MO-H / MO-HW

CERTIFICATES

CE STRUCTURAL FIXINGS IN CRACKED & UNCRACKED CONCRETE ETA 14/0138

CE REBAR CONNECTIONS ETA 13/0780

CE FIXINGS IN MASONRY ETA 16/0841

SEISMIC C1

FIRE RESISTANCE

ÉMISSIONS DANS L'AIR INTÉRIEUR A+

LEED TESTED

WRAS APPROVED PRODUCT

BASE MATERIAL

CHARACTERISTICS

- Assessed for structural applications in cracked and non-cracked concrete, M8 to M30. Rebar used as stud from Ø8 to Ø32.
- Assessed for post-installed rebar connections Ø8 to Ø25.
- Assessed for use in masonry.
- Certificate of contact with drinking water (WRAS).
- Fire resistance certificate for studs and rebar (IBMB).
- LEED and A+ certificates, Styrene free.
- Use for high loads, static or quasi-static. Seismic loads C1.
- 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.
- Temperature range: from -40ºC to +80ºC (long term maximum temperature +50ºC).

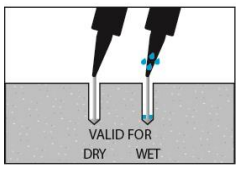
VALID FOR

Ø8 – Ø25 Rebar

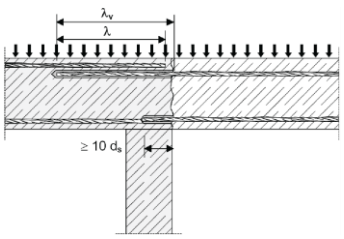
APPLICATIONS

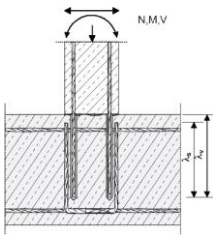
- Use in indoor and outdoor environments.
- Structural applications
- Fixing of building substructures.
- Rebar and start rebar.
- For fixing enginery, balconies, awnings, shelving units, billboards, catenaries, safety barriers, railings, handrails, etc.
- Large metric sizes, retaining walls.

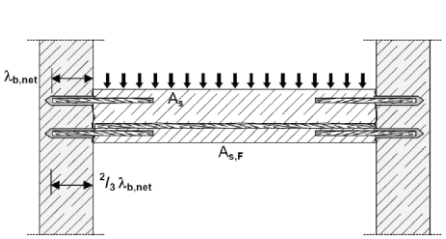
DRILL HOLE CONDITION

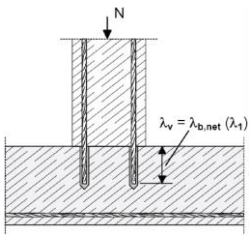


APPLICATION EXAMPLES









1. RANGE

ITEM	CODE	SIZE	PHOTO	COMPONENT	MATERIAL	
1	**MOH300** **MOH410**	300 ml. 410 ml.		HYBRID RESIN STYRENE FREE	Hybrid resin styrene free Format: cartridges de 300 y 410 ml	12

2. ACCESORIES

ITEM	CODE	PHOTO	COMPONENT	MATERIAL
1	**MOPISSI**		APPLICATION GUNS	Gun for 300 ml standard cartridges
	MOPISTO			Gun for 410 ml coaxial 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	**MORCANU**		MIXING NOZZLE	Plastic. Helix static mixer.

3. PRODUCT SET UP

3.1. SETTING UP PROCEDURE

0. PROTECT YOURSELF

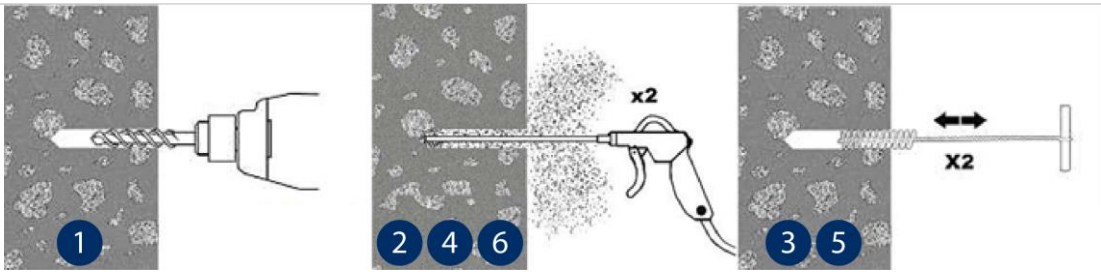
Always use and wear your personal protective equipment (PPE).

