



**BUILDING RESEARCH INSTITUTE**  
PL 00-611 WARSAW, ul. Filtrowa 1, www.itb.pl



# **NATIONAL TECHNICAL ASSESSMENT**

## **ITB-KOT-2021/2004 revision 1**

This National Technical Assessment was issued in accordance with the Regulation of the Minister of Infrastructure and Construction of November 17, 2016 on national technical assessments (Journal U. z 2016 r., poz. 1968) przez Instytut Techniki Budowlanej w Warszawie, na wniosek:

**Airwent System Sp. z o.o. Sp. komandytowa**  
**ul. Mizikowskiego 3, 05-082 Stare Babice**

The National Technical Assessment ITB-KOT-2021/2004 revision 1 is a positive assessment of the performance of the following construction products for the intended use:

**Pre-insulated PIANO-SYSTEM + I ventilation ducts with a rectangular cross-section**

National Technical Assessment validity date:

**16 November 2026**



DIRECTOR of  
Building Research Institute

Ph.D. Robert Geryło

Warsaw, November 16, 2021

Building Research Institute

ul. Filtrowa 1, 00-611 Warsaw

phone: 22 825 04 71; TIN: 525 000 93 58; KRS: 0000158785

## 1. TECHNICAL DESCRIPTION OF THE PRODUCT

This National Technical Assessment covers pre-insulated PIANO-SYSTEM + I ventilation ducts with a rectangular cross-section, manufactured by Airwent System Sp. z o.o. Sp. komandytowa, ul. Mizikowskiego 3, 05-082 Stare Babice, at the production plants in Stare Babice.

The National Technical Assessment covers the types of products specified by the manufacturer and resulting from the performance specified in point 3 and the combination of materials and components.

The National Technical Assessment covers:

- straight pipes PIANO-SYSTEM K + I, as shown in Fig. A1,
- symmetric elbows PIANO-SYSTEM BS + I, as shown in Fig. A2,
- asymmetric elbows PIANO-SYSTEM BA + I, as shown in Fig. A3,
- symmetric diffusers (reducers) PIANO-SYSTEM US + I, as shown in Fig. A4,
- asymmetric diffusers (reducers) PIANO-SYSTEM UA + I, as shown in Fig. A5,
- symmetric circular-rectangular reducers PIANO-SYSTEM RS + I, as shown in Fig. A6,
- asymmetric circular and rectangular reducers PIANO-SYSTEM RA + I, as shown in Fig. A7,
- symmetric tees PIANO-SYSTEM TRS + I, as shown in Fig. A8,
- asymmetric tees PIANO-SYSTEM TRA + I, as shown in Fig. A9,
- rectangular tees with circular outlet PIANO-SYSTEM TRO + I, as shown in Fig. A10,
- cross-pieces PIANO-SYSTEM CZ + I, as shown in Fig. A11,
- offsets PIANO-SYSTEM ES + I, as shown in Fig. A12,
- lids PIANO-SYSTEM F + I, as shown in Fig. A13.

Pre-insulated PIANO-SYSTEM + I ventilation ducts with a rectangular cross-section consist of an inner duct and an outer casing (as shown in Fig. A14), of galvanized steel sheet, grade DX51D + Z275 acc. to PN-EN 10346:2015 standard. Between the inner duct and the outer casing there is polyurethane (PUR) foam insulation, 25-100 mm thick. The dimension of the outer casing results from the thickness of the applied insulation layer. The minimum sheet thickness of the inner duct and the outer casing is 0.5 mm.

Transverse connections (flanged frames), used in the internal channel and external jacket, are made of P-20 and P-30 flange profiles (frames) and N-20 and N-30 corners, of galvanized steel sheet, grade DX51D + Z275 according to PN-EN 10346:2015 standard. The scope of application of particular sizes of flange profiles is given in Table B1.

PIANO-SYSTEM + I ventilation ducts are made in tightness class D according to the PN-EN 1507:2007 standard.

In tightness class D, the ventilation ducts (internal duct and external casing) are joined longitudinally with overlapping sheet metal locks (Pittsburgh overlap joint) or welded. Between the frames of flange connections (inner duct and outer casing) there is a seal made of self-adhesive polyethylene foam (PES) tape, not less than 12 mm wide and not less than 4 mm thick. Duct corners are sealed with silicone compound.

