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

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European Technical Assessment

ETA-07/0221 of 18/01/2018

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	KI-10N and KI-10NS
Product family to which the construction product belongs	Nailed-in and screwed-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(s)	Manufacturing Plant No. 3
This European Technical Assessment contains	20 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"*
This version replaces	ETA-07/0221 issued on 22/12/2014

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Specific Part

1 Technical description of the product

The KI-10N nailed-in plastic anchor consists of anchor sleeve with a plate made of polypropylene and an accompanying 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-10NS screwed-in plastic anchor consists of anchor sleeve with a plate made of polypropylene and an accompanying specific steel nail with threaded end as an expansion pin. The plastic anchor sleeve is expanded by screwing a nail, which press the sleeve against the wall of the drilled hole.

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

The illustration 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 spacings	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	Annex C2

3.2 Methods used for the assessment

The assessment of the product for the declared intended use has been made in accordance with the 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 Regulation (EU) No 305/2011) applies.

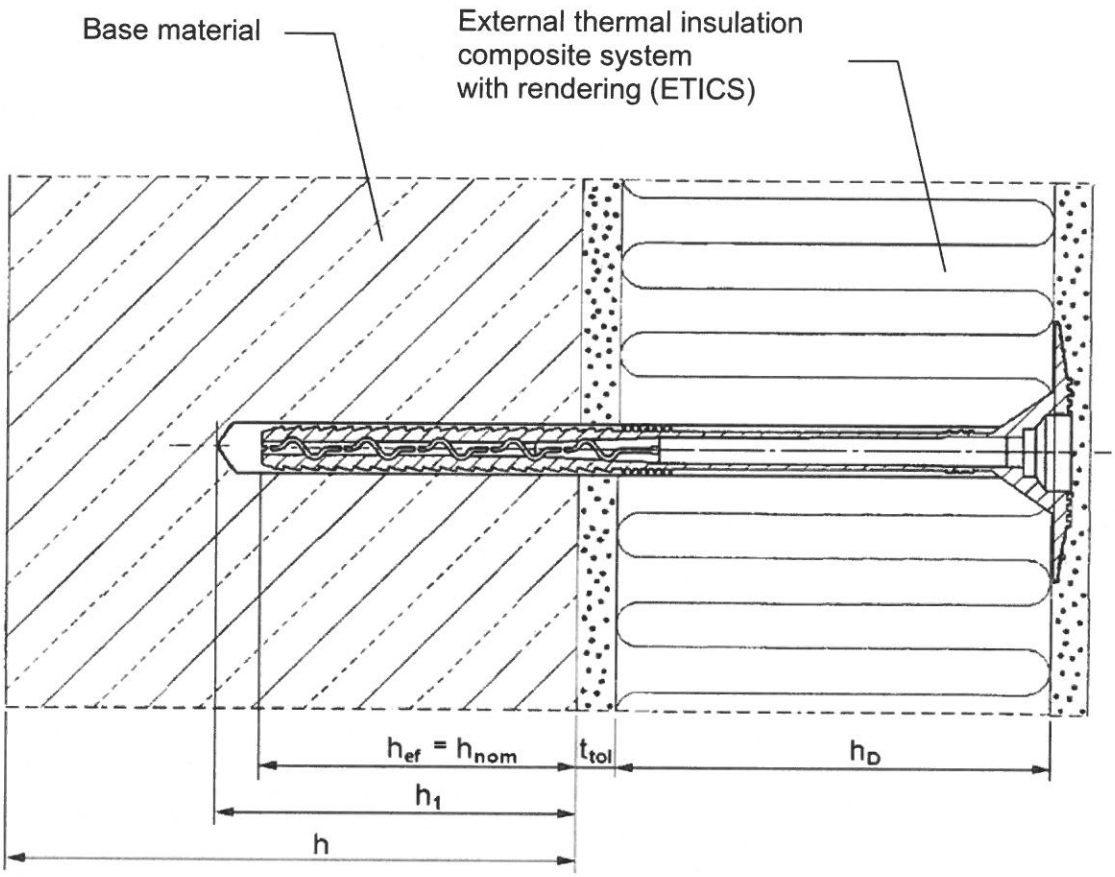
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document (EAD)

