



UL 299

STANDARD FOR SAFETY

Dry Chemical Fire Extinguishers

UL Standard for Safety for Dry Chemical Fire Extinguishers, UL 299

Twelfth Edition, Dated December 18, 2024

Summary of Topics

This New Twelfth Edition of ANSI/UL 299 dated December 18, 2024 incorporates editorial changes including renumbering and reformatting to align with current style, including the revisions to salt spray corrosion test, [46.1](#) – [46.5](#) and [46.7](#).

The new requirements are substantially in accordance with Proposal(s) on this subject dated June 21, 2024 and November 1, 2024.

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Documents

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Commitment for Amendments

This Standard is issued jointly by ULSE Inc. (ULSE) and ULC Standards. Amendments to this Standard will be made only after processing according to the Standards writing procedures by ULSE and ULC.

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This ANSI/UL Standard for Safety consists of the Twelfth Edition.

The most recent designation of ANSI/UL 299 as an American National Standard (ANSI) occurred on December 18, 2024. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface.

The Department of Defense (DoD) has adopted UL 299 on August 6, 1990. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

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Preface

This is the common ULSE and ULC Standard for Dry Chemical Fire Extinguishers. It is the Fourth edition of CAN/ULC 504, and the Twelfth edition of ANSI/UL 299.

This common Standard was prepared by ULSE Inc., ULC Standards and the Dry Chemical Fire Extinguisher Manufacturing Industry.

This Standard was formally approved by the ULC Committee on Portable Fire Extinguishers.

Only metric SI units of measurement are used in this Standard. If a value for measurement is followed by a value in other units in parentheses, the second value may be approximate. The first stated value is the requirement.

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.

Annex [A](#), identified as Normative, forms a mandatory part of this Standard.

NOTE: Although the intended primary application of this Standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

Level of Harmonization

This Standard used an ISO format, but is not based on, nor shall it be considered equivalent to, an ISO standard. This Standard is published as an identical standard.

An identical standard is a standard that is the same in technical content except for conflicts in Codes and Governmental Regulations. Presentation shall be word for word except for editorial changes.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard shall be based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision shall be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

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INTRODUCTION

1 Scope

1.1 These requirements cover the construction and performance, exclusive of performance during fire tests, of portable dry chemical and dry powder (Class D) fire extinguishers. Dry chemical and dry powder fire extinguishers are intended to be utilized in accordance with the Standard for Portable Fire Extinguishers, NFPA 10 and with the National Fire Code of Canada.

1.2 The requirements for performance during fire testing of dry chemical fire extinguishers are specified in the Binational Standard for Rating and Fire Testing of Fire Extinguishers, UL 711/ULC-S508.

1.3 As used in these requirements, the term "extinguisher" refers to all extinguishers or any part thereof covered by these requirements, unless specifically noted otherwise.

2 Units of Measurement

2.1 The metric unit shall be designated as the official unit for purposes of this Standard. Where values of measurement are specified in both SI and English units, either unit is used. In cases of dispute, the metric unit shall be used.

3 Referenced Publications

3.1 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.

3.2 The following publications are referenced in this Standard:

ASTM A370, *Standard Test Methods and Definitions for Mechanical Testing of Steel Products*

ASTM B117, *Standard Practice for Operating Salt Spray (Fog) Testing Apparatus*

ASTM B209, *Standard Specifications for Aluminum and Aluminum-Alloy Sheet and Plate*

ASTM D638, *Standard Test Method for Tensile Properties*

ASTM D677, *Standard Test Methods for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes*

ASTM D2565, *Standard Practice for Operating Xenon Arc-Type (Water-Cooled) Light Exposure Apparatus with and without Water for Exposure of Plastics*

CGA C-1, *Methods of Hydrostatic Testing of Compressed Gas Cylinders*

National Fire Code of Canada

NFPA 10, *Portable Fire Extinguishers*

UL 92, *Fire Extinguisher, Booster, and Noncollapsible Standpipe Hose and Hose Assemblies*

UL 94, *Tests for Flammability of Plastic Materials for Parts in Devices and Appliances*

UL 157, *Gaskets and Seals*

UL/ULC 252, *Compressed Gas Regulators*

UL/ULC 404, *Gauges, Indicating Pressure, for Compressed Gas Service*

UL 711, *Rating and Fire Testing of Fire Extinguishers*

UL 1439, *Test for Sharpness of Edges on Equipment*

ULC 522, *Fire Extinguishers and Booster Hose*

ULC-S508, *Rating and Fire Testing of Fire Extinguishers*

4 Components

4.1 Except as indicated in [4.2](#), a component of a product covered by this Standard shall comply with the requirements for that component. A component shall comply with both the UL and ULC standards for the component.

4.2 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.

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

4.4 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.

5 Glossary

5.1 For the purpose of this Standard, the following definitions apply.

5.2 **DISPOSABLE (NONRECHARGEABLE) FIRE EXTINGUISHER** – A fire extinguisher not capable of nor intended to undergo complete maintenance including internal inspection of cylinder, replacement of parts and seals and hydrostatic testing.

5.3 **EFFECTIVE DISCHARGE** – The time of discharge of extinguishing agent from the extinguisher until gas point.

5.4 **EXPELLANT GAS** – A compressed or pressurized gas used to propel the dry chemical extinguishing agent from a single cylinder.

5.5 **GALVANIC COMPATIBILITY** – Fire extinguisher cylinder and component parts which are not susceptible to 10-day stress corrosion cracking nor corrosion from combination of dissimilar materials.

