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NATIONAL TECHNICAL ASSESSMENT
ITB-KOT-2021/0996 edition 1

This National Technical Assessment was issued in accordance with the Regulation of the Minister of Infrastructure and Construction of 17th November 2016 on National Technical Assessments (Dziennik Ustaw 2016, item 1968) by the Institute of Building Technology in Warsaw, at the request of:

Ciecholewski-Wentylacje Sp. z o.o.
Koźmin 30, 83-236 Pogódki

The National Technical Assessment ITB-KOT-2021/0996 edition 1 is a positive assessment of the performance of the following construction products for the intended use:

PKC ventilation ducts of circular cross-section

Date of validity of the National Technical Assessment:

14th December 2026

DIRECTOR of the
Institute of Building Technology

[*illegible signature*]

Robert Geryło, PhD, Eng.

[*round seal with the national emblem of the Republic of Poland in the centre and the following wording*: Institute of Building Technology]

Warsaw, 14th December 2021

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1. TECHNICAL DESCRIPTION OF THE PRODUCT

This National Technical Assessment covers PKC ventilation ducts of circular cross-section, manufactured by Ciecholewski-Wentylacje Sp. z o.o., Koźmin 30, 83-236 Pogódki, at its production plant in Koźmin.

The National Technical Assessment covers product types specified by the manufacturer and derived from the performance characteristics given in section 3 and the combination of materials and components.

The National Technical Assessment includes the following:

- straight ducts PPS, acc. to Fig. A1,
- straight ducts PPBI, acc. to Fig. A2,
- segment bends LS90, acc. to Fig. A3,
- segment bends LS60, acc. to Fig. A4,
- segment bends LS45, acc. to Fig. A5,
- segment bends LS30, acc. to Fig. A6,
- segment bends LS15, acc. to Fig. A7,
- segment bends with branch LSO, acc. to Fig. A8,
- segment bends "short" LSK90, acc. to Fig. A9,
- symmetrical adapters short RSSK, acc. to Fig. A10,
- symmetrical adapters RSS, acc. to Fig. A11,
- asymmetrical adapters RSA, acc. to Fig. A12,
- straight adapters RPC, acc. to Fig. A13,
- straight adapters RED, acc. to Fig. A14,
- pipe tees T90, acc. to Fig. A15,
- pipe tees T45, acc. to Fig. A16,
- pipe tees with washout hole TZWC, acc. to Fig. A17,
- pipe tees with rectangular stub pipe TZK, acc. to Fig. A18,
- pipe tees TY, acc. to Fig. A19,
- adapter pipe tees TR90, acc. to Fig. A20,
- adapter pipe tees TRC90, acc. to Fig. A21,
- adapter pipe tees TR45, acc. to Fig. A22,
- adapter pipe tees TRC45, acc. to Fig. A23,
- cross pieces CZ90, acc. to Fig. A24,
- saddle cover plates NS1, acc. to Fig. A25,
- saddle cover plates NS2, acc. to Fig. A26,
- saddle cover plates NS3, acc. to Fig. A27,
- saddle cover plates NS4, acc. to Fig. A28,
- saddle cover plates NS6, acc. to Fig. A29,
- offset pipes OSO, acc. to Fig. A30,
- connection stub pipes KP, acc. to Fig. A31,
- diffuser stub pipes KD, acc. to Fig. A32,

- external connectors ZZ, acc. to Fig. A33,
- internal connectors ZW, acc. to Fig. A34,
- plugs ZN, acc. to Fig. A35,
- plugs ZM, acc. to Fig. A36,
- release plugs ZS, acc. to Fig. A37,
- roof bases PDBI, acc. to Fig. A38,
- roof bases PDBII, acc. to Fig. A39,
- roof bases adjustable PDR1, acc. to Fig. A40,
- roof bases adjustable PDR2, PDR3 i PDR4, acc. to Fig. A41,
- roof bases adjustable WPWC1, acc. to Fig. A42,
- roof bases adjustable WPWC2, WPWC3 and WPWC4, acc. to Fig. A43,
- roof gangways PDC3, acc. to Fig. A44,
- roof gangways PDC4, acc. to Fig. A45,
- roof gangways PDC10, acc. to Fig. A46,
- adapters PDC17, acc. to Fig. A47.

PKC ventilation ducts with circular cross-section are made of galvanized steel sheet, grade DX51D+Z275 according to PN-EN 10346:2015, steel sheet with aluminium-zinc coating, grade DX51D+AZ185 according to PN-EN 10346:2015 or corrosion-resistant steel sheet, grade 1.4301, 1.4307, 1.4401 or 1.4404 according to PN-EN 10088-1:2014.

Straight ducts are made of sheet metal (strip) as spiral wound (PPS) or with longitudinal sheet metal lock or longitudinal welded connection (PPBI), and fittings are made of sheet metal joined by sheet metal lock or joined by welding. Minimum sheet (wall) thickness of straight ducts and fittings (as per Fig. A1 ÷ A47) made of galvanized steel sheet and steel sheet with aluminium-zinc coating is given in Table 1, and that made of corrosion-resistant steel sheet in Table 2.

Table 1

Duct diameter, mm	Minimum sheet thickness, mm		
	Straight ducts		Fittings
	PPS	PPBI	
63	-	-	0.5
80	0.5	0.5	0.5
100	0.5	0.5	0.5
125	0.5	0.5	0.5
140	0.5	0.5	0.5
150	0.5	0.5	0.5
160	0.5	0.5	0.5
180	0.5	0.5	0.5
200	0.5	0.5	0.5
224	0.5	0.5	0.5
250	0.5	0.5	0.5
280	0.5	0.6	0.5
300	0.5	0.6	0.5
315	0.5	0.6	0.5
355	0.5	0.6	0.5
400	0.5	0.6	0.5
450	0.6	0.7	0.6
500	0.6	0.7	0.6

Table 1, cont.

Duct diameter, mm	Minimum sheet thickness, mm		
	Straight ducts		Fittings
	PPS	PPBI	
560	0.6	0.7	0.6
600	0.6	0.9	0.6
630	0.6	0.9	0.6
710	0.7	0.9	0.7
800	0.7	0.9	0.7
900	0.9	1.0	0.9
1000	0.9	1.0	0.9
1120	0.9	1.1	0.9
1250	0.9	1.1	1.0
1400	1.2	1.2	1.2
1600	1.2	1.2	1.2

Table 2

Duct diameter, mm	Minimum sheet thickness, mm		
	Straight ducts		Fittings
	PPS	PPBI	
63	-	-	0.5
80	0.5	0.5	0.5
100	0.5	0.5	0.5
125	0.5	0.5	0.5
140	0.5	0.5	0.5
150	0.5	0.5	0.5
160	0.5	0.5	0.5
180	0.5	0.5	0.5
200	0.5	0.5	0.5
224	0.5	0.5	0.5
250	0.5	0.5	0.5
280	0.5	0.6	0.5
300	0.5	0.6	0.5
315	0.5	0.6	0.5
355	0.5	0.6	0.5
400	0.6	0.6	0.5
450	0.6	0.8	0.6
500	0.6	0.8	0.6
560	0.6	0.8	0.6
600	0.6	1.0	0.6
630	0.6	1.0	0.6
710	0.8	1.0	0.8
800	0.8	1.0	0.8
900	0.8	1.0	1.0
1000	0.8	1.0	1.0
1120	0.8	1.2	1.0
1250	0.8	1.2	1.0

PKC ducts are made in the following tightness classes in accordance with PN-EN 12237:2005 standard:

- C, for ducts made of galvanized steel sheet and steel sheet with aluminium-zinc coating,

- D, for ducts made of galvanized steel sheet, steel sheet with aluminium-zinc coating and corrosion-resistant steel sheet.

In tightness class C (ducts made of galvanised steel sheet and steel sheet with aluminium-zinc coating), metal sheet overlaps in the fittings are sealed with acrylic compound, assembly joints of the duct elements are screwed with self-tapping bolts and sealed with adhesive tape.

In leakage class D (ducts made of galvanized steel sheet and steel sheet with aluminium-zinc coating), the fittings are equipped with EPDM gaskets (type E and F), metal sheet overlaps in the fittings are sealed with acrylic compound, assembly joints of the duct elements are screwed with self-tapping bolts and sealed with adhesive tape.

In tightness class D (ducts made of corrosion-resistant steel sheet), the fittings are equipped with EPDM gaskets (type U), metal sheet overlaps in the fittings are sealed with polyurethane compound, assembly joints of the duct elements are screwed with self-tapping bolts and sealed with adhesive tape.

Sections of straight PKC ducts are connected among themselves with internal connectors ZW (as per Fig. A34), and fittings with external connectors ZZ (as per Fig. A33). The method of connecting ventilation ducts of circular cross-section is shown in Fig. A48. The method of connecting PKC ducts with other ventilation system components is shown in Fig. A49.

The materials and elements from which circular ducts are made are presented in Attachment B.

2. INTENDED USE OF THE PRODUCT

PKC ducts of circular cross-section are designed for air distribution in ventilation and air conditioning systems in buildings, including residential buildings, collective residence and public utility buildings. They may also be used in warehouse, industrial and household buildings.

Straight ducts and fittings can be used in the following conditions:

- temperature of transported air within the range from -30°C to +70°C,
- relative humidity of transported air up to 100 %,
- transported air free from chemically aggressive and abrasive agents,
- air flow speed up to 16 m/s,
- static pressure difference of air inside and outside the duct from -750 Pa to 2000 Pa.

Due to the requirements for corrosion resistance, PKC ventilation ducts of circular cross-section made of:

- galvanized steel sheet, grade DX51D+Z275 according to PN-EN 10346:2015, can be used in environments with corrosivity category C3 (long durability - H) and C4 (medium durability - M) in accordance with standards PN-EN ISO 9223:2012 and PN-EN ISO 14713-1:2017,

- steel sheet with aluminium-zinc coating, DX51D+AZ185 grade as per standard PN-EN 10346:2015, can be used in environments with corrosivity category C3 (very long durability - VH) and C4 (long durability - H) in accordance with standards PN-EN ISO 9223:2012 and PN-EN ISO 14713- 1:2017,
- corrosion-resistant steel sheet, grade 1.4301 and 1.4307 as per standard PN-EN 10088-1:2014, can be used in environments with corrosivity category C3 (long durability - H) and C4 (medium durability - Min accordance with standards PN-EN ISO 9223:2012 and PN-EN ISO 12944-1:2018,
- corrosion-resistant steel sheet, grade 1.4401 and 1.4404 as per standard PN-EN 10088-1:2014, may be used in environments with corrosivity category C4 (long durability - H) and C5 (medium durability - M) in accordance with standards PN-EN ISO 9223:2012 and PN-EN ISO 12944-1:2018.

Connecting elements should be protected against corrosion in a manner adapted to the corrosion resistance of the ducts.

PKC ventilation duct sections have been classified in Class A1 of reaction to fire in accordance with PN-EN 13501-1:2019 standard, based on European Commission Decision 96/603/EC, as amended according to European Commission Decision 2000/605/EC.

PKC ventilation ducts have been classified as class A2-s1,d0 of reaction to fire in accordance with PN-EN 13501-1:2019 standard and as non-flammable and non-drip according to the Regulation of the Minister of Infrastructure of 12th April 2002 (Dziennik Ustaw No. 75, item 690, as amended). At the same time, the products are classified as not falling off under the influence of fire, and as not spreading fire inside and outside buildings. The above classification applies to PKC ducts fixed directly to elements with at least A2-s3,d0 of reaction to fire class in accordance with PN-EN 13501-1:2019 standard or at any distance from them.

For sealing joints of PKC ventilation ducts, sealing elements should be used as per section 1.

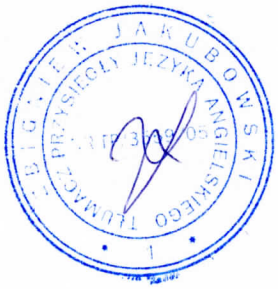
For connection of PKC ventilation ducts and pipe fittings with fans or other vibration generating devices, flexible stub ZEO made of steel sheet and glass fibre coated with polyurethane, manufactured by Ciecholewski-Wentylacje Sp. z o.o., classified in class A2-s1,d0 of reaction to fire in accordance with PN-EN 13501-1:2019 standard.

The method of connecting PKC ventilation ducts with other elements and devices of the system, as well as the method of thermal and/or acoustic insulation of ducts should be specified in the technical design prepared for a specific building facility.

PKC ventilation ducts should be suspended or supported in a way specified in the technical design.

PKC ventilation ducts of circular cross-section should be used in accordance with:

- the technical design, developed for a specific facility, taking into account 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 (Dziennik Ustaw of 2019, item 1065, as amended),
- provisions of this National Technical Assessment,
- instructions developed by the manufacturer and provided to customers.



3. PERFORMANCE OF THE PRODUCT AND METHODS USED TO ASSESS IT

3.1. Dimensions

Dimensions of PKC are in accordance with those specified section 1 and Attachment A.
Dimensions are checked by means of universal measuring instruments with appropriate accuracy.

3.2. Wall thickness

The wall thickness of PKC ventilation ducts is in accordance with Tables 1 ÷ 2, in section 1.
Wall thickness is checked by means of universal measuring instruments with appropriate accuracy.

3.3. Tightness

PKC ventilation ducts made of galvanized steel sheet and steel sheet with aluminium-zinc coating, without gaskets, sealed in accordance with section 1, are characterized by air tightness class C in accordance with PN-EN 12237:2005 standard.

PKC ventilation ducts made of galvanized steel sheet, steel sheet with aluminium-zinc coating and corrosion resistant steel sheet, with EPDM gaskets, sealed in accordance with section 1, are characterized by tightness class D in accordance with PN-EN 12237:2005 standard.

Tightness test is conducted in accordance with standard PN-EN 12237:2005 and WO-KOT/36/01 edition 2, in the static pressure limits from -750 to 2000 Pa.

