



Instytut Techniki Budowlanej

TECHNICAL APPROVAL ITB
AT-15-9031/2012

Plastic-metal
sleeve anchors
WKREŃT-MET- general application

WARSAW

This technical approval was prepared in
Zakładzie Aprobat Technicznych (Technical Approvals Office)
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TECHNICAL APPROVAL ITB AT-15-9031/2012

On the basis of the directive of the Ministry of Infrastructure dated 8 November 2004 relating to technical approvals and organizational entities authorized to issue them (Law Gazette No. 249, pos.. 2497), as a result of the approval procedure carried out in the Instytucie Techniki Budowlanej w Warszawie (Institute of Construction Techniques in Warsaw) regarding the application of the following company:

WKREŃ-MET sp. z o.o. sp. komandytowa
ul. Wincentego Witosa 170/176, Kuźnica Kiedrzyńska, 42-233 Mykanów

the usefulness of the products for application in construction under the following name is stated:

PLASTIC-METAL SLEEVE ANCHORS
WKREŃ-MET-general application

Within the period and principles stipulated in the Appendix which constitutes an integral part of the herein Technical Approval ITB.

Expiry date:

18 december 2017 r.

Appendix:

General and technical resolutions



DYREKTOR
Instytutu Techniki Budowlanej

Jan Bobrowicz
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Warsaw, 18 December 2012

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1. SUBJECT OF APPROVAL

The subject of the Technical Approval is that of plastic-metal sleeve anchors by WKREȚ-MET for general application, which are the products of the said company WKREȚ-MET sp. z o.o. sp. komandytowa.

This approval includes sleeve anchors by WKREȚ-MET for general application consisting of the sleeve anchors of the following markings: SM, SMN, SMK, SMNK, SMKC, SMNKC, KRX, KXX, BKMMX, PX, WX, HX, HOX, KWDX, BKMUX, BKMPX, KNDX, KPK12, KPD, KPO16 and PR.

The composite elements of the sleeve anchors of WKREȚ-MET for general application are plastic sleeves and steel screws. The anchors are illustrated on the drawings 1÷5 and the dimensions of the anchors are provided in the tables 1÷15.

The sleeve anchors of WKREȚ-MET for general application are made of polypropylene or polyamide, while the screws are made of ordinary steel, carbon steel and covered with a protective layer of zinc of a thickness of no less than 5µm.

With the aim of embedding the connectors of WKREȚ-MET for general application it is necessary to drill a hole in the floor and insert the plastic sleeves. Subsequently, a steel screw is screwed into the sleeve, causing the sleeve to be pressed down on the internal surface of the hole, thus creating permanent anchorage of the connector. The connectors are fixed to the floor as illustrated in Fig.6.

The required technical properties of WKREȚ-MET for general application have been provided on page 3

2. DESIGNATION, SCOPE AND CONDITIONS OF APPLICATION

The plastic-metal sleeve anchors of WKREȚ-MET for general application are designated for executing multi-point non-construction fittings on non-load bearing construction elements in normal concrete flooring of a class no lower than C20/25 according to the PB-EN 206-1:2003 norms, with ceramic bricks, full, and ceramic airbricks of a resistance to compression of no lower than 15 N/mm² (class no lower than 15) according to

PN-EN 771-1:2011 norms, with silicate bricks of a resistance to compression no lower than 20 N/mm

(class no lower than 20) according to PN-EN 771-2:2011 norm or with blocks of aerated concrete of a gross density in a dry state of no lower than 600 kg/m³ (variations no lower than 600) of an average resistance to compression of no lower than 5 N/mm² (class of resistance no lower than 5) according to PN-EN 771-4:2011 norm.

Due to the corrosive power of the environs of the WKREȚ-MET connectors for general application, the application should be run in accordance with: PN-EN ISO 2081:2011 and PN-EN ISO 12944-2:2001 norms.

The calculated load bearing capacity of the WKREȚ-MET connectors for general application has been provided in Table 16, while their assembly parameters in Table 17.

The plastic-metal connectors of WKREȚ-MET for general application should be applied in accordance with the design, which is prepared while taking account of the Polish norms and construction regulations, requirements of the herein Technical Approval, as well as the instructions of the producer relating to the conditions of carrying out fastening with the aid of the afore-mentioned connectors.

3. TECHNICAL PROPERTIES, REQUIREMENTS

3.1. Materials

The plastic sleeves of the WKREȚ-MET connectors for general application with the SM, SMK, SMKC, KPX, KRX, KKX, PX, WX, HX and KNDX markings should be made with polypropylene, while the connectors with the SMN, SMNK, SMNKC, KNX, BKMMX, HOX, KWDX, BKMUX, BKMPX, KPR, KPK, KPD, KPO and PR markings with PA6 polyamide.. PA6 polypropylene and polyamide should be characterized by differential scanning calorimetry graph (DSC) in accordance with the patterns established in the approval procedure.

The steel screws of the WKREȚ-MET connectors for general application should be made with wire rod of C9D or C4D1 non-alloy steel in accordance with the PN-EN ISO 16120-2:2011 norm. The screws should be covered with a protective layer of zinc of a thickness of no less than 5 μm , fulfilling the requirements of the PN-EN ISO 4042:2001/Ap1:2004 norm.

3.2. Connectors

3.2.1. The shape and dimensions of the connectors. The shape and dimensions of the WKREȚ-MET connectors for general application should be in accordance with the drawings 1 ÷ 5, as well as the tables 1 ÷ 15.

3.2.2. The external appearance of the plastic sleeves. The surface of the plastic connectors of WKREȚ-MET for general application should be smooth, without fractures or tears, as well as without protuberances or dents.

3.2.3. The characteristic load bearing capacity of the connectors for fastening. The characteristic load bearing capacity of the WKREȚ-MET connectors for fastening should not be lower than the load bearing capacity provided in Table 18 for general application.

4. PACKING, STORAGE AND TRANSPORT

The connectors of WKREȚ-MET for general application should be delivered in complete sets in the company packing system of the producer and be stored and transported in a manner that ensures the unchangeability of their technical properties. Each packed set should display the following data:

- name of the product,
- name and address of the producer,
- Technical Approval number ITB AT-15-9031/2012,
- number and date of issuing the national declaration of compliance,
- name of certification authority body that participated in the assessment of the compliance,
- type of raw material,
- construction product label.

The way of marking a product with the construction product label should be in accordance with the directive of the Ministry of Infrastructure dated 11 August 2004 relating to the ways of declaring compliance of construction products, as well as the way of marking with the construction product label (Law Gazette No. 198/2004, pos. 2041).

5. ASSESSMENT OF COMPLIANCE

5.1. General principles

In accordance with art. 4, art. 5 Act. 1, pt. 3 and art. 8 Act. 1 dated 16 April 2004 relating to construction products (Law Gazette No. 92/2004, pos. 881, with further amendments) goods which are incorporated in the herein Technical Approval may be sold on the market and applied during the course of construction work in a scope that is appropriate for their properties of use and designation if the producer has carried out an assessment of the compliance, issued a national declaration of compliance together with the Technical Approval ITB AT-15-9031/2012 and marked the goods with construction product label in accordance with the binding regulations.

In accordance with the directive of the Ministry of Infrastructure dated 11 August 2004 with reference to the ways of declaring compliance of the construction products and the manner of their marking by the construction product label (Law Gazette No. 198/2004, pos. 2041) assessment of the goods incorporated in the Technical Approval ITB AT-15-9031/2012 carried out by the producer by applying the 2+ system.

