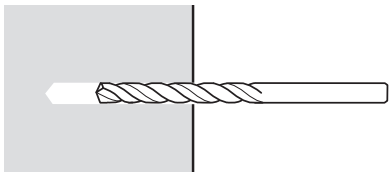
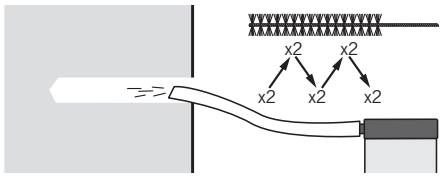
ESI-V STYRENE FREE INJECTION MORTAR

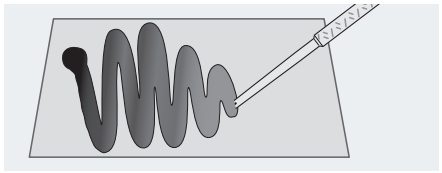
Installation:



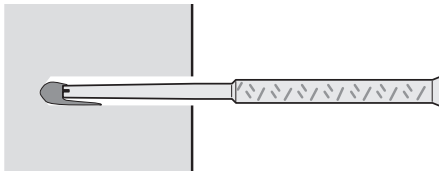
1 Drill a hole in correct diameter and depth



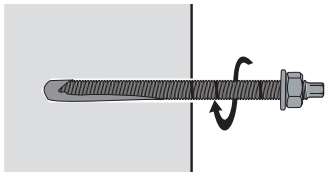
2 Clean the drilled hole thoroughly - follow above illustration



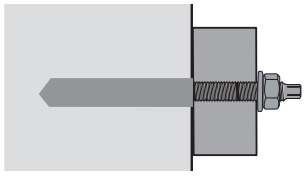
3 Eject approximately 10-15 cm mortar in order to ensure correct mixing ratio for injection



4 Insert the mixer into the drilled hole, and while the mixer is slowly retracted inject the correct volume of styrene free injection mortar



5 Insert the treaded rod or socket in a slowly rotating motion, complying with specified embedment depth (M8-M12: h_{ef2}. M16-M24: h_{ef1}). For optimal filling of the hole excess mortar should flow out. Observe temperature dependent curing time - see cartridge or matrix on the following page



6 After ended curing time the fixing can be loaded - installation is finished

Accessories:

Blow Out Bulp.
Brush.

Expandet have a complete programme in threaded rods

Threaded rods - see sheet 506.
Socket Anchor with internal thread - see sheet 503.
Injection gun for 300 ml.

ESI-V (Winter) Styrene Free Injection Mortar for fixing of threaded rods etc. at low temperatures - secures efficient fixing down to -18°C

Advantages:

Can be used with normal professional silicone gun.
Cures at temperatures down to -18°C.
Expansion-free fixing.
Applicable close to free edge - and with small spacing.
Anchorages can be designed in Expandet Calculation Software

Materials:

ESI-V (Winter) Expandet Styrene Free Injection Mortar is a two-component hybrid mortar, supplied in 300 ml cartridges for use with normal professional silicone gun.

Threaded rods: Zinc plated or Hot dipped galvanized in accordance with ISO 898.
Stainless steel (A4-70) in accordance with ISO 3506.

See sheet 506 for Expandet standard assortment in Threaded Rods.

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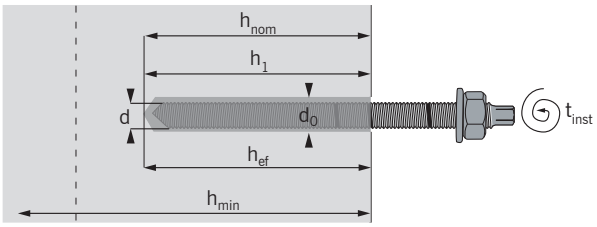
Graphic: Vedkom /Expandet

ESI-V STYRENE FREE INJECTION MORTAR



Type	Fixing							Load Capacities*			
Threaded rod	h_{nom}	d_0	h_1	h_{ef}		T_{inst}	h_{min}	S_{min}	C_{min}	N_{Rd}	V_{Rd}
	Embedment depth (minimum) mm	Drill hole diameter mm	Depth of drill hole (Min.) mm	Effective anchorage depth mm	Approx. filling quantity per hole ml	Required setting torque Nm	Thickness of conctrete member min., mm	Minimum allowable spacing mm	Minimum allowable edge distance mm	**Design resistance** tension kN◆	**Design resistance** shear kN◇
M8- 80	80	10	80	80	3,0	10	110	40	40	9,5	7,6 (8,2)
M10- 90	90	12	90	90	4,4	20	120	45	45	13,3	12,1 (13,0)
M12-110	110	14	110	110	6,7	40	140	55	55	21,2	17,5 (18,9)
M16-125	125	18	125	125	10,6	80	160	65	65	27,0	32,6 (35,2)
M20-170	170	22	170	170	19,5	150	210	85	85	37,0	50,9 (55,0)
M24-210	210	26	210	210	31,5	200	258	105	105	58,0	73,4 (79,2)

