

Guide to specifying performance requirements for hinged or pivoted doors (including test methods)

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- Department of Health and Social Security
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Foreword

This Draft for Development has been prepared under the direction of the Elements and Components (of Diverse Materials) for Buildings Standards Committee. It applies to door assemblies in all materials that are primarily for use by pedestrians and their chattels, and its objectives are to provide guidance on performance specification and component selection and to give some methods by which products can be evaluated.

It has not been possible to give guidance on the specification of every door application. Although different building projects may pose broadly similar problems they are not identical; the identification of the factors involved does not necessarily lead to a complete design solution. It is also evident, particularly when the many aspects of environmental insulation are involved, that the design of the complete building needs to be considered before more specific guidance can be given. A prevailing factor in setting economic performance levels is that relatively low cost and simplicity in a door are often not compatible with easy, frequent passage and good insulation when shut, although they can be compatible with either of the latter alone.

This publication is not to be regarded as a British Standard.

It is being issued in the Draft for Development series of publications and is of a provisional nature because further evidence is required before the guide can be incorporated into a British Standard. It is recommended that it should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

A review of this Draft for Development will be carried out not later than two years after its publication. Notification of the start of the review period, with a request for the submission of comments from users of this Draft for Development, will be made in an announcement in the appropriate issue of *BSI News*. Observations which it is felt should receive attention before the official call for comments will be welcomed.

According to the replies received, the responsible BSI Committee will judge whether the Draft for Development can be converted into a British Standard or what other action should be taken.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 22, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

The building owner is primarily concerned with the performance of the door assembly as a whole and has a common law right to expect that each part and component of that assembly will perform its own function and will not contribute to a failure of the assembly. This is clearly more easily managed when the door assembly is a doorset obtained from one source or manufacturer. The difficulty, however, is that door installations are commonly composed of a number of separate components obtained from unrelated sources that are brought together in a site operation in a multitude of different combinations; this kind of installation is identified as a door assembly.

In these circumstances it is vitally important that each part or component of such a door is conceived and manufactured as an integral element of the door installation so that it will not only give the performance required of the particular component but also make its contribution to the performance of the complete door assembly. This demands that the performance requirements be precisely defined and defined over a greater range of attributes than has been the previous practice. In many cases these attributes now being defined in this document do not have test methods. It is hoped that experience of the use of this document will indicate whether a method of test is desirable and what or how it should be done.

Many of the attributes are dependent upon adequate storage and handling as well as upon the workmanship used in the fitting and fixing of the parts together. It follows that in the event of a failure or inadequacy of a door it is necessary to establish the exact nature and reason for the failure before ascribing responsibility.

The ideal component is that which is fit for the intended use but not grossly overspecified. Doors do not all have the same usage or have to endure the same conditions. The usage and conditions change according to the needs of the occupants and the places where doors are installed. This Draft for Development aims to cover and define this range of purposes within the limits of current knowledge.

There are, however, two important aspects of performance which as yet have not proved to be amenable to general definition. One of these is appearance which is a subjective criterion and in any case depends on the context within which a door is installed. The other is durability. This encompasses a great number of factors which may cause deterioration of the product, some of which can be described but not quantified. Hence, with the exception of general strength requirements which are one important element of durability, these factors appear to be better dealt with in codes of practice or in product standards.

1 Scope

This Draft for Development gives guidance on specifying the performance requirements for hinged or pivoted door assemblies designed primarily for use by pedestrians and their chattels. Some of the requirements are applicable to door leaves in isolation; requirements not applicable to separate door leaves are indicated. Test methods for performance requirements are included in Appendix A.

This Draft for Development does not cover doors for specialized applications such as, for example, where safe storage of valuables is essential.

NOTE The titles of the publications referred to in this Draft for Development are listed on inside back cover.

2 Definitions

For the purposes of this Draft for Development the following definitions apply.

2.1 door

a term used for convenience where the context applies equally to door leaves, door frames, doorsets, door assemblies and door kits

2.2 door leaf

a hinged or pivoted construction, the function of which is to allow or prevent access

2.3 door kit

a set of fully machined and fitted frame components together with a door leaf or leaves fully prepared for site assembly and fixing. Door kits may or may not include all the items of hardware required for the finished door assembly

2.4

door frame

the fixed surround into which are fitted one or more door leaves. The door frame may also be designed to surround other panels, and may include sill, threshold, architraves or other cover moulds. The door frame may be a separate item to be fixed to the adjacent structure, or it may be an integral part of a wall or partition

2.5

door assembly

a complete assembly as installed, comprising door frame and one or more door leaves and any other panels, together with their hardware and any seals

2.6

doorset

a door frame with its door leaf or leaves pre-hung on hinges or pivots, supplied as an assembled unit from a single source

2.7

seal

a fitting provided to close a gap for the purpose of controlling the passage of air, water, fire, sound, etc.