In the case of the 2+ system of assessing compliance, the producer may issue a national declaration of conformity with the Technical Approval of ITB AT-15-9031/2012 on the basis of the following:

a) task of the producer:

- preliminary test type,
- company inspection of production,
- testing of ready-made products (samples) chosen in the factory, carried out by the producer in accordance with the established plan of tests, incorporating the tests provided in pt. 5.4.3.

b) task of accreditation entity:

- certification of the company inspection of production on the following basis: preliminary inspection of plant facilities and the company inspection of production, as well as constant supervision, assessment and acceptance of the company inspection of production.

5.2. Preliminary test type

The preliminary test type is a test to confirm the required technical and utilization properties carried out prior to launching the product on the market.

The preliminary test type of WKREȚ-MET connectors for general application incorporates the calculated load-bearing capacity for the fastening of these connectors, thickness of the zinc coating on the steel screws, as well as differential scanning calorimetry (DSC) of the plastic which the sleeves are made of.

The tests in the approval procedure which, were the basis for the establishment of the technical and utilization properties constitute the preliminary test type in the assessment of compliance.

5.3. Company inspection of production

The company inspection of production consists of the following:

- 1) specification and inspection of raw materials and materials,
- 2) inspection and tests in the process of production, as well as testing of ready-made products (pt.. 5.4.2) run by the producer in accordance with the established plan of tests, as well as in accordance with the principles and procedures stipulated in the company documentation of inspection of production adjusted to the technology of production and aimed at acquiring the required properties of the goods produced.

Inspection of production should ensure that the goods are in accordance with the Technical Approval ITB AT-15-9031/2012. The results of the inspection of production should be registered systematically. The entries into the registry should confirm that the goods fulfil the criteria of the assessment of compliance. The particular goods or lot of goods and the associated production details must be fully possible to identify and reproduce.

5.4. Tests on ready-made products

5.4.1. Program of testing. The program of testing incorporates the following:

- a) running tests,
- b) periodical tests.

5.4.2. Running tests. Running tests incorporate the checking of the following:

- a) shape and dimensions of the connectors,
- b) external appearance of the surface of the plastic sleeves,
- c) thickness of the zinc coating of the steel screws.

5.4.3. Periodical tests. Periodical tests incorporate the checking of the characteristic load-bearing capacity of the connectors for fastening and the differential scanning calorimetry (DSC) of the plastic which the sleeves are made of.

5.5. Frequency of tests

Running tests should be carried out in accordance with the established plan of tests, but not more rarely than for each lot of goods. The size of the lot of goods should be stipulated in the company documentation for the inspection of production.

Periodical tests should be carried out not less often than once every three years.

5.6. Methods of testing

5.6.1. Checking the shape and dimensions of the connectors.

Checking the shape and dimensions of the connectors should be carried out with the aid of measuring equipment that ensures the acquisition of the accuracy of the measurement of up to 0.1 mm in the case of the plastic sleeves and up to 0.01mm in the case of the steel screws.

5.6.2. Checking the external appearance of the surface of the plastic sleeves. Checking the external appearance of the plastic sleeves should be carried out visually.

5.6.3. Checking the differential scanning calorimetry (DSC) of the plastic which the sleeves are made from. Checking the differential scanning calorimetry (DSC) of the plastic which the sleeves are made of should be executed in accordance with the PN-EN ISO 11357-1:2002 norm.

5.6.4. Checking the thickness of the zinc coating of the steel screws. Checking the zinc coating of the steel screws should be performed in accordance with the PN-EN ISO 2178:1998 or PN-EN ISO 3497:2006 norms.

5.6.5. Checking the characteristic load-bearing capacity of the connectors for fastening. Checking the characteristic load-bearing capacity of the connectors for fastening should be carried out by pulling out the connectors from the flooring illustrated in Table 18. The measurement of power should be executed with the aid of equipment with a range selected for the expected value of the destructive force, enabling the constant and gradual increase of power until destruction takes place. Errors in measurements should not exceed 3% of the whole range of measurements.

5.7. Taking samples for testing.

Samples for testing should be taken at random in accordance with the PN-N-03010:1983 norm.

5.8. Assessment of test result.

The goods produced should be acknowledged to be in accordance with the requirements of the herein Technical Approval ITB, if the results of all the tests are positive.

6. FORMAL-LEGISLATIVE DECISIONS

6.1. The Technical Approval ITB AT-15-9031/2012 is a document to confirm the usefulness of the WKREȚ-MET connectors for general application in construction in the scope reflected in the postulates of the said Approval.

In accordance with art. 4, art. 5 Act. 1 pt. 3 and art. 8 Act. 1 dated 16 April 2004 relating to construction products (Law Gazette No. 92/2004, pos. 881, with further amendments) the goods which are referred to in the herein Technical Approval may be launched on the market and applied during the process of performing construction work in the scope appropriate to their utilization properties and designation if the producer has carried out an assessment of the compliance, issued a national declaration of compliance with the Technical Approval ITB AT-15-9031/2012 and marked the goods with the construction product label in accordance with the binding regulations.

6.2. The Technical Approval ITB does not violate authorization stipulated in the regulations regarding protection of intellectual property, particularly the promulgation of the Chief Whip of the Polish Parliament dated 13 June 2003 with reference to the submission of a uniform wording of the Act dated 30 June 2000. – Industrial ownership rights (Law Gazette No. 119, pos. 1117). Ensuring these rights lies within the obligations of the herein Technical Approval ITB.

6.3. ITB in issuing this Technical Approval does not take responsibility for any possible violation of exclusive rights or acquired rights.

6.4. The Technical Approval ITB does not exclude the producer from responsibility for the appropriate quality of goods or contractors of construction work from responsibility for their appropriate application.

6.5. In the contents of the issued prospectus and advertisements, as well as other documents associated with launching plastic-metal WKREĆ-MET connectors on the market and application in construction, it is necessary to

insert information relating to the receipt of the Technical Approval ITB AT-15-9031/2012 for the goods in question.

7. EXPIRY DATE

The Technical Approval ITB AT-15-9031/2012 is valid until 18 December 2017.

The validity of the Technical Approval ITB may be extended by further periods of time if the Applicant or official deputy submits an appropriate application to Instytutu Techniki Budowlanej (the Institute of Construction Techniques) no later than 3 months prior to the expiry date of the validity of the herein document.

The end.

ADDITIONAL INFORMATION

Associated norms

PN-EN 206-1:2003 Concrete. Part 1: Requirements, properties, production and compliance.

PN-EN 771-1:2011 Requirements relating to wall elements. Part 1: Ceramic wall elements.

PN-EN ISO 2081:2011 Metal coating and other non-organic coating. Electrolytic zinc coating with additional machining on iron or steel.

PN-EN 771-2:2011 Requirements relating to wall elements. Part 2: Silicate wall elements.

PN-EN 771-4:2011 Requirements relating to wall elements. Part 4: Wall elements with autoclave cellular concrete.

PN-EN ISO 2081:2011 Metal coating and other non-organic coating. Electrolytic zinc coating with additional machining on iron or steel.

PN-EN ISO 12944-2:2001 Paint and lacquer. Protection from corrosion of the steel construction with the aid of protective paint systems. Part 2: Classification of environment.

PN-EN ISO 16120-2:2011 Wire rods with non-alloy steel for pulling or cold rolling. Requirements for wire rods for general designation.

PN-EN 4042:2001/ Fastener parts. Electrolytic coating. Ap:2004

PN-EN ISO 11357-1:2002 Artificial materials. Differential scanning calorimetry (DSC).

Part 1: General principles.

PN-EN ISO 2178:1998 Non-magnetic coating on magnetic base.

Measurement of thickness of coating. Magnetic method.

PN-EN ISO 3497:2006 Metal and solid oxide coating. Measurement of thickness of coating. Microscopic method.

PN-N-03010:1983 Statistical quality control. Random selection of product units for samples.