1. DRILLING THE HOLE

Check the concrete base is compact and porosity is insignificant. Suitable for wet or dry drill holes.
Cartridge installation temperature: ≥ 5 ºC.
Base material installation temperature: MO-H ≥ +5 ºC.
Use drill in hammer mode.
Drill to the specified diameter and depth values.

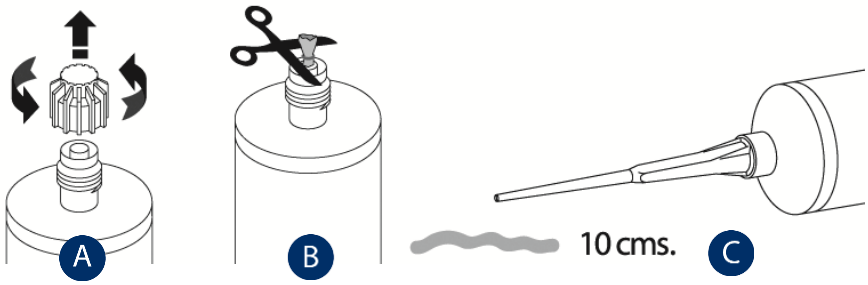
2 - 6. BLOW AND CLEAN

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.



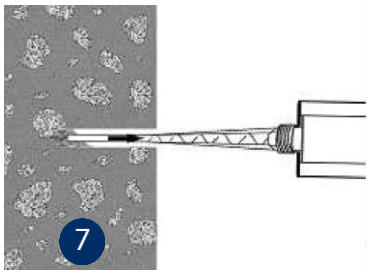
A – B* – C. OPEN CARTRIDGE

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 grey color. Any iridescence indicates improper mixing. Always discard the first two doses of each cartridge: these are never to be used for fixing. ***For 300 ml cartridges, cut end of bag, behind seal clip.**



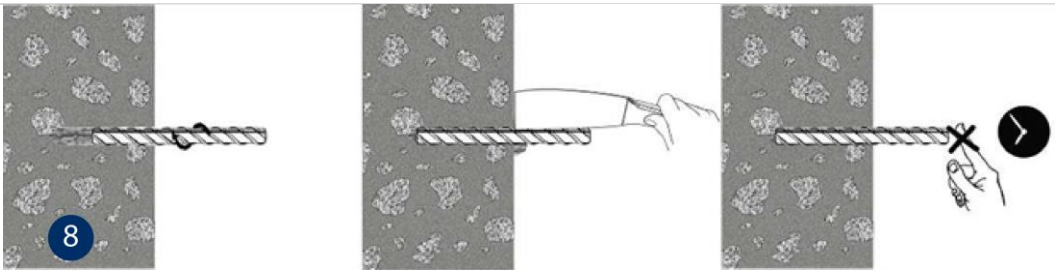
7. INJECT MORTAR

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 ½ and ¾ 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.

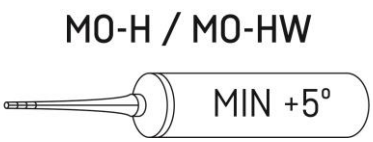


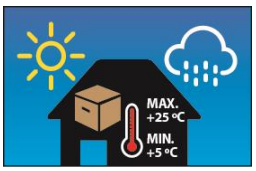
3.2 TEMPERATURE AND CURING TIME

TYPE	Base material temperature [ºC]	Handling time [min]	Curing time [min]
MO-H	+5 to +10	10	145
	+10 to +15	8	85
	+15 to +20	6	75
	+20 to +25	5	50
	+25 to +30	4	40

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 ºC and +25 ºC.





