INSTYTUT TECHNIKI BUDOWLANEJ
(BUILDING RESEARCH INSTITUTE)
PL 00-611 WARSZAWA, ul. Filtrowa 1, www.itb.pl

MEMBER of EOTA and UEAtc

NATIONAL TECHNICAL ASSESSMENT
ITB-KOT-2017/0345, Version 2

This National Technical Assessment (NTA) is issued by BRI (the Building Research Institute) pursuant to the Polish Regulation of the Ministry of Infrastructure and Construction dated 17 November 2016 and concerning the National Technical Assessment (Dz. U. 2016.1968) and on the commission from:

RAWLPLUG S.A.
ul. Kwidzyńska 6, 51-416 Wrocław

This NTA ref. ITB-KOT-2017/0345 Version 2 is a positive assessment of performance of the following building products with their intended use:

KOELNER-KC plastic/metal fasteners for thermal insulation attachment

NTA date of expiry:

14 December 2027

DIRECTOR
by authority of
Deputy Director for
Technical Assessment
and European Harmonisation

mgr inż. Anna Panek

Warsaw, 14 December 2022.

Instytut Techniki Budowlanej
(Building Research Institute)

ul. Filtrowa 1, 00-611 Warszawa

tel.: +48 22 825 04 71 | NIP (TIN): 525 000 93 58; KRS: 0000158785

1. TECHNICAL DESCRIPTION OF THE PRODUCT

This National Technical Assessment applies to the KOELNER-KC plastic/metal fasteners for thermal insulation attachment, manufactured by RAWLPLUG S.A., registered office at ul. Kwidzyńska 6, 51-416 Wrocław (Poland), at the RAWLPLUG S.A. production plant at ul. Kwidzyńska 6, 51-416 Wrocław (Poland).

The components of the KOELNER-KC fasteners are steel screws and KC pressure plates with a diameter of 60 mm, made of polypropylene (PP). The KOELNER-KC fasteners can be used with additional KWL pressure plates with a diameter of 140 mm, made of polypropylene (PP). The additional KWL pressure plates are attached to the KC plates.

The KOELNER-KC fasteners are manufactured in five types, depending on the type and diameter of the screw used (see Fig. A1 and A2):

- KC/UC with a diameter of 5 mm,
- KC/UC with a diameter of 6 mm,
- KC/WB with a diameter of 4.8 mm,
- KC/WX with a diameter of 4.8 mm,
- KC/WO with a diameter of 4.8 mm.

The UC and WB screws are made of case-hardened carbon steel, grade SEA 1022 according to AMS 5070:1994/RG, and are electrolytically plated with a zinc layer of not less than 5 µm.

The WX and WO screws are made of regular carbon steel, with a minimum mechanical strength class of 3.6 per PN-EN ISO 898-1:2013 and are electrolytically plated with a zinc layer of not less than 5 µm and a PTFE ceramic coating.

The KC and KWL pressure plates are made of polypropylene (PP) (virgin material), characterised by a differential scanning calorimetry (DSC) curve, determined by a method according to PN-EN ISO 11357-1:2016, in accordance with the standard established in the National Technical Assessment procedure.

The external appearance, shape and dimensions of the KOELNER-KC fasteners are specified in Appendix A.

2. INTENDED USE

The KOELNER-KC plastic/metal fasteners are designed for the mechanical attachment of thermal insulation made of polystyrene boards or mineral wool boards, to substrates made of:

- structural timber, minimum grade C24 (EN 338:2016) and a minimum specific density of 350 kg/m^3 , applicable to the KC/UC and KC/WO fasteners;
- MEB Green Suprema GB 600 fibre-cement boards specified in PN-EN 13168+A1:2015, with a minimum thickness of 25 mm, a minimum density of 600 kg/m^3 and a minimum compressive strength of 300 kPa, applicable to the KC/WO fasteners;
- MEB Green Suprema GB 1050 fibre-cement boards specified in PN-EN 13986+A1:2015, with a minimum thickness of 18 mm and a minimum density of 1050 kg/m^3 , applicable to the KC/WO fasteners;

- **MIAMI** Eco Boards specified in **PN-EN** 13986+A1:2015, with a minimum thickness of 20 mm and a minimum density of 1300 kg/m^3, applicable to the **KC/WO fasteners;**
- steel sheet, from regular carbon steel grade S280GD per PN-EN 10346:2015, with a minimum characteristic tensile strength Rm of 360 MPa and a thickness of 0.75 to 2.00 mm, applicable to the KC/WB, KC/WX and KC/WO fasteners.

