NFPA 105

Standard for the Installation of Smoke Door Assemblies

2003 Edition

NFPA, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101
An International Codes and Standards Organization

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2003 Edition

This edition of NFPA 105, *Standard for the Installation of Smoke Door Assemblies*, was prepared by the Technical Committee on Fire Doors and Windows and acted on by NFPA at its November Association Technical Meeting held November 16–20, 2002, in Atlanta, GA. It was issued by the Standards Council on January 17, 2003, with an effective date of February 6, 2003, and supersedes all previous editions.

This edition of NFPA 105 was approved as an American National Standard on January 17, 2003.

Origin and Development of NFPA 105

This publication is the result of a multiyear project by the Technical Committee on Fire Doors and Windows and is based on the acknowledgment that smoke is the principal killer in destructive fires. Historically, fire doors have been permitted to have such clearances and deflections as would permit the passage of relatively great quantities of smoke. Those fire doors, when properly installed, have proven to be adequate barriers against the passage of fire, but improvement is needed to protect against the passage of smoke. The first edition of the recommended practice was prepared to introduce parameters for door performance that will limit smoke spread through a door opening.

The 1993 edition was the third edition and replaced the 1989 edition. It made use of new information that recognized that smoke-control doors in buildings protected by automatic sprinklers will have substantially lower pressures created by a potential fire.

The 1999 edition included modifications to Table 3.2.1 recognizing the pressure differentials caused by stack effect in elevator hoistways.

The 2003 edition incorporates formatting updates to comply with NFPA *Manual of Style* requirements, as well as formatting requirements for conversion from a recommended practice to a standard. This edition also includes significant modifications to Chapter 4 on installation and testing requirements, and Chapter 5 on maintenance requirements. Annex A contains a considerable amount of new and updated information.

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Committee Scope: The 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.

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.

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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, Annex B lists the complete title and edition of the source documents for both mandatory and nonmandatory extracts. 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 B.

Chapter 1 Administration

1.1 Scope. This standard shall prescribe minimum requirements for smoke door assemblies for use in providing safety to life and protection of property from smoke.

1.2* Purpose. The purpose of this standard shall be to provide a means to restrict the movement of smoke through door assemblies in order to maintain a tenable environment.

1.3* Application. This standard shall regulate the installation and maintenance of smoke door assemblies.

1.3.1* This standard shall regulate smoke door assemblies that are intended to restrict the passage of smoke at temperatures up to 204°C (400°F).

1.3.2* This standard shall not regulate elevator hoistway doors.

1.4 Retroactivity. This standard is based on product and engineering practices recognized as acceptable at the date of issue. Therefore, the provisions of this standard are not intended to be applied retroactively to installations that were in compliance at the time of installation.

1.5 Equivalency.

1.5.1 This standard shall not prohibit the development of new, modified, or improved devices that meet the intent of these requirements. It shall be the responsibility of the manufacturer to furnish the information necessary to update the requirements pertaining to such new and improved devices.

1.5.2 For devices not described in this standard, the authority having jurisdiction 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, P. O. Box 9101, Quincy, MA 02269-9101.

NFPA 72®, National Fire Alarm Code®, 2002 edition.
NFPA 80, *Standard for Fire Doors and Fire Windows,* 1999 edition.

2.3 Other Publications.

2.3.1 UL Publication. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062.

UL 1784, *Air Leakage Tests of Door Assemblies,* 2001.

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 included, common usage of the terms shall apply.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). The organization, office, or individual responsible 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 Smoke Door. The door component of a smoke door assembly.

3.3.2 Smoke Door Assembly. Any combination of a door, frame, hardware, and any other accessories that together restrict smoke movement through door openings by limiting the amount of air that can pass through the assembly.

3.3.3 Temperature.

3.3.3.1 ***Ambient Temperature.*** An assumed air temperature at the exposed face of the door at or near 24°C (75°F).

3.3.3.2* ***Elevated Temperature.*** An assumed air temperature at the exposed face of the door in excess of ambient temperature.

3.3.4 Tenable Environment. An environment in which smoke and heat is limited or otherwise restricted to maintain the impact on occupants to a level that is not life threatening. [**92B**:1.4]

Chapter 4 Testing and Installation

4.1 General. This chapter shall cover the requirements for testing and installation of smoke door assemblies.

4.1.1 Fire door assemblies that are intended for use as smoke door assemblies shall also comply with NFPA 80, *Standard for Fire Doors and Fire Windows.*

4.1.2 Doors without fire protection ratings shall be permitted to be used as smoke doors in door openings not required to be protected by fire doors.

