



Designated according to The Construction Products (Amendment etc.) (EU Exit) Regulations 2020

UK Technical Assessment	UKTA-0836-22/6369 of 11/11/2022
Technical Assessment Body issuing the UK Technical Assessment:	British Board of Agrément
Trade name of the construction product:	KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M
Product family to which the construction product belongs:	Area Code 33, 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(s):	Manufacturing Plant no. 3
This UK Technical Assessment contains:	22 pages including 3 annexes which form an integral part of this assessment
This UK Technical Assessment is issued in accordance with The Construction Products (Amendment etc.) (EU Exit) Regulations 2020 on the basis of:	UKAD 330196-01-0604 <i>Plastic anchors made of virgin or non-virgin material for fixing of external thermal insulation composite systems with rendering</i>

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1 Technical description of the product

The KOELNER KI-10 nailed-in plastic anchor consists of an anchor sleeve with a plate manufactured from polypropylene and an accompanying specific nail as an expansion pin manufactured from glass fibre reinforced polypropylene.

The KOELNER KI-10PA nailed-in plastic anchor consists of anchor sleeve with a plate manufactured from polypropylene and an accompanying specific nail as an expansion pin manufactured from glass fibre reinforced polyamide.

The KOELNER KI-10M nailed in plastic anchor consists of anchor sleeve with a plate manufactured from polypropylene and an accompanying specific steel nail as an expansion pin.

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

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

The illustration and the description of the product are given in Annex A.

2 Specification of the intended use(s) in accordance with the applicable UK Assessment Document (hereinafter UKAD)

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 UK 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 Mechanical resistance and stability (BWR 1)

Not relevant.

3.2 Safety in case of fire (BWR 2)

Not relevant.

3.3 Health, hygiene and the environment (BWR 3)

Not relevant.

3.4 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

3.5 Protection against noise (BWR 5)

Not relevant.

3.6 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Point thermal transmittance	Annex C2

3.7 Sustainable use of natural resources (BWR 7)

No performance assessed.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied

4.1 System of assessment and verification of constancy of performance

According to UKAD No. 330196-01-0604 and Annex V of the Construction Products Regulation (Regulation (EU) 305/2011 as brought into UK law and amended, the system of assessment and verification of constancy of performance (AVCP) 2+ applies.

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the British Board of Agrément and made available to the UK Approved Bodies involved in the conformity attestation process.

5.1 UKCA marking for the product/ system must contain the following information:

- Identification number of the Approved Body
- Name/address of the manufacturer of the product/ system
- Marking with intention of clarification of intended use
- Date of marking
- Number of certificate of constancy of performance
- UKTA number.

On behalf of the British Board of Agrément



Date of Issue: 11 November 2022

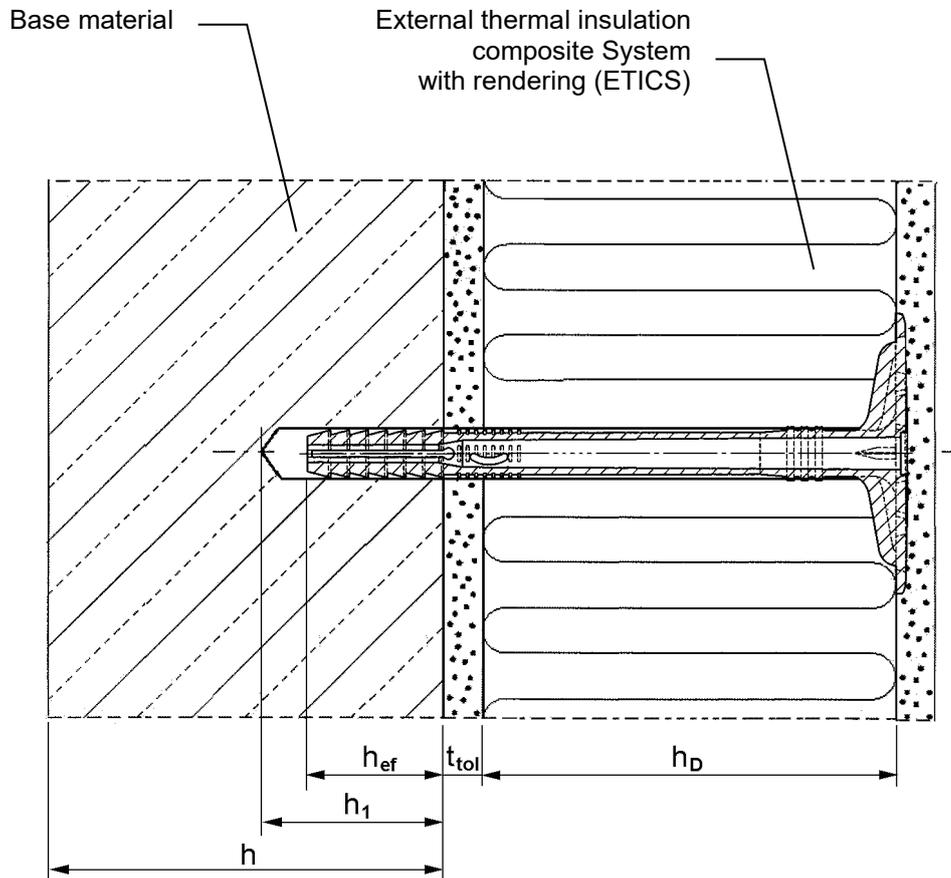
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ANNEXES

