

NFPA®

1936

**Standard on
Rescue Tools**

2020



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NFPA® 1936

Standard on

Rescue Tools

2020 Edition

This edition of NFPA 1936, *Standard on Rescue Tools*, was prepared by the Technical Committee on Fire Department Rescue Tools. It was issued by the Standards Council on June 10, 2019, with an effective date of June 30, 2019, and supersedes all previous editions.

This edition of NFPA 1936 was approved as an American National Standard on June 30, 2019.

Origin and Development of NFPA 1936

Work on this document began in a subcommittee of the Technical Committee on Fire Department Equipment. In October 1992, the NFPA Standards Council organized a new committee, the Technical Committee on Fire Department Rescue Tools, which took over the responsibility for developing the document. The first edition of NFPA 1936 was presented to the NFPA membership at the Annual Meeting in Baltimore, MD, on May 19, 1999, and issued by the Standards Council on July 22, 1999, with an effective date of August 13, 1999.

The second edition of NFPA 1936 incorporated the *Manual of Style for NFPA Technical Committee Documents* format for codes and standards, which caused the renumbering of some chapters, the relocation of another chapter, and the addition of a new chapter. The title of the document was changed to “Powered Rescue Tools,” eliminating the “system” concept of the first edition. The standard addressed the tools and components as individual items and not as a “system” approach. All design, performance, and testing requirements were reviewed and refined as necessary.

The second edition was presented to the association membership at the 2004 November meeting in Miami Beach, FL, on November 17, 2004, and issued by the Standards Council with an effective date of February 7, 2005.

The 2010 edition updated referenced publications and product label requirements.

The 2015 edition included third-party certification as part of the process for manufacturing compliant tools, especially in Chapter 4, where the change was carried throughout. Further, there was a language shift from training documentation to user information, as well as clarification on the requirements for powering a tool and the cutting test.

The 2020 edition includes a title change and content changes to reflect that NFPA 1936 does not apply only to powered rescue tools. The committee added new requirements for labels to ensure that they are permanent, unalterable, and sized appropriately for the intended rescue tool. Also updated were requirements for rescue tools used for cutting to ensure they can cut the more commonly used high-strength materials noted in new Figure 5.6.15.1 in Chapter 5.

Finally, the committee removed requirements for rescue struts. Existing material related to rescue struts is incomplete and requires more work, and new requirements for struts must be developed.

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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 related to the design, inspection, testing, and use of rescue tools for the fire services.

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NFPA 1936

Standard on

Rescue Tools

2020 Edition

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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. 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 and extracted publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1 Scope.

Δ 1.1.1 This standard shall specify the minimum requirements for the design, performance, testing, and certification of rescue tools and components thereof.

Δ 1.1.2 This standard shall specify the requirements for spreader, ram, cutter, combination powered rescue tools, and lifting bags.

Δ 1.1.3 This standard shall also specify the requirements for cable assemblies, hose assemblies, power unit components for powered rescue tools, and lifting bags.

Δ 1.1.4 This standard shall not specify any requirements for any accessories for powered rescue tools.

Δ 1.1.5 **Safety and Health.**

N 1.1.5.1 This standard shall not be construed as addressing all of the safety concerns, if any, associated with its use.

N 1.1.5.2 It shall be the responsibility of the persons and organizations that use this standard to establish safety and health practices and determine the applicability of regulatory limitations prior to use of this standard.

1.1.6 Nothing herein shall restrict any jurisdiction from specifying powered rescue tools or lifting bags and components thereof that exceed the minimum requirements of this standard.

1.1.7 Nothing herein shall restrict any manufacturer from producing powered rescue tools, lifting bags, and components thereof that exceed the minimum requirements of this standard.

1.2 Purpose.

1.2.1 The purpose of this standard shall be to establish minimum performance requirements for powered rescue tools, lifting bags, and components thereof that are used by emergency services personnel to extricate victims from entrapment.

1.2.2 Controlled laboratory, environmental, and physical tests are used to determine compliance with the performance requirements of this standard only; however, such tests shall not be deemed as establishing the performance levels of powered rescue tools, lifting bags, and components thereof for all situations.

1.2.3 This standard is not intended to serve as a detailed manufacturing or purchase specification but shall be permitted to be referenced in purchase specifications as minimum acceptable requirements.

1.3 Application.

1.3.1 This standard shall apply to the design, manufacturing, and certification of manufactured powered rescue tools, lifting bags, and components thereof.

1.3.2 The requirements of this standard shall not apply to accessories that might be attached to powered rescue tools, lifting bags, or components thereof.

1.3.3 This standard shall not apply to manually powered rescue tools and manually powered rescue tool components.

Δ 1.3.4 This standard shall not apply to small multipurpose tools including, but not limited to, saws, drills, chisels, pry bars, and similar tools.

1.3.5 This standard shall not apply to powered rescue tools and components thereof that are manufactured prior to the NFPA effective date of this standard.

1.3.6 This standard shall not apply to powered rescue tools that are manufactured in accordance with other specifications or standards of other organizations.