* Above design resistance is only valid together with threaded rods:
Zinc Plated Minimum 5.8 steel in accordance with ISO 898
Hot dipped galvanised: Minimum 5.8 steel in accordance with ISO 898
Stainless steel: Minimum class A4-70 in accordance with EN ISO 3506 (1.4401)

◆ Design resistance for tension is valid for a single anchor in concrete C20/25 not influenced by edge distance and/or spacing: C ≥ 1,5 h_{ef} and S ≥ 3 h_{ef}. $\Psi_{re,N}$ = 1 (Normal reinforcement according to ETAG 001, Annex C - 5.2.2.4)

◇ Design resistance for shear is valid for a single anchor in concrete ≥C20/25 not influenced by edge distance and/or spacing: C ≥ 10 h_{ef} and S ≥ 3 h_{ef}. Loads in ( ) are only valid together with threaded rods in stainless steel class A4-70.

Combined resistance shall be verified if both tension and shear actions are applied. See *"Principles for Fastening"* page 5 (Verification Method 2).

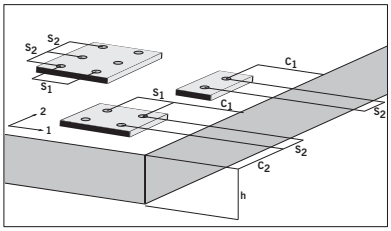
Partial safety factor for material (γ_m) is included. Partial safety factor for actions (γ_f) has to be applied in accordance with national building code. If no guidance for γ_f exists ETAG 001, Annex C recommends factor 1,35 for permanent actions and factor 1,5 for variable actions.

When calculating load capacities for anchors or anchorgroup use Expandet Calculation Software allowing for design with individual edge distance and spacing in accordance with ETAG 001, Annex C, Design Method A. Download for free at www.expandet.com.

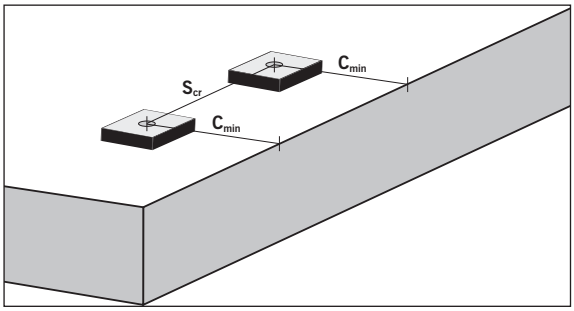
Expandet Calculation Software, in addition to above specifications for threaded rods, also allow calculations based on threaded rods in carbon steel 8.8.

CURING TIME:		
Temperature*	Processing time	Curing time
-18°C	100 minutter	1200 minutter
-10°C	75 minutter	480 minutter
-5°C	60 minutter	300 minutter
5°C	18 minutter	120 minutter
15°C	6 minutter	60 minutter

* In concrete.



ESI-V STYRENE FREE INJECTION MORTAR



Design shear load capacities for a single anchor at minimum edge distance (C_{min})◆

Threaded Rod: zinc plated, hot dipped galvanized and Stainless steel

			M8	**M10**	**M12**	M16	M20	M24
h_{nom}	Embedment depth	mm	80	90	110	125	170	210
$V_{Rd,c}$	(non-cracked concrete)	kN	2,3	3,1	4,6	6,6	11,3	14,2
C_{min}	(non-cracked concrete)	mm	40	45	55	65	85	105
S_{cr}	(non-cracked concrete)	mm	120	135	165	195	255	315

◆ Design shear load capacity is valid at minimum edge distance in concrete C20/25 providing that spacing is ≥ S_{cr} and that threaded rod has a steel strength of minimum: Carbon steel: 5.8 steel and Stainless steel: A4-70.

Partial safety factor for edge failure (γ_{mc}) is included.

Use Expandet Calculation Software for calculation of load capacities for single anchors and anchor groups in accordance with ETAG 001, Annex C – Design Method A. Download for free at www.expandet.com

Design shear load capacities (steel failure) and resistance against bending (lever arm) Threaded Rod, Zinc plated & Hot dipped galvanized◇

Threaded Rod: zinc plated and hot dipped galvanized

			M8	M10	M12	M16	M20	M24
h_{nom}	Embedment depth	mm	80	90	110	125	170	210
$V_{Rd,s}$	(5.8 steel)	kN	7,6	12,0	17,5	32,6	50,9	73,4
M_{Rd}	(5.8 steel)	Nm	15,2	31,2	54,4	138,4	269,6	467,2
$V_{Rd,s}$	(8.8 steel)	kN	11,6	18,5	26,9	50,2	78,4	112,9
M_{Rd}	(8.8 steel)	Nm	24,0	48,0	84,0	212,8	415,2	718,4

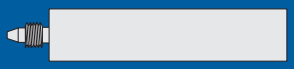
◇ Design shear load capacity (steel failure) and resistance against bending (lever arm) include partial safety factor for material (γ_{ms}).

