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European Technical Assessment

**ETA-07/0221
of 22/12/2014**

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

Guideline for European Technical Approval of ETAG 014, "*Plastic anchors for fixing of external thermal insulation composite systems with rendering*", Edition February 2011 used as European Assessment Document (EAD)

This version replaces

ETA-07/0221 issued on 26/06/2013

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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 EAD

The performances given in Annex C 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 Mechanical resistance and stability (BWR 1)

Requirements with respect to the mechanical resistance and stability of non load bearing parts of the works are not included in this Basic Works Requirements but are under the Basic Works Requirement safety in use (BWR 4).

3.1.2 Hygiene, health and the environment (BWR 3)

In addition to the clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

3.1.3 Safety in use (BWR 4)

| Essential characteristic | Performance |
|-----------------------------|-------------|
| Characteristic resistance | Annex C1 |
| Edge distances and spacings | Annex B2 |
| Point thermal transmittance | Annex C2 |
| Plate stiffness | Annex C2 |
| Displacements | Annex C3 |

3.1.4 Sustainable use of natural resources (BWR 7)

No performance determined (NPD).

3.2 Methods used for the assessment

The assessment of fitness of the anchor for the declared intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirement 4 has been made in accordance with the ETAG 014 "Plastic anchors for fixing of external thermal insulation composite systems with rendering", Edition February 2011.

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

According to the Decision 97/463/EC of the European Commission of 27 June 1997 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 |
|--|--|----------------|--------|
| Plastic anchor for use in concrete and masonry | For use in systems, such as façade systems, for fixing or supporting elements which contribute to the stability of the systems | – | 2+ |

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

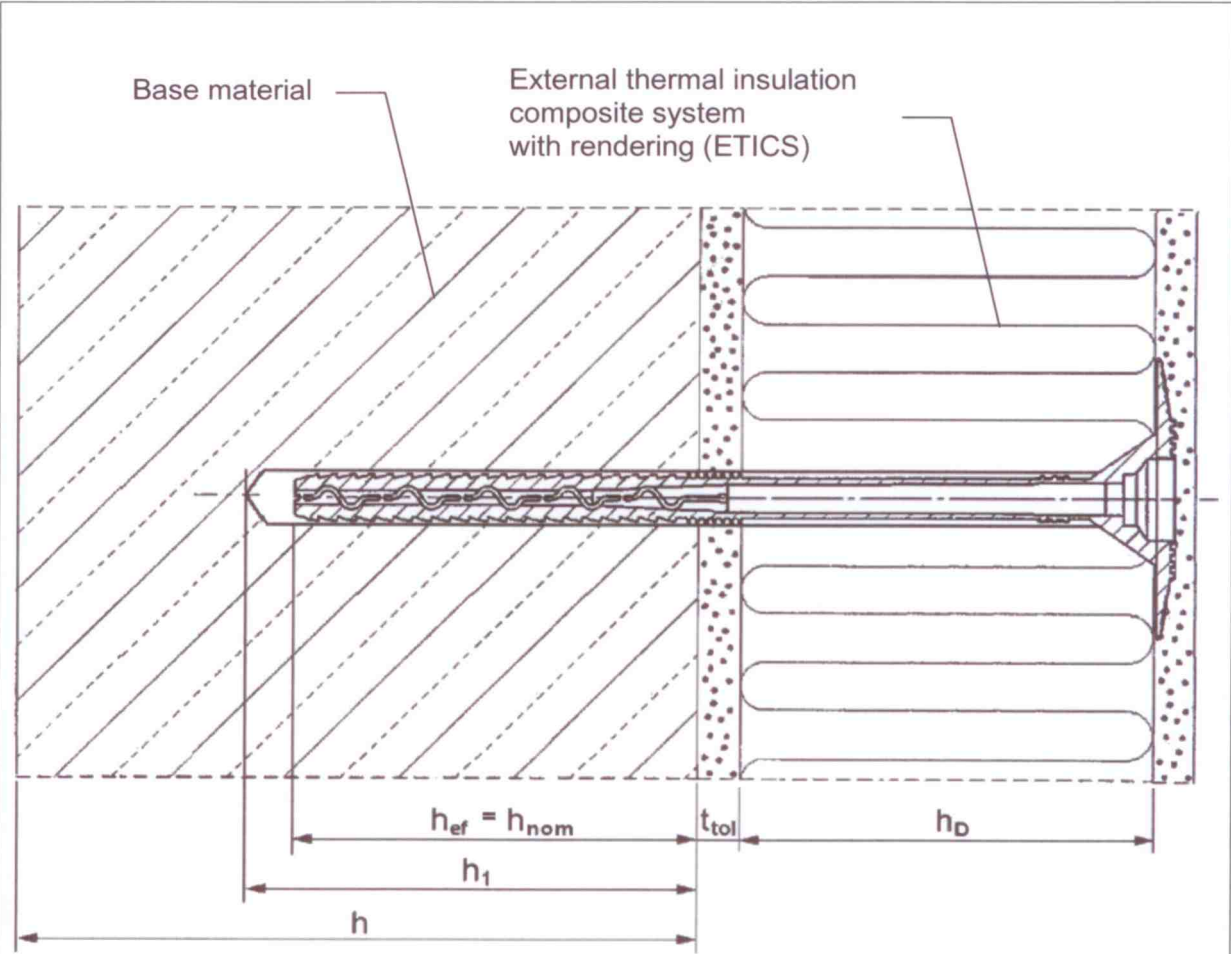
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

