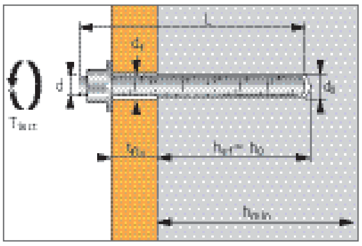
SPIT MULTI-MAX

Zinc coated & stainless steel

ETA Option 7
n° 13/0435

Methacrylate chemical resin



APPLICATION

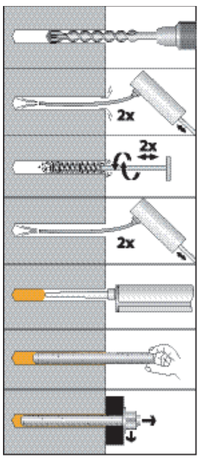
- Fixing steel framed structures
- Fixing machinery (resistant to vibration)
- Fixing of storage silos, refinery pipework supports
- Fixing motorway signs
- Fixing safety barriers

MATERIAL

- **Threaded rod M8-M16:** cold formed steel NF A35-053
- **Threaded rod M20-M30:** 11 SMnPb37 - NFA 35-561
- **Nut:** Steel, EN 20898-2 grade 6 or 8
- **Washer:** Steel DIN 513
- **Zinc coating 5 µm min.** NF E25-009

INSTALLATION

Standard cleaning



Technical data

MULTI-MAX Resin with threaded rods	Max. anchor depth (mm)	Max. thick of base material (mm)	Ø thread (mm)	Drilling depth (mm)	Ø Drill bit (mm)	Ø Clearance (mm)	Total rod length (mm)	Max. tighten (Nm)
	h_{ef}	h_{min}	d	h_0	d_0	d_f	L	T_{inst}
Rod M8	80	110	8	80	10	9	110	10
Rod M10	90	120	10	90	12	12	130	20
Rod M12	110	140	12	110	14	14	160	30
Rod M16	125	160	16	128	18	18	190	60
Rod M20	170	220	20	170	25	22	260	120
Rod M24	210	265	24	210	28	26	300	200

MULTI-MAX: Dual component cartridge methacrylate resin	- vol. 280 ml	Code	060040
	- vol. 410 ml	Code	060047

Anchor mechanical properties

Threaded part (maxima Rod)		M8	M10	M12	M16	M20	M24
f_{uk} (N/mm²)	Min. tensile strength	600	600	600	600	520	520
f_{yk}(N/mm²)	Yield strength	420	420	420	420	420	420
As (mm²)	Stressed cross-section	36,6	58	84,3	157	227	326,9
W_{el} (mm³)	Elastic section modulus	31,2	62,3	109,2	277,5	482,4	833,7
$M^0_{Rk,s}$ (Nm)	Characteristic bending moment	22	45	78	200	301	520
M (Nm)	Recommended bending moment	9,0	18,4	31,8	81,6	122,9	212,2

Working time and curing time

Ambient temperature (°C)	Working time	Curing time
30°C > T ≥ 40°C	2 min	35 min
20°C > T ≥ 30°C	4 min	45 min
10°C > T ≥ 20°C	6 min	60 min
5°C > T ≥ 10°C	12 min	90 min
0°C > T ≥ 5°C	18 min	180 min
-5°C > T ≥ 0°C	-	360 min

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The loads specified on this page allow judging the product's performances, but cannot be used for the designing.
The data given in the pages "CC method" have to be applied.

Number of sealings per cartridge

Studs diameter	M8	M10	M12	M16	M20	M24
Drilling Ø (mm)	10	12	14	18	25	28
Drilling depth (mm)	80	90	110	125	170	210
Nb. of sealings for one cartridge						
MULTIMAX 280	103	75	52	35	8	7
MULTIMAX 410	151	110	76	51	12	10

Ultimate ($N_{Ru,m}$, $V_{Ru,m}$) / characteristic loads (N_{Rk}, V_{Rk}) in kN

Mean Ultimate loads are derived from test results in admissible service conditions, and characteristic loads are statistically determined.

