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European Technical Assessment

**ETA-07/0221
of 12/04/2022**

General Part

Technical Assessment Body issuing the European Technical Assessment

Instytut Techniki Budowlanej

Trade name of the construction product

KI-10N

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

RAWLPLUG S.A.
ul. Kwidzyńska 6
PL 51-416 Wrocław
Poland

Manufacturing plant

Manufacturing Plant No. 3

This European Technical Assessment contains

19 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 330196-01-0604 "Plastic anchors made of virgin or non-virgin material for fixing of external thermal insulation composite systems with rendering"

This version replaces

ETA-07/0221 issued on 18/01/2018

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Specific Part

1 Technical description of the product

The KI-10N nailed-in plastic anchors consists of anchor sleeve with a plate made of polypropylene (virgin material) and specific steel nail as an expansion pin.

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

The KI-10N anchors may in addition be combined with the plates R-KWL-90, KWL-090PP, KWL-110PP and R-KWL-140.

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 Technical Assessment (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	Annex C2

3.2 Methods used for the assessment

The assessment has been made in accordance with EAD 330196-01-0604.

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)

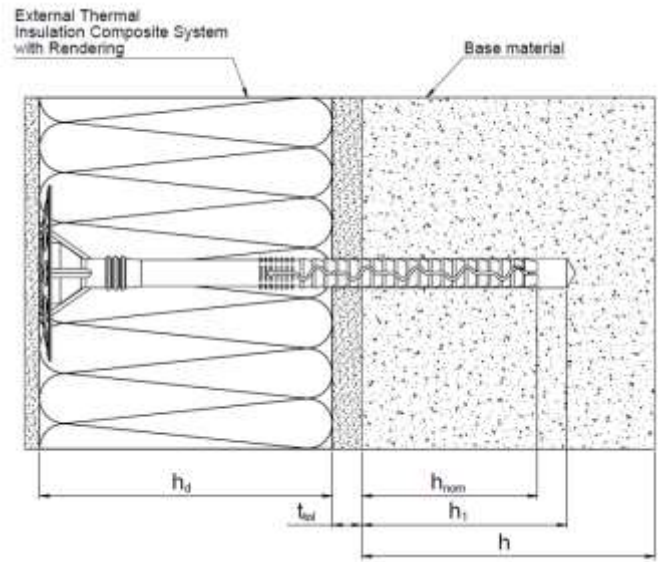
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

For 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.

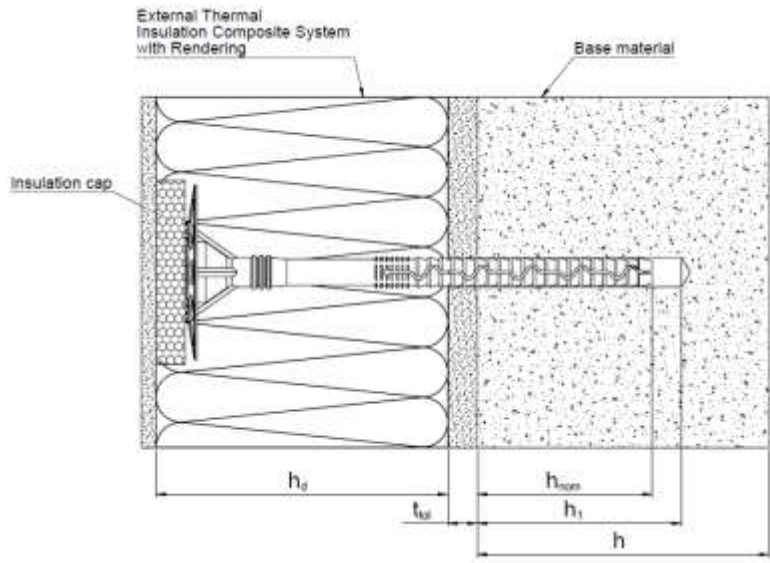
Issued in Warsaw on 12/04/2022 by Instytut Techniki Budowlanej



