



INSTYTUT TECHNIKI BUDOWLANEJ

PL 00-611 WARSZAWA, ul. Filtrowa 1, www.itb.pl

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NATIONAL TECHNICAL ASSESSMENT ITB-KOT-2018/0526 1st Edition

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

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

National Technical Assessment ITB-KOT-2018/0526 1st Edition is a favourable assessment of the performance properties of the following construction products for their intended use:

The pgb plastic-metal anchors for fixing thermal insulation

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DIRECTOR
of Building Research Institute

Robert Geryło, Ph.D. (Eng)



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The Document of National Technical Assessment ITB-KOT-2018/0526, first edition, contains 16 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. The National Technical Assessment ITB-KOT-2018/0526, first edition, concerns products covered by the Technical Approval ITB AT-8671/2011.

Instytut Techniki Budowlanej

ul. Filtrowa 1, 00-611 Warszawa

Phone: 22 825 04 71; Tax identification NIP number: 525 000 93 58; National Court Register KRS: 0000158785

1. TECHNICAL DESCRIPTION OF THE PRODUCT

This National Technical Assessment covers the pgb plastic-metal anchors of types: SPKKØ6, SPKKØ8, SPKKØ10, SPCKØ6, SPCKØ8, SPCKØ10, SPØ6, SPØ8 and SPØ10 for fixing thermal insulation manufactured by pgb-Polska Sp. z o.o., ul. Fryderyka Wilhelma Redena 3, 41-807 Zabrze, in manufacturing plant in Zabrze.

The pgb anchors consist of plastic sleeves with a countersunk, cylindrical or mushroom flange and steel pins with tapered head (Figures A1, A2 and A3).

The dimensions of the pgb anchors, shown in Figures A1, A2 and A3 are given in Table A1. Dimension tolerances are in accordance with the standard: PN-EN 22768-1:1999 for linear dimensions m , and PN-EN ISO 965-2:2001 for thread dimensions.

Fixing with the pgb anchors is shown in Figures A4 ÷ A6.

The sleeves of the pgb anchors are made of polypropylene characterized by a differential scanning calorimetry (DSC) curve, according to the standard: PN-EN ISO 11357-1:2016, in accordance with the standard established in the National Technical Assessment procedure.

The pins are made of carbon steel in mechanical property class not lower than 4.8 according to the standard: PN-EN ISO 898-1:2013 and covered with zinc coating with thickness not less than 5 μm , meeting the requirements of the standard: PN-EN ISO 4042:2001.

2. SPECIFICATION OF THE INTENDED USE OF THE PRODUCT

The pgb anchors are designed for mechanical fixing of profile/boards, used as fastening elements for the insulation layer of external walls, in the following substrates:

- made of normal concrete class C20/25 ÷ C50/60 according to the standard: PN-EN 206+A1:2016,
- made of ceramic solid bricks with compressive strength not less than 15 N/mm^2 (class not less than 15) according to the standard: PN-EN 771-1+A1:2015,
- made of silicate bricks, solid with a compressive strength of not less than 15 N/mm^2 (class not lower than 15) according to the standard: PN-EN 771-2+A1:2015

Due to the corrosion aggressiveness of the environment, the pgb anchors shall be used in accordance with the requirements given in the standards: PN-EN ISO 12944-2:2001, PN-EN ISO 9223:2012 and PN-EN ISO 2081:2009.

In order to determine the design characteristic resistance values of the pgb anchors, the characteristic resistance values provided in Annex C shall be divided by the partial safety factor equal to 2,0.

The number of anchors shall be determined on the basis of statistical calculations taking into account the aforementioned design resistance.

The parameters for the installation and arrangement of the pgb anchors are given in Annex B.

In order to perform fixing, a hole shall be drilled in the substrate, a plastic sleeve inserted into it and by driving the expansion pin a permanent anchorage will be created.

The pgb anchors shall be used in accordance with the technical design prepared taking into account Polish building standards and regulations, the provisions of this National Technical Assessment and in accordance with the manufacturer's instructions relating to the conditions for fixings with use of the above specified anchors.

3. PERFORMANCE PROPERTIES OF THE PRODUCT AND METHODS APPLIED TO ASSESS THE PROPERTIES

3.1 Performance properties of the product

3.1.1. Characteristic resistance of fixings with the anchors. Characteristic tension resistance of fixings with the pgb anchors are provided in Annex C.

3.1.2. Working life of steel expansion pins. Zinc coating with a thickness not less than 5 µm of steel expansion pins of the pgb anchors ensures the working life of the anchors to the extent resulting from article 2.

3.2. Methods used to assess performance properties

3.2.1. Characteristic resistance of fixings with the anchors. Characteristic tension resistance of fixings with the pgb anchors shall be tested according to EAD 330196-00-0604 on the anchors seated in the substrates described in Annex C.