The design pull-out strength and pull-over capacity of the KOELNER-KC fasteners after installation and fixing is specified in Appendix C Table C1. The number of fasteners must be determined on the basis of static calculations, considering the design pull-out strength and pull-over capacity values specified in Appendix C Table C1, while the number of fasteners per 1 m^2 of insulation material must not be less than 4.

Due to the corrosive aggressiveness of the environment, the KOELNER-KC plastic/metal fasteners for thermal insulation attachment should be used in accordance with the requirements of PN-EN ISO 9223:2012.

When attaching thermal insulation, the steel screw is driven rotationally into the substrate with a power drill, without pre-drilling a hole for the fastener. The installation parameters for the KOELNER-KC fasteners are specified in Appendix B Tables B1 and B2.

The scope of application of the products under this National Technical Assessment shall be derived from their performance defined in Section 3.

The products under this National Technical Assessment shall be used in accordance with the engineering design developed for the specific project, considering:

- Applicable Polish standards and the technical and construction regulations, in particular the Polish Regulation of the Minister of Infrastructure of 12 April 2002 concerning the Technical Requirements for Buildings and Locations Thereof (Dz. U. 2022.1225);
- the provisions of this NTA;
- the manufacturer's instructions for use.

3. PRODUCT PERFORMANCE AND ITS ASSESSMENT METHODS

3.1. Product performance

3.1.1. Characteristic pull-out strength and pull-over capacity of fastener fixings. The characteristic pull-out strength and pull-over capacity of the fasteners are specified in Appendix C Table C1.

3.1.2. Pressure plate strength properties. The stiffness of the KC pressure plate is 0.4 kN/mm minimum with a failure load at 1.3 kN minimum.

3.1.3. Fastener durability. The zinc coating applied to the fasteners with a thickness of 5 µm provides the fasteners with the durability limits specified in Section 2.

3.2. Performance assessment methods

3.2.1. Characteristic pull-out strength and pull-over capacity of fastener fixings. The test of the characteristic pull-out strength and pull-over capacity of the fasteners fixing (including the pull-over capacity of the screw head across the pressure plate) is carried out on fasteners embedded in substrates according to Appendix C Table C1.

The force measurements shall be performed with a test machine the indication range of which is selected that includes the expected failure force and allows a steady and slow increase of the applied force until failure results.

3.2.2. Pressure plate strength properties. The strength performance of the pressure plate is tested according to the EOTA Technical Report 026.

3.2.3. Fastener durability. The zinc coating thickness is tested according to PN-EN ISO 2178:2016 or PN-EN ISO 3497:2004.

4. PACKAGING, TRANSPORT AND STORAGE; PRODUCT MARKING

The KOELNER-KC plastic/metal fasteners shall be delivered in product component complements, in original packaging of the manufacturer and stored and transported in conditions which ensure constancy of the technical properties.

The method of application of the Polish Building Mark “B” shall comply with the Polish Regulation of the Minister of Infrastructure and Construction dated 17 November 2016 and concerning the Methods of Performance Declaration for Building Products and Application of Polish Construction Mark “B” (Dz. U. 2016.1966, as amended).

The product’s Polish Building Mark “B” shall be applied with the following data in the marking:

- the two last digits of the first year of application of the Polish Building Mark “B” on the building product;
- the manufacturer’s name and address or a logo by which the manufacturer’s name and address can be explicitly identified;
- the building product name and type designation;
- the reference number and year of issue of the NTA by which the product performance is declared (here, ITB-KOT-2017/0345 Version 2);
- the National Declaration of Performance reference;
- the grade or level of declared performance;
- the name of the certification body which participated in the assessment and verification of constancy of performance of the building product;
- the manufacturer’s website address, if the National Declaration of Performance is available at it.

