INSTYTUT TECHNIKI BUDOWLANEJ
PL 00-611 WARSZAWA
ul. Filtrowa 1
tel.: (+48 22) 825-04-71
(+48 22) 825-76-55
fax: (+48 22) 825-52-86
www.itb.pl

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

Member of EOTA
www.eota.eu

European Technical Assessment

ETA-17/0678 of 17/08/2017

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	DROP IN ANCHOR TDX
Product family to which the construction product belongs	Deformation-controlled expansion anchors for use in non-cracked concrete
Manufacturer	Trutek Fasteners Polska Sp. z o.o. Al. Krakowska 55, Sękocin Nowy 05-090 Raszyn Poland
Manufacturing plant	Manufacturing Plant no. 1
This European Technical Assessment contains	11 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) 330232-00-0601 “Mechanical fasteners for use in concrete”

This 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 should be identified as such.

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

Specific Part

1 Technical description of the product

DROP IN ANCHOR TDX are deformation-controlled expansion anchors. The anchors DROP IN ANCHOR TDX are made of zinc plated steel.

The anchor is installed in a drilled hole and anchored by deformation-controlled expansion.

The description of the product 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 anchors are used in compliance with the specifications and conditions given in Annex B.

The performances given 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 the 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, displacements	See Annexes C1 to C3
Edge distance and spacing	See Annexes C1 to C3

3.1.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchors satisfy requirements for Class A1
Resistance to fire	No performance assessed

3.2 Methods used for the assessment

The assessment of fitness of the anchors for the declared intended use in relation to the requirements for mechanical resistance and stability and safety in case of fire in the sense of the Basic Requirements 1 and 2 has been made in accordance with the EAD 330232-00-0601 "*Mechanical fasteners for use in concrete*".

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 of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table applies.

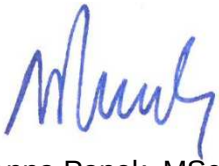
Product	Intended use	Level or class	System
Metal anchors for use in concrete	For fixing and/or supporting to concrete structural elements (which contributes to the stability of the works) or heavy units	–	1

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

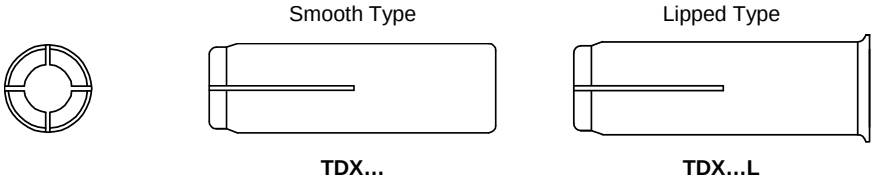
Technical details necessary for the implementation of the AVCP system are laid down in the control plan which is deposited at Instytut Techniki Budowlanej.

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 17/08/2017 by Instytut Techniki Budowlanej

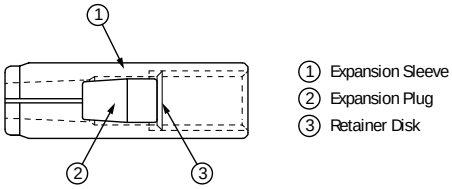


Anna Panek, MSc
Deputy Director of ITB



Marking on the body

1. **TDX** anchor identification and type
   XX – size
   S – short verion
2. producer identification mark



