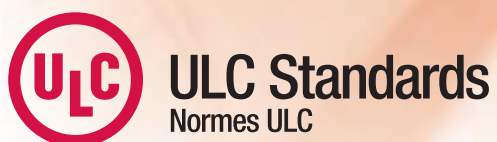




CAN/ULC-S503-05-R2018 (Reaffirmed 2018)

Standard for Carbon-Dioxide Fire Extinguishers



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CORPORATE HEADQUARTERS

Underwriters Laboratories of Canada
7 Underwriters Road
Toronto, Ontario M1R 3A9
Telephone: (416) 757-3611
Fax: (416) 757-9540

REGIONAL OFFICES

PACIFIC OFFICE

13775 Commerce Parkway, Suite 130
Richmond, British Columbia V6V 2V4
Telephone: (604) 214-9555
Fax: (604) 214-9550

EASTERN OFFICE

6505, Rte Transcanadienne, Suite 330
St-Laurent, Québec H4T 1S3
Telephone: (514) 363-5941
Fax: (514) 363-7014

For further information on ULC standards, please contact:

ULC STANDARDS

171 Nepean Street, Suite 400
Ottawa, Ontario K2P 0B4
Telephone: (613) 755-2729

To purchase ULC Standards, visit: www.ulc.ca/ulcstandards

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CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS FRANÇAISE ET ANGLAISE

Standard for Carbon-Dioxide Fire Extinguishers, CAN/ULC-S503-05-R2018

Fourth Edition, Dated February 2005

Summary of Topics

This revision of CAN/ULC-S503 is being issued to update the title page to reflect the reaffirmation of this Fourth Edition National Standard of Canada. No changes in requirements are involved.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated March 10, 2017.

PLEASE NOTE THAT CERTAIN CODES MAY REFER TO A SUPERSEDED VERSION OF THIS STANDARD. IN THOSE INSTANCES, THE RELEVANT VERSIONS ARE AVAILABLE FOR PURCHASE.

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Prepared by:



**ULC Standards
CAN/ULC-S503-05-R2018
Fourth Edition**



**Underwriters Laboratories Inc.
ANSI/UL 154
Ninth Edition**

Standard for Carbon-Dioxide Fire Extinguishers

February 28, 2005

(Title Reprinted on June 8, 2018)

This harmonized standard has been jointly revised on June 8, 2018 to reflect the SCC reaffirmation in Canada. For this purpose, UL and ULC Standards have updated the Title Page and Preface dated June 8, 2018.



ANSI/UL 154-2009 (R2014)



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Commitment for Amendments

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

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This ANSI/UL Standard for Safety consists of the Ninth Edition including revisions through May 6, 2014.

The most recent designation of of ANSI/UL 154 as a Reaffirmed American National Standard (ANS) occurred on May 6, 2014. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface.

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ULC Preamble

International Classification for Standards (ICS): 13.220.10

This Standard has been developed in compliance with the requirements of the Standards Council of Canada (SCC) for accreditation of a Standards Development Organization.

Attention is drawn to the possibility that some of the elements of this Canadian standard may be the subject of patents rights. ULC Standards shall not be held responsible for identifying any or all such patents rights.

This Standard is intended to be used for conformity assessment.

The Fourth Edition National Standard of Canada has now been reaffirmed.

This CAN/ULC-S503 standard is under continuous maintenance, whereby each revision is approved in compliance with the requirements of 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.

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 On-Line Collaborative Standards Development System (CSDS) at <https://csds.ul.com/canada>.

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Name	Affiliation	Category	Region
L. Bourgeois	Tritop Inc.	General Interest	Canada
J. Di Filippo	Kidde Canada Inc.	Producer	Canada
G. Faber	SCM Risk Management Services	General Interest	Canada
G. Ferris	Protection RT Inc.	Producer	Quebec
F. Goodnight	Amerex Corp.	Producer	USA
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ANNEX A

ANNEX B

Preface

This is the common UL and ULC Standard for Carbon-Dioxide Fire Extinguishers. It is the Fourth edition of CAN/ULC-S503, and the Ninth edition of ANSI/UL 154.

This Joint Standard was prepared by Underwriters Laboratories Inc., ULC Standards, and the UL/ ULC Extinguisher Technical Harmonization Committee. The efforts and support of the Harmonization Technical Committee are gratefully acknowledged.

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.

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 is published as an identical standard between UL and ULC Standards. 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 SDO 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 SDO. 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 SDOs to more accurately reflect the intent.

A INTRODUCTION

1 Scope

1.1 These requirements cover the construction and performance, exclusive of performance during fire tests, of portable carbon-dioxide fire extinguishers. Carbon-dioxide fire extinguishers are intended to be utilized in accordance with the Standard for Portable Fire Extinguishers, NFPA 10 and the National Fire Code of Canada.

