BRITISH STANDARD

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Ventilation for buildings — Ductwork — Requirements for ductwork components to facilitate maintenance of ductwork systems

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ICS ICS 91.140.30

National foreword

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The UK participation in its preparation was entrusted to Technical Committee RHE/2, Ventilation for buildings, heating and hot water services.

A list of organizations represented on RHE/2 can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Ventilation for Buildings - Ductwork - Requirements for ductwork components to facilitate maintenance of ductwork systems

Ventilation des bâtiments - Réseau de conduits - Exigences relatives aux composants destinés à faciliter l'entretien des réseaux de conduits

Lüftung von Gebäuden - Luftleitungen - Anforderungen an Luftleitungsbauteile zur Wartung von Luftleitungssystemen

This European Standard was approved by CEN on 1 August 2006.

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Foreword

This document (EN 12097:2006) 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of an identical text or by endorsement, at the latest by March 2007, and conflicting national standards shall be withdrawn at the latest by March 2007.

This document supersedes ENV 12097:1997

The standard is one of a series of standards for ductwork used for ventilation and air conditioning of buildings for human occupancy.

The position of this standard in the field of mechanical services is shown in Figure N° 1.

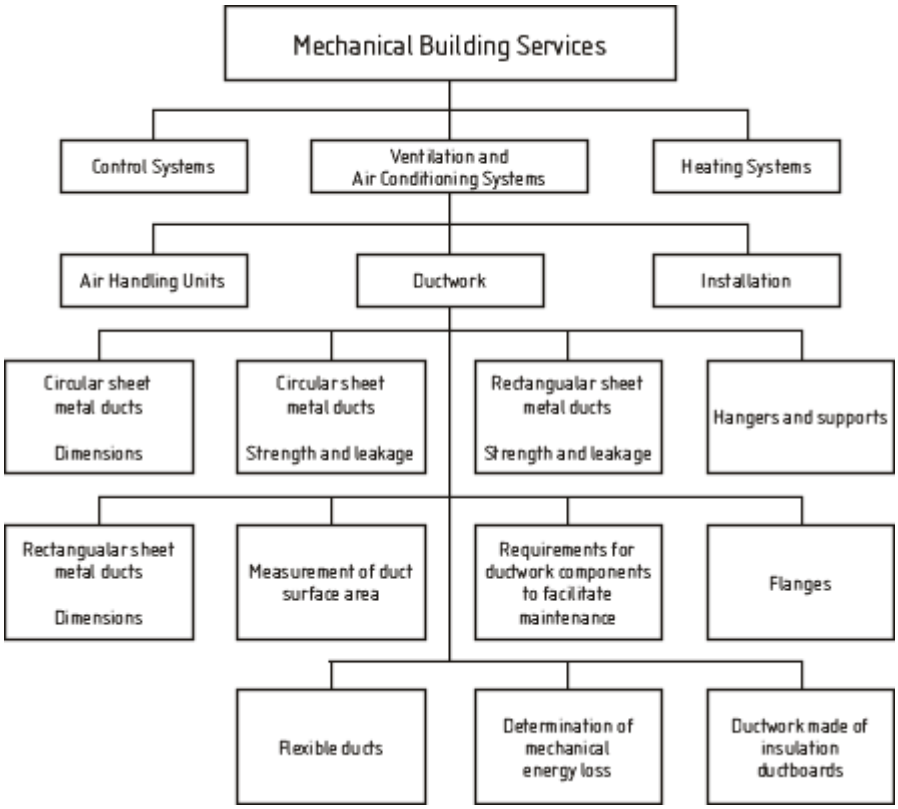

Figure 1 — Position of EN 12097 in the field of mechanical building services

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

1 Scope

This European standard specifies requirements for dimension, shape and location for access panels for cleaning and service in ductwork systems, which conform to EN 1505, EN 1506 and EN 13180.

National regulations shall always be followed, even when they deviate from requirements given in this standard.

2 Normative references

The following referenced documents are indispensable for the application 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 1506, *Ventilation for buildings — Sheet metal air ducts and fittings with circular cross-section — Dimensions*

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

EN 12236, *Ventilation for buildings — Ductwork hangers and supports — Requirements for strength*

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

EN 12792:2003, *Ventilation for buildings — Symbols, terminology and graphical symbols*

EN 13180, *Ventilation for buildings — Ductwork — Dimensions and mechanical requirements for flexible ducts*

EN 13779, *Ventilation for non-residential buildings — Performance requirements for ventilation and room-conditioning systems*

3 Definition and symbols

For the purposes of this document the terms definitions given in EN 12792:2003 and the following apply.

