UL 1715

STANDARD FOR SAFETY

Fire Test of Interior Finish Material

UL Standard for Safety for Fire Test of Interior Finish Material, UL 1715

Third Edition, Dated September 9, 1997

Summary of Topics

This revision to ANSI/UL 1715 dated January 4, 2022 is being issued to update the title page to reflect the most recent designation as a Reaffirmed American National Standard (ANS). No technical changes have been made.

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 requirements are substantially in accordance with Proposal(s) on this subject dated November 12, 2021.

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UL 1715

Standard for Fire Test of Interior Finish Material

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Third Edition

September 9, 1997

This ANSI/UL Standard for Safety consists of the Third Edition including revisions through January 4, 2022.

The most recent designation of ANSI/UL 1715 as a Reaffirmed American National Standard (ANS) occurred on January 4, 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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INTRODUCTION

1 Scope

1.1 This test method describes the testing procedures and requirements applicable to the classification of interior finish material assemblies by use of a standardized room fire exposure.

1.2 This test method is intended for use in the evaluation of the flammability contribution of wall material assemblies, ceiling material assemblies, or both, exposed to early fire growth under specified room fire exposure conditions. The effectiveness of fire barrier materials as protection for other combustible materials or components within the assembly is of primary interest for this evaluation.

1.3 Data with respect to surface flammability characteristics of interior finish materials is provided by evaluations in accordance with the Standard for Test for Surface Burning Characteristics of Building Materials, UL 723, as described in 1.5.

1.4 The results obtained by use of this test method are intended to be used as one element of the total body of data used in the processes of selecting and controlling materials for use in building construction.

1.5 Related classification information for building materials and assemblies intended for specific end-uses is promulgated under categorical designations in accordance with specified testing procedures. These classification categories are as follows:

a) Surface Burning Characteristics Classification – Establishes the comparative burning characteristics of building materials and assemblies by measurement of flame spread over exposed surfaces and the density of the smoke developed during the fire exposure period. This test method is described in the Standard for Test for Surface Burning Characteristics of Building Materials, UL 723.

b) Fire Resistance Classification – Establishes hourly fire resistance ratings of building assemblies through large-scale fire exposures under specific loading conditions. This test method is described in the Standard for Fire Tests of Building Construction and Materials, UL 263.

c) Roof-Covering Materials Classification – Establishes performance measurements for coverings relative to resistance to exterior fire spread and penetration. This test method is described in the Standard for Test Methods for Fire Resistance of Roof-Covering Materials, UL 790.

d) Roof-Deck Construction Materials Classification – Establishes performance measurements for roofing systems with respect to resistance to the spread-of-flame and damage from underdeck interior fire exposure. Information pertaining to the test method used in this classification is published in the General Information section, under Guide TGKX, in Underwriters Laboratories Inc.'s Annual Building Materials Directory.

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.

PERFORMANCE

3 General

3.1 A nominal 30 pound (13.6 kg) wood crib is to be used to produce a uniform flame for direct impingement on the walls and ceiling in the corner of an 8 by 12 by 8 foot (2.44 by 3.66 by 2.44 m) high room. The contribution of the wall, ceiling, or both wall and ceiling materials or assemblies, to fire growth is to be defined in terms of:

a) The time history of temperature development within the room,

b) The time from ignition to flameover, and

c) The maximum observed flame progression.

The test is to be conducted with natural ventilation to the room provided through a single doorway 2-1/2 by 7 feet (0.76 by 2.13 m) in width and height, respectively.

3.2 During the test the observed surface burning shall not extend to the extremities of the test specimen nor shall flame project through the doorway opening at any time.

3.3 At the conclusion of the test, observations shall show that the combustive damage, such as burning and charring, of the test materials within the assembly diminishes at increasing distance from the immediate fire exposure area.

3.4 A report of the test results shall be prepared as specified in Report, Section 11.

4 Ignition Source

4.1 The ignition source for the test is to be a wood crib weighing 30 pounds (13.6 kg), having dimensions of 15 by 15 by 15 inches (381 by 381 by 381 mm), and constructed of 10 tiers of spruce, pine, or fir lumber strips. Each strip is to be 15 inches long, and is to have a cross section of trade size 2 by 2 inches [nominal 1-1/2 by 1-1/2 inches (38 by 38 mm)]. Each tier is to consist of five parallel strips arranged with equal spacing between strips so that the tier dimensions are 15 by 15 inches. Within the crib, the strips in each tier are to lie at right angles to the strips in the tier below. Adjacent tiers are to be fastened to each other by chisel-point staples or 8d nails at each point of contact between strips. Each staple is to have a flat top, and the two pointed ends each are to be 1-1/4 inch (32 mm) long and on 1 inch (25 mm) centers.

4.2 The crib is to be placed into a curing cell, at a temperature of 120 ±10°F (48.9 ±5.5°C) and 20 ±5 percent relative humidity, until constant weight is achieved.

4.3 The wood crib is to be removed from the curing cell not more than 1 hour prior to the start of the test.

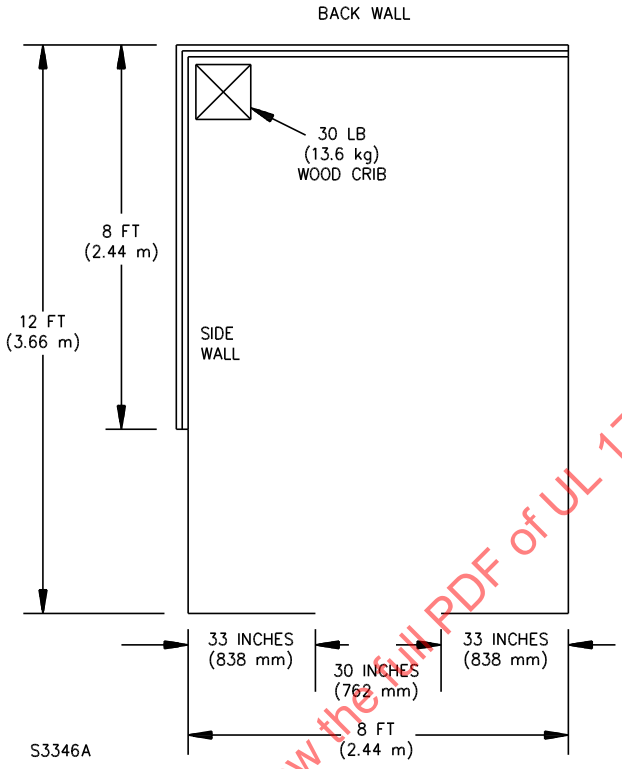
4.4 Immediately prior to test, the crib weight is to be adjusted to a final weight of 30 ±1 pound (13.61 ±0.45 kg) by the addition of conditioned strips.

5 Fire Test Room Geometry and Construction

5.1 With the test specimens in place, the interior dimensions of the test room floor are to be 8 feet ±1 inch by 12 feet ±1 inch (2.4 m ±25 mm by 3.66 m ±25 mm). The finished ceiling is to be 8 feet ±0.5 inch (2.44 m ±13 mm) above the floor. There are to be four walls at right angles defining the room (see Figure 5.1).

Figure 5.1

Room-corner test



5.2 The 2-1/2 by 7 foot (0.76 by 2.13 m) doorway is to be in the center of one of the 8 by 8 foot (2.44 by 2.44 m) walls. There are to be no other wall or ceiling openings. The door frame is to be constructed so that the height and width remain unchanged during the test period to a tolerance of ±1 percent.

5.3 There is to be a framed structure resting on a non-combustible floor, with an interior membrane of calcium silicate board of 46 pounds per cubic foot (736 kg/m^3) density or equivalent non-combustible board material and 1/2 inch (13 mm) nominal thickness, defining the edges of the ceiling and walls to which the test specimens are attached. Self-supporting panels do not require the frame or calcium silicate board substrate.

6 Specimen Mounting

6.1 The mounting of the test specimens on the framing or support system shall include backing materials, insulation, and air gaps, or air gaps without backing materials or insulation, as appropriate for the intended application.

6.2 Ceiling material assemblies are to be mounted horizontally to form an 8 by 8 foot (2.44 by 2.44 m) area tangent to the back and side walls. Wall materials and assemblies are to be mounted vertically to cover the 8 by 8 foot wall opposite the doorway and 8 feet of the width of one adjacent side wall so as to form an additional 8 by 8 foot wall forming a corner with the back wall as indicated in Figure 5.1.