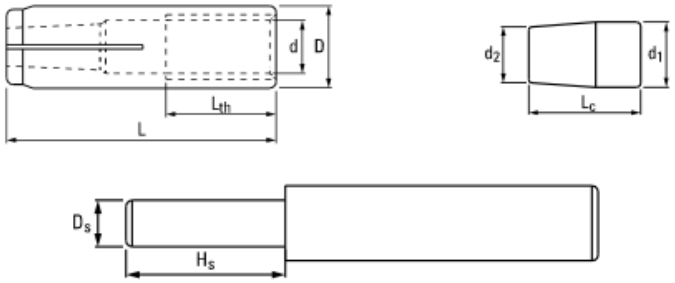


Table A1. DROP IN ANCHOR TDX – dimensions and materials

Dimensions								
Anchor size			**TDX08**	**TDX10**	**TDX12TS**	**TDX12**	**TDX16**	**TDX20**
Expansion sleeve								
Sleeve diameter	D	mm	10	12	15	16	20	25
Sleeve length	L	mm	30	40	50	50	65	80
Thread	d	-	M8	M10	M12	M12	M16	M20
Thread length	L_{th}	mm	13	17	21	21	30	30
Expansion plug								
Plug diameter	d_1	mm	6,5	8	10,1	10,1	13,5	17,3
Plug diameter	d_2	mm	5,5	6,5	8,5	8,5	11,4	16,3
Plug length	L_c	mm	12	15	20	20	27	30
Installation pin								
Setting pin diameter	D_s	mm	6,6	7,8	9,6	9,6	13,5	15,8
Setting pin length	H_s	mm	18	25	30	30	38	50

Materials		
Element	**Material**	**Protection**
Expansion sleeve	Q195 acc. to GB/T 700	zinc coating (≥ 5 µm); electroplated acc. to EN ISO 4042
Expansion plug	Q195 acc. to GB/T 700	

DROP IN ANCHOR TDX

Annex A1

of European Technical Assessment ETA-17/0678

Product description
Characteristic of the product

SPECIFICATION OF INTENDED USE

Anchorages subject to:

- Static and quasi-static loads.

Base material:

- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum to C50/60 at maximum according to EN 206.
- Non-cracked concrete.

Use conditions (environmental conditions):

- Structures 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 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 are designed in accordance with EOTA Technical Report TR 055.

Installation:

- 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 specifications and drawings and using the appropriate tools.
- Check of concrete being well compacted, e.g. without significant voids.
- 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.
- Anchor installation such that the effective anchorage depth is complied with.

DROP IN ANCHOR TDX	**Annex B1** of European Technical Assessment ETA-17/0678
Intended use Specification	