TENSILE

Anchor size	M8	M10	M12	M16	M20	M24
h_{ef}	*80*	*90*	*110*	*125*	*170*	*210*
$N_{Ru,m}$	**21,1**	**29,6**	**41,1**	**58,5**	**99,5**	**138,3**
N_{Rk}	18,1	25,4	35,2	50,3	85,5	118,8

SHEAR

Anchor size	M8	M10	M12	M16	M20	M24
$V_{Ru,m}$	15,92	22,75	32,8	56,2	73,6	115,0
V_{Rk}	10,98	18,9	25,3	46,8	59,02	95,8

Design Loads (N_{Rd}, V_{Rd}) for one anchor without edge or spacing influence in kN

$$N_{Rd} = \frac{N_{Rk}*}{\gamma_{Mc}}$$

$$V_{Rd} = \frac{V_{Rk}*}{\gamma_{Ms}}$$

*Derived from test results

TENSILE

Anchor size	M8	M10	M12	M16	M20	M24
h_{ef}	*80*	*90*	*110*	*125*	*170*	*210*
N_{Rd}	**12,1**	**14,1**	**19,6**	**27,9**	**47,5**	**66,0**

γ_{Mc} = 1,5 for M8 & γ_{Ms} = 1,8 for M10 to M24

SHEAR

Anchor size	M8	M10	M12	M16	M20	M24
V_{Rd}	7,7	13,2	17,7	32,7	39,3	63,9

γ_{Ms} = 1,43 for M8 to M16 & γ_{Ms} = 1,5 for M20 to M24

Recommended loads (N_{rec}, V_{rec}) for one anchor without edge or spacing influence in kN

$$N_{Rec} = \frac{N_{Rk}*}{\gamma_M . \gamma_F}$$

$$V_{Rec} = \frac{V_{Rk}*}{\gamma_M . \gamma_F}$$

*Derived from test results

TENSILE

Anchor size	M8	M10	M12	M16	M20	M24
h_{ef}	*80*	*90*	*110*	*125*	*170*	*210*
N_{Rec}	**8,6**	**10,1**	**14,0**	**19,9**	**33,9**	**47,1**

γ_F = 1,4
γ_{Mc} = 1,5 for M8 & γ_{Mc} = 1,8 for M10 to M24

SHEAR

Anchor size	M8	M10	M12	M16	M20	M24
V_{Rec}	5,5	9,4	12,6	23,4	28,1	45,6

γ_F = 1,4
γ_{Ms} = 1,43 for M8 to M16 & γ_{Ms} = 1,5 for M20 to M24

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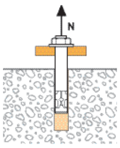
SPIT CC- Method (values issued from ETA)

TENSILE in kN

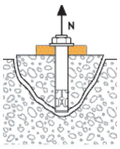


¬ Pull out resistance for dry, wet (1) concrete

$$N_{Rd,p} = N^{O}_{Rd,p} . f_b$$

$N^0_{Rd,p}$			Design pull-out resistance			
Anchor size	M8	M10	M12	M16	M20	M24
h_{ef}	*80*	*90*	*110*	*125*	*170*	*210*
-40°C to +40°C	**12,1**	**14,1**	**19,6**	**27,9**	**47,5**	**66,0**

γ_{Mc} = 1,5 for M8 & γ_{Mc} = 1,8 for M10 to M24

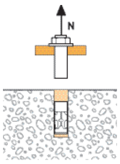


¬ Concrete cone resistance for dry, wet (1) concrete

$$N_{Rd,c} = N^{O}_{Rd,c} . f_b . \Psi_s . \Psi_{c,N}$$

$N^0_{Rd,c}$				Design cone resistance		
Anchor size	M8	M10	M12	M16	M20	M24
h_{ef}	*80*	*90*	*110*	*125*	*170*	*210*
-40°C to +40°C	24,0	23,9	32,3	39,1	62,1	85,2

