

## MO-PU

## CHARACTERISTICS

- Universal polyester resin for all types of materials.
- Valid for all types of concrete, non-cracked, and all concrete applications. Valid for hollow and solid masonry.
- Valid studs from M8 to M24.
- Use for medium loads.
- Valid for dry, wet and flooded holes.
- Use for static or quasi-static loads.
- Versions in zinc plated and stainless steel A2 and A4.
- Temperature range: from -40°C to +80°C (long term maximum temperature +50°C).

## CERTIFICATES



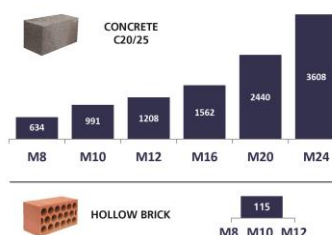
## APPLICATIONS

- Use in indoor and outdoor environments.
- Structural applications.
- For fixing stone cladding.
- Rehabilitation of facades.
- For fixing notices, air conditioning supports, boilers, awnings, signs, balconies, shelving units, railings, etc.

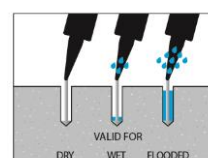
## BASE MATERIAL



## MAXIMUM LOAD RECOMMENDED [kg]



## DRILL HOLE CONDITION



## APPLICATION EXAMPLES



## VALID FOR

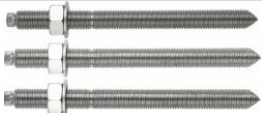
STUD

M8-M24 Stud

## 1. RANGE

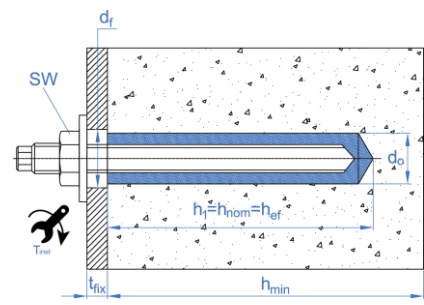
| ITEM | CODE               | SIZE               | PHOTO                                                                             | COMOPONENT                    | MATERIAL                                                           |    |
|------|--------------------|--------------------|-----------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------|----|
| 1    | MOPU300<br>MOPU410 | 300 ml.<br>410 ml. |  | UNIVERSAL<br>POLYESTER MORTAR | Universal polyester resin.<br>Format: cartridges of 300 and 410 ml | 12 |