1.4 Units.

1.4.1 Values for measurement in this standard are followed by an equivalent in parentheses, but only the first stated value shall be regarded as the requirement.

1.4.2 Equivalent values in parentheses shall not be considered as the requirement as these values are approximate.

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

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2018 edition.

2.3 Other Publications.

2.3.1 ANSI Publications. American National Standards Institute, Inc., 25 West 43rd Street, 4th floor, New York, NY 10036.

ANSI S12.36, *Standard Survey Methods for the Determination of Sound Pressure Levels of Noise Sources*, 1990, revised 1997.

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

ASME B40.100, *Pressure Gauges and Gauge Attachments*, 2013.

2.3.3 ASTM Publications. ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.

ASTM A519/A519M, *Standard Specification for Seamless Carbon and Alloy Steel Mechanical Tubing*, 2017.

2.3.4 CENELEC Publications. European Committee for Electrotechnical Standardization, CEN-CENELEC Management Centre, Avenue Marnix 17, 4th floor, B - 1000 Brussels.

EN 837-1, *Standard Bourdon Tube Pressure Gauges*, 2016.

EN 837-2, *Pressure Gauges — Part 2: Selection and Installation Recommendations for Pressure Gauges*, 1998.

EN 837-3, *Pressure Gauges — Part 3: Diaphragm and Capsule Pressure Gauges — Dimensions, Metrology, Requirements and Testing*, 1998.

2.3.5 ISO Publications. International Organization for Standardization, ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland.

ISO 2503, *Gas welding equipment — Pressure regulators for gas cylinders used in welding, cutting and allied processes up to 300 bar*, 2009.

ISO 9001, *Quality management systems — Requirements*, 2015.

ISO/IEC 17011, *General requirements for accreditation bodies accrediting conformity assessment bodies*, 2004.

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*, 2005.

ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes and services*, 2012.

2.3.6 SAE Publications. SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 6371, *Steel, Mechanical Tubing 0.95Cr – 0.20Mo (0.28 – 0.33C)* (SAE 4130).

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

UL 252, *Standard for Safety Compressed Gas Regulators*, 2017.

UL 969, *Standard for Marking and Labeling Systems*, 1995, revised 2014.

UL 60745-1, *Standard for Hand-Held Motor-Operated Electric Tools — Safety — Part 1: General Requirements*, 2013.

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. (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* 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. An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that 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 the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of

Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1 Accessories. Those items that are attached to the powered rescue tool or to a component thereof, but are not necessary for the rescue tool or component to meet the requirements of this standard.

3.3.2 Certification. A system whereby a third-party certification organization determines that a manufacturer has demonstrated the ability to produce a product that complies with the requirements of this standard, authorizes the manufacturer to use a label on listed products that comply with the requirements of this standard, and establishes a follow-up program conducted by the third-party certification organization as a check on the methods the manufacturer uses to determine continued compliance of labeled and listed products with the requirements of this standard.

3.3.3 Compliant. Verified as meeting or exceeding all applicable requirements of this standard.

3.3.4 Continual. With respect to the testing of a powered rescue tool, a test sequence performed with pauses or interruptions.

3.3.5 Continuous. With respect to the testing of a powered rescue tool, a test sequence performed without any pauses or interruptions for any purpose.

3.3.6 Creep. Unintended movement.

3.3.7 Cycle. See 3.4.6, Operational Cycle.

3.3.8 Deadman Control. A device designed to automatically return the operational controls to the neutral position in the event that the operational control is released.

3.3.9 Follow-Up Program. The sampling, inspections, tests, or other measures conducted by the third-party certification organization on a periodic basis to determine the continued compliance of listed products that are being produced by the manufacturer to the requirements of this standard.

3.3.10 Identical Rescue Tools. Powered rescue tools that are produced to the same engineering and manufacturing specifications.

3.3.11 Manufacturer. The entity that assembles the compliant product and also maintains the certification.

3.3.12* Product Label. A label or marking affixed to powered rescue tools and components thereof by the manufacturer containing general information, care, maintenance, or similar data.

3.3.13 Rescue Tool. Another term for powered rescue tool.

3.3.14 Rescue Tool Components. See 3.4.9, Powered Rescue Tool Components.

3.3.15 System Input. The input pressure or electrical power that the powered rescue tool is subjected to at any given moment.

3.3.16 Third-Party Certification Organization. An independent third-party certification organization that determines product compliance with the requirements of this standard with a labeling/listing/follow-up program.

3.3.17 Tool. Another term for powered rescue tool.

3.3.18 Vendor Confirmation. A written statement by the original manufacturer of a component that states the specification or performance range, or both, of the component.

3.4 Powered Rescue Tools.

3.4.1 Cable Assembly. A powered rescue tool component consisting of the power cable with all permanently attached connectors that connect the powered rescue tool to the power unit.

