

NFPA 80

Standard for Fire Doors and Other Opening Protectives

2007 Edition



NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471
An International Codes and Standards Organization

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NFPA 80
Standard for
Fire Doors and Other Opening Protectives
2007 Edition

This edition of NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, was prepared by the Technical Committee on Fire Doors and Windows. It was issued by the Standards Council on July 28, 2006, with an effective date of August 17, 2006, and supersedes all previous editions.

This edition of NFPA 80 was approved as an American National Standard on August 17, 2006.

Origin and Development of NFPA 80

The *Standard for Fire Doors and Other Opening Protectives* can be traced to the early days of the NFPA. Reports covering various phases of the problems of protectives for openings were submitted to the Association by several of the committees concerned and were adopted in 1897, 1898, 1899, 1900, 1901, 1902, and 1908. In 1911, a standard on door openings was presented and adopted, and *Rules for Fire Protection Coverings for Openings in Walls and Partitions on the Interior of Buildings* was adopted in 1912. In 1915, the existing rules were recodified and reorganized. In 1916, the committee in charge of this document was renamed the Committee on Protection of Openings in Walls and Partitions. Revisions recommended by the committee were adopted by the NFPA in 1916, 1917, 1918, 1926, 1927, 1928, 1931, 1937, and 1941.

In 1955, the committee was renamed the Committee on Fire Doors and Windows. In 1959, a complete revision of the 1941 edition, including changing the title to correspond with the name of the committee, was adopted. The 1959 edition was revised in 1961, 1962, 1965, 1966, 1967, 1968, 1970, 1973, 1974, 1975, 1977, 1979, 1981, 1983, 1986, and 1990.

In 1992, the committee changed the title of the document to *Standard for Fire Doors and Fire Windows*. Major changes in the 1992 edition included additions to the standard that recognized the technological changes in glazing materials for fire barrier openings and appendix material on radiant heat transfer. Radiant heat transfer, while not included in the performance requirements for fire doors and fire windows, is a consideration in the design of fire barriers.

The 1995 edition reorganized Chapter 2 for better usability, with many changes to improve consistency. Appendix J was updated to provide more current information on radiant heat transfer.

The chapters were reorganized in the 1999 edition to correlate the section numbers and their requirements. Requirements that are common to all doors such as clearances and detection were moved to Chapter 1.

The 2007 edition includes a major reorganization in accordance with the *Manual of Style for NFPA Technical Committee Documents* and a title change to accommodate the broader scope of the document. New chapters on fabric fire safety curtains and the installation, testing, and maintenance of fire dampers have been added. Major technical changes pertain to the maximum clearance permitted under the bottom of doors, new provisions regarding the care and maintenance of fire doors and fire windows, the option for developing performance-based maintenance activities provisions, and provisions regarding chute doors, fire shutters, rolling steel doors, and service counter doors. New information concerning floor fire door assemblies and ratings associated with glazing materials also has been added. It is noted that the 8-year gap between the 1999 and 2007 editions was due to NFPA 80 being returned to committee during the Fall 2002 revision cycle.

Technical Committee on Fire Doors and Windows

Harold D. Hicks, Jr., *Chair*
Atlantic Code Consultants, PA [SE]

Calvin A. Banning, Framatome ANP, TX [SE]
Robert M. Berhinig, Underwriters Laboratories Incorporated, IL [RT]
Daniel R. Bernacki, International Door Association, OH [IM]
Bruce G. Campbell, Hughes Associates, Incorporated, CO [SE]
David S. Cha, Northwestern Memorial Hospital, IL [U]
Paul R. Coleman, Sisters of Providence Health Care System, OR [U]
Rep. NFPA Health Care Section
William Conner, Bill Conner Associates LLC, IL [SE]
Rep. American Society of Theater Consultants
Edward A. Donoghue, Edward A. Donoghue Associates, Incorporated, NY [M]
Rep. National Elevator Industry Incorporated
(Vote Limited to Elevators)
Philip C. Favro, Philip C. Favro & Associates, CA [SE]
Jerrold S. Gorrell, City of Phoenix, AZ [IM]
Rep. United States Institute for Theatre Technology
Jeffrey E. Gould, FM Approvals/FM Global, MA [I]
Steven C. Hahn, Lawrence Roll-Up Doors, Incorporated, CA [M]
Rep. American Rolling Door Institute

Wayne D. Holmes, HSB Professional Loss Control, CT [I]
Thomas R. Janicak, Ceco Door Products, TN [M]
Rep. Steel Door Institute
William E. Koffel, Koffel Associates, Incorporated, MD [M]
Rep. Glazing Industry Code Committee
Nancy L. Kokesh, Intertek Testing Services, NA Incorporated, WI [RT]
Curtis Maffett, City of Columbia, SC [E]
Richard N. McDaniel, Virginia Department of Housing and Community Development, VA [E]
Keith E. Pardoe, Door and Hardware Institute, VA [M]
Vernon J. Patton, First Energy Corporation, OH [U]
Ronald Rispoli, Entergy Corporation, AR [U]
Joseph N. Saino, Chase Durus Industries, TN [M]
Rep. National Association of Architectural Metal Manufacturers
David A. San Paolo, The Maiman Company, MO [M]
Rep. Window & Door Manufacturers Association
Michael L. Savage, Sr., Middle Department Inspection Agency, Incorporated, MD [E]
Michael Tierney, Builders Hardware Manufacturers Association, CT [M]
Robert Van Becelaere, Ruskin Manufacturing, MO [M]
Anthony W. Yuen, University of California, CA [U]

Alternates

Scott K. Anderson, FM Global, MA [I]
(Alt. to J. E. Gould)
Richard Cookson, The Cookson Company, AZ [M]
(Alt. to S. C. Hahn)
John G. Crowther, Framatome ANP, TX [SE]
(Alt. to C. A. Banning)
Michael D. Fischer, Window & Door Manufacturers Association, IL [M]
(Alt. to D. A. San Paolo)
James L. Giles, International Door Association, MN [IM]
(Alt. to D. R. Bernacki)
David F. Mauldin, Schindler Elevator Corporation, PA [M]
(Alt. to E. A. Donoghue)
Kurt A. Roeper, Ingersoll-Rand Security & Safety, OH [M]
Rep. Steel Door Institute
(Alt. to T. R. Janicak)

Helen Rose, Lorient North America, KY [M]
Rep. Builders Hardware Manufacturers Association
(Alt. to M. Tierney)
Thomas M. Rubright, William S. Trimble Company, Incorporated, TN [M]
Rep. Door and Hardware Institute
(Alt. to K. E. Pardoe)
Emmanuel A. Sopeju, Underwriters' Laboratories of Canada, Canada [RT]
(Alt. to R. M. Berhinig)
James A. Stapleton, Jr., Habersham Metal Products Company, GA [M]
(Alt. to J. N. Saino)

Milosh T. Puchovsky, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on the installation and maintenance of fire doors, windows, shutters, and other equipment used to restrict the spread of fire, including arrangements for automatic operation in case of fire. This includes installation to protect buildings against external fire and to restrict the spread of fire within buildings. Vault and record room doors are covered by the Technical Committee on Record Protection.



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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex L. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex L.

Chapter 1 Administration

1.1* Scope. This standard regulates the installation and maintenance of assemblies and devices used to protect openings in walls, floors, and ceilings against the spread of fire and smoke within, into, or out of buildings.

1.1.1* With the exception of fabric fire safety curtain assemblies, this standard addresses assemblies that have been subjected to standardized fire tests. (See Chapter 20.)

1.1.2* Incinerator doors, record room doors, and vault doors are not covered in this standard.

1.1.3* Requirements for horizontally sliding, vertically sliding, and swinging doors as used in this standard do not apply to hoistway doors for elevators and dumbwaiters.

1.1.4* This standard does not cover fire-resistant glazing materials and horizontally sliding accordion or folding assemblies fabricated for use as walls and tested as wall assemblies in accordance with NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*.

1.2 Purpose.

1.2.1* The purpose of this document is to set national standards for the installation and maintenance of assemblies used to protect openings in walls, floors, and ceilings to prevent or retard the spread of fire and smoke within, into, or out of buildings.

1.2.2 This document is also intended to give guidance to authorities having jurisdiction (AHJs) so they can determine in

the field if an assembly meets the requirements and standards outlined in this document and if maintenance standards have been maintained.

1.2.3 It is not the purpose of this standard to establish the degree of protection required or to constitute the approval of any product.

1.3* Retroactivity.

1.3.1 This standard is based on product and engineering practices recognized as acceptable at the date of issue.

1.3.2 Unless otherwise noted, it is not intended that the provisions of this document be applied to facilities, equipment, structures, or installations that were existing or approved for construction or installation prior to the effective date of the document.

1.3.3 In those cases where it is determined by the AHJ that the existing situation involves a distinct hazard to life or property, retroactive application of the provisions of this document shall be permitted.

1.4 Equivalency.

1.4.1* This standard shall not prohibit the development of new, modified, or improved devices that meet the intent of these requirements.

1.4.2 It shall be the responsibility of the manufacturer to furnish the information necessary to update the requirements pertaining to such new and improved devices.

1.4.3 For devices not described in this standard, the AHJ shall request descriptive information from manufacturers that is provided by a testing laboratory concerning acceptable methods for satisfactory field installation based on fire tests and engineering studies for operation and maintenance considerations, where applicable.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 72®, *National Fire Alarm Code*®, 2007 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 2002 edition.

NFPA 105, *Standard for the Installation of Smoke Door Assemblies and Other Opening Protectives*, 2007 edition.

NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*, 2006 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, 2003 edition.

NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source*, 2006 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, 2007 edition.

NFPA 272, *Standard Method of Test for Heat and Visible Smoke Release Rates for Upholstered Furniture Components or Composites and Mattresses Using an Oxygen Consumption Calorimeter*, 2003 edition.

NFPA 288, *Standard Methods of Fire Tests of Floor Fire Door Assemblies Installed Horizontally in Fire Resistance-Rated Floor Systems*, 2007 edition.

NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, 2004 edition.

2.3 Other Publications.

2.3.1 ASME Publications. American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990.

ASME A17.1, *Safety Code for Elevators and Escalators*, 2004 including Addenda ASME A17.1a-2005 and ASME A17.1S-2005.

2.3.2 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM A 36, *Standard Specification for Carbon Structural Steel*, 2005.

ASTM D 4157, *Standard Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method)*, 2002.

ASTM D 5034, *Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)*, 2001.

ASTM D 6193, *Standard Practice for Stitches and Seams*, 1997 (2004).

2.3.3 CSA Publications. Canadian Standards Association, 500 Spectrum Way, Suite 100, Mississauga, ON L4W 5N6, Canada.

CSA B44, *Safety Code for Elevators*, 2004.

2.3.4 BHMA Publications. Builders Hardware Manufacturers Association, 335 Lexington Avenue, 17th Floor, New York, NY 10017.

ANSI/BHMAA156.1, *Standard for Butts and Hinges*, 2000.

ANSI/BHMAA156.4, *Standard for Door Controls (Closers)*, 2000.

ANSI/BHMAA156.17, *Standard for Self-Closing Hinges & Pivots*, 2004.

2.3.5 GSA Publications. U.S. General Services Administration, 1800 F Street, N.W., Washington, DC 20405.

Federal Specification A-A-1923A, *Shield Expansion (Lag, Machine and Externally Threaded Wedge)*, 1995.

Federal Specification A-A-1924A, *Shield, Expansion (Self-Drilling Tubular Expansion Shell Bolt)*, 1995.

Federal Specification A-A-55614, *Shield, Expansion (Non-Drilling Expansion Anchors)*, 1995.

2.3.6 SMACNA Publications. Sheet Metal and Air Conditioning Contractors' National Association, 4201 Lafayette Center Drive, Chantilly, VA 20151-1209.

Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems, 2002.

2.3.7 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 9, *Standard for Fire Tests of Window Assemblies*, 2000.

UL 10A, *Standard for Tin-Clad Fire Doors*, 1998.

UL 14C, *Swing Hardware for Tin-Clad Doors Mounted Singly and in Pairs*, 1999.

UL 33, *Standard for Heat Responsive Links for Fire-Protection Services*, 2003.

UL 555, *Standard for Fire Dampers*, 1996.

2.3.8 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 72®, *National Fire Alarm Code*®, 2007 edition.

NFPA 220, *Standard on Types of Building Construction*, 2006 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2006 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

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

3.2.3 Labeled. 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 inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.2.7 Standard. A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.



3.3 General Definitions.

3.3.1 Access Door. A door assembly, for installation in fire resistance-rated walls or for installation in ceilings of fire resistance-rated floor-ceiling or roof-ceiling assemblies, that is used to provide access to shafts, chases, attics, spaces above ceilings, or other concealed spaces.

3.3.1.1 Horizontal Access Door. An access door installed in the horizontal plane used to protect openings in ceilings of fire resistance-rated floor-ceiling or roof-ceiling assemblies.