Sections of pre-insulated PIANO-SYSTEM + I ventilation ducts are connected by means of flange connections screwed with M8 and M10 screws according to DIN 933 or PN-EN ISO 4017:2014,

M8 and M10 nuts according to DIN 934 or PN-EN ISO 4032:2013 and washers <J> 8 and 4> 12 mm made of galvanized steel, according to DIN 125 or PN-EN ISO 7090:2004.

Frames of PIANO-SYSTEM + I ventilation ducts (applies to the outer casing), in the case of elements with a duct side length greater than 200 mm, are additionally reinforced with galvanized steel sheet mounting clips (clamps), as shown in Fig. B1.

The method of making connections of pre-insulated PIANO-SYSTEM + 1 ventilation ducts with a rectangular cross-section with the use of flange frames is shown in Fig. A15.

Elements and materials of the pre-insulated PIANO-SYSTEM + 1 rectangular ventilation ducts are presented in Annex C.

## 2. INTENDED USE OF THE PRODUCT

Pre-insulated PIANO-SYSTEM + I ventilation ducts with a rectangular cross-section are intended for air distribution in ventilation and air-conditioning systems in buildings, including residential buildings, collective residence and public utility buildings. They can also be used in warehouse, industrial and farm buildings.

Straight lines and fittings may be used under the following conditions:

- temperature of transported air in the range from -30 °C to + 70 °C,
- relative humidity of transported air up to 100%,
- air transport without chemically aggressive and abrasive factors,
- air flow speed up to 16 m/s,
- static air pressure difference inside and outside the duct from -500 Pa to 1000 Pa (execution class N, according to WO-KOT / 36/01 revision 2).

Due to the requirements for corrosion resistance, pre-insulated PIANO-SYSTEM + I ventilation ducts made of galvanized steel sheet, grade DX51D + Z275 according to PN-EN 10346:2015 standard, are characterized by high durability and can be used in corrosive environments. C1, C2 and C3 atmospheres according to PN-EN ISO 9223:2012.

The connecting elements should be protected against corrosion in a manner appropriate to the corrosion resistance of the pipes.

Pre-insulated PIANO-SYSTEM + ventilation ducts with a rectangular cross-section have been classified in class B-s3, d0 reaction to fire according to PN-EN 13501-1:2019 and as non-flammable, non-drip and non-spreading fire inside buildings according to the decision of the Minister of Infrastructure of 12 April 2002 (Journal of Laws No. 75 of April 12, 2002, item 690, as amended). At the same time, the products are classified as fire resistant. The above classification applies to pre-insulated PIANO-SYSTEM + I ventilation ducts mounted directly to elements of A1 or A2 reaction to fire class according to PN-EN 13501-1:2019 or at any distance from them.

Sealing elements according to p. 1 should be used to seal the connections of the pre-insulated PIANO-SYSTEM + 1 ventilation ducts.

The method of connecting pre-insulated PIANO-SYSTEM + I ventilation ducts with other elements and devices of the installation, as well as the method of thermal and / or acoustic

insulation of the ducts should be specified in the technical design prepared for a specific building object.

Pre-insulated PIANO-SYSTEM + I ventilation ducts should be suspended or supported in the manner specified in the technical design.

Pre-insulated PIANO-SYSTEM + I ventilation ducts with a rectangular cross-section should be used in accordance with:

- a technical design, developed for a specific facility, taking into account Polish standards and technical and construction regulations, in particular the decision of the Minister of Infrastructure of April 12, 2002 on technical conditions to be met by buildings and their location (Journal of Laws of 2019, item 1065, as amended),
- ruling of this National Technical Assessment,
- instructions prepared by the manufacturer and delivered to recipients.

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

The performance of pre-insulated PIANO-SYSTEM + 1 rectangular ventilation ducts and the methods used for its assessment are given in tables 1 and 2.

