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NATIONAL TECHNICAL ASSESSMENT ITB-KOT-2018/0725 1st Edition

This National Technical Assessment has been issued in accordance with the Regulation of the Minister of Infrastructure and Construction of 17th November 2016 on national technical assessments (Official Journal of the Republic of Poland of 2016, pos. 1968) by Instytut Techniki Budowlanej (ITB - Building Research Institute) in Warsaw, upon a request of:

pgb-Polska sp. z o.o.
ul. Fryderyka Wilhelma Redena 3, 41-807 Zabrze

The National Technical Assessment ITB-KOT-2018/0725 1st Edition is a positive assessment of the performance of the following construction products for their intended use:

Plastic fasteners IPH 10/p and plastic-metal fasteners IPH 10/s for the fixing of thermal insulation

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The Document of the National Technical Assessment ITB-KOT-2018/0725, first edition, contains 17 pages, including 3 Annexes. The text of this document may only be copied in its entirety. Any publication or dissemination in any other form of excerpts from the text of the National Technical Assessment shall require written agreement with Instytut Techniki Budowlanej.

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1. TECHNICAL DESCRIPTION OF THE PRODUCT

The present National Technical Assessment refers to plastic fasteners of IPH 10/p type and plastic-metal fasteners IPH 10/s intended for the fixing of thermal insulation, manufactured by pgb-Polska sp. z o.o., ul. Fryderyka Wilhelma Redena 3, 41-807 Zabrze, in a manufacturing plant in Zabrze.

The components of plastic fasteners IPH 10/p are as follows: a plastic sleeve including a plate and a plastic expansion pin (drawing A1).

The components of plastic-metal fasteners IPH 10/s are as follows: a plastic sleeve including a plate and a steel expansion pin with a head covered with a plastic layer (figure A2).

Fasteners IPH 10/p and IPH 10/s can be applied together with additional plastic camping plates $\Phi 90$ and $\Phi 140$ (figures: A3 and A4).

The dimensions of the fasteners IPH 10/p and IPH 10/s presented in figures A1 and A2 are provided in tables A1 and A2.

The sleeves of fasteners IPH 10/p and IPH 10/s are made of processed Juroplast polypropylene with a melt mass-flow rate $MFR = 2,6 \div 9,0$ g/10 min., determined according to the standard PN-EN ISO 1133:2006 and the coefficient of thermal-oxidative durability $\alpha = 1,0$ determined according to the European Assessment Document EAD 330196-01-0604.

Plastic pins of IPH 10/p fasteners are made of polyamide reinforced with glass fibre (between 30% and 50%), while steel pins of IPH 10/s fasteners are made of ordinary carbon steel with tensile strength $f_{uk} \geq 360$ MPa and coated with a zinc coating of ≥ 5 μm thickness according to the standard PN-EN ISO 4042:2001, with the head covered with a layer of polyamide reinforced with glass fibre (between 30% and 50%).

2. THE INTENDED USE OF THE PRODUCT

The fasteners IPH 10/p and IPH 10/s are intended for mechanical fixing of thermal insulation of Styrofoam boards or mineral wool boards to the base material made of

- plain concrete, reinforced or unreinforced, of the following classes: C12/15 \div C50/60 according to the standard PN-EN 206+A1:2016,
- solid ceramic bricks with compressive strength not less than 15 N/m^2 (class not less than 15) according to the standard PN-EN 771-1+A1:2015,
- solid silicate bricks with compressive strength not less than 15 N/m^2 (class not less than 15) according to the standard PN-EN 771-2+A1:2015,
- porous bricks with holes with compressive strength not less than 15 N/m^2 (class not less than 15) according to the standard PN-EN 771-1+A1:2015 (with 12 mm wall thickness),
- silicate bricks with compressive strength not less than 15 N/m^2 (class not less than 15) according to the standard PN-EN 771-2+A1:2015 (with 40 mm wall thickness),
- autoclaved cellular concrete (aerated concrete) with a gross density in dry state not less than 350 kg/m^3 and average compressive strength not less $3,5 \text{ N/m}^2$ (class not less than 3,5) according to the standard PN-EN 771-4+A1:2015,

- concrete on lightweight aggregate with a gross density in dry state not less than 880 kg/m³ and an average compressive strength not less than 5 N/m² (class not less than 5) according to the standard PN-EN 771-3+A1:2015.

Due to the corrosive aggressiveness of the environment, IPH 10/s fasteners shall be used in accordance with the requirements set forth in the standards: PN-EN ISO 12944-2:2018, PN-EN ISO 9223:2012 and PN-EN ISO 2081:2018.

In order to determine the design resistances of the fasteners IPH 10/p and IPH 10/s, the characteristic resistances provided in Annex C shall be divided by a partial safety factor of 2,0.

The number of IPH 10/p and IPH 10/s fasteners shall be determined on the basis of the static calculation taking into account the design resistances.

