

Vorpa **VEX+SEISMIC** - Seismic category C1+C2

Heavy duty safety anchor with European Technical Assessment for cracked concrete and seismic zone



cracked
concrete

products group



VEX+SEISMIC



* **VEX+SEISMIC
A4 STAINLESS STEEL**

Approved for

- cracked and non-cracked concrete M8-M27
- reinforced and unreinforced normal weight concrete C20/25 - C50/60
- anchorage under static, quasi/static actions M8-M27
- seismic applications C1-C2 TR045 - M10 - M20
- anchorage under fire exposure in standard TR 020 R30-R120

To fix

- parapets
- steel beams
- machine tools
- industrial systems
- heavy duty metal constructions
- static, quasi/static anchorages
- structural fixings



EAD 330232-00-0601
for cracked and uncracked
concrete and seismic zone.
Seismic Category C1-C2



product information

Characteristics

- special wedge anchor assembled with hex nut and washer with European Technical Assessment for cracked concrete and performance category C1-C2 under seismic action (M10 to M20, maximum anchor length 210 mm)
- two effective anchorage depths for greater flexibility (M8 to M16, maximum anchor length 210 mm)
- anchoring with the smaller effective anchorage depth reduces drilling and installation time
- anchoring with the standard effective anchorage depth is suitable for the highest load limits
- fire tested in compliance with DIN 4102-2. Fire resistance ratings R30-R120, for sprinkler system installations complying with VdS requirements (M10 to M16)
- shock approval by the Swiss Federal office for Civil Protection

Installation

- through-setting anchor

Suggestion for use

- choose the right size of the anchor according to the load
- always check load bearing capacity values in the table
- respect the installation data
- **clean the hole before the installation**