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 22/12/2014 by Instytut Techniki Budowlanej

Michał Wójtowicz
Head 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 | |

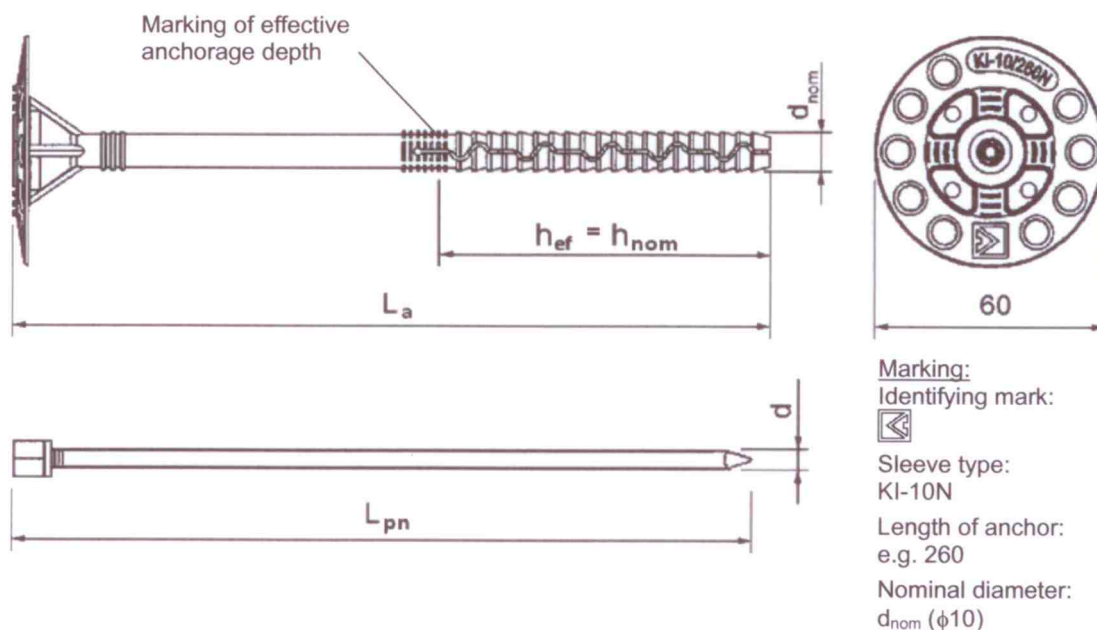


Table 1: KI-10N anchor types and dimensions [mm]

| Anchor type | Anchor sleeve | | | Expansion pin | |
|-------------|-------------------|-------|--------------------|---------------|----------------|
| | $d_{nom} \pm 0,1$ | L_a | $h_{ef} = h_{nom}$ | $d \pm 0,1$ | $L_{pn} \pm 2$ |
| 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 of European Technical Assessment ETA-07/0221 |
| Product description Marking and dimensions of the anchor sleeve and expansion element of the KI-10N anchors | |