Anna Panek, MSc
Deputy Director of ITB



Surface assembly



Countersunk assembly

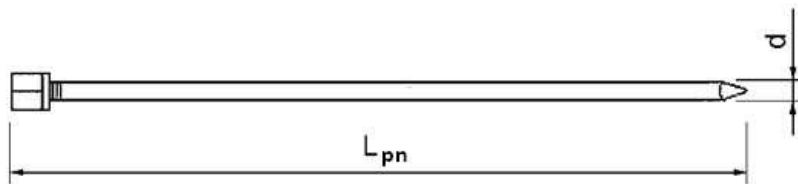
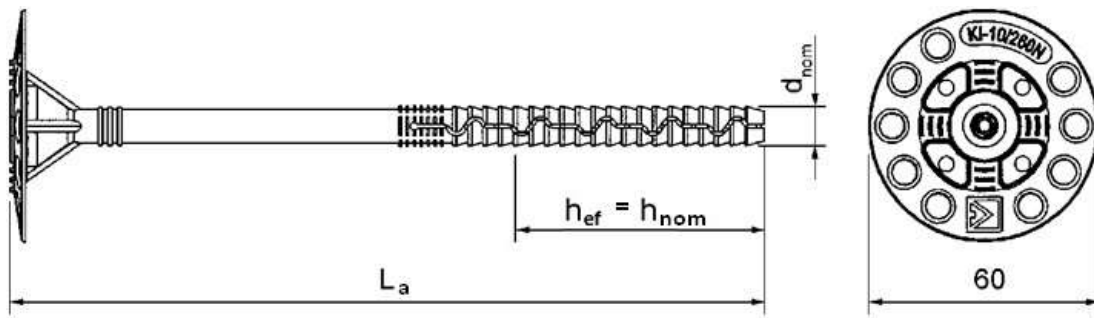
Intended use


Fixing of external thermal insulation composite systems in concrete and in masonry

Legend

- $h_{nom} = h_{ef}$ = effective anchorage depth
- h_1 = depth of drill hole in base material
- h = thickness of base material
- h_d = thickness of insulating material
- t_{tot} = thickness of equalizing and/or non-load-bearing layer

KI-10N	Annex A1 of European Technical Assessment ETA-07/0221
Product description Installation conditions	



Marking:
 Identifying mark:

 Sleeve type:
 KI-10N
 Length of anchor:
 e.g. 260
 Nominal diameter:
 d_{nom} (φ10)

Insulation cap

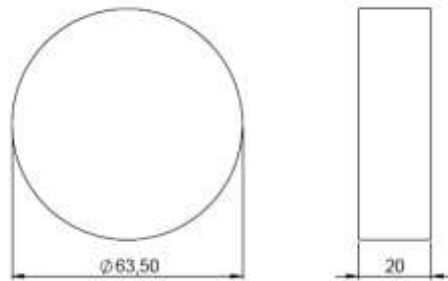


Table A1: KI-10N anchor types and dimensions [mm]

Anchore type	Anchor sleeve			Expansion pin	
	d _{nom} ± 0,1	L _a	h _{ef} = h _{nom}	d ± 0,1	L _{pn} ± 2
KI10-L _a N	10	120 - 340	60	4,9	120 - 340

Determination of maximum thickness of insulation material:

For surface assembly: $h_d = L_a - t_{tol} - h_{ef}$

For countersunk assembly: $h_d = L_a - t_{tol} - h_{ef} + 20 \text{ mm}$

KI-10N	Annex A2 of European Technical Assessment ETA-07/0221
<p style="text-align: center;">Product description</p> <p>Marking and dimensions of the anchor sleeve and expansion element of the KI-10N anchors</p>	