3.1 Access panel
permanent duct component intended to permit access into ducts for inspection and maintenance. An access panel according to this standard can be opened and closed repeatedly, without cutting or damaging the duct. Refer to “Door and inspection panel” in EN 12792

4 Requirements

4.1 General

The air distribution system shall be designed, manufactured and installed in such a way that cleaning of internal surfaces and components is possible.

The design and installation documentation shall indicate by dimensions, the location of all access components and provide details of the size and type of component required. The documentation shall also indicate the location of the components mentioned in 4.3 to enable proper service and re-adjustment.

The cleaning method may vary depending on the category of the air distribution system. The arrangements for cleaning depend on the category of air system, as specified in EN 13779. This category influences the frequency of access covers, the method for cleaning and the cleaning intervals.

All equipment or components inside the ductwork that inhibits cleaning shall be avoided. Stiffeners, or other equipment necessary inside the ducts shall be smooth.

Sufficient free space shall be provided around the ductwork so that cleaning operations can be carried out without obstruction.

The requirements for the strength and air tightness of ducts equipped with access components shall conform to those for the whole ductwork, as specified in EN 12237 and in EN 1507.

The requirements for strength of ductwork hangers and supports shall conform to EN 12236.

For ductwork in dimensions unsuited for mechanized cleaning and where human access is needed, the type and location of access components shall allow the cleaning person to safely and without hindrance enter and exit from the ducts.

4.2 Openings

4.2.1 General

Covers, access panels and doors shall be easy to open.

All access components shall be constructed and installed to match the performance, including air tightness and strength, of the system and facilitate the cleaning process.

In ductwork where thermal, acoustic or fire insulation is specified, the design documentation shall define how the insulation value is maintained across the opening. Access components shall be constructed and installed in the ductwork such that the integrity of the thermal, acoustic or fire insulation is maintained.

A duct-mounted component, which may be dismounted for cleaning may also be regarded as an opening, provided it fulfils the requirements stated for openings.

4.2.2 Installation and location of openings

Consideration shall be given to the security of access panels and doors installed in public areas. Detachable access panels and doors shall be secured to prevent them from causing injury or falling into the duct.

Access components shall be provided to ensure that the whole ductwork system can be cleaned (see 4.4).

Unobstructed access to the access panels of the ducts shall be provided. See annex A.

4.2.3 Dimensions

4.2.3.1 General

Unless cleaning conditions are specified in technical agreement, the dimensions shall conform to 4.2.3.2 and 4.2.3.4.

Openings could reduce the stability of ducts. This should be prevented by an adequate fixing.

4.2.3.2 Openings for rigid circular ducts

For cleaning access, the ducts shall be provided either with openings of sizes according to Table 1 and Figure 2 or T-pieces with removable end caps with a minimum nominal diameter (EN 1506) according to Table 1 and Figure 2.

Table 1 — Access panels in circular ducts, minimum dimensions

Rectangular or oval opening		Branch/T-piece + end cap with minimum diameter	
Duct diameter nominal (mm) D	Minimum dimensions of openings in duct walls (mm) A x B	Duct diameter, nominal (mm) D [a)]	Nominal EN 1506 male dimension or minimum opening (mm) d
100 ≤ D < 200	180 x 80	100	100
200 ≤ D ≤ 315	200 x 100	125	100
315 < D ≤ 500	300 x 200	160	125
500 < D	400 x 300	200	160
		250	200
		315	250
		400	315
		500	400
		≥ 630	500

[a)] For additional sizes the requirements of the nearest larger nominal size apply.

