

NFPA® 274

Standard Test Method to Evaluate Fire Performance Characteristics of Pipe Insulation

2013 Edition



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

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® DOCUMENTS
NOTICE AND DISCLAIMER OF LIABILITY CONCERNING THE USE OF NFPA DOCUMENTS

NFPA® codes, standards, recommended practices, and guides (“NFPA Documents”), of which the document contained herein is one, are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus on fire and other safety issues. While the NFPA administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in NFPA Documents.

The NFPA disclaims liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on NFPA Documents. The NFPA also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making NFPA Documents available, the NFPA is not undertaking to render professional or other services for or on behalf of any person or entity. Nor is the NFPA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

The NFPA has no power, nor does it undertake, to police or enforce compliance with the contents of NFPA Documents. Nor does the NFPA list, certify, test, or inspect products, designs, or installations for compliance with this document. Any certification or other statement of compliance with the requirements of this document shall not be attributable to the NFPA and is solely the responsibility of the certifier or maker of the statement.

REMINDER: UPDATING OF NFPA DOCUMENTS

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Documents”) should be aware that NFPA Documents may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. An official NFPA Document at any point in time consists of the current edition of the document together with any Tentative Interim Amendment and any Errata then in effect.

In order to determine whether an NFPA Document has been amended through the issuance of Tentative Interim Amendments or corrected by Errata, visit the Document Information Pages on NFPA’s website. The Document Information Pages provide up-to-date, document specific information including any issued Tentative Interim Amendments and Errata.

To access the Document Information Page for a specific NFPA Document go to <http://www.nfpa.org/document> for a list of NFPA Documents, and click on the appropriate Document number (e.g., NFPA 101). In addition to posting all existing Tentative Interim Amendments and Errata, the Document Information Page also includes the option to sign-up for an “Alert” feature to receive an email notification when new updates and other information are posted regarding the document.

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® DOCUMENTS

ADDITIONAL NOTICES AND DISCLAIMERS

Updating of NFPA Documents

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Documents”) should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of Tentative Interim Amendments. An official NFPA Document at any point in time consists of the current edition of the document together with any Tentative Interim Amendments and any Errata then in effect. In order to determine whether a given document is the current edition and whether it has been amended through the issuance of Tentative Interim Amendments or corrected through the issuance of Errata, consult appropriate NFPA publications such as the National Fire Codes® Subscription Service, visit the NFPA website at www.nfpa.org, or contact the NFPA at the address listed below.

Interpretations of NFPA Documents

A statement, written or oral, that is not processed in accordance with Section 6 of the Regulations Governing Committee Projects shall not be considered the official position of NFPA or any of its Committees and shall not be considered to be, nor be relied upon as, a Formal Interpretation.

Patents

The NFPA does not take any position with respect to the validity of any patent rights referenced in, related to, or asserted in connection with an NFPA Document. The users of NFPA Documents bear the sole responsibility for determining the validity of any such patent rights, as well as the risk of infringement of such rights, and the NFPA disclaims liability for the infringement of any patent resulting from the use of or reliance on NFPA Documents.

NFPA adheres to the policy of the American National Standards Institute (ANSI) regarding the inclusion of patents in American National Standards (“the ANSI Patent Policy”), and hereby gives the following notice pursuant to that policy:

NOTICE: The user’s attention is called to the possibility that compliance with an NFPA Document may require use of an invention covered by patent rights. NFPA takes no position as to the validity of any such patent rights or as to whether such patent rights constitute or include essential patent claims under the ANSI Patent Policy. If, in connection with the ANSI Patent Policy, a patent holder has filed a statement of willingness to grant licenses under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, copies of such filed statements can be obtained, on request, from NFPA. For further information, contact the NFPA at the address listed below.

Law and Regulations

Users of NFPA Documents should consult applicable federal, state, and local laws and regulations. NFPA does not, by the publication of its codes, standards, recommended practices, and guides, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

NFPA Documents are copyrighted. They are made available for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of safe practices and methods. By making these documents available for use and adoption by public authorities and private users, the NFPA does not waive any rights in copyright to these documents.

Use of NFPA Documents for regulatory purposes should be accomplished through adoption by reference. The term “adoption by reference” means the citing of title, edition, and publishing information only. Any deletions, additions, and changes desired by the adopting authority should be noted separately in the adopting instrument. In order to assist NFPA in following the uses made of its documents, adopting authorities are requested to notify the NFPA (Attention: Secretary, Standards Council) in writing of such use. For technical assistance and questions concerning adoption of NFPA Documents, contact NFPA at the address below.

For Further Information

All questions or other communications relating to NFPA Documents and all requests for information on NFPA procedures governing its codes and standards development process, including information on the procedures for requesting Formal Interpretations, for proposing Tentative Interim Amendments, and for proposing revisions to NFPA documents during regular revision cycles, should be sent to NFPA headquarters, addressed to the attention of the Secretary, Standards Council, NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101; email: stds_admin@nfpa.org

For more information about NFPA, visit the NFPA website at www.nfpa.org.

