

NFPA® 423

Standard for Construction and Protection of Aircraft Engine Test Facilities

2016 Edition



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

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

NOTICE AND DISCLAIMER OF LIABILITY CONCERNING THE USE OF NFPA STANDARDS

NFPA® codes, standards, recommended practices, and guides (“NFPA Standards”), 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 Standards.

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 Standards. The NFPA also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making NFPA Standards 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 Standards. 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 STANDARDS

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) should be aware that NFPA Standards may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. An official NFPA Standard 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 Standard 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 Standard, go to <http://www.nfpa.org/docinfo> to choose from the list of NFPA Standards or use the search feature on the right to select the NFPA Standard 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® STANDARDS

ADDITIONAL NOTICES AND DISCLAIMERS

Updating of NFPA Standards

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) 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 or corrected by Errata. An official NFPA Standard 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 Standards

A statement, written or oral, that is not processed in accordance with Section 6 of the Regulations Governing the Development of NFPA Standards 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 Standard. The users of NFPA Standards 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 Standards.

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 Standard 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 Standards 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 Standards 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 Standards 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 Standards, contact NFPA at the address below.

For Further Information

All questions or other communications relating to NFPA Standards 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 standards 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. All NFPA codes and standards can be viewed at no cost at www.nfpa.org/freeaccess.

Copyright © 2014 National Fire Protection Association®. All Rights Reserved.

NFPA® 423

Standard for

Construction and Protection of Aircraft Engine Test Facilities

2016 Edition

This edition of NFPA 423, *Standard for Construction and Protection of Aircraft Engine Test Facilities*, was prepared by the Technical Committee on Airport Facilities. It was issued by the Standards Council on July 14, 2014, with an effective date of July 29, 2014, and supersedes all previous editions.

This edition of NFPA 423 was approved as an American National Standard on July 29, 2014.

Origin and Development of NFPA 423

The Sectional Committee started work on this standard in 1972. It was first submitted to the Association at the 1975 Fall Meeting but was returned to committee for coordination with the NFPA Committee on Fire Tests. The 1977 edition contained the results of that coordination effort. The standard was reconfirmed in 1983. The 1989 edition was a complete revision of the 1983 edition, and the 1994 and 1999 editions were partial revisions of the standard.

The 2004 edition of this standard was revised to comply with the *Manual of Style for NFPA Technical Committee Documents* for this edition.

The 2010 edition of this standard was a partial revision.

The 2016 edition is updated to address the usage of modern gaseous extinguishing agents as alternatives to Halons.



Technical Committee on Airport Facilities

James R. Doctorman, *Chair*
The Boeing Company, KS [U]

Michael E. Aaron, *Secretary*
The RJA Group, Inc., IL [SE]

Andrew T. Barrowcliffe, XL Global Asset Protection Services, Canada [I]
Gene E. Benzenberg, Alison Control Inc., NJ [M]
James J. Blake, Vancouver Airport Authority, Canada [E]
J. Robert Boyer, UTC/Edwards Company, NJ [M]
Rep. National Electrical Manufacturers Association
David Brandenburg, Continental Airlines, TX [U]
Thomas G. Burk, Federal Express Corporation, TN [U]
David J. Burkhart, Code Consultants, Inc., MO [SE]
Patrick Corcoran, Wolverine Fire Protection Company, MI [IM]
Matthew J. Daelhousen, FM Global, MA [I]
James Devonshire, Buckeye Fire Equipment Company, TX [M]
Scott Enides, S.R.I. Fire Sprinkler Corporation, NY [M]
Rep. National Fire Sprinkler Association
Michael E. France, National Air Transportation Association, VA [U]
Thomas D. Gambino, Prime Engineering, Inc., GA [SE]

Elwin G. Joyce, II, Eastern Kentucky University, KY [E]
Rep. International Fire Marshals Association
John R. Kitchens, Los Angeles City Fire Department, CA [E]
Keith C. Kremkow, Marsh Risk Consulting, IL [I]
Christy J. Marsolo, Tyco/SimplexGrinnell, OH [M]
Maurice M. Pilette, Mechanical Designs Ltd., MA [SE]
Jack Poole, Poole Fire Protection, Inc., KS [SE]
Randy D. Pope, Burns & McDonnell Engineering Company, MO [SE]
Robert W. Rees, Sunland Fire Protection, Inc., NC [IM]
Rep. American Fire Sprinkler Association
Robert Saunders, Wasatch Design Consultants, UT [SE]
(Vote Limited to Document: 415)
Joseph L. Scheffey, Hughes Associates, Inc., MD [SE]
Joseph A. Simone, U.S. Department of the Navy, DC [E]
Fred K. Walker, U.S. Department of the Air Force, FL [U]
Martin H. Workman, The Viking Corporation, MI [M]
Kevin M. Wypychoski, Precision Mechanical Services, Inc., CT [IM]

Alternates

Delbert R. Chase, Jr., Federal Express Corporation, TN [U]
(Alt. to T. G. Burk)
Richard M. DiMisa, Code Consultants, Inc., MO [SE]
(Alt. to D. J. Burkhart)
W. Mercer Dye, Jr., Dye Aviation Facilities, Inc., GA [U]
(Alt. to M. E. France)
Robert J. Eaker, The Boeing Company, WA [U]
(Alt. to J. R. Doctorman)
Rick J. Jackson, Jackson Associates, Inc., MI [IM]
(Alt. to R. W. Rees)

