



UL 263

STANDARD FOR SAFETY

Fire Tests of Building Construction and Materials

UL Standard for Safety for Fire Tests of Building Construction and Materials, UL 263

Fourteenth Edition, Dated June 21, 2011

Summary of Topics

This revision to ANSI/UL 263 dated March 14, 2022 includes air-dry conditions for test assemblies with SFRM; [5.2A.9](#)

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated December 31, 2021.

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1

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The most recent designation of ANSI/UL 263 as an American National Standard (ANSI) occurred on March 14, 2022. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

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 <https://csds.ul.com>.

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CONTENTS

INTRODUCTION

1	Scope	5
2	General	6
2.1	Units of measurement	6
2.2	Undated references	6
3	Control of Fire Tests	6
3.1	Time-temperature curve	6
3.2	Furnace temperatures	7
3.3	Temperatures of unexposed surfaces of floors, roofs, walls, partitions, and ceilings	8
3.4	Furnace pressure	9
4	Classification as Determined by Test	10

PERFORMANCE

5	General	11
5.1	Test specimen	11
5.2	Protection and conditioning of test specimen	12
5.2A	Protection and conditioning of test specimen	12
5.3	Conduct of fire endurance tests	13
5.4	Conduct of hose stream test	13
5.4A	Conduct of cotton pad test	14
5.5	Furnace exposure	16
5.6	Recording and reporting data	17
6	Bearing Walls and Partitions Test	17
6.1	Application	17
6.2	Size and character of specimen	17
6.3	Loading	17
6.4	Conditions of acceptance	18
7	Nonbearing Walls and Partitions Test	18
7.1	Application	18
7.2	Size and character of specimen	18
7.3	Conditions of acceptance	18
8	Columns Test	18
8.1	Application	18
8.2	Size and character of specimen	19
8.3	Loading	19
8.4	Exposure to fire	19
8.5	Conditions of acceptance	19
9	Alternate Test – Protection for Structural Steel Columns	19
9.1	Application	19
9.2	Size and character of specimen	19
9.3	Temperature measurement	20
9.4	Exposure to fire	20
9.5	Conditions of acceptance	20
9.6	Report of results	20
10	Floor and Roof Assemblies Test	20
10.1	Application	20
10.2	Size and character of specimen	21
10.3	Loading	21
10.4	Temperature measurement	21
10.5	Conditions of acceptance – restrained assembly	23
10.6	Conditions of acceptance – unrestrained assembly	24



11	Loaded Restrained Beams Test	25
11.1	Application	25
11.2	Size and character of specimen	25
11.3	Loading	25
11.4	Temperature measurement	25
11.5	Conditions of acceptance	26
12	Loaded Unrestrained Beams Test	27
12.1	Application	27
12.2	Size and character of specimen	27
12.3	Loading	27
12.4	Conditions of acceptance	27
13	Alternate Test – Protection for Loaded Beams	28
13.1	Application	28
13.2	Conditions of acceptance	28
14	Alternate Test – Protection for Solid Structural Steel Beams and Girders	28
14.1	Application	28
14.2	Size and character of specimen	28
14.3	Temperature measurement	29
14.4	Conditions of acceptance	29
14.5	Report of results	29
15	Tests of Protective Membranes in Wall, Partition, Floor, or Roof Assemblies	29
15.1	Application	29
15.2	Size and character of specimen	29
15.3	Temperature performance of protective membranes	29
15.4	Conditions of acceptance	30
15.5	Report of results	30
16	Ceiling Membrane Test	30
16.1	Application	30
16.2	Size and character of specimen	31
16.3	Test method	31
16.4	Conditions of acceptance	31
16.5	Report of results	31

APPENDIX A Standard Time-Temperature Curve for Control of Fire Tests

APPENDIX B Requirements for Thermocouple Pads

APPENDIX C Nonmandatory Guide for Determining Conditions of Restraint for Floor and Roof Assemblies and for Individual Beams

APPENDIX D (Informative) Guidance on Determining the Dampest Portion of a Test Specimen