The NTA shall be supplied with a Safety Data Sheet and/or information about hazardous substances, or the SDS and/or the information shall be made available, according to Article 31 or 33 (as applicable in either case) of Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency.

If the building product is a hazardous mixture as defined in REACH, its marking shall comply with Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006 (CLP).

5. ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

5.1. National system for assessment and verification of constancy of performance (AVCP)

Pursuant to the Polish Regulation of the Minister of Infrastructure and Construction dated 17 November 2016 and concerning the Methods of Performance Declaration for Building Products and Application of Polish Construction Mark “B” (Dz. U. 2016.1966, as amended) the AVCP system 2+ applies.

5.2. Type testing

The performance assessed in Section 3 are the type test of the building product which remains valid until a change is made to stock materials, ingredients, production lines of the production plant of the building product.

5.3. Factory production control (FPC)

The manufacturer shall have an FPC (Factory Production Control) system implemented and maintained at its production plant. All elements, requirements and provisions of the FPC adopted by the manufacturer shall be consistently documented as rules and procedures, and complete with the records of tests done under the FPC. The FPC shall be adapted to the manufacturing process and ensure that the building product retains the declared performance in its serial production.

The FPC comprises a specification and checks of stock materials and ingredients, control and testing during the manufacturing process, and verification tests (ref. Section 5.4) carried out by the manufacturer according to a testing plan and the FPC-established rules and procedures.

The FPC results shall be periodically recorded. The records shall confirm that the building products meet the criteria of AVCP. Each product unit or product lot and their detailed manufacturing information shall be fully identifiable and traceable.

5.4. Verification tests

5.4.1. Testing program: The testing program includes:

a) routine tests;
b) periodic tests.

5.4.2. Routine tests: The routine tests shall include the verification of:

(a) shape and dimensions;

(b) the thickness of the zinc coating on steel components.

5.4.3. Periodic tests: Periodic testing shall include verification of the characteristic strength and capacity of the fasteners.

5.5. Testing frequency

The routine tests shall be completed according to an established testing plan and at least on every product lot. The product lot size shall be defined in the FPC documentation.

The periodic tests shall be completed at least every 3 years.

6. ADVICE

6.1. National Technical Assessment ITB-KOT-2017/0345 Version 2 replaces National Technical Assessment ITB-KOT-2017/0345 Version 1.

6.2. This NTA ITB-KOT-2017/0345 Version 2 is a positive assessment of the essential performance of the KOELNER-KC plastic/metal fasteners, where the performance, according to the intended use defined for the Neodisc plastic and metal fasteners in the NTA affect the compliance with essential requirements applicable to the buildings in which the building product will be applied.

6.3. This NTA ITB-KOT-2017/0345 Version 2 does not authorize any application of the Polish Construction Mark “B” to the building product.

Pursuant to the Polish Construction Product Act of 16 April 2004 (Dz. U. 2021.1213), the building products this NTA applies to can be marketed or made available on the domestic market if the manufacturer has completed the AVCP for the building products, issued a National Declaration of Performance compliant with the NTA ITB-KOT-2017/0345 Version 2 and applied the Polish Construction Mark “B” to the building products pursuant to the prevailing regulations of law.

6.4. This NTA ITB-KOT-2017/0345 Version 2 does not violate any rights granted by the industrial property protection laws, especially the Industrial Property Act of 30 June 2000 (Dz. U. 2021.324). The users of this BRI NTA shall be liable for assurance of the rights contemplated above.

6.5. By issuing this BRI NTA, BRI shall not be liable for any violation of acquired and exclusive rights.

6.6. The BRI NTA shall not relieve the manufacturer from its liability for proper quality of the building products or any construction contractor from its liability for the intended use of the building products.

