



INSTYTUT TECHNIKI BUDOWLANEJ



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European Technical Assessment

**ETA-17/0237
of 28/03/2024**



General Part

Technical Assessment Body issuing the European Technical Assessment

Instytut Techniki Budowlanej

Trade name of the construction product

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4

Product family to which the construction product belongs

Torque controlled expansion fastener of sizes M8, M10, M12, M16 and M20 for use in uncracked concrete

Manufacturer

G&B Fissaggi S.r.l.
Corso Savona, 22
10029 Villastellone (TO)
Italy

Manufacturing plant

Plant 1

This European Technical Assessment contains

15 pages including 3 Annexes which form an integral part of this Assessment

This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of

European Assessment Document (EAD) 330232-01-0601 "Mechanical fasteners for use in concrete"

This version replaces

ETA-17/0237 issued on 15/05/2017

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Specific Part

1 Technical description of the product

The G&B Fissaggi SITA Acciaio CE7 GBK torque controlled expansion anchor in the sizes M8, M10, M12, M16 and M20 is an anchor made of galvanized steel. The anchor is placed into a drill hole and anchored by torque-controlled expansion.

The G&B Fissaggi SITA Acciaio CE7 GBKI-A4 torque controlled expansion anchor in the sizes M8, M10 and M12 is an anchor made of stainless steel. The anchor is placed into a drill hole and anchored by torque-controlled expansion

The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The provisions made in this European Technical Assessment are based on an assumed working life of the anchor of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or Technical Assessment Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Performance of the product

3.1.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	Annex C1
Characteristic resistance to shear load (static and quasi-static loading)	Annex C2
Displacements	Annexes C1, C2

3.1.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	No performance assessed

3.1.3 Aspects of durability

Essential characteristic	Performance
Durability	Annex B1

3.2 Methods used for the assessment

The assessment has been made in accordance with EAD 330232-01-0601.

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to Decision 96/582/EC of the European Commission the system 1 of assessment and verification of constancy of performance applies (see Annex V to regulation (EU) No 305/2011).

5 Technical details necessary for the implementation of the AVCP system, as provided in the applicable European Assessment Document (EAD)

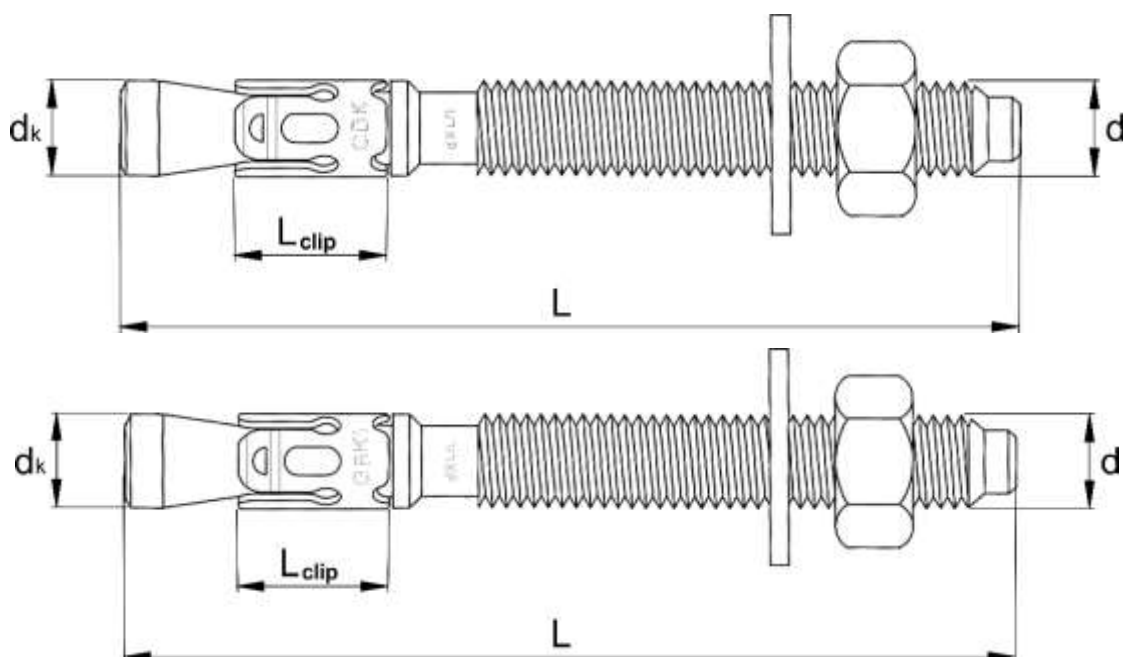
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 28/03/2024 by Instytut Techniki Budowlanej