γ_{Mc} = 1,5 for M8 & γ_{Mc} = 1,8 for M10 to M24

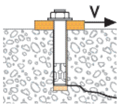


¬ Steel resistance

$N_{Rd,s}$			Steel design tensile resistance			
Anchor size	M8	M10	M12	M16	M20	M24
Std. rod grade 5.8*	12,0	19,3	28,0	52,0	81,3	118,0
Std. rod grade 8.8*	19,3	30,7	44,7	84,0	130,7	188,0
Std. rod grade 10.9*	26,4	41,4	60,0	112,1	175,0	252,1
Std. rod grade A4*	13,7	21,7	31,6	58,8	91,7	132,1

Std. rod grade 5.8 & 8.8 : γ_{Ms} = 1,5
Std. rod grade 10.9 : γ_{Ms} = 1,4
Std. rod grade A4 : γ_{Ms} = 1,87

SHEAR in kN

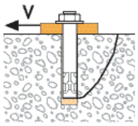


¬ Concrete edge resistance

$$V_{Rd,c} = V^{O}_{Rd,c} . f_b . f_{\beta,V} . \Psi_{S-C,V}$$

$V^0_{Rd,c}$		Design concrete edge resistance at minimum edge distance (C_{min})				
Anchor size	M8	M10	M12	M16	M20	M24
h_{ef}	*80*	*90*	*110*	*125*	*170*	*210*
C_{min}	40	50	60	80	100	120
S_{min}	40	50	60	80	100	120
$V^0_{Rd,c}$	**2,5**	**3,8**	**5,5**	**9,4**	**15,4**	**21,9**

γ_{Mc} = 1,5

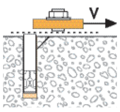


¬ Pryout failure

$$V_{Rd,cp} = V^{0}_{Rd,cp} . f_b . \Psi_s . \Psi_{c,N}$$

$V^0_{Rd,cp}$			Design pryout resistance			
Anchor size	M8	M10	M12	M16	M20	M24
h_{ef}	*80*	*90*	*110*	*125*	*170*	*210*
-40°C to +40°C	**24,1**	**33,9**	**47,0**	**67,0**	**113,9**	**158,3**

γ_{Mcp} = 1,5



¬ Steel resistance

$V_{Rd,s}$			Steel design tensile resistance			
Anchor size	M8	M10	M12	M16	M20	M24
Std. rod grade 5.8*	7,36	11,6	16,9	31,2	48,8	70,4
Std. rod grade 8.8*	11,68	18,6	27,0	50,4	78,4	112,8
Std. rod grade 10.9*	12,2	19,3	28,1	52,0	81,3	117,3
Std. rod grade A4*	7,3	11,9	17,3	32,7	51,3	73,1

Std. rod grade 5.8 et 8.8 : γ_{Ms} = 1,25
Std. rod grade 10.9 : γ_{Ms} = 1,5
Std. rod grade A4 : γ_{Ms} = 1,56

* Special grade available on request.

(1) Category 1

$N_{Rd} = \min(N_{Rd,p} ; N_{Rd,c} ; N_{Rd,s})$

$\beta_N = N_{Sd} / N_{Rd} \leq 1$

$V_{Rd} = \min(V_{Rd,c} ; V_{Rd,cp} ; V_{Rd,s})$

$\beta_V = V_{Sd} / V_{Rd} \leq 1$

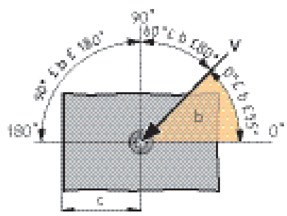
$$\beta_N + \beta_V \leq 1,2$$

f_B INFLUENCE OF CONCRETE

Concrete class	f_B
C25/30	1,02
C30/37	1,04
C40/50	1,07
C50/60	1,09

$f_{B,V}$ INFLUENCE OF SHEAR LOADING DIRECTION

Angle β [°]	$f_{\beta,V}$
0 to 55	1
60	1,1
70	1,2
80	1,5
90 to 180	2

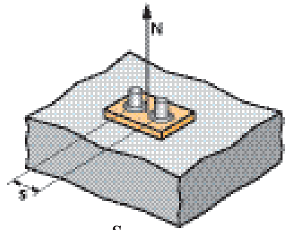


SPIT MULTI-MAX

Zinc coated & stainless steel

SPIT CC- Method (values issued from ETA)