4.1.3 Doors without fire protection ratings shall comply with this standard.

4.2 Test Specimen.

4.2.1 The size of the door to be tested shall be 0.9 m × 2.1 m (3 ft × 7 ft) for a single side-hinged swinging door, 1.8 m × 2.1 m (6 ft × 7 ft) for a pair of side-hinged swinging doors, and 1.8 m × 2.1 m (6 ft × 7 ft) for all other doors, or shall be representative of the full range of smoke door production for that type of construction as determined by the testing laboratory.

4.2.2 For the air leakage test, fire door assemblies shall be installed in accordance with NFPA 80, *Standard for Fire Doors and Fire Windows.*

4.2.2.1 Clearances for doors without a fire protection rating shall be in accordance with the manufacturer's specifications.

4.2.3* Doors intended for installation in frames containing transoms, side lights, or side panels shall be tested with such frames.

4.2.4 Specimens of door assemblies shall be tested as they are intended to be installed.

4.3 Air Leakage Test.

4.3.1* Smoke door assemblies shall have an air leakage rating not greater than 0.9 $m^3/min/m^2$ (3 $ft^3/min/ft^2$) of door opening when tested in accordance with UL 1784, *Air Leakage Tests of Door Assemblies.*

4.3.2 Smoke door assemblies intended to be installed where pressurization is provided to control smoke movement shall not have an artificial bottom seal installed during the test.

4.3.3* Where data exists to verify that tests at ambient temperature result in a higher leakage rate, additional tests at elevated temperature shall not be required.

4.3.4* The test shall only be required to be performed at a pressure differential of 25, 50, or 75 +/− 1.25 Pa (0.1, 0.2, or 0.3 +/− 0.005 in. of water).

4.4 Labeling. Smoke door assemblies shall bear an "S" label indicating a maximum air leakage rate of 3 $m^3/min/m^2$ (0.3 $ft^3/min/ft^2$) and the tested pressure differential of 25, 50, or 75 Pa (0.1, 0.2, or 0.3 in. of water).

4.5 Installation.

4.5.1 Smoke doors shall be self-closing or automatic closing in accordance with NFPA 80, *Standard for Fire Doors and Fire Windows.*

4.5.2 Automatic closing smoke door assemblies shall be activated by smoke detection installed in accordance with *NFPA 72®*, *National Fire Alarm Code®*.

4.5.3 Devices for the release of smoke doors shall be permitted to be part of an overall system, such as a fire alarm or an automatic extinguishing system, that shall release the door and shall be installed and tested in accordance with *NFPA 72®*, *National Fire Alarm Code®*.

4.5.4 Fixed sealed transoms, side lights, side panels, or door vision lights shall be permitted in listed assemblies without additional testing.

4.5.5 Transoms, side lights, side panels, or door vision panels that are not fixed and sealed shall be installed in accordance with the smoke door listing.

4.5.6 The opening between the bottom edge of the smoke door and the sill when the door is in the closed position shall not be required to be provided with a means to seal the opening.

4.5.6.1 Smoke door assemblies installed where pressurization is provided to restrict smoke movement shall be required to have a bottom seal.

4.5.7 Louvers shall not be installed in smoke door assemblies unless otherwise tested and listed.

Chapter 5 Maintenance

5.1 General. This chapter shall cover the care and maintenance of smoke doors.

5.1.1 Removal of Smoke Doors. Where a door or opening is no longer in use, the opening shall be filled with construction equivalent to that of the wall.

5.1.2 Operability. Doors shall be operable at all times.

5.1.2.1 The doors shall be kept closed or arranged for automatic closing.

5.1.2.2 Where required, the doors shall be latched.

5.1.3 Replacement. Where it is necessary to replace all or part of a smoke door assembly, replacement components shall be installed to meet the requirements of this standard and the manufacturer's instructions.

5.1.4* Repairs. Damage and impairments to smoke door assemblies shall be corrected.

5.1.4.1 Damaged glazing material shall be replaced.

5.1.4.2 Replacement glazing material shall be installed in accordance with their individual listing, where required, and the manufacturer's listing.

5.1.4.3 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 either of 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

5.2 Specific Requirements.

5.2.1* Inspections.