Examples of applications



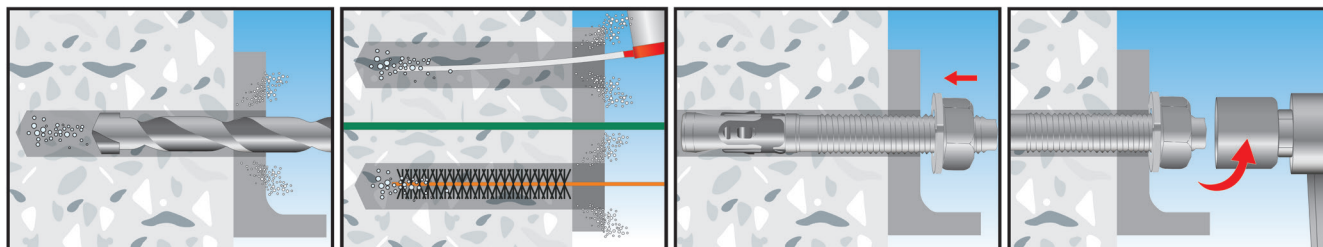
through-setting heavy duty anchors

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installation sequence

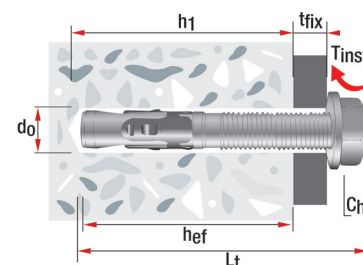


product code and technical data



VEX+SEISMIC zincplated

Code	Description		L_t mm	h_{ef}/h_{efrid} mm	$d_{0xh1}/d_{0xh1rid}$ mm	t_{fix1}/t_{fix2} mm	T_{inst} Nm	Ch
32102	VEX+SEISMIC	8/15-26-80	80	46/35	8x60/8x49	15/26	20	13
32103	VEX+SEISMIC	8/30-41-95	95	46/35	8x60/8x49	30/41	20	13
32104	VEX+SEISMIC	8/50-61-115	115	46/35	8x60/8x49	50/61	20	13
32105	VEX+SEISMIC	10/10-30-90	90	60/40	10x75/10x55	10/30	25	17
32106	VEX+SEISMIC	10/15-35-95	95	60/40	10x75/10x55	15/35	25	17
32107	VEX+SEISMIC	10/20-40-100	100	60/40	10x75/10x55	20/40	25	17
32108	VEX+SEISMIC	10/30-50-110	110	60/40	10x75/10x55	30/50	25	17
32109	VEX+SEISMIC	10/50-70-130	130	60/40	10x75/10x55	50/70	25	17
32110	VEX+SEISMIC	10/75-95-155	155	60/40	10x75/10x55	75/95	25	17
32111	VEX+SEISMIC	10/100-120-180	180	60/40	10x75/10x55	100/120	25	17
32112	VEX+SEISMIC	12/10-30-105	105	70/50	12x90/12x70	10/30	45	19
32113	VEX+SEISMIC	12/15-35-110	110	70/50	12x90/12x70	15/35	45	19
32114	VEX+SEISMIC	12/20-40-115	115	70/50	12x90/12x70	20/40	45	19
32115	VEX+SEISMIC	12/30-50-125	125	70/50	12x90/12x70	30/50	45	19
32116	VEX+SEISMIC	12/50-70-145	145	70/50	12x90/12x70	50/70	45	19
32117	VEX+SEISMIC	12/65-85-160	160	70/50	12x90/12x70	65/85	45	19
32118	VEX+SEISMIC	12/85-105-180	180	70/50	12x90/12x70	85/105	45	19
32119	VEX+SEISMIC	12/105-125-200	200	70/50	12x90/12x70	105/125	45	19
32120	VEX+SEISMIC	16/15-35-135	135	85/65	16x110/16x90	15/35	90	24
32121	VEX+SEISMIC	16/25-45-145	145	85/65	16x110/16x90	25/45	90	24
32122	VEX+SEISMIC	16/50-70-170	170	85/65	16x110/16x90	50/70	90	24
32123	VEX+SEISMIC	16/80-100-200	200	85/65	16x110/16x90	80/100	90	24
32124	VEX+SEISMIC	20/30-165	165	100/-	20x125/-	30/-	160	30
32125	VEX+SEISMIC	20/60-195	195	100/-	20x125/-	60/-	160	30



L_t = Anchor length
 h_{ef} = Effective anchorage depth
 h_1 = Min. hole depth
 d_0 = Hole diameter
 t_{fix} = Fixture thickness
 T_{inst} = Torque
 Ch = Spanner



R30-R120

Only standard anchorage depth

Examples of applications



through-setting heavy duty anchors

Vorpa **VEX+SEISMIC** - Seismic category C1+C2

Heavy duty safety anchor with European Technical Assessment for cracked concrete and seismic zone