Copyright © 2013 National Fire Protection Association®. All Rights Reserved.

NFPA® 274

Standard

**Test Method to Evaluate Fire Performance Characteristics
of Pipe Insulation**

2013 Edition

This edition of NFPA 274, *Standard Test Method to Evaluate Fire Performance Characteristics of Pipe Insulation*, was prepared by the Technical Committee on Fire Tests. It was issued by the Standards Council on November 27, 2012, with an effective date of December 17, 2012, and supersedes all previous editions.

This edition of NFPA 274 was approved as an American National Standard on December 17, 2012.

Origin and Development of NFPA 274

NFPA 274, *Test Method to Evaluate Fire Performance Characteristics of Pipe Insulation*, was developed by the Technical Committee on Fire Tests to fill the need for a standard method of determining the fire performance of pipe insulation materials. Other codes and standards have identified the issue of the installation of such materials in air-handling plenums. Although NFPA 274 does not prescribe pass/fail criteria, suggested acceptance criteria are provided in Annex B for consideration by the other referencing codes and standards.

The 2009 edition included a new requirement for a quantifiable determination of the presence of flames at the top of the exhaust chase using thermocouples.

The 2013 edition is a reconfirmation of the previous edition.

Technical Committee on Fire Tests

Barry L. Badders, Jr., *Chair*
Southwest Research Institute, TX [RT]

Farid Alfawakhiri, American Iron and Steel Institute, IL [M]
Jesse J. Beitel, Hughes Associates, Inc., MD [SE]
Rhonda P. Byrne, QAI Laboratories, CA [RT]
Gordon H. Damant, Inter-City Testing & Consulting Corp. of California, CA [SE]
William E. Fitch, Phyrefish.com, FL [SE]
Marcelo M. Hirschler, GBH International, CA [SE]
Alfred J. Hogan, Winter Haven, FL [E]
Rep. International Fire Marshals Association
Paul A. Hough, Armstrong World Industries, Inc., PA [M]
Mohammed M. Khan, FM Global, MA [I]
William E. Koffel, Koffel Associates, Inc., MD [SE]
Richard T. Long, Jr., Exponent, Inc., MD [M]
Rep. Upholstered Furniture Action Council

Michael E. Luna, Intertek Testing Services, TX [RT]
Andre W. Marshall, University of Maryland, MD [SE]
Rodney A. McPhee, Canadian Wood Council, Canada [M]
Kathleen A. Newman, Firetect, CA [M]
David T. Sheppard, U.S. Bureau of Alcohol, Tobacco, Firearms & Explosives, MD [RT]
Dwayne E. Sloan, Underwriters Laboratories Inc., NC [RT]
Kuma Sumathipala, American Forest & Paper Association, DC [M]
Rick Thornberry, The Code Consortium, Inc., CA [SE]
Robert A. Wessel, Gypsum Association, MD [M]

Alternates

Scott W. Adams, Park City Fire Service District, UT [E]
(Alt. to A. J. Hogan)
Erik H. Anderson, Koffel Associates, Inc., MD [SE]
(Alt. to W. E. Koffel)
Richard J. Davis, FM Global, MA [I]
(Alt. to M. M. Khan)
Timothy Earl, GBH International, MI [SE]
(Alt. to M. M. Hirschler)
Sam W. Francis, American Wood Council, PA [M]
(Alt. to K. Sumathipala)
Stephen P. Fuss, U.S. Bureau of Alcohol, Tobacco, Firearms & Explosives, MD [RT]
(Alt. to D. T. Sheppard)
Richard G. Gann, National Institute of Standards & Technology, MD [RT]
(Voting Alt. to NIST Rep.)

Marc L. Janssens, Southwest Research Institute, TX [RT]
(Alt. to B. L. Badders, Jr.)
Arthur J. Parker, Hughes Associates, Inc., MD [SE]
(Alt. to J. J. Beitel)
Stanislav I. Stoliarov, University of Maryland, MD [SE]
(Alt. to A. W. Marshall)
Ineke Van Zeeland, Canadian Wood Council, Canada [M]
(Alt. to R. A. McPhee)
Robert J. Wills, American Iron and Steel Institute, AL [M]
(Alt. to F. Alfawakhiri)
Joe Ziolkowski, American Furniture Manufacturers Association, NC [M]
(Alt. to R. T. Long, Jr.)

Nonvoting

Robert H. Barker, American Fiber Manufacturers Association, VA [M]

Rohit Khanna, U.S. Consumer Product Safety Commission, MD [C]

Tracy L. Vecchiarelli, 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 fire testing procedures, for reviewing existing fire test standards and recommending appropriate action to NFPA, for recommending the application of and advising on the interpretation of acceptable test standards for fire problems of concern to NFPA technical committees and members, and for acting in a liaison capacity between NFPA and the committees of other organizations writing fire test standards. This Committee does not cover fire tests that are used to evaluate extinguishing agents, devices, or systems.



