

Heavy duty through anchor



ANTI-SLIDING
The shape of the expander clip guarantees a high fastening capacity

HIGH RESISTANCE
Achieved through the cold forging process

UNIFORM EXPANSION
The special clip ensures an uniform distribution of pressure in the hole

FM-753®

White zinc plated
Assembled



White zinc plated Code	Stainless steel A4 Code	NAUTILUS Code	d x L mm	Thread length mm	do mm	tfx mm	df mm	sw	Box q.ty	Outer box
75320b06045 ⁽¹⁾⁽²⁾		75320c06045 ⁽¹⁾	M6x45	20	6	3	7	10	200	2000
75320b06065	75320006065 ⁽²⁾	75320c06065	M6x65	40	6	15	7	10	100	1000
75320b06085	75320006085 ⁽²⁾	75320c06085	M6x85	60	6	35	7	10	100	1000
75320b06100		75320c06100	M6x100	60	6	50	7	10	50	500
75320b08050 ⁽¹⁾⁽²⁾	75320008050 ⁽¹⁾⁽²⁾	75320c08050 ⁽¹⁾	M8x50	23	8	5	9	13	100	1000
75320b08065	75320008065	75320c08065	M8x65	38	8	7	9	13	100	800
75320b08075	75320008075	75320c08075	M8x75	48	8	15	9	13	100	800
75320b08090	75320008090	75320c08090	M8x90	63	8	30	9	13	100	500
75320b08115	75320008115	75320c08115	M8x115	83	8	55	9	13	100	500
75320b08135	75320008135	75320c08135	M8x135	88	8	75	9	13	100*	500
75320b08165	75320008165	75320c08165	M8x165	88	8	105	9	13	50	250
75320b10060 ⁽¹⁾⁽²⁾	75320010060 ⁽¹⁾⁽²⁾	75320c10060 ⁽¹⁾	M10x60	28	10	5	12	17	50	500
75320b10075	75320010075	75320c10075	M10x75	43	10	5	12	17	50	500
75320b10090	75320010090	75320c10090	M10x90	55	10	20	12	17	50	400
75320b10100		75320c10100	M10x100	60	10	30	12	17	50	400
75320b10120	75320010120	75320c10120	M10x120	85	10	50	12	17	50	250
75320b10145		75320c10145	M10x145	85	10	75	12	17	50	250
75320b10170		75320c10170	M10x170	85	10	100	12	17	50	200
75320b10210 ⁽²⁾			M10x210	85	10	140	12	17	25	200
75320b12080 ⁽¹⁾⁽²⁾	75320012080 ⁽¹⁾⁽²⁾	75320c12080 ⁽¹⁾	M12x80	40	12	7	14	19	50	300
75320b12100	75320012100	75320c12100	M12x100	58	12	10	14	19	50	250
75320b12110	75320012110	75320c12110	M12x110	68	12	20	14	19	50	250
75320b12135	75320012135	75320c12135	M12x135	93	12	45	14	19	25	200
75320b12160	75320012160	75320c12160	M12x160	93	12	70	14	19	25	150
75320b12185	75320012185	75320c12185	M12x185	93	12	100	14	19	25	150
75320b12200 ⁽²⁾			M12x200	93	12	115	14	19	20	120
75320b12220 ⁽²⁾			M12x220	93	12	135	14	19	20	120
75320b12240 ⁽²⁾			M12x240	93	12	155	14	19	20	120
75320b12255 ⁽²⁾			M12x255	93	12	170	14	19	20	100
75320b12285 ⁽²⁾			M12x285	93	12	200	14	19	20	100
75320b12300 ⁽²⁾			M12x300	93	12	215	14	19	20	100
75320b12325 ⁽²⁾			M12x325	93	12	240	14	19	20	75
75320b12355 ⁽²⁾			M12x335	93	12	270	14	19	20	75
75320b14100			M14x100	50	14	3	16	22	25	150
75320b14110			M14x110	60	14	10	16	22	25	150
75320b14130			M14x130	65	14	30	16	22	25	150
75320b14150			M14x150	90	14	50	16	22	25	100
75320b14170			M14x170	90	14	70	16	22	25	100
75320b14200			M14x200	90	14	100	16	22	25	100
75320b16110 ⁽¹⁾⁽²⁾	75320016110 ⁽¹⁾⁽²⁾	75320c16110 ⁽¹⁾	M16x110	53	16	15	18	24	20	100
75320b16125	75320016125	75320c16125	M16x125	68	16	10	18	24	20	100
75320b16145	75320016145	75320c16145	M16x145	88	16	30	18	24	20	100
75320b16175	75320016175	75320c16175	M16x175	88	16	60	18	24	20	80
75320b16215		75320c16215	M16x215	88	16	100	18	24	15	60
75320b16230 ⁽²⁾			M16x230	88	16	115	18	24	10	50
75320b16250 ⁽²⁾			M16x250	88	16	135	18	24	10	50
75320b16270 ⁽²⁾			M16x270	88	16	155	18	24	10	50
75320b16285 ⁽²⁾			M16x285	88	16	170	18	24	10	50
75320b16320 ⁽²⁾			M16x320	88	16	205	18	24	10	50
75320b20170 ⁽²⁾		75320c20170	M20x170	60	20	30	22	30	10	50
75320b20215 ⁽²⁾		75320c20215	M20x215	60	20	75	22	30	10	50
75320b24160▲ ⁽¹⁾⁽²⁾			M24x160	60	24	10	26	36	10	
75320b24180▲ ⁽²⁾			M24x180	60	24	10	26	36	10	
75320b24200▲ ⁽²⁾			M24x200	80	24	30	26	36	10	
75320b24220▲ ⁽²⁾			M24x220	100	24	50	26	36	10	
75320b24260▲ ⁽²⁾			M24x260	100	24	90	26	36	10	
75320b24310▲ ⁽²⁾			M24x310	100	24	140	26	36	10	