The installation and layout parameters of IPH 10/p and IPH 10/s fasteners are given in Annex B.

For fixing, a hole shall be drilled in the base material, to which a plastic sleeve shall be inserted into, and through driving the expansion pin a permanent anchorage is obtained.

Fasteners IPH 10/p and IPH 10/s shall be used in accordance with the technical design, developed taking into account the Polish construction standards and regulations, the findings of this National Technical Assessment and the manufacturer's instructions concerning the conditions of performing the fixings with the use of the above specified fasteners.

3. PERFORMANCE OF THE PRODUCT AND METHODS USED FOR ITS ASSESSMENT

3.1 Performance of the product

3.1.1. Characteristic resistances of fastener fixings. Characteristic resistances of fixings of IPH 10p and IPH 10/s fasteners for pulling out of the base material are given in Annex C.

3.1.2. Strength properties of the sleeve plates of fasteners. The stiffness of the sleeve plates of IPH 10p and IPH 10/s fasteners shall not be less than 0,4 kN/mm and breaking load of the plate shall not be less than 1,42 kN.

3.1.3. Durability of the suspension pins. Zinc coating of steel suspension pins with a thickness of not less than 5 µm ensures the durability of the fasteners in the scope resulting from point 2.

3.2. Methods used for performance assessment

3.2.1. Characteristic resistances of fastener fixings. Characteristic resistances of fixings of IPH 10/p and IPH 10/3 fasteners are tested in compliance with EAD 330196-01-0604 on fasteners anchored in base materials described in Annex C.

3.2.2. Strength parameters of the sleeve plate of fasteners. Strength parameters of the sleeve plate of IPH 10/p and IPN 10/s fasteners are tested in compliance with EOTA Technical Report TR 026.

3.2.3. Durability of the steel suspension pins. Test of zinc coating thickness is carried out in compliance with the standard PN-EN ISO 2178:2016 or PN-EN ISO 3497:2004.

4. PACKAGING, TRANSPORT AND STORAGE AND MARKING OF THE PRODUCT

The IPH 10/p and IPH 10/s fasteners shall be delivered in sets, in the manufacturer's own packaging and stored and transported in a way that ensures that their technical properties remain unchanged.

The method of marking the products with a construction mark shall be in accordance with the Regulation of the Minister of Infrastructure and Construction of 17th November 2016 on the method of declaring the performance of construction products and the method of marking them with a construction mark (Journal of Laws of the Republic of Poland of 2016, item 1966, including later amendments).

The marking of the product with a construction mark shall be accompanied by the following information:

- the last two digits of the year in which the construction mark was first placed on the construction product;
- the name and address of the manufacturer's registered office or an identification mark allowing explicit identification of the name and address of the manufacturer's registered office;
- the name and type designation of the construction product;
- the number and year of issue of the National Technical Assessment, which served as the basis for the declaration of performance; (ITB-KOT-2018/0725 1st edition);
- the number of the national declaration of performance;
- the level or class of the declared performance;
- the name of the certification body that has participated in the assessment and verification of constancy of performance of the construction product,
- the address of the manufacturer's website, if the national declaration of performance is made available on that website.

A safety data sheet and/or information on hazardous substances contained in a construction product referred to in the Articles 31 or 33 of Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and Establishing the European Chemicals Agency shall be provided or made available together with the national declaration of performance, as appropriate.

Moreover, the marking of a construction product, being a hazardous mixture according to the REACH regulation, shall comply with the requirements of Regulation (EC) No. 1272/2008 of the European Parliament and of the Council on Classification, Labelling and Packaging of Substances and Mixtures (CLP), amending and repealing Directives: 67/548/EEC and 1999/45/EC, as well as amending Regulation (EC) No. 1907/2006.

5. ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE (AVCP)

5.1. National system for the assessment and verification of the constancy of performance

In accordance with the Regulation of the Minister of Infrastructure and Construction of 17th November 2016 on the method of declaring the performance of construction products and the method of marking them with a construction mark (Journal of Laws of the Republic of Poland of 2016, item 1966, including later amendments) the System 2+ of AVCP shall be applicable.

5.2. Type testing

The performance characteristics assessed in point 3 constitute the product-type testing, unless raw materials, components, production line or manufacturing plant have been changed.

5.3. Factory production control

In the manufacturing plant the manufacturer shall have implemented a factory production control system. All the elements, requirements and provisions adopted by the manufacturer for the system shall be documented methodically in the form of written policies and procedures, including test records. The factory production control shall be adapted to the manufacturing processes and ensure the achievement of the declared performance of the product in series production.

The factory production control includes the specification and verification of raw materials and components, inspections and in-process tests and control tests (following point 5.4) carried out by the manufacturer in accordance with the prescribed test plan and according to the principles and procedures laid down in the documentation of the factory production control.