6.7. This NTA can be renewed for successive periods, with each no longer than 5 years.

7. LIST OF REFERENCES FOR THE NTA PROCEDURE

7.1. Reports, test reports, assessment and classification

1) Test Report LZK00-022328/22/R166NZK, KC fasteners for thermal insulation attachment, BRI Building Structures, Geotechnics and Concrete Laboratory, Katowice 2022.
2) Test Report LZK00-022328/21/R158NZK, GOK-II, GOK-II PLUS, BRI Building Structures, Geotechnics and Concrete Laboratory, Katowice 2022.
3) Periodic Test Report FJ-RD-07 of 20.05.2020, Rawlplug S.A., 2020.
4) Manufacturer's Routine Test Report, Rawlplug S.A, 2018 2022.
5) Technical Survery Report 01940/17/Z00NZK, KOELNER-KC plastic/metal fasteners for thermal insulation attachment, BRI Building Structures and Geotechnics Laboratory, Warsaw 2017.
6) Technical Survery Report 02328/17/R99NZK, Technical survey of the KC fastener pressure plate rigidity, BRI Building Structures and Geotechnics Laboratory, Warsaw 2017.
7) Test Reports FJ-8.2.4.A-DKWT 32/10/2017, Koelner Rawlplug IP Sp. z o.o, 2014 2017.
8) LOK-851/A/05. Test Report and Technical Assessment for KOELNER-KC plastic/metal fasteners for thermal insulation attachment. BRI Building Structure Element Laboratory, Silesian Branch, Katowice 2005.
9) LOK-558/A/06. Test Report and Technical Assessment for type WB type screws for thermal insulation and waterproofing attachment. BRI Building Structure Element Laboratory, Silesian Branch, Katowice 2006.
10) LOK00-2328/12/R21OSK. Test Report for KC plastic-metal fasteners for thermal insulation attachment, BRI, Laboratory of Fasteners and Building Products – LOK, Katowice 2012.

7.2. Reference standards and documentation

PN-EN 338:2016 *Structural timber. Strength classes*

PN-EN 10346:2015 *Continuous hot-dip coated steel flat products for cold forming. Technical delivery conditions*

PN-EN 13168+A1:2015 *Thermal insulation products for buildings. Factory* made *wood wool (WW) products. Specification*

PN-EN 13986+A1:2015 *Wood-based panels for use in construction. Characteristics, evaluation of conformity and marking*

PN-EN ISO 898-1:2013 *Mechanical properties of fasteners made of carbon steel and alloy steel. Part 1: Bolts, screws and studs* with *specified property classes. Coarse thread and fine pitch thread*

PN-EN ISO 2178:2016 *Non-magnetic coatings on magnetic substrates. Measurement of coating thickness. Magnetic method*

PN-EN ISO 3497:2004	*Metallic coatings. Measurement of coating thickness. X-ray spectrometric methods*
PN-EN ISO 9223:2012	*Corrosion of metals and alloys. Corrosivity of atmospheres. Classification, determination and estimation.*
PN-EN ISO 11357-1:2016	*Plastics. Differential scanning calorimetry (DSC). Part 1: General principles*
AMS 5070:1994/RG	*Steel Bars and Forgings,* 0,*18-0,23C (SAE 1022)*
EOTATR026	*Plate stiffness of plastic anchors for ETICS*
ITB-KOT-2017 /0345 Version 1	*KOELNER-KC plastic/metal fasteners for thermal insulation attachment*

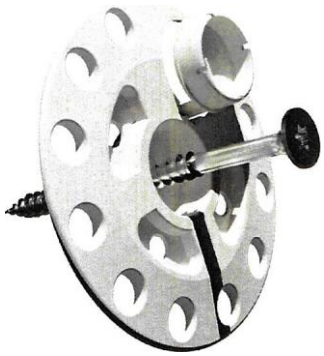
APPENDICES

Appendix A.

