

# MO-H HYBRID RESIN STYRENE FREE

Denomination: **HYBRID RESIN STYRENE FREE**

Codes: **MOH, MOHW**

Reference: **FT MOH-en**

Date: **17/06/19**

Revision: **1**

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## MO-H



### CHARACTERISTICS

- Assessed for all types of concrete, cracked and non-cracked, masonry and all concrete applications.
- Certificate of contact with drinking water (WRAS).
- Fire resistance certificate for studs and rebar (IBMB).
- Assessed studs from M8 to M30, even M27.
- Rebar used as stud from Ø8 to Ø32.
- Post-installed rebar Ø8 to Ø25.
- Use for high loads.
- Styrene free.
- Valid for dry, wet and flooded holes.
- Use for static or quasi-static loads.
- Versions in zinc plated steel and stainless steel A2 and A4.
- Temperature range: from -40°C to +80°C (long term maximum temperature +50°C).

### CERTIFICATES



### APPLICATIONS

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

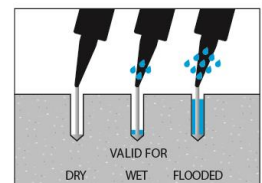
### BASE MATERIAL



### VALID FOR



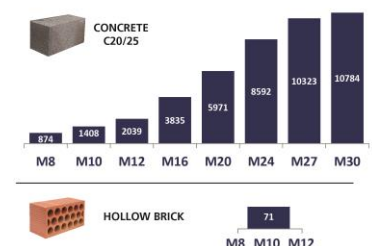
### DRILL HOLE CONDITION



### APPLICATION EXAMPLES



### MAXIMUM RECOMMENDED LOADS [kg]



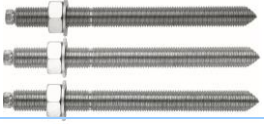
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## 1. RANGE

| ITEM | CODE                       | SIZE               | PHOTO                                                                             | COMPONENT                                      | MATERIAL                                                                               |    |
|------|----------------------------|--------------------|-----------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------|----|
| 1    | <b>MOH300<br/>MOH410</b>   | 300 ml.<br>410 ml. |  | HYBRID RESIN<br>STYRENE FREE                   | Hybrid resin styrene free.<br>Format: cartridges de 300 y 410 ml                       | 12 |
| 2    | <b>MOHW300<br/>MOHW410</b> | 300 ml.<br>410 ml. |  | HYBRID RESIN<br>STYRENE FREE<br>WINTER VERSION | Hybrid resin styrene free for low<br>temperature.<br>Format: 300 and 410 ml cartridges | 12 |

## 2. ACCESORIES

| ITEM | CODE                             | PHOTO                                                                               | COMPONENT             | MATERIAL                                                                                                               |
|------|----------------------------------|-------------------------------------------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------|
| 1    | <b>MOPISSI</b>                   |   | APPLICATION GUNS      | Gun for 300 ml standard cartridges                                                                                     |
|      | <b>MOPISTO</b>                   |  |                       | Gun for 410 ml coaxial cartridges                                                                                      |
| 2    | <b>EQ-AC<br/>EQ-A2<br/>EQ-A4</b> |  | STUD BOLTS            | Threaded steel stud, class 5.8 ISO 898-1<br>Threaded stainless steel stud A2-70<br>Threaded stainless steel stud A4-70 |
| 3    | <b>MORCEPKIT</b>                 |  | CLEANING BRUSHES      | 3 Cleaning brushes kit of Ø14, Ø20 and Ø29 mm.                                                                         |
| 4    | <b>MOBOMBA</b>                   |  | CLEANING PUMP         | Pump for cleaning dust and drill hole fragments                                                                        |
| 5    | <b>MORCANU</b>                   |  | MIXING NOZZLE         | Plastic. Helix static mixer.                                                                                           |
| 6    | <b>MO-TN</b>                     |  | NYLON SLEEVE          | Plastic. Available in white and grey                                                                                   |
| 7    | <b>MO-TR</b>                     |  | METAL THREADED SLEEVE | Metal threaded sleeve M8, M10, M12, zinc plated.                                                                       |
| 8    | <b>MO-TM</b>                     |  | METAL SLEEVE          | Metal sleeve of Ø12, Ø16 and Ø22,                                                                                      |