3.4.2 Combination Tool. A powered rescue tool capable of, at a minimum, spreading and cutting.

3.4.3 Cutter. A powered rescue tool with at least one movable blade used to cut, shear, or sever material.

3.4.4 Dump Valve. A device on a power unit to redirect all of the system flow to the reservoir.

3.4.5 Hose Assembly. A powered rescue tool component consisting of hose with all permanently attached fittings that connect the powered rescue tool to the power unit.

3.4.6 Operational Cycle. The movement of the powered rescue tool from the fully closed or retracted position to the fully open or extended position and returned to the fully closed or retracted position.

3.4.7 Power Unit. A powered rescue tool component consisting of a prime mover and the principal power output device used to power the rescue tool.

3.4.8 Powered Rescue Tool. A rescue tool that receives power from the power unit component and generates the output forces or energy used to perform one or more of the functions of spreading, lifting, holding, crushing, pulling, or cutting.

3.4.9* Powered Rescue Tool Components. Components such as cable assemblies, hose assemblies, power units, hose reels, and remote valve blocks.

3.4.10 Prime Mover. Part of the power unit component and the energy source that drives the principal power output device of the power unit.

3.4.11 Pulling Force. The force to pull generated by a powered rescue tool and measured or calculated at the standard production pulling attachment points on the tool.

3.4.11.1 Highest Pulling Force (HPF). The pulling force achieved by the powered rescue tool while operating at the rated system input at the position of the arms or piston where the tool generates its greatest amount of force.

3.4.11.2 Lowest Pulling Force (LPF). The pulling force achieved by the powered rescue tool while operating at the rated system input at the position of the arms or piston where the tool generates its least amount of force.

3.4.12 Ram. A powered rescue tool that has an extender that generates extending forces or both extending and retracting forces.

3.4.13 Rated System Input. The maximum input pressure/ electrical power at which the powered rescue tool is designed to operate.

3.4.14 Spreader. A powered rescue tool that has at least one movable arm that opens to move material.

3.4.15 Spreading Force. The force to push or pull generated by a spreader rescue tool and measured or calculated at the very tips of the spreader arms or ram.

3.4.15.1 Highest Spreading Force (HSF). The spreading force achieved by the powered rescue tool while operating at the rated system input at the position of the arms or piston where the tool generates its greatest amount of force.

3.4.15.2 Lowest Spreading Force (LSF). The spreading force achieved by the powered rescue tool while operating at the rated system input at the position of the arms or piston where the tool generates its least amount of force.

3.5 Lifting Bags.

3.5.1 Allowable Pressure (AP). The maximum operating pressure for each component of the system stated in bar and psi.

3.5.2 Components. See 3.5.10.2, Lifting Bag Components.

3.5.3 Control Device. A lifting bag system component that controls the inflation and deflation of a lifting bag.

3.5.4 Couplings. Connectors attached to the hose assemblies, lifting bags, or accessories to allow for the connection and disconnection of components.

3.5.5 Hose Assembly. A hose complete with attached quick-action coupler(s) with or without fittings.

3.5.6 Identical Lifting Bags. Lifting bags produced to the same engineering and manufacturing specifications.

3.5.7 Inflation Height. The sum of the insertion height and the inflated proportion of a bag's maximum inflation height.

3.5.8 Inlet Connection. A fitting incorporated into a lifting bag in such a way that it is not readily removable, to which a quick-action coupling is connected.

3.5.9 Insertion Height. The smallest opening into which a deflated bag can be inserted.

3.5.10 Lifting Bag System. The combination of components, excluding the air source, that, when assembled, can inflate or deflate a lifting bag using compressed air from an operator-controlled air source.

3.5.10.1 Lifting Bag. A portable inflatable bag used to apply force to move or lift objects.

3.5.10.2 Lifting Bag Components. Components such as a hose and hose assembly, regulator, pressure indicator, safety valve, and a control device.

3.5.11 Lifting Capacity. The maximum load a lifting bag can lift at allowable pressure.

3.5.12 Loss of Integrity. Damage caused by leakage, delaminating, or unexpected deformation.

3.5.13 Maximum Lifting Height. The sum of the insertion height and stroke of the lifting bag.

3.5.14 Operational Cycle. The movement of the lifting bag from the fully deflated position to the fully inflated position and then returned to the fully deflated position.

3.5.15 Preset Regulator. A regulator set before incorporation into a lifting bag system to a defined pressure level and not intended to be easily adjusted by the user.

3.5.16 Pressure Indicator. A device that measures and visually displays pressure.

3.5.17 Quick-Action Couplings. Couplings designed for quick connection and disconnection.

3.5.18 Regulator. A device for regulating a generally variable inlet pressure to as constant as possible outlet pressure.

3.5.19 Stroke. The distance from the insertion height to the maximum inflated position at allowable pressure without a load applied.

3.5.20 System Input. The input pressure a lifting bag is subjected to at any given moment.

3.5.21 Volume. Geometric internal volume of a lifting bag when inflated to allowable pressure without load.

Chapter 4 Certification

4.1 General.

4.1.1 The process of product certification being compliant with NFPA 1936 shall meet the requirements of Sections 4.1 through 4.4.