Shelf life of unopened cartridge: 18/12 months for the MO-H/MO-HW respectively 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 fyk or f0,2k (MPa)		400 to 600	
Minimum value of k = (ft / fy)k		≥ 1,08	≥ 1,15
			< 1,35
Characteristic strain at maximum force εuk (%)		≥ 5,0	≥ 7,5
Bendability		Bend / Rebend test	
Maximum deviation from nominal mass (individual bar) (%)	Nominal bar size (mm) ≤ 8 > 8	± 6,0 ± 4,5	
Bond: Minimum relative rib area, $f_{R,min}$	Nominal bar size (mm) 8 to 12 > 12	0,040 0,056	

6. MINIMUM/MAXIMUM LENGTHS

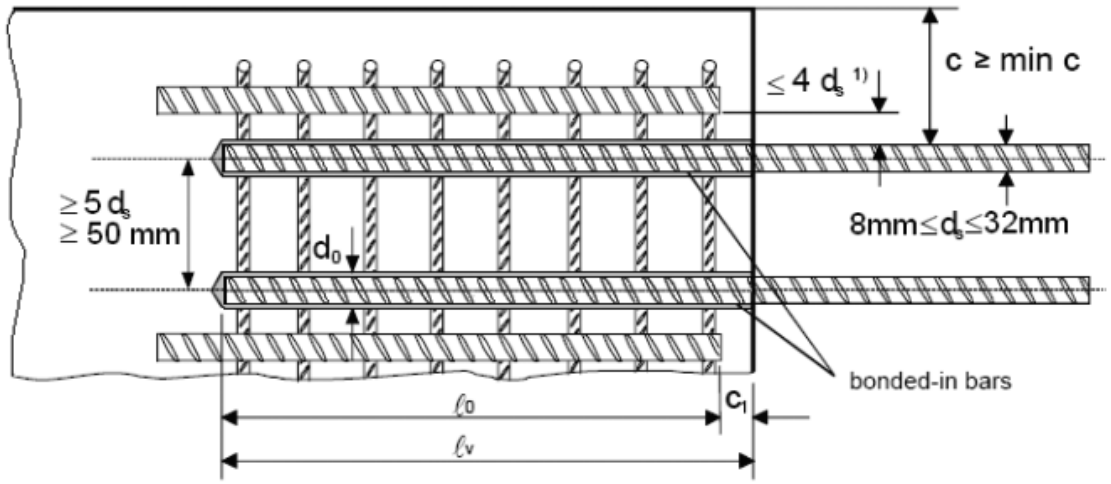
Rebar		**Minimum**		**Maximum**
Ød$_s$ [mm]	**$f_{y,k}$ [N/mm2]**	**Anchorage ℓ$_{b,min}$ [mm]**	**Overlap ℓ$_{0,min}$ [mm]**	**ℓ$_{max}$ [mm]**
8	500	114	200	40
10	500	142	200	500
12	500	171	200	600
14	500	199	210	700
16	500	227	240	800
20	500	284	300	1000
25	500	355	375	1000

7. DESIGN BOND RESISTANCE [N/mm²]

Rebar Ø d_s [mm]	Concrete Class								
	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
8 to 16	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
20								3,7	
25						3,0			

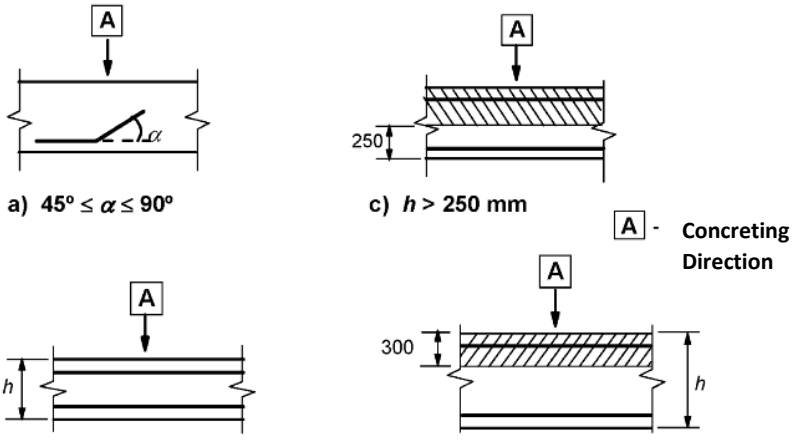
8. PRECALCULATED VALUE TABLES

- **Design Load Approach according to Eurocode 2 and EOTA technical report 023.**
- **Data information according to ETA 13/0780.**
- **Non-cracked concrete, dry or wet conditions**
- **Temperature range: -40ºC to +80ºC (long term maximum temperature +50ºC).**
- **Minimum spacing conditions ≥5d_s, min 50 mm**:



- **Minimum concrete covering**
  - **compressed air drilling ≥ 50 + 0,06 L_b**
  - **hammer drilling ≥ 30 + 0,08 L_b ≥ 2ϕ**

- **Good bond Conditions (EU2, figure 8.2):**



a) 45° ≤ α ≤ 90°

c) *h* > 250 mm

A - Concreting Direction

b) *h* ≤ 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 contidions

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

Resistances values can be increased in the following scenarios:

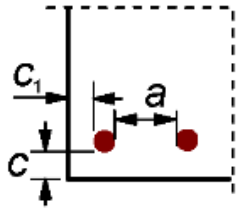
- **In case of transverse tension / compression pressure (α_2)**
- **In case of concreting cover (α_5)**
- **In case of overlapping (α_6)**

VALUES FOR α_2 , α_5 AND α_6

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

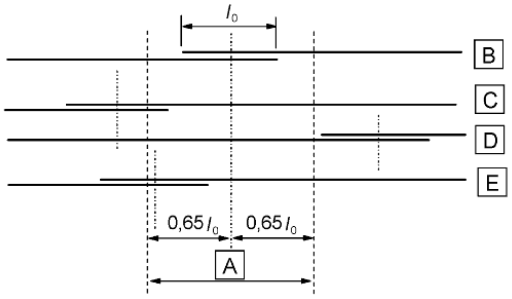
Where:

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 10 from the centre of the lap length considered



A Considered section B Rebar I C Rebar II D Rebar III E Rebar IV

CONCRETE CLASS 20/25

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

Rebar Ø	d_s	[mm]	**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**
Rebar Size	d_s	[mm]	8	10	12	14	16	20	25
Cross-sectional area	A_s	[mm²]	50,3	78,5	113,1	201,1	314,2	314,2	490,9
Steel Yield	f_{yd}	[kN]	500	500	500	500	500	500	500
Partial safety factor	$\gamma_{M,s}$	[mm²]	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	87,4	136,6	136,6	213,4
Bond stress	$f_{bd,PIR}$	[N/mm²]	2,30	2,30	2,30	2,30	2,30	2,30	2,30
Drilled hole diameter	d_h	[mm]	10 ~ 12	12 ~ 14	16	18	20	25	32
Bar spacing ≥	s	[mm]	50	50	60	80	100	100	125
Edge distance (compressed air drilling) ≥	c	[mm]	50 + 0,06 L_b						
Edge distance (hammer drilling) ≥	c	[mm]	30 + 0,08 $L_b \geq 2\phi$						

Anchorage length, L_b [mm]	**Design tensile pull-out bond resistance, N_{Rd} [kN]**						
114	6,6						
142	8,2	10,3					
171	9,9	12,4	14,8				
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	
355	20,5	25,7	30,8	35,9	41,0	51,3	64,1
375	21,7	27,1	32,5	37,9	43,4	54,2	67,7
400	**21,9**	28,9	34,7	40,5	46,2	57,8	72,3
500		**34,1**	43,4	50,6	57,8	72,3	90,3
600			**49,2**	60,7	69,4	86,7	108,4
700				**66,9**	80,9	101,2	126,4
800					**87,4**	115,6	144,5
900						130,1	162,6
1000						**136,6**	180,6
Length to develop steel yield, $L_{b,rqd}$ [mm]	**378**	**473**	**567**	**662**	**756**	**945**	**1.181**

NOT ALLOWED AREA

REBAR YIELDING AREA

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**
Rebar Size	d_s	[mm]	8	10	12	14	16	20	25
Cross-sectional area	A_s	[mm²]	50,3	78,5	113,1	201,1	314,2	314,2	490,9
Steel Yield	f_{yd}	[kN]	500	500	500	500	500	500	500
Partial safety factor	$\gamma_{M,s}$	[mm²]	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	87,4	136,6	136,6	213,4
Bond stress	$f_{bd,PIR}$	[N/mm²]	3,00	3,00	3,00	3,00	3,00	3,00	3,00
Drilled hole diameter	d_h	[mm]	10 ~ 12	12 ~ 14	16	18	20	25	32
Bar spacing ≥	s	[mm]	50	50	60	80	100	100	125
Edge distance (compressed air drilling) ≥	c	[mm]	$50 + 0{,}06\ L_b$						
Edge distance (hammer drilling) ≥	c	[mm]	$30 + 0{,}08\ L_b \geq 2\phi$						