3.3.1.2 Vertical Access Door. An access door installed in the vertical plane used to protect openings in fire-rated walls.

3.3.2 Active Leaf. The first operating door of a pair, which is usually the door in which a lock is installed.

3.3.3 Ambient. For the purposes of this standard, the temperature of the room in which the test is being conducted.

3.3.4 Anchor. A device for attaching frames to the surrounding structure.

3.3.5* Astragal.

3.3.5.1 Overlapping Astragal. A horizontal or vertical molding attached to one leaf of a pair of doors.

3.3.5.2* Split Astragal. A horizontal or vertical molding attached to both leaves of a pair of doors.

3.3.6 Automatic-Closing Device. A device that causes the door or window to close when activated by a fusible link or detector.

3.3.7* Automatic-Closing Door. A door that normally is open but that closes when the automatic-closing device is activated.

3.3.8 Automatic Fire Detector. A device designed to detect the presence of a fire signature and to initiate action. For the purpose of this standard, automatic fire detectors are classified as follows: Automatic Fire Extinguishing or Suppression System Operation Detector, Fire-Gas Detector, Heat Detector, Other Fire Detectors, Radiant Energy-Sensing Fire Detector, Smoke Detector. [72, 2007]

3.3.9 Automatic Louver. An opening in a door with a series of slats or blades to allow passage of air and designed to close automatically in the event of fire.

3.3.10 Automatic Top and Bottom Bolts. See 3.3.68.1, Automatic Flush Bolts.

3.3.11 Barrel. A cylindrical horizontal member at the head of the opening that supports the door curtain of a rolling steel door and contains the counterbalance springs.

3.3.12 Batten. A horizontal pipe, tube, or other structural shape in a pocket of or attached to a fire safety curtain.

3.3.13 Binders. Pieces of hardware used to hold a sliding door to the wall, preventing lateral movement of the door from the wall.

3.3.14 Biparting. A vertically sliding door in which half of the door moves up and half of the door moves down in order to open, or a horizontal sliding door in which one door moves to the right and one moves to the left in order to open.

3.3.15 Bottom Bar (Rolling Steel Door). A reinforcing member at the lower edge of the door curtain assembly.

3.3.16 Breakaway Connection. A joint connecting a fire damper sleeve and attached ductwork that will allow col-

lapse of the ductwork during a fire without disturbing the integrity of the fire damper.

3.3.17 Bumper (Fire Safety Curtain). A filled fabric pocket below the bottom batten or frame member of a fire safety curtain designed to press against the floor.

3.3.18 Bumpers. Stops to limit the closing or opening movement of a sliding door.

3.3.19 Ceiling Radiation Damper. A listed device installed in a ceiling membrane of a fire resistance-rated floor-ceiling or roof-ceiling assembly to automatically limit the radiative heat transfer through an air inlet/outlet opening. [5000, 2006]

3.3.20 Center Latch. A latch used to hold the two halves of a center-parting or biparting fire door together, which is usually two pieces surface-applied to doors and interlocked in the closed position.

3.3.21 Center Parting. See 3.3.14, Biparting.

3.3.22 Chafing Strip. A metal strip applied to the back surface of a sliding door to protect the door surface from damage from the wall.

3.3.23 Channel Frame. A frame that consists of head and jamb members of structural steel channels, either shop assembled or field assembled, to be used with masonry walls.

3.3.24* Classified. Products or materials of a specific group category that are constructed, inspected, tested, and subsequently reinspected in accordance with an established set of requirements.

3.3.25 Closed Position (Rolling Steel Fire Door). A position of the door curtain with the underside of the bottom bar, including a compressible seal or sensing edge, if provided, in contact with the sill along the entire width of the opening.

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

3.3.27 Combination Fire/Smoke Damper. A device that meets both the fire damper and smoke damper requirements.

3.3.28 Concrete Lintel. A precast concrete horizontal member spanning and carrying the load above an opening.

3.3.29 Continuous Glazing Molding. A continuous molding used to hold glass or glazing in a window.

3.3.30 Coordinator. A device used on pairs of swinging doors that prevents the active leaf from closing before the inactive leaf closes.

3.3.31 Counterbalancing. A method by which the hanging weight of the door is balanced by helical torsion springs or weights.

3.3.32 Cover Plate. A plate to cover the joint between the sections of multiple panel doors, usually applied to the front and back of the vertical or horizontal slide door.

3.3.33 Crush Plates. Bearing plates provided where doors are mounted on concrete masonry wall units with hollow cells to accommodate through-wall bolts to prevent crushing of the hollow concrete masonry unit.

3.3.34 Curtain (Rolling Steel Fire Door). Interlocking curtain slats assembled together.

3.3.35 Curtain Slats. Formed sheet steel members that, when interlocked together, form the rolling steel door curtain.

3.3.36 Detector. See 3.3.8, Automatic Fire Detector.

3.3.37 Door, Access. See 3.3.1, Access Door.

3.3.38 Door, Automatic-Closing. See 3.3.7, Automatic-Closing Door.

3.3.39 Door Closer (Swinging). A labeled device that, when applied to a door and frame, causes an open door to close by mechanical force. The closing speed can be regulated by this device.

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

3.3.41 Door, Power-Operated. See 3.3.93, Power-Operated Fire Doors.

3.3.42 Door Protection Plate. Protective material applied to the face of a door and generally made of approximately 0.05 in. (1.2 mm) thick brass, bronze, aluminum, or stainless steel or 1/8 in. (3.2 mm) thick laminated plastic.

3.3.43 Door, Self-Closing. See 3.3.101, Self-Closing Doors.

3.3.44 Door, Service Counter. See 3.3.104, Service Counter Fire Door.

3.3.45* Double Egress Doors. A pair of swinging doors, each leaf of which swings in the opposite direction of the other.

3.3.46 Dutch Door. A door divided horizontally so that the lower part can be shut while the upper part remains open.

3.3.47 Dynamic System. An HVAC system designed to maintain the movement of air within the system at the indication of a fire.

3.3.48 Egress Side. The side of an opening from which traffic exits.

3.3.49 Fail-Safe Device. A device that will provide its intended function upon loss of power.

3.3.50 Finish Frame. A subframe attached to a rough buck to which the door is attached.

3.3.51 Fire Damper. A device installed in an air distribution system, designed to close automatically upon detection of heat, to interrupt migratory airflow and to restrict the passage of flame. Fire dampers are classified for use in either static systems or for dynamic systems, where the dampers are rated for closure under airflow.

3.3.52* Fire Door. The door component of a fire door assembly.

3.3.53 Fire Door Assembly. Any combination of a fire door, a frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening.

3.3.54 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.

3.3.55* Fire Door Frame for Lights. A frame that, in addition to a door opening, contains an opening(s) for use with glazing materials.

3.3.56* Fire Door Frame for Panels. A frame that, in addition to a door opening, contains an opening(s) for use with fixed panels of solid metal or wood.

3.3.57 Fire Door Hardware. Door hardware furnished for swinging and sliding fire doors by the door manufacturer as a component part of the listed door assembly.

3.3.58 Fire Exit Hardware. Labeled devices for swinging fire doors installed to facilitate safe egress of persons and generally consisting of a cross bar and various types of latch mechanisms that cannot hold the latch in a retracted locked position.

3.3.59 Fire Protection Rating. For the purposes of this standard, the designation indicating the duration of the fire test exposure to which a fire door assembly or fire window assembly was exposed and for which it successfully met all acceptance criteria as determined in accordance with NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, or NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, respectively. (See also Annex D.)

3.3.60 Fire-Rated Damper Mullion. A mullion used to separate multiple listed dampers in large openings.

3.3.61 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 NFPA 251. [220, 2006]

3.3.62 Fire Safety Curtain. A curtain of fire-resistant fabric and noncombustible framing materials.

3.3.62.1 Brail Fire Safety Curtain. A fire safety curtain that folds up and stores in the space above a proscenium opening.

3.3.62.2 Straight-Lift Fire Safety Curtain. A fire safety curtain consisting of one or more flat panel(s) that lifts up and stores above the proscenium opening.

3.3.62.3 Unframed Fire Safety Curtain. A straight lift fire safety curtain containing no internal vertical framing members.

3.3.63 Fire Safety Curtain Assembly. A fire safety curtain and all other components necessary to form a complete assembly.

3.3.63.1 Framed Fire Safety Curtain Assembly. A straight lift type fire safety curtain assembly containing a rigid perimeter frame and internal members.

3.3.64 Fire Shutter. A fire door assembly used for the protection of a window opening in an exterior wall.

3.3.65 Fire Window Assembly. A window or glass block assembly having a fire protection rating.

3.3.66 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.

3.3.67 Floor Fire Door Assembly. A combination of a fire door, a frame, hardware, and other accessories installed in a horizontal plane, which together provide a specific degree of fire protection to a through-opening in a fire resistance-rated floor.

3.3.68 Flush Bolts.

3.3.68.1 Automatic Flush Bolts. A mortised bolt installed near the top or bottom of the inactive leaf of a pair of doors that holds the inactive leaf in a closed position until the active leaf is opened.

3.3.68.2 Manual Flush Bolts. A mortised bolt installed near the top or bottom of the inactive leaf of a pair of doors in which the bolts are manually extended or retracted into or out of the header or sill by means of a lever.

3.3.69 Fusible Link. For the purposes of this standard, a listed device consisting of pieces of metal held together by low-melting-point solder.



3.3.70* Glazing Angle Clips. Steel clips used to hold glass in place in windows glazed only with glazing compound.

3.3.71* Glazing Material. A transparent or translucent material used in fire door assemblies and fire windows.

3.3.72 Governor (Sliding, Vertical, and Rolling Steel Fire Doors). A device that limits the rate of descent of the door during automatic closure.

3.3.73 Guide (Rolling Doors). 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.

3.3.74 Guide Rail (Sliding Door, Vertical). A steel member attached to the wall or frame used with vertical sliding doors to guide the door.

3.3.75 Guide Shoe (Sliding Door, Vertical). A member attached to vertical sliding doors used to guide and retain the door on the guide rail.

3.3.76 Guide Wall Angle (Rolling Steel Doors). The component of the guide assembly that is fastened to the jamb.

3.3.77 Hanger (Sliding Door, Horizontal). A member used to attach a horizontally sliding door to the track and to cause the door to roll on or in the track.

3.3.78 Heat-Actuated Device. Devices that include fixed temperature releases, rate-of-temperature-rise releases, and door closers with hold-open arms embodying a fusible link.

3.3.79 Hollow Metal Frame. A frame formed from sheet metal.

3.3.80 Hood (Rolling Steel Door). A sheet metal housing that mounts horizontally between the brackets, serving as an enclosure for the coiled curtain and closing the space between the door coil and the lintel.

3.3.81 Inactive Leaf. One door of a pair of doors that ordinarily is latched closed; the second operating door of a pair.

3.3.82 Keeper. A guide and a restraint used on latching devices.

3.3.83 Knocked-Down Frame. Door frame furnished by manufacturer in three or more basic parts for assembly in the field.

3.3.84 Lap-Mounted Door (Sliding Door, Vertical Door, Horizontal Door, Swinging Door). Doors mounted on the face of a wall and overlapping the opening by a prescribed dimension.

3.3.85 Latching Device. A spring-loaded latch bolt or a gravity-operated steel bar that, after release by physical action, returns to its operating position and automatically engages the strike plate when it is returned to the closed position.

3.3.86 Lintel. A horizontal member spanning and carrying the load above an opening.

3.3.87 Mullion. A fixed or removable vertical member set in a double door opening that allows both leaves to be active or set between a door and a side light or a separate, framed, glazed area.

3.3.87.1 Window Mullion. The separate horizontal or vertical member or members used to join windows in a multiple window opening.

3.3.88* Multiple Opening Door Frame. A door assembly that consists of more than two doors.

3.3.89 Muntin. A bar member supporting and separating panes of glass within a sash, door, or glazing frame.

3.3.89.1 Window Muntin. A tee-shaped bar in a frame or ventilator, dividing the glass.

3.3.90 Noncombustible. Not capable of igniting and burning when subjected to a fire.

3.3.91 Pass Door. A swinging door in a sliding door for personnel use.

3.3.92 Plant-On. A decorative trim applied to the surface of a door. (See also Annex E.)

3.3.93 Power-Operated Fire Doors. Doors that normally are opened and closed electrically or pneumatically.

3.3.94 Proscenium Wall. The wall that separates the stage from the audience or house. [5000, 2006]

3.3.95 Purchase Line (Hand Line). The line attached to the counterweight for manual opening and closing of the fire safety curtain.

3.3.96 Retaining Angle. The metal angle used to retain the fire damper in the opening.

3.3.97 Retrofit Operator. A device labeled as a "retrofit rolling steel fire door operator" intended to replace operator and governor systems (including automatic-closing devices) used on existing listed rolling steel fire doors.

3.3.98 Roller Guide/Metal Track Side Edge Guide System. Continuous tracks with captive trolleys or rollers at each vertical edge of the curtain used to guide and restrain the fire safety curtain.

