



INSTYTUT TECHNIKI BUDOWLANEJ
PL 00-611 WARSZAWA
ul. Filtrowa 1
tel.: (+48 22) 825-04-71
(+48 22) 825-76-55
fax: (+48 22) 825-52-86
www.itb.pl



Member of



www.eota.eu

European Technical Assessment

**ETA-12/0297
of 14/05/2018**

General Part

Technical Assessment Body issuing the European Technical Assessment

Instytut Techniki Budowlanej

Trade name of the construction product

NF46001-9, NF46040-7
and NF46040-7M

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

AKIFIX S.p.A. unipersonale
Corso Italia, 27
I-39100 Bolzano
Italy

Manufacturing plant(s)

Manufacturing Plant EO2

This European Technical Assessment contains

21 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-12/0297 issued on 28/06/2012

This European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

Specific Part

1 Technical description of the product

The NF46001-9 nailed-in plastic anchor consists of an anchor sleeve with a plate made of polypropylene (virgin material) and an accompanying specific nail as an expansion pin made of the glass fibre reinforced polypropylene (virgin material).

The NF46040-7 nailed-in plastic anchor consists of anchor sleeve with a plate made of polypropylene (virgin material) and an accompanying specific nail as an expansion pin made of glass fibre reinforced polyamide (virgin material).

The NF46040-7M nailed in plastic anchor consists of anchor sleeve with a plate made of polypropylene (virgin material) 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 NF46001-9, NF46040-7 and NF46040-7M 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 in accordance with the applicable European Assessment Document (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 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

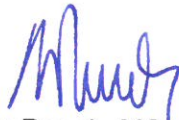
According to the Decision 97/463/EC of the European Commission the system 2+ of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) applies.

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

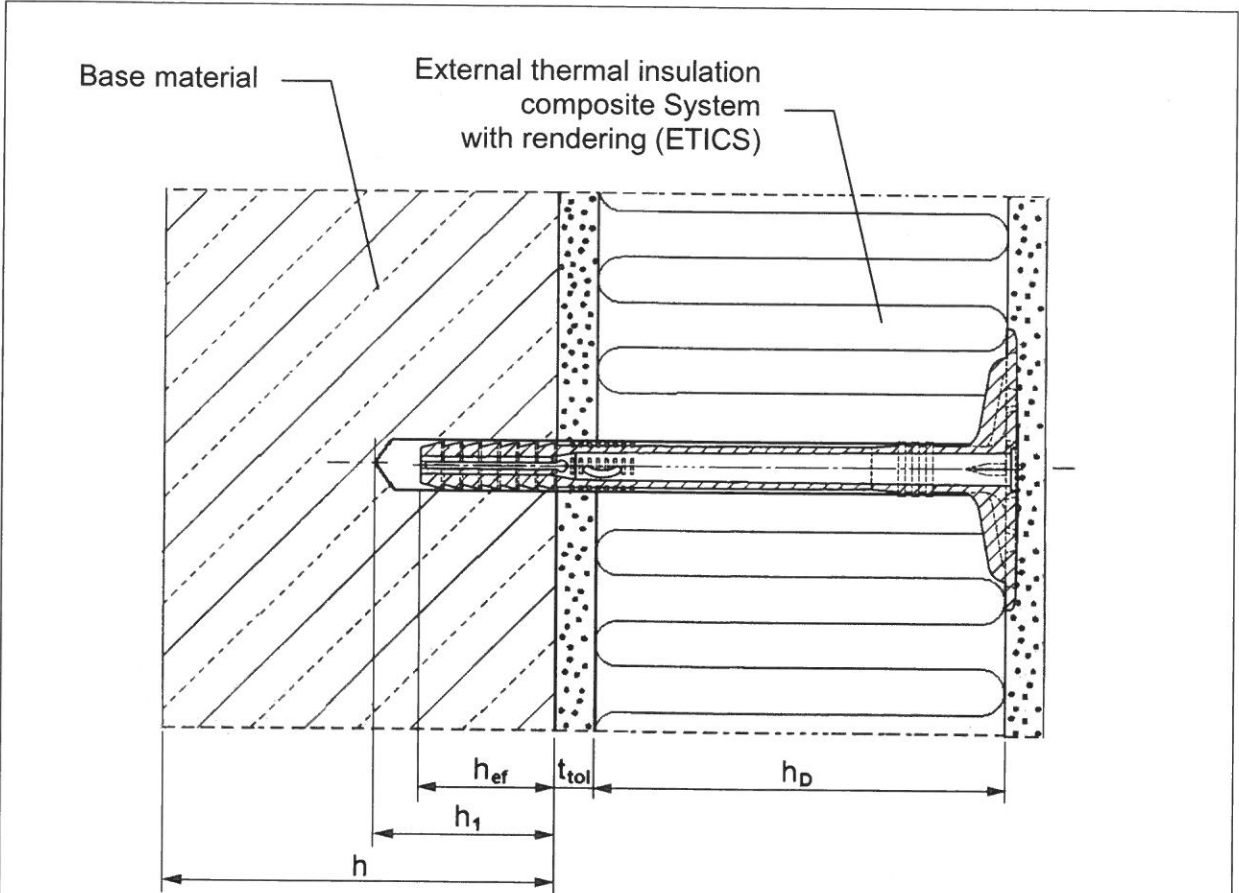
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