Testing and assessment.

- 1) LOK-00684/A/10. Reports on testing and technical evaluation relating to Wkrętmet sleeve anchors with SM, SMN, KRX, KXX, PX, SK, HK, HOX, KNDX, KWDX markings. Zakład Elementów Konstrukcji Budowlanych Oddziału Śląskiego ITB, Katowice, 2010.
- 2) LOK02-1863/11/R05OSK. Reports on testing and technical information relating to plastic-metal connectors with KPR marking. Zakład Elementów Konstrukcji Budowlanych Oddziału Śląskiego ITB, Katowice, 2011.
- 3) LOK00-01365/11/Z00OSK. Reports on testing and additional information relating to KRX 6, SMN 8 × 45, KXX 10, KNDX 12, KPD 12, HOX 14, HOX 16 connectors. Zakład Elementów Konstrukcji Budowlanych Oddziału Śląskiego ITB, Katowice, 2011.
- 4) LOK05-1863/12/R08OSK. Reports on testing and additional information relating to plastic-metal connectors with PR and KPD marking. Zakład Elementów Konstrukcji Budowlanych Oddziału Śląskiego ITB, Katowice, 2012.
- 5) LOK01-1863/12/R09OSK. Reports on testing and additional information relating to plastic-metal sleeve anchors with SMN marking. Zakład Elementów Konstrukcji Budowlanych Oddziału Śląskiego ITB, Katowice, 2012.
- 6) D₂₉₋₃₀/2011. Reports on testing relating to DSC analysis on plugs made of polymer with SMN 8 marking (polyamide) and KXX 10 (polypropylene). Instytut Inżynierii Materiałów Polimerowych i Barwników, Toruń 2011.

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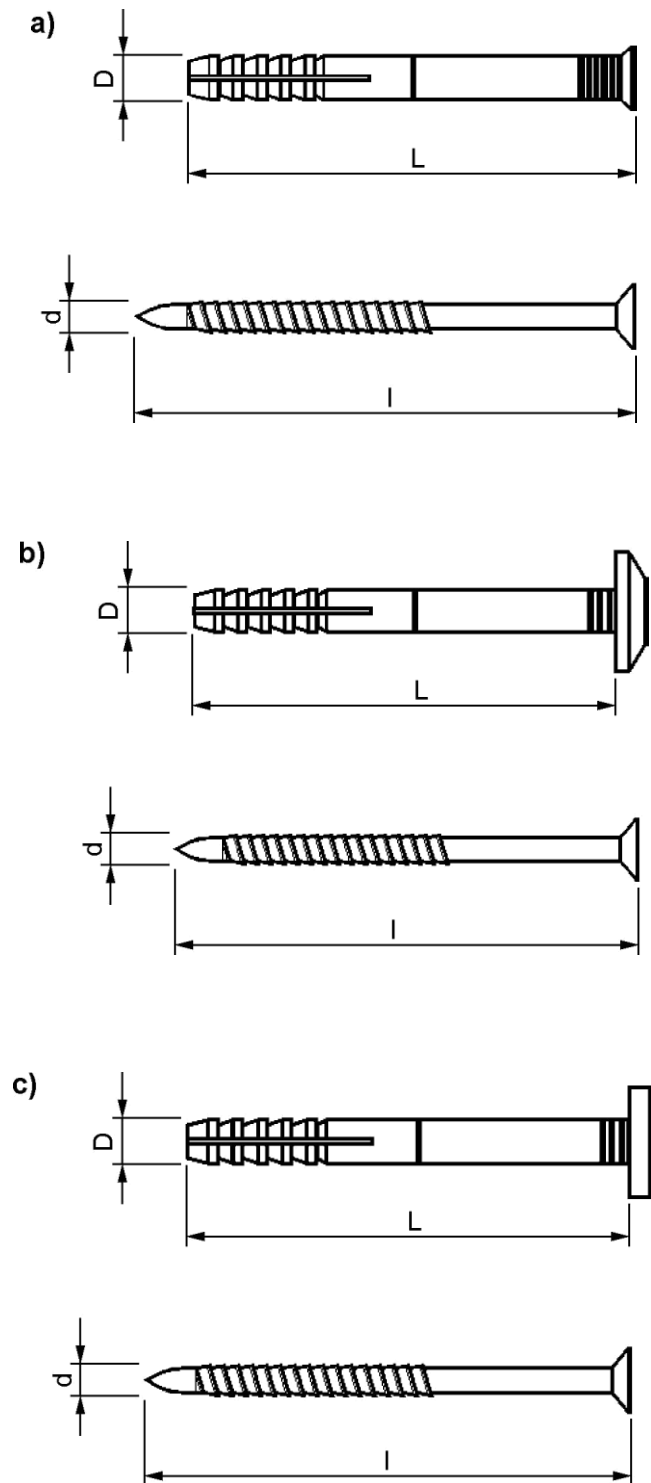


Fig. 1. Plastic-metal sleeve anchors of WKREĆ-MET- general application with SM, SMN, SMK, SMNK, SMKC and SMNKC markings.
 a) sleeve anchor SM or SMN, b) sleeve anchor SMK or SMNK, c) sleeve anchor SMKC or SMNKC

