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Subject 162

12 Laboratory Drive
 Research Triangle Park, NC 27709
 January 11, 1996

TO: Fire Council of Underwriters Laboratories Inc.,
 Subscribers to UL's Standards Service for Foam Equipment and Liquid Concentrates

SUBJECT: Request for Comments on Proposed Requirements for the Seventh Edition of the
 Standard for Foam Equipment and Liquid Concentrates, UL 162; PROPOSED
 EFFECTIVE DATE

SUMMARY OF TOPICS

This bulletin proposes the following changes in requirements:

To delete the Mercurous Nitrate Immersion Test

To replace it with a 10-Day Moist Ammonia Air Stress Cracking Test.

COMMENTS DUE: February 21, 1996

Attached as Appendix A for your review and comment are proposed requirements for UL 162. Questions regarding interpretation of requirements should be directed to the responsible UL Staff. Please see Appendix B of this bulletin regarding designated responsibility for the subject product categories.

Please note that proposed requirements are of a tentative and early nature and are for review and comment only. Current requirements are to be used to judge a product until these requirements are published in final form.

PROPOSED EFFECTIVE DATE

The proposed requirements specified in Section 16A will necessitate a review and possible retest of currently Listed products. Therefore, UL proposes that the new requirements become effective 18 months after publication. This is intended to provide manufacturers with sufficient time to submit modified products for investigation and to implement the necessary changes in production. Please note that this also includes the time that will be needed by UL to conduct a review of the modified product.

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Subject 162

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January 11, 1996

REQUEST FOR COMMENTS ON PROPOSALS

Please provide the following:

1. Your comments concerning the proposed requirements; and
2. Your comments concerning the proposed effective date, should the proposals be adopted.

Written comments should be sent to the attention of Deborah Prince at UL's Research Triangle Park office, 12 Laboratory Drive, Research Triangle Park, NC 27709-3995. Please reference all correspondence to Subject 162.

All comments should be sent by February 21, 1996.

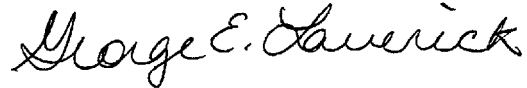
Unless specifically requested to do so, UL will not acknowledge comments indicating concurrence with these proposals.

UNDERWRITERS LABORATORIES INC.



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SR:SMB

162BUL.001

PROPOSED REQUIREMENTS ARE OF A TENTATIVE AND EARLY NATURE AND ARE FOR REVIEW AND COMMENT ONLY. CURRENT REQUIREMENTS ARE TO BE USED TO JUDGE A PRODUCT UNTIL THESE REQUIREMENTS ARE PUBLISHED IN FINAL FORM.

APPENDIX A

PROPOSED REQUIREMENTS AND PROPOSED EFFECTIVE DATE FOR THE SEVENTH EDITION OF THE STANDARD FOR FOAM EQUIPMENT AND LIQUID CONCENTRATES, UL 162

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~. Proposed new requirements are identified by (NEW). In the case of extensively revised paragraphs, the original text is identified by (CURRENT) and is ~~lined-out~~, followed by the proposed text identified by (PROPOSED). A paragraph that is proposed to be deleted is identified by (DELETED) and is shown ~~lined-out~~.

10-DAY MOIST AMMONIA AIR STRESS CRACKING TEST

RATIONALE

UL's March 18, 1994 Subject 162 bulletin proposed replacing the mercurous nitrate test with a 10-day moist ammonia-air stress cracking test. Based on review of comments to the bulletin and after further study, UL has concluded that (1) the aqueous ammonia used for the test should have a specific gravity of 0.94 rather than the 0.90, as the 0.94 solution is more likely to produce test results consistent with results obtained when testing with mercurous nitrate, and (2) cracking is considered acceptable provided that the part demonstrates acceptable performance when subjected to the hydrostatic pressure test, following exposure to the moist ammonia-air mixture. Cracking is to be observed using 25X magnification.

IMPACT

If adopted, this proposal will require a review and possible retest of currently Listed products to verify compliance with the new requirements. Products currently Listed that do not comply with the new requirements would need to be modified as appropriate by the effective date for the Listing to continue beyond that date.

PROPOSAL

16 Mercurous Nitrate Immersion Test

(DELETED)

~~16.1 All parts that are made of a copper alloy containing more than 15 percent zinc shall not crack while totally immersed for 30 minutes in an aqueous mercurous nitrate solution containing 10 grams of mercurous nitrate and 10 milliliters of nitric acid (specific gravity 1.42) per liter of solution. Solutions are to be prepared and replenished, and samples are to be cleaned and degreased in accordance with the Standard Method for Mercurous Nitrate Test for Copper and Copper Alloys, ASTM B164-92.~~

16.1 deleted effective (18 months after date of publication)

~~16.2 A test sample is to be subjected to the physical stresses intended to be imposed on or within the sample as a result of assembly and connection to tubing or piping. Such stresses are to be applied to the sample prior to and are to be maintained during the test.~~