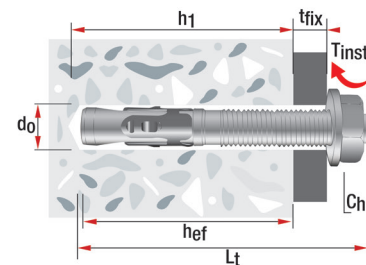
product code and technical data



VEX+SEISMIC INOX A4



Code	Description		L_t mm	h_{ef}/h_{efrid} mm	$d_0 \times h_1 / d_0 \times h_{1rid}$ mm	T_{fix1} / T_{fix2} mm	T_{inst} Nm	Ch
4250	VEX+SEISMIC A4	8/15-26-80	80	46/35	8x60/8x49	15/26	20	13
4251	VEX+SEISMIC A4	8/30-41-95	95	46/35	8x60/8x49	30/41	20	13
4252	VEX+SEISMIC A4	8/50-61-115	115	46/35	8x60/8x49	50/61	20	13
4662	VEX+SEISMIC A4	10/10-30-90	90	60/40	10x75/10x55	10/30	35	17
4675	VEX+SEISMIC A4	10/15-35-95	95	60/40	10x75/10x55	15/35	35	17
4676	VEX+SEISMIC A4	10/20-40-100	100	60/40	10x75/10x55	20/40	35	17
4677	VEX+SEISMIC A4	10/30-50-110	110	60/40	10x75/10x55	30/50	35	17
4678	VEX+SEISMIC A4	10/50-70-130	130	60/40	10x75/10x55	50/70	35	17
4679	VEX+SEISMIC A4	10/75-95-155	155	60/40	10x75/10x55	75/95	35	17
4680	VEX+SEISMIC A4	10/100-120-180	180	60/40	10x75/10x55	100/120	35	17
4681	VEX+SEISMIC A4	12/10-30-105	105	80/50	12x90/12x70	10/30	50	19
4682	VEX+SEISMIC A4	12/15-35-110	110	80/50	12x90/12x70	15/35	50	19
4683	VEX+SEISMIC A4	12/20-40-115	115	80/50	12x90/12x70	20/40	50	19
4684	VEX+SEISMIC A4	12/30-50-125	125	80/50	12x90/12x70	30/50	50	19
4685	VEX+SEISMIC A4	12/50-70-145	145	80/50	12x90/12x70	50/70	50	19
4686	VEX+SEISMIC A4	12/65-85-160	160	80/50	12x90/12x70	65/85	50	19
4687	VEX+SEISMIC A4	12/85-105-180	180	80/50	12x90/12x70	85/105	50	19
4688	VEX+SEISMIC A4	12/105-125-200	200	80/50	12x90/12x70	105/125	50	19
4689	VEX+SEISMIC A4	16/5-25-125	125	97/65	16x110/16x90	5/25	110	24
4690	VEX+SEISMIC A4	16/15-35-135	135	97/65	16x110/16x90	15/35	110	24
4691	VEX+SEISMIC A4	16/25-45-145	145	97/65	16x110/16x90	25/45	110	24
4692	VEX+SEISMIC A4	16/50-70-170	170	97/65	16x110/16x90	50/70	110	24
4693	VEX+SEISMIC A4	16/80-100-200	200	97/65	16x110/16x90	80/100	110	24
4694	VEX+SEISMIC A4	20/30-165	165	100/-	20x125/-	30/-	200	30
4695	VEX+SEISMIC A4	20/60-195	195	100/-	20x125/-	60/-	200	30



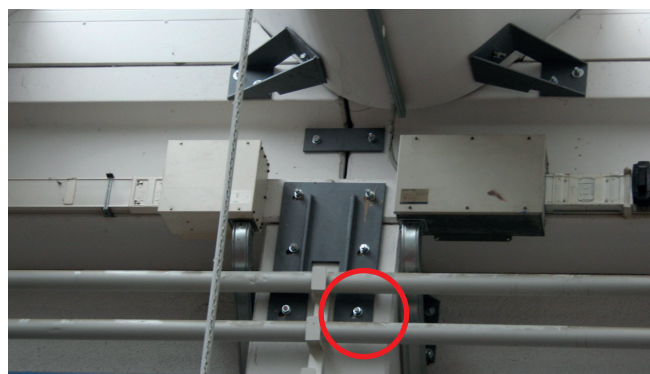
L_t = Anchor length
 h_{ef} = Effective anchorage depth
 h_1 = Min. hole depth
 d_0 = Hole diameter
 t_{fix} = Fixture thickness
 T_{inst} = Torque
 Ch = Spanner



R30-R120

Only standard anchorage depth

Examples of applications



Vorpa **VEX+SEISMIC** - Seismic category C1+C2

Heavy duty safety anchor with European Technical Assessment for cracked concrete and seismic zone

cracked
concrete

technical data

VEX+SEISMIC zincplated

			M8	M10	M12	M16	M20	M24	M27
Nominal drill hole diameter	d ₀	[mm]	8	10	12	16	20	24	28
Torque moment	T _{inst}	[Nm]	20	25	45	90	160	200	300
Spanner	SW	[mm]	13	17	19	24	30	36	41
Setting depth	h _{nom}	[mm]	46	60	70	85	100	115	125
Minimum thickness of concrete member	h _{min}	[mm]	100	120	140	170	200	230	250
Drill hole depth	h ₁	[mm]	60	75	90	110	125	145	160
Hole in the fixture	d _f	[mm]	9	12	14	18	22	26	30

