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MasterFlow[®] 920 AN (Formerly known as Masterflow[®] 920 SF)

Universal, High Performance, Methacrylate Resin Based, Styrene Free, Anchoring Mortar

DESCRIPTION OF PRODUCT

MasterFlow[®] 920 AN is a two-component, high performance thixotropic, styrene free, and methacrylate based chemical 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 components of **MasterFlow[®] 920 AN**, packed in a single cartridge with separate compartments, are correctly mixed in the mixing nozzle while pressing the material out of the cartridge.

FIELDS OF APPLICATION

MasterFlow[®] 920 AN is typically used for:

- Anchoring of rebar in preformed holes in concrete
- Fixing of anchoring bolts
- Fixing of bolts, screws and beaming plates
- Installation of bonded rebar/shear reinforcement
- Low temperature applications down to -5°C
- Fixing gates, blinds, antennas and other domestic uses

FEATURES AND BENEFITS

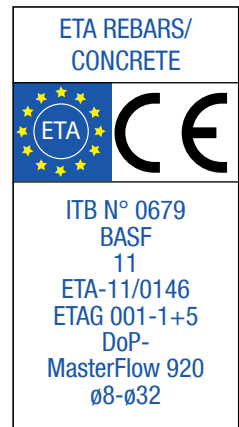
- Easy to use, no mixing required
- High adhesive power
- Fast curing for quick installation
- For medium and high load fixing
- Can be used in diamond drilled holes
- High early and final mechanical strengths
- Applicable in slightly damp conditions
- Can be used at low or high temperatures
- For use with a standard silicon gun (280 ml)

- Very low shrinkage
- For interior and exterior use
- Suitable for technical applications where high performance is needed
- Performance guaranteed by ETA certification
- Styrene and solvent free formulation

The performance characteristics of **MasterFlow[®] 920 AN** are covered by:

- ETA-07/0091-Stainless steel
- ETA-07/0092-Galvanised steel
- ETA-11/0146-Rebar

issued on behalf of **BASF** Construction Chemicals France



APPLICATION PROCEDURE

The performance, durability and safety of the installed product used for anchoring steel (rebar), bolts and screws strongly depends on the substrate, the dimensions of the element, the drilling and cleaning of holes, the substrate temperature and the type of anchoring bolt or bar.



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It is therefore important that a proper structural assessment of the structural elements to be repaired is carried out by qualified engineers, and that the choice of products, anchor types etc. is based upon such assessment.

Guideline information on performance data and dimensioning is given in the tables hereafter.

(a) Surface 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 can be made using diamond or hammer drilling machines. Depth and diameter of the holes should be 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. The substrate can be damp, but must be without free standing water.

(b) Mixing

MasterFlow[®] 920 AN is packed in ready to use plastic cartridges in different dimensions. 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[®] 920 AN** requires more effort with material temperatures below 0°C.

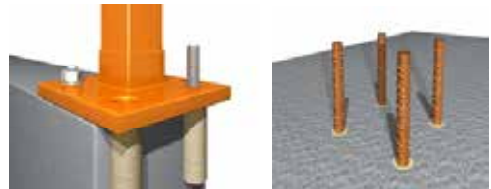
Remove the sealing plug and fix the mixing unit onto the cartridge. Place the cartridge in the extrusion gun and squeeze. Do not use the first

few centimetres of material, until the mixed material is of uniform colour. During longer application interruptions, remove the mixing unit and put back the sealing plug.

(c) Application

Anchoring in solid materials

Insert the mixing unit of the **MasterFlow[®] 920 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.



Anchoring 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[®] 920 AN** for total anchoring.

Introduce the anchoring bolt by pressing and



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turning till the back of the hole. Do not move the bolt before final setting of the **MasterFlow[®] 920 AN**. Before tightening the anchors and exposing them to loads, respect the waiting times as shown in the tables hereafter.



COVERAGE

Theoretical consumption rates are given in the table for the diamond drilled holes and treated rods as anchor. Note: These are theoretical values and depending on the construction site conditions and the application accuracy, practical consumption values might be much higher.

Anchor	M8	M10	M12	M16	M20
Drill bit/hole diameter (mm)	10	12	14	18	22
Drill depth (mm)	64	80	96	128	160
Consumption (ml)	1.8	2.8	3.9	6.8	10.6
Drill depth (mm)	96	120	144	192	240
Consumption (ml)	2.7	4.1	5.9	10.2	15.8

FINISHING AND CLEANING

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

CURING

Cartridge temperature	Minimum cartridge temperature = +5°C		+5°C to +10°C	+10°C to +20°C	+20°C to +35°C
Substrate temperature	-5°C to +0°C	0°C to +5°C	+5°C to +10°C	+10°C to +20°C	+20°C to +35°C
Working time	Minimum cartridge temperature = +5°C		10 min.	4 min.	1 min. 30
Curing time on dry concrete	5 h	2 h 30	105 min.	75 min.	45 min.
Curing time on wet concrete	7 h 30	3 h 45	160 min.	110 min.	70 min.

WORKING TIME

The following chart is a guide for the working time of a **MasterFlow[®] 920 AN** at various ambient temperatures.