This annex applies to the product described in the main body of the UK Technical Assessment.



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

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Product description
Installation conditions

Annex A 1

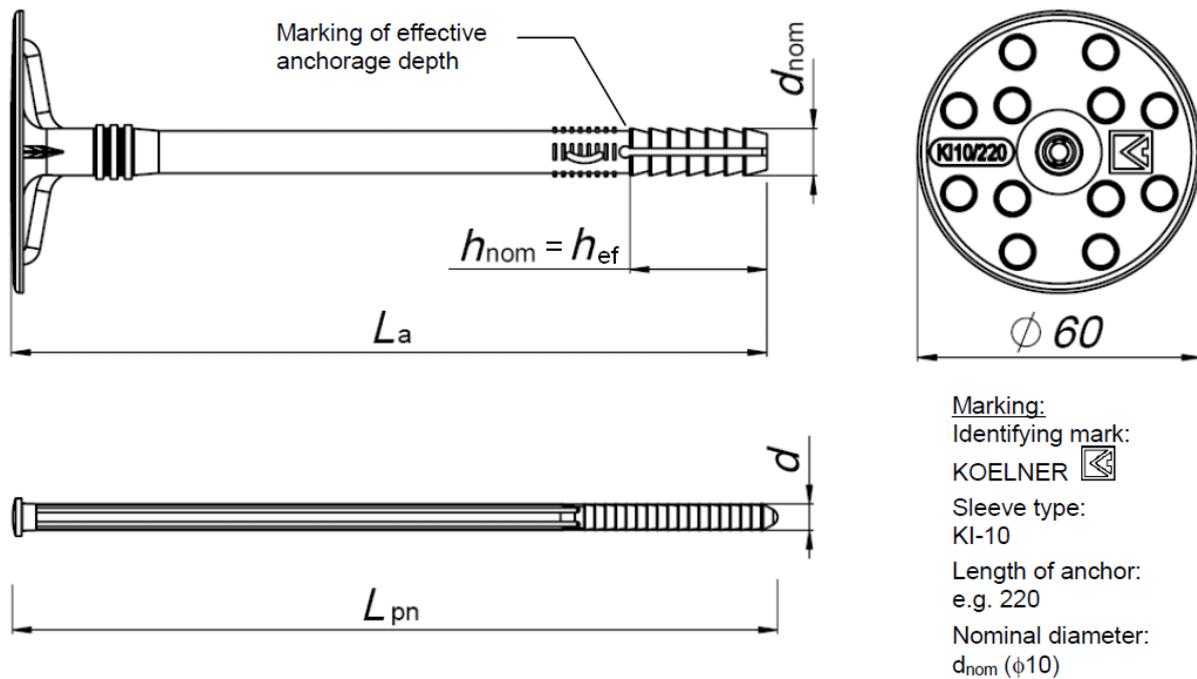


Table A1: KOELNER KI-10 and KOELNER KI-10PA anchor types and dimensions [mm]