4.1.2 Compliance.

4.1.2.1 All products that are labeled as being compliant with this standard shall meet or exceed all applicable requirements specified in this standard.

4.1.2.2 All products that are labeled as being compliant with this standard shall be certified by a third-party certification organization.

4.1.3 Certification and Accreditation.

4.1.3.1 All certifications shall be performed by a third-party certification organization that meets at least the requirements specified in Section 4.2, and that is accredited for powered rescue tools or lifting bags, as applicable, in accordance with ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes and services*.

4.1.3.2 The accreditation shall be issued by an accreditation body operating in accordance with ISO/IEC 17011, *General requirements for accreditation bodies accrediting conformity assessment bodies*.

4.1.4 Manufacturers shall not claim compliance with portions or segments of the requirements of this standard and shall not use the NFPA name or the name or identification of this standard, NFPA 1936, in any statements about their respective product(s) unless the product(s) is certified by a third-party certification organization as compliant to this standard.

4.1.5 All compliant products shall be labeled and listed by a third-party certification organization.

4.1.6 All compliant products shall also have a product label that meets the requirements specified in Sections 5.2 and 6.2.

Δ 4.1.7* The third-party certification organization's label, symbol, or identifying mark shall be part of the product label, attached to the product label, or immediately adjacent to the product label.

4.1.8 The third-party certification organization shall not issue any new verifications to the 2015 edition of this standard on or after the NFPA effective date for the 2020 edition.

4.1.9 The third-party certification organization shall not permit any manufacturer to continue to label any products that are certified as compliant with the 2015 edition of this standard on or after July 1, 2020.

Δ 4.1.10 Certification Label Removal.

N 4.1.10.1 The third-party certification organization shall require manufacturers to remove all certification labels and product labels indicating compliance with the 2015 edition of this standard from all powered rescue tools and components that are under the control of the manufacturer on July 1, 2020.

N 4.1.10.2 The third-party certification organization shall verify the action in 4.1.10.1 is taken.

4.2 Certification Program.

4.2.1* The third-party certification organization shall not be owned or controlled by manufacturers or vendors of the product being certified.

4.2.2 The third-party certification organization shall be primarily engaged in certification work and shall not have a monetary interest in the product's ultimate profitability.

4.2.3 The third-party certification organization shall be accredited for powered rescue tools or lifting bags, as applicable, in accordance with ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes and services*, with the accreditation issued by an accreditation body operating in accordance with ISO/IEC 17011, *General requirements for accreditation bodies accrediting conformity assessment bodies*.

4.2.4 The third-party certification organization shall refuse to certify products to this standard that do not comply with all applicable requirements of this standard.

4.2.5* The contractual provisions between the third-party certification organization and the manufacturer shall specify that product certification is contingent on compliance with all applicable requirements of this standard.

4.2.5.1 The third-party certification organization shall not offer or confer any conditional, temporary, or partial product conformance verifications.

4.2.5.2 Manufacturers shall not be authorized to use any label of or reference to the third-party certification organization on products that are not compliant with all applicable requirements of this standard.

4.2.6* The third-party certification organization shall have laboratory facilities and equipment available for conducting proper tests to determine product compliance.

4.2.6.1 The third-party certification organization laboratory facilities shall have a program in place and functioning for calibration of all instruments, and procedures shall be in use to ensure proper control of all testing.

4.2.6.2 The third-party certification organization laboratory facilities shall follow good practice regarding the use of laboratory manuals, form data sheets, documented calibration and calibration routines, performance verification, proficiency testing, and staff qualification and training programs.

4.2.7 The third-party certification organization shall require the manufacturer to establish and maintain a quality assurance program that meets the requirements of Section 4.4. The third-party certification organization shall verify the manufacturer's quality assurance program to ensure that the quality assurance program provides continued product compliance with this standard.

4.2.8 The third-party certification organization and the manufacturer shall evaluate any changes affecting the design, construction, or materials of the compliant product to determine its continued conformance to this standard.

4.2.9* The third-party certification organization shall have a follow-up inspection program of the manufacturing facilities of the compliant product with at least two random and unannounced visits per 12-month period.

4.2.9.1 As part of the follow-up inspection program, the third-party certification organization shall select sample compliant product at random from the manufacturer's production line, from the manufacturer's in-house stock, or from the open market.

4.2.9.2 Sample product shall be evaluated by the third-party certification organization to verify the product's continued compliance.

4.2.10 The third-party certification organization shall have in place a series of procedures that address report(s) of situation(s) in which a compliant product is subsequently found to be hazardous.

4.2.11 The third-party certification organization's operating procedures shall provide a mechanism for the manufacturer to appeal decisions. The procedures shall include the presentation of information from both sides of a controversy to a designated appeals panel.

4.2.12 The third-party certification organization shall be in a position to use legal means to protect the integrity of its name and label. The name and label shall be registered and legally defended.

4.3 Inspection and Testing.

4.3.1 For certification of product, the third-party certification organization shall conduct both inspection and testing as specified in Section 4.3.

