

MOPUR3



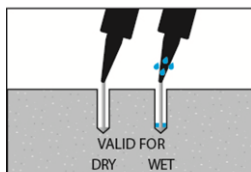
CERTIFICATES



BASE MATERIAL



DRILL HOLE CONDITION



CHARACTERISTICS

- Assessed for structural applications in cracked and non-cracked concrete, M8 to M30. Rebar used as stud from $\varnothing 8$ to $\varnothing 32$.
- Assessed for post-installed rebar connections $\varnothing 8$ to $\varnothing 32$.
- Certificate of contact with drinking water (WRAS).
- Fire resistance certificate for post-installed rebar (CSTB).
- Pure Epoxy 3:1 red colored.
- LEED and A+ certificates.
- Use for high loads, static or quasi-static. Seismic loads C1&C2.
- Working life of 50 and/or 100 years.
- Valid for dry, wet and flooded holes.
- Valid for zinc plated steel, hot-dip galvanized, stainless steel A2, A4 and HCR.
- Service temperature range: from -40°C to $+70^{\circ}\text{C}$ (long term maximum temperature $+50^{\circ}\text{C}$).

VALID FOR

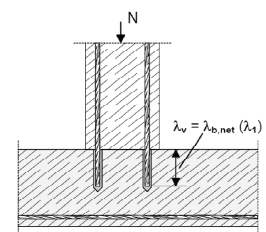
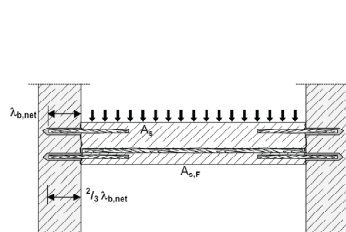
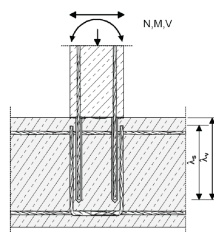
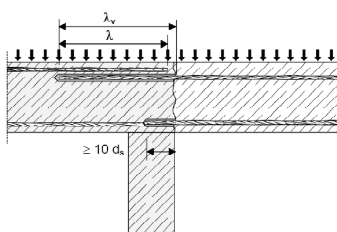


$\varnothing 8 - \varnothing 32$ Rebar

APPLICATIONS

- Use in indoor and outdoor environments.
- Structural applications.
- Fixing of building substructures.
- Rebar and start rebar.
- For fixing enginery, balconies, awnings, shelving units, billboards, catenaries, safety barriers, railings, handrails, etc.
- Large metric sizes, retaining walls.

APPLICATION EXAMPLES



1. RANGE

ITEM	CODE	SIZE	PHOTO	COMPONENT	MATERIAL	
1	MOPUR30385 MOPUR30585	385 ml. 585 ml.		PURE EPOXY MORTAR	Pure epoxy resin. Format: cartridges of 385 and 585 ml.	12

2. ACCESSORIES

ITEM	CODE	PHOTO	COMPONENT	MATERIAL
1	MOISP3385		APPLICATION GUNS	Gun for 385 ml cartridges
	MOISP3585			Gun for 585 ml cartridges
2	MORCEPKIT		CLEANING BRUSHES	3 Cleaning brushes kit of ø14, ø20 and ø29 mm.
3	MOBOMBA		CLEANING PUMP	Pump for cleaning dust and drill hole fragments
4	MORCAPU		MIXING NOZZLE	Plastic. Helix static mixer.

3. PRODUCT SET UP

3.1. SETTING UP PROCEDURE

0. PROTECT YOURSELF

Always use and wear your personal protective equipment (PPE).

1. DRILLING THE HOLE

Check the concrete base is compact and porosity is insignificant. Suitable for wet or dry drill holes.

Cartridge installation temperature: $\geq 5^{\circ}\text{C}$.