## 2. ACCESSORIES

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

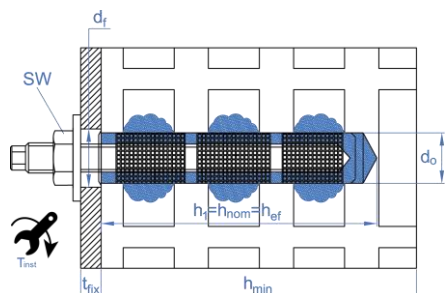
### 3. INSTALLATION DATA

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

| SIZE                                                                                |      | M8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | M10                    | M12                    | M16                    | M20                    | M24                    |
|-------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| d <sub>0</sub> : nominal diameter                                                   | [mm] | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 12                     | 14                     | 18                     | 22                     | 26                     |
| d <sub>f</sub> : fixture hole diameter ≤                                            | [mm] | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12                     | 14                     | 18                     | 22                     | 26                     |
| T <sub>ins</sub> : torque ≤                                                         | [Nm] | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 20                     | 40                     | 80                     | 150                    | 200                    |
| Circular cleaning brush diameter                                                    |      | Ø14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                        | Ø20                    |                        | Ø29                    |                        |
| h <sub>ef,min</sub> = 8d                                                            |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |                        |                        |                        |                        |
| h <sub>1</sub> : drill hole depth                                                   | [mm] | 64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 80                     | 96                     | 128                    | 160                    | 192                    |
| s <sub>cr,N</sub> : critical spacing                                                | [mm] | 192                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 240                    | 288                    | 384                    | 480                    | 576                    |
| c <sub>cr,N</sub> : critical edge distance                                          | [mm] | 96                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 120                    | 144                    | 192                    | 240                    | 288                    |
| c <sub>min</sub> : minimum distance to edge                                         | [mm] | 35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 40                     | 50                     | 65                     | 80                     | 96                     |
| s <sub>min</sub> : minimum spacing                                                  | [mm] | 35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 40                     | 50                     | 65                     | 80                     | 96                     |
| h <sub>min</sub> : minimum concrete thickness                                       | [mm] | 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 110                    | 126                    | 158                    | 204                    | 244                    |
| Standard stud                                                                       |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |                        |                        |                        |                        |
| h <sub>1</sub> : drill hole depth                                                   | [mm] | 80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 90                     | 110                    | 128                    | 170                    | 210                    |
| s <sub>cr,N</sub> : critical spacing                                                | [mm] | 240                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 270                    | 330                    | 384                    | 510                    | 630                    |
| c <sub>cr,N</sub> : critical edge distance                                          | [mm] | 120                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 135                    | 165                    | 192                    | 255                    | 315                    |
| c <sub>min</sub> : minimum distance to edge                                         | [mm] | 43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 45                     | 56                     | 65                     | 85                     | 105                    |
| s <sub>min</sub> : minimum spacing                                                  | [mm] | 43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 45                     | 56                     | 65                     | 85                     | 105                    |
| h <sub>min</sub> : minimum concrete thickness                                       | [mm] | 110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 120                    | 140                    | 158                    | 214                    | 262                    |
| h <sub>ef,max</sub> = 12d                                                           |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |                        |                        |                        |                        |
| h <sub>1</sub> : drill hole depth                                                   | [mm] | 96                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 120                    | 144                    | 192                    | 240                    | 288                    |
| s <sub>cr,N</sub> : critical spacing                                                | [mm] | 288                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 360                    | 432                    | 576                    | 720                    | 864                    |
| c <sub>cr,N</sub> : critical edge distance                                          | [mm] | 144                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 180                    | 216                    | 288                    | 360                    | 432                    |
| c <sub>min</sub> : minimum distance to edge                                         | [mm] | 50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 60                     | 70                     | 95                     | 120                    | 145                    |
| s <sub>min</sub> : minimum spacing                                                  | [mm] | 50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 60                     | 70                     | 95                     | 120                    | 145                    |
| h <sub>min</sub> : minimum concrete thickness                                       | [mm] | 126                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 150                    | 174                    | 222                    | 284                    | 340                    |
| Zinc plated stud code                                                               |      | EQAC08110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | EQAC10130              | EQAC12160              | EQAC16190              | EQAC20260              | EQAC24300              |
| Stainless steel stud code A2 / A4                                                   |      | EQA208110<br>EQA408110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | EQA210130<br>EQA410130 | EQA212160<br>EQA412160 | EQA216190<br>EQA416190 | EQA220260<br>EQA420260 | EQA224300<br>EQA424300 |
|  |      | <ul style="list-style-type: none"><li>h<sub>ef</sub> depth value may be selected by the user ranging between h<sub>ef,min</sub> = 8d and h<sub>ef,max</sub> = 12d. Any intermediate values may be interpolated.</li><li>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.</li><li>Standard studs are available for each measurement, as shown in the table.</li></ul> |                        |                        |                        |                        |                        |