4.3.2 All inspections, evaluations, conditioning, and testing for product conformance verification shall be conducted by a third-party certification organization's testing laboratory that is accredited in accordance with the requirements of ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*.

4.3.2.1 The third-party certification organization's testing laboratory's scope of accreditation to ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*, shall encompass testing of powered rescue tools or lifting bags, as applicable.

4.3.2.2 The accreditation of a third-party certification organization's testing laboratory shall be issued by an accreditation body operating in accordance with ISO/IEC 17011, *General requirements for accreditation bodies accrediting conformity assessment bodies*.

Δ 4.3.3 Sampling levels for testing and inspection shall be established by the third-party certification organization and the manufacturer to ensure that products certified to this standard are compliant, unless such sampling levels are specified herein.

4.3.4 Inspection by the third-party certification organization shall include a review of all product labels to ensure that all required label attachments, compliance statements, certification statements, and other product information are at least as specified for the products in **Sections 5.2 and 6.2**.

Δ 4.3.5 Inspection by the third-party certification organization shall include an evaluation of any symbols and pictorial graphic representations used on product labels or in user information, as permitted by **5.2.1.6** and **5.3.3**, to ensure that the symbols are explained in the product's user information package.

Δ 4.3.6 Inspection by the third-party certification organization shall include a review of the user information required by **Sections 5.3 and 6.3** to ensure that the information has been developed and is available.

Δ 4.3.7 Inspection by the third-party certification organization for determining compliance with the design requirements specified in **Sections 5.4 and 6.4** shall be performed on whole or complete products.

Δ 4.3.8 Testing to determine product compliance with the performance requirements specified in **Sections 5.5 and 6.5** shall be conducted by the third-party certification organization in accordance with the specified testing requirements of **Sections 5.6 and 6.6**.

4.3.8.1 Testing shall be performed on whole products.

4.3.8.2 The third-party certification organization shall also be permitted to use specimens representative of materials and components used in the actual construction of **the product**.

4.3.9 The third-party certification organization shall accept from the manufacturer, for evaluation and testing for certification, only products or product components that are the same in every respect to the actual final product or product component.

4.3.10 The third-party certification organization shall not allow any modifications, pretreatment, conditioning, or other such special processes of the product or any product component prior to the submission of the product or product component for evaluation and testing by the third-party certification organization.

4.3.11 The third-party certification organization shall not allow the substitution, repair, or modification, other than as specifically permitted herein, of any product or any product component during testing.

4.3.12 The third-party certification organization shall not allow test specimens that have been conditioned and tested for one method to be reconditioned and tested for another test method unless specifically permitted in the second test method.

Δ 4.3.13 Product Changes.

N 4.3.13.1 Any change in the design, construction, or materials of a compliant product shall necessitate new inspection and testing to verify conformance to all applicable requirements of this standard that the third-party certification organization determines can be affected by such change.

N 4.3.13.2 The certification stated in 4.3.13.1 shall be conducted before labeling the modified product as being compliant with this standard.

4.4 Manufacturer's Quality Assurance Program.

4.4.1* The manufacturer shall be registered to ISO 9001, *Quality management systems — Requirements*.

4.4.2 The operation of the quality assurance program shall evaluate and test compliant product production against this standard to ensure production remains in compliance.

Δ Chapter 5 Powered Rescue Tools

N 5.1 Administration.

N 5.1.1 Scope.

N 5.1.1.1 This chapter shall specify the minimum requirements for the design, performance, testing, and certification of powered rescue tools and components thereof.

N 5.1.1.2 This chapter shall specify the requirements for spreader, ram, cutter, and combination powered rescue tools.

N 5.1.1.3 This chapter shall also specify the requirements for cable assemblies, hose assemblies, and power unit components for powered rescue tools.

N 5.1.1.4 This chapter shall not specify any requirements for any accessories for powered rescue tools or components thereof.

N 5.1.1.5 Safety and Health.

N 5.1.1.5.1 This chapter shall not be construed as addressing all of the safety concerns, if any, associated with its use.

N 5.1.1.5.2 It shall be the responsibility of the persons and organizations that use this standard to establish safety and health practices and determine the applicability of regulatory limitations prior to use of this standard.

N 5.1.1.6 Nothing herein shall restrict any jurisdiction from specifying powered rescue tool systems and components thereof that exceed the minimum requirements of this standard.

N 5.1.1.7 Nothing herein shall restrict any manufacturer from producing powered rescue tools and components thereof that exceed the minimum requirements of this standard.

N 5.1.2 Purpose.

N 5.1.2.1 The purpose of this chapter shall be to establish minimum performance requirements for powered rescue tools and components thereof that are utilized by emergency services personnel to facilitate the extrication of victims from entrapment.

N 5.1.2.2 Controlled laboratory, environmental, and physical tests are used to determine compliance with the performance requirements of this chapter only; however, such tests shall not

be deemed as establishing the performance levels of powered rescue tools and components thereof for all situations.

