

Standard for Safety

UL 263

Fire Tests of Building Construction and Materials

Standard

Northbrook, Illinois • (708) 272-8800
Melville, New York • (516) 271-6200
Santa Clara, California • (408) 985-2400
Research Triangle Park,
North Carolina • (919) 549-1400



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July 10, 1992

Standard for

Fire Tests of Building Construction and Materials

UL 263, Eleventh Edition

Accompanying this transmittal notice is a copy of the eleventh edition of UL 263.

THIS EDITION OF THE STANDARD IS NOW IN EFFECT.

The requirements in this standard are substantially in accordance with UL's bulletin on this subject dated July 18, 1991. This bulletin is now obsolete and may be discarded.

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

Subscribers to UL's services in the area covered by this standard will receive these revised and/or additional pages automatically. Others may receive such pages by subscribing to UL's subscription service for revisions. See UL's CATALOG OF STANDARDS FOR SAFETY for a description of the revision subscription service, the cost of the service for this standard, and ordering information.

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ELEVENTH EDITION

July 10, 1992

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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(1 – 07/10/92 – 07/10/92)

HISTORICAL NOTE

These requirements are an outgrowth of proposals of the British Fire Prevention Committee and were adopted in 1903 at an International Fire Congress in London. They were modified for American practice as the result of experience of Underwriters Laboratories Inc. (UL), dating from about the same time, and of study by the Committee on Fire Resistive Construction of the National Fire Prevention Association (NFPA) and the Committee on Fire Proofing of the American Society for Testing Materials (ASTM).

Conferences called jointly by the two committees in 1916–17, which were attended by representatives of the National Board of Fire Underwriters (NFBU), currently the American Insurance Association (AIA), UL, Associated Factory Mutual Fire Insurance Companies, currently the Factory Mutual Research Corporation (FMRC), National Bureau of Standards (NBS), currently the National Institute of Standards and Technology, and other interested national societies, resulted in drafting fire-test requirements which were adopted in 1918 by NFPA and ASTM. They were approved as a tentative American Engineering Standards Committee in 1919.

The Standard Time-Temperature Curve is a composite of a considerable number of performance and calculated curves studied by the above conference. Its principal difference from other curves lies in the rapid rate of rise during the first 10 minutes of the test, a feature embodying the experience and practice of UL.

Fire-test requirements were promulgated by UL as appendices to its reports to clients for many years prior to the adoption of the above requirements. The first UL publication of the fire test requirements, as a separate Standard, appeared in 1926 and was followed by the First Edition of the present Standard in May, 1929.

The Standard has been revised and approved on several occasions as an American National Standard, ANSI A2.1, by the American National Standards Institute (ANSI) under joint sponsorship of ASTM (Serial designation E119), NBS, and ANSI Fire Protection Group, consisting of NFPA, AIA, FMRC, and UL.

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FOREWORD

A. This Standard contains a description of the basic test method(s) for evaluating 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. This test method(s) is 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. It is subject to revision as further experience and investigation may show is necessary or desirable.

B. The consistent and uniform production of the product so that it will perform in the manner indicated by the coverage is one of the conditions of the continued coverage of the manufacturer's product.

C. A product which performs in a specified manner will not necessarily be judged to be eligible for coverage if, when examined and tested, it is found to have other features which impair the significance associated with such performance.

D. 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.

E. 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 fire tests are applicable to assemblies of masonry units and to composite assemblies of structural materials for buildings, including bearing and other walls and partitions, columns, girders, beams, slabs, and composite slab and beam assemblies for floors and roofs. They are also applicable to other assemblies and structural units that constitute permanent integral parts of a finished building.

1.2 The classifications for building construction and materials are intended to register performance during the period of fire exposure and are not intended to be interpreted as having determined their acceptability for use after fire exposure.

1.3 These requirements are intended to evaluate the length of time that the types of assemblies specified in 1.1 will contain a fire or retain their structural integrity, or both, dependent upon the type of assembly involved, during a predetermined test exposure. The test evaluates the assembly's resistance to heat, and in some instances to a hose stream, while carrying an applied load, if the assembly is load bearing.

1.4 Under these requirements a specimen is subjected to a standard fire exposure controlled to achieve specified temperatures throughout a specified time period. In some instances, the fire exposure may be followed by the application of a specified standard fire hose stream. This exposure by itself may not be representative of all fire conditions; conditions may vary with changes in the amount, nature, and distribution of fire loading, ventilation, compartment size and configuration, and heat sink characteristics of the compartment. These requirements provide a relative measure of fire performance of comparable assemblies under these specified fire exposure conditions. Any variation from the construction or conditions that are tested such as size, method of assembly, and materials, may substantially change the performance characteristics of the assembly.

1.5 These requirements cover the following measurements and determinations during the test exposure:

- a) Measurement of the transmission through the assembly of heat, and of gases sufficiently hot to ignite cotton waste in walls, partitions, floors, and roofs.
- b) Measurement of the load carrying ability of load bearing elements in wall, partition, floor, and roof assemblies.
- c) Measurement of the load carrying ability of individual load bearing assemblies, such as beams and columns, with consideration for the end support conditions, either restrained or not restrained.

