BRITISH STANDARD

BS EN
12236:2002

Ventilation for buildings — Ductwork hangers and supports — Requirements for strength

The European Standard EN 12236:2002 has the status of a British Standard

ICS 91.140.30

National foreword

This British Standard is the official English language version of EN 12236:2002.

The UK participation in its preparation was entrusted to Technical Committee RHE/2, Air distribution and air diffusion, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

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This British Standard, having been prepared under the direction of the Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 4 April 2002

Summary of pages

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English version

Ventilation for buildings - Ductwork hangers and supports - Requirements for strength

Ventilation des bâtiments - Supports et appuis pour réseau de conduits - Prescriptions de résistance

Lüftung von Gebäuden - Aufhängungen und Auflager für Luftleitungen - Anforderungen an die Festigkeit

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by July 2002, and conflicting national standards shall be withdrawn at the latest by July 2002.

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 building services is shown in Figure 1.

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

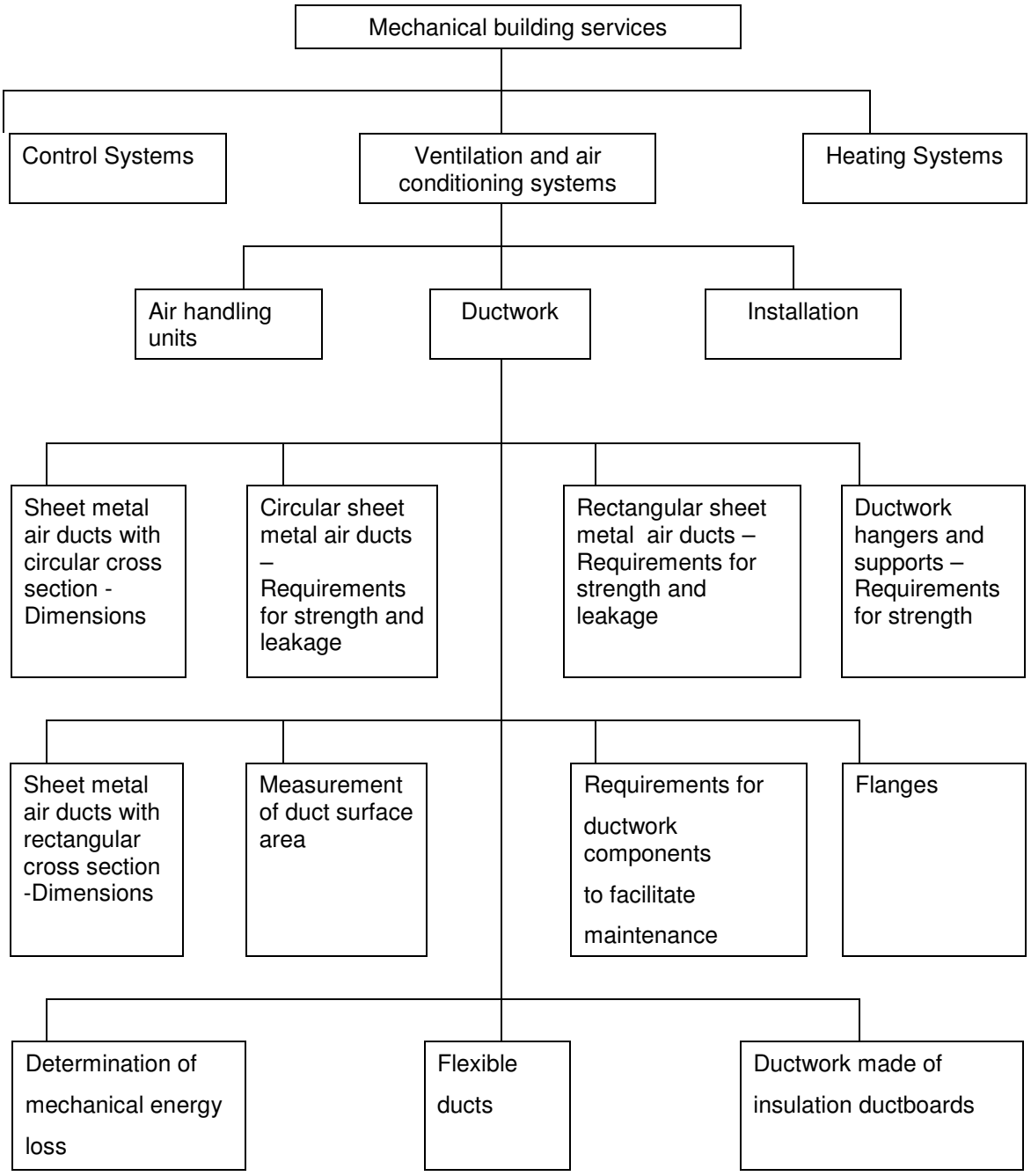

Figure 1 – Position of EN 12236 in the field of mechanical building services

1 Scope

This standard specifies requirements for the construction and application of supports for sheet metal ductwork in ventilation and air conditioning systems.

