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

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European Technical Assessment

ETA-21/0611 of 30/06/2021

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE
Product family to which the construction product belongs	Nailed-in plastic anchors for fixing of external thermal insulation composite systems with rendering in concrete and masonry
Manufacturer	TRUTEK Fasteners Polska Sp. z o.o. Al. Krakowska 38, Janki 05-090 Raszyn Poland e-mail: info@trutek.com.pl www.trutek.com.pl
Manufacturing plant	Manufacturing plant no. 7
This European Technical Assessment contains	26 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 330196-01-0604 "Plastic anchors made of virgin or non-virgin material for fixing of external thermal insulation composite systems with rendering"

Specific Part

1 Technical description of the product

The TIA PPSE and TIA PPLE nailed-in plastic anchors consist of a plastic expansion sleeve with a plate made of polypropylene (virgin material) and an accompanying nail as an expansion pin made of polyamide PA6 reinforced with glass fibers GF30 (virgin material).

The TIA MPSE, TIA MPPHSE, TIA MPLE and TIA MPPHLE nailed-in plastic anchors consist of a plastic expansion sleeve with a plate made of polypropylene (virgin material) and an accompanying nail as an expansion pin made of carbon steel with zinc coating.

The plastic anchor sleeve is expanded by hammering in a nail, which press the sleeve against the wall of the drilled hole.

The TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE and TIA MPPHLE anchors may in addition be combined with the additional plate type TIA140, made of polypropylene, polyamide PA6 or polyamide PA6 reinforced with glass fibers (virgin materials).

The drawings and the description of the products are given in Annex A.

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

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

The provisions made in this European Technical Assessment are based on an assumed working life of the anchor of 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or Technical Assessment Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

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

3.1 Performance of the product

3.1.1 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Characteristic resistance	Annex C1
Edge distances and spacing	Annex B2
Plate stiffness	Annex C2
Displacements	Annex C3

3.1.2 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Point thermal transmittance of an anchor	No performance assessed

3.2 Methods used for the assessment

The assessment of the products has been made in accordance with the European Assessment Document EAD 330196-01-0604 "Plastic anchors made of virgin or non-virgin material for fixing of external thermal insulation composite systems with rendering".

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

According to the Decision 97/463/EC of the European Commission the system 2+ of assessment and verification of constancy of performance (see Annex V to the Regulation (EU) No 305/2011) applies.

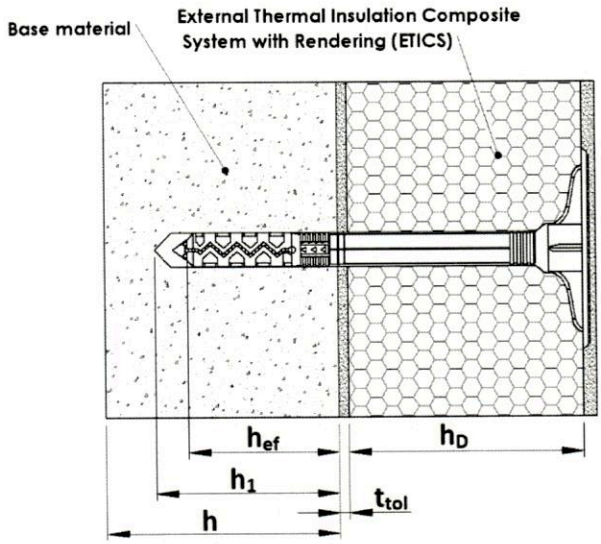
5 Technical details necessary for the implementation of the AVCP system, as provided in the applicable European Assessment Document (EAD)

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

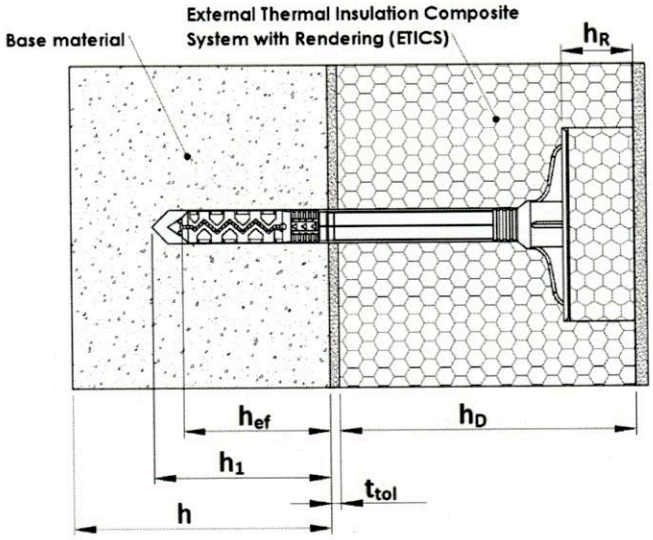
For the type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified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

Issued in Warsaw on 30/06/2021 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB



Surface assembly



Countersunk assembly

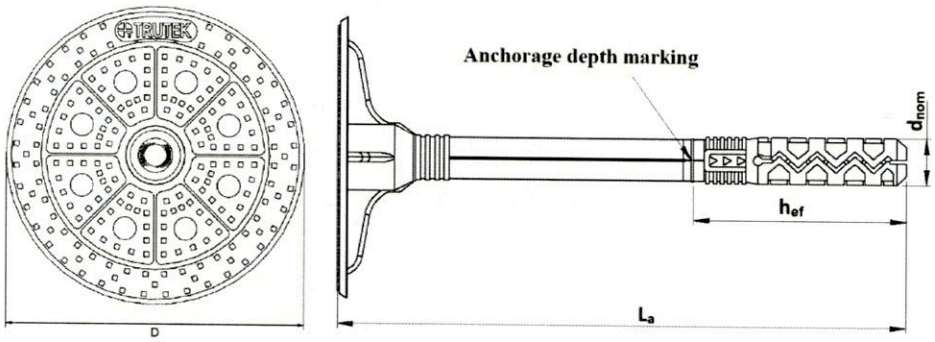
Intended Use

Fixing of external thermal insulation composite systems in concrete and masonry

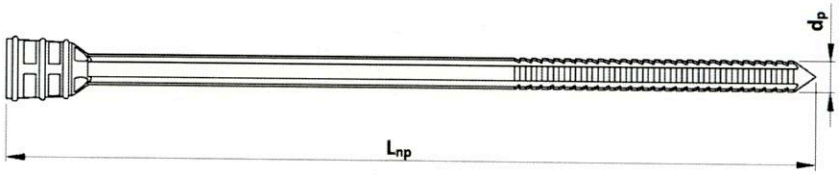
Legend

h_{ef} = effective anchorage depth
h_1 = depth of drill hole in base material
h = thickness of base material
h_D = thickness of insulation material
t_{tol} = thickness of equalizing and/or non-load-bearing layer
h_R = thickness of plug

TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex A1** of European Technical Assessment ETA-21/0611
Product description Installation conditions	



Plastic expansion sleeve



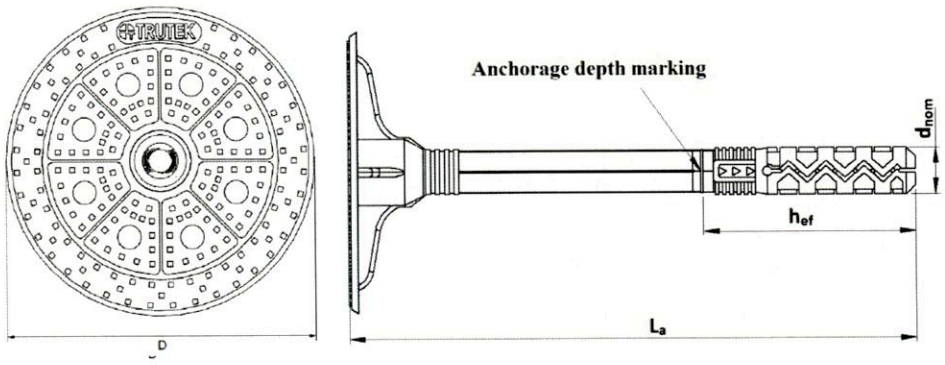
Plastic expansion pin

Table A1: TIA PPSE anchor types and dimensions [mm]

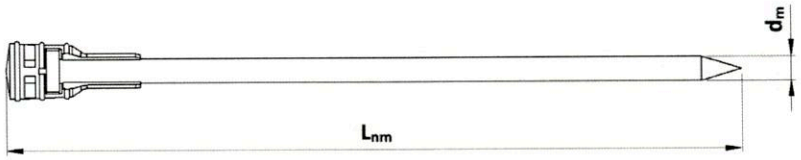
Anchor type	Anchor sleeve				Expansion pin	
	d_{nom} ± 0,1	L_a ± 2	D +3/-1	h_{ef}	d_p ± 0,1	L_{np} ± 2
TIA10070PPSE	10	70	60	50	5,7	75
TIA10090PPSE	10	90	60	50	5,7	95
TIA10100PPSE	10	100	60	50	5,7	105
TIA10120PPSE	10	120	60	50	5,7	125
TIA10140PPSE	10	140	60	50	5,7	145
TIA10160PPSE	10	160	60	50	5,7	165
TIA10180PPSE	10	180	60	50	5,7	185
TIA10200PPSE	10	200	60	50	5,7	205
TIA10220PPSE	10	220	60	50	5,7	225
TIA10260PPSE	10	260	60	50	5,7	265
TIA10300PPSE	10	300	60	50	5,7	305
TIA10350PPSE	10	350	60	50	5,7	355
TIA10400PPSE	10	400	60	50	5,7	405

Determination of maximum thickness of insulation material:
For surface assembly: $h_D = L_a - t_{tol} - h_{ef}$
For countersunk assembly: $h_D = L_a - t_{tol} - h_{ef} + h_R$

TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex A2** of European Technical Assessment ETA-21/0611
Product description Dimensions of the TIA PPSE anchor elements	



Plastic expansion sleeve



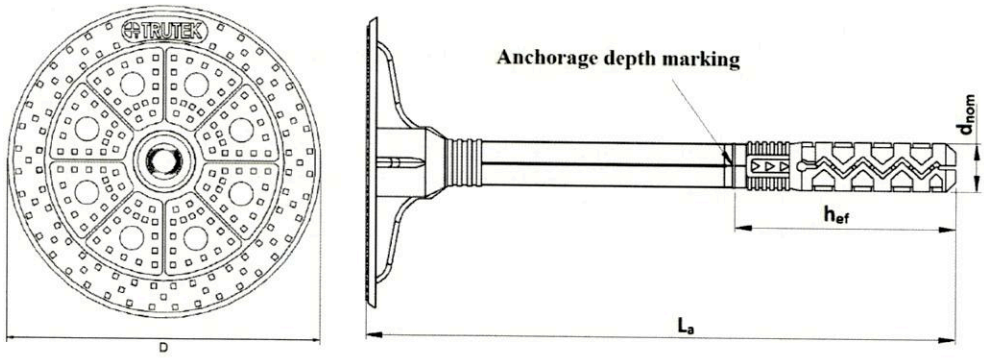
Steel expansion pin

Table A2: TIA MPSE anchor types and dimensions [mm]

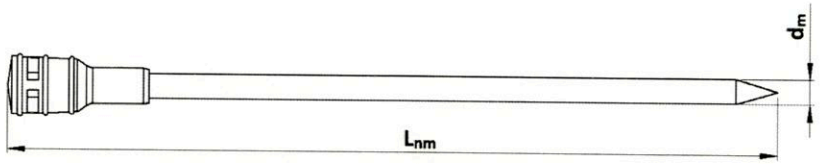
Anchor type	Anchor sleeve				Expansion pin	
	d_{nom} ± 0,1	L_a ± 2	D +3/-1	h_{ef}	d_m ± 0,1	L_{nm} ± 2
TIA10070MPSE	10	70	60	50	5,5	75
TIA10090MPSE	10	90	60	50	5,5	95
TIA10100MPSE	10	100	60	50	5,5	105
TIA10120 MPSE	10	120	60	50	5,5	125
TIA10140MPSE	10	140	60	50	5,5	145
TIA10160MPSE	10	160	60	50	5,5	165
TIA10180MPSE	10	180	60	50	5,5	185
TIA10200MPSE	10	200	60	50	5,5	205
TIA10220MPSE	10	220	60	50	5,5	225
TIA10260MPSE	10	260	60	50	5,5	265
TIA10300MPSE	10	300	60	50	5,0	305
TIA10350MPSE	10	350	60	50	5,0	355
TIA10400MPSE	10	400	60	50	5,0	405

Determination of maximum thickness of insulation material:
For surface assembly: $h_D = L_a - t_{tol} - h_{ef}$
For countersunk assembly: $h_D = L_a - t_{tol} - h_{ef} + h_R$

TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex A2** of European Technical Assessment ETA-21/0611
Product description Dimensions of the TIA MPSE anchor elements	



Plastic expansion sleeve



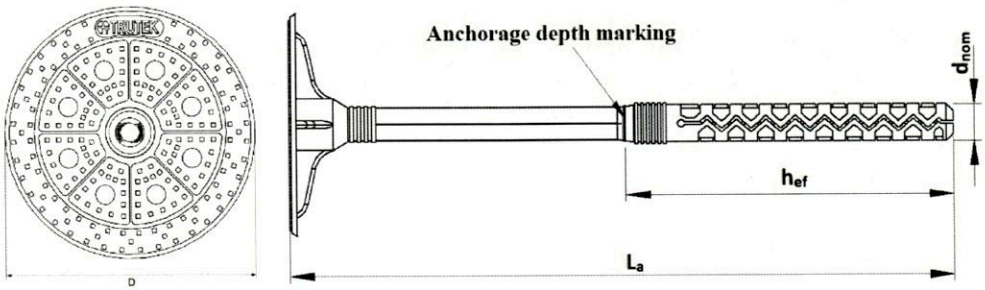
Steel expansion pin

Table A3: TIA MPPHSE anchor types and dimensions [mm]

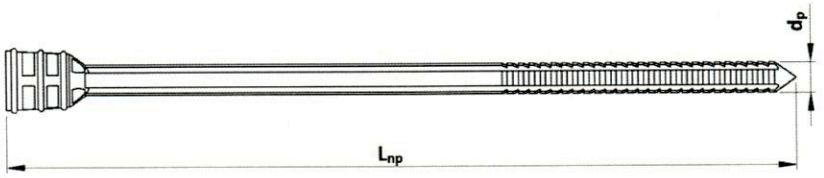
Anchor type	Anchor sleeve				Expansion pin	
	d_{nom} ± 0,1	L_a ± 2	D +3/-1	h_{ef}	d_m ± 0,1	L_{nm} ± 2
TIA10070MPPHSE	10	70	60	50	5,5	75
TIA10090MPPHSE	10	90	60	50	5,5	95
TIA10100MPPHSE	10	100	60	50	5,5	105
TIA10120MPPHSE	10	120	60	50	5,5	125
TIA10140MPPHSE	10	140	60	50	5,5	145
TIA10160MPPHSE	10	160	60	50	5,5	165
TIA10180MPPHSE	10	180	60	50	5,5	185
TIA10200MPPHSE	10	200	60	50	5,5	205
TIA10220MPPHSE	10	220	60	50	5,5	225
TIA10260MPPHSE	10	260	60	50	5,5	265
TIA10300MPPHSE	10	300	60	50	5,0	305
TIA10350MPPHSE	10	350	60	50	5,0	355
TIA10400MPPHSE	10	400	60	50	5,0	405

Determination of maximum thickness of insulation material:
For surface assembly: $h_D = L_a - t_{tol} - h_{ef}$
For countersunk assembly: $h_D = L_a - t_{tol} - h_{ef} + h_R$

TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex A2** of European Technical Assessment ETA-21/0611
Product description Dimensions of the TIA MPPHSE anchor elements	



Plastic expansion sleeve



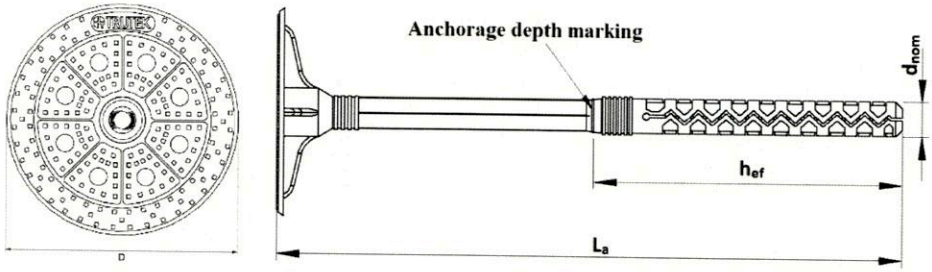
Plastic expansion pin

Table A4: TIA PPLE anchor types and dimensions [mm]

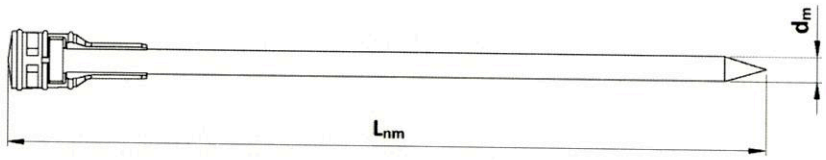
Anchor type	Anchor sleeve				Expansion pin	
	d_{nom} ± 0,1	L_a ± 2	D +3/-1	h_{ef}	d_p ± 0,1	L_{np} ± 2
TIA10140PPLE	10	140	60	80	5,7	145
TIA10160PPLE	10	160	60	80	5,7	165
TIA10180PPLE	10	180	60	80	5,7	185
TIA10200PPLE	10	200	60	80	5,7	205
TIA10220PPLE	10	220	60	80	5,7	225
TIA10260PPLE	10	260	60	80	5,7	265
TIA10300PPLE	10	300	60	80	5,7	305
TIA10350PPLE	10	350	60	80	5,7	355
TIA10400PPLE	10	400	60	80	5,7	405

Determination of maximum thickness of insulation material:
For surface assembly: $h_D = L_a - t_{tol} - h_{ef}$
For countersunk assembly: $h_D = L_a - t_{tol} - h_{ef} + h_R$

TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex A2** of European Technical Assessment ETA-21/0611
Product description Dimensions of the TIA PPLE anchor elements	