⁽¹⁾ Anchors with reduced embedment depths. ⁽²⁾ Sizes not covered by CE certification. *50 for Stainless steel A4.

FM-753®

- INOX A4 -

Stainless steel A4
Assembled



FM-753® NAUTILUS

Stainless steel A4 clip
Assembled



NAUTILUS 1000 h

Special anti-corrosion coating with matte finish - 1000 hours in salt spray test

▲ Quantity and delivery terms to be agreed

VERSIONS:

- white zinc plated
- stainless steel A4
- NAUTILUS special anti-corrosion coating with stainless steel A4 clip

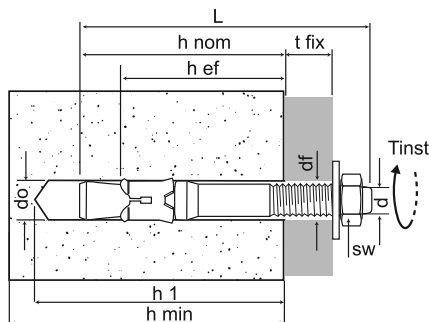
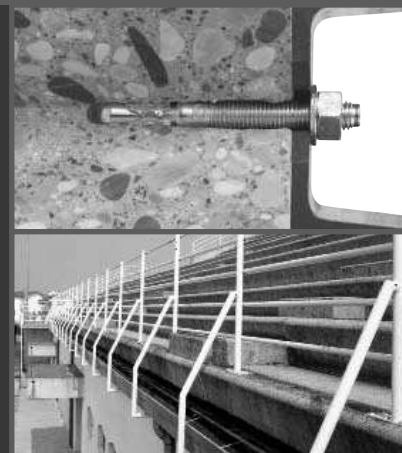
PRODUCT FEATURES:

- cold forged anchor body
- increased thickness of three expander segments
- six teeth and anti-slip ridge to prevent slip during tightening

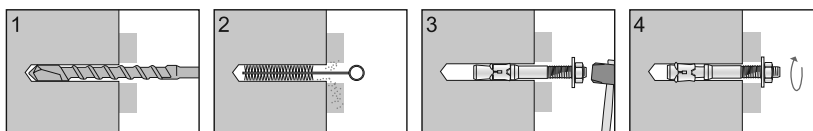
BASE MATERIALS:

- concrete
- solid stone

- suitable applications
- partially suitable applications



- d = screw diameter
- df = hole diameter of fixing element
- do = hole diameter
- h1 = minimum hole depth
- hef = minimum depth of anchorage
- hmin = minimum support thickness
- hnom = nominal embedment depth
- L = anchor length
- sw = wrench
- tfix = fixture thickness
- Tinst = torque