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## 3. INSTALLATION DATA

### 3.1. CONCRETE FIXING (SET UP PARAMETERS)

| SIZE                                 |      | M8               | M10 | M12              | M16 | M20              | M24 | M27              | M30 |
|--------------------------------------|------|------------------|-----|------------------|-----|------------------|-----|------------------|-----|
| $d_0$ : nominal diameter             | [mm] | 10               | 12  | 14               | 18  | 22               | 26  | 30               | 35  |
| $d_f$ : fixture hole diameter $\leq$ | [mm] | 9                | 12  | 14               | 18  | 22               | 26  | 30               | 33  |
| $T_{ins}$ : torque $\leq$            | [Nm] | 10               | 20  | 40               | 80  | 150              | 200 | 240              | 275 |
| Circular cleaning brush diameter     |      | $\varnothing 14$ |     | $\varnothing 20$ |     | $\varnothing 29$ |     | $\varnothing 40$ |     |

 **$h_{ef,min} = 8d$** 

|                                        |      |     |     |     |     |     |     |     |     |
|----------------------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| $h_1$ : drill hole depth               | [mm] | 64  | 80  | 96  | 128 | 160 | 192 | 216 | 240 |
| $s_{cr,N}$ : critical spacing          | [mm] | 192 | 240 | 288 | 384 | 480 | 576 | 648 | 720 |
| $c_{cr,N}$ : critical edge distance    | [mm] | 96  | 120 | 144 | 192 | 240 | 288 | 324 | 360 |
| $c_{min}$ : minimum distance to edge   | [mm] | 35  | 40  | 50  | 65  | 80  | 96  | 110 | 120 |
| $s_{min}$ : minimum spacing            | [mm] | 35  | 40  | 50  | 65  | 80  | 96  | 110 | 120 |
| $h_{min}$ : minimum concrete thickness | [mm] | 100 | 110 | 126 | 158 | 204 | 244 | 276 | 310 |

**Standard stud**

|                                        |      |     |     |     |     |     |     |   |     |
|----------------------------------------|------|-----|-----|-----|-----|-----|-----|---|-----|
| $h_1$ : drill hole depth               | [mm] | 80  | 90  | 110 | 128 | 170 | 210 | - | 280 |
| $s_{cr,N}$ : critical spacing          | [mm] | 240 | 270 | 330 | 384 | 510 | 630 | - | 840 |
| $c_{cr,N}$ : critical edge distance    | [mm] | 120 | 135 | 165 | 192 | 255 | 315 | - | 420 |
| $c_{min}$ : minimum distance to edge   | [mm] | 43  | 45  | 56  | 65  | 85  | 105 | - | 140 |
| $s_{min}$ : minimum spacing            | [mm] | 43  | 45  | 56  | 65  | 85  | 105 | - | 140 |
| $h_{min}$ : minimum concrete thickness | [mm] | 110 | 120 | 140 | 158 | 214 | 262 | - | 350 |

 **$h_{ef,max} = 20d$** 

|                                        |      |     |     |     |     |      |      |      |      |
|----------------------------------------|------|-----|-----|-----|-----|------|------|------|------|
| $h_1$ : drill hole depth               | [mm] | 160 | 200 | 240 | 320 | 400  | 480  | 540  | 600  |
| $s_{cr,N}$ : critical spacing          | [mm] | 480 | 600 | 720 | 960 | 1200 | 1440 | 1620 | 1800 |
| $c_{cr,N}$ : critical edge distance    | [mm] | 240 | 300 | 360 | 480 | 600  | 720  | 810  | 900  |
| $c_{min}$ : minimum distance to edge   | [mm] | 80  | 100 | 120 | 160 | 200  | 240  | 270  | 300  |
| $s_{min}$ : minimum spacing            | [mm] | 80  | 100 | 120 | 160 | 200  | 240  | 270  | 300  |
| $h_{min}$ : minimum concrete thickness | [mm] | 176 | 220 | 264 | 352 | 444  | 532  | 600  | 730  |

Zinc plated stud code

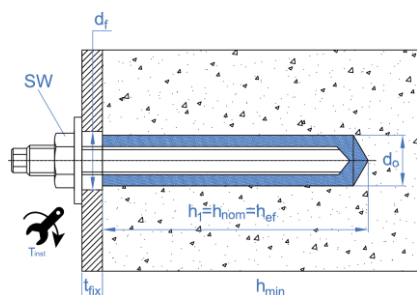


EQAC08110 EQAC10130 EQAC12160 EQAC16190 EQAC20260 EQAC24300 --- EQAC30330

Stainless steel stud code A2 / A4



EQA208110 EQA210130 EQA212160 EQA216190 EQA220260 EQA224300 EQA408110 EQA410130 EQA412160 EQA416190 EQA420260 EQA424300 --- EQA230330 EQA430330



- The  $h_{ef}$  depth value may be selected by the user ranging between  $h_{ef,min} = 8d$  and  $h_{ef,max} = 20d$ . Any intermediate values may be interpolated.
- Critical distances are those where anchors in a group of anchors are not influenced by one another with regard to tension load effects. For smaller distances, down to minimum distances, corresponding reduction coefficients must be applied.
- Standard studs are available for each measurement, as shown in the table.