2.8

hardware

any functional fittings and fixings for a door, excluding seals and decorative fittings

3 General requirements

3.1 Application to door assemblies

A door should perform satisfactorily in its intended situation and under its expected conditions of use.

The performance of any door assembly will be affected by the performance of its component parts and in general, each design for a door assembly will need to be specified, constructed and tested or assessed individually. The possibility exists for the development of designs which can be type tested in accordance with this Draft for Development for application in a variety of appropriate situations.

3.2 Application to door leaves in isolation

Provision is also made in this Draft for Development for many of the performance requirements to be applicable to door leaves considered in isolation. The implication of this is that a manufacturer of door leaves will be in a position to claim that his door leaves meet the relevant requirements of this Draft for Development. Where the performance of the completed door is dependent on its fixings, etc. it is indicated against the appropriate requirement (see 11.2, 11.4 and 11.5). It must, however, be clearly understood that the fact that a particular door leaf meets the relevant requirements does not mean that a door assembly incorporating that door leaf necessarily meets the requirements.

3.3 Categories of duty

3.3.1 Doors are employed in a range of situations in buildings varying from an interior door in a dwelling which is used rarely, and then generally with care, to an entrance door of a shop which is in constant use by people who have little incentive to exercise care and who may be carrying bulky objects or propelling trolleys. This is a wide spectrum of use, but nevertheless for all practical purposes this range of use can be accommodated by the four categories of duty described in Table 1.

3.3.2 To perform satisfactorily under each of these categories, a door assembly has to attain a specific level of performance for each of a number of relevant attributes. Many of these attributes concern both the component parts of a door assembly and also the parts in combination with each other. Some only relate to one component. For most doors, three basic attributes have to be considered; strength, the ability to be operated, and stability or freedom from excessive distortion in service. These attributes are considered in clauses 4 to 8 and performance levels given for each category of duty. Sound insulation and fire resistance are also considered in clauses 9 and 10.

3.3.3 For external doors additional performance categories of weather resistance and thermal insulation may have to be considered. These are discussed in clauses 11 and 12 and a classification given.

3.3.4 The performance of a door might thus be described by means of a code for each category, e.g. MD-W1-H2.

4 Strength

4.1 General

A door should have sufficient strength to meet its intended conditions of use.

An important factor in the performance of a door is that it should be strong enough for its conditions of use and that it should withstand some common abuse. The strength required to do this depends on the severity of the duty which includes a number of aspects; the frequency of use, the degree of care likely to be exercised by users, the mix of traffic, i.e. people alone or people carrying or propelling bulky objects, the likelihood of the occurrence and the severity of accidental impacts and for some locations the need for a degree of security against unauthorised entry and for a measure of resistance to vandalism.

Whatever the severity of duty, however, the required strength should be such that normal usage should not result in damage leading to excessive maintenance costs. Damage caused by an occasional accident or by misuse should be repairable but it must be recognized that a catastrophic event can lead to the necessity for complete replacement to part or all of the door assembly.

There are many ways in which a door may get damaged and data are not available on the levels and combinations of force and impact which result in failure in service. Thus an assessment of the likely strength performance of a door has to be based upon a very limited number of arbitrary tests which are considered to simulate the likely modes of failure. These tests have been developed with some knowledge of the strength performance achieved with doors, of constructions and of materials in current use. However, for products of an innovative character it should be emphasized that these tests can only provide guidance on the expected performance and should not be used as a basis for definitive statements on their strength performance.

The strength of the fixing of a door frame to the surrounding structure may be an important consideration in practice, but it has not been found possible within this Draft for Development to prescribe for the wide variety of structures and fixing methods which could be encountered.

Table 1 — Categories of duty, description and examples

Category of duty	Description	Examples
Light duty (LD)	Low frequency of use by those with a high incentive to exercise care, e.g. by private house owners, i.e. where small chance of accident occurring or of misuse	Internal doors in dwellings. External doors in dwellings providing secondary access to private areas
Medium duty (MD)	Medium frequency of use primarily by those with some incentive to exercise care, i.e. where some chance of accident occurring or of misuse	External doors of dwellings providing primary access. Office doors providing access to designated public areas but not used by public or by people carrying or propelling bulky objects
Heavy duty (HD)	High frequency of use by public and others with little incentive to exercise care, i.e. where a chance of accident occurring and of misuse	Doors of shops, hospitals and of other buildings which provide access to designated public areas and which are used by the public and others frequently carrying or propelling bulky objects
Severe duty (SD)	Subject to frequent violent usage	Doors of stockrooms, etc. commonly opened by driving trolleys against them; doors in educational establishments subject to frequent impact by people