1.2 The requirements for performance during fire testing of carbon-dioxide fire extinguishers are specified in the Binational Standard for Rating and Fire Testing of Fire Extinguishers, ANSI/UL 711 CAN/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 Reference Publications

3.1 See Annex A for a list of publications referenced in this standard. 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. When the latest edition of a standard is not applicable, the appropriate edition is indicated accordingly in Annex A.

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 Underwriters Laboratories Inc. and the Underwriters' Laboratories of Canada 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 an extinguishing agent from the extinguisher until gas point.

5.4 **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.

5.5 **GAS POINT** – The point in time when the combined snow and gas discharge changes into a purely gaseous condition.

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

5.7 **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.

B 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 An extinguisher having a capacity of 2.3 kg (5 lb) mass or more of carbon dioxide shall stand in the upright position without support.

6.4 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.

6.5 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 Handle and Mounting Device Test, Clause 24; Hydrostatic Pressure Test, Clause 30; Vibration Test, Clause 33; Roadability and Rough Usage Tests, Clause 34; Nameplate Exposure Tests, Clause 42;
- b) Moisture absorption; see Salt Spray Corrosion Test, Clause 39; One-Year Time Leakage Test, Clause 41, Nameplate Exposure Tests, Clause 42;
- c) Flammability, see 6.6;

d) Resistance to deterioration due to aging, see Aging Tests – Polymeric Materials, Clause 37; One-Year Time Leakage Test, Clause 41; Nameplate Exposure Tests, Clause 42;

e) Exposure to light and water, see 37.3 and Nameplate Exposure Tests, Clause 42.

6.6 With reference to flammability, polymeric materials shall be classified as HB, V-0, V-1, V-2, 5VA, or 5VB, when tested in accordance with the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94. Other nonmetallic materials shall have equivalent characteristics.

6.7 An extinguisher shall operate as intended from the minimum storage temperature to 49°C (120°F), inclusive.

6.7.1 The minimum storage and use temperature shall not be higher than minus 30°C (minus 22°F). Temperatures lower than minus 30°C (minus 22°F) shall be permitted only for low temperature charges. See Clause 21.1(c).

6.8 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.

6.9 Whenever reference measurements are necessary to determine that a part as described in 6.8 is not sufficiently sharp to constitute a risk of injury to persons, the method described in the Standard for Test for Sharpness of Edges on Equipment, UL 1439, is to be employed.

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

7 Cylinders

7.1 The requirements in this Clause do not apply to a cylinder marked as complying with U.S. Department of Transportation (DOT), or Canada Transportation of Dangerous Goods Regulations (TDGR).

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 A cylinder shall be threaded at the valve opening to accommodate a discharge valve.

7.4 The thread strength of the valve opening shall withstand not less than ten times the maximum rating of the pressure-relief mechanism. See 11.1.

7.5 The capacity of a cylinder shall be such that, when charged with the extinguisher's rated capacity plus the allowable tolerance of carbon dioxide, the weight of carbon dioxide does not exceed 68 percent of the water capacity, by weight, of the cylinder.

8 Discharge Valves

8.1 A cylinder of a hand-portable extinguisher shall be fitted with a manually opened, self-closing type valve. A cylinder for a wheeled extinguisher, shall be fitted with a manually opened valve having a manually or automatically operated locking mechanism, or other means, to maintain the valve in the open position throughout the effective duration of the extinguisher discharge.

8.2 A cylinder-mounted valve shall be constructed of a material that is compatible with the material of the cylinder with respect to the galvanic corrosion thread wear, or galling.

8.3 An extinguisher having a capacity greater than 9.1 kg (20 lb) or a wheeled extinguisher, shall be fitted with a self-closing type discharge valve at the discharge end of the hose.

8.4 A discharge valve shall be gas tight when closed, shall form a gastight connection with the components of the fire extinguisher to which it is intended to be attached, and shall operate as intended in atmospheric temperature as high as 49°C (120°F).

8.5 The construction of a cylinder-mounted discharge valve shall be such that the extinguisher is rechargeable as intended after use.

8.6 Operating parts of a discharge valve (valve stem, plunger pin, springs, bushings, and the like) shall be made of nonferrous metal or stainless steel resistant to corrosive influences encountered during intended use. See Salt Spray Corrosion Test, Clause 39.

9 Gaskets and "O" Rings

9.1 A gasket or an "O" ring shall be retained in a recess or the equivalent, in the cylinder or valve. A gasket or an "O" ring of a rubber-like material shall be of thickness to provide a compression-type seal and shall fit snugly against the cylinder or valve. See Elastomeric Parts Test, Clause 38.

10 Antirecoil Devices

10.1 An antirecoil device shall be provided to reduce risk of personal injury from recoil at the point where the horn or the hose-and-horn assembly is detached for recharging.