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 14/05/2018 by Instytut Techniki Budowlanej



Anna Panek, MSc
Deputy Director of ITB



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

NF46001-9, NF46040-7 and NF46001-9M	Annex A1 of European Technical Assessment ETA-12/0297
Product description Installation conditions	

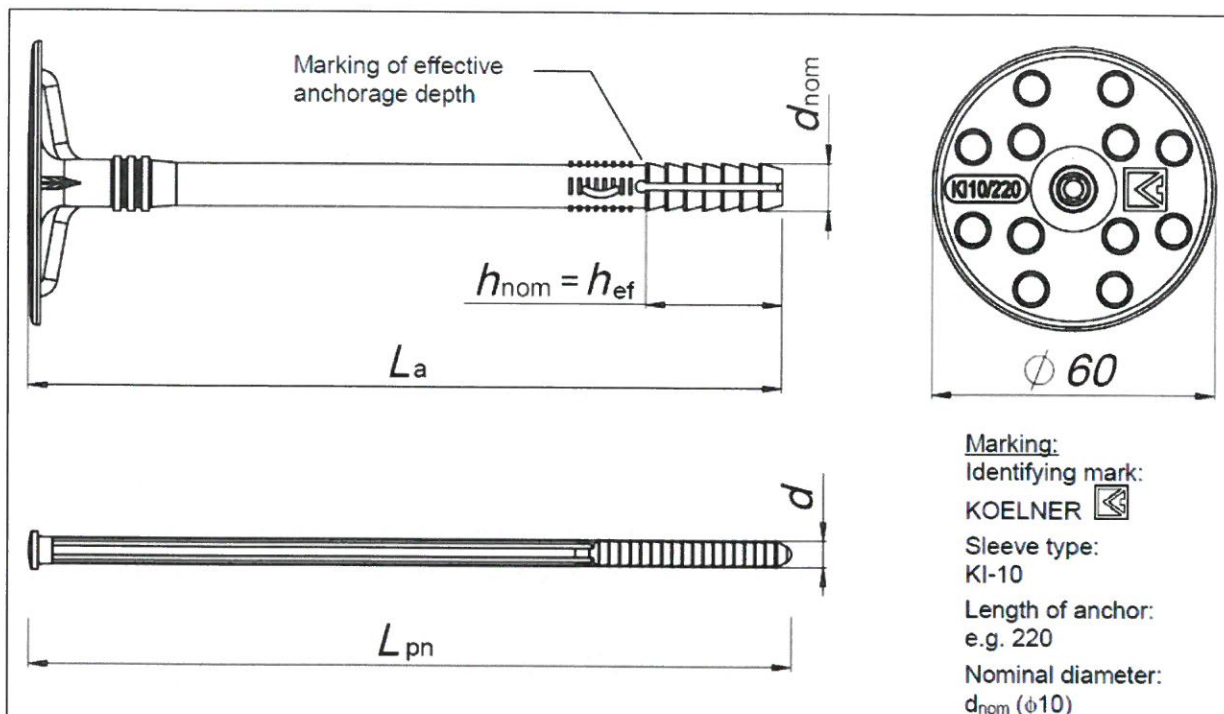


Table A1: NF46001-9 and NF46040-7 anchor types and dimensions [mm]