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

| SIZE                                                   |                                                                                   | M8                                    |                                             | M10                                        |                                       | M12                                         |                                            |                                       |                                             |                                            |
|--------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------|--------------------------------------------|---------------------------------------|---------------------------------------------|--------------------------------------------|---------------------------------------|---------------------------------------------|--------------------------------------------|
| Nylon Sleeve                                           | ls                                                                                |                                       |                                             | 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                                         |                                       |                                             |                                            |                                       |                                             |                                            |
| h <sub>nom</sub> : sleeve installation depth           | [mm]                                                                              |                                       |                                             | 85                                         |                                       |                                             |                                            |                                       |                                             |                                            |
| h <sub>ef</sub> : stud bolt depth ≥                    | [mm]                                                                              |                                       |                                             | 80                                         |                                       |                                             |                                            |                                       |                                             |                                            |
| t <sub>fix</sub> : thickness of material to be fixed ≤ | [mm]                                                                              | 22                                    |                                             | 25                                         |                                       | 18                                          |                                            |                                       |                                             |                                            |
| h <sub>c</sub> : base material thickness ≥             | [mm]                                                                              |                                       |                                             | 110                                        |                                       |                                             |                                            |                                       |                                             |                                            |
| d <sub>f</sub> : metal sheet diameter ≤                | [mm]                                                                              | 9                                     |                                             | 12                                         |                                       | 14                                          |                                            |                                       |                                             |                                            |
| T <sub>ins</sub> : torque ≤                            | [Nm]                                                                              |                                       |                                             | 2                                          |                                       |                                             |                                            |                                       |                                             |                                            |
| Circular brush                                         |                                                                                   | [mm]                                  |                                             | 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> =<br>C <sub>min</sub> | S <sub>cr II</sub> =<br>S <sub>min II</sub> | S <sub>min ⊥</sub> =<br>C <sub>min ⊥</sub> | C <sub>cr</sub> =<br>C <sub>min</sub> | S <sub>cr II</sub> =<br>S <sub>min II</sub> | S <sub>min ⊥</sub> =<br>C <sub>min ⊥</sub> | C <sub>cr</sub> =<br>C <sub>min</sub> | S <sub>cr II</sub> =<br>S <sub>min II</sub> | S <sub>min ⊥</sub> =<br>C <sub>min ⊥</sub> |
| Brick number 1                                         | [mm]                                                                              | 100                                   | 235                                         | 115                                        | 100                                   | 235                                         | 115                                        | 120                                   | 235                                         | 115                                        |
| Brick number 2                                         | [mm]                                                                              | 100                                   | 240                                         | 113                                        | 100                                   | 240                                         | 113                                        | 120                                   | 240                                         | 113                                        |
| Brick number 3                                         | [mm]                                                                              | 100                                   | 237                                         | 237                                        | 100                                   | 237                                         | 237                                        | 120                                   | 250                                         | 237                                        |
| Brick number 4                                         | [mm]                                                                              | 128                                   | 255                                         | 255                                        | 128                                   | 255                                         | 255                                        | 128                                   | 255                                         | 255                                        |
| Brick number 5                                         | [mm]                                                                              | 128                                   | 255                                         | 255                                        | 128                                   | 255                                         | 255                                        | 128                                   | 255                                         | 255                                        |
| Brick number 6                                         | [mm]                                                                              | 100                                   | 250                                         | 240                                        | 100                                   | 250                                         | 240                                        | 120                                   | 250                                         | 240                                        |
| Brick number 7                                         | [mm]                                                                              | 100                                   | 250                                         | 248                                        | 100                                   | 250                                         | 248                                        | --                                    | --                                          | --                                         |
| Brick number 8                                         | [mm]                                                                              | 100                                   | 250                                         | 248                                        | 100                                   | 250                                         | 248                                        | 120                                   | 250                                         | 248                                        |
| Brick number 9                                         | [mm]                                                                              | 100                                   | 370                                         | 238                                        | 100                                   | 370                                         | 238                                        | 120                                   | 370                                         | 238                                        |

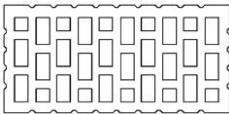
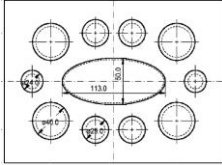
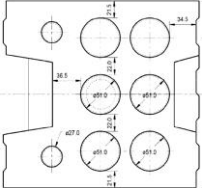
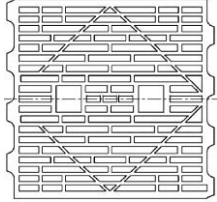
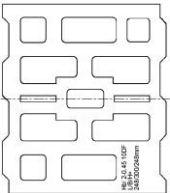
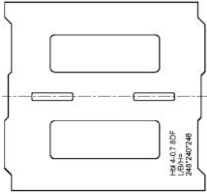
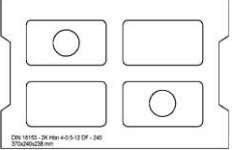


In order to make fixations in hollow bricks a nylon sleeve should be used to prevent the resin from falling through the inner holes.

In some cases to perform installations in bricks where a stud is required to be threaded, a metal sleeve with an internal thread can be used for fixing. In this case, the metal sleeve with internal thread must be inside a plastic sleeve. The parameters are indicated in the following table:

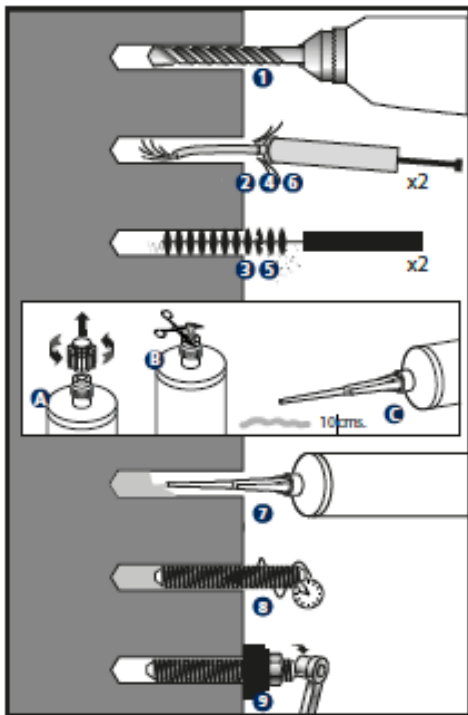
| SIZE                                                     |                                                                                   | M8                                    |                                             |                                            | M10                                   |                                             |                                            | M12                                   |                                             |                                            |
|----------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------|--------------------------------------------|---------------------------------------|---------------------------------------------|--------------------------------------------|---------------------------------------|---------------------------------------------|--------------------------------------------|
| Metal threaded sleeve (d <sub>0</sub> x l <sub>t</sub> ) | [mm]                                                                              | 12X80                                 |                                             |                                            | 14X80                                 |                                             |                                            | 16X80                                 |                                             |                                            |
| Nylon Sleeve                                             | l <sub>s</sub>                                                                    |                                       |                                             |                                            | 85                                    |                                             |                                            |                                       |                                             |                                            |
|                                                          | d <sub>0</sub>                                                                    | 15                                    |                                             |                                            | 20                                    |                                             |                                            | 20                                    |                                             |                                            |
| Mortar volume per sleeve                                 | [ml]                                                                              | 15                                    |                                             |                                            | 15                                    |                                             |                                            | 20                                    |                                             |                                            |
| h <sub>1</sub> : drill hole depth ≥                      | [mm]                                                                              |                                       |                                             |                                            | 90                                    |                                             |                                            |                                       |                                             |                                            |
| h <sub>nom</sub> : sleeve installation depth             | [mm]                                                                              |                                       |                                             |                                            | 85                                    |                                             |                                            |                                       |                                             |                                            |
| h <sub>ef</sub> : metal threaded sleeve depth ≥          | [mm]                                                                              |                                       |                                             |                                            | 80                                    |                                             |                                            |                                       |                                             |                                            |
| t <sub>fix</sub> : thickness of material to be fixed ≤   | [mm]                                                                              | 26                                    |                                             |                                            | 32                                    |                                             |                                            | 24                                    |                                             |                                            |
| h <sub>c</sub> : base material thickness ≥               | [mm]                                                                              |                                       |                                             |                                            | 110                                   |                                             |                                            |                                       |                                             |                                            |
| d <sub>f</sub> : metal sheet diameter ≤                  | [mm]                                                                              | 9                                     |                                             |                                            | 12                                    |                                             |                                            | 14                                    |                                             |                                            |
| T <sub>ins</sub> : torque ≤                              | [Nm]                                                                              |                                       |                                             |                                            | 2                                     |                                             |                                            |                                       |                                             |                                            |
| Circular brush                                           | [mm]                                                                              |                                       |                                             |                                            | ø20                                   |                                             |                                            |                                       |                                             |                                            |
| Stud code                                                |  | MOES08110                             |                                             |                                            | MOES10115                             |                                             |                                            | MOES12110                             |                                             |                                            |
| Sleeve code                                              |  | MOTN15085                             |                                             |                                            | MOTN15085                             |                                             |                                            | MOTN20085                             |                                             |                                            |
| Metal sleeve code                                        |  | MOTRO08                               |                                             |                                            | MOTRO10                               |                                             |                                            | MOTRO12                               |                                             |                                            |
| BASE MATERIAL                                            |                                                                                   | METAL SLEEVE                          |                                             |                                            |                                       |                                             |                                            |                                       |                                             |                                            |
|                                                          |                                                                                   | M8                                    |                                             |                                            | M10                                   |                                             |                                            | M12                                   |                                             |                                            |
| Critical/Minimum spacing and distance to edge            |                                                                                   | C <sub>cr</sub> =<br>C <sub>min</sub> | S <sub>cr II</sub> =<br>S <sub>min II</sub> | S <sub>min ⊥</sub> =<br>C <sub>min ⊥</sub> | C <sub>cr</sub> =<br>C <sub>min</sub> | S <sub>cr II</sub> =<br>S <sub>min II</sub> | S <sub>min ⊥</sub> =<br>C <sub>min ⊥</sub> | C <sub>cr</sub> =<br>C <sub>min</sub> | S <sub>cr II</sub> =<br>S <sub>min II</sub> | S <sub>min ⊥</sub> =<br>C <sub>min ⊥</sub> |
| Brick number 1                                           | [mm]                                                                              | 100                                   | 235                                         | 115                                        | 120                                   | 235                                         | 115                                        | 120                                   | 235                                         | 115                                        |
| Brick number 2                                           | [mm]                                                                              | 100                                   | 240                                         | 113                                        | 120                                   | 240                                         | 113                                        | 120                                   | 240                                         | 113                                        |
| Brick number 3                                           | [mm]                                                                              | --                                    | --                                          | --                                         | 120                                   | 250                                         | 237                                        | 120                                   | 250                                         | 237                                        |
| Brick number 4                                           | [mm]                                                                              | 128                                   | 255                                         | 255                                        | 128                                   | 255                                         | 255                                        | 128                                   | 255                                         | 255                                        |
| Brick number 5                                           | [mm]                                                                              | 128                                   | 255                                         | 255                                        | 128                                   | 255                                         | 255                                        | 128                                   | 255                                         | 255                                        |
| Brick number 6                                           | [mm]                                                                              | 100                                   | 250                                         | 240                                        | 120                                   | 250                                         | 240                                        | 120                                   | 250                                         | 240                                        |
| Brick number 7                                           | [mm]                                                                              | 100                                   | 250                                         | 248                                        | 120                                   | 250                                         | 248                                        | 120                                   | 250                                         | 248                                        |
| Brick number 8                                           | [mm]                                                                              | --                                    | --                                          | --                                         | 120                                   | 250                                         | 248                                        | 120                                   | 250                                         | 248                                        |
| Brick number 9                                           | [mm]                                                                              | 100                                   | 370                                         | 238                                        | 120                                   | 370                                         | 238                                        | 120                                   | 370                                         | 238                                        |

