JOINT CANADA-UNITED STATES
NATIONAL STANDARD

ANSI/CAN/UL 793:2020

STANDARD FOR SAFETY

Automatically Operated Roof Vents for Smoke and Heat

Approved American National Standard

ANSI/UL 793-2020

SCC FOREWORD

National Standard of Canada

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UL Standard for Safety for Automatically Operated Roof Vents for Smoke and Heat, ANSI/CAN/UL 793

Fourth Edition, Dated December 15, 2020

Summary of Topics

This Fourth Edition of ANSI/CAN/UL 793, Standard for Automatically Operated Roof Vents for Smoke and Heat, has been issued to reflect the latest ANSI and SCC approval dates, and to incorporate the proposal(s) dated July 31, 2020.

The new requirements are substantially in accordance with Proposal(s) on this subject dated July 31, 2020.

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DECEMBER 15, 2020

ANSI/CAN/UL 793:2020

Standard for Automatically Operated Roof Vents for Smoke and Heat

First Edition – November, 1995
Second Edition – June, 2003
Third Edition – December, 2008

Fourth Edition

December 15, 2020

This ANSI/CAN/UL Safety Standard consists of the Fourth Edition.

The most recent designation of ANSI/UL 793 as an American National Standard (ANSI) occurred on December 15, 2020. 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 December 15, 2020.

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Preface (UL)

This is the Fourth Edition of ANSI/CAN/UL 793 Standard for Automatically Operated Roof Vents for Smoke and Heat.

UL 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 793 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.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at http://csds.ul.com.

To purchase UL Standards, visit the UL Standards Sales Site at http://www.shopulstandards.com/HowToOrder.aspx or call tollfree 1-888-853-3503.

This Edition of the Standard has been formally approved by the UL Standards Technical Panel (STP) on Automatically Operated Roof Vents for Smoke and Heat, STP 793.

This list represents the STP 793 membership when the final text in this standard was balloted. Since that time, changes in the membership may have occurred.

STP 793 Membership

Name	Representing	Interest Category	Region
Harms, Donald	Lane-Aire Manufacturing Corporation	Producer	USA
McGrath, Alan	Underwriters Laboratories Inc.	STP Project Manager – Non-voting	USA
Milke, James	University of Maryland	General	USA
Mion, Peter	Code Consultants	General	USA
Musso, Joe	Underwriters Laboratories Inc.	STP Chair – Non-voting	USA
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STP 793 Membership Continued on Next Page

STP 793 Membership Continued

Name	Representing	Interest Category	Region
Rezaiefar, Ali	National Research Council Canada	Government	Canada
Rodgers, Brian	UL LLC	Testing and Standards	USA
Savage Sr., Michael	Marion County, Fl.	AHJ	USA
Schmidt, Carl	Bristol Fiberlite Industries	Producer	USA
Scott, Kevin	KH Scott & Associates	AHJ	USA

International Classification for Standards (ICS): 13.220.20

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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.

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

INTRODUCTION

1 Scope

1.1 These requirements cover automatically operated roof vents for smoke and heat that fall into two general categories: mechanically-opened and gravity-opened. Mechanically-opened vents consist primarily of a body frame, one or more damper covers and hatches, and operating mechanisms which generally include a heat responsive device and spring(s). Gravity-opened vents consist primarily of a body frame and nonmetallic drop-out panel. The vents covered by these requirements are operated manually or automatically in the event of fire to remove smoke and heat from the building. Automatic operation does not depend on electrical power or other energy sources that may be interrupted during a fire, but rather depends upon operation of a heat responsive device or on the action of a plastic cover shrinking and falling from place due to fire exposure, or the like. These vents are not intended for use as general purpose building ventilation devices.

2 Normative References

CSA Group Standards

CAN/CSA C22.2 No. 0.17, Evaluation of Properties of Polymeric Materials

UL Standards

UL 33, Standard for Heat Responsive Links for Fire-Protection Service

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

UL 746C, Standard for Polymeric Materials – Use In Electrical Equipment Evaluations

UL 790, Standard for Standard Test Methods for Fire Tests of Roof Coverings

UL 1332, Standard for Organic Coatings for Steel Enclosures for Outdoor Use Electrical Equipment

Other Standards

International Building Code

NFPA 204, Standard for Smoke and Heat Venting

ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM B555, Standard Guide for Measurement of Electrodeposited Metallic Coating Thicknesses by the Dropping Test

ASTM E11, Standard Specification for Wire Cloth and Sieves for Testing Purpose

3 Units of measurement

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

4 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 Components

5.1 Except as indicated in 5.2, a component of a product covered by this standard shall comply with the requirements for that component.

5.2 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.uperseded by a requirement in this standard.

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

5.4 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.

CONSTRUCTION

6 General

6.1 A roof vent shall be constructed to open during an internal building fire to facilitate venting of smoke and heat.

6.2 A vent shall be constructed to operate automatically, independent of electrical power or other energy sources that may be interrupted during a fire.

7 Materials

7.1 The nonmetallic materials used in a dome or cover(s) of a vent shall have the following properties:

a) They shall comply with the ultraviolet light exposure test in CAN/CSA C22.2 No. 0.17 and UL 746C, and

b) After the ultraviolet light exposure test, the materials shall:

1) Retain their physical properties as outlined in CAN/CSA C22.2 No. 0.17 and UL 746C (for example, retain their tensile strength and tensile impact, or flexural strength and Izod impact, depending on the type of material being tested), and

2) Have a minimum flammability rating of HB or better, in accordance with CAN/CSA C22.2 No. 0.17 and UL 94.