N 5.1.2.3 This chapter is not intended to serve as a detailed manufacturing or purchase specification but shall be permitted to be referenced in purchase specifications as minimum acceptable requirements.

N 5.1.3 Application.

N 5.1.3.1 This chapter shall apply to the design, manufacturing, and certification of manufactured powered rescue tools and components thereof.

N 5.1.3.2 The requirements of this chapter shall not apply to accessories that might be attached to powered rescue tools or components thereof.

N 5.1.3.3 This chapter shall not apply to manually powered rescue tools and manually powered rescue tool components.

Δ 5.2 Product Labeling Requirements.

N 5.2.1 General.

N 5.2.1.1 All product labels for powered rescue tools and for power unit components shall also meet the requirements specified in 5.2.2.

N 5.2.1.2 All product labels for cable assembly components and hose assembly components shall also meet the requirements specified in 5.2.3.

N 5.2.1.3 On all product labels, the font size for the third-party certification organization's label, symbol, or identifying mark and the compliance statement shall be at least 2 mm ($\frac{3}{32}$ in.) high.

N 5.2.1.4 On all product labels, the font size for the itemized information list that follows the compliance statement, including any symbols, shall be at least 2 mm ($\frac{3}{32}$ in.) high.

N 5.2.1.5 All product labels shall have the text printed at least in English.

N 5.2.1.6 All product labels shall be permitted to use symbols and other pictorial graphic representations to supplement worded statements on the product labels where those symbols and pictorial graphic representations are explained in the user information.

N 5.2.1.7 All product labels shall meet the requirements of UL 969, *Standard for Marking and Labeling Systems*, for resistance to damage from temperatures between -29°C and 71°C (-20°F and 160°F) outdoor use, and exposure to oil, fuel, water, and the hydraulic fluids used in the rescue tools.

N 5.2.1.8 In addition to 5.2.1.7, where any required product labels are self-adhesive, the adhesion shall be applicable for the adhered surface.

N 5.2.1.9 The powered rescue tool manufacturer shall provide the country of manufacture in either the manual or on the product label.

Δ 5.2.2 Powered Rescue Tools and Power Unit.

N 5.2.2.1 Each powered rescue tool and each power unit shall have a product label permanently attached to the tool or system.

Δ 5.2.2.2 Each product label shall have the third-party certification organization's label, symbol, or identifying mark and at least the following compliance statement printed on the product label:

THIS (insert "POWERED RESCUE TOOL" or "POWER UNIT" as applicable) MEETS THE REQUIREMENTS OF NFPA 1936, *STANDARD ON RESCUE TOOLS*, 2020 EDITION.
DO NOT REMOVE THIS LABEL.

Δ 5.2.2.3 The following information shall also be printed on the product label following the compliance statement specified in 5.2.2.2:

- (1) Manufacturer's name, identification, or designation
- (2) Product identification number, lot number, or serial number
- (3) Month and year of manufacture (not coded)
- (4) Model name, number, or design
- (5) Rated system pressure, where applicable
- (6) Manufacturer's specified hydraulic fluid for power unit, where applicable
- (7) Fluid capacity of the hydraulic reservoir of the power unit, where applicable
- (8) Operating voltage and current type, where applicable
- (9) Operating amperage at no load, where applicable
- (10) Operating amperage at maximum load, where applicable

Δ 5.2.2.4 More than one label piece shall be permitted to carry all statements and information required of the product label; however, all label pieces that compose the entire product label shall be located adjacent to each other.

N 5.2.3 Cable Assembly and Hose Assembly.

N 5.2.3.1 Each cable assembly and each hose assembly shall have a product label that is permanently stamped, bonded, or embossed on the cable or hose.

N 5.2.3.2 Each product label specified in 5.2.3.1 shall have the third-party certification organization's label, symbol, or identifying mark and at least the following compliance statement printed as the product label:

MEETS NFPA 1936 (2020 ED.).

N 5.2.3.3 In addition, each cable assembly and each hose assembly shall also have a product label attached to it.

N 5.2.3.3.1 This additional product label shall be permitted to be permanently attached to the assembly or configured as a hangtag attached to the assembly.

N 5.2.3.3.2 Where the additional product label is configured as a hangtag as permitted by 5.2.3.3.1, the hangtag shall have the following printed on the label: DO NOT DISPOSE OF THIS HANGTAG.

N 5.2.3.3.3 Where the additional product label is permanently attached, the following shall be printed on the label:

DO NOT REMOVE THIS LABEL.

N 5.2.3.4 The third-party certification organization's label, symbol, or identifying mark and at least the following statement shall be printed on the additional product label:

THIS (insert "CABLE ASSEMBLY" OR "HOSE ASSEMBLY" as applicable) MEETS THE REQUIREMENTS OF NFPA 1936, *STANDARD ON RESCUE TOOLS*, 2020 EDITION. DO NOT

DISPOSE OF THIS LABEL. STORE THIS LABEL WITH PRODUCT AND USER INFORMATION FOR FUTURE REFERENCE.