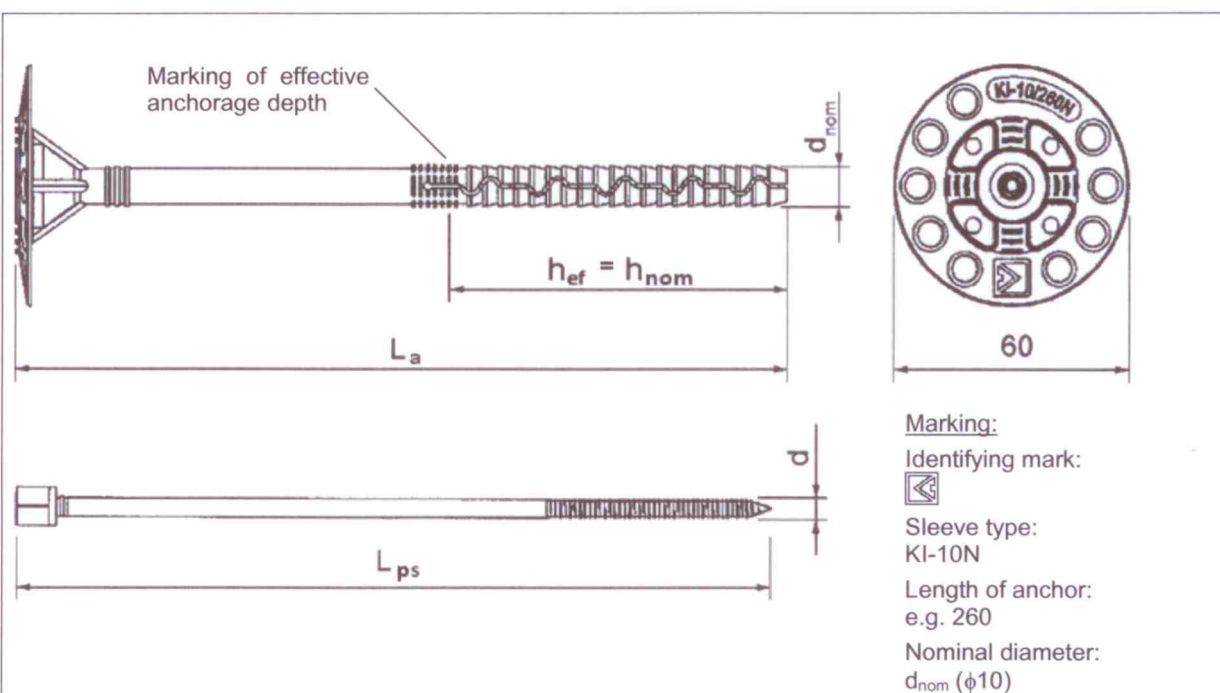


Table 2: KI-10NS anchor types and dimensions [mm]

| Anchor type | Anchor sleeve | | | Expansion pin | |
|-------------|-------------------|-------|----------------------|---------------|----------------|
| | $d_{nom} \pm 0,1$ | L_a | $h_{ef} = h_{nom}$ | $d \pm 0,1$ | $L_{ps} \pm 2$ |
| 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 | Polypropylene TIPPLEN K 499, nature |
| 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 and KI-10NS