3.4. Strength

Under the influence of the static pressure limits in accordance with standard PN-EN 12237:2005 (from -750 to 2000 Pa), there is no permanent deformation or sudden change in tightness.
Strength test is conducted in accordance with standard PN-EN 12237:2005 and WO-KOT/36/01 edition 2, in the static pressure limits from -750 to 2000 Pa.

3.5. Durability

Durability of PKC ventilation ducts of circular cross-section, related to the corrosive aggressiveness of the environment, within the scope resulting from section 2, is ensured by:

- The applied corrosion resistant steel grades: 1.4301, 1.4307, 1.4401, 1.4404 according to standard PN-EN 10088-1:2014,
- the applied steel sheet grades and protective anti-corrosion coatings, with the properties given in Table 3.

Table 3

Item	Essential characteristics	Performance	Assessment methods
1	*2*	*3*	*4*
1	Zinc coating (steel sheet products, grade DX51D+Z275 in accordance with PN-EN 10346:2015 standard)		
	a) coating mass, g/m^2	≥ 275	PN-EN 10346:2015
	b) coating thickness, pm	20 tolerance acc. to PN-EN 10346:2015	PN-EN ISO 2178:2016 PN-EN ISO 2808:2020
2	Aluminium-zinc coating (steel sheet products with aluminium-zinc coating, grade DX51D+AZ185 according to PN-EN 10346:2015 standard)		
	a) coating mass, g/m^2	≥ 185	PN-EN 10346:2015
	b) coating thickness, pm	25 tolerance acc. to PN-EN 10346:2015	PN-EN ISO 2178:2016 PN-EN ISO 2808:2020

3.6. Fire classification

PKC ventilation duct sections meet the criteria for class A1 reaction to fire in accordance with PN-EN 13501-1:2019, based on European Commission Decision 96/603/EC, as amended according to European Commission Decision 2000/605/EC.

PKC ventilation ducts, used in accordance with section 2, are classified as class A2-s1,d0 of reaction to fire in accordance with PN-EN 13501-1:2019. The ducts are classified as non fire-spreading.

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

The products covered by this National Technical Assessment should be delivered in manufacturer's packaging, and stored and transported in a way that ensures unchanging of their technical properties.

The method of marking products with the construction mark should 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 the construction mark (Dziennik Ustaw of 2016, item 1966, as amended).

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

- the last two digits of the year in which the construction mark was first affixed to the construction product,
- name and address of the registered office of the manufacturer or an identification mark allowing to uniquely identify the name and address of the registered office of the manufacturer,
- name and indication of the type of construction product,
- the number and year of the national technical assessment according to which the performance was declared (ITB-KOT-2021/0996 edition 1),
- the number of the national declaration of performance,
- the level or class of the declared performance,

- the address of the manufacturer's website if the national declaration of performance is available on it.

A safety data sheet and/or information on hazardous substances contained in a construction product, as defined in Article 31 or 33 of Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency, should be supplied or, where appropriate, made available together with the national declaration of performance.

Furthermore, the labelling of a construction product, which is a hazardous mixture according to REACH, should be compliant 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, and amending Regulation (EC) No 1907/2006.

5. ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

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

According to 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 the construction mark (Dziennik Ustaw of 2016, item 1966, as amended), system 3 of assessment and verification of constancy of performance applies.

5.2. Type examination

The performance characteristics evaluated in section 3 constitute type testing of the product as long as there are no changes in raw materials, components, production line, or manufacturing facility.

5.3. Factory production control

The manufacturer shall have a factory production control system in place at the manufacturing site. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of rules and procedures, including records of tests conducted. The factory production control shall be adapted to the production technology, and ensure that the declared performance of the product is maintained in series production.

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

The results of production control should be systematically recorded. The records shall confirm that the products meet the criteria for assessment and verification of constancy of performance. Individual products or batches of products and their associated manufacturing details must be fully identifiable and reproducible.

5.4. Control tests

5.4.1. Test program. The test program includes:

a) current tests,

b) periodic tests.

5.4.2. Current tests. The current tests include checking the following:

a) dimensions,

b) wall thickness,

c) mass or thickness of zinc and aluminium-zinc coatings.

5.4.3. Periodic tests. The periodic tests include checking the following:

a) tightness,

b) strength.

5.5. Frequency of testing

Ongoing tests should be conducted in accordance with the established test plan, but not less frequently than for each batch of products. The batch size should be defined in the factory production control documentation.

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

6. INSTRUCTION

6.1. The National Technical Assessment ITB-KOT-2021/0996 edition 1 is a positive assessment of the performance of those essential characteristics of PPC ducts of rectangular cross-section, which in accordance with the intended use resulting from the provisions of the Assessment, affect the fulfilment of basic requirements by construction works in which the product will be used.

6.2. The National Technical Assessment ITB-KOT-2021/0996 edition 1 is not a document authorizing to mark a construction product with a construction mark.

In accordance with the Act of 16th April 2004 on construction products (Dziennik Ustaw of 2021, item 1213), the products covered by this National Technical Assessment may be launched or made available on the domestic market if the manufacturer has assessed and verified the constancy of performance, prepared a national declaration of performance in accordance with the National Technical Assessment ITB-KOT-2021/0996 edition 1, and marked the products with the construction mark in accordance with applicable regulations.

6.3. The National Technical Assessment ITB-KOT-2021/0996 edition 1 does not violate the rights arising from the provisions of the protection of industrial property, in particular the Act of 30th June 2000 - Industrial Property Law (Dziennik Ustaw of 2021, item 324). Ensuring these rights is the responsibility of the users of this National Technical Assessment ITB.

6.4. When issuing the National Technical Assessment, ITB shall not take responsibility for any possible infringement of exclusive or acquired rights.

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

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

7. LIST OF DOCUMENTS USED IN THE PROCEEDINGS

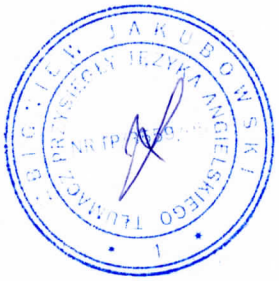
7.1. Reports, test reports, evaluations, classifications