5.2.1.1 Smoke door assemblies shall be inspected annually.

5.2.1.2 Doors shall be operated to confirm full closure.

5.2.1.3 Hardware and gaskets shall be inspected annually, and any parts found to be damaged or inoperative shall be replaced.

5.2.1.4 Tin clad and Kalamein doors shall be inspected regularly for dry rot.

5.2.1.5 A written record shall be maintained and shall be made available to the authority having jurisdiction.

5.2.1.6 Records shall be maintained for not less than 1 year.

5.2.2 Prevention of Door Blockage.

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

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

5.2.3 Maintenance of Closing Mechanisms.

5.2.3.1 Self-closing and automatic closing devices shall be kept in working condition at all times.

5.2.3.2 Care shall be taken to prevent paint accumulation on any movable parts such as, but not limited to, stay rolls, gears, and closing mechanisms.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.2 For the purposes of this standard, smoke can be considered to be airborne particulates and gases resulting from combustion. Therefore, to understand smoke movement it is only necessary to understand air movement. Hot smoke, however, will be buoyant and will be located above the neutral plane in the fire compartment. As it moves away from the fire source, it will cool, lose its buoyancy, and become less stratified. Beyond the immediate influence of the fire, smoke will behave just as warm or cool air would behave. It will be driven by pressure differentials within the building, or it will follow air currents created by the heating, ventilating, and air-conditioning (HVAC) system or smoke management system in the building. Pressure differentials can be the result of the following:

(1) Fire pressure buildup, which would only drive the smoke out of the compartment or area of origin
(2) Stack effect due to temperature differentials between the interior and exterior of the building
(3) Wind
(4) Pressures created mechanically using HVAC systems, exhaust fans, supply or pressurization fans, vents, and smoke management systems

This standard has its beginnings in measurements from test results reported in NFPA *Operation School Burning* and from NFPA Technical Paper No. 341, "Factors in Controlling Smoke in High Buildings," where tenable or tolerable smoke concentration lists were established. Since the publication of *Operation School Burning* in 1959, considerable effort in the field of fire protection has been focused upon smoke movement in the built environment. NFPA *101®*, *Life Safety Code®*, and NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, recognize that smoke control can be either active or passive. The passive approach recognizes the long-standing compartmentation concept, which requires that fans shut down and fire/smoke dampers in ductwork close under fire conditions. The active approach utilizes the building's HVAC systems to create differential pressures to prevent smoke migration from the fire area and to exhaust the products of combustion to the outside. Active smoke-control systems use passive barrier components that include smoke door assemblies to create zones or areas for effective smoke movement, as an essential component.

Smoke management utilizing active and passive methods in combination to modify smoke movement must be engineered into a system and focused upon property or people protection. While passive methods of smoke management do exist *(see NFPA 204, Standard for Smoke and Heat Venting)*, dynamic smoke-control systems using mechanical equipment to meet design goals dominate. NFPA 92B, *Guide for Smoke Management Systems in Malls, Atria, and Large Areas*, provides methodologies for determining smoke development in large spaces. NFPA 92A, *Recommended Practice for Smoke-Control Systems*, is used for the design, installation, testing, operation, and maintenance of systems for smoke control.

Smoke door assemblies are intended to maintain egress, allow for the rescue of the occupants, or allow occupants to remain in an area of refuge. The required duration of smoke protection can be equated with the path of egress. Evacuation typically starts in a room, progresses through a corridor, perhaps passes through a smoke barrier or horizontal exit, and proceeds through an entrance to the exit, which can be a stair enclosure, exit passageway, or the exit discharge. As with fire door assemblies, the longest time of protection is generally required at the entrance to an exit enclosure or horizontal exit, with shorter durations appropriate for preceding doors.

The path of egress arrangement should also be the case with smoke door assemblies. This arrangement is compatible with the protect-in-place concept as occupants are expected to be moved from one compartment to another for protection or, in some cases, protected in rooms other than the room of fire origin.

Occupancies not typical of this scenario include atria, malls, and open office plans. Areas of this sort can be adequately protected by reasonably tight-fitting doors without specific smoke door ratings because of the large volume of space involved.

A.1.3 While the use of smoke door assemblies will be helpful in reducing the flow of airborne gases, it is not assumed that using this standard obviates the concern over toxic combustion products.

