through-setting heavy duty anchors

Vorpa **VE.7CE M6-M16**

Heavy duty anchor with European Technical Assesment for non cracked concrete

non cracked concrete

products group

Approved for
- non-cracked concrete C20/25-C50/60
- anchorage under static, quasi/static actions M6-M20
- anchorage under fire exposure in standard TR 020 R30-R120 only for M20 size

To fix
- parapets
- gates, stairs, profiles
- steel beams
- machine tools
- industrial systems
- heavy duty metal constructions
- static, quasi/static anchorages

EAD 330232-00-0601
for non cracked concrete

R30-R120
Only for M20

CALCULATION SOFTWARE

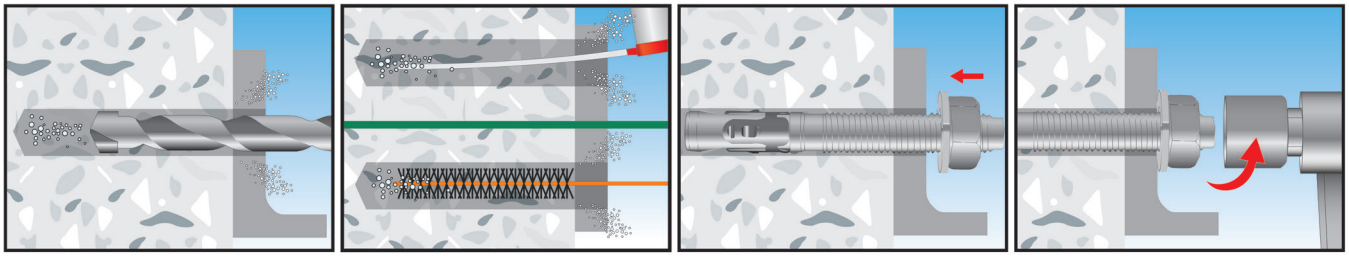
product information

Characteristics
- special wedge anchor assembled with hex nut and washer with European Technical Assessment for non cracked concrete
- fire tested in compliance with TR020. Fire resistance ratings R30–R120 for M20 sizes
- reduced hole diameter
- suitable for through-setting applications in concrete
- thread diameter and hole diameter are the same
- reinforced anchor's head to avoid damaging the thread during the installation

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**

installation sequence



Examples of applications

Vorpa **VE.7CE M6-M16**

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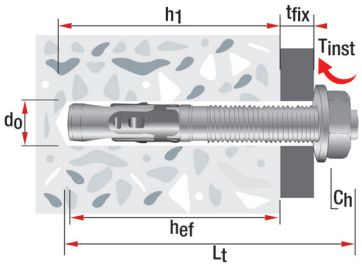
non cracked concrete

product code and technical data

VE.7CE

Code	Description	L_t mm	d_o mm	h_1 mm	t_{fix} max mm	T_{inst} Nm	Ch
4637	VE.7CE 6/10-55	55	6	55	10	5	10
4638	VE.7CE 6/20-65	65	6	55	20	5	10
4640	VE.7CE 8/1-65	65	8	65	1	15	13
4641	VE.7CE 8/15-80	80	8	65	15	15	13
4642	VE.7CE 8/30-95	95	8	65	30	15	13
4643	VE.7CE 8/50-115	115	8	65	50	15	13
4644	VE.7CE 8/65-130	130	8	65	65	15	13
4645	VE.7CE 10/1-75	75	10	70	1	25	17
4646	VE.7CE 10/15-90	90	10	70	15	25	17
4696	VE.7CE 10/25-105	105	10	70	25	25	17
4647	VE.7CE 10/45-120	120	10	70	45	25	17
4648	VE.7CE 10/75-150	150	10	70	75	25	17
4649	VE.7CE 12/10-90	90	12	90	10	45	19
4650	VE.7CE 12/15-110	110	12	90	15	45	19
4651	VE.7CE 12/25-120	120	12	90	25	45	19
4652	VE.7CE 12/45-140	140	12	90	45	45	19
4653	VE.7CE 12/65-160	160	12	90	65	45	19
4654	VE.7CE 12/85-180	180	12	90	85	45	19
4655	VE.7CE 16/5-125	125	16	110	5	100	24
4656	VE.7CE 16/20-140	140	16	110	20	100	24
4657	VE.7CE 16/30-150	150	16	110	30	100	24
4658	VE.7CE 16/55-175	175	16	110	55	100	24
4659	VE.7CE 16/100-220	220	16	110	100	100	24

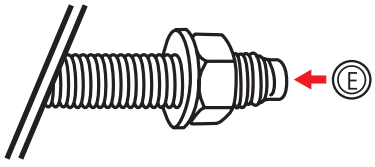


L_t = Anchor length
h_{ef} = Effective anchorage depth
h_1 = Min. hole depth
d_o = Hole diameter
t_{fix} = Fixture thickness
T_{inst} = Torque
Ch = Spanner

VE.7CE M6 - M16

The letter on the top of the head indicated the anchors length.