DESIGN⁽¹⁾ AND RECOMMENDED⁽²⁾ LOADS

Single anchor with large anchor spacing and edge distances in non-cracked concrete C20/25 - Standard embedment depth

Anchor		M6	M8	M10	M12	M14	M16	M20	M24	
Minimum support thickness	h_{min} mm	100	100	100	120	140	170	200	240	
Minimum hole depth	h_1 mm	50	60	70	85	95	115	130	165	
Nominal embedment depth	h_{nom} mm	41	48	59	71	80	96	115	145	
Minimum depth of anchorage	h_{ef} mm	35	40	50	60	70	85	95	120	
Hole diameter	d_0 mm	6	8	10	12	14	16	20	24	
Spacing	$S_{cr,N}$ mm	105	120	150	180	210	255	290	360	
Edge distance	$C_{cr,N}$ mm	53	60	75	90	105	130	145	180	
FM-753 [®] - CE certified white zinc plated ETA 01/0014	Tensile non-cracked concrete	N_{rd} kN	3,4	5,0	6,7	13,3	16,7	23,4	23,5 ⁽³⁾	32,0 ⁽³⁾
	Shear $C \geq 10x_{hef}$	N kN	2,4	3,6	4,8	9,5	11,9	16,7	17,0 ⁽³⁾	23,0 ⁽³⁾
		V_{rd} kN	4,1	6,0	9,8	12,3	21,4	28,1	37,0 ⁽³⁾	53,0 ⁽³⁾
FM-753 [®] - CE certified stainless steel A4 ETA 01/0009	Tensile non-cracked concrete	N_{rd} kN	2,2 ⁽³⁾	5,0	8,0	15,5	-	23,4	-	
	Shear $C \geq 10x_{hef}$	N kN	1,6 ⁽³⁾	3,6	5,7	11,1	-	16,7	-	
		V_{rd} kN	3,5 ⁽³⁾	9,0	14,1	20,7	-	38,5	-	
FM-753 [®] - CE certified NAUTILUS hrg opaque ETA 13/0367	Tensile non-cracked concrete	N_{rd} kN	4,1	8,0	8,0	15,7	-	23,4	26,6	
	Shear $C \geq 10x_{hef}$	N kN	2,9	5,7	5,7	11,2	-	16,7	19,0	
		V_{rd} kN	4,3	6,2	9,2	13,4	-	28,4	34,3	
Minimum spacing	S_{min} mm	50	60	75	90	105	130	145	180	
Minimum edge distance	C_{min} mm	50	60	75	90	105	130	145	180	
Shear $C = C_{min}$	$V_{rd,cmin}$ kN	1,7	2,5	3,9	5,7	7,8	11,6	15,3	23,2	
	V_{cmin} kN	1,2	1,8	2,8	4,1	5,6	8,3	10,9	16,6	
Torque	T_{inst} Nm	6	15	25	50	70	100	160	200	

Single anchor with large anchor spacing and edge distances in non-cracked concrete C20/25 Reduced embedment depth - Not certified⁽⁴⁾

Anchor		M6	M8	M10	M12	M16	M24
Minimum support thickness	h_{min} mm	100	100	100	100	130	200
Minimum hole depth	h_1 mm	45	50	55	70	95	145
Nominal embedment depth	h_{nom} mm	36	38	44	56	76	125
Minimum depth of anchorage	h_{ef} mm	30	30	35	45	65	100
Hole diameter	d_0 mm	6	8	10	12	16	24
Spacing	$S_{cr,N}$ mm	120	120	140	180	260	400
Edge distance	$C_{cr,N}$ mm	90	90	105	135	195	300
FM-753 [®] - CE certified NAUTILUS hrg opaque ETA 13/0367	Tensile non-cracked concrete	N_{rd} kN	3,4	4,1	4,1	8,0	17,6
	Shear $C \geq 10x_{hef}$	N kN	2,4	2,9	2,9	5,7	12,6
		V_{rd} kN	4,3	6,2	9,2	13,4	28,4
Tensile/Shear non-cracked concrete Not certified ⁽³⁾	V_{rd} kN	3,1	4,4	6,6	9,6	20,3	
	F kN	1,8	2,0	3,5	4,9	8,4	
	F kN	1,3	1,4	2,5	3,5	6,0	
Minimum spacing	S_{min} mm	45	50	55	70	100	150
Minimum edge distance	C_{min} mm	45	50	55	70	100	150
Torque	T_{inst} Nm	6	15	25	50	100	200

1kN = 100 kgf

⁽¹⁾ The design loads N_{rd} and V_{rd} derive from the characteristic loads on the ETA certification and are inclusive of the partial safety factors γ_m proportional to each diameter (see ETA).