3.3.99* Rolling Steel Fire Door. A fire door assembly consisting of a curtain, bottom bar, barrel, brackets, hood, and an automatic-releasing device.

3.3.100 Rough Buck. A subframe, usually channel shaped, attached to an existing wall to which the finished frame is attached.

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

3.3.102 Self-Latching Bolt. An automatic-latching device that engages in a keeper to hold a door leaf in a closed position and that can only be released manually.

3.3.103 Sensing Edge (Rolling Steel Fire Door). A device added to the underside of the bottom bar of a power-operated rolling steel fire door or fire shutter that stops or reverses the door curtain upon contact with an obstruction when closing under power.

3.3.104 Service Counter Fire Door. A labeled assembly consisting of a rolling steel fire door that incorporates a four-sided frame used for the protection of openings in walls where the primary purpose of the opening is for nonpedestrian use, such as counter service for food, a pharmaceutical dispensary, package and baggage transfer, or observation ports.

3.3.105 Shutter. A labeled door assembly that is used for the protection of a window opening in an exterior wall. (See also 3.3.64, Fire Shutter.)

3.3.106 Side Guide Cable System. A continuous vertical cable at each vertical edge of the curtain used to guide and restrain the fire safety curtain.

3.3.107 Side Light. An opening in a fire door frame alongside the fire door opening that is filled with glazing material.

3.3.108* Side Light Frame. A fire door frame prepared for the application of a glazing material alongside the door opening.

3.3.109* Side Panel Frame. A door frame prepared for the installation of a fixed solid metal or wood panel alongside the door opening.

3.3.110 Sill (Rolling Steel Fire Door). The bottom part of an opening onto which the door curtain and bottom bar come to rest when in the closed position.

3.3.111 Sill (Service Counter Fire Door). The bottom part of a frame onto which the door curtain and bottom bar come to rest when in the closed position.

3.3.112 Single-Point Latch. A latch located in the edge of a door to engage either in the frame or in the edge of the inactive leaf of a pair of doors.

3.3.113 Sliding Hardware. A system of rails, hangers, rollers, guides, binders, and closing devices that are self-closing by means of gravity, weights, and pulleys or spring-actuated devices.

3.3.114 Smoke Damper. A device within an operating (dynamic) air distribution system to control the movement of smoke.

3.3.115 Smoke Detector. A device that detects visible or invisible particles of combustion. [72, 2007]

3.3.116 Spring Hinge. A closing device in the form of a hinge with a built-in spring used to hang and close the door.

3.3.117 Spring Release Device (Rolling Steel Door). A device that, when activated, releases part of the spring counterbalancing force and causes the door to close.

3.3.118 Static System. An HVAC system designed to stop the movement of air within the system at the indication of a fire.

3.3.119 Stay Chain. A chain used to support the fire safety curtain.

3.3.120 Stay Rollers (Sliding Door, Horizontal). A device used on horizontally sliding doors at their back lower corners to guide the door and prevent the door from moving away from the wall under fire conditions.

3.3.121 Strike.

3.3.121.1 Electric Strike. A strike that, when activated, either releases or retains a projected latch or dead bolt.

3.3.121.2 Open Back Strike. A strike applied to the inactive leaf of a pair of doors and cut away at the back to allow either leaf to open or close independently.

3.3.122 Strike Plate. A wear plate for projecting hardware or a wear plate and keeper for a latch bolt.

3.3.123 Struts. Adjustable vertical members that extend from the head of the hollow metal door frame to the ceiling to hold the frame rigidly in place.

3.3.124 Track Brackets (Sliding Doors). Hardware bolted to the wall that serves to support the track.

3.3.125 Transom. An opening in a fire door frame above the door opening that is filled by a solid panel or with glazing material.

3.3.126* Transom and Side Light Frame. A fire door frame prepared for the application of a glazing material above and alongside the door opening.

3.3.127* Transom and Side Panel Frame. A fire door frame prepared for the application of solid metal or wood panels above and alongside the door opening.

3.3.128* Transom Light Frame. A fire door frame prepared for the application of a glazing material above the door opening that has a horizontal member such as a transom bar provided to separate the glazed opening from the door opening.

3.3.129 Transom Panel. A panel, fixed or removable, installed in a frame above the door.

3.3.130* Transom Panel Frame. A fire door frame prepared for the application of a transom panel above the door opening that has a horizontal member such as a transom bar provided to separate the transom opening from the door opening unless the transom panel or the bottom of the panel and the top of the door are rabbetted.

3.3.131 Vent (Sliding Door, Vertical and Horizontal Tin Clad Only). A hole cut in a fire door to allow for venting of the products of combustion.

3.3.132 Vertical Guide Pocket. A partial enclosure at the vertical edge of the proscenium that protects the vertical edges and guides of a fire safety curtain.

3.3.133 Vertically Sliding Door. Labeled single-piece doors and sectional doors operating in a vertical direction.

3.3.134 Viewer. A viewing device installed in a door to allow observation of persons opposite the security side of the door without having to open the door.

3.3.135 Volume Control Damper. A fire damper, smoke damper, or combination fire/smoke damper that is also used to control the volume of air in an HVAC system.

3.3.136 Wedge (Sliding Door, Horizontal Tin Clad and Flush Sheet Metal). A plate mounted on the face of a sliding door designed to force the door against the wall.

3.3.137 Window. Integral fabricated units, placed in an opening in a wall, primarily intended for the admission of light, or light and air, and not intended primarily for human entrance or exit.

3.3.138 Window Frame. The perimeter of a window.

3.3.139 Window Sash. The horizontal or vertical sliding component of a window.

3.3.140 Window Ventilator. The part of a projected window, casement window, or pivoted window that opens.

3.3.141 Wire Glazing Clips. Small, spring wire clips used to hold glass in place where windows are glazed only with glazing compound.

3.3.142 Wired Glass. A glazing material with embedded wire mesh.

Chapter 4 General Requirements

4.1* General Limitations.

4.1.1 Classification. Fire doors and fire windows shall be classified by designating a required fire protection rating expressed in hours or fractions thereof. (See Annex D.)



4.1.2* Fusible Links.

4.1.2.1 The particular fusible link used shall depend on the temperature and load requirements of the application.

4.1.2.2 Multiple links shall be permitted to be used to meet the load rating requirements where the load rating of a single link is exceeded.

4.1.3 Appurtenances.

4.1.3.1 Preparation of fire door assemblies for locks, latches, hinges, remotely operated or remotely monitored hardware, concealed closers, glass lights, vision panels, louvers, astragals and split astragals, and the application of plant-ons and laminated overlays shall be performed in accordance with the manufacturer's inspection service procedure and under label service. (See Annex E and Annex F.)

4.1.3.2 For job site preparation of surface-applied hardware, function holes for mortise locks, and holes for labeled viewers, a maximum $\frac{3}{4}$ in. (19 mm) wood and composite door undercutting, and protection plates (see 6.4.5) shall be permitted.

4.1.3.3 Surface-applied hardware shall be applied to the door or frame without removing material other than drilling round holes to accommodate cylinders, spindles, similar operational elements, and through-bolts in doors.

4.1.3.4 The holes described in 4.1.3.3 shall not be permitted to exceed a diameter of 1 in. (25.4 mm) with the exception of cylinders.

4.1.4 **Signage.** Informational signs shall be permitted to be installed on the surfaces of fire doors in accordance with 4.1.4.1 through 4.1.4.4 or in accordance with the manufacturer's published listing.

4.1.4.1 The total area of all attached signs shall not exceed 5 percent of the area of the face of the fire door to which they are attached.

4.1.4.2 Means of Attachment.

4.1.4.2.1 Signs shall be attached to fire doors by use of an adhesive.

4.1.4.2.2 Mechanical attachments such as screws or nails shall not be permitted.

4.1.4.3 Signs shall not be installed on glazing material in fire doors.

4.1.4.4 Signs shall not be installed on the surface of fire doors so as to impair or otherwise interfere with the proper operation of the fire door.

4.1.5 Sliding Doors.

4.1.5.1 Sliding doors shall be permitted to have integral swinging doors.

4.1.5.2 Where sliding doors include an integral swinging door, they shall be permitted to be used on exits to the exterior of the building.

4.2 **Listed and Labeled Products.** (See 3.2.3 and 3.2.4 for definitions.)

4.2.1* Listed items shall be identified by a label.

4.2.2 Labels shall be applied in locations that are readily visible and convenient for identification by the AHJ after installation of the assembly.

4.2.3 The label or the listing shall be considered evidence that samplings of such devices or materials have been evaluated by tests and that such devices or materials are produced under an in-plant, follow-up inspection program.

4.2.4 Specification of items of a generic nature, such as hinges, that are not labeled shall comply with the specifications contained in this standard.

4.3 Classifications and Types of Doors.

4.3.1* Only labeled fire doors shall be used.

4.3.2 Swinging fire doors shall be permitted to be furnished separately from labeled door frames and builders hardware if the complete fire door assembly including the door, frame, and builders hardware comprises a labeled fire door assembly.

4.3.3 Fire doors furnished with fire exit hardware shall bear a label reading "Fire door to be equipped with fire exit hardware."

4.3.4 The label described in 4.3.3 shall address the reinforcements necessary for the exit devices, and the complete fire door assembly shall have been tested for egress panic load requirements.

4.3.5 Rolling steel fire doors shall be labeled and shall be furnished as a complete assembly that includes curtain, bottom bar, barrel, guides, brackets, hood, automatic closing device, and any other components required by their listing for a complete assembly.

4.3.6 Elevator doors shall be in accordance with Section 14.2.

4.3.7 Access-type door assemblies shall consist of single swinging steel doors with frames, self-latching devices, and closing mechanisms.

4.3.8 Service counter doors shall be of the single- or two-speed counterbalanced types of flush design or the rolling steel type of formed steel and shall include wall guides, frame, sill, latching, and counterbalancing mechanism.

4.3.9* Authorities having jurisdiction shall be consulted for information on the size of oversize doors that shall be permitted in a given location.

4.4 Glazing Material in Fire Doors.

4.4.1* Only labeled fire resistance-rated or fire protection-rated glazing material shall be used in fire door assemblies when permitted by the door listing. (See A.3.3.71, *Glazing Material*.)

4.4.2 Where required, the glazing material shall also meet safety standards.

4.4.3* Glazing materials in vision panels shall be installed in labeled glass light kits or in accordance with the fire door listing and shall be installed in accordance with the manufacturer's installation instructions.

4.4.4* Glazing material not exceeding 100 in.² (0.065 m²) shall be permitted in fire doors having a 3-hour fire protection rating or in fire doors having a 1½-hour fire protection rating for use in severe exterior fire exposure locations where the glazing material has been tested for the desired rating period with no through-openings in accordance with NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*.

4.4.5* Glazing material shall be permitted in fire doors having the fire protection ratings shown in Table 4.4.5 when tested in accordance with NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, and shall be limited in size and area in accordance with Table 4.4.5.

Table 4.4.5 Fire Door Rating

Fire Door Rating (hr)	Maximum Area of Glazing (per Door Leaf ^a)
½, ⅓	Limited to maximum area tested
¼	Limited to maximum area tested ^b
1 ^c , 1½ ^{a,c}	Limited to maximum area tested
3 ^a	100 in. ² (0.065 m ²)

^aSee also requirements in 4.4.4.

^bSee 4.4.5.1.

^cFire protection-rated glazing materials exceeding 100 in.² (0.065 m²) in area are not permitted in temperature rise-rated doors.

4.4.5.1 Maximum area of individual exposed lights shall be 1296 in.² (0.84 m²) with no dimension exceeding 54 in. (1.37 m) unless otherwise tested.

4.4.6 Each individual glazing unit shall be identified with a label that is visible after installation.

4.4.7 Viewers in fire doors shall be labeled.

4.5 Transparent Composite Panels. Transparent composite panels that limit the temperature rise on the unexposed surface and withstand the impact of the hose stream test as required for walls for the required duration in accordance with NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*, and subsequently tested in accordance with NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, or NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, shall be limited to the maximum area tested in doors or windows having a fire protection rating of 1½ hours or less. (See Annex D.)

4.6 Classification of Hardware for Fire Doors.

4.6.1 Hardware required for the installation of all types of fire doors shall be as specified in those sections covering installation.

4.6.2 Hardware for fire doors shall be referred to as builders hardware or fire door hardware.

4.6.2.1 Fire exit hardware shall be within the category of builders hardware.

4.6.3 In this standard, builders hardware shall be applied only to swinging doors.

4.6.3.1* Builders hardware shall include hinges (full mortise, half mortise, half surface, full surface, olive knuckle, paumelle, or spring), single-, two-, or three-point locks and latches, top and bottom bolts (flush, surface, or concealed), and door closers.

4.6.3.2 Builders hardware shall not be required to be shipped from the factory with the fire doors.

4.6.3.3* Fire exit hardware shall consist of exit devices that have been labeled for both fire and panic protection.

4.6.4* Fire door hardware shall be applied to both swinging and sliding doors.

