ULC-S645-93-REV2
(Includes Revision 2)

STANDARD FOR POWER ROOF VENTILATORS FOR COMMERCIAL AND INSTITUTIONAL KITCHEN EXHAUST SYSTEMS



UNDERWRITERS' LABORATORIES OF CANADA (ULC) is a not-for-profit organization incorporated in 1920 by letters patent issued by the Canadian Government. It maintains and operates laboratories and certification services for the examination, testing and classification of devices, constructions, materials and systems to determine their relation to life, fire and property hazards. Underwriters' Laboratories of Canada also develops and publishes, standards, classifications and specifications for products having a bearing on fire, accident, or property hazards.

Underwriters' Laboratories of Canada is accredited by the Standards Council of Canada as a Certification Organization, a Testing Organization, and a Standards Development Organization under the National Standards System of Canada, and is affiliated with Underwriters Laboratories Inc. in the United States of America.

ULC Standards is a not-for-profit organization and is accredited by the Standards Council of Canada as a Standards Development Organization.

National Standards of Canada developed by ULC Standards conform to the criteria and procedures established by the Standards Council of Canada. Such standards are prepared using the consensus principle by individuals who provide a balanced representation of interests relevant to the subject area on a national basis.

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: canada.ul.com/ulcstandards/

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 the particular application.

Copies of this ULC Standard may be ordered from ULC Standards.

Standard for Power Roof Ventilators for Commercial and Institutional Kitchen Exhaust Systems, ULC-S645

First Edition, Dated January 1, 1993

Summary of Topics

This revision of ULC-S645 dated November 8, 2021 has been issued to incorporate the proposals dated August 6, 2021 which include Corrections to Temperature Rise and Table Numbers; 4.4.1, 4.5.1, 4.6.1, TABLE 1, TABLE 3, and TABLE 4.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated August 6, 2021.

PLEASE NOTE THAT CERTAIN CODES MAY REFER TO A SUPERSEDED VERSION OF THIS STANDARD.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

UL COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM UL INC.

STANDARD FOR POWER ROOF VENTILATORS FOR COMMERCIAL AND INSTITUTIONAL KITCHEN EXHAUST SYSTEMS

ICS 23.120; 97.040.20

ULC Standards
Normes ULC

FIRST EDITION . . . . . JANUARY 1993
Reaffirmed . . . . . March 23, 2021
Revision 1 . . . . . April 12, 2021
REVISION 2 . . . . . NOVEMBER 8, 2021

Copyright © 2021

ULC Standards

All rights reserved. No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without prior permission.

UL COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM UL INC.

CONTENTS

ULC STANDARDS COMMITTEE ON KITCHEN EXHAUST EQUIPMENT AND SYSTEMS....7

REFERENCE PUBLICATIONS....9

PREFACE....11

1 SCOPE....13
2 GLOSSARY....13
3 CONSTRUCTION....13
3.1 MATERIALS....13
3.2 SERVICE ACCESS DOORS....13
3.3 EXHAUST DISCHARGE....13
3.4 ELECTRICAL COMPONENTS....14
3.5 GUARDING OF MOVING PARTS....14
3.6 MECHANICAL ASSEMBLY....14
4 PERFORMANCE....15
4.1 GENERAL....15
4.2 TEST INSTALLATION....15
4.3 TEMPERATURE MEASUREMENT....15
4.4 TEST NO. 1 – NORMAL TEMPERATURE....15
4.5 TEST NO. 2 – ABNORMAL FLARE UP....16
4.6 TEST NO. 3 – BURNOUT....16
4.7 TEST NO. 4 – DIELECTRIC WITHSTAND....16
4.8 TEST NO. 5 – RAIN....16
4.9 TEST NO. 6 – OVERVOLTAGE AND UNDERVOLTAGE....17
4.10 TEST NO. 7 – SHORT CIRCUIT....17
5 INSTALLATION INSTRUCTIONS....17
6 MARKING....17
7 POWER-SUPPLY CONNECTIONS....18
TABLES....21
FIGURES....23

APPENDIX A EXAMPLES OF TYPES OF CONSTRUCTION ASSEMBLIES CONTAINING NONCOMBUSTIBLE, LIMITED-COMBUSTIBLE, AND COMBUSTIBLE MATERIALS

UL COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM UL INC.