3.2.2. Working life of the steel expansion pins. Thickness of the zinc coating shall be tested according to the standard: PN-EN ISO 2178:2016 or PN-EN ISO 3497:2004.

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

The pgb anchors shall be delivered in sets in original manufacturer's packaging and stored and transported in such a way as to ensure that their performance properties remain unchanged.

The manner of marking the products with the construction mark shall be in accordance with the Regulation of the Minister of Infrastructure and Construction of November 17, 2016 on the way of declaring the performance properties of construction products and the manner of marking them with the construction mark (Journal of Laws of the Republic of Poland (Dz. U.) of 2016, item 1966).

Product marking 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 the 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 properties; (ITB-KOT-2018/0526 1st edition);
- the number of the national declaration of performance properties;

- the level or class of the declared performance properties;
- the name of the certification body which participated in the assessment and verification of the constancy of performance properties of the construction product;
- the address of the manufacturer's website, if the national declaration of performance properties 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 Article 31 or 33 of the 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 properties, as appropriate.

Moreover, the marking of a construction product, being a hazardous mixture according to the REACH regulation, shall comply with the requirements of the 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 the Directives 67/548/EEC and 1999/45/EC, and amending the Regulation (EC) No. 1907/2006.

5. ASSESSMENT AND VERIFICATION OF THE 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 November 17, 2016 on the manner of declaring the performance properties of construction products and the manner of marking them with a construction mark (Official Journal of the Republic of Poland (Dz. U.) of 2016, item 1966), the system for the assessment and verification of the constancy of performance: 2+ shall be applicable.

5.2. Type testing

The performance properties assessed in article 3 shall constitute the product type testing unless the changes in raw materials, components, production line or manufacturing plant have been introduced.

5.3. Factory production control

At 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 in a systematic manner 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 properties of the product in serial production.

The factory production control includes the specification and verification of raw materials and components, inspections and tests to be carried out during manufacture process and control tests (according to article 5.4), conducted by the manufacturer in accordance with the established test plan and according to the principles and procedures specified 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 confirm whether the products have satisfied the criteria of the assessment and verification of the constancy of performance properties. Individual products or batches of 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 verification of:

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

5.4.3. Periodic tests. The periodic tests shall include verification of characteristic resistance of fixings with the anchors.

5.5. Frequency of tests

The ongoing tests shall be conducted in accordance with the prescribed test plan, but not less frequently than for each batch of the products. The size of a batch of 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-2018/0526 1st edition is a favourable assessment of the performance properties of those essential characteristics of the pgb anchors which, in accordance with the intended use, resulting from the provisions of the Assessment, influence the fulfilment of basic requirements by the construction objects in which the product will be applied.

6.2. The National Technical Assessment ITB-KOT-2018/0526 1st edition is not a document authorizing to mark a construction product with a construction mark.

Pursuant to the Act on Construction Products of April 16, 2004, as later amended (consolidated text: Journal of Laws of the Republic of Poland (Dz. U.) of 2016, item 1570), the products to which this National Technical Assessment applies may be marketed or made available on the domestic market, if the manufacturer has assessed and verified the constancy of performance properties, drawn up a national declaration of performance properties in accordance with the National Technical Assessment ITB-KOT-2018/0526 1st edition and marked the products with a construction mark in compliance with the applicable regulations.

6.3. The National Technical Assessment ITB-KOT-2018/0526 1st edition does not infringe the rights resulting from the provisions on industrial property protection, and in particular from the Act of June 30, 2000 – Industrial Property Law (consolidated text: Journal of Laws of the Republic of Poland (Dz. U.) of 2013, item 1410, as later amended). Ensuring these rights shall be the responsibility of the users of this ITB National Technical Assessment.

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 shall not release the manufacturer of products from responsibility for their proper quality, while the contractors of construction works from responsibility for their proper use.

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

7. LIST OF DOCUMENTS USED IN THE PROCEEDINGS

7.1. Reports, test reports, evaluations, classifications

- 1) LZK00-06026/17/R38NZK. Test report and register of test results concerning the pgb anchors for mechanical fixing of profile/boards, used as fastening elements for the insulation layer of external walls. Department of Building Constructions and Geotechnics of the Building Research Institute (ITB), Katowice, 2017.
- 2) 51/2018. Test report concerning the analysis of differential scanning calorimetry (DSC) of plastic sleeves of the pgb anchors. Institute for Engineering of Polymer Materials and Dyes, Toruń, 2018.

