



Examination Standard for Fire Door Assemblies

Class Number 4100

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Foreword

This standard is intended to verify that the products and services described will meet stated conditions of performance, safety and quality useful to the ends of property conservation. The purpose of this standard is to present the criteria for certification of various types of products and services.

Examination in accordance with this standard shall demonstrate compliance and that quality control in manufacturing shall ensure a consistent and reliable product.

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1 INTRODUCTION

1.1 Purpose

- 1.1.1 This standard states the specific fire, hose stream and other performance test and certification requirements used in evaluating fire door assemblies.
- 1.1.2 The degree of fire protection measured provides a period of time in which a fire door assembly will remain in the opening and retard the passage of fire as measured in the form of flames, heat and hot gases.

1.2 Scope

- 1.2.1 This standard applies to fire door assemblies and to components used in fire door assemblies.
 - 1.2.1.1 The fire exposure used in this standard is not representative of all fire conditions which may vary with changes in the fire loading, ventilation and configuration, compartment size and heat sink characteristics of the compartment which contains the fire.
 - 1.2.1.2 Similarly, the hose stream exposure is not intended to be representative of actual hose streams used by fire fighters during suppression efforts as these too can vary.
- 1.2.2 The test methods in this standard shall not be used to provide the following:
 - a) Full information regarding the performance of specific fire door assemblies installed in fire resistive barriers constructed of materials other than those tested.
 - b) An evaluation of the degree to which the fire door assembly contributes to the hazards by the generation of smoke, toxic gases or other products of combustion.
 - c) Measurement of a fire door assembly's ability to control or limit the passage of smoke or similar products of combustion.
 - d) A temperature transmission limitation to the unexposed surface of the fire door assembly.
 - e) Measurement that determines a limit on the number and size of vision panels permitted or the number and size of lateral openings permitted between the door and any frame.
 - f) The degree or hourly rating of protection required to protect an opening.
 - g) Requirements for items attached to, or used in conjunction, with fire doors assemblies that serve the purpose, or act, as hold open or release devices.
 - h) Test requirements for other types of detection devices that can be used with various fire door assemblies or where such detection devices are to be located except as stated in this document.
- 1.2.3 This standard states performance requirements for fire door accessories that incorporate items that serve to function as self-closing, automatic closing or testing devices. This includes, but is not limited to, power operators, chain hoist assemblies and other testing devices that, when used in

conjunction with a fire door assembly, initiate automatic closing or cause or allow the fire door assembly to attain the fully closed position.

- 1.2.4 The performance requirements shown in this standard shall be considered to be the minimum requirements. Additional testing above and beyond what is stated in this standard shall be permitted in order to satisfy other national or international jurisdictional requirements.

1.3 Basis for Requirements

- 1.3.1 The requirements of this standard are based on experience, research and testing, and/or the standards of other organizations. The advice of manufacturers, users, trade associations and loss control specialists was also considered.
- 1.3.2 The requirements of this standard reflect tests and practices used to examine characteristics of fire door assemblies. Fire door assemblies having characteristics not anticipated by this standard may be permitted to be certified by an agency if performance equal, or superior, to that required by this standard is demonstrated.

1.4 Basis for Certification

Certification is based upon satisfactory evaluation of the product and the manufacturer in the following major areas:

- the performance of the product as specified by the manufacturer and required for certification; and as far as practical,
- the durability and reliability of the product.

An examination of the manufacturing facilities and audit of quality control procedures may be made to evaluate the manufacturer's ability to consistently produce the product which is examined and tested, and the marking procedures used to identify the product. Subsequent surveillance may be required by the certification agency in accordance with the certification scheme to ensure ongoing compliance.

1.5 Basis for Continued Certification

The basis for continual certification may include, but is not limited to, the following based upon the certification scheme and requirements of the certification agency:

- production or availability of the product as currently certified;
- the continued use of acceptable quality assurance procedures;
- satisfactory field experience;
- compliance with the terms stipulated by the certification;
- satisfactory re-examination of production samples for continued conformity to requirements; and
- satisfactory surveillance audits conducted as part of the agency's product surveillance program.

1.6 Effective Date

The effective date of an examination standard mandates that all products tested after the effective date shall satisfy the requirements of this standard.

The effective date of this standard is eighteen (18) months after publication date of the standard for compliance with all requirements.

1.7 System of Units

Units of measurement used in this Standard are United States (U.S.) customary units. These are followed by their arithmetic equivalents in International System (SI) units, enclosed in parentheses. The first value stated shall be regarded as the requirement. The converted equivalent value may be approximate. Conversion of U.S. customary units is in accordance with the ANSI/IEEE/ASTM SI 10.

1.8 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 cited edition applies. For undated references, the latest edition of the referenced document (including any amendments) apply.

American Society for Testing and Materials (ASTM)

E-119, Standard Test Method for Fire Tests of Building Construction and Materials

E-2226, Standard Practice for Application of Hose Stream

Australian Standards

AS 1530.4, Methods for Fire Tests on Building Materials, Components and Structures, Part 4: Fire Resistance Test of Elements of Construction

AS 1905.1, Components for the Protection of Openings in Fire Resistant Walls, Part 1: Fire Resistant Doorsets

Canadian Standards

CAN4-S104-10, Standard method for Tests of Door Assemblies

European Standards

EN 1363-1, Fire Resistance Tests Part 1: General Requirements

EN 1634-1, Fire Resistance and Smoke Control Tests for Door and Shutter Assemblies, Openable Windows and Elements of Building Hardware, Part 1: Fire Resistance Tests for Door and Shutter Assemblies and Openable Windows

EN 12605, Industrial, Commercial and Garage Doors and Sets – Mechanical Aspects – Test Methods

EN 13501-2, Fire Classification of Construction Products and Building Elements – Part 2 – Classification Using data From Fire Resistance Tests Excluding Ventilation Services

EN 16034, Pedestrian Doorsets, Industrial, Commercial, Garage Doors and Openable Windows – Product Standard, Performance Characteristics – Fire Resisting and/or Smoke Control Characteristics

FM Approvals Standards

FM 3010, Approval Standard for Fire Alarm Signaling Systems

International Standards Organization

ISO 834-1, Fire Resistance Tests – Elements of Building Construction, Part 1: General Requirements

ISO 3008, Fire Resistance Tests – Door and Shutter Assemblies

National Fire Protection Association (NFPA)

NFPA 72, National Fire Alarm Code

NFPA 80, Standard for Fire Doors and Other Opening Protectives

NFPA 252, Standard Methods of Fire Tests of Door Assemblies

NFPA 257, Standard on Fire Test for Window and Glass Block Assemblies

1.9 Definitions

For purposes of this standard, the following terms apply:

Agency – a certification agency or test agency

Ambient – the temperature of the room in which the test is being conducted.

Astragal – a horizontal or vertical molding attached to one leaf of a pair of doors.

Authority Having Jurisdiction (AHJ) – the organization, office, official or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation or a procedure.

Automatic Closing Device – a device that causes a door to close when activated by a fusible link, testing device or detector.

Automatic Closing Door – a door that normally is open but closes when an automatic closing device is activated.

Binder – a piece of hardware used to hold a sliding fire door to the wall, preventing lateral movement of the door from the wall.

Bottom Bar – a reinforcing member at the lower edge of the door curtain assembly.

Builders Hardware – metal hardware found on swinging type fire doors. Hardware includes items such as hinges, locks, latches, exit devices and door closers. Builders hardware is generally not supplied by the door manufacturer.

Closed Position – an arrangement of the fire door assembly such that all edges of the door are fully engaged into or against locks, latches, sills, jambs, stops, binders, guides or any other such device used to secure the door and protect the opening from the passage of flame. Allowance is made for designed clearances between items within the assembly.

Closing Device – a means of closing a door from the partially or fully opened position.

Detector – a device designed to detect the presence of a fire signature and to initiate action.

Door Panel – the panel portion of a swinging fire door assembly. Normally consists of stiles (vertical side pieces) and rails (horizontal pieces).

Door Holder/Release Device – a certified, fail safe device, controlled by a detection device, used on an automatic closing or self-closing door to release the door at the time of a fire.

Double Egress Doors – a pair of swinging doors, each leaf of which swings in the opposite direction of the other.

Fail Safe Device – a device that will provide its intended function upon a loss of power.

Fire Door – the door component of a fire door assembly.

Fire Door Assembly – any combination of a fire door, frame, hardware and other accessories that together provide a specific degree of fire protection to an opening.

Fire Door Frame – A component forming the perimeter of an opening in a fire door assembly that is supplied welded or knocked down and anchored to the surrounding structure.

Fire Door Hardware – Door hardware furnished by the door manufacturer as a component of a labeled fire door assembly.

Fire Door Testing Device – a feature of a closing or release device that simplifies the testing of automatic or manual closing systems under simulated fire conditions.

Fire Exit Hardware – labeled devices for swinging fire doors installed to facilitate safe egress of people and generally consisting of a crossbar and various types of mechanisms that cannot hold the latch in a retracted locked position.

Fire Protection Glazing – glazing that has a fire protection rating.

Fire Protection Rating – the designation indicating the duration of the fire test exposure to which a fire door or glazing assembly was exposed and for which it successfully met all acceptance criteria as determined in accordance with NFPA 252 or NFPA 257.

Fire Resistance Glazing – glazing that has a fire resistance rating.

Fire Resistance Rating – the time, in minutes or hours, that materials or assemblies have withstood a fire exposure as established in accordance with the test procedures of ASTM E-119.

Flame Baffle – a hinged piece of sheet metal within the hood that, when released, closes the space between the top of the curtain and the hood of a rolling steel fire door.

Fusible Link – a labeled detection device consisting of two pieces of metal held together by a special solder that melts at a predetermined temperature allowing the pieces of metal to separate.

Gasketing – a piece of material that is used to make a tight seal between adjacent components. Normally used to prevent or limit the passage of smoke, flame or hot gases from passing through an assembly.

Glazing – the part of a window or wall made of glass or other transparent or translucent material.

Governor – a device that limits the rate of descent of the door during automatic closure.

Guide – a vertical assembly in which the curtain travels and that is fastened to the jamb, retaining the edges of the door curtain and closing the space between the curtain, edges and the jamb.

Integrated Test Method – a fire resistance test that combines the most critical attributes of the fire tests under consideration so that multiple jurisdictions can be satisfied using a single, worst case fire test.

Label – devices, equipment or materials to which has been attached a label, symbol or other identifying mark of an organization that is acceptable to the Authority Having Jurisdiction and concerned with product evaluation, that maintains periodic in-plant inspections and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Negative Pressure – a situation in a fire test furnace that results in the neutral pressure plane being located at the top of the opening or top of the assembly.

Neutral Pressure Plane – the location in a fire test furnace where the pressure within the furnace during test conditions is zero. The location is usually stated as a distance above the sill.

Oversize – fire door assemblies for openings that are too large to be fire tested due to test facility limitations

Positive Pressure – a situation in a fire test furnace that results in the neutral pressure plane being located a distance of 40 in. (1016 mm) maximum above the sill.

Power Operated Fire Door – doors that are normally opened and closed electrically or mechanically.

Retrofit Operator – a product that incorporates any combination of operator, governor and/or automatic closing device that is installed on an existing fire door assembly in order to modernize, simplify or improve the performance of a fire door assembly.

Rolling Steel Fire Door – a fire door assembly consisting of a curtain, a bottom bar, a barrel, brackets, guides, a hood and an automatic releasing device.

Sealant – a substance used to seal a surface or adjacent surfaces so as to prevent or limit the passage of smoke, flames or hot gases through an assembly.

Self-Closing Doors – doors that, when opened and released, return to the closed position.

Service (Counter) Fire Door Assembly – a labeled assembly consisting of a rolling steel fire door used for the protection of openings in walls where the primary purpose of the opening is for non-pedestrian use such as conveyors. When in the closed position, the bottom bar of these units is generally above floor level.

Sidelight – an opening in a fire door frame alongside the fire door opening that is filled with a glazing material.

Sill – the bottom part of an opening onto which the door curtain and bottom bar come to rest in the closed position.

Swinging Fire Door Assembly – a fire door assembly that consists of a side hinged door panel, fire door frame and other builders hardware items such as locks, latches, hinges and door closers

Sliding Fire Door Assembly – a type of door that slides either horizontally or vertically across an opening. They normally consist of a door panel and fire door hardware such as tracks, hangers, binders, stay rollers and handles.

Special Purpose Door – a fire door assembly of special construction whose intended end use does not lend itself to be included in other door classifications. Generally these doors are not self-latching or provided with automatic closing devices. Examples would be acoustical, radiation shielding or blast resistance.

Temperature Rise Rating – the maximum temperature rise above the ambient temperature developed on the unexposed face of a door at 30 minutes of fire exposure.

Transom – an opening in a frame located above the door which contains fire rated glazing or a metal panel.

Vision Panel – a glazed opening contained within a fire door assembly.