ULC STANDARDS COMMITTEE ON KITCHEN EXHAUST EQUIPMENT AND SYSTEMS

NAME	AFFILIATION	REGION	CATEGORY
C. Dineley (Chair)	Anjinnov Management, Inc.	Ontario	User
G. Cardenas	Halton Indoor Climate Systems, Ltd.	Canada	Producer
T. Crimi	A. C. Consulting Solutions, Inc.	Ontario	General Interest
R. de Launay	Office of the Fire Marshall and Emergency Management	Ontario	Regulator
D. Hui	Ministry of Municipal Affairs and Housing	Ontario	Regulator
T. Kelley	Giles Enterprises, Inc.	USA	Producer
M. McClure	Thermofire Systems	Ontario	General Interest
D. McNaughton	Ottawa Fire Services	Ontario	Regulator
T. Mills	Spring Air Systems, Inc.	Ontario	Producer
F. Riou	Cadexair	Quebec	Producer
M. Skierkiewicz	UL LLC	USA	Testing & Standards
D. Haithcock (Associate Member)	Underwriters Laboratories Inc.	USA	Non-Voting
N. Weeks (Secretary)	Underwriters Laboratories Inc.	USA	Non-Voting

This list represents the membership at the time the Committee balloted on the final text of this edition. Since that time, changes in the membership may have occurred.

UL COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM UL INC.

REFERENCE PUBLICATIONS

The documents shown below are referenced in the text of this Standard. Unless otherwise stated elsewhere in this Standard such reference shall be considered to indicate the edition and/or revisions of the document available at the date on which the Committee approved this ULC Standard.

Document Published by the American Society for Testing and Materials (ASTM)
100 Barr Harbour Drive, PO Box C700, West Conshohocken, PA 19428-2959 U.S.A.
Telephone: (610) 832-9585
www.astm.org

• ASTM B117-94, Standard Practice for Operating Salt Spray (Fog) Testing Apparatus

---

Documents Published by the Canadian Standards Association (CSA)
5060 Spectrum Way, Mississauga, ON L4W 5N6 Canada
Telephone: (416) 747-4000 or 1-800-469-6727
www.csa.ca

• CSA C22.1-1994, Canadian Electrical Code, Part 1

• CSA C22.2 No.100-95, Motors and Generators

• CSA C22.2 No.77-95, Motors With Inherent Overheating Protection

---

Document Published by Underwriters' Laboratories of Canada (ULC)
7 Underwriters Road, Toronto, ON M1R 3B4 Canada
Telephone: (416) 757-3611 or 1-866-9373-ULC
www.ulc.ca

• CAN4-S114-M80, Standard Method of Test for Determination of Noncombustibility in Building Materials

---

UL COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM UL INC.

PREFACE

This is the First Edition of the Standard for Power Roof Ventilators for Commercial and Institutional Kitchen Exhaust Systems, ULC-S645.

This Edition of the Standard has been formally approved by the ULC Standards Committee on Kitchen Exhaust Equipment and Systems.

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.

Appendix A, identified as informative, is for information purposes only.

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.

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.

Requests for interpretation of this Standard should be sent to ULC Standards. 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.

The initiation of the review of this Standard will commence within 5 years of the date of publication, unless the Standard is identified as fitting within a stabilized category, whereby the review will commence within the appropriate time frame set out by ULC Standards.

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.

This Standard is intended to be used for conformity assessment.

UL COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM UL INC.

1 SCOPE

1.1 These ventilators are for use with exhaust systems serving restaurant type cooking equipment such as ranges, broilers, deep fat fryers, grilles, etc. They are complete units, which may include a fan, motor, enclosing housing, roof penetration and duct connection flange.

1.2 They are intended for use in exhaust systems incorporating *exhaust hoods*.

1.3 They are designed to safely remove residual exhaust vapours and air-borne particles from the cooking area and discharge these exhaust products at a minimum height of 1000 mm above roof level.

2 GLOSSARY

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

COMBUSTIBLE MATERIAL – A material that fails to meet the acceptance criteria of CAN4-S114, Standard Method of Test for Determination of Non-Combustibility in Building Materials. See Appendix A for examples of types of construction assemblies containing combustible materials.

DUCTS – A continuous passageway for the transmission of air and vapours.

DUCT SYSTEM – A system including duct fittings, dampers, plenums, and/or other items or air handling equipment.

EXHAUST HOOD (Ventilator) – A device provided for a cooking appliance to capture and direct grease-laden vapours and exhaust gases.

GREASE – Rendered animal fat, vegetable shortening and other such oily matter used for the purpose of, and resulting from, the activity of cooking and/or preparing foods. Grease may be liberated and entrained with exhaust air, or may be visible as liquid or solid.

3 CONSTRUCTION

3.1 MATERIALS

3.1.1 The construction materials of a power roof ventilator shall be capable of meeting the performance requirements of Section 4.

3.1.2 The construction materials of a power roof ventilator shall be protected against corrosion by means such as painting, plating, or epoxy coating.

3.2 SERVICE ACCESS DOORS

3.2.1 Access openings communicating to the air stream shall have doors or covers that are smoke and flame tight and are located a minimum of 38 mm above the floor or assembly housing to prevent possible *grease* leakage.

3.3 EXHAUST DISCHARGE

3.3.1 Power roof ventilators shall discharge exhaust a minimum of 1000 mm above the roof level in an upward direction.

UL COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM UL INC.