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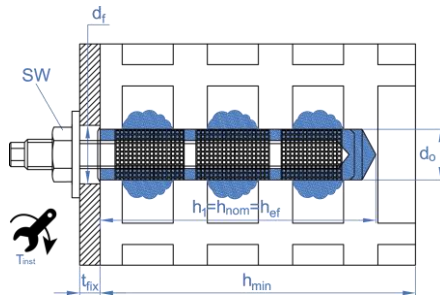
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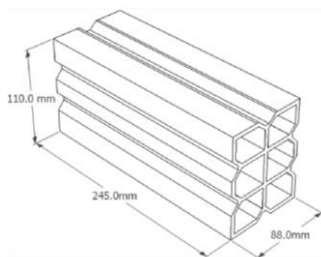
## 3.2. FIXING IN SOLID OR HOLLOW MASONRY (SET UP PARAMETERS)

| SIZE                                                   |                                                                                   | M8                                 | M10                                      | M12                                  |                                    |                                          |                                      |
|--------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------|------------------------------------------|--------------------------------------|------------------------------------|------------------------------------------|--------------------------------------|
| Nylon Sleeve                                           | ls                                                                                | 85                                 | 85                                       | 85                                   |                                    |                                          |                                      |
|                                                        | d <sub>0</sub>                                                                    | 15                                 | 15                                       | 20                                   |                                    |                                          |                                      |
| Mortar volume per sleeve                               | [ml]                                                                              | 15                                 | 15                                       | 27                                   |                                    |                                          |                                      |
| h <sub>1</sub> : drill hole depth ≥                    | [mm]                                                                              | 90                                 | 90                                       | 90                                   |                                    |                                          |                                      |
| h <sub>nom</sub> : sleeve installation depth           | [mm]                                                                              | 85                                 | 85                                       | 85                                   |                                    |                                          |                                      |
| h <sub>ef</sub> : stud bolt depth ≥                    | [mm]                                                                              | 80                                 | 80                                       | 80                                   |                                    |                                          |                                      |
| t <sub>fix</sub> : thickness of material to be fixed ≤ | [mm]                                                                              | 22                                 | 25                                       | 18                                   |                                    |                                          |                                      |
| h <sub>c</sub> : base material thickness ≥             | [mm]                                                                              | 110                                | 110                                      | 110                                  |                                    |                                          |                                      |
| d <sub>f</sub> : metal sheet diameter ≤                | [mm]                                                                              | 9                                  | 12                                       | 14                                   |                                    |                                          |                                      |
| T <sub>ins</sub> : torque ≤                            | [Nm]                                                                              | 2                                  | 2                                        | 2                                    |                                    |                                          |                                      |
| Circular brush                                         |                                                                                   | ø20                                |                                          |                                      |                                    |                                          |                                      |
| Stud code                                              |  | MOES08110                          | MOES10115                                | MOES12110                            |                                    |                                          |                                      |
| Sleeve code                                            |  | MOTN15085                          | MOTN15085                                | MOTN20085                            |                                    |                                          |                                      |
| BASE MATERIAL                                          |                                                                                   | NYLON SLEEVE                       |                                          |                                      |                                    |                                          |                                      |
|                                                        |                                                                                   | M8, M10                            |                                          |                                      | M12                                |                                          |                                      |
| Critical/Minimum spacing and distance to edge          |                                                                                   | c <sub>cr</sub> = c <sub>min</sub> | s <sub>cr ll</sub> = s <sub>min ll</sub> | s <sub>cr⊥</sub> = s <sub>min⊥</sub> | c <sub>cr</sub> = c <sub>min</sub> | s <sub>cr ll</sub> = s <sub>min ll</sub> | s <sub>cr⊥</sub> = s <sub>min⊥</sub> |
| Brick number 1                                         | [mm]                                                                              | 100                                | 245                                      | 110                                  | 120                                | 245                                      | 110                                  |
| Brick number 2                                         | [mm]                                                                              | 100                                | 373                                      | 238                                  | 120                                | 373                                      | 238                                  |



In order to make fixations in hollow bricks a nylon sleeve should be used to prevent the resin from falling through the inner holes.