Technical details necessary for the implementation of the AVCP system are laid down in the control plan 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 18/01/2018 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB



Intended Use

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

Legend

h_{ef} = effective anchorage depth

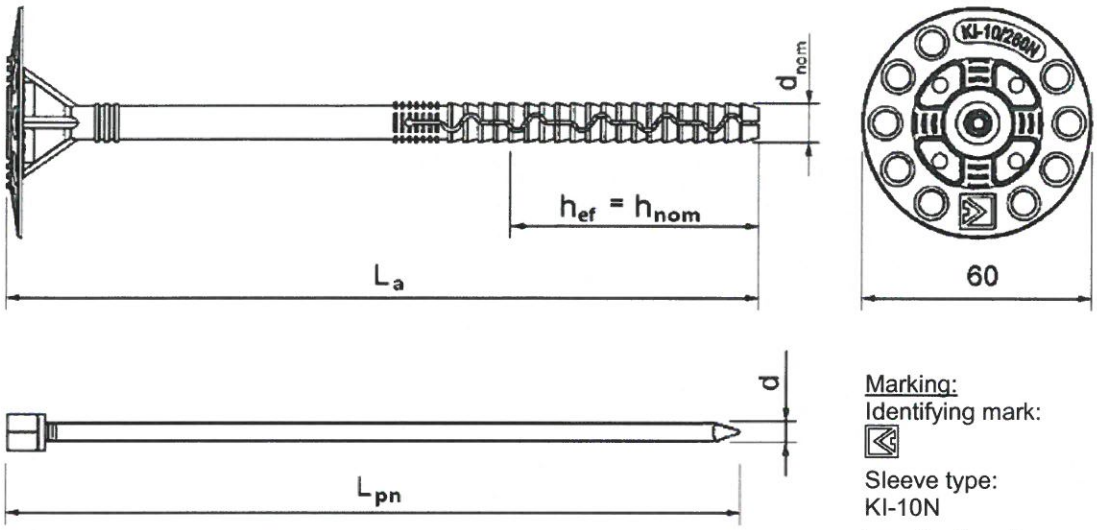
h_1 = depth of drill hole in base material

h = thickness of base material

h_D = thickness of insulation material

t_{tol} = thickness of equalizing and/or non-load-bearing layer

KI-10N and KI-10NS	**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

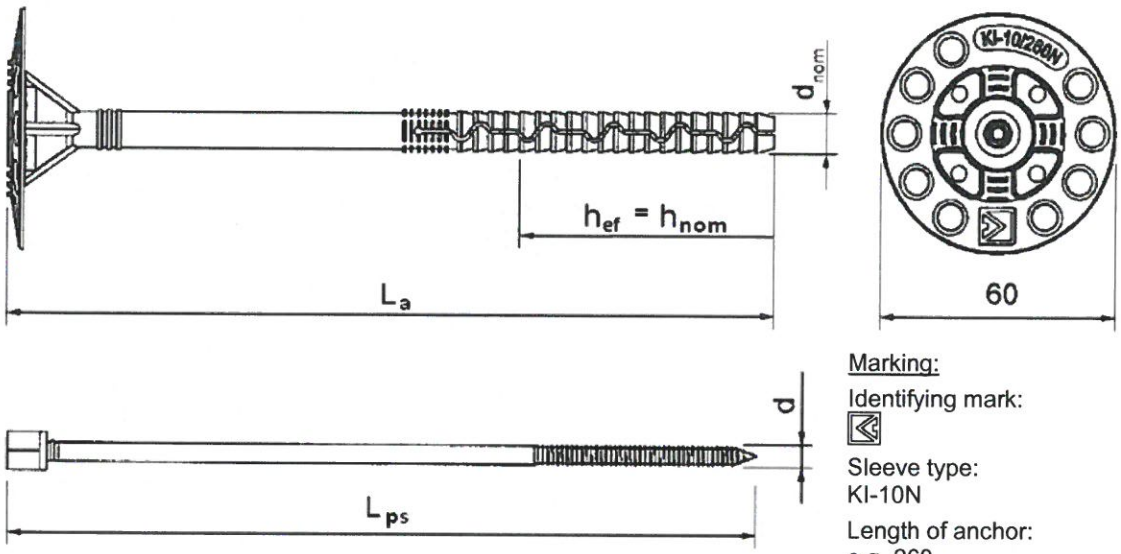
Nominal diameter:
d_{nom} (ϕ10)