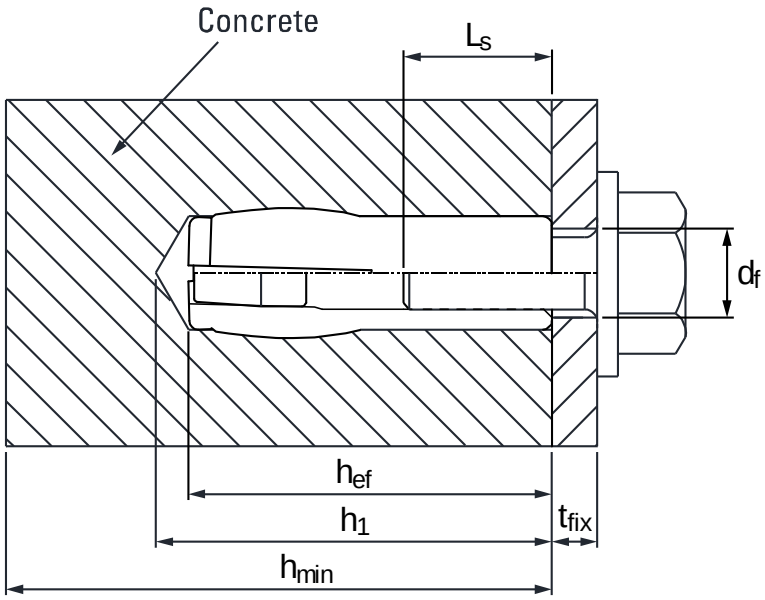


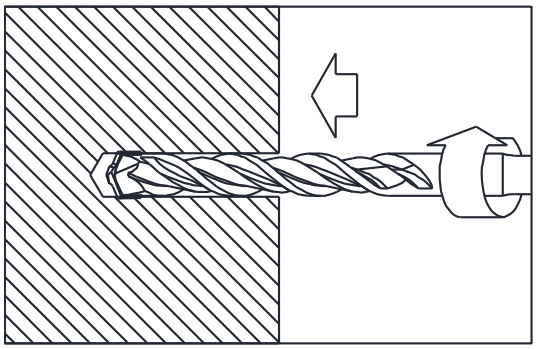
Table B1: Installation parameters

Anchor			**DROP IN ANCHOR TDX**					
Size			**TDX08**	**TDX10**	**TDX12TS**	**TDX12**	**TDX16**	**TDX20**
Effective anchorage depth	h_{ef}	[mm]	30	40	50	50	65	80
Drill hole depth	h_1	[mm]	33	43	54	54	70	85
Drill hole diameter	d_0	[mm]	10	12	15	16	20	25
Installation torque (max)	T_{inst}	[mm]	8	15	35	35	60	120
Thickness of concrete member (min)	h_{min}	[mm]	100	100	100	100	130	160
Screwing depth (min)	$L_{s, min}$	[mm]	8	10	12	12	16	20
Screwing depth (max)	$L_{s, max}$	[mm]	13	17	21	21	30	30
Diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	14	18	22
Spacing (min)	s_{min}	[mm]	41	54	68	68	88	108
Edge distance (min)	c_{min}	[mm]	41	54	68	68	88	108

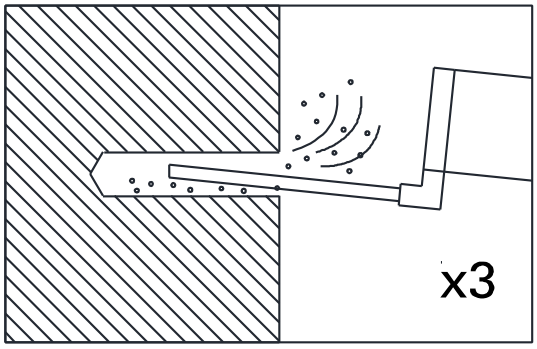
Fastening screws or anchor threaded rods:

Steel, property class 4.6 / 4.8 / 5.8 / 6.8 / 8.8 according to EN-ISO 898-1; thickness of galvanizing ≥ 5 µm

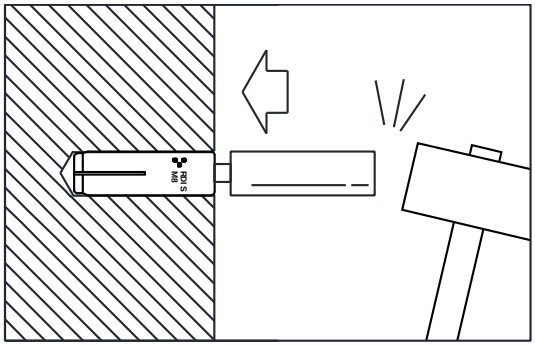
DROP IN ANCHOR TDX	**Annex B2** of European Technical Assessment ETA-17/0678
Intended use Installation parameters	



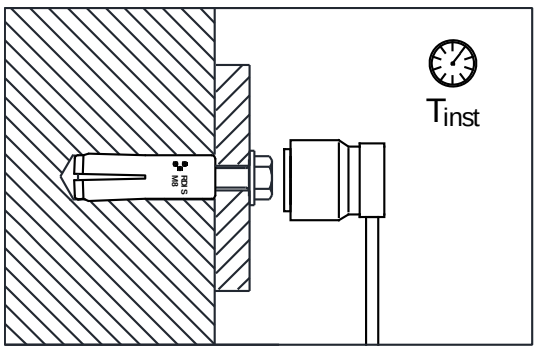
Drill hole with rotary percussive machine. Drill to a required depth.



Blow out dust at least 3 times with a hand pump.



Put the anchor into the drill hole, hammering with the installation tool, until the setting pin fully insert into the anchor.



Fix the fixture by screw or threaded rod with max. T_{inst}.

