UL 1479

ISBN 0-7629-0867-X

Fire Tests of Through-Penetration Firestops

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Underwriters Laboratories Inc. (UL)
333 Pfingsten Road
Northbrook, IL 60062-2096

UL Standard for Safety for Fire Tests of Through-Penetration Firestops, UL 1479

Third Edition, Dated May 23, 2003

Revisions: This Standard contains revisions through and including April 6, 2007.

Summary of Topics

The revisions dated April 6, 2007, were issued to correct an editorial error in the Fire Exposure Test, Section 5. Table 5.1 has been reinserted since it was incorrectly deleted as part of the September 20, 2006 revision pages.

UL Standards for Safety are developed and maintained in the Standard Generalized Markup Language (SGML). SGML -- an international standard (ISO 8879-1986) -- is a descriptive markup language that describes a document's structure and purpose, rather than its physical appearance on a page. Due to formatting differences resulting from the use of UL's new electronic publishing system, please note that additional pages (on which no requirements have been changed) may be included in revision pages due to relocation of existing text and reformatting of the Standard.

Text that has been changed in any manner is marked with a vertical line in the margin. Changes in requirements are marked with a vertical line in the margin and are followed by an effective date note indicating the date of publication or the date on which the changed requirement becomes effective.

The revisions dated April 6, 2007 include a reprinted title page (page1) for this Standard.

The following table lists the future effective dates with the corresponding reference.

Future Effective Date	References
September 20, 2007	4.1.2.1

As indicated on the title page (page 1), this UL Standard for Safety is an American National Standard. Attention is directed to the note on the title page of this Standard outlining the procedures to be followed to retain the approved text of this ANSI/UL Standard.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: http://ulstandardsinfonet.ul.com/ulforeword.html.

The master for this Standard at UL's Northbrook Office is the official document insofar as it relates to a UL service and the compliance of a product with respect to the requirements for that product and service, or if there are questions regarding the accuracy of this Standard.

UL's Standards for Safety are copyrighted by UL. Neither a printed copy of a Standard, nor the distribution diskette for a Standard-on-Diskette and the file for the Standard on the distribution diskette should be altered in any way. All of UL's Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of UL.

Document Was Downloaded By Ricoh Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 6/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of UL.

Revisions of UL Standards for Safety are issued from time to time. A UL Standard for Safety is current only if it incorporates the most recently adopted revisions.

UL provides this Standard ″as is″ without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if UL or an authorized UL representative has been advised of the possibility of such damage. In no event shall UL's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

UL will attempt to answer support requests concerning electronic versions of its Standards. However, this support service is offered on a reasonable efforts basis only, and UL may not be able to resolve every support request. UL supports the electronic versions of its Standards only if they are used under the conditions and operating systems for which it is intended. UL's support policies may change from time-to-time without notification.

UL reserves the right to change the format, presentation, file types and formats, delivery methods and formats, and the like of both its printed and electronic Standards without prior notice.

Purchasers of the electronic versions of UL's Standards for Safety agree to defend, indemnify, and hold UL harmless from and against any loss, expense, liability, damage, claim, or judgement (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic Standard on the purchaser's computer system.

If a single-user version electronic Standard was purchased, one copy of this Standard may be stored on the hard disk of a single personal computer, or on a single LAN file-server or the permanent storage device of a multiple-user computer in such a manner that this Standard may only be accessed by one user at a time and for which there is no possibility of multiple concurrent access.

If a multiple-user version electronic Standard was purchased, one copy of the Standard may be stored on a single LAN file-server, or on the permanent storage device of a multiple-user computer, or on an Intranet server. The number of concurrent users shall not exceed the number of users authorized.

Electronic Standards are intended for on-line use, such as for viewing the requirements of a Standard, conducting a word search, and the like. Only one copy of the Standard may be printed from each single-user version of an electronic Standard. Only one copy of the Standard may be printed for each authorized user of a multiple-user version of an electronic Standard. Because of differences in the computer/software/printer setup used by UL and those of electronic Standards purchasers, the printed copy obtained by a purchaser may not look exactly like the on-line screen view or the printed Standard.

An employee of an organization purchasing a UL Standard can make a copy of the page or pages being viewed for their own fair and/or practical internal use.

The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a ″SUPERSEDED REQUIREMENTS″ notice.

Document Was Downloaded by Ricoh Shi SHIMISHENG
For Use By RUANYECHI CO., LTD
1-20089 : 2/6/2007 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if the applicant elects this option, it should be noted that compliance with all the requirements in this Standard will be required as a condition of continued Classification and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

Copyright © 2007 Underwriters Laboratories Inc.

This Standard consists of pages dated as shown in the following checklist:

Page	Date
1	April 6, 2007
2-3	September 20, 2006
4-8B	March 10, 2006
9-10B	September 20, 2006
11-16	May 23, 2003
17-18	April 6, 2007
19	May 23, 2003
20-20B	March 10, 2006
21	May 23, 2003
22-23	May 8, 2006
24-24B	March 10, 2006
25-26	May 23, 2003
27-28	March 10, 2006
A1-A2	March 10, 2006
CRG1-CRG2	March 10, 2006
CRG3-CRG4	May 23, 2003

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

No Text on This Page

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

MAY 23, 2003
(Title Page Reprinted: April 6, 2007)

ANSI/UL 1479-2006

UL 1479

Standard for Fire Tests of Through-Penetration Firestops

Prior to the first edition, the requirements for the products covered by this standard were included in the Standard for Fire Tests of Building Construction and Materials, UL 263, and in the Standard for Fire Tests of Door Assemblies, UL 10B.

First Edition – January, 1983
Second Edition – June, 1994

Third Edition

May 23, 2003

The most recent designation of ANSI/UL 1479-2006 as an American National Standard (ANSI) occurred on September 18, 2006. The ANSI approval for this standard does not include the Cover Page, Transmittal Pages, Title Page, or the CRG.

This ANSI/UL Standard for Safety, which consists of the Third Edition with revisions through April 6, 2007, is under continuous maintenance, whereby each revision is ANSI approved upon publication.

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc. and is not part of the ANSI Standard.

Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements. 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.

ISBN 0-7629-0867-X

COPYRIGHT © 1973, 2007 UNDERWRITERS LABORATORIES INC.

Document Was Downloaded By Rico, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

No Text on This Page

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

CONTENTS

INTRODUCTION

1 Scope 7
2 General 8
2.1 Units of measurement 8
2.2 References 8
3 Glossary 8

PERFORMANCE

4 Fire Exposure Test 9
4.1 Test sample 9
4.2 Conditioning 10
4.3 Protection of assembly and sample 10
4.4 Furnace temperature control and measurement 10A
4.5 Furnace thermocouple preparation 12
4.6 Unexposed side temperature measurement 14
4.7 Differential pressure measurements 16
4.8 Duration of test 17
5 Hose Stream Test 17
6 Air Leakage Test 18
6.1 Test sample 18
6.2 Conditioning 18
6.3 Test chamber 19
6.4 Test setup 19
6.5 Extraneous chamber leakage requirements 19
6.6 Ambient temperature exposure tests 20
6.7 Elevated temperature exposure tests 20
6.8 Recorded test data 20
6A Water Leakage Test 20A
6A.1 Test sample 20A
6A.2 Test chamber 20A
6A.3 Test setup 20A
6A.4 Recorded test data 20B
7 Environmental Exposure Tests for Intumescent Material 21
7.1 General 21
7.2 Required environmental exposures 21
7.3 Supplemental environmental exposures 21
7.4 Expansion pressure test 22
7.5 Expansion factor test 23

RATING

8 F Rating 24
9 T Rating 24
10 L Rating 24
10A W rating 24
11 Fire Exposure Correction 24A

Document Was Downloaded By Rice, Shi SHUMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

REPORT

12 Results 25

APPENDIX A

A.1 Background information for the W-Rating A1

CANADIAN REQUIREMENTS COMPARISON GUIDE CRG 1479

UL AND CANADIAN STANDARDS FOR FIRE TESTS OF THROUGH-PENETRATION FIRESTOPS CRG1

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

No Text on This Page

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

This page intentionally left blank.

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

INTRODUCTION

1 Scope

1.1 These requirements cover through-penetration firestops of various materials and construction that are intended for use in openings in fire resistive wall or floor-ceiling assemblies, or both.

1.2 The method of testing through-penetration firestops as specified by these requirements consists of exposure of test samples to a fire of standard time and temperature and to an application of a hose stream. Ratings are then established on the basis of:

a) The length of time the firestop resists fire before the first development of through openings or flaming on the unexposed surface,

b) Acceptable limitation of thermal transmission, and

c) Acceptable performance under the application of the hose stream.

1.2 revised and separated into 1.2.1 – 1.2.4 March 10, 2006

1.2.1 The method of testing also includes optional air leakage tests to determine the rate of air leakage through through-penetration firestop systems resulting from a specified air pressure difference applied across the surface of the systems.