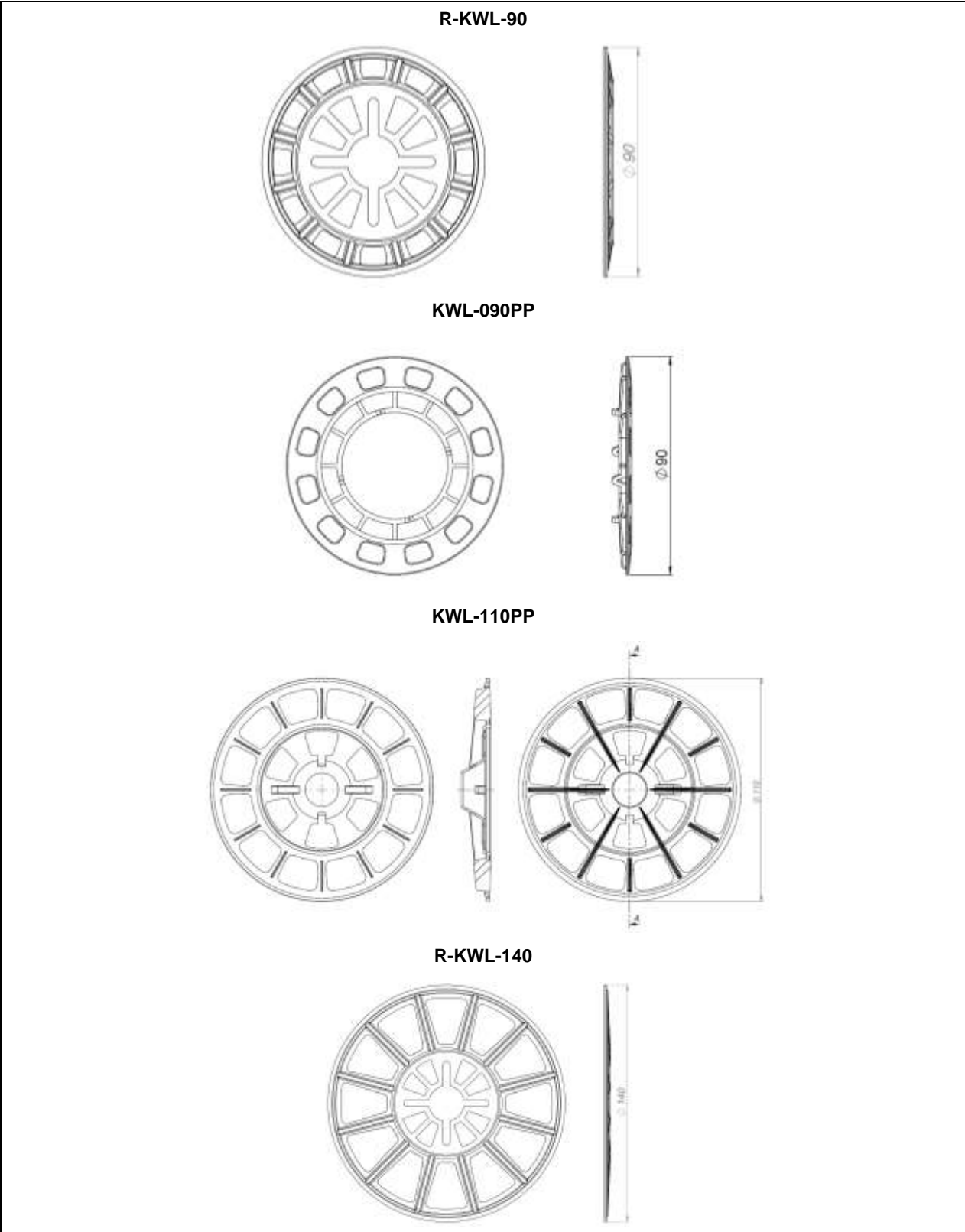
Table A2: Materials

Designation	Material
Anchor sleeve	Polypropylene, natural and white, virgin material
Expansion pin	Carbon steel ($f_{y,k} = 190 \text{ MPa}$, $f_{u,k} = 330 \text{ MPa}$) galvanised $\geq 5 \text{ }\mu\text{m}$ according to EN ISO 4042, with head coating of polyamide PA6, nature