Table 1: KI-10N anchor types and dimensions [mm]

Anchor type	Anchor sleeve			Expansion pin	
	$d_{nom} \pm 0,1$	L_a	$h_{ef} = h_{nom}$	$d \pm 0,1$	$L_n \pm 2$
KI10-120N	10	120	60	4,9	120
KI10-140N	10	140	60	4,9	140
KI10-160N	10	160	60	4,9	160
KI10-180N	10	180	60	4,9	180
KI10-200N	10	200	60	4,9	200
KI10-220N	10	220	60	4,9	220
KI10-240N	10	240	60	4,9	240
KI10-260N	10	260	60	4,9	260
KI10-300N	10	300	60	4,9	300
KI10-340N	10	340	60	4,9	340

Determination of maximum thickness of insulation material: $h_D = L_a - t_{tol} - h_{ef}$

KI-10N and KI-10NS	**Annex A2**
Product description Marking and dimensions of the anchor sleeve and expansion element of the KI-10N anchors	of European Technical Assessment ETA-07/0221



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

Table 2: KI-10NS anchor types and dimensions [mm]

Anchor type	Anchor sleeve			Expansion pin	
	$d_{nom} \pm 0,1$	L_a	$h_{ef} = h_{nom}$	$d \pm 0,1$	$L_s \pm 2$
KI10-140NS	10	140	60 (40)[1]	5,1	140
KI10-160NS	10	160	60 (40)[1]	5,1	160
KI10-180NS	10	180	60 (40)[1]	5,1	180
KI10-200NS	10	200	60 (40)[1]	5,1	200
KI10-220NS	10	220	60 (40)[1]	5,1	220
KI10-240NS	10	240	60 (40)[1]	5,1	240
KI10-260NS	10	260	60 (40)[1]	5,1	260
KI10-300NS	10	300	60 (40)[1]	5,1	300
KI10-340NS	10	340	60 (40)[1]	5,1	340

[1] for KI-10NS anchors in the base material category A

Determination of maximum thickness of insulation material: $h_D = L_a - t_{tol} - h_{ef}$

KI-10N and KI-10NS	**Annex A3** of European Technical Assessment ETA-07/0221
Product description Marking and dimensions of the anchor sleeve and expansion element of the KI-10NS anchors	

Table A3: Materials

Designation	Material
Anchor sleeve	Virgin plastic: Polypropylene, nature
Expansion pin	Carbon steel ($f_{y,k}$ = 190 MPa, $f_{u,k}$ = 330 MPa) galvanised ≥ 5 µm according to EN ISO 4042, with head coating of polyamide PA6, nature