The results of production control shall be recorded on a regular basis. The records of the register shall prove that the products have satisfied the criteria of the assessment and verification of the constancy of performance. Individual products or batches of the products and related manufacturing details shall be fully identifiable and traceable.

5.4. Control tests

5.4.1. Test plan. The test plan shall include:

- a) ongoing tests,
- b) periodic tests.

5.4.2. Ongoing tests. The ongoing tests shall include inspection of:

- a) the shape and dimensions,
- b) the thickness of zinc coating.

5.4.3. Periodic tests. Periodic tests shall include the verification of characteristic resistances of fastener fixings.

- a) verification of characteristic resistances of fastener fixings,
- b) verification of the coefficient of thermal-oxidative durability of the sleeve material.

5.5. Frequency of tests

The ongoing tests shall be conducted in compliance with the prescribed test plan, however not less frequently than for each batch of the products. The size of a batch of the products shall be specified in the documentation of factory production control.

The periodic tests shall be performed at least once every 3 years.

6. INSTRUCTIONS

6.1. The National Technical Assessment ITB-KOT-2018/0725 1st edition is a positive assessment of the performance of those essential characteristics of the plastic fasteners IPH 10/p and plastic-metal fasteners IPH 10/s, which, in accordance with the intended use, resulting from the provisions of the Assessment, have an impact on the fulfilment of basic requirements by the construction works in which the product will be used.

6.2. The National Technical Assessment ITB-KOT-2018/0725 1st edition is not a document authorizing to mark the construction product with a construction mark.

Pursuant to the Act on Construction Products of 16th April, 2004 (Journal of Laws of 2016, item 1570, including later amendments) the products to which this National Technical Assessment refers may be launched or made available on the domestic market, if the manufacturer has assessed and verified the constancy of performance, drawn up a national declaration of performance in accordance with the National Technical Assessment ITB-KOT-2018/0725 1st edition and marked the products with the construction mark in compliance with the applicable regulations.

6.3. The National Technical Assessment ITB-KOT-2018/0725 1st edition does not infringe the rights resulting from the provisions on industrial property protection, and in particular the Act of 30th June, 2000 – the Industrial Property Law (the consolidated text: Journal of Laws of 2013, item 1410, including later amendments). Ensuring these rights is the responsibility of the users of this National Technical Assessment, by ITB.

6.4. When issuing the National Technical Assessment, ITB shall not be held responsible for any possible infringement of exclusive and acquired rights.

6.5. The National Technical Assessment does not release the manufacturer of products from responsibility for their proper quality, and the contractors of construction works from responsibility for their proper use.

6.6. The validity of the National Technical Assessment may be extended for further periods, however not exceeding 5 years.

7. A LIST OF DOCUMENTS USED IN THE PROCEEDINGS

7.1. Reports, test reports, evaluations, classifications

- 1) LK00-06026/18/R41NZK. Test report and summary of test results of plastic fasteners S-IPH-JΦ10 for mechanical fixing of thermal insulation in external wall insulation systems – fixing resistances, stiffness of the plate and thickness of zinc coating. Building Structures,

Geotechnics and Concrete Department of the Building Research Institute (ITB), Katowice, 2018.

- 2) LK00-06026/17/R39NZK. Test report and summary of test results of plastic fasteners S-IPT-8-J for mechanical fixing of thermal insulation in external wall insulation systems – coefficient of thermal-oxidative durability. Building Structures, Geotechnics and Concrete Department of the Building Research Institute (ITB), Katowice, 2017.

7.2. Related standards and documents

PN-EN 1133:2006	<i>PLASTICS - DETERMINATION OF THE MELT MASS-FLOW RATE (MFR) AND MELT VOLUME-FLOW RATE (MVR) OF THERMOPLASTICS</i>
PN-EN ISO 4042:2001	<i>FASTENERS. ELECTROLYTIC COATINGS</i>
PN-EN 206+A1:2016	<i>CONCRETE. PART 1: REQUIREMENTS, PROPERTIES, PRODUCTION AND COMPLIANCE</i>
PN-EN 771-1+A1:2015	<i>SPECIFICATION FOR MASONRY UNITS. PART 1: CLAY MASONRY UNITS.</i>
PN-EN 771-2+A1:2015	<i>SPECIFICATION FOR MASONRY UNITS. PART 2: CALCIUM SILICATE MASONRY UNITS.</i>
PN-EN 771-4+A1:2015	<i>SPECIFICATION FOR MASONRY UNITS. PART 4: AUTOCLAVED AERATED MASONRY UNITS.</i>
PN-EN 771-3+A1:2015	<i>SPECIFICATION FOR MASONRY UNITS. PART 3: AGGREGATE CONCRETE MASONRY UNITS (DENSE AND LIGHTWEIGHT AGGREGATES).</i>
PN-EN ISO 12944-2:2018	<i>PAINTS AND VARNISHES. CORROSION PROTECTION OF STEEL STRUCTURES BY PROTECTIVE PAINT SYSTEMS. PART 2: CLASSIFICATION OF ENVIRONMENTS</i>
PN-EN ISO 9223:2012	<i>CORROSION OF METALS AND ALLOYS. CORROSIVITY OF ATMOSPHERES. CLASSIFICATION, DETERMINATION AND ASSESSMENT.</i>
PN-EN ISO 2081:2018	<i>METALLIC AND OTHER INORGANIC COATINGS. ELECTROPLATED COATINGS OF ZINC WITH SUPPLEMENTARY TREATMENTS ON IRON OR STEEL.</i>
PN-EN ISO 2178:2016	<i>NON-MAGNETIC COATINGS ON MAGNETIC SUBSTRATES. MEASUREMENT OF COATING THICKNESS. MAGNETIC METHOD.</i>
PN-EN ISO 3497:2004	<i>METALLIC AND OXYGEN COATINGS. MEASUREMENT OF COATING THICKNESS. MICROSCOPIC METHOD.</i>
EAD 330196-01-0604	<i>Plastic anchors made of virgin or non-virgin material for fixing of external thermal insulation composite systems with rendering Plastic anchors for fixing of external thermal insulation composite systems with rendering</i>
EOTA TR 026	<i>Plate stiffness of plastic anchors for ETICS (external thermal insulation composite systems)</i>