KI-10N

Product description
Materials

Annex A3
of European
Technical Assessment
ETA-07/0221



KI-10N

Product description
 Additional plates R-KWL-90, KWL-090PP, KWL-110PP and R-KWL-140

Annex A4
 of European
 Technical Assessment
 ETA-07/0221

Table A3: Additional plate KWL-090, KWL-090PP, KWL-110PP and KWL-140

Plate type	Outer diameter [mm]	Material
R-KWL-90	90	Glass fibre reinforced polyamide PA6 GF 30, nature or polypropylene, nature
KWL-090PP	90	
KWL-110PP	110	
R-KWL-140	140	

KI-10N

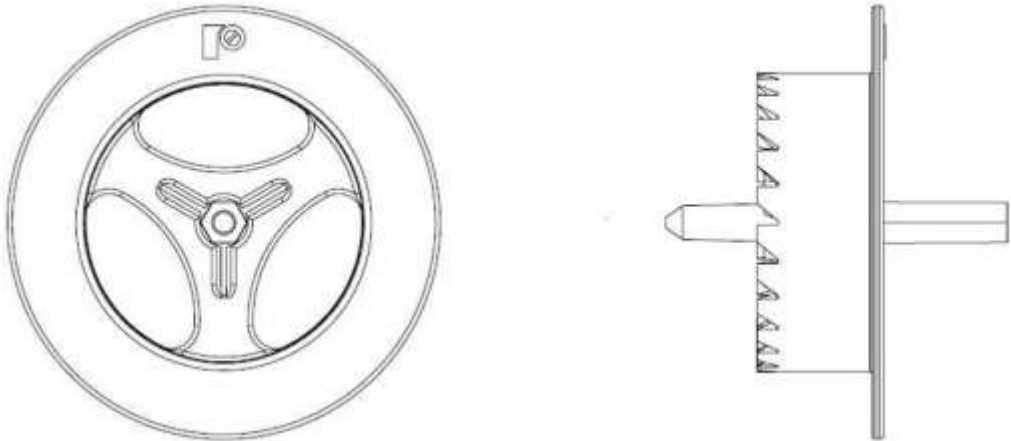
Product description

Additional plates R-KWL-90, KWL-090PP, KWL-110PP and R-KWL-140

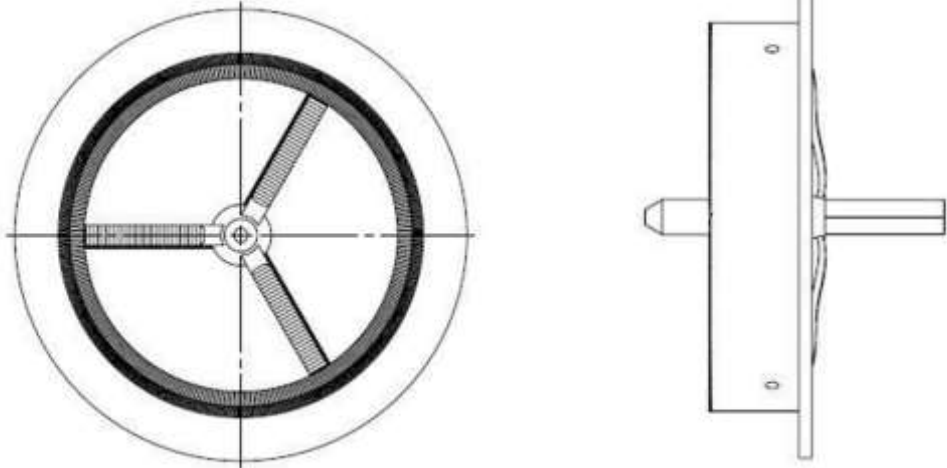
Annex A5

of European
Technical Assessment
ETA-07/0221

Cutter K-KFS for countersunk assembly



Cutter R-KFS for countersunk assembly



KI-10N

Product description

Cutters K-KFS and R-KFS for countersunk assembly used with KI-10N

Annex A6
of European
Technical Assessment
ETA-07/0221

Specification of intended use

Anchorage 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 (ETICS).