Anna Panek, MSc
Deputy Director of ITB



Marking:

- expansion sleeve: **GBK or GBKI** (marking identifying the product)
- bolt: **dXL/t** (d – diameter, L – length, t – thickness of fixed element)
- one letter marking on the bolt head, according to table below:

Marking letter	Length L [mm]	Marking letter	Length L [mm]
A	60 – 67	N	148 – 155
B	68 – 80	O	156 – 165
C	81 – 87	P	166 – 175
D	88 – 92	Q	176 – 190
E	93 – 97	R	191 – 210
F	98 – 105	S	211 – 230
G	106 – 112	T	231 – 255
H	113 – 117	U	256 – 275
I	118 – 122	V	276 – 290
J	123 – 127	W	291 – 315
K	128 – 135	X	316 – 345
L	136 – 142	Y	346 – 375
M	143 – 147	Z	376 – 400

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4

Product description
Dimensions and marking

Annex A1
of European
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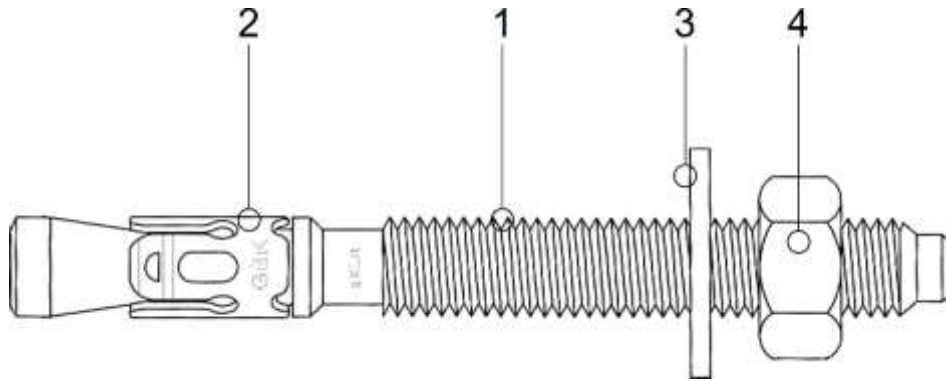
Table A2.1: G&B Fissaggi SITA Acciaio CE7 GBK anchor dimensions

Type of anchor			d [mm]	d _k [mm]	L [mm]	L _{clip} [mm]	SW ²⁾ [mm]
Size	Marking	t _{fix} ¹⁾ [mm]					
M8	GBK M8	2 – 142	8	7,8	60 – 200	15	13
M10	GBK M10	2 – 135	10	9,8	67 – 200	18	17
M12	GBK M12	3 – 278	12	11,8	85 – 360	20	19
M16	GBK M16	2 – 285	16	15,8	117 – 400	24	24
M20	GBK M20	2 – 135	20	19,8	137 – 270	28	30

¹⁾ thickness of the fixture²⁾ torque wrench width**Table A2.2: G&B Fissaggi SITA Acciaio CE7 GBKI-A4 anchor dimensions**

Type of anchor			d [mm]	d _k [mm]	L [mm]	L _{clip} [mm]	SW ²⁾ [mm]
Size	Marking	t _{fix} ¹⁾ [mm]					
M8	GBKI-A4 M8	2 – 142	8	7,8	60 – 200	15	13
M10	GBKI-A4 M10	2 – 135	10	9,8	67 – 200	18	17
M12	GBKI-A4 M12	3 – 278	12	11,8	85 – 360	20	19

¹⁾ thickness of the fixture²⁾ torque wrench width**G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4****Product description**
Dimensions**Annex A2**
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Table A3.1: Materials – G&B Fissaggi SITA Acciaio CE7 GBK