Product description
Materials

Annex A4
of European
Technical Assessment
ETA-07/0221

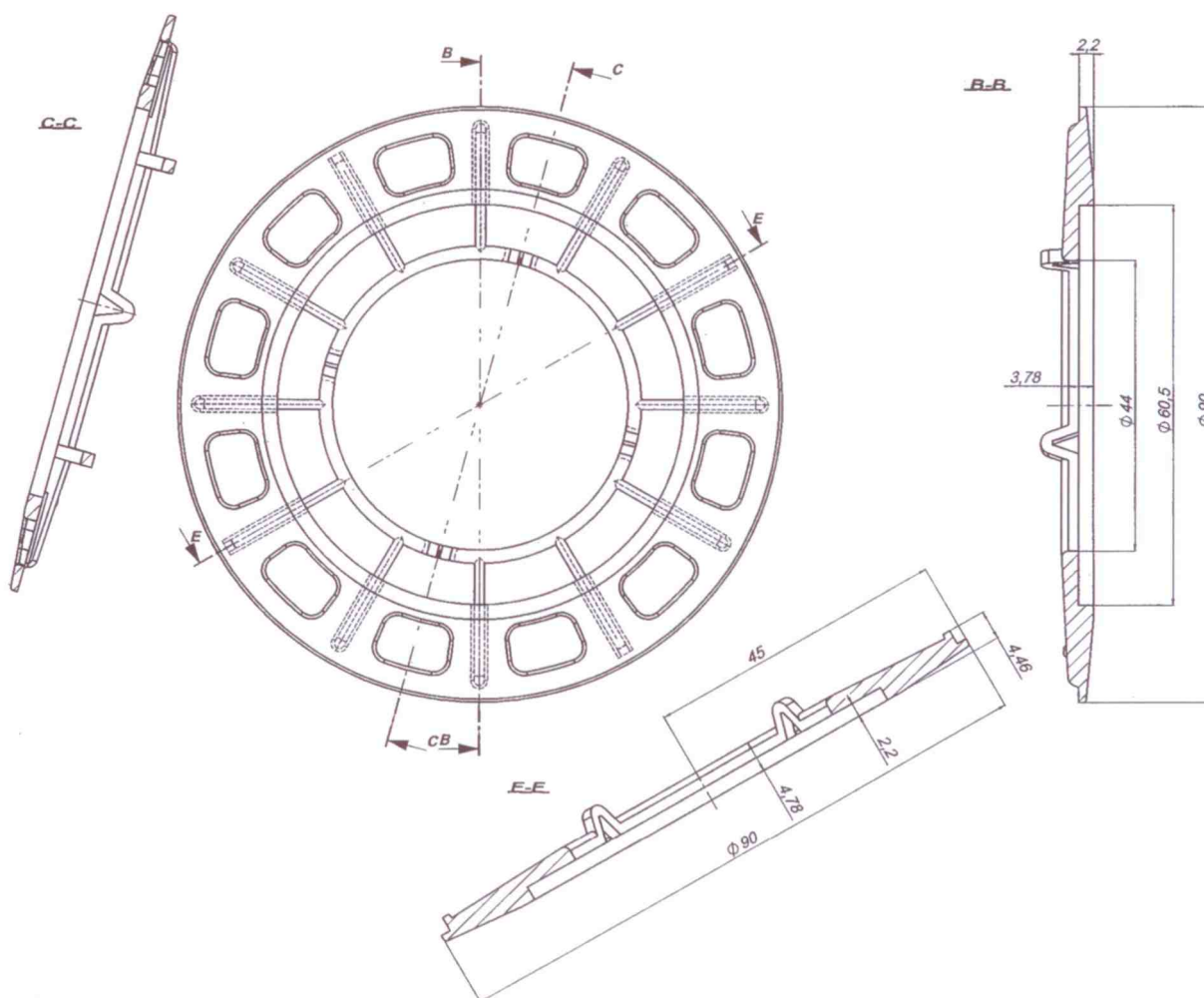


Table A4: Additional plate KWL-90

| 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