Cartridge temperature	5°C to 10°C	10°C to 20°C	20°C to 35°C
Substrate temperature	5°C to 10°C	10°C to 20°C	20°C to 35°C
Working time	10 min.	4 min.	1 min. 30

PACKAGING

MasterFlow[®] 920 AN is available in cartridges of:

- 280 ml peel pack for standard silicon gun
- 380 ml coaxial for special gun
- 825 ml side by side for special gun

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.





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Watch Points

- **MasterFlow® 920 AN** is in hardened condition resistant to many chemicals. A list of chemicals can 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® 920 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

Usual preventive measures for the handling of chemical products should be observed when using this product, for example do not eat, smoke or drink while working and wash hands when taking a break or when the job is completed.

Specific safety information referring the handling and transport of this product can be found in the Material Safety Data Sheet. For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted.

Disposal of product and its container should be carried out according to the local legislation in force. Responsibility for this lies with the final owner of the product.

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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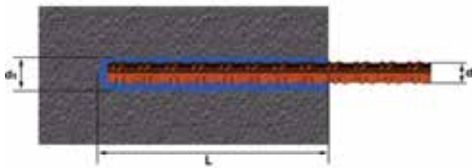
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MasterFlow 920 AN Technical Data Sheet - Issue Date: 02/2016

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Rebar anchoring according BAEL 91



d : rebar diameter
d₁ : drill bit / hole diameter
L : effective anchoring depth

Properties of bar Fe E500

d (mm)	min. resistance at breaking point (kN)	Elasticity limit of Rebar (kN)	Max. Load Rebar/1.15 (kN)
8	27.7	25.2	21.9
10	43.2	39.3	34.1
12	62.2	56.5	49.1
14	84.7	77.0	66.9
16	110.6	100.5	87.4
20	172.7	157.0	136.5

Rebar anchoring according BAEL 91

The working loads are derived from the equation:

$$L = \beta * (F/d_1)$$

where:

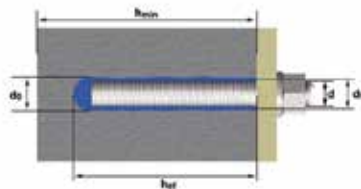
- L : depth (mm)
- F : max. load possible on the bar (kN)
- d₁ : drill bit / hole diameter (mm)
- β : parameter linked to the concrete quality
 - β = 1.51 (C20/25 and Fe E500)
 - β = 1.00 (C35/45 and Fe E500)

Pull-out working loads according BAEL 91 for MasterFlow 920 AN based upon the properties of steel bar HA Fe E500

d (mm)	d ₁ (mm)	Concrete 20/25		Concrete 35/45	
		L min. / max. (mm)	F min. / max. (kN)	L min. / max. (mm)	F min. / max. (kN)
8	10	80 / 330	5.3 / 21.9	80 / 219	8.0 / 21.9
10	12	100 / 429	7.9 / 34.1	100 / 284	12.0 / 34.1
12	16	120 / 463	12.7 / 49.1	120 / 307	19.2 / 49.1
14	18	140 / 561	16.7 / 66.9	140 / 372	25.2 / 66.9
16	20	160 / 660	21.2 / 87.4	160 / 437	32.0 / 87.4
20	25	200 / 824	33.1 / 136.5	200 / 546	50.0 / 136.5

Anchoring in concrete according ETAG N°001

Installation data - minimum and maximum embedment depth



d: diameter of threaded rod hef: effective anchoring depth
d₀: drill bit/hole diameter Tinst: tightening torque
df: diameter of hole in anchor plate hmin: minimum thickness of concrete

Nominal diameter	d ₀ (mm)	d _f (mm)	hef (mm) Effective anchor length		Tinst (N.m)	h _{min} (mm) Min. concrete thickness	
			h _{ef} 8 x d	h _{ef} 12 x d		h _{ef} 8 x d	h _{ef} 12 x d
M8	10	9	64	96	10	100	130
M10	12	12	80	120	20	110	150
M12	14	14	96	144	40	130	175
M16	18	18	128	192	80	160	225
M20	22	22	160	240	150	200	280



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Anchoring in concrete according ETAG N°001

Positioning of the holes

Pull-out and concrete cone failure in non-cracked concrete C20 / 25 to C 50 / 60

Smin : minimum spacing Cmin : minimum edge distance	Nominal diameter	h_{ef} 8 x d				h_{ef} 12 x d			
		Smin (mm)	Cmin (mm)	h_{ef} 8 x d (mm)	Concrete Cone Failure (kN)	Smin (mm)	Cmin (mm)	h_{ef} 8 x d (mm)	Concrete Cone Failure (kN)
Partial safety factor: 1.5 (for concrete cone failure load limits)	M8	35	35	64	25	48	48	96	35
	M10	40	40	80	30	60	60	120	40
	M12	48	48	96	40	72	72	144	60
	M16	64	64	128	60	96	96	192	95
	M20	80	80	160	75	120	120	240	115

Effect of temperature

Reduction factor for working loads

Temperature (°C)	-20	0	20	40	60	80	100	120	140
Reduction factor	1	1	1	1	0.9	0.7	0.5	0.4	0.3

Chemical resistance

Chemical	Water	Salty water	Hot water < 60°C	Petrol	Kerosene	Gasoline	Methanol	Acetone	White spirit	Sodium hydroxide (50 %)	HCl (10 % at 20°C)	H2SO4 (50 % at 30°C)	Citric acid
Permanent immersion	*	*	*	*	*	*							
Temporary immersion							*	*	*	*	*		*
Not recommended												*	