Base materials:

- Solid masonry (base material group B), according to Annex C1 and C3.
- Hollow or perforated masonry (base material group C), according to Annex C1 and C3.
- Lightweight aggregate concrete (base material group D), according to Annex C1 and C3.
- Autoclaved aerated concrete (base material group E), according to Annex C1 and C3.
- For other base materials of the base material groups 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.

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 $\gamma_M = 2,0$ and $\gamma_F = 1,5$, 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.
- Fasteners 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.

KI-10N	Annex B1 of European Technical Assessment ETA-07/0221
Intended use Specifications	

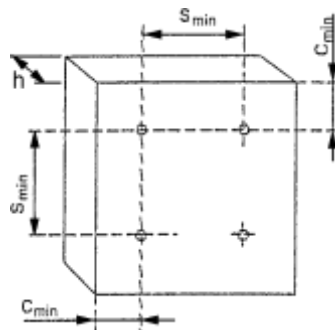
Table B1: Installation characteristics

Anchor type		KI-10N
Nominal diameter of drill bit	d_{nom} [mm]	10
Cutting diameter of drill bit	d_{cut} [mm]	$\leq 10,45$
Depth of drill hole	h_1 [mm]	≥ 70
Effective anchorage depth	h_{ef} [mm]	≥ 60

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

Anchor type		KI-10N
Minimum thickness of base material	h [mm]	100
Minimum spacing	s_{min} [mm]	100
Minimum edge distance	c_{min} [mm]	100

Diagram of spacing



KI-10N

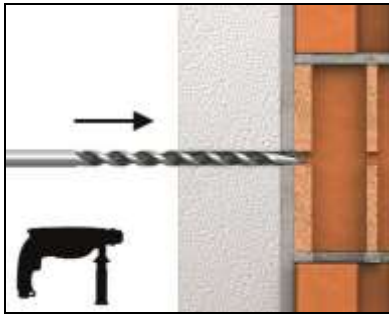
Intended use

Installation characteristics, minimum thickness of base material, spacing and minimum edge distance

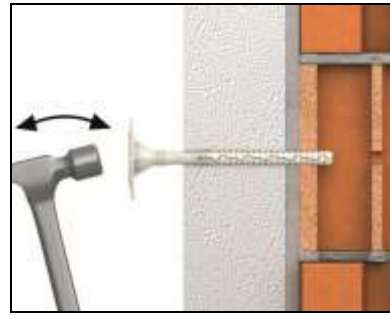
Annex B2

of European
Technical Assessment
ETA-07/0221

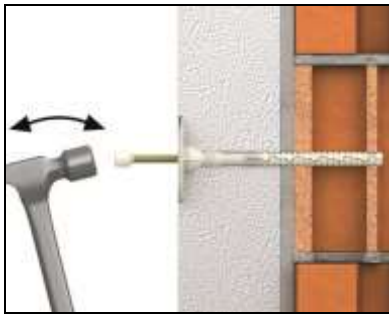
Installation instruction - surface assembly



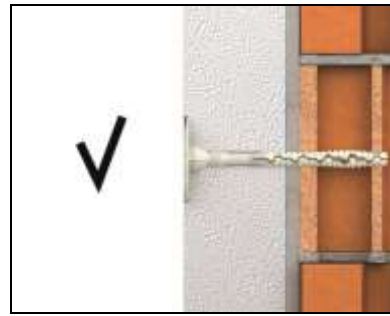
1. Drill hole using method acc. to Annex C1



