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MasterFlow® 918 AN

High Performance, Vinylester Based, Anchoring Mortar

DESCRIPTION OF PRODUCT

MasterFlow® 918 AN is a two-component high performance, thixotropic, vinylester based anchoring mortar. The product is specially designed for applications where medium and heavy loads are to be fixed in hollow blocks or solid material.

Both parts of **MasterFlow® 918 AN**, packed in a single cartridge with separate compartments, are correctly mixed in the mixing nozzle while pressing the material out of the cartridge.

APPROVALS&TESTS

- ETAG 001 Part 5 Option 7 for threaded bars (M8-M24) in galvanized steel 5.8-8.8 & 10.9 and Stainless Steel A4-70; A4-80 & HCR (1.4529) in C20/25 to C50/60 uncracked concrete

FIELDS OF APPLICATION

- Anchoring of rebars in preformed holes in concrete
- Fixing of anchoring bolts
- Fixing of facades
- Fixing balcony fences, handrails
- Fixing gates, blinds, antennas and other domestic uses

FEATURES AND BENEFITS

- Easy to use, no mixing required
- Suitable for dry, wet & flooded holes without loss of performance
- Rapid curing
- For medium and high load fixing
- Pasty consistency, easy to apply and nonsag properties in over-head applications.
- Resists to chemicals.

APLICATION PROCEDURE

Preparation

The substrate must be clean, structurally sound, and without substances which can have a negative effect on the adhesion of the chemical anchoring mortar. Concrete or mortars in which bolts or rods are to be fixed should be at least 28 days old.

Holes

Holes can be made using diamond or hammer drilling machines. Depth and diameter of the holes are to determined by the substrate, effective loads and the diameter of the anchor bolts or rebars. The drilled holes need to be cleaned with round brushes and oil-free compressed air directly from a compressor or using special hand pumps.

Using The Cartridges

It is advised to store the cartridges in a warmer environment if the material is to be used in cold conditions, since squeezing the **MasterFlow® 918 AN** requires more effort with material temperatures below 0°C. Remove the sealing plug and fix the mixing unit onto the cartridge. Place the cartridge in the extrusion gun and squeeze.

Do not use the first few centimetres of material, until the mixed material is of uniform colour.

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During longer application interruptions, remove the mixing unit and put back the sealing plug.

Application In Solid Material

Insert the mixing unit of the **MasterFlow® 918 AN** cartridge into the back of the hole and squeeze sufficient material while slowly pulling out. Ensure that no air is entrapped while filling the hole. Introduce the anchoring bolt or rebar by pressing and turning till the back of the hole is reached. An excess of material needs to be visible. Respect the waiting times as shown in the tables hereafter, before the anchors or rebars are exposed to loads.

Application In Hollow Blocks

Drill a 16 mm hole, clean the hole as mentioned above and insert the sleeve specially designed for this type of application. Close the gasket of this sleeve, press the mixing unit against this gasket and inject, without entrapping air, sufficient **MasterFlow® 918 AN** for total anchoring. Introduce the anchoring bolt by pressing and turning till the back of the hole.
Do not move the bolt before final setting of the **MasterFlow® 918 AN**. Before tightening the anchors and exposing them to loads, respect the waiting times as shown in the tables hereafter.

CLEANING OF TOOLS

Residual material must be mechanically removed after hardening, or by brush and with plenty of soapy water or solvent when still uncured.

PACKAGING

MasterFlow® 918 AN is available in cartridges of 410 ml coaxial for special gun

STORAGE

12 months in original unopened cartridges. Store at +5°C to + 25°C.

WATCH POINTS

- **MasterFlow® 918 AN** is in hardened condition resistant to many chemicals. A list of chemicals can be be found hereafter.
- Material can be applied at temperatures from -5°C to +35°C, but cartridges have to be stored at +5°C or above.
- **MasterFlow® 918 AN** can in unhardened conditions be a pollutant for water or soil. Take the necessary precautions and clean according to local guidelines.

HANDLING AND TRANSPORT

Avoid contact with skin by using protective gloves and/or protective cream. Should skin contact occur, wash immediately with soap and water. Protect eyes with safety goggles. Harmful if swallowed. Use only with adequate ventilation. Specific information on handling and transport can be found in the Material Safety Data Sheet of **MasterFlow® 916 AN**. Dispose empty packaging and unused, hardened material according to local regulations.

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DISCLAIMER

The technical information given in this publication is based on the present state of our best scientific and practical knowledge. **BASF Türk Kimya Sanayi ve Tic. Ltd. Şti.** is only responsible for the quality of the product. **BASF Türk Kimya Sanayi ve Tic. 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

A. Working & Loading Times

Resin cartridge Temperature °C			T Work minutes	Base Material Temperature °C			T Load minutes
+5	to	+10	12	+5	to	+10	120
+10	to	+20	6	+10	to	+20	80
+20	to	+25	4	+20	to	+25	40
+25	to	+30	3	+25	to	+30	30
+30	to	+35	2	+30	to	+35	20
+35	to	+40	1.5	+35	to	+40	15
+40			1.5	+40			10

Note: T Work is the typical time to gel at the highest temperature in the range.

B. Chemical Resistance

The chemical mortar has undergone extensive chemical resistance testing. The results are summarised in the table below.