ANNEXES

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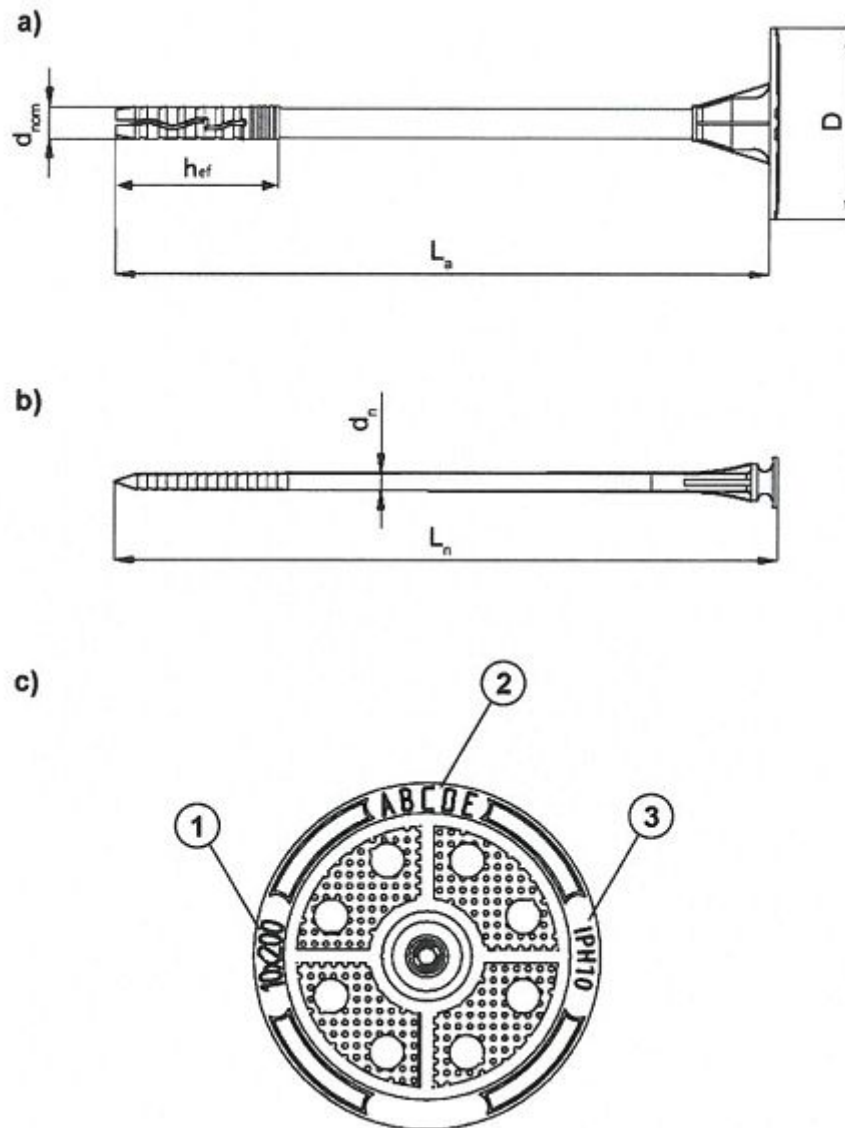


Figure A1. Plastic fastener IPH 10/p for fixing of thermal insulation
 a) plastic sleeve together with a plate; b) plastic pin; c) sleeve plate
 1 – dimensions of the fastener; 2 – functional category according to EAD 330196-01-0604;
 3 – sleeve marking