Product description
Additional plate KWL-90

Annex A5
of European
Technical Assessment
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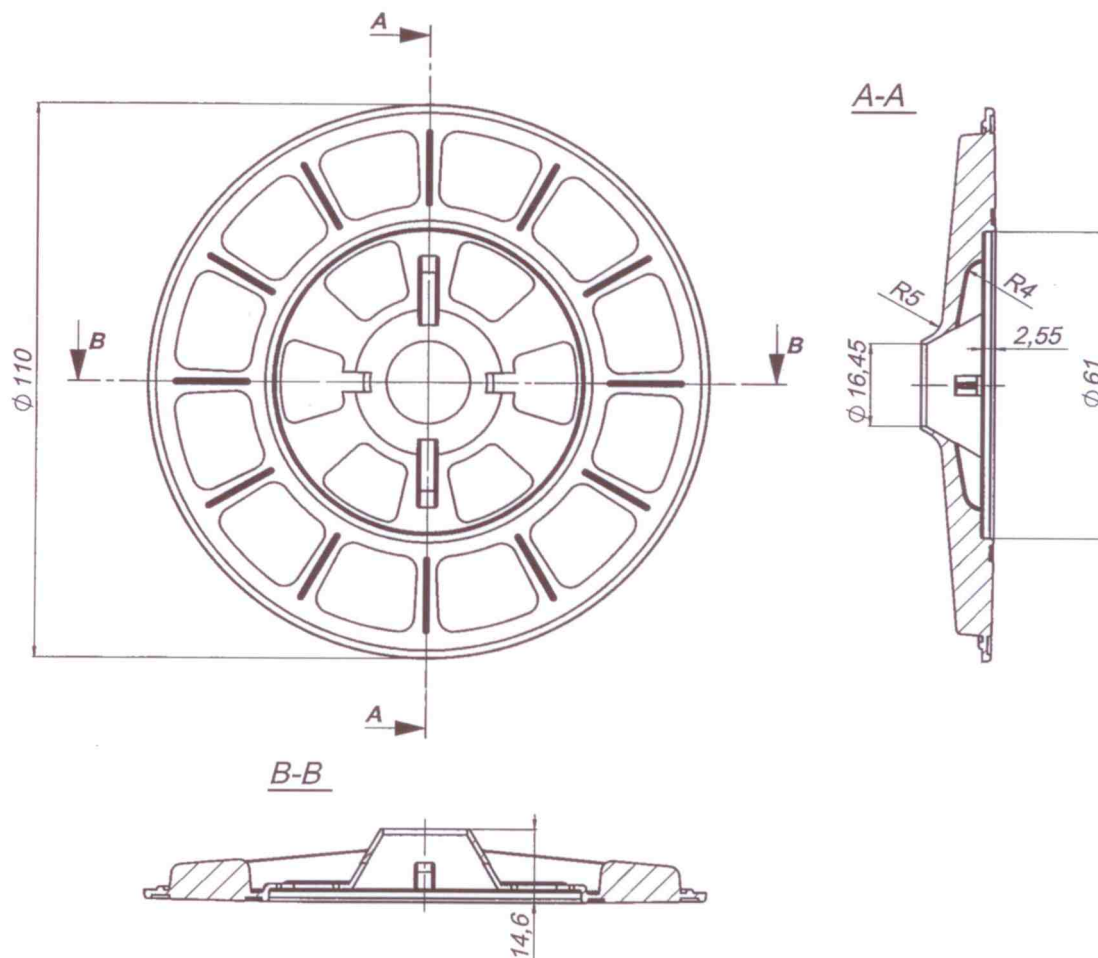