## BRICK TYPES

|                                                                                                                                                                                                                                                           |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <p><b>Brick nº 1</b><br/>Hollow baked clay brick HLz<br/>12-1, 0-2DF according to EN 771-1<br/>Length / width / height:<br/>235 mm / 112 mm / 115 mm<br/><math>f_b \geq 12 \text{ N/mm}^2</math> / <math>\rho \geq 1,0 \text{ kg/dm}^3</math></p>         |    | <p><b>Brick nº 2</b><br/>Hollow sillico calcareous brick KSL<br/>12-1, 4-3DF according to EN 771-2<br/>Length / width / height:<br/>240 mm / 175 mm / 113 mm<br/><math>f_b \geq 12 \text{ N/mm}^2</math> / <math>\rho \geq 1,4 \text{ kg/dm}^3</math></p>                                                                                                                                                                                                                     |    |
| <p><b>Brick nº 3</b><br/>Hollow sillico calcareous brick KSL<br/>12-1, 4-2DF according to EN 771-2<br/>Length / width / height:<br/>250 mm / 240 mm / 237 mm<br/><math>f_b \geq 12 \text{ N/mm}^2</math> / <math>\rho \geq 1,4 \text{ kg/dm}^3</math></p> |    | <p><b>Brick nº 4</b><br/>Solid baked clay brick Mz 12-2, 0-NF according to EN 771-1. Length / width / height: 240 mm / 116 mm / 71 mm<br/><math>f_b \geq 12 \text{ N/mm}^2</math> / <math>\rho \geq 2,0 \text{ kg/dm}^3</math></p> <p><b>Brick nº 5</b><br/>Solid sillico calcareous brick KS 12-2, 0-NF according to EN 771-2. Length / width / height: 240 mm / 115 mm / 70 mm<br/><math>f_b \geq 12 \text{ N/mm}^2</math> / <math>\rho \geq 2,0 \text{ kg/dm}^3</math></p> |                                                                                       |
| <p><b>Brick nº 6</b><br/>Hollow baked clay brick HLzW<br/>6-0,7-8DF according to EN 771-1<br/>Length / width / height:<br/>250 mm / 240 mm / 240 mm<br/><math>f_b \geq 6 \text{ N/mm}^2</math> / <math>\rho \geq 0,8 \text{ kg/dm}^3</math></p>           |   | <p><b>Brick nº 7</b><br/>Hollow lightweight concrete block Hbl 2-0,45-10DF according to EN 771-3<br/>Length / width / height:<br/>250 mm / 300 mm / 248 mm<br/><math>f_b \geq 2,0 \text{ N/mm}^2</math> / <math>\rho \geq 0,45 \text{ kg/dm}^3</math></p>                                                                                                                                                                                                                     |   |
| <p><b>Brick nº 8</b><br/>Hollow lightweight concrete block Hbl 4-0, 7-8DF according to EN 771-3<br/>Length / width / height:<br/>250 mm / 240 mm / 248 mm<br/><math>f_b \geq 4,0 \text{ N/mm}^2</math> / <math>\rho \geq 0,7 \text{ kg/dm}^3</math></p>   |  | <p><b>Brick nº 9</b><br/>Concrete block Hbn 4-12DF according to EN 771-3<br/>Length / width / height:<br/>370 mm / 240 mm / 238 mm<br/><math>f_b \geq 4 \text{ N/mm}^2</math> / <math>\rho \geq 1,2 \text{ kg/dm}^3</math></p>                                                                                                                                                                                                                                                |  |

## 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-PU  $\geq +5^{\circ}\text{C}$

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\* – 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.