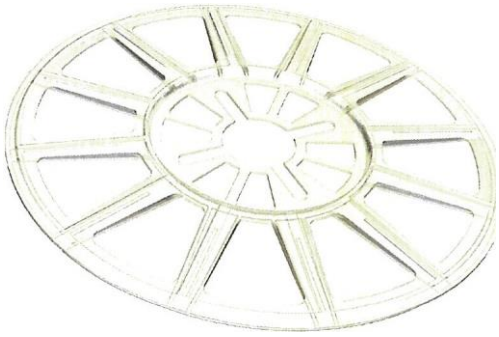
KC+UC

KC+WB

KC+WX

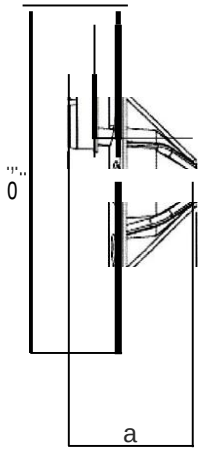


KC+WO

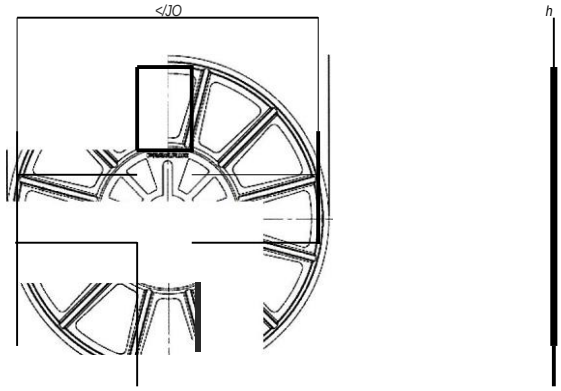


Additional KWL-140 pressure plate

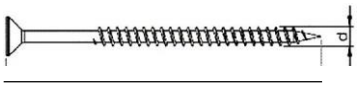
Fig. A1. KOELNER-KC plastic/metal fasteners for thermal insulation attachment



KC

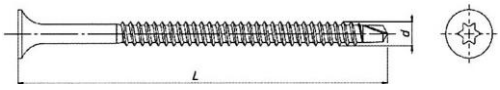


KWL

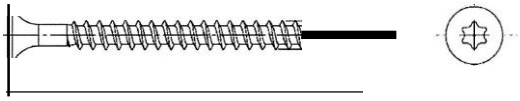


UC

WB



WX



WO

Fig. A2. Dimensions of the KOELNER-KC plastic/metal fasteners for thermal insulation attachment

Table A1. Dimensions of the KOELNER-KC plastic/metal fasteners with UC steel screws

#	Fastener type	KC pressure plate			UC screws		Additional KWL pressure plate	
		D1, mm	D2, mm	a, mm	d,mm	L,mm	D,mm	h,mm
1	*2*	*3*	*4*	*5*	*6*	7	*8*	*g*
1	KC/UC 05	60	6.1	15	5	25 + 120	140	4.05
2	KC/UC 06				6	30 + 220		
Maximum dimensional deviations		±1,5	±0,1	±0,5	±0,1	+0.0 -2.0	±2,0	±0,5

Table A2. Dimensions of the KOELNER-KC plastic/metal fasteners with WB steel screws

#	Fastener type	KC pressure plate			WB screws		Additional KWL pressure plate	
		D1, mm	D2, mm	a, mm	d1, mm	L,mm	D,mm	h,mm
1	*2*	*3*	*4*	5	*6*	7	*8*	*9*
1	KC/WB 04,8	60	6.1	15	4.8	80 + 220	140	4.05
Maximum dimensional deviations		±1,5	±0,1	±0,5	+0.10 -0.20	±1,0	±2,0	±0,5

Table A3. Dimensions of the KOELNER-KC plastic/metal fasteners with WX steel screws

#	Fastener type	KC pressure plate			WX screws		Additional KWL pressure plate	
		D1, mm	D2, mm	a, mm	d,mm	L,mm	D,mm	h,mm
1	*2*	*3*	*4*	5	*6*	7	*8*	*9*
1	KC/WX04,8	60	6.1	15	4.8	50 + 300	140	4.05
Maximum dimensional deviations		±1,5	±0,1	±0,5	+0.10 -0.20	±1,0	±2,0	±0,5