8 Assembly

8.1 A mechanically-opened vent shall be assembled so that it can be manually operated (opened) from inside or outside the building.

8.2 A mechanically-opened vent shall be constructed so as to open and lock in an open position.

8.3 A mechanically-opened vent shall open outward and the top cover shall not be any closer than 241 mm (9-1/2 in) from the finished roof surface, or 305 mm (12 in) to the bottom of the roof deck when opening or when fully open.

9 Protection Against Corrosion

9.1 A metal part used in the vent shall be one of the 300 Series of stainless steel or shall be provided with one of the following corrosion-protection systems or the equivalent.

a) A coating of hot-dipped mill galvanized sheet steel complying with the coating Designation G60 (G90 for an enclosure that houses live parts) or A60 in Table I of ASTM A653/A653M, with not less than 40 percent of the zinc on any side, based on the minimum single spot test requirement in the ASTM Designation. The weight of the zinc coating may be determined by any method, but in case of question shall be established in accordance with the test method in ASTM A90. An A60 (alloyed) coating shall also comply with the requirements in 9.4.

b) A zinc coating, other than that provided on hot-dipped mill galvanized sheet steel, uniformly applied to an average thickness of not less than 0.0104 mm (0.00041 in) on each surface with a minimum thickness of 0.00864 mm (0.00034) The thickness of the coating is to be established in accordance with the test method in ASTM B555. An annealed coating shall also comply with the requirements in 9.4.

c) A cadmium coating not less than 0.0127 mm (0.0005 in) thick on both surfaces. The thickness of coating is to be established in accordance with ASTM B555.

d) Two coats of an organic finish of the epoxy or alkyd-resin type or other outdoor paint on each surface. The acceptability of the paint may be determined by its composition or by corrosion tests as specified in UL 1332.

9.2 Coated or uncoated metals used in the assembly of vents shall be galvanically compatible.

9.3 Component springs and bearings used in the assembly of vents shall be of material having resistance to atmospheric corrosion.

9.4 A hot-dipped mill galvanized A60 (alloyed) coating or an annealed zinc coating that is bent or similarly formed after annealing and that is not otherwise required to be painted shall be painted in the bent or formed area as specified in 9.1(d) if the bending or forming process damages the zinc coating as described in 9.5.

9.5 If flaking or cracking of the zinc coating at the outside radius of the bent or formed section is visible at 25 power magnification, the zinc coating is to be considered damaged. Simple sheared or cut edges and punched holes are not considered to be formed, but rolled edges shall comply with the requirements in 9.4.

10 Heat Responsive Devices

10.1 A heat responsive device shall comply with UL 33, and shall be used in a manner such that it is not subjected to loads that exceed its rating.

10.2 The temperature rating of the fusible link or other heat responsive devices shall be a minimum of 71°C (160°F) and shall not exceed 271°C (520°F).

10.3 A fusible link, thermostat, or other heat responsive device shall be located so as to be in a heat exposed position when the vent is subjected to an internal building fire.

10.4 When more than one heat responsive device is used to release the vent, the operation of any one heat responsive device shall open the vent.

10.5 A plastic drop-out cover which serves as a heat responsive device that shrinks and falls from place due to fire exposure shall comply with the fire test requirements of this standard. See Section 19, Fire Test of Drop Out Vents.

11 Covers

11.1 A vent cover that employs nonmetallic material shall:

a) Have its cover rise not less than 10 percent of the maximum span, or not less than 127 mm (5 in), whichever is greater; or

b) Incorporate a protective wire mesh screen made of steel wire at least 2.37 mm (0.093 in) thick with a maximum mesh opening 25.4 mm (1 in), placed not less than 102 mm (4 in) nor more than 252 mm (10 in) above the entire nonmetallic portion of the cover. The screen shall also be formed around the extreme edges of the nonmetallic portion of the cover.

Exception: A vent that complies with the Impact Resistance Test, Section 18, need not incorporate a wire mesh screen.

11.2 A vent that incorporates a fall out type nonmetallic dome shall have a maximum area of 9.30 m^2 (100 sq. ft.).

PERFORMANCE

12 Cycling Test

12.1 Representative sample(s) of a mechanically-opened vent shall function as intended after being operated for 250 full-stroke (that is, locked-open and reclose) operations under static conditions. These operations will be conducted by simulating the vent's fusible link or other heat responsive device actuation.

12.2 The vents are to be cycled at an ambient temperature between 10 – 40° C (50 – 104° F) while oriented in the horizontal position.

12.3 If the vent's manual operating (opening) device and the related linkage mechanisms are different than the operating linkage mechanisms in which the fusible link or other heat responsive device are located, the sample(s) of the vent which underwent the 250 cycles test is to be subjected to 50 full-stroke operations using the manual operating device.

13 Speed of Opening Test

13.1 The speed of opening of the vent shall not be less than an average of 2.5 s. This average is based on five consecutive cycles with no one cycle less than 2.0 s.

14 Wind and Snow Load Test

14.1 A vent shall open to the locked-open position when subjected to a load (force) of 44.5 N (10 lbf) per 0.09 m^2 (1 ft^2). The force is to be applied in a vertical direction to simulate wind and snow conditions.