Anchor type	Anchor sleeve			Expansion pin	
	d_{nom}	L_a	h_{ef}	d	L_{pn}
NF46001-9/70 or NF46040-7/70	$10_{\pm 0,5}$	$70_{\pm 2}$	25	$6,2_{\pm 0,2}$	$70_{\pm 2}$
NF46001-9/90 or NF46040-7/90	$10_{\pm 0,5}$	$90_{\pm 2}$	25	$6,2_{\pm 0,2}$	$90_{\pm 2}$
NF46001-9/120 or NF46040-7/120	$10_{\pm 0,5}$	$120_{\pm 2}$	25	$6,2_{\pm 0,2}$	$120_{\pm 2}$
NF46001-9/140 or NF46040-7/140	$10_{\pm 0,5}$	$140_{\pm 2}$	25	$6,2_{\pm 0,2}$	$140_{\pm 2}$
NF46001-9/160 or NF46040-7/160	$10_{\pm 0,5}$	$160_{\pm 2}$	25	$6,2_{\pm 0,2}$	$160_{\pm 2}$
NF46001-9/180 or NF46040-7/180	$10_{\pm 0,5}$	$180_{\pm 2}$	25	$6,2_{\pm 0,2}$	$180_{\pm 2}$
NF46001-9/200 or NF46040-7/200	$10_{\pm 0,5}$	$200_{\pm 2}$	25	$6,2_{\pm 0,2}$	$200_{\pm 2}$
NF46001-9/220 or NF46040-7/220	$10_{\pm 0,5}$	$220_{\pm 2}$	25	$6,2_{\pm 0,2}$	$220_{\pm 2}$

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

NF46001-9, NF46040-7 and NF46001-9M	Annex A2 of European Technical Assessment ETA-12/0297
Product description Marking and dimensions of the anchor sleeve and expansion element of the NF46001-9 and NF46040-7 anchors	

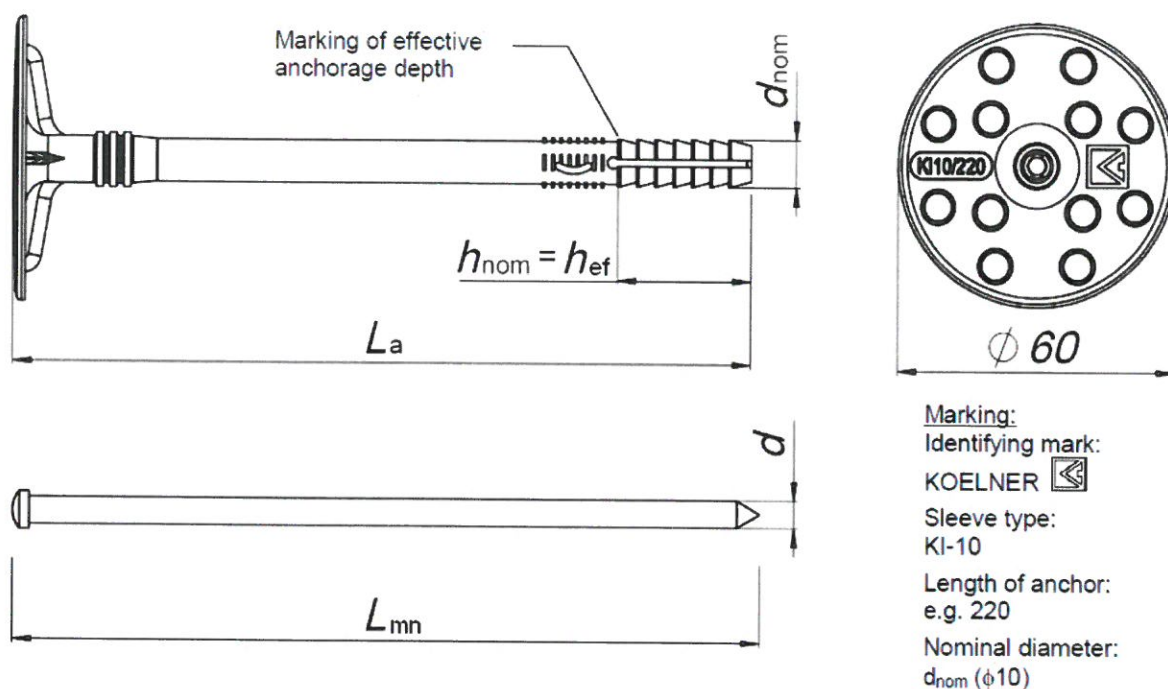


Table A2: NF46040-7M anchor types and dimensions [mm]

