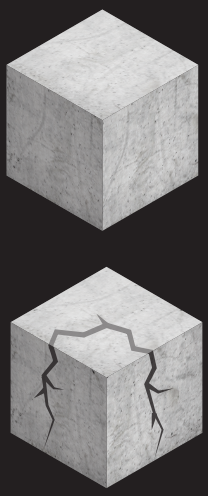
EUROPEAN TECHNICAL ASSESSMENT

BETABOLT



EUROPEAN TECHNICAL ASSESSMENT
18/0859

Scell-it®

Deutsches Institut für Bautechnik

Member of EOTA
www.eota.eu

Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-18/0859 of 11 March 2019

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	SCELL-IT Concrete Screw BT, A4-BT
Product family to which the construction product belongs	Mechanical fasteners for use in concrete
Manufacturer	SCELL-IT 28 Rue Paul Dubrule 59854 LESQUIN FRANKREICH
Manufacturing plant	SCELL-IT Plant 11
This European Technical Assessment contains	18 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	EAD 330232-00-0601

The European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction shall be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission in accordance with Article 25(3) of Regulation (EU) No 305/2011.

Specific Part

1 Technical description of the product

The SCELL-IT Concrete Screw BT, A4-BT is an anchor made of galvanized or stainless steel of sizes BT 8, BT 10 and BT 12. The anchor is screwed into a predrilled cylindrical drill hole. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterised by mechanical interlock in the special thread.

The product description is given in Annex A.

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

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

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the concrete screw of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, 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 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	see Annex C 1 and C 2
Characteristic resistance to shear load (static and quasi-static loading)	see Annex C 4
Displacements (static and quasi-static loading)	see Annex C 3 and C 5
Characteristic resistance and displacements for seismic performance categories C1 and C2	No performance assessed

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C 6 and C 7

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

In accordance with European Assessment Documents EAD No. 330232-00-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

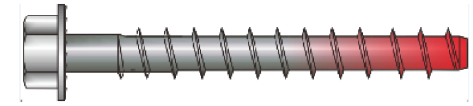
Issued in Berlin on 11 March 2019 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

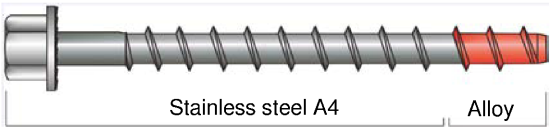
beglaubigt:
Baderschneider

Deutsches Institut für Bautechnik DIBt

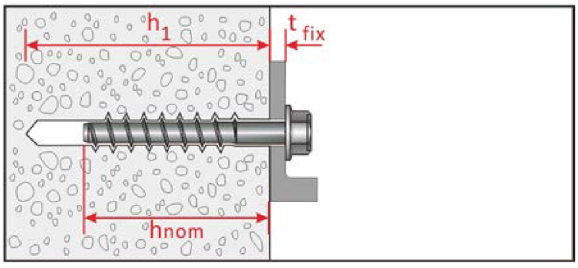
Product in the installed condition



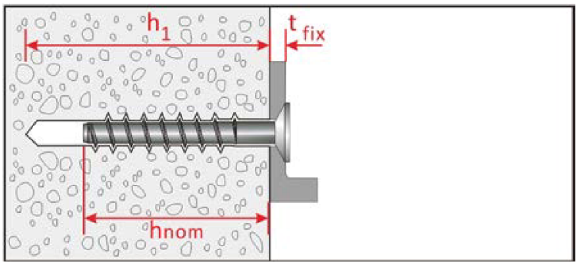
Steel 10B21



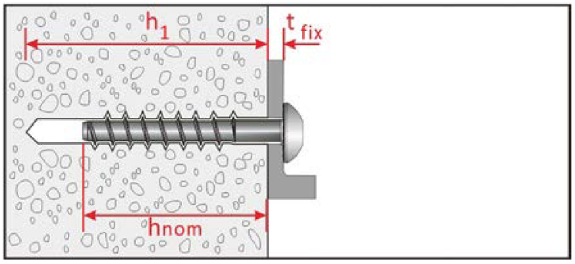
Stainless steel A4



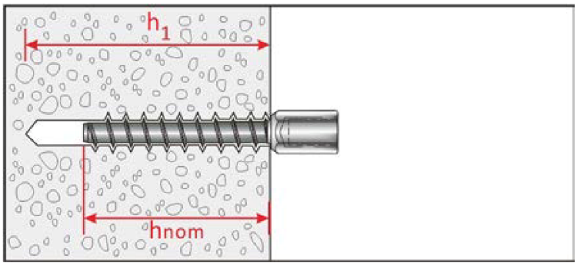
Hexagon Head: BT-H, BT-HF
Material 10B21 or A4



Countersunk Head: BT-C
Material 10B21 or A4



Pan Head: BT-P
Material 10B21 or A4



Hanger Bolt: BT-I
Material A4

SCELL-IT Concrete Screw BT, A4-BT	Annex A1
Product description Installed condition	

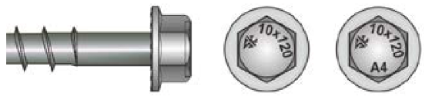
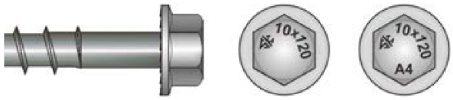
Deutsches Institut für Bautechnik DIBt

Table A1: Materials and screw types

Name	Material
Screw fastener	

Head marking	material
SK	Steel 10B21 acc. to SAE-J403 zinc coating: electroplated (> 5 µm) or mechanical plated (> 30 µm) (only head type –H and –HF)
SK A4	Stainless steel 1.4401, 1.4404 (both A4)

Anchor size / head types			BT 8			BT 10			BT 12	
			-H -HF -C -P	-H -HF	-C -P	-H -HF -C -P	-H -HF -I	-C -P	-H -HF -C -P	
Material			10B21	A4		10B21	A4		10B21	A4
Characteristic yield strength	f_{yk}	N/mm^2	780	640	432	750	640	432	750	640
Characteristic tensile strength	f_{uk}	N/mm^2	870	800	540	850	800	540	850	800
Elongation at rupture	As	[%]	≤ 8							