1.2 revised and separated into 1.2.1 – 1.2.4 March 10, 2006

1.2.2 The method of testing also includes optional water leakage tests to determine the ability of through-penetration firestop systems to resist the passage of water under a three foot pressure head. This method does not evaluate the ability of uncured firestop systems to resist such exposure.

1.2 revised and separated into 1.2.1 – 1.2.4 March 10, 2006

1.2.3 Two ratings are established for each through-penetration firestop system: an F rating based upon flame occurrence on the unexposed side of the test sample and acceptable hose stream performance; and a T rating based on temperature rise and flame occurrence on the unexposed side of the test sample and acceptable hose stream performance.

1.2 revised and separated into 1.2.1 – 1.2.4 March 10, 2006

1.2.4 An L rating may also be established for a through-penetration firestop system. The L rating is based on the amount of air leakage through the test sample.

1.2 revised and separated into 1.2.1 – 1.2.4 March 10, 2006

1.2.5 An W rating may also be established for a through-penetration firestop system. The W rating is based on the water resistance of the test sample.

1.2.5 added March 10, 2006

1.3 The method of testing through-penetration firestop systems containing piping systems for vented (drain, waste or vent) systems and closed (process or supply) systems is differentiated by the capping or non-capping of the piping systems on the unexposed side of the test assembly as described in 4.1.2.

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 9:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

1.4 Tests conducted in accordance with these requirements are intended to demonstrate the performance of through-penetration firestops during exposure to fire, but are not intended to determine acceptability of firestops for use after exposure to fire. These requirements do not cover the ampacity of conductors encased in through-penetration firestop materials.

1.5 The results obtained from the air leakage tests are expressed in cubic feet per minute (cubic meter per second) per square foot (square meter) of opening. The results are intended to develop data to assist authorities having jurisdiction, and others, in determining the acceptability of through-penetration firestops with reference to the control of air movement through the assembly.

1.6 These requirements do not cover devices that penetrate fire resistive floors and walls but terminate on the opposite side, as, for example, an outlet box and fitting.

2 General

2.1 Units of measurement

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

2.2 References

2.2.1 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 Glossary

3.1 For the purpose of this standard the following definitions apply.

3.2 AIR-FLOW METERING SYSTEM – A device used to measure the air flow.

3.3 AIR LEAKAGE (Q) – The volume of air flowing, per unit of time, through the openings around the test sample under a test pressure difference, expressed as cubic feet per minute (m^3/s). This air leakage volume is to be reported standardized to an ambient air temperature of 75°F (24°C).

3.4 AIR LEAKAGE TEST CHAMBER – A sealed chamber or box with an opening, a removable mounting panel, or one open side in which or against which the test sample is installed and sealed.

3.5 AIR SYSTEM – A controllable blower, compressed air supply, exhaust system, or reversible blower designed to provide an essentially constant required air flow at the specified fixed test pressure difference for the period required to obtain readings of air leakage.

3.6 AMBIENT TEMPERATURE EXPOSURE – The temperature at the exposed face of the test sample is to be 75 ±20°F (24 ±11°C).

3.7 ELEVATED TEMPERATURE EXPOSURE – The temperature at the exposed face of the test sample is to be 400 ±10°F (204 ±5°C).

3.8 EXTRANEOUS LEAKAGE (Q_L) – The difference between the metered air flow (Q_m) and the air leakage (Q).

3.9 METERED AIR FLOW (Q_m) – The volume of air flowing per unit of time through the air flow metering system, expressed as cubic feet per minute (m^3/s).

Document Was Downloaded By Rice, Shi BHIMISHENG
For Use By KUANTECH CO LTD
12089 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007

3.10 RATE OF AIR LEAKAGE – The total air leakage per sample, expressed as cubic feet per minute (m^3/s) per square foot (square meter) of opening.

3.11 REPLACEMENT AIR – The volume of air, at ambient temperature, added to the test chamber, to replace the air leakage (Q) volume of air in either the ambient or elevated temperature exposure tests.

3.12 TEST ASSEMBLY – The wall or floor into which the test sample is mounted or installed.

3.13 TEST PRESSURE DIFFERENCE – The specified difference in static air pressure across the fixed test sample, expressed as inch of water column (Pa).

3.14 TEST SAMPLE – The through-penetration firestop being tested.

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 2:34 AM

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

Documents
Document Sharing Hub

Full document details: UL 1479 2007