1. LZF00-01906/19/Z00NZF. Report on tightness and strength tests of PKC ventilation ducts with circular cross-section. Department of Thermal Physics, Acoustics and Environment of the ITB, 2019.
2. LZF03-01777/19/Z00NZF. Report on tightness and strength tests of PKC ventilation ducts with circular cross-section. Department of Thermal Physics, Acoustics and Environment of the ITB, 2019.
3. LZF04-01777/19/Z00NZF. Report on tightness and strength tests of PKC ventilation ducts with circular cross-section. Department of Thermal Physics, Acoustics and Environment of the ITB, 2019.
4. LZF09-01429/19/Z00NZF. Report on tightness and strength tests of PKC ventilation ducts with circular cross-section. Department of Thermal Physics, Acoustics and Environment of the ITB, 2019.
5. LZF11-01429/19/Z00NZF. Report on tightness and strength tests of PKC ventilation ducts with circular cross-section. Department of Thermal Physics, Acoustics and Environment of the ITB, 2019.
6. LZF12-01429/19/Z00NZF. Report on tightness and strength tests of PKC ventilation ducts with circular cross-section. Department of Thermal Physics, Acoustics and Environment of the ITB, 2019.
7. 01432.1/19/Z00NZP. PKC ventilation duct classification report on reaction to fire for the duct system. Fire Research Department of the ITB, 2019
8. LZP01-01432/19/Z00NZP, LZP02-01432/19/Z00NZP, LZP03-01432/19/Z00NZP, LZP04-01432/19/Z00NZP, LZP05-01432/19/Z00NZP. Report on the testing of sealing materials used in ventilation ducts. Fire Research Department of the ITB, 2019.
9. 02139/19/Z00NZP. Flexible stub pipe classification report. Fire Research Department of the ITB, 2019.
10. LZP01-02139/19/Z00NZP, LZP01-02139/19/Z00NZP. Flexible stud pipe test reports. Fire Research Department of the ITB, 2019.
11. LZM00-02084/19/Z00NZM. Report on durability tests of protective coatings of ventilation ducts. Department of Building Materials Engineering of the ITB, 2019.
12. 02084/19/Z00NZM. Technical opinion on the durability of steel sheets intended for ventilation ducts in relation to the environmental corrosivity category. Department of Building Materials Engineering of the ITB, 2019.

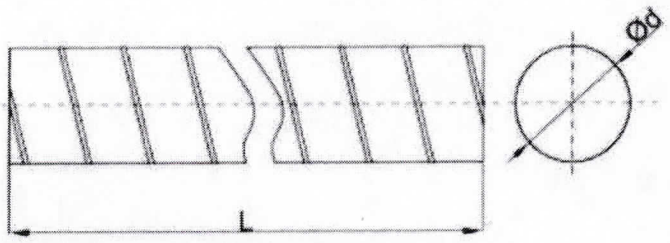
7.2. Standards and related documents

PN-EN 1506:2007	*Ventilation of buildings. Ducts and fittings of circular cross-section sheet metal ventilation. Dimensions*
PN-EN 12237:2005	*Ventilation of buildings. Duct network. Strength and tightness of the ducts from sheet metal with a circular cross-section*
PN-EN ISO 9223:2012	*Corrosion of metals and alloys. Corrosivity of atmospheres. Classification, determination and evaluation*
PN-EN ISO 14713-1:2017	*Zinc coatings. Guidelines and recommendations for corrosion protection of cast iron and steel structures. Part 1: General principles for design and corrosion resistance*
PN-EN ISO 12944-1:2018	*Paints and varnishes. Protection against corrosion of steel structures by protective coating systems. Part 1: General introduction*
PN-EN ISO 2178:2016	*Non-magnetic coatings on magnetic substrates. Measurement of coating thickness. Magnetic method*
PN-EN ISO 2808:2020	*Paints and varnishes. Determination of film thickness*
PN-EN 10346:2015	*Continuous hot-dip coated steel flat products for cold forming. Technical delivery conditions*
PN-EN 10088-1:2014	*Corrosion resistant steels. Part 1: List of corrosion resistant steels*
PN-EN 13501-1:2019	*Fire classification of construction products and building elements. Part 1: Classification using the results of reaction to fire*
PN-EN ISO 15480:2019	*Fasteners. Self-tapping drill screws with hexagonal head with cylindrical flange*
PN-EN ISO 15481:2002	*Self-tapping drill screws with pan head with cross recess*
PN-EN ISO 2702:2011	*Self-tapping screws made of tempered steel. Mechanical properties*
PN-EN ISO 868:2005	*Plastics and hard rubber. Determination of hardness by pressing with the use of a hardness tester (Shore hardness)*
DIN 7504-K	*Self-drilling screws with tapping screw thread. Dimensions, requirements and testing*
WO-KOT/36/01 *edition* 2	*Conditions for assessing the performance of a construction product. Steel sheet ventilation ducts*

ATTACHMENTS

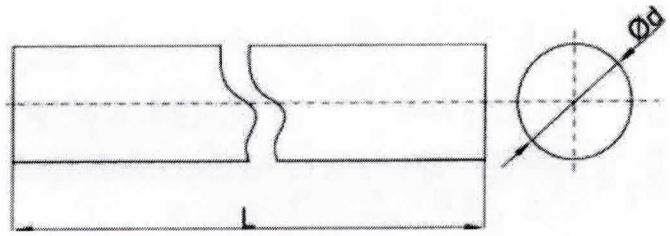


Attachment A.



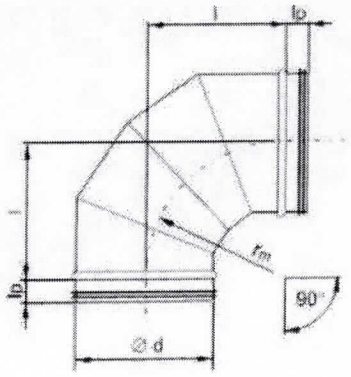
Ød, mm	Duct length L, mm
80 ÷ 1600	100 ÷ 3000
Dimension tolerance acc. PN-EN 1506:2007	

Fig. A1. Straight ducts PPS



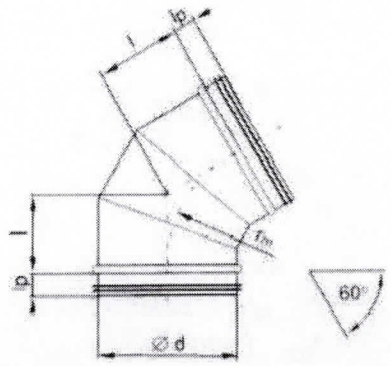
Ød, mm	Duct length L, mm
80 ÷ 1600	100 ÷ 2000
Dimension tolerance acc. PN-EN 1506:2007	

Fig. A2. Straight ducts PPBI



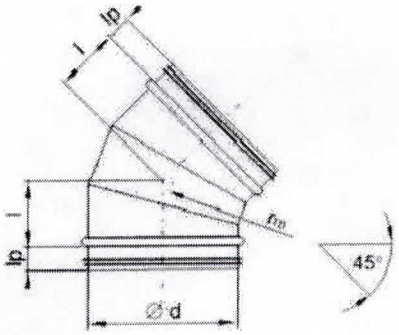
Ød, mm	r_m, mm	l, mm	l_p, mm
63 ÷ 1600	1d ÷ 2d	80 ÷ 3200	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

Fig. A3. Segment bends LS90



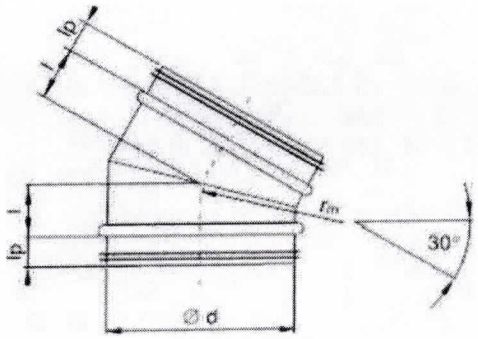
Ød, mm	rm, mm	l, mm	lp, mm
63 ÷ 1600	1d ÷ 2d	45 ÷ 1850	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