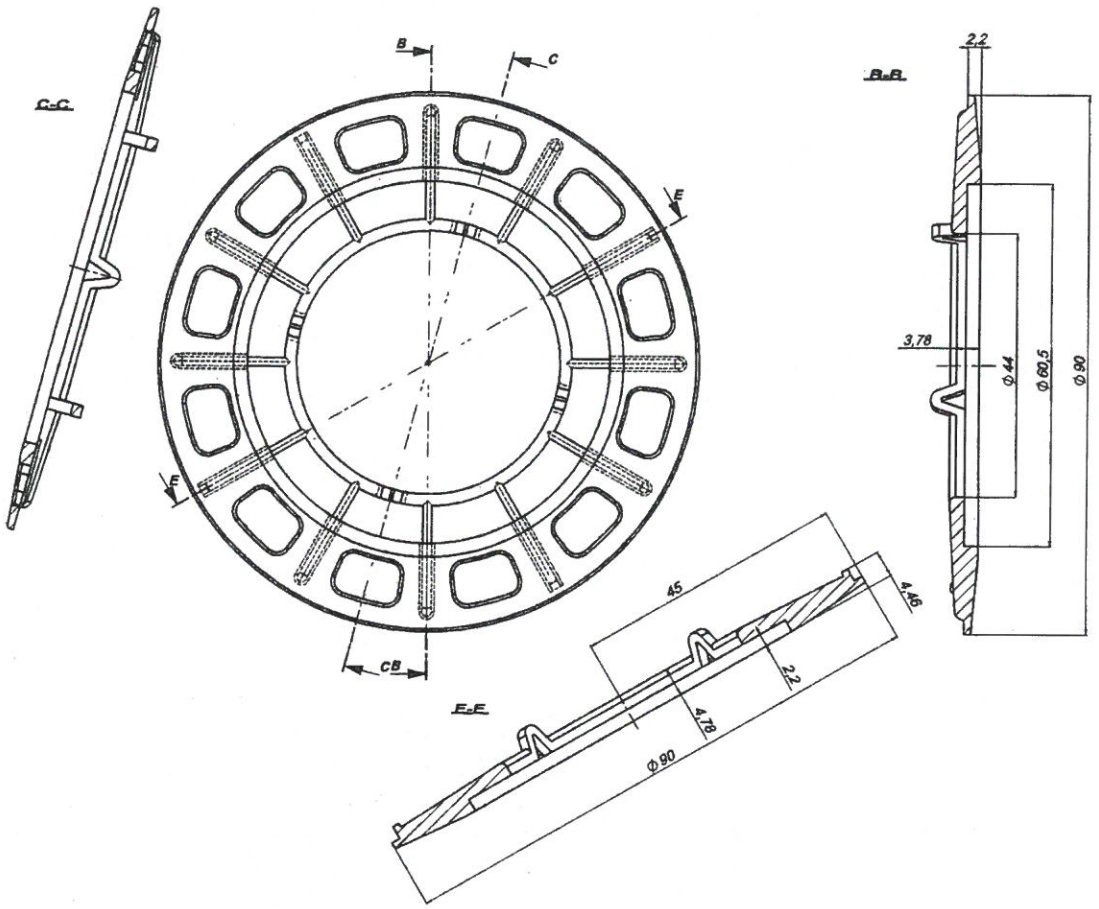


Table A4: Additional plate KWL-90

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

KI-10N and KI-10NS	**Annex A5** of European Technical Assessment ETA-07/0221
Product description Additional plate KWL-90	