4.6.4.1 Fire door hardware that is applied to swinging doors shall consist of surface-mounted strap hinges, surface-applied latches, and closing devices.

4.6.4.2 In this standard, all hardware for sliding doors shall be fire door hardware.

4.6.4.3 Fire door hardware shall be shipped from the factory with the fire door.

4.7 Placement of Detectors.

4.7.1 All detectors, including fusible links, shall be placed as shown in Figure 4.7.1 (a) and Figure 4.7.1 (b), but in no event shall detectors be placed in the dead air space shown in Figure 4.7.1 (a).

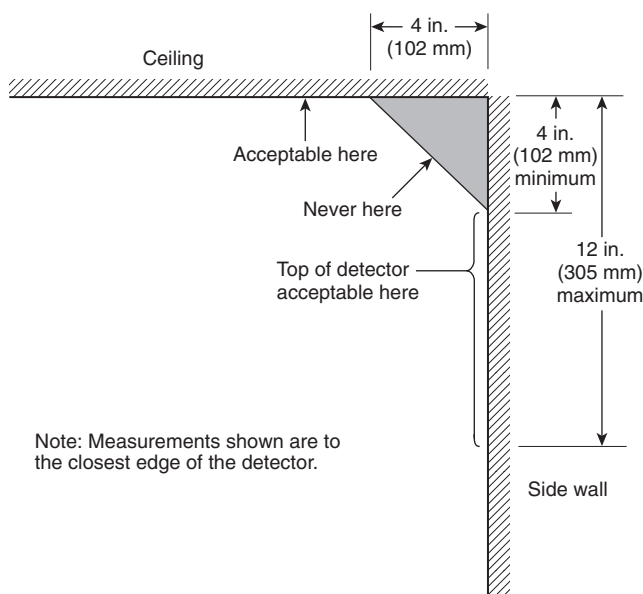


FIGURE 4.7.1(a) Proper Placement of Detectors.

4.7.2 Detectors for the release of fire doors shall be permitted to be part of an overall system, such as a fire alarm, water flow alarm, or carbon dioxide release system, that releases the door.

4.7.3 Where smoke detectors are used, they shall be located in accordance with NFPA 72, *National Fire Alarm Code*.

4.7.4 Detectors and their components shall be installed in accordance with the manufacturers' instructions.

4.7.5* Unless otherwise acceptable to the AHJ, heat detectors or fusible links shall be installed on both sides of the wall, interconnected so that the operation of any single detector or fusible link causes the door to close.

4.7.5.1 Where fusible links are used, one fusible link shall be located near the top of the opening, and additional links shall be located at or near the ceiling on each side of the wall.



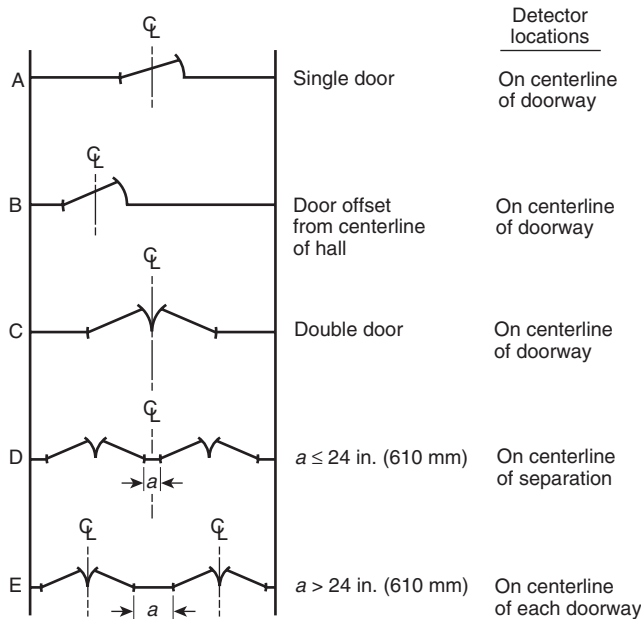


FIGURE 4.7.1(b) Detector Locations.

4.8 Supporting Construction.

4.8.1 Walls.

4.8.1.1 Walls shall be plumb and true, present smooth surfaces, and have a fire resistance rating as required by the AHJ.

4.8.1.2 Walls shall be of brick, concrete, or concrete masonry unit construction except that, where hollow concrete masonry units are used, all hollow cells within a minimum of 16 in. (0.41 m) of the opening shall be filled with concrete.

4.8.1.3* Where hollow concrete masonry units are used and where tin clad and sheet metal (corrugated) doors are mounted, the wall openings shall be reinforced to provide anchorage for door-mounting hardware equal to that of brick or concrete.

4.8.1.4* For tin-clad and sheet metal (corrugated) doors, continuous steel-bearing plates (crush plates) of $\frac{3}{16}$ in. $\times$ 3 in. (4.76 mm $\times$ 76.2 mm) minimum dimensions shall be permitted to be used to bridge the cavities and to prevent the through-wall bolts from crushing the hollow blocks.

4.8.1.5 Door assemblies shall be used on walls of other construction only if listed for such installation.

4.8.2 Sills.

4.8.2.1 In buildings with noncombustible floors, special sill construction shall not be required, provided the floor structure is extended through the door opening.

4.8.2.2 In buildings with combustible floors or combustible floor coverings, special sill construction shall be required if the floor structure is extended through the door opening, as combustible floor construction shall not be permitted to extend through the door opening.

4.8.2.3 Door openings required to be protected by $\frac{1}{2}$ -hour or $\frac{3}{4}$ -hour rated fire protection door assemblies shall be exempted from the requirements of 4.8.2.2.

4.8.2.4 Sills shall be constructed of noncombustible materials.

4.8.2.5* For swinging doors with builders hardware and special purpose horizontally sliding accordion or folding doors with frames having a jamb depth of 4 in. (102 mm) or less, the sill width shall be equal to the jamb depth.

4.8.2.6* Where frames have a greater jamb depth, the sills shall have a minimum width of 4 in. (102 mm) and shall be installed so that the sill extends from the face of the frame on the door side into the frame.

4.8.2.7 For swinging doors with fire door hardware, sills shall extend at least the depth of the door frame for flush-mounted doors.

4.8.2.8* For lap-mounted doors, sills shall extend beyond the opening for a length equal to the projection of the installed door or doors.

4.8.2.9* For horizontally sliding fire doors and vertically sliding fire doors, sills shall be constructed of noncombustible material and shall extend 6 in. (152 mm) past the edge of the opening on each side and 4 in. (102 mm) out from the face of the wall.

4.8.2.10 Rolling Steel Fire Doors.

4.8.2.10.1 For rolling steel fire doors, sills shall be constructed of noncombustible material, shall extend past each jamb as necessary to be completely under the guides, and shall extend out from the centerline of the guide groove a minimum of 4 in. (102 mm) on each side to accommodate deflection of the bottom bar.

4.8.2.11 For service counter fire doors, sills shall be provided as part of the fire door assembly.

4.8.2.12 Flush concrete sills shall extend to the wall opening on both sides.

4.8.2.13* For swinging doors with builders hardware, horizontally sliding doors, and special purpose horizontally sliding accordion or folding doors, raised noncombustible sills or thresholds shall be permitted wherever combustible floor coverings are contemplated or are in use on one or both sides of the door openings.

4.8.3 Lintels.

4.8.3.1 Lintels shall be brick, concrete or masonry arches, steel, or reinforced concrete.

4.8.3.2 Lintels of other types of construction shall be allowed when acceptable to the AHJ.

4.8.4 Clearance.

4.8.4.1 The clearance under the bottom of a door shall be a maximum of $\frac{3}{4}$ inch (19 mm).

4.8.4.2 Where the bottom of the door is more than 38 in. (965 mm) above the finished floor, the maximum clearance shall not exceed $\frac{3}{8}$ in. (9.5 mm) or as specified by the manufacturer's label service procedure.

4.8.5 Floor Coverings.

4.8.5.1 Combustible floor coverings shall be permitted to extend through openings required to be protected by $\frac{1}{2}$ -hour, 1-hour, or $\frac{3}{4}$ -hour rated fire protection fire door assemblies without a sill where they have a minimum critical radiant flux of 0.22 W/cm² in accordance with NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source*.

4.8.5.2 Combustible floor coverings shall not extend through openings protected by 3-hour rated fire protection door assemblies.

4.8.6* Where permitted by the individual door assembly listing, expansion anchors used in concrete, brick, or filled concrete masonry unit walls shall meet the following conditions:

- (1) Expansion anchors shall be manufactured from steel and shall be zinc-coated or cadmium-coated.
- (2) Expansion anchors shall conform to Federal Specification A-A-1923A, *Shield Expansion (Lag, Machine and Externally Threaded Wedge)*; A-A-1924A, *Shield, Expansion (Self Drilling Tubular Expansion Shell Bolt)*; or A-A-55614, *Shield, Expansion (Non-Drilling Expansion Anchors)*.
- (3) The compressive strength of the concrete shall not be less than 2000 psi (13,790 kPa), and the bolt load shall not exceed $\frac{1}{4}$ of the proof test load.
- (4) Where used in brick or filled concrete masonry unit walls, the bolt load shall not exceed $\frac{1}{12}$ of the proof test load.
- (5) No expansion anchor shall be set closer to the edge of the wall opening than six times the diameter of the anchor or closer to another anchor than eight times the diameter of the anchor.

4.9* Testing.

4.9.1 Upon completion of installation, all fire door and fire window assemblies shall be tested to confirm operation of the automatic closing device and full closure.

4.9.2 Resetting of the automatic closing device shall be in accordance with the manufacturer's written instructions.

4.9.3 A written record shall be maintained and shall be made available to the AHJ.

Chapter 5 Care and Maintenance

5.1* General.

5.1.1 Application.

5.1.1.1 This chapter shall cover the care and maintenance of fire doors and fire windows.

5.1.1.2 The requirements of this chapter shall apply to new and existing installations.

5.1.2 Removal of Door or Window. Where a door or window opening is no longer in use, the opening shall be filled with construction equivalent to that of the wall.

5.1.3 Operability.

5.1.3.1 Doors, shutters, and windows shall be operable at all times.

5.1.3.2 Doors, shutters, and windows shall be kept closed and latched or arranged for automatic closing.

5.1.4 Replacement. Where it is necessary to replace fire doors, shutters, windows or their frames, glazing materials, hardware, and closing mechanisms, replacements shall meet the requirements for fire protection and shall be installed as required by this standard for new installations.

5.1.5 Repairs and Field Modifications.

5.1.5.1 Repairs shall be made, and defects that could interfere with operation shall be corrected without delay.

5.1.5.2 Field Modifications.

5.1.5.2.1 In cases where a field modification to a fire door assembly is desired, the laboratory whose label is on the assembly shall be contacted and a description of the modifications shall be presented to the laboratory.

5.1.5.2.2 If the laboratory finds that the modifications will not compromise the integrity and fire resistance capabilities of the assembly, the modifications shall be permitted to be authorized by the laboratory without a field visit from the laboratory.

5.2* Inspections.

5.2.1* Fire door assemblies shall be inspected and tested not less than annually, and a written record of the inspection shall be signed and kept for inspection by the AHJ.

5.2.2* Performance-Based Option.

5.2.2.1 As an alternate means of compliance with 5.2.1, subject to the AHJ, fire door assemblies shall be permitted to be inspected, tested, and maintained under a written performance-based program.

5.2.2.2 Goals established under a performance-based program shall provide assurance that the fire door assembly will perform its intended function when exposed to fire conditions.

5.2.2.3 Technical justification for inspection, testing, and maintenance intervals shall be documented.

5.2.2.4 The performance-based option shall include historical data acceptable to the AHJ.

5.2.3 Functional Testing.

5.2.3.1 Functional testing of fire door and window assemblies shall be performed by individuals with knowledge and understanding of the operating components of the type of door being subject to testing.

5.2.3.2 Before testing, a visual inspection shall be performed to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting.

5.2.4 Swinging Doors with Builders Hardware or Fire Door Hardware.

5.2.4.1 Fire door assemblies shall be visually inspected from both sides to assess the overall condition of door assembly.

5.2.4.2 As a minimum, the following items shall be verified:

- (1) No open holes or breaks exist in surfaces of either the door or frame.
- (2) Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped.
- (3) The door, frame, hinges, hardware, and noncombustible threshold are secured, aligned, and in working order with no visible signs of damage.
- (4) No parts are missing or broken.
- (5) Door clearances at the door edge to the frame, on the pull side of the door, do not exceed clearances listed in 4.8.4 and 6.3.1.
- (6) The self-closing device is operational, that is, the active door completely closes when operated from the full open position.
- (7) If a coordinator is installed, the inactive leaf closes before active leaf.
- (8) Latching hardware operates and secures the door when it is in the closed position.



- (9) Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame.
- (10) No field modifications to the door assembly have been performed that void the label.
- (11) Gasketing and edge seals, where required, are inspected to verify their presence and integrity.