DROP IN ANCHOR TDX	**Annex B3** of European Technical Assessment ETA-17/0678
Intended use Installation instruction and tools	

Table C1: Characteristic resistance to tension load in non-cracked concrete (static and quasi-static loading)

Anchor				**DROP IN ANCHOR TDX**				
Size			**TDX08**	**TDX10**	**TDX12TS**	**TDX12**	**TDX16**	**TDX20**
Steel failure								
Steel failure with threaded rod grade 4.6								
Characteristic resistance	$N_{Rk,s}$	[kN]	14,6	23,2	33,7	33,7	62,8	98,0
Partial safety factor	γ_{Ms} 2)	[-]	2,0	2,0	2,0	2,0	2,0	2,0
Steel failure with threaded rod grade 4.8								
Characteristic resistance	$N_{Rk,s}$	[kN]	14,6	23,2	33,7	33,7	62,8	98,0
Partial safety factor	γ_{Ms} 2)	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Steel failure with threaded rod grade 5.8								
Characteristic resistance	$N_{Rk,s}$	[kN]	18,3	29,0	42,2	42,2	78,5	122,5
Partial safety factor	γ_{Ms} 2)	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Steel failure with threaded rod grade 6.8								
Characteristic resistance	$N_{Rk,s}$	[kN]	22,0	34,8	50,6	50,6	94,2	147,0
Partial safety factor	γ_{Ms} 2)	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Steel failure with threaded rod grade 8.8								
Characteristic resistance	$N_{Rk,s}$	[kN]	29,3	46,4	67,4	67,4	125,6	196,0
Partial safety factor	γ_{Ms} 2)	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Pullout failure								
Characteristic resistance in non-cracked concrete C20/25	$N_{Rk,p}$	[kN]	1)	1)	1)	1)	25	30
Installation safety factor	γ_2 3) = γ_{inst} 4) 5)	[-]	1,2	1,2	1,4	1,2	1,2	1,2
Increasing factor: concrete C30/37	ψ_c	[-]	1,22	1,22	1,22	1,22	1,22	1,22
Increasing factor: concrete C40/50	ψ_c	[-]	1,41	1,41	1,41	1,41	1,41	1,41
Increasing factor: concrete C50/60	ψ_c	[-]	1,55	1,55	1,55	1,55	1,55	1,55
Concrete cone failure and splitting failure								
Effective embedment depth	h_{ef}	[mm]	30	40	50	50	65	80
Factor for non-cracked concrete	k_1 3) = k_{ucr} 4)	[-]	10,1	10,1	10,1	10,1	10,1	10,1
Factor for non-cracked concrete	$k_{ucr,N}$ 5)	[-]	11,0	11,0	11,0	11,0	11,0	11,0
Installation safety factor	γ_2 3) = γ_{inst} 4) 5)	[-]	1,2	1,2	1,4	1,2	1,2	1,2
Increasing factor: concrete C30/37	ψ_c	[-]	1,22	1,22	1,22	1,22	1,22	1,22
Increasing factor: concrete C40/50	ψ_c	[-]	1,41	1,41	1,41	1,41	1,41	1,41
Increasing factor: concrete C50/60	ψ_c	[-]	1,55	1,55	1,55	1,55	1,55	1,55
Characteristic resistance to splitting	$N^0_{Rk,sp}$	[kN]	1)	1)	1)	1)	25	30
Characteristic spacing: concrete cone failure	$s_{cr,N}$	[mm]	90	120	150	150	195	240
Characteristic spacing: splitting failure	$s_{cr,sp}$	[mm]	210	280	350	350	455	560
Characteristic edge distance: concrete cone failure	$c_{cr,N}$	[mm]	45	60	75	75	97	120
Characteristic edge distance: splitting failure	$c_{cr,sp}$	[mm]	105	140	175	175	227	280

DROP IN ANCHOR TDX

Annex C1

of European Technical Assessment ETA-17/0678

Performances
Characteristic resistance to tension load

Table C2: Characteristic resistance to shear load in non-cracked concrete (static and quasi-static loading)