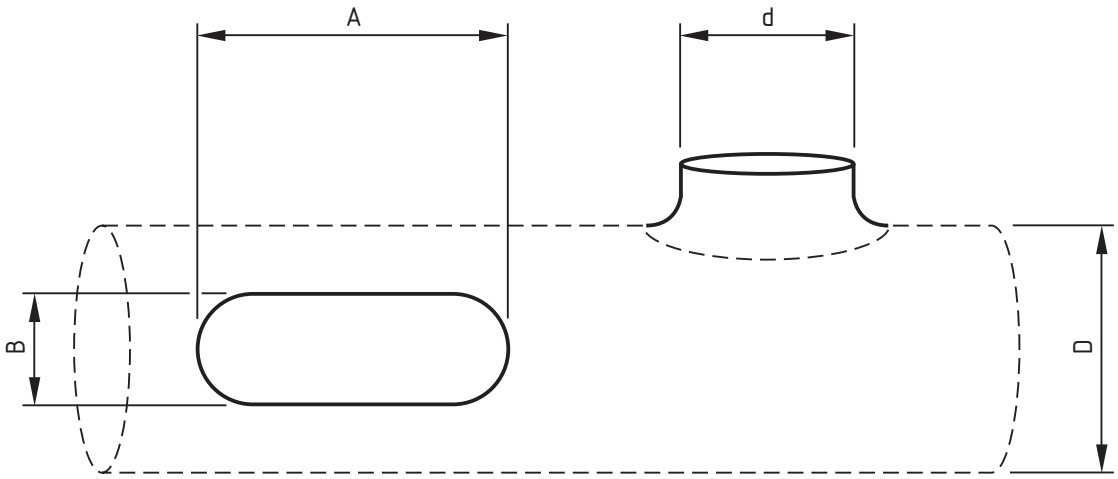

Figure 2 – Openings for rigid circular ducts

4.2.3.3 Openings for flexible circular ducts

Flexible ducts shall, where possible, be removed for inspection and cleaning, unless they can be satisfactorily cleaned in situ. For cleaning of flexible ductwork in situ, access shall be provided through rigid access components.

4.2.3.4 Openings for rectangular ducts

For cleaning access the ducts shall be provided either with openings of sizes according to Table 2 and Figure 3 or T-pieces with removable end caps with a minimum nominal diameter (EN 1506) according to Table 2 and Figure 3.

Table 2 — Access panels in rectangular ducts, minimum dimensions

Rectangular or oval opening		Branch/T-piece + end cap with minimum diameter	
Width S of duct side where access panel is installed (mm)	Minimum dimensions of openings in duct walls (mm) A x B	Width S of duct side where access panel is installed (mm)	Nominal EN1506 male dimension or minimum opening (mm) d
S ≤ 200	300 x 100	≤ 200	125
200 < S ≤ 500	400 x 200	≤ 250	160
500 < S	500 x 400	≤ 300	200
		≤ 350	250
		≤ 450	315
		≤ 630	400
		> 630	500

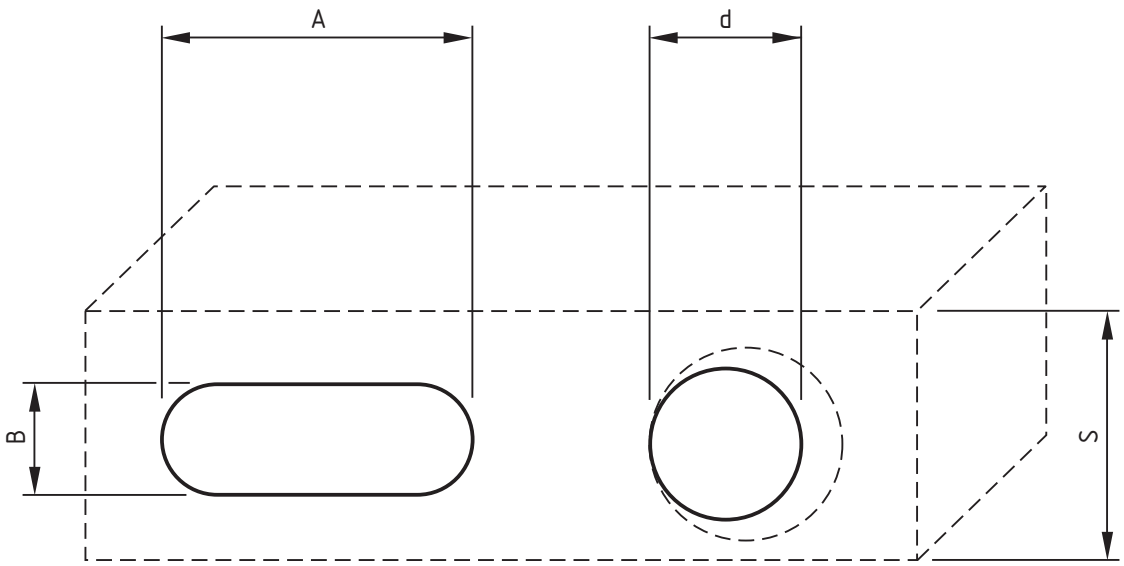

Figure 3 — Openings for rectangular ducts

4.2.3.5 Openings for flatoval ducts

For access panels fitted to the semi-circular side 4.2.3.2 (Openings for rigid circular ducts) applies. For access panels fitted to the flat side 4.2.3.4 (Openings for rectangular ducts) applies.

