

Injection System VMU plus

| Installation parameters in solid base material (without Perfo Sleeve) | | | | | |
|---|---------|------------------------------|------------------------------|------------------------------|------------------------------|
| Threaded Stud ¹⁾ : Steel: ≥ FKL 5.8, A4, HCR: ≥ FKL 70 | | M8 | M10 | M12 | M16 |
| Drill hole diameter d_o | [mm] | 10 | 12 | 14 | 18 |
| Depth of drill hole h_o | [mm] | 80 | 90 | 100 | 100 |
| Clearance hole in the fixture $d_f \leq$ | [mm] | 9 | 12 | 14 | 18 |
| Drill hole diameter $d_b \geq$ | [mm] | 12 | 14 | 16 | 20 |
| Installation torque $T_{inst,max}$ | [Nm] | 2 (14 für Mauerziegel Mz-DF) | 2 (14 für Mauerziegel Mz-DF) | 2 (14 für Mauerziegel Mz-DF) | 2 (14 für Mauerziegel Mz-DF) |
| Amount of mortat per drill hole | [ml] | 5,2 | 7,3 | 9,8 | 13,6 |
| Drill holes per cartridge VMU plus 280 | [Stück] | 46 | 33 | 24 | 18 |

¹⁾ Installation permissible with perforated sleeve allowed; technical values, see ETA-17/0307

Extract from Permissible Service Conditions of ETA-17/0307

Approved loads for single anchor without influence of spacing and edge distance. Butt joint and horizontal joint with mortar. Total safety factor as per ETAG included (γ_M and γ_F). (Temperature range +25°C to +40°C - use category dry/dry)

| Solid base material without Perfo Sleeve ¹⁾ | | | | | | |
|---|------------------------------|------|-----------------|-----------------|-----------------|-----------------|
| Clay solid brick Mz-DF according EN 771-1, Bulk density ρ : 1,6 kg/dm ³ , Minimum brock size: 240x115x55 mm (e.g. Unipor) | | | | | | |
| Threaded Stud ¹⁾ : Steel: ≥ FKL 5.8, A4, HCR: ≥ FKL 70 | | | M8 | M10 | M12 | M16 |
| Anchoring depth h_{ef} | | [mm] | 80 | 90 | 100 | 100 |
| Spacing s_{cr} | | [mm] | 240 | 270 | 300 | 300 |
| Minimum Spacing s_{min} | | [mm] | 120 | 120 | 120 | 120 |
| Edge distance c_{cr} | | [mm] | 120 | 135 | 150 | 150 |
| Minimum edge distance c_{min} | | [mm] | 60 | 60 | 60 | 60 |
| Min. thickness of base material (masonry) h_{min} | | [mm] | 110 | 120 | 130 | 130 |
| Approved tension load für compressive strength zul. N | $f_b \geq 10 \text{ N/mm}^2$ | [kN] | 1,00 | 1,00 | 1,14 | 1,14 |
| Approved tension load für compressive strength zul. N | $f_b \geq 20 \text{ N/mm}^2$ | [kN] | 1,29 | 1,57 | 1,71 | 1,71 |
| Approved tension load für compressive strength zul. N | $f_b \geq 28 \text{ N/mm}^2$ | [kN] | 1,57 | 1,71 | 1,94 | 1,94 |
| Approved shear load for compressive strength zul. V | $f_b \geq 10 \text{ N/mm}^2$ | [kN] | 1,00 | 1,00 | 1,00 | 1,57 |
| Approved shear load for compressive strength zul. V | $f_b \geq 20 \text{ N/mm}^2$ | [kN] | 1,43 | 1,43 | 1,43 | 2,29 |
| Approved shear load for compressive strength zul. V | $f_b \geq 28 \text{ N/mm}^2$ | [kN] | 1,57 | 1,57 | 1,57 | 2,57 |
| Drilling method | | | Hammer drilling | Hammer drilling | Hammer drilling | Hammer drilling |

Injection System VMU plus

| Calcium silicate solid brick KS-NF according EN 771-2, Bulk density ρ: 2,0 kg/dm³, Minimum brock size: 240x115x71 mm (e.g. Wemding) | | | | | | |
|---|---------------------------------|------|-----------------|-----------------|-----------------|-----------------|
| Threaded Stud¹⁾: Steel: \geq FKL 5.8, A4, HCR: \geq FKL 70 | | | M8 | M10 | M12 | M16 |
| Anchoring depth h_{ef} | | [mm] | 80 | 90 | 100 | 100 |
| Spacing s_{cr} | | [mm] | 240 | 270 | 300 | 300 |
| Minimum Spacing s_{min} | | [mm] | 120 | 120 | 120 | 120 |
| Edge distance c_{cr} | | [mm] | 120 | 135 | 150 | 150 |
| Minimum edge distance c_{min} | | [mm] | 60 | 60 | 60 | 60 |
| Min. thickness of base material (masonry) h_{min} | | [mm] | 110 | 120 | 130 | 130 |
| Approved tension load für compressive strength zul. N | $f_b \geq 10$ N/mm ² | [kN] | 1,29 | 1,29 | 1,29 | 1,00 |
| Approved tension load für compressive strength zul. N | $f_b \geq 20$ N/mm ² | [kN] | 1,71 | 1,71 | 1,71 | 1,43 |
| Approved tension load für compressive strength zul. N | $f_b \geq 27$ N/mm ² | [kN] | 2,00 | 2,00 | 2,00 | 1,71 |
| Approved shear load for compressive strength zul. V | $f_b \geq 10$ N/mm ² | [kN] | 0,71 | 0,86 | 0,71 | 0,71 |
| Approved shear load for compressive strength zul. V | $f_b \geq 20$ N/mm ² | [kN] | 1,14 | 1,29 | 1,14 | 1,14 |
| Approved shear load for compressive strength zul. V | $f_b \geq 27$ N/mm ² | [kN] | 1,29 | 1,57 | 1,29 | 1,29 |
| Drilling method | | | Hammer drilling | Hammer drilling | Hammer drilling | Hammer drilling |

| Brickwork of solid lightweight concrete according EN 771-3, Bulk density ρ: 0,6 kg/dm³, Minimum brock size: 300x123x248 mm (e.g. Bisotherm) | | | | | | |
|---|--------------------------------|------|-----------------|-----------------|-----------------|-----------------|
| Threaded Stud¹⁾: Steel: \geq FKL 5.8, A4, HCR: \geq FKL 70 | | | M8 | M10 | M12 | M16 |
| Anchoring depth h_{ef} | | [mm] | 80 | 90 | 100 | 100 |
| Spacing s_{cr} | | [mm] | 240 | 270 | 300 | 300 |
| Minimum Spacing s_{min} | | [mm] | 120 | 120 | 120 | 120 |
| Edge distance c_{cr} | | [mm] | 120 | 135 | 150 | 150 |
| Minimum edge distance c_{min} | | [mm] | 60 | 60 | 60 | 60 |
| Min. thickness of base material (masonry) h_{min} | | [mm] | 110 | 120 | 130 | 130 |
| Approved tension load für compressive strength zul. N | $f_b \geq 6$ N/mm ² | [kN] | 0,86 | 0,86 | 1,00 | 0,86 |
| Approved shear load for compressive strength zul. V | $f_b \geq 6$ N/mm ² | [kN] | 0,86 | 0,86 | 0,86 | 0,86 |
| Drilling method | | | Rotary drilling | Rotary drilling | Rotary drilling | Rotary drilling |

| Autoclaved aerated concrete AAC6 gemäß EN 771-4, Bulk density ρ : 0,6 kg/dm ³ , Minimum brock size: 499x240x249 mm (e.g. Porit) | | | | | | |
|---|-----------------------------|------|-----------------|-----------------|-----------------|-----------------|
| Threaded Stud ¹⁾ : Steel: \geq FKL 5.8, A4, HCR: \geq FKL 70 | | | M8 | M10 | M12 | M16 |
| Anchoring depth h_{ef} | | [mm] | 80 | 90 | 100 | 100 |
| Spacing s_{cr} | | [mm] | 240 | 270 | 300 | 300 |
| Minimum Spacing s_{min} | | [mm] | 100 | 100 | 100 | 100 |
| Edge distance c_{cr} | | [mm] | 120 | 135 | 150 | 150 |
| Minimum edge distance $c_{min,N}$ | | [mm] | 75 | 75 | 75 | 75 |
| Minimum edge distance $c_{min,v,II}$ ²⁾ | | [mm] | 75 | 75 | 75 | 75 |
| Minimum edge distance $c_{min,v,I}$ ³⁾ | | [mm] | 120 | 135 | 150 | 150 |
| Min. thickness of base material (masonry) h_{min} | | [mm] | 110 | 120 | 130 | 130 |
| Approved tension load für compressive strength zul. N | $f_b \geq 2 \text{ N/mm}^2$ | [kN] | 0,89 | 1,43 | 1,79 | 2,32 |
| Approved shear load for compressive strength zul. V | $f_b \geq 2 \text{ N/mm}^2$ | [kN] | 2,14 | 3,57 | 3,57 | 3,57 |
| Drilling method | | | Rotary drilling | Rotary drilling | Rotary drilling | Rotary drilling |

¹⁾ Installation permissible with perforated sleeve allowed; technical values, see ETA-17/0307

²⁾ Minimum edge distance $c_{min,v,II}$ for shear loads parallel to free edge

³⁾ Minimum edge distance $c_{min,v,I}$ for shear loads perpendicular to free edge