	Hexagon washer head 1) BT-H size 8,10,12 (10B21 steel) 2) A4-BT-H size 8,10,12 (stainless A4)
	Hexagon washer head 3) BT-HF size 8,10,12 (10B21 steel) 4) A4-BT-HF size 8,10,12 (stainless A4)
	Countersunk head 5) BT-C size 8,10 (10B21 steel) 6) A4-BT-C size 8,10 (stainless A4)
	Pan head 7) BT-P size 8,10 (10B21 steel) 8) A4-BT-P size 8,10 (stainless A4)
	Hanger Bolt head 9) A4-BT-I size 10 with M12 internal thread (stainless A4)

SCELL-IT Concrete Screw BT, A4-BT

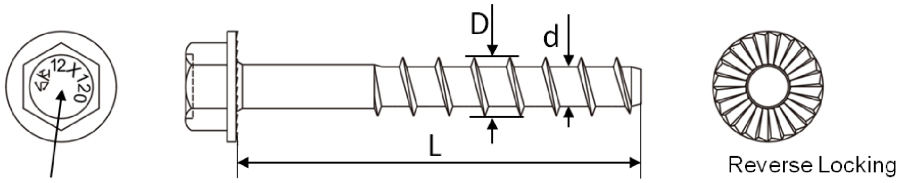
Product description
Materials and screw types

Annex A2

Table A2: Dimensions and markings

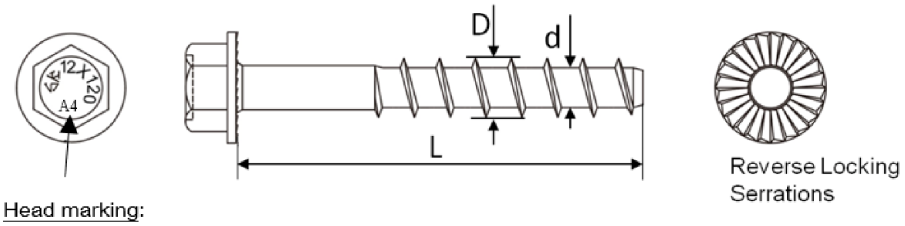
Fastener size			**BT 8**				**BT 10**				**BT 12**	
Head type			**H, HF, P**		**C**		**H, HF, P, I**		**C**		**H, HF**	
Material			**10B21**	**A4**	**10B21**	**A4**	**10B21**	**A4**	**10B21**	**A4**	**10B21**	**A4**
Embedment depth	h_{nom}	[mm]	65	85	65	85	75	100	75	100	95	120
Length of fastener	min L	[mm]	70	90	75	95	80	105	85	110	100	125
	max L	[mm]	150				150				150	
Thread diameter	D	[mm]	9,9				12,5				14,3	
Shaft diameter	d	[mm]	7,4				9,4				11,3	
Thread pitch	p	[mm]	5,8				7,7				8,1	

Steel
10B21



Head marking:
Identifying mark of producer: SK
Nominal size: e.g. 12 mm
Length L: e.g. 120 mm

Stainless Steel
A4



Head marking:
Identifying mark of producer: SK
Nominal size: e.g. 12mm
Length L: 120mm
Material: A4

SCELL-IT Concrete Screw BT, A4-BT	**Annex A3**
Product description Dimensions and markings	

Deutsches Institut für Bautechnik DIBt

Specifications of Intended use

Anchorages subject to:

- Static and quasi-static loads: All sizes.
- Fire exposure: All sizes

Base materials:

- Compacted reinforced or unreinforced normal weight concrete without fibres according to EN 206:2013,
- Strength classes C20/25 to C50/60 according to EN 206:2013,
- Uncracked or cracked concrete: all sizes.

Use conditions (Environmental conditions)

- Anchorages subject to dry internal conditions. (zinc plated steel and stainless steel)
- Anchorages subject to external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal conditions if no particular aggressive conditions exist. (Stainless steel)

  Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere or indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used)

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e. g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed in accordance with EN 1992-4:2018 and Technical Report TR 055.

Installation:

- Hammer drilling only.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- 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 hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of the load application.
- After installation further turning of the anchor shall not be possible.
- The head of the anchor must be fully engaged on the fixture and show no signs of damage.

SCELL-IT Concrete Screw BT, A4-BT	Annex B1
Intended Use Specifications	

Table B1: Installation parameters (Steel 10B21)

Fastener size			**BT 8**			**BT 10**			**BT 12**
Head type			**H HF**	**C**	**P**	**H HF**	**C**	**P**	**H HF**
Material			**Steel 10B21**						
Diameter of drill bit	d_0	[mm]	8			10			12
Embedment depth	h_{nom}	[mm]	65			75			95
Min. hole depth in concrete	$h_1 \geq$	[mm]	75			85			105
Effective embedment depth	h_{ef}	[mm]	50,6			58,1			75,4
Clearance hole in the fixture	d_f	[mm]	11			13			15
Thickness of fixture	t_{fix}	[mm]	5-85	10-85	5-85	5-75	10-75	5-75	5-55
Installation torque	T_{inst}	[Nm]	40	-[1]	-[1]	60	-[1]	-[1]	80
Wrench size (types: H, HF)	WS	[mm]	13	-	-	17	-	-	19
Torx size (types: C, P)	TX	-	-	45		-	50		-
Max. power output, machine setting	$T_{max} \leq$	[Nm]	185	120	120	350	120	120	350

1) For the installation of the C and P head types only impact screw driver can be used.

Table B2: Installation parameters (Stainless Steel A4)

Fastener size			**BT 8**			**BT 10**				**BT 12**
Head type			**H HF**	**C**	**P**	**H HF**	**I**	**C**	**P**	**H HF**
Material			**Stainless A4**							
Diameter of drill bit	d_0	[mm]	8			10				12
Embedment depth	h_{nom}	[mm]	85			100				120
Min. hole depth in concrete	$h_1 \geq$	[mm]	95			110				130
Effective embedment depth	h_{ef}	[mm]	51,9			58,7				75,6
Clearance hole	d_f	[mm]	11			13				15
Thickness of fixture	t_{fix}	[mm]	5-65	10-65	5-65	5-50	5-50	10-50	5-50	5-30
Installation torque	T_{inst}	[Nm]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]
Wrench size (types: H, HF, I)	WS	[mm]	13	-	-	17	19	-	-	19
Torx size (types: C, P)	TX	-	-	45		-	-	50		-
Max. torque moment, machine setting	$T_{max} \leq$	[Nm]	120	120	120	185	185	185	185	185

[1] For the installation of the C and P head types only impact screw driver can be used.