Fig. A4. Segment bends LS60



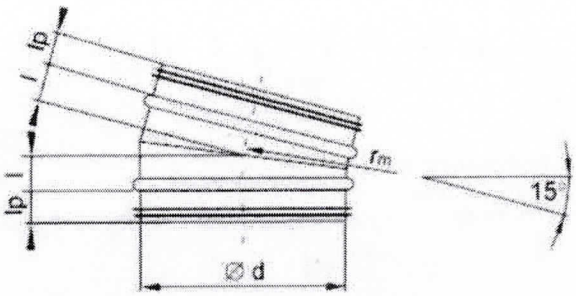
Ød, mm	rm, mm	l, mm	lp, mm
63 ÷ 1600	1d ÷ 2d	30 ÷ 1330	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

Fig. A5. Segment bends LS45



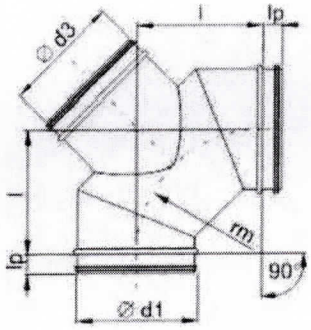
Ød, mm	rm, mm	l, mm	lp, mm
63 ÷ 1600	1d ÷ 2d	20 ÷ 860	30 ÷160
Dimension tolerance acc. PN-EN 1506:2007			

Fig. A6. Segment bends LS30



Ød, mm	rm, mm	l, mm	l_p, mm
63 ÷ 1600	1d ÷ 2d	10 ÷ 430	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

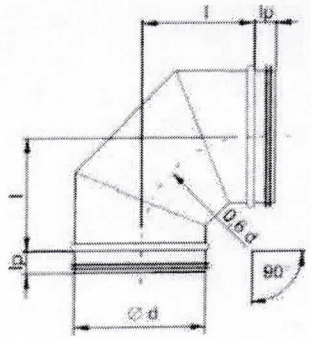
Fig. A7. Segment bends LS15



Ød1, Ød3, mm	r_m, mm	l, mm	l_p, mm
63 ÷ 1600	1d ÷ 2d	80 ÷ 3200	30 ÷ 160

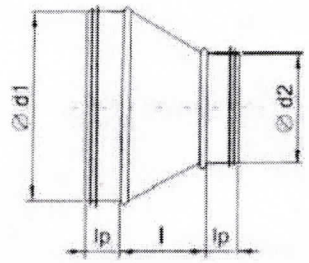
Dimension tolerance acc. PN-EN 1506:2007

Fig. A8. Segment bends with branch LSO



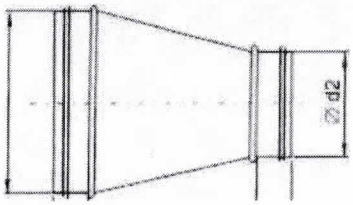
Ød, mm	l, mm	l_p, mm
80 ÷ 1000	48 ÷ 600	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A9. Segment bends "short" LSK90



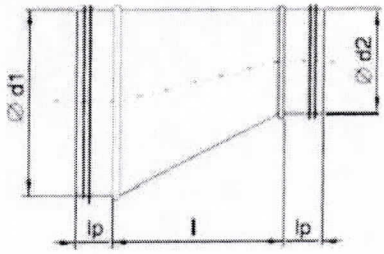
Ød1, Ød2, mm	l, mm	l_p, mm
63 ÷ 1600	20 ÷ 1000	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A10. Symmetrical adapters short RSSK



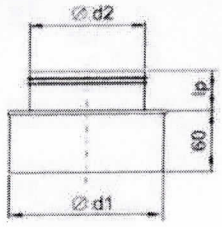
Ød1, Ød2, mm	l, mm	l_p, mm
63 ÷ 1600	40 ÷ 1500	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A11. Symmetrical adapters RSS



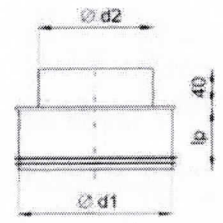
Ød1, Ød2, mm	l, mm	l_p, mm
63 ÷ 1600	40 ÷ 1500	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A12. Asymmetrical adapters RSA



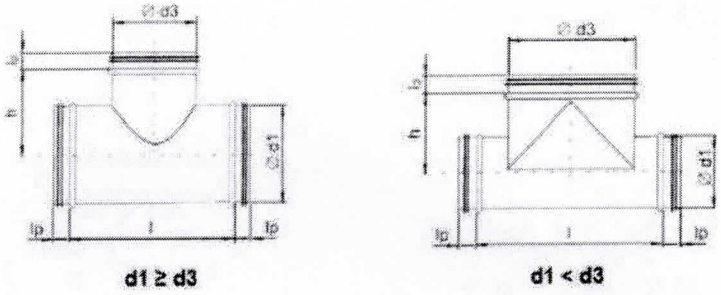
Ød1, Ød2, mm	L_p, mm
63 ÷ 400	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007	

Fig. A13. Straight adapters RPC



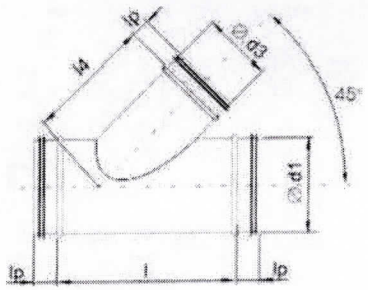
Ød1, Ød2, mm	l_p, mm
63 ÷ 400	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007	

Fig. A14. Straight adapters RED



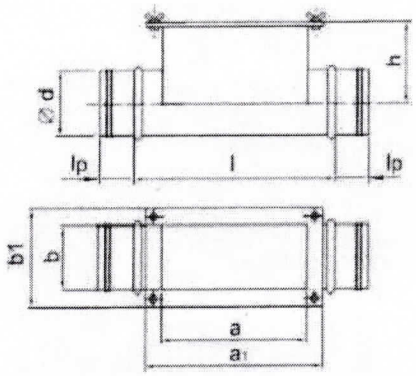
Ød1, Ød3, mm	h, mm	l, mm	l_p, mm
63 ÷ 1600	50 ÷ 1000	100 ÷ 1800	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

Fig. A15. Pipe tees T90



Ød1, Ød3, mm	l4, mm	l, mm	l_p, mm
63 ÷ 1600	150 ÷ 2100	200 ÷ 2500	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

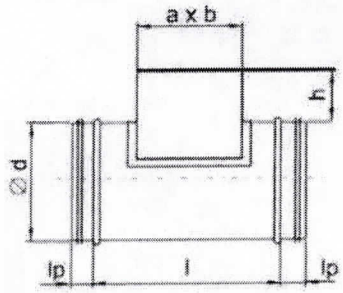
Fig. A16. Pipe tees T45



Ød, mm	a, a1, b, b1, mm	h, mm	l, mm	lp, mm
80- 1250	80 ÷ 500	100 ÷ 800	100 ÷ 800	30 ÷ 160