Ψ_s INFLUENCE OF SPACING FOR CONCRETE CONE RESISTANCE IN TENSILE LOAD



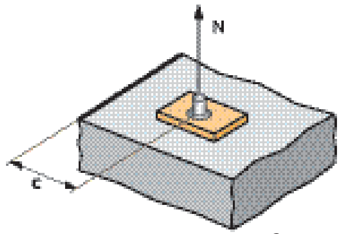
$$\Psi_S = 0{,}5 + \frac{s}{4.h_{ef}}$$

$S_{min} < S < S_{cr,N}$
$S_{cr,N} = 2.h_{ef}$
Ψ_S must be used for each spacing influenced the anchors group.

SPACING S	Reduction factor Ψ_s Non-cracked concrete			
	M8	M10	M12	M16
40	0,58			
50	0,60	0,59		
60	0,63	0,61	0,59	0,58
80	0,67	0,65	0,62	0,61
100	0,71	0,69	0,65	0,63
150	0,81	0,78	0,73	0,70
200	0,92	0,87	0,80	0,77
250	1,00	0,96	0,88	0,83
300		1,00	0,95	0,90
330			1,00	0,94
375				1,00

SPACING S	Reduction factor Ψ_s Non-cracked concrete	
	M20	M24
100	0,60	
120	0,62	0,60
150	0,65	0,62
180	0,68	0,64
200	0,70	0,66
250	0,75	0,70
350	0,84	0,78
450	0,94	0,86
510	1,00	0,90
630		1,00
750		1,00

$\Psi_{c,N}$ INFLUENCE OF EDGE FOR CONCRETE CONE RESISTANCE IN TENSILE LOAD



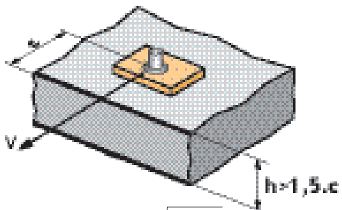
$$\Psi_{c,N} = 0{,}27 + 0{,}725.\frac{c}{h_{ef}}$$

$C_{min} < C < C_{cr,N}$
$C_{cr,N} = h_{ef}$
$\Psi_{c,N}$ must be used for each distance influenced the anchors group.

EDGE C	Reduction factor $\Psi_{c,N}$ Non-cracked concrete			
	M8	M10	M12	M16
40	0,50			
50	0,56	0,53		
60	0,63	0,58	0,52	
80	0,75	0,69	0,61	0,57
120	1,00	0,92	0,80	0,73
135		1,00	0,86	0,79
165			1,00	0,91
190				1,00

EDGE C	Reduction factor $\Psi_{c,N}$ Non-cracked concrete	
	M20	M24
100	0,54	
120	0,60	0,54
150	0,69	0,61
180	0,78	0,68
200	0,84	0,73
255	1,00	0,86
315		1,00

$\Psi_{s-c,V}$ INFLUENCE OF SPACING AND EDGE DISTANCE FOR CONCRETE EDGE RESISTANCE IN SHEAR LOAD

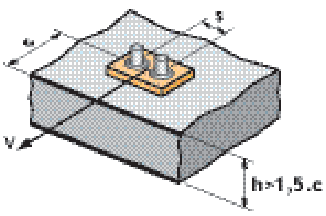


$$\Psi_{s-c,V} = \frac{c}{c_{min}}.\sqrt{\frac{c}{c_{min}}}$$

For single anchor fastening

Factor $\Psi_{s-c,V}$
Non-cracked concrete

$\frac{C}{C_{min}}$	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2
$\Psi_{s-c,V}$	1,00	1,31	1,66	2,02	2,41	2,83	3,26	3,72	4,19	4,69	5,20	5,72

