

Injection system FIS VL with threaded rod FIS A in solid and perforated masonry

Permissible loads<sup>1)2)</sup> for a single anchor in masonry for pre-positioned installation. In solid bricks and aerated concrete push-trough installation is also possible. For the design the complete current assessment ETA-15/0263 of 07.07.2020 has to be considered.

|                                                                 | Compressive<br>brick<br>strength | Brick raw<br>density | Minimum brick<br>dimensions <sup>3)</sup> | Effective<br>anchor-<br>age<br>depth | Mini-<br>mum<br>member<br>thick-<br>ness | Maximum<br>installa-<br>tion<br>torque | Permis-<br>sible<br>tensile<br>load <sup>4)</sup> | Permis-<br>sible<br>shear<br>load <sup>4)</sup> | Minimum-<br>spacing <sup>5)</sup>                | Charac-<br>teristic<br>resp.<br>minimum<br>edge dis-<br>tance <sup>6)</sup> |
|-----------------------------------------------------------------|----------------------------------|----------------------|-------------------------------------------|--------------------------------------|------------------------------------------|----------------------------------------|---------------------------------------------------|-------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------|
| Type                                                            | f <sub>b</sub><br>[N/mm²]        | ρ<br>[kg/dm³]        | (L x B x H)<br>[mm]                       | h <sub>ef</sub><br>[mm]              | h <sub>min</sub><br>[mm]                 | T <sub>inst,max</sub><br>[Nm]          | N <sub>perm</sub><br>[kN]                         | V <sub>perm</sub><br>[kN]                       | S <sub>min</sub>    / S <sub>min-L</sub><br>[mm] | c <sub>cr</sub> = c <sub>min</sub><br>[mm]                                  |
| Solid brick Mz, NF, acc. to EN 771-1                            |                                  |                      |                                           |                                      |                                          |                                        |                                                   |                                                 |                                                  |                                                                             |
| M8                                                              | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | <sup>3</sup> 50                      | 115                                      | 10                                     | 1.14                                              | 0.71                                            | 240 / 75                                         | 100                                                                         |
| M10                                                             | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | 80                                   | 115                                      | 10                                     | 1.43                                              | 1.14                                            | 240 / 75                                         | 100                                                                         |
| M10                                                             | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | 200                                  | 240                                      | 10                                     | 3.43                                              | 2.43                                            | 240 / 75                                         | 100                                                                         |
| M12                                                             | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | 80                                   | 115                                      | 10                                     | 1.57                                              | 1.14                                            | 240 / 75                                         | 100                                                                         |
| M12                                                             | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | 200                                  | 240                                      | 10                                     | 2.29                                              | 3.29                                            | 240 / 75                                         | 100                                                                         |
| Solid sand-lime brick KS, acc. to EN 771-2                      |                                  |                      |                                           |                                      |                                          |                                        |                                                   |                                                 |                                                  |                                                                             |
| M8                                                              | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | 50                                   | 115                                      | 5                                      | 1.14                                              | 0.43                                            | 80 / 150                                         | 60                                                                          |
| M8                                                              | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | 100                                  | 240                                      | 5                                      | 2.29                                              | 0.86                                            | 80 / 300                                         | 60                                                                          |
| M10                                                             | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | 100                                  | 240                                      | 15                                     | 1.57                                              | 0.57                                            | 80 / 300                                         | 60                                                                          |
| M10                                                             | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | 200                                  | 240                                      | 15                                     | 3.43                                              | 0.57                                            | 80 / 600                                         | 60                                                                          |
| M12                                                             | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | 100                                  | 240                                      | 15                                     | 1.29                                              | 0.57                                            | 80 / 300                                         | 60                                                                          |
| M12                                                             | ≥ 12                             | ≥ 1.8                | 240 x 115 x 71                            | 200                                  | 240                                      | 15                                     | 3.43                                              | 0.57                                            | 80 / 300                                         | 60                                                                          |
| Perforated sand-lime brick KSL, acc. to EN 771-2 <sup>3)</sup>  |                                  |                      |                                           |                                      |                                          |                                        |                                                   |                                                 |                                                  |                                                                             |
| M8 mit FIS H 12 x 85 K                                          | ≥ 12                             | ≥ 1.4                | 240 x 175 x 113                           | 85                                   | 175                                      | 2                                      | 0.71                                              | 0.71                                            | 100 / 115                                        | 60                                                                          |
| M8 / M10 mit FIS H 16 x 85 K                                    | ≥ 12                             | ≥ 1.4                | 240 x 175 x 113                           | 85                                   | 175                                      | 2                                      | 0.86                                              | 1.29                                            | 100 / 115                                        | 80                                                                          |
| M12 mit FIS H 20 x 85 K                                         | ≥ 12                             | ≥ 1.4                | 240 x 175 x 113                           | 85                                   | 175                                      | 2                                      | 0.86                                              | 1.29                                            | 100 / 115                                        | 80                                                                          |
| M8 / M10 mit FIS H 16 x 130 K                                   | ≥ 12                             | ≥ 1.4                | 240 x 175 x 113                           | 130                                  | 175                                      | 2                                      | 0.86                                              | 1.29                                            | 100 / 115                                        | 80                                                                          |
| Vertically perforated brick H1z, acc. to EN 771-1 <sup>3)</sup> |                                  |                      |                                           |                                      |                                          |                                        |                                                   |                                                 |                                                  |                                                                             |
| M8 mit FIS H 12 x 85 K                                          | ≥ 10                             | ≥ 0.9                | 240 x 175 x 113                           | 85                                   | 175                                      | 2                                      | 1.14                                              | 1.14                                            | 240 / 115                                        | 100                                                                         |
| M8 / M10 mit FIS H 16 x 85 K                                    | ≥ 10                             | ≥ 0.9                | 240 x 175 x 113                           | 85                                   | 175                                      | 2                                      | 1.00                                              | 1.57                                            | 240 / 115                                        | 100                                                                         |
| M12 mit FIS H 20 x 85 K                                         | ≥ 10                             | ≥ 0.9                | 240 x 175 x 113                           | 85                                   | 175                                      | 2                                      | 1.43                                              | 1.71                                            | 240 / 115                                        | 100                                                                         |
| M8 / M10 mit FIS H 16 x 130 K                                   | ≥ 10                             | ≥ 0.9                | 240 x 175 x 113                           | 130                                  | 175                                      | 2                                      | 1.43                                              | 1.57                                            | 240 / 115                                        | 100                                                                         |
| M12 mit FIS H 20 x 130 K                                        | ≥ 10                             | ≥ 0.9                | 240 x 175 x 113                           | 130                                  | 175                                      | 2                                      | 1.43                                              | 1.71                                            | 240 / 115                                        | 100                                                                         |
| Aerated concrete acc. to EN 771-4 <sup>6)</sup>                 |                                  |                      |                                           |                                      |                                          |                                        |                                                   |                                                 |                                                  |                                                                             |
| M8                                                              | ≥ 2                              | ≥ 0.35               | -                                         | ≥ 100                                | 130                                      | 1                                      | 0.54                                              | 0.43                                            | 250 / 250                                        | 100                                                                         |
| M8                                                              | ≥ 4                              | ≥ 0.50               | -                                         | 200                                  | 230                                      | 8                                      | 1.07                                              | 0.71                                            | 80 / 80                                          | 100                                                                         |
| M10                                                             | ≥ 2                              | ≥ 0.35               | -                                         | ≥ 100                                | 130                                      | 2                                      | 0.54                                              | 0.43                                            | 250 / 250                                        | 100                                                                         |
| M10                                                             | ≥ 4                              | ≥ 0.50               | -                                         | 200                                  | 230                                      | 12                                     | 1.79                                              | 0.71                                            | 80 / 80                                          | 100                                                                         |
| M12                                                             | ≥ 2                              | ≥ 0.35               | -                                         | ≥ 100                                | 130                                      | 2                                      | 0.71                                              | 0.54                                            | 250 / 250                                        | 100                                                                         |
| M12                                                             | ≥ 4                              | ≥ 0.50               | -                                         | 200                                  | 230                                      | 16                                     | 1.79                                              | 0.71                                            | 80 / 80                                          | 100                                                                         |

<sup>1)</sup> The required partial safety factors for material resistance as well as a partial safety factor for load actions of γ<sub>L</sub> = 1.4 are considered. Load values are valid for zinc-plated steel, stainless steel R and highly corrosion-resistant steel HCR. In perforated bricks and hollow blocks threaded rod FIS A in combination with anchor sleeve FIS H K.

<sup>2)</sup> The given loads are valid for installation and use of fixations in dry masonry - use category d/d - for temperatures in the substrate up to 50 °C (resp. short term up to 80 °C) and drill hole cleaning according to assessment. The given brick types in combination with the permissible loads are an extract of the assessment.

<sup>3)</sup> More information about, e.g. hole patterns, assortment of anchor sleeves FIS H K see assessment.

<sup>4)</sup> In the case of combinations of tensile and shear loads, bending moments and reduced edge and axial spacings (anchor groups), the design must be carried out in accordance with the provisions of the complete assessment.

<sup>5)</sup> Minimum feasible spacing resp. edge distance. Details as well as to the distances to joints see assessment.

<sup>6)</sup> Cylindrical drill hole.