Plastic expansion sleeve

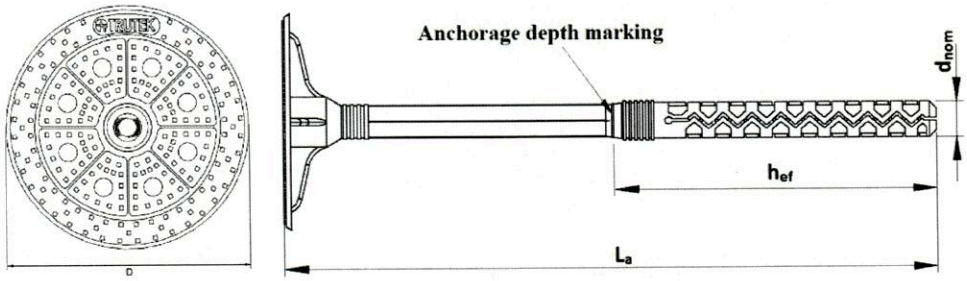


Steel expansion pin

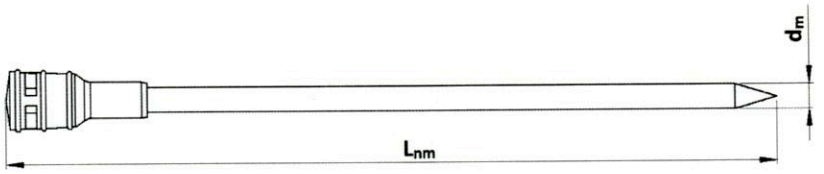
Table A5: TIA MPLE anchor types and dimensions [mm]

Anchor type	Anchor sleeve				Expansion pin	
	d_{nom} ± 0,1	L_a ± 2	D +3/-1	h_{ef}	d_m ± 0,1	L_{nm} ± 2
TIA10140MPLE	10	140	60	80	5,0	145
TIA10160MPLE	10	160	60	80	5,0	165
TIA10180MPLE	10	180	60	80	5,0	185
TIA10200MPLE	10	200	60	80	5,0	205
TIA10220MPLE	10	220	60	80	5,0	225
TIA10260MPLE	10	260	60	80	5,0	265
TIA10300MPLE	10	300	60	80	5,0	305
TIA10350MPLE	10	350	60	80	5,0	355
TIA10400MPLE	10	400	60	80	5,0	405

Determination of maximum thickness of insulation material:
For surface assembly: $h_D = L_a - t_{tol} - h_{ef}$
For countersunk assembly: $h_D = L_a - t_{tol} - h_{ef} + h_R$



Plastic expansion sleeve



Steel expansion pin

Table A6: TIA MPPHLE anchor types and dimensions [mm]

Anchor type	Anchor sleeve				Expansion pin	
	d_{nom} ± 0,1	L_a ± 2	D +3/-1	h_{ef}	d_m ± 0,1	L_{nm} ± 2
TIA10140MPPHLE	10	140	60	80	5,0	145
TIA10160MPPHLE	10	160	60	80	5,0	165
TIA10180MPPHLE	10	180	60	80	5,0	185
TIA10200MPPHLE	10	200	60	80	5,0	205
TIA10220MPPHLE	10	220	60	80	5,0	225
TIA10260MPPHLE	10	260	60	80	5,0	265
TIA10300MPPHLE	10	300	60	80	5,0	305
TIA10350MPPHLE	10	350	60	80	5,0	355
TIA10400MPPHLE	10	400	60	80	5,0	405

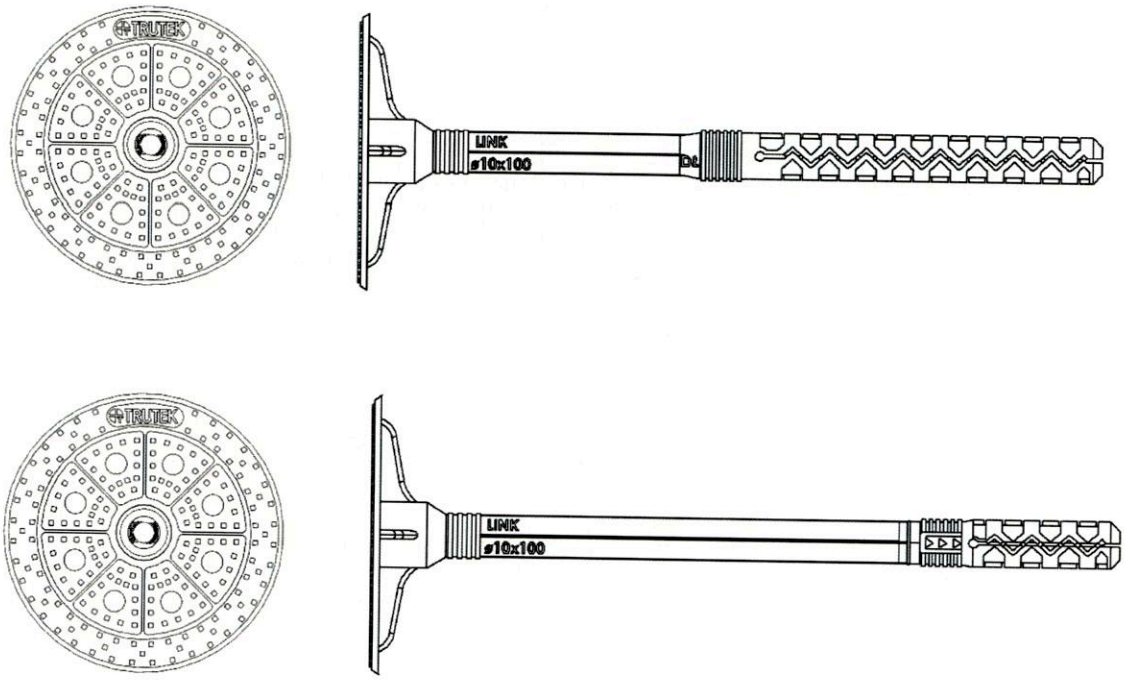
Determination of maximum thickness of insulation material:
For surface assembly: $h_D = L_a - t_{tol} - h_{ef}$
For countersunk assembly: $h_D = L_a - t_{tol} - h_{ef} + h_R$

TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex A2** of European Technical Assessment ETA-21/0611
Product description Dimensions of the TIA MPPHLE anchor elements	

Table A7: Materials

Designation		Material
Plastic expansion anchor sleeve		Polypropylene (orange / grey / white), virgin material
Plastic expansion pin Ø 5,7 mm		Polyamide PA6 (natural / grey / orange / black) reinforced with glass fibre GF30, virgin material
Steel expansion pin	Ø 5 mm	Carbon steel ($f_{y,k} \geq 490$ MPa, $f_{u,k} \geq 650$ MPa) with zinc coating ≥ 5 µm; galvanized according to EN ISO 4042
	Ø 5,5 mm	Carbon steel ($f_{y,k} \geq 450$ MPa, $f_{u,k} \geq 600$ MPa) with zinc coating ≥ 5 µm; galvanized according to EN ISO 4042

Marking:



Diameter and length of anchor: e.g. ø10 x 100

TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex A3** of European Technical Assessment ETA-21/0611
Product description Materials and marking	