SCELL-IT Concrete Screw BT, A4-BT	**Annex B2**
Intended Use Installation parameters	

Deutsches Institut für Bautechnik DIBt

Table B3: Minimum thickness of member, Minimum spacing and edge distance

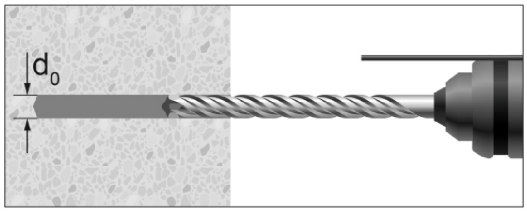
Fastener size			**BT 8**		**BT 10**		**BT 12**	
Head type			**H, HF, C, P**		**H, HF, C, P, I**		**H,HF**	
Material			**10B21**	**A4**	**10B21**	**A4**	**10B21**	**A4**
Minimum member thickness	h_{min}	[mm]	110	125	130	140	160	170
Minimum edge distance	c_{min}	[mm]	50	50	60	60	70	70
Minimum spacing	s_{min}	[mm]	50	50	60	60	70	70

SCELL-IT Concrete Screw BT, A4-BT

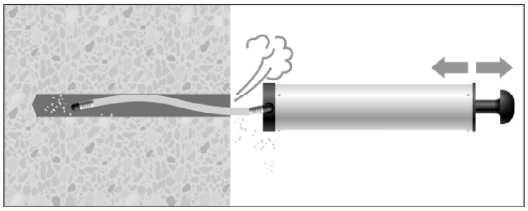
Intended Use
Minimum member thickness, minimum edge distance and anchor spacing

Annex B3

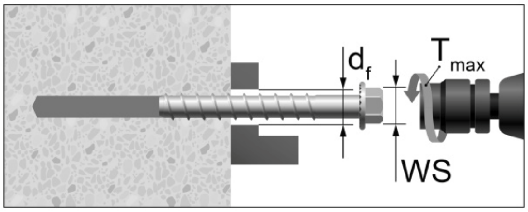
Installation instruction



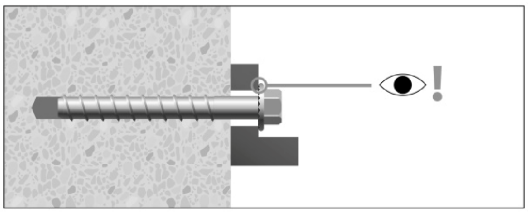
Drill the hole to the bore hole depth $\mathbf{h_1}$.



Clean the hole.



Screw in the anchor by using a torque wrench or an impact screw driver.
In case of using torque wrench: T_{inst} acc. to Table B1 and B2.
In case of using impact screw driver: T_{max} acc. to Table B1 and B2
WS= Wrench Size



Control of complete setting, full contact of screw head with fixture part.

SCELL-IT Concrete Screw BT, A4-BT	Annex B4
Intended Use Installation Instruction	

Deutsches Institut für Bautechnik DIBt

Table C1:
Characteristic resistance under tension loading (Steel 10B21)

Fastener size			**BT 8**			**BT 10**			**BT 12**
Head type			**H HF**	**C**	**P**	**H HF**	**C**	**P**	**H HF**
Material			**Steel 10B21**						
Steel failure									
Characteristic resistance	$N_{Rk,s}$	[kN]	35,9			57,0			83,0
Partial factor	γ_{Ms} [1)]	[-]	1,4			1,4			1,4
Pull-out failure									
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	4,5			10,0			12,0
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	9,0	9,0	6,5	16,0	16,0	11	25,0
Increasing factors for $N_{Rk,p}$ in cracked or uncracked concrete	ψ_c	C30/37	1,22						
		C40/50	1,41						
		C50/60	1,58						
Installation factor	γ_{inst}	[-]	1,4			1,0			1,2
Concrete cone failure									
Effective embedment depth	h_{ef}	[mm]	50,6			58,1			75,4
Characteristic edge distance	$c_{cr,N}$	[mm]	$1{,}5h_{ef}$						
Characteristic spacing	$s_{cr,N}$	[mm]	$3h_{ef}$						
Factor for cracked concrete	k_{cr}	[-]	7,7						
Factor for uncracked concrete	k_{ucr}	[-]	11,0						
Splitting failure									
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	$N^0_{Rk,sp} = N_{Rk,p}$						
Characteristic edge distance for splitting	$c_{cr,sp}$	[mm]	$1{,}5h_{ef}$						
Characteristic anchor spacing for splitting	$s_{cr,sp}$	[mm]	$3h_{ef}$						

[1)] In absence of other national regulations.

SCELL-IT Concrete Screw BT, A4-BT

Performance
Characteristic values under tension loading

Annex C1

Deutsches Institut für Bautechnik DIBt

Table C2: Characteristic resistance under tension loading (Stainless Steel A4)

Fastener size			**BT 8**			**BT 10**				**BT 12**
Head type			**H HF**	**C**	**P**	**H HF**	**I**	**C**	**P**	**H HF**
Material			**Stainless steel A4**							
Steel failure										
Characteristic resistance	$N_{Rk,s}$	[kN]	33,0	22,3	22,3	53,7	53,7	36,2	36,2	78,1
Partial factor	γ_{Ms} [1)]	[-]	1,5			1,5				1,5
Pull-out failure										
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	4,5	4,5	4,0	7,0	7,0	7,0	7,0	12,0
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	9,0	5,5	4,0	16,0	16,0	10	7,0	25,0
Increasing factors for $N_{Rk,p}$ in cracked or uncracked concrete	ψ_c	C30/37	1,22							
		C40/50	1,41							
		C50/60	1,58							
Installation factor	γ_{inst}	[-]	1,4			1,0				1,2
Concrete cone failure										
Effective embedment depth	h_{ef}	[mm]	51,9			58,7				75,6
Characteristic edge distance	$c_{cr,N}$	[mm]	$1,5h_{ef}$							
Characteristic spacing	$s_{cr,N}$	[mm]	$3h_{ef}$							
Factor for cracked concrete	k_{cr}	[-]	7,7							
Factor for uncracked concrete	k_{ucr}	[-]	11,0							
Splitting failure										
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	$N^0_{Rk,sp} = N_{Rk,p}$							
Characteristic edge distance for splitting	$c_{cr,sp}$	[mm]	$1,5h_{ef}$							
Characteristic anchor spacing for splitting	$s_{cr,sp}$	[mm]	$3h_{ef}$							

[1)] In absence of other national regulations.

SCELL-IT Concrete Screw BT, A4-BT

Performance
Characteristic values under tension loading

Annex C2

Table C3: Displacements under tension loads for non-cracked and cracked concrete

Fastener size	Material	Head type	Concrete	Tension load N	Displacement	
					δ_{N0}	$\delta_{N\infty}$
[-]	[-]	[-]	[-]	[kN]	[mm]	[mm]
BT 8	Steel 10B21	H/HF	cracked C20/25	1,5	0,1	0,8
		C				
		P				
BT 10		H/HF		4,8	0,2	1,0
		C				
		P				
BT 12		H/HF		4,8	0,3	1,2
BT 8	Stainless steel A4	H/HF	cracked C20/25	1,5	0,1	0,8
		C		1,5		
		P		1,4		
BT 10		H/HF/I		3,3	0,2	1,0
		C				
		P				
BT 12		H/HF		4,8	0,3	1,2
BT 8	Steel 10B21	H/HF	uncracked C20/25	3,1	0,1	0,8
		C				
		P		2,2		
BT 10		H/HF		7,6	0,1	1,0
		C				
		P		5,2		
BT 12		H/HF		9,9	0,3	1,2
BT 8	Stainless steel A4	H/HF	uncracked C20/25	3,1	0,1	0,8
		C		1,8		
		P		1,4		
BT 10		H/HF/I		7,6	0,1	1,0
		C		4,8		
		P		3,3		
BT 12		H/HF		9,9	0,3	1,2

SCELL-IT Concrete Screw BT, A4-BT

Performance
Displacements under tension loading

Annex C3

Deutsches Institut für Bautechnik DIBt

Table C4: Characteristic resistance under shear loading

Fastener size			**BT 8**			**BT 10**			**BT 12**	
Head type			H HF C P	H HF	C P	H HF C P	H HF, I	C P	H HF C P	H HF
Material			10B21	A4		10B21	A4		10B21	A4
Setting depth	h_{nom}	[mm]	65	85		75	100		95	120
Effective embedment depth	h_{ef}	[mm]	50,6	51,9		58,1	58,7		75,4	75,6
Steel failure without lever arm										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	16,9	16,5	11,2	26,8	26,8	18,1	39,0	39,0
Ductility factor	k_7	[-]	0,8							
Partial factor	γ_{Ms} [1)]	[-]	1,5	1,25		1,5	1,25		1,5	1,25
Steel failure with lever arm										
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	39,1	35,9	24,2	79,0	74,4	50,2	138,8	130.6
Partial factor	γ_{Ms} [1)]	[-]	1,5	1,25		1,5	1,25		1,5	1,25
Concrete pryout failure										
k-factor	k_8	[-]	1,0						2,0	
Partial factor	γ_{Mcp} [1)]	[-]	1,5							
Concrete edge failure										
Effective length of anchor	ℓ_f	[mm]	50,6	51,9		58,1	58,7		75,4	75,6
Outside diameter of fastener	d_{nom}	[mm]	7,25			9,24			11,15	
Partial factor	γ_{Mc} [1)]	[-]	1,5							

[1)] In absence of other national regulations.

SCELL-IT Concrete Screw BT, A4-BT	**Annex C4**
Performance Characteristic values under shear loading	

Table C5: Displacements under shear loads for non-cracked and cracked concrete

Fastener size	Material	Head type	Concrete	Shear load V	Displacement	
					δ_{V0}	$\delta_{V\infty}$
[-]	[-]	[-]	[-]	[kN]	[mm]	[mm]
BT 8	Steel 10B21	H/HF	Cracked and uncracked C20/25	8,0	1,8	2,7
		C				
		P				
BT 10		H/HF		12,8		
		C				
		P				
BT 12		H/HF		18,6		
BT 8	Stainless steel A4	H/HF	Cracked and uncracked C20/25	9,4	1,8	2,7
		C		6,4		
		P				
BT 10		H/HF/I		15,3		
		C		10,3		
		P				
BT 12		H/HF		22,3		

SCELL-IT Concrete Screw BT, A4-BT	Annex C5
Performance Displacements under shear loading	

Deutsches Institut für Bautechnik DIBt

Table C6: Characteristic tension resistance values for resistance to fire

Fastener size				**BT 8**			**BT 10**		**BT 12**	
Head type				H HF C P	H HF C	P	H HF C P	H HF I C P	P	H HF C P
Material				10B21	A4		10B21	A4	10B21	A4
Steel failure										
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	0,41	0,8		1,0	1,7	2,0	2,9
	R60	$N_{Rk,s,fi}$	[kN]	0,37	0,7		0,9	1,3	1,5	2,4
	R90	$N_{Rk,s,fi}$	[kN]	0,29	0,5		0,7	1,0	1,3	2,0
	R120	$N_{Rk,s,fi}$	[kN]	0,21	0,4		0,5	0,9	1,0	1,6
Pull-out failure										
Characteristic resistance in concrete ≥ C20/25	R30	$N_{Rk,p,fi}$	[kN]	1,1	1,1	1,0	2,5	1,8	3,0	3,0
	R60									
	R90									
	R120	$N_{Rk,p,fi}$	[kN]	0,9	0,9	0,8	2,0	1,4	2,4	2,4
Concrete cone failure										
Characteristic resistance in concrete ≥ C20/25	R30	$N^0_{Rk,c,fi}$	[kN]	3,1	3,3		4,4	4,5	8,5	8,6
	R60									
	R90									
	R120	$N^0_{Rk,c,fi}$	[kN]	2,5	2,7		3,5	3,6	6,8	6,8
Effective embedment depth		h_{ef}	[mm]	50,6	51,9		58,1	58,7	75,4	75,6
Minimum member thickness		h_{min}	[mm]	110	125		130	140	160	170
Spacing		$s_{cr,N,fi}$	[mm]	$4h_{ef}$						
		s_{min}	[mm]	50			60		70	
Edge distance		$c_{cr,N,fi}$	[mm]	$2h_{ef}$						
Fire exposure from one side only		c_{min}	[mm]	50			60		70	
Fire exposure from more than one side				≥ 300 mm						

[1] In absence of other national regulations.