5.2.5 Horizontally Sliding, Vertically Sliding, and Rolling Doors.

5.2.5.1 Fire door assemblies shall be visually inspected from both sides to assess the overall condition of door assembly.

5.2.5.2 The following items shall be verified:

- (1) No open holes or breaks exist in surfaces of either the door or frame.
- (2) Slats, endlocks, bottom bar, guide assembly, curtain entry hood, and flame baffle are correctly installed and intact.
- (3) Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped.
- (4) Curtain, barrel, and guides are aligned, level, plumb, and true.
- (5) Expansion clearance is maintained in accordance with manufacturer's listing.
- (6) Drop release arms and weights are not blocked or wedged.
- (7) Mounting and assembly bolts are intact and secured.
- (8) Attachment to jambs are with bolts, expansion anchors, or as otherwise required by the listing.
- (9) Smoke detectors, if equipped, are installed and operational.
- (10) No parts are missing or broken.
- (11) Fusible links, if equipped, are in the location; chain/cable, s-hooks, eyes, and so forth, are in good condition (i.e., no kinked or pinched cable, no twisted or inflexible chain); and links are not painted or coated with dust or grease.
- (12) Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame.
- (13) No field modifications to the door assembly have been performed that void the label.

5.2.6 Inspection shall include an operational test for automatic-closing doors and windows to verify that the assembly will close under fire conditions.

5.2.7 Assembly shall be reset after a successful test.

5.2.8 Resetting of the release mechanism shall be done in accordance with manufacturer's instructions.

5.2.9 Hardware shall be examined, and inoperative hardware, parts, or other defects shall be replaced without delay.

5.2.10 Tin-clad and kalamein doors shall be inspected for dry rot of the wood core.

5.2.11 Chains or cables employed shall be inspected for excessive wear and stretching.

5.2.12 Lubrication and Adjustments.

5.2.12.1 Guides and bearings shall be kept well lubricated to facilitate operation.

5.2.12.2 Chains or cables on biparting, counterbalanced doors shall be checked and adjustments shall be made to ensure latching and to keep the doors in proper relation to the opening.

5.2.13 Prevention of Door Blockage.

5.2.13.1 Door openings and the surrounding areas shall be kept clear of anything that could obstruct or interfere with the free operation of the door.

5.2.13.2 Where necessary, a barrier shall be built to prevent the piling of material against sliding doors.

5.2.13.3 Blocking or wedging of doors in the open position shall be prohibited.

5.2.14 Maintenance of Closing Mechanisms.

5.2.14.1 Self-closing devices shall be kept in working condition at all times.

5.2.14.2 Swinging doors normally held in the open position and equipped with automatic-closing devices shall be operated at frequent intervals to ensure operation.

5.2.14.3 All horizontal or vertical sliding and rolling fire doors shall be inspected and tested annually to check for operation and full closure.

5.2.14.3.1 Resetting of the release mechanism shall be done in accordance with the manufacturer's instructions.

5.2.14.3.2 A written record shall be maintained and shall be made available to the AHJ.

5.2.14.3.3 When conducting the annual test for operation and full closure, rolling steel fire doors shall be drop tested twice.

5.2.14.3.4 The first test shall be to check for operation and full closure.

5.2.14.3.5 A second test shall be done to verify that the automatic-closing device has been reset.

5.2.14.4 Fusible links or other heat-actuated devices and release devices shall not be painted.

5.2.14.5* Paint shall be prevented from accumulating on any movable part.

5.2.15 Repair of Fire Doors and Windows.

5.2.15.1 Damaged glazing material shall be replaced with labeled glazing.

5.2.15.1.1 Replacement glazing materials shall be installed in accordance with their individual listing.

5.2.15.2 Any breaks in the face covering of doors shall be repaired immediately.

5.2.15.3 Where a fire door, frame, or any part of its appurtenances is damaged to the extent that it could impair the door's proper emergency function, the following actions shall be performed:

- (1) The fire door, frame, or any part of its appurtenances shall be repaired with parts obtained from the door's manufacturer.
- (2) The door shall be tested to ensure emergency operation and closing upon completion of the repairs.

5.2.15.4 When holes are left in a door or frame due to changes or removal of hardware or plant-ons, the holes shall be repaired by the following methods:

- (1) Install steel fasteners that completely fill the holes
- (2) Fill the screw or bolt holes with the same material as the door or frame

5.3 Retrofit Operators.

5.3.1 The operator, governor, and automatic-closing device on rolling steel fire doors shall be permitted to be retrofitted with a labeled retrofit operator under the conditions specified in 5.3.2 through 5.3.5.

5.3.2 The retrofit operator shall be labeled as such.

5.3.3 The retrofit operator shall be installed in accordance with its installation instructions and listing.

5.3.4 The installation shall be acceptable to the AHJ.

5.3.5 The retrofit operator shall be permitted to be provided by a manufacturer other than the original manufacturer of the rolling steel fire door on which it is retrofitted, provided its listing allows it to be retrofitted on that manufacturer's doors.

Chapter 6 Swinging Doors with Builders Hardware

6.1 Doors.

6.1.1 General. This chapter shall cover the installation of swinging doors with builders hardware.

6.1.2* Components. A fire door assembly shall consist of components that are separate products incorporated into the assembly and allowed to have their own subcomponents.

6.1.3 Mounting of Doors. Swinging composite, hollow metal, flush sheet metal, metal-clad (kalamein), and wood core doors with builders hardware shall be flush mounted in labeled door frames.

6.1.4 Operation of Doors. All swinging doors shall be closed and latched at the time of fire.

6.1.4.1 For the purposes of 6.1.4, the operation of doors shall be divided into the following categories:

- (1) Self-closing doors
- (2) Automatic-closing doors
- (3) Power-operated fire doors

6.1.4.2 Self-Closing Doors.

6.1.4.2.1 Self-closing doors shall swing easily and freely and shall be equipped with a closing device to cause the door to close and latch each time it is opened.

6.1.4.2.2 The closing mechanism shall not have a hold-open feature.

6.1.4.3 Automatic-Closing Doors. Automatic-closing doors shall be permitted to close automatically by means of the installation of a closing device and one of the following:

- (1) A separate, labeled, fail-safe door holder/release device or a hold-open mechanism that shall be permitted to be an integral part of the basic closing device
- (2) An integral closing device that allows the door to swing freely and that automatically closes the door during an alarm condition, provided the hold-open mechanisms are released by one or a combination of automatic fire detectors acceptable to the AHJ

6.1.4.4 Power-Operated Fire Doors. Power-operated fire doors shall be equipped with a releasing device that shall automatically disconnect the power operator at the time of fire, allowing a self-closing or automatic device to close the door regardless of power failure or manual operation.

6.2 Supporting Construction.

6.2.1 Walls. Wall openings shall be constructed to readily accept the fire door frame.

6.2.1.1 The frame shall be considered to be non-load-bearing except where specifically designed to carry loads.

6.2.1.2 Frames shall be anchored securely to the wall construction.

6.2.2 Sills. Sills shall be installed in accordance with 4.8.2.

6.2.3 Lintels. Separate reinforcing units shall be provided for pressed steel door frames, where necessary, to support overhead wall loads over door openings.

6.3 Openings.

6.3.1 Door Frames.

6.3.1.1* Only labeled door frames shall be used.

6.3.1.2* Methods of anchoring shall be as shown in the listing.

6.3.1.3* Door frames intended for drywall installation shall be of the flush butt mounted or wrap-around type, and anchors shall be secured in accordance with the manufacturer's instructions.

6.3.1.4* Proprietary-type slip-on door frames shall be installed in accordance with the manufacturer's installation instructions.

6.3.1.5 Door frames provided with expansion bolt-type anchors shall be installed in masonry walls only.

6.3.1.6 Steel-faced composite, hollow metal, metal-clad (kalamein), and flush sheet metal doors shall be installed in pressed steel or steel channel frames.

6.3.1.7* Clearances.

6.3.1.7.1 The clearances between the top and vertical edges of the door and the frame, and the meeting edges of doors swinging in pairs, shall be $\frac{1}{8}$ in. $\pm \frac{1}{16}$ in. (3.18 mm $\pm$ 1.59 mm) for steel doors and shall not exceed $\frac{1}{8}$ in. (3.18 mm) for wood doors.

6.3.1.7.2 Clearances shall be measured from the pull face of the door(s).

6.3.2 Frames for Lights or Panels. Where a frame assembly consists of both solid panels and glazed lights, the fire protection rating shall be based on the glazed area.

6.3.3 Frames for Transom Lights, Side Lights, or Both.

6.3.3.1 Transom or side lights shall be fixed.

6.3.3.2 Multiple section transom and side light frames (*see G.10.3*) shall be field assembled using the assembly methods that are in accordance with the manufacturer's label service procedures.

6.3.3.3 Frames with transom lights, side lights, or both shall be permitted where a $\frac{3}{4}$ -hour fire protection rating or less is required.

6.3.3.4 Frames with transom lights, side lights, or both, installed with fire resistance-rated glazing tested as an assembly in accordance with NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*, shall be permitted where a fire protection rating exceeding $\frac{3}{4}$ hour is required.

6.3.3.5 Only labeled glazing material shall be used to glaze the light openings.



6.3.4 Frames for Transom or Side Panels.

6.3.4.1 Side panels, transom panels, or both shall be fixed.

6.3.4.2 Removable transom panels shall be permitted to allow for movement of materials or equipment through the opening.

6.3.4.3 Frames with transom panels shall be permitted in situations where fire protection ratings up to and including 3 hours are required.

6.3.4.4 Louvers shall not be installed in either transom or side panels.

6.3.5 Multiple Opening Door Frames.

6.3.5.1 Individual frames shall be of a maximum size as defined in the manufacturer's published listing but are not to exceed 12 ft 8 in. (3.9 m) in overall width.

6.3.5.2 Where multiple opening frames are installed adjoining each other in a fire-resistive wall, a 16 in. (406 mm) minimum wall section shall be provided between the frames.

6.3.5.3 The maximum fire protection rating of the door assembly shall not exceed 1½ hours.

6.4 Assembly Components.**6.4.1 Closing Devices.**

6.4.1.1* Unless otherwise permitted by the AHJ, a closing device shall be installed on every fire door.

6.4.1.2 Coordinating Device.

6.4.1.2.1 Where there is an astragal or projecting latch bolt that prevents the inactive door from closing and latching before the active door closes and latches, a coordinating device shall be used.

6.4.1.2.2 A coordinating device shall not be required where each door closes and latches independently of the other.

6.4.1.3 All components of closing devices used shall be attached securely to doors and frames by steel screws or through-bolts.

6.4.1.4* All closing mechanisms shall be adjusted to overcome the resistance of the latch mechanism so that positive latching is achieved on each door operation.

6.4.1.5 Where door holder/release devices are used, they shall be labeled.

6.4.2* Application of Door Holder/Release Devices. Door holder/release devices shall be installed in accordance with the manufacturer's instructions and only in conformance with the individual manufacturer's published listings.

6.4.3* Builders Hardware.

6.4.3.1 Hinges. Hinges shall be as specified in individual door manufacturer's published listings or Table 6.4.3.1.

6.4.3.1.1 Doors up to 60 in. (1.52 m) in height shall be provided with two hinges and an additional hinge for each additional 30 in. (0.76 m) of door height or fraction thereof.

6.4.3.1.1.1 The distance between hinges shall be permitted to exceed 30 in. (0.76 m).

6.4.3.1.1.2 Where spring hinges are used, at least two shall be provided.

6.4.3.1.2 All hinges or pivots, except spring hinges, shall be of the ball bearing type.

6.4.3.1.2.1 Hinges or pivots employing other antifriction bearing surfaces shall be permitted if they meet the requirements of ANSI/BHMAA156.1, *Standard for Butts and Hinges*.

6.4.3.1.2.2 Spring hinges shall be labeled and shall meet the requirements of ANSI/BHMAA156.17, *Standard for Self Closing Hinges & Pivots*, Grade 1.

