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Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

European Technical Assessment ETA-22/0153 of 2022/09/09

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S	
Trade name of the construction product:	TDA Drop In anchor
Product family to which the above construction product belongs:	Mechanical fasteners for use in non-cracked concrete sizes M12, M12D and M16
Manufacturer:	Trutek Fasteners Polska Sp. z o.o. Al. Krakowska 38, Janki PL-05-090 Raszyn e-mail: info@trutek.com.pl www.trutek.com.pl www.trutekfasteners.eu
Manufacturing plant:	Trutek Fasteners Plant No 7
This European Technical Assessment contains:	14 pages including 9 annexes which form an integral part of the document
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	EAD 330232-01-0601; Mechanical fasteners for use in concrete
This version replaces:	

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product
The TDA Drop In anchor is a type expansion anchor made of carbon steel. The anchor consists of an expansion sleeve with an inner thread and internal cone, and is installed in a drilled hole and anchored by a deformation controlled expansion.

An illustration of the product is given in Annex A.

The characteristic material values, dimensions and tolerances of the anchors not indicated in Annexes shall correspond to the respective values laid down in the technical documentation of this European Technical Assessment.

The anchors are intended to be used with embedment depth given in Annex B, Table B1. The intended use specifications of the product are detailed in the Annex B1.

2 Specification of the intended use in accordance with the applicable 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 intended 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 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 Characteristics of product

Mechanical resistance and stability (BWR 1):
The essential characteristics are detailed in the Annex from C1 to C3.

Safety in case of fire (BWR 2):
Reaction to fire
The anchor parts are made from steel classified as Euroclass A1 in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364.

Resistance to fire
The essential characteristics are detailed in the Annex C4

Other Basic Requirements are not relevant.

3.2 Methods of assessment

The assessment of fitness of the anchor for the intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Works Requirements 1 and 4 has been made in accordance with EAD 330232-01-0601; Mechanical fasteners for use in concrete.

4 Assessment and verification of constancy of performance (AVCP)

4.1 AVCP system

According to the decision 1996/582/EC of the European Commission, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 1.

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking

Issued in Copenhagen on 2022-09-09 by

Thomas Bruun
Managing Director, ETA-Danmark

Figure A1 TDA Drop In anchor

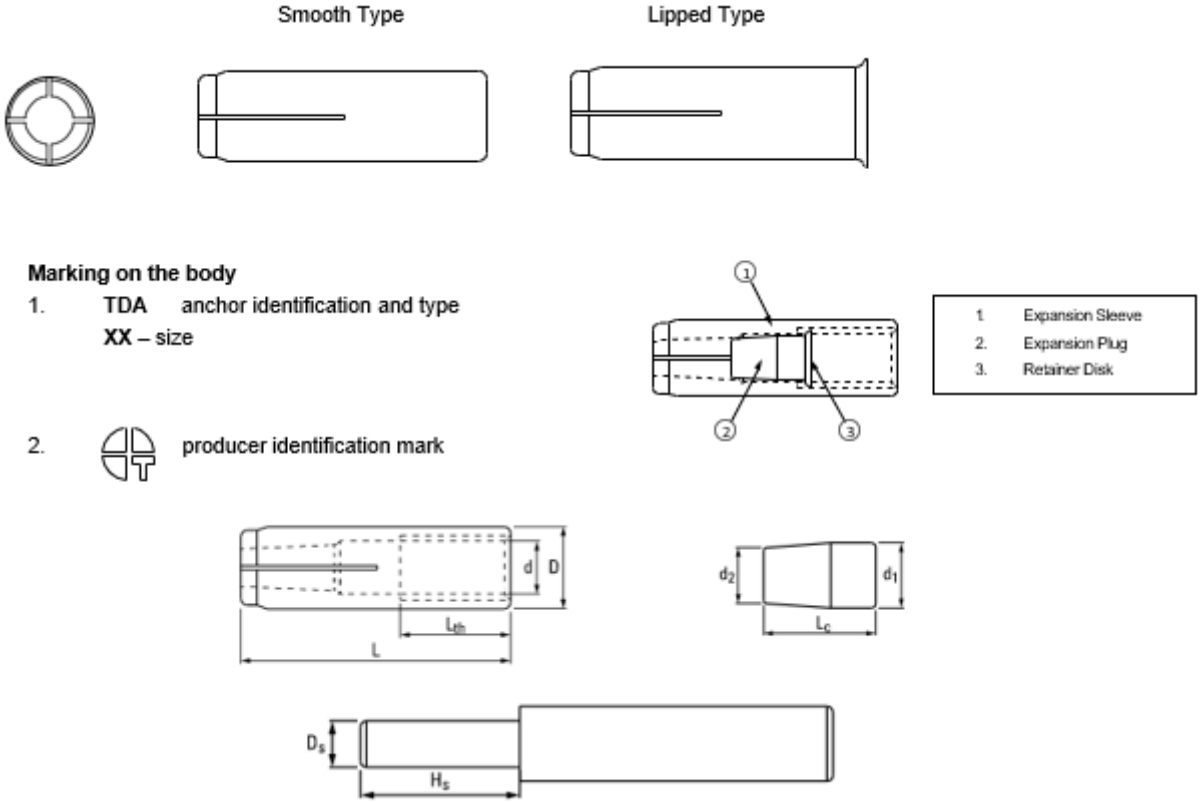
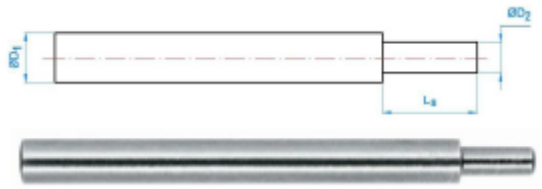