SCELL-IT Concrete Screw BT, A4-BT	**Annex C6**
Performance Characteristic values for resistance to fire (tension)	

Deutsches Institut für Bautechnik DIBt

Table C7: Characteristic shear resistance values for resistance to fire

Fastener size				**BT 8**		**BT 10**		**BT 12**	
Head type				all	all	all	all	all	all
Material				10B21	A4	10B21	A4	10B21	A4
Steel failure without level arm									
Characteristic resistance	R30	$V^0_{Rk,s,fi}$	[kN]	0,41	0,8	1,0	1,7	2,0	2,9
	R60	$V^0_{Rk,s,fi}$	[kN]	0,37	0,7	0,9	1,3	1,5	2,4
	R90	$V^0_{Rk,s,fi}$	[kN]	0,29	0,5	0,7	1,0	1,3	2,0
	R120	$V^0_{Rk,s,fi}$	[kN]	0,21	0,4	0,5	0,9	1,0	1,6
Steel failure with level arm									
Characteristic resistance	R30	$M^0_{Rk,p,fi}$	[Nm]	0,45	0,9	1,4	2,3	3,4	4,9
	R60	$M^0_{Rk,p,fi}$	[Nm]	0,40	0,7	1,2	1,9	2,5	4,0
	R90	$M^0_{Rk,p,fi}$	[Nm]	0,31	0,5	0,9	1,5	2,1	3,3
	R120	$M^0_{Rk,p,fi}$	[Nm]	0,22	0,45	0,7	1,3	1,6	2,6
Pry-out failure									
k_8			[-]	1		1		2	
Characteristic resistance	R30	$V^0_{Rk,cp,fi}$	[kN]	3,1	3,3	4,4	4,5	17,0	17,1
	R60								
	R90								
	R120	$V^0_{Rk,cp,fi}$	[kN]	2,5	2,7	3,5	3,6	13,6	13,7
Concrete edge failure									
Characteristic resistance	≤ R90	$V^0_{Rk,c,fi}$	[kN]	$V^0_{Rk,c,fi} = 0.25 * V^0_{Rk,c}$ [2)]					
	R120	$V^0_{Rk,c,fi}$	[kN]	$V^0_{Rk,c,fi} = 0.20 * V^0_{Rk,c}$ [2)]					

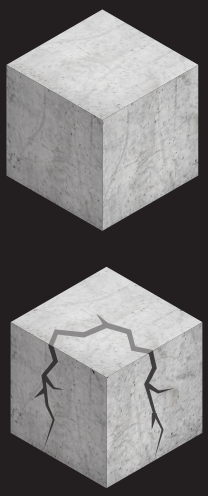
[1)] In absence of other national regulations.

[2)] $V^0_{Rk,c}$ = characteristic resistance for concrete edge failure in cracked concrete C20/C25 under normal temperature calculated acc. to EN 1992-4.

SCELL-IT Concrete Screw BT, A4-BT	**Annex C7**
Performance Characteristic values for resistance to fire (shear)	

EUROPEAN TECHNICAL ASSESSMENT

BETABOLT



EUROPEAN TECHNICAL ASSESSMENT
18/0860

Scell-it®

Deutsches Institut für Bautechnik

Member of EOTA
www.eota.eu

Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-18/0860 of 11 March 2019

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	SCELL-IT Concrete Screw BT, A4-BT
Product family to which the construction product belongs	Fasteners for use in concrete for redundant non-structural systems
Manufacturer	SCELL-IT 28 Rue Paul Dubrule 59854 LESQUIN FRANKREICH
Manufacturing plant	SCELL-IT PLANT 11
This European Technical Assessment contains	14 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	EAD 330747-00-0601

Deutsches Institut für Bautechnik
Kolonnenstraße 30 B | 10829 Berlin | GERMANY | Phone: +49 30 78730-0 | Fax: +49 30 78730-320 | Email: dibt@dibt.de | www.dibt.de

The European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction shall be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission in accordance with Article 25(3) of Regulation (EU) No 305/2011.

Specific Part

1 Technical description of the product

The SCELL-IT Concrete Screw BT, A4-BT is an anchor made of galvanised or stainless steel of sizes 6 and 8. The anchor is screwed into a predrilled cylindrical drill hole. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterised by mechanical interlock in the special thread.

The product description is given in Annex A.

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

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 verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, 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 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C 3 and C 4

3.2 Safety in use (BWR 4)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	See Annex C 1
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C 2

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

In accordance with European Assessment Document EAD No. 330747-00-0601, the applicable European legal act is: [97/161/EC].

The system to be applied is: 2+

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

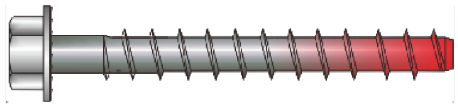
Issued in Berlin on 11 March 2019 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

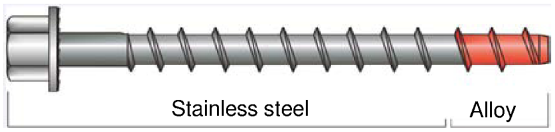
beglaubigt:
Baderschneider

Deutsches Institut für Bautechnik DIBt

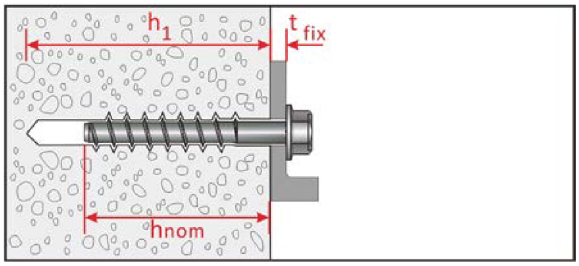
Product in the installed condition



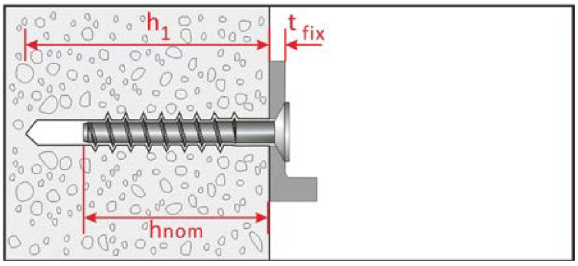
Steel 10B21



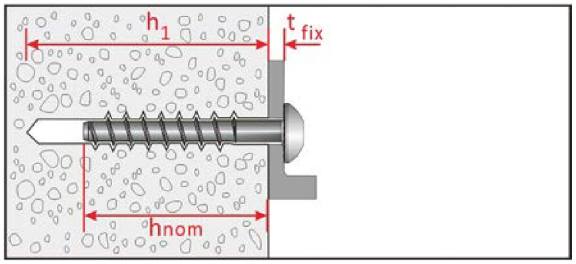
Stainless steel A2 /A4



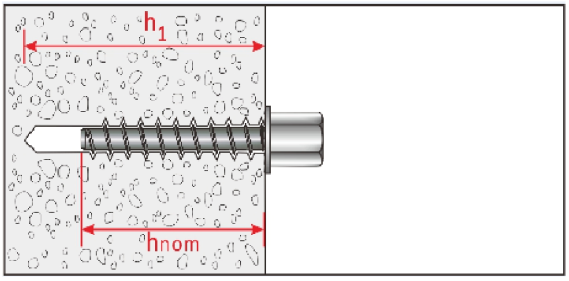
Hexagon Head: BT -H,-HF
Material 10B21, A4 or A2