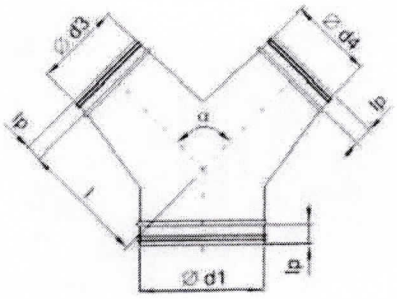
Dimension tolerance acc. PN-EN 1506:2007

Fig. A17. Pipe tees with washout hole TZWC



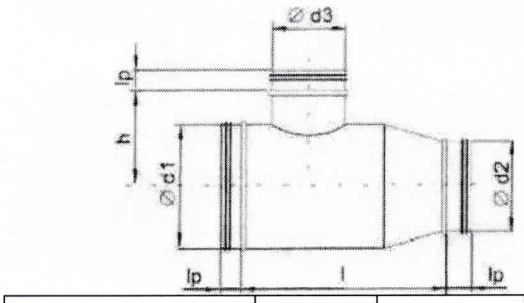
Ød, mm	a, b, mm	h, mm	l, mm	lp, mm
80 ÷ 1250	80 ÷ 500	100 ÷ 800	100 ÷ 800	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007				

Fig. A18. Pipe tees with rectangular stub pipe TZK



Ød1, Ød3, Ød4, mm	α,°	l, mm	lp, mm
63 ÷ 1250	45 ÷ 90	100 ÷ 1600	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

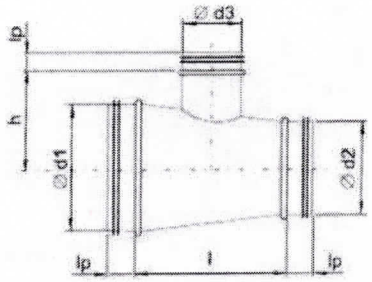
Fig. A19. Pipe tees TY



Ød1, Ød2, Ød3, mm	h, mm	l, mm	l_p, mm
63 ÷ 1250	50 ÷ 800	150 ÷ 2500	30 ÷ 160

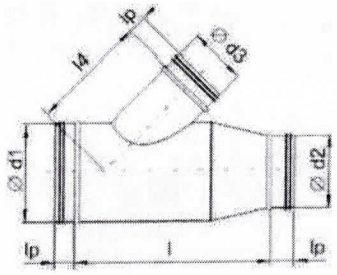
Dimension tolerance acc. PN-EN 1506:2007

Fig. A20. Adapter pipe tees TR90



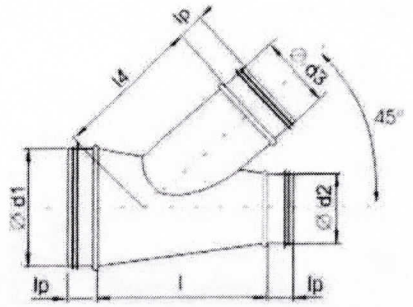
Ød1, Ød2, Ød3, mm	h, mm	l, mm	l_p, mm
63 ÷ 1250	50 ÷ 800	100 ÷ 1500	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

Fig. A21. Adapter pipe tees TRC90



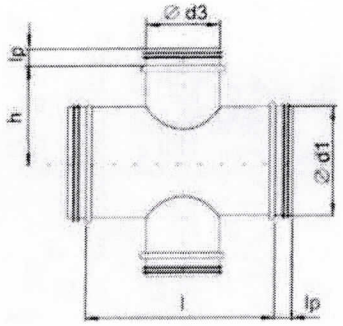
Ød1, Ød2, Ød3, mm	l4, mm	l, mm	l_p, mm
63 ÷ 1250	150 ÷ 2000	200 ÷ 2500	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

Fig. A22. Adapter pipe tees TR45



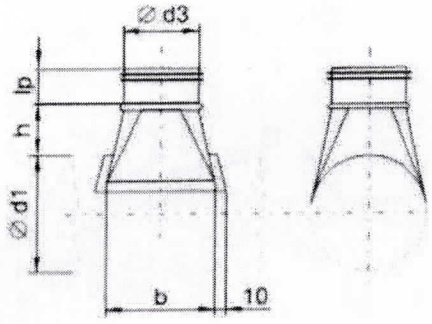
Ød1, Ød2, Ød3, mm	l4, mm	l, mm	l_p, mm
63 ÷ 1250	150 ÷ 1500	200 ÷ 2500	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

Fig. A23. Adapter pipe tees TRC45



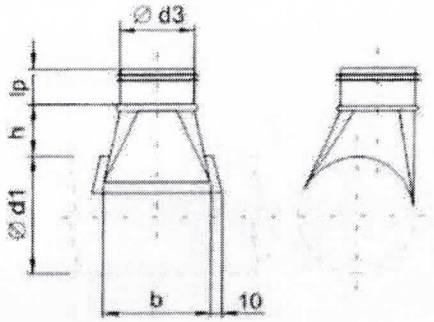
Ød1, Ød3, mm	h, mm	l, mm	l_p, mm
63 ÷ 1600	50 ÷ 1000	100 ÷ 1800	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

Fig. A24. Cross pieces CZ90



Ød1, Ød3, mm	b, mm	h, mm	l_p, mm
80 ÷ 1250	80 ÷ 1250	50 ÷ 500	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007			

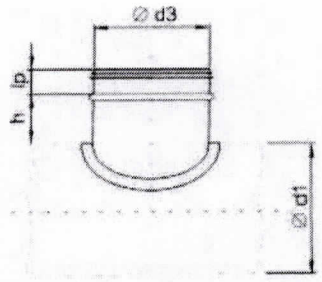
Fig. A25. Saddle cover plates NS1



Ød1, Ød3, mm	b, mm	h, mm	l_p mm
80 ÷ 1250	80 ÷ 1250	50 ÷ 500	30 ÷ 160

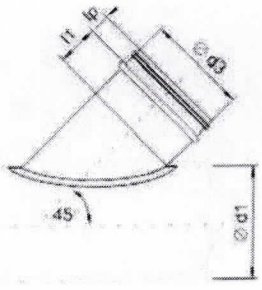
Dimension tolerance acc. PN-EN 1506:2007

Fig. A26. Saddle cover plates NS2



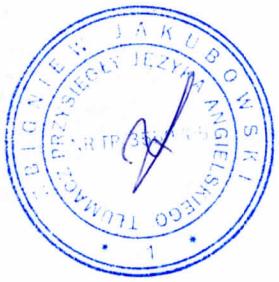
Ød1, Ød3, mm	h, mm	l_p, mm
63 ÷ 1250	50 ÷ 200	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

