



JOINT CANADA-UNITED STATES
NATIONAL STANDARD

ANSI/CAN/UL 2901B:2024

STANDARD FOR SAFETY

Vapor Corrosion Inhibitors for Use in
Fire Sprinkler Systems



ANSI/UL 2901B-2024

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SCC FOREWORD

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UL Standard for Safety for Vapor Corrosion Inhibitors for Use in Fire Sprinkler Systems, ANSI/CAN/UL 2901B

First Edition, Dated November 28, 2023

Summary of Topics

This revision of ANSI/CAN/UL 2901B dated July 12, 2024 includes the addition of the Standard for the Installation of Standpipe and Hose Systems, NFPA 14, to the Scope, [1.2\(d\)](#).

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 requirements are substantially in accordance with Proposal(s) on this subject dated April 5, 2024.

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ANSI/CAN/UL 2901B:2024

Standard for Vapor Corrosion Inhibitors for Use in Fire Sprinkler Systems

First Edition

November 28, 2023

This ANSI/CAN/UL Safety Standard consists of the First Edition including revisions through July 12, 2024.

The most recent designation of ANSI/UL 2901B as an American National Standard (ANSI) occurred on July 12, 2024. 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 July 12, 2024.

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Preface

This is the First Edition of ANSI/CAN/UL 2901B, Standard for Vapor Corrosion Inhibitors for Use in Fire Sprinkler Systems.

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 2901B 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.

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.

This joint American National Standard and National Standard of Canada is based on, and now supersedes the first issue of UL 2901B, Outline of Investigation for Vapor Corrosion Inhibitors for Use in Fire Sprinkler Systems.

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 <http://csds.ul.com>.

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This Edition of the Standard has been formally approved by the Technical Committee (TC) on TC 2901, Antifreeze Solutions for Use in Fire Sprinkler Systems.

This list represents the TC 2901 membership when the final text in this Standard was balloted. Since that time, changes in the membership may have occurred.

TC 2901 Membership

Name	Representing	Interest Category	Region
P. Berken	American Valve & Hydrant Mfg. Co.	Supply Chain	USA
D. Bonn	Travelers Insurance	General Interest	USA
C. Browning	Medford Fire Rescue	Authorities Having Jurisdiction	USA
K. Bush	Office of the Maryland State Fire Marshal	Authorities Having Jurisdiction	USA
G. Colavecchia	Centurion Fire Control	Supply Chain	Canada
B. Cronin	Strategic Code Solutions	General Interest	USA

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TC 2901 Membership Continued

Name	Representing	Interest Category	Region
R. Ghandour – TC Project Manager	UL Standards & Engagement	Non-voting	Canada
M. Ghotikar	HD Fire Protect Pvt. Ltd.	Producer	India
F. Hampton	Lubrizol Advanced Materials, Inc.	Producer	USA
J. Hebenstreit	UL Solutions	Testing & Standards Org.	USA
M. Klaus	National Fire Protection Association	Testing & Standards Org.	USA
G. Lobdell	Dyne Fire Protection Labs	Testing & Standards Org.	USA
F. Luz – TC Chair	UL Standards & Engagement	Non-voting	Canada
L. Manninen	Marioff Corporation Oy	Producer	Finland
J. McDonald	American Fire Sprinkler Association	Producer	USA
T. Noble	American Fire Protection Group	Supply Chain	USA
M. O'Leary	Huguenot Labs	Producer	USA
S. Pearce	National Fire Equipment LTD.	Supply Chain	Canada
S. Pugsley	Seneca College	General Interest	Ontario
M. Savage	Marion County, FL	Authorities Having Jurisdiction	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 This Standard covers requirements for vapor corrosion inhibitors and their delivery system for use in fire sprinkler systems.

1.2 These corrosion inhibitors are intended for use in dry pipe and pre-action sprinkler systems for installation in accordance with the manufacturer's design and installation instructions and the following standards:

- a) Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes, NFPA 13D;
- b) Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies, NFPA 13R;
- c) Standard for Installation of Automatic Sprinkler Systems, NFPA 13; and
- d) Standard for the Installation of Standpipe and Hose Systems, NFPA 14.

1.3 These corrosion inhibitors are intended for use in dry pipe and pre-action sprinkler systems and intended to be inspected, tested and maintained in accordance with the Standard for Inspection, Testing and Maintenance of Water Based Fire Protection Systems, NFPA 25.

