

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. 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.

FEATURES AND BENEFITS

- Fixings close to free edges
- Fire tested
- Versatile
- Anchoring without expansion pressure
- Ultra High load capacities
- Available in side-by-side cartridges (385ml) (585ml)
- Component volume ratio of 3:1
- Extended gel/open time
- Suitable for diamond-drilled holes
- Suitable for dry and wet holes

USES & APPLICATIONS

- 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.
- 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

PACKAGING

MasterFlow 936 AN is available in boxes of 12 side-by-side cartridges of 385ml & boxes of 12 side-by-side cartridges of 585ml.e

INSTALLATION PROCEDURES

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

SHELF LIFE

Cartridges should be stored in their original packaging, the correct way up and in cool dry conditions (+10°C to +25°C) out of direct sunlight. When stored correctly, the shelf life will be for 12 months from the date of manufacture.

PRECAUTIONS

For detailed Environmental, Health and Safety information, please consult and follow all instructions on the product Material Safety Data Sheet. Contact your local Master Builders Solutions office for the latest version

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WORKING & LOADING TIMES

Resin cartridge Temperature	T Work	Base Material Temperature	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	Ø25	Ø32
		Drilling Ø 12mm	Drilling Ø 14mm	Drilling Ø 16mm	Drilling Ø 20mm	Drilling Ø 25mm	Drilling Ø 32mm	Drilling Ø 40mm
385ml side by side	10d	65	43	30	17	8	4	2
	12d	54	35	25	14	7	3	1
	20d	32	21	15	8	4	2	1

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	NRd,p	[kN]	17.43	24.50	35.94	47.05	74.62	102.45	160.85
	C50/60	NRd,p	[kN]	18.99	26.71	39.17	54.79	93.14	143.82	175.33
Shear	C20/25	NRd,s	[kN]	9.33	14.67	20.67	36.67	57.33	90.00	147.33
Cracked concrete										
Tension	C20/25	NRd,p	[kN]	10.72	20.49	27.65	33.54	53.20	73.04	124.71
	C50/60	NRd,p	[kN]	11.69	22.60	30.13	45.66	77.62	101.87	142.45
Shear	C20/25	NRd,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	NRec,p	[kN]	12.45	17.50	25.67	33.61	53.30	73.18	114.89
	C50/60	NRec,p	[kN]	13.57	19.08	27.98	39.14	66.53	102.73	125.23
Shear	C20/25	NRec,s	[kN]	6.67	10.48	14.76	26.19	40.95	64.29	105.24
Cracked concrete										
Tension	C20/25	NRec,p	[kN]	7.66	14.64	19.75	23.96	38.00	52.17	89.08
	C50/60	NRec,p	[kN]	8.35	16.14	21.52	32.61	55.44	72.77	101.75
Shear	C20/25	NRec,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 $+50^{\circ}\text{C}$ and short term temperature of $+70^{\circ}\text{C}$

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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	NRd,p	[kN]	22.79	28.27	38.84	48.75	74.62	102.45	149.36
	C50/60	NRd,p	[kN]	24.84	30.82	45.20	56.10	93.14	138.07	175.67
Shear	C20/25	NRd,s	[kN]	7.20	12.00	16.80	31.20	48.80	70.40	112.00
Cracked concrete										
Tension	C20/25	NRd,p	[kN]	13.40	18.85	27.65	34.76	53.20	73.04	101.79
	C50/60	NRd,p	[kN]	14.61	20.55	30.13	44.42	69.86	103.55	110.95
Shear	C20/25	NRd,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	NRec,p	[kN]	16.28	20.20	27.74	34.82	53.30	73.18	106.69
	C50/60	NRec,p	[kN]	17.74	22.01	32.29	40.07	66.53	98.62	125.48
Shear	C20/25	NRec,s	[kN]	5.14	8.57	12.00	22.29	34.86	50.29	80.00
Cracked concrete										
Tension	C20/25	NRec,p	[kN]	9.57	13.46	19.75	24.83	38.00	52.17	72.71
	C50/60	NRec,p	[kN]	10.44	14.68	21.52	31.73	49.90	73.97	79.25
Shear	C20/25	NRec,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 γ 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°C and short term temperature of +70°C

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