

Understanding Compliance: Fire Doors

Across the world, different approaches have been documented in the form of test methods re-creating scenarios and detailing criteria to evaluate the 'fire resistance rating' of 'fire doors'. Let us review how they are similar.

EN 1634-1

Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware. Fire resistance test for door and shutter assemblies and openable windows (+A1:2018) (Incorporating corrigendum August 2018). The test determines the fire resistance of door and shutter assemblies and openable windows designed for installation within openings incorporated in vertical separating elements such as: hinged or pivoted doors; horizontally sliding and vertically sliding doors including articulated sliding doors and sectional doors, folding doors and shutters, sliding folding doors/shutters, tilting doors, rolling shutter doors, openable windows and openable fabric curtains.

BS 476 - 22:1987: Section 6, 7 and 8 Corr 1:2014

Fire tests on building materials and structures - Method for determination of the fire resistance of non-loadbearing elements of construction. This standard has been superseded by the current BS EN 1634 1, but it has been retained based on legitimate need for the standards within non-EU markets. This Part of BS 476 describes procedures for determining the fire resistance of non-loadbearing elements of building construction when subjected to the heating and pressure conditions specified in BS 476 20. This Part is applicable to vertical partitions, to fully insulated, partially insulated and uninsulated vertical doorsets and shutter assemblies (except fire dampers incorporated in ducts), to ceiling membranes, and to glazed elements. The methods described are appropriate to normal combinations of these elements.

ISO 3008-1:2019

Fire resistance tests — Door and shutter assemblies — Part 1: General requirements. This standard used in conjunction with ISO 834-1, specifies a method for determining the fire resistance of door and shutter assemblies designed primarily for installation within openings incorporated in vertical separating elements, such as

- hinged and pivoted doors,
- horizontally sliding and vertically sliding doors, including articulated sliding doors and sectional doors,
- steel single-skin folding shutters (un-insulated),
- other sliding, folding doors,
- tilting doors,
- rolling shutter doors,
- removable panels in walls,
- self-closing openable windows.

Requirements are included for mechanical pre-conditioning, e.g. "cycling" of door and shutter assemblies prior to the conduct of the fire-resistance test.

UL10B:2008

Standard for Fire Tests of Door Assemblies. These methods of fire tests are applicable to door assemblies of various materials and types of construction for use in wall openings to retard the passage of fire. Tests made in conformity with these test methods register performance during the test exposure; and such tests shall not be construed as determining compliance for use after exposure to fire. It is the intent that tests made in conformity with these test methods develop data to enable regulatory bodies to determine the compliance of door assemblies for use in locations where fire resistance of a specified duration is required. These methods are intended to evaluate the ability of a door assembly to remain in an opening during a predetermined test exposure. The tests expose a specimen to a standard fire exposure controlled to achieve specified temperatures throughout a specified time period, followed by the application of a specified standard fire hose stream. The exposure, however, is not representative of all

fire conditions, which vary with changes in the amount, nature, and distribution of fire loading, ventilation, compartment size and configuration, and heat sink characteristics of the compartment. It does, however, provide a relative measure of fire performance of door assemblies under these specified fire exposure conditions. Any variation from the construction or conditions that are tested is capable of substantially changing the performance characteristics of the assembly.

UL10C:2016

UL Standard for Safety Positive Pressure Fire Tests of Door Assemblies. These methods of fire tests are applicable to swinging door assemblies, including door frames with lights and panels, of various materials and types of construction for use in wall openings to retard the passage of fire. The method does not provide an evaluation of a swinging door assembly when that assembly is part of a larger assembly (e.g. sliding fire door assembly), or when it is intended to be used as an elevator entrance. Tests made in conformity with these test methods are intended to register performance during the test exposure; but such tests shall not be construed as determining suitability for use after exposure to fire. It is the intent that tests made in conformity with these test methods allow for the development of data to enable regulatory bodies to determine the suitability of door assemblies for use in locations where fire resistance of a specified duration is required. These methods are intended to evaluate the ability of a door assembly to remain in an opening during a predetermined test exposure. The tests expose a specimen to a standard fire exposure controlled to achieve specified temperatures throughout a specified time period, followed by the application of a specified standard fire hose stream. The exposure, however, is not representative of all fire conditions, which vary with changes in the amount, nature, and distribution of fire loading, ventilation, compartment size and configuration, and heat sink characteristics of the compartment. It does, however, provide a relative measure of fire performance of door assemblies under these specified fire exposure conditions. Any variation from the construction or conditions that are tested is capable of substantially changing the performance characteristics of the assembly.