Part	Designation	Material	Coating
1	Bolt	Cold-formed steel, $f_{uk} \geq \begin{cases} 500 \text{ MPa for M8 - M16} \\ 480 \text{ MPa for M20} \end{cases}$ $f_{yk} \geq 400 \text{ MPa}$	Zinc plated $\geq 5 \mu\text{m}$ EN ISO 4042
2	Expansion clip	Cold-formed steel	
3	Washer	ISO 7089 (DIN 125-A) or ISO 7093 (DIN 9021)	
4	Hexagon nut	EN ISO 898-2 class 8 / DIN 934	

Table A3.2: Materials – G&B Fissaggi SITA Acciaio CE7 GBKI-A4

Part	Designation	Material	Coating
1	Bolt	Stainless steel A4	-
2	Expansion clip	Stainless steel A4	
3	Washer	Stainless steel A4	
4	Hexagon nut	Stainless steel A4	

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4
Product description
Materials

Annex A3
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Specification of intended use

Anchorage subject to:

- Static and quasi-static loads.

Base material:

- Uncracked concrete.
- Reinforced or unreinforced normal weight concrete (without fibres) of strength classes C20/25 to C50/60 according to EN 206.

Use conditions (environmental conditions):

- Structures subject to dry internal conditions: all anchors.
- For all other conditions according to EN 1993-1-4:2006+A1:2015 corresponding to corrosion resistance class (CRC): anchors made of stainless steel.

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).
- Verifiable calculation notes and drawings are taking account of the loads to be transmitted.
- Anchorages under static and quasi-static loads are designed in accordance with EN 1992-4:2018.

Installation of anchors:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Use of the anchor only as supplied by the manufacturer without exchanging any component of the anchor.
- Anchor installation in accordance with the manufacturer's specification and drawings and using the appropriate tools.
- Checks before placing the anchor to ensure that the strength class of the concrete in which the anchor is to be placed is in the range given and is not lower than that of the concrete to which the characteristic loads apply.
- Check of concrete being well compacted, e.g. without significant voids.
- Effective anchorage depth, edge distances and spacings not less than the specified values without minus tolerances.
- Positioning of the drill holes without damaging the reinforcement.
- Hole drilling by hammer drill.
- Cleaning of the hole of drilling dust.
- Application of the torque moment using a calibrated torque wrench.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not in the direction of load application.

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4

Intended use
Specifications

Annex B1
of European
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Anchor G&B Fissaggi SITA Acciaio CE7 GBK:

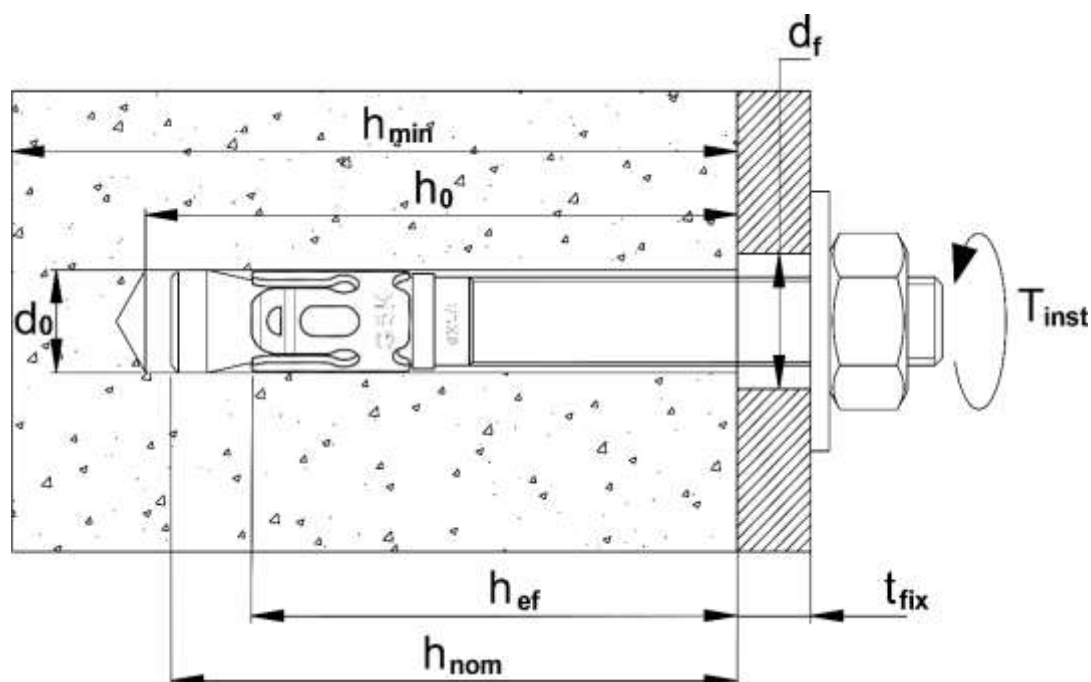


Table B1: Installation parameters

Anchor size		M8	M10	M12	M16	M20
Effective embedment depth	h_{ef} [mm]	45	50	60	85	100
Nominal drill hole diameter	d_0 [mm]	8	10	12	16	20
Depth of drill hole to deepest point	$h_0 \geq$ [mm]	60	65	80	110	125
Overall embedment depth in concrete	$h_{nom} \geq$ [mm]	50	55	70	100	115
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	9	12	14	18	22
Installation torque moment	T_{inst} [Nm]	20	35	55	100	150
Minimum thickness of concrete member	h_{min} [mm]	100	100	120	170	200
Minimum spacing	s_{min} [mm]	61	68	81	115	135
Minimum edge distance	c_{min} [mm]	61	68	81	115	135
Thickness of the fixture	t_{fix} [mm]	see Table A2.1				

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4

Intended use
Installation parameters of anchor
G&B Fissaggi SITA Acciaio CE7 GBK

Annex B2
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Anchor G&B Fissaggi SITA Acciaio CE7 GBKI-A4:

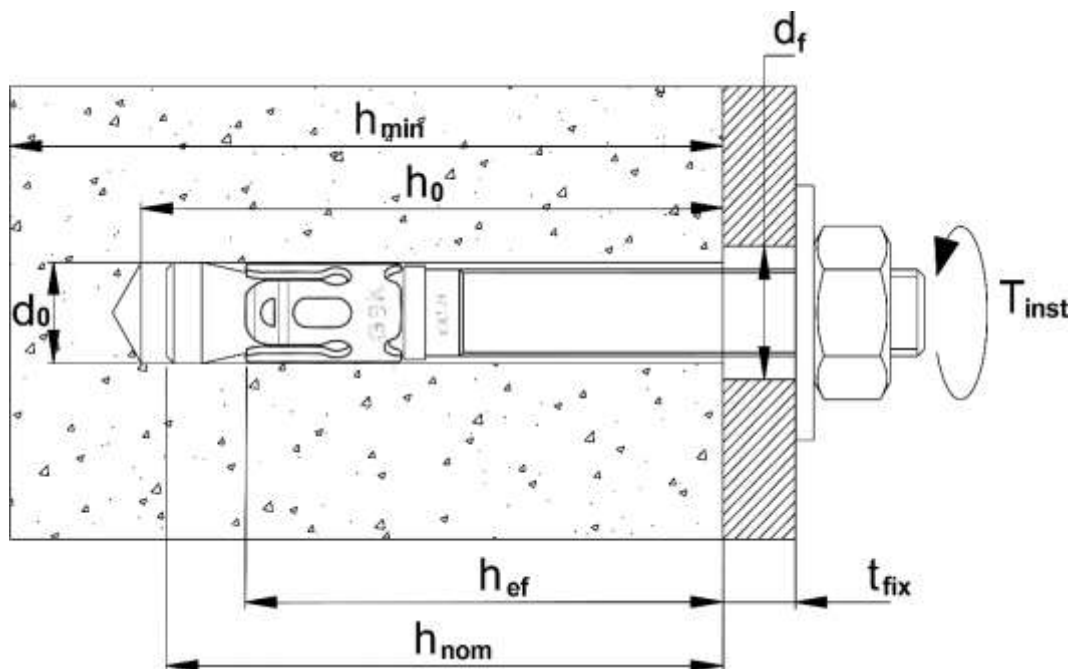


Table B2: Installation parameters

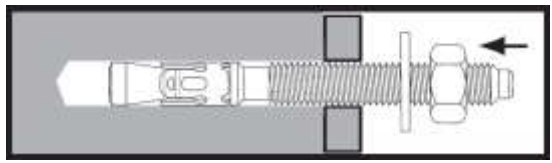
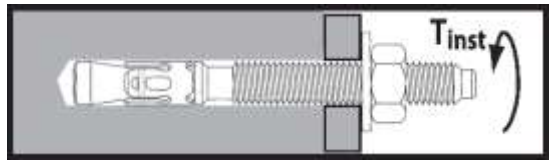
Anchor size		M8	M10	M12
Effective anchorage depth	h_{ef} [mm]	45	50	60
Nominal drill hole diameter	d_o [mm]	8	10	12
Depth of drill hole to deepest point	$h_o \geq$ [mm]	60	65	80
Overall embedment depth in concrete	$h_{nom} \geq$ [mm]	50	55	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	9	12	14
Installation torque moment	T_{inst} [Nm]	15	30	50
Minimum thickness of concrete member	h_{min} [mm]	100	100	120
Minimum spacing	s_{min} [mm]	61	68	81
Minimum edge distance	c_{min} [mm]	61	68	81
Thickness of the fixture	t_{fix} [mm]	see Table A2.2		

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4

Intended use

Installation parameters of anchor
G&B Fissaggi SITA Acciaio CE7 GBKI-A4

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	1. Drill the hole perpendicular to the substrate surface.
	2. Clean the drill hole.
	3. Place an anchor sleeve in the drill hole.
	4. Assemble anchor with appropriate installation torque T_{inst} .

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4

Intended use
Installation instruction

Annex B4
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Table C1.1: Characteristic resistance to tension load (static and quasi-static loading) in uncracked concrete, method A

Anchor size			M8	M10	M12	M16	M20
Steel failure							
Characteristic resistance		$N_{Rk,s}$ [kN]	18,3	29,0	42,2	78,5	117,6
Partial safety factor		$\gamma_{MS}^{1)}$	1,5				
Pull-out failure							
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p}$ [kN]	9	12	20	22	30
Installation safety factor		γ_{inst}	1,2	1,2	1,2	1,4	1,0
Increasing factor for concrete	C30/37	ψ_c	1,22	1,22	1,10	1,10	1,22
	C40/50		1,41	1,41	1,10	1,10	1,41
	C50/60		1,55	1,55	1,20	1,20	1,55
Concrete cone failure and splitting failure							
Effective embedment depth		h_{ef} [mm]	45	50	60	85	100
Factor for uncracked concrete		$k_{ucr,N}$	11,0	11,0	11,0	11,0	11,0
Installation safety factor		γ_{inst}	1,2	1,2	1,2	1,4	1,0
Characteristic resistance for splitting		$N^0_{Rk,sp}$ [kN]	9	12	16	16	30
Characteristic spacing	concrete cone failure	$s_{cr,N}$ [mm]	3 x h_{ef}				
	splitting failure	$s_{cr,sp}$ [mm]	225	250	320	440	500
Characteristic edge distance	concrete cone failure	$c_{cr,N}$ [mm]	1,5 x h_{ef}				
	splitting failure	$c_{cr,sp}$ [mm]	113	125	160	220	250
1) in the absence of other national regulations							

Table C1.2: Displacements under tension loading

Anchor size		M8	M10	M12	M16	M20
Tension load	N [kN]	3,8	5,0	8,7	9,8	14,4
Displacement	δ_{NO} [mm]	0,8	1,9	3,7	3,7	3,7
	$\delta_{N\infty}$ [mm]	1,2	1,2	1,2	1,2	1,2

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4

Performances
G&B Fissaggi SITA Acciaio CE7 GBK
 Characteristic resistance to tension load, displacements

Annex C1
 of European
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Table C2.1: Characteristic resistance to shear load (static and quasi-static loading) in uncracked concrete, method A

Anchor size		M8	M10	M12	M16	M20
Steel failure without lever arm						
Characteristic resistance	$V_{Rk,s}^0$ [kN]	9,2	14,5	21,1	39,3	58,8
Ductility factor	k_7	0,8	0,8	0,8	0,8	0,8
Partial safety factor	$\gamma_{Ms}^{1)}$	1,25				
Steel failure with lever arm						
Characteristic bending moment	$M_{Rk,s}^0$ [Nm]	18,8	37,4	98,6	231,3	311,8
Partial safety factor	$\gamma_{Ms}^{1)}$	1,25				
Concrete pry-out failure						
Concrete pry-out failure factor	k_8	1,0	1,0	2,0	2,0	2,0
Installation safety factor	γ_{inst}	1,0	1,0	1,0	1,0	1,0
Concrete edge failure						
Effective length of anchor under shear loading	l_f [mm]	45	50	60	85	100
Outside diameter of anchor	d_{nom} [mm]	8	10	12	16	20
Installation safety factor	γ_{inst}	1,0	1,0	1,0	1,0	1,0
1) in the absence of other national regulations						