Robert Kasiski, FM Global, MA [I]
(Alt. to M. J. Daelhousen)
Lee T. Rindfuss, Marsh Risk Consulting, MA [I]
(Alt. to K. C. Kremkow)
Robert J. Tabet, U.S. Department of the Navy, VA [E]
(Alt. to J. A. Simone)
Robert Vincent, Shambaugh & Son, L.P., IN [M]
(Alt. to S. Enides)
Alison J. Wakelin, Hughes Associates, Inc., MD [SE]
(Alt. to J. L. Scheffey)

Nonvoting

L. M. Krasner, Medfield, MA [SE]
(Member Emeritus)

Thomas J. Lett, Albuquerque Fire & Safety Associates, NM [SE]
(Member Emeritus)

Barry D. Chase, 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 safety for the construction and protection at airport facilities involving construction engineering but excluding airport fixed fueling systems.



Contents

Chapter 1 Administration	423- 4	Chapter 6 Fire Protection Requirements	423- 7
1.1 Scope	423- 4	6.1 Engine Test Facility	423- 7
1.2 Purpose	423- 4	6.2 Engine Test Cell	423- 7
Chapter 2 Referenced Publications	423- 4	6.3 Control Rooms	423- 8
2.1 General	423- 4	6.4 Support Rooms	423- 8
2.2 NFPA Publications	423- 4	Chapter 7 Fixed Fire Protection Systems	423- 8
2.3 Other Publications	423- 4	7.1 General Design Requirements	423- 8
2.4 References for Extracts in Mandatory Sections	423- 4	7.2 Carbon Dioxide Systems	423- 8
Chapter 3 Definitions	423- 4	7.3 Gaseous Agent Systems	423- 8
3.1 General	423- 4	7.4 Dry Chemical Systems	423- 9
3.2 NFPA Official Definitions	423- 4	7.5 Foam, High-Expansion Foam, Foam-Water Sprinkler, and Foam-Water Spray Systems	423- 9
3.3 General Definitions	423- 5	7.6 Water Spray Systems, Water Deluge Systems, and Automatic Sprinkler Systems	423- 9
Chapter 4 Construction and Internal Subdivisions	423- 5	Chapter 8 Employee Organization for Fire Safety	423- 9
4.1 Construction of Aircraft Engine Test Facilities	423- 5	8.1 General	423- 9
4.2 Internal Subdivisions of Aircraft Engine Test Facilities	423- 5	Annex A Explanatory Material	423- 9
Chapter 5 Service and Utilities	423- 5	Annex B Supplementary Fire Protection Systems	423-11
5.1 General Safeguards	423- 5	Annex C Agent Selection	423-12
5.2 Drainage Systems	423- 5	Annex D Informational References	423-12
5.3 Electrical Requirements	423- 6	Index	423-13
5.4 Heating and Cooling	423- 6		
5.5 Ventilation	423- 6		
5.6 Fuel Systems and Lubricating Oil Systems	423- 6		
5.7 Compressed Air	423- 7		
5.8 Hydraulic Fluids	423- 7		
5.9 Instrumentation	423- 7		

NFPA 423**Standard for****Construction and Protection of Aircraft
Engine Test Facilities****2016 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.

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 D. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. 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 D.

Chapter 1 Administration**1.1 Scope.**

1.1.1 This standard establishes the minimum fire safety practices regarding location, construction, services, utilities, fire protection, operation, and maintenance of aircraft engine test facilities.

1.1.2 These facilities include test cells and test stands.

1.1.3 This standard does not apply to engines and engine accessories or to engine test facilities where fuels other than hydrocarbon fuels are used.

1.2 Purpose. The purpose of this standard is to provide aircraft engine test facilities with a reasonable degree of life safety and protection from fire, based on sound engineering principles, test data, and field experience.

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 10, *Standard for Portable Fire Extinguishers*, 2013 edition.

NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, 2010 edition.

NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems*, 2011 edition.

NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems*, 2009 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2013 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2013 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2012 edition.

NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, 2011 edition.

NFPA 17, *Standard for Dry Chemical Extinguishing Systems*, 2013 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2015 edition.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment*, 2011 edition.

NFPA 54, *National Fuel Gas Code*, 2015 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2014 edition.

NFPA 70®, *National Electrical Code®*, 2014 edition.

NFPA 72®, *National Fire Alarm and Signaling Code*, 2013 edition.

NFPA 75, *Standard for the Fire Protection of Information Technology Equipment*, 2013 edition.

NFPA 86, *Standard for Ovens and Furnaces*, 2015 edition.

NFPA 101®, *Life Safety Code®*, 2015 edition.

NFPA 220, *Standard on Types of Building Construction*, 2015 edition.

NFPA 2001, *Standard on Clean Agent Fire Extinguishing Systems*, 2012 edition.

2.3 Other Publications.

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

ASME B31.1, *Code for Power Piping*, 2012.

2.3.2 Other Publications.

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

2.4 References for Extracts in Mandatory Sections.

NFPA 409, *Standard on Aircraft Hangars*, 2011 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* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the au-