Anchor type	Anchor sleeve			Expansion pin	
	d_{nom}	L_a	h_{ef}	d	L_{mn}
NF46040-7M /70	$10_{\pm 0,5}$	$70_{\pm 2}$	25	$4,9_{\pm 0,1}$	70_{+5}
NF46040-7M /90	$10_{\pm 0,5}$	$90_{\pm 2}$	25	$4,9_{\pm 0,1}$	90_{+5}
NF46040-7M /120	$10_{\pm 0,5}$	$120_{\pm 2}$	25	$4,9_{\pm 0,1}$	120_{+5}
NF46040-7M /140	$10_{\pm 0,5}$	$140_{\pm 2}$	25	$4,9_{\pm 0,1}$	140_{+5}
NF46040-7M /160	$10_{\pm 0,5}$	$160_{\pm 2}$	25	$4,9_{\pm 0,1}$	160_{+5}
NF46040-7M /180	$10_{\pm 0,5}$	$180_{\pm 2}$	25	$4,9_{\pm 0,1}$	180_{+5}
NF46040-7M /200	$10_{\pm 0,5}$	$200_{\pm 2}$	25	$4,9_{\pm 0,1}$	200_{+5}
NF46040-7M /220	$10_{\pm 0,5}$	$220_{\pm 2}$	25	$4,9_{\pm 0,1}$	220_{+5}
NF46040-7M /260	$10_{\pm 0,5}$	$260_{\pm 2}$	25	$4,9_{\pm 0,1}$	260_{+5}

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

**NF46001-9, NF46040-7
and NF46001-9M**

Product description

Marking and dimensions of the anchor sleeve and expansion
element of the NF46040-7M anchors

Annex A3
of European
Technical Assessment
ETA-12/0297

Table A3: Materials

Designation	Material
Anchor sleeve	Virgin plastic: polypropylene, with different colours ¹⁾
Expansion pin made of steel	Carbon steel ($f_{y,k} = 180 \text{ MPa}$, $f_{u,k} = 300 \text{ MPa}$) galvanised $\geq 5 \text{ }\mu\text{m}$ according to EN ISO 4042
Expansion pin made of plastic	Virgin plastic: glass fibre reinforced polypropylene PPHGF30 nature (NF46001-9) or glass fibre reinforced polyamide PA6 GF30, nature (NF46040-7)
¹⁾ nature, blue, brown, red, white, black, green, yellow, grey	

