CAN/ULC 109:2014 (R2024)

Standard Method for Flame Tests of Flame-Resistant Fabrics and Films

ULC Standards
Normes ULC

SCC CCN

Underwriters Laboratories of Canada (ULC) was established in 1920 by letters patent issued by the Canadian Government. It maintains and operates laboratories and certification services for the examination, testing and certification of appliances, equipment, materials, constructions and systems to determine their relation to life, fire and property hazards as well as providing inspection services.

ULC Standards develops and publishes standards and other related publications for building construction, security and burglar protection, environmental safety, electrical equipment, fire protection equipment, gas and oil equipment, thermal insulation products, materials and systems, energy use in the built environment and electrical utility safety.

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.

National Standard of Canada

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

For further information on ULC standards, please contact:

ULC STANDARDS
Telephone: 1-888-853-3503
E-mail: ClientService@shopULStandards.com

To purchase ULC Standards, visit: https://www.shopulstandards.com

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 National Standard of Canada may be ordered from ULC Standards.

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

Standard Method for Flame Tests of Flame-Resistant Fabrics and Films, CAN/ULC 109

Third Edition, Dated September 1, 2014

Summary of Topics

This reaffirmation of CAN/ULC 109 dated November 26, 2024 is being issued to update the title page to reflect the latest SCC approval dates as a National Standard of Canada (NSC). No changes in requirements are involved.

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 requirements are substantially in accordance with Proposal(s) on this subject dated September 6, 2024.

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

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

CAN/ULC 109:2014 (R2024)

Standard Method for Flame Tests of Flame-Resistant Fabrics and Films

ICS 59.080.30; 83.140.10; 13.220.40; 13.220.50

ULC Standards
Normes ULC

scc ccn

First Edition . . . . . May 1987
Second Edition . . . . . March 2003
THIRD EDITION . . . . . SEPTEMBER 2014
Reaffirmed . . . . . September 2019
REAFFIRMED . . . . . NOVEMBER 26, 2024

© 2024

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.

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

CONTENTS

ULC STANDARDS COMMITTEE ON FIRE TESTS 7

PREFACE 9

1 SCOPE 11
2 REFERENCE PUBLICATIONS 11
3 GENERAL 12
4 SAMPLE PREPARATION 12
4.1 GENERAL 12
4.2 AREA DENSITY OF FABRICS OR FILMS 12
4.3 SMALL-FLAME TEST 12
4.4 LARGE-FLAME TEST 13
5 TEST METHOD 13
5.1 SMALL-FLAME TEST 13
5.2 LARGE-FLAME TEST 14
6 PERFORMANCE REQUIREMENTS 14
6.1 GENERAL 14
6.2 SMALL-FLAME TEST 15
6.3 LARGE-FLAME TEST 15
7 CLEANING AND WEATHERING 15
7.1 GENERAL 15
7.2 LAUNDERING 15
7.3 DRY CLEANING 16
7.4 WATER LEACHING 16
7.5 SCRUBBING 16
7.6 ACCELERATED WEATHERING 16
8 REPORT 17
TABLES 17
FIGURES 18