Countersunk Head: BT -C
Material 10B21 or A4



Pan Head: BT -P
Material 10B21 or A4



Internal Thread: BT -I
Material 10B21

SCELL-IT Concrete Screw BT, A4-BT	**Annex A1**
Product description Installed condition	

Deutsches Institut für Bautechnik DIBt

Table A1: Materials and screw types

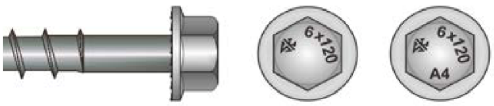
Name	Material

Screw anchor

Head marking	material
SK	Steel 10B21 acc. To SAE-J403 zinc coating: electro plated (> 5 µm) or mechanical plated (> 30 µm)
SK A4 SK A2	Stainless steel 1.4401, 1.4404 (both A4) Stainless steel 1.4301

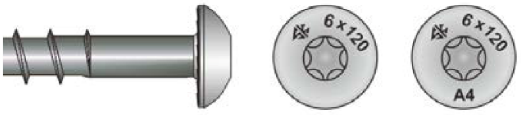
Anchor size / head types			BT 6			BT 8	
			-H -HF -C -P -I	-H -HF	-C -P	-H	-H
material			10B21	A4		A2	A4
Nominal value of the characteristic yield strength	f_{yk}	N/mm²	780	640	432	640	640
Nominal value of the characteristic teisile strength	f_{uk}	N/mm²	870	800	540	800	800
Elongation at rupture	As	[%]	≤ 8				

Hexagon washer head
1) BT -H size 6 (10B21 steel)
2) A4-BT -H size 6,8 (stainless A4)
3) A2-BT -H size 8 (stainless A2)

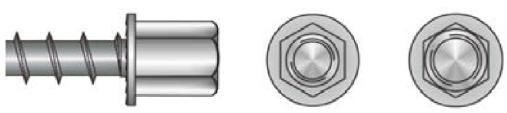


Hexagon washer head
4) BT -HF size 6 (10B21 steel)
5) A4-BT -HF size 6 (stainless A4)

Countersunk head
6) BT -C size 6 (10B21 steel)
7) A4-BT –C size 6 (stainless A4)



Pan head
8) BT -P size 6 (10B21 steel)
9) A4-BT -P size 6 (stainless A4)



Internal thread head (10B21 steel)
10) BT -I size 6 with internal thread M8 or M10
11) BT -I size 6 with internal thread M8 and M10

SCELL-IT Concrete Screw BT, A4-BT

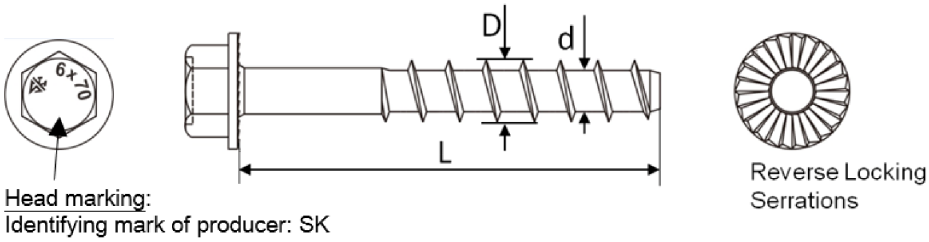
Product description
Materials and screw types

Annex A2

Table A2: Dimensions and markings

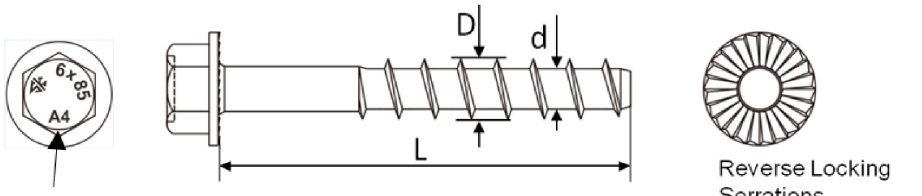
Anchor size			**BT 6**					**BT 8**	
Head type			**H, HF, P**	**C**	**H, HF, P**	**C**	**I**	**H**	**H**
Material			Steel 10B21		Stainless A4		Steel 10B21	Stainless A2	Stainless A4
Nominal Embedment depth	h_{nom}	[mm]	55		70		55	52	52
Length of anchor	min L	[mm]	60	65	75	80	57	55	55
	max L	[mm]	140				57	150	
Thread diameter	D	[mm]	7,5					9,9	
Shaft diameter	d	[mm]	5,5					7,4	
Thread pitch	p	[mm]	4,45					5,8	

Steel 10B21



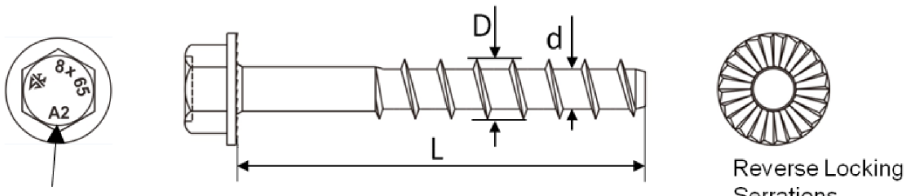
Head marking:
Identifying mark of producer: SK
Nominal size: e.g. 6mm
Length L: 70mm

Stainless Steel A4



Head marking:
Identifying mark of producer: SK
Nominal size: e.g. 6mm
Length L: 85mm
Material: A4

Stainless Steel A2



Head marking:
Identifying mark of producer: SK
Nominal size: e.g. 8mm
Length L: 65mm
Material: A2

SCELL-IT Concrete Screw BT, A4-BT

Product description
Dimensions and markings

Annex A3

Deutsches Institut für Bautechnik DIBt

Specifications of Intended use

Anchorages subject to:

- Static and quasi-static loads:
- Used only for redundant non-structural systems.
- Fire exposure: only for concrete C20/25 to C50/60.