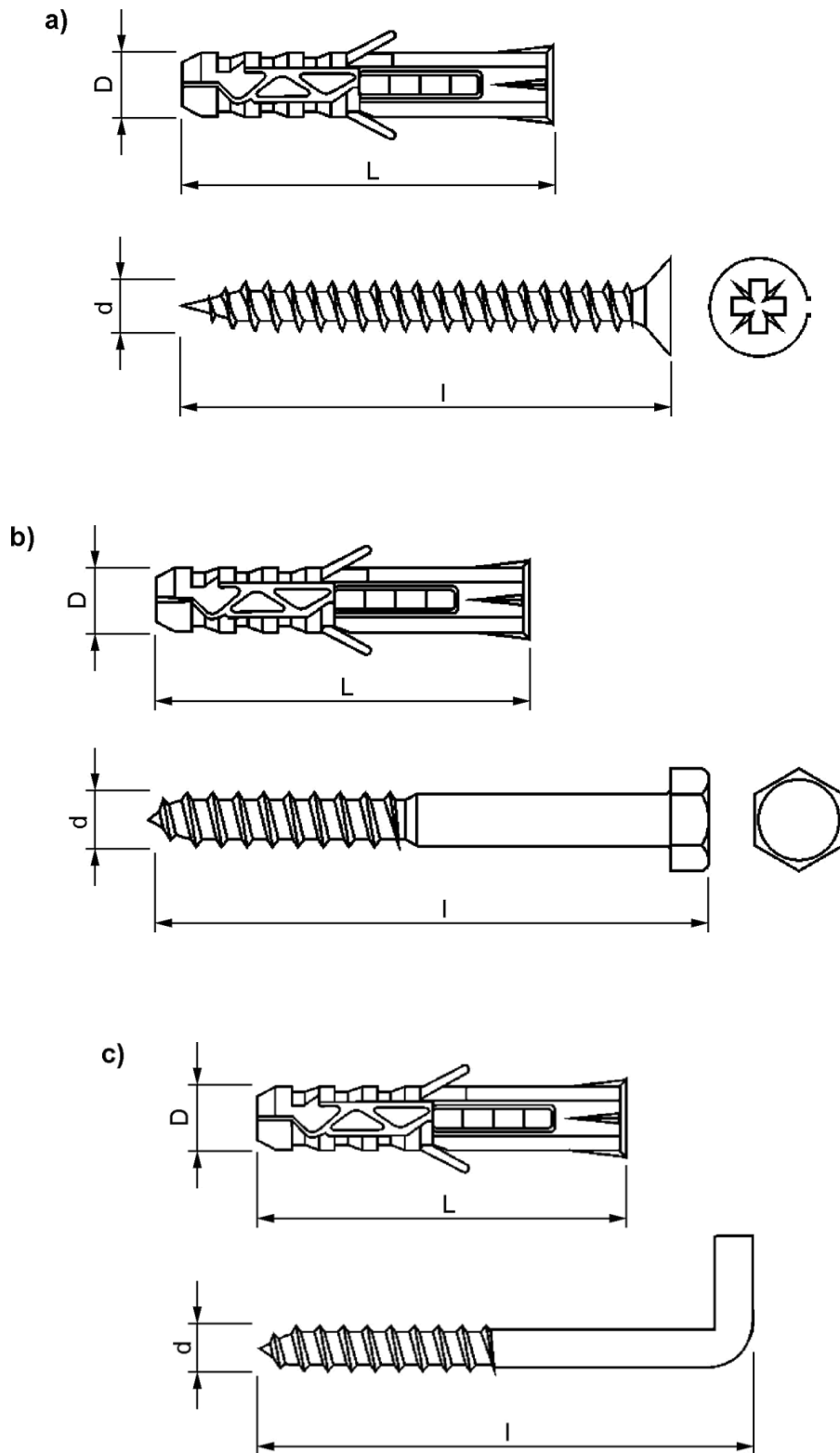


Fig 2. Plastic-metal sleeve anchor of WKREŹ-MET- general application with KRX, KXX, BKMMX AND PX markings. a) sleeve anchor KRX, b) sleeve anchor KXX or BKMMX, c) sleeve anchor PX

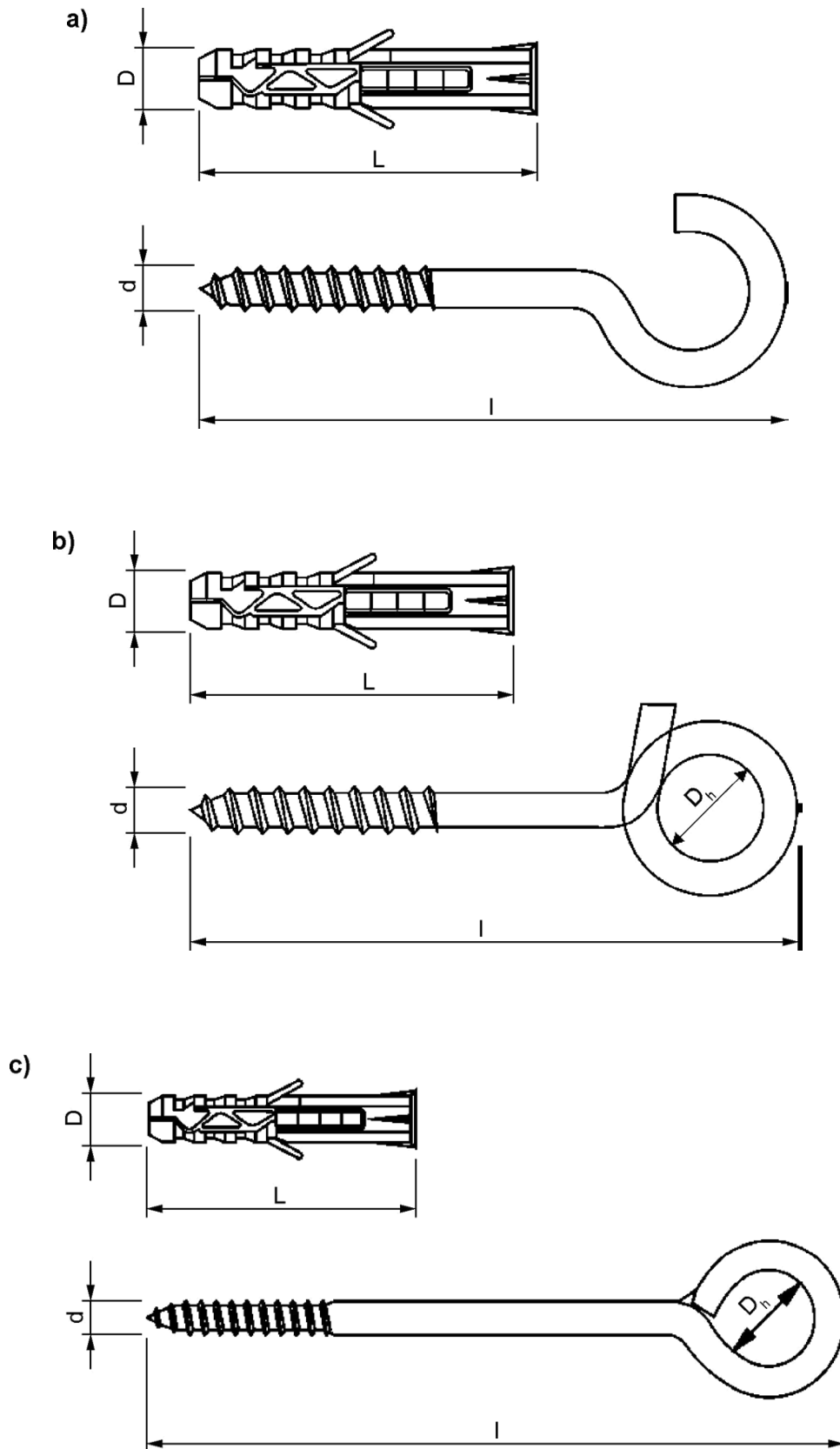


Fig 3. Plastic-metal sleeve anchors of WKREĆ-MET- general application with WX, HX and HOX markings. a) sleeve anchor WX, b) sleeve anchor HX, c) sleeve anchor HOX