Table 6.4.3.1 Builders Hardware Mortise, Surface, and Full-Length Hinges, Pivots, or Spring Hinges for Swinging Doors

Door Rating (hr)	Maximum Door Size				Minimum Hinge Size				Hinge Type
	Width		Height		Height		Thickness		
	ft	m	ft	m	in.	mm	in.	mm	
For 1¾ in. (44.5 mm) or Thicker Doors									
3, 1½, 1, ¾, ½, ⅓	4	1.22	10	3.05	4½	114.3	0.180	4.57	Steel, mortise or surface
3, 1½, 1, ¾, ½, ⅓	4	1.22	8	2.44	4½	114.3	0.134	3.40	Steel, mortise or surface
1½, ¾, ½, ⅓	3½	0.96	8	2.44	6	152.4	0.225	5.72	Steel, olive knuckle or paumelle
3, 1½, ¾, ½, ⅓	4	1.22	10	3.05	4	101.6	0.225	5.72	Steel pivots (including top, bottom, and intermediate)
1½, 1, ¾, ½, ⅓	3	0.91	5	1.52	4	101.6	0.130	3.30	Steel, mortise or surface
1½, 1, ¾, ½, ⅓	2	0.61	3	0.91	3	76.2	0.092	2.34	Steel, mortise or surface
3, 1½, 1, ¾, ½, ⅓	3	0.91	7	2.13	4½	114.3	0.134	3.40	Steel, mortise or surface (labeled, self-closing, spring type)
3, 1½, 1, ¾, ½, ⅓	3	0.91	7	2.13	4	101.6	0.105	2.67	Steel, mortise or surface (labeled, self-closing, spring type)
For 1⅜ in. (34.93 mm) Doors									
3, 1½, ¾, ½, ⅓	3	0.91	7	2.13	3½	88.9	0.123	3.12	Steel, mortise or surface
3, 1½, 1, ¾, ½, ⅓	2⅔	0.81	7	2.13	3½	88.9	0.105	2.67	Steel, mortise or surface (labeled, self-closing, spring type)

6.4.3.1.3 Hinges 4½ in. (114 mm) high and 0.180 in. (4.57 mm) thick shall be permitted for use on wide and heavy doors or doors that are subjected to heavy use or unusual stress.

6.4.3.1.4 Fire doors with hinges of lighter weight that are not of the ball bearing type shall be permitted under the following conditions:

- (1) They are part of a listed assembly.
- (2) They meet the test requirements of ANSI/BHMAA156.1, *Standard for Butts and Hinges*.
- (3) They have been tested to a minimum of 350,000 cycles.

6.4.3.1.5 Pivot sets made up of components that are smaller or of a lighter gauge than shown in Table 6.4.3.1 shall be permitted to be used, provided they meet the requirements of ANSI/BHMAA156.4, *Standard for Door Controls (Closers)*, and are in accordance with the manufacturer's label service procedures.

6.4.3.2 Attaching Hinges to Doors.

6.4.3.2.1 Hinges shall be secured in accordance with the listing and the manufacturer's installation instructions.

6.4.3.2.2 Mortise hinges shall be secured to reinforcements in the doors with steel machine screws.

6.4.3.2.3 Mortise hinges shall be secured to wood and plastic-covered composite doors or wood core doors with No. 12 × 1¼ in. (31.75 mm) flat, threaded-to-the-head, steel wood screws. Pilot holes shall be drilled that are ⅝ in. (4 mm) in diameter.

6.4.3.2.4 Surface hinges shall be attached with steel through-bolts.

6.4.3.3 Attaching Hinges to Frames. Hinges shall be secured to frames with steel screws.

6.4.3.3.1 Types of screws shall be permitted to vary depending on material used for the manufacture of labeled door frames.

6.4.3.3.2 The manufacturer's instructions and published listings for labeled door frames shall be referenced for specific screw requirements.

6.4.3.4 Shimming. When required to meet the clearances stated in 6.3.1.7, the shimming of hinges using steel shims shall be permitted.

6.4.4 Locks or Latches.

6.4.4.1 Only labeled locks and latches or labeled fire exit hardware (panic devices) meeting both life safety requirements and fire protection requirements shall be used.

6.4.4.2 Fire exit hardware shall be installed only on fire doors bearing the marking "Fire Door To Be Equipped with Fire Exit Hardware."

6.4.4.2.1 Fire exit hardware shall be labeled for both fire and panic.

6.4.4.2.2 Fire exit hardware shall have a permanently attached label that bears the serial number and shows the manufacturer's name and type of approval.

6.4.4.2.3 The label shall differentiate between panic hardware, which is not acceptable for use on fire doors, and fire exit hardware.

6.4.4.3 All single doors and active leaves of pairs of doors shall be provided with an active latch bolt that cannot be held in a retracted position as specified in the individual manufacturer's published listings.

6.4.4.3.1 Doors other than those used in means of egress shall be permitted to be provided with dead bolts in addition to the active latch bolts or as otherwise permitted by the AHJ.

6.4.4.3.2 Locks with dead bolts that are interconnected with latch bolts and retract when the latch bolt is retracted shall be permitted for use on fire doors within a means of egress.

6.4.4.3.3 Latching arrangements that do not provide positive latching in the normal mode shall be permitted to be used provided that, in a fire emergency, the door becomes positively latched by means of an automatic fail-safe device that is activated by an automatic fire detector. (See Section 4.7.)

6.4.4.4 Where both leaves are required for exit purposes, they shall be provided with labeled fire exit hardware.

6.4.4.4.1 Where permitted by the AHJ, pairs of doors not provided with an astragal shall be permitted to have labeled fire exit hardware and an open back strike installed on the inactive leaf, and either labeled fire exit hardware or any labeled latch capable of being opened by one obvious operation from the egress side installed on the active leaf.

6.4.4.5 Where a pair of doors is needed for the movement of equipment and where the inactive leaf of the pair of doors is not required for exit purposes, labeled, top and bottom, self-latching or automatic flush bolts, or labeled two-point latches shall be permitted.

6.4.4.5.1* Manually operated, labeled, top and bottom flush-mounted or surface-mounted bolts on the inactive leaf of a pair of doors shall be permitted to be used where acceptable to the AHJ, provided they do not pose a hazard to safety to life.

6.4.4.6 Throw.

6.4.4.6.1 The throw of single-point latch bolts shall not be less than the minimum shown on the fire door label.

6.4.4.6.2 The minimum throw shall be as specified in the manufacturer's installation instructions.

6.4.4.7 Door Attachments.

6.4.4.7.1 Locks, latches, surface-mounted top and bottom bolts, and fire exit hardware shall be secured to reinforcements in the doors with machine screws or shall be attached with through-bolts.

6.4.4.7.1.1 Pilot holes shall be drilled prior to lock and latch installation, in accordance with manufacturer's installation instructions.

6.4.4.7.2 Flush-mounted top and bottom bolts shall be secured to reinforcements in the doors with machine screws.

6.4.4.7.3 Locks and latches shall be attached to wood and plastic-covered composite doors or wood core doors with not less than No. 8, flat, threaded-to-the-head wood screws or shall be attached with through-bolts.

6.4.4.7.4 Fire exit hardware and surface-mounted top and bottom bolts shall be attached to wood and plastic-covered composite doors with through-bolts or with steel screws at locations specified in the door manufacturer's installation instructions.



6.4.4.8 Strike plates shall be secured to the frame with steel screws or other types of screws as indicated by the manufacturer's published listing or label service procedure.

6.4.4.9 Strike plates for doors swinging in pairs shall be secured to reinforcements in the inactive leaf with machine screws.

6.4.4.9.1 Pilot holes shall be drilled prior to strike plate installation, in accordance with manufacturer's installation instructions.

6.4.4.10* Open back strikes shall be permitted to be used in lieu of conventional strikes only where specifically provided for in the published listings.

6.4.4.11* Electric strikes shall be permitted to be used in lieu of conventional strikes in single swinging doors and pairs of doors where provided for in the published listings.

6.4.5 Protection Plates.

6.4.5.1 Factory-installed protection plates shall be installed in accordance with the listing of the door.

6.4.5.2 Field-installed protection plates shall be labeled and installed in accordance with their listing.

6.4.5.3 Labeling shall not be required where the top of the protection plate is not more than 16 in. (406 mm) above the bottom of the door.

6.4.6 Automatic Louvers. Only labeled fire door louvers shall be used in fire doors.

6.4.7* Astragals.

6.4.7.1 Doors swinging in pairs, where located within a means of egress, shall not be equipped with astragals that inhibit the free use of either leaf.

6.4.7.2* Pairs of doors that require astragals shall have at least one attached in place to project approximately $\frac{3}{4}$ in. (19 mm) or as otherwise indicated in the individual published listings.

6.4.8 Gasketing. Gasketing on fire doors or frames shall be furnished only in accordance with the published listings of the door, frame, or gasketing material manufacturer.

6.5 Application, Installation, and Adjustment.

6.5.1 General. The installation of all components of a fire door assembly shall be in accordance with the specific listing of each component.

6.5.2 Manufacturers' Instructions. All components shall be installed in accordance with the manufacturers' installation instructions and shall be adjusted to function as described in the listing.

6.5.3 Attachment. All components of a fire door assembly shall be attached firmly to walls, doors, and frames in a manner acceptable to the AHJ.

6.5.4 Mounting. All mounting screws, bolts, or shields shall be steel except where otherwise permitted by this standard.

6.5.5 Anchorage. Attachments to doors with composite cores shall provide firm anchorage for anticipated use.

Chapter 7 Swinging Doors with Fire Door Hardware

7.1 Doors.

7.1.1 General. This chapter shall cover the installation of swinging doors with fire door hardware.

7.1.2 Components. A fire door assembly shall consist of components that are separate products incorporated into the assembly.

7.1.3 Mounting of Doors.

7.1.3.1 Swinging tin-clad doors and flush- or corrugated-type sheet metal doors with fire door hardware shall be flush or lap mounted.

7.1.3.2 Flush-mounted doors shall be hung in steel channel frames securely anchored to the wall construction.

7.1.3.3 Lap-mounted doors shall be hung on the surface of the wall and shall lap the opening at least 4 in. (102 mm) at the top and on each side.

7.1.4 Operation of Doors.

7.1.4.1 The doors shall swing easily and freely on their hinges.

7.1.4.2 The latches shall operate freely.

7.2 Supporting Construction.

7.2.1 Walls.

7.2.1.1 Attachment of the door assembly to the wall shall be by means of through-wall bolts.

7.2.1.2 As an alternative, expansion anchors shall be permitted to be used as specified in 4.8.6.

7.2.2 Sills. Sills shall be installed in accordance with 4.8.2.

7.2.3 Reserved.

7.2.4 Vents.

7.2.4.1 Each tin-clad door formed of 14 in. $\times$ 20 in. (0.36 m $\times$ 0.51 m) sheets shall be provided with 3 in. (76.2 mm) diameter vent holes.

7.2.4.2 The vent holes shall be cut through the sheets on the face of the door to be provided with the fire door hardware, using care to avoid interference with the hardware or injury to the wood core when cutting the holes in the sheets.

7.2.4.3 The metal covering around the opening shall be secured with small nails spaced about 1 in. (25.4 mm) apart, and the exposed wood shall be painted thoroughly.

7.3 Openings.

7.3.1 Frames for Lap-Mounted Doors. Frames shall not be required for lap-mounted doors.

7.3.2* Frames for Flush-Mounted Doors.

7.3.2.1 Only labeled frames of the structural steel type shall be used for flush-mounted doors.

7.3.2.2 The frames shall be erected before the wall is built.

7.4 Assembly Components.

7.4.1* Closing Devices for Swinging Tin-Clad and Sheet Metal Fire Doors.

7.4.1.1 Swinging tin-clad and sheet metal fire doors shall be equipped with self-closing or automatic-closing devices to ensure that they are closed and latched at the time of fire.

7.4.1.2 Other arrangements acceptable to the AHJ shall be permitted.

7.4.2 Coordinating Devices.

7.4.2.1 Where there is an astragal or projecting latch bolt that prevents the inactive door of a pair of doors from closing and latching before the active door closes and latches, a coordinating device shall be used.

7.4.2.2 A coordinating device shall not be required where each door closes and latches independent of the other door.

7.4.3 Fire Door Hardware.

7.4.3.1 General.

7.4.3.1.1 Only labeled fire door hardware shall be used.

7.4.3.1.2 The design and construction of typical fire door hardware for swinging fire doors shall be as illustrated in UL 14C, *Swing Hardware for Tin-Clad Fire Doors Mounted Singly and in Pairs*.

7.4.3.2 Components. Fire door hardware shall include hinge brackets, hinges, latches, latch keepers, and operating handle mechanisms, and hardware for inactive door or pairs of doors shall include top and bottom bolts and keepers.

7.4.3.3* Hinges and Latches, Number and Length. The number of hinges and the length of the hinges and the length of the latches and the number of latches shall be in accordance with the manufacturer's label service procedure and individual published listing.

7.4.3.4 Attaching Fire Door Hardware to Frames for Flush-Mounted Doors. Hinges and latch keepers shall be bolted, riveted, or welded to the frame.

7.4.3.5 Attaching of Wall Strips for Lap-Mounted Doors.

7.4.3.5.1 Hinges and latch keepers shall be mounted on wall strips bolted to or through the wall (*see* 7.2.1).

7.4.3.5.2 Bolts of not less than $\frac{3}{4}$ in. (19.05 mm) shall be used for attaching hinge wall strips, and bolts not less than $\frac{1}{2}$ in. (12.7 mm) shall be used for latch keeper wall strips.

Chapter 8 Horizontally Sliding Doors

8.1 Doors.

8.1.1 General. This chapter shall cover the installation of horizontally sliding doors.

8.1.2 Door Panels.

8.1.2.1 Door panels shall be permitted to be single section or multiple sections.

8.1.2.2 Connection between the panels shall be in accordance with the manufacturer's instructions and the individual published listing.

