

**FIXED CONDENSED AEROSOL EXTINGUISHING SYSTEM  
UNITS**



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## FIXED CONDENSED AEROSOL EXTINGUISHING SYSTEM UNITS

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## FOREWORD

Certification organizations are periodically requested to promptly provide certification services for devices, constructions, materials and systems where Canadian recognized Standards do not currently exist or are not entirely applicable. Accordingly, the certification organization utilizes its experience, existing specifications and requirements in related areas, together with assistance from its advisory councils to develop and prepare Other Recognized Documents (ORDs) for use in conducting the necessary tests and evaluation investigation.

Underwriters Laboratories of Canada has prepared many ORDs in response to requests from, and in conjunction with, industry, code writing bodies, regulatory agencies and others prior to promulgating a certification program. In many instances such documents have become published ULC Standards and subsequently National Standards of Canada. It is the intention of Underwriters' Laboratories of Canada to continue this practice, as appropriate.

Comments on the content of this ORD should be directed to the Head Office of Underwriters Laboratories of Canada, 7 Underwriters Road, Toronto, Ontario, CANADA, M1R 3A9.

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## FIXED CONDENSED AEROSOL EXTINGUISHING SYSTEM UNITS

### PREFACE

This is the First Edition of ULC/ORD-C2775, Fixed Condensed Aerosol Extinguishing System Units.

Only metric SI units of measurement are used in this ORD. 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.

Requests for interpretation of this ORD should be sent to the ULC Mark Program Owner of Underwriters Laboratories of Canada. The requests should be worded in such a manner as to permit a “yes” or “no” answer based on the literal text of the requirement concerned.

This ORD is intended to be used for conformity assessment.

## 1 SCOPE

1.1 These requirements cover the construction and operation of fixed *condensed aerosol* fire extinguishing system units and *automatic extinguisher units* for total flooding applications intended to be installed, used, inspected, tested, and maintained in accordance with NFPA 2010, standard for Fixed Aerosol Fire Extinguishing Systems.

1.2 These requirements also cover performance requirements and methods of testing for fixed *condensed aerosol* systems, and associated components.

1.3 These requirements also cover *automatic extinguisher units* intended to be used in accordance with the manufacturer's installation instructions. Automatic units are not intended for:

- A use as a general substitute for aerosol generating extinguishing system units; or
- B protection of fire risks larger than those specified in the manufacturer's instructions for a single unit by using multiple units.

1.4 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involves a risk of fire or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the level of safety as originally anticipated by the intent of these requirements. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this document does not comply with these requirements.

## 2 REFERENCE PUBLICATIONS

The documents shown below are referenced in the text of this ULC Other Recognized Document (ORD). Unless otherwise stated elsewhere in this ORD, such reference shall be considered to indicate the edition and/or revisions of the documents available at the date on which this ULC ORD is published.

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- ASTM B117-2011, Standard Practice for Operating Salt Spray (Fog) Testing Apparatus
- ASTM E 1354-11b, Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

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- NFPA 2010 (2010 Edition), Fixed Aerosol Fire-Extinguishing Systems

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- ULC-S529-09, Smoke Detectors for Fire Alarm Systems
- CAN/ULC-S530-M91, Standard for Heat Actuated Fire Detectors for Fire Alarm Systems

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- UL 969-2008, Standard for Marking and Labelling Systems

### 3 GLOSSARY

NOTE: Terms used in this Standard that are in *italic* print are defined as follows:

**ACTUATING MECHANISM** — A mechanism whose automatic or manual operation leads to the discharge of extinguishing agent.

**AEROSOL GENERATOR** — A device for creating a fire-extinguishing medium by pyrotechnical means.

**AGENT QUANTITY** — Mass of *solid aerosol forming compound* required to achieve the *design application* density within the protected volume within the specified *discharge time*.

**AUTOMATIC EXTINGUISHER UNIT** — A unit that has no manual means of actuation and discharges extinguishing agent upon thermal actuation, is intended for use in *normally unoccupied* space, and is limited to a single protected area. Three automatic extinguisher units are intended to be used in accordance with the manufacturer's installation instructions. Automatic units are not intended for use as a general substitute for aerosol generating extinguishing system units; or protection of fire risks larger than those specified in the manufacturer's instructions for a single unit by using multiple units..

**AUTOMATIC/MANUAL SWITCH** — Means of converting the system from automatic to manual actuation.

**CONDENSED AEROSOL** — An extinguishing-medium consisting of finely divided solid particles, generally less than 10 microns in diameter, and gaseous matter, generated by a combustion process of a solid aerosol-forming pyrotechnic compound.

**COOLANT** — A heat absorbing medium or process.

**DENSITY, DESIGN APPLICATION (G/M<sup>3</sup>)** — *Extinguishing application* density, including a safety factor, required for system design purposes.