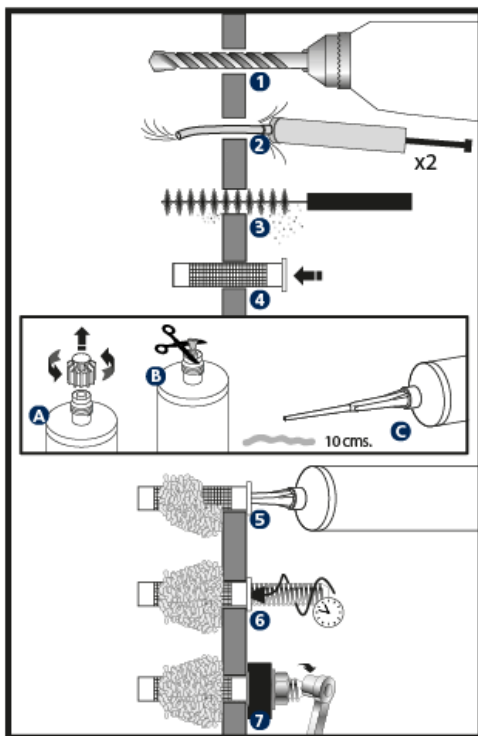
### TEMPERATURE AND CURING TIME

| TYPE  | Base material temperature [ $^{\circ}\text{C}$ ] | Handling time [min] | Curing time [min] |
|-------|--------------------------------------------------|---------------------|-------------------|
| MO-PU | min +5                                           | 18                  | 145               |
|       | +5 to +10                                        | 10                  | 145               |
|       | +10 to +20                                       | 6                   | 85                |
|       | +20 to +25                                       | 5                   | 50                |
|       | +25 to +30                                       | 4                   | 40                |
|       | +30                                              | 4                   | 35                |

#### 9. APPLY TORQUE

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

## 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:  $\geq 5^{\circ}\text{C}$ .

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

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  | Base material temperature [ $^{\circ}\text{C}$ ] | Handling time [min] | Curing time [min] |
|-------|--------------------------------------------------|---------------------|-------------------|
| MO-PU | min +5                                           | 18                  | 145               |
|       | +5 a +10                                         | 10                  | 145               |
|       | +10 a +20                                        | 6                   | 85                |
|       | +20 a +25                                        | 5                   | 50                |
|       | +25 a +30                                        | 4                   | 40                |
|       | +30                                              | 4                   | 35                |

### 7. APPLY TORQUE

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

## 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          |
|----------------------|-----------------|---------|--------------------|----------|------|-------------|-------------|-------------|-------------|-------------|--------------|
|                      |                 |         |                    |          |      |             |             |             |             |             |              |
| NON-CRACKED CONCRETE | ZINC PLATED     | Tension | $h_{ef,min} = 8d$  | $N_{Rk}$ | [kN] | 10,4        | 16,3        | 19,9        | 25,7        | 40,2        | 59,4         |
|                      |                 |         | Standard stud      | $N_{Rk}$ | [kN] | 13,0        | 18,3        | 22,8        | 25,7        | 42,7        | 60,0         |
|                      |                 |         | $h_{ef,max} = 12d$ | $N_{Rk}$ | [kN] | 15,6        | 24,5        | 29,8        | 38,6        | 60,3        | 89,2         |
|                      |                 | 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>  |
|                      | STAINLESS STEEL | Tension | $h_{ef,min} = 8d$  | $N_{Rk}$ | [kN] | 10,4        | 16,3        | 19,9        | 25,7        | 40,2        | 59,4         |
|                      |                 |         | Standard stud      | $N_{Rk}$ | [kN] | 13,0        | 18,3        | 22,8        | 25,7        | 42,7        | 60,0         |
|                      |                 |         | $h_{ef,max} = 12d$ | $N_{Rk}$ | [kN] | 15,6        | 24,5        | 29,8        | 38,6        | 60,3        | 89,2         |
|                      |                 | 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> |