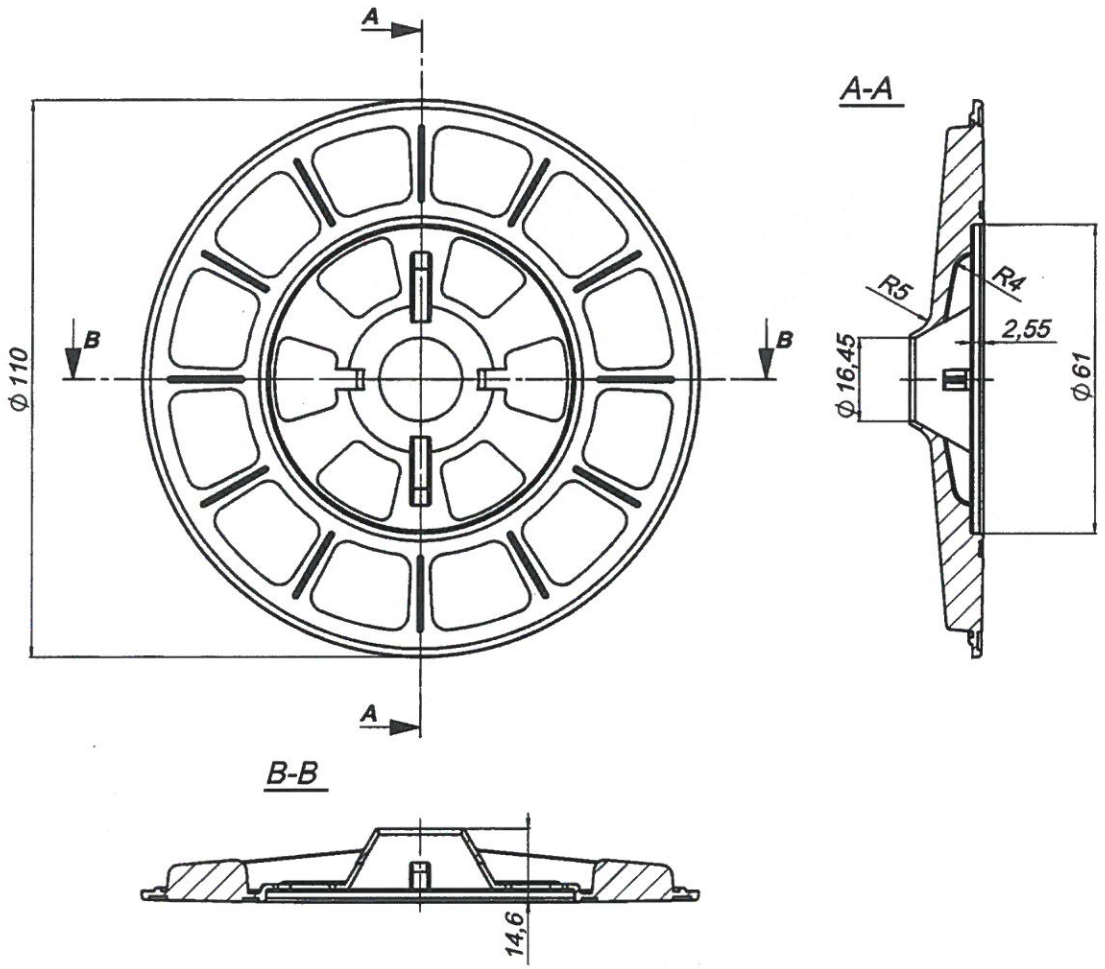


Table A5: Additional plate KWL-110

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

KI-10N and KI-10NS	**Annex A6** of European Technical Assessment ETA-07/0221
Product description Additional plate KWL-110	