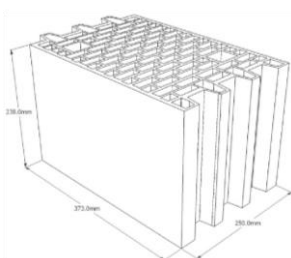
## BRICK TYPES



### Brick n° 1

Hollow baked clay brick according to EN 771-1

Length / width / height: 245 mm / 110 mm / 88 mm  
f<sub>b</sub> ≥ 2,5 N/mm<sup>2</sup> / ρ ≥ 0,74 kg/dm<sup>3</sup>



### Brick n° 2

Hollow baked clay brick Porotherm according to EN 771-1

Length / width / height: 373 mm / 250 mm / 238 mm  
f<sub>b</sub> ≥ 12 N/mm<sup>2</sup> / ρ ≥ 0,9 kg/dm<sup>3</sup>

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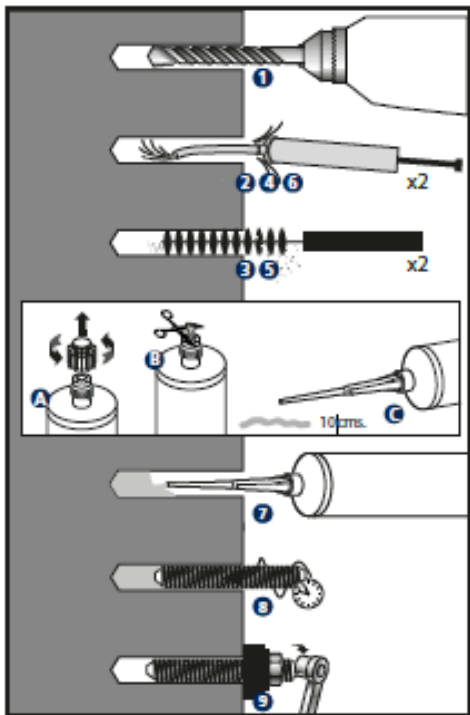
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## 4. PRODUCT SET UP

### 4.1. CONCRETE SET UP



#### 1. DRILL

Check the concrete base is compact and porosity is insignificant.

Suitable for wet, dry or flooded drill holes.

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

Base material installation temperature: MO-H  $\geq +5^{\circ}\text{C}$

MO-HW  $\geq -10^{\circ}\text{C}$

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\* - 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  $\frac{1}{2}$  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. INSTALLATION

Introduce the stud to be installed by screwing it lightly down to the installation depth value manually; ensuring the mortar covers the stud thread. 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 stud and the drill hole.

### TEMPERATURE AND CURING TIME

| TYPE  | Base material temperature [ $^{\circ}\text{C}$ ] | 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                |
| MO-HW | -10 a -5*                                        | 50                  | 720               |
|       | -5 a 0*                                          | 5                   | 50                |
|       | 0 a +5*                                          | 10                  | 75                |
|       | +5 a +20                                         | 5                   | 50                |
|       | +20                                              | 100 seconds         | 20                |

#### 9. APPLY TORQUE

Once the curing time has elapsed, apply torque, never exceeding the values indicated in the table.

\*Curing time not covered by ETA

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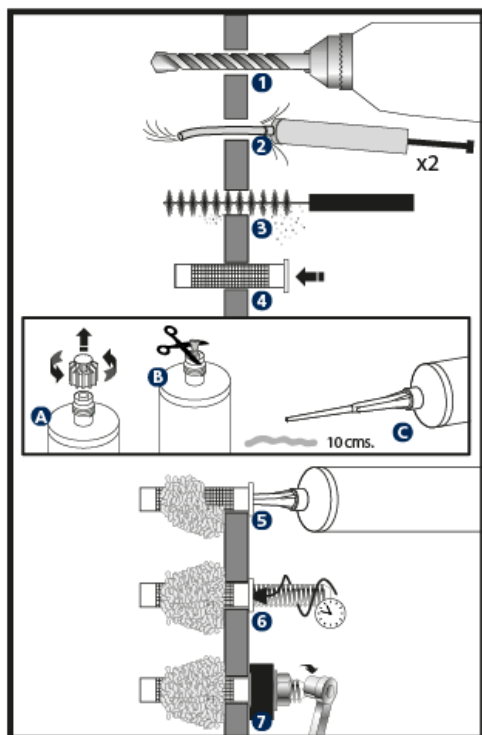
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## 4.2. MASONRY SET UP



### 1. DRILL

Check the concrete base is compact and porosity is insignificant.

Suitable for wet, dry or flooded drill holes.

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

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

MOEPSEW  $\geq -10\text{ }^{\circ}\text{C}$

Use drill in rotation mode.

Drill to the specified diameter and depth values

### 2 - 3. 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.

### 4. POSITION SLEEVE(s)

Insert the metal or plastic sleeve into the drill hole so it is level with the surface of the base material.