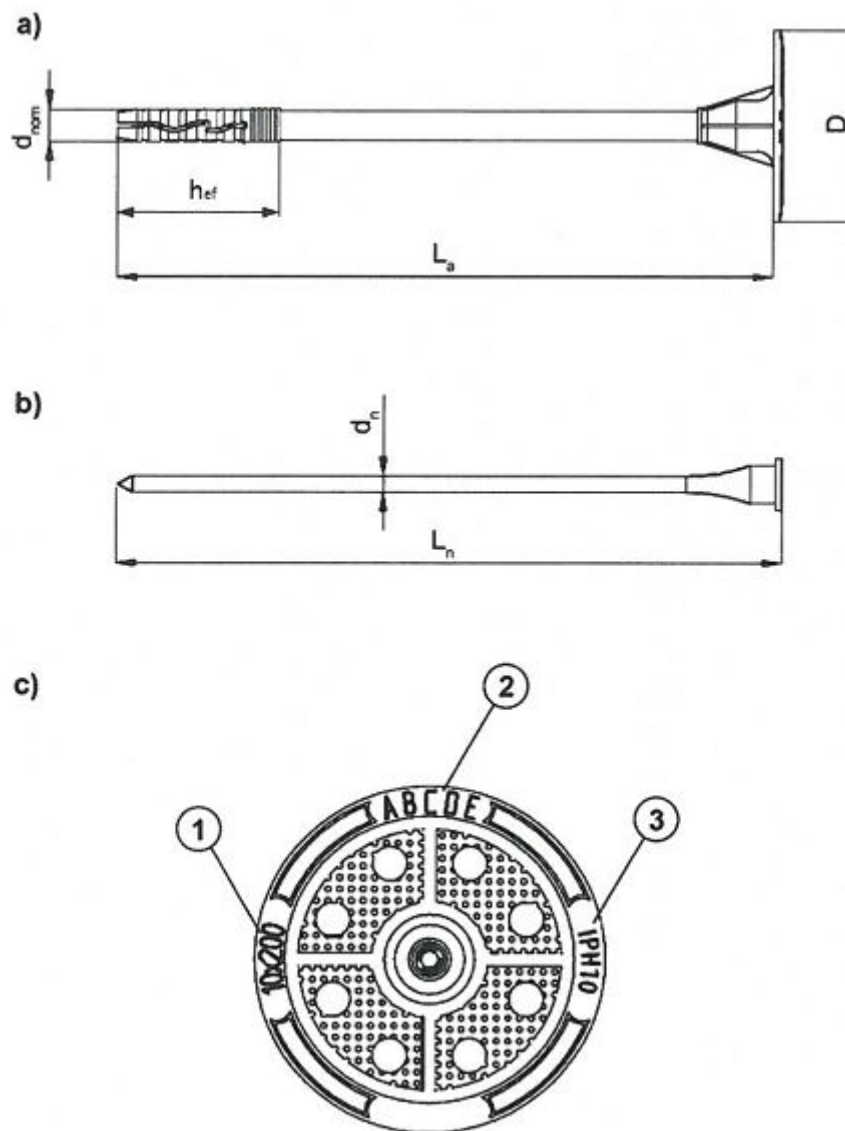


Figure A2. Plastic fastener IPH 10/s for fixing of thermal insulation

a) plastic sleeve together with a plate; **b)** steel pin

1 – dimensions of the fastener; 2 – functional category according to EAD 330196-01-0604;

