

MasterFlow[®] 936 AN

Pure epoxy (3:1) resin based high performance anchoring grout

DESCRIPTION

MasterFlow 936 AN is a two component (3:1) pure epoxy resin based high performance anchoring grout for use in cracked and uncracked concrete under normal as well as seismic conditions (seismic category C1 and C2). Designed for post-installed rebar connection applications, **MasterFlow 936 AN** offers a very high load-bearing capacity. The system can be installed in percussive and diamond drilled dry, wet and flooded holes.

TYPICAL APPLICATIONS

- Structural applications in cracked and uncracked concrete applications in seismic zones (C1 and C2)
- Post installed rebar connections
- Crash barriers
- Structural steel

APPROVALS & TESTS

- ETA according ETAG 001 Part 1 & 5 Option 1 for anchoring of threaded bars into cracked & uncracked concrete application in seismic zones (C1 and C2)
- ETA according to TR023 for post-installed rebar connections
- Tested according to LEED 2009 EQ c4.1, SCAQMD rule 1168 (2005)
- Fire resistance F240 for reinforcing bars
- A+ as per French VOC Regulation
- WRAS – Suitable for use with potable water

ADVANTAGES

- Fixings close to free edges
- Fire tested
- Versatile
- Anchoring without expansion pressure
- Ultra High load capacities
- Available in side-by-side cartridges
- Component volume ratio of 3:1
- Extended gel/open time
- Suitable for diamond-drilled holes
- Suitable for dry and wet holes



PACKAGING

MasterFlow 936 AN is available in boxes of 12 side-by-side cartridges of 585 ml.

APPLICATION GUIDELINES

Please refer to the method statement or contact Master Builders Solutions Technical Services department.



	
<p>European Technical Assessment 15.1020. ETA 15/0602. BASF Construction Solutions GmbH. MasterFlow 936 AN. DoP MF936ANTR023. ETAG 001-Part 1 and Part 5 used as an EAD. For fixing and/or supporting concrete structural elements or heavy units such as cladding and suspended ceilings.</p>	<p>European Technical Assessment ETA 17/0153. BASF Construction Solutions GmbH. 15.1020. MasterFlow 936 AN. DoP MF936AN. ETAG 001 Part 1 and Part 5, edition 2013, used as EAD. For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units.</p>

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WORKING & LOADING TIMES

Resin cartridge Temperature	T Work	Base Material	T Load
+10 to +15°C	40 mins	+10 to +15°C	18 hrs
+15 to +20°C	25 mins	+15 to +20°C	12 hrs
+20 to +25°C	18 mins	+20 to +25°C	8 hrs
+25 to +30°C	12 mins	+25 to +30°C	6 hrs
+30 to +35°C	8 mins	+30 to +35°C	4 hrs
+35 to +40°C	6 mins	+35 to +40°C	2 hrs
Ensure cartridge is >10°C			

Note: T Work is at the highest temperature in the range. T load is at the lowest temperature in the range

PHYSICAL PROPERTIES

Property		Unit	Value	Test Standard
Density		g/cm ³	1.5	ASTM D 1875 @ +20°C / +72°F
Compressive Strength	24 hours	N/mm ²	75	ASTM D 695 @ +20°C / +72°F
	7 days	N/mm ²	95	
Tensile Strength	24 hours	N/mm ²	18	ASTM D 638 @ +20°C / +72°F
	7 days	N/mm ²	23	
Elongation at Break	24 hours	%	6.6	ASTM D 638 @ +20°C / +72°F
	7 days		5.9	
Tensile Modulus	24 hours	GN/m ²	5.7	ASTM D 638 @ +20°C / +72°F
	7 days	GN/m ²	5.5	
Flexural Strength	24 hours	N/mm ²	45	ASTM D 790 @ +20°C / +72°F
HDT	7 days	°C	49	ASTM D 648 @ +20°C / +72°F
VOC		g/L	4.5	ASTM D 2369

THEORETICAL NUMBER OF FIXINGS PER CARTRIDGE

Applies to installations in solid substrates only

Cartridge Volume	h _{ef}	Ø8	Ø10	Ø12	Ø16	Ø20	Ø24	Ø27	Ø30
		Drilling Ø 10mm	Drilling Ø 12mm	Drilling Ø 14mm	Drilling Ø 18mm	Drilling Ø 22mm	Drilling Ø 26mm	Drilling Ø 30mm	Drilling Ø 35mm
585 ml side by side	8d	218	134	89	47	28	17	11	6
	10d	174	107	71	38	22	14	8	4
	12d	145	89	59	31	18	11	7	4
	20d	87	53	35	19	11	7	4	2

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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MasterFlow 936 AN with REINFORCING BARS (ANCHOR THEORY)

INSTALLATION PARAMETERS

Diameter of rebar (mm)	Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Drilled hole diameter (mm)	12	14	16	20	25	32	40