Anchor type	Anchor sleeve			Expansion pin	
	d_{nom}	L_a	h_{ef}	d	L_{pn}
KI-10/70 or KI-10PA/70	$10_{\pm 0.5}$	$70_{\pm 2}$	25	$6.2_{\pm 0.2}$	$70_{\pm 2}$
KI-10/90 or KI-10PA/90	$10_{\pm 0.5}$	$90_{\pm 2}$	25	$6.2_{\pm 0.2}$	$90_{\pm 2}$
KI-10/120 or KI-10PA/120	$10_{\pm 0.5}$	$120_{\pm 2}$	25	$6.2_{\pm 0.2}$	$120_{\pm 2}$
KI-10/140 or KI-10PA/140	$10_{\pm 0.5}$	$140_{\pm 2}$	25	$6.2_{\pm 0.2}$	$140_{\pm 2}$
KI-10/160 or KI-10PA/160	$10_{\pm 0.5}$	$160_{\pm 2}$	25	$6.2_{\pm 0.2}$	$160_{\pm 2}$
KI-10/180 or KI-10PA/180	$10_{\pm 0.5}$	$180_{\pm 2}$	25	$6.2_{\pm 0.2}$	$180_{\pm 2}$
KI-10/200 or KI-10PA/200	$10_{\pm 0.5}$	$200_{\pm 2}$	25	$6.2_{\pm 0.2}$	$200_{\pm 2}$
KI-10/220 or KI-10PA/220	$10_{\pm 0.5}$	$220_{\pm 2}$	25	$6.2_{\pm 0.2}$	$220_{\pm 2}$

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

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Product description

Marking and dimensions of the anchor sleeve and expansion element of the KOELNER KI-10 and KOELNER KI-10PA anchors

Annex A 2

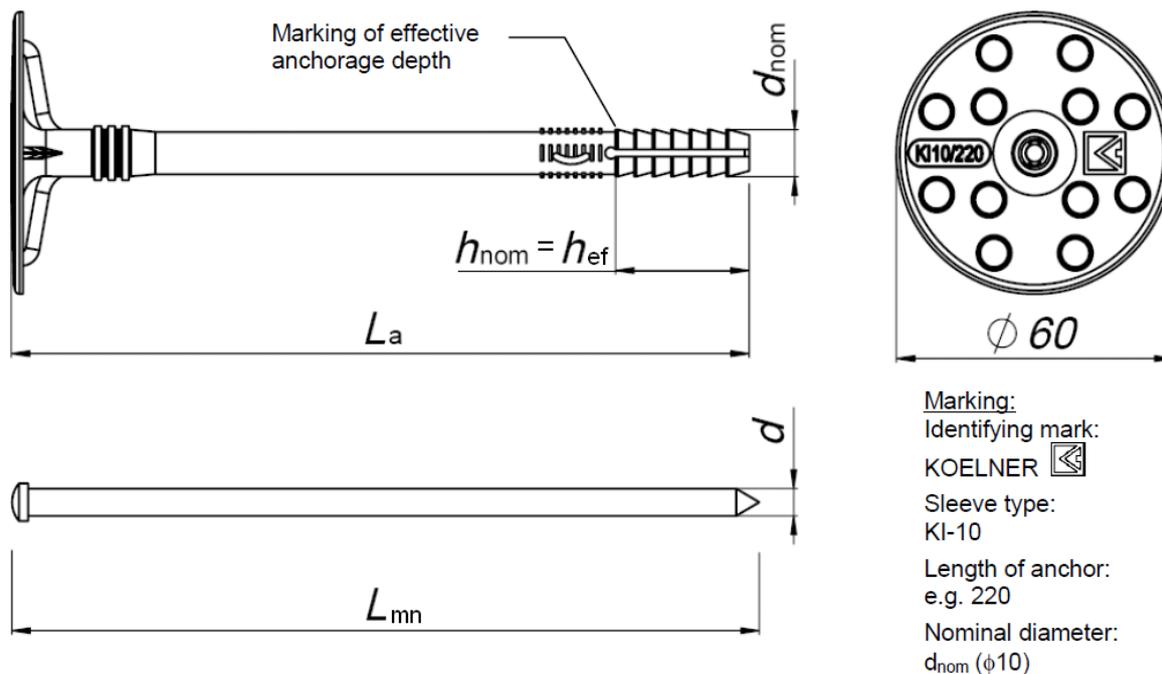


Table A2: KOELNER KI-10M anchor types and dimensions [mm]

Anchor type	Anchor sleeve			Expansion pin	
	d_{nom}	L_a	h_{ef}	d	L_{mn}
KI-10M/70	$10_{\pm 0.5}$	$70_{\pm 2}$	25	$4.9_{\pm 0.1}$	70_{+5}
KI-10M/90	$10_{\pm 0.5}$	$90_{\pm 2}$	25	$4.9_{\pm 0.1}$	90_{+5}
KI-10M/120	$10_{\pm 0.5}$	$120_{\pm 2}$	25	$4.9_{\pm 0.1}$	120_{+5}
KI-10M/140	$10_{\pm 0.5}$	$140_{\pm 2}$	25	$4.9_{\pm 0.1}$	140_{+5}
KI-10M/160	$10_{\pm 0.5}$	$160_{\pm 2}$	25	$4.9_{\pm 0.1}$	160_{+5}
KI-10M/180	$10_{\pm 0.5}$	$180_{\pm 2}$	25	$4.9_{\pm 0.1}$	180_{+5}
KI-10M/200	$10_{\pm 0.5}$	$200_{\pm 2}$	25	$4.9_{\pm 0.1}$	200_{+5}
KI-10M/220	$10_{\pm 0.5}$	$220_{\pm 2}$	25	$4.9_{\pm 0.1}$	220_{+5}
KI-10M/260	$10_{\pm 0.5}$	$260_{\pm 2}$	25	$4.9_{\pm 0.1}$	260_{+5}