6.3 Either wall, or ceiling, or both wall and ceiling material assemblies are to be mounted in the wall-ceiling relationship intended for the anticipated end-use(s). Wall materials to be evaluated alone are to utilize a ceiling fabricated of 1/2 inch (13 mm) thick calcium silicate board supplied in 4 by 8 foot (1.22 by 2.44 m) sheets with a density of 46 pounds per cubic foot (736 kg/m^3) or 5/8 inch (15.9 mm) thick gypsum wallboard "Type X" supplied in 4 by 8 foot sheets, having a density of 42.2 pounds per cubic foot (675

kg/m^3), and uncoated; or an equivalent non-combustible board material. Ceiling materials to be evaluated alone are to utilize the specified calcium silicate board or an equivalent non-combustible material on the walls and an uncovered 4 by 8 foot ceiling panel adjacent to the doorway.

7 Protection and Conditioning of Test Assembly

7.1 Prior to mounting, specimens are to be conditioned at a temperature of 73 ±4°F (22.8 ±2.2°C) and relative humidity of 50 ±5 percent until constant weight is achieved.

7.2 The test assembly is to be mechanically protected during and after mounting to provide for its integrity at the time of test. Assemblies are not to be tested until final material conditioning and strength levels have been attained. Materials containing moisture or solvents are to achieve constant weight condition prior to test.

8 Fire Test Room Environment

8.1 Ventilation

8.1.1 The fire test room is to be located within a building vented to discharge combustion products and intake fresh air, so that oxygen-deficient air is not introduced into the fire test room during the test.

8.2 Ambient conditions in test room

8.2.1 The ambient temperature in the test room is to be a minimum 60°F (15.6°C) at the initiation of the test. The temperature is to be measured at the center of the test room.

8.2.2 The relative humidity in the test room at the time of test is to be a maximum of 70 percent, measured.

9 Instrumentation

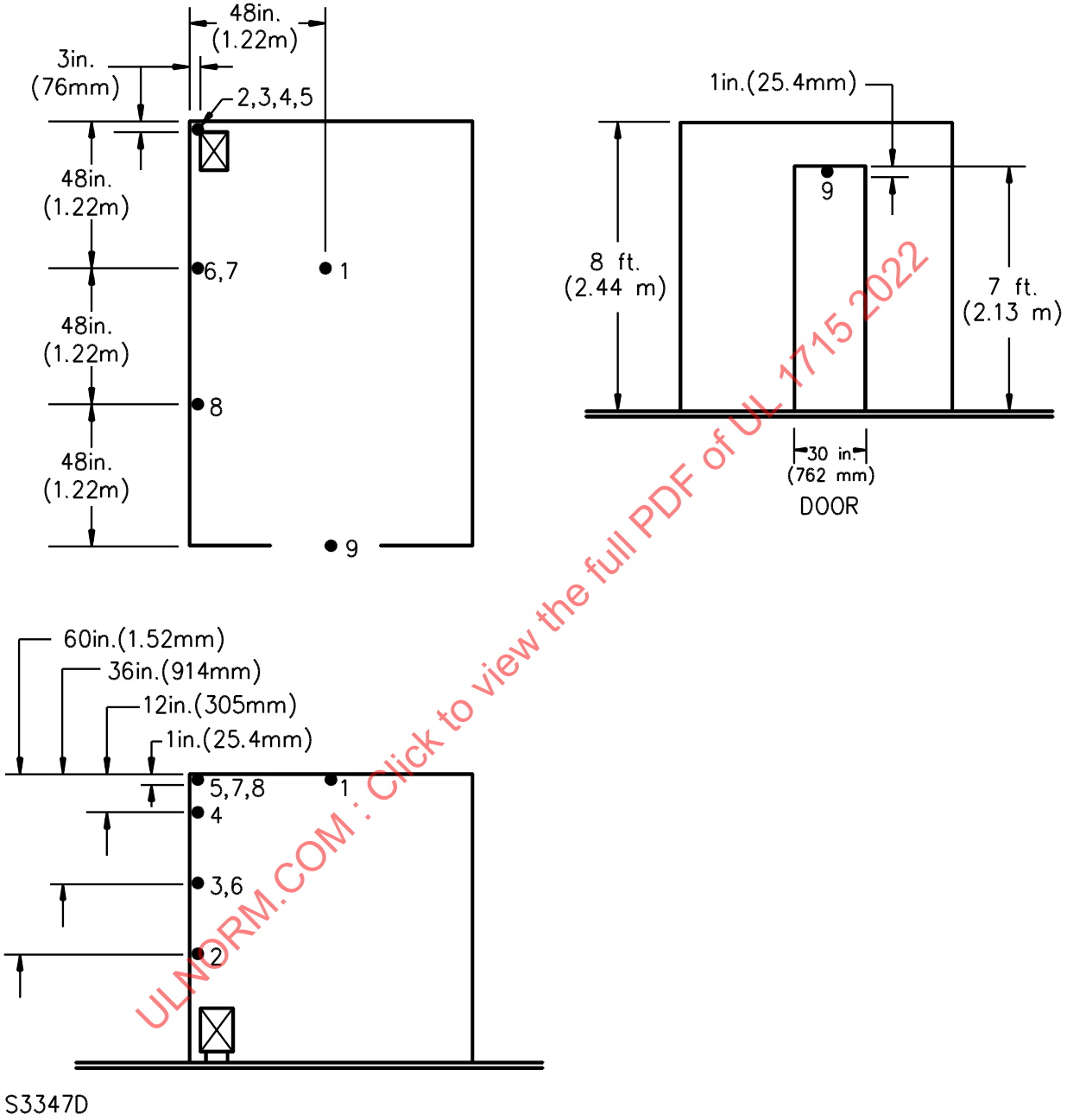
9.1 Ignition source monitoring thermocouples