Table A4. Dimensions of the KOELNER-KC plastic/metal fasteners with WO steel screws

#	Fastener type	KC pressure plate			WO screws		Additional KWL pressure plate	
		D1, mm	D2, mm	a, mm	d,mm	L,mm	D,mm	h,mm
1	*2*	*3*	*4*	5	*6*	7	*8*	*9*
1	KC/WO 04,8	60	6.1	15	4.8	60 + 300	140	4.05
Maximum dimensional deviations		±1,5	±0,1	±0,5	+0.10 -0.20	±1,0	±2,0	±0,5

Appendix B.

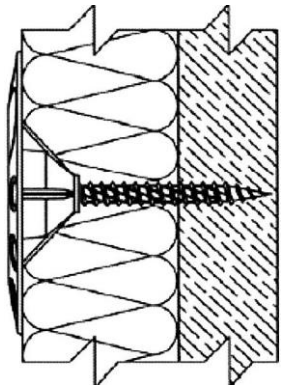


Fig. B1. Installation example of a KOELNER-KC fastener in a wooden substrate

Table B1. Installation characteristics of KOELNER-KC plastic/metal fasteners in steel sheet substrates

#	Installation parameter	Screws		
		WB04.8	**WX04.8**	**WO04.8**
1	*2*	*3*	*4*	*5*
1	Screw diameter, mm	4.8	4.8	4.8
2	Driving depth [1], mm	:::0.75 s; 2.00	:::0.63 s; 1.50	:::0.50 s; 1.00
3	Minimum screw spacing, mm	100	100	100
4	Minimum edge distance, mm	100	100	100
[1] The values specified are the thickness of the substrate sheet				

Table B2. Installation characteristics of KOELNER-KC plastic/metal fasteners in other substrates

#	Installation parameter	Screws		
		UC05	**UC06**	**WO04.8**
1	*2*	*3*	*4*	*5*
1	Screw diameter, mm	5.0	6.0	4.8
2	Driving depth, mm	:::20	:::25	:::18
3	Minimum screw spacing, mm	100	100	100
4	Minimum edge distance, mm	100	100	100

Appendix C.

Table C1. Pull-out strength and pull-over capacity of KOELNER-KC plastic/metal fasteners

#	Fastener type	Substrate type	Specific capacity, kN	Design capacity, kN
1	*2*	3	*4*	5
1	KC/UC 05 x L	Structural timber [1)]	0.73 [8)]	0.36 [8)]
2	KC/UC 06 x L	Structural timber [1)]	0.91 [8)]	0.45 [8)]
3	KC/WB 04.8 x L	Sheet steel [2)]	0.81 [8)]	0.40 [8)]
4	KC/WX 04.8 x L	Sheet steel [3)]	0.89 [8)]	0.44 [8)]
5	KC/WO 04.8 x L	Structural timber [1)]	0.89 [8)]	0.44 [8)]
		Sheet steel [4)]	0.89 [8)]	0.44 [8)]
		MEB Green Board Suprema GB 600 [5)]	0.35	0.17
		MEB Green Board Suprema GB 1050 [6)]	0.89 [8)]	0.44 [8)]
		MIAMI ECO BOARD Panel [7)]	0.89 [8)]	0.44 [8)]

[1)] Structural timber, minimum grade C24 (EN 338:2016) and a minimum specific density of 350 kg/m^3
[2)] sheet metal with a thickness of 0.75 + 2.00 mm, steel grade S280GD per PN-EN 10346:2015
[3)] sheet metal with a thickness of 0.63 + 1.50 mm, steel grade S280GD per PN-EN 10346:2015
[4)] sheet metal with a thickness of 0.50 + 1.00 mm, steel grade S280GD per PN-EN 10346:2015
[5)] board per PN-EN 13168+A1:2015, thickness 25 mm
[6)] board per PN-EN 13986+A1:2015, thickness 18 mm
[7)] board per PN-EN 13986+A1:2015, thickness 20 mm
[8)] Pull-over capacity per the screw head pull through the pressure plate