



**SLOVENSKI STANDARD
SIST EN 17192:2019**

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Prezračevanje stavb - Kanali - Nekovinski kanali - Zahteve in preskusne metode

Ventilation for buildings - Ductwork - Non-metallic ductwork - Requirements and test methods

Lüftung von Gebäuden - Nichtmetallische Kanäle - Anforderungen und Prüfmethode

Réseau de conduits - Réseau de conduits non métalliques - Exigences et méthodes d'essai

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91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning systems
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Ventilation for buildings - Ductwork - Non-metallic ductwork - Requirements and test methods

Réseau de conduits - Réseau de conduits non métalliques - Exigences et méthodes d'essai

Lüftung von Gebäuden - Nichtmetallische Kanäle - Anforderungen und Prüfmethoden

This European Standard was approved by CEN on 5 November 2018.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 17192:2018) has been prepared by Technical Committee CEN/TC 156 “Ventilation for buildings”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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1 Scope

This document defines the test methods and performance characteristics for rigid or semi-rigid non-metallic ductwork which are used for ventilation and air conditioning of buildings.

This document does not include flexible ducts such as those made of textiles, non-metallic spiral ductwork or others, which are handled in EN 13180 or ductwork made from insulation duct board, which is handled in EN 13403. Requirements for the air tightness of the ventilation system for non-residential buildings are given in EN 16798-3. For residential buildings, it is essential to apply national rules.

This document specifies methods to test rigid or semi-rigid non-metallic ductwork under laboratory conditions. On-site tests are excluded. The test methods and performance characteristics are valid for ventilation ducts with circular, rectangular or other cross sections.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1507, *Ventilation for buildings - Sheet metal air ducts with rectangular section - Requirements for strength and leakage*

EN 12237, *Ventilation for buildings - Ductwork - Strength and leakage of circular sheet metal ducts*

EN 12664, *Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Dry and moist products of medium and low thermal resistance*

EN 12667, *Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance*

EN 12792, *Ventilation for buildings - Symbols, terminology and graphical symbols*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

CR 14378, *Ventilation for buildings — Experimental determination of mechanical energy loss coefficients of air handling components*

EN ISO 846, *Plastics - Evaluation of the action of microorganisms (ISO 846)*

EN ISO 1182, *Reaction to fire tests for products - Non-combustibility test (ISO 1182)*

EN ISO 1716, *Reaction to fire tests for products - Determination of the gross heat of combustion (calorific value) (ISO 1716)*

ISO 22196, *Measurement of antibacterial activity on plastics and other non-porous surfaces*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12792 and the following apply.

ISO and IEC maintain terminological databases for use in standardization on the following websites:

- IEC Electropedia: <http://www.electropedia.org/>
- ISO Online browsing platform: <http://www.iso.org/obp>

- 3.1**
ductwork
system or network of ducts and their components for the transport of air
- 3.2**
rigid duct
duct which cannot be manually longitudinally compressed or decompressed and cannot be flexed in any direction without permanently damaging the cross sectional area
- 3.3**
semi rigid duct
duct which cannot be manually longitudinally compressed or decompressed but can be flexed in at least one direction without permanently damaging the cross sectional area

- 3.4**
bending radius
centerline radius after bending a duct **(standards.iteh.ai)**

- 3.5**
sealed connection length
length of the perimeter where a duct or component is connected with another duct or component

- 3.6**
internal surface area
internal surface area is the sum of each internal perimeter multiplied by the length of that section of the ductwork

Note 1 to entry: The length of semi-rigid ductwork is the centreline, the length of rigid ductwork is defined in accordance with EN 14239.

- 3.7**
maximum Service Temperature
STH
highest temperature at which the ducts and fittings, when installed, continue to function within specified limits of performance

- 3.8**
minimum Service Temperature
STL
lowest temperature at which the ducts and fittings, when installed, continue to function within specified limits of performance

- 3.9**
pressure drop
difference between total pressure upstream and downstream of component or duct

3.10**purpose-designed seal**

sealing solution designed, described and delivered by manufacturer

3.11**purpose - designed fixation**

connection solution of the ductwork designed, described and delivered by manufacturer

3.12**manufacturer**

any natural or legal person who manufactures a construction product or who has such a product designed or manufactured and markets that product under his name or trademark

4 Symbols

Nomenclature shown in Table 1 is used throughout this document.