The standard applies to any shape of ductwork (rectangular, circular and oval), and components used in ventilation and air conditioning systems in buildings.

The standard also takes into account insulation loads, safety factors, imposed loads (cleaning and maintenance), vibration isolation, and corrosion resistance.

The standard does not consider loading due to earthquakes.

The standard does not deal with fire requirements and fire protection of ducts and support systems.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

CR 12792	*Ventilation for buildings - Symbols and terminology.*
EN 1505	*Ventilation for buildings - Sheet metal air ducts and fittings with rectangular cross section – Dimensions.*
EN 1506	*Ventilation for buildings - Sheet metal air ducts and fittings with circular cross section – Dimensions.*
ENV 12097	*Ventilation for buildings – Ductwork - Requirements for ductwork components to facilitate maintenance of ductwork systems.*
prEN 1507	*Ventilation for buildings – Ductwork – Rectangular sheet metal air ducts – Requirements for testing Strength and leakage.*
prEN 12237	*Ventilation for buildings – Ductwork – Strength and leakage of circular sheet metal ducts.*

3 Terms and definitions

For the purposes of this European Standard the terms and definitions given in CR 12792 apply.

4 Function

The principal function of the support/hanger system is to ensure a secure connection to the building that will accept the load imposed by the air distribution system. The support/hanger system shall therefore be designed to ensure a secure support for the ductwork system.

Particular attention shall be given to the support of individual components included in ductwork systems. Ductwork components will generally be in accordance with EN 1505, EN 1506, ENV 12097, prEN 1507 and prEN 12237.

The designer shall also take account of insulation loads, imposed loads (cleaning and maintenance), vibration isolation and corrosion resistance, together with necessary safety factors.

5 Support attachment to building structure

The requirements in this standard are specified on the basis that the building has been designed to accept the load imposed by mechanical and air distribution services and systems. The selected method of attachment to the structure shall ensure the following:

a) compatibility with the building material at the fixing point;

b) a defined permissible load;

c) an anti-corrosion characteristic appropriate to the installation environment.

6 Determination of load

Due to the wide variety of construction methods used in both manufacturing of sheet metal air ducts and similarly the variety of supporting methods in each particular building, it is not practical to offer a fixed method of calculating loads.

Deflection of the duct shall not significantly affect the airflow conditions and consideration shall be given to the loading conditions including the following:

a) the weight tables for various sizes of duct provided by the duct manufacturer;

b) the weight of the insulation material, if any, applied to the ductwork, including the weight of any surface cladding;

c) the weight of any components included in the ductwork and not independently suspended, e.g. acoustic treatment, silencers, dampers etc.;

d) the weight of the hanger structure;

e) the additional weight of a person or persons who may gain access to the ductwork for purpose of cleaning or maintenance;

f) the possibility that external loads, e.g. ladders, will be imposed for which a separate loading calculation is required;

g) the operating temperature of the duct system, where applicable.

Taking account of the factors a) to g), the availability of suitable fixing points shall be established and a separate calculation shall be made, where necessary, to establish the load on each fixing.

7 Supports for ductwork

7.1 Attachment to structure

The fixing selected to provide the attachment to the structure shall have a safety factor of at least three in respect to the calculated load imposed by the support and duct sections.

7.2 Support construction

For ducts the support can comprise vertical and/or horizontal components.

The vertical component(s) shall be designed with a safety factor of at least 1,5 related to the yield strength of the material of the support in respect of the load imposed by the duct to be supported, including additional loads due to, for example, insulation, cladding or future access requirements.

The horizontal components shall be capable of supporting the total calculated load imposed by the duct and any other loads (e.g. man loading) on the duct. Components shall be designed to ensure that the deflection between the connections to the vertical components and any part of the horizontal component shall not exceed 0,4 % of the distance between the vertical fixings.

The connection between the vertical and horizontal components(s) shall also be designed with a safety factor of 1,5 in relation to the yield strength of the material of the support, and shall not rely on friction devices.

Where applicable, brackets shall be designed to support the load due to the ductwork and insulation and any benefit derived from horizontal duct connections or supports shall be excluded from the calculations.

8 Connection between duct and support

It is usually not required to fasten support members to ducts where ducts are installed horizontally, and are supported on a support bearer.

Where the duct is supported by brackets that are fixed directly to the duct wall, or a duct joint, the fixings used the design of the fixings used shall include the same safety factors as the support structure.

9 Spacing of duct supports

Spacing requirements shall be such as to take account of the strength of the supports, the strength of the ductwork assembly and the need to ensure that deflection of the ductwork shall not affect the leakage, aerodynamic properties and the physical integrity of the ductwork system.

Where items of equipment, e.g. fans, heaters, mixing boxes, etc., are likely to be removed or replaced, they shall be supported independently of the ductwork.

All items that are subjected to the effects of mechanical pressure related vibrations or thermal movement shall be considered individually in the support system design.

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