

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-19/0592
of 18 October 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

Drillcutta Plus 6x40

Product family
to which the construction product belongs

Mechanical fastener for redundant non-structural systems

Manufacturer

Drillcut Pty Ltd
15 Corporate Place
BROADMEADOWS VIC 3047
AUSTRALIEN

Manufacturing plant

Plant 1

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

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Specific Part

1 Technical description of the product

The Drillcutta Plus 6x40 is an anchor made of galvanised steel of size 6. 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
Durability	See Annex B 1

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

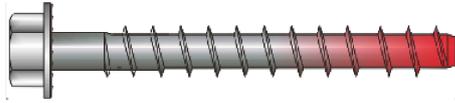
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 18 October 2019 by Deutsches Institut für Bautechnik

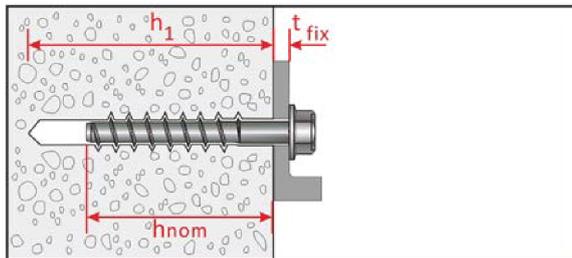
BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Lange

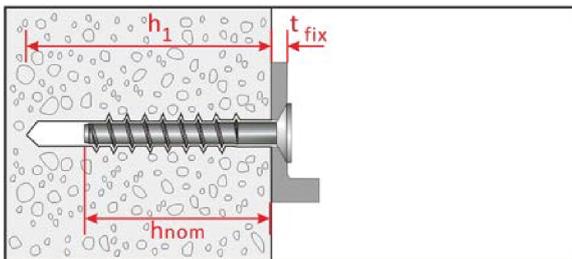
Product in the installed condition



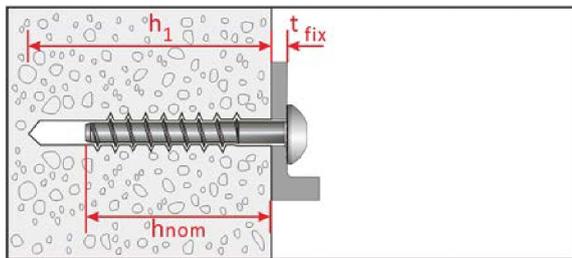
Steel 10B21



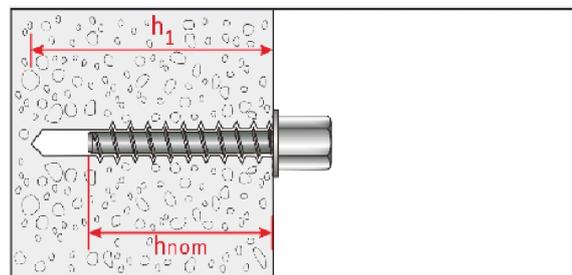
Hexagon Head: M6



Countersunk Head: M6



Pan Head: M6



Internal Thread: 05CDCP655F10

Drillcutta Plus 6x40

Product description
Installed condition

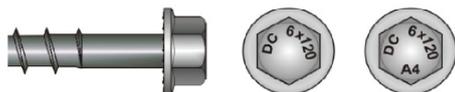
Annex A1

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)	
	Anchor size / head types		DC 6 -H -HF -C -P -I	
	material		10B21	
	Nominal value of the characteristic yield strength	f _{yk}	N/mm ²	780
	Nominal value of the characteristic teisile strength	f _{uk}	N/mm ²	870
	Elongation at rupture	A _s	[%]	≤ 8



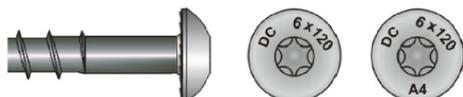
Hexagon washer head
1) DC-H size 6 (10B21 steel)



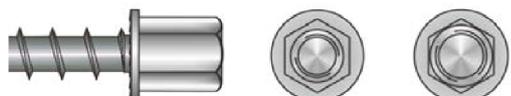
Hexagon washer head
2) DC-HF size 6 (10B21 steel)



Countersunk head
3) DC-C size 6 (10B21 steel)



Pan head
4) DC-P size 6 (10B21 steel)



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

Drillcutta Plus 6x40

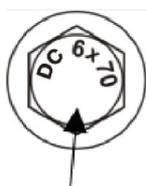
Product description
Materials and screw types

Annex A2

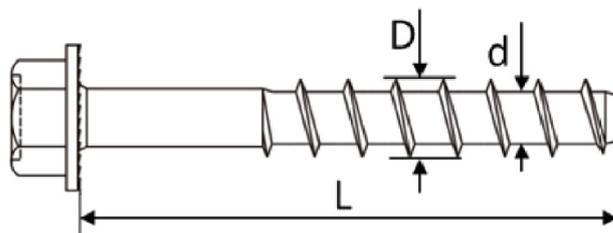
Table A2: Dimensions and markings

Anchor size			DC 6		
Head type			H, HF, P	C	I
Material			Steel 10B21		
Nominal Embedment depth	h_{nom}	[mm]	55		55
Length of anchor	min L	[mm]	60	65	57
	max L	[mm]	140		57
Thread diameter	D	[mm]	7,5		
Shaft diameter	d	[mm]	5,5		
Thread pitch	p	[mm]	4,45		

Steel 10B21



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



Reverse Locking
Serrations

Drillcutta Plus 6x40

Product description
Dimensions and markings

Annex A3

Specifications of Intended use

Anchorage 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.