8.1.2.3 Tin-clad and metal-clad (kalamein) doors shall not be furnished in more than two sections.

8.1.2.4 Hollow metal or composite doors shall be furnished in not more than five panels, constructed for either field or factory assembly.

8.1.2.5 For biparting doors, not more than four panels shall comprise a single leaf.

8.1.2.6 Personnel swinging-type pass doors shall be permitted to be used if tested with the sliding door and listed in the manufacturer's individual published listing.

8.1.2.7* Pass doors shall be provided with hinges, latchset, spring hinges, or closer.

8.1.3 Mounting of Doors.

8.1.3.1 General.

8.1.3.1.1* Horizontally sliding doors shall be wall mounted in a track attached to a wall or bottom roller mounted with a top guide in accordance with the manufacturer's instructions and individual published listing.

8.1.3.1.2 Doors in detention security applications shall be mounted to a listed detention sliding door device in accordance with the manufacturer's instructions and individual published listing.

8.1.3.1.3 When in the closed position, the clearance between the wall and the door or the frame and the door shall not be more than $\frac{3}{4}$ in. (19.05 mm) unless otherwise tested and listed in the manufacturer's individual published listings.

8.1.3.2 Lap.

8.1.3.2.1 Unless tested otherwise, doors shall lap openings at least 4 in. (102 mm) at the sides and top.

8.1.3.2.2 Where doors provide protection of openings located in walls above floor level and no projection sill is provided, the doors shall lap the bottom of the opening at least 4 in. (102 mm).

8.1.3.3 Biparting doors shall have an astragal securely attached in place so as to project a minimum of $\frac{3}{4}$ in. (19.05 mm) unless otherwise required or permitted in the individual manufacturer's published listing.

8.2 Supporting Construction.

8.2.1 Walls.

8.2.1.1 Walls shall be plumb and true and have a fire resistance rating as required by the AHJ.

8.2.1.2* Walls shall be of brick, concrete, or concrete masonry construction except that where tin-clad doors are used on hollow concrete masonry units, the wall opening shall be reinforced to provide anchorage for door-mounting hardware equal to that of brick or concrete.

8.2.1.3 Tin-clad doors used on hollow concrete masonry units shall be reinforced in accordance with 4.8.1.2.

8.2.1.4 Attachment of the door assembly to the wall shall be by means of through-wall bolts.

8.2.1.5 Expansion anchors shall be permitted to be used as specified in 4.8.6.

8.2.2 Sills. Sills shall be installed in accordance with 4.8.2.

8.2.3 Reserved.

8.2.4 Vents.

8.2.4.1 Tin-Clad Doors.

8.2.4.1.1 Each tin-clad door formed of 14 in. $\times$ 20 in. (0.36 m $\times$ 0.51 m) sheets shall be provided with 3 in. (76.2 mm) diameter vent holes that shall be permitted to be field or factory cut and shall be located as shown in UL 10A, *Standard for Tin-Clad Fire Doors*.



8.2.4.1.2 Each section of spliced single doors and each leaf of center-parting doors shall be vented as indicated in UL 10A, *Standard for Tin-Clad Fire Doors*.

8.2.4.1.3 Other types of doors containing combustible core material shall be vented as provided by the manufacturer's procedure under label service.

8.2.4.2 The vent holes shall be cut through the sheets on the face of the door opposite the rear binder pockets, using care to avoid injury to the wood core when cutting the holes in the sheets.

8.2.4.3 The metal covering around the opening shall be secured with small nails spaced about 1 in. (25.4 mm) apart, and the exposed wood shall be painted thoroughly.

8.3 Openings. (Reserved)

8.4 Assembly Components.

8.4.1 Closing Devices.

8.4.1.1 Doors shall be equipped with self-closing or automatic-closing devices to ensure that they shall close or be closed at the time of a fire.

8.4.1.1.1 Closing devices shall be a system of weights or a listed closing device.

8.4.1.1.2* Automatic-closing doors shall not have a delay of more than 10 seconds in the initiation of closing or reclosing.

8.4.1.2 Closing Speed.

8.4.1.2.1 The average closing speed shall be not less than 6 in./sec (152 mm/sec), not including any initial delay time.

8.4.1.2.2 In buildings where access by the general public is not restricted, the average closing speed for doors used shall be not more than 24 in./sec (610 mm/sec).

8.4.2* Releasing Devices.

8.4.2.1 General.

8.4.2.1.1 Power-operated doors not equipped with standby or emergency power shall be equipped with an integral or a separate listed releasing device that shall automatically disconnect the door from the control of the power operator at the time of a fire.

8.4.2.1.2 The releasing device shall be activated at the time of the fire by detectors or fusible links installed on both sides of the wall and interconnected so that the operation of the single detector or fusible link shall allow the door to be disconnected and closed.

8.4.2.1.3 If closing is achieved by power operation, standby or emergency power shall be provided.

8.4.2.1.4 The time delay from failure of normal power operation to emergency power operation shall not exceed 10 seconds.

8.4.2.1.5 The standby or emergency power source shall have capacity to operate a minimum of 50 closing cycles of the door.

8.4.2.1.6 If door opening also is achieved by power operation, the standby or emergency power source shall have capacity to operate a minimum of 50 opening and closing cycles of the door.

8.4.2.2 Power operation shall not allow opening if temperatures on either side of the door reach 500°F (260°C).

8.4.3 Hardware.

8.4.3.1* Type. Only hardware listed for use with the door shall be permitted to be used.

8.4.3.2 Tracks. Tracks shall be inclined or level, depending on the manufacturer's specific label service procedure.

8.4.3.3 Bolts.

8.4.3.3.1 The wall bolts shall not be less than 5/8 in. (15.8 mm) in diameter unless so listed.

8.4.3.3.2 The bolt spacing depends on the manufacturer's specific test and label service procedure.

8.4.3.4 Hangers.

8.4.3.4.1 No fewer than two hangers shall be provided for each door.

8.4.3.4.2 Tin-clad and sheet metal doors for openings in excess of 6 ft (1.83 m) shall have an additional hanger.

8.4.3.4.3 Two hangers shall be provided on each section of vertically spliced tin-clad doors.

8.4.3.5 Binders.

8.4.3.5.1* At least two binders shall be required on the vertical jambs, and at least one shall be required at the head unless otherwise listed.

8.4.3.5.2 Biparting sliding doors shall be provided with the sill binders or center guides if required by the individual manufacturer's label service procedure.

8.4.3.6* Stay Rollers. Stay rollers shall be installed in an approved manner.

8.4.3.7 Center Latch. Where doors are power operated, center-parting doors requiring a center latch shall be provided with a fusible link arrangement that shall hold the latch in an unlatched position during day-to-day operation while causing the latch to operate and secure the door in the event of a fire.

8.4.3.8 Handles.

8.4.3.8.1 Handles shall be provided for opening the doors from either side.

8.4.3.8.2 If flush pulls are used, they shall not be located back-to-back on tin-clad doors.

Chapter 9 Special Purpose Horizontally Sliding Accordion or Folding Doors

9.1 Doors.

9.1.1 General. This chapter shall cover the installation of special purpose horizontally sliding accordion or folding doors.

9.1.2 Components. A special purpose horizontally sliding accordion or folding door assembly shall consist of doors, frames, latches, hinges, and closers of special construction or for special use.

9.1.3 Mounting of Doors.

9.1.3.1* Horizontally sliding accordion or folding doors shall be ceiling or wall mounted in track or tracks attached to a lintel or wall in accordance with the manufacturer's instructions and individual published listings.

9.1.3.2 Doors shall lap the opening if mounted completely on the surface of the wall or shall extend across the opening if ceiling mounted or surface mounted.

9.1.3.2.1 Doors shall completely close the opening.

9.1.3.2.2 Where doors provide protection of openings located in walls above floor level and no projecting sill is provided, the doors shall extend below the bottom of the opening in accordance with the listing.

9.1.3.3* Single doors shall be affixed to a jamb at one wall and shall close against a strike jamb provided at the other wall in accordance with the individual manufacturers' published listings.

9.1.3.4 Biparting doors shall each be affixed to a jamb at a wall and shall close together at the meeting stiles in accordance with the individual manufacturers' published listings.

9.2 Supporting Construction.

9.2.1 Walls.

9.2.1.1 Jambs attached to drywall construction shall be installed in accordance with the manufacturer's installation instructions.

9.2.1.2 Structural support shall be provided.

9.2.1.3 Attachment of jambs to masonry, concrete, or brick shall be by expansion bolt-type anchors or in accordance with the individual manufacturers' published listings.

9.2.2 Sills. Sill shall be installed in accordance with 4.8.2.

9.2.3 Lintels.

9.2.3.1* Lintels shall be applied to or be an integral part of the ceiling.

9.2.3.2 If lintels are not a part of the ceiling assembly, they shall not reduce the fire resistance rating of the door assembly.

9.2.3.3 Applied lintels (headers) shall be in accordance with the manufacturer's published listings.

9.2.3.4 Fasteners, if required, shall be in accordance with the manufacturer's installation instructions with spacing over the door stack area equal to half that of normal spacing.

9.3* Clearances Around Openings. Clearances at the lintel, jambs, and meeting stiles shall not exceed 1/8 in. (3.18 mm).

9.4 Assembly Components.

9.4.1 Closing Devices.

9.4.1.1 Closing devices shall be listed.

9.4.1.2 Doors shall be self-closing or automatic-closing and shall not have a delay in the initiation of closing or reclosing of more than 10 seconds.

9.4.1.3 The average closing speed shall be not less than 6 in./sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).

9.4.2 Power Operators.

9.4.2.1 Only labeled power operators listed for use with the door shall be used.

9.4.2.2 If closing is achieved by power operation, standby or emergency power shall be provided.

9.4.2.2.1 The time delay from failure of normal power operation to emergency power operation shall not exceed 10 seconds.

9.4.2.2.2 The standby or emergency power source shall have capacity to operate a minimum of 50 closing cycles of the door.

9.4.2.2.3 If door opening also is achieved by power operation, the standby or emergency power source shall have capacity to operate a minimum of 50 opening and closing cycles of the door.

9.4.2.3 Power operation shall not occur if temperatures on either side of the door reach 500°F (260°C).

9.4.3 Hardware. Only hardware listed for use with the door shall be used.

Chapter 10 Vertically Sliding Fire Doors

10.1 Doors.

10.1.1 General. This chapter shall cover the installation of vertically sliding fire doors.

10.1.2 Mounting of Doors.

10.1.2.1 Vertically sliding doors of the tin-clad, sheet metal (flush and corrugated) types shall be wall mounted.

10.1.2.2 The tin-clad and sheet metal doors shall lap the opening at least 4 in. (102 mm) at the sides and top.

10.2 Supporting Construction.

10.2.1 Walls. Walls shall be reinforced as necessary to provide anchorage of wall-mounted pulleys that carry the weight of the door and counterbalances.

10.2.1.1 Attachment of Door Assembly.

10.2.1.1.1 Attachment of the door assembly to the wall shall be by means of through-wall bolts.

10.2.1.1.2 As an alternative, expansion anchors shall be permitted to be used.

10.2.2 Sills. Sills shall be installed in accordance with 4.8.2.

10.2.3 Lintels. Lintels shall be as indicated in 4.8.3: brick, concrete, or masonry arches, steel, or reinforced concrete.

10.2.4 Vents.

10.2.4.1 Each tin-clad door shall be provided with 3 in. (76.2 mm) diameter vent holes.

10.2.4.2 Doors up to 6 ft (1.83 m) wide shall be provided with three vents, and doors over 6 ft (1.83 m) wide shall be provided with four vents.

10.2.4.3 The vent holes shall be cut through the sheets on the face of the door to be provided with the guide shoes, using care to avoid interference with the hardware or injury to the wood core when cutting the holes in the sheet.

10.2.4.4 The metal covering around the opening shall be secured with small nails spaced about 1 in. (25.4 mm) apart, and the exposed wood shall be painted.

10.3 Clearances. The clearances between the door and the wall when the door is in the closed position shall not exceed 3/8 in. (9.53 mm).



10.4 Assembly Components.

10.4.1 Closing Devices.

10.4.1.1 Vertically sliding tin-clad, sheet metal, and sectional steel doors shall be equipped to close automatically at the time of fire.

10.4.1.2 Vertically sliding sectional doors shall close automatically upon operation of a fusible link or detector that releases the overhead sectional door, and the governor shall control the rate of descent.

10.4.1.3 Vertically sliding doors shall have an average closing speed of not less than 6 in./sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).

10.4.2 Automatic Closers. Automatic-closing, vertically sliding doors shall be suspended by a system of weights and ropes, wire cables, or chains over pulleys.

10.4.2.1 All weights shall be enclosed in a substantial metal enclosure for the entire length of travel.

10.4.2.2 Pulleys over which the weight cable or chain passes shall be shielded to prevent the cable or chain from jumping off the pulley.

10.4.3 Fire Door Hardware.

10.4.3.1* Fire Door Hardware for Tin-Clad and Sheet Metal Doors. Only labeled fire door hardware shall be used.

