonry according to ETAG 029 (anchors in masonry)					
			M8	**M10**	**M12**
recommended distance from edge (mm)			half longest side of brick	half longest side of brick	half longest side of brick
recommended pitch between anchors (mm)			equal to longest side of brick	equal to longest side of brick	equal to longest side of brick
depth of threaded bar (mm)			80	85	85
depth of anchor hole (mm)			85	90	90
diameter of threaded bar (mm)			8	10	12
diameter of anchor hole (mm)			12	16	20
thickness anchored (mm)			10	20	30
tightening torque (Nm)			3	4	6
Solid brick 120x240x60 mm	tensile	values in kN	0.7	1.0	1.2
	shear		1.3	2.5	2.6
UNI double-perforated brick 240x120x120 mm	tensile		1.5	1.8	2.1
	shear		1.7	2.0	2.9
Perforated brick 120x250x250 mm	tensile		0.3	0.7	0.8
	shear		0.9	0.9	0.9
RC40 perforated brick 555x195x275 mm	tensile		0.3	0.3	0.3
	shear		0.8	1.0	1.0
Porotherm 25 P+W 373x238x250 mm	tensile		0.9	0.9	1.0
	shear		0.8	1.0	1.0
Hlz B 1.0 1NF 12-1 115x240x71 mm	tensile		1.2	1.7	1.8

	shear		1.3	1.7	1.7

Table 7: design suggestions for 5.8 steel minimum class threaded bar in various types of masonry

Design suggestions for threaded bar anchored in concrete						
threaded bar	**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
diameter of threaded bar (mm)	8	10	12	16	20	24
diameter of anchor hole (mm)	10	12	14	18	24	28
depth of anchor hole (mm)	90	95	115	130	175	215
depth of threaded bar (mm)	85	90	110	125	170	210
distance from edge (mm)	85	90	110	125	170	210
pitch between anchors (mm)	170	180	220	250	340	420
minimum thickness of substrate (mm)	115	120	140	161	218	266
tightening torque (Nm)	10	25	45	90	150	200
maximum tensile load (kN) temperature 30°C	3.7	6.3	9.3	12.7	18.0	27.0
maximum shear load (kN) temperature 30°C	5.4	8.6	12.5	23.3	36.3	52.5

Table 8: design suggestions for 5.8 steel minimum class threaded bar in class C 20/25 concrete