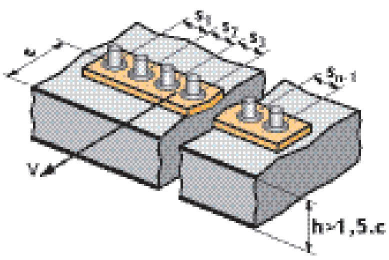


$$\Psi_{s-c,V} = \frac{3.c + s}{6.c_{min}}.\sqrt{\frac{c}{c_{min}}}$$

For 2 anchors fastening

Factor $\Psi_{s-c,V}$
Non-cracked concrete

$\frac{S}{C_{min}}$ \ $\frac{C}{C_{min}}$	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2
1,0	0,67	0,84	1,03	1,22	1,43	1,65	1,88	2,12	2,36	2,62	2,89	3,16
1,5	0,75	0,93	1,12	1,33	1,54	1,77	2,00	2,25	2,50	2,76	3,03	3,31
2,0	0,83	1,02	1,22	1,43	1,65	1,89	2,12	2,38	2,63	2,90	3,18	3,46
2,5	0,92	1,11	1,32	1,54	1,77	2,00	2,25	2,50	2,77	3,04	3,32	3,61
3,0	1,00	1,20	1,42	1,64	1,88	2,12	2,37	2,63	2,90	3,18	3,46	3,76
3,5		1,30	1,52	1,75	1,99	2,24	2,50	2,76	3,04	3,32	3,61	3,91
4,0			1,62	1,86	2,10	2,36	2,62	2,89	3,17	3,46	3,75	4,05
4,5				1,96	2,21	2,47	2,74	3,02	3,31	3,60	3,90	4,20
5,0					2,33	2,59	2,87	3,15	3,44	3,74	4,04	4,35
5,5						2,71	2,99	3,28	3,71	4,02	4,33	4,65
6,0						2,83	3,11	3,41	3,71	4,02	4,33	4,65



For 3 anchors fastening and more

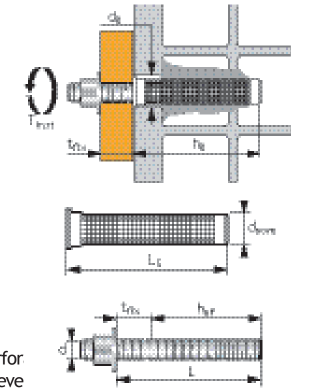
$$\Psi_{s-c,V} = \frac{3.c + s_1 + s_2 + s_3 + \ldots + s_{n-1}}{3.n.c_{min}}.\sqrt{\frac{c}{c_{min}}}$$

Chemical anchors

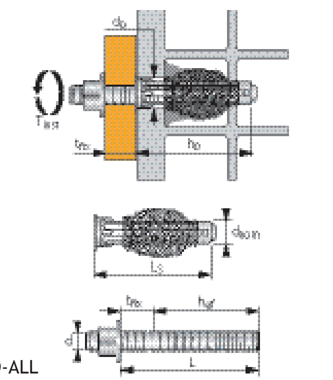
SPIT MULTI-MAX

ETAG 029
ETA n° 13/0437

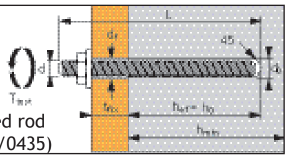
Methacrylate resin for fixing in hollow masonry



Perfor sleeve



iD-ALL

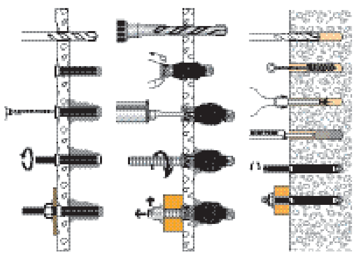


Threaded rod (ETA 13/0435)

APPLICATION

- Signs
- Scaffolding
- Electrical switchboards
- Radiators
- Air conditioning ducts
- Rail guard returns
- Blinds
- Climbing walls
- Metal scale
- Hand rails
- Pole and ducts
- Demountable partitions
- Kitchen furniture
- Decorations...