Design method according to ETAG 001 part 1-2 Annex E

			M8	M10	M12	M16	M20	M24	M27
Steel failure									
Characteristic resistance									
Tension	N _{Rk,s}	[kN]	16	27	40	60	86	126	196
Partial safety factor	Y _{Ms}		1,53	1,53	1,5	1,5	1,6	1,5	1,5
Shear	V _{Rk,s}	[kN]	12,2	20,1	30	55	69	114	169,4
Partial safety factor	Y _{Ms}		1,25	1,25	1,25	1,25	1,33	1,25	1,25
Bending moment	M ⁰ _{Rk,s}	[Nm]	23	47	82	216	363	898	1331,5
Partial safety factor	Y _{Ms}		1,25	1,25	1,25	1,25	1,33	1,25	1,25
Tension loads C1	N _{Rk,s, C1}	[kN]	16	27	40	60	86	-	-
Tension loads C2	N _{Rk,s, C2}	[kN]	16	27	40	60	86	-	-
Partial safety factor	Y _{Ms, seis}		1,53	1,53	1,5	1,5	1,6	-	-
Shear loads C1	V _{Rk, seis, C1}	[kN]	9,3	20	27	44	69	-	-
Shear loads C1	V _{Rk, seis, C2}	[kN]	6,7	14	16,2	35,7	55,2	-	-
Partial safety factor	Y _{Ms, seis}		1,25	1,25	1,25	1,25	1,33	-	-
Pull-out failure									
Characteristics resistance non cracked concrete C20/25	N _{Rk,p,ucr}	[kN]	12	16	25	35	1)	1)	1)
Characteristics resistance cracked concrete C20/25	N _{Rk,p,cr}	[kN]	5	9	16	25	1)	1)	1)
Characteristics resistance seismic performance C1	N _{Rk,seis,C1}	[kN]	5	9	16	25	36	-	-
Characteristics resistance seismic performance C2	N _{Rk,seis,C2}	[kN]	2,3	3,6	10,2	13,8	22,4	-	-
Increasing factor	ψ _c	[-]				1,22			
						1,41			
						1,55			
Concrete cone failure and Anchorage depth	h _{ef}	[mm]	46	60	70	85	100	115	125
	s _{cr,sp}	[mm]	138	180	210	255	300	345	375
	c _{cr,sp}	[mm]	69	90	105	127,5	150	172,5	187,5
K factor cracked concrete	k					7,2			
K factor non-cracked concrete	k					10,1			

1) Pull out it not decisive

Examples of applications



cracked
concrete

Vorpa VEX+SEISMIC - Seismic category C1+C2

Heavy duty safety anchor with European Technical Assessment for cracked concrete and seismic zone

technical data

VEX+SEISMIC A4 stainless steel

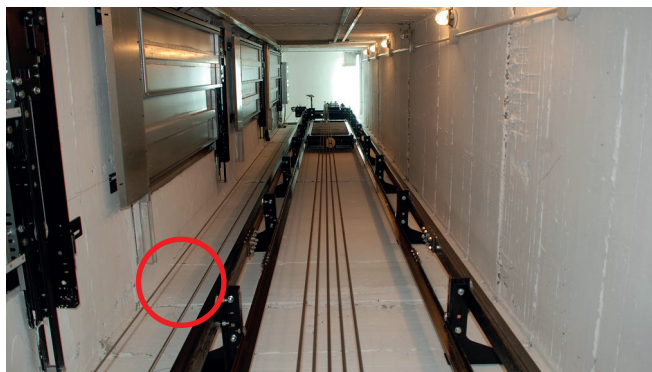
			M8	M10	M12	M16	M20	M24	M27
Nominal drill hole diameter	d _o	[mm]	8	10	12	16	20	24	-
Torque moment	T _{inst}	[Nm]	20	35	50	110	200	290	-
Spanner	SW	[mm]	13	17	19	24	30	36	-
Standard sett. depth	h _{nom}	[mm]	46	60	70	85	100	125	-
Minimum thickness of concrete member	h _{min}	[mm]	100	120	140	160	200	250	-
Drill hole depth	h _i	[mm]	60	75	90	110	125	155	-
Hole in the fixture	d _f	[mm]	9	12	14	18	22	26	-

