NFPA® 77

Recommended Practice on Static Electricity

2019

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NFPA® 77

Recommended Practice on

Static Electricity

2019 Edition

This edition of NFPA 77, *Recommended Practice on Static Electricity*, was prepared by the Technical Committee on Static Electricity. It was issued by the Standards Council on May 4, 2018, with an effective date of May 24, 2018, and supersedes all previous editions.

This edition of NFPA 77 was approved as an American National Standard on May 24, 2018.

Origin and Development of NFPA 77

An NFPA project addressing static electricity was initiated in 1936, and a progress report was presented to the NFPA in 1937. A tentative edition of NFPA 77 was adopted in 1941. This tentative edition was further revised and officially adopted by the NFPA in 1946. Revisions were adopted in 1950, 1961, 1966, 1972, 1977, 1982, 1988, 1993, 2000, and 2007.

The 2000 edition of NFPA 77 presented a totally revised overview of the subject of static electricity and its hazards, including the current level of understanding of static electricity and considerable new information explaining the fundamental aspects of the phenomenon and recommendations for evaluating and controlling potential hazards. Also included were sections addressing specific hazards of flammable gases and vapors and combustible dusts, sections on specific industrial processes and operations, a database of relevant properties of numerous commercially significant materials, a glossary of terms, and diagrams that showed acceptable methods of bonding and grounding.

The 2007 edition of NFPA 77 included the following amendments:

(1) Numerous editorial changes to comply with the *Manual of Style for NFPA Technical Committee Documents*
(2) Text that allowed use of self-checking bonding clamps and bond wires that continuously monitor the resistance to ground and verify that resistance is maintained within acceptable levels
(3) Cautionary statements regarding the use of appropriate instruments based on the electrical classification of the area in which the instruments will be used
(4) Cautionary statements regarding the use of high-voltage static neutralizers in electrically classified areas and the use of such static neutralizers as inductive neutralizers when de-energized or at failure
(5) Correction of errors

The 2014 edition of NFPA 77 includes the following amendments:

(1) The document has been reorganized into a more logical arrangement, and some large chapters have been divided into several small chapters that are focused on a single topic.
(2) Many definitions that had been in Annex H, Glossary of Terms, have been moved to Chapter 2, because the defined terms are used numerous times in the body of the text.
(3) The discussion in Chapter 5 of the mechanisms of static electric charging and discharging of same has been revised for clarity.
(4) Information on the hazards of switch loading has been added to Chapter 9.
(5) Recommendations for filling storage tanks have been rewritten.
(6) Recommendations for flexible intermediate bulk containers have been rewritten.
(7) Recommendations for web processes have been rewritten.

The 2019 edition includes the following changes:

(1) Updates to reference documents, Chapter 2, and Annex I to reflect current editions of the documents.
(2) Changes to the definitions for *combustible dust* and *grounding*. These definitions reflect the use of the terms specific to NFPA 77.
(3) Changes to the characterization of low, medium, and high resistivity powders in Chapter 15 to reflect generally accepted international standards.
(4) Other editorial changes to meet *Manual of Style for NFPA Technical Committee Documents* requirements.

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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 safeguarding against the fire and explosion hazards associated with static electricity, including the prevention and control of these hazards. This Committee shall also have primary responsibility for conductive and static-dissipative floors, except as this subject is addressed by the Committee on Health Care Facilities.

Contents

NFPA 77

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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 the recommendations sections of this document are given in Chapter 2 and those for extracts in the informational sections are given in Annex I. 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 should be sent to the technical committee responsible for the source document.

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

Chapter 1 Administration

1.1 Scope.

1.1.1 This recommended practice applies to the identification, assessment, and control of static electricity for purposes of preventing fires and explosions.

1.1.2* This recommended practice does not apply directly to shock hazards from static electricity. However, application of the principles set forth in this recommended practice can reduce such shock hazards to personnel.

1.1.3 Reserved.

1.1.4* This recommended practice does not apply to lightning.

1.1.5* This recommended practice does not apply to stray electrical currents or to induced currents from radio frequency (RF) energy.

1.1.6* This recommended practice does not apply to fueling of motor vehicles, marine craft, or aircraft.

1.1.7* This recommended practice does not apply to cleanrooms.

1.1.8 This recommended practice does not apply to control of static electricity and its hazards as they might affect electronic components or circuits, which have their own requirements.

1.2 Purpose. The purpose of this recommended practice is to assist the user in controlling the hazards associated with the generation, accumulation, and discharge of static electricity by providing the following:

(1) Basic understanding of the nature of static electricity
(2) Guidelines for identifying and assessing the hazards of static electricity
(3) Techniques for controlling the hazards of static electricity
(4) Guidelines for controlling static electricity in selected industrial applications

1.3 Application. (Reserved)

1.4 Equivalency. Nothing in this recommended practice is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this recommended practice.

1.4.1 Technical documentation should be submitted to the authority having jurisdiction to demonstrate equivalency.

1.4.2 The system, method, or device should be approved for the intended purpose by the authority having jurisdiction.

1.5 Symbols, Units, and Formulas. The units of measure and symbols used in this recommended practice are as described in Chapter 4.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this recommended practice and should be considered part of the recommendations of this document.

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

NFPA 30, *Flammable and Combustible Liquids Code,* 2018 edition.

NFPA 69, *Standard on Explosion Prevention Systems,* 2014 edition.

NFPA 70®, National Electrical Code®, 2017 edition.

NFPA 495, *Explosive Materials Code,* 2018 edition.

NFPA 496, *Standard for Purged and Pressurized Enclosures for Electrical Equipment,* 2017 edition.

NFPA 498, *Standard for Safe Havens and Interchange Lots for Vehicles Transporting Explosives,* 2018 edition.

NFPA 654, *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids,* 2017 edition.