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

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

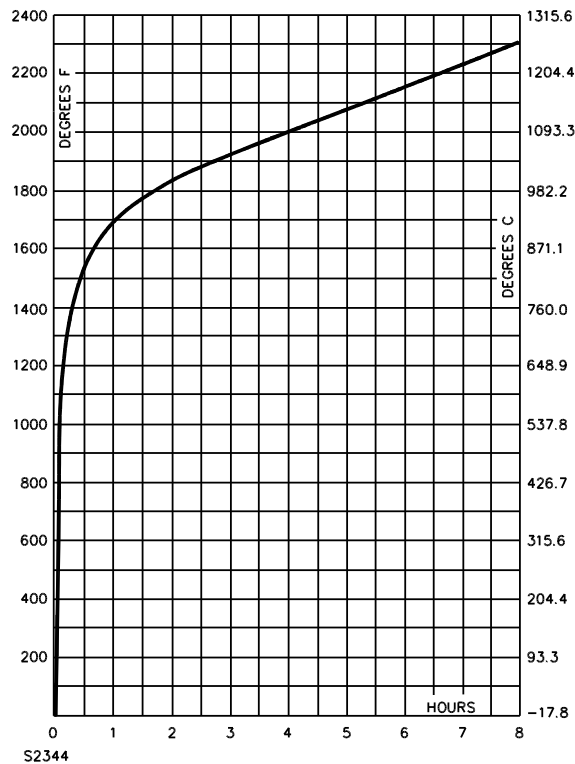
3.1 Time-temperature curve

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 determine its character are:

- a) 1000°F (538°C) at 5 min;
- b) 1300°F (704°C) at 10 min;
- c) 1550°F (843°C) at 30 min;
- d) 1700°F (927°C) at 1 h;
- e) 1850°F (1010°C) at 2 h;
- f) 2000°F (1093°C) at 4 h;
- g) 2300°F (1260°C) at 8 h or over.

For a more precise definition of the time-temperature curve, see Standard Time-Temperature Curve for Control of Fire Tests, Appendix [A](#).

Figure 3.1
Time-temperature curve



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 fewer than nine thermocouples for a floor, roof, wall or partition and not fewer than eight thermocouples for a structural beam or column, symmetrically disposed and distributed to indicate the temperature near all parts of the specimen.

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-in [0.84-in (21.3 mm) outside diameter] black wrought steel or black wrought iron pipe. See the Standard for Welded and Seamless Wrought Steel Pipe, ASME B36.10M. The exposed length of the pyrometer tube and thermocouple in the furnace chamber is to be not less than 12 in (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, roofs, beams and columns, the junction of each thermocouple is to be placed 12 in (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.

3.2.4 For walls and partitions, the thermocouples are to be placed 6 in (152 mm) away from the exposed face of the specimen at the beginning of the test and are not to touch the specimen during the test as a result of specimen deflection.

3.2.5 The temperatures are to be read at intervals not exceeding 1 min.

3.2.6 The temperature of the furnace is to be controlled so that the area under the measured time-temperature curve, obtained by averaging the results from the pyrometer readings, is within:

- a) 10 percent of the corresponding area under the standard time-temperature curve shown in [Figure 3.1](#) for fire tests of 1 hour or less duration,
- b) 7.5 percent for tests longer than 1 hour but not longer than 2 hours, and
- c) 5 percent for tests exceeding 2 hours in duration.

3.3 Temperatures of unexposed surfaces of floors, roofs, walls, partitions, and ceilings

3.3.1 Temperatures at unexposed surfaces are to be measured with thermocouples placed under flexible, dry, felted pads. The properties of these pads shall comply with the requirements specified in Requirements for Thermocouple Pads, Appendix [B](#).

3.3.2 The wire leads of the thermocouple are to have an immersion under the pad and be in contact with the unexposed surface for not less than 3-1/2 ins (88.9 mm). The hot junction of the thermocouple is to be placed approximately under the center of the pad. The pad is to be held firmly against the surface and is to fit closely about the thermocouples. The wires for the thermocouple in the length covered by the pad are not to be heavier than No. 18 B&S gage [0.04 in (1.02 mm)] and are to be electrically insulated with heat- and moisture-resistant coatings.

3.3.3 For the purpose of testing roof assemblies, the "unexposed surface" is defined as the surface exposed to ambient air.

3.3.4 Temperature readings are to be taken at not less than nine points on the surface. Five of these are to be symmetrically disposed, one at approximately the center of the specimen and four at approximately the center of its quarter sections. The other four are to be located at the discretion of the testing body to obtain representative information on the performance of the construction under test. No thermocouple is to be located nearer to the edges of the test specimen than one and one-half times the thickness of the construction, or 12 in (305 mm), unless necessary to include an element of the construction not otherwise represented in the remainder of the test specimen.

