

Approval Standard for Fire Doors

Class Number 4100

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Foreword

FM Approvals are 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 FM Approval Standards is to present the criteria for FM Approval of various types of products and services, as guidance for FM Approvals personnel, manufacturers, users and authorities having jurisdiction.

Products submitted for Approval shall demonstrate that they meet the intent of the Approval Standard, and that quality control in manufacturing and/or applications shall ensure a consistently uniform and reliable product or service. FM Approval Standards strive to be performance-oriented and to facilitate technological development.

For examining equipment, materials and services, FM Approval Standards:

- a) must be useful to the ends of property conservation by preventing, limiting or not causing damage under the conditions stated by the Approval listing; and
- b) must be readily identifiable.

Continuance of Approval and Listing depends on compliance with the Approval agreement, satisfactory performance in the field, on successful re-examinations of equipment, materials, and services as appropriate, and on periodic follow-up audits of the manufacturing facility or service/application.

FM Approvals LLC reserves the right in its sole judgement to change or revise its standards, criteria, methods, or procedures.

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I INTRODUCTION

1.1 Purpose

This standard states FM Approval requirements of fire door and frame assemblies.

1.2 Scope

1.2.1 This standard sets requirements for the performance of fire door and frame assemblies for the protection of openings in walls against the spread of fire within buildings, whether from an interior or exterior source.

1.2.2 This standard applies to the following door and frame classifications:

Classification

- a) Composite Doors
- b) Curtain-type Doors
- c) Hollow Metal Doors
- d) Metal Clad (Kalamein) Doors
- e) Rolling Steel Doors
- f) Sheet Metal Doors
- g) Special Purpose Doors
- h) Tinclad Doors
- i) Wood Core Doors
- j) Fire Door Hardware
- k) Fire Door Frames

1.2.3 This standard shall be used to measure and describe the performance of fire door and frame assemblies subjected to fire exposure under controlled laboratory conditions. The results of these controlled exposures shall not be used to describe or appraise actual exposure conditions, since such conditions vary widely.

1.3 Basis for FM Approval

FM Approval is based upon satisfactory evaluation of the product and the manufacturer in the following areas:

1.3.1 Examination and tests on production samples shall be performed to evaluate

- the suitability of the product;
- the proper operation and performance of the product as specified by the manufacturer and required by FM Approvals; and, as far as practical,
- the durability and reliability of the product.

1.3.2 An examination of the manufacturing facilities and audit of quality control procedures shall be made to evaluate the manufacturer's ability to produce the product which is examined and tested, and the marking procedures used to identify the product. These examinations are repeated as part of FM Approvals' product follow-up program.

1.4 Basis for Continued Approval

Continued Approval is based upon:

- production or availability of the product as currently Approved;
- the continued use of acceptable quality control procedures;
- satisfactory field experience;
- compliance with the terms stipulated in the Approval Agreement; and
- re-examination of production samples for continued conformity to requirements.

1.5 Basis for Requirements

- 1.5.1 The requirements of this standard are based on experience, research and testing and/or the standards of other national and international organizations. The advice of manufacturers, users, trade associations and loss control specialists was also considered.
- 1.5.2 Authorization must be obtained from FM Approvals before a revision or substitution of any component is allowed in an Approved fire door and frame assembly.
- 1.5.3 The requirements of this standard reflect tests and practices used to examine characteristics of fire door assemblies for the purpose of obtaining FM Approval. These requirements are intended primarily as guides, and strict conformity is not always mandatory. Fire door assemblies having characteristics not anticipated by this standard may be Approved if performance is equal or superior to that required by this standard, or if the intent of the standard is met. Alternatively, fire door assemblies which do meet all the requirements identified in this standard may not be Approved if other conditions which adversely affect performance exist or if the intent of this standard is not met.

1.6 Effective Date

- 1.6.1 The effective date of an Approval Standard mandates that all products tested for Approval after the effective date shall satisfy the requirements of that standard. Products Approved under a previous edition shall comply with the new version by the effective date or else forfeit Approval. The effective date shall apply to the entire Approval Standard, or, where so indicated, only to specific paragraphs of the standard.
- 1.6.2 The effective date of this standard is **January 1, 1990** for full compliance with all requirements.

1.7 System of Units

Units of Measurement are English System standard units. These are followed by their arithmetic equivalents in International System (SI) units, enclosed in parentheses. Appendix A lists the selected units for quantities dealt with in testing these products; conversions to SI units are included. Conversion of customary English units is in accordance with ASTM E 380.