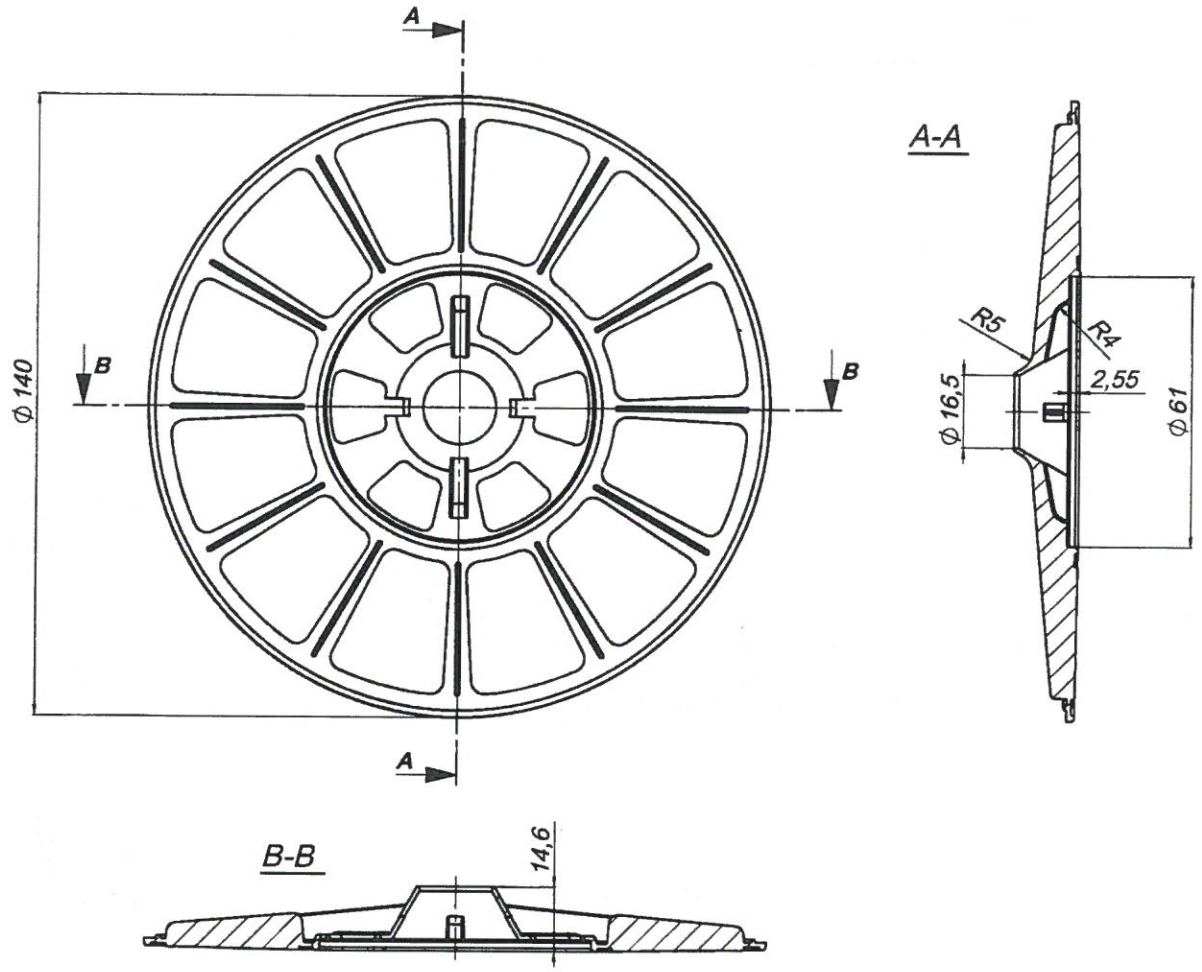


Table A6: Additional plate KWL-140

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

KI-10N and KI-10NS	**Annex A7** of European Technical Assessment ETA-07/0221
Product description Additional plate KWL-140	

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 (ETICS).

Base materials:

- Normal weight concrete (use category A), according to Annex C1.
- Solid masonry (use category B), according to Annex C1.
- Hollow or perforated masonry (use category C), according to Annex C1.
- Lightweight aggregate concrete (use category D), according to Annex C1.
- Autoclaved aerated concrete (use category E), according to Annex C1.
- 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.

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.
- Fasteners are only to be used for multiple fixings of thermal insulation composite system (ETICS).

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 by the mortar shall not exceed 6 weeks.

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

Table B1: Installation characteristics

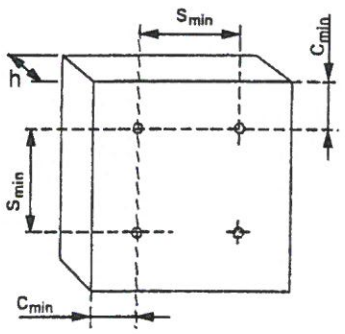
Anchor type		KI-10N and KI-10NS
Nominal diameter of drill bit	d_{nom} [mm]	10
Cutting diameter of drill bit	d_{cut} [mm]	≤ 10,45
Depth of drill hole	h_1 [mm]	≥ (70)[1], (50)[2]
Effective anchorage depth	h_{ef} [mm]	≥ (60)[1], (40)[2]

[1] for KI-10N and KI-10NS anchors in the base material category B, C, D, E
[2] for KI-10NS anchors in the base material category A

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

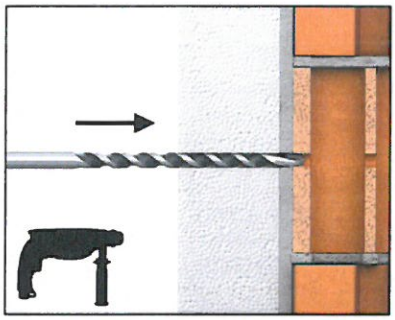
Anchor type		KI-10N and KI-10NS
Minimum thickness of base material	h [mm]	100
Minimum spacing	s_{min} [mm]	100
Minimum edge distance	c_{min} [mm]	100

Diagram of spacing

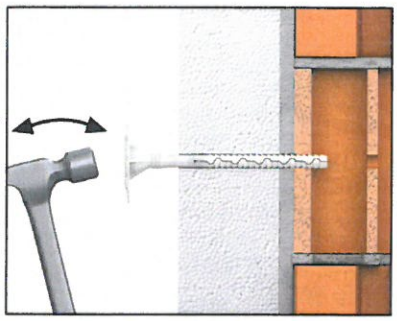


KI-10N and KI-10NS	Annex B2
Intended use Installation characteristics, minimum thickness of base material, spacing and minimum edge distance	of European Technical Assessment ETA-07/0221