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

ULC STANDARDS COMMITTEE ON FIRE TESTS

NAME	AFFILIATION	CATEGORY	REGION
M. Acheson	City Of Edmonton	Authorities Having Jurisdiction	Alberta
E. Banks	e.w.banks consulting llc	General Interest	USA
B. Banting	Canada Masonry Design Centre	Producer	Canada
B. Cheer	Ontario Building Officials Association	Authorities Having Jurisdiction	Ontario
J. Chisholm	Toronto Fire Services	Authorities Having Jurisdiction	Ontario
G. Chu	Chemistry Industry Association Of Canada / Spray Polyurethane Foam Producers & Applicators	Producer	Canada
S. Craft (Chair)	CHM Fire Consultants LTD	General Interest	Canada
T. Crimi	A C Consulting Solutions INC	General Interest	Canada
J. Current	Ministry of Solicitor General	Government	Canada
C. Dagenais	FPInnovations	Commercial / Industrial User	Canada
P. Darley	Miami Beach Fire Department	Authorities Having Jurisdiction	USA
C. Diercks	James Hardie Building Products, Inc.	Producer	USA
I. El-Hajj	DS Consultants Ltd.	General Interest	Canada
D. Esposito	Jensen Hughes	General Interest	Canada
D. Falconer	Falconer Engineering & Testing	General Interest	Canada
R. Ghandour	UL Standards & Engagement	TC Project Manager – Non-voting	Canada
M. Gilifillan	Matteo Gilfillan & Associates Inc.	General Interest	Canada
L. Gill	IPEX Management Inc.	Producer	Canada
E. Goldhammer	Hilti INC	Producer	USA
L. Hamre	Professional Loss Control INC	General Interest	Canada
L. Henke	PTW	Producer	Canada
T. Jukes	Wheatland County Fire Services	Authorities Having Jurisdiction	Alberta
K. Kooner	Intertek Testing Services	Testing & Standards Org.	Canada
M. Lansdowne	QAI Laboratories Ltd	Testing & Standards Org.	Canada
A. Laroche	National Research Council of Canada	Government	Canada
M. McClure	ThermoFire Systems INC	General Interest	Canada
B. McHugh	THE MCHUGH COMPANY (TMC)	General Interest	USA
R. McPhee	Canadian Wood Council	Producer	Canada
A. Nanji	Standards Individuals	General Interest	Canada
C. Palumbo	Capital Testing and Certification Services	Testing & Standards Org.	USA
J. Roberts	Standards Individuals	General Interest	Canada
R. Roos	Rockwool	Producer	Canada
S. Salem	Lakehead University	General Interest	Canada
D. Seale	Home Innovation Research Labs	Testing & Standards Org.	USA
G. Senechal	Cerco Cable Canada	Supply Chain	Canada
P. Shinkoda	USG/CGC Inc.	Producer	Canada
D. Sloan	UL Solutions	Testing & Standards Org.	USA

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

NAME	AFFILIATION	CATEGORY	REGION
I. Smith	Element Materials Technology	Commercial / Industrial User	Canada
L. Uku	Ministry of Municipal Affairs and Housing	Government	Canada
M. Van Geyn	Canadian Steel Door Manufacturers Association	Producer	Canada
F. Wiesner	University of British Columbia	General Interest	Canada
M. Birk	Queen's University	Non-Voting	Canada
E. Dahan	Department of National Defence / Government of Canada	Non-Voting	Canada
D. Haithcock	UL Standards & Engagement	Non-Voting	USA
L. Kearns	Standards Individuals	Non-Voting	Canada
H. Locke	Locke & Locke INC	Non-Voting	Canada
E. Sopeju	Standards Individuals	Non-Voting	Canada
B. Weckman	University of Waterloo	Non-Voting	Canada

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.

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

PREFACE

This is the Third Edition of the Standard Method for Flame Tests of Flame-Resistant Fabrics and Films, CAN/ULC 109.

This Edition of the Standard has been developed by the ULC Standards Task Group on Combustibility and has been formally approved by the ULC Standards Committee on Fire Tests.

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

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.

This Third Edition National Standard of Canada is based on, and now supersedes, the Second Edition.

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

This CAN/ULC 109 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 Collaborative Standards Development System (CSDS) at https://csds.ul.com.

This Standard is intended to be used for conformity assessment.

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

1 SCOPE

1.1 These requirements apply to the performance in flame-exposure tests of flame-resistant fabrics of natural, synthetic, or combinations of natural and synthetic fibres, or plastic films intended for such use as tents, awnings, draperies, or decorations. The flame resistance of the fabric or film may be inherent in the material used or may be the result of chemical treatment to retard ignition and spread of flame.

1.2 These requirements are not intended to apply to fabrics and films to be used for clothing nor to materials to be applied to surfaces of building or backing materials as interior finishes.