Contents

Chapter 1 Administration	274- 4	5.7 Smoke Density Measuring Instruments	274- 8
1.1 Scope	274- 4	5.8 Data Acquisition	274- 8
1.2 Purpose	274- 4	5.9 Photographic Equipment	274- 8
1.3 Application	274- 4	Chapter 6 Calibration	274- 8
1.4 Units and Formulas	274- 4	6.1 Calibration of Equipment	274- 8
Chapter 2 Referenced Publications	274- 4	6.2 Daily Calibration	274- 9
2.1 General	274- 4	Chapter 7 Test Procedure	274- 9
2.2 NFPA Publications (Reserved)	274- 4	7.1 Testing Procedure	274- 9
2.3 Other Publications	274- 4	Chapter 8 Calculations	274- 9
2.4 References for Extracts in Mandatory Sections (Reserved)	274- 4	8.1 Method of Calculation	274- 9
Chapter 3 Definitions	274- 4	8.2 Symbols	274- 9
3.1 General	274- 4	8.3 Calibration Constant Using Propane	274-10
3.2 NFPA Official Definitions	274- 4	8.4 Heat Release for Test Specimens	274-10
3.3 General Definitions (Reserved)	274- 5	8.5 Smoke Obscuration	274-10
Chapter 4 Test Specimens	274- 5	Chapter 9 Report of Results	274-10
4.1 Size and Preparation	274- 5	9.1 Documentation	274-10
4.2 Conditioning	274- 5	Annex A Explanatory Material	274-10
Chapter 5 Test Equipment and Instrumentation ...	274- 5	Annex B Commentary	274-11
5.1 Pipe Chase	274- 5	Annex C Heat Release Calculations Using Additional Gas Analysis	274-11
5.2 Ignition Source	274- 6	Annex D Informational References	274-12
5.3 Canopy Hood and Exhaust Duct	274- 6	Index	274-13
5.4 Instrumentation in Exhaust Duct	274- 7		
5.5 Sampling Line	274- 7		
5.6 Gas Sampling and Analysis Equipment	274- 8		

NFPA 274

Standard

Test Method to Evaluate Fire Performance Characteristics of Pipe Insulation

2013 Edition

IMPORTANT NOTE: This NFPA document is made available for use subject to important notices and legal disclaimers. These notices and disclaimers appear in all publications containing this document and may be found under the heading "Important Notices and Disclaimers Concerning NFPA Documents." They can also be obtained on request from NFPA or viewed at www.nfpa.org/disclaimers.

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

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet (•) between the paragraphs that remain.

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

Chapter 1 Administration

1.1* Scope. This standard describes a test method for determining the heat release and the smoke generation of pipe insulation assemblies mounted on steel pipes in a full-scale pipe chase.

1.2 Purpose.

1.2.1 This is a test method for an examination of the complete insulation assembly, including elbows, in an actual configuration that is found in the end use application. This test method shall be used to ascertain the resulting fire performance characteristics of the insulation assembly when exposed to a standard flaming ignition source in a standard pipe chase.

1.2.2* The results from this procedure provide information that shall be permitted to be used as an aid in the selection of pipe insulation assemblies that provide less contribution of heat, flame, and smoke to fire scenarios. The configuration and flame exposure that the specimens incur during the test produce results that clearly differentiate between products.

1.3 Application.

1.3.1* This test procedure shall be used to determine performance of pipe insulation assemblies exposed to a flaming ignition source.

1.3.2 The specimens shall include any jackets, elbows, tapes, sealants, coatings, adhesives, or other accessories used with the insulation in practice.

1.3.3* The test shall determine the potential extent to which the pipe insulation assemblies contribute to fire growth and the potential for fire spread under the particular conditions simulated.

1.3.4 Full-size specimens of pipe insulation assemblies shall be enclosed in a pipe chase and exposed to a gas burner ignition source.

1.3.5 During the test, the gas burner shall be set at an output level of 20 kW for the first 3 minutes and subsequently 70 kW for an additional 7 minutes.

1.3.6* Measurements shall be made of heat release and smoke density.

1.3.7 The total heat released, the peak rate of heat release, and the total smoke released shall be determined from the heat release and smoke density measurements, respectively.

1.3.8 Observations shall be taken during the test of flame spread out the top of the chase and other visual events.

1.3.9 Post-test observations of the condition of the specimens shall be recorded.

1.4 Units and Formulas.

1.4.1 SI Units. Metric units of measurement in this standard are in accordance with the modernized metric system known as the International System of Units (SI).

1.4.2 Primary Values. The SI value for a measurement and the equivalent inch-pound value given in parentheses shall each be acceptable for use as primary units for satisfying the requirements of this standard.

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. (Reserved)**2.3 Other Publications.**

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

2.4 References for Extracts in Mandatory Sections. (Reserved)

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 Shall. Indicates a mandatory requirement.

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

3.2.3 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 are not to be considered a part of

