



JOINT CANADA-UNITED STATES
NATIONAL STANDARD

ANSI/CAN/UL 1821:2025

STANDARD FOR SAFETY

Thermoplastic Sprinkler Pipe and
Fittings for Fire Protection Service



SCC FOREWORD

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UL Standard for Safety for Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service,
ANSI/CAN/UL 1821

Fourth Edition, Dated July 30, 2019

Summary of Topics

This revision of ANSI/CAN/UL 1821 dated November 10, 2025 includes revised requirements from proposals dated June 6, 2025 and September 26, 2025: [9.7](#), [9.8](#), [12.1](#), [19.1](#), [20.2A](#), [21.2A](#), [23.4](#), [24.2A](#), [24.4](#), [Figure 24.1](#), [25.2A](#), [26.2A](#), [31.7](#), [Figure 31.1](#), [Figure 31.2](#), [31.8](#), [31.9](#), [Table 27.1](#), and [Table 28.1](#).

Text that has been changed in any manner or impacted by ULSE's electronic publishing system is marked with a vertical line in the margin.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated June 6, 2025 and September 26, 2025.

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ANSI/CAN/UL 1821:2025

Standard for Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service

Prior to the first edition, the requirements for the products covered by this Standard were included in the Outline of Investigation for Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service, Subject 1821.

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Second Edition – April, 2003

Third Edition – August, 2015

Fourth Edition

July 30, 2019

This ANSI/CAN/UL Safety Standard consists of the Fourth Edition including revisions through November 10, 2025.

The most recent designation of ANSI/UL 1821 as an American National Standard (ANSI) occurred on November 10, 2025. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, Preface or SCC Foreword.

This standard has been designated as a National Standard of Canada (NSC) on November 10, 2025.

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Preface

This is the Fourth Edition of the ANSI/CAN/UL 1821, Standard for Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service.

ULSE is accredited by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC) as a Standards Development Organization (SDO).

This Standard has been developed in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization.

This ANSI/CAN/UL 1821 Standard is under continuous maintenance, whereby each revision is approved in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization. In the event that no revisions are issued for a period of four years from the date of publication, action to revise, reaffirm, or withdraw the standard shall be initiated.

This Fourth Edition Joint National Standard and National Standard of Canada is based on, and now supersedes, the Third Edition of UL 1821 and the Second Edition of ULC/ORD-C199P.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

Comments or proposals for revisions on any part of the Standard may be submitted at any time. Proposals should be submitted via a Proposal Request in the Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

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This Edition of the Standard has been formally approved by the Technical Committee (TC) on Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service, TC 1821.

This list represents the TC 1821 membership when the final text in this Standard was balloted. Since that time, changes in the membership may have occurred.

TC 1821 Membership

Name	Representing	Interest Category	Region
J. Bittenbender	Rehau INC	Producer	USA
A. Black	Carmel Fire Protection Associates	Authorities Having Jurisdiction / Regulator	USA
M. Carassoulis	Insurance Engineering Services	General Interest	Ontario
G. Carrier	PGA Experts INC	General Interest	Canada
R. Fleming	Northeast Fire Suppression Associates, LLC	General Interest	USA
J. Gardiner	North BAY Fire & Emergency Services	Authorities Having Jurisdiction / Regulator	Ontario

TC 1821 Membership Continued on Next Page

TC 1821 Membership Continued

Name	Representing	Interest Category	Region
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F. Hampton	Lubrizol Advanced Materials INC	Producer	USA
J. Hebenstreit	UL Solutions	Testing & Stds Org	USA
K. Hubbard	City Of Airdrie	Authorities Having Jurisdiction / Regulator	Canada
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J. Paschal	Aquatherm	Producer	USA
S. Pearce	National Fire Equipment LTD.	Supply Chain	Ontario
S. Pugsley	Seneca Polytechnic	General Interest	Ontario
R. Ray	Cybor Fire Protection CO	Supply Chain	USA
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M. Sewell	Victaulic CO Of America	Producer	USA
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This Standard is intended to be used for conformity assessment.

The intended primary application of this Standard is stated in its scope. It is important to note that it remains the responsibility of the user of the standard to judge its suitability for this particular application.

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INTRODUCTION

1 Scope

1.1 These requirements cover thermoplastic pipe and fittings for use in wet pipe sprinkler systems for fire protection service.

1.2 Thermoplastic pipe and fittings covered by these requirements are intended for use in sprinkler systems in any of the following types of occupancies:

- a) Light hazard occupancies as defined in the Standard for Installation of Sprinkler Systems, NFPA 13;
- b) Residential occupancies as defined in the Standard for Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes, NFPA 13D; and
- c) Residential occupancies as defined in the Standard for Installation of Sprinkler Systems in Low-Rise Residential Occupancies, NFPA 13R.

1.3 The pipe and fittings covered by these requirements are intended to be installed in accordance with the Standard for Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes, NFPA 13D; the Standard for Sprinkler Systems in Low-Rise Residential Occupancies, NFPA 13R; or the Standard for Installation of Sprinkler Systems, NFPA 13.