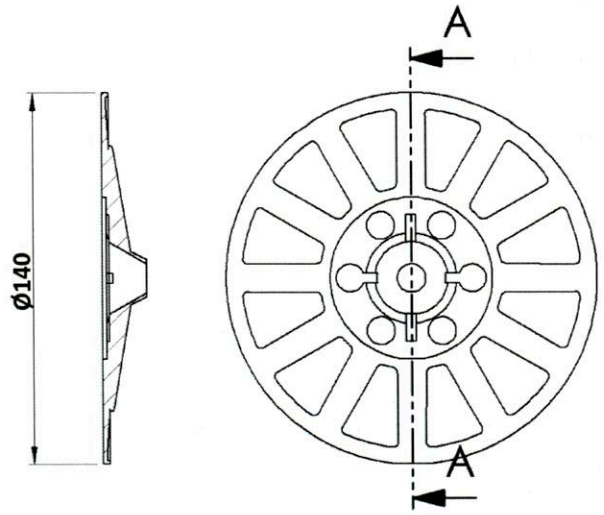
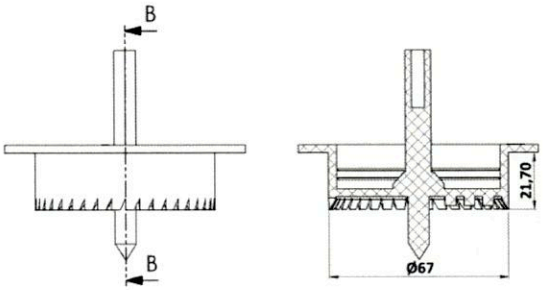


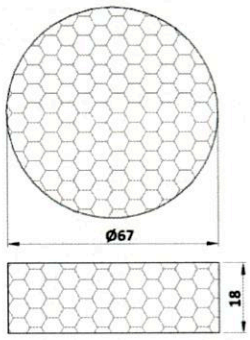
Table A8: Additional plate TIA140

Plate type	Outer diameter [mm]	Material
TIA140	140	Polypropylene, polyamide PA6 reinforced with glass fibre or not reinforced (orange / white / grey / natural)

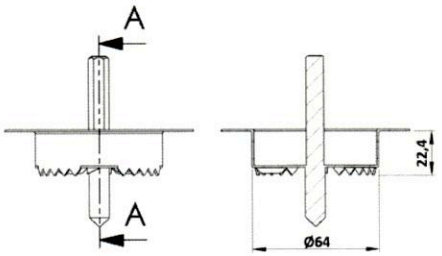
Equipment for countersunk assembly



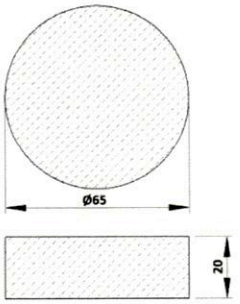
Cutter TIA67CS for styrofoam



Plug TIA67PW or TIA67PG made of styrofoam



Cutter TIA64CW for mineral wool (MW)



Plug TIA65PW made of mineral wool (MW)

TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex A4** of European Technical Assessment ETA-21/0611
Product description Additional plate TIA140 and equipment for countersunk assembly used with TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	

Specification of intended use

Anchorages subject to:

- Wind suction loads.
  Note: The anchor shall not be used for the transmission of dead loads of the external thermal insulation composite system.

Base materials:

- Reinforced or unreinforced normal weight concrete (use category A), according to Annex C1 and C3.
- Solid masonry (use category B), according to Annex C1 and C3.
- Hollow or perforated masonry (use category C), according to Annex C1 and C3.
- Lightweight aggregate concrete (use category D), according to Annex C1 and C3.
- Autoclaved aerated concrete (use category E), according to Annex C1 and C3.
- For other base materials of the use categories A, B, C, D or E the characteristic resistance of the anchor may be determined by job site tests according to EOTA Technical Report TR 051, edition December 2016.

Application temperature range:

- 0°C to +40°C (max. short term temperature +40°C and max. long term temperature +24°C).

Design:

- The anchorages are designed under the responsibility of an engineer experienced in anchorages and masonry work with the partial safety factors γ_M = 2,0 and γ_F = 1,5, if there are no other national regulations.
- Verifiable calculation notes and drawings with anchor positions are prepared taking into account of the loads to be anchored.
- Anchors are only to be used for multiple fixings of thermal insulation composite system (ETICS), according to EAD 330196-01-0604.

Installation:

- Hole shall be drilled by the drill modes according to Annex C1.
- Anchor installation shall be carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Installation shall be executed in temperature from 0°C to +40°C.
- Exposure to UV due to solar radiation of the anchor not protected by rendering shall not exceed 6 weeks.

TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex B1**
Intended use Specifications	of European Technical Assessment ETA-21/0611

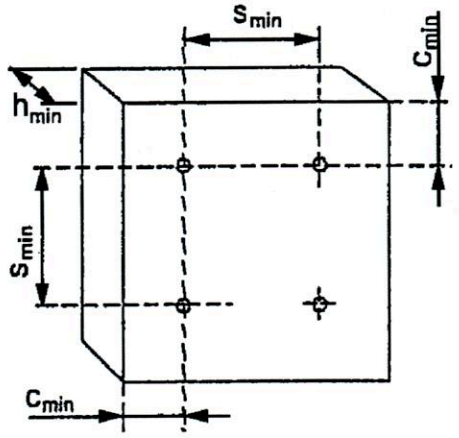
Table B1: Installation characteristics

Anchor type		TIA PPSE, TIA MPSE, TIA MPPHSE	TIA PPLE, TIA MPLE, TIA MPPHLE
Nominal diameter	d_{nom} [mm]	10	10
Nominal diameter of drill bit	d_o [mm]	10	10
Cutting diameter of drill bit	d_{cut} [mm]	≤ 10,45	≤ 10,45
Depth of drill hole for base material category A, B, C, D, E	h_1 [mm]	≥ 50	≥ 90
Effective anchorage depth for base material category A, B, C, D, E	h_{ef} [mm]	≥ 40	≥ 80

Table B2: Minimum thickness of base material, anchor spacing and edge distance

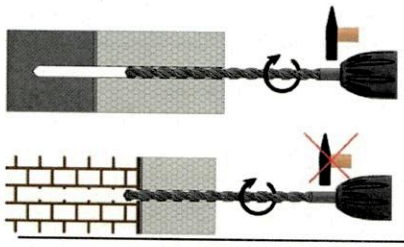
Anchor type		TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE
Minimum thickness of base material	h_{min} [mm]	100
Minimum spacing	s_{min} [mm]	100
Minimum edge distance	c_{min} [mm]	100