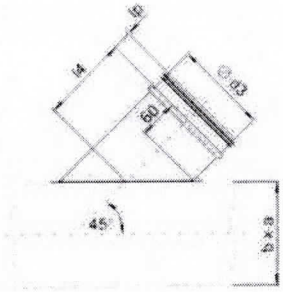
Fig. A27. Saddle cover plates NS3



Ød1, Ød3, mm	h, mm	l_p, mm
63 ÷ 1250	100 ÷ 500	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

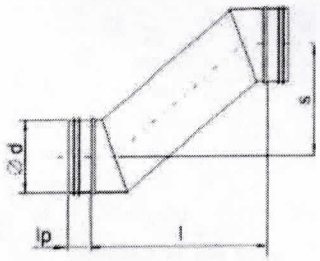
Fig. A28. Saddle cover plates NS4





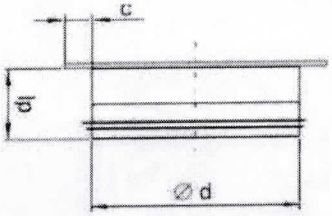
Ød1, mm	l4, mm	l_p, mm
63 ÷ 1250	100 ÷ 1000	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A29. Saddle cover plates NS6



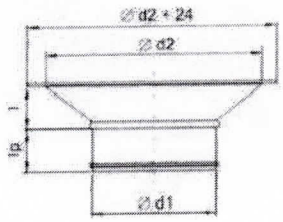
Ød, mm	l, mm	l_p, mm
63 ÷ 1600	100 ÷ 2000	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A30. Offset pipes OSO



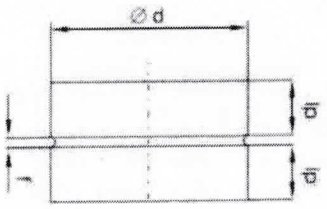
Ød, mm	c, mm	l_p, mm
63 ÷ 1250	10 ÷ 15	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A31. Connection stub pipes KP



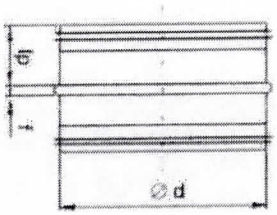
Ød1, Ød2, mm	1, mm	l_p, mm
63 ÷ 1600	30 ÷ 200	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A32. Diffuser stub pipes KD



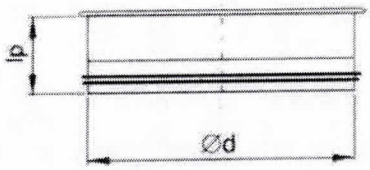
Ød, mm	f, mm	l_p, mm
63 ÷ 1600	5 ÷ 1600	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A33. External connectors ZZ



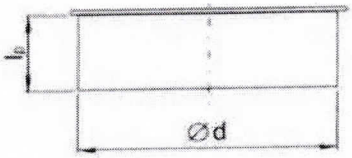
Ød, mm	f, mm	l_p, mm
63 ÷ 1600	5 ÷ 15	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A34. Internal connectors ZW



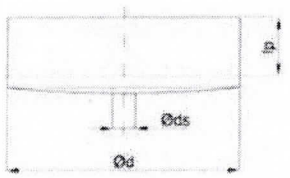
Ød, mm	l_p, mm
63 ÷ 1600	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007	

Fig. A35. Plugs ZN



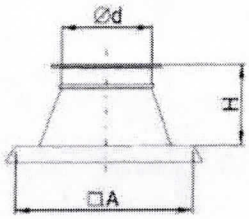
Ød, mm	l_p, mm
63 ÷ 1600	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007	

Fig. A36. Plugs ZM



Ød, mm	Øds, "	l_p, mm
80 ÷ 1250	1/2 ÷ 1	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007		

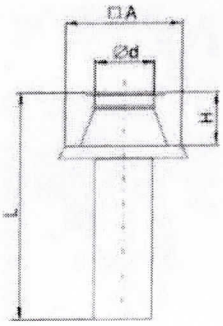
Fig. A37. Release plugs ZS



Ød, mm	A, mm	H, mm
100 ÷ 1250	400 ÷ 1600	80 ÷ 500

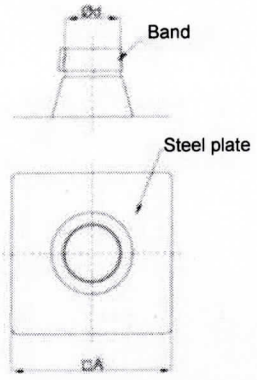
Dimension tolerance acc. PN-EN 1506:2007

Fig. A38. Roof bases PDBI



Ød, mm	A, mm	H, mm	L, mm
100 ÷ 1250	400 ÷ 1600	80 ÷ 500	500 ÷ 1500
Dimension tolerance acc. PN-EN 1506:2007			

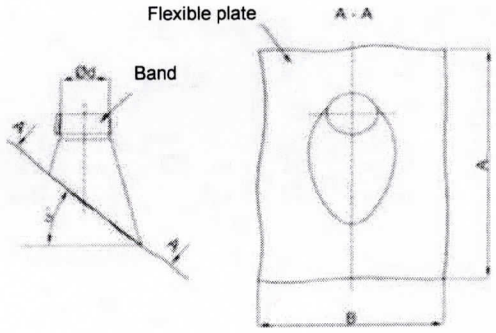
Fig. A39. Roof bases PDBII



Ød, mm	A, mm
80 ÷ 800	400 ÷ 1400

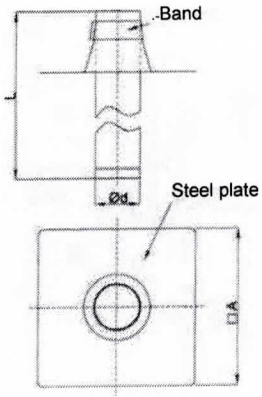
Dimension tolerance acc. PN-EN 1506:2007

Fig. A40. Roof bases adjustable PDR1



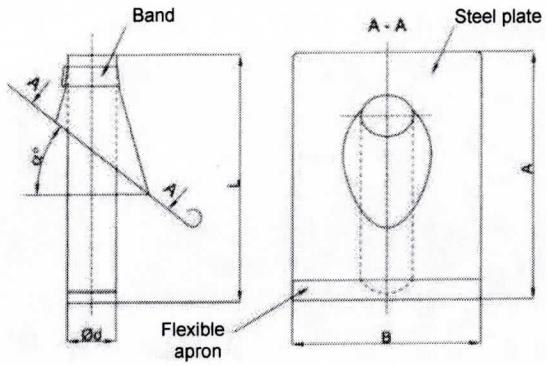
Designation	Ød, mm	A, B, mm	α,°
PDR2	80 ÷ 800	400 ÷ 2200	1 ÷ 30
PDR3	80 ÷ 800	400 ÷ 2200	31 ÷ 45
PDR4	80 ÷ 800	400 ÷ 2200	46 ÷ 50
Dimension tolerance acc. PN-EN 1506:2007			