16.2 deleted effective (18 months after date of publication)

~~16.3 A female or male sample is to be engaged with brass plugs or fittings tightened to a degree that produces a leak tight and vibration resistant assembly.~~

16.3 deleted effective (18 months after date of publication)

~~16.4 CAUTION Testing with mercury, both in the form of mercurous nitrate crystals and in the form of vapor produced by volatilization, can result in illness or injury to persons. Equipment for the detection and removal of mercury vapor is always to be provided. Rubber gloves are to be used.~~

16.4 deleted effective (18 months after date of publication)

(NEW SECTION)

16A 10-Day Moist Ammonia Air Stress Cracking Test

16A.1 After being subjected to the conditions described in 16A.2 – 16A.4, a brass part containing more than 15 percent zinc when examined using 25X magnification shall:

- a) Show no evidence of cracking; or
- b) Comply with the Hydrostatic Pressure Test, in Section 14 at two times the maximum operating pressure rather than four times the maximum operating pressure, if there is evidence of cracking.

Added 16A.1 effective (18 months after date of publication)

16A.2 Each test sample is to be subjected to the physical stresses normally imposed on or within a part as the result of assembly with other components. Such stresses are to be applied to the sample prior to and maintained during the test. Samples with threads, intended to be used for installing the product in the field, are to have the threads engaged and tightened to the torque specified in Table 16A.1. Teflon tape or pipe compound are not to be used on the threads.

Added 16A.2 effective (18 months after date of publication)

Table 16A.1
Torque requirements for threaded connections

Nominal thread size, Inches	Torque	
	pound-inches	(N•m)
1	1200	(135.6)
1-1/4	1450	(168.8)
1-1/2	1550	(175.1)
2	1650	(186.4)
2-1/2	1750	(197.7)
3	1800	(203.4)

Added Table 16A.1 effective (18 months after date of publication)

16A.3 Three samples are to be degreased and then continuously exposed in a set position for ten days to a moist ammonia-air mixture maintained in a glass chamber approximately 12 by 12 by 12 inches (305 by 305 by 305 mm) having a glass cover.

Added 16A.3 effective (18 months after date of publication)

16A.4 Approximately 600 ml of aqueous ammonia having a specific gravity of 0.94 is to be maintained at the bottom of the glass chamber below the samples. The samples are to be positioned 1-1/2 inch (38.1 mm) above the aqueous ammonia solution and supported by an inert tray. The moist ammonia-air mixture in the chamber is to be maintained at atmospheric pressure and at a temperature of 93°F (34°C).

Added 16A.4 effective (18 months after date of publication)

APPENDIX B

**DESIGNATED RESPONSIBILITY FOR UL
PRODUCT CATEGORIES FOR
EXTINGUISHERS AND EXTINGUISHING SYSTEM UNITS
GLHZ, GUXZ, GOHR, GFGV, GFUT, GFXX, GGIR, GHJX, GHXV**

The individual shown in the following table is involved with the investigation of products covered under the subject categories. The Primary Designated Engineer (**shown in UPPERCASE letters**) coordinates the establishment and uniform interpretation of UL requirements applicable to the product categories. The Designated Engineers (**shown in lowercase letters**) work with the Primary Designated Engineer to interpret requirements and maintain standards.

Should you have questions regarding the interpretation of the requirements proposed in this bulletin or any adopted requirements that affect your product, you are encouraged to contact the individual at the office to which you normally submit your products.

The Industry Advisory Conference (IAC) Chairman for the subject categories is William Metes at UL's Northbrook office. The IAC Chairman oversees the significant interpretations made by the Primary Designated Engineer and arbitrates any differences regarding interpretation of UL requirements.

CCN	Office/Subsidiary	Responsible Engineer	Extension
GLHZ, GUXZ, GOHR, GFGV, GFUT, GFXX, GGIR, GHJX, GHXV	Northbrook	KENNETH ZASTROW	42284

UL 162

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Foam Equipment and Liquid Concentrates



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**Underwriters Laboratories Inc.®**

Underwriters Laboratories Inc., founded in 1894, is chartered as a not-for-profit organization without capital stock, under the laws of the State of Delaware, to establish, maintain, and operate laboratories for the examination and testing of devices, systems and materials to determine their relation to hazards to life and property, and to ascertain, define and publish standards, classifications and specifications for materials, devices, products, equipment, constructions, methods, and systems affecting such hazards.

UL Standards for Safety are developed under a procedure which provides for participation and comment from the affected public as well as industry. The procedure takes into consideration a survey of known existing standards and the needs and opinions of a wide variety of interests concerned with the subject matter of the standard. Thus manufacturers, consumers, individuals associated with consumer-oriented organizations, academicians, government officials, industrial and commercial users, inspection authorities, insurance interests and others provide input to UL in the formulating of UL Standards for Safety, to keep them consonant with social and technological advances.