3.3.5 Thermocouples located opposite or on top of fasteners, such as screws, nails, or staples that will be obviously higher or lower in temperature than at more representative locations, are not to be used in determining the classification period if:

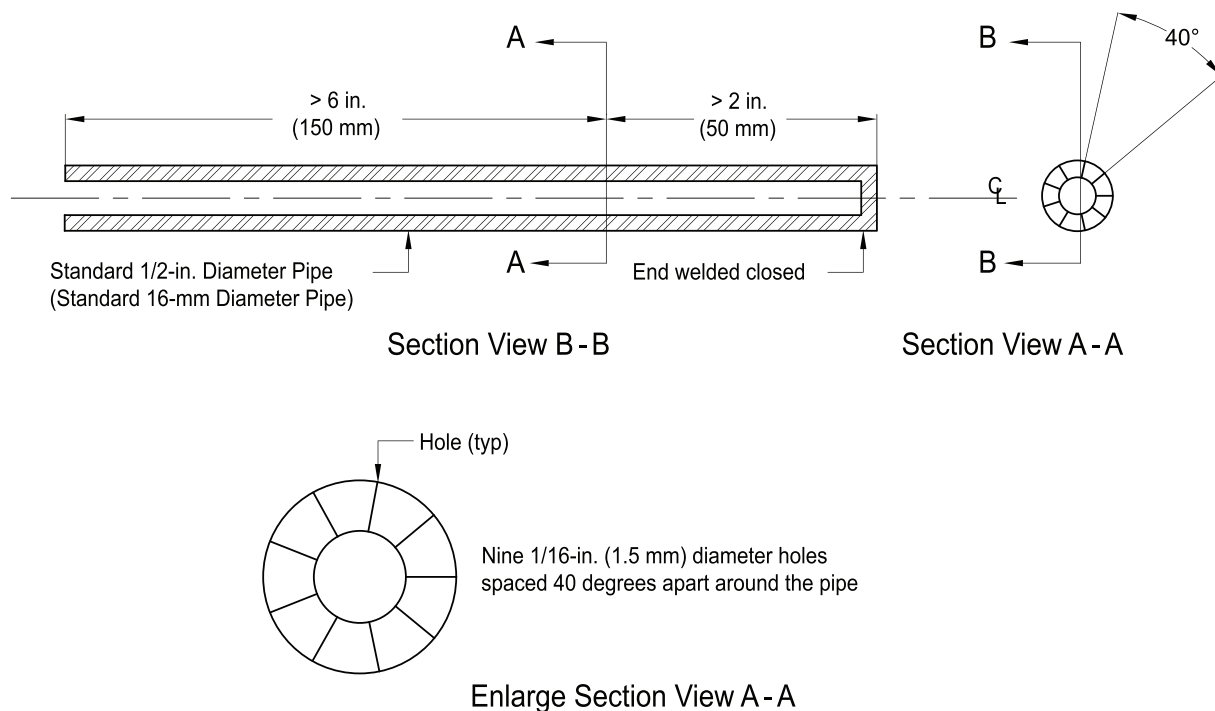
- a) The aggregate area of any part of such fasteners projected to the unexposed surface is less than 0.8% of the area within any 5-in (127-mm) square area, and
- b) The fasteners do not extend through the assembly.

3.3.6 Thermocouples are not to be located opposite or on top of beams, girders, pilasters, or other structural members if temperatures at such points will be obviously lower than at more representative locations.

3.3.7 Temperature readings are to be taken at intervals not exceeding 1 min.

3.3.8 If the conditions of acceptance place a limitation on the rise of temperature of the unexposed surface, the temperature end point of the fire endurance period is to be determined by the average of the measurements taken at individual points, except that if a temperature rise of 30% in excess of the specified limit occurs at any one of these points, the remainder is to be ignored and the fire endurance period considered as ended.

Figure 3.3
Pressure measurement probe



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3.4.5 A minimum of two pressure sensors shall be used when testing vertical specimens. The pressure sensors shall be separated by a vertical distance of at least 3 ft (0.91 m).

3.4.6 A minimum of two pressure sensors shall be used when testing horizontal specimens. The pressure sensors shall be in the same horizontal plane but in different positions relative to the perimeter of the test specimen.

4 Classification as Determined by Test

4.1 Results are to be reported in accordance with the performance in the tests described in these requirements and are to be expressed in time periods of resistance to the nearest integral minute. Reports are to include observations of significant details of the behavior of the material or construction during the test and after the furnace fire is extinguished, including information on deformation, spalling, cracking, burning of the specimen or its component parts, continuance of flaming, and production of smoke.

4.2 Reports of tests involving wall, floor, beam, or ceiling constructions in which restraint is provided against expansion, contraction, or rotation of the construction are to include a description of the method used to provide the restraint.

4.3 A report of a test in which other than maximum load conditions were imposed is to fully define the conditions of loading used in the test, and the title of the report is to specify that a restricted load condition was used.

4.4 When the indicated resistance period is 1/2-h or longer as determined by the average or maximum temperature rise on the unexposed surface or within the test specimen, or by failure under load, a