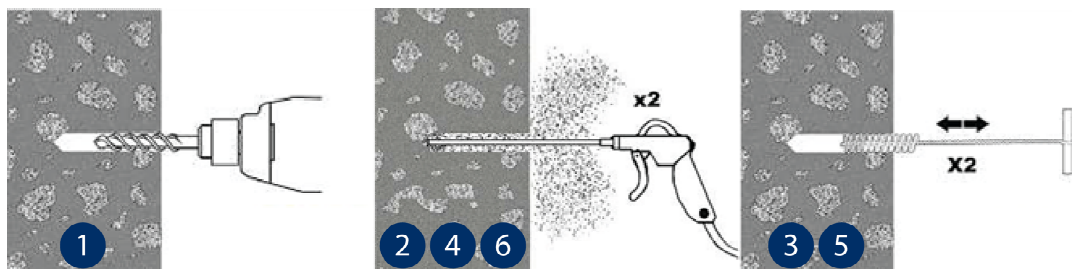
Base material installation temperature: MOPUR3 $\geq +5^{\circ}\text{C}$.

Use drill in hammer mode.

Drill to the specified diameter and depth values.

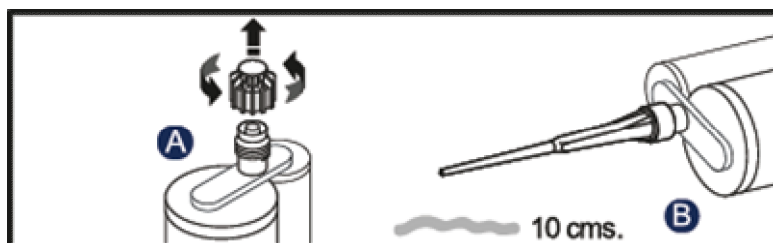
2 - 6. BLOW AND CLEAN

Clear the drill holes completely of dust and fragments by following the procedure shown in the picture. If the drill hole is flooded, the water must be removed before mortar is injected.



A – B. OPEN CARTRIDGE

Screw the nozzle into the cartridge and place the assembly in the application gun. Squeeze on the trigger repeatedly until the mortar comes out of the nozzle in a uniform red color. Any iridescence indicates improper mixing. Always discard the first two doses of each cartridge: these are never to be used for fixing.

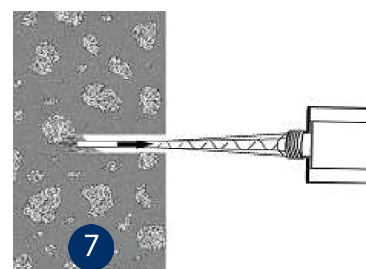


7. INJECT MORTAR

Insert the nozzle to the bottom of the drill hole and apply mortar: gradually remove the nozzle, ensuring there are no air bubbles.

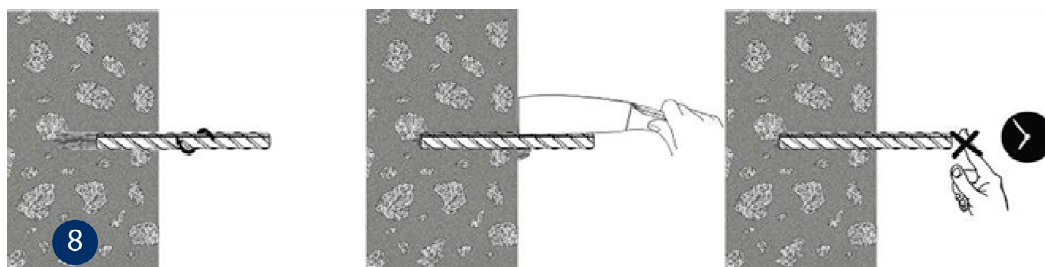
Fill the hole to $\frac{1}{2}$ and $\frac{3}{4}$ of its depth.

In the event of not fully using the cartridge, leave nozzle attached. Only change if using again and handling time has expired, remembering to discard the first two doses of mortar.



8. INSERT THE REBAR

Introduce the rebar to be installed by screwing it lightly down to the installation depth value manually; ensuring the mortar covers the rebar rivet. The introduction of the anchor must take place within the handling time. The mortar must seep from the top of the drill hole to ensure it is completely full and there are no gaps between the rebar and the drill hole.