Anchorage length, L_b [mm]	**Design tensile pull-out bond resistance, N_{Rd} [kN]**						
114	8,6						
142	10,7	13,4					
171	12,9	16,1	19,3				
200	15,1	18,8	22,6	26,4			
210	15,8	19,8	23,8	27,7			
27	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	
355	**21,9**	33,5	40,1	46,8	53,5	66,9	83,6
375	**21,9**	**34,1**	42,4	49,5	56,5	70,7	88,4
400	**21,9**	**34,1**	45,2	52,8	60,3	75,4	94,2
500		**34,1**	**49,2**	66,0	75,4	94.2	117,8
600			**49,2**	**66,9**	**87,4**	113,1	141,4
700				**66,9**	**87,4**	131,9	164,9
800					**87,4**	**136,6**	188,5
900						**136,6**	212,1
1000						**136,6**	**213,4**
Length to develop steel yield, $L_{b,rqd}$ [mm]	**290**	**362**	**435**	**580**	**725**	**725**	**906**

NOT ALLOWED AREA

REBAR YIELDING AREA

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**
Rebar Size	d_s	[mm]	8	10	12	14	16	20	25
Cross-sectional area	A_s	[mm²]	50,3	78,5	113,1	201,1	314,2	314,2	490,9
Steel Yield	f_{yd}	[kN]	500	500	500	500	500	500	500
Partial safety factor	$\gamma_{M,s}$	[mm²]	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	87,4	136,6	136,6	213,4
Bond stress	$f_{bd,PIR}$	[N/mm²]	3,70	3,70	3,70	3,70	3,70	3,70	3,00
Drilled hole diameter	d_h	[mm]	10 ~ 12	12 ~ 14	16	18	20	25	32
Bar spacing ≥	s	[mm]	50	50	60	80	100	100	125
Edge distance (compressed air drilling) ≥	c	[mm]	$50 + 0{,}06\ L_b$						
Edge distance (hammer drilling) ≥	c	[mm]	$30 + 0{,}08\ L_b \geq 2\phi$						

Anchorage length, L_b [mm]	**Design tensile pull-out bond resistance, N_{Rd} [kN]**						
114	10,6						
142	13,2	16,5					
171	15,9	19,9	23,9				
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	
355	**21,9**	**34,1**	**49,2**	57,8	66,0	82,5	83,6
375	**21,9**	**34,1**	**49,2**	61,0	69,7	87,2	88,4
400	**21,9**	**34,1**	**49,2**	65,1	74,4	93,0	94,2
500		**34,1**	49,2	66,9	**87,4**	116,2	117,8
600			49,2	66,9	**87,4**	**136,6**	141,4
700				66,9	**87,4**	**136,6**	164,9
800					**87,4**	**136,6**	188,5
900						**136,6**	212,1
1000						**136,6**	**213,4**
Length to develop steel yield, $L_{b,rqd}$ [mm]	**235**	**294**	**352**	**470**	**587**	**587**	**906**

NOT ALLOWED AREA

REBAR YIELDING AREA

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**
Rebar Size	d_s	[mm]	8	10	12	16	20	20	25
Cross-sectional area	A_s	[mm²]	50,3	78,5	113,1	201,1	314,2	314,2	490,9
Steel Yield	f_{yd}	[kN]	500	500	500	500	500	500	500
Partial safety factor	$\gamma_{M,s}$	[mm²]	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	87,4	136,6	136,6	213,4
Bond stress	$f_{bd,PIR}$	[N/mm²]	4,30	4,30	4,30	4,30	4,30	3,70	3,00
Drilled hole diameter	d_h	[mm]	10 ~ 12	12 ~ 14	16	18	20	25	32
Bar spacing ≥	s	[mm]	50	50	60	80	100	100	125
Edge distance (compressed air drilling) ≥	c	[mm]	$50 + 0{,}06\ L_b$						
Edge distance (hammer drilling) ≥	c	[mm]	$30 + 0{,}08\ L_b \geq 2\phi$						