⁽²⁾ The recommended loads N and V derive from the characteristic loads on the ETA certification and are inclusive of the partial safety factors $\gamma_1=1.4$ and γ_m proportional to each diameter (see ETA).

⁽³⁾ Versions Not Certified: white zinc plated and size M6 of stainless steel A4. The recommended loads N, V or F derive from the mean ultimate loads and are inclusive of the total safety factor $\gamma=4$ (shear $\gamma=3$).

⁽⁴⁾ In the absence of CE markings, the recommended loads derive from tests carried out in the Friulsider laboratory in accordance with the appropriate standards. The load values are only valid if the installation has been carried out correctly. The designing and calculation of the anchorage should be carried out in accordance with annex C, of the ETAG 001, design method A.

Chemical fixings:

- Styrene free pure epoxy
- Styrene free vinylester
- Styrene free polyester



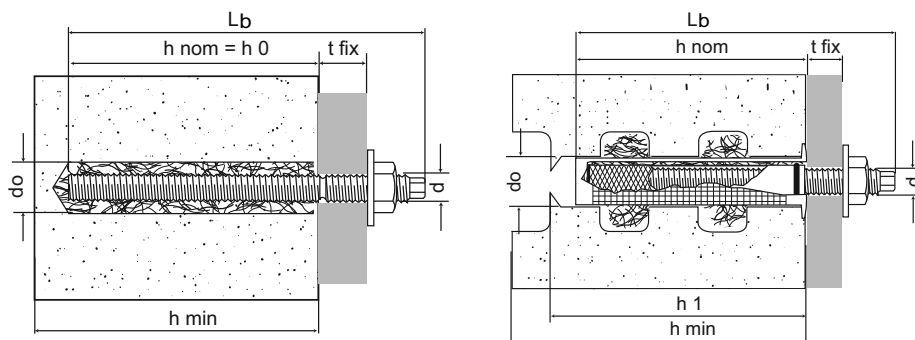
Friulsider, thanks to its experience matured in the fixing sector, offers a complete range of resins able to satisfy any type of fixing requirement



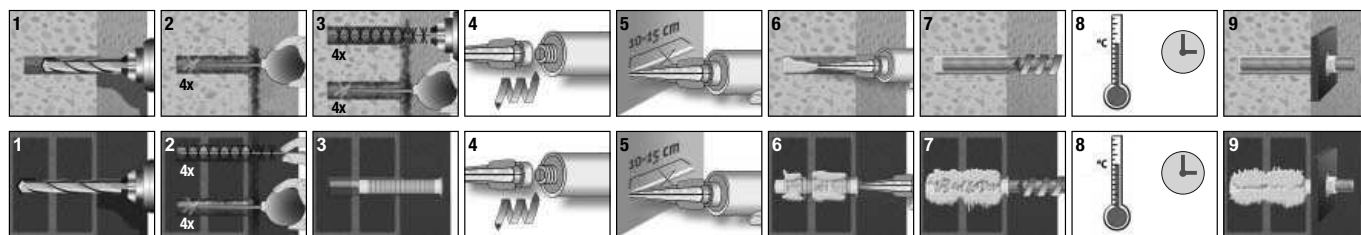
Most of the resins have obtained the European CE certification (also for cracked concrete) signifying safety and a high quality product

BASE MATERIALS:

- concrete
- light weight honeycomb brick
- solid stone
- wood (for KEM-UP 934-935)
- solid brick
- hollow dense aggregate block
- wood (for KEM-UP 941-942-943)
- honeycomb brick
- hollow light aggregate block
- suitable applications
- partially suitable applications
- cell like clay brick
- aerated concrete