3 – sleeve marking

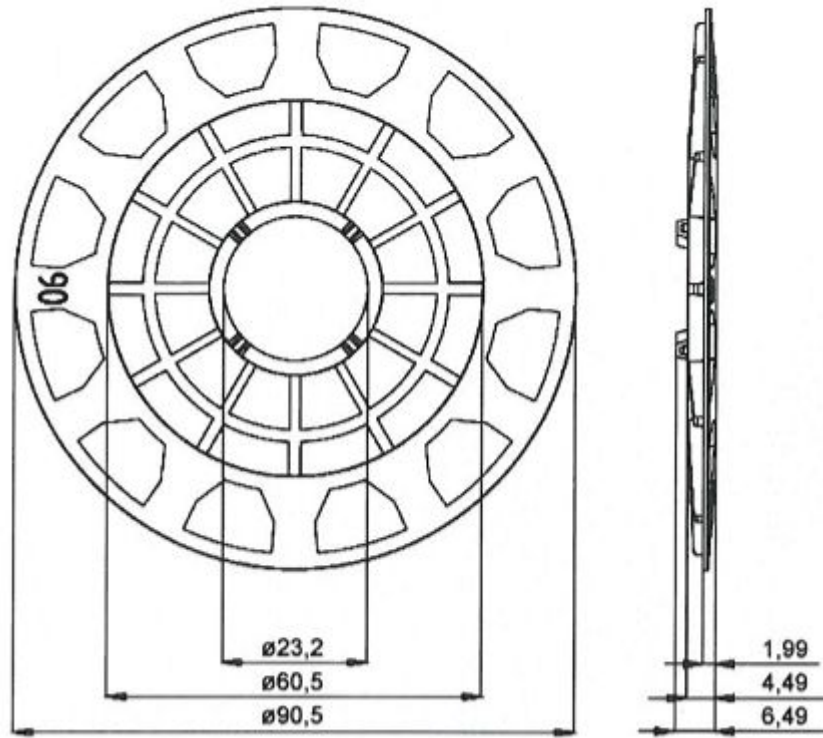


Figure A3. Additional plastic clamping plate $\Phi 90$

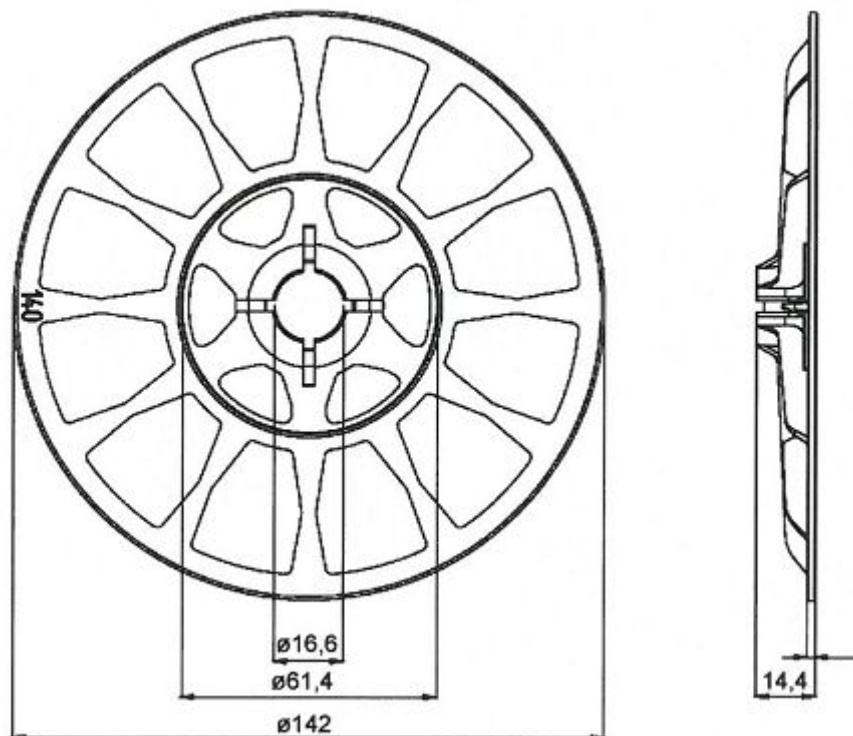


Figure A4. Additional plastic clamping plate $\Phi 140$

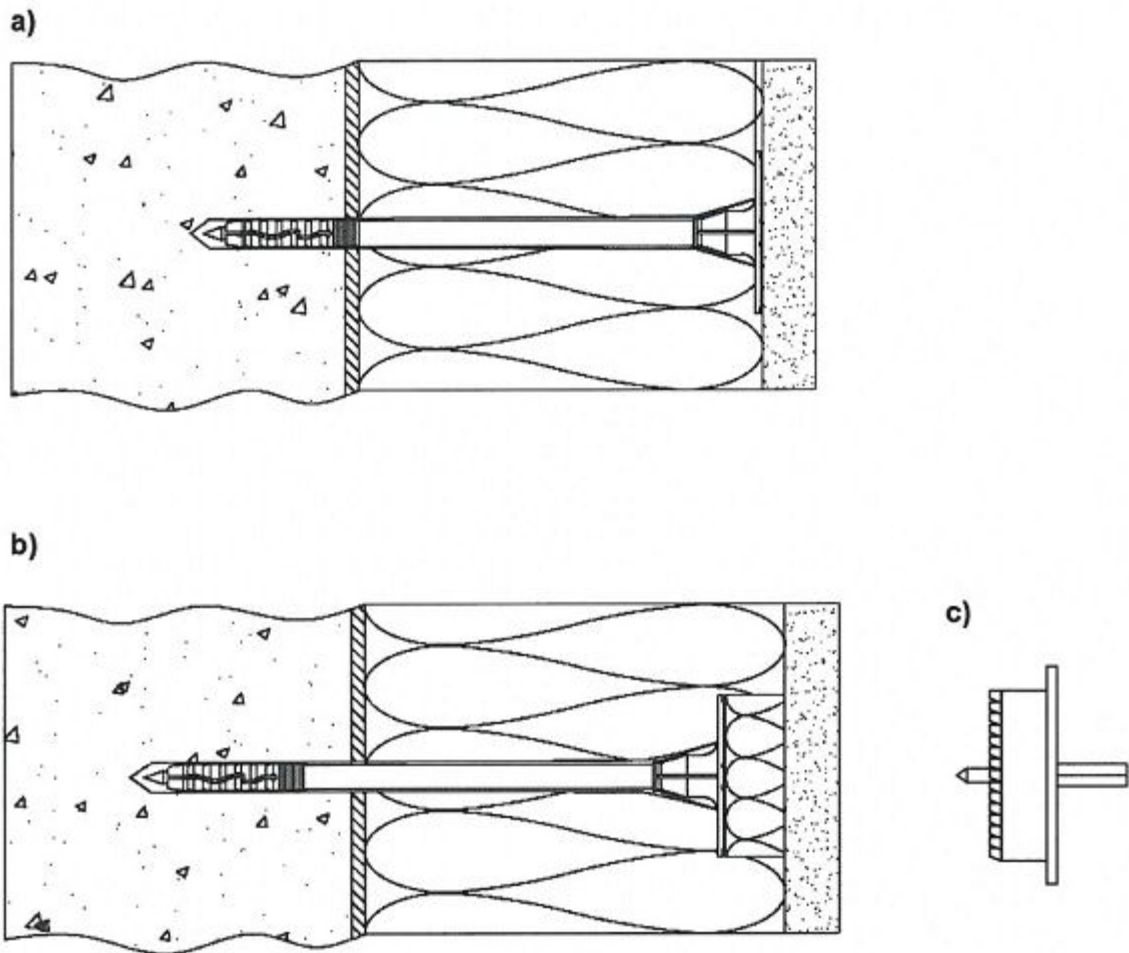


Figure A5. Fixing with the use of the IPH 10/p or IPH 10/s fastener

- a)** standard fixing; **b)** fixing with the use of additional thermal insulation for the fastener;
c) drill bit tip used for making a hole for additional thermal insulation

Table A1. Dimensions of the IPH 10/p plastic fasteners in mm

Pos.	Fastener marking	Plastic steeve				Plastic pin	
		$d_{nom} \pm 0,1$	$L_a \pm 2$	$D \pm 1$	h_{ef}	$d_n \pm 0,15$	$L_n \pm 2$
1	2	3	4	5	6	7	8
1	IPH 10/p x 70	10	70	60	50	5,10	75
2	IPH 10/p x 90	10	90	60	50	5,10	95
3	IPH 10/p x 120	10	120	60	50	5,10	125
4	IPH 10/p x 140	10	140	60	50	5,10	145