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

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Product description

Marking and dimensions of the anchor sleeve and expansion element of the KOELNER KI-10M anchors

Annex A 3

Table A3: Materials

Designation	Material
Anchor sleeve	Virgin plastic: polypropylene, with different colours ⁽¹⁾
Expansion pin made of steel	Carbon steel ($f_{y,k} = 180 \text{ MPa}$, $f_{u,k} = 300 \text{ MPa}$) galvanized $\geq 5 \mu\text{m}$ according to EN ISO 4042
Expansion pin made of plastic	Virgin plastic: glass fibre reinforced polypropylene PPHGF30 nature (KOELNER KI-10) or glass fibre reinforced polyamide PA6 GF30, nature (KOELNER KI-10PA)
(1) nature, blue, brown, red, white, black, green, yellow, grey	

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M**Product description**
Materials**Annex A 4**

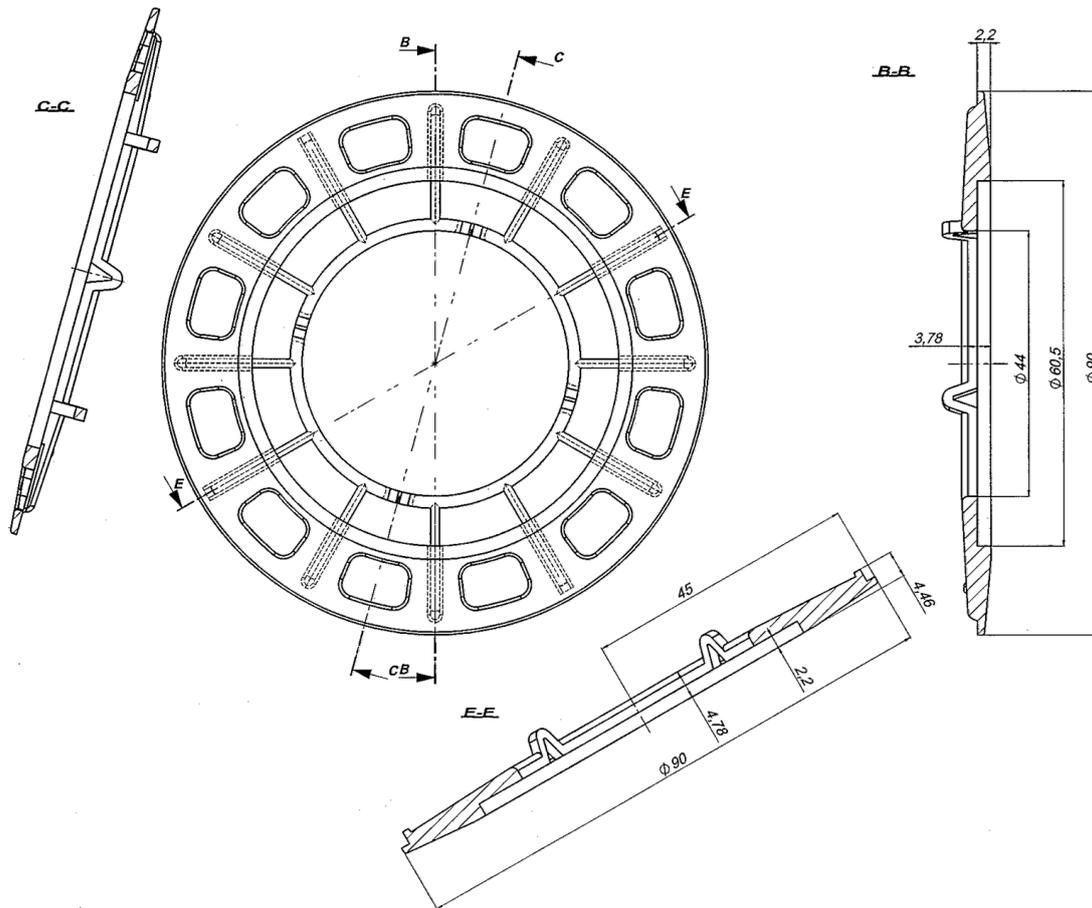


Table A4: Additional plate KWL-90

Plate type	Outer diameter [mm]	Material
KWL-90	90	Glass fibre reinforced polyamide PA6 GF30, nature or polypropylene, nature

