

Bolt anchor FAZ II

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

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

| 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] | Cracked concrete | | | | Non-cracked concrete | | | |
|------------------|-----------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------|----------------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------|----------------------------------------------|
| | | | | | 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 | 45 | 55 | 8,5 | 16,9 | 50 | 55 |
| | | 70 | 140 | 60,0 | 7,6 | 16,9 | 45 | 55 | 11,9 | 16,9 | 50 | 55 |
| FAZ II 16 | 65 | | 140 | 110,0 | 9,0 | 20,7 | 60 | 65 | 12,6 | 29,0 | 60 | 65 |
| | | 85 | 170 | 110,0 | 13,4 | 31,4 | 60 | 65 | 18,8 | 31,4 | 60 | 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 a 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 ($h_{min} \geq 2 \times h_{ef}$). 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 ($h_{min} \geq 2 \times h_{ef}$) can be reduced under specific conditions.

Bolt anchor FAZ II A4

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

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

| 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] | gerissener Beton | | | | ungerissener Beton | | | |
|---------------------|-----------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------|----------------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------|----------------------------------------------|
| | | | | | 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 | 45 | 55 | 8,5 | 16,9 | 50 | 55 |
| | | 70 | 140 | 60,0 | 7,6 | 16,9 | 45 | 55 | 11,9 | 16,9 | 50 | 55 |
| FAZ II 16 A4 | 65 | | 140 | 110,0 | 9,0 | 20,7 | 60 | 65 | 12,6 | 29,0 | 60 | 65 |
| | | 85 | 170 | 110,0 | 13,4 | 31,4 | 60 | 65 | 18,8 | 31,4 | 60 | 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 ($h_{min} \geq 2 \times h_{ef}$). 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 ($h_{min} \geq 2 \times h_{ef}$) can be reduced under specific conditions.

Bolt anchor FAZ II C

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

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

| 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] | Cracked concrete | | | | Non-cracked concrete | | | |
|--------------------|-----------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------|----------------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------|----------------------------------------------|
| | | | | | 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 | 45 | 55 | 8,5 | 16,9 | 50 | 55 |
| | | 70 | 140 | 60,0 | 7,6 | 16,9 | 45 | 55 | 11,9 | 16,9 | 50 | 55 |
| FAZ II 16 C | 65 | | 140 | 110,0 | 9,0 | 20,7 | 60 | 65 | 12,6 | 29,0 | 60 | 65 |
| | | 85 | 170 | 110,0 | 13,4 | 31,4 | 60 | 65 | 18,8 | 31,4 | 60 | 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 a 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 ($h_{min} \geq 2 \times h_{ef}$). 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 ($h_{min} \geq 2 \times h_{ef}$) can be reduced under specific conditions.

Bolt anchor FAZ II GS

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

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

| 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] | Cracked concrete | | | | Non-cracked concrete | | | |
|---------------------|-----------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------|----------------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------|----------------------------------------------|
| | | | | | 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 GS | | 45 | 100 | 20,0 | 2,4 | 6,9 | 35 | 40 | 4,3 | 6,9 | 40 | 40 |
| FAZ II 10 GS | 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 GS | 50 | | 100 | 60,0 | 6,1 | 13,9 | 45 | 55 | 8,5 | 16,9 | 50 | 55 |
| | | 70 | 140 | 60,0 | 7,6 | 16,9 | 45 | 55 | 11,9 | 16,9 | 50 | 55 |
| FAZ II 16 GS | 65 | | 140 | 110,0 | 9,0 | 20,7 | 60 | 65 | 12,6 | 29,0 | 60 | 65 |
| | | 85 | 170 | 110,0 | 13,4 | 31,4 | 60 | 65 | 18,8 | 31,4 | 60 | 65 |

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 a 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 ($h_{min} \geq 2 \times h_{ef}$). 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 ($h_{min} \geq 2 \times h_{ef}$) can be reduced under specific conditions.

Bolt anchor FAZ II GS A4

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

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

| 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] | Cracked concrete | | | | Non-cracked concrete | | | |
|------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------|----------------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------|----------------------------------------------|
| | | | | | 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 GS A4 | | 45 | 100 | 20,0 | 2,4 | 6,9 | 35 | 40 | 4,3 | 6,9 | 40 | 40 |
| FAZ II 10 GS 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 GS A4 | 50 | | 100 | 60,0 | 6,1 | 13,9 | 45 | 55 | 8,5 | 16,9 | 50 | 55 |
| | | 70 | 140 | 60,0 | 7,6 | 16,9 | 45 | 55 | 11,9 | 16,9 | 50 | 55 |
| FAZ II 16 GS A4 | 65 | | 140 | 110,0 | 9,0 | 20,7 | 60 | 65 | 12,6 | 29,0 | 60 | 65 |
| | | 85 | 170 | 110,0 | 13,4 | 31,4 | 60 | 65 | 18,8 | 31,4 | 60 | 65 |

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 a 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.

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