5	IPH 10/p x 160	10	160	60	50	5,10	165
6	IPH 10/p x 180	10	180	60	50	5,10	185
7	IPH 10/p x 200	10	200	60	50	5,10	205
8	IPH 10/p x 220	10	220	60	50	5,10	225
9	IPH 10/p x 260	10	260	60	50	5,10	265
10	IPH 10/p x 300	10	300	60	50	5,10	305

Table A2. Dimensions of the IPH 10/s plastic fasteners in mm

Pos.	Fastener marking	Plastic steeve				Steel pin	
		$d_{nom} \pm 0,1$	$L_a \pm 2$	$D \pm 1$	h_{ef}	$d_n \pm 0,15$	$L_n \pm 2$
1	2	3	4	5	6	7	8
1	IPH 10/s x 70	10	70	60	50	5,00	75
2	IPH 10/s x 90	10	90	60	50	5,00	95
3	IPH 10/s x 120	10	120	60	50	5,00	125
4	IPH 10/s x 140	10	140	60	50	5,00	145
5	IPH 10/s x 160	10	160	60	50	5,00	165
6	IPH 10/s x 180	10	180	60	50	5,00	185
7	IPH 10/s x 200	10	200	60	50	5,00	205
8	IPH 10/s x 220	10	220	60	50	5,00	225
9	IPH 10/s x 260	10	260	60	50	5,00	265
10	IPH 10/s x 300	10	300	60	50	5,00	305