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Product description
 Additional plate KWL-90 in combination with anchor sleeve

Annex A 5

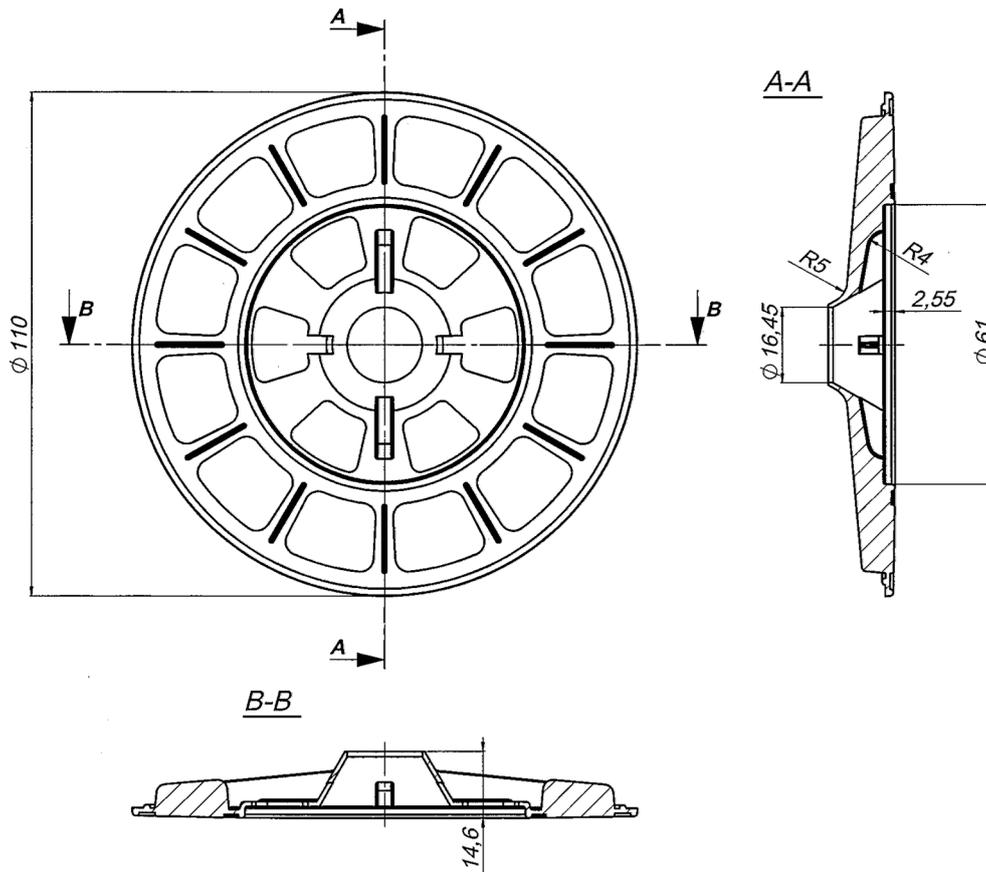


Table A5: Additional plate KWL-110

Plate type	Outer diameter [mm]	Material
KWL-110	110	Glass fibre reinforced polyamide PA6 GF30, nature or polypropylene, nature

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Product description
Additional plate KWL-110 in combination with anchor sleeve