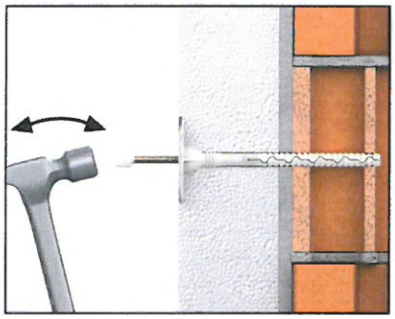
Installation instruction



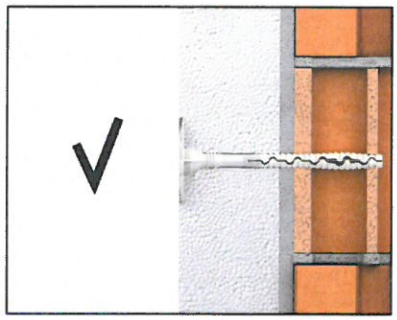
1. Drill hole using method acc. to Annex C1



2. Set-in sleeve manually



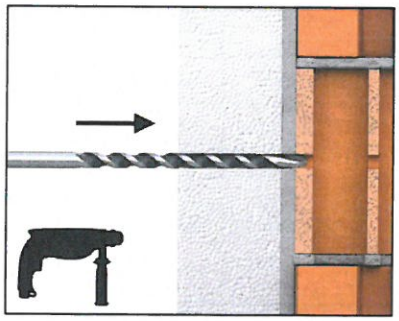
3. Set expansion element by hammer blow



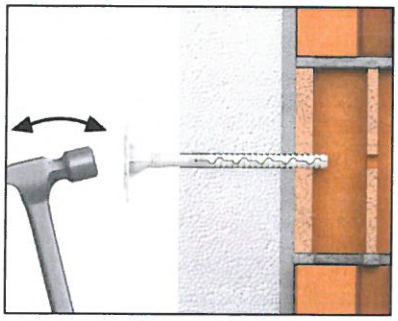
4. Correctly installed anchor

KI-10N and KI-10NS	**Annex B3** of European Technical Assessment ETA-07/0221
Intended use Installation instruction of the KI-10N anchor	

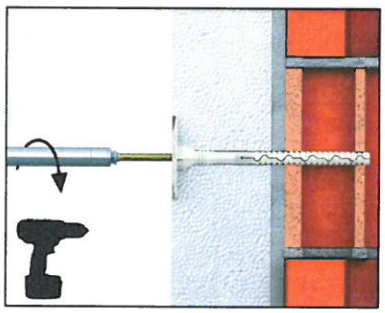
Installation instruction



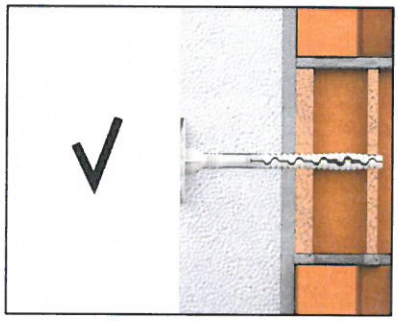
1. Drill hole using method acc. to Annex C1



2. Set-in sleeve manually



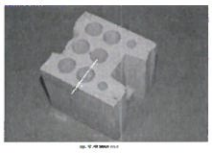
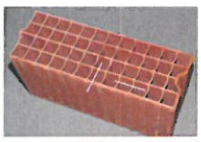
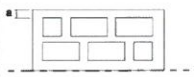
3. Set expansion element by screwing



4. Correctly installed anchor

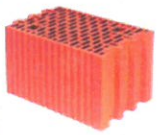
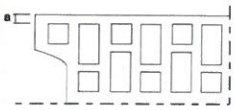
KI-10N and KI-10NS	**Annex B4** of European Technical Assessment ETA-07/0221
Intended use Installation instruction of the KI-10NS anchor	

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

Category	Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	Referring standard	Drill method	N_{Rk} [kN]	
						KI-10N	KI-10NS
A	Concrete C20/25	≥ 2,25	≥ 30,0	EN 206	hammer	–	0,50
	Concrete C50/60	≥ 2,30	≥ 65,0	EN 206	hammer	–	0,60
B	Clay brick 	≥ 1,70	≥ 20,0	EN 771-1	hammer	0,75	0,90
C	Calcium silicate hollow block (KSL-R 8 DF)  a[1)] = 22 mm	≥ 1,30	≥ 15,0	EN 771-2	rotary drilling only	0,50	0,75
	Hollowed brique (Optibrick PV acc. to EN 771-1) a[1)] = 10 [mm] 	≥ 0,60	≥ 7,5	EN 771-1	rotary drilling only	0,40	0,60
	Perforated ceramic brick (Hlz B – 1.0 1NF 12-1)  a[1)] = 13 [mm] 	≥ 0,95	≥ 12,0	EN 771-1	rotary drilling only	0,60	0,90