3.2 TEMPERATURE AND CURING TIME

TYPE	Base material temperature [°C]	Handling time [min]	Curing time [hrs]
MOPUR3	+5	300	24
	+5 a +10	150	24
	+10 a +15	40	18
	+15 a +20	25	12
	+20 a +25	18	8
	+25 a +30	12	6
	+30 a +35	8	4
	+35 a +40	6	2

4. STORAGE CONDITIONS

Keep the product stored in a cool, dry place, away from direct sunlight and heat sources, at an average temperature between +5 °C and +25 °C.



Shelf life of unopened cartridge: 18 months from the date of manufacture. The expiration date is indicated on the cartridge.

The tables below are referred to EN 1992-1-1 Annex C Table C.1 and C.2N Properties of reinforcement:

5. REBAR PROPERTIES

Product form		Bars and de-coiled rods	
Class		B	C
Characteristic yield strength f_{yk} or $f_{0,2k}$ (MPa)		400 to 600	
Minimum value of $k = (f_t / f_y)k$		$\geq 1,08$	$\geq 1,15$
Characteristic strain at maximum force ϵ_{uk} (%)		$\geq 5,0$	$\geq 7,5$
Bendability		Bend / Rebend test	
Maximum deviation from nominal mass (individual bar) (%)	Nominal bar size (mm) ≤ 8	$\pm 6,0$	
	> 8	$\pm 4,5$	
Bond: Minimum relative rib area, $f_{R,min}$	Nominal bar size (mm) 8 to 12	0,040	
	> 12	0,056	

6. MINIMUM/MAXIMUM LENGTHS

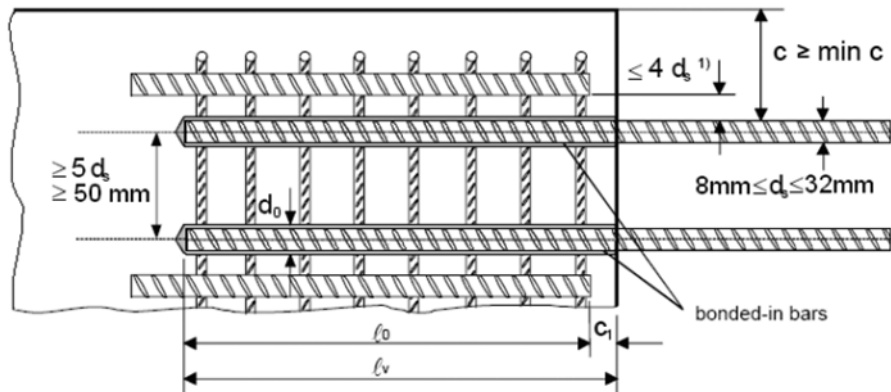
Rebar		Minimum		Maximum
ϕ_{d_s} [mm]	$f_{y,k}$ [N/mm ²]	Anchorage $\ell_{b,min}$ [mm]	Overlap $\ell_{o,min}$ [mm]	ℓ_{max} [mm]
8	500	113	200	400
10	500	142	200	500
12	500	170	200	600
14	500	198	210	700
16	500	227	240	800
20	500	284	300	1000
25	500	354	375	1000
28	500	397	420	1000
32	500	454	480	1000

7. DESIGN BOND RESISTANCE [N/mm²]

Rebar $\varnothing$ d_s [mm]	Concrete class								
	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
8 a 26							3,7	4,0	4,3
28	1,6	2,0	2,3	2,7	3,0	3,4			4,0
32								3,4	

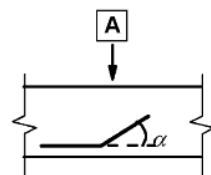
8. PRECALCULATED VALUE TABLES

- Design Load Approach according to Eurocode 2 and EOTA technical report 023.
- Data information according to ETA 17/0658.
- Non-cracked concrete, dry or wet conditions
- Temperature range: -40°C to +80°C (long term maximum temperature +50°C).
- Minimum spacing conditions $\geq 5d_s$, min 50 mm:

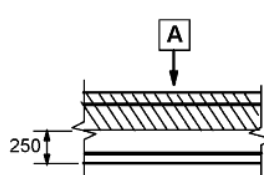


- Minimum concrete covering
 - compressed air drilling $\geq 50 + 0,06 L_b$
 - hammer drilling $\geq 30 + 0,08 L_b \geq 2\phi$