Base materials:

- Compacted reinforced or unreinforced normal weight concrete without fibres according to EN 206:2013,
- Strength classes C20/25 to C50/60 according to EN 206:2013,
- Non-cracked or cracked concrete: all sizes.

Use conditions (Environmental conditions)

- Anchorages subject to dry internal conditions. (zinc plated steel and stainless steel)
- Anchorages subject to external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal conditions if no particular aggressive conditions exist. (only stainless steel with marking A4)

  Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere or indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used)

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e. g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed in accordance with EN 1992-4:2018 Design method A and Technical Report TR 055.

Installation:

- Hammer drilling only: all sizes and all embedment depths.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- 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 hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of the load application.
- After installation further turning of the anchor shall not be possible.
- The head of the anchor must be fully engaged on the fixture and show no signs of damage.

SCELL-IT Concrete Screw BT, A4-BT	Annex B1
Intended use Specifications	

Table B1: Installation parameters

Anchor size			**BT 6**							**BT 8**	
Head type			**H, HF**	**P**	**I**	**C**	**H, HF**	**P**	**C**	**H**	**H**
Material			**Steel 10B21**				**Stainless A4**			**Stainless A2**	**Stainless A4**
Nominal diameter of drill bit	d_0	[mm]	6							8	
Nominal embedment depth	h_{nom}	[mm]	55				70			52	
Min. hole depth in concrete	$h_1 \geq$	[mm]	64				80			65	
Effective embedment depth	h_{ef}	[mm]	42,6				43,1			22,2	
Clearance hole	d_f	[mm]	9							11	
Thickness of fixture	t_{fix}	[mm]	5-85		-	10-85	5-70		10-70	3-98	
Installation torque[1)]	T_{inst}	[Nm]	20	-[1)]	20	-[1)]	-[1)]		-[1)]	31	
Wrench size	WS	[mm]	10	-	12,7	-	-		-	13	
Torx size	TX	-	-	40	-	40	-	40	40	-	
Max. power output, machine setting	$T_{max} \leq$	[Nm]	80				120	80	80	185	

1) Screws can only be set using a impact screw driver.

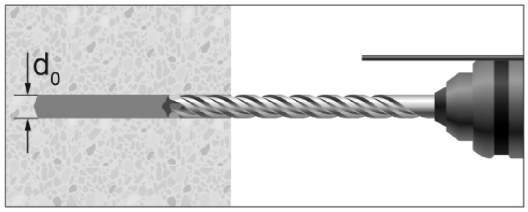
Table B2: Minimum thickness of member, minimum spacing and edge distance

Anchor size			**BT 6**		**BT 8**	
			H, HF, C, P, I	**H, HF, C, P**	**H**	**H**
Material			**Steel 10B21**	**Stainless A4**	**Stainless A2**	**Stainless A4**
Minimum member thickness	h_{min}	[mm]	100	110	100	
Minimum edge distance	c_{min}	[mm]	40	40	55	
Minimum spacing	s_{min}	[mm]	40	40	55	

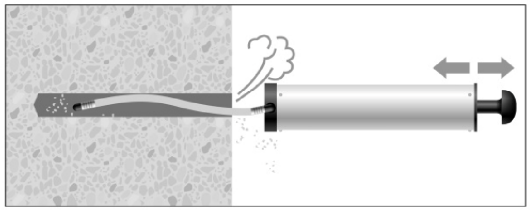
SCELL-IT Concrete Screw BT, A4-BT	**Annex B2**
Intended use Installation parameters	

Deutsches Institut für Bautechnik DIBt

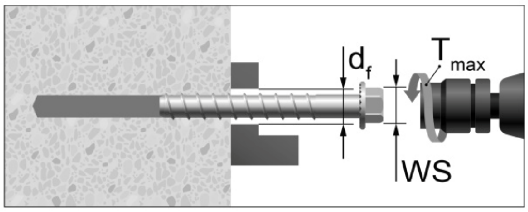
Installation instruction



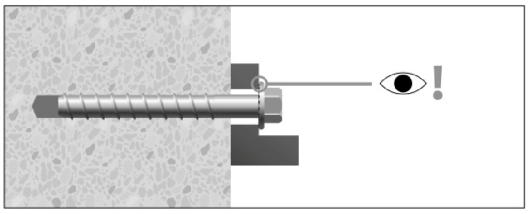
Drill the hole to the depth $\mathbf{h_1}$.



Clean the hole.



Screw in the anchor by using a torque wrench or an impact screw driver.
In case of using torque wrench: T_{inst} acc. to Table B1.
In case of using impact screw driver: T_{max} acc. to Table B1.
WS= Wrench Size



Control of complete setting, full contact of screw head with fixture part.

SCELL-IT Concrete Screw BT, A4-BT	
Intended Use Installation Instruction	**Annex B3**

Deutsches Institut für Bautechnik DIBt

Table C1: Characteristic resistance under tension loading

Anchor size			**BT 6**						**BT 8**	
Head type			**H,HF,I**	**C**	**P**	**H,HF**	**C**	**P**	**H**	**H**
Material			**Steel 10B21**			**Stainless A4**			**Stainless A2**	**Stainless A4**
Steel failure										
Characteristic resistance	$N_{Rk,s}$	[kN]	19,7			18,1	12,2	12,2	33,0	33,0
Partial factor	γ_{Ms}	[-]	1,4			1,5			1,5	
Pull-out failure										
Characteristic resistance in cracked and uncracked concrete C20/25	$N_{Rk,p}$	[kN]	5,0	5,0	4,0	5,0	3,5	2,5	2,0	
Increasing factors for $N_{Rk,p}$ in cracked or non-cracked concrete	ψ_c	C30/37	1,22						1,20	
		C40/50	1,41						1,37	
		C50/60	1,58						1,51	
Installation factor	γ_{inst}	[-]	1,0			1,0			1,0	
Concrete cone failure										
Effective embedment depth	h_{ef}	[mm]	42,6			43,1			22,2	
Characteristic edge distance	$c_{cr,N}$	[mm]	$1,5\ h_{ef}$							
Characteristic spacing	$s_{cr,N}$	[mm]	$3,0\ h_{ef}$							
Installation factor	γ_{inst}	[-]	1,0			1,0			1,0	
Factor for cracked concrete	$k_{cr,N}$	[-]	7,7							
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11,0							
Splitting failure										
Characteristic resistance in cracked and uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	$N^0_{Rk,sp} = N_{Rk,p}$							
Characteristic edge distance for splitting	$c_{cr,sv\ p}$	[mm]	$1,5h_{ef}$			$1,5h_{ef}$			$2,5h_{ef}$	
Characteristic anchor spacing for splitting	$s_{cr,sp}$	[mm]	$3,0h_{ef}$			$3,0h_{ef}$			$5,0h_{ef}$	
Installation factor	γ_{inst}	[-]	1,0			1,0			1,0	
Factor for cracked concrete	$k_{cr,N}$	[-]	7,7							
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11,0							