7.2. Related standards and documents

PN-EN 22768-1:1999	<i>Tolerancje ogólne. Tolerancje wymiarów liniowych i kątowych bez indywidualnych oznaczeń tolerancji (Tolerances for linear and angular dimensions without individual tolerance indications)</i>
PN-EN ISO 965-2:2001	<i>Gwinty metryczne ISO ogólnego przeznaczenia. Tolerancje. Część 2: Wymiary graniczne gwintów zewnętrznych i wewnętrznych ogólnego przeznaczenia. Klasa średniodokładna. (ISO general-purpose metric screw threads. Part 2: Limits of sizes for general purpose external and internal screw threads. Medium quality.)</i>
PN-EN ISO 11357-1:2016	<i>Tworzywa sztuczne. Różnicowa kalorymetria skaningowa (DSC). Część 1: Zasady ogólne. (Plastics. Differential scanning calorimetry (DSC). Part 1: General principles.)</i>
PN-EN ISO 898-1:2013	<i>Własności mechaniczne części złącznych wykonanych ze stali węglowej i stopowej - Śruby i śruby dwustronne (Mechanical properties of fasteners made of carbon steel and alloy steel. - The anchors and studs)</i>
PN-EN ISO 4042:2001	<i>Części złączne - Powłoki elektrolityczne (Fasteners - Electrolytical coatings)</i>
PN-EN 206:1016	<i>Beton. Część 1. Wymagania, właściwości, produkcja i zgodność (Concrete – Requirements, properties, production and compliance)</i>
PN-EN 771-1:2015	<i>Wymagania dotyczące elementów murowych. Część 1: Elementy murowe ceramiczne (Requirements relating to masonry units. Part 1: Ceramic masonry units)</i>
PN-EN 771-2+A1:2015	<i>Wymagania dotyczące elementów murowych – Część 2: Elementy murowe silikatowe (Requirements relating to masonry units – Part 2: Silicate masonry units)</i>

PN-EN ISO 12944-2:2001	<i>Farby i lakiery. Ochrona przed korozją konstrukcji stalowych za pomocą ochronnych systemów malarskich. Część 2: Klasyfikacja środowisk (Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Part 2: Classification of environments)</i>
PN-EN ISO 9223:2012	<i>Korozja metali i stopów. Korozyjność atmosfer. Klasyfikacja, określenie i ocena (Corrosion of metals and alloys. Corrosivity of atmospheres. Classification, determination and estimation)</i>
PN-EN ISO 2081:2009	<i>Powłoki metalowe i inne nieorganiczne. Elektrolityczne powłoki cynkowe z dodatkową obróbką na żelazie lub stali (Metallic and other inorganic coatings. Electroplated coatings of zinc with supplementary treatments on iron or steel.)</i>
PN-EN ISO 2178:2016	<i>Powłoki niemagnetyczne na podłożu magnetycznym. Pomiar grubości powłok. Metoda magnetyczna (Non-magnetic coatings on magnetic substrates. Measurement of coating thickness. Magnetic method.)</i>
PN-EN ISO 3497:2004	<i>Powłoki metalowe i tlenkowe. Pomiar grubości powłok. Metoda mikroskopowa (Metallic and oxygen coatings. Measurement of coating thickness. Microscopic method)</i>
EAD 330196-00-0604	<i>Plastic anchors for fixing of external thermal insulation composite systems with rendering</i>
AT-15-8671/2011	<i>Tworzywowo-metalowe łączniki pgb (pgb plastic-steel anchors)</i>

ANNEXES

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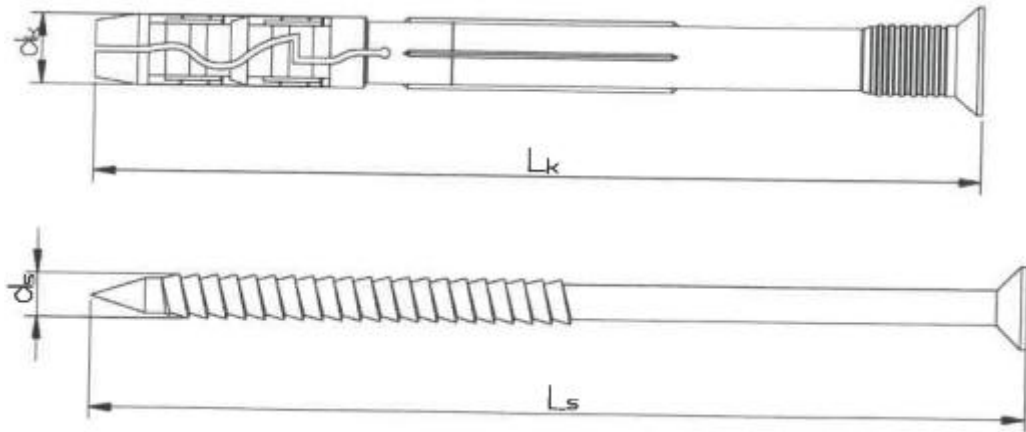