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 TR 055, Edition December 2016

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.

Drillcutta Plus 6x40

**Intended use
Specifications**

Annex B1

Table B1: Installation parameters

Anchor size			DC 6			
Head type			H, HF	P	I	C
Material			Steel 10B21			
Nominal diameter of drill bit	d_0	[mm]	6			
Nominal embedment depth	h_{nom}	[mm]	55			
Min. hole depth in concrete	$h_1 \geq$	[mm]	64			
Effective embedment depth	h_{ef}	[mm]	42,6			
Clearance hole	d_f	[mm]	9			
Thickness of fixture	t_{fix}	[mm]	5-85	-	10-85	
Installation torque ¹⁾	T_{inst}	[Nm]	20	- ¹⁾	20	- ¹⁾
Wrench size	WS	[mm]	10	-	12,7	-
Torx size	TX	-	-	40	-	40
Max. power output, machine setting	$T_{max} \leq$	[Nm]	80			

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

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

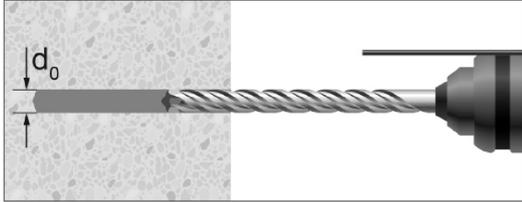
Anchor size			DC 6			
			H, HF, C, P, I			
Material			Steel 10B21			
Minimum member thickness	h_{min}	[mm]	100			
Minimum edge distance	c_{min}	[mm]	40			
Minimum spacing	s_{min}	[mm]	40			

Drillcutta Plus 6x40

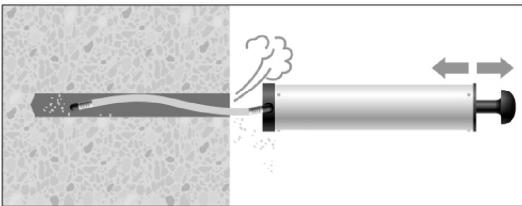
Intended use
Installation parameters

Annex B2

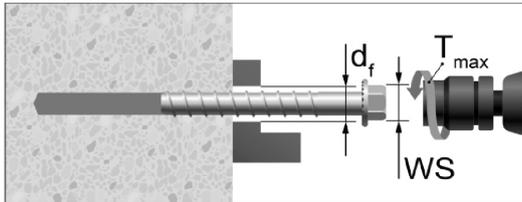
Installation instruction



Drill the hole to the depth h_1 .



Clean the hole.

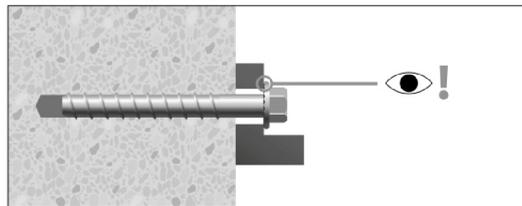


Screw in the anchor by using a torque wrench or an impact screw driver.

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.

Drillcutta Plus 6x40

Intended Use
Installation Instruction

Annex B3

Table C1: Characteristic resistance under tension loading

Anchor size			DC 6		
Head type			H, HF, I	C	P
Material			Steel 10B21		
Steel failure					
Characteristic resistance	$N_{Rk,s}$	[kN]	19,7		
Partial factor	γ_{Ms}	[-]	1,4		
Pull-out failure					
Characteristic resistance in cracked and uncracked concrete C20/25	$N_{Rk,p}$	[kN]	5,0	5,0	4,0
Increasing factors for $N_{Rk,p}$ in cracked or non-cracked concrete	ψ_c	C30/37	1,22		
		C40/50	1,41		
		C50/60	1,58		
Installation factor	γ_{inst}	[-]	1,0		
Concrete cone failure					
Effective embedment depth	h_{ef}	[mm]	42,6		
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		
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]	1,5 h_{ef}		
Characteristic anchor spacing for splitting	$s_{cr,sp}$	[mm]	3,0 h_{ef}		
Installation factor	γ_{inst}	[-]	1,0		
Factor for cracked concrete	$k_{cr,N}$	[-]	7,7		
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11,0		

Drillcutta Plus 6x40

Performance
Characteristic values under tension loading

Annex C1

Table C2: Characteristic resistance under shear loading

Anchor size			DC 6
Head type			H, HF, I C P
Material			Steel 10B21
Setting depth	h_{nom}	[mm]	55
Effective embedment depth	h_{ef}	[mm]	42,6
Steel failure without lever arm			
Characteristic resistance	$V_{Rk,s}$	[kN]	7,9
Ductility factor	k_7	[-]	0,8
Partial factor	γ_{Ms}	[-]	1,5
Steel failure with lever arm			
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	15,9
Partial factor	γ_{Ms}	[-]	1,5
Concrete pryout failure			
k-factor	k_8	[-]	1,0
Partial factor	γ_{Mcp}	[-]	1,5
Concrete edge failure			
Effective length of anchor in shear loading	l_f	[mm]	42,6
Effective diameter of anchor	d_{nom}	[mm]	5,37
Partial factor	γ_{Mc}	[-]	1,5

Drillcutta Plus 6x40

Performance
Characteristic values under shear loading

Annex C2

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

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

Drillcutta Plus 6x40

Performance
Characteristic values for resistance to fire

Annex C3

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

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

Drillcutta Plus 6x40

Performance
Characteristic values for resistance to fire

Annex C4