**Table 1**

Pos.	Basic characteristics	Performance	Assessment method
1	2	3	4
1	Dimensions	acc. to Annex A	checking with universal measuring instruments of appropriate accuracy
2	Wall thickness (inner duct and outer casing), mm	$\geq 0.5$	
3	Ducts strength	acc. to table 2	PN-EN 1507:2007 WO-KOT/36/01 revision 2 testing conditions: from -500 to 1000 Pa
4	Duct tightness	class D	
5	Durability (elements made of galvanized steel sheet): - weight of the zinc coating, g/m <sup>2</sup> - thickness of the zinc coating, $\mu\text{m}$	$\geq 275$ 20 (tolerance acc. to PN-EN 10346)	PN-EN 10346:2015, PN-EN ISO 2808:2020
6	Dimensional stability (PUR foam core), after 24 h at the temperature of +100°C, %, towards: - length and width - internal thickness	$\pm 2$ $\pm 10$	PN-EN 1604:2013
7	Tensile strength perpendicular to the faces (sandwich samples with a PUR foam core), kPa	$\geq 35$	PN-EN 1607:2013
8	Thermal conductivity at a temperature of 10 °C (PUR foam core), $\lambda_D$ , W/mK	$\leq 0.025$	PN-EN 12667:2002
9	Fire classification in terms of reaction to fire, class	B-s3,d0	PN-EN 13501-1:2019

Table 2

Pos.	Basic characteristics	Performance	Assessment method
1	2	3	4
1	Deformation	no permanent deformation or sudden change of tightness at the limit values of static pressure	PN-EN 1507:2007 WO-KOT/36/01 revision 2 testing conditions: from - 500 to 1000 Pa
2	Duct deflection, mm	$\leq 0.4$ % total duct length or 20 mm <sup>1)</sup>	
3	Deflection of the duct connection, mm	$\leq 1/250$ of the length of the longer side under the influence of the maximum pressure corresponding to the execution class according to p. 2	
4	Bulge and depression, mm	$\leq 3\%$ of the duct wall width or 30 mm <sup>1)</sup>	
<sup>1)</sup> the lower value is taken			

#### 4. PACKING, TRANSPORT AND STORAGE AND THE METHOD OF MARKING THE PRODUCT

Products covered by the National Technical Assessment should be delivered in the manufacturer's packaging and stored and transported in a manner ensuring that their technical properties remain unchanged.

The method of marking products with a construction mark should comply with the decision of the Minister of Infrastructure and Construction of 17 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 2016, item 1966, as amended).

Marking 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 placed on the construction product,
- the name and address of the manufacturer's registered office or an identification mark allowing for the unambiguous determination of the name and address of the manufacturer's registered office,
- name and designation of the construction product type,
- number and year of issue of the national technical assessment, according to which the performance were declared (ITB-KOT-2021/2004 revision 1),
- number of the national declaration of performance,
- level or class of declared performance,
- manufacturer's website address, if the national declaration of performance is available on it.

Along with the national declaration of performance, in special cases one should provide safety data sheet and / or information on hazardous substances contained in a construction product, referred to in Art. 31 or 33 of Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency.

In addition, the labelling of a construction product, which is a hazardous mixture according to the REACH Regulation, should 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 Directive 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**

In accordance with the decision of the Minister of Infrastructure and Construction of 17 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 2016, item 1966, as amended), the System 3 of Assessment and Verification of Constancy of Performance is applicable.

### **5.2. Test type**

The performance, assessed in point 3, is a type test of the product, until there are any changes to the raw materials, components, production line or production plant.

### **5.3. Plant production control**

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

Factory production control includes specification and checking of raw materials and ingredients, control and testing in the manufacturing process as well as control tests (according to p. 5.4), carried out by the manufacturer in accordance with the prescribed test plan and in accordance with the rules and procedures specified in the factory production control documentation.

The results of production control should be recorded systematically. The entries in the register should confirm that the products meet the criteria of assessment and verification of constancy of performance. Individual products or product batches and related production details must be fully identifiable and traceable.

### **5.4. Checks**

#### **5.4.1. Test program.** The test program includes:

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

#### **5.4.2. Current tests.** Current tests cover the inspection of:

- a) dimensions,
- b) duct wall thickness,

- c) apparent density of the PUR foam core,
- d) weight or thickness of the zinc coating.

**5.4.3. Periodical tests.** Periodical tests include checking:

- a) tightness,
- b) strength,
- c) dimensional stability of the PUR foam core,
- d) thermal conductivity coefficient of the PUR foam core,
- e) tensile strength perpendicular to the faces.