Note: Where fabrics and films are backed by a substrate, the fabric and film is more appropriately tested to the requirements in CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies. For the evaluation of roof coverings refer to the requirements in CAN/ULC-S107, Methods of Fire Tests of Roof Coverings.

1.3 The fabrics and films are intended for use in accordance with the requirements in the National Building Code of Canada.

2 REFERENCE PUBLICATIONS

2.1 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 International)
100 Barr Harbour Drive, PO Box C700, West Conshohocken, PA 19428-2959 U.S.A.
Telephone: (610) 832-9585
www.astm.org

• ASTM G155-13, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

---

Documents Published by Canadian General Standards Board (CGSB)
Place du Portage, Phase III, 6B1 11 Laurier Street, Gatineau, Quebec K1A 1G6 Canada
Telephone: (819) 956-0425 or 1-800-665-2472
www.tpsgc-pwgsc.gc.ca/ongc-cgsbd

• CAN/CGSB-4.2 No.24-2002, Textile Test Methods – Colourfastness and Dimensional Change in Commercial Laundering

• CAN/CGSB-4.2 No.30.3-94, Textile Test Methods – Procedure for the Removal of Non-Permanent Flame-Retardant Treatments from Textile Products

---

Document Published by the National Research Council Canada (NRCC)
1200 Montreal Road, Bldg. M-58, Ottawa, ON K1A 0R6 Canada
Telephone: (613) 993-9101 or 1-877-672-2672
www.nrc-cnrc.gc.ca

• National Building Code of Canada, 2010

Documents Published by ULC Standards
171 Nepean Street, Suite 400, Ottawa, ON K2P 0B4 Canada

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

Telephone: (416) 757-3611, ext. 61744; Fax (613) 231-5977, “ATTN: Publications”
E-mail: publications@ulc.ca
www.ulc.ca

• CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

• CAN/ULC-S107-10, Methods of Fire Tests of Roof Coverings

3 GENERAL

3.1 Fabrics and films have varied resistance to flaming, charring, and decomposition when exposed to heat and flames of different intensities. The following tests provide a means of determining the relative response to flame of fabrics or films under low intensities of fire exposure.

3.2 The small-flame test is intended to determine selected burning characteristics of fabrics and films in single sheets when exposed to a luminous flame 40 mm high for 12 s.

3.3 The large-flame test is intended to determine selected burning characteristics of fabrics and films in folds and single sheets when exposed to an oxidizing flame 280 mm high for 120 s.

3.4 Fabrics and films, which show acceptable performance in one test, may not show acceptable performance in the other test. Fabrics and films, which show acceptable performance in either test, may not retard flaming or smouldering combustion under different fire exposures.

3.5 Flame-resistant fabrics and films shall comply with the performance requirements of both the Small-Flame Test and the Large-Flame Test.

4 SAMPLE PREPARATION

4.1 GENERAL

4.1.1 Samples of the fabrics or films shall be obtained from the producing plant during the process of manufacture or from stock representative of production. They shall be of full width and of adequate length for full exploration.

4.2 AREA DENSITY OF FABRICS OR FILMS

4.2.1 The area density of each fabric or film shall be determined by obtaining the mass, length, and width of the samples, and computing the area density in terms of grams per square metre.

4.3 SMALL-FLAME TEST

4.3.1 Ten specimens, 90 by 250 mm, of each fabric or film shall be cut from locations as widely separated and as symmetrically located as possible over the area of each fabric or film sample. Five of the specimens shall be cut with the long dimension in the lengthwise direction of the roll, and five shall be cut with the long dimension in the direction of roll width.

4.3.2 The specimens shall be placed in a drying oven at 105 ± 2 °C for 30 min, then allowed to cool in a desiccator before testing. In the case of fabrics that are affected by heating to 105 ± 2 °C, such as wax-treated fabrics, pre-drying shall be achieved by placing the specimens in a desiccator for at least 12 h at 20 ± 2 °C and 50 ± 5 % relative humidity before testing, or by drying in an oven for 1 h at 60 ± 2 °C.

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