1.6 These requirements do not cover:

- a) Accumulation of data as to performance of assemblies constructed with components or lengths other than those tested.
- b) Evaluation of the contribution of the assembly to generation of smoke, toxic gases, or other products of combustion.
- c) Measurement of the degree of control or limitation of the passage of smoke or products of combustion through the assembly.
- d) Simulation of the fire behavior of joints between building elements, such as floor-wall or wall-wall, and like connections.

- e) Measurement of flame spread over the surface of the tested element.
- f) The effect on fire endurance of conventional openings in the assembly, such as openings for electrical receptacle outlets, plumbing pipe, or the like, unless specifically provided for in the construction tested.

1.7 Tests for burning characteristics of building materials, based on the rate of flame spread, can be found in the Standard for Test for Surface Burning Characteristics of Building Materials, UL 723.

1.8 The tests described herein may be cited as the "Standard Fire Tests," and the performance of exposure is expressed as "2-hour," "6-hour," "1/2-hour," or the like.

1.9 The results of these tests represent one factor in assessing fire performance of building construction and assemblies. These requirements prescribe a standard fire exposure for comparing the performance of building construction assemblies. Application of these test results to predict the performance of actual building construction requires careful evaluation of test conditions.

1.10 If a factor of safety exceeding that inherent in the test conditions is desired, a proportional increase should be made in the specified time classification period.

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 Undated 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 Control Of Fire Tests

3.1 Time-temperature curve

3.1.1 The conduct of fire tests of materials and construction is to be controlled by the standard time-temperature curve shown in Figure 3.1. The points on the curve that determines its character are:

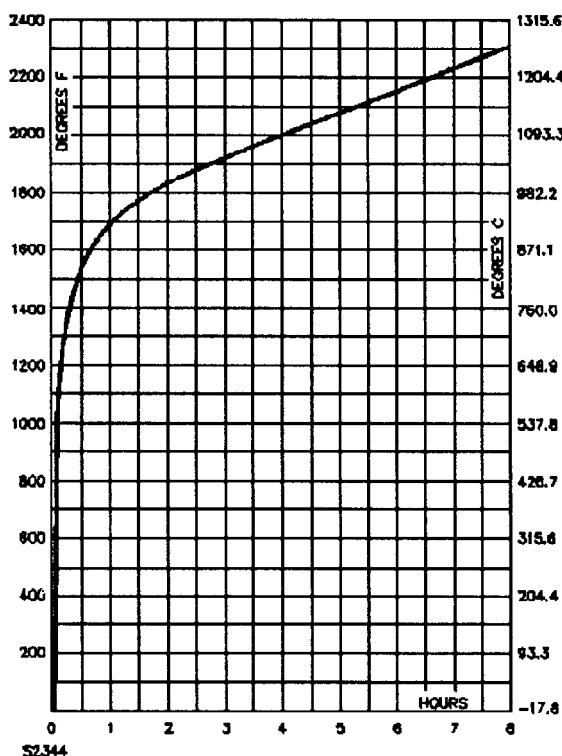
1000°F (538°C) at 5 minutes
1300°F (704°C) at 10 minutes
1550°F (843°C) at 30 minutes
1700°F (927°C) at 1 hour
1850°F (1010°C) at 2 hours
2000°F (1093°C) at 4 hours
2300°F (1260°C) at 8 hours
or over

For a more precise definition of the time-temperature curve, see Standard Time-Temperature Curve for Control of Fire Test, Appendix A.

3.2 Furnace temperatures

3.2.1 The measured temperature to be compared with the standard time-temperature curve is to be the average temperature obtained from the readings of not less than nine thermocouples for a floor, roof, wall, or partition and not less than eight thermocouples for a structural column, symmetrically disposed and distributed to indicate the temperature near all parts of the specimen.

Figure 3.1 — Time-temperature curve



3.2.2 The thermocouples are to be enclosed in sealed porcelain tubes, 3/4 inch (19.1 mm) in outside diameter and 1/8 inch (3.2 mm) in wall thickness or, as an alternative in the case of base metal thermocouples, enclosed in sealed, standard-weight 1/2 inch [0.84 inch (21.3 mm) outside diameter] black wrought steel or black wrought iron pipe. See the Standard for Welded and Seamless Wrought Steel Pipe, ANSI/ASME B36.10M-1985. The exposed length of the pyrometer tube and thermocouple in the furnace chamber is to be not less than 12 inches (305 mm). Other types of protecting tubes or pyrometers may be used that, under test conditions, give the same indications as those specified within the limit of accuracy that applies for furnace temperature measurements.

3.2.3 For floors and columns, the junction of each thermocouple is to be placed 12 inches (305 mm) away from the exposed face of the specimen at the beginning of the test and is not to touch the specimen during the test, as a result of specimen deflection.