Table A1 Dimensions and Materials

Dimensions					
Anchor size			TDA M12 TDAL M12	TDAD M12 TDADL M12	TDA M16 TDAL M16
Expansion sleeve					
Sleeve Diameter	D	mm	15	16	20
Sleeve length	L	mm	50	50	65
Thread	d		M12	M12	M16
Thread length	L_{th}	mm	22	22	30
Expansion plug					
Plug diameter	d_1	mm	10,15	10,15	13,5
Plug diameter	d_2	mm	8,5	8,5	11,4
Plug length	L_c	mm	20	20	27
Setting punch					
Reduced section diameter	D_s	mm	10,2	10,2	13,5
Reduced section length	H_s	mm	30,0	30,0	36,0
Materials					
Element	Material			Protection	
Expansion sleeve	AISI C1008			Zinc coating ≥ 5 µm Electroplated acc. to EN ISO 4042	
Expansion plug	Q195 acc. to GB/T 700				

Table A2: Setting tool



Size	Unit	M12	M16
ØD1	mm	14,5	18,0
ØD2	mm	10,2	13,5
Ls	mm	30	36

Use:

The anchors are intended to be used for anchorages for which requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirements 1 of Regulation 305/2011 (EU) shall be fulfilled and failure of anchorages made with these products would compromise the stability of the works, cause risk to human life and/or lead to considerable economic consequences.

Anchorages subject to:

Static and quasi-static loads.

Anchorages with requirements related to resistance to fire

Base material:

- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum to C50/60 at maximum according to EN 206-1.
- Non-cracked concrete: sizes from M12, M12D and M16.

Temperature range:

- The covered temperature range of the anchorage base concrete during the working life is within the range -40 °C to +80 °C

Use conditions (environmental conditions):

- Dry internal conditions.

Installation:

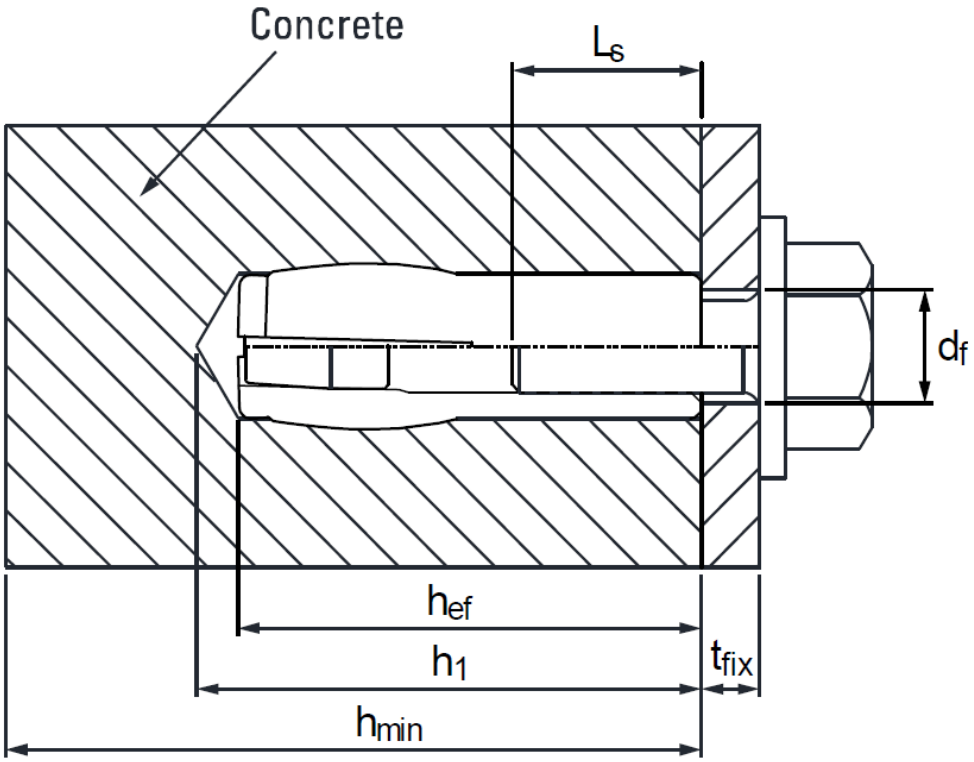
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools.
- Check before placing the anchor to ensure that the strength class of the concrete, in which the anchor is to be placed, is identical with the values which the characteristic loads apply.
- Check of concrete being well compacted, e.g. without significant voids.
- Edge distances and spacings not less than the specified values without minus tolerances.
- Positioning of the drill holes without damaging the reinforcement.
- 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.
- Hole shall be clean from drilling dust.
- Anchor installation such that the effective anchorage depth is complied with: the compliance is ensured if the thickness of the fixture is not larger than the maximum values given in Annex B2.
- Anchor expansion by impact on the wedge of the anchor; the anchor is properly set if the wedge is fully dropped in.
- Application of the torque moment given in Annex B2 using a calibrated torque wrench.

Proposed design method:

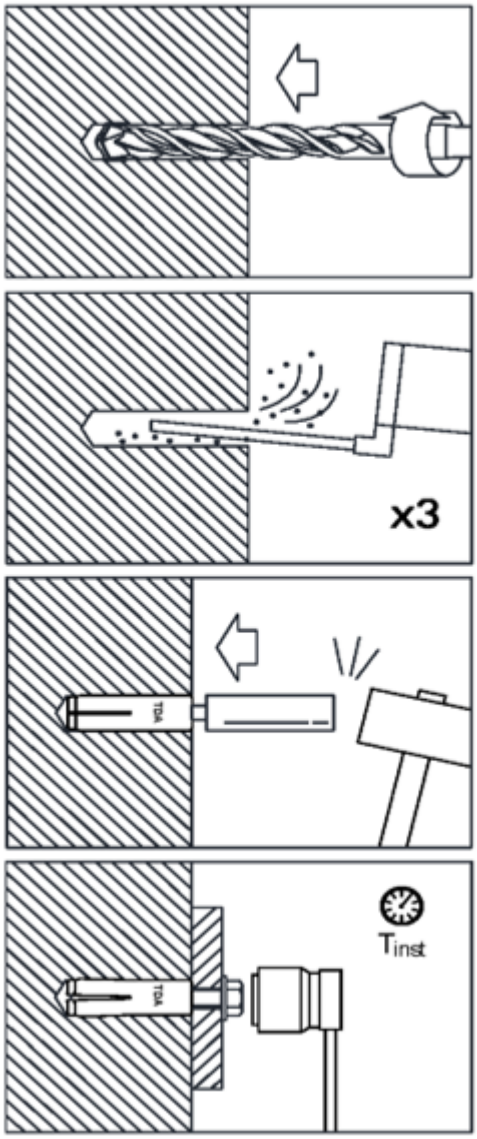
- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete works.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be transmitted. The position of the anchor is indicated on the design drawings (e.g. position of the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

TDA Drop In anchor	**Annex B1**
Intended use – Specification	of European Technical Assessment ETA-22/0153

Table B1: Installation parameters



Anchor			TDA and TDA L		
			M12	M12D	M16
Effective anchor depth	h_{ef}	[mm]	50	50	65
Drill hole depth	h_1	[mm]	54	54	70
Drill hole diameter	d_0	[mm]	15	16	20
Max. installation torque	T_{inst}	[mm]	35	35	60
Min. thickness of concrete member	h_{min}	[mm]	100	100	130
Min. screw-in depth	$L_{s, min}$	[mm]	12	12	16
Max. screw-in depth	$L_{s, max}$	[mm]	22	22	30
Diameter of clearance hole in the fixture	d_f	[mm]	14	14	18
Fastening screws or anchor threaded rods: steel, property class 4.8 / 5.8 / 6.8 / 8.8 according to EN-ISO 898-1					