DESIGN RESISTANCE

Rebar size				Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Effective embedment depth h_{ef} [mm]				80	90	110	125	170	210	300
	non-cracked concrete									
tension	C20/25	$N_{Rd,p}$	[kN]	17.43	24.50	35.94	47.05	74.62	102.45	160.85
	C50/60	$N_{Rd,p}$	[kN]	18.99	26.71	39.17	54.79	93.14	143.82	175.33
shear	C20/25	$N_{Rd,s}$	[kN]	9.33	14.67	20.67	36.67	57.33	90.00	147.33
	cracked concrete									
tension	C20/25	$N_{Rd,p}$	[kN]	10.72	20.49	27.65	33.54	53.20	73.04	124.71
	C50/60	$N_{Rd,p}$	[kN]	11.69	22.60	30.13	45.66	77.62	101.87	142.45
shear	C20/25	$N_{Rd,s}$	[kN]	9.33	14.67	20.67	36.67	57.33	90.00	147.33

RECOMMENDED RESISTANCE

Rebar size				Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Effective embedment depth h_{ef} [mm]				80	90	110	125	170	210	300
	non-cracked concrete									
tension	C20/25	$N_{Rec,p}$	[kN]	12.45	17.50	25.67	33.61	53.30	73.18	114.89
	C50/60	$N_{Rec,p}$	[kN]	13.57	19.08	27.98	39.14	66.53	102.73	125.23
shear	C20/25	$N_{Rec,s}$	[kN]	6.67	10.48	14.76	26.19	40.95	64.29	105.24
	cracked concrete									
tension	C20/25	$N_{Rec,p}$	[kN]	7.66	14.64	19.75	23.96	38.00	52.17	89.08
	C50/60	$N_{Rec,p}$	[kN]	8.35	16.14	21.52	32.61	55.44	72.77	101.75
shear	C20/25	$N_{Rec,s}$	[kN]	6.67	10.48	14.76	26.19	40.95	64.29	105.24

Steel strength must also be considered and the lowest value controls.

Partial safety factor $\gamma_{1.4}$

For resistance values in higher temperatures, please contact Master Builders Solutions Technical Services.

All the above resistance values are considering combined pull out and concrete cone failure in tension and steel failure in shear.

The above load values are for long term temperature of -40°C to +50°C and short-term temperature of +70°C

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MasterFlow 936 AN with THREADED RODS

INSTALLATION PARAMETERS

Diameter of threaded rod (mm)	M8	M10	M12	M16	M20	M24	M30
Drilled hole diameter (mm)	10	12	14	18	22	26	35

DESIGN RESISTANCE

Threaded Rod size			M8	M10	M12	M16	M20	M24	M30
Effective embedment depth h_{ef} [mm]			80	90	110	128	170	210	270
non-cracked concrete									
tension	C20/25	$N_{Rd,p}$ [kN]	22.79	28.27	38.84	48.75	74.62	102.45	149.36
	C50/60	$N_{Rd,p}$ [kN]	24.84	30.82	45.20	56.10	93.14	138.07	175.67
shear	C20/25	$N_{Rd,s}$ [kN]	7.20	12.00	16.80	31.20	48.80	70.40	112.00
cracked concrete									
tension	C20/25	$N_{Rd,p}$ [kN]	13.40	18.85	27.65	34.76	53.20	73.04	101.79
	C50/60	$N_{Rd,p}$ [kN]	14.61	20.55	30.13	44.42	69.86	103.55	110.95
shear	C20/25	$N_{Rd,s}$ [kN]	7.20	12.00	16.80	31.20	48.80	70.40	112.00

RECOMMENDED RESISTANCE

Threaded Rod size			M8	M10	M12	M16	M20	M24	M30
Effective embedment depth h_{ef} [mm]			80	90	110	128	170	210	270
non-cracked concrete									
tension	C20/25	$N_{Rec,p}$ [kN]	16.28	20.20	27.74	34.82	53.30	73.18	106.69
	C50/60	$N_{Rec,p}$ [kN]	17.74	22.01	32.29	40.07	66.53	98.62	125.48
shear	C20/25	$N_{Rec,s}$ [kN]	5.14	8.57	12.00	22.29	34.86	50.29	80.00
cracked concrete									
tension	C20/25	$N_{Rec,p}$ [kN]	9.57	13.46	19.75	24.83	38.00	52.17	72.71
	C50/60	$N_{Rec,p}$ [kN]	10.44	14.68	21.52	31.73	49.90	73.97	79.25
shear	C20/25	$N_{Rec,s}$ [kN]	5.14	8.57	12.00	22.29	34.86	50.29	80.00

Steel strength must also be considered and the lowest value controls.

Partial safety factor $\gamma_{1.4}$

Design resistance and recommended resistance in tension are only valid for single anchors without close edge considerations for combined pullout and concrete cone failure and concrete cone failure. Steel failure is not considered by these calculations.

Design resistance and recommended resistance in shear are only valid for single anchors for steel failure without lever arm.

The above load values are for long term temperature of -40°C to $+50^{\circ}\text{C}$ and short-term temperature of $+70^{\circ}\text{C}$

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STORAGE AND SHELF LIFE

Cartridges should be stored in their original packaging, the correct way up and in cool dry conditions (+5°C to +25°C) out of direct sunlight. When stored correctly, the shelf life will be for 12 months from the date of manufacture.

QUALITY AND CARE

All products originating from Master Builders Solutions Dubai, UAE facility are manufactured under a management system independently certified to conform to the requirements of the quality, environmental and occupational health & safety standards ISO 9001, ISO 14001 and ISO 45001.

* Properties listed are based on laboratory controlled tests.

® = Registered trademark of the MBCC Group in many countries.

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STATEMENT OF RESPONSIBILITY

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