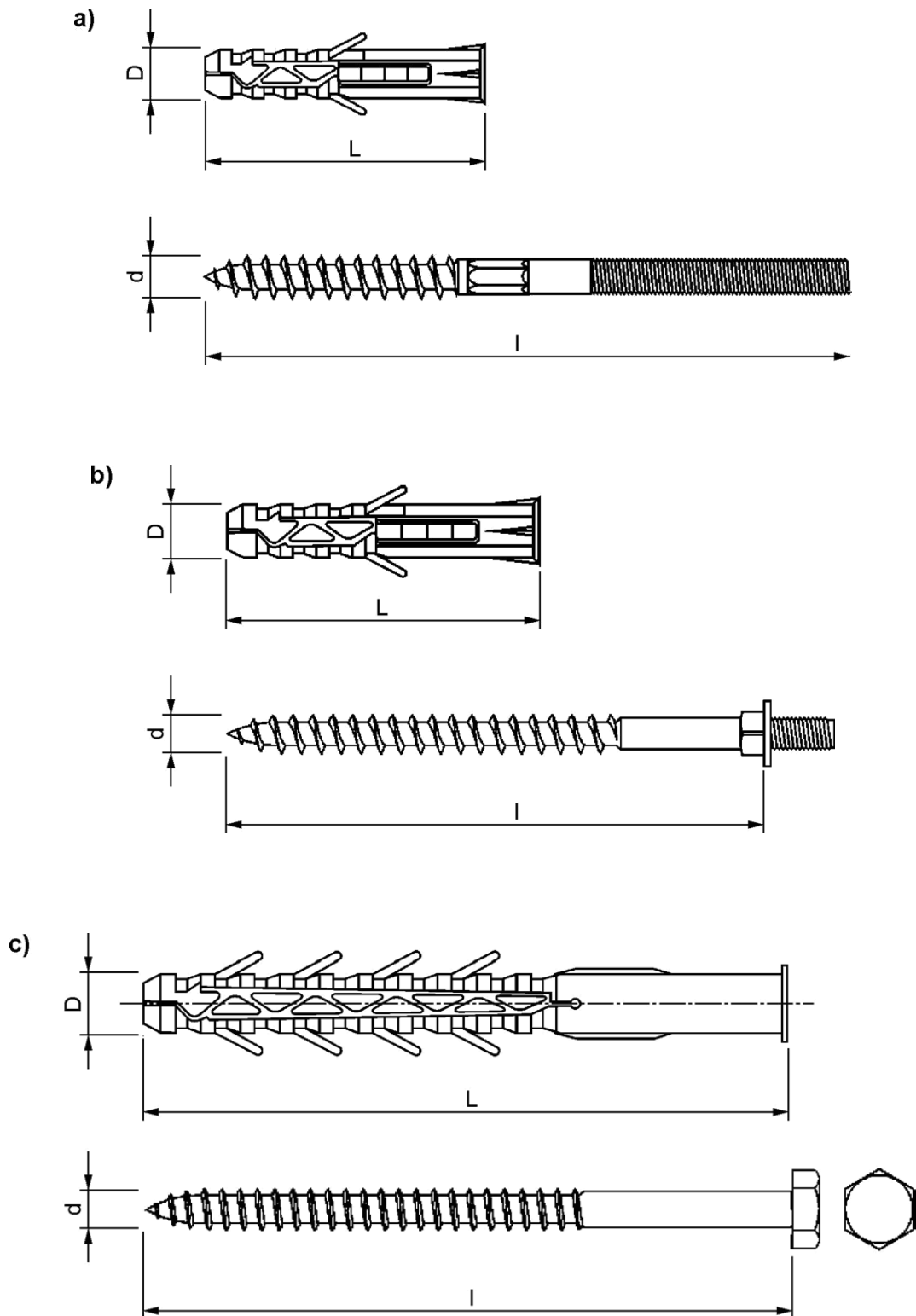


Fig. 4. Plastic-metal sleeve anchors of WKREĆ-MET- general application with KWDX, BKMUX, BKMPX, KNDX and KPK 12 markings.

a) sleeve anchor KWDX, BKMUX or BKMPX, b) sleeve anchor KNDX, c) sleeve anchor KPK 12

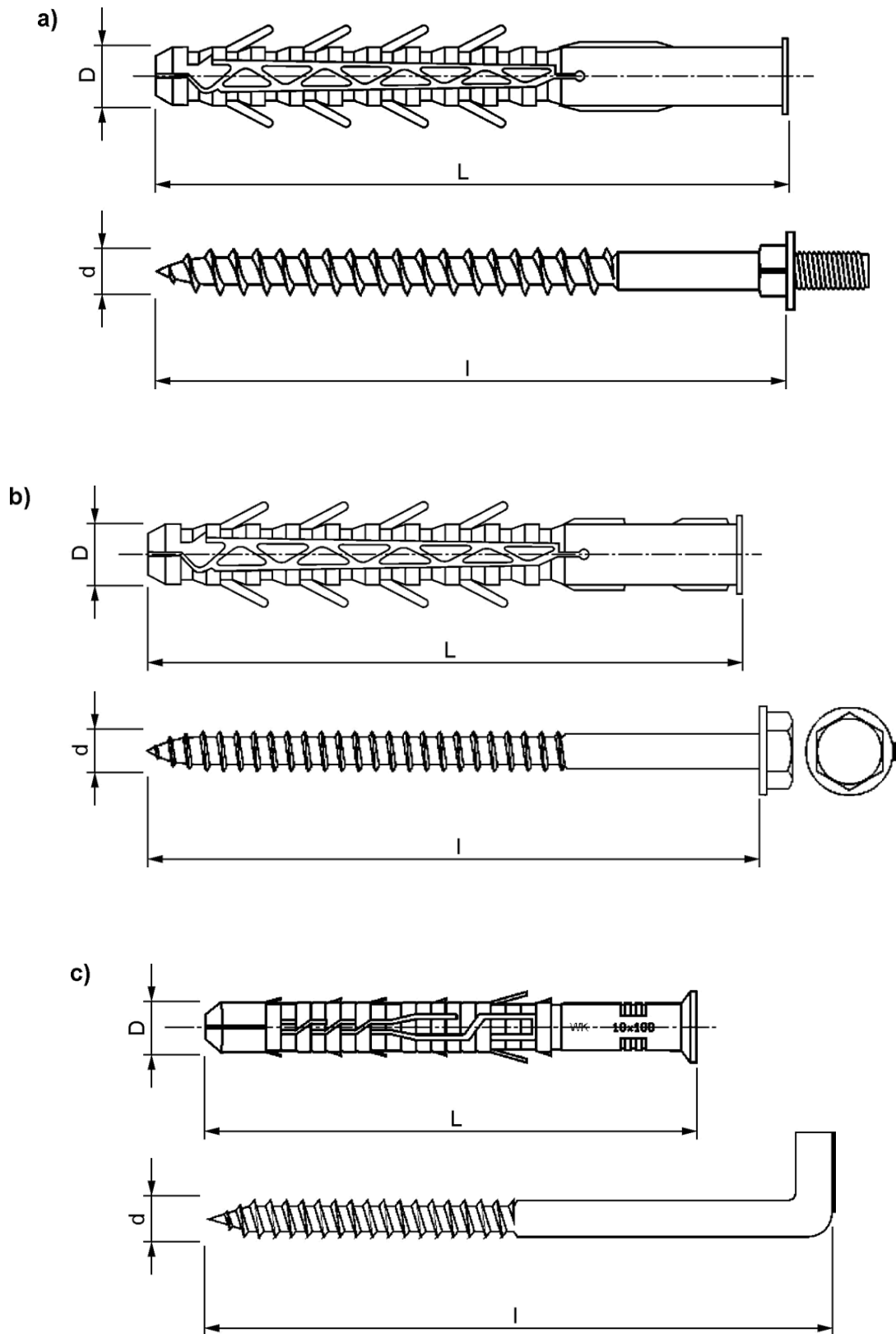


Fig 5. Plastic-metal sleeve anchors of WKREMET-MET- general application with KPD, KPO 16 AND PR markings.