**NF46001-9, NF46040-7
and NF46001-9M**

Product description
Materials

Annex A4
of European
Technical Assessment
ETA-12/0297

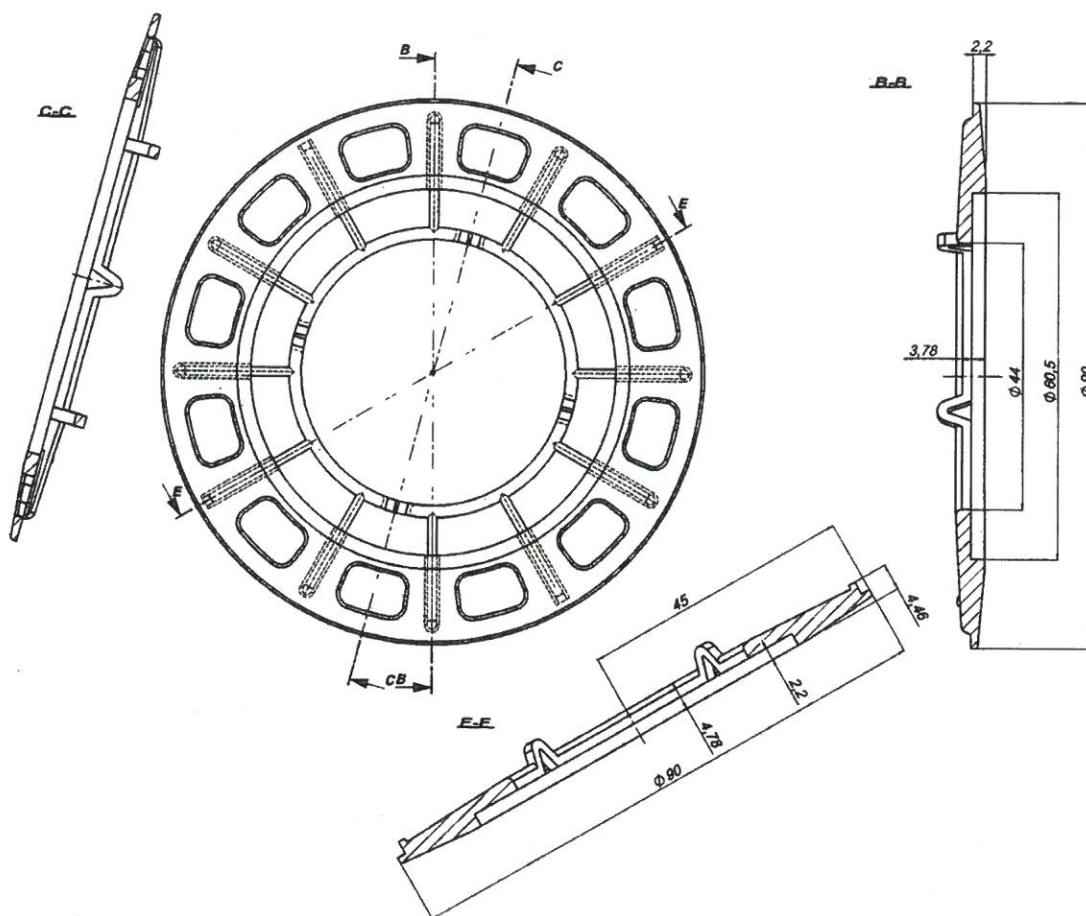


Table A4: Additional plate KWL-90

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

NF46001-9, NF46040-7
and NF46001-9M

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

Annex A5
of European
Technical Assessment
ETA-12/0297

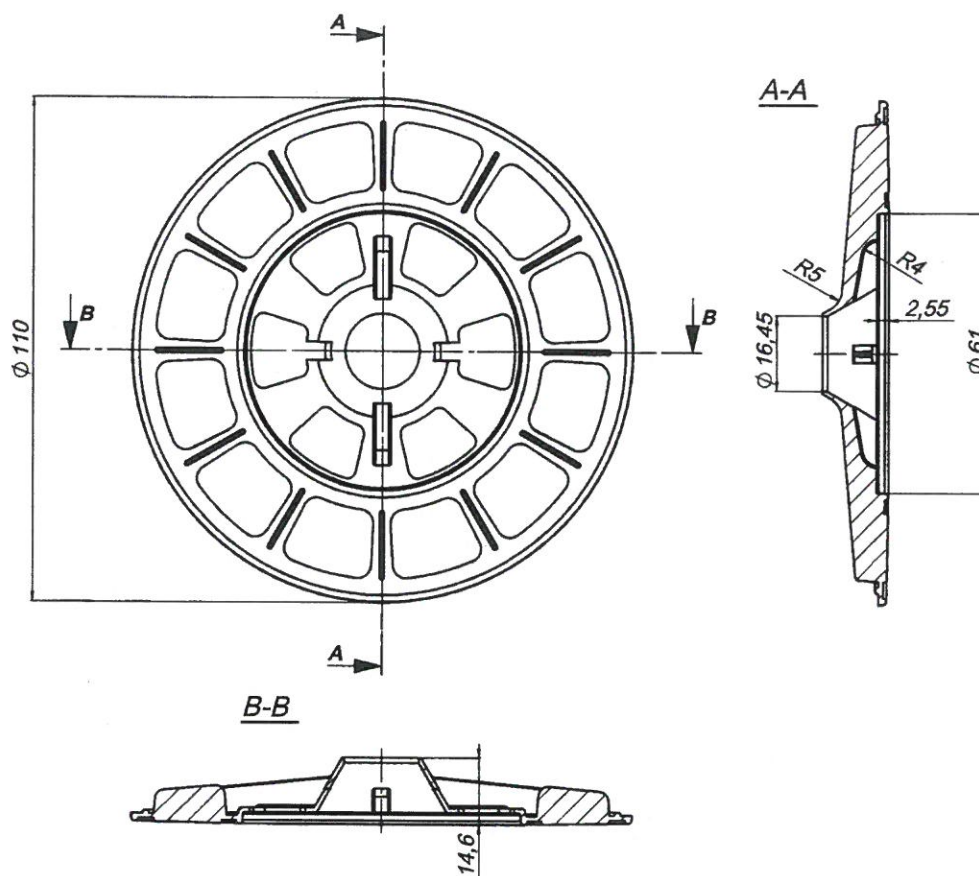


Table A5: Additional plate KWL-110

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

**NF46001-9, NF46040-7
and NF46001-9M**