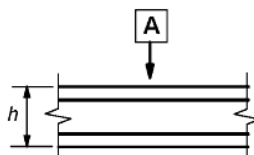
- Good bond Conditions (EU2, figure 8.2):



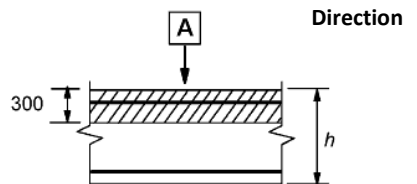
a) $45^\circ \leq \alpha \leq 90^\circ$



c) $h > 250$ mm



b) $h \leq 250$ mm



d) $h > 600$ mm

a) y b) "good" bond conditions for all types of rebars

c) y d) no shaded area – "good" bond conditions
shaded area – "poor" bond conditions

* For other bond conditions, multiply resistance by 0,7.

Resistances values can be increased in the following scenarios:

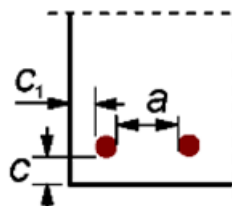
- In case of transverse tension / compression pressure (α_2)
- In case of concreting cover (α_5)
- In case of overlapping (α_6)

VALUES FOR α_2 , α_5 AND α_6

INFLUENCING FACTOR	REINFORCEMENT BAR	
	IN TENSION	IN TENSION
Concrete Cover	$\alpha_2 = 1 - 0,15 (c_d - \phi) / \phi$ $\geq 0,7$ $\leq 1,0$	$\alpha_2 = 1 - 0,15 (c_d - \phi) / \phi$ $\geq 0,7$ $\leq 1,0$
Confinement by transverse pressure	$\alpha_5 = 1 - 0,004p$ $\geq 0,7$ $\leq 1,0$	$\alpha_5 = 1 - 0,004p$ $\geq 0,7$ $\leq 1,0$
Overlapping length	$\alpha_6 = (p_1/25)^{0,25}$ $\geq 1,0$ $\leq 1,5$	

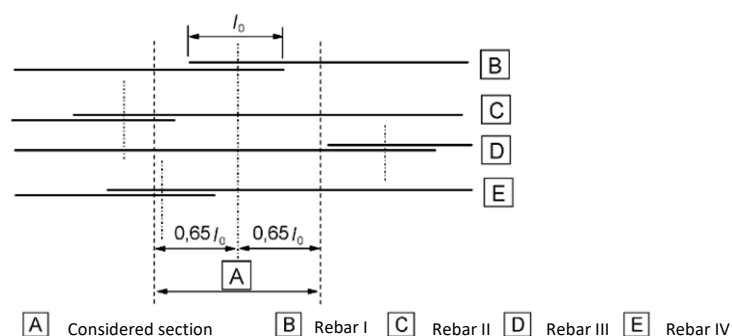
Where:

$$c_d = \min (a/2, c_1, c)$$



p : transverse pressure [MPa] at ultimate limit state along l_{bd}

p_1 is the percentage of reinforcement lapped within 0,65 l_0 from the centre of the lap length considered



CONCRETE CLASS 20/25

Concrete compressive strength [$f_{ck,cube}$]: 25 N/mm²

Rebar $\emptyset$	d_s	[mm]	$\emptyset 8$	$\emptyset 10$	$\emptyset 12$	$\emptyset 14$	$\emptyset 16$	$\emptyset 20$	$\emptyset 25$	$\emptyset 28$	$\emptyset 32$
Rebar Size	d_s	[mm]	8	10	12	14	16	20	25	28	32
Cross-sectional area	A_s	[mm ²]	50,3	78,5	113,1	153,9	201,1	314,2	490,9	615,8	804,2
Steel Yield	f_{yd}	[kN]	500	500	500	500	500	500	500	500	500
Partial safety factor	$\gamma_{M,s}$	[mm ²]	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15
Design steel resistance	$N_{Rd,s}$	[kN]	21,9	34,1	49,2	66,9	87,4	136,6	213,4	267,7	349,7
Bond stress	$f_{bd,PIR}$	[N/mm ²]	2,30	2,30	2,30	2,30	2,30	2,30	2,30	2,30	2,30
Drilled hole diameter	d_h	[mm]	12	14	16	18	20	25	32	35	40
Bar spacing $\geq$	s	[mm]	50	50	60	70	80	100	125	140	160
Edge distance (compressed air drilling) $\geq$	c	[mm]	50 + 0,06 L_b								
Edge distance (hammer drilling) $\geq$	c	[mm]	30 + 0,08 $L_b \geq 2\phi$								