1.4 The requirements covered by this standard do not address compatibility of plastic pipe and fittings with materials or products that they may be in contact with in storage, handling, or use.

2 Components

2.1 Except as indicated in [2.2](#), a component of a product covered by this standard shall comply with the requirements for that component. See Annex [A](#) for a list of standards for components referenced in this standard.

2.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or
- b) Is superseded by a requirement in this standard.

2.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

4 Undated References

4.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

5 Reference Publications

ASME B1.20.1, *Standard for Pipe Threads, General Purpose, Inch*

ASTM D 396, *Standard for Specification for Fuel Oils*

ASTM D 638, *Standard Test Method for Tensile Properties of Plastics*

ASTM D 1598, *Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure*

ASTM D 2444, *Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)*

ASTM D2837, *Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products*

NFPA 13, *Standard for the Installation of Sprinkler Systems*

NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*

NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies*

NFPA 90A, *Standard for the Installation of Air Conditioning and Ventilating Systems*

6 Terminology

6.1 The term "pipe", "piping", or "fitting" as used in these requirements refers to all thermoplastic pipe or fittings or any part thereof covered by these requirements unless specifically noted otherwise.

7 Glossary

7.1 For the purposes of these requirements, the following definitions apply.

7.2 FLEXIBLE THERMOPLASTIC PIPE – A fire sprinkler pipe that has sufficient flexibility to achieve directional changes, provided turns are not made with the pipe using a bending radius less than the minimum specified in the installation and design manual.

7.3 MULTIPURPOSE PIPING SYSTEM – A piping system within residential occupancies (NFPA 13R), dwellings, and manufactured homes (NFPA 13D), intended to serve both domestic and fire protection needs.

7.4 NPS (NOMINAL PIPE SIZE) – A dimensionless designator for pipe sizes defined in standards including Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR), ASTM F442/F442M and for PEX it is Standard Specification for Crosslinked Polyethylene (PEX) Hot- and Cold-Water Distribution Systems, ASTM F877 used to replace terms such as "Nominal Diameter" and "Nominal Size."

7.5 **RATED PRESSURE** – The maximum internal water pressure to which the piping is intended to be subjected to in the sprinkler system.

7.6 **RATED TEMPERATURE** – The maximum ambient temperature for which the piping is intended to be exposed for the fire sprinkler application.

7.7 **THERMOPLASTIC** – A plastic capable of being repeatedly softened by heating and hardened by cooling through a particular temperature range that is characteristic of the plastic. In the softened state, it is able to be shaped by processes such as molding or extrusion.

8 Use in Environmental Air Handling Spaces

8.1 Thermoplastic pipe intended for use in ceiling cavity environmental air handling spaces shall comply with (a) and (b) below:

a) Pipe shall be tested in accordance with the requirements in the Standard for Fire Test of Plastic Sprinkler Pipe for Visible Flame and Smoke Characteristics, UL 1887, and comply with the applicable requirements of the Standard for the Installation of Air Conditioning and Ventilating Systems, NFPA 90A.

b) Thermoplastic pipe intended for use in ceiling cavity environmental air handling spaces, shall comply with the applicable requirements of the National Building Code of Canada, and shall be tested in accordance with the Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies, ULC 102, if they are thermoset pipes, or in accordance with the Standard Method of Test for Surface Burning Characteristics of Floor, Floor Covering and Miscellaneous Materials and Assemblies, ULC 102.2, if they are thermoplastic pipes. Samples shall consist of two 7.4 m (24 ft.) lengths of pipe spaced 200 mm (8 in.) on center. Sprinkler piping intended to be used within a plenum shall have a flame-spread rating of not more than 25, and a smoke developed classification of not more than 50.

CONSTRUCTION

9 General

9.1 Pipe and fittings shall be in sizes 3/4 NPS and larger diameter and free from visible cracks, holes, foreign inclusions, or other defects.

Exception: Pipe and fittings for use in network systems (NFPA 13D) may be in sizes 1/2 NPS and larger diameter and shall be free from visible cracks, holes, foreign inclusions, or other defects.

9.2 Pipe and fittings shall be joined by a means applicable for the type of piping material such as by solvent cement, fusion, or mechanical means.

9.3 Threaded thermoplastic fittings intended for transition to other piping material shall be threaded in accordance with [9.5](#). Threaded thermoplastic fittings shall be made in accordance with the American Society for Testing and Materials (ASTM) requirements applicable to the thermoplastic material being used, as well as comply with the requirements of this Standard.

9.4 Male or female threaded thermoplastic fittings intended for direct connection to a sprinkler, with or without a metal insert, shall have threads that comply with [9.5](#), in addition to complying with the requirements of this Standard.

9.5 Threaded thermoplastic fittings intended for transition to other piping material in [9.3](#) and connection to sprinklers in [9.4](#) shall be threaded with threads conforming to the following: