

Fastening injection system

ResiFIX VY

ECO SF



Approvals and certificates



Class A+: Lowest emissions of critical substances in closed spaces

- Harmless to health after curing



Sustainability certification LEED

- Environmentally friendly, low-pollutant, low-emission and sustainable construction product



European Technical Assessment Option 1 for cracked (M8 - M16) and non-cracked concrete (M8 - M24)

- For a wide range of safety critical applications



Usage under seismic conditions

- Tested for use in areas with high risk of earthquakes



Two mixing nozzles are included with every cartridge

- You can continue working immediately after an interruption



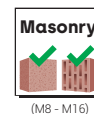
Usage also in water-filled drill holes

- Extended range of applications



Good load values in concrete and masonry

- Multi-material usage



European Technical Assessment for masonry (M8 - M16)

- For more application flexibility





Styrene free

- Reduced odour exposure

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Vynylester VY ECO SF (styrene free)

Type	Art-No	Content [ml]	Mixings nozzles included [pcs]	Shelf life [months]		€ / pc	 [pcs]
VY ECO 300 SF	300VYECOSF	300	2	12	●		12
VY ECO 410 SF	410VYECOSF	410	1	18	●		12

Curing times ResiFIX Vynylester VY ECO SF

Temperature of building material		> -5	> 0	> +5	> +10	> +20	> +30	> +40
Max. working time	[min]	90	45	25	20	6	4	2
Min. curing time ²⁾	[min]	6h	3h	2h	100	45	25	20

¹⁾ Cartridge temperature min. 15 °C

²⁾ Double curing time in wet concrete

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Fastening in concrete

Permissible loads F_{per} in [kN] in non-cracked concrete C20/25 (Option 7) and cracked concrete C20/25 (Option 1) without influence of spacing and edge distance, installation parameters and unit dimensions. Total safety factors as per ETAG 001 included (γ_M and γ_p). Design according to TR029. See ETA assessment for design and calculations.

Anchor studs RESI AST, VA AST	M8	M10	M12	M16	M20	M24
Drill hole \varnothing d_0 [mm]	10	12	14	18	24	28
Anchorage depth $h_{ef,min}/h_{ef,stand}/h_{ef,max}$ [mm]	60 / 80 / 160	60 / 90 / 200	70 / 110 / 240	80 / 125 / 320	90 / 170 / 400	96 / 210 / 480

Permissible tension load ^{1) 2)} [24 °C / 40 °C] ³⁾ in non-cracked concrete (dry or wet)

	N_{per} [kN]	M8	M10	M12	M16	M20	M24
Zinc plated 5.8		5,1 / 6,8 / 8,7	6,0 / 9,0 / 13,8	8,4 / 13,2 / 20,0	12,8 / 19,9 / 37,3	17,1 / 33,9 / 58,3	18,8 / 50,3 / 83,9
Stainless steel A4		5,1 / 6,8 / 9,8	6,0 / 9,0 / 15,5	8,4 / 13,2 / 22,5	12,8 / 19,9 / 41,9	17,1 / 33,9 / 65,5	18,8 / 50,3 / 94,3

Permissible tension load ^{1) 2)} [24 °C / 40 °C] ³⁾ in cracked concrete (dry or wet)

	N_{per} [kN]	M8	M10	M12	M16	M20	M24
Zinc plated 5.8		2,7 / 3,6 / 7,2	3,4 / 5,0 / 11,2	4,7 / 7,4 / 16,2	7,2 / 11,2 / 28,7	–	–
Stainless steel A4		2,7 / 3,6 / 7,2	3,4 / 5,0 / 11,2	4,7 / 7,4 / 16,2	7,2 / 11,2 / 28,7	–	–

Permissible tension load ^{1) 2)} [50 °C / 80 °C] ³⁾ in non-cracked concrete (dry or wet)

	N_{per} [kN]	M8	M10	M12	M16	M20	M24
Zinc plated 5.8		3,9 / 5,2 / 8,7	4,5 / 6,7 / 13,8	6,3 / 9,9 / 20,0	9,6 / 15,0 / 37,3	13,5 / 25,4 / 58,3	17,2 / 37,7 / 83,9
Stainless steel A4		3,9 / 5,2 / 9,8	4,5 / 6,7 / 15,0	6,3 / 9,9 / 21,5	9,6 / 15,0 / 38,3	13,5 / 25,4 / 59,8	17,2 / 37,7 / 86,2

Permissible tension load ^{1) 2)} [50 °C / 80 °C] ³⁾ in cracked concrete (dry or wet)

	N_{per} [kN]	M8	M10	M12	M16	M20	M24
Zinc plated 5.8		2,1 / 2,8 / 5,6	2,6 / 3,9 / 8,7	3,7 / 5,8 / 12,6	5,6 / 8,7 / 22,3	–	–
Stainless steel A4		2,1 / 2,8 / 5,6	2,6 / 3,9 / 8,7	3,7 / 5,8 / 12,6	5,6 / 8,7 / 22,3	–	–

Permissible shear load ¹⁾ in non-cracked concrete

	V_{per} [kN]	M8	M10	M12	M16	M20	M24
Zinc plated 5.8		5,2	8,3	12,0	22,4	35,0	45,2 / 50,4 / 50,4
Stainless steel A4		5,9	9,3	13,5	25,1	39,2	45,2 / 56,5 / 56,5

Permissible shear load ¹⁾ in cracked concrete

	V_{per} [kN]	M8	M10	M12	M16	M20	M24
Zinc plated 5.8		5,2 / 5,2 / 5,2	8,1 / 8,3 / 8,3	11,3 / 12,0 / 12,0	17,2 / 22,4 / 22,4	–	–
Stainless steel A4		5,9 / 5,9 / 5,9	8,1 / 9,3 / 9,3	11,3 / 13,5 / 13,5	17,2 / 25,1 / 25,1	–	–

	M_{per} [Nm]	M8	M10	M12	M16	M20	M24
Permissible bending moment (Zinc plated 5.8)		10,7	21,4	37,4	94,9	185,2	320,0
Permissible bending moment (Stainless steel A4)		12,0	24,0	41,9	106,4	207,8	359,0

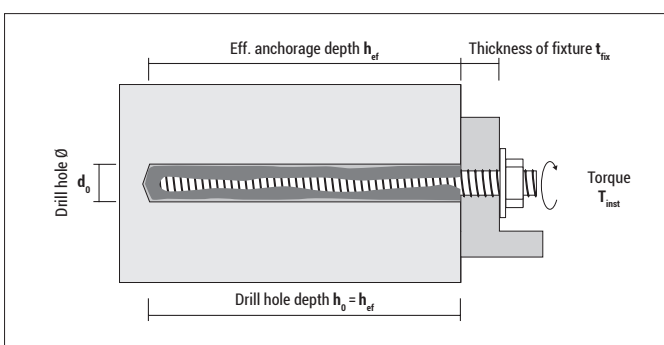
Spacing and edge distance

	$s_{cr,N}$ [mm]	M8	M10	M12	M16	M20	M24
Spacing		180 / 240 / 480	180 / 270 / 600	210 / 330 / 720	240 / 375 / 960	270 / 510 / 1200	288 / 630 / 1440
Edge distance		90 / 120 / 240	90 / 135 / 300	105 / 165 / 360	120 / 188 / 480	135 / 255 / 600	144 / 315 / 720
Minimum spacing		40	50	60	80	100	120
Minimum edge distance		40	50	60	80	100	120
Min. thickness of structural part		$h_{ef} + 30 \text{ mm} \geq 100 \text{ mm}$			$h_{ef} + 2d_0$		
Max. installation torque		10	20	40	80	120	160

¹⁾ Values are valid for $h_{ef,min} / h_{ef,stand} / h_{ef,max}$

²⁾ For higher concrete strengths up to C50/60 the values increase by max. 19%.

³⁾ Max. long term temperature / max. short term temperature after installation. For temperature range 72°C/120°C please see ETA assessment
If underrun the char. spacing or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min} , S_{min} and C_{min} must be observed.



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Fastening in masonry (Solid and hollow brick)

Permissible loads in [kN] and installation parameters - selection; for additional brick types and application conditions please see ETA assessment.