NFPA *101®*, *Life Safety Code®*, and building codes include specific requirements for smoke door assemblies and should be consulted in every instance. NFPA 80, *Standard for Fire Doors*

and Fire Windows, should be followed when fire door assemblies are used as smoke door assemblies.

Consideration should be given to the leakage characteristics of adjacent wall, ceiling, and floor assemblies. It is generally considered to be of marginal benefit to install smoke door assemblies in locations where adjacent walls, ceilings, or floors do not effectively resist the passage of smoke. *(For additional information, see ASHRAE Design of Smoke Control Systems for Buildings.)*

When protecting against smoke migration into spaces of large volume, a reasonably tight-fitting door can be considered adequate because of the relatively long time it would take for such a space to become untenable due to smoke. Conversely, the average 2.4 m (8 ft) high by 1.2 m to 1.8 m (4 ft to 6 ft) wide corridor can become untenable in less than 2 minutes, as shown in a test conducted in California entitled, *Operation School Burning*, where the fire room door was open.

Tests indicate that listed gaskets, if properly installed and maintained in accordance with manufacturer's instructions, do a good job of reducing the smoke infiltration to a sufficient level to provide protection against smoke infiltration through the door assembly. In a fire condition, there would normally be a room of fire origin, and temperatures would be high in this area. Immediately outside the room of origin there might be warm smoke.

A.1.3.1 Smoke door assemblies used in locations likely to be in close proximity to a fire can be exposed to elevated temperatures, including door assemblies separating rooms and corridors. Such door assemblies, whether rated as fire doors or not, should restrict the passage of smoke that can be heated to a temperature of 204°C (400°F). In a fully sprinklered building, protection against elevated temperature smoke might not be necessary, and the criteria for protection against ambient temperature smoke might be appropriate.

Mention should be made of the effects of automatic sprinkler protection on smoke. The activation of an automatic sprinkler occurs early in a flaming fire condition, usually within 5 minutes or so after visible flaming is observed. Temperatures immediately drop to almost ambient, and smoke is driven to the floor and diffused throughout the available space. Smoke production rate is reduced as the fire size decreases and the temperature of the flame plume is reduced. The temperature of the smoke is also reduced to near ambient. Thus, in a sprinklered building it can be appropriate to treat smoke as if it were at or near ambient temperature. Fewer mitigating measures can be taken to control smoke movement since the production rate of smoke will be reduced. However, under a smoldering fire condition, sprinkler activation can be delayed and this, too, should be considered.

Fire door assemblies protecting stair enclosures and vestibules adjacent to stair enclosures, for example, are more likely to be exposed to ambient temperature smoke, provided there are no combustible materials in the enclosure. These doors can form part of a control system involving pressurized stairwells or vestibules. The air leakage characteristics of such door assemblies are an essential part of smoke control design.

A.1.3.2 See NFPA 92A, *Recommended Practice for Smoke-Control Systems*, for additional information on protection of elevator openings.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.4 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.3.3.3.2 Elevated Temperature. Depending on the function of the door, its location in relation to the fire, and the movement of hot gases and air, door assemblies might be exposed to elevated smoke temperatures; warm smoke has an assumed temperature at the exposed face of the door at or near 204°C (400°F); and hot smoke has an assumed temperature at the exposed face of the door in excess of 204°C (400°F). A nationally recognized standard test for measuring hot smoke temperature leakage does not exist.

It has been determined from many full-scale fire tests of compartments that the maximum instantaneous pressure differential created by an uncontrolled fire can approach 37.5 Pa (0.15 in. of water). More typically, a pressure differential of 15 Pa to 25 Pa (0.06 in. of water to 0.10 in. of water) is achieved over the period of most intense burning in light fire loading occupancies such as residential, health care, and business (offices).

In sprinklered buildings where the fire will be controlled, it is anticipated that the maximum pressure differential generated should not exceed 12.5 Pa (0.05 in. of water).

Typical stair pressurization systems can often result in pressure differentials as high as 62.5 Pa to 125 Pa (0.25 in. of water to 0.50 in. of water) across the door assembly.

Stack effect can also play a major role in determining pressure that must be overcome in order to pressurize shafts, such as elevators and stairs, to prevent smoke infiltration. Pressure differentials between the exterior and unvented shafts can range from virtually nothing to as much as 125 Pa to 250 Pa (0.5 in. of water to 1.0 in. of water) or more, depending on the location of the building neutral pressure plane, the height of the building, and the outside temperature.

