NATIONAL
STANDARD
OF CANADA

CAN/ULC-S112.1:2010-R2016
(Reaffirmed 2016)

STANDARD FOR LEAKAGE RATED DAMPERS FOR USE IN SMOKE CONTROL SYSTEMS

Prepared and Published by:

ULC Standards
Normes ULC

Approved by:

Standards Council of Canada
Conseil canadien des normes

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

Underwriters Laboratories of Canada is accredited by the Standards Council of Canada as a Certificatio Organization, a Testing Organization, and an Inspection Body under the National Standards System of Canada.

ULC Standards develops and publishes standards and other related publications for building construction, security and burglar protection, environmental safety, electrical equipment, fir 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-profi 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.

ULC is represented across Canada as well as many countries worldwide. For further information on ULC services, please contact:

Customer Service: 1-866-937-3852

National Standard of Canada

A National Standard of Canada is a standard developed by an SCC-accredited Standards Development Organization (SDO), and approved by the Standards Council of Canada (SCC), in accordance with SCC's: *Requirements and Guidance-Accreditation for Standards Development Organizations*, and *Requirements and Guidance-Approval of National Standards of Canada Designation*. More information on National Standard requirements can be found at www.scc.ca.

An SCC-approved standard reflect the consensus of a number of experts whose collective interests provide, to the greatest practicable extent, a balance of representation of affected stakeholders. National Standards of Canada are intended to make a significan and timely contribution to the Canadian interest.

SCC is a Crown corporation within the portfolio of Industry 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 identifie 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.

Users should always obtain the latest edition of a National Standard of Canada from the standards development organization responsible for its publication, as these documents are subject to periodic review.

CORPORATE HEADQUARTERS
Underwriters Laboratories of Canada
7 Underwriters Road
Toronto, Ontario M1R 3A9
Telephone: (416) 757-3611
Fax: (416) 757-9540

REGIONAL OFFICES

PACIFIC OFFICE
13775 Commerce Parkway, Suite 130
Richmond, British Columbia V6V 2V4
Telephone: (604) 214-9555
Fax: (604) 214-9550

EASTERN OFFICE
6505, Rte Transcanadienne, Suite 330
St-Laurent, Québec H4T 1S3
Telephone: (514) 363-5941
Fax: (514) 363-7014

For further information on ULC standards, please contact:
ULC STANDARDS
171 Nepean Street, Suite 400
Ottawa, Ontario K2P 0B4
Telephone: (613) 755-2729
Fax: (613) 231-5977
E-mail: customerservice@ulc.ca
Web site: www.ulc.ca

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.

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

NATIONAL STANDARD OF CANADA

CAN/ULC-S112.1:2010-R2016

STANDARD FOR LEAKAGE RATED DAMPERS FOR USE IN SMOKE CONTROL SYSTEMS

ICS 13.040; 13.220.30; 23.060; 91.140.30

Prepared and Published by:

ULC Standards
Normes ULC

Approved by:

Standards Council of Canada
Conseil canadien des normes

First Edition . . . . . June 1990
Second Edition . . . . . July 2010
REAFFIRMED . . . . . APRIL 2016

Copyright © 2016

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.

TABLE OF CONTENTS

ULC STANDARDS COMMITTEE ON FIRE TESTS I

PREFACE III

1 SCOPE 1

2 REFERENCE PUBLICATIONS 1

3 GLOSSARY 2

4 CONSTRUCTION 3

4.1 GENERAL 3
4.2 HEAT RESPONSIVE DEVICES 3
4.3 SLEEVES 4
4.4 ACTUATORS 4
4.5 CORROSION PROTECTION 5

5 PERFORMANCE REQUIREMENTS 5

6 FIRE-ENDURANCE AND HOSE-STREAM TEST 6

7 CYCLING TEST 6

8 SALT-SPRAY EXPOSURE TEST 7

9 SPRING CLOSING FORCE TEST 7

10 DYNAMIC CLOSURE TEST 7

11 DUCT IMPACT TEST 7

12 HYDROSTATIC STRENGTH TEST FOR PNEUMATIC ACTUATORS 7

13 TEMPERATURE DEGRADATION / CYCLING TEST 8

14 LEAKAGE TEST 8

14.1 GENERAL 8
14.2 HEATED AIR LEAKAGE MEASUREMENT FOR CORRELATION 9
14.3 SAMPLES REQUIRED FOR CORRELATION 9
14.4 AMBIENT LEAKAGE MEASUREMENT FOR CORRELATION 9