Design method according to EAD 330232-00-0601

			M8	M10	M12	M16	M20	M24	M27
Steel failure									
Characteristic resistance									
Tension	N _{Rk,s}	[kN]	16	27	40	64	108	110	-
Partial safety factor	Y _{Ms}		1,5	1,5	1,5	1,5	1,68	1,5	-
Shear	V _{Rk,s}	[kN]	13	20	30	55	86	123,6	-
Partial safety factor	Y _{Ms}		1,0	1,0	1,0	1,0	1,0	1,0	-
Bending moment	M ⁰ _{Rk,s}	[Nm]	26	52	92	200	454	785,4	-
Partial safety factor	Y _{Ms}		1,25	1,25	1,25	1,25	1,4	1,25	-
Tension loads C1	N _{Rk,s,C1}	[kN]	16	27	40	64	108	-	-
Tension loads C2	N _{Rk,s,C2}	[kN]	16	27	40	64	108	-	-
Partial safety factor	Y _{Ms,seis}		1,5	1,5	1,5	1,5	1,68	-	-
Shear loads C1	V _{Rk,seis,C1}	[kN]	9,3	20	27	44	69	-	-
Shear loads C1	V _{Rk,seis,C2}	[kN]	6,7	14	16,2	35,7	55,2	-	-
Partial safety factor	Y _{Ms,seis}		1,25	1,25	1,25	1,25	1,4	-	-
Pull-out failure									
Characteristics resistance non cracked concrete C20/25	N _{Rk,p,ucr}	[kN]	12	16	25	35	1)	1)	-
Characteristics resistance cracked concrete C20/25	N _{Rk,p,cr}	[kN]	5	9	16	25	1)	40	-
Characteristics resistance seismic performance C1	N _{Rk,seis,C1}	[kN]	5	9	16	25	36	-	-
Characteristics resistance seismic performance C2	N _{Rk,seis,C2}	[kN]	2,3	3,6	10,2	13,8	24,4	-	-
Increasing factor	ψ _c	[-]				1,22			
						1,41			
						1,55			
Concrete cone failure and Anchorage depth	h _{ef}	[mm]	46	60	70	85	100	125	-
	Scr,sp	[mm]	138	180	210	255	300	375	-
	Ccr,sp	[mm]	69	90	105	127,5	150	187,5	-
K factor cracked concrete	k					7,2			
K factor non-cracked concrete	k					10,1			

1) Pull out it not decisive

Examples of applications



Vorpa **VEX+SEISMIC** - Seismic category C1+C2

Heavy duty safety anchor with European Technical Assessment for cracked concrete and seismic zone



technical data

VEX+SEISMIC reduced anchorage depth fixings

			M8	M10	M12	M16	M20	M24	M27
Nominal drill hole diameter	d _o	[mm]	8	10	12	16			
Torque moment	T _{inst}	[Nm]	20	35	50	110			
Spanner	SW	[mm]	13	17	19	24			
Standard sett. depth	h _{nom, rid}	[mm]	35	40	50	65			
Minimum thickness of concrete member	h _{min}	[mm]	80	80	100	140			
Drill hole depth	h _{1rid}	[mm]	49	55	70	90			
Hole in the fixture	d _f	[mm]	9	12	14	18			

Minimum spacing and edge distance reduced anchorage depth

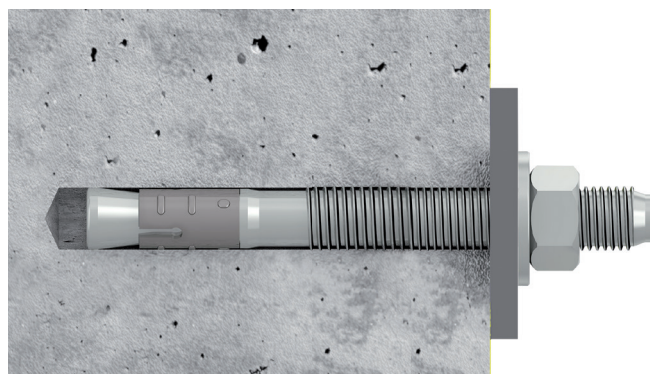
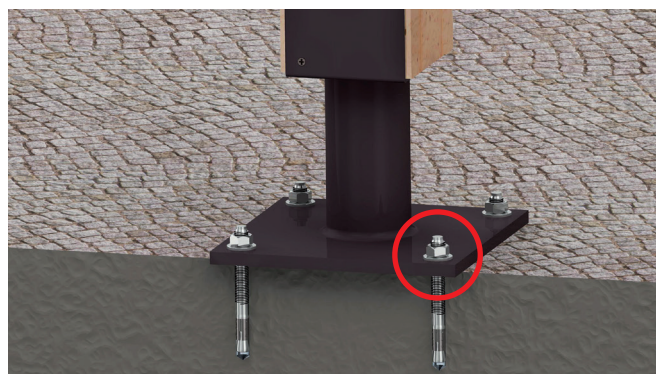
			M8	M10	M12	M16	M20	M24	M27
Non cracked concrete									
Minimum spacing	S _{min}	[mm]	50	50	50	65			
	per C _≥	[mm]	60	100	160	170			
Minimum edge distance	C _{min}	[mm]	40	65	100	170			
	per S _≥	[mm]	185	180	185	65			
Cracked concrete									
Minimum spacing	S _{min}	[mm]	50	50	50	65			
	per C _≥	[mm]	60	100	160	170			
Minimum edge distance	C _{min}	[mm]	40	65	65	100			
	per S _≥	[mm]	85	180	250	250			
Cracked concrete									
Pull-out failure									
Characteristic resistance	N _{Rk,p,rid}	[kN]	5	7,5	1)	1)			
Increasing factor	C30/37 C40/50 C50/60	ψ _c		1,22 1,41 1,55					
Concrete cone failure									
Anchorage depth	h _{ef, rid}		35	40	50	65			
K factor	k			7,2					
Non-cracked concrete									
Pull-out failure									
Characteristic resistance	N _{Rk,p,rid}		7,5	9	1)	1)			
Increasing factor	C30/37 C40/50 C50/60	ψ _c		1,22 1,41 1,55					
Concrete cone failure									
Anchorage depth	h _{ef, rid}		35	40	50	65			
K factor	k			10,1					