Table 1 — Symbols

Symbol	Quantity	Units
A_p	Product surface area	m ²
d_h	Hydraulic diameter	m
L_{sc}	Sealed connection length	m
A_s	Internal surface area	m ²
f_c	Air leakage factor	m ³ · s ⁻¹ · m ⁻²
f_{max}	Limits leakage rate	m ³ · s ⁻¹ · m ⁻²
p_a	Atmospheric pressure	Pa
p_s	Static gauge pressure	Pa
p_{test}	Test pressure	Pa
$q_{vl\ measured}$	Measured air leakage volume rate	m ³ · s ⁻¹
q_{vl}	Leakage volume rate of air flow	m ³ · s ⁻¹
t	Air temperature	°C

5 Specification**5.1 General**

The following ductwork parameters shall be specified:

- Air tightness;
- Pressure drop;
- Service temperature;

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- Reaction to fire;
- Resistance to external pressure;
- Thermal resistance;
- Microbial resistance.

5.2 Air tightness

The air tightness classes and the limits for the leakage rate are defined in Table 2.

Table 2 — Air tightness classes

Air tightness class		Air leakage limit (f_{max}) $m^3 \cdot s^{-1} \cdot m^{-2}$
Old	New	
	ATC 7	Not classified
	ATC 6	$0,0675 \times p_t^{0,65} \times 10^{-3}$
A	ATC 5	$0,027 \times p_t^{0,65} \times 10^{-3}$
B	ATC 4	$0,009 \times p_t^{0,65} \times 10^{-3}$
C	ATC 3	$0,003 \times p_t^{0,65} \times 10^{-3}$
D	ATC 2	$0,001 \times p_t^{0,65} \times 10^{-3}$
	ATC 1	$0,00033 \times p_t^{0,65} \times 10^{-3}$

NOTE If no leakage is measured the default value for calculation will be $0,0675 \times p_t^{0,65} \times 10^{-3}$.

The operating pressure range of the ductwork is defined by negative and positive pressures.

The air tightness class shall be declared together with the operating pressure range. The declared air tightness class shall be valid for the specified operating pressure range.

The operating pressure range shall be declared in increments of 10 Pa together with the air tightness class.

EXAMPLE

Operating pressure range: -60 Pa to 260 Pa

Air tightness class B: -60 Pa to +260 Pa

Air tightness class C: -40 Pa to +110 Pa

5.3 Pressure drop

The pressure drop shall be declared for every duct and component of the ductwork.

5.4 Service temperature

The temperature class defines the range of the operating temperature for the use of the ventilation ductwork. The designation for the lowest service temperature is STL and for the highest service temperature STH.

The designation is followed by the operating temperature.

EXAMPLE STL-20 to STH +100

The operating temperature range for the use of the ventilation ductwork is -20 °C to $+100\text{ °C}$.

5.5 Reaction to fire

The reaction to fire shall be classified in accordance with EN 13501-1.

5.6 Resistance to external pressure

The resistance to pressure value is the maximum allowed force determined in accordance with 8.6. The value shall be rounded down to the nearest ten.

5.7 Thermal resistance

The thermal resistance shall be determined in accordance with EN 12664 or EN 12667.

5.8 Microbial resistance

The microbial resistance shall be determined in accordance with EN ISO 846 or ISO 22196. If ISO 22196 is used, then the biocidal effect of the additive shall be assessed.

5.9 Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this document are placed on those markets.

In the absence of harmonized European test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available on the following website: http://ec.europa.eu/growth/tools-databases/cp-ds_en

6 General characteristics

6.1 Dimension and tolerances

The manufacture shall specify the dimensions and tolerances of its ductwork, including the minimum bending radius for each permitted bending direction of semi-rigid non-metallic ducts.

6.2 Documentation

The manufacturer shall provide installation, operational and maintenance manuals.

6.3 Mechanical connection

The mechanical connection shall be assigned to one of the following categories:

- MC0 Without purpose-designed seal/without purpose-designed fixation;
- MC1 Without purpose-designed seal/with purpose-designed fixation;
- MC2 With purpose-designed seal/without purpose-designed fixation;