Letter	A	B	C	D	E	F	G	H	I	J	K	L	M
≥	-	50	60	70	80	90	100	110	120	130	140	150	160
<	50	60	70	80	90	10	110	120	130	140	150	160	170
Letter	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
≥	170	180	190	200	220	240	260	280	300	320	340	360	380
<	180	190	200	220	240	260	280	300	320	340	360	380	400



Examples of applications

Vorpa **VE.7CE M6-M16**

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non cracked concrete

technical data

VE.7CE M6-M16			M6	M8	M10	M12	M16
Anchor diameter	d	mm	6	8	10	12	16
Effective anchorage depth	h_{ef}	mm	40	45	51	66	80
Drill hole diameter	d_o	mm	6	8	10	12	16
Drill hole depth	h_1	mm	55	65	70	90	110
Hole diameter in the fixture	d_f	mm	7	9	12	14	18
Torque moment	T_{inst}	mm	5	15	25	45	100
Critical axial spacing	$S_{cr,N}$	Nm	120	135	155	200	240
Critical edge distance	$C_{cr,N}$	mm	60	70	80	100	120
Minimum axial spacing	S_{min}	mm	60	67,5	76,5	99	120
Minimum edge distance	C_{min}	mm	60	67,5	76,5	99	120
Minimum thickness member	h_{min}	mm	100	100	105	135	160
Characteristic values							
Pull out failur							
non cracked concrete	$N_{rk,P}$ C20/25	KN	4	9	12	16	30
ψc C30/37			1,08	1,08	1,08	1,08	1,08
ψc C40/50			1,15	1,15	1,15	1,15	1,15
ψc C50/60			1,19	1,19	1,19	1,19	1,19
Shear failure	$V_{Rk,S}$ C20/25	KN	4	7,3	11,6	16,9	31,4
Bending moment	$M_{RK,S}$	Nm	6,1	15	29,9	52,4	133,2
Values where the reduction factor γ is included (Design loads)							
Pull out failure	$N_{rk,P}$	KN	2,6	6	8	8,8	16,6
Shear failure	$V_{RK,S}$	KN	3,2	5,8	9,2	13,5	25,1
Bending moment	$M_{RK,S}$	Nm	4,8	12	23,9	41,9	106,5
Recommended loads							
Pull out failure	N	KN	1,8	4,2	5,7	6,2	11,8
Shear failure	T	KN	2,2	4,1	6,5	9,6	17,9
Bending moment	M	Nm	3,4	8,5	17	29,9	76

Examples of applications

Vorpa **VE.7CE M20**

Heavy duty anchor with European Technical Assesment for non cracked concrete

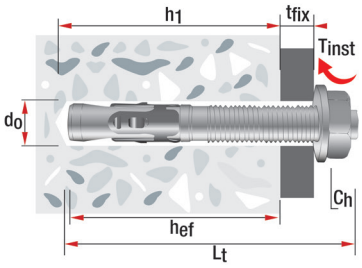
non cracked concrete

product code and technical data

VE.7CE zincplated M20

R30-R120

Code	Description	L_t mm	h_{ef}/ h_{ef} rid mm	d_o h_1/ d_o h_1 rid mm	T_{fix} / T_{fix2} mm	T_{inst} Nm	Ch
4660	VE.7CE 20/5 -27-150	150	100/78	20x130/20x110	5/27	200	30
4670	VE.7CE 20/35 -57-180	180	100/78	20x130/20x110	35/57	200	30
4672	VE.7CE 20/95 -117-240	240	100/78	20x130/20x110	95/117	200	30

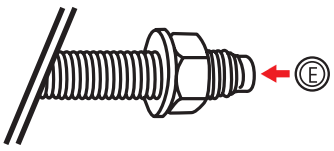


VE.7CE M20

The letter on the top of the head indicated the anchors length.

