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NATIONAL TECHNICAL ASSESSMENT ITB-KOT-2019/1113 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 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-2019/1113 1st Edition is a positive assessment of the performance of the following construction products for their intended use:

Steel fasteners SMMIP for the fixing of thermal insulation

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DYREKTOR
Instytutu Techniki Budowlanej

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1. TECHNICAL DESCRIPTION OF THE PRODUCT

The subject of the National Technical Assessment are steel fastener SMMIP for the fixing of thermal insulation (product type designation), manufactured by pgb-Polska Sp. z o.o., ul. Fryderyka Wilhelma Redena 3, 41-807 Zabrze, in a manufacturing plant in China.

The fasteners covered by this National Technical Assessment are in the form of a sleeve of $\varnothing 8$ nominal diameter and a plate with diameter $\varnothing 35$.

The fasteners SMMIP are made of galvanised carbon steel, DX51D+Z100 grade according to the standard: PN-EN 10346:2015 and coated with a zinc coating of not less than 5 μm thickness according to the standard: PN-EN ISO 4042:2018 or PN-EN ISO 2081:2018.

The shape and dimensions of the fasteners under this National Technical Assessment are provided in Annex A.

2. THE INTENDED APPLICATION OF THE PRODUCT

The steel fasteners SMMIP are intended for mechanical fixing thermal insulation of Styrofoam boards or mineral wool boards to the base material of common, non-cracked concrete of C20/25 ÷ C50/60 class according to PN-EN 206+A1:2016.

Due to the corrosive aggressiveness of the environment, fasteners SMMIP shall be applied in compliance with the requirements set forth in standards: PN-EN ISO 12944-2:2018 and PN-EN ISO 9223:2012.

The parameters of installation and arrangement of fasteners SMMIP in the base material are provided in Annex B.

The design resistances of the fasteners anchorages for pulling out from the base material shall be determined taking into account the characteristic resistances given in Annex C and partial safety factor amounting to 2.52 for pulling out (tension load) and 1.25 for shearing.

The number of fasteners shall be determined on the basis of static calculations, which take into account the design resistance given in Annex C, where the number of fasteners per 1 m^2 of insulating material shall not be less than 4.

The fastener is installed by manually placing it in the pre-drilled hole in the base material and then hammering it in, which causes the fastener to be permanently anchored in the base material.

The steel fasteners SMMIP shall be used in accordance with the technical design elaborated for a particular facility taking into account the following:

- requirements of the Polish standards and technical and construction regulations, in particular the Regulation of the Minister of Infrastructure of 12th April 2002 on technical conditions to be met by buildings and their location (Journal of Laws of the Republic of Poland of 2019, item 1065),
- provisions of this National Technical Assessment,
- manufacturer's instructions concerning the conditions for making fixings with the use of the above mentioned fasteners, supplied to the customers.

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 fastener fixings for tension and shear loads are given in Annex C.

3.1.2. Durability of the fasteners. Zinc coating with a thickness of not less than 5 µm ensures the durability of the fasteners in the scope specified in point 2.

3.2. Methods used for performance assessment

3.2.1. Characteristic resistances of fastener fixings. Characteristic resistances of fastener fixings are tested in accordance with EAD 330232-00-0601 on fasteners anchored in base material of common, non-cracked concrete, of C20/25 – C50/60 class according to PN-EN 206+A1:2016. The forces shall be measured by means of a device selected to the expected value of the destructive force, enabling a constant and slow increase of the force until destruction.

3.1.2. Durability of the fasteners. Test of zinc coating thickness is carried out in compliance with PN-EN ISO 2178:2016 or PN-EN ISO 3497:2004.

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

Steel fasteners SMMIP shall be delivered in manufacturer's packaging and stored and transported in such a way as to ensure that their technical 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 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).

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 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-2019/1113 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 item 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 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 of the product in series production.

The factory production control includes the specification and verification of raw materials and components, inspections and tests carried out during manufacture and control tests (following item 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 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. 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.

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.

Periodic tests should be performed at least once every 3 years.

6. INSTRUCTIONS

6.1. The National Technical Assessment ITB-KOT-2019/1113 1st edition is a positive assessment of the performance of those essential characteristics of the steel fasteners SMMIP for the fixing of thermal insulation 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 objects in which the product will be applied.