**5.5. Frequency of testing**

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

Periodic examinations should be performed at least every 3 years.

**6. INSTRUCTIONS**

**6.1.** The National Technical Assessment ITB-KOT-2021/2004 revision 1 is a positive assessment of the performance of these essential characteristics of the pre-insulated PIANO-SYSTEM + I ventilation ducts with a rectangular cross-section, which, in accordance with the intended use, resulting from the provisions of the Assessment, have an impact on the satisfaction of the basic requirements by the construction facilities in which the product will be used.

**6.2.** The National Technical Assessment ITB-KOT-2021/2004 revision 1 is not a document authorizing the marking of a construction product with a construction mark.

Pursuant to the Act of 16 April 2004 on construction products (Journal of Laws of 2021, item 1213), the products covered by this National Technical Assessment may be marketed or made available on the domestic market, provided that the manufacturer performed the assessment and verification of constancy of performance, prepared the national declaration of performance in accordance with the National Technical Assessment ITB-KOT-2021/2004, revision 1, and marked the products with a construction mark in accordance with applicable regulations.

**6.3.** The National Technical Assessment ITB-KOT-2021/2004, revision 1, does not infringe the rights resulting from the provisions on the protection of industrial property, in particular the Act of 30 June 2000 - Industrial Property Law (Journal of Laws of 2021, item 324). Providing these rights is the responsibility of the users of this Building Research institute (ITB) National Technical Assessment.

**6.4.** ITB, by issuing the National Technical Assessment, is not responsible for any infringement of exclusive and acquired rights.



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



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6.6. The validity of the National Technical Assessment may be extended for subsequent periods, not longer than 5 years.

## 7. LIST OF DOCUMENTS USED IN THE PROCEDURE

### 7.1. Reports, test reports, assessments, classifications

1. LZF01 -01947/21 /Z00NZF. Strength test report of pre-insulated ventilation ducts with rectangular cross-section PIANO-SYSTEM + 1. Department of Thermal Physics, Acoustics and Environment ITB, 2021
2. LZF02-01947/21/Z00NZF. Report on the tightness tests of pre-insulated ventilation ducts with a rectangular cross-section PIANO-SYSTEM + 1. Department of Thermal Physics and Acoustics and Environment ITB, 2021
3. LZF03-01947/21/Z00NZF. Report on the tightness tests of pre-insulated ventilation ducts with a rectangular cross-section PIANO-SYSTEM + 1. Department of Thermal Physics, Acoustics and Environment ITB, 2021
4. 02100/21/Z00NZP. Classification report on reaction to fire for pre-insulated ventilation ducts. Department of Fire Research ITB, 2021
5. LZP01-02400/21/Z00NZP. Report on testing pre-insulated ventilation ducts. Department of Fire Research ITB, 2021
6. LZM00-01800/21/Z00NZM. Report on testing pre-insulated ventilation ducts. Department of Construction Materials Engineering ITB, 2021
7. LZM00-00905/19/Z00NZM. Report on the mass test of the zinc coating of ventilation ducts. Department of Construction Materials Engineering ITB, 2019
8. 00905/19/Z00NZM. Technical opinion on the durability of galvanized steel sheets intended for ventilation ducts in relation to the environmental corrosivity category according to PN-EN ISO 9223:2012. Department of Construction Materials Engineering ITB, 2019

### 7.2. Reference standards and documents

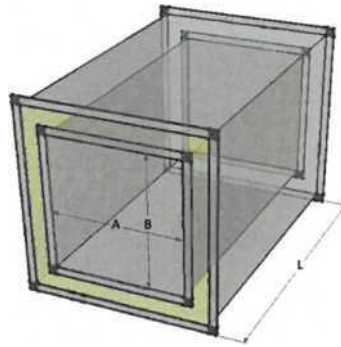
PN-EN 1602:2013	<i>Thermal insulation products in construction. Determining the apparent density</i>
PN-EN 1607:2013	<i>Thermal insulation products in construction. Determination of the tensile strength perpendicular to the faces</i>
PN-EN 1604:2013	<i>Thermal insulation products in construction. Determining dimensional stability under certain temperature and humidity conditions</i>
PN-EN ISO 4017:2014	<i>Connectors. Hexagon head screws fully threaded. Accuracy classes A and B</i>
PN-EN ISO 4032:2013	<i>Hex nuts (type 1). Accuracy classes A and B</i>