Table A5: Additional plate KWL-110

| 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

Product description
Additional plate KWL-110

Annex A6
of European
Technical Assessment
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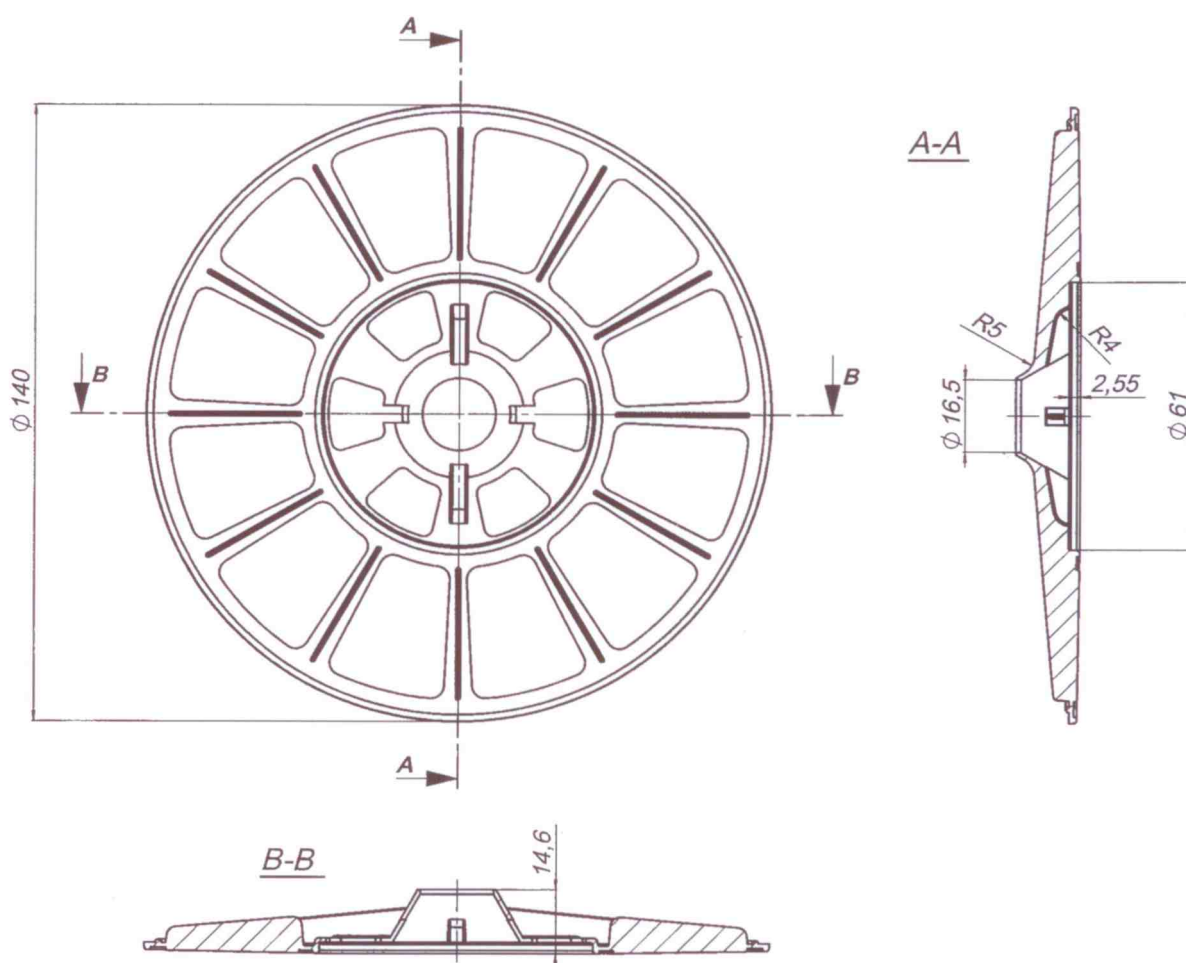


Table A6: Additional plate KWL-140

| 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

Product description
Additional plate KWL-140

Annex A7
of European
Technical Assessment
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Specification of intended use

Anchorage subject to:

- Wind suction loads.

Note: Dead loads have to be transmitted by the adhesion of the relevant external thermal insulation composite system.

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 ETAG 014, edition February 2011, Annex D.

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 in accordance with the ETAG 014, edition February 2011, under the responsibility of an engineer experienced in anchorages and masonry work.
- Verifiable calculation notes and drawings are prepared taking into account of the loads to be anchored. The position of the anchor is indicated on the design drawings.
- Fasteners are only to be used for multiple fixings for non-structural application, according to ETAG 014, edition February 2011.

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 of European Technical Assessment ETA-07/0221 |
| Intended use Specifications | |

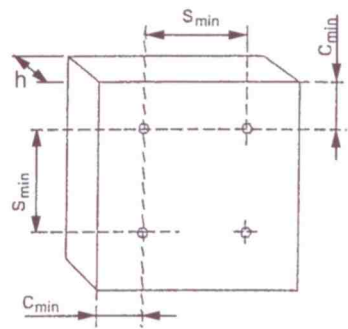
Table B1: Installation characteristics

| | | |
|---|--------------------|-----------------------------|
| Anchor type | KI-10N and KI-10NS | |
| Nominal diameter of drill bit | d_o [mm] | 10 |
| Cutting diameter of drill bit | d_{cut} [mm] | $\leq 10,45$ |
| Depth of drill hole | h_1 [mm] | $\geq (70)^{1)}, (50)^{2)}$ |
| Effective anchorage depth | h_{ef} [mm] | $\geq (60)^{1)}, (40)^{2)}$ |
| 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