- d = threaded bar diameter
- do = hole diameter
- h0 = minimum hole depth
- hmin = minimum support thickness
- hnom = nominal embedment depth
- Lb = threaded bar length
- tfix = fixture thickness
- Tmax = torque



► KEM-UP EPOXY

Styrene free pure epoxy chemical fixing

► KEM-UP VINYLESTER

Styrene free vinylester chemical fixing

► KEM-UP POLYESTER

Styrene free polyester chemical fixing



PRODUCT FEATURES:

- Excellent performance
- Suitable for use on wood
- Suitable for underwater use
- Low shrinkage
- Excellent adhesive properties
- For structural fixings and wood floor reinforcement
- Suitable for damp base materials
- Excellent mechanical and thermal characteristics
- Styrene free
- Suitable for extremely aggressive atmospheres
- KEM-UP 934: ETA certificate op.1 and suitable for cracked concrete



► KEM-UP EPOXY Styrene free pure epoxy chemical fixing



Code	Name	Content	Pkg.	Pcs/Pallet
9340000000	KEM-UP 934	585 ml	12	672
9350000000*	KEM-UP 935	250 ml	12	900

KEM-UP 934					
Temperature °C	+ 5°C	+ 10°C	+ 20°C	+ 30°C	+ 40°C
Gel time	120 min	90 min	30 min	20 min	12 min
Curing time	50 h	30 h	10 h	6 h	4 h

Working temperature: -40 / +43°C (max 72°C for short period)

KEM-UP 935*					
Temperature °C	+ 5°C	+ 10°C	+ 20°C	+ 30°C	+ 40°C
Gel time	140 min	80 min	40 min	25 min	12 min
Curing time	50 h	24 h	10 h	7 h	5 h

Working temperature: -40 / +43°C (max 72°C for short period)

* Not covered by CE certification

DESIGN⁽¹⁾ AND RECOMMENDED⁽²⁾ LOADS (KEM-UP 934)

Single anchor with large anchor spacing and edge distances in cracked and non-cracked concrete C20/25 (24°C - dry and wet hole)

Anchor		M8	M10	M12	M16	M20	M24	M30
Minimum support thickness	h_{min} mm	110	120	140	160	220	270	340
Nominal embedment depth = depth of hole	$h_{nom} = h_0$ mm	80	90	110	125	170	210	270
Hole diameter	d_0 mm	10	12	14	18	24	28	35
Spacing	$S_{cr,N}$ mm	$2 \times C_{cr,N}$						
Edge distance	$C_{cr,N}$ mm	113	135	165	188	255	304	379
Tensile cracked concrete	N_{rd} kN	-	-	17,2	22,7	30,5	41,4	66,6
	N kN	-	-	12,3	16,2	21,8	29,6	47,6
Tensile non-cracked concrete	N_{rd} kN	12,7	20,1	29,2	39,2	53,3	73,2	106,7
	N kN	9,1	14,4	20,9	28,0	38,1	52,3	76,2
Shear $C \geq 10x_{ef}$ screw grade 5.8	V_{rd} kN	7,0	12,0	17,0	31,0	50,0	70,0	112,0
	V kN	5,0	8,5	12,0	22,0	35,0	50,0	80,0
Minimum spacing	S_{min} mm	40	50	60	80	100	120	150
Minimum edge distance	C_{min} mm	40	50	60	80	100	120	150
	$V_{rd,cmin}$ kN	1,8	2,8	3,9	6,7	10,9	15,7	24,8
Shear $C = C_{min}$	V_{cmin} kN	1,3	2,0	2,8	4,8	7,8	11,2	17,7
	T_{max} Nm	10	20	40	80	120	160	200

1kN = 100 kgf

⁽¹⁾ The design loads N_{rd} and V_{rd} derive from the characteristic loads on the ETA 09/0061 certification and are inclusive of the partial safety factors γ_m proportional to each diameter (see ETA).

⁽²⁾ The recommended loads N and V derive from the characteristic loads on the ETA 09/0061 certification and are inclusive of the partial safety factors $\gamma_r=1.4$ and γ_m proportional to each diameter (see ETA). The decisive failure is the concrete cone.

The load values are only valid if the installation has been carried out correctly. The design engineer is responsible for the designing and calculation of the fixing.