Vorpa **CSB CE - Seismic category C1+C2**

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

cracked concrete

products group

CSB CE [*]
*** CSB INOX A4**
with hexagonal head

CSB
with mushroom head
Torx recess

CSB E CE [*]
with hexagonal stud
and nut

CSB S CE [*]
with countersunk head
Torx recess

ETA version approved for
- cracked and non-cracked concrete Ø8 - Ø16
- seismic applications C1-C2 TR045 - Ø12 - Ø16
- seismic applications C1 TR045 Ø10
- anchorage under fire exposure in standard TR 020 R30-R120

All versions suitable for
- non-cracked concrete
- natural stone

To fix
- parapets
- steel beams
- machine tools
- industrial systems
- heavy duty metal constructions
- structural fixings
- profiles
- pipes
- plants engineering
- railings
- gates
- window and door frames

[*] FIXING IN SEISMIC C1+C2

R30-R120

A4 INOX 316 *

CALCULATION SOFTWARE

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

product information

Characteristics
- steel screw fixing with special dual lead thread design with European Technical Assesment for cracked concrete and performance category C1-C2 under seismic action
- reduced hole diameter
- vibrations resistance, easy to identify by the screw's head
- ideal for permanent and removable fixing both inside and outside
- virtually expansion-free operation allows cost-efficient fixing with small axial spacing and edge distances.
- fire tested in compliance with DIN 4102-2. Fire resistance ratings R30–R120

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

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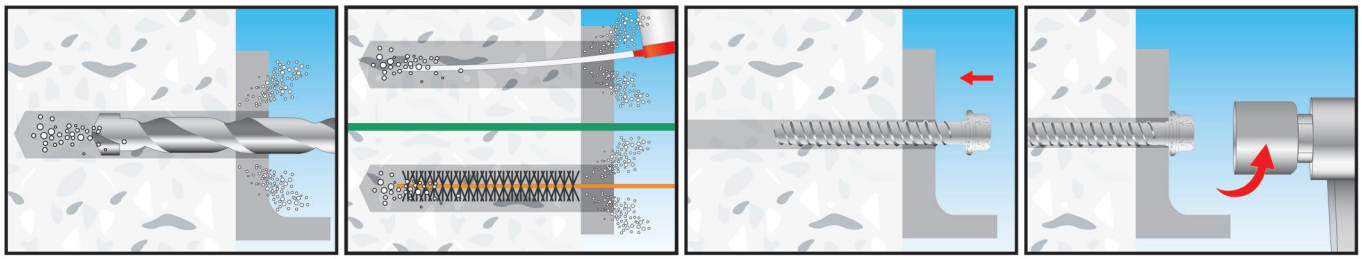
installation sequence

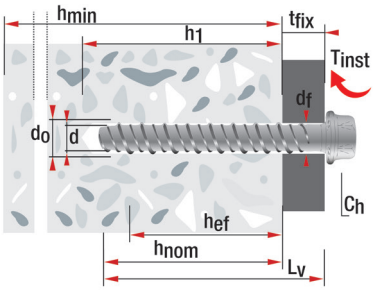


Clean the hole before the installation

product code and technical data

CSB CE [*]
with hexagonal head

Code	Description		d_v x L_v mm	t_{fix} mm	d_o mm	h_1 mm	h_{min} mm	h_{nom} mm	h_{ef} mm	T_{inst} Nm	Ch	C_{min} mm	S_{min} mm
93672	CSB CE	8x80	8 x 80	20	6	75	100	60	48	20	10	45	45
93673	CSB CE	8x100	8 x 100	40	6	75	100	60	48	20	10	45	45
93674	CSB CE	8x120	8 x 120	60	6	75	100	60	48	20	10	45	45
93676	CSB CE+SM C1	10x80	10 x 80	10	8	85	110	70	56	50	13	50	50
93677	CSB CE+SM C1	10x100	10 x 100	30	8	85	110	70	56	50	13	50	50
93678	CSB CE+SM C1	10x120	10 x 120	50	8	85	110	70	56	50	13	50	50
93679	CSB CE+SM C1	10x140	10 x 140	70	8	85	110	70	56	50	13	50	50
93680	CSB CE+SM C1	10x160	10 x 160	90	8	85	110	70	56	50	13	50	50
93681	CSB CE+SM C2	12x90	12 x 90	10	10	100	130	80	64	80	15	60	60
93682	CSB CE+SM C2	12x110	12 x 110	30	10	100	130	80	64	80	15	60	60
93683	CSB CE+SM C2	12x130	12 x 130	50	10	100	130	80	64	80	15	60	60
93684	CSB CE+SM C2	12x150	12 x 150	70	10	100	130	80	64	80	15	60	60
93685	CSB CE+SM C2	12x190	12 x 190	110	10	100	130	80	64	80	15	60	60
93686	CSB CE+SM C2	12x210	12 x 210	130	10	100	130	80	64	80	15	60	60
93687	CSB CE+SM C2	12x250	12 x 250	170	10	100	130	80	64	80	15	60	60
93688	CSB CE+SM C2	12x290	12 x 290	210	10	100	130	80	64	80	15	60	60
93689	CSB CE+SM C2	16x130	16 x 130	20	14	140	170	110	85	160	21	80	80
93690	CSB CE+SM C2	16x150	16 x 150	40	14	140	170	110	85	160	21	80	80
93691	CSB CE+SM C2	16x180	16 x 180	70	14	140	170	110	85	160	21	80	80