10.4.3.1.1 Components. Fire door hardware shall consist of tracks, brackets, guides, bumpers, and counterbalancing mechanisms.

10.4.3.1.2* Track.

10.4.3.1.2.1 Two tracks, each with a length equal to twice the height plus 9 in. (229 mm), shall be provided.

10.4.3.1.2.2 The track shall be attached with track brackets at each bolt.

10.4.3.1.3 Guides.

10.4.3.1.3.1 Two track guides shall be provided for each track for openings 5 ft (1.52 m) or less in height.

10.4.3.1.3.2 An additional guide for each track shall be provided for each 2½ ft (0.76 m) or fraction thereof in excess of 5 ft (1.52 m) in height.

10.4.3.1.3.3 Each of the track guides shall be bolted through the door.

10.4.3.1.4 Cables.

10.4.3.1.4.1 Cables shall support the load.

10.4.3.1.4.2 Cable brackets shall be required and shall be bolted through the door.

10.4.3.1.4.3 Cable fasteners and thimbles shall be required.

10.4.3.1.4.4 Cable pulleys with frames and sheaves shall be bolted through the wall with ¾ in. (19.05 mm) bolts.

10.4.3.1.5 Chafing Strips.

10.4.3.1.5.1 Tin-clad and flush-type sheet metal doors shall be provided with two half-oval chafing strips for the back of doors not exceeding 8 ft (2.44 m) in width.

(1) The length shall be 2 in. (50.8 mm) less than the height of the door.

(2) The strips shall be held by ¼ in. (6.35 mm) through-bolts with countersunk heads and with nuts bearing against washers.

(3) Where doors exceed the specified width, three strips shall be required.

10.4.3.1.5.2 Chafing strips shall not be required for corrugated doors.

10.4.3.1.6 Bumpers and Bumper Shoes.

10.4.3.1.6.1 One bumper shall be bolted to the top of each track with wall bolts.

10.4.3.1.6.2 Four bumper shoes shall be installed, one bumper at each corner of the door.

10.4.3.1.6.3 Each bumper shall be fastened to the faces and edges of the door by wood screws.

10.4.3.1.7* Rear Binders. Doors shall be provided with one rear binder located at the center of the lintel and attached with ¾ in. (19 mm) bolts.

10.4.3.1.8 Handles.

10.4.3.1.8.1 Flush pull handles on the wall side of the door shall be countersunk flush with the surface of the door.

10.4.3.1.8.2 Bow-shaped handles shall be bolted to the flush pull by through-bolts or otherwise securely attached.

10.4.3.2 Fire Door Hardware for Steel Sectional Doors.

10.4.3.2.1 Label. The fire door label on a sectional door shall include the hinged steel panels, wall guides, interlock at the top edge, vertical and horizontal tracks, roller wheels, counterbalance, automatic-closing mechanism, and governors.

10.4.3.2.2 Track. The horizontal track section shall extend from the wall a distance of the wall opening height plus 3 ft (0.91 m) and shall be connected by a fusible track link to the vertical track section such that the track breaks away from the vertical track section if subjected to damage from falling materials at the time of fire.

10.4.3.2.3 Guides.

10.4.3.2.3.1 The wall guides shall be plumb and bolted to or through the wall.

10.4.3.2.3.2 The guides shall extend above the wall opening a distance of 2½ in. (63.5 mm).

10.4.3.2.4 Interlocking. An angle-type interlock shall be bolted to the lintel and shall engage a matching pocket on the top edge of the door when in the closed position.

10.4.3.2.5 Counterbalancing Mechanism.

10.4.3.2.5.1 The sectional door shall be counterbalanced by an overhead horizontal helical spring on a shaft.

10.4.3.2.5.2 The shaft shall be attached to a reel with a steel cable attached to both sides of the door near the bottom edge.

Chapter 11 Rolling Steel Doors

11.1 Doors.

11.1.1 General. This chapter shall cover the installation of rolling steel fire doors.

11.1.2 Mounting of Doors.

11.1.2.1* The mounting for rolling steel doors shall be either face-of-wall mounted or between-the-jamb mounted.

11.1.2.2 The opening shall be protected by either a single or double door installation as determined by the AHJ.

11.1.2.3 Rolling steel fire doors shall be permitted to be mounted to steel members set in or against the wall in accordance with their listing.

11.2 Supporting Construction.

11.2.1 Walls. Walls shall be constructed in accordance with 4.8.1 and support the size and weight of the door assembly and its intended use.

11.2.2 Sills. Sills shall be constructed in accordance with 4.8.2.

11.2.3 Lintels. Lintels shall be constructed in accordance with 4.8.3.

11.3 Openings.

11.3.1 Fire door frames shall not be required for rolling steel fire door installations.

11.3.2 Where metal jambs are provided, only minimum $\frac{3}{16}$ in. (4.76 mm) nominal structural steel or formed steel shall be used.

11.3.3 Jambs shall be in accordance with the manufacturer's listing.

11.3.4 Items that are not a part of the fire door assembly shall not be field attached to any component of a rolling steel fire door.

11.3.5 Access to any clearances between surrounding construction and a rolling steel fire door shall allow for required testing and maintenance.

11.4 Assembly Components.

11.4.1 Closing Devices.

11.4.1.1 An automatic-closing device shall be installed on every rolling steel door.

11.4.1.2 Rolling steel doors shall close automatically upon activation or release of a fusible link or detector.

11.4.1.3 After automatic closing, the bottom bar shall come to rest in the closed position.

11.4.1.4 A governor, where provided, shall control the rate of descent of the door curtain during automatic closing.

11.4.1.5 Rolling steel fire doors shall have an average closing speed of not less than 6 in./sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).

11.4.2* Power-Operated Rolling Steel Fire Doors.

11.4.2.1 Power-operated fire doors shall be permitted to be furnished with a sensor that causes the door closer to stop or reverse upon contact with an obstruction under normal conditions.

11.4.2.2 Power-operated rolling steel fire doors shall be equipped with an automatic-closing device that, upon activation, will cause the door to close.

11.4.2.2.1 After automatic closing is activated, the door shall remain in the closed position until the automatic-closing device has been reset.

11.4.2.2.2 When automatic closing is accomplished by means of a power operator, the door shall remain in the closed position or shall be permitted to automatically open and then reclose if a sensing edge has been provided and an obstruction is encountered during automatic closure.

11.4.2.2.2.1 The door shall remain in the closed position until the automatic closing device has been reset.

11.4.2.2.3 When an automatic closing device is designed to open and reclose when encountering an obstruction, the unit shall be designed such that it can reopen a maximum of three times.

11.4.2.2.3.1 After encountering an obstruction for the third time, the bottom bar shall come to rest on the obstruction.

11.4.3 Assembly of Rolling Doors.

11.4.3.1 Guides.

11.4.3.1.1 Guides for rolling steel fire doors shall be mounted either on the face of the wall or between the jambs, or a combination thereof.

11.4.3.1.2 The guides shall be mounted plumb and with the required clearances to allow for vertical expansion when exposed to fire.

11.4.3.1.3* The individual door manufacturer's written installation instructions and listing shall be consulted for the location and amount of clearance required.

11.4.3.1.4 The guides shall be permitted to be either exposed or concealed in a pocket or wall reveal.

11.4.3.1.5 Attachment of the guides to masonry wall construction shall be by means of through-wall bolts.

11.4.3.1.6 Attachment of guides to a wall of non-masonry construction shall be in accordance with the manufacturer's written installation instructions and listing.

11.4.3.1.7 As an alternative to 11.4.3.1.5, expansion anchors shall be permitted to be used in accordance with 4.8.6.

11.4.3.1.8 Where metal jambs that have been designed to support the size and weight of the door assembly for its intended function are used, guides shall be bolted to the jambs.

11.4.3.1.9 As an alternative to 11.4.3.1.8, guides shall be permitted to be welded to the jambs in accordance with the manufacturer's written instructions and listing.

11.4.3.2 Hoods.

11.4.3.2.1 A hood shall be provided.

11.4.3.2.2 Where a flame baffle is provided, a fusible link connection to the flame baffle shall be permitted to be independent of the detectors or fusible link connections that activate the door's automatic-closing device.

11.5 Weather Protection. Where rolling steel fire doors are installed on the exterior of a building, the doors shall be protected against the weather to ensure operation.

Chapter 12 Fire Shutters

12.1 Types. Fire shutters shall be of the following three general types:

- (1) Swinging door
- (2) Horizontally or vertically sliding door
- (3) Rolling steel door



12.2 Requirements. The requirements of fire shutters shall be in accordance with the requirements for the general types shown in Section 12.1.

12.3* Weather Protection. Where rolling steel horizontally or vertically sliding fire shutters are installed on the exterior of a building, they shall be protected against the weather to ensure operation.

Chapter 13 Service Counter Fire Doors

13.1 Doors.

13.1.1 General. This chapter shall cover the installation of service counter fire doors.

13.1.2 Types. Service counter fire doors shall be of the following three general types:

- (1) Swinging door panels of a single or multiple section vertical type, integrally mounted in a four-sided frame to form a labeled door and frame assembly
- (2) Horizontally or vertically sliding door
- (3) Rolling steel fire door

13.2 Supporting Construction.

13.2.1 Walls. Walls shall be constructed in accordance with 4.8.1 and support the size and weight of the door assembly and its intended use.

13.2.2 Sills. Sills shall be constructed in accordance with 4.8.2.

13.2.3 Lintels.

13.2.3.1 Lintels shall be constructed in accordance with 4.8.3.

13.2.3.2 Heads of integral door frame assemblies shall not support a wall above.

13.2.3.3 Separate lintels of a size based on the type of wall construction and loads to be supported shall be provided.

13.3 Counters. Where counters are supplied separately from the balance of the door assemblies, they shall be labeled and installed in accordance with their listing.

13.4 Automatic Closing.

13.4.1 All service counter fire doors shall be equipped to close automatically in the event of fire.

13.4.2 A service counter fire door of the rolling type shall be automatic closing so that, upon activation or release of a fusible link or detector, the door shall close.

13.4.3 A service counter fire door of the swinging or sliding type shall be made automatic closing by a system of weights suspended by ropes, cables, or chains over pulleys that, when activated by release of an automatic fire detector, shall cause the door to close.

13.4.4 A governor, where employed on a service counter fire door, shall work in coordination with the closing device and shall control the closing speed of the door.

13.4.5 A service counter fire door of the rolling type shall have an average closing speed of not less than 6 in./sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).

Chapter 14 Hoistway Doors for Elevators and Dumbwaiters

14.1 Doors.

14.1.1 General.

14.1.1.1* This chapter shall cover only fire door assemblies in hoistway entrances directly connected with closed elevator or dumbwaiter operation and used in the vertical hoistway enclosure for the purpose of preventing the passage of fire through such entrances.

14.1.2 Components. Fire door entrances shall consist of fire door panels, frames, headers, track, hangers (some doors are provided with integral hangers), pendant bolts, sills, sill support plates, sill brackets, retaining angles, and a closer assembly.

14.1.3 Mounting of Doors. Fire door entrances used in elevator hoistways also shall conform to the requirements of ASME A17.1, *Safety Code for Elevators and Escalators*, including Addenda ASME A17.1a-2005 and Supplement ASME A17.1S-2005, or CSA B44, *Safety Code for Elevators*.

14.1.3.1 Fire door assemblies shall have fire protection ratings of $\frac{3}{4}$ hour, 1 hour, 1½ hours, or 2 hours (2 hours in Canada only).

14.1.3.2 Labeled hoistway door assemblies shall be installed in walls of approved fire resistance-rated construction.

14.1.3.3 Hoistway door frame assemblies shall be installed in accordance with the listing and labeling procedures, including the manufacturer's installation instructions.

14.1.3.4 Where horizontal sliding entrances without frames are used in masonry or concrete, the panels shall overlap the sides of the opening at least $\frac{5}{8}$ in. (16 mm) beyond the thickness of any facing used to finish the opening.

14.1.3.5 Where vertically sliding entrances without frames are used in masonry or concrete, the panels shall overlap the top and bottom of the opening by at least 2 in. (51 mm) beyond the thickness of any facing used to finish the opening.

14.1.3.6 Where the entrance is too large for the regularly available test facilities, the certifying organization shall be permitted to issue oversize certificates or oversize labels.

14.2 Types of Doors.

14.2.1 Labeled Swing Hoistway Doors for Elevators and Dumbwaiters — Fire-Rated Entrance.

14.2.1.1 Each entrance shall be labeled.

14.2.1.2 Each label shall bear the name of the manufacturer.

14.2.1.3* Elevator Entrances.

14.2.1.3.1 One label shall be provided for the door panels and shall be located so that it is visible after installation.

14.2.1.3.2 One label shall be provided for the frame and shall be located so that it is visible after installation.

14.2.1.3.3 Where all entrance hardware components have not been tested in a complete assembly, individually labeled hardware components that are designed to be compatible with the entrance assembly shall be provided.