6.2. The National Technical Assessment ITB-KOT-2019/1113 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 2019, pos. 266, including later amendments) the products to which this National Technical Assessment refers to 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 ITB-KOT-2019/1113 National Technical Assessment 1st edition and marked the products with a construction mark in compliance with the applicable regulations.

6.3. The National Technical Assessment ITB-KOT-2019/1113 1st edition does not infringe the rights resulting from the provisions on industrial property protection, in particular the Act of 30th June, 2000 – the Industrial Property Law (Journal of Laws of 2017, pos. 776, including later amendments). Ensuring these rights is 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 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) LK00-06026/19/R48NZK. Test report concerning metal fasteners for the fixing of thermal insulation, the Building Structures, Geotechnics and Concrete Department, Building Research Institute (ITB), Katowice, 2018.
- 2) LK00-06026/18/R42NZK. Test report concerning metal fasteners for the fixing of thermal insulation, the Building Structures and Geotechnics Department, Building Research Institute (ITB), Katowice, 2018.

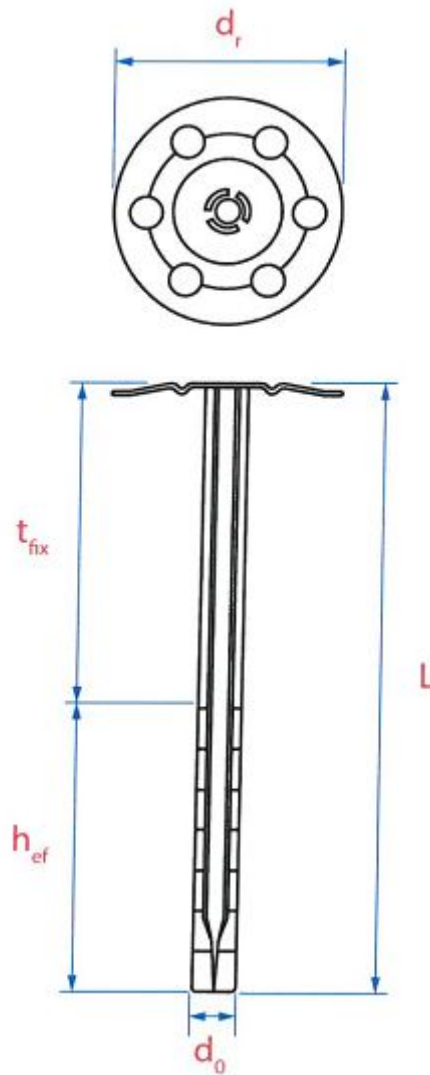
7.2. Related standards and documents

PN-EN 206+A1:2016	<i>Beton. Wymagania, właściwości, produkcja i zgodność. - Concrete. Requirements, properties, production and compliance</i>
PN-EN 10346:2015	<i>Wyroby płaskie stalowe powlekane ogniowo w sposób ciągły do obróbki plastycznej na zimno. Warunki techniczne dostawy. – Continuously hot-dip</i>

	<i>coated steel flat products for cold forming. Technical delivery conditions.</i>
PN-EN ISO 4042:2018	<i>Części złączne. Powłoki elektrolityczne. - Fasteners. Electroplated coating systems.</i>
PN-EN ISO 2081:2018	<i>Powłoki metalowe i inne nieorganiczne. Elektrolityczne powłoki cynkowe z obróbką dodatkową 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. Pomiary grubości powłok. Metody spektrometrii rentgenowskiej. – Metal coatings. Measurements of coating thickness. Methods of X-ray spectrometry.</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 assessment.</i>
PN-EN ISO 12944-2:2018	<i>Farby i lakiery. Ochrona przed korozją konstrukcji stalowych za pomocą ochronnych systemów malarskich. Part 2: Klasyfikacja środowisk. - Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Part 2: Classification of environments</i>
EAD 330232-00-0601	<i>Mechanical fasteners for use in concrete</i>

ANNEXES

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Annex A.