Chemical Environment	Concentration	Result
Aqueous Solution Aluminium Chloride	Saturated	√
Benzoic Acid	Saturated	√
Butyl Alcohol	100%	C
Carbon Monoxide	Gas	√
Citric Acid Aqueous Solution	Saturated	√
Diesel Fuel	100%	C
Hydrochloric Acid	10% 15% 25%	√ √ C
Lubricating Oil	100%	√
Mineral Oil	100%	√
Paraffin / Kerosene (Domestic)	100%	C
Phosphoric Acid	50%	√
Sea Water	100%	C
Sulphur Dioxide Solution	10%	√
Sulphur Dioxide (40°C)	5%	√
Sulphuric Acid	10% 50%	√ √
White Spirit	100%	√

√ = Resistant to 75°C with at least 80% of physical properties retained.

C = Contact only to a maximum of 25°C

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C. Installation Parameters

Size			M8	M10	M12	M16	M20	M24
Nominal drill hole diameter	$Ød_0$	[mm]	10	12	14	18	22	26
Diameter of cleaning brush d_b	d_b	[mm]	14	14	20	20	29	29
Torque moment T_{inst}	T_{inst}	[Nm]	10	20	40	80	150	200
$h_{ef,min} = 8d$								
Depth of drill hole h_0	h_0	[mm]	64	80	96	128	160	192
Minimum edge distance c_{min}	c_{min}	[mm]	35	40	50	65	80	96
Minimum spacing s_{min}	s_{min}	[mm]	35	40	50	65	80	96
Minimum thickness of member h_{min}	h_{min}	[mm]	$h_{ef} + 30\ mm \geq 100\ mm$				$h_{ef} + 2d_0$	
$h_{ef,max} = 12d$								
Depth of drill hole h_0	h_0	[mm]	96	120	144	192	240	288
Minimum edge distance c_{min}	c_{min}	[mm]	50	60	70	95	120	145
Minimum spacing s_{min}	s_{min}	[mm]	50	60	70	95	120	145
Minimum thickness of member h_{min}	h_{min}	[mm]	$h_{ef} + 30\ mm \geq 100\ mm$				$h_{ef} + 2d_0$	

D. Theoretical Number of Fixings Per Cartridge

Applies to solid substrates

h_{ef}	M8 Drilling Ø 10 mm	M10 Drilling Ø 12 mm	M12 Drilling Ø 14 mm	M16 Drilling Ø 18 mm	M20 Drilling Ø 22 mm	M24 Drilling Ø 26 mm
8d	148	91	60	32	19	12
10d	118	72	48	26	15	9
12d	98	60	40	21	12	8

Note: Jobsite/contractor installations usually result in more resin being injected than the theoretical requirement resulting in lower number of fixings per cartridge. The reduction to the number of fixings per cartridge in practice is greater for smaller diameter holes and shallower embedment depths.

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E.Using with Threaded Bars

Combined pullout and concrete cone failure in non-cracked concrete C20/25

Size				M8	M10	M12	M16	M20	M24
Characteristic bond resistance dry/wet concrete and flooded hole		τ_{Rk}	[N/mm²]	12	10	12	10	8.5	7.5
Partial safety factor		γ_{Mc}	[-]	1.8					
Factor for concrete	C30/37	ψ_c	[-]	1.12					
	C40/45			1.19					
	C50/60			1.30					

Tension load calculations for combined concrete cone & pullout failure at various embedment depths using threaded rods in dry / wet / flooded, uncracked, C20/25 concrete. Temperature range -40°C to +80°C.

Property	Symbol	Unit	Anchor Size					
			M8	M10	M12	M16	M20	M24
Effective Embedment Depth = 8d	h_{ef}	mm	64	80	96	128	160	192
Characteristic Load (Combined Concrete Cone & Pullout Failure)	$N^{\circ}_{Rk,p}$	kN	19.30	25.13	43.43	64.34	85.45	108.57
Partial Safety Factor (Dry / Wet Concrete)	γ_{Mc}	-	1.80	1.80	1.80	1.80	1.80	1.80
Effective Embedment Depth = 10d	h_{ef}	mm	80	100	120	160	200	240
Characteristic Load (Combined Concrete Cone & Pullout Failure)	$N^{\circ}_{Rk,p}$	kN	24.13	31.42	54.29	80.42	106.81	135.72
Partial Safety Factor (Dry / Wet Concrete)	γ_{Mc}	-	1.80	1.80	1.80	1.80	1.80	1.80
Effective Embedment Depth = 12d	h_{ef}	mm	96	120	144	192	240	288
Characteristic Load (Combined Concrete Cone & Pullout Failure)	$N^{\circ}_{Rk,p}$	kN	28.95	37.70	65.14	96.51	128.18	162.86
Partial Safety Factor (Dry / Wet Concrete)	γ_{Mc}	-	1.80	1.80	1.80	1.80	1.80	1.80

1. Characteristic loads are valid for combined concrete cone and pullout failure as defined by TR029 only. All other failure modes, including steel failure, detailed in TR029 as well as including combined effects of tension and shear, must be considered in accordance with TR029.

2. Characteristic loads are valid for single anchors without close edge, anchor spacing or eccentric loading considerations.

3. Tabulated values are valid for temperture range -40°C to +80°C (Max LTT = +50°C; Max STT = +80°C).

4. Tabulated values are only valid for the installation conditions stated. Other conditions, such as different temperature ranges, may affect the performance of the product.

5. Long term temperatures are those that remain roughly constant over prolonged periods. Short term temperatures occur over brief intervals, eg: diurnal cycling.

6. The compressive strength of the concrete (fck,cube) is assumed to be 25 N/mm2 for C20/25 concrete.

7. Tabulated values assume that the geometry of the anchor(s) and concrete member is sufficient to avoid splitting failure.

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