Drill the correct diameter hole to the correct depth with a rotary percussion drilling machine

Blow out the dust 3 times using a hand pump

Place the anchor in the hole and using the correct setting punch hammer the expansion plug fully into the anchor

Attach the fixture by means of a screw or threaded rod and tighten. Do not exceed the maximum torque, T_{inst}

TDA Drop In anchor	**Annex B3** of European Technical Assessment ETA-22/0153
Intended use - installation instruction and tools	

Table C1: Characteristic tension load values

Anchor				TDA and TDA L		
				M12	M12D	M16
Steel failure						
Steel failure with threaded rod grade 4.8						
Characteristic resistance		$N_{Rk,s}$	[kN]	33,7	33,7	62,8
Partial safety factor		γ_{Ms} 1)	[-]	1,5		
Steel failure with threaded rod grade 5.8						
Characteristic resistance		$N_{Rk,s}$	[kN]	42,2	42,2	78,5
Partial safety factor		γ_{Ms} 1)	[-]	1,5		
Steel failure with threaded rod grade 6.8						
Characteristic resistance		$N_{Rk,s}$	[kN]	50,6	50,6	94,2
Partial safety factor		γ_{Ms} 1)	[-]	1,5		
Steel failure with threaded rod grade 8.8						
Characteristic resistance		$N_{Rk,s}$	[kN]	67,4	67,4	125,6
Partial safety factor		γ_{Ms} 1)	[-]	1,5		
Pull-out failure						
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p}$	[kN]	2)	2)	2)
Installation factor		γ_{inst}	[-]	1,0	1,0	1,2
Increasing factor	concrete C30/37	ψ_c	[-]	1,22	1,22	1,22
	concrete C40/50		[-]	1,41	1,41	1,41
	concrete C50/60		[-]	1,55	1,55	1,55

1) in absence of other national regulations
2) pull-out failure mode is not decisive

Anchor				TDA and TDA L		
				M12	M12D	M16
Concrete cone failure and splitting failure						
Effective anchorage depth		h_{ef}	[mm]	50	50	65
Factor for uncracked concrete		$k_{ucr,N}$	[-]	11,0	11,0	11,0
Installation factor		γ_{inst}	[-]	1,0	1,0	1,2
Characteristic resistance to splitting		$N^0_{Rk,sp}$	[kN]	1)	1)	1)
Characteristic spacing	concrete cone failure	$s_{cr,N}$	[mm]	300	300	300
	splitting failure	$s_{cr,sp}$	[mm]			
Characteristic edge distance	concrete cone failure	$c_{cr,N}$	[mm]	150	150	150
	splitting failure	$c_{cr,sp}$	[mm]			

1) splitting failure mode is not decisive

Table C2: Characteristic shear load values

Anchor			TDA and TDA L		
			M12	M12D	M16
Steel failure without lever arm					
Steel failure with threaded rod grade 4.8					
Characteristic resistance	$N_{Rk,s}$	[kN]	16,9	16,9	31,4
Factor of ductility	k_7	[-]	0,8		
Partial safety factor	γ_{Ms} 1)	[-]	1,25		
Steel failure with threaded rod grade 5.8					
Characteristic resistance	$N_{Rk,s}$	[kN]	21,1	21,1	39,3
Factor of ductility	k_7	[-]	0,8		
Partial safety factor	γ_{Ms} 1)	[-]	1,25		
Steel failure with threaded rod grade 6.8					
Characteristic resistance	$N_{Rk,s}$	[kN]	25,3	25,3	47,1
Factor of ductility	k_7	[-]	0,8		
Partial safety factor	γ_{Ms} 1)	[-]	1,25		
Steel failure with threaded rod grade 8.8					
Characteristic resistance	$N_{Rk,s}$	[kN]	33,7	33,7	62,8
Factor of ductility	k_7	[-]	0,8		
Partial safety factor	γ_{Ms} 1)	[-]	1,25		
Steel failure with lever arm					
Characteristic bending moment 4.8	$M^0_{Rk,s}$	[mm]	52,4	52,4	133,3
Partial safety factor	γ_{Ms} 1)	[-]	1,25		
Characteristic bending moment 5.8	$M^0_{Rk,s}$	[mm]	65,6	65,6	166,6
Partial safety factor	γ_{Ms} 1)	[-]	1,25		
Characteristic bending moment 6.8	$M^0_{Rk,s}$	[mm]	78,7	78,7	199,9
Partial safety factor	γ_{Ms} 1)	[-]	1,25		
Characteristic bending moment 8.8	$M^0_{Rk,s}$	[mm]	104,9	104,9	266,6
Partial safety factor	γ_{Ms} 1)	[-]	1,25		
Resistance to pry-out failure					
Pry-out factor	k_8	[-]	1,0	1,0	2,0
Partial safety factor	γ_{Ms} 1)	[-]	1,5		
1) in absence of other national regulations					