Letter	A	B	C	D	E	F	G	H	I	J	K	L	M
≥	38,1	50,8	63,5	76,2	88,9	101,6	114,3	127,0	139,7	152,4	165,1	177,8	190,5
<	50,8	63,5	76,2	88,9	101,6	114,3	127,0	139,7	152,4	165,1	177,8	190,5	203,2
Letter	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
≥	203,2	215,9	228,6	241,3	254,0	279,4	304,8	330,2	355,6	381,0	406,4	431,8	457,2
<	215,9	228,6	241,3	254,0	279,4	304,8	330,2	355,6	381,0	406,4	431,8	457,2	483,0

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



VE.7CE M20

Installation data			M20	
Performance data				
Effective anchorage depth	h_{ef}	mm	100	-
Reduced anchorage depth	$h_{ef,red}$	mm	-	78
Drill hole diameter	d_o	mm	20	20
Drill hole diameter in the fixture	d_o	mm	22	22
Drill hole depth	h_1	mm	130	110
Torque moment	T_{inst}	Nm	200	200
Width across nut	SW	mm	30	30
Spacing and edge distance				
Effective anchorage depth	h_{ef}	mm	100	78
Characteristic spacing	$S_{cr,N}$	mm	300	234
Characteristic edge distance	$C_{cr,N}$	mm	150	117
Minimum spacing	S_{min}	mm	105	140
Minimum edge distance	C_{min}	mm	125	140
Minimum thickness of concrete slab	h_{min}	mm	200	160

Characteristic values - Effective anchorage depth (hef)			M20
Pull out failure			*
ψc C30/37	C25/30		1,22
ψc C40/50			1,41
ψc C50/60			1,55
Shear failure	V	kN	69
Bending moment	M	Nm	363

Design loads - Effective anchorage depth (hef)			M20
Pull out failure	N	kN	*
Shear failure	V	kN	51,8
Bending moment	M	Nm	272,9
Recommended loads			**M20**
Pull out failure	N	kN	*
Shear failure	V	kN	37
Bending moment	M	Nm	194,9

* Pull-out failure is not decisive

Vorpa **VE.7CE M16 extra long**

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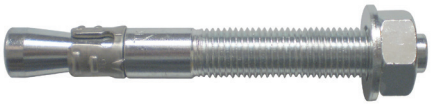
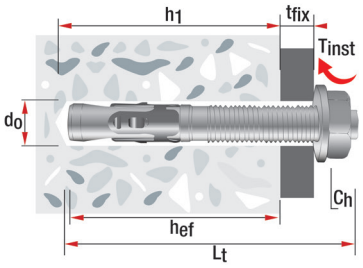


VE.CE7 M16 extra long

Code	Description	L_t mm	d_o mm	h_1 mm	t_{fix} max mm	T_{inst} Nm	Ch
2227	VE.CE 7 16/125-240	240	16	120	125	100	24
2228	VE.CE 7 16/145-260	260	16	120	145	100	24
2229	VE.CE 7 16/165-280	280	16	120	165	100	24
2230	VE.CE 7 16/185-300	300	16	120	185	100	24
2235	VE.CE 7 16/215-330	330	16	120	215	100	24
2236	VE.CE 7 16/245-360	360	16	120	245	100	24
2237	VE.CE 7 16/280-400	400	16	120	280	100	24

Note: All anchors Ø16 whose length is more than 220 mm will be assembled with DIN 9021 washer
Max T_{fix} = 280 mm



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

VE.CE7 M16 extra long

VE.CE7 EXTRA LONG

Installation data			M16 EXTRA LONG
Anchor diameter	d	mm	16
Anchor length	L	mm	221-400
Effective anchorage depth	h_{ef}	mm	75,8
Fixture thickness	T_{fix}	mm	280
Drill hole diameter	d_o	mm	16
Drill hole depth	h_1	mm	120
Drill hole diameter in the fixture	d_f	mm	18
Torque moment	T_{inst}	Nm	100
Critical axial spacing	$S_{cr,N}$	mm	270
Critical edge distance	$C_{cr,N}$	mm	135
Minimum axial spacing	S_{min}	mm	96
Minimum edge distance	C_{min}	mm	128
Minimum thickness member	h_{min}	mm	200

Characteristic values			
Pull out failure kN (1kN≃100kg)			
non-cracked concrete	$N_{rk,P}$ C20/25	KN	25
ψc C30/37			1,22
ψc C40/50			1,41
ψc C50/60			1,55
Shear failure	$V_{Rk,S}$ C20/25	KN	13,5
Bending moment	$M_{RK,S}$	Nm	166

Values with reduction factor γ (Design loads)			
Pull out failure	$N_{rk,P}$	KN	13,9
Shear failure	$V_{Rk,S}$	KN	10,8
Bending moment	$M_{RK,S}$	Nm	132,8

Recommended loads			
Pull out failure	N	KN	9,9
Shear failure	T	KN	7,7
Bending moment	M	Nm	75