Annex A 6

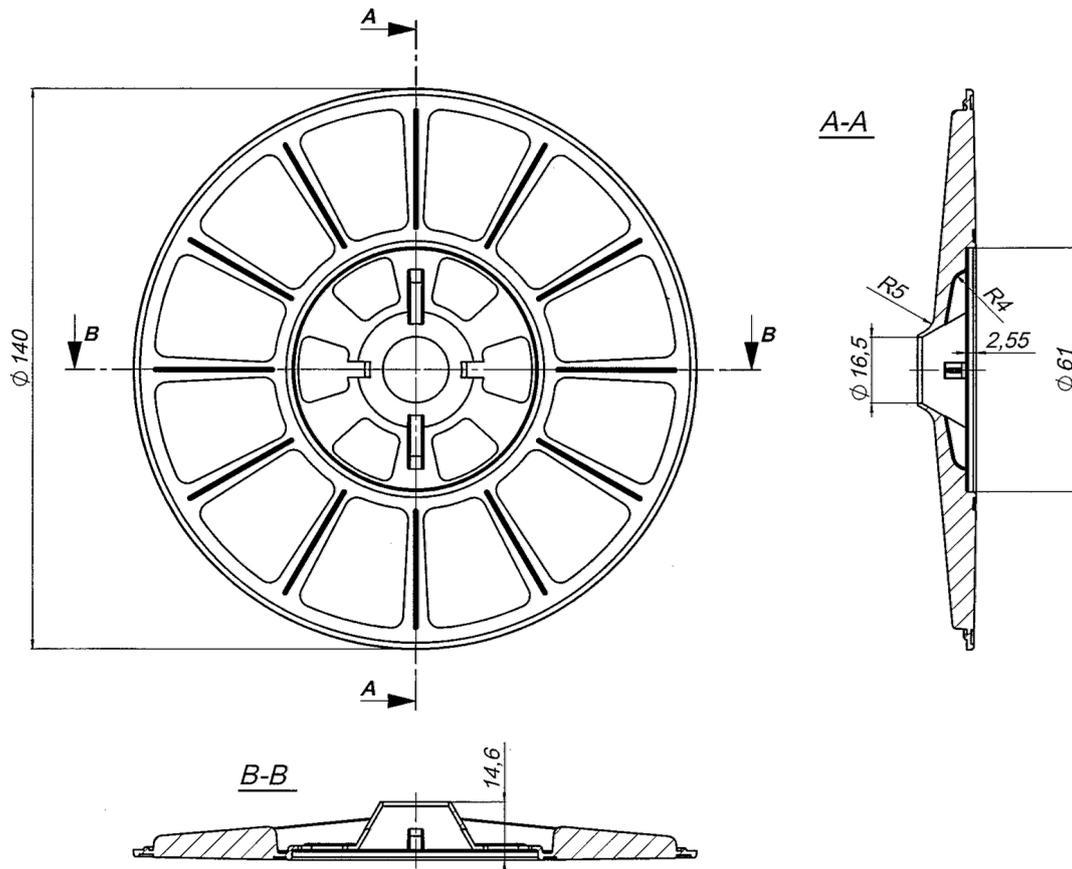


Table A6: Additional plate KWL-140

Plate type	Outer diameter [mm]	Material
KWL-140	140	Glass fibre reinforced polyamide PA6 GF30, nature or polypropylene, nature

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Product description
 Additional plate KWL-140 in combination with anchor sleeve

Annex A 7

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 systems (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 $\gamma_M = 2.0$ 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 the loads to be anchored.
- Fasteners are only to be used for multiple fixings of external 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.

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Intended Use
Specifications

Annex B 1

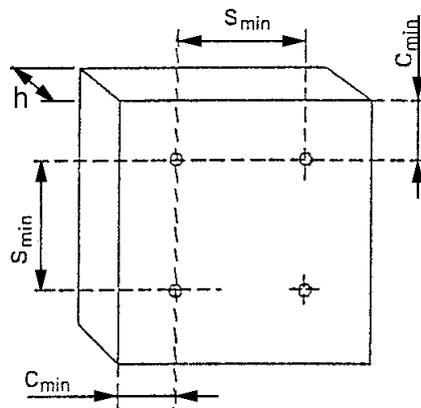
Table B1: Installation characteristics

Anchor type		KI-10, KI-10PA and KI-10M		
Use category for intended use		A, B, C	D	E
Nominal diameter of drill bit	d_o [mm]	10		
Cutting diameter of drill bit	d_{cut} [mm]	≤ 10.45		
Depth of drill hole	h_1 [mm]	≥ 35	≥ 50	≥ 70
Effective anchorage depth	h_{ef} [mm]	≥ 25	≥ 40	≥ 60

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

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

Diagram of spacing



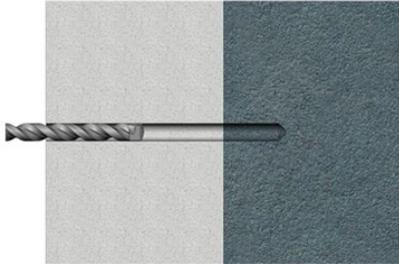
KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Intended Use