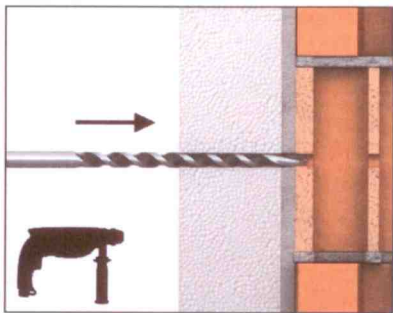


KI-10N and KI-10NS

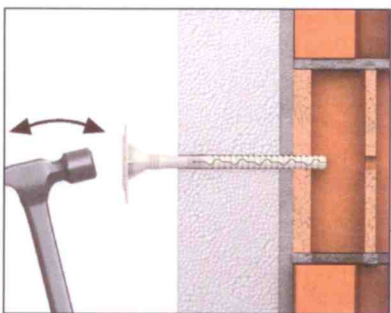
Intended use
Installation characteristics, minimum thickness
of base material, spacing and minimum edge distance

Annex B2
of European
Technical Assessment
ETA-07/0221

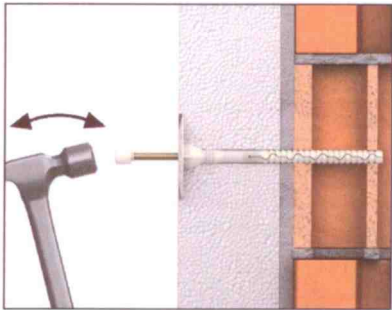
Installation instruction



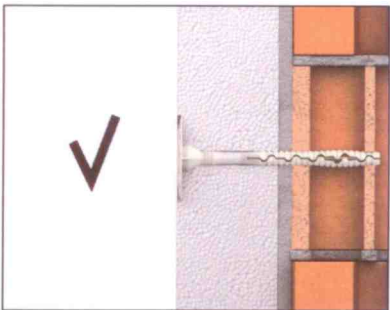
1. Drill hole by corresponding drilling method



2. Set the anchor by light hammering



3. Set the metal bolt by hammering to the insulation level



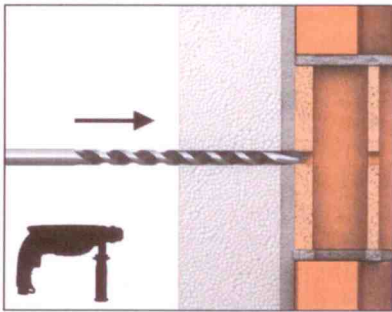
4. Correctly installed anchor

KI-10N and KI-10NS

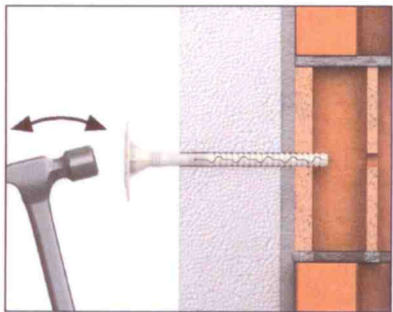
Intended use
Installation instruction of the KI-10N anchor

Annex B3
of European
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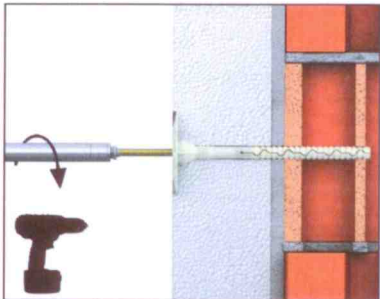
Installation instruction



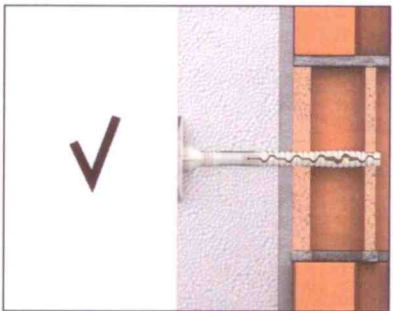
1. Drill hole by corresponding drilling method