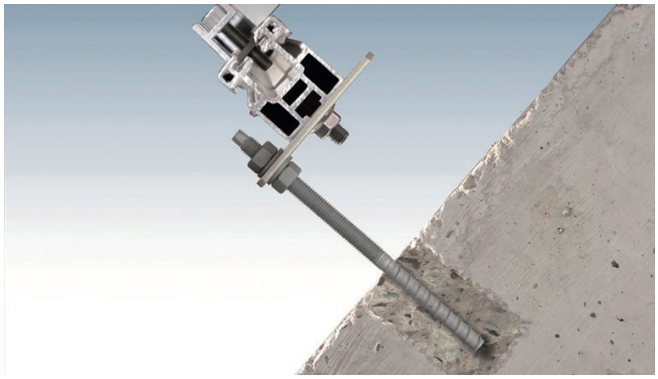


h_1 = Minimum depth of drill hole
L_v = Screw length
d_o = Drill hole diameter
d_v = Screw diameter
d_f = Diameter of clearance hole in the fixture
t_{fix} = Maximum thickness of fixture
t_{inst} = Required torque moment
Ch = Spanner
h_{min} = Minimum thickness of concrete member
h_{nom} = Overall anchor embedment depth
h_{ef} = Effective anchorage depth
T = 6 lobe recess
C_{min} = Minimum allowable edge distance
S_{min} = Minimum allowable spacing

[*]

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

Examples of applications



Vorpa **CSB CE - Seismic category C1+C2**

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

cracked concrete

product code and technical data

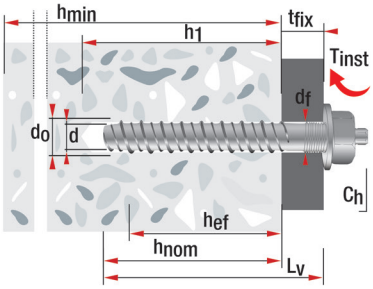
CSB CE INOX A4
with hexagonal head

A4 INOX 316

Code	Description		d_v x L_v mm	t_{fix} mm	d_o mm	h_1 mm	h_{min} mm	h_{nom} mm	h_{ef} mm	d_f mm	T_{inst} Nm	SW	C_{min} mm	S_{min} mm	C_{cr} mm	S_{cr} mm	Characteristic loads (kN) Estrazione	Taglio
4340	CSB A4	6x30	6x30	4	5	35	80	26	20	7	10	8	**35**	**35**	**20**	**40**	**2,0**	**4,50**
4341	CSB A4	6x40	6x40	5	5	50	80	35	27	7	10	8	**35**	**35**	**40**	**80**	**3,0**	**6,50**
4342	CSB A4	6x60	6x60	5	5	70	90	55	45	7	10	8	**35**	**35**	**68**	**135**	**9,0**	**6,50**
4343	CSB A4	6x80	6x80	25	5	70	90	55	45	7	10	8	**35**	**35**	**68**	**135**	**9,0**	**6,50**
4350	CSB A4	8x40	8x40	5	6	40	80	35	27	7	20	10	**40**	**40**	**40**	**80**	**4,23**	**7,10**
4351	CSB A4	8x50	8x50	15	6	40	80	35	27	7	20	10	**40**	**40**	**40**	**80**	**4,23**	**7,10**
4352	CSB A4	8x65	8x65	5	6	70	100	60	48	7	20	10	**50**	**50**	**75**	**150**	**12,5**	**9,75**
4353	CSB A4	8x80	8x80	20	6	70	100	60	48	7	20	10	**50**	**50**	**75**	**150**	**12,5**	**9,75**
4354	CSB A4	8x100	8x100	40	6	70	100	60	48	7	20	10	**50**	**50**	**75**	**150**	**12,5**	**9,75**
4360	CSB A4	10x60	10x60	15	8	75	-	55	-	*	13	40	**-**	**-**	**55**	**110**	**14,0**	**15,03**
4361	CSB A4	10x80	10x80	10	8	90	90	70	44	*	13	50	**40**	**40**	**85**	**170**	**23,0**	**17,50**
4362	CSB A4	10x100	10x100	30	8	90	90	70	44	*	13	50	**40**	**40**	**85**	**170**	**23,0**	**17,50**
4363	CSB A4	10x140	10x140	70	8	90	90	70	44	*	13	50	**40**	**40**	**85**	**170**	**23,0**	**17,50**