### 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.

### 5. 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 sleeve fully.

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.

### 6. INSTALLATION

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

## TEMPERATURE AND CURING TIME

| TYPE  | TYPE       | 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                |
| MO-HW | -10 a -5*  | 50                  | 720               |
|       | -5 a 0*    | 5                   | 50                |
|       | 0 a +5*    | 10                  | 75                |
|       | +5 a +20   | 5                   | 50                |
|       | +20        | 100 seconds         | 20                |

### 7. APPLY TORQUE

Once the curing time has elapsed, apply torque, never exceeding the values indicated in the table.

\*Curing time not covered by ETA

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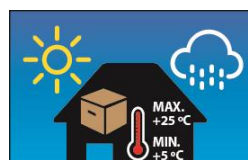
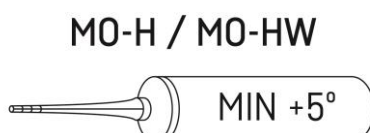
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## 5. STORAGE CONDITIONS

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.

## 6. RESISTANCES

### 6.1 CONCRETE FIXATION

Characteristic resistances for C20/25 concrete for an isolated anchor (without considering anchor-to-anchor or anchor-to-edge distance effects) and class 5.8 studs or A4-70 stainless steel are shown in tables below.

#### CHARACTERISTIC RESISTANCES

| CONCRETE CLASS       | SIZE            |         |                    |          |      | M8          | M10         | M12         | M16          | M20          | M24          | M27          | M30          |
|----------------------|-----------------|---------|--------------------|----------|------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|
|                      |                 |         |                    |          |      |             |             |             |              |              |              |              |              |
| NON-CRACKED CONCRETE | ZINC PLATED     | Tension | $h_{ef,min} = 8d$  | $N_{Rk}$ | [kN] | 16,0        | 23,8        | 34,3        | 57,9         | 85,4         | 115,8        | 119,0        | 124,4        |
|                      |                 |         | Standard stud      | $N_{Rk}$ | [kN] | 20,1        | 26,8        | 39,4        | 57,9         | 90,7         | 126,6        | --           | 145,1        |
|                      |                 |         | $h_{ef,max} = 20d$ | $N_{Rk}$ | [kN] | <u>18,0</u> | <u>29,0</u> | <u>42,0</u> | <u>79,0</u>  | <u>123,0</u> | <u>177,0</u> | 297,7        | 311,1        |
|                      |                 | Shear   | All depths         | $V_{Rk}$ | [kN] | <u>9,0</u>  | <u>15,0</u> | <u>21,0</u> | <u>39,0</u>  | <u>61,0</u>  | <u>88,0</u>  | <u>115,0</u> | <u>140,0</u> |
|                      | STAINLESS STEEL | Tension | $h_{ef,min} = 8d$  | $N_{Rk}$ | [kN] | 16,0        | 23,8        | 34,3        | 57,9         | 85,4         | 115,8        | 119,0        | 124,4        |
|                      |                 |         | Standard stud      | $N_{Rk}$ | [kN] | 20,1        | 26,8        | 39,4        | 57,9         | 90,7         | 126,6        | --           | 145,1        |
|                      |                 |         | $h_{ef,max} = 20d$ | $N_{Rk}$ | [kN] | <u>26,0</u> | <u>41,0</u> | <u>59,0</u> | <u>110,0</u> | <u>172,0</u> | <u>247,0</u> | 297,7        | 311,0        |
|                      |                 | Shear   | All depths         | $V_{Rk}$ | [kN] | <u>13,0</u> | <u>20,0</u> | <u>30,0</u> | <u>55,0</u>  | <u>86,0</u>  | <u>124,0</u> | <u>161,0</u> | <u>196,0</u> |
| CRACKED CONCRETE     | ZINC PLATED     | Tension | $h_{ef,min} = 8d$  | $N_{Rk}$ | [kN] | --          | 11,3        | 16,2        | 28,9         | 40,2         | 57,9         | --           | --           |
|                      |                 |         | Standard stud      | $N_{Rk}$ | [kN] | --          | 12,7        | 18,6        | 28,9         | 42,7         | 63,3         | --           | --           |
|                      |                 |         | $h_{ef,max} = 20d$ | $N_{Rk}$ | [kN] | --          | 28,2        | 40,7        | 72,3         | 100,5        | 144,7        | --           | --           |
|                      |                 | Shear   | All depths         | $V_{Rk}$ | [kN] | --          | <u>15,0</u> | <u>21,0</u> | <u>39,0</u>  | <u>61,0</u>  | <u>88,0</u>  | --           | --           |
|                      | STAINLESS STEEL | Tension | $h_{ef,min} = 8d$  | $N_{Rk}$ | [kN] | --          | 11,3        | 16,2        | 28,9         | 40,2         | 57,9         | --           | --           |
|                      |                 |         | Standard stud      | $N_{Rk}$ | [kN] | --          | 12,7        | 18,6        | 28,9         | 42,7         | 63,3         | --           | --           |
|                      |                 |         | $h_{ef,max} = 20d$ | $N_{Rk}$ | [kN] | --          | 28,2        | 40,7        | 72,3         | 100,5        | 144,7        | --           | --           |
|                      |                 | Shear   | All depths         | $V_{Rk}$ | [kN] | --          | <u>20,0</u> | <u>30,0</u> | <u>55,0</u>  | <u>86,0</u>  | <u>124,0</u> | --           | --           |