| DESIGN RESISTANCES                                                                                                  |                 |         |                    |           |      |            |             |             |             |             |             |
|---------------------------------------------------------------------------------------------------------------------|-----------------|---------|--------------------|-----------|------|------------|-------------|-------------|-------------|-------------|-------------|
| CONCRETE CLASS                                                                                                      | SIZE            |         |                    |           |      | M8         | M10         | M12         | M16         | M20         | M24         |
| NON-CRACKED CONCRETE                                                                                                | ZINC PLATED     | Tension | $h_{ef,min} = 8d$  | $N_{Rd}$  | [kN] | 5,8        | 9,0         | 11,0        | 14,3        | 22,3        | 33,0        |
|                                                                                                                     |                 |         | Standard stud      | $N_{Rd}$  | [kN] | 7,2        | 10,2        | 12,6        | 14,3        | 23,7        | 33,3        |
|                                                                                                                     |                 |         | $h_{ef,max} = 12d$ | $N_{Rd}$  | [kN] | 8,7        | 13,6        | 16,5        | 21,4        | 33,5        | 49,5        |
|                                                                                                                     | STAINLESS STEEL | Tension | 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> |
|                                                                                                                     |                 |         | $h_{ef,min} = 8d$  | $N_{Rd}$  | [kN] | 5,8        | 9,0         | 11,0        | 14,3        | 22,3        | 33,0        |
|                                                                                                                     |                 |         | Standard stud      | $N_{Rd}$  | [kN] | 7,2        | 10,2        | 12,6        | 14,3        | 23,7        | 33,3        |
|                                                                                                                     |                 | Shear   | $h_{ef,max} = 12d$ | $N_{Rd}$  | [kN] | 8,7        | 13,6        | 16,5        | 21,4        | 33,5        | 49,5        |
|                                                                                                                     |                 |         | 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> |
| MAXIMUM LOADS RECOMMENDED (when $\gamma_F= 1.4$ )                                                                   |                 |         |                    |           |      |            |             |             |             |             |             |
| CONCRETE CLASS                                                                                                      | SIZE            |         |                    |           |      | M8         | M10         | M12         | M16         | M20         | M24         |
| NON-CRACKED CONCRETE                                                                                                | ZINC PLATED     | Tension | $h_{ef,min} = 8d$  | $N_{rec}$ | [kN] | 4,1        | 6,4         | 7,9         | 10,2        | 15,9        | 23,6        |
|                                                                                                                     |                 |         | Standard stud      | $N_{rec}$ | [kN] | 5,1        | 7,2         | 9,0         | 10,2        | 16,9        | 23,8        |
|                                                                                                                     |                 |         | $h_{ef,max} = 12d$ | $N_{rec}$ | [kN] | 6,2        | 9,7         | 11,8        | 15,3        | 23,9        | 35,4        |
|                                                                                                                     | 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> |
|                                                                                                                     |                 |         | $h_{ef,min} = 8d$  | $N_{rec}$ | [kN] | 4,1        | 6,4         | 7,9         | 10,2        | 15,9        | 23,6        |
|                                                                                                                     |                 |         | Standard stud      | $N_{rec}$ | [kN] | 5,1        | 7,2         | 9,0         | 10,2        | 16,9        | 23,8        |
|                                                                                                                     |                 | Shear   | $h_{ef,max} = 12d$ | $N_{rec}$ | [kN] | 6,2        | 9,7         | 11,8        | 15,3        | 23,9        | 35,4        |
|                                                                                                                     |                 |         | All depths         | $V_{rec}$ | [kN] | <u>5,9</u> | <u>9,1</u>  | <u>13,7</u> | <u>25,1</u> | <u>39,3</u> | <u>56,7</u> |
| 1 KN $\approx$ 100 kg<br>The italic font underlined values indicate steel failure; rest indicates pull-out failure. |                 |         |                    |           |      |            |             |             |             |             |             |

| COEFFICIENTS FOR TENSION LOADS<br>IN PULL-OUT FAILURE IN HIGH-RESISTANCE CONCRETE TYPES |        |        |        |
|-----------------------------------------------------------------------------------------|--------|--------|--------|
| CONCRETE COEFFICIENT                                                                    | C30/37 | C40/50 | C50/60 |
| $\Psi_c$ (Non-cracked)                                                                  | 1,04   | 1,07   | 1,09   |