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**Documents**

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March 30, 1994

Standard for

Foam Equipment and Liquid Concentrates

UL 162, Seventh Edition

Accompanying this transmittal notice is a copy of the Seventh edition of UL 162.

A CHANGE IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM.

THIS EDITION OF THE STANDARD IS NOW IN EFFECT EXCEPT FOR PARAGRAPHS 3.7, 3.16(f), 3.27, 4.2.5, 8.1.1, 9.3.6, 10.2.3, 12.1, 18.1.1, 18.2.1, 18.2.2, 23.1, 23.2, 24.1, 24.2, and 24.3, SECTION 6, AND FOOTNOTE C OF TABLE 10.1, WHICH BECOME EFFECTIVE JULY 6, 1995 AS INDICATED IN THE SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEMS.

THE CURRENT REQUIREMENTS IN EFFECT FOR THE REQUIREMENTS HAVING FUTURE EFFECTIVE DATES ARE LOCATED IN THE BACK OF THE STANDARD.

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

The requirements in this standard are substantially in accordance with UL's bulletins on this subject dated July 6, 1993 and July 16, 1993. These bulletins are now obsolete and may be discarded.

Revised and/or additional pages may be issued from time to time.



Documents

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MARCH 30, 1994

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UL 162

Standard for

Foam Equipment and Liquid Concentrates

First Edition – May, 1960
Second Edition – August, 1969
Third Edition – March, 1974
Fourth Edition – June, 1975
Fifth Edition – June, 1983
Sixth Edition – March, 1989

The first through fourth editions were titled Air-Foam Equipment and Liquid Concentrates.

Seventh Edition

March 30, 1994

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

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 published set of revision pages.

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FOREWORD

A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.

B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.

C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.

D. A product employing materials or having forms of construction differing from those detailed in the requirements of this Standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with the Standard.

E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of or reliance upon this Standard.

F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

INTRODUCTION

1 Scope

1.1 These requirements cover foam producing equipment and liquid concentrates employed for the production and discharge of foam that has an expansion ratio of 20:1 or less and is used for fire extinguishment. These requirements are based on the premise that foam equipment and specified types of foam liquid concentrates with which they are intended to be used are to be investigated for use with each other.

1.2 If foam equipment covered by these requirements incorporate sprinklers, the sprinklers shall comply with the Standard for Automatic Sprinklers for Fire Protection Service, UL 199.

1.3 Requirements for the installation and use of foam equipment and liquid concentrates are included in the following standards of the National Fire Protection Association:

- a) Low Expansion Foam and Combined Agent Systems, NFPA 11;
- b) Deluge Foam-Water Sprinkler and Spray Systems, NFPA 16;
- c) Installation of Closed-Head Foam-Water Sprinkler Systems, NFPA 16A.

1.4 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involve a risk of fire, electric shock, or injury to persons, shall be evaluated using the appropriate additional component and end-product requirements as determined necessary to maintain the level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this Standard cannot be judged to comply with this Standard. Where considered appropriate, revision of requirements may be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this Standard.

2 General

2.1 Units of measurement

2.1.1 If a value for measurement is followed by a value in other units in parentheses, the second value may be only approximate. The first stated value is the requirement.

2.2 Components

2.2.1 Except as indicated in 2.2.2, a component of a product covered by this standard shall comply with the requirements for that component.

2.2.2 A component need not comply with a specific requirement that:

- a) Involves a feature or characteristic not needed in the application of the component in the product covered by this standard, or
- b) Is superseded by a requirement in this standard.

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

2.2.4 Specific components are recognized as being 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 for which they have been recognized.

2.3 Undated references

2.3.1 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 CLASS B FIRES – Fires in flammable and combustible liquids, gases, and greases.

3.3 CONTROL – A reduction in fire intensity of approximately 90 percent.

3.4 DISCHARGE COEFFICIENT "K" – Coefficient of discharge in the formula:

$$K = \frac{Q}{\sqrt{p}}$$

where:

Q = Flow in gallons per minute (L/s x 15.85),

p = Pressure in psi (6.89 kPa)

3.5 DISCHARGE DEVICE – Fixed, semifixed, or portable devices, such as foam chambers, fixed foam makers, monitors, nozzles, spray nozzles, and sprinklers, that direct the flow to the fire or flammable liquid surface.

3.6 FIRE TEST PAN – The fire test pan is to be square, straight sided, with a minimum area of 50 square feet (4.65 m²). The pan is to be of steel not less than 1/4 inch (6.4 mm) thick with liquid tight welded joints and provided with 3/16 inch (4.8 mm) thick angle to reinforce the upper edge. The reinforcement is to be continuous around the perimeter of the pan and is to form a turned-out edge flush with the top edge of the pan. The top edge surface so formed is to be 1-3/4 inch (44 mm). The reinforcing angle is to be continuously welded to the outside of the pan at the top edge and tackwelded at the edge of the lower lip of the angle.