PN-EN ISO 7090:2004	<i>Cut round washers. Normal series. Accuracy class A</i>
PN-EN ISO 9223:2012	<i>Corrosion of metals and alloys. Corrosivity of atmospheres. Classification, determination and evaluation</i>
PN-EN 1505:2001	<i>Building ventilation. Straight ducts / fittings made of sheet metal with a rectangular cross-section. Dimensions</i>
PN-EN ISO 2808:2020	<i>Paints and varnishes. Determination of the thickness of the coating</i>
PN-EN 10346:2015	<i>Continuously hot-dip coated steel flat products for cold forming. Technical delivery conditions</i>
PN-EN 1507:2007	<i>Building ventilation. Rectangular ventilation ducts of steel sheet. Requirements for strength and tightness</i>
PN-EN 13501-1:2019	<i>Fire classification of construction products and building elements. Part 1: Classification based on the results of reaction to fire</i>
DIN 933	<i>M 1,6 to M 52 hexagon head screws with thread up to the head; product grades A and B (modified version of ISO 4017)</i>
DIN 934	<i>Hexagon nuts with metric coarse and fine pitch thread; product grades A and B</i>
DIN 9021	<i>Plain washers with large outside diameter</i>
WO-KOT/36/01 revision 2	<i>Conditions for the assessment of the performance of a construction product. Ventilation ducts made of steel sheet</i>

## ANNEXES

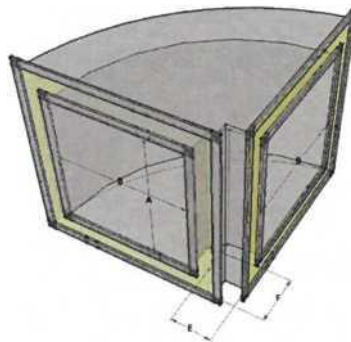
Annex A.....	11
Annex B.....	16
Annex C.....	17

## Annex A.



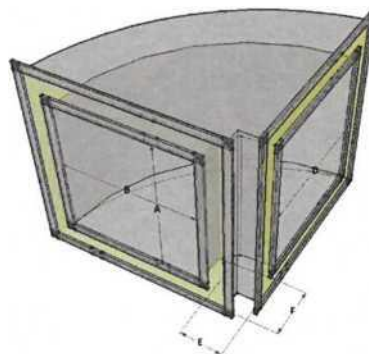
Duct side dimension A, B, mm	Duct length L, mm
100 ÷ 2000	50 ÷ 1500
Dimension tolerances acc. to PN-EN 1505:2001	

Fig. A1. Straight duct PIANO-SYSTEM K+I



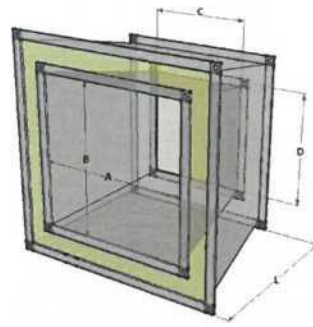
Duct side dimension A, B, mm	Dimension E, F, mm	$\alpha$ , °
100 ÷ 2000	$\geq 100$	0 ÷ 135
Dimension tolerances acc. to PN-EN 1505:2001		

Fig. A2. Symmetric elbow PIANO-SYSTEM BS+I



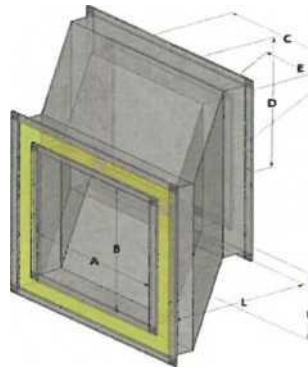
Duct side dimension A, B, D, mm	Dimension E, F, mm	$\alpha$ , °
100 ÷ 2000	$\geq 100$	0 ÷ 135
Dimension tolerances acc. to PN-EN 1505:2001		