Anchorage length, L_b [mm]

Design tensile pull-out bond resistance, N_{Rd} [kN]

113	6,5	NOT ALLOWED AREA									
142	8,2	10,3									
170	9,8	12,3	14,7								
198	11,4	14,3	17,2	20,0							
200	11,6	14,5	17,3	20,2							
210	12,1	15,2	18,2	21,2							
227	13,1	16,4	19,7	23,0	26,2						
240	13,9	17,3	20,8	24,3	27,7						
284	16,4	20,5	24,6	28,7	32,8	41,0					
300	17,3	21,7	26,0	30,3	34,7	43,4					
354	20,5	25,6	30,7	35,8	40,9	51,2	63,9				
375	21,7	27,1	32,5	37,9	43,4	54,2	67,7				
397	21,9	28,7	34,4	40,2	45,9	57,4	71,7	80,3			
400	21,9	28,9	34,7	40,5	46,2	57,8	72,3	80,9			
420	REBAR YIELDING AREA		30,3	36,4	42,5	48,6	60,7	75,9	85,0		
454			32,8	39,4	45,9	52,5	65,6	82,0	91,9	105,0	
480			34,1	41,6	48,6	55,5	69,4	86,7	97,1	111,0	
500			34,1	43,4	50,6	57,8	72,3	90,3	101,2	115,6	
600					49,2	60,7	69,4	86,7	108,4	121,4	138,7
700						66,9	80,9	101,2	126,4	141,6	161,9
800							87,4	115,6	144,5	161,9	185,0
1000								136,6	180,6	202,3	231,2
Length to develop steel yield, $L_{b,rqd}$ [mm]			378	473	567	662	756	945	1.181	1.323	1.512

Values shaded in grey are not allowed for overlapping joints

CONCRETE CLASS 30/37

Concrete compressive strength [$f_{ck,cube}$]: 37 N/mm²

Rebar Ø	d _s	[mm]	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32					
Rebar Size	d _s	[mm]	8	10	12	14	16	20	25	28	32					
Cross-sectional area	A _s	[mm²]	50,3	78,5	113,1	153,9	201,1	314,2	490,9	615,8	804,2					
Steel Yield	f _{yd}	[kN]	500	500	500	500	500	500	500	500	500					
Partial safety factor	γ _{M,s}	[mm²]	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15					
Design steel resistance	N _{Rd,s}	[kN]	21,9	34,1	49,2	66,9	87,4	136,6	213,4	267,7	349,7					
Bond stress	f _{bd,PIR}	[N/mm²]	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00					
Drilled hole diameter	d _h	[mm]	12	14	16	18	20	25	32	35	40					
Bar spacing ≥	s	[mm]	50	50	60	70	80	100	125	140	160					
Edge distance (compressed air drilling) ≥	c	[mm]	50 + 0,06 L _b													
Edge distance (hammer drilling) ≥	c	[mm]	30 + 0,08 L _b ≥ 2φ													
Anchorage length, L _b [mm]			Design tensile pull-out bond resistance, N _{Rd} [kN]													
113			8,5	NOT ALLOWED AREA												
142			10,7									13,4				
170			12,8									16,0	19,2			
198			14,9									18,7	22,4	26,1		
200			15,1									18,8	22,6	26,4		
210			15,8									19,8	23,8	27,7		
227			17,1									21,4	25,7	30,0	34,2	
240			18,1									22,6	27,1	31,7	36,2	
284			21,4									26,8	32,1	37,5	42,8	53,5
300			21,9									28,3	33,9	39,6	45,2	56,5
354			21,9	33,4	40,0	46,7	53,4	66,7	83,4							
375			21,9	34,1	42,4	49,5	56,5	70,7	88,4							
397			21,9	34,1	44,9	52,4	59,9	74,8	93,5		104,8					
400			21,9	34,1	45,2	52,8	60,3	75,4	94,2		105,6					
420				34,1	47,5	55,4	63,3	79,2	99,0		110,8					
454				34,1	49,2	59,9	68,5	85,6	107,0	119,8	136,9					
480				34,1	49,2	63,3	72,4	90,5	113,1	126,7	144,8					
500				34,1	49,2	66,0	75,4	94,2	117,8	131,9	150,8					
600				49,2		66,9	87,4	113,1	141,4	158,3	181,0					
700			REBAR YIELDING AREA			66,9	87,4	131,9	164,9	184,7	164,9					
800						87,4	136,6	188,5	211,1	188,5						
1000						136,6			213,4	263,9	301,6					
Length to develop steel yield, L _{b,rqd} [mm]			290	362	435	507	580	725	906	1.014	1.159					