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

Annex A6
of European
Technical Assessment
ETA-12/0297

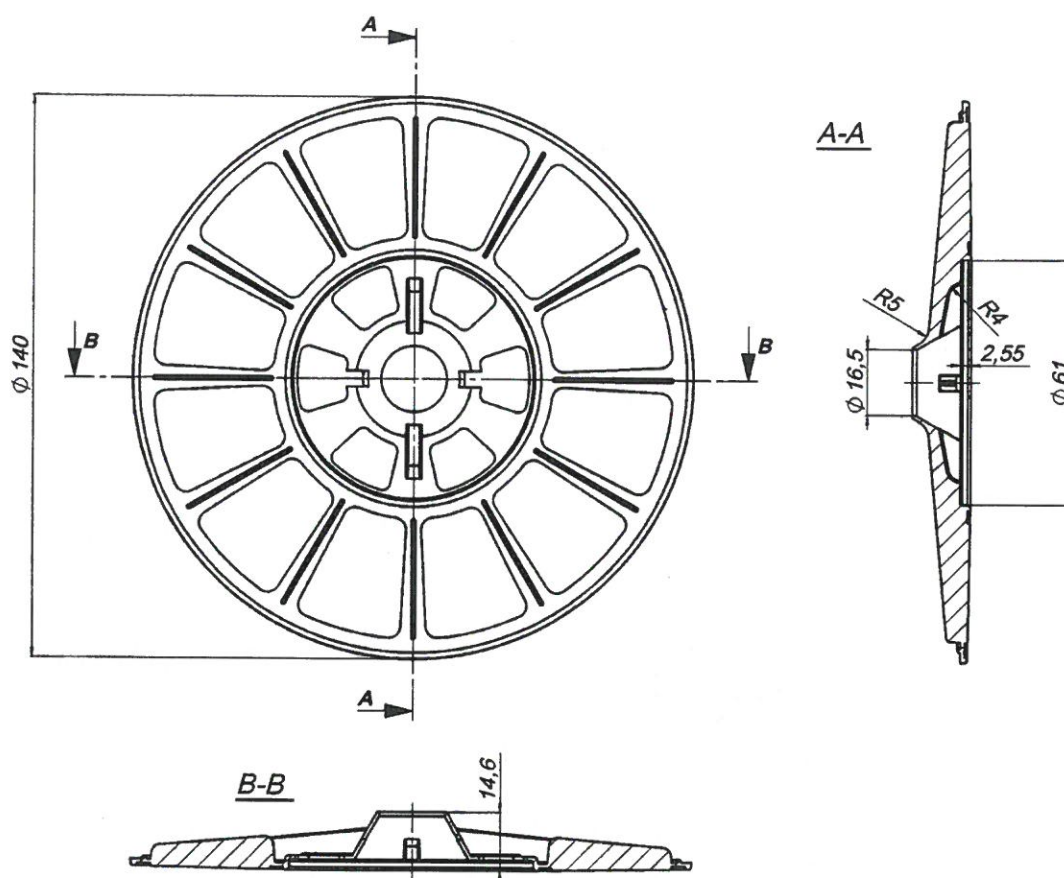


Table A6: Additional plate KWL-140

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

NF46001-9, NF46040-7
and NF46001-9M

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

Annex A7
of European
Technical Assessment
ETA-12/0297

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:

- 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 of 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.