INSTALLATION



Hollow material with sleeve | Hollow material with iD-ALL | Solid material

Technical data

Type	Max. anchor depth (mm)	Max. thick of base material (mm)	Drilling depth (mm)	Ø thread (mm)	Ø Drill bit (mm)	Ø Clearance (mm)	Total rod length (mm)	Max. tighten (Nm)	Code
	h_{ef}	d_o	h_o	d	L	d_{nom}	L_s	T_{inst}	
iD-ALL + rod M8	65	16	70	8	76 + t_{fix}	16	70	3 (1)	-
iD-ALL + rod M10	65	16	70	10	78 + t_{fix}	16	70	3 (1)	-
Sleeve Ø20 + rod M12	85	20	90	12	98 + t_{fix}	20	85	3 (1)	061490
Sleeve Ø15 + rod M8	130	15	135	8	138 + t_{fix}	15	130	3 (1)	557080
Sleeve Ø15 + rod M10	130	15	135	10	140 + t_{fix}	15	130	3 (1)	557080
MULTI-MAX: Dual component cartridge methacrylate resin					- vol. 280 ml				060040
					- vol. 410 ml				060047

(1) 2 Nm in Clay masonry OPTIBRIC PV 3+ and in hollow concrete block.

Working time and curing time

Ambient temperature (°C)	Working time	Curing time
30°C > T ≥ 40°C	2 min	35 min
20°C > T ≥ 30°C	4 min	45 min
10°C > T ≥ 20°C	6 min	60 min
5°C > T ≥ 10°C	12 min	90 min
0°C > T ≥ 5°C	18 min	180 min
-5°C > T ≥ 0°C	-	360 min

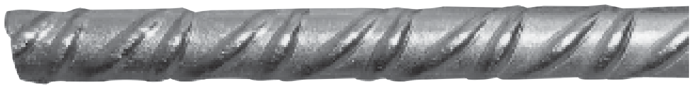
Recommended loads in masonry with stud sleeve and iD-ALL (kN)

$$N_{Rec} = \frac{N_{Rk}}{\gamma_M.\gamma_F} \qquad V_{Rec} = \frac{V_{Rk}}{\gamma_M.\gamma_F}$$

Type		Concrete hollow block B40 $f_b \geq 6.0$ N/mm²		Clay masonry OPTIBRIC PV 3+ $f_b \geq 9.0$ N/mm²		Clay masonry POROTHE RM GF R20 Th+ $f_b \geq 10.0$ N/mm²		Clay masonry POROTHE RM R37 12-1,6-8 DF $f_b \geq 8.0$ N/mm²		Calcium silicate masonry KSL-R (P) 240 $f_b \geq 12.0$ N/mm²	
		N_{rec}	V_{rec}	N_{rec}	V_{rec}	N_{rec}	V_{rec}	N_{rec}	V_{rec}	N_{rec}	V_{rec}
iD-ALL	M8	0.57	0.71	0.43	0.43	0.25	1.14	0.34	0.25	0.43	2.57
	M10										3.14
SLEEVE Ø20X85	M12	0.43	0.57	0.71	1.00	0.71	0.86	0.25	1.14	1.00	2.85
SLEEVE Ø15X130	M8	0.43	0.86	0.43	0.34	0.34	1.00	0.57	0.43	0.86	2.57
	M10										3.43

$\gamma_F = 1{,}4$; $\gamma_M = 2{,}5$

SPIT MULTI-MAX



Rebar anchoring system

ETA - TR23
n° 13/0436

MULTI-MAX range

- Methacrylate resin
- Fast drying time
- Storage time: 18 months
- Usable in wet environments
- Styrene free
- V.O.C. (Volatile Organic Compounds) free
- Cartridge compatible with standard guns

Range

CARTRIDGES

060040 – Cartridge MULTI-MAX 280 ml (delivered with 2 injection nozzles)
060047 – Cartridge MULTI-MAX 410 ml (delivered with 2 injection nozzles)