UL10D:2017

UL Standard for Safety Fire Tests of Fire-Protective Curtain Assemblies. These requirements cover the evaluation of fire-protective curtain assemblies intended to provide supplemental, passive fire protection as part of an engineered fire protection system. Fire-protective curtain assemblies are horizontally or vertically oriented. Horizontally or vertically oriented fire-protective curtain assemblies provide nonstructural separation only, and are not intended to be substituted for structural hourly rated partitions or opening protectives that have been tested for fire endurance and hose stream performance. Note: Fire-protective curtains do not include proscenium type (theater) curtains. This document does not apply to proscenium type curtains in assembly occupancies for legitimate stages. Tests made in conformity with these test methods are intended to register performance during the test exposure. Such tests shall not be construed as determining suitability for use after exposure to fire. It is the intent that tests made in conformity with these test methods allow for the development of data to enable regulatory bodies to determine the suitability of horizontally or vertically oriented fire-protective curtain assemblies for use in locations where fire protection of a specified duration is required. These methods are intended to evaluate the ability of fire-protective curtain assemblies to remain in a horizontal or vertical opening during a predetermined test exposure. The tests expose a specimen to a standard controlled fire exposure to achieve specified temperatures throughout a specified time period. The exposure, however, is not representative of all fire conditions, which vary with changes in ventilation, compartment size, and configuration. It does provide a relative measure of fire performance of horizontally or vertically oriented fire-protective

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curtain assemblies under these specified fire exposure conditions. Any variation from the construction or conditions that are tested is capable of substantially changing the performance characteristics of the horizontally or vertically oriented fire-protective curtain assembly.

NFPA 252

Standard methods of fire tests of door assemblies. This standard prescribes standardized fire and hose stream test procedures that apply to fire door assemblies intended to be used to retard the spread of fire through door openings in fire-resistive walls. The purpose of this standard is to prescribe specific fire and hose stream test procedures for fire door assemblies in order to standardize a method for determining the degree of fire protection provided by such assemblies in retarding the spread of fire (flame, heat, and hot gases) through door openings in fire-resistive walls. The degree of fire protection measured in units of time is not an absolute value because all possible actual fire scenarios are not represented by the standard fire exposure described herein. This standard allows different fire door assemblies to be compared with each other in order to evaluate their relative performance as measured against a standard fire exposure.

SANS 10177-2

This is the South African standard for fire testing of materials, components and elements used in buildings Part 2: Fire resistance test for building elements. It covers the method of test used to determine the fire resistance of specific elements on the basis of the length of time within which a representative test specimen of specified dimensions will satisfy the criteria in respect of stability, integrity, and insulation.

IS 16947

Indian standard for fire resistance tests for doors with glass panes, openable glass windows and sliding glass Doors. This Indian Standard describes a method of test for determining the fire resistance behavior of glass doors, shutters and openable

windows, designed for installation within openings incorporated in vertical separating elements, such as hinged or pivoted doors, openable windows, sliding doors etc. The test provides for the determination of fire resistance of glass elements of architectural structures on the basis of the length of time for which the test specimens of specified dimensions satisfy the criteria laid down under the prescribed test conditions during the period of fire exposure.

IS 3614

Indian Standard for Fire Doors and Doorsets – Specifications. This is a specification standard of the product but points to an ISO standard which is adopted in India. IS/ISO 3008-1. 1.1 This standard lays down quality requirements including the requirements regarding materials and details of construction of fire rated metal swing doors, wooden composite swing doors, metal sliding doors and metal rolling shutters. The standard also provides requirement on the supply, installation and maintenance of fire door assemblies. This also covers the protection of door openings or the wall openings where the fire door is to be installed, and also floors and ceilings from the spread of fire and smoke within, into or out of a building so as to ensure proper compartmentation. This standard does not cover doors which are horizontal or vertical sliding and swinging doors that are used in hoist way doors for lifts and dumb waiters. Fire safety curtains and vault doors are also not covered in this standard.

NFPA 288

Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance-Rated Assemblies

This standard shall apply to horizontal fire door assemblies of various materials and types of construction that are installed in openings of fire resistance-rated floor systems or roofs to retard the passage of fire. Tests made in conformity with this test method demonstrate the performance of horizontal fire door assemblies during the test exposure; however, such tests shall not be construed as determining the suitability of horizontal fire door assemblies for use after their exposure to fire.