N 5.2.3.5 The following information shall also be printed on the additional product label following the compliance statement specified in 5.2.3.4:

- (1) Manufacturer's name, identification, or designation
- (2) Product identification number, lot number, or serial number
- (3) Month and year of manufacture (not coded)
- (4) Model name, number, or design
- (5) Rated system pressure, where applicable
- (6) Manufacturer's specified hydraulic fluid for power unit, where applicable
- (7) Fluid capacity of the hydraulic reservoir of the power unit, where applicable
- (8) Operating voltage and current type, where applicable
- (9) Operating amperage at no load, where applicable
- (10) Operating amperage at maximum load, where applicable

N 5.2.3.6 More than one label piece shall be permitted to carry all statements and information required of the additional product label; however, all label pieces of the entire additional product label shall be attached to each other.

N 5.3 User Information.

N 5.3.1 The powered rescue tool manufacturer shall provide user information for users with each rescue tool and component thereof.

N 5.3.2 Such user information shall be permitted to be in the form of printed, audiovisual, or web-based material, or any combination thereof.

N 5.3.3 Symbols and other pictorial graphic representations shall be permitted to be used to supplement worded statements on the product labels where those symbols and pictorial graphic representations are explained in the user information.

N 5.3.4 Manuals.

N 5.3.4.1 The powered rescue tool manufacturer shall provide a manual(s) with each rescue tool or component thereof.

N 5.3.4.2 The manual(s) shall provide, at a minimum, the following information:

- (1) Manufacturer's name and address
- (2) Source for service and technical information
- (3) How or where parts can be obtained
- (4) Setup procedures
- (5) Operating instructions
- (6) Safety considerations
- (7) Limitations of use
- (8) Inspection procedures
- (9) Recommended maintenance procedures
- (10) Troubleshooting guide
- (11) Manufacturer's warranty
- (12) Special requirements or data required by this standard

N 5.3.5 The powered rescue tool manufacturer shall specify in the manual the length, width, and height dimensions of all powered rescue tools and components thereof to establish the minimum storage dimensions.

N 5.3.6 The data for the opening distance of cutters and the opening and closing travel distance for other rescue tools as established in 5.4.2.3, 5.4.3.1, 5.4.4.3, 5.4.4.5, and 5.4.5.1 shall be provided in the manual.

N 5.3.7 Ratings.

N 5.3.7.1 The data on the cutting rating of cutters as established in 5.4.4.4 and 5.4.5.3 shall be provided in the manual.

N 5.3.7.2 Where cutters are rated for cutting high-strength materials, the data on the rating of cutters as established in 5.4.5.2 shall be provided in the manual.

N 5.3.8 The data on highest spreading force (HSF), lowest spreading force (LSF), highest pulling force (HPF), and lowest pulling force (LPF) ratings of the rescue tools as established in 5.5.1.4, 5.5.1.5, 5.5.2.5, 5.5.2.6, 5.5.3.6, and 5.5.3.7 shall be provided in the manual.

N 5.3.9 The weight of the rescue tool or component thereof in a ready-to-use configuration shall be provided in the manual.

N 5.3.9.1 The weight of the power unit shall include maximum specified quantities of the hydraulic fluid, fuel, engine oil, and battery, if the power unit requires these items for normal operation.

N 5.3.9.2 The weight of tools and cable assemblies or hose assemblies, including hose reels where provided, shall be determined with the rescue tools and cable or hose assembly attached, and hose assembly filled with hydraulic fluid and configured so that they would be operational by attachment to a power source.

N 5.3.10 The manufacturer of the power unit shall provide copies of any owner's manuals that are provided by the manufacturer of the prime mover.

N 5.3.11 A safety data sheet (SDS) shall be provided for each hydraulic fluid that is supplied for use in the rescue tool and components thereof.

N 5.4 Design Requirements.

N 5.4.1 General.

N 5.4.1.1 Where hydraulic fluid is used, the manufacturer of seals, valves, and fittings that will come into contact with hydraulic fluid in the rescue tool shall supply the rescue tool manufacturer with written documentation that such seals, valves, and fittings are compatible with the specified hydraulic fluid for the rescue tool and that they will function at a maximum hydraulic fluid temperature of 71°C (160°F).

N 5.4.1.2 Handles and controls shall be located on the rescue tool to allow the rescue tool to be carried and operated by personnel wearing gloves that are certified as compliant with the glove requirements of NFPA 1971.

N 5.4.1.3 All handles and controls shall be located and designed so that when gripped will prevent the user's hand(s) from being caught or crushed by powered moving parts of the tool during the tool's operation.

N 5.4.1.4 Rescue tools shall be equipped with a "deadman control."

N 5.4.1.4.1 When the operating control is in the neutral position, the rescue tool shall not operate by itself.