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## DESIGN RESISTANCES

| CONCRETE CLASS       | SIZE             |             |                    |                    |          |             | M8          | M10         | M12         | M16         | M20          | M24          | M27          | M30 |
|----------------------|------------------|-------------|--------------------|--------------------|----------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|-----|
| NON-CRACKED CONCRETE | ZINC PLATED      | Tension     | $h_{ef,min} = 8d$  | $N_{Rd}$           | [kN]     | 8,9         | 13,2        | 19,1        | 32,1        | 47,4        | 64,3         | 56,7         | 59,2         |     |
|                      |                  |             | Standard stud      | $N_{Rd}$           | [kN]     | 11,1        | 14,9        | 21,8        | 32,1        | 50,4        | 70,3         | --           | 69,1         |     |
|                      |                  |             | $h_{ef,max} = 20d$ | $N_{Rd}$           | [kN]     | <u>12,0</u> | <u>19,3</u> | <u>28,0</u> | <u>52,6</u> | <u>82,0</u> | <u>118,0</u> | 141,7        | 148,1        |     |
|                      |                  | Shear       | All depths         | $V_{Rd}$           | [kN]     | <u>7,2</u>  | <u>12,0</u> | <u>16,8</u> | <u>31,2</u> | <u>48,8</u> | <u>70,4</u>  | <u>92,0</u>  | <u>112,0</u> |     |
|                      | STAINLESS STEEL  | Tension     | $h_{ef,min} = 8d$  | $N_{Rd}$           | [kN]     | 8,9         | 13,2        | 19,1        | 32,1        | 47,4        | 64,3         | 56,7         | 59,2         |     |
|                      |                  |             | Standard stud      | $N_{Rd}$           | [kN]     | 11,1        | 14,9        | 21,8        | 32,1        | 50,4        | 70,3         | --           | 69,1         |     |
|                      |                  |             | $h_{ef,max} = 20d$ | $N_{Rd}$           | [kN]     | <u>13,6</u> | <u>21,5</u> | <u>31,0</u> | <u>57,8</u> | <u>90,5</u> | <u>130,0</u> | 141,7        | 148,1        |     |
|                      |                  | Shear       | All depths         | $V_{Rd}$           | [kN]     | <u>8,3</u>  | <u>12,8</u> | <u>19,2</u> | <u>35,2</u> | <u>55,1</u> | <u>79,4</u>  | <u>103,2</u> | <u>125,6</u> |     |
|                      | CRACKED CONCRETE | ZINC PLATED | Tension            | $h_{ef,min} = 8d$  | $N_{Rd}$ | [kN]        | --          | 6,2         | 9,0         | 16,0        | 22,3         | 32,1         | --           | --  |
|                      |                  |             |                    | Standard stud      | $N_{Rd}$ | [kN]        | --          | 7,0         | 10,3        | 16,0        | 23,7         | 35,1         | --           | --  |
|                      |                  |             |                    | $h_{ef,max} = 20d$ | $N_{Rd}$ | [kN]        | --          | 15,7        | 22,6        | 40,2        | 55,8         | 80,4         | --           | --  |
|                      |                  |             | Shear              | All depths         | $V_{Rd}$ | [kN]        | --          | <u>12,0</u> | <u>16,8</u> | <u>31,2</u> | <u>48,8</u>  | <u>70,4</u>  | --           | --  |
| STAINLESS STEEL      |                  | Tension     | $h_{ef,min} = 8d$  | $N_{Rd}$           | [kN]     | --          | 6,2         | 9,0         | 16,0        | 22,3        | 32,1         | --           | --           |     |
|                      |                  |             | Standard stud      | $N_{Rd}$           | [kN]     | --          | 7,0         | 10,3        | 16,0        | 23,7        | 35,1         | --           | --           |     |
|                      |                  |             | $h_{ef,max} = 20d$ | $N_{Rd}$           | [kN]     | --          | 15,7        | 22,6        | 40,2        | 55,8        | 80,4         | --           | --           |     |
|                      |                  | Shear       | All depths         | $V_{Rd}$           | [kN]     | --          | <u>12,8</u> | <u>19,2</u> | <u>35,2</u> | <u>55,1</u> | <u>79,4</u>  | --           | --           |     |

## MAXIMUM LOADS RECOMMENDED (when $\gamma_f = 1.4$ )

| CONCRETE CLASS       | SIZE               |                    |                    |               |                   | M8          | M10          | M12          | M16          | M20          | M24          | M27          | M30          |
|----------------------|--------------------|--------------------|--------------------|---------------|-------------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| NON-CRACKED CONCRETE | ZINC PLATED        | Tension            | $h_{ef,min} = 8d$  | $N_{rec}$     | [kN]              | 6,3         | 9,4          | 13,6         | 22,9         | 33,9         | 45,9         | 40,5         | 42,3         |
|                      |                    |                    | Standard stud      | $N_{rec}$     | [kN]              | 7,9         | 10,6         | 15,6         | 22,9         | 36,0         | 50,2         | --           | 49,3         |
|                      |                    |                    | $h_{ef,max} = 20d$ | $N_{rec}$     | [kN]              | <u>8,5</u>  | <u>13,8</u>  | <u>20,0</u>  | <u>37,6</u>  | <u>58,5</u>  | <u>84,2</u>  | 101,2        | 105,7        |
|                      | STAINLESS STEEL    | Tension            | All depths         | $V_{rec}$     | [kN]              | <u>5,1</u>  | <u>8,5</u>   | <u>12,0</u>  | <u>22,2</u>  | <u>34,8</u>  | <u>50,2</u>  | <u>65,7</u>  | <u>80,0</u>  |
|                      |                    |                    | $h_{ef,min} = 8d$  | $N_{rec}$     | [kN]              | 6,3         | 9,4          | 13,6         | 22,9         | 33,9         | 45,9         | 40,5         | 42,3         |
|                      |                    |                    |                    | Standard stud | $N_{rec}$         | [kN]        | 7,9          | 10,6         | 15,6         | 22,9         | 36,0         | 50,2         | --           |
|                      |                    | $h_{ef,max} = 20d$ |                    | $N_{rec}$     | [kN]              | <u>9,77</u> | <u>15,41</u> | <u>22,18</u> | <u>41,35</u> | <u>64,66</u> | <u>92,86</u> | 101,2        | 105,7        |
|                      |                    | Shear              | All depths         | $V_{rec}$     | [kN]              | <u>5,95</u> | <u>9,16</u>  | <u>13,74</u> | <u>25,18</u> | <u>39,38</u> | <u>56,78</u> | <u>73,72</u> | <u>89,74</u> |
|                      |                    |                    |                    |               |                   |             |              |              |              |              |              |              |              |
|                      |                    | CRACKED CONCRETE   | ZINC PLATED        | Tension       | $h_{ef,min} = 8d$ | $N_{rec}$   | [kN]         | --           | 4,4          | 6,4          | 11,4         | 15,9         | 22,9         |
| Standard stud        | $N_{rec}$          |                    |                    |               | [kN]              | --          | 5,0          | 7,4          | 11,4         | 16,9         | 25,1         | --           | --           |
| $h_{ef,max} = 20d$   | $N_{rec}$          |                    |                    |               | [kN]              | --          | 11,2         | 16,1         | 28,7         | 39,8         | 57,4         | --           | --           |
| STAINLESS STEEL      | Shear              |                    | All depths         | $V_{rec}$     | [kN]              | --          | <u>8,5</u>   | <u>12,0</u>  | <u>22,2</u>  | <u>34,8</u>  | <u>50,2</u>  | --           | --           |
|                      |                    |                    | $h_{ef,min} = 8d$  | $N_{rec}$     | [kN]              | --          | 4,4          | 6,4          | 11,4         | 15,9         | 22,9         | --           | --           |
|                      |                    |                    |                    | Standard stud | $N_{rec}$         | [kN]        | --           | 5,0          | 7,4          | 11,4         | 16,9         | 25,1         | --           |
|                      | $h_{ef,max} = 20d$ |                    |                    | $N_{rec}$     | [kN]              | --          | 11,2         | 16,1         | 28,7         | 39,8         | 57,4         | --           | --           |
|                      | Shear              |                    | All depths         | $V_{rec}$     | [kN]              | --          | <u>9,16</u>  | <u>13,74</u> | <u>25,18</u> | <u>39,38</u> | <u>56,78</u> | --           | --           |
|                      |                    |                    |                    |               |                   |             |              |              |              |              |              |              |              |

1 kN  $\approx$  100 kg

The italic font underlined values indicate steel failure; rest indicates pull-out failure.