## 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<br>TENSION AND SHEAR [kN] |     |     | THREADED METAL SLEEVE<br>TENSION AND SHEAR [kN] |      |      |
|----------------|-----------------------------------------|-----|-----|-------------------------------------------------|------|------|
|                | M8                                      | M10 | M12 | M8                                              | M10  | M12  |
| BRICK NUMBER 1 | 2,5                                     | 2   | 2   | 1,5                                             | 2,5  | 2,5  |
| BRICK NUMBER 2 | 0,75                                    | 1,2 | 0,5 | 0,6                                             | 0,75 | 0,9  |
| BRICK NUMBER 3 | 0,75                                    | 1,2 | 0,5 | --                                              | 0,75 | 0,4  |
| BRICK NUMBER 4 | 1,5                                     | 1,5 | 3   | 2                                               | 3    | 4    |
| BRICK NUMBER 5 | 0,75                                    | 0,9 | 1,5 | 2                                               | 1,5  | 0,9  |
| BRICK NUMBER 6 | 1,2                                     | 1,2 | 0,9 | 0,9                                             | 1,5  | 0,6  |
| BRICK NUMBER 7 | 0,6                                     | 0,2 | --  | 0,5                                             | 0,3  | 0,75 |
| BRICK NUMBER 8 | 0,6                                     | 1,5 | 1,2 | --                                              | 0,4  | 0,6  |
| BRICK NUMBER 9 | 2,5                                     | 1,5 | 2,5 | 0,6                                             | 1,2  | 0,9  |

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

| BASE MATERIAL  | THREADED RODS<br>TENSION AND SHEAR [kN] |      |      | THREADED METAL SLEEVE<br>TENSION AND SHEAR [kN] |      |      |
|----------------|-----------------------------------------|------|------|-------------------------------------------------|------|------|
|                | M8                                      | M10  | M12  | M8                                              | M10  | M12  |
| BRICK NUMBER 1 | 1                                       | 0,8  | 0,8  | 0,6                                             | 1    | 1    |
| BRICK NUMBER 2 | 0,3                                     | 0,48 | 0,2  | 0,24                                            | 0,3  | 0,36 |
| BRICK NUMBER 3 | 0,3                                     | 0,48 | 0,2  | --                                              | 0,3  | 0,16 |
| BRICK NUMBER 4 | 0,6                                     | 0,6  | 1,2  | 0,8                                             | 1,2  | 1,6  |
| BRICK NUMBER 5 | 0,3                                     | 0,36 | 0,6  | 0,8                                             | 0,6  | 0,36 |
| BRICK NUMBER 6 | 0,48                                    | 0,48 | 0,36 | 0,36                                            | 0,6  | 0,24 |
| BRICK NUMBER 7 | 0,24                                    | 0,08 | --   | 0,2                                             | 0,12 | 0,3  |
| BRICK NUMBER 8 | 0,24                                    | 0,6  | 0,48 | --                                              | 0,16 | 0,24 |
| BRICK NUMBER 9 | 1                                       | 0,6  | 1    | 0,24                                            | 0,48 | 0,36 |

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

| BASE MATERIAL  | THREADED RODS<br>TENSION AND SHEAR [kN] |      |      | THREADED METAL SLEEVE<br>TENSION AND SHEAR [kN] |      |      |
|----------------|-----------------------------------------|------|------|-------------------------------------------------|------|------|
|                | M8                                      | M10  | M12  | M8                                              | M10  | M12  |
| BRICK NUMBER 1 | 0,71                                    | 0,57 | 0,57 | 0,43                                            | 0,71 | 0,71 |
| BRICK NUMBER 2 | 0,21                                    | 0,34 | 0,14 | 0,17                                            | 0,21 | 0,26 |
| BRICK NUMBER 3 | 0,21                                    | 0,34 | 0,14 | --                                              | 0,21 | 0,11 |
| BRICK NUMBER 4 | 0,43                                    | 0,43 | 0,86 | 0,57                                            | 0,86 | 1,14 |
| BRICK NUMBER 5 | 0,21                                    | 0,26 | 0,43 | 0,57                                            | 0,43 | 0,26 |
| BRICK NUMBER 6 | 0,34                                    | 0,34 | 0,26 | 0,26                                            | 0,43 | 0,17 |
| BRICK NUMBER 7 | 0,17                                    | 0,06 | --   | 0,14                                            | 0,09 | 0,21 |
| BRICK NUMBER 8 | 0,17                                    | 0,43 | 0,34 | --                                              | 0,11 | 0,17 |
| BRICK NUMBER 9 | 0,71                                    | 0,43 | 0,71 | 0,17                                            | 0,34 | 0,26 |

## 7. OFFICIAL DOCUMENTATION

The following documents are available through our Sales Department or on our official website: [www.indexfix.com](http://www.indexfix.com):

- MOPU Safety Data Sheet.
- European Technical Assessment ETA 20/0650 for use on non-cracked concrete according to EAD 330449-01-0601 Guide, option 7, for M8 to M24.
- Classified A+ according to French Regulation DEVL11044875A relative to the emission of volatile pollutants for indoor use.
- LEED MOH Certification of sustainability.
- INDEXcal anchor calculation software.
- INDEXmor cartridge calculation needs software