Diagram of spacing



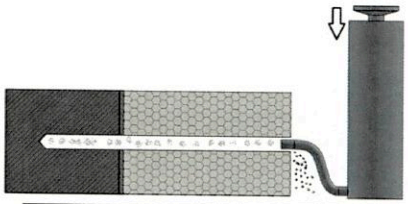
TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	Annex B2 of European Technical Assessment ETA-21/0611
Intended use Installation characteristics, minimum thickness of base material, edge distance and spacing	

Installation instruction – surface assembly

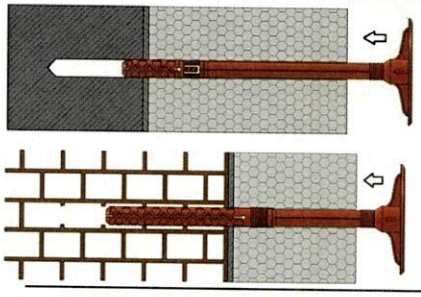


Drill perpendicular hole by corresponding method acc. to Annex C1.

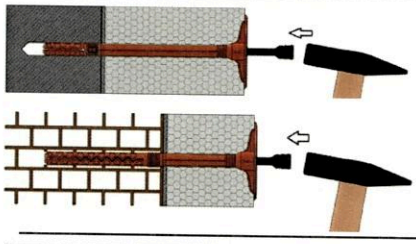
or



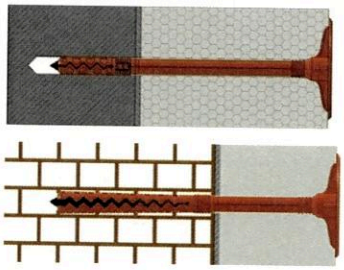
In case of installation in solid base materials clean correctly the hole by removing dust.



Set-in the anchor and make sure that the plate bottom is flush with the ETICS surface.



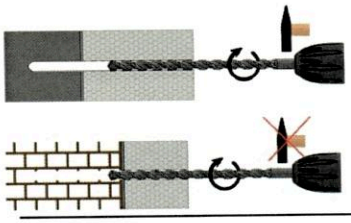
Nail-in the expansion pin.



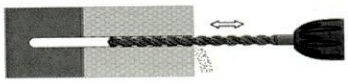
Correctly installed anchor.

TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex B3** of European Technical Assessment ETA-21/0611
Intended use Installation instruction – surface assembly	

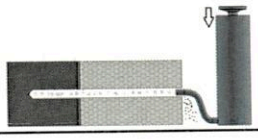
Installation instruction – countersunk assembly



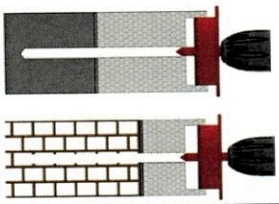
Drill prendicular hole by corresponding method acc. to Annex C1.



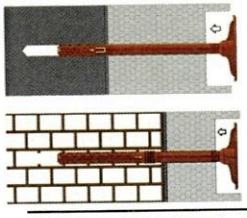
or



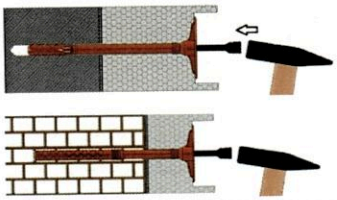
In case of installation in solid base materials clean correctly the hole by removing dust.



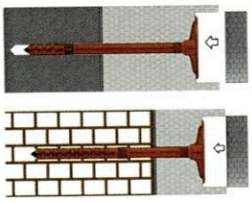
Using the cutter make a hole in insulation material.



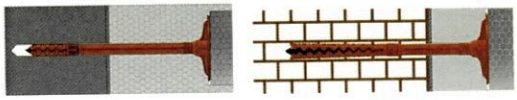
Set-in the anchor and make sure that the plate bottom is flush with the ETICS surface.



Nail-in the expansion pin.



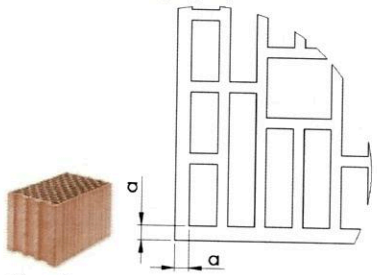
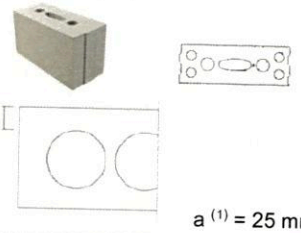
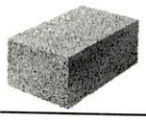
Set-in the plug.



Correctly installed anchor.

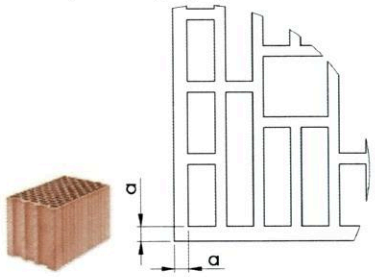
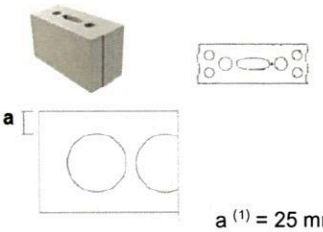
TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	**Annex B3** of European Technical Assessment ETA-21/0611
Intended use Installation instruction – countersunk assembly	

Table C1: Characteristic resistance to tension loads N_{Rk} in concrete and in masonry for single TIA PPSE anchor

Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	Referring standard	N_{Rk} [kN]	Drill method
Concrete C12/15 (use category A)			EN 206	0,55	hammer
Concrete C16/20 to C50/60 (use category A)			EN 206	0,80	hammer
Clay bricks MZ (use category B)	≥ 2,0	≥ 20,0	EN 771-1	1,00	hammer
Calcium silicate bricks KS (use category B)	≥ 2,0	≥ 20,0	EN 771-2	0,40	hammer
Vertically perforated clay bricks Porotherm 25 P+D (use category C)  a (1) = 11 mm	≥ 0,8	≥ 15,0	EN 771-1	0,10	rotary
Calcium silicate hollow blocks KSL (use category C)  a (1) = 25 mm	≥ 1,6	≥ 15,0	EN 771-2	0,65	rotary
Lightweight concrete blocks LAC (use category D) 	≥ 0,88	≥ 5,0	EN 771-3	0,20	rotary
Partial safety factor for anchor resistance, γ_M (2)	2,0				