- N 5.4.1.4.2** The operation of the operating control shall be indicated on the tool.
- N 5.4.1.5** Where the rescue tool has an extension area of the activating piston rod assembly that is greater than 1.5 times the retract area of the piston rod assembly, the rescue tool shall be equipped with a built-in automatic safety relief device to prevent overpressurization.
- N 5.4.1.6** Where hydraulic fluid is used, the hydraulic fluid specified for use with the rescue tool shall not be classified as either a flammable liquid or a combustible fluid unless classified as a Class IIIB combustible liquid in accordance with NFPA 30.
- N 5.4.1.7 Rating.**
- N 5.4.1.7.1** Where hydraulic fluid is used, all rescue tool hydraulic fittings and quick-connect couplers shall be rated for, at a minimum, the rated system input.
- N 5.4.1.7.2** Where hydraulic fluid is used, all rescue tool hydraulic fittings and quick-connect couplers shall have a safety factor of at least 2:1.
- N 5.4.1.8* Check Valves for Quick-Connect Couplers.**
- N 5.4.1.8.1** Rescue tools shall be equipped with quick-connect couplers.
- N 5.4.1.8.2** Where hydraulic fluid is used, each quick-connect coupler shall have a check valve that can withstand the specified rated system input when disconnected.
- N 5.4.1.9** All rescue tool quick-connect couplers shall be designed to prevent accidental uncoupling during operation.
- N 5.4.1.10** All controls that are required for the safe operation of the rescue tool shall be marked to indicate their function.
- N 5.4.1.11** The length, width, and height dimensions of the rescue tool, as supplied by the tool manufacturer, shall be verified by the third-party certification organization.
- N 5.4.1.12 Labels.**
- N 5.4.1.12.1** All electric components shall be labeled and listed for the intended application.
- N 5.4.1.12.2** Where labeled and listed electric components are not available for a specific application, the electric components that are used shall be evaluated for the intended application by the third-party certification organization.
- N 5.4.1.13** Where rescue tools utilize electric power, such rescue tools shall comply with the applicable and appropriate electrical safety requirements in Annex K of UL 60745-1, *Standard for Safety for Hand-Held Motor-Operated Electric Tools — Safety — Part 1: General Requirements*.
- N 5.4.1.14** All rescue tool electrical connectors shall be rated to handle the electrical current realized when the system is operating at rated system input.
- N 5.4.1.15** A switch or other control device shall be acceptable for the application, with voltage and amperage ratings not less than the corresponding values of the load that it controls.
- N 5.4.1.16** Electrical parts of the rescue tool shall be so located or enclosed that protection against unintentional contact with noninsulated live parts shall be provided.
- N 5.4.1.17** Strain relief shall be provided to prevent a mechanical stress on a flexible cord from being transmitted to terminals, splicing, or internal wiring.
- N 5.4.1.18** Wiring shall be protected from sharp edges, burrs, moving parts, and other conditions that might cause abrasion of the insulation of conductors.
- N 5.4.1.19** The electric motor of the rescue tool shall drive the maximum intended load of the tool without introducing risk of fire, electric shock, or injury to persons.
- N 5.4.1.20** Where an enclosure as part of the rescue tool or rescue tool component is provided for a battery or battery cell, the enclosure shall be vented to permit the circulation of air for dispersion of gases that can be generated under abnormal battery or battery cell or charging conditions.
- N 5.4.1.21** Where an enclosure as part of the rescue tool or rescue tool component is provided for a battery or battery cell, the enclosure shall be provided with means of heat transfer, such as ventilation openings or heat sinks, located so as to prevent thermal runaway of the battery or battery cell during normal charging at the maximum allowable ambient temperature as specified by the battery or battery cell manufacturer.
- N 5.4.1.22** Where rescue tools use batteries that are the prime energy source for the rescue tool, such rescue tools shall provide an indicator or other means to visually check the battery's state of charge.
- N 5.4.1.23** All battery or battery pack exposed live terminals shall provide a means to prevent accidental contact and arcing when not being used.
- N 5.4.2 Additional Requirements for Spreader Rescue Tools.**
- N 5.4.2.1 Gripping Surface.**
- N 5.4.2.1.1** The outside of the spreader arm ends or tips shall be provided with a gripping surface.
- N 5.4.2.1.2** The gripping surface shall extend the full width of the ends or tips.
- N 5.4.2.1.3** The gripping surface shall be at least 25 mm (1 in.) in length where measured inward from the ends or tips.
- N 5.4.2.2** Double-acting spreaders that are designed for pulling as well as pushing shall have pulling attachment points.
- N 5.4.2.3** The opening and closing travel distance of the spreader shall be determined at 21°C, ±3°C (70°F, ±5°F).
- N 5.4.2.3.1** The spreader shall be opened to the fullest extent using the rated system input and no external load.
- N 5.4.2.3.2** The distance between the tips shall be measured.
- N 5.4.2.3.3** The spreader shall then be closed to its full closure using the rated system input and no external load.
- N 5.4.2.3.4** The distance between the tips shall again be measured.
- N 5.4.2.3.5** The difference in measurements shall be the travel distance.
- N 5.4.2.3.6** The opening and closing travel distances of the spreader shall be recorded and verified with the data supplied by the manufacturer.