## LOADS

**Bolt anchor FAZ II**

**Highest permissible loads for a single anchor**[1] in concrete C20/25[4]

For the design the complete approval ETA - 05/0069 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | **minimum effective anchorage depth** $h_{ef,min}$ [mm] | **maximum effective anchorage depth** $h_{ef,max}$ [mm] | **minimum member thickness**[5] $h_{min}$ [mm] | **torque moment** $T_{inst}$ [Nm] | **permissible tensile load** $N_{perm}$[3] [kN] | **permissible shear load** $V_{perm}$[3] [kN] | **min. spacing** $s_{min}$[2] [mm] | **min. edge distance** $c_{min}$[2] [mm] | **permissible tensile load** $N_{perm}$[3] [kN] | **permissible shear load** $V_{perm}$[3] [kN] | **min. spacing** $s_{min}$[2] [mm] | **min. edge distance** $c_{min}$[2] [mm] |
| **FAZ II 8** | | 45 | 100 | 20,0 | 2,4 | 6,9 | 35 | 40 | 4,3 | 6,9 | 40 | 40 |
| **FAZ II 10** | 40 | | 80 | 45,0 | 4,3 | 8,7 | 40 | 45 | 6,1 | 11,4 | 40 | 45 |
| | | 60 | 120 | 45,0 | 4,3 | 11,4 | 40 | 45 | 7,6 | 11,4 | 40 | 45 |
| **FAZ II 12** | 50 | | 100 | 60,0 | 6,1 | 13,9 | 50 | 55 | 8,5 | 16,9 | 50 | 55 |
| | | 70 | 140 | 60,0 | 7,6 | 16,9 | 50 | 55 | 11,9 | 16,9 | 50 | 55 |
| **FAZ II 16** | 65 | | 140 | 110,0 | 9,0 | 20,7 | 65 | 65 | 12,6 | 29,0 | 65 | 65 |
| | | 85 | 170 | 110,0 | 13,4 | 31,4 | 65 | 65 | 18,8 | 31,4 | 65 | 65 |
| **FAZ II 20** | | 100 | 200 | 200,0 | 17,1 | 40,0 | 95 | 85 | 24,0 | 40,0 | 95 | 95 |
| **FAZ II 24** | | 125 | 250 | 270,0 | 24,0 | 49,1 | 100 | 100 | 33,6 | 49,1 | 100 | 135 |

[1] The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$. Accurate data see approval.

[2] Minimum possible axial spacings resp. edge distance while reducing the permissible load for the minimum member thickness ($h_{min} \geqq 2 \times h_{ef}$). The combination of the given min. spacing and min. edge distance is not possible. One of them has to be increased according approval.

[3] For combination of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

[4] For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

[5] According approval the minimum member thickness ($h_{min} \geqq 2 \times h_{ef}$) can be reduced under specific conditions.

## LOADS

**Bolt anchor FAZ II A4**

**Highest permissible loads for a single anchor**[1] in concrete C20/25[4]

For the design the complete approval ETA - 05/0069 has to be considered.

| | | | | | gerissener Beton | | | | ungerissener Beton | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | **minimum effective anchorage depth** $h_{ef,min}$ [mm] | **maximum effective anchorage depth** $h_{ef,max}$ [mm] | **minimum member thickness**[5] $h_{min}$ [mm] | **torque moment** $T_{inst}$ [Nm] | **permissible tensile load** $N_{perm}$[3] [kN] | **permissible shear load** $V_{perm}$[3] [kN] | **min. spacing** $s_{min}$[2] [mm] | **min. edge distance** $c_{min}$[2] [mm] | **permissible tensile load** $N_{perm}$[3] [kN] | **permissible shear load** $V_{perm}$[3] [kN] | **min. spacing** $s_{min}$[2] [mm] | **min. edge distance** $c_{min}$[2] [mm] |
| **FAZ II 8 A4** | | 45 | 100 | 20,0 | 2,4 | 6,9 | 35 | 40 | 4,3 | 6,9 | 40 | 40 |
| **FAZ II 10 A4** | 40 | | 80 | 45,0 | 4,3 | 8,7 | 40 | 45 | 6,1 | 11,4 | 40 | 45 |
| | | 60 | 120 | 45,0 | 4,3 | 11,4 | 40 | 45 | 7,6 | 11,4 | 40 | 45 |
| **FAZ II 12 A4** | 50 | | 100 | 60,0 | 6,1 | 13,9 | 50 | 55 | 8,5 | 16,9 | 50 | 55 |
| | | 70 | 140 | 60,0 | 7,6 | 16,9 | 50 | 55 | 11,9 | 16,9 | 50 | 55 |
| **FAZ II 16 A4** | 65 | | 140 | 110,0 | 9,0 | 20,7 | 65 | 65 | 12,6 | 29,0 | 65 | 65 |
| | | 85 | 170 | 110,0 | 13,4 | 31,4 | 65 | 65 | 18,8 | 31,4 | 65 | 65 |
| **FAZ II 20 A4** | | 100 | 200 | 200,0 | 17,1 | 40,0 | 95 | 85 | 24,0 | 40,0 | 95 | 95 |
| **FAZ II 24 A4** | | 125 | 250 | 270,0 | 24,0 | 49,1 | 100 | 100 | 33,6 | 49,1 | 100 | 135 |