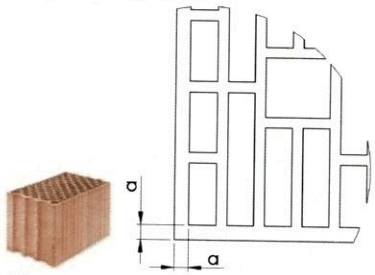
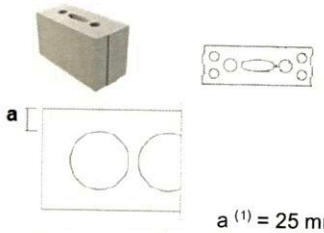
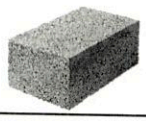
(1) minimum values "a", for elements with lower value of "a" the load tests on the construction site are required
(2) in the absence of other national regulations

Table C2: Characteristic resistance to tension loads N_{Rk} in concrete and in masonry for single TIA MPSE and TIA MPPHSE anchors

Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	Referring standard	N_{Rk} [kN]	Drill method
Concrete C12/15 (use category A)			EN 206	0,40	hammer
Concrete C16/20 to C50/60 (use category A)			EN 206	0,55	hammer
Clay bricks MZ (use category B)	≥ 2,0	≥ 20,0	EN 771-1	0,65	hammer
Calcium silicate bricks KS (use category B)	≥ 2,0	≥ 20,0	EN 771-2	0,35	hammer
Vertically perforated clay bricks Porotherm 25 P+D (use category C)  a (1) = 11 mm	≥ 0,8	≥ 15,0	EN 771-1	0,10	rotary
Calcium silicate hollow blocks KSL (use category C)  a (1) = 25 mm	≥ 1,6	≥ 15,0	EN 771-2	0,40	rotary
Lightweight concrete blocks LAC (use category D) 	≥ 0,88	≥ 5,0	EN 771-3	0,30	rotary
Autoclaved concrete blocks AAC 2 (use category E)	≥ 0,35	≥ 2,0	EN 771-4	0,10	rotary
Partial safety factor for anchor resistance, γ_M (2)	2,0				

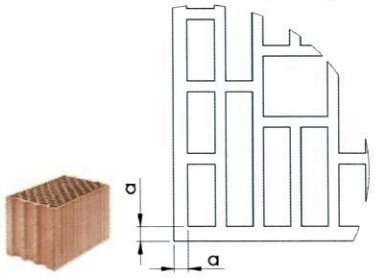
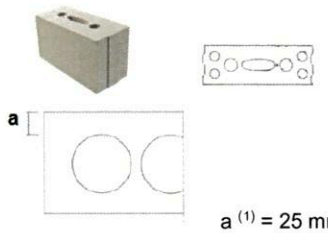
(1) minimum values "a", for elements with lower value of "a" the load tests on the construction site are required
(2) in the absence of other national regulations

Table C3: Characteristic resistance to tension loads N_{Rk} in concrete and in masonry for single TIA PPLE anchor

Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	Referring standard	N_{Rk} [kN]	Drill method
Concrete C12/15 (use category A)			EN 206	0,30	hammer
Concrete C16/20 to C50/60 (use category A)			EN 206	0,45	hammer
Clay bricks MZ (use category B)	≥ 2,0	≥ 20,0	EN 771-1	0,45	hammer
Calcium silicate bricks KS (use category B)	≥ 2,0	≥ 20,0	EN 771-2	0,25	hammer
Vertically perforated clay bricks Porotherm 25 P+D (use category C)  a (1) = 11 mm	≥ 0,8	≥ 15,0	EN 771-1	0,15	rotary
Calcium silicate hollow blocks KSL (use category C)  a (1) = 25 mm	≥ 1,6	≥ 15,0	EN 771-2	0,15	rotary
Lightweight concrete blocks LAC (use category D) 	≥ 0,88	≥ 5,0	EN 771-3	0,15	rotary
Autoclaved concrete blocks AAC 2 (use category E)	≥ 0,35	≥ 2,0	EN 771-4	0,10	rotary
Partial safety factor for anchor resistance, γ_M (2)	2,0				

(1) minimum values "a", for elements with lower value of "a" the load tests on the construction site are required
(2) in the absence of other national regulations

Table C4: Characteristic resistance to tension loads N_{Rk} in concrete and in masonry for single TIA MPLE and TIA MPPHLE anchors

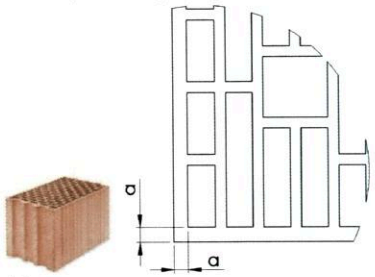
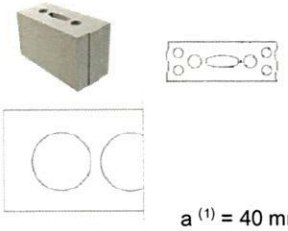
Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	Referring standard	N_{Rk} [kN]	Drill method
Concrete C12/15 (use category A)			EN 206	0,55	hammer
Concrete C16/20 to C50/60 (use category A)			EN 206	0,80	hammer
Clay bricks MZ (use category B)	≥ 2,0	≥ 20,0	EN 771-1	0,60	hammer
Calcium silicate bricks KS (use category B)	≥ 2,0	≥ 20,0	EN 771-2	0,65	hammer
Vertically perforated clay bricks Porotherm 25 P+D (use category C)  a (1) = 11 mm	≥ 0,8	≥ 15,0	EN 771-1	0,25	rotary
Calcium silicate hollow blocks KSL (use category C)  a (1) = 25 mm	≥ 1,6	≥ 15,0	EN 771-2	0,25	rotary
Lightweight concrete blocks LAC (use category D) 	≥ 0,88	≥ 5,0	EN 771-3	0,30	rotary
Autoclaved concrete blocks AAC 2 (use category E)	≥ 0,35	≥ 2,0	EN 771-4	0,10	rotary
Partial safety factor for anchor resistance, γ_M (2)	2,0				

(1) minimum values "a", for elements with lower value of "a" the load tests on the construction site are required
(2) in the absence of other national regulations