1) Pull out is not decisive

ATTENTION:

Partial technical data. Please consult ETA annexes to verify complete values.

Examples of applications



Vorpa VEX+SEISMIC - Seismic category C1+C2

Heavy duty safety anchor with European Technical Assessment for cracked concrete and seismic zone

cracked
concrete

technical data

VEX+SEISMIC

Characteristic values for tension and shear load under fire exposure standard anchorage depth, cracked and non-cracked concrete C20/25 to C50/60, design acc. to TR 020 or CEN/TS 1192-4, Annex D

				M8	M10	M12	M16	M20	M24	M27
Tension load										
Steel failure										
Steel zinc plated										
R30	N _{Rk,s, fi}	[kN]	1,4	2,2	3,2	6,0	9,4	13,6	17,6	
R60			1,1	1,8	2,8	5,2	8,2	11,8	15,3	
R90			0,8	1,4	2,4	4,4	6,9	10,0	13,0	
R120			0,7	1,2	2,2	4,0	6,3	9,1	11,8	
Stainless steel A4										
R30	N _{Rk,s, fi}	[kN]	3,8	6,9	11,5	21,5	33,5	48,2		
R60			2,9	5,2	8,6	16	25,0	35,9		
R90			2,0	3,5	5,6	10,5	16,4	23,6		
R120			1,6	2,7	4,2	7,8	12,1	17,4		
Shear load										
Steel failure without lever arm										
Steel zinc plated										
R30	V _{Rk,s, fi}	[kN]	1,6	2,6	3,8	7,0	11	16	20,6	
R60			1,5	2,5	3,6	6,8	11	15	19,8	
R90			1,2	2,1	3,5	6,5	10	15	19,0	
R120			1,0	2,0	3,4	6,4	10	14	18,6	
Stainless steel A4										
R30	V _{Rk,s, fi}	[kN]	3,8	6,9	11,5	21,5	33,5	48,2		
R60			2,9	5,2	8,6	16	25,0	35,9		
R90			2,0	3,5	5,6	10,5	16,4	23,6		
R120			1,6	2,7	4,2	7,8	12,1	17,4		
Bending moment										
Steel failure with lever arm										
Steel zinc plated										
R30	M ^o _{Rk,s, fi}	[Nm]	1,7	3,3	5,9	15	29	50	75	
R60			1,6	3,2	5,6	14	28	48	72	
R90			1,2	2,7	5,4	14	27	47	69	
R120			1,1	2,5	5,3	13	26	46	68	
Stainless steel A4										
R30	M ^o _{Rk,s, fi}	[Nm]	3,8	9,0	17,9	45,5	88,8	153,5		
R60			2,9	6,8	13,3	33,9	66,1	114,3		
R90			2,1	4,5	8,8	22,2	43,4	75,1		
R120			1,6	3,4	6,5	16,4	32,1	55,5		

Examples of applications