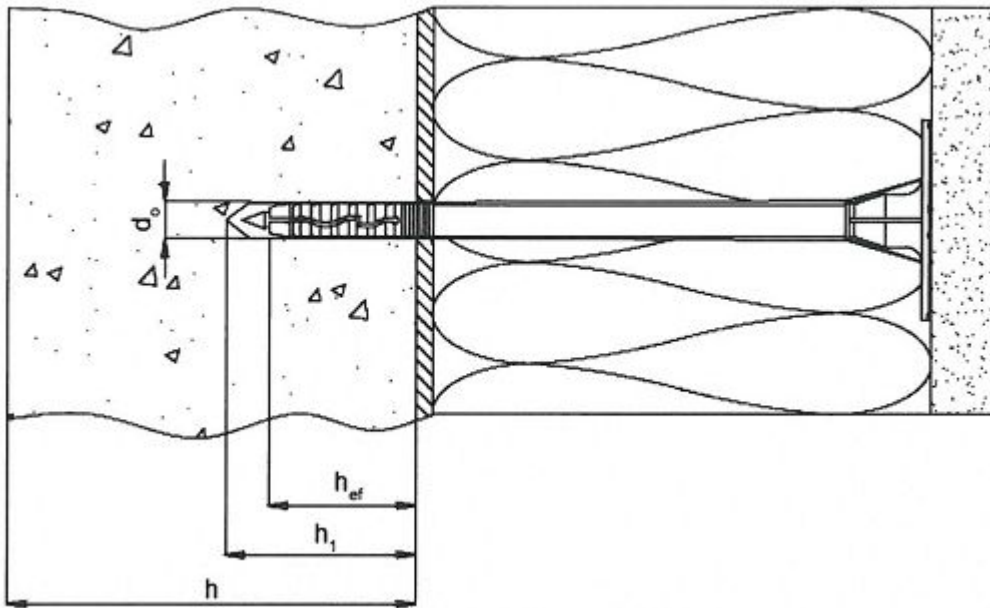


Figure B1. Installation parameters of the IPH 10/p and IPH 10/s

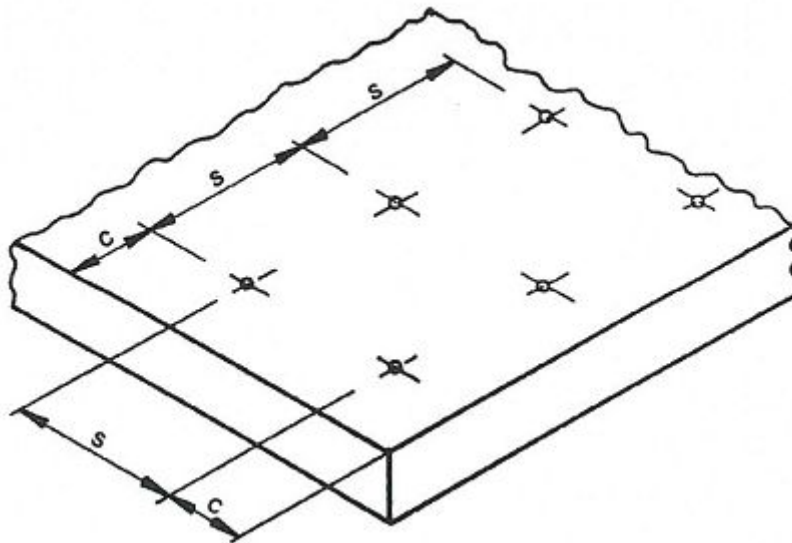


Figure B2. Layout parameters of the IPH 10/p and IPH 10/s fasteners
 s – axial spacing of fasteners, c – fastener distance from the base material edge

Table B1. Installation and layout parameters of the IPH 10/p and IPH 10/s fasteners

Pos.	Parameter	Fastener type	
		IPH 10/p	IPH 10/s
1	2	3	4
1	Maximal hole diameter d_o equal to nominal drill bit diameter d_{nom} , mm	10	10
2	Minimal hole depth h_1 , mm	60	60
3	Effective anchorage depth h_{ef} , mm	50	50
4	Minimal spacing of fasteners s , mm	100	100
5	Minimal distance between the fastener and base material edge c , mm	100	100
6	Minimal base material thickness h_{min} , mm	100	100

Table C1. Characteristic resistances of fixings of the IPH 10/p and IPH 10/s fasteners to tension loads

Pos.	Parameter	Characteristic resistance N_{Rk} , kN	
		Fastener type	
		IPH 10/p	IPH 10/s
1	2	3	4
1	Plain concrete of C12/15 class ⁽¹⁾	0,55	0,45
2	Plain concrete of C16/20 ÷ C50/60 ⁽¹⁾	0,75	0,65
3	Solid ceramic bricks of 15 class ⁽²⁾	0,45	0,45
4	Solid silicate bricks of 15 class ⁽²⁾	0,45	0,45
5	Porous ceramic bricks with holes of 15 class ⁽³⁾ , with 12 mm wall thickness	0,10	0,20
6	Silicate bricks with holes of 15 class ⁽²⁾ , with 40 mm wall thickness	0,45	0,40
7	Autoclaved cellular concrete (aerated concrete) with 350 kg/m ³ density, 3,5 class ⁽⁴⁾	0,10	0,10
8	Concrete on lightweight aggregate LAC5 with 880 kg/m ³ density and compressive strength ≥ 5 MPa ⁽⁵⁾	0,40	0,40
⁽¹⁾ – according to the standard PN-EN 206+A1:2016 ⁽²⁾ – according to the standard PN-EN 771-1+A1:2015 ⁽³⁾ – according to the standard PN-EN 771-2+A1:2015 ⁽⁴⁾ – according to the standard PN-EN 771-4+A1:2015 ⁽⁵⁾ – according to the standard PN-EN 771-3+A1:2015			