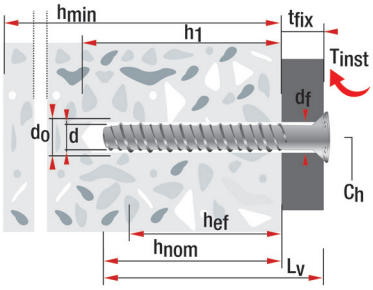
CSB E CE [*]
with hexagonal stud and nut

Code	Description		d_v x L_v mm	t_{fix} mm	d_o mm	h_1 mm	h_{min} mm	h_{nom} mm	h_{ef} mm	T_{inst} Nm	Ch ⬡	C_{min} mm	S_{min} mm
93710	CSB E CE	8x90	8 x 90	10	6	75	100	60	48	20	5	45	45
93711	CSB E CE	8x120	8 x 120	40	6	75	100	60	48	20	5	45	45
93713	CSB E CE+SM C1	10x105	10 x 105	10	8	90	110	70	56	50	7	50	50
93725	CSB E CE+SM C1	10x125	10 x 125	30	8	90	110	70	56	50	7	50	50
93726	CSB E CE+SM C1	10x195	10 x 195	100	8	90	110	70	56	50	7	50	50
93727	CSB E CE+SM C2	12x118	12 x 118	10	10	100	130	80	64	80	8	60	60
93728	CSB E CE+SM C2	12x138	12 x 138	30	10	100	130	80	64	80	8	60	60



CSB S CE [*]
with countersunk head Torx recess

Code	Description		d_v x L_v mm	t_{fix} mm	d_o mm	h_1 mm	h_{min} mm	h_{nom} mm	h_{ef} mm	T_{inst} Nm	Ch	C_{min} mm	S_{min} mm
93700	CSB S CE	8x70	8 x 70	10	6	75	100	60	48	20	T30	45	45
93701	CSB S CE	8x100	8 x 100	40	6	75	100	60	48	20	T30	45	45
93702	CSB S CE	8x140	8 x 140	80	6	75	100	60	48	20	T30	45	45
93703	CSB S CE+SM C1	10x80	10 x 80	10	8	90	110	70	56	50	T40	50	50
93704	CSB S CE+SM C1	10x100	10 x 100	30	8	90	110	70	56	50	T40	50	50
93705	CSB S CE+SM C1	10x160	10 x 160	90	8	90	110	70	56	50	T40	50	50
93706	CSB S CE+SM C2	12x100	12 x 100	20	10	100	130	80	64	80	T50	60	60
93707	CSB S CE+SM C2	12x120	12 x 120	40	10	100	130	80	64	80	T50	60	60



ETA CE [*]

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Seismic Category C1-C2

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d_o = Drill hole diameter
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t_{fix} = Maximum thickness of fixture
t_{inst} = Required torque moment
Ch = Spanner
h_{min} = Minimum thicknessof concrete member

h_{nom} = Overall anchor embedment depth
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T = 6 lobe recess
C_{min} = Minimum allowable edge distance
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Vorpa **CSB CE - Seismic category C1+C2**

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

cracked concrete

technical data ETA versions

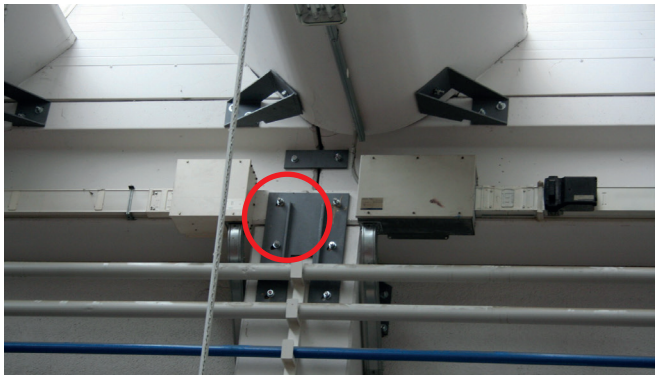
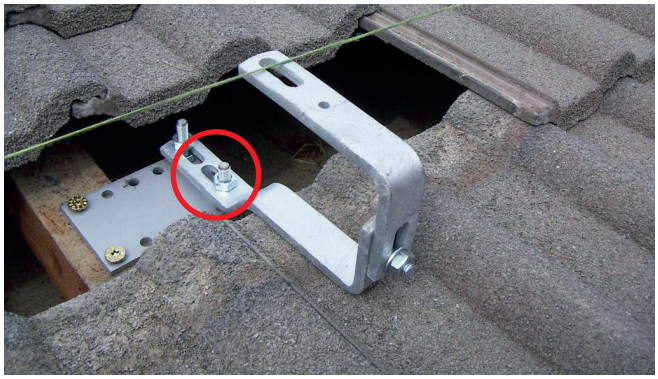
CSB CE - CSB E - CSB S