The quantity of air movement through a door gap can be determined by the following general formula:

$$Q = KAP^{\frac{1}{N}}$$

where:
Q = volume flow rate of air
K = orifice coefficient for the gap around the door perimeter
A = area of the gap
P = pressure differential across the door
N = number between 1 and 2 that can be determined empirically

(For more information, see NFPA Fire Protection Handbook.)

A.4.2.3 Hardware requiring extensive door mortising that could provide considerable air leakage through the door panel should be tested if required by the testing laboratory.

A.4.3.1 Smoke management systems both affect and are affected by smoke door assemblies. Pressurized stair enclosures, for example, are more easily engineered when leakage through the stair doors is reduced. In other areas, pressurization can inhibit smoke flow so that reasonably tight-fitting doors unrated for smoke protection can be entirely appropriate.

Complete sealing of doors is not always desirable. A disadvantage of complete sealing is the difficulty to open or close doors because of the pressure differential. Some smoke management designs call for some areas to be pressurized. A small pressure acting across the full area of a door can exert sufficient force to make opening a door difficult. A seal must be first broken to equalize the pressure on both sides of the door before the door can be opened easily.

Smoke doors should take the entire smoke management system into account. The amount of leakage tolerable will vary according to the degree of compartmentation, whether smoke management systems are used, and whether the building is protected by sprinklers.

An engineering evaluation should be performed when the volume of the space to be protected is known so that the values can be modified to restrict smoke leakage in terms of a specified smoke tenability level. The evaluation should include, but not be limited to, fuel load, pressurization, stack effect, the presence of smoke-control systems, and construction, as well as smoke leakage in assessing tenability.

A.4.3.3 Test data exists for certain door types, demonstrating that air leakage at ambient temperature is greater than warm air temperature leakage. In such instances the air leakage rate for ambient temperature could also apply for warm temperatures when additional data tests are not conducted at elevated temperature.

A.4.3.4 Pressure differentials of at least 10 Pa (0.04 in. of water) are developed in the upper parts of rooms that are involved in fire. Considerably higher pressure differentials can exist in rooms, corridors, and stair enclosures due to the action of air-handling systems, stack effect, and wind.

In sprinklered buildings where the fire will be controlled, it is anticipated that the maximum pressure differential generated should not exceed 12.5 Pa (0.05 in. of water). See pressure differences discussed in NFPA 92A, *Recommended Practice for Smoke-Control Systems*, and ASHRAE *Design of Smoke Control Systems for Buildings*.

A.5.1.4 Where failure of a smoke door could result in greater life risk or property damage due to fire, administrative measures should be developed to provide protection prior to repair.

A.5.2.1 Smoke doors are of no value unless they are properly maintained and are closed at the time of fire. Damage or impairments that affect the proper operation of smoke door assemblies should be corrected immediately. To ensure this, a periodic inspection and maintenance program should be implemented and should be the responsibility of the property management.

Annex B Informational References

B.1 Referenced Publications. The following documents or portions thereof are referenced within this standard for informational purposes only and are thus not part of the requirements of this document unless also listed in Chapter 2.

B.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 80, *Standard for Fire Doors and Fire Windows*, 1999 edition.

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

NFPA 92A, *Recommended Practice for Smoke-Control Systems*, 2000 edition.

NFPA 92B, *Guide for Smoke Management Systems in Malls, Atria, and Large Areas*, 2000 edition.

NFPA *101®*, *Life Safety Code®*, 2003 edition.

NFPA 204, *Standard for Smoke and Heat Venting*, 2002 edition.

NFPA *Operation School Burning*, 1959-1961.

NFPA *Fire Protection Handbook*, 18th edition.

NFPA Technical Paper No. 341, "Factors in Controlling Smoke in High Buildings."

B.1.2 Other Publications.

B.1.2.1 ASHRAE Publication. American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329-2305.

Design of Smoke Control Systems for Buildings, 2000.

B.2 Informational References. (Reserved)

B.3 References for Extracts. The following documents are listed here to provide reference information, including title and edition, for extracts given throughout this standard as indicated by a reference in brackets [ ] following a section or paragraph. These documents are not a part of the requirements of this document unless also listed in Chapter 2 for other reasons.

NFPA 92B, *Guide for Smoke Management Systems in Malls, Atria, and Large Areas*, 2000 edition.

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