Values shaded in grey are not allowed for overlapping joints

CONCRETE CLASS 40/50

Concrete compressive strength [$f_{ck,cube}$]: 50 N/mm²

Rebar Ø	d _s	[mm]	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32					
Rebar Size	d _s	[mm]	8	10	12	14	16	20	25	28	32					
Cross-sectional area	A _s	[mm²]	50,3	78,5	113,1	153,9	201,1	314,2	490,9	615,8	804,2					
Steel Yield	f _{yd}	[kN]	500	500	500	500	500	500	500	500	500					
Partial safety factor	γ _{M,s}	[mm²]	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15					
Design steel resistance	N _{Rd,s}	[kN]	21,9	34,1	49,2	66,9	87,4	136,6	213,4	267,7	349,7					
Bond stress	f _{bd,PR}	[N/mm²]	3,70	3,70	3,70	3,70	3,70	3,70	3,70	3,70	3,40					
Drilled hole diameter	d _h	[mm]	12	14	16	18	20	25	32	35	40					
Bar spacing ≥	s	[mm]	50	50	60	70	80	100	125	140	160					
Edge distance (compressed air drilling) ≥	c	[mm]	50 + 0,06 L _b													
Edge distance (hammer drilling) ≥	c	[mm]	30 + 0,08 L _b ≥ 2φ													
Anchorage length, L _b [mm]			Design tensile pull-out bond resistance, N _{Rd} [kN]													
113			10,5	NOT ALLOWED AREA												
142			13,2									16,5				
170			15,8									19,8	23,7			
198			18,4									23,0	27,6	32,2		
200			18,6									23,2	27,9	32,5		
210			19,5									24,4	29,3	34,2		
227			21,1									26,4	31,7	36,9	42,2	
240			21,9									27,9	33,5	39,1	44,6	
284			21,9									33,0	39,6	46,2	52,8	66,0
300			21,9									34,1	41,8	48,8	55,8	69,7
354			21,9	34,1	49,2	57,6	65,8	82,3	102,9							
375			21,9	34,1	49,2	61,0	69,7	87,2	109,0							
397			21,9	34,1	49,2	64,6	73,8	92,3	115,4		129,2					
400			21,9	34,1	49,2	65,1	74,4	93,0	116,2		130,2					
420				34,1	49,2	66,9	78,1	97,6	122,1	136,7						
454				34,1	49,2	66,9	84,4	105,5	131,9	147,8		155,2				
480				34,1	49,2	66,9	87,4	111,6	139,5	156,2		164,1				
500				34,1	49,2	66,9	87,4	116,2	145,3	162,7		170,9				
600					49,2	66,9	87,4	136,6	174,4	195,3		205,1				
700			REBAR YIELDING AREA			66,9	87,4	136,6	203,4	227,8	260,4					
800							87,4	136,6	213,4	260,4	297,6					
1000									136,6	213,4	267,7	341,8				
Length to develop steel yield, L _{b,req} [mm]			235	294	352	411	470	587	734	822	940					

