Injection System VMU plus

Installation parameter in solid brickwork with a Perfo Sleeve						
Threades Stud[1)]: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70		M8	M8 / M10	M8 / M10	M12 / M16	M12 / M16
Perfo Sleeve VM-SH		12x80	16x85	16x130	20x85	20x130
Drill hole diameter do	[mm]	12	16	16	20	20
Depth of drill hole ho	[mm]	85	90	135	90	135
Clearance hole in the fixture df ≤	[mm]	9	9 / 12	9 / 12	14 / 18	14 / 18
Drill hole diameter db ≥	[mm]	14	18	18	22	22
Installation torque Tinst,max	[Nm]	2	2	2	2	2
Amount of mortar per drill hole	[ml]	11,2	24,9	38,0	41,1	62,9
Drill hoels per cartridge VMU plus 280	[Stück]	21	9	6	5	3
Drilling method		Rotary drilling	Rotary drilling	Rotary drilling	Rotary drilling	Rotary drilling

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 categroy dry/dry)

Perforated brick with Perfo Sleeve							
Clay hollow brick Protherm Homebric according EN 771-1, Bulk density ρ: 0,7 kg/dm3, Minimum brick size: 500x200x299mm (e.g. Wienerberger)							
Threades Stud: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			M8	M8 / M10	M8 / M10	M12 / M16	M12 / M16
Perfo Sleeve VM-SH			12x80	16x85	16x130	20x85	20x130
Anchorage depth h_{ef}		[mm]	80	85	130	85	130
Spacing parallel to horizontal joint $s_{cr,II}$		[mm]	500	500	500	500	500
Spacing perpendicular to horizontal joint $s_{cr,\perp}$		[mm]	300	300	300	300	300
Minimum Spacing s_{min}		[mm]	100	100	100	100	100
Edge distance c_{cr}		[mm]	100	100	100	120	120
Minimum edge distance c_{min} [1)]		[mm]	100	100	100	120	120
Min. thickness of base material (masonry) h_{min}		[mm]	115	115	175	115	175
Approved tension load für compressive strength zul. N	f_b ≥ 4 N/mm²	[kN]	0,26	0,26	0,34	0,26	0,34
Approved tension load für compressive strength zul. N	f_b ≥ 6 N/mm²	[kN]	0,26	0,26	0,34	0,26	0,34
Approved tension load für compressive strength zul. N	f_b ≥ 10 N/mm²	[kN]	0,34	0,34	0,43	0,34	0,43
Approved shear load for compressive strength zul. V	f_b ≥ 4 N/mm²	[kN]	0,57	0,57	0,57	0,71	0,71
Approved shear load for compressive strength zul. V	f_b ≥ 6 N/mm²	[kN]	0,71	0,71	0,71	0,86	0,86
Approved shear load for compressive strength zul. V	f_b ≥ 10 N/mm²	[kN]	0,86	0,86	1,00	1,14	1,14

Injection System VMU plus

Clay hollow brick BGV Thermo according EN 771-1, Bulk density ρ: 0,8 kg/dm3, Minimum brick size: 497x240x238 mm (e.g. Unipor)							
Threades Stud: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			**M8**	**M8 / M10**	**M8 / M10**	**M12 / M16**	**M12 / M16**
Perfo Sleeve VM-SH			12x80	16x85	16x130	20x85	20x130
Anchorage depth h_{ef}		[mm]	80	85	130	85	130
Spacing parallel to horizontal joint $s_{cr,II}$		[mm]	497	497	497	497	497
Spacing perpendicular to horizontal joint $s_{cr,\perp}$		[mm]	238	238	238	238	238
Minimum Spacing s_{min}		[mm]	100	100	100	100	100
Edge distance c_{cr}		[mm]	100	100	100	120	120
Minimum edge distance c_{min} [1)]		[mm]	100	100	100	120	120
Min. thickness of base material (masonry) h_{min}		[mm]	115	115	175	115	175
Approved tension load für compressive strength zul. N	$f_b \geq 6$ N/mm²	[kN]	0,71	0,71	1,00	0,71	1,00
Approved tension load für compressive strength zul. N	$f_b \geq 8$ N/mm²	[kN]	0,86	0,86	1,29	0,86	1,29
Approved tension load für compressive strength zul. N	$f_b \geq 12$ N/mm²	[kN]	1,00	1,00	1,43	1,00	1,43
Approved tension load für compressive strength zul. N	$f_b \geq 14$ N/mm²	[kN]	1,14	1,14	1,57	1,14	1,57
Approved shear load for compressive strength zul. V	$f_b \geq 6$ N/mm²	[kN]	0,71	1,29	1,29	1,43	1,71
Approved shear load for compressive strength zul. V	$f_b \geq 8$ N/mm²	[kN]	0,86	1,57	1,57	1,71	2,00
Approved shear load for compressive strength zul. V	$f_b \geq 12$ N/mm²	[kN]	1,14	1,86	1,86	2,00	2,57
Approved shear load for compressive strength zul. V	$f_b \geq 14$ N/mm²	[kN]	1,14	1,86	1,86	2,00	2,57