INJECTION TOOLS

077151 – M380-410 manual injection tool
050918 – P380-410 pneumatic injection tool
054217 – EGI-380-410 electric injection tool
063000 – M300 manual injection tool
057912 – EGI-300 electric injection tool
060052 – EGI battery

CLEANING KITS

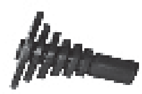
055832 – Manuel cleaning kit for rebar (without injection tool)
055852 – Pneumatic cleaning kit for rebar (without injection tool)

INJECTION NOZZLES

050882 – 150-300-345-380-410 10 nozzles

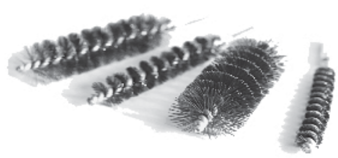
NOZZLE EXTENSION TUBES

050898 – 8 x 200 extension for nozzles code 050882 & 050069
050971 – 13 x 1000 extension for nozzles code 050882 & 050069
063300 – 9 x 1000 extension for nozzles code 050882 & 050069
050969 – Measuring caps (5 caps/package)



METAL BRUSHES

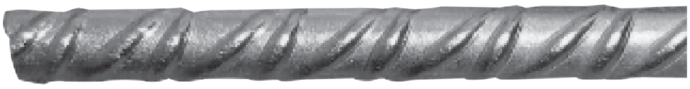
052971 – Ø 11 metal brush
052972 – Ø 13 metal brush
052973 – Ø 15 metal brush
052974 – Ø 20 metal brush
052975 – Ø 22 metal brush
052976 – Ø 26 metal brush
052977 – Ø 30
052978 – Ø 32 (to order)
052979 – Ø 37 (to order)
052981 – Ø 42 (to order)
051010 – L325 metal brush extension
051009 – L300 T-handle



CLEANING BLOWER

065990 – Manual cleaning blower

SPIT MULTI-MAX



ETA - TR 023
n° 13/0436

METHACRYLATE RESIN
Steel reinforcement fixings for reinforced concrete

Mechanical Characteristics of rebars

Nominal steel bar Ø		8	10	12	14	16	20
Sections (cm^2)		0.503	0.785	1.13	1.54	2.01	3.14
Min. resistances	Fe E400	21,13	32,97	47,46	64,68	84,42	131,88
to failure (kN)	Fe E500	25,90	40,43	58,20	79,31	103,52	161,71
Ultimate limit load N_{Rd} (kN)	**Fe E500**	**21,85**	**34,15**	**49,17**	**66,93**	**87,42**	**136,59**

The mechanical characteristics of the high adhesion rebars are defined in the NFA 35-016 and NFA 35-017.

SIZING RULES FOR STEEL REINFORCEMENT FIXINGS FOR CONCRETE ACCORDING TO EUROCODE 2 REGULATIONS AND ETA 13/0436

The basic anchorage length $L_{b,rqd}$ (mm) for the ultimate limit load for rebar F_{RD} (N) is given by following equation:

$$L_{b,rqd} = \frac{F_{Rd}}{\Pi \cdot \varnothing \cdot \eta_1 \cdot \eta_2 \cdot f_{bd}}$$

F_{Rd} : Design ultimate load (N))

f_{bd} : Design value of the bond strength in N/m²e d'adhérence en N/mm²

Ø : Rebar diameter (mm)

η_1 : depends on bond conditions - η_1 =1 (good bond conditions). See § 8.4.2 (EN 1992-1-1)

η_2 : depends on rebar diameter - η_2 = 1 for Øbar ≤ 32 mm

The design anchorage length L_{bd} (mm) is determined as follow:

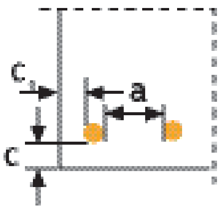
$$L_{bd} = L_{b,rqd} \cdot \alpha_2 \cdot \alpha_5$$

	f_{bd} Design adhesive strength according to EN 1992-1-1								
Size	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Ø8	1.6	2.0	2.3	2.7	3.0	3.4	3.4	3.7	3.7
Ø10	1.6	2.0	2.3	2.7	3.0	3.4	3.4	3.4	3.4
Ø12	1.6	2.0	2.3	2.7	3.0	3.0	3.0	3.0	3.4
Ø14	1.6	2.0	2.3	2.7	3.0	3.0	3.0	3.0	3.0
Ø16	1.6	2.0	2.3	2.7	2.7	2.7	2.7	2.7	3.0
Ø20	1.6	2.0	2.3	2.3	2.3	2.3	2.3	2.3	2.7

With α_2 : **Influence of concrete minimum cover.**

$$\alpha 2 = 1 - 0.15(Cd - \varnothing_{fer}) / \varnothing_{fer} \geq 0{,}7$$

$$Cd = \min\left(c\,;c_1\,;\frac{a}{2}\right)$$



With α_5 : **Influence of the confinement by transverse pressure.**

The factor α_5 take into account of the effect of the pressure transverse to the plane of splitting along the design length.

$$\alpha_5 = 1 - 0{,}04.p \geq 0{,}7$$

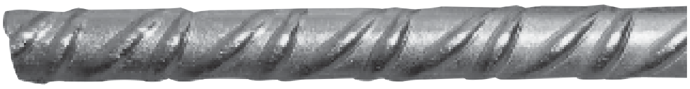
p (Mpa)	α_5
3	0,88
5	0,8
7	0,72

where *p* is the transverse pressure at the ultimate limit state along L_{bd} in MPa.

Limit of this formula

- The max. anchor depth will be limited to 900 mm with pneumatic injection tool.

SPIT MULTI-MAX

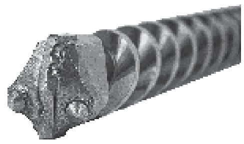


Eurocode 2 table for straight rebar anchoring

CONCRETE C25/30 - HAMMER DRILLING

European Technical Approval

ETA 13/0436



Rebar Ø (mm)	Drilling Ø d_0 (mm)	Length of anchor L_{bd} (mm)	Ultimate limit load (daN) without influence of centre distance and/or edge (1) (α2 = 0,7)	Ultimate limit load (daN) with influence of centre distance and/or edge (2) (α2 = 1)	Number of fixings for a SPIT MULTI-MAX cartridge (3)	
					280 ml	*410 ml*
8	**10**	170	1648	1154	*48,5*	*71,1*
		190	1842	1289	*43,4*	*63,6*
		225	**2185**	1530	*36,6*	*53,6*
		322	-	**2185**	*25,6*	*37,5*
10	**12**	213	2577	1804	*31,7*	*46,5*
		240	2908	2036	*28,1*	*41,2*
		282	**3415**	2391	*24,0*	*35,1*
		403	-	**3415**	*16,8*	*24,6*
12	**15**	255	3711	2597	*14,4*	*21,0*
		290	4217	2952	*12,6*	*18,5*
		338	**4917**	3442	*10,8*	*15,9*
		483	-	**4917**	*7,6*	*11,1*
14	**18**	298	5051	3536	*7,8*	*11,4*
		340	5768	4038	*6,8*	*10,0*
		395	**6693**	4685	*5,9*	*8,6*
		564	-	**6693**	*4,1*	*6,0*
16	**20**	340	6597	4618	*6,1*	*8,9*
		380	7367	5157	*5,4*	*7,9*
		451	**8742**	6119	*4,6*	*6,7*
		644	-	**8742**	*3,2*	*4,7*
20	**25**	425	8781	6147	*3,1*	*4,5*
		490	10116	7081	*2,7*	*3,9*
		662	**13659**	9561	*2,0*	*2,9*
		900	-	**13006**	*1,5*	*2,1*

(1) Absence of edge distances greater than or equal to 7.Ø.

(2) Presence of edge distances and/or centre distances less than 7.Ø.

(3) The number of fixings per cartridge is calculated taking into account an increasing by 20% the real volume of sealing.
$1,2 \times (d_0^2 - Ø_{rebar}^2) \times \Pi \times L_{bd}/4$

Chemical rebars