Pos.	Marking of the fastener	Dimensions, mm				
		$\varnothing d_0$	$\varnothing d_r$	L	t_{fix}	h_{ef}
1	2	3	4	5	6	7
1	SMMIP\08090 Z	8	35	90	40	50
2	SMMIP\08110 Z	8	35	110	60	50
3	SMMIP\08140 Z	8	35	140	90	50
4	SMMIP\08170 Z	8	35	170	120	50
5	SMMIP\08200 Z	8	35	200	150	50
6	SMMIP\08250 Z	8	35	250	200	50
7	SMMIP\08300 Z	8	35	300	250	50

Figure A. Steel fasteners SMMIP

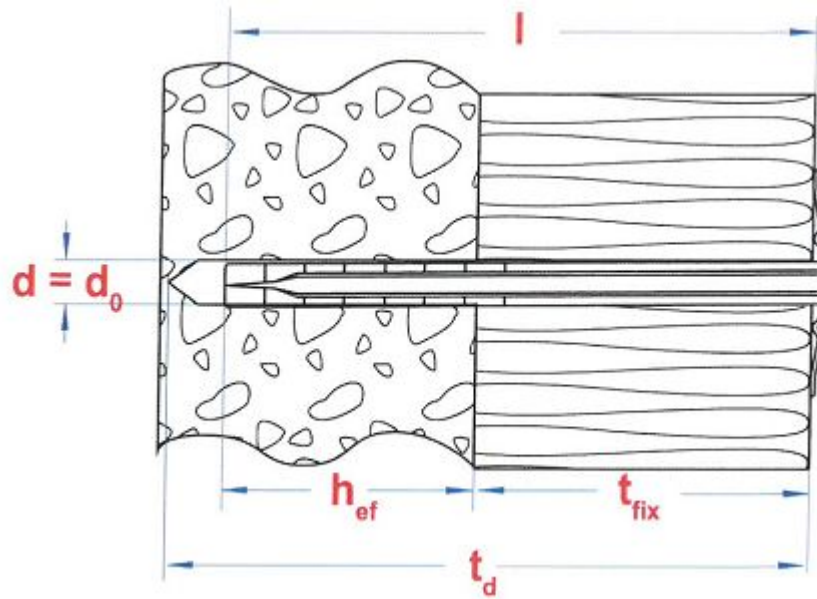
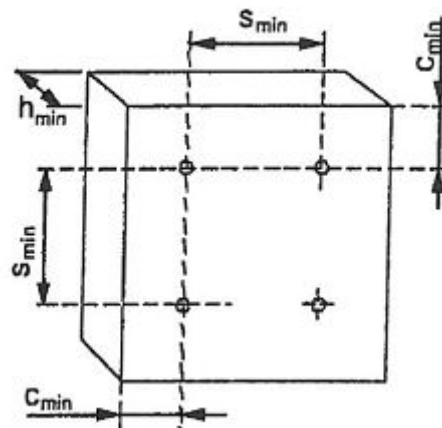
Annex B.

Figure B1. Assembly parameters of steel fasteners SMMIP

Figure B2. Layout parameters of steel fasteners SMMIP

Table B. Assembly parameters and layout of steel fasteners SMMIP

Pos.	Parameter	Fasteners SMMIP
1	2	3
1	Nominal drill diameter d_{nom} , equal to nominal hole diameter d_0 , mm	8
2	Minimal depth of hole h_1 , mm	60
4	Effective embedment depth h_{ef} , mm	50
5	Minimal thickness of base h_{min} , mm	80
6	Minimal spacing of fasteners s , mm	105
7	Minimal distance from base edge c , mm	53

Annex C.
Table C1. Characteristic resistance of fixings of steel fasteners SMMIP to tension load N_{Rk} and shear load V_{Rk}

Pos.	Base type	Effective embedment depth h_{ef} , mm	Depth of drilled hole, h_1 , mm	Characteristic resistance to tension load N_{Rk} and shear load V_{Rk}	
				N_{Rk} , kN	V_{Rk} , kN
1	2	3	4	5	6
1	Plain concrete, non-cracked, C20/25 ÷ C50/60 class, according to PN-EN 206+A1:2016	50	60	0,85	0,85

Table C2. Characteristic resistance of fasteners SMMIP to fire

Fire resistance class	Characteristic resistance to tension load $N_{Rk,fi}$ ²⁾ , kN
1	2
R30	0,21
R60	0,21
R90	0,21
R120	0,17
Effective embedment depth h_{ef} , mm	50
Spacing of fasteners $s_{cr,fi}$, mm	4 x h_{ef}
Distance of fasteners from edge ¹⁾ $c_{cr,fi}$, mm	2 x h_{ef}
¹⁾ In case of fire on more than one side, the distance from the edge shall be ≥ 300 mm ²⁾ Partial safety factor $\gamma_{m,fi} = 1$	