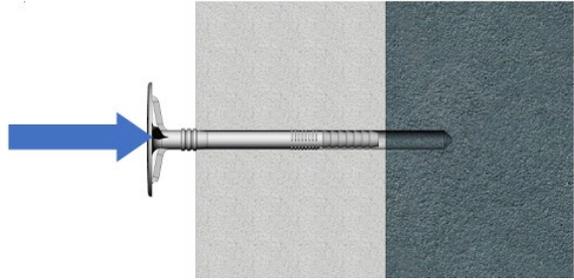
Installation characteristics, minimum thickness of base material, edge distance and spacing

Annex B 2

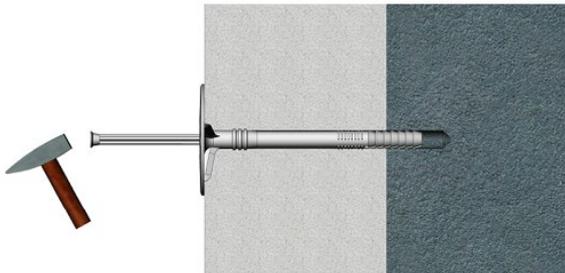
Installation Instruction



1. Drill hole using method acc. Annex C1



2. Set sleeve in manually



3. Set expansion element by hammer blows



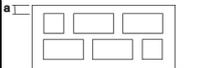
4. Correctly installed anchor

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Intended Use
Installation Instruction

Annex B 3

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

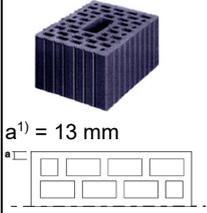
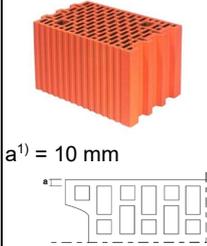
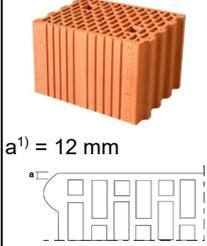
Category	Base material	Bulk density [kg/dm ³]	Min. compressive strength [N/mm ²]	Referring standard	N_{Rk} [kN]			Drill method
					KI-10	KI-10PA	KI-10M	
A	Concrete C12/15			EN 206-1	0.5	0.4	0.5	
	Concrete C16/20 + C50/60			EN 206-1	0.5	0.4	0.5	
B	Clay brick 	≥ 1.70	30.0	EN 771-1	0.5	0.4	0.4	hammer
	Calcium silicate brick (for example Kalksandstein KS NF 20-2.0 Vollstein according to DIN 106) 	≥ 2.00	20.0	EN 771-2	0.6	0.4	0.6	hammer
C	Calcium silicate hollow block (for example Kalksandstein KS L-R(P) 8 DF Lochstein according to DIN 106)  a ¹⁾ = 30 mm 	≥ 1.60	12.0	EN 771-2	0.6	0.4	0.5	rotary
	Perforated ceramic brick (for example Hlz B – 1.0 1NF 12-1 according to DIN 105)  a ¹⁾ = 13 mm 	≥ 0.95	12.0	EN 771-1	0.4	0.3	0.4	rotary

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Performances
Characteristic resistance

Annex C 1

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

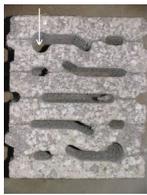
Category	Base material	Bulk density [kg/dm ³]	Min. compressive strength [N/mm ²]	Referring standard	N_{Rk} [kN]			Drill method
					KI-10	KI-10PA	KI-10M	
C	Perforated ceramic brick (for example Hlz B – 1.0 3NF 12-1 according to DIN 105) 	≥ 0.95	12.0	EN 771-1	0.4	0.4	0.4	rotary
	Vertically perforated posited block (for example Porotherm 25 P+W) 	≥ 0.80	15.0	EN 771-1	0.4	0.4	0.3	rotary
	Vertically perforated ceramic block (for example MEGA-MAX 250) 	≥ 0.80	15.0	EN 771-1	0.3	0.4	0.3	rotary

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Performances
Characteristic resistance

Annex C 1

Table C1-3: Characteristic resistance to tension loads N_{Rk} in concrete and in masonry for single anchor

Category	Base material	Bulk density [kg/dm ³]	Min. compressive strength [N/mm ²]	Referring standard	N_{Rk} [kN]			Drill method
					KI-10	KI-10PA	KI-10M	
C	Lightweight concrete hollow block (for example Hbl according to DIN 18151) a ¹⁾ = 30 [mm] 	≥ 0.80	2.0	EN 771-3	0.4	0.4	0.4	rotary
D	Lightweight concrete block	≥ 1.56	20.0	EN 771-3	0.5	0.75	0.6	hammer
E	Autoclaved aerated concrete block	≥ 0.35	2.0	EN 771-4	0.1	0.1	0.1	rotary
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 are required ²⁾ Valid in absence of national regulations								