# MO-H HYBRID RESIN STYRENE FREE

Denomination: **HYBRID RESIN STYRENE FREE**Codes: **MOH, MOHW**Reference: **FT MOH-en**Date: **17/06/19**Revision: **1**Page: **9 of 11**

## COEFFICIENTS FOR TENSION LOADS IN PULL-OUT FAILURE IN HIGH-RESISTANCE CONCRETE TYPES

| CONCRETE COEFFICIENT   | C30/37 | C40/50 | C50/60 |
|------------------------|--------|--------|--------|
| $\Psi_c$ (Non-cracked) | 1,00   | 1,00   | 1,00   |
| $\Psi_c$ (Cracked)     | 1,12   | 1,23   | 1,30   |

## 6.2 MASONRY FIXATION

Characteristic resistances in masonry for an isolated anchor (without considering anchor-to-anchor or anchor-to-edge distance effects) and class 5.8 studs or A4-70 stainless steel are shown in tables below.

### CHARACTERISTIC RESISTANCES ( $F_{Rk}$ )

| BASE MATERIAL* | THREADED RODS          |     |     |
|----------------|------------------------|-----|-----|
|                | TENSION AND SHEAR [kN] |     |     |
|                | M8                     | M10 | M12 |
| BRICK NUMBER 1 | 0,9                    | 1,5 | 1,5 |
| BRICK NUMBER 2 | 2                      | 2   | 2,5 |

### DESIGN RESISTANCES ( $F_{Rd}$ )

| BASE MATERIAL* | THREADED RODS          |     |     |
|----------------|------------------------|-----|-----|
|                | TENSION AND SHEAR [kN] |     |     |
|                | M8                     | M10 | M12 |
| BRICK NUMBER 1 | 0,36                   | 0,6 | 0,6 |
| BRICK NUMBER 2 | 0,8                    | 0,8 | 1   |

### MAXIMUM LOADS RECOMMENDED ( $F_{recom}$ ) [with $\gamma_F = 1.4$ ]

| BASE MATERIAL* | THREADED RODS          |      |      |
|----------------|------------------------|------|------|
|                | TENSION AND SHEAR [kN] |      |      |
|                | M8                     | M10  | M12  |
| BRICK NUMBER 1 | 0,26                   | 0,43 | 0,43 |
| BRICK NUMBER 2 | 0,57                   | 0,57 | 0,71 |

\*Consult brick type on page 4, section 3.2

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## 6.3 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                                  | Saturado      | ✓      |                                    | 15%           | ✓      |
| Aqueous Solution Aluminium Nitrate                                   | 10%           | ✓      |                                    | 25%           | C      |
| Ammonia Solution                                                     | 5%            | ✓      | Hydrogen Sulphide Gas              | 100%          | ✓      |
| Jet Fuel                                                             | 100%          | ✓      | Isopropyl Alcohol                  | 100%          | C      |
| Benzene                                                              | 100%          | X      | Linseed Oil                        | 100%          | ✓      |
| Benzoic Acid                                                         | Saturado      | ✓      | 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                                    | Saturado      | ✓      | Phosphoric Acid                    | 50%           | ✓      |
| Carbon Monoxide                                                      | Gas           | ✓      | Potassium Hydroxide                | 10% / pH13    | C      |
| Carbon Tetrachloride                                                 | 100%          | ✓      | Sea Water                          | 100%          | ✓      |
| Chlorine Water                                                       | Saturado      | ✓      | Styrene                            | 100%          | X      |
| Chloro Benzene                                                       | 100%          | X      | Sulphur Dioxide Solution           | 10%           | ✓      |
| Citric Acid Aqueous Solution                                         | Saturado      | ✓      | 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      |

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## 7. OFFICIAL DOCUMENTATION

The following documents are available through our Sales Department or on our official website: [www.indexfix.com](http://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 concrete reinforcements with diameters from 8 to 25 mm according to guide EAD 330087-00-0601
- European Technical Assessment ETA 16/0841 for the use in masonry according to guide EAD 330076-00-0604.
- Classified A+ according to French Regulation DEVL11044875A relative to the emission of volatile pollutants for indoor use.
- LEED MOH Certification of sustainability.
- Certification AVCP 1020-CPR-090-032411 for use in concrete.
- Certification AVCP 1020-CPR-090-043513 for post-installed rebar.
- Certification AVCP 1020-CPR-090-036865 for use in masonry.
- 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.