Anchorage length, L_b [mm]	**Design tensile pull-out bond resistance, N_{Rd} [kN]**						
114	12,3						
142	15,3	19,2					
171	18,5	23,1	27,7				
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	66,0	
300	**21,9**	**34,1**	48,6	56,7	64,8	69,7	
355	**21,9**	**34,1**	**49,2**	**66,9**	76,7	82,5	83,6
375	**21,9**	**34,1**	**49,2**	**66,9**	81,1	87,2	88,4
400	**21,9**	**34,1**	**49,2**	**66,9**	86,5	93,0	94,2
500		**34,1**	**49,2**	**66,9**	**87,4**	116,2	117,8
600			**49,2**	**66,9**	**87,4**	**136,6**	141,4
700				**66,9**	**87,4**	**136,6**	164,9
800					**87,4**	**136,6**	188,5
900						**136,6**	212,1
1000						**136,6**	**213,4**
Length to develop steel yield, $L_{b,rqd}$ [mm]	**202**	**253**	**303**	**404**	**505**	**587**	**906**

NOT ALLOWED AREA

REBAR YIELDING AREA

Values shaded in grey are not allowed for overlapping joints

9. CHEMICAL RESISTANCE

Chemical resistance of the product for different kind of chemical environments and for a specific concentration.

Chemical Environment	Concentration	Result	Chemical Environment	Concentration	Result
Aqueous Solution Acetic Acid	10%	✓	Hexane	100%	C
Acetone	100%	X	Hydrochloric Acid	10%	✓
Aqueous Solution Aluminium Chloride	Saturated	✓		15%	✓
Aqueous Solution Aluminium Nitrate	10%	✓		25%	C
Ammonia Solution	5%	✓	Hydrogen Sulphide Gas	100%	✓
Jet Fuel	100%	✓	Isoproyl Alcohol	100%	C
Benzene	100%	X	Linseed Oil	100%	✓
Benzoic Acid	Saturated	✓	Lubricating Oil	100%	✓
Benzyl Alcohol	100%	X	Mineral Oil	100%	✓
Sodium Hypochlorite Solution	5 - 15%	C	Paraffin / Kerosene (Domestic)	100%	✓
Butyl Alcohol	100%	C	Phenol Aqueous Solution	1%	X
Calcium Sulphate Aqueous Solution	Saturated	✓	Phosphoric Acid	50%	✓
Carbon Monoxide	Gas	✓	Potassium Hydroxide	10% / pH13	C
Carbon Tetrachloride	100%	✓	Sea Water	100%	✓
Chlorine Water	Saturated	✓	Styrene	100%	X
Chloro Benzene	100%	X	Sulphur Dioxide Solution	10%	✓
Citric Acid Aqueous Solution	Saturated	✓	Sulphur Dioxide (40°C)	5%	✓
Cyclohexanol	100%	✓	Sulphuric Acid	10%	✓
Diesel Fuel	100%	✓		50%	✓
Diethylene Glycol	100%	✓	Turpentine	100%	C
Ethanol	95%	✓	White Spirit	100%	✓
Ethanol Aqueous Solution	20%	C	Xylene	100%	X
Heptane	100%	✓	**Contact only to a maximum of 25°C.**		C
Resistant to 75°C with at least 80% of physical properties retained.		✓	**Not Resistant**		X

10. OFFICIAL DOCUMENTATION

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

- MOH Safety Data Sheet.
- European Technical Assessment ETA 14/0138 for use on cracked and non-cracked concrete according to EAD 330449-00-0601 Guide, option 1, for M8 to M30. Assessment for seismic loads C1.
- European Technical Approval ETA 13/0785 for the installation of post-installed rebar with diameters from 8 to 25 mm according to EAD 330087-00-0601 Guide.
- European Technical Assessment ETA 16/0841 for the use in masonry according to EAD 330076-00-0604 Guide.
- Classified A+ according to French Regulation DEVL11044875A relative to the emission of volatile pollutants for indoor use.
- LEED MOH Certification of sustainability.
- WRAS certificate - 160454 of material admitted for use in contact with drinking water.
- IBMB certificate – (2101/941/16) – CM of 24/01/2017 of behavior of material in contact with fire.
- Declaration of Performance DoP MOH.
- INDEXcal anchor calculation software.
- INDEXmor cartridge calculation needs software.