Fig. A3. Asymmetric elbow PIANO-SYSTEM BA+I



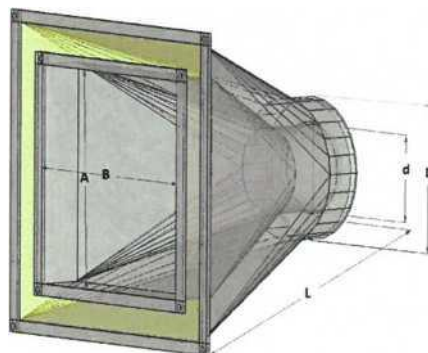
Duct side dimension A, B, C, D, mm	Dimension L, mm
100 ÷ 2000	100 ÷ 1500
Dimension tolerances acc. to PN-EN 1505:2001	

**Fig. A4.** Symmetric diffusers (reducers) PIANO-SYSTEM US+I



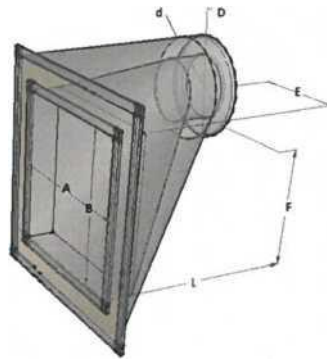
Duct side dimension A, B, C, D, mm	Dimension E, F, mm	Dimension L, mm
100 ÷ 2000	0 ÷ 2000	100 ÷ 1500
Dimension tolerances acc. to PN-EN 1505:2001		

**Fig. A5.** Asymmetric diffusers (reducers) PIANO-SYSTEM UA+I



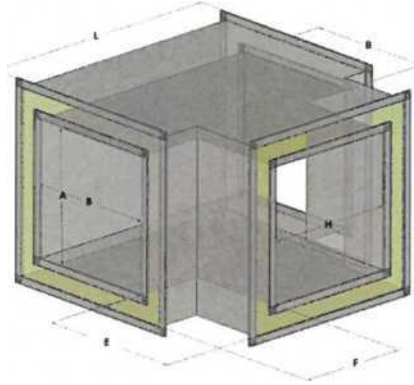
Duct side dimension A, B, mm	Diameter D, mm	Diameter d, mm	Stub-pipe length, mm	Dimension L, mm
100 ÷ 1000	120 ÷ 500	100 ÷ 480	70	200 ÷ 1000
Dimension tolerances acc. to PN-EN 1505:2001				

**Fig. A6.** Symmetric circular-rectangular reducers PIANO-SYSTEM RS+I



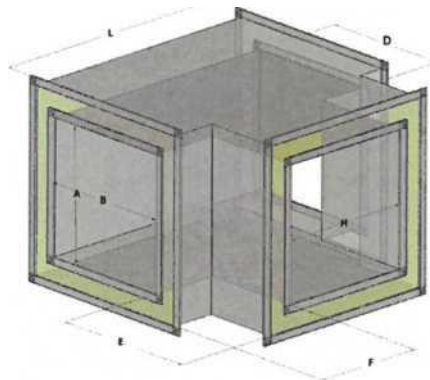
Duct side dimension A, B, mm	Diameter D, mm	Diameter d, mm	Stub-pipe length, mm	Dimension L, mm	Dimension E, F, mm
100 ÷ 1000	120 ÷ 500	100 ÷ 480	70	200 ÷ 1000	≤ 1000
Dimension tolerances acc. to PN-EN 1505:2001					

**Fig. A7.** Asymmetric circular-rectangular reducers PIANO-SYSTEM RA+I



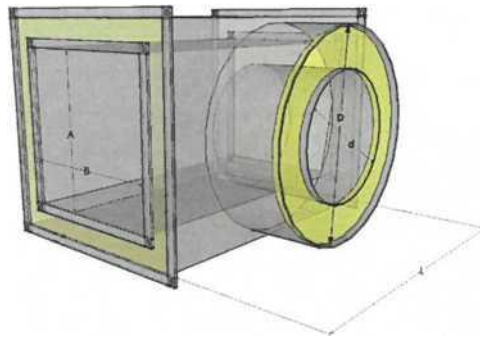
Duct side dimension A, B, H, mm	Dimension E, F, mm	Dimension L, mm
100 ÷ 2000	≥ 100	300 ÷ 1500
Dimension tolerances acc. to PN-EN 1505:2001		

**Fig. A8.** Symmetric tee PIANO-SYSTEM TRS+I



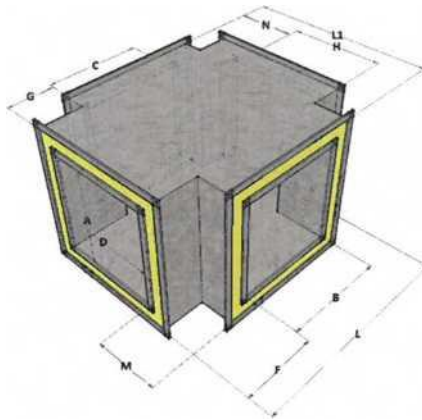
Duct side dimension A, B, D, H, mm	Dimension E, F, mm	Dimension L, mm
100 ÷ 2000	≥ 100	300 ÷ 1500
Dimension tolerances acc. to PN-EN 1505:2001		

**Fig. A9.** Asymmetric tee PIANO-SYSTEM TRA+I



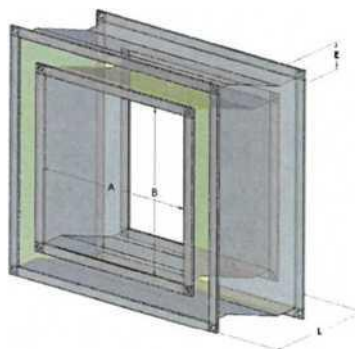
Duct side dimension A, B, mm	Diameter D, mm	Diameter d, mm	Stub-pipe length, mm	Dimension L, mm
100 ÷ 2000	120 ÷ 500	100 ÷ 480	70 + insulation layer thickness	220 ÷ 600
Dimension tolerances acc. to PN-EN 1505:2001				

**Fig. A10.** Rectangular tee with circular outlet PIANO-SYSTEM TRO+I



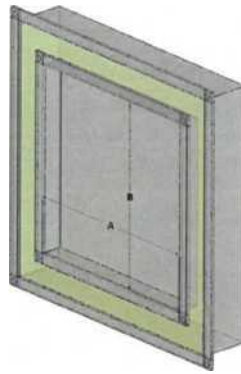
Duct side dimension A, B, C, D, H, mm	Dimension F, G, M, N, mm	Dimension L, L1, mm
100 ÷ 2000	≥ 100	$L = B + 2 \cdot F$ $L1 = H + M + N$
Dimension tolerances acc. to PN-EN 1505:2001		

**Fig. A11.** Cross-piece PIANO-SYSTEM CZ+I



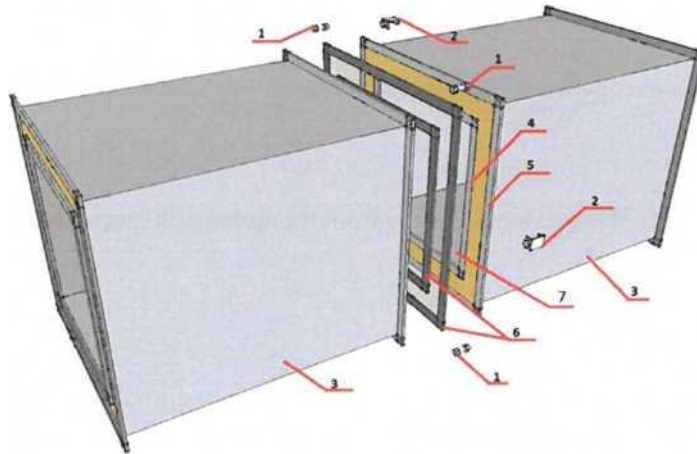
Duct side dimension A, B, mm	Dimension E, mm	Dimension L, mm
100 ÷ 2000	0 ÷ 2000	100 ÷ 1500
Dimension tolerances acc. to PN-EN 1505:2001		

**Fig. A12.** Offset PIANO-SYSTEM ES+I



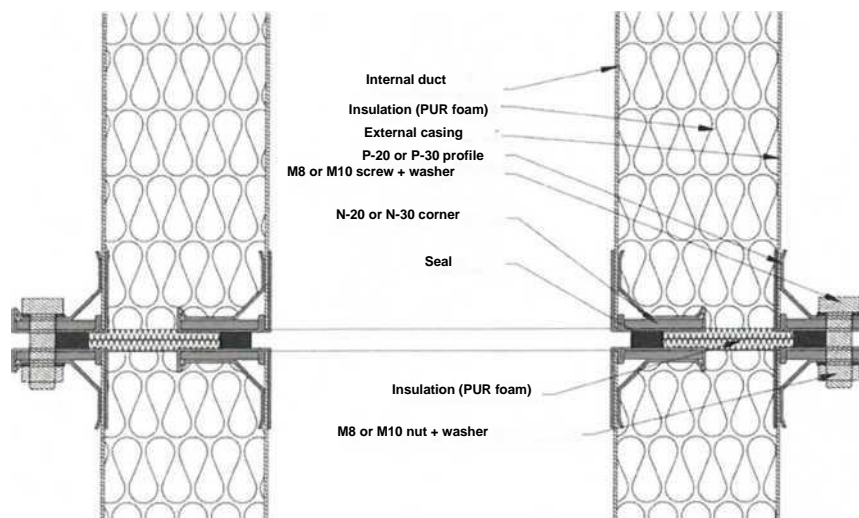
<b>Duct side dimension A, B, mm</b>
100 ÷ 2000
Dimension tolerances acc. to PN-EN 1505:2001

**Fig. A13.** Lid PIANO-SYSTEM F+I



- 1 - screw; 2 - mounting clamp; 3 - outer casing; 4 - inner frame; 5 - outer frame;  
6 - seal; 7 - internal duct

**Fig. A14.** Pre-insulated PIANO-SYSTEM + I ventilation ducts with a rectangular cross-section - design

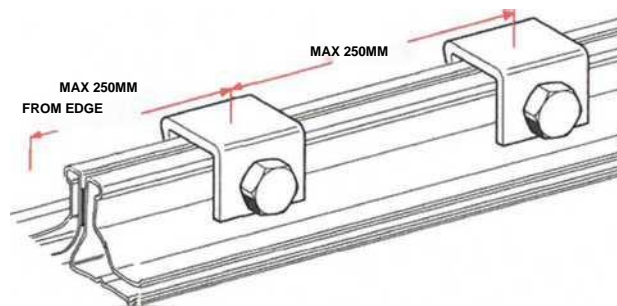


**Fig. A15.** Method of making connections of pre-insulated PIANO-SYSTEM + I ventilation ducts with a rectangular cross-section



**Annex B.****Table B1.** The scope of application of flange profiles

Duct side dimension A, B, mm	
100 ÷ 1500	1501 ÷ 2000
P-20 + N-20	P-30 + N-30

**Fig. B1.** Scope of application of mounting clamps (clamps)



**Annex C.**

For the production of pre-insulated PIANO-SYSTEM + I ventilation ducts, the following should be used:

- galvanized steel sheet, grade DX51D + Z275 according to PN-EN 10346:2015,
- rigid polyurethane foam (PUR), with the properties given in Table C1.

**Table C1.**

Pos.	Properties	Requirements	Test methods
1	<b>2</b>	3	4
1	Apparent density, kg/m <sup>3</sup>	≥ 35	PN-EN 1602:2013
2	Reaction to fire class	E	PN-EN 13501-1:2019

The polyurethane foam is introduced into the space between the inner duct and the outer casing by injection.

Pre-insulated PIANO-SYSTEM + I ventilation ducts should be installed and sealed with:

- polyethylene foam (PES) tape, not less than 12 mm wide and not less than 4 mm thick,
- silicone mastic,
- M8 and M10 screws according to DIN 933 or PN-EN ISO 4017:2014,
- M8 and M10 nuts according to DIN 934 or PN-EN ISO 4032:2013,
- washers <j> 8 mm and 4> 10 mm, made of galvanized steel, according to DIN 9021 or PN-EN ISO 7090:2004,
- P-20 and P-30 profiles made of galvanized steel sheet,
- N-20 and N-30 corners made of galvanized steel sheet,
- assembly clamps (clamps) made of galvanized steel sheet.