15 OPERATION TEST 10

15.1 GENERAL 10
15.2 METHOD 10

16 MULTIPLE ASSEMBLY 11

17 ACCELERATED AGING TEST 11

18 RIGIDITY TESTS 12

18.1 GENERAL 12
18.2 LATERAL DISPLACEMENT TEST 12
18.3 LONGITUDINAL DISPLACEMENT TEST 12

19 CONDITIONS OF ACCEPTANCE 12

19.1 CLASSIFICATION 12

20 INSTALLATION AND OPERATING INSTRUCTIONS 13

21 REPORT 14

TABLES 15

FIGURES 18

ULC STANDARDS COMMITTEE ON FIRE TESTS

NAME	AFFILIATION	REGION	CATEGORY
A. Laroche (Chair)	Canadian Codes Centre, National Research Council Canada	Canada	Regulator
C. Andersson	Health Canada	Canada	Regulator
B. Bulley	Canadian Steel Door Manufacturers Association	Canada	Producer
B. Cheer	Ontario Building Officials Association	Ontario	Regulator
S. Craft	CHM Fire Consultants Ltd.	Ontario	General Interest
T. Crimi	A.C. Consulting Solutions Inc.	Ontario	General Interest
C. Dagenais	FPInnovations	Canada	User
D. Falconer	Falconer Engineering & Testing	Ontario	General Interest
G. Frater	Canadian Steel Construction Council	Canada	Producer
G. Gardin	Canadian Plastics Industry Association	Canada	Producer
M. Gilfillan	Canadian Fire Safety Association	Canada	General Interest
G. Hadjisophocleous	Carleton University	Ontario	General Interest
L. Hamre	PLC Fire Safety Solutions	New Brunswick	General Interest
J. Humpries	City of Toronto	Ontario	Regulator
G. Lougheed	National Research Council Canada	Canada	User
M. McClure	ThermoFire Systems Inc.	Ontario	General Interest
R. McGrath	Cement Association of Canada	Canada	Producer
G. Morinville	National Defence and the Canadian Armed Forces	Canada	User
E. Randsalu	Office of the Fire Marshal and Emergency Management	Ontario	Regulator
J. Roberts	LRI Engineering Inc.	Canada	User
P. Shinkoda	CGC Inc.	Canada	Producer
I. Smith	Exova Canada Inc.	Canada	User
I. Van Zeeland	Canadian Wood Council	Canada	Producer
N. Benichou (Associate Member)	National Research Council Canada	Canada	Non-Voting
M. Birk (Associate Member)	Queen's University	Ontario	Non-Voting
L. Kearns (Associate Member)	National Defence and the Canadian Armed Forces	Canada	Non-Voting
K. Kooner (Associate Member)	Intertek	Canada	Non-Voting
H. Locke (Associate Member)	Locke & Locke Inc.	British Columbia	Non-Voting
E. Sopeju (Associate Member)	Underwriters Laboratories of Canada	Canada	Non-Voting
J. Su (Associate Member)	National Research Council Canada	Canada	Non-Voting
B. Weckman (Associate Member)	University of Waterloo	Ontario	Non-Voting
K. Wu (Project Manager)	ULC Standards	Canada	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.

STANDARD FOR LEAKAGE RATED DAMPERS FOR USE IN SMOKE CONTROL SYSTEMS

PREFACE

This is the Reaffirmation of the Second Edition of the Standard for Leakage Rated Dampers for Use in Smoke Control Systems, CAN/ULC-S112.1.

This Edition of the Standard 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.

The Second Edition of this National Standard of Canada has been reaffirmed.

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.

The review and action to revise or reaffirm this Standard will not exceed 5 years from 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.

This Standard is intended to be used for conformity assessment.

1 SCOPE

1.1 These requirements cover dampers intended for use in heating, ventilating and air conditioning (HVAC) systems.

1.2 *Leakage-rated dampers (smoke dampers)* are intended to restrict the spread of smoke in HVAC systems that are designed to control the movement of smoke within a building when the HVAC system is operational in engineered *smoke control systems*.

1.3 *Combination Fire and Smoke Dampers* are intended to restrict the spread of smoke in HVAC systems that are designed to control the movement of smoke within a building when the HVAC system is operational in engineered *smoke control systems*, and provide a barrier to passage of flame and hot gases. *Combination Fire and Smoke Dampers* shall meet the requirements of CAN/ULC-S112, Standard Method of Fire Test of Fire-Damper Assemblies and this Standard (see Table 1).

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.

Documents Published by the Air Movement and Control Association Inc. (AMCA)
30 West University Drive, Arlington Heights, Illinois, 60004, U.S.A.
Telephone: (847) 394-0150
www.amca.org

• AMCA 500-D-98, Laboratory Methods for Testing Dampers for Rating

---

Documents 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 A90/A90M-06, Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
• ASTM A313/A313M-02 (R2003), Standard Specification for Stainless Steel Spring Wire
• ASTM A653/A653M-06 REV A,Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
• ASTM A792/A792M-05, Standard Specification for Sheet Steel, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
• ASTM B117-03,Standard Practice for Operating Salt Spray (Fog) Apparatus
• ASTM B555-86 (R2002), Standard Guide for Measurement of Electro-Deposited Metallic Coating Thicknesses by the Dropping Test
• ASTM D412-06 REV A, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension

---

Documents Published by the National Fire Protection Association (NFPA)
1 Batterymarch Park Quincy, Massachusetts, U.S.A 02169-7471
Telephone: (617) 770-3000
Fax: (617) 770-0700
www.nfpa.org