2. Set-in sleeve manually



3. Set expansion element by hammer blow



4. Correctly installed anchor

KI-10N

Intended use
Installation instruction - surface assembly

Annex B3
of European
Technical Assessment
ETA-07/0221


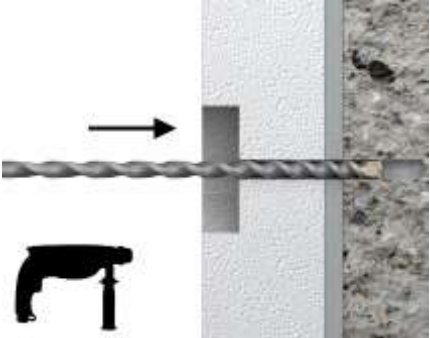
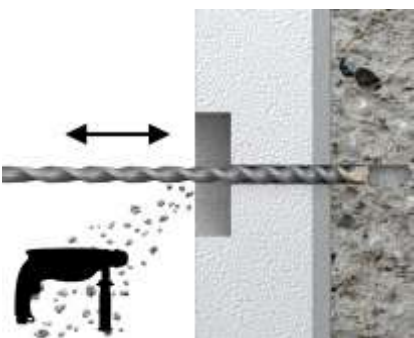

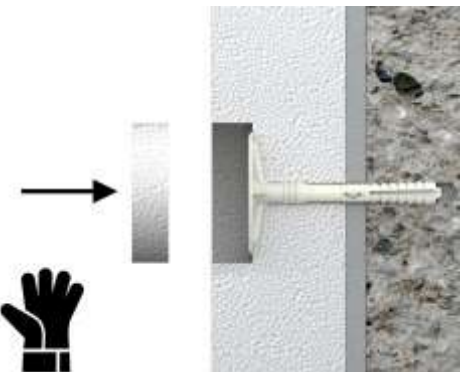
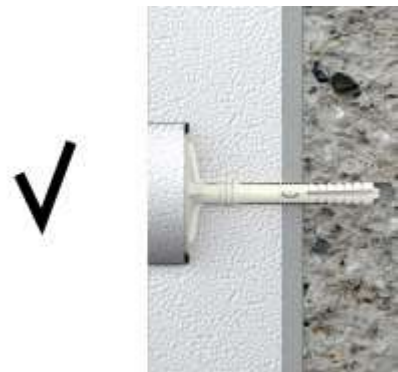
Installation instruction - countersunk assembly	
 <p>1. Make a hole for the plug using a cutter</p>	 <p>2. Drill hole perpendicular to substrate surface</p>
 <p>3. Clean the drill hole 3 times</p>	 <p>4. Set-in the anchor and make sure that the plate bottom is flush with the ETICS surface</p>
 <p>5. Use the cap to close the system</p>	 <p>6. Correctly installed anchor</p>
KI-10N	Annex B4 of European Technical Assessment ETA-07/0221
Intended use Installation instruction - countersunk assembly	

Table C1-1: Characteristic resistance to tension loads N_{Rk} in concrete and in masonry for single anchor





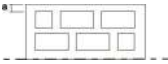
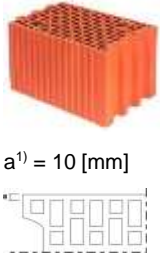
Base material group	Base material	Bulk density [kg/dm ³]	Compressive strength [N/mm ²]	Referring standard	Drill method	N_{Rk} [kN]
B	Clay brick 	≥ 1,70	≥ 20,0	EN 771-1	hammer	0,75
C	Calcium silicate hollow block (KSL-R 8 DF)  a ¹⁾ = 22 [mm]	≥ 1,30	≥ 15,0	EN 771-2	rotary	0,40
	Hollowed brique (Optibrick PV acc. to EN 771-1) a ¹⁾ = 10 [mm] 	≥ 0,60	≥ 7,5	EN 771-1	rotary	0,40
	Perforated ceramic brick (Hz B – 1.0 1NF 12-1)  a ¹⁾ = 13 [mm] 	≥ 0,95	≥ 12,0	EN 771-1	rotary	0,55
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						
KI-10N					Annex C1 of European Technical Assessment ETA-07/0221	
Performances Characteristic resistance						