a) sleeve anchor KPD, b) sleeve anchor KPO 16, c) sleeve anchor PR

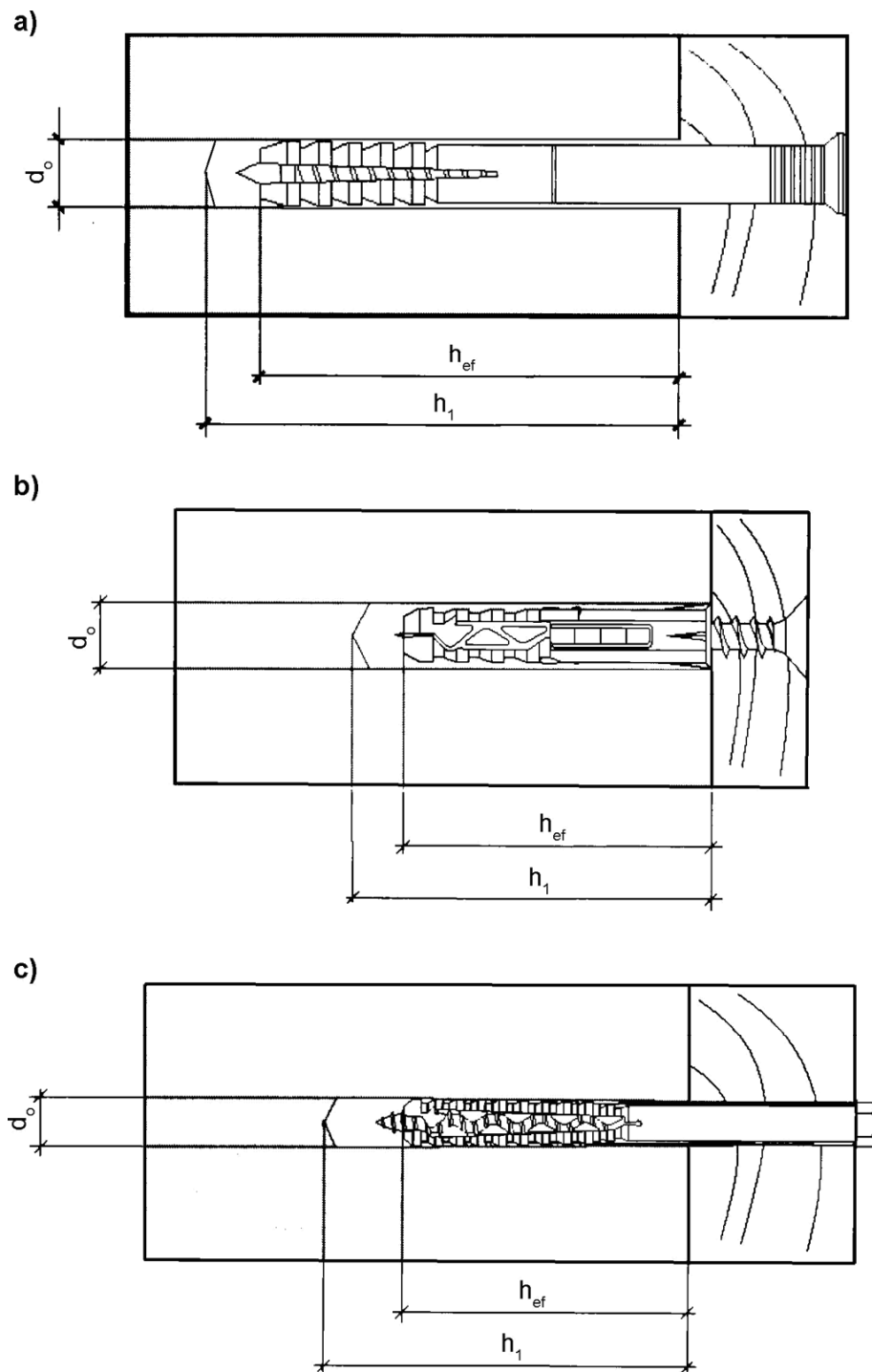


Fig. 6. Plastic-metal sleeve anchors of WKREȚ-MET- general application with SM (SMN), KRX and KPK-12 markings embedded in the base.

a) sleeve anchor SM (SMN), b) sleeve anchor KRX, c) sleeve anchor KPK-12

Table 1

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with SM and SMN markings.

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	SM-5 × 45 SMN-5 × 45	5	45	3,5	50
2	SM-6 × 40 SMN-6 × 40	6	40	3,9	45
3	SM-6 × 50 SMN-6 × 50	6	50	3,9	55
4	SM-6 × 60 SMN-6 × 60	6	60	3,9	65
5	SM-6 × 70 SMN-6 × 70	6	70	3,9	75
6	SM-6 × 80 SMN-6 × 80	6	80	3,9	85
7	SM-8 × 45 SMN-8 × 45	8	45	4,9	50
8	SM-8 × 60 SMN-8 × 60	8	60	4,9	65
9	SM-8 × 80 SMN-8 × 80	8	80	4,9	85
10	SM-8 × 100 SMN-8 × 100	8	100	4,9	105
11	SM-8 × 120 SMN-8 × 120	8	120	4,9	125
12	SM-8 × 140 SMN-8 × 140	8	140	4,9	145
13	SM-8 × 160 SMN-8 × 160	8	160	4,9	165
14	SM-10 × 80 SMN-10 × 80	10	80	6,9	90
15	SM-10 × 100 SMN-10 × 100	10	100	6,9	110
16	SM-10 × 120 SMN-10 × 120	10	120	6,9	130
17	SM-10 × 140 SMN-10 × 140	10	140	6,9	150
18	SM-10 × 160 SMN-10 × 160	10	160	6,9	170
19	SM-10 × 180 SMN-10 × 180	10	180	6,9	190
20	SM-10 × 200 SMN-10 × 200	10	200	6,9	210
21	SM-10 × 220 SMN-10 × 220	10	220	6,9	230

Table 2

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with SMK and SMNK markings

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	SMK-6 × 40 SMNK-6 × 40	6	40	3,9	45
2	SMK-6 × 60 SMNK-6 × 60	6	60	3,9	65
3	SMK-6 × 80 SMNK-6 × 80	6	80	3,9	85

Table 3

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with SMKC AND SMNKC markings

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	SMKC-5 × 35 SMNKC-5 × 35	5	35	3,5	40
2	SMKC-6 × 40 SMNKC-6 × 40	6	40	3,9	45
3	SMKC-6 × 60 SMNKC-6 × 60	6	60	3,9	65

Table 4

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with KRX marking

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	KRX-6 × 30	6	30	3,5	30
2	KRX-6 × 35	6	30	3,5	35
3	KRX-6 × 40	6	30	3,5	40
4	KRX-6 × 50	6	30	3,5	50
5	KRX-8 × 40	8	40	4	40
6	KRX-8 × 45	8	40	4	45
7	KRX-8/4 × 50	8	40	4	50
8	KRX-8/4 × 60	8	40	4	60
9	KRX-8 × 50	8	50	5	50
10	KRX-8 × 60	8	50	5	60
11	KRX-8 × 70	8	50	5	70
12	KRX-8 × 80	8	50	5	80
13	KRX-8 × 100	8	50	5	100

c.d. Table 4

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
14	KRX-10 × 50	10	50	5	50
15	KRX-10 × 60	10	50	5	60
16	KRX-10 × 70	10	50	5	70
17	KRX-10 × 80	10	50	5	80
18	KRX-10 × 100	10	50	5	100
19	KRX-10/6 × 60	10	60	6	60
20	KRX-10/6 × 70	10	60	6	70
21	KRX-10/6 × 80	10	60	6	80
22	KRX-10/6 × 100	10	60	6	100
23	KRX-10/6 × 120	10	60	6	120
24	KRX-12 × 60	12	60	6	60
25	KRX-12 × 70	12	60	6	70
26	KRX-12 × 80	12	60	6	80
27	KRX-12 × 100	12	60	6	100
28	KRX-12 × 120	12	60	6	120

Table 5

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with KKK and BKMMX

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	KKX-10 × 60	10	60	6	60
2	KKX-10 × 70	10	60	6	70
3	KKX-10 × 80	10	60	6	80
4	KKX-10 × 90	10	60	6	90
5	KKX-10 × 100	10	60	6	100
6	KKX-10 × 120	10	60	6	120
7	KKX-10 × 140	10	60	6	140
8	KKX-12 × 60	12	60	8	60
9	KKX-12 × 70	12	60	8	70
10	KKX-12 × 80	12	60	8	80
11	KKX-12 × 90	12	60	8	90
12	KKX-12 × 100	12	80	8	100
13	KKX-12 × 120	12	80	8	120
14	KKX-12 × 140	12	80	8	140
15	KKX-12 × 160	12	80	8	160
16	KKX-12 × 180	12	80	8	180
17	KKX-12 × 200	12	80	8	200
18	KKX-12 × 220	12	80	8	220
19	KKX-12 × 240	12	80	8	240
20	KKX-12 × 260	12	80	8	260