¹⁾ in the absence of other national regulations

Table C2.2: Displacements under shear loading

Anchor size		M8	M10	M12	M16	M20
Shear load	V [kN]	2,7	6,2	8,3	13,7	25,1
Displacement	δ_{vo} [mm]	0,5	0,9	0,9	0,9	1,9
	$\delta_{v\infty}$ [mm]	0,7	1,3	1,3	1,3	2,8

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4

Performances
G&B Fissaggi SITA Acciaio CE7 GBK
Characteristic resistance to shear load, displacements

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Table C3.1: Characteristic resistance to tension load (static and quasi-static loading) in uncracked concrete, method A

Anchor size			M8	M10	M12
Steel failure					
Characteristic resistance		$N_{Rk,s}$ [kN]	22,0	34,8	50,6
Partial safety factor		$\gamma_{Ms}^{1)}$	1,8		
Pull-out failure					
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p}$ [kN]	9	13	22
Installation safety factor		γ_{inst}	1,2	1,0	1,0
Increasing factor for concrete	C30/37	ψ_c	1,0		
	C40/50		1,0		
	C50/60		1,0		
Concrete cone failure and splitting failure					
Effective embedment depth		h_{ef} [mm]	45	50	60
Factor for uncracked concrete		$k_{ucr,N}$	11,0	11,0	11,0
Installation safety factor		γ_{inst}	1,2	1,0	1,0
Characteristic resistance for splitting		$N^0_{Rk,sp}$ [kN]	9	12	16
Characteristic spacing	concrete cone failure	$s_{cr,N}$ [mm]	$3 \times h_{ef}$		
	splitting failure	$s_{cr,sp}$ [mm]	240	260	320
Characteristic edge distance	concrete cone failure	$c_{cr,N}$ [mm]	$1,5 \times h_{ef}$		
	splitting failure	$c_{cr,sp}$ [mm]	120	130	160
1) in the absence of other national regulations					

¹⁾ in the absence of other national regulations

Table C3.2: Displacements under tension loading

Anchor size		M8	M10	M12
Tension load	N [kN]	5,2	9,2	14,9
Displacement	δ_{NO} [mm]	1,7	1,9	2,1
	$\delta_{N\infty}$ [mm]	2,4	2,6	2,8

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4

Performances
G&B Fissaggi SITA Acciaio CE7 GBKI-A4
 Characteristic resistance to tension load, displacements

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Table C4.1: Characteristic resistance to shear load (static and quasi-static loading) in uncracked concrete, method A

Anchor size		M8	M10	M12
Steel failure without lever arm				
Characteristic resistance	$V_{Rk,s}^0$ [kN]	11,0	17,4	25,3
Ductility factor	k_7	0,8	0,8	0,8
Partial safety factor	$\gamma_{Ms}^{1)}$	1,5		
Steel failure with lever arm				
Characteristic bending moment	$M_{Rk,s}^0$ [Nm]	33,5	66,5	116,1
Partial safety factor	$\gamma_{Ms}^{1)}$	1,5		
Concrete pry-out failure				
Concrete pry-out failure factor	k_8	1,0	1,0	2,0
Installation safety factor	γ_{inst}	1,0	1,0	1,0
Concrete edge failure				
Effective length of anchor under shear loading	l_f [mm]	45	50	60
Outside diameter of anchor	d_{nom} [mm]	8	10	12
Installation safety factor	γ_{inst}	1,0	1,0	1,0
1) in the absence of other national regulations				

Table C4.2: Displacements under shear loading

Anchor size		M8	M10	M12
Shear load	V [kN]	6,1	11,6	16,9
Displacement	δ_{vo} [mm]	1,5	1,8	2,0
	$\delta_{v\infty}$ [mm]	2,3	2,7	3,0

G&B Fissaggi SITA Acciaio CE7 GBK and GBKI-A4

Performances
G&B Fissaggi SITA Acciaio CE7 GBKI-A4
Characteristic resistance to shear load, displacements

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