Table C1-2: Characteristic resistance to tension loads N_{Rk} in concrete and in masonry for single anchor

Base material group	Base material	Bulk density [kg/dm ³]	Compressive strength [N/mm ²]	Referring standard	Drill method	N_{Rk} [kN]
C	Vertical perforated porosited block (Porotherm 25 P+W)  $a^{(1)} = 10$ [mm]	$\geq 0,80$	$\geq 15,0$	EN 771-1	rotary	0,60
D	Lightweight concrete block	$\geq 1,56$	$\geq 20,0$	EN 771-3	rotary	0,65
E	Autoclaved aerated concrete block (AAC 2)	$\geq 0,35$	$\geq 2,0$	EN 771-4	rotary	0,30
	Autoclaved aerated concrete block (AAC 5)	$\geq 0,60$	$\geq 5,0$	EN 771-4	rotary	0,90
Partial safety factor for anchor resistance, $\gamma_M^{(2)}$		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						

KI-10N

Performances
Characteristic resistance

Annex C1
of European
Technical Assessment
ETA-07/0221

Table C2-1: Point thermal transmittance according to EOTA Technical Report TR 025





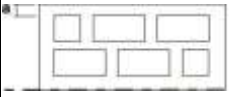
Anchor type	Insulation thickness H_D [mm]	Point thermal transmittance χ [W/K]
KI-10N	45 - 280	0,003

Table C2-2: Plate stiffness according to EOTA Technical Report TR 026

Anchor type	Diameter of the anchor plate d_{plate} [mm]	Load resistance of the anchor plate $N_{u,m}$ [kN]	Plate stiffness $N_{0,m}$ [kN/mm]
KI-10N	60	1,23	0,5


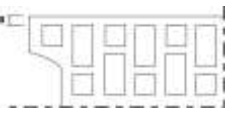
KI-10N	Annex C2 of European Technical Assessment ETA-07/0221
Performances Point thermal transmittance and plate stiffness	

Table C3-1: Displacement behavior

Base material	Bulk density [kg/dm ³]	Compressive strength [N/mm ²]	$\frac{N_{Rk}}{3}$, [kN]	$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]
Clay brick 	≥ 1,70	≥ 20,0	0,25	0,91
Calcium silicate hollow block (KSL-R 8 DF)  a ¹⁾ = 22 [mm]	≥ 1,30	≥ 15,0	0,13	0,36
Hollowed brique (Optibrick PV acc. to EN 771-1) a ¹⁾ = 10 [mm] 	≥ 0,60	≥ 7,5	0,13	0,54
Perforated ceramic brick (Hlz B – 1.0 1NF 12-1)  a ¹⁾ = 13 [mm] 	0,95	≥ 12,0	0,18	0,63
(1) minimum values "a", for elements with lower value of "a" the load tests on the construction site are required				

KI-10N**Performances**
Displacements**Annex C3**
of European
Technical Assessment
ETA-07/0221

Table C3-2: Displacement behavior

Base material	Bulk density [kg/dm ³]	Compressive strength [N/mm ²]	$\frac{N_{Rk}}{3}$, [kN]	$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]
Vertical perforated porosited block (Porotherm 25 P+W)  a ¹⁾ = 10 [mm] 	≥ 0,80	≥ 15,0	0,20	0,79
Lightweight concrete block	≥ 1,56	≥ 20,0	0,22	0,80
Autoclaved aerated concrete block (AAC 2)	≥ 0,35	≥ 2,0	0,10	0,55
Autoclaved aerated concrete block (AAC 5)	≥ 0,60	≥ 5,0	0,30	0,84
(1) minimum values "a", for elements with lower value of "a" the load tests on the construction site are required				

KI-10N

Performances
 Displacements

Annex C3
 of European
 Technical Assessment
 ETA-07/0221