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Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
21	KKX-14 × 80	14	80	10	80
22	KKX-14 × 100	14	80	10	100
23	KKX-14 × 120	14	80	10	120
24	KKX-14 × 140	14	80	10	140
25	KKX-14 × 160	14	80	10	160
26	KKX-14 × 180	14	80	10	180
27	KKX-14 × 200	14	80	10	200
28	KKX-14 × 220	14	80	10	220
29	KKX-14 × 240	14	80	10	240
30	KKX-14 × 260	14	80	10	260
31	KKX-16 × 120	16	100	12	120
32	KKX-16 × 140	16	100	12	140
33	KKX-16 × 160	16	100	12	160
34	KKX-16 × 180	16	100	12	180
35	KKX-16 × 200	16	100	12	200
36	KKX-16 × 220	16	100	12	220
37	KKX-16 × 240	16	100	12	240
38	KKX-16 × 260	16	100	12	260
39	KKX-16 × 280	16	100	12	280
40	KKX-16 × 300	16	100	12	300
41	BKMMX-10 × 80	10	50	6	80

Table 6

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with PX marking

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
1	PX-6	6	30	4	45
2	PX-8	8	40	4,5	55
3	PX-10	10	50	5,5	65
4	PX-10 D	10	60	5,5	80
5	PX-12	12	60	7	80
6	PX-12 D	12	80	8	105

Table 7

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with WX marking.

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
1	WX-6	6	30	4	60
2	WX-8	8	40	4,5	80
3	WX-10	10	50	5,5	90
4	WX-12	12	60	7,0	105

Table 8

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with HX marking.

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
1	HX-12 × 60	12	60	8	130

Table 9

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with HOX marking.

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
1	HOX-14 × 120	14	80	10	165
2	HOX-14 × 160	14	80	10	205
3	HOX-14 × 190	14	80	10	235
4	HOX-14 × 230	14	80	10	275
5	HOX-16 × 160	16	100	12	210
6	HOX-16 × 190	16	100	12	240
7	HOX-16 × 230	16	100	12	280
8	HOX-16 × 270	16	100	12	320
9	HOX-16 × 300	16	100	12	350
10	HOX-16 × 350	16	100	12	400

Table 10

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with KWDX, BKMUX and BKMPX markings

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	KWDX-12 × 80	12	60	8	80
2	KWDX-12 × 100	12	60	8	100
3	KWDX-12 × 120	12	60	8	120
4	KWDX-12 × 140	12	60	8	140
5	KWDX-12 × 160	12	60	8	160
6	KWDX-12 × 180	12	60	8	180
7	KWDX-12 × 200	12	60	8	200
8	KWDX-12/80 × 100	12	80	8	100
9	KWDX-12/80 × 120	12	80	8	120
10	KWDX-12/80 × 140	12	80	8	140
11	KWDX-12/80 × 160	12	80	8	160
12	KWDX-12/80 × 180	12	80	8	180
13	KWDX-12/80 × 200	12	80	8	200
14	KWDX-14 × 140	14	80	10	140
15	KWDX-14 × 160	14	80	10	160
16	KWDX-14 × 180	14	80	10	180
17	KWDX-14 × 200	14	80	10	200
18	BKMUX-12 × 100	12	80	8	100
19	BKMUX-12 × 120	12	80	8	120
20	BKMPX-12 × 100	12	80	8	100
21	BKMPX-12 × 120	12	80	8	120
22	BKMPX-14 × 140	14	80	10	140

Table 11

Dimensions of plastic-metal sleeve anchors of WKREĆ-MET- general application with KNDX marking.

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	KNDX-10 × 100	10	60	7	105
2	KNDX-10 × 160	10	60	7	165
3	KNDX-10 × 200	10	60	7	205
4	KNDX-12 × 100	12	60	8	105
5	KNDX-12 × 160	12	60	8	165
6	KNDX-12 × 200	12	60	8	205

Table 12

Dimensions of plastic-metal sleeve anchors of WKREĆ-MET- general application with KPK 12 marking.

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	KPK-12 × 100 N	12	100	8	100
2	KPK-12 × 120 N	12	120	8	120
3	KPK-12 × 140 N	12	140	8	140
4	KPK-12 × 160 N	12	160	8	160
5	KPK-12 × 180 N	12	180	8	180
6	KPK-12 × 200 N	12	200	8	200

Table 13

Dimensions of plastic-metal sleeve anchors of WKREĆ-MET- general application with KPD marking.

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	KPD-10 × 100 N	10	100	7	105
2	KPD-10 × 160 N	10	160	7	165
3	KPD-10 × 200 N	10	200	7	205
4	KPD-12 × 100 N	12	100	8	105
5	KPD-12 × 160 N	12	160	8	165
6	KPD-12 × 200 N	12	200	8	205

Table 14

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET-general application with KPO 16 marking.

Pos.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	KPO-16 × 140 N	16	140	12	150
2	KPO-16 × 160 N	16	160	12	170
3	KPO-16 × 200 N	16	200	12	210
4	KPO-16 × 240 N	16	240	12	250

Table 15

Dimensions of plastic-metal sleeve anchors of WKREȚ-MET- general application with PR marking.

Poz.	Sleeve anchor marking	D mm	L, mm	d, mm	l, mm
1	2	3	4	5	6
1	PR-8 × 80	8	80	6	100
2	PR-8 × 100	8	100	6	120
3	PR-10 × 100	10	100	7	120
4	PR-10 × 135	10	140	7	155
5	PR-10 × 160	10	160	7	180

Table 16

Calculated load-bearing of plastic-metal sleeve anchors of WKREȚ-TMET - general application

Pos.	Sleeve anchor marking	Depth of anchorage mm	Calculated load-bearing capacity, kN				
			Type of base				
			Normal concrete ⁽¹⁾	ceramic brick, full ⁽²⁾	Airbricks ⁽³⁾	Silicate bricks ⁽⁴⁾	Aerated concrete ⁽⁵⁾
1	2	3	4	5	6	7	8
1	SM-5 SMKC-5	30	0,31	0,06	–	0,26	0,10
2	SM-6 SMK-6 SMKC-6	30	0,23	0,18	–	0,32	0,13
3	SM-8	40	0,42	0,21	–	0,43	0,23
4	SM-10	50	1,13	0,36	–	1,00	0,30

Pos.	Sleeve anchor marking	Depth of anchorage mm	Calculated load-bearing capacity, kN				
			Type of base				
			Normal concrete (1)	ceramic brick, full(2)	Airbricks (3) (3)	Silikate bricks (4)	Aerated concrete (5)
1	2	3	4	5	6	7	8
5	SMN-5 SMNKC-5	30	0,64	0,40	–	0,42	0,08
6	SMN-6 SMNK-6 SMNKC-6	30	0,67	0,30	–	0,42	0,11
7	SMN-8	40	1,08	0,48	–	–	0,20
8	SMN-10	50	2,02	1,34	–	–	0,44
9	KRX-6 PX-6 WX-6	30	0,13	0,03	–	0,05	–
10	KRX-8/4	40	0,09	–	–	0,07	0,02
11	KRX-8	50	0,24	0,16	–	0,42	0,12
12	KRX-10	50	0,24	0,13	–	0,19	–
13	KRX-10/6	60	0,49	0,14	–	0,48	0,20
14	KRX-12	60	0,47	0,30	–	0,36	–
15	KKX-10 BKMMX-10	60	0,79	0,18	–	0,35	0,28
16	KKX-12/60 KWDX-12/60	60	1,20	1,03	–	1,00	0,45
17	KKX-12/80 KWDX-12/80 BKMUX-12 BKMPX-12	80	1,57	1,14	–	0,79	0,64
18	KKX-14 KWDX-14 BKMPX-14	80	2,17	1,22	–	1,29	0,50
19	KKX-16	100	2,38	3,03	–	0,74	1,28
20	PX-8 WX-8	40	0,23	0,12	–	0,21	0,08
21	PX-10 WX-10 PX-10D	50	0,28	0,16	–	0,47	0,06
22	PX-12 WX-12 HX-12 PX-12D	60	0,74	0,13	–	0,61	0,18
23	HOX-14	80	9,3	4,08	–	2,35	1,28
24	HOX-16	100	16,86	2,39	–	2,65	–
25	KNDX-10	60	1,68	1,20	–	1,53	0,48