**NF46001-9, NF46040-7
and NF46001-9M**

**Intended use
Specifications**

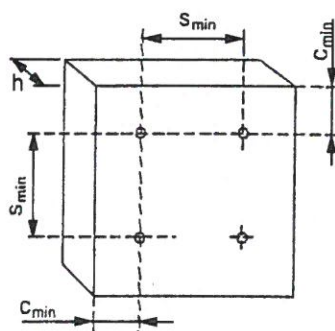
Annex B1
of European
Technical Assessment
ETA-12/0297

Table B1: Installation characteristics

Anchor type	NF46001-9, NF46001-9 and NF46040-7M		
Use category for infendent use	A, B, C	D	E
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]	≥ 35	≥ 50	≥ 70
Effective anchorage depth h_{ef} [mm]	≥ 25	≥ 40	≥ 60

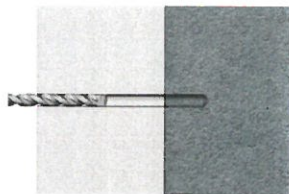
Table B2: Minimum thickness of base material, edge distance and anchor spacing

Anchor type	NF46001-9, NF46001-9 and NF46040-7M
Minimum thickness of base material h [mm]	100
Minimum spacing s_{min} [mm]	100
Minimum edge distance c_{min} [mm]	100

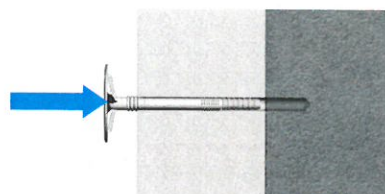
Diagram of spacing

NF46001-9, NF46001-9 and NF46001-9M	Annex B2 of European Technical Assessment ETA-12/0297
Intended use Installation characteristics, minimum thickness of base material, edge distance and spacing	

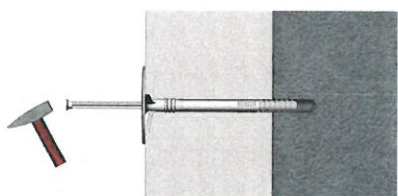
Installation instruction



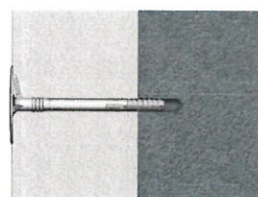
1. Drill hole using method acc. Annex C1



2. Set-in sleeve manually



3. Set expansion element by hammer blows






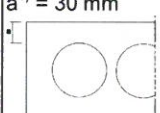

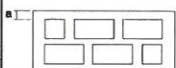
4. Correctly installed anchor

**NF46001-9, NF46040-7
and NF46001-9M**

Intended use
Installation instruction

Annex B3
of European
Technical Assessment
ETA-12/0297

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


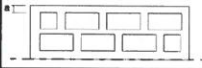


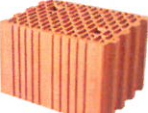

Category	Base material	Bulk density [kg/dm ³]	Min. compressive strength [N/mm ²]	Referring standard	N _{Rk} [kN]			Drill method
					NF46001-9	NF46040-7	NF46040-7M	
A	Concrete C12/15			EN 206-1	0,5	0,4	0,5	hammer
	Concrete C16/20 ÷ C50/60			EN 206-1	0,5	0,4	0,5	
B	Clay brick 	≥ 1,70	30,0	EN 771-1	0,5	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

**NF46001-9, NF46040-7
and NF46001-9M**

Performances
Characteristic resistance

Annex C1
of European
Technical Assessment
ETA-12/0297

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
					NF46001-9	NF46040-7	NF46040-7M	
C	Perforated ceramic brick (for example Hlz B – 1.0 3NF 12-1 according to DIN 105)  $a^{1)} = 13 \text{ mm}$ 	$\geq 0,95$	12,0	EN 771-1	0,4	0,4	0,4	rotary
	Vertically perforated porosited block (for example Porotherm 25 P+W)  $a^{1)} = 10 \text{ mm}$ 	$\geq 0,80$	15,0	EN 771-1	0,4	0,4	0,3	rotary
	Vertically perforated ceramic block (for example MEGA-MAX 250)  $a^{1)} = 12 \text{ mm}$ 	$\geq 0,80$	15,0	EN 771-1	0,3	0,4	0,3	rotary