Table C5: Plate stiffness according to EOTA Technical Report TR 026

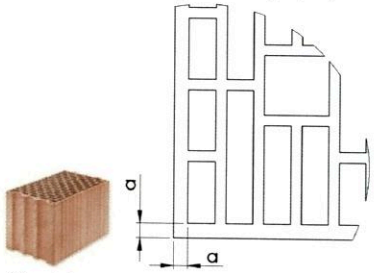
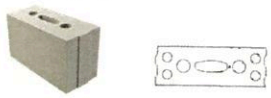
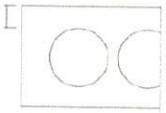
Anchor type	Diameter of the anchor plate d_{plate} [mm]	Characteristic load resistance of the anchor plate [kN]	Plate stiffness [kN/mm]
TIA PPSE, TIA MPSE, TIA MPPHSE, TIA PPLE, TIA MPLE, TIA MPPHLE	60	0,84	0,20

Table C6: Displacement of TIA PPSE anchors

Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	$\frac{N_{Rk}}{3}$ [kN]	$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]
Concrete C12/15 (use category A)			0,18	0,40
Concrete C16/20 to C50/60 (use category A)			0,27	0,70
Clay bricks MZ (use category B)	≥ 2,0	≥ 20,0	0,33	1,00
Calcium silicate bricks KS (use category B)	≥ 2,0	≥ 20,0	0,13	0,42
Vertically perforated clay bricks Porotherm 25 P+D (use category C)  a (1) = 11 mm	≥ 0,8	≥ 15,0	0,03	0,09
Calcium silicate hollow blocks KSL (use category C)  a (1) = 40 mm	≥ 1,6	≥ 12,0	0,22	0,88
Lightweight concrete blocks LAC (use category D) 	≥ 0,88	≥ 5,0	0,06	0,13

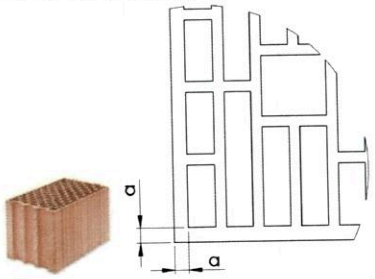
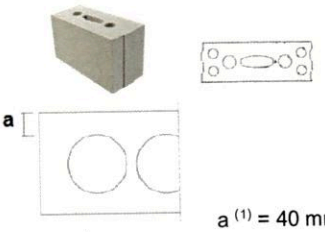
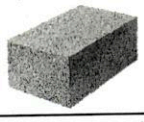
(1) minimum values "a", for elements with lower value of "a" the load tests on the construction site are required

Table C7: Displacement of TIA MPSE and TIA MPPHSE anchors

Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	$\frac{N_{Rk}}{3}$ [kN]	$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]
Concrete C12/15 (use category A)			0,13	0,40
Concrete C16/20 to C50/60 (use category A)			0,18	0,70
Clay bricks MZ (use category B)	≥ 2,0	≥ 20,0	0,22	0,90
Calcium silicate bricks KS (use category B)	≥ 2,0	≥ 20,0	0,12	0,57
Vertically perforated clay bricks Porotherm 25 P+D (use category C)  a (1) = 11 mm	≥ 0,8	≥ 15,0	0,03	0,13
Calcium silicate hollow blocks KSL (use category C)   a (1) = 40 mm	≥ 1,6	≥ 12,0	0,13	0,70
Lightweight concrete blocks LAC (use category D) 	≥ 0,88	≥ 5,0	0,10	0,45
Autoclaved concrete blocks AAC 2 (use category E)	≥ 0,35	≥ 2,0	0,03	0,08

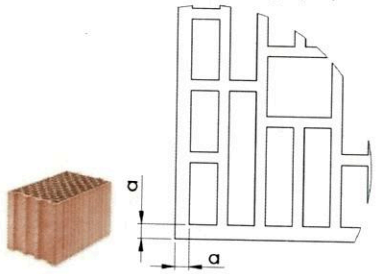
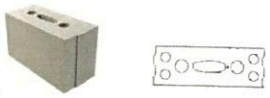
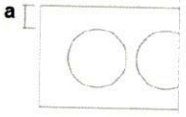
(1) minimum values "a", for elements with lower value of "a" the load tests on the construction site are required

Table C8: Displacement of TIA PPLE anchor

Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	$\frac{N_{Rk}}{3}$ [kN]	$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]
Concrete C12/15 (use category A)			0,10	0,32
Concrete C16/20 to C50/60 (use category A)			0,15	0,34
Clay bricks MZ (use category B)	≥ 2,0	≥ 20,0	0,15	0,36
Calcium silicate bricks KS (use category B)	≥ 2,0	≥ 20,0	0,08	0,10
Vertically perforated clay bricks Porotherm 25 P+D (use category C)  a (1) = 11 mm	≥ 0,8	≥ 15,0	0,05	0,06
Calcium silicate hollow blocks KSL (use category C)  a (1) = 40 mm	≥ 1,6	≥ 12,0	0,05	0,08
Lightweight concrete blocks LAC (use category D) 	≥ 0,88	≥ 5,0	0,05	0,07
Autoclaved concrete blocks AAC 2 (use category E)	≥ 0,35	≥ 2,0	0,03	0,05

(1) minimum values "a", for elements with lower value of "a" the load tests on the construction site are required

Table C9: Displacement of TIA MPLE and TIA MPPHLE anchors

Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	$\frac{N_{Rk}}{3}$ [kN]	$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]
Concrete C12/15 (use category A)			0,18	0,47
Concrete C16/20 to C50/60 (use category A)			0,27	0,70
Clay bricks MZ (use category B)	≥ 2,0	≥ 20,0	0,20	0,77
Calcium silicate bricks KS (use category B)	≥ 2,0	≥ 20,0	0,22	0,70
Vertically perforated clay bricks Porotherm 25 P+D (use category C)  a (1) = 11 mm	≥ 0,8	≥ 15,0	0,08	0,14
Calcium silicate hollow blocks KSL (use category C)   a (1) = 40 mm	≥ 1,6	≥ 12,0	0,08	0,25
Lightweight concrete blocks LAC (use category D) 	≥ 0,88	≥ 5,0	0,10	0,31
Autoclaved concrete blocks AAC 2 (use category E)	≥ 0,35	≥ 2,0	0,03	0,04

(1) minimum values "a", for elements with lower value of "a" the load tests on the construction site are required