Design shear load capacities (steel failure) and resistance against bending (lever arm) Threaded Rod, Stainless steel A4-70◇

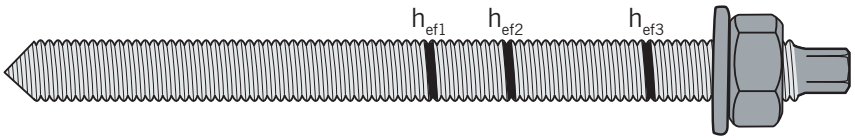
Threaded Rod: Stainless Steel A4 (EGS-A4)

			M8			M10			M12			M16			M20			M24		
h_{nom}	Embedment depth	mm	65	80	95	80	90	110	95	110	140	125	160	190	170	200	240	210	240	285
$V_{Rd,s}$	(A4-70)	kN		8,2			13,0			18,9			35,2			55,0			79,2	
M_{Rd}	(A4-70)	mm		20,8			41,6			73,6			186,4			363,2			628,8	
$V_{Rd,s}$	(A4-80)	kN		11,6			18,5			26,9			50,2			78,4			112,9	
M_{Rd}	(A4-80)	mm		24,0			48,0			84,0			212,8			415,2			718,4	

◇ Design shear load capacity (steel failure) and resistance against bending (lever arm) include partial safety factor for material (γ_{ms}).



ESI-V STYRENE FREE INJECTION MORTAR



Standard Expandet Threaded Rod assortment:

Zinc plated & Hot dipped galvanized, 5.8 steel

Type	Dimensions				h_{ef1} ◇		h_{ef2} ◇		h_{ef3} ◇	
	L	d	L_{thread}	SW_{hex}	h_{ef1} ◇	t_{fix1}	h_{ef2} ◇	t_{fix2}	h_{ef3} ◇	t_{fix3}
Threaded Rod mm	Anchor length mm	Bolt diameter mm	Thread length mm	With across hexagon mm	Effective anchorage depth, mm	Thickness of fixture mm	Effective anchorage depth, mm	Thickness of fixture mm	Effective anchorage depth, mm	Thickness of fixture mm
8 x 90	90	M8	86	5	65	12	-	-	-	-
8 x 110	110	M8	106	5	65	32	**80**	**17**	95	2
8 x 130	130	M8	126	5	65	52	**80**	**37**	95	22
8 x 150	150	M8	146	5	65	72	**80**	**57**	95	42
8 x 175	175	M8	171	5	65	97	**80**	**82**	95	67
8 x 200	200	M8	196	5	65	122	**80**	**105**	95	92
10 x 110	110	M10	105	7	80	15	**90**	**5**	-	-
10 x 130	130	M10	125	7	80	35	**90**	**25**	110	5
10 x 165	165	M10	160	7	80	70	**90**	**60**	110	40
10 x 200	200	M10	195	7	80	105	**90**	**95**	110	75
10 x 220	220	M10	215	7	80	125	**90**	**115**	110	95
10 x 250	250	M10	245	7	80	155	**90**	**145**	110	125
10 x 300	300	M10	295	7	80	205	**90**	**195**	110	175
12 x 120	120	M12	114	8	95	5	-	-	-	-
12 x 140	140	M12	134	8	95	25	**110**	**10**	140	-
12 x 160	160	M12	154	8	95	45	**110**	**30**	140	-
12 x 190	190	M12	184	8	95	75	**110**	**60**	140	30
12 x 220	220	M12	214	8	95	105	**110**	**90**	140	60
12 x 250	250	M12	244	8	95	135	**110**	**120**	140	90
12 x 300	300	M12	294	8	95	185	**110**	**170**	140	140
16 x 170	170	M16	162	12	**125**	**20**	-	-	-	-
16 x 190	190	M16	182	12	**125**	**40**	160	5	-	-
16 x 230	230	M16	222	12	**125**	**80**	160	45	190	15
16 x 250	250	M16	242	12	**125**	**100**	160	65	190	35
20 x 260	260	M20	250	13	**170**	**60**	200	30	-	-
20 x 360	360	M20	350	13	**170**	**160**	200	130	240	-
24 x 300	300	M24	288	13	**210**	**55**	240	25	-	-
24 x 360	360	M24	348	13	**210**	**115**	240	85	285	40

Stainless steel, A4-70

8 x 110	110	M8	106	5	65	32	**80**	**17**	95	2
8 x 150	150	M8	146	5	65	72	**80**	**57**	95	42
10 x 130	130	M10	125	7	80	35	**90**	**25**	110	5
10 x 165	165	M10	160	7	80	70	**90**	**60**	110	40
12 x 160	160	M12	154	8	95	45	**110**	**30**	140	-
12 x 190	190	M12	184	8	95	75	**110**	**60**	140	30
16 x 170	170	M16	162	12	**125**	**20**	-	-	-	-
16 x 190	190	M16	182	12	**125**	**40**	160	5	-	-
20 x 260	260	M20	250	13	**170**	**60**	200	30	-	-
24 x 300	300	M24	288	13	**210**	**55**	240	25	-	-

◇ Embedment markings (h_{ef1}, h_{ef2} & h_{ef3}) =Effective anchorage depth, Embedment depth (h_{nom}) and Depth of drilled hole (h_1).