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Performances
Characteristic resistance

Annex C 1

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

Anchor type	Insulation thickness H_b [mm]	Point thermal transmittance χ [W/K]
KI-10 and KI-10PA	45 – 195	0
KI-10M	45	0.006
	150	0.004
	195	0.004
	235	0.003

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

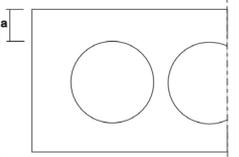
Anchor type	Diameter of the anchor plate d_{plate} [mm]	Load resistance of the anchor plate $N_{u,m}$ [kN]	Plate stiffness $N_{0,m}$ [kN/mm]
KI-10 and KI-10PA	60	2.1	0.5
KI-10M	60	2.6	0.4

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M**Performances**

Point thermal transmittance and plate stiffness

Annex C 2

Table C4-1: Displacement behaviour

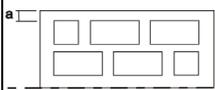
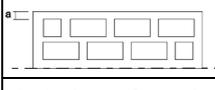
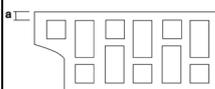
Category	Base material	Bulk density [kg/dm ³]	Compressive strength [N/mm ²]	$\frac{N_{Rk}}{3}$ [kN]			$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]		
				KI-10	KI-10PA	KI-10M	KI-10	KI-10PA	KI-10M
A	Concrete C20/25	–	–	0.17	0.13	0.17	0.60	0.95	0.63
	Concrete C50/60	–	–	0.17	0.13	0.17	0.60	0.95	0.63
B	Clay brick 	≥ 1.70	≥ 30.0	0.17	0.13	0.13	0.93	1.05	0.76
B	Calcium silicate brick (for example Kalksandstein KS NF 20-2.0 Vollstein according to DIN 106) 	≥ 2.00	≥ 20.0	0.20	0.13	0.20	0.86	0.96	0.75
C	Calcium silicate hollow block (for example Kalksandstein KS L-R(P) 8 DF Lochstein according to DIN 106)  a ¹⁾ = 30 mm 	≥ 1.60	≥ 12.0	0.20	0.13	0.17	0.73	0.90	0.57

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Performances
Displacements

Annex C 3

Table C4-2: Displacement behaviour

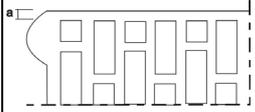
Category	Base material	Bulk density [kg/dm ³]	Compressive strength [N/mm ²]	$\frac{N_{Rk}}{3}$ [kN]			$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]		
				KI-10	KI-10PA	KI-10M	KI-10	KI-10PA	KI-10M
C	Perforated ceramic brick (for example Hz B – 1,0 1NF 12-1 according to DIN 105)  a ¹⁾ = 13 mm 	≥ 0.95	≥ 12.0	0.13	0.10	0.13	0.84	0.67	0.52
	Perforated ceramic brick (for example Hz B – 1,0 3NF 12-1 according to DIN 105)  a ¹⁾ = 13 mm 	≥ 0.95	≥ 12.0	0.13	0.13	0.13	0.59	0.84	0.64
	Vertically perforated porosited block (for example Porotherm 25 P+W)  a ¹⁾ = 10 mm 	≥ 0.80	≥ 15.0	0.13	0.13	0.10	0.56	0.60	0.49

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Performances
Displacements

Annex C 3

Table C4-3: Displacement behaviour

Category	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-10	KI-10PA	KI-10M	KI-10	KI-10PA	KI-10M
C	vertically perforated ceramic block (for example MEGA-MAX 250)  a ¹⁾ = 12 mm 	≥ 0.80	≥ 15.0	0.10	0.13	0.10	0.61	0.64	0.74
	Lightweight concrete hollow block (for example Hbl according to DIN 18151) a ¹⁾ = 30 [mm] 	≥ 0.80	≥ 2.0	0.13	0.13	0.13	0.53	0.72	0.57
D	Lightweight concrete block	≥ 1.56	≥ 20.0	0.17	0.25	0.20	0.99	0.92	0.61
E	Autoclaved aerated concrete block	≥ 0.35	≥ 2.0	0.03	0.03	0.03	0.50	0.41	0.40
¹⁾ Minimum values "a". For elements with lower value of "a" the load tests on the construction are required									

KOELNER KI-10, KOELNER KI-10PA and KOELNER KI-10M

Performances
Displacements

Annex C 3



British Board of Agrément,
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