**DENSITY, EXTINGUISHING APPLICATION (G/M<sup>3</sup>)** — Minimum mass of a specific *aerosol forming compound* per m<sup>3</sup> of enclosure volume required to extinguish fire involving a particular fuel under defined experimental conditions excluding any safety factor.

**DISCHARGE TIME** — The time required to discharge 95 % of the agent mass at 20 °C (68 °F) necessary to achieve the minimum design concentration.

**DISCONNECT SWITCH** — A manually operated switch, electrically supervised and secured from unauthorized use, that prevents the automatic or manual electrical activation of the *aerosol generators* during *maintenance*, by electrically opening the releasing circuit.

**ELECTRIC INITIATOR** — An electrically operated device that is integral to an *aerosol generator* and starts the pyrotechnic reaction of a *solid aerosol forming compound*.

**ELECTRICAL CLEARANCE** — The unobstructed air distance between the *condensed aerosol generator*, and unenclosed or non-insulated live electrical components not at ground potential.

**HOLD TIME** — Period of time during which an extinguishant is required to maintain an even distribution throughout the protected volume in an amount at least at the *extinguishing application* density.

**INSPECTION** — A visual check to give reasonable assurance that the extinguishing system is fully operable.

**MAINTENANCE** — Thorough check and corrective actions, as necessary, to give maximum assurance that the extinguishing system will operate as intended.

**MANUAL MEANS OF ACTIVATION** — A means of system actuation in which the system operator initiates system discharge manually.

**NORMALLY OCCUPIED** — An area or space where, under normal circumstances, persons are present.

**NORMALLY UNOCCUPIED** — An area or space not *normally occupied* by people but which may be entered occasionally for brief periods.

**PRE-ENGINEERED SYSTEM** — A system that is tested in accordance with the limitations prescribed by the manufacturer for maximum and minimum height limitations, number and types of extinguishing units and placement, maximum areas, volumes, or both areas and volumes of protection.

**RELEASE** — The physical discharge or emission of aerosol as a consequence of the *condensed aerosol generator's* actuation.

**SOLID AEROSOL FORMING COMPOUND** — A solid mixture of oxidant, combustible component and technical admixtures that produces a *condensed aerosol* upon actuation.

**THERMAL CLEARANCE** — The air distance between a *condensed aerosol generator* and any structure or components sensitive to the temperature developed by the generator.

**TOTAL FLOODING EXTINGUISHING SYSTEM** — A system arranged to discharge an extinguishant into an enclosed space to achieve a uniform distribution of that extinguishant, at or above the *design application* density, throughout the space.

**UNOCCUPIABLE** — An area or space which cannot be occupied due to dimensional or other physical constraints.

**VOLUME PROTECTED** — Volume enclosed by the building elements around the protected enclosure, minus the volume of any permanent impermeable building elements within the enclosure.

## 4 CONSTRUCTION

### 4.1 GENERAL

4.1.1 After discharge of the extinguishing agent is initiated, an extinguishing system unit shall maintain the maximum rate of application of the extinguishing agent without requiring a manual action.

4.1.2 All exposed parts of an extinguishing system, including the finishes on coated or painted parts, the assemblies of moving parts, the nameplates as secured in place, the mounting bracket, or other similar parts, shall be resistant to commonly encountered atmospheric corrosive influences, and to galvanic corrosion, as determined by the Salt Spray Corrosion Test (see Subsection 5.5), Moist Hydrogen Sulphide Exposure Test (see Subsection 5.7), and Moist Carbon Dioxide/Sulphur Dioxide Exposure Test (see Subsection 5.8).

4.1.3 When the deterioration, breakage or other malfunction of a material for an extinguishing system unit presents a risk of causing the extinguishing system to become inoperable, the material shall not be susceptible to stress cracking. See Clause 5.15.2.

4.1.4 As covered by these requirements, an extinguishing system unit consists of:

- A Actuating assemblies;
- B *Aerosol generators*;
- C Mounting brackets;
- D Remote manual controls;
- E Other accessory equipment.

4.1.5 An extinguishing system unit shall have a minimum storage temperature of either -54 °C (-65 °F), -40 °C (-40 °F), -18 °C (0 °F), or 0 °C (32 °F); and a maximum storage temperature of either 49 °C (120 °F), or 54 °C (130 °F). A maximum storage temperature of 38 °C (100 °F) is permitted to apply to an *automatic extinguisher unit* only.

4.1.6 When used as part of a multiple unit system, an extinguishing system unit shall be provided with a means for simultaneous operation of all system units within 1 s.

4.1.7 The design concentrations for an extinguishing system unit and an *automatic extinguisher unit* shall be in accordance with NFPA 2010, standard for Fixed Aerosol Fire Extinguishing Systems. An extinguishing system unit shall comply with the Class A and Class B Fire Extinguishing Tests described