Clay hollow brick Doppio Uni according EN 771-1, Bulk density ρ: 0,9 kg/dm3, Minimum brick size: 250x120x120 mm (z.B. Wienerberger)							
Threades Stud: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			**M8**	**M8 / M10**	**M8 / M10**	**M12 / M16**	**M12 / M16**
Perfo Sleeve VM-SH			12x80	16x85	16x130	20x85	20x130
Anchorage depth h_{ef}		[mm]	80	85	130	85	130
Spacing parallel to horizontal joint $s_{cr,II}$		[mm]	250	250	250	250	250
Spacing perpendicular to horizontal joint $s_{cr,\perp}$		[mm]	120	120	120	120	120
Min. spacing parallel to horizontal joint $s_{min,II}$		[mm]	100	100	100	100	100
Min. perpendicular to horizontal joint spacing $s_{min,\perp}$		[mm]	120	120	120	120	120
Edge distance c_{cr}		[mm]	100	100	100	120	120
Minimum edge distance c_{min} [1)]		[mm]	60	60	60	60	60
Min. thickness of base material (masonry) h_{min}		[mm]	115	115	175	115	115
Approved tension load für compressive strength zul. N	$f_b \geq 10$ N/mm²	[kN]	0,17	0,17	0,17	0,17	0,17
Approved tension load für compressive strength zul. N	$f_b \geq 16$ N/mm²	[kN]	0,21	0,21	0,21	0,21	0,21
Approved tension load für compressive strength zul. N	$f_b \geq 20$ N/mm²	[kN]	0,26	0,26	0,26	0,26	0,26
Approved tension load für compressive strength zul. N	$f_b \geq 28$ N/mm²	[kN]	0,34	0,34	0,34	0,34	0,34
Approved shear load for compressive strength zul. V	$f_b \geq 10$ N/mm²	[kN]	0,43	0,43	0,43	0,43	0,43
Approved shear load for compressive strength zul. V	$f_b \geq 16$ N/mm²	[kN]	0,57	0,57	0,57	0,57	0,57
Approved shear load for compressive strength zul. V	$f_b \geq 20$ N/mm²	[kN]	0,57	0,57	0,57	0,57	0,57
Approved shear load for compressive strength zul. V	$f_b \geq 28$ N/mm²	[kN]	0,71	0,71	0,71	0,71	0,71

