

**MASTERFLOW 920 AN (MASTERFLOW 920 SF)**

Universal, high performance, methacrylate resin based, styrene free, anchoring mortar.

**Description of the Product:**

**MASTERFLOW 920 AN** is a two-component, high performance thixotropic, styrene free, 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 the most polyvalent or universal anchoring mortar typically used for:

- Anchoring of rebars in preformed holes in concrete
- Fixing of anchoring bolts
- Fixing of bolts, screws and beaming plates
- Installation of bonded rebars / 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.

**Application 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 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.

**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 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.

**Application in solid material:**

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.

### 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 920 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 920 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.

### 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.

### Technical data:

#### 1. Curing times

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	15-20 min.		10 min.	4 min.	1.5 min.

Curing time on dry concrete	5 h.	2 h. 30 min.	1 h. 45 min.	1 h. 15 min.	45 min.
Curing time on wet concrete	7 h. 30 min.	3 h. 45 min.	2 h. 40 min.	1 h. 50 min.	1 h. 10 min.

#### 2. Chemical resistance

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

#### 3. Effect of temperature

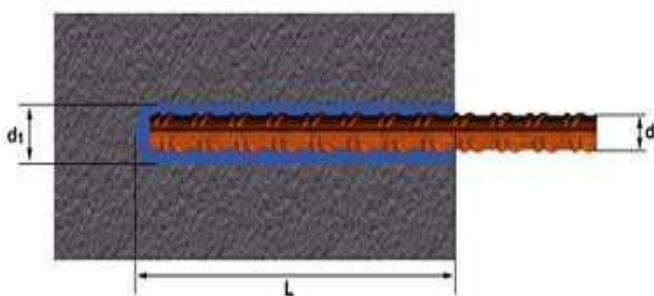
##### Reduction factor for working loads

Temperature (°C)	Reduction factor
-20	1
0	1
20	1
40	1
60	0,9
80	0,7
100	0,5
120	0,4
140	0,3

## 4. Consumption

Drill bit / hole diameter (mm)	M8	M10	M12	M16	M20
	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
	2,7	4,1	5,9	10,2	15,8

## 5. Rebar anchoring according to the BAEL 91 standart



$d$  = rebar diameter

$d_1$  = drill bit / hole diameter

$L$  = effective anchoring depth

## Properties

$d$ (mm)	min. resistance at breaking point (kN)	Elasticity limit $F_e$ (kN)	Max. load $F_{e/1,15}$ (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

The working loads are from the equation:

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

Where:  $L$  = depth (mm)

$F$  = max. load possible on the bar (daN)

$d$  = drill bit / hole diameter (mm)

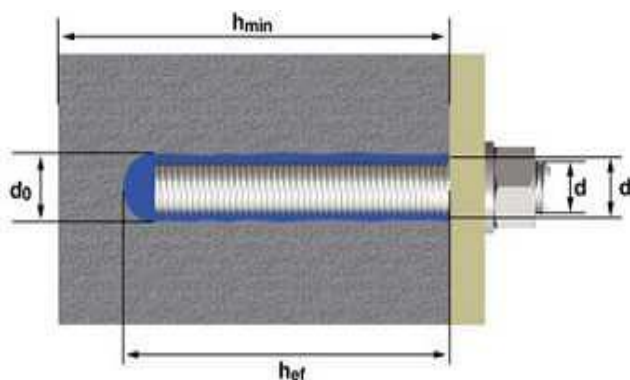
$\beta$  = parameter linked to the concrete quality.

Concrete	C 20- 25	C 35- 40
$\beta$	1,51	1

## Minimal and maximal set load

$d$ (mm)	$d_1$ (mm)	Concrete 20-25		Concrete 35-40	
		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	120/483	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	160/680	21,2/87,4	160/437	32,0/87,4
20	25	200/824	33,1/136,5	200/546	50,0/136,5

## 6. Anchoring in concrete according to the ETAG N°001 standart



$d$  = diameter of threaded rod

$d_0$  = drill bit / hole diameter

$d_r$  = diameter of hole in anchor plate

$h_{ef}$  = effective anchoring depth

$I_{inst}$  = tightening torque

$h_{min}$  = minimum thickness of concrete

### Installation data

Nominal diameter	d <sub>0</sub> (mm)	d (mm)	h (mm) Effective anchor length		T <sub>inst</sub> (N.m)	h (mm) Min. concrete thickness	
			8xd	12xd		8xd	12xd
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	16	128	192	80	160	225
M20	22	22	160	240	150	200	280

One of the most important limiting factors for the effective use of anchoring systems, apart from the concrete quality, quality and cleanliness of the drilled hole, is the positioning of the holes in relation to the edges of the concrete element and to each other.

### Hole locations

Nominal diameter d (mm)	hef (mm) 8xd		hef (mm) 12xd	
	S <sub>min</sub>	C <sub>min</sub>	S <sub>min</sub>	C <sub>min</sub>
M8	35	35	48	48
M10	40	40	60	60
M12	48	48	72	72
M16	64	64	96	96
M20	80	80	120	120

S<sub>min</sub> = minimum spacing between holes

C<sub>min</sub> = minimum edge distance

### Pull-out and concrete cone failure in non cracked concrete C20/25 to C50/60

	M8	M10	M12	M16	M20
h <sub>ef</sub> 8xd (in mm)	64	80	96	128	160
Concrete cone failure (in kN)	25	30	40	60	75
h <sub>ef</sub> 12xd (in mm)	96	120	144	192	240
Concrete cone failure (in kN)	35	40	60	95	115
Partial safety factor	1.5				

### 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 in original unopened cartridges at +5°C to +25°C.