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Pos.	Sleeve anchor marking	Depth of anchorage mm	Calculated load-bearing capacity, kN				
			Type of base				
			Normal concrete	ceramic brick, full(2)	Airbricks ⁽³⁾	Silikate bricks ⁽⁴⁾	Aerated concrete ⁽⁵⁾
1	2	3	4	5	6	7	8
26	KNDX-12	60	2,51	1,49	–	1,68	0,71
27	KPK-12	80	1,74	0,52	0,39	0,93	0,19
28	KPD-10	70	5,19	3,79	0,70	3,72	0,86
29	KPD-12	100	1,8	1,18	–	1,23	0,49
30	KPO-16	120	2,59	1,88	1,34	1,72	0,87
31	PR-8	60	0,41	0,29	0,29	0,29	0,37
32	PR-10	70	0,84	0,61	0,61	0,61	0,76

1) – concrete of normal class C20/25 according to PN-EN 206-1:2004
 (2) – ceramic brick, full class 15 according to PN-EN 771-1:2011 norm
 (3) – ceramic airbricks, class 15 according to PN-EN 771-1:2011 norm.
 (4) – Silikate brick class 20 according to PN-EN 771-2:2011 norm.
 (5) – aerated concrete variation 600 class 5 according to PN-EN 771-4:2011 norm

Table 17

Parameters of assembly of plastic-metal sleeve anchors of WKRET-MET- general application

Pos.	Sleeve anchor marking	Diameter Of drilled hole d_0 , mm	Minimum Depth of hole h_1 , mm	Depth Of anchorage h_{ef} , mm
1	2	3	4	5
1	SM-5 SMKC-5	5	40	30
2	SM-6 SMK-6 SMKC-6	6	40	30
3	SM-8	8	50	40
4	SM-10	10	60	50
5	SMN-5 SMNKC-5	5	40	30
6	SMN-6 SMNK-6 SMNKC-6	6	40	30
7	SMN-8	8	50	40
8	SMN-10	10	60	50

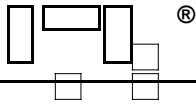
c.d. Table 17

Pos.	Sleeve anchor marking	Diameter Of drilled hole d_o , mm	Minimum Depth of hole h_1 , mm	Depth Of anchorage h_{eg} , mm
1	2	3	4	5
9	KRX-6 PX-6 WX-6	6	40	30
10	KRX-8/4	8	50	40
11	KRX-8	8	60	50
12	KRX-10	10	60	50
13	KRX-10/6	10	70	60
14	KRX-12	12	70	60
15	KKX-10 BKMMX-10	10	70	60
16	KKX-12/60 KWDX-12/60	12	70	60
17	KKX-12/80 KWDX-12/80 BKMUX-12 BKMPX-12	12	90	80
18	KKX-14 KWDX-14 BKMPX-14	14	90	80
19	KKX-16	16	110	100
20	PX-8 WX-8	8	50	40
21	PX-10 WX-10 PX-10D	10	60	50
22	PX-12 WX-12 HX-12 PX-12D	12	70	60
23	HOX-14	14	90	80
24	HOX-16	16	110	100
25	KNDX-10	10	70	60
26	KNDX-12	12	70	60
27	KPK-12	12	90	80
28	KPD-10	10	80	70
29	KPD-12	12	110	100
30	KPO-16	16	130	120
31	PR-8	8	70	60
32	PR-10	10	80	70

Table 18

Characteristic load-bearing capacity of plastic-metal sleeve anchors of WKREŹ-MET- general application

Poz.	Sleeve anchor marking	Depth anchorage, mm	Calculated load-bearing capacity, kN				
			Type of base				
			Normal ⁽¹⁾ concrete	ceramic brick, full ⁽²⁾	Airbricks ⁽³⁾	Silikate bricks ⁽⁴⁾	Aerated concrete ⁽⁵⁾
1	2	3	4	5	6	7	8
1	SM-5 SMKC-5	30	0,56	0,16	–	0,64	0,20
2	SM-6 SMK-6 SMKC-6	30	0,41	0,45	–	0,80	0,25
3	SM-8	40	0,75	0,53	–	1,07	0,45
4	SM-10	50	2,03	0,89	–	2,51	0,60
5	SMN-5 SMNKC-5	30	1,16	1,01	–	1,04	0,16
6	SMN-6 SMNK-6 SMNKC-6	30	1,20	0,74	–	1,05	0,22
7	SMN-8	40	1,95	1,19	–	–	0,40
8	SMN-10	50	3,63	3,34	–	–	0,88
9	KRX-6 PX-6 WX-6	30	0,23	0,08	–	0,13	–
10	KRX-8/4	40	0,16	–	–	0,18	0,04
11	KRX-8	50	0,44	0,41	–	1,05	0,23
12	KRX-10	50	0,43	0,32	–	0,48	–
13	KRX-10/6	60	0,88	0,35	–	1,20	0,39
14	KRX-12	60	6,85	0,75	–	0,90	–
15	KKX-10 BKMMX-10	60	1,43	0,46	–	0,88	0,55
16	KKX-12/60 KWDX-12/60	60	2,16	2,57	–	2,49	0,90
17	KKX-12/80 KWDX-12/80 BKMUX-12 BKMPX-12	80	2,83	2,86	–	1,97	1,27
18	KKX-14 KWDX-14 BKMPX-14	80	3,90	3,04	–	3,23	1,00
19	KKX-16	100	4,28	7,58	–	4,36	2,55



c.d. Table 18

Pos.	Sleeve anchor marking	Depth anchorage, mm	Calculated load-bearing capacity, kN				
			Type of base				
			Normal ⁽¹⁾ concrete	ceramic brick, full ⁽²⁾	Airbricks ⁽³⁾	Silikate bricks ⁽⁴⁾	Aerated concrete ⁽⁵⁾
1	2	3	4	5	6	7	8
20	PX-8 WX-8	40	0,41	0,30	–	0,53	0,15
21	PX-10 WX-10 PX-10D	50	0,51	0,39	–	1,17	0,12
22	PX-12 WX-12 HX-12 PX-12D	60	1,34	0,32	–	1,52	0,36
23	HOX-14	80	16,74	10,21	–	5,87	2,56
24	HOX-16	100	30,35	5,98	–	6,62	–
25	KNDX-10	60	3,03	2,99	–	3,83	0,96
26	KNDX-12	60	4,52	3,73	–	4,21	1,42
27	KPK-12	80	3,14	1,30	0,97	2,32	0,38
28	KPD-10	70	9,35	9,48	1,76	9,29	1,71
29	KPD-12	100	3,24	2,94	–	3,08	0,98
30	KPO-16	120	4,66	4,71	3,35	4,29	1,00
31	PR-8	60	0,73	0,73	0,73	0,73	0,73
32	PR-10	70	1,52	1,52	1,52	1,52	1,52

(1) – concrete of normal class C20/25 according to PN-EN 206-1:20

(2) – ceramic brick, full class 15 according to PN-EN 771-1:2011 norm

(3) – ceramic airbricks, class 15 according to PN-EN 771-1:2011 norm.

(4) – Silikate brick class 20 according to PN-EN 771-2:2011 norm.

(5) – aerated concrete variation 600 class 5 according to PN-EN 771-4:2011norm



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