Suitable building materials	Density ρ [kg/dm ³]	Compressive strength f_b [N/mm ²]	Anchor studs RESI AST, VA AST		Min. Anchorage depth h_{ef} [mm]	Use category dry / dry 24°C/40°C ¹⁾		
			Size	Sleeve Size		Tension load N_{per} [kN]	Shear load V_{per} [kN]	
Solid sand-lime brick KS (NF)		≥ 2,0	≥ 20	M8	without / SH 12-80	80 / 80	1,29 / 1,14	1,29 / 1,14
				M10	without / SH 16-85	90 / 85	1,29 / 1,14	1,29 / 1,29
				M12	without / SH 20-85	100 / 85	1,57 / 1,14	1,43 / 1,43
				M16	without / SH 20-85	100 / 85	1,29 / 1,14	1,43 / 1,43
Solid brick Mz (DF)		≥ 1,6	≥ 20	M8	without / SH 12-80	80 / 80	0,71 / 0,86	1,29 / 1,14
				M10	without / SH 16-85	90 / 85	0,71 / 0,86	1,57 / 1,43
				M12	without / SH 20-85	100 / 85	0,57 / 0,86	2,14 / 1,43
Aerated concrete AAC4		≥ 0,50	≥ 4	M8	without	80	0,32	0,54
				M10	without	90	0,89	0,71
				M12	without	100	0,89	0,89
				M16	without	100	1,25	1,25
Hollow sand-lime brick KSL (KSL 3DF)		≥ 1,4	≥ 12	M8	SH 12-80	80	0,57	0,71
				M10	SH 16-85	85	0,57	1,00
				M12	SH 16-130	130	1,00	1,29
				M16	SH 20-85	85	0,57	1,00
Hollow brick HLz (16DF)		≥ 0,8	≥ 12	M8	SH 12-80	80	0,43	1,00
				M10	SH 16-85	85	0,71	1,71
				M12	SH 16-130	130	1,00	2,29
				M16	SH 20-85	85	1,00	1,71

N_{per} , V_{per} : Permissible loads incl. safety factors (v_M and $v_F = 1,4$), without influence of spacing and edge distance.

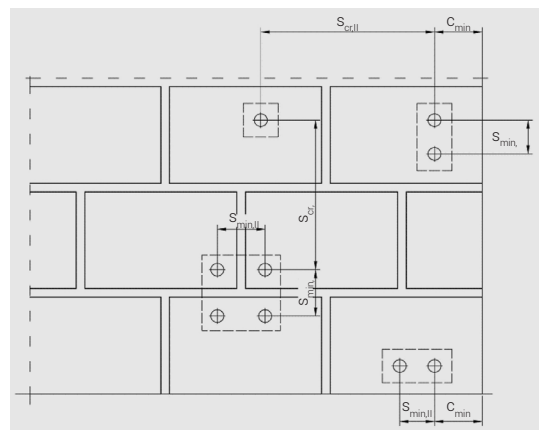
Drilling method: KS and Mz: hammer drilling; Aerated concrete, KSL and HLz: rotary drilling

¹⁾ Max. long term temperature / max. short term temperature. Long-term temperature is constant over a longer period of time. The short-term temperature is only present for a short time (day/night change).

Spacing and edge distance

Suitable building materials	Anchor stud	Sleeve	Char. Edge distance c_{cr} [mm]	Min. Edge distance c_{min} [mm]	Char. Spacing parallel to the bearing joint $s_{cr,II}$ [mm]	Char. Spacing perpendicular to the bearing joint $s_{cr,\perp}$ [mm]	Min. Spacing s_{min} [mm]	Max. Torque T_{inst} [Nm]
Solid sand-lime brick KS (NF)	M8	without	120	120	240	240	240	10
	M10	without	135	135	270	270	270	20
	M12	without	150	150	300	300	300	20
	M16	without	150	150	300	300	300	20
Solid brick Mz (DF)	M8	without	120	120	240	240	240	6
	M10	without	135	135	270	270	270	10
	M12	without	150	150	300	300	300	10
Aerated concrete AAC4	M8	without	120	120	240	240	240	2
	M10	without	135	135	270	270	270	2
	M12	without	150	150	300	300	300	2
Hollow sand-lime brick KSL (KSL 3DF)	M8	SH 12-80	100	100	240	240	113*	8
	M10	SH 16-85	100	100	240	240	113*	8
	M12	SH 16-130	100	100	240	240	113*	8
	M12,M16	SH 20-85	120	120	240	240	113*	8
Hollow brick HLz (16DF)	M8	SH 12-80	100	100	497	497	238**	6
	M10	SH 16-85	100	100	497	497	238**	6
	M12	SH 16-130	100	100	497	497	238**	6
	M12,M16	SH 20-85	120	120	497	497	238**	6

Permissible bending moment		Anchor stud			
Steel		M8	M10	M12	M16
Zinc plated 5.8	M_{per} [Nm]	10,8	21,2	37,7	94,9
Stainless steel A4	M_{per} [Nm]	11,9	23,8	42,1	106,2



* Values are valid for $s_{min,\perp}$. For $s_{min,II}$ 240 mm is valid.

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