Figure A1. SPKK anchor

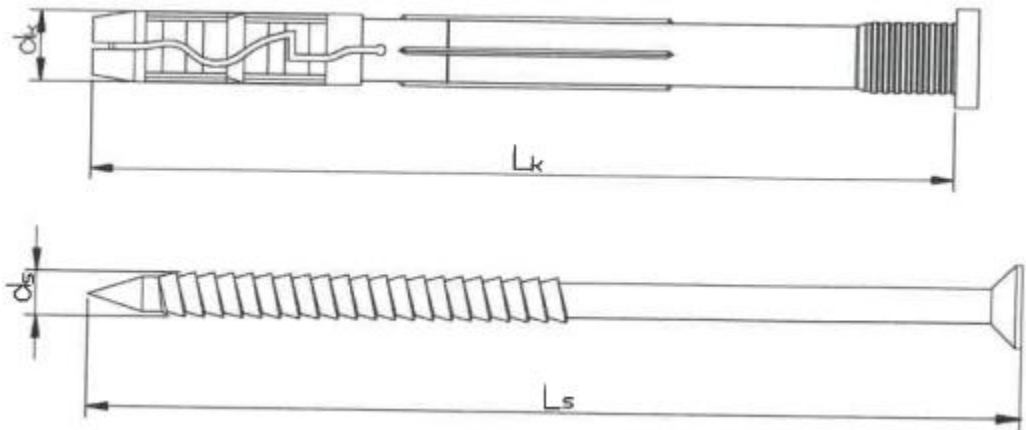


Figure A2. The anchor SPCK

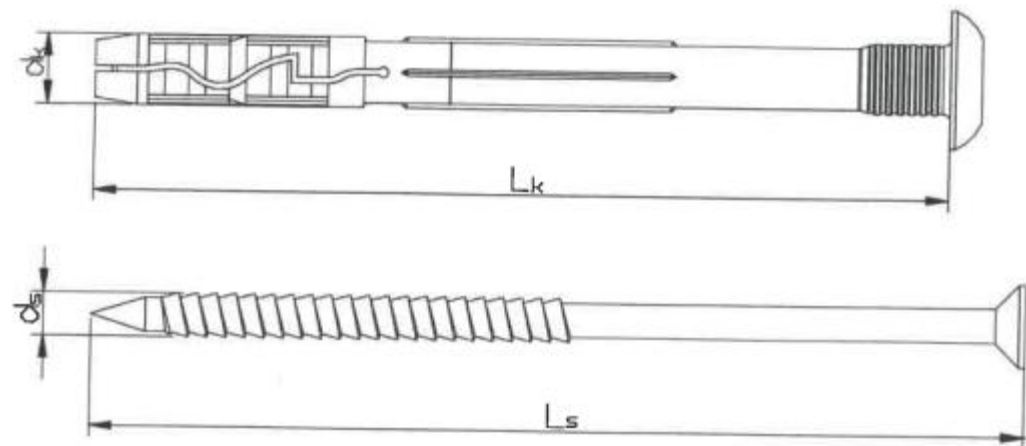


Figure A3. The anchor SP

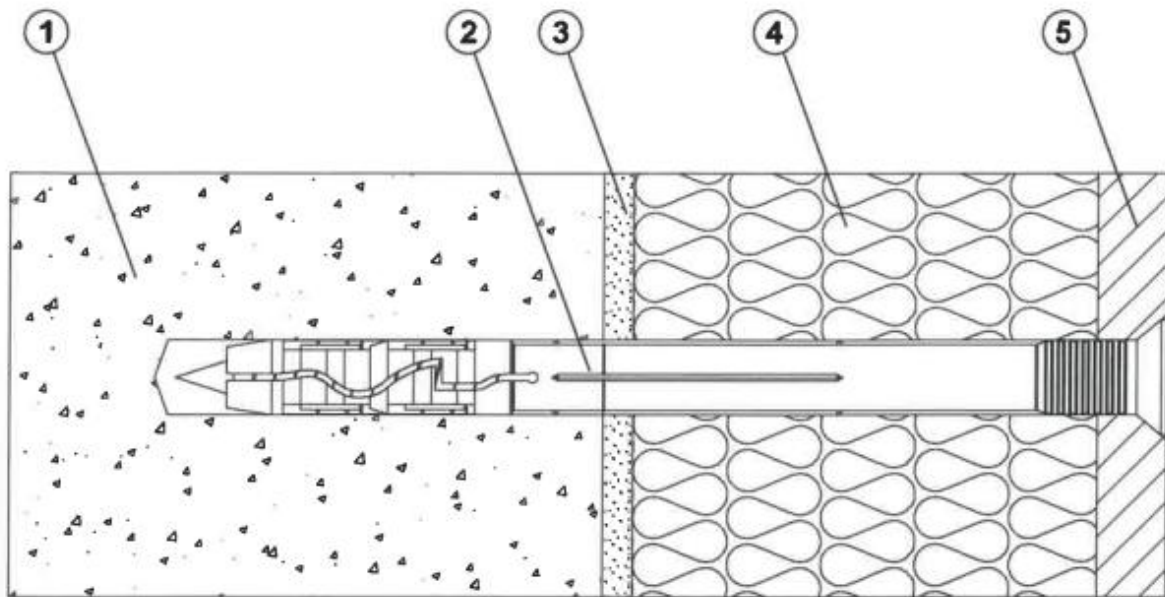


Figure A4. Fixing with use of the anchor SPKK