5.6 **GAS POINT** – The point in time when the discharge changes from extinguishing agent to a gas and dry chemical combination.

5.7 HIGH FLOW EXTINGUISHER – A dry chemical extinguisher with a minimum 4.54 kg (10.0 lb) of extinguishing agent, an agent flow rate of at least 0.454 kg/s (1.0 lb/s), and having attained a Class B rating, suitable for Class B specific hazard applications specified in NFPA 10.

5.8 PORTABLE FIRE EXTINGUISHER – A fire extinguisher carried or on wheels and operated by hand.

5.9 PRESSURE GAUGE – A gauge that shows the pressure in the cylinder and the operating range of the extinguisher based upon the operating temperature-pressure relationship in appropriate pressure units.

5.10 PRESSURE INDICATOR – An indicator that shows that the extinguisher is pressurized with its rated expellant gas pressure.

5.11 RECHARGEABLE (REFILLABLE) FIRE EXTINGUISHER – A fire extinguisher capable of undergoing complete maintenance including internal inspection of cylinder, replacement of parts and seals and hydrostatic testing.

5.12 STORED PRESSURE TYPE FIRE EXTINGUISHER – A fire extinguisher in which both the extinguishing agent and expellant gas are in a single cylinder.

CONSTRUCTION

6 General

6.1 The construction of an extinguisher shall be such that the method of operation is obvious after observing the operating instructions.

6.2 The construction of an extinguisher shall be such that after discharge of the agent is initiated, the operator of the extinguisher is not required to take further manual actions to maintain the maximum possible flow of agent, other than holding the operating device in the fully opened position. The extinguisher shall be usable by one operator, without assistance from a second individual.

6.3 A disposable extinguisher shall not be rechargeable.

6.4 An extinguisher having a volume in excess of 2.3 L (140 in³) shall stand in the upright position without support.

6.5 A material for an extinguisher part, the deterioration of which causes the extinguisher to become inoperable or results in the risk of injury to persons, shall not be susceptible to stress corrosion.

6.6 A polymeric or other nonmetallic part, other than an "O" ring or gasket, shall be evaluated on the basis of:

a) Mechanical strength, including resistance to impact, see Vibration Tests, Section [41](#); Roadability and Rough Usage Tests, Section [42](#); Handle and Mounting Device Test, Section [26](#); Hydrostatic Pressure Test, Section [40](#); Burst Strength Test – Gauges and Indicators, Section [52](#); and Nameplate Exposure Tests, Section [60](#);

b) Moisture absorption, see [44.3.1](#) and [44.3.2](#), Salt Spray Corrosion Test, Section [46](#); One-Year Time Leakage Test, Section [50](#); Nameplate Exposure Tests, Section [60](#);

c) Flammability, see [6.7](#);

d) Resistance to deterioration due to aging, see Aging Tests – Polymeric Materials, Section [44](#); One-Year Time Leakage Test, Section [50](#); and Nameplate Exposure Tests, Section [60](#);

e) Exposure to light, see [44.3.2](#), Nameplate Exposure Tests, Section [60](#); and

f) Exposure to the extinguishing agent, see [44.2.1](#).

6.7 With reference to flammability, see [6.6\(c\)](#), polymeric materials shall be classified as HB, V-0, V-1, V-2, 5VA, or 5VB, when tested in accordance with UL 94. Other nonmetallic materials shall have equivalent characteristics.

6.8 An extinguisher shall operate as intended from the minimum storage temperature to 49 °C (120 °F), inclusive. Currently recognized minimum storage temperatures are minus 40 °C (minus 40 °F) and minus 54 °C (minus 65 °F). See Operating Temperature Limits Test, Section [32](#).

6.9 The edges and surfaces of a valve, cap, closure, hose, cylinder, handle, mounting device, and similar items, shall not be sufficiently sharp to constitute a risk of injury to persons in intended maintenance and use.

6.10 Whenever reference measurements are necessary to determine that a part as described in [6.9](#) is not sufficiently sharp to constitute a risk of injury to persons, the method described in UL 1439, is to be employed.

6.11 A hand portable extinguisher shall have a gross weight not exceeding 27 kg (60 lb).

6.12 A pressurizing adaptor for a rechargeable stored pressure type extinguisher shall have threads or other mechanical means for securement to the valve assembly.

7 Cylinders

7.1 The requirements in this clause do not apply to a rechargeable cylinder marked as complying with U.S. Department of Transportation (DOT), or Canadian Transportation of Dangerous Goods Regulations (TDGR), or ASME specifications, unless otherwise specifically indicated.

7.2 An extinguisher cylinder under the jurisdiction of the DOT or TDGR shall comply with the appropriate DOT or TDGR specifications for shipping containers.

7.3 An extinguisher cylinder shall be fabricated of a material having rigidity, durability, and resistance to corrosion at least equivalent to:

a) An aluminum alloy such as 6661-T6 or 6351-T6, see ASTM B209, having a minimum thickness of 0.71 mm (0.028 in);

b) An aluminum alloy, such as 1100, 1170, or 3003 having a minimum thickness of 0.71 mm (0.028 in);

c) A mild steel alloy, such as SAE 1010, having a minimum thickness of 0.71 mm (0.028 in); or

d) An austenitic stainless steel having a maximum of 0.03 % carbon content and having a wall thickness of at least 0.71 mm (0.028 in).

7.4 A cylinder assembled complete with permanently attached fittings shall be resistant to any corrosive influence of the extinguishing agent.

7.5 The material of the dome and bottom of a metal cylinder shall be of the same material as the cylinder.