II GENERAL INFORMATION

2.1 Fire Door Assemblies

Fire door assemblies consist of a door, frame and hardware. They are used to prevent the passage of fire through openings in fire resistant-rated walls.

2.2 Operation

Fire doors are designed for automatic closing by actuation of an FM Approved fusible link or other method acceptable to FM Approvals. Each fire door and frame is reinforced where necessary to permit attachment of hardware and automatic closing devices.

III APPLICABLE DOCUMENTS AND GLOSSARY

3.1 Applicable Documents

The following are standards, test methods and practices referenced in this standard:

American Society for Testing and Materials ASTM E 152
Standard Methods of Fire Tests for Door Assemblies

National Fire Protection Association NFPA 80
Standard for Fire Doors and Windows

National Fire Protection Association NFPA 101
Code for Safety to Life from Fire in Buildings and Structures

3.2 Glossary

For purposes of this standard, the following terms apply:

<i>Astragal</i>	— A horizontal or vertical molding attached to the meeting edge of one leaf of a pair of swinging or biparting sliding doors for protection against the passage of smoke, flame or gases during a fire.
<i>Automatic Closing Device</i>	— A device attached to a door that causes the door to close when activated as a result of a predetermined temperature, rate of temperature rise, smoke or product of combustion.
<i>Builders Hardware</i>	— Hardware that is intended for use with swinging doors. This type of hardware is not usually supplied by the door manufacturer.
<i>Closed Position</i>	— 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 or any other such devices used to secure the door and protect the opening from the passage of flame. Allowance is made for designed clearances between items in the assembly.

<i>Composite Door</i>	— A door consisting of wood, plastic or metal facings bonded to a solid core.
<i>Curtain-Type Door</i>	— A door consisting of interlocking steel blades or a continuous formed spring steel curtain installed in a steel frame.
<i>Door Closer</i>	— A device applied to a door and frame to cause the open door to close by mechanical force. The closing speed may be regulated by this device.
<i>Fire Door</i>	— The door component of a fire door assembly.
<i>Fire Door Assembly</i>	— Any combination of a fire door, frame, hardware and other accessories, that together provide a specific degree of fire protection to the opening.
<i>Fire Door Hardware</i>	— Hardware that is intended for use with both swinging or sliding doors, and is supplied by the door manufacturer. It consists of all hardware attached to sliding doors and special items applied to swinging doors such as, but not limited to, surface mounted strap hinges, surface applied latches, latch keepers and operating handle mechanisms.
<i>Fire Exit Hardware</i>	— Exit devices that have been tested for both fire and panic situations.
<i>Fire Protection Rating</i>	— A designation relative to the duration of the fire test exposure to which a fire door assembly was successfully exposed.
<i>Fire Rated Glass</i>	— Glass that is suitable for use in fire doors as a vision panel or in frames as a side light or transom light. Glass may be either wired glass (containing an embedded wire netting) $\frac{1}{4}$ in. (6.4 mm) minimum thickness, or clear glass (containing no wires) $\frac{3}{16}$ (4.8 mm) minimum thickness. When clear glass is used, each individual light installed shall bear the marking of an independent testing agency certifying that the glass has satisfactorily withstood the necessary fire and hose stream tests.
<i>Flame Baffle</i>	— A hinged sheet metal piece within the hood of a rolling steel door which, when released, closes the space between the top of the curtain and the hood.
<i>Frame</i>	— The component of a fire door assembly that is integrally attached to the perimeter of the opening and is used to support the door.
<i>Fusible Link</i>	— Consists of two pieces of metal joined together by a special solder that melts at a predetermined temperature allowing the pieces of metal to separate.
<i>Governor</i>	— A device that limits the speed of descent of the door during automatic closure.
<i>Hardware</i>	— A generic term used to describe items that are mounted in or on the door or frame. It includes, but is not limited to, items such as locks, latches, hinges and door closers.
<i>Hollow Metal Door</i>	— A door having a suitably reinforced outer skin. The door faces are supported by steel stiffeners or alternatively, a paper honeycomb core material. Insulating or sound deadening cores may also be used.
<i>Metal Clad (Kalamein) Door</i>	— A door having a well-seasoned wood core covered by sheets of 24 gauge (0.51 mm) or lighter metal.
<i>Power Operator</i>	— A device which opens and/or closes doors electrically, pneumatically, or mechanically.