Injection System VMU plus

Calcium silicate hollow brick KSL-3DF according EN 771-2, Bulk density ρ: 1,4 kg/dm3, Minimum brick size: 240x175x113 mm (e.g. Wemding)							
Threades Stud: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			**M8**	**M8 / M10**	**M8 / M10**	**M12 / M16**	**M12 / M16**
Perfo Sleeve VM-SH			12x80	16x85	16x130	20x85	20x130
Anchorage depth h_{ef}		[mm]	80	85	130	85	130
Spacing parallel to horizontal joint $s_{cr,II}$		[mm]	240	240	240	240	240
Spacing perpendicular to horizontal joint $s_{cr,\perp}$		[mm]	120	120	120	120	120
Minimum Spacing s_{min}		[mm]	120	120	120	120	120
Edge distance c_{cr}		[mm]	100	100	100	120	120
Minimum edge distance c_{min}		[mm]	60	60	60	60	60
Min. thickness of base material (masonry) h_{min}		[mm]	115	115	175	115	175
Approved tension load für compressive strength zul. N	$f_b \geq 8$ N/mm²	[kN]	0,43	0,43	0,43	1,29	1,29
Approved tension load für compressive strength zul. N	$f_b \geq 12$ N/mm²	[kN]	0,57	0,57	0,71	1,71	1,71
Approved tension load für compressive strength zul. N	$f_b \geq 14$ N/mm²	[kN]	0,71	0,71	0,71	1,86	1,86
Approved shear load for compressive strength zul. V	$f_b \geq 8$ N/mm²	[kN]	0,71	1,14	1,14	1,14	1,14
Approved shear load for compressive strength zul. V	$f_b \geq 12$ N/mm²	[kN]	0,86	1,29	1,29	1,29	1,29
Approved shear load for compressive strength zul. V	$f_b \geq 14$ N/mm²	[kN]	1,00	1,71	1,71	1,71	1,71

Calcium silicate hollow brick KSL-12DF according EN 771-2, Bulk density ρ: 1,4 kg/dm3, Minimum brick size: 498x175x238 mm (e.g. Wemding)							
Threades Stud: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			**M8**	**M8 / M10**	**M8 / M10**	**M12 / M16**	**M12 / M16**
Perfo Sleeve VM-SH			12x80	16x85	16x130	20x85	20x130
Anchorage depth h_{ef}		[mm]	80	85	130	85	130
Spacing parallel to horizontal joint $s_{cr,II}$		[mm]	498	498	498	498	498
Spacing perpendicular to horizontal joint $s_{cr,\perp}$		[mm]	238	238	238	238	238
Minimum Spacing s_{min}		[mm]	120	120	120	120	120
Edge distance c_{cr}		[mm]	100	100	100	120	120
Minimum edge distance c_{min}		[mm]	100	100	100	120	120
Min. thickness of base material (masonry) h_{min}		[mm]	115	115	175	115	175
Approved tension load für compressive strength zul. N	$f_b \geq 10$ N/mm²	[kN]	0,17	0,17	0,71	0,43	0,71
Approved tension load für compressive strength zul. N	$f_b \geq 12$ N/mm²	[kN]	0,21	0,21	0,86	0,43	0,86
Approved tension load für compressive strength zul. N	$f_b \geq 16$ N/mm²	[kN]	0,26	0,26	1,14	0,57	1,14
Approved shear load for compressive strength zul. V	$f_b \geq 10$ N/mm²	[kN]	0,71	1,57	1,57	1,57	1,57
Approved shear load for compressive strength zul. V	$f_b \geq 12$ N/mm²	[kN]	0,86	1,86	1,86	1,86	1,86
Approved shear load for compressive strength zul. V	$f_b \geq 16$ N/mm²	[kN]	1,00	2,29	2,29	2,29	2,29

Hollow lightweight concrete Bloc creux B40 according EN 771-3, Bulk density ρ: 0,8 kg/dm3, Minimum brick size: 494x200x190 mm (e.g. Sepa)							
Threades Stud: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			**M8**	**M8 / M10**	**M8 / M10**	**M12 /M16**	**M12 /M16**
Perfo Sleeve VM-SH			12x80	16x85	16x130	20x85	20x130
Anchorage depth h_{ef}		[mm]	80	85	130	85	130
Spacing parallel to horizontal joint $s_{cr,II}$		[mm]	494	494	494	494	494
Spacing perpendicular to horizontal joint $s_{cr,\ I}$		[mm]	190	190	190	190	190
Minimum Spacing s_{min}		[mm]	100	100	100	100	100
Edge distance c_{cr}		[mm]	100	100	100	120	120
Minimum edge distance c_{min}		[mm]	100	100	100	120	120
Min. thickness of base material (masonry) h_{min}		[mm]	115	115	175	115	175
Approved tension load für compressive strength zul. N	$f_b \geq 4$ N/mm²	[kN]	0,34	0,34	0,34	0,34	0,34
Approved shear load for compressive strength zul. V	$f_b \geq 4$ N/mm²	[kN]	0,86	0,86	0,86	0,86	0,86

[1] For $V_{rk,c}$:c_{min} see ETAG 029, Annex C