Anchor			DROP IN ANCHOR TDX					
Size			**TDX08**	**TDX10**	**TDX12TS**	**TDX12**	**TDX16**	**TDX20**
Steel failure without lever arm								
Steel failure with threaded rod grade 4.6								
Characteristic resistance	$V_{Rk,s}$ [3)4)] = $V^0_{Rk,s}$ [5)]	[kN]	7,3	11,6	31,4	16,9	31,4	49,0
Factor considering ductility	k [3)] = k_2 [4)] = k_7 [5)]	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,67	1,67	1,67	1,67	1,67	1,67
Steel failure with threaded rod grade 4.8								
Characteristic resistance	$V_{Rk,s}$ [3)4)] = $V^0_{Rk,s}$ [5)]	[kN]	7,3	11,6	31,4	16,9	31,4	49,0
Factor considering ductility	k [3)] = k_2 [4)] = k_7 [5)]	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 5.8								
Characteristic resistance	$V_{Rk,s}$ [3)4)] = $V^0_{Rk,s}$ [5)]	[kN]	9,2	14,5	39,3	21,1	39,3	61,3
Factor considering ductility	k [3)] = k_2 [4)] = k_7 [5)]	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 6.8								
Characteristic resistance	$V_{Rk,s}$ [3)4)] = $V^0_{Rk,s}$ [5)]	[kN]	11,0	17,4	47,1	25,3	47,1	73,5
Factor considering ductility	k [3)] = k_2 [4)] = k_7 [5)]	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 8.8								
Characteristic resistance	$V_{Rk,s}$ [3)4)] = $V^0_{Rk,s}$ [5)]	[kN]	14,6	23,2	62,8	33,7	62,8	98,0
Factor considering ductility	k [3)] = k_2 [4)] = k_7 [5)]	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with lever arm								
Steel failure with threaded rod grade 4.6								
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	15,0	29,9	52,4	52,4	133,3	259,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,67	1,67	1,67	1,67	1,67	1,67
Steel failure with threaded rod grade 4.8								
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	15,0	29,9	52,4	52,4	133,3	259,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 5.8								
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	18,8	37,4	65,6	65,6	166,6	324,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 6.8								
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	22,5	44,9	78,7	78,7	199,9	389,7
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 8.8								
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	30,0	59,9	104,9	104,9	266,6	519,7
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25

DROP IN ANCHOR TDX

Performances
Characteristic resistance to shear loads

Annex C2

of European Technical Assessment ETA-17/0678

Table C3: Characteristic resistance and displacements (static and quasi-static loading)

Anchor			**DROP IN ANCHOR TDX**					
Size			**TDX08**	**TDX10**	**TDX12TS**	**TDX12**	**TDX16**	**TDX20**
Resistance to pry-out failure								
Factor for non-cracked concrete	$k^{3)} = k_3{}^{4)} = k_8{}^{5)}$	[-]	1,0	1,0	1,0	1,0	2,0	2,0
Partial safety factor	$\gamma_{Ms}{}^{2)}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Resistance to concrete edge failure								
Outside diameter of anchor	d_{nom}	[mm]	10	12	15	16	20	25
Effective length of anchor under shear loads	l_f	[mm]	30	40	50	50	65	80
Partial safety factor	$\gamma_{Mc}{}^{2)}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Minimum member thickness	h_{min}	[mm]	100	100	100	100	130	160
Minimum edge distance	c_{min}	[mm]	41	54	68	68	88	108
Minimum spacing	s_{min}	[mm]	41	54	68	68	88	108
Displacements under static and quasi-static loading								
Tension and shear load in non-cracked concrete C20/25 to C50/60								
Tension load and shear load	N = V	[kN]	4,44	6,91	6,40	9,92	11,46	23,86
Short term tension displacement	δ_{N0}	[mm]	0,98	3,54	3,06	2,73	1,15	4,26
Long term tension displacement	$\delta_{N\infty}$	[mm]	0,50	0,50	0,38	0,50	0,50	0,50
Short term shear displacement	δ_{V0}	[mm]	0,98	3,54	3,06	2,73	1,15	4,26
Long term shear displacement	$\delta_{V\infty}$	[mm]	0,50	0,50	0,38	0,50	0,50	0,50

1) Pull-out failure mode is not decisive
2) 3) Parameter for design acc. to ETAG 001 Annex C
4) Parameter for design acc. to CEN/TS 1992-4-4:2009
5) Parameter for design acc. to prEN 1992-4:2016

DROP IN ANCHOR TDX

Annex C3

of European Technical Assessment ETA-17/0678

Performances
Characteristic resistance and displacements