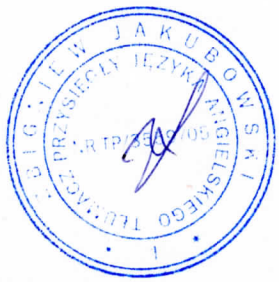
Fig. A41. Roof bases adjustable PDR2, PDR3, PDR4



Ød, mm	A, mm	L, mm
100 ÷ 500	600 ÷ 1100	500 ÷ 1500
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A42. Roof bases adjustable WPWC1

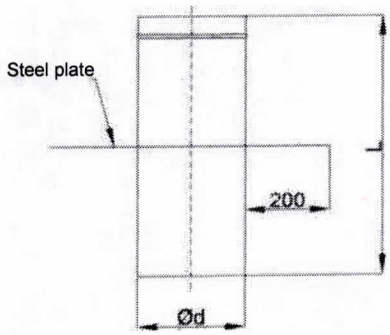




Designation	Ød, mm	A, B, mm	α, °	L, mm
WPWC2	100 ÷ 500	600 ÷ 1700	1 ÷ 30	500 ÷ 1500
WPWC3	100 ÷ 500	600 ÷ 1700	31 ÷ 45	500 ÷ 1500
WPWC4	100 ÷ 500	600 ÷ 1700	46 ÷ 50	500 ÷ 1500

Dimension tolerance acc. PN-EN 1506:2007

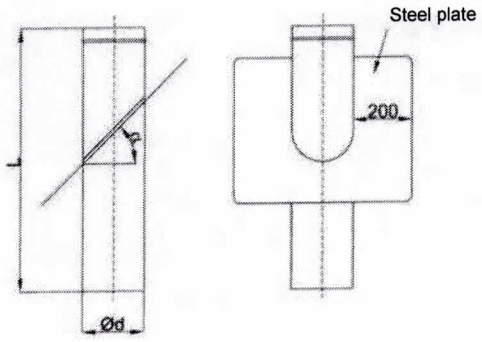
Fig. A43. Roof bases adjustable WPWC2, WPWC3, WPWC4



Ød, mm	L, mm
80 ÷ 800	500 ÷ 1500

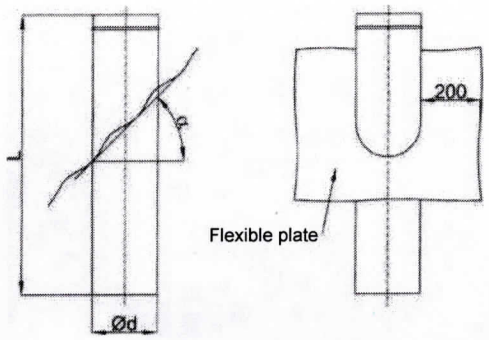
Dimension tolerance acc. PN-EN 1506:2007

Fig. A44. Roof gangways PDC3



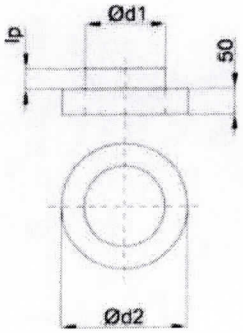
Ød, mm	α,⁰	L, mm
80 ÷ 800	1 ÷ 60	500 ÷ 1500
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A45. Roof gangways PDC4



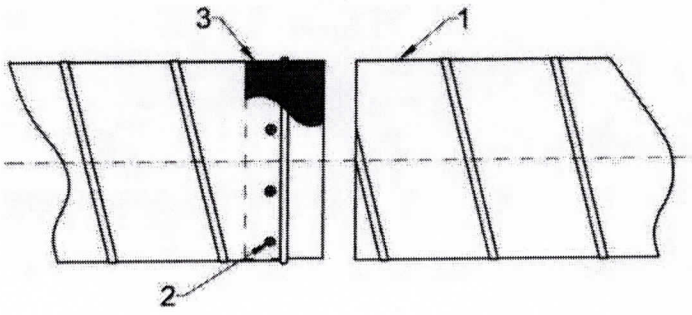
Ød, mm	α, °	L, mm
80 ÷ 800	1 ÷ 60	500 ÷ 1500
Dimension tolerance acc. PN-EN 1506:2007		

Fig. A46. Roof gangways PDC10



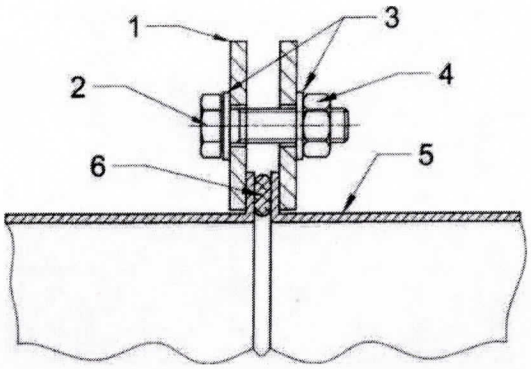
Ød1, Ød2, mm	l_p, mm
100 ÷ 250	30 ÷ 160
Dimension tolerance acc. PN-EN 1506:2007	

Fig. A47. Adapters PDC17



1 - PKC duct sheath, 2 - drilling screws, 3 - adhesive tape

Fig. A48. Method of making connections of PKC ventilation ducts of circular cross-section



1 - flange, 2 - screw, 3 - washer, 4 - nut, 5 – duct sheath, 6 - gasket

Fig. A49. Method of making connections of PKC ventilation ducts of circular cross-section with other ventilation system components

Attachment B.

For the manufacture of PKC ventilation ducts, the following should be used:

- galvanised steel sheet, grade DX51D+Z275 in accordance with standard PN-EN 10346:2015,
- steel sheet with aluminium-zinc coating, grade DX51D+AZ185 in accordance with standard PN-EN 10346:2015,
- corrosion-resistant steel sheet, grade 1.4301, 1.4307, 1.4401 and 1.4404 in accordance with PN-EN 10088-1:2014 standard.

For the installation and sealing of PKC ventilation ducts, the following should be used:

- acrylic sealing compound,
- polyurethane sealing compound,
- self-adhesive tape on a carrier of aluminium foil or aluminium foil reinforced with glass fibre mesh or self-adhesive tape of fabric covered with polyethylene film, with a width of not less than 45 mm,
- drilling screws made of galvanised steel or corrosion-resistant steel in accordance with DIN 7504-K, DIN 7504-N, PN-EN ISO 15480:2019, PN-EN ISO 15481:2002 or PN-EN ISO 2702:2011,
- seals (type U), made of an EPDM-based compound, with Shore hardness class: 60 ± 5°, 70 ± 5° or 80 ± 5° according to PN-EN ISO 868:2005,
- gaskets (type E), made of an EPDM-based compound, hardness class according to Shore: 60 ± 5°, 70 ± 5° or 80 ± 5° according to PN-EN ISO 868:2005 standard,
- seals (type F), made of an EPDM-based compound, hardness class according to shore: 50 ± 5°, 60 ± 5° or 70 ± 5° according to PN-EN ISO 868:2005 standard.

Conformity of the above translation with the original presented to me is hereby certified.
Gniezno, 25th April 2022

Rep. no.: 138/2022 *Fee as agreed*