KI-10N and KI-10NS	**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

Category	Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	Referring standard	Drill method	N_{Rk} [kN]	
						KI-10N	KI-10NS
C	Vertical perforated porosited block (Porotherm 25 P+W)  $a^{1)}$ = 10 [mm] 	≥ 0,80	≥ 15,0	EN 771-1	rotary drilling only	0,40	0,50
D	Lightweight concrete block	≥ 1,56	≥ 20,0	EN 771-3	rotary drilling only	0,60	0,60
E	Autoclaved aerated concrete block (AAC 2)	≥ 0,35	≥ 2,0	EN 771-4	rotary drilling only	0,30	0,60
	Autoclaved aerated concrete block (AAC 5)	≥ 0,60	≥ 5,0	EN 771-4	rotary drilling only	0,90	0,75
Partial safety factor γ_M [3)]		2,0					

[1)] Minimum values "a". For elements with lower value of "a" the load tests on the construction are required
[2)] Valid in absence of national regulations

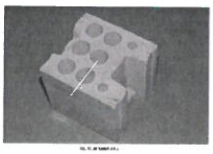
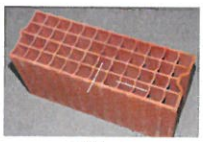
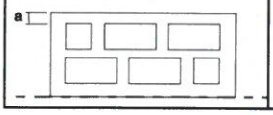
Table C2: Point thermal transmittance according to EOTA Technical Report TR 025

Anchor type	Insulation thickness H_D [mm]	Point thermal transmittance χ [W/K]
KI-10N and KI-10NS	45-195	0,003

Table C3: Plate stiffness according to EOTA Technical Report TR 026

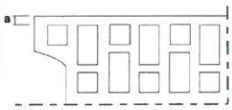
Anchor type	Diameter of the anchor plate d_{plate} [mm]	Load resistance of the anchor plate $N_{u,m}$ [kN]	Plate stiffness $N_{0,m}$ [kN/mm]
KI-10N and KI-10NS	60	1,23	0,5

Table C4-1: Displacement behavior

Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	$\frac{N_{Rk}}{3}$, [kN]		$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]	
			KI-10N	KI-10NS	KI-10N	KI-10NS
Concrete C20/25	≥ 2,25	≥ 30,0	–	0,17	–	0,32
Concrete C50/60	≥ 2,30	≥ 65,0	–	0,20	–	0,37
Clay brick 	≥ 1,70	≥ 20,0	0,25	0,30	0,91	0,33
Calcium silicate hollow block (KSL-R 8 DF)  a[1)] = 22 mm	≥ 1,30	≥ 15,0	0,17	0,25	0,58	0,76
Hollowed brique (Optibrick PV acc. to EN 771-1) a[1)] = 10 [mm] 	≥ 0,60	≥ 7,5	0,13	0,20	0,36	0,40
Perforated ceramic brick (Hlz B – 1.0 1NF 12-1)  a[1)] = 13 [mm] 	0,95	≥ 12,0	0,20	0,30	0,79	0,44

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

Table C4-2: Displacement behavior

Base material	Bulk density [kg/dm³]	Compressive strength [N/mm²]	$\frac{N_{Rk}}{3}$, [kN]		$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]	
			KI-10N	KI-10NS	KI-10N	KI-10NS
Vertical perforated porosited block (Porotherm 25 P+W)  a[1)] = 10 [mm] 	≥ 0,80	≥ 15,0	0,13	0,17	0,54	0,25
Lightweight concrete block	≥ 1,56	≥ 20,0	0,20	0,20	0,74	0,30
Autoclaved aerated concrete block (AAC 2)	≥ 0,35	≥ 2,0	0,10	0,20	0,55	0,25
Autoclaved aerated concrete block (AAC 5)	≥ 0,60	≥ 5,0	0,30	0,25	0,84	0,31

[1)] Minimum values "a". For elements with lower value of "a" the load tests on the construction are required