1 – substrate; 2 – anchor; 3 – finishing layer; 4 – insulation layer; 5 – fastening profile/board

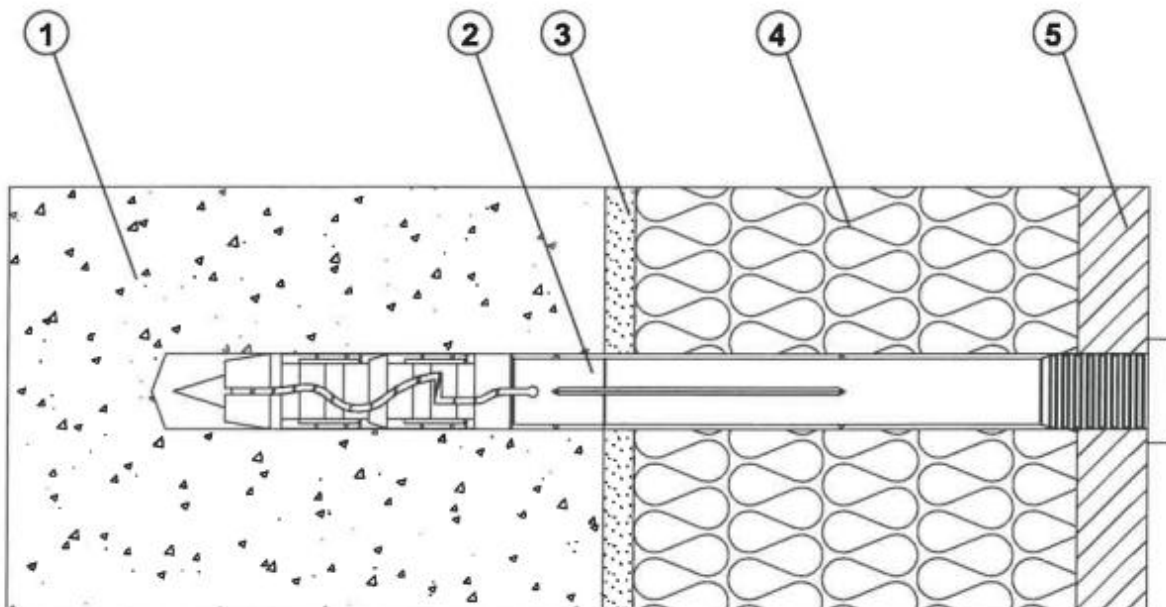


Figure A5. Fixing with use of the anchor SPCK

1 – substrate; 2 – anchor; 3 – finishing layer; 4 – insulation layer; 5 – fastening profile/board

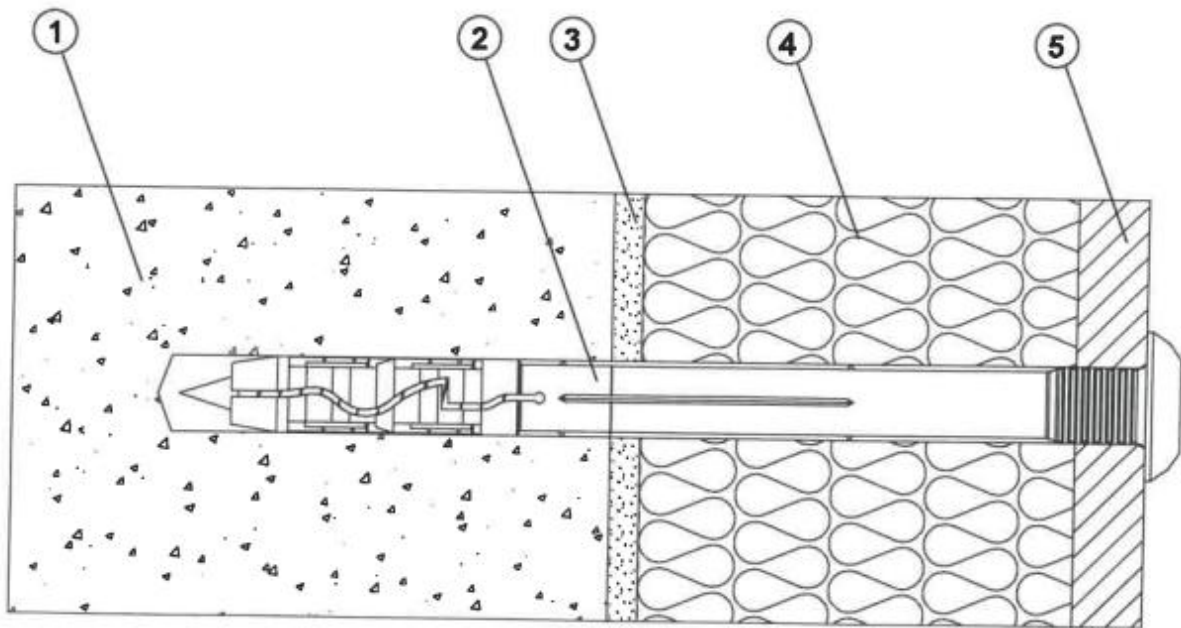


Figure A5. Fixing with use of the anchor SP

1 – substrate; 2 – anchor; 3 – finishing layer; 4 – insulation layer; 5 – fastening profile/board

Table A1. Dimensions of the anchors SPKK, SPCK and SP

Item	Designation of the anchor	d_k , mm	L_k , mm	d_s , mm	L_s , mm
1	2	3	4	5	6
1	SPKKØ6 x 35	6	35	3,9	40
2	SPKKØ6 x 40	6	40	3,9	45
3	SPKKØ6 x 50	6	50	3,9	55
4	SPKKØ6 x 60	6	60	3,9	65
5	SPKKØ6 x 80	6	80	3,9	85
6	SPKKØ8 x 45	8	45	5,0	50
7	SPKKØ8 x 60	8	60	5,0	65
8	SPKKØ8 x 80	8	80	5,0	85
9	SPKKØ8 x 100	8	100	5,0	105
10	SPKKØ8 x 120	8	120	5,0	125
11	SPKKØ8 x 140	8	140	5,0	145
12	SPKKØ10 x 80	10	80	6,9	85
13	SPKKØ10 x 100	10	100	6,9	105
14	SPKKØ10 x 120	10	120	6,9	125
15	SPKKØ10 x 140	10	140	6,9	145
16	SPKKØ10 x 160	10	160	6,9	165
17	SPCKØ6 x 40	6	40	3,9	45
18	SPCKØ6 x 50	6	50	3,9	55
19	SPCKØ6 x 60	6	60	3,9	65
20	SPCKØ6 x 80	6	80	3,9	85
21	SPCKØ8 x 45	8	45	5,0	50
22	SPCKØ8 x 60	8	60	5,0	65
23	SPCKØ8 x 80	8	80	5,0	85
24	SPCKØ8 x 100	8	100	5,0	105
25	SPCKØ8 x 120	8	120	5,0	125
26	SPCKØ8 x 140	8	140	5,0	145
27	SPØ6 x 40	6	40	3,9	45
28	SPØ6 x 60	6	60	3,9	65
29	SPØ6 x 80	6	80	3,9	85

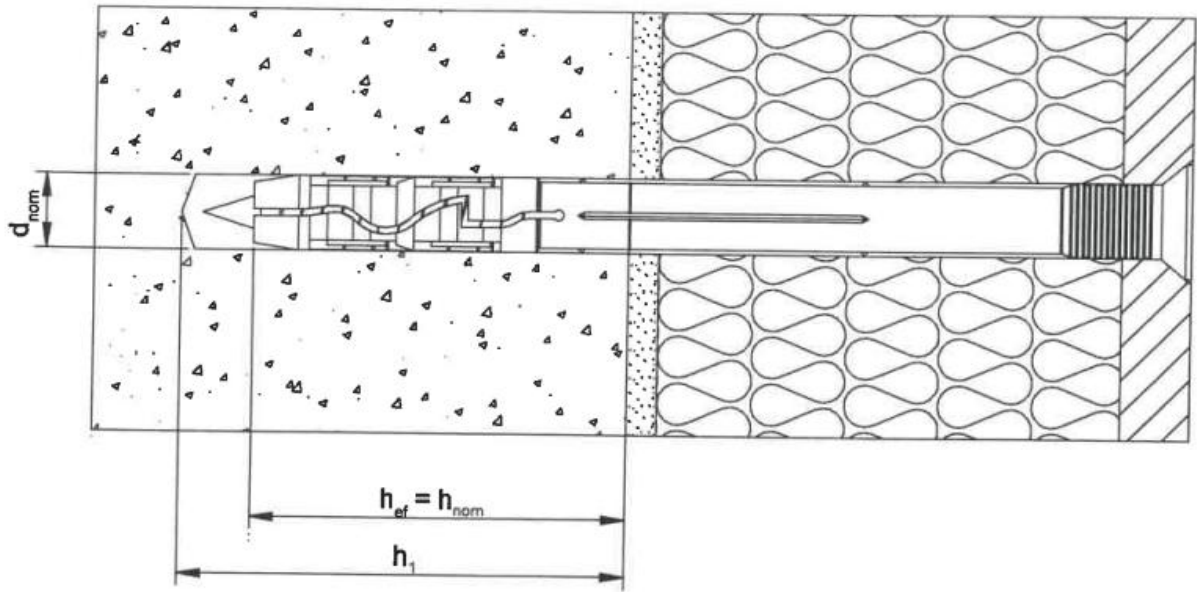


Figure B1. Installation parameters of the anchors SPKK

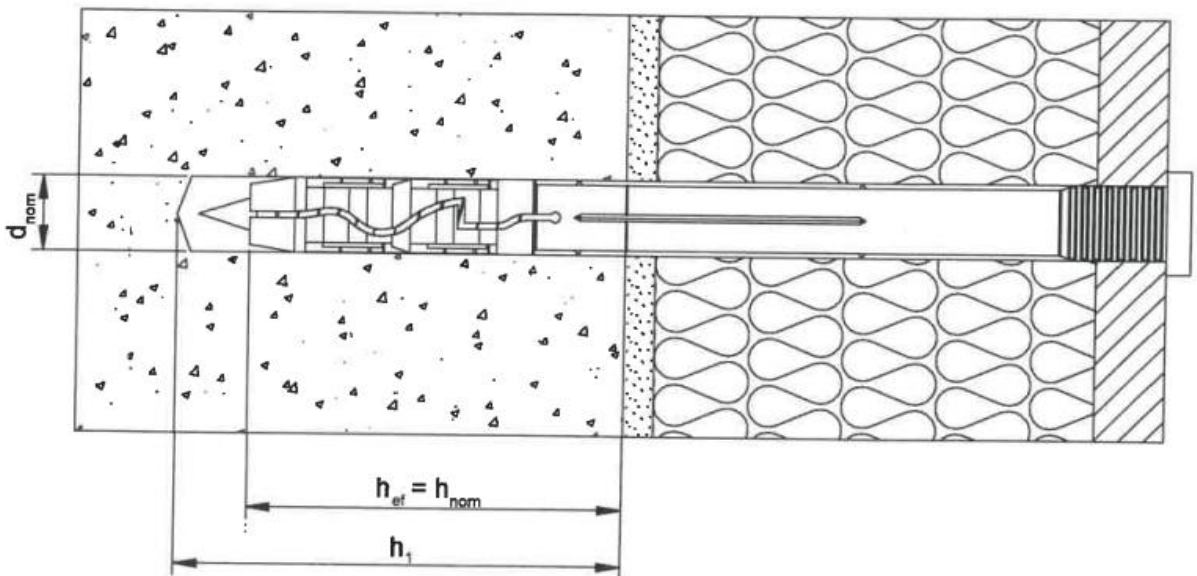


Figure B2. Installation parameters of the anchors SPCK

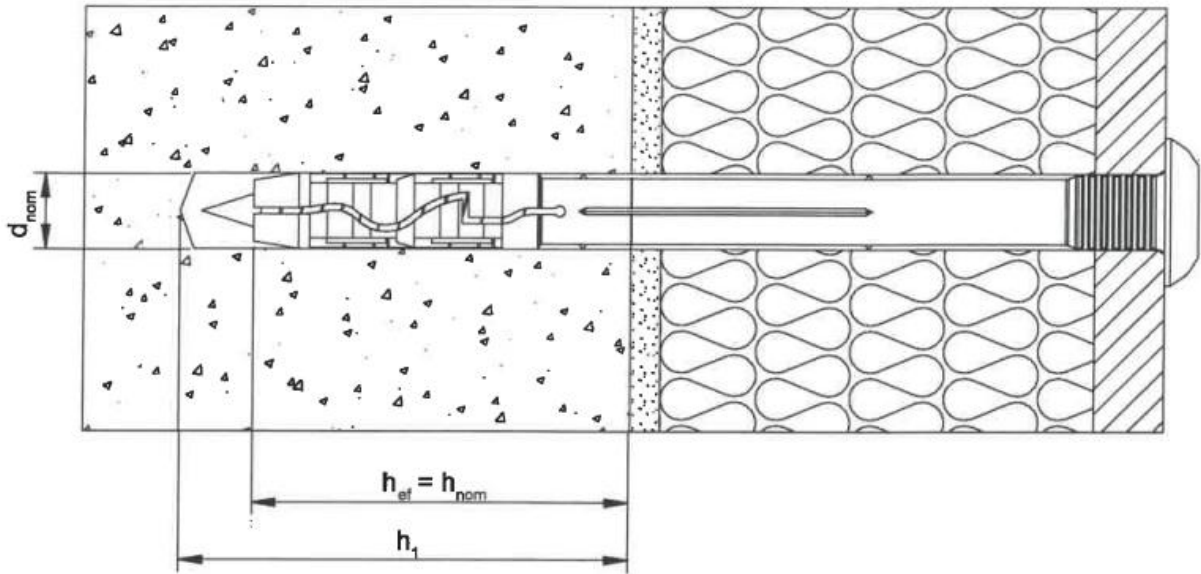


Figure B3. Installation parameters of the anchors SP

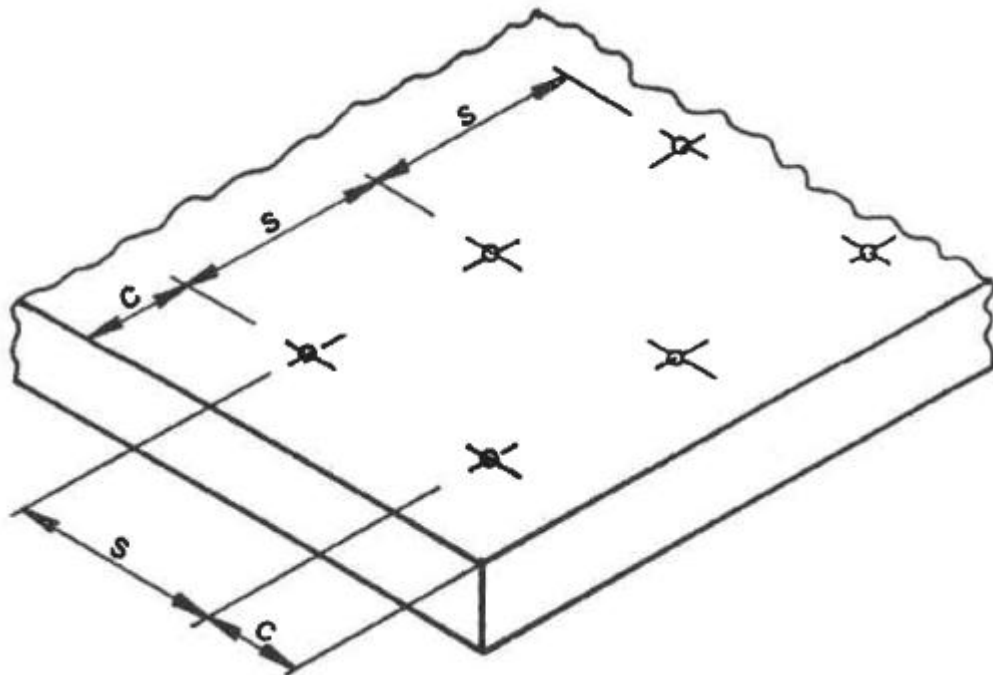


Figure B4. Arrangement parameters of the anchors SPKK, SPCK or SP in the substrate
 s – axial spacing of the anchors, c – anchor distance from the substrate edge

Table B1. Parameters of installation and arrangement of the pgb anchors

Item	Parameter	Designation of the anchor		
		SPKKØ6 SPCKØ6 SPØ6	SPKKØ8 SPCKØ8 SPØ8	SPKKØ10 SPCKØ10 SPØ10
1	2	3	4	5
1	Nominal diameter of a drill d_{nom} , mm	6	8	10
2	Depth of a drilled hole h_1 , mm	35	45	55
3	Effective depth of anchorage h_{ef} , mm equal to nominal depth of anchorage h_{nom} 1 mm	30	40	50
4	Minimum spacing of the anchors s , mm	100	100	100
5	Minimum distance of the anchor from the substrate edge c , mm	100	100	100

Table C1. Characteristic tension resistance of fixings with the pgb anchors

Item	Type of the substrate	Characteristic resistance $N_{R,k}$, kN		
		Designation of the anchor		
		SPKKØ6 SPCKØ6 SPØ6	SPKKØ8 SPCKØ8 SPØ8	SPKKØ10 SPCKØ10 SPØ10
1	2	3	4	5
1	Concrete, class C20/25 ⁽¹⁾	0,50	0,75	0,90
2	Ceramic bricks, full, class 15 ⁽²⁾	0,40	0,75	1,50
3	Silicate bricks, full, class 15 ⁽³⁾	0,40	0,75	1,50
⁽¹⁾ - according to the standard PN-EN 206+A1:2016 ⁽²⁾ - according to the standard PN-EN 771-1: 2015 ⁽³⁾ - according to the standard PN-EN 771-2: 2015				