2. Set the anchor by light hammering to the insulation level



3. Set the metal bolt by screwing to the insulation level



4. Correctly installed anchor

KI-10N and KI-10NS

Intended use
Installation instruction of the KI-10NS anchor

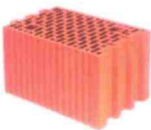

Annex B4
of European
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Table C1: Characteristic resistance to tension loads N_{Rk} , kN in concrete and in masonry for single anchor

| Base material | Bulk density [kg/dm ³] | Compressive strength [N/mm ²] | Referring standard | Drill method | N_{Rk} [kN] | |
|---|---------------------------------------|--|--------------------|----------------------|---------------|---------|
| | | | | | KI-10N | KI-10NS |
| Concrete C20/25 | $\geq 2,25$ | $\geq 30,0$ | EN 206 | hammer | – | 0,50 |
| Concrete C50/60 | $\geq 2,30$ | $\geq 65,0$ | EN 206 | hammer | – | 0,60 |
| Clay brick  | $\geq 1,70$ | $\geq 20,0$ | EN 771-1 | hammer | 0,75 | 0,90 |
| Calcium silicate hollow block (KSL-R 8 DF)  $a^1) = 22 \text{ mm}$ | $\geq 1,30$ | $\geq 15,0$ | EN 771-2 | rotary drilling only | 0,50 | 0,75 |
| Hollowed brique (Optibrick PV acc. to EN 771-1) $a^1) = 10 \text{ [mm]}$  | $\geq 0,60$ | $\geq 7,5$ | EN 771-1 | rotary drilling only | 0,40 | 0,60 |
| Perforated ceramic brick (Hlz B – 1.0 1NF 12-1)  $a^1) = 13 \text{ [mm]}$  | $\geq 0,95$ | $\geq 12,0$ | EN 771-1 | rotary drilling only | 0,60 | 0,90 |

KI-10N and KI-10NS**Performances**
Characteristic resistance**Annex C1**
of European
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Extension of Table C1

| Base material | Bulk density [kg/dm ³] | Compressive strength [N/mm ²] | Referring standard | Drill method | N _{Rk} [kN] | |
|--|---------------------------------------|--|--------------------|----------------------|----------------------|---------|
| | | | | | KI-10N | KI-10NS |
| 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 |
| LAC 2 | ≥ 1,56 | ≥ 2,0 | EN 771-3 | rotary drilling only | 0,60 | 0,60 |
| AAC 2 | ≥ 0,35 | ≥ 2,0 | EN 771-4 | rotary drilling only | 0,30 | 0,60 |
| AAC 5 | ≥ 0,60 | ≥ 5,0 | EN 771-4 | rotary drilling only | 0,90 | 0,75 |
| Partial safety factor γ _{Mn} ³⁾ | | | | | 2,0 | |
| ¹⁾ a – wall thickness, minimum value. In the other cases are required load tests on the construction ²⁾ valid in absence of national regulations | | | | | | |

KI-10N and KI-10NS

Performances
Characteristic resistance

Annex C1
of European
Technical Assessment
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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



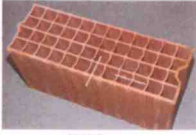

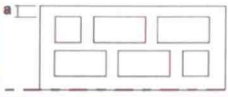
| Anchor type | Diameter of the anchor plate d_{plate} [mm] | Load resistance of the anchor plate $N_{u,m}$ [kN] | Plate stiffness $N_{0,m}$ [kN/mm] |
|--------------------|--|---|---|
| KI-10N and KI-10NS | 60 | 1,23 | 0,5 |

KI-10N and KI-10NS

Performances
Point thermal transmittance and plate stiffness

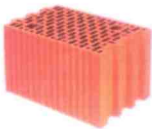

Annex C2
of European
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Table C4: Displacement behaviour

| 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] | |
|--|---------------------------------------|--|---------------------------|---------|--|---------|
| | | | 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**Performances
Displacements****Annex C3**
of European
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Extension of Table C4

| 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] | |
|--|---------------------------------------|--|---------------------------|---------|--|---------|
| | | | 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 |
| LAC 2 | ≥ 1,56 | ≥ 2,0 | 0,20 | 0,20 | 0,74 | 0,30 |
| AAC 2 | ≥ 0,35 | ≥ 2,0 | 0,10 | 0,20 | 0,55 | 0,25 |
| AAC 5 | ≥ 0,60 | ≥ 5,0 | 0,30 | 0,25 | 0,84 | 0,31 |
| ¹⁾ a – wall thickness, minimum value. In the other cases are required load tests on the construction | | | | | | |

KI-10N and KI-10NS

Performances
Displacements

Annex C3
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