1.4 This Standard does not contain requirements for delivery systems that use electricity.

1.5 The requirements of this Standard evaluate the safety and compatibility of vapor corrosion inhibitors when used in a fire sprinkler system but do not evaluate the level of corrosion protection provided by an individual vapor corrosion inhibitor.

2 Units of Measurement

2.1 Where values of measurement are specified in both SI and U.S. Customary units, it is the responsibility of the user of this Standard to determine the unit of measurement appropriate for the user's needs.

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:

NFPA 13, *Installation of Sprinkler Systems*

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

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

NFPA 25, *Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*

UL 1450, *Motor-Operated Air Compressors, Vacuum Pumps, and Painting Equipment*

UL 2901, *Antifreeze Solutions for Use in Fire Sprinkler Systems*

4 Glossary

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

4.2 DELIVERY SYSTEM – The components that contain the corrosion inhibitor media and facilitate the introduction of the inhibitor to the sprinkler system, such as a housing, filter, and media packaging.

4.3 MEDIA – A solid substance that contains the vapor corrosion inhibitor which is retained in the delivery system that releases vapor for introduction into the sprinkler system.

4.4 VAPOR CORROSION INHIBITOR – A substance diffused or suspended in the air released from the sublimated media intended to mitigate corrosion when introduced into a fire sprinkler system.

CONSTRUCTION

5 General

5.1 The manufacturer shall provide a method and instructions for verifying the vapor corrosion inhibitor presence in the fire sprinkler system.

5.2 The vapor corrosion inhibitor system shall be designed so that media is retained in the delivery system.

5.3 The vapor or gas composition shall not form a combustible mixture.

5.4 The delivery system temperature limitations shall be determined by the manufacturer and indicated in the installation instructions.

5.5 The vapor corrosion inhibitor temperature limitations shall be determined by the manufacturer and indicated in the installation instructions. The maximum use temperature is not to be less than 150 °F (66 °C).

PERFORMANCE

6 General

6.1 A vapor corrosion inhibitor and delivery system shall comply with the requirements stated herein.

7 Composition Test

7.1 The vapor corrosion inhibitor composition shall be characterized using Gas Chromatography (GC).

7.2 A sample of the media containing the vapor corrosion inhibitor shall be added to a closed container at the maximum concentration specified by the manufacturer.

7.3 The container shall be placed in an oven for 70 hours at 150 °F (66 °C).

7.4 Immediately upon removal from the oven, the gas in the container shall be analyzed.

7.5 The composition of the gas from the container shall be determined using Gas Chromatography (GC) with detection techniques for quantifying component gases or equivalent gas analysis techniques.

7.6 The results from the test shall be included in the toxicity assessment.

8 Toxicity

8.1 A vapor corrosion inhibitor shall be considered acceptable for use in a sprinkler system based upon a toxicology assessment of the inhibitor constituents when used in accordance with the manufacturer's instructions and NFPA 13.

8.2 Exposure scenarios considered as a part of the toxicology assessment are to include at least the following:

- a) Release into an occupied space;
- b) Release into an occupied space during operation of a relief valve; and
- c) Release into the natural environment.

8.3 The GC data generated in Section [10](#) shall be included in the toxicity assessment.

8.4 The toxicological assessment with respect to human health under exposure scenarios in [8.2](#) is to be based upon exposures that are episodic and short-term in nature, and occur by direct dermal contact, limited inhalation, and limited ocular exposure of the product.

8.5 The toxicity assessment shall also include any exposure scenarios not covered by those indicated in [8.2](#) based on the manufacturers intended use, including system commissioning.

9 Corrosion Rate

9.1 A vapor corrosion inhibitor shall comply with the Corrosion Rate test in UL 2901.

9.2 The total immersion condition shall consist of an empty jar containing enough vapor corrosion inhibitor and media to achieve the maximum concentration specified by the manufacturer.

9.3 The partial immersion condition shall consist of a jar partially filled with tap water. Enough vapor corrosion inhibitor and media to achieve the maximum concentration specified by the manufacturer shall be suspended above the water in an open or permeable container within the jar.

10 Pit Depth Corrosion

10.1 A vapor corrosion inhibitor shall comply with the Pit Depth Corrosion test in UL 2901.

10.2 Upon completion of the Corrosion Rate test, the same coupons shall be used for the evaluation of Pit Depth Corrosion.

11 Stress Corrosion

11.1 A vapor corrosion inhibitor shall comply with the Stress Corrosion test in UL 2901.

11.2 The immersion condition shall consist of an empty jar containing enough vapor corrosion inhibitor and media to achieve the maximum concentration specified by the manufacturer.