**NF46001-9, NF46040-7
and NF46001-9M**

Performances
Characteristic resistance

Annex C1
of European
Technical Assessment
ETA-12/0297

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
					NF4600 1-9	NF4604 0-7	NF4604 0-7M	
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, γ _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.								

NF46001-9, NF46040-7
and NF46001-9M

Performances
Characteristic resistance

Annex C1
of European
Technical Assessment
ETA-12/0297

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]
NF46001-9 and NF46040-7	45 – 195	0
NF46040-7M	45	0,006
	150	0,004
	195	0,004
	235	0,003

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




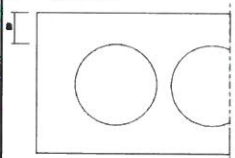
Anchor type	Diameter of the anchor plate d_{plate} [mm]	Load resistance of the anchor plate $N_{u,m}$ [kN]	Plate stiffness $N_{0,m}$ [kN/mm]
NF46001-9 and NF46040-7	60	2,1	0,5
NF46040-7M	60	2,6	0,4

**NF46001-9, NF46040-7
and NF46001-9M**

Performances
Point thermal transmittance and plate stiffness

Annex C2
of European
Technical Assessment
ETA-12/0297

Table C4-1: Displacement behavior


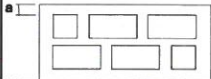

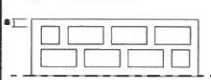

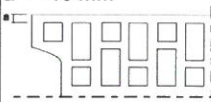
Category	Base material	Bulk density [kg/dm ³]	Compressive strength [N/mm ²]	$\frac{N_{Rk}}{3}$ [kN]			$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]		
				NF4600 1-9	NF4604 0-7	NF4604 0-7M	NF4600 1-9	NF4604 0-7	NF4604 0-7M
A	Concrete C20/25	–	–	0,17	0,13	0,17	0,60	0,95	0,63
	Concrete C50/60	–	–	0,17	0,13	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

NF46001-9, NF46040-7
and NF46001-9M

Performances
Displacements

Annex C3
of European
Technical Assessment
ETA-12/0297

Table C4-2: Displacement behavior

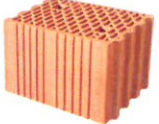
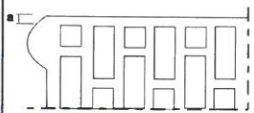

Category	Base material	Bulk density [kg/dm ³]	Compressive strength [N/mm ²]	$\frac{N_{Rk}}{3}$ [kN]			$\delta\left(\frac{N_{Rk}}{3}\right)$ [mm]		
				NF4600 1-9	NF4604 0-7	NF4604 0-7M	NF4600 1-9	NF4604 0-7	NF4604 0-7M
C	Perforated ceramic brick (for example Hlz B – 1,0 1NF 12-1 according to DIN 105)  $a^1 = 13 \text{ mm}$ 	≥ 0,95	≥ 12,0	0,13	0,10	0,13	0,84	0,67	0,52
	Perforated ceramic brick (for example Hlz B – 1,0 3NF 12-1 according to DIN 105)  $a^1 = 13 \text{ mm}$ 	≥ 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)  $a^1 = 10 \text{ mm}$ 	≥ 0,80	≥ 15,0	0,13	0,13	0,10	0,56	0,60	0,49

**NF46001-9, NF46040-7
and NF46001-9M**

**Performances
Displacements**

Annex C3
of European
Technical Assessment
ETA-12/0297

Table C4-3: Displacement behavior

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]		
				NF4600 1-9	NF4604 0-7	NF4604 0-7M	NF4600 1-9	NF4604 0-7	NF4604 0-7M
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.

NF46001-9, NF46040-7
and NF46001-9M

Performances
Displacements

Annex C3
of European
Technical Assessment
ETA-12/0297