4.3 Duct-mounted components

For duct-mounted components that cannot be cleaned through without obstruction, access according to 4.4 shall be provided from both sides, or it shall be possible to remove the component for maintence. Examples of such components are:

- adjustment and shut-off dampers;
- fire dampers;
- heating and cooling coils;
- humidifiers;
- sound attenuators with internal pods or baffles;
- filter sections;
- in-duct fans;
- heat recovery devices;
- air flow control devices;
- air turning vane.

NOTE If a component is to be removed for service, the service instructions shall include sufficient guidance for the checking its function. Airflow direction shall be labelled on all these components and they shall be installed in such a way, that the intended removal, servicing or inspection is possible. If re-setting of equipment, e.g. fire damper or controller, inside a duct is required, the access panel shall be located to allow the necessary work and inspection.

4.4 Location and frequency of access panels

The ductwork shall be equipped with sufficient access panels in order to ensure that no part of the ductwork is located with more than:

a) one dimensional change from an access panel;

b) one change of direction of more that 45 ° from an access panel;

c) 7,5 meters of duct from an access panel.

NOTE The top and bottom of vertical risers should be equipped access panels.

Flexible ductwork shall be complemented with rigid access components at a minimum of every 6 m.

4.5 Screws and rivets

It is accepted that screws or preferably rivets used during installation intrude into the ductwork, provided that they do not obstruct cleaning and maintenance. Screws of maximum length 13 mm may be used.

Sharp pointed screws shall not be used nearby openings where they can cause injury to persons. They are therefore not to be used within a distance of 1 m from terminal devices or access panels. When mounting access panels in old ductwork, existing screws within 1 m from the access opening shall be replaced with rivets.

Annex A
(informative)

Service and access recommendations

An example of access to service openings is given in Figure A.1. Care should be taken to avoid that access panels later are found to be inaccessible. Special consideration should be given to the practical problems associated with gaining personnel access to heavily congested ceiling areas and multi-layered ductwork systems.

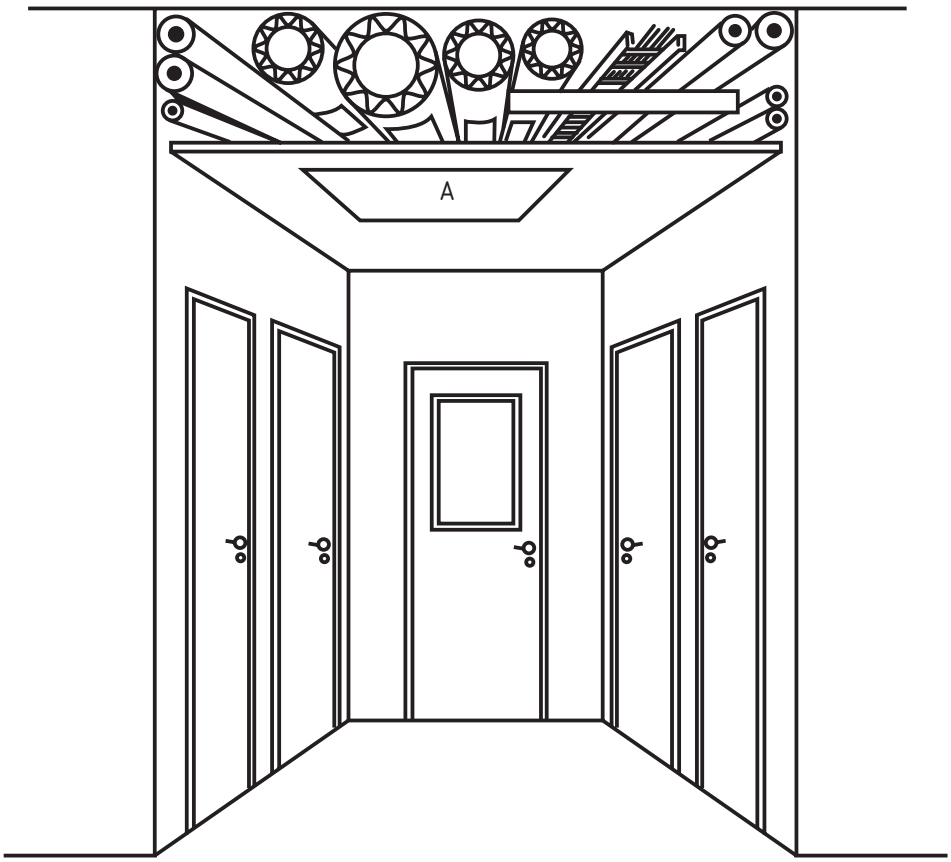

Figure A.1 — Service openings in suspended ceilings

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