SCELL-IT Concrete Screw BT, A4-BT

Performance
Characteristic values under tension loading

Annex C1

Deutsches Institut für Bautechnik DIBt

Table C2: Characteristic resistance under shear loading

Anchor size			**BT 6**						**BT 8**	
Head type			**H,HF,I**	**C**	**P**	**H,HF**	**C**	**P**	**H**	**H**
Material			**Steel 10B21**			**Stainless A4**			**Stainless A2**	**Stainless A4**
Setting depth	h_{nom}	[mm]	55			70			52	
Effective embedment depth	h_{ef}	[mm]	42,6			43,1			22,2	
Steel failure without lever arm										
Characteristic resistance	$V_{Rk,s}$	[kN]	7,9			9,0	6,1	6,1	13,2	
Ductility factor	k_7	[-]	0,8							
Partial factor	γ_{Ms}	[-]	1,5			1,25			1,25	
Steel failure with lever arm										
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	15,9			14,6	9,9	9,9	35,9	
Partial factor	γ_{Ms}	[-]	1,5			1,25			1,25	
Concrete pryout failure										
k-factor	k_8	[-]	1,0			1,0			1,0	
Partial factor	γ_{Mcp}	[-]	1,5							
Concrete edge failure										
Effective length of anchor in shear loading	ℓ_f	[mm]	42,6			43,1			22,2	
Effective diameter of anchor	d_{nom}	[mm]	5,37						7,4	
Partial factor	γ_{Mc}	[-]	1,5							

SCELL-IT Concrete Screw BT, A4-BT

Performance
Characteristic values under shear loading

Annex C2

Deutsches Institut für Bautechnik DIBt

Table C3: Characteristic values for resistance to fire (Tension)

Anchor size				**BT 6**						**BT 8**	
Head type				**H,HF,I**	**C**	**P**	**H,HF**	**C**	**P**	**H**	**H**
Material				**Steel 10B21**			**Stainless A4**			**Stainless A2**	**Stainless A4**
Partial factor		$\gamma_{M,fi}$	[-]	1,0			1,0			1,0	
Steel failure											
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	0,23			0,23			0,8	
	R60	$N_{Rk,s,fi}$	[kN]	0,20			0,20			0,7	
	R90	$N_{Rk,s,fi}$	[kN]	0,16			0,16			0,5	
	R120	$N_{Rk,s,fi}$	[kN]	0,11			0,11			0,4	
Pull-out failure											
Characteristic resistance in concrete >= C20/25	R30	$N_{Rk,p,fi}$	[kN]	1,3		1,0	1,3	0,9	0,6	0,5	
	R60										
	R90										
	R120	$N_{Rk,p,fi}$	[kN]	1,0		0,8	1,0	0,7	0,5	0,4	
Concrete cone failure											
Characteristic resistance in concrete >= C20/25	R30	$N^0_{Rk,c,fi}$	[kN]	2,0			2,1			0,4	
	R60										
	R90										
	R120	$N^0_{Rk,c,fi}$	[kN]	1,6			1,7			0,3	
Effective embedment depth		h_{ef}	[mm]	42,6			43,1			22,2	
Minimum member thickness		h_{min}	[mm]	100			110			100	
Spacing		$s_{cr,N,fi}$	[mm]	$4h_{ef}$							
		s_{min}	[mm]	40						55	
Edge distance		$c_{cr,N,fi}$	[mm]	$2h_{ef}$							
Fire exposure from one side only		c_{min}	[mm]	40						55	
Fire exposure from more than one side				≥ 300 mm							

SCELL-IT Concrete Screw BT, A4-BT

Performance
Characteristic values for resistance to fire

Annex C3

Table C4: Characteristic values for resistance to fire (Shear)

Anchor size				**BT 6**						**BT 8**	
Head type				**H, HF, I**	**C**	**P**	**H, HF**	**C**	**P**	**H**	**H**
Material				**Steel 10B21**			**Stainless A4**			**Stainless A2**	**Stainless A4**
Partial factor		$\gamma_{M,fi}$	[-]	1.0							
Steel failure without level arm											
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	0,23			0,23			0,8	
	R60	$V_{Rk,s,fi}$	[kN]	0,20			0,20			0,7	
	R90	$V_{Rk,s,fi}$	[kN]	0,16			0,16			0,5	
	R120	$V_{Rk,s,fi}$	[kN]	0,11			0,11			0,4	
Steel failure with level arm											
Characteristic resistance	R30	$M^0_{Rk,p,fi}$	[Nm]	0,18			0,18			0,9	
	R60	$M^0_{Rk,p,fi}$	[Nm]	0,16			0,16			0,7	
	R90	$M^0_{Rk,p,fi}$	[Nm]	0,13			0,13			0,5	
	R120	$M^0_{Rk,p,fi}$	[Nm]	0,09			0,09			0,4	
Pry-out failure											
k_8			[-]	1,0			1,0			1,0	
Characteristic resistance	R30	$V_{Rk,cp,fi}$	[kN]	2,0			2,1			0,4	
	R60										
	R90										
	R120	$V_{Rk,cp,fi}$	[kN]	1,6			1,7			0,3	
Concrete edge failure											
Characteristic resistance	≤ R90	$V_{Rk,c,fi}$	[kN]	$V^0_{Rk,c,fi} = 0,25 * V^0_{Rk,c}$							
	R120	$V_{Rk,c,fi}$	[kN]	$V^0_{Rk,c,fi} = 0,20 * V^0_{Rk,c}$							

SCELL-IT Concrete Screw BT, A4-BT	**Annex C4**
Performance Characteristic values for resistance to fire	