Anchor			TDA and TDA L		
			M12	M12D	M16
Resistance to concrete edge failure					
Outside diameter of anchor	d_{nom}	[mm]	15	16	20
Effective length of anchor under shear loads	l_f	[mm]	50	50	65
Partial safety factor	γ_{Mc} 1)	[-]	1,5		
Minimum member thickness	h_{min}	[mm]	100	100	130
Minimum edge distance	c_{min}	[mm]	68	68	88
Minimum spacing	s_{min}	[mm]	68	68	88
1) in absence of other national regulations					

Table C3: Displacements under tension and shear load values

Anchor			TDA and TDA L		
			M12	M12D	M16
Displacements under static and quasi-static loading					
Tension and shear load in uncracked concrete C20/25 to C50/60					
Tension load and shear load	$N_{Rk,s}$	[kN]	12,7	12,7	21,1
Short term tension displacement	δ_{No}	[mm]	1,91	2,35	2,09
Long term tension displacement	$\delta_{N\infty}$	[mm]	2,70	3,13	2,87
Short term shear displacement	δ_{Vo}	[mm]	1,91	2,35	2,09
Long term shear displacement	$\delta_{V\infty}$	[mm]	2,87	3,52	3,13

Table C4: Characteristic resistance for tension load under fire exposure in uncracked concrete C20/25 to C50/60

Anchor				TDA and TDA L		
				M12	M12D	M16
Steel failure						
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	1,7	1,7	3,1
	R60	$N_{Rk,s,fi}$	[kN]	1,3	1,3	2,4
	R90	$N_{Rk,s,fi}$	[kN]	1,1	1,1	2,0
	R120	$N_{Rk,s,fi}$	[kN]	0,8	0,8	1,6
Pull-out failure						
Characteristic resistance	R30	$N_{Rk,p,fi}$	[kN]	4,8	4,8	9,5
	R60	$N_{Rk,p,fi}$	[kN]	4,8	4,8	9,5
	R90	$N_{Rk,p,fi}$	[kN]	4,8	4,8	9,5
	R120	$N_{Rk,p,fi}$	[kN]	3,8	3,8	7,6
Concrete cone failure						
Characteristic resistance	R30	$N_{Rk,c,fi}$	[kN]	4,5	4,5	8,6
	R60	$N_{Rk,c,fi}$	[kN]	4,5	4,5	8,6
	R90	$N_{Rk,c,fi}$	[kN]	4,5	4,5	8,6
	R120	$N_{Rk,c,fi}$	[kN]	3,6	3,6	8,9
Spacing		$s_{cr,N,fi}$	[mm]	200	200	260
Edge distance		$c_{cr,N,fi}$	[mm]	100	100	130
The design method covers anchors with a fire attack from one side only. In case of fire attack from more than one side, the edge distance shall be ≥ 300mm.						

Table C5: Characteristic resistance for shear loads under fire exposure in uncracked concrete C20/25 to C50/60

Anchor				TDA and TDA L		
				M12	M12D	M16
Steel failure without lever arm						
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	1,7	1,7	3,1
	R60	$V_{Rk,s,fi}$	[kN]	1,3	1,3	2,4
	R90	$V_{Rk,s,fi}$	[kN]	1,1	1,1	2,0
	R120	$V_{Rk,s,fi}$	[kN]	0,8	0,8	1,6
Steel failure with lever arm						
Characteristic bending resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	3,9	3,9	9,3
	R60	$M^0_{Rk,s,fi}$	[Nm]	2,9	2,9	7,0
	R90	$M^0_{Rk,s,fi}$	[Nm]	2,5	2,5	6,0
	R120	$M^0_{Rk,s,fi}$	[Nm]	1,9	1,9	4,6