[1] The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$. Accurate data see approval.

[2] Minimum possible axial spacings resp. edge distance while reducing the permissible load for the minimum member thickness ($h_{min} \geqq 2 \times h_{ef}$). The combination of the given min. spacing and min. edge distance is not possible. One of them has to be increased according approval.

[3] For combination of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

[4] For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

[5] According approval the minimum member thickness ($h_{min} \geqq 2 \times h_{ef}$) can be reduced under specific conditions.

## LOADS

**Bolt anchor FAZ II C**

**Highest permissible loads for a single anchor**[1] in concrete C20/25[4]

For the design the complete approval ETA - 05/0069 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | **minimum effective anchorage depth** $h_{ef,min}$ [mm] | **maximum effective anchorage depth** $h_{ef,max}$ [mm] | **minimum member thickness**[5] $h_{min}$ [mm] | **torque moment** $T_{inst}$ [Nm] | **permissible tensile load** $N_{perm}$[3] [kN] | **permissible shear load** $V_{perm}$[3] [kN] | **min. spacing** $s_{min}$[2] [mm] | **min. edge distance** $c_{min}$[2] [mm] | **permissible tensile load** $N_{perm}$[3] [kN] | **permissible shear load** $V_{perm}$[3] [kN] | **min. spacing** $s_{min}$[2] [mm] | **min. edge distance** $c_{min}$[2] [mm] |
| **FAZ II 8 C** | | 45 | 100 | 20,0 | 2,4 | 6,9 | 35 | 40 | 4,3 | 6,9 | 40 | 40 |
| **FAZ II 10 C** | 40 | | 80 | 45,0 | 4,3 | 8,7 | 40 | 45 | 6,1 | 11,4 | 40 | 45 |
| | | 60 | 120 | 45,0 | 4,3 | 11,4 | 40 | 45 | 7,6 | 11,4 | 40 | 45 |
| **FAZ II 12 C** | 50 | | 100 | 60,0 | 6,1 | 13,9 | 50 | 55 | 8,5 | 16,9 | 50 | 55 |
| | | 70 | 140 | 60,0 | 7,6 | 16,9 | 50 | 55 | 11,9 | 16,9 | 50 | 55 |
| **FAZ II 16 C** | 65 | | 140 | 110,0 | 9,0 | 20,7 | 65 | 65 | 12,6 | 29,0 | 65 | 65 |
| | | 85 | 170 | 110,0 | 13,4 | 31,4 | 65 | 65 | 18,8 | 31,4 | 65 | 65 |
| **FAZ II 20 C** | | 100 | 200 | 200,0 | 17,1 | 40,0 | 95 | 85 | 24,0 | 40,0 | 95 | 95 |
| **FAZ II 24 C** | | 125 | 250 | 270,0 | 24,0 | 49,1 | 100 | 100 | 33,6 | 49,1 | 100 | 135 |

[1] The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$. Accurate data see approval.

[2] Minimum possible axial spacings resp. edge distance while reducing the permissible load for the minimum member thickness ($h_{min} \geqq 2 \times h_{ef}$). The combination of the given min. spacing and min. edge distance is not possible. One of them has to be increased according approval.

[3] For combination of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

[4] For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

[5] According approval the minimum member thickness ($h_{min} \geqq 2 \times h_{ef}$) can be reduced under specific conditions.