Characteristic values				CSB Ø8	CSB Ø10	CSB Ø12	CSB Ø16
Pull out	N_{RKP}	C20/25 (non cracked)	[kN]	16	20	25	40
Pull out	N_{RKP}	C20/25 (cracked)	[kN]	4	7,5	9	16
Pull out	$N_{RKP, p, eq}$	Category C1	[kN]	-	6	6,3	16
Pull out	$N_{RKP, p, eq}$	Category C2	[kN]	-	-	2,7	7,2
ψc C30/37				1,22			
ψc C40/50				1,41			
ψc C50/60				1,55			
Shear failure	V_{RKS}		[kN]	9,4	20,1	32,4	56,9
Shear failure	$V_{RKS, s, eq}$	Category C1	[kN]	-	12,1	19,1	39,8
Shear failure	$V_{RKS, s, eq}$	Category C2	[kN]	-	-	17,7	39,8
Bending moment	M_{RKS}		[kN]	19	44	83	216
Values with reduction factor (design loads)							
Pull out	N_{RKP}	C20/25 (non cracked)	[kN]	11,4	16,6	17,8	28,5
Pull out	N_{RKP}	C20/25 (cracked)	[kN]	2,8	6,2	6,4	11,4
Pull out	$N_{RKP, p, eq}$	Category C1	[kN]	-	5	4,5	11,4
Pull out	$N_{RKP, p, eq}$	Category C2	[kN]	-	-	1,9	5,1
Shear failure	V_{RKS}		[kN]	6,2	13,4	21,6	37,9
Bending moment	M_{RKS}		[kN]	12,6	29,3	55,3	144
Recommended loads							
Pull out	N	(non cracked)	[kN]	8,1	11,8	12,7	20,3
Pull out	N	(cracked)	[kN]	2	4,4	4,5	8,1
Pull out	N	Category C1	[kN]	-	3,5	3,2	8,1
Pull out	N	Category C2	[kN]	-	-	1,3	3,6
Shear failure	V		[kN]	4,4	9,5	15,4	27
Bending moment	M		[kN]	9	20	39,5	102

product code and technical data

CSB B
with mushroom head Torx recess

Code	Description		d_v x L_v mm	t_{fix} mm	d_o mm	h_1 mm	h_{min} mm	h_{nom} mm	h_{ef} mm	d_f mm	T_{inst} Nm	T	C_{min} mm	S_{min} mm	C_{cr} mm	S_{cr} mm	Characteristic loads (kN) Estrazione	Taglio
3381	CSB B	8x60	8 x 60	10	6	65	100	50	40	9	20	T30	**45**	**45**	**75**	**150**	**6,8**	**8,5**
3383	CSB B	8x80	8 x 80	20	6	75	110	60	50	9	20	T30	**45**	**45**	**90**	**180**	**11,2**	**8,5**
4379	CSB B	8x100	8 x 100	40	6	75	110	60	50	9	20	T30	**45**	**45**	**90**	**180**	**11,2**	**8,5**
93735	CSB B	10x60	10 x 60	10	8	70	100	50	35	12	50	T40	**55**	**55**	**75**	**150**	**9,2**	**10,5**
93736	CSB B	10x80	10 x 80	10	8	90	130	70	55	12	50	T40	**55**	**55**	**105**	**210**	**15,6**	**18,1**
93738	CSB B	10x100	10 x 100	30	8	90	130	70	55	12	50	T40	**55**	**55**	**105**	**210**	**15,6**	**18,1**
93739	CSB B	10x120	10 x 120	50	8	90	130	70	55	12	50	T40	**55**	**55**	**105**	**210**	**15,6**	**18,1**

Pull-out and shear showed in the table are CHARACTERISTIC LOADS from tests run on non-cracked concrete C20/25 without edge and spacing effect (Pull-out and shear loads are in kN: 1kN = 100kg)

Examples of applications