Values shaded in grey are not allowed for overlapping joints

CONCRETE CLASS 50/60

Concrete compressive strength [$f_{ck,cube}$]: 60 N/mm²

Rebar Ø	d _s	[mm]	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32					
Rebar Size	d _s	[mm]	8	10	12	14	16	20	25	28	32					
Cross-sectional area	A _s	[mm²]	50,3	78,5	113,1	153,9	201,1	314,2	490,9	615,8	804,2					
Steel Yield	f _{yd}	[kN]	500	500	500	500	500	500	500	500	500					
Partial safety factor	γ _{M,s}	[mm²]	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15					
Design steel resistance	N _{Rd,s}	[kN]	21,9	34,1	49,2	66,9	87,4	136,6	213,4	267,7	349,7					
Bond stress	f _{bd,PIR}	[N/mm²]	4,30	4,30	4,30	4,30	4,30	4,30	4,30	4,00	3,40					
Drilled hole diameter	d _h	[mm]	12	14	16	18	20	25	32	35	40					
Bar spacing ≥	s	[mm]	50	50	60	70	80	100	125	140	160					
Edge distance (compressed air drilling) ≥	c	[mm]	50 + 0,06 L _b													
Edge distance (hammer drilling) ≥	c	[mm]	30 + 0,08 L _b ≥ 2φ													
Anchorage length, L _b [mm]			Design tensile pull-out bond resistance, N _{Rd} [kN]													
113			12,2	NOT ALLOWED AREA												
142			15,3									19,2				
170			18,4									23,0	27,6			
198			21,4									26,7	32,1	37,4		
200			21,6									27,0	32,4	37,8		
210			21,9									28,4	34,0	39,7		
227			21,9									30,7	36,8	42,9	49,1	
240			21,9									32,4	38,9	45,4	51,9	
284			21,9									34,1	46,0	53,7	61,4	76,7
300			21,9									34,1	48,6	56,7	64,8	81,1
354			21,9	34,1	49,2	66,9	76,5	95,6	119,6							
375			21,9	34,1	49,2	66,9	81,1	101,3	126,6							
397			21,9	34,1	49,2	66,9	85,8	107,3	134,1	139,7						
400			21,9	34,1	49,2	66,9	86,5	108,1	135,1	140,7						
420			REBAR YIELDING AREA	34,1	49,2	66,9	87,4	113,5	141,8	147,8						
454				34,1	49,2	66,9	87,4	122,7	153,3	159,7	155,2					
480				34,1	49,2	66,9	87,4	129,7	162,1	168,9	164,1					
500				34,1	49,2	66,9	87,4	135,1	168,9	175,9	170,9					
600				49,2			66,9	87,4	136,6	202,6	211,1	205,1				
700			REBAR YIELDING AREA			66,9	87,4	136,6	213,4	264,8	260,4					
800						87,4	136,6	213,4	267,7	297,6						
1000						136,6			213,4	267,7	341,8					
Length to develop steel yield, L _{b,rqd} [mm]			202	253	303	354	404	505	632	761	1023					
Values shaded in grey are not allowed for overlapping joints																

9. OFFICIAL DOCUMENTATION

The following documents are available through our Sales Department or on our official website: www.indexfix.com:

- MOPUR3 Safety Data Sheet.
- European Technical Assessment ETA 17/0659 for use in cracked and non-cracked concrete according to EAD 330232-00-0601 Guide, option 1, for M8 to M30.
- European Technical Approval ETA 17/0658 for the installation of post-installed rebar with diameters from 8 to 32 mm according to technical report EAD 330087-01-0601.
- Classified A+ according to French Regulation DEVL11044875A relative to the emission of volatile pollutants for indoor use.
- LEED MOPUR3 Certification of sustainability
- WRAS certificate - 1506532 of material admitted for use in contact with drinking water.
- CSTB certificate (MRF 26072903 _ SP0363-1) of 14/12/2017 of the material's behavior in contact with fire for post-installed rebar connections.
- Declaration of Performance DoP MOPUR3.
- INDEXcal anchor calculation software.
- INDEXmor cartridge calculation needs software.