9.1.1 The ignition source monitoring thermocouples are to be constructed of No. 14 gauge (5.03 mm^2) bare chromel-alumel wire mounted in ceramic insulation and placed within a 1/2 inch, Schedule 40 pipe (ASME B36.10M, Welded and Seamless Wrought Steel Pipe). The bare thermocouple junction is to protrude 1 inch (25.4 mm) beyond the end of the ceramic insulation and 3 inches (76 mm) beyond the end of the pipe.

9.1.2 Four thermocouples are to be positioned vertically above the ignition source, at locations 1, 12, 36, and 60 inches (25.4 mm, 0.30 m, 0.91 m, and 1.52 m) below the ceiling, and 3 inches (76 mm) from both sample walls at the intersecting corner (see Figure 9.1, thermocouples 2, 3, 4, and 5).

Figure 9.1

Thermocouple locations



9.2 Test measurement thermocouples

9.2.1 Test measurement thermocouples are to be constructed of No. 24 gauge (1.60 mm^2) bare chromel-alumel wire. The thermocouple wire within 0.5 inch (13 mm) of the thermocouple junction is to be positioned along projected isotherms to minimize conduction errors. The insulation between the chromel and alumel wires is to be stable at a temperature of no less than 2000°F (1100°C), otherwise the thermocouple wires are to be separated.

9.2.2 One thermocouple is to be placed at each of the following five locations (see Figure 9.1):

a) One inch (25.4 mm) below the ceiling and 4 feet (1.22 m) from both intersecting sample walls (thermocouple No. 1).

b) One inch below the ceiling, 4 feet from the back wall and 3 inches (76 mm) from the side wall (thermocouple No. 6).

c) Three feet (914 mm) below the ceiling, 4 feet from the back wall, and 3 inches (76 mm) from the side wall (thermocouple No. 7).

d) One inch below the ceiling, 8 feet from the 8 foot sample wall and 3 inches from the side wall (thermocouple No. 8).

e) Centered in the interior plane of the door opening 1 inch below the top of the opening (thermocouple No. 9).

9.2.3 All thermocouples are to be monitored at maximum 30-second intervals.

9.3 Visual records

9.3.1 Photographic equipment consisting of a 35-mm camera and either a Super 8 or 16-mm motion picture camera, or video film is to be used to document flame propagation, smoke development and flame projection from the intersecting corners of the assembly. The cameras are to be located 10 feet (3.04 m) from the door opening to avoid interference with air movement into the room. Color slides are to be taken at 15-second intervals for the first 5 minutes of the test and at least 30-second intervals for the duration of the test.

10 Test Procedure

10.1 All recording devices are to be activated and steady-state baseline readings are to be maintained for at least 1 minute prior to the start of the test.

10.2 The ignition source is to be ignited in accordance with the following procedure and the time record simultaneously initiated:

a) A base is to be prepared for placement of the wood crib by using four brick pieces, each nominally 4 by 4 by 3 inches (102 by 102 by 76 mm), positioned to provide a nominal 3 inch (76 mm) space between the floor and the lower surface of the crib. A 1 pound (0.45 kg) pile of shredded wood excelsior, fully fluffed, is to be arranged among the bricks, and is to cover an area nominally 21 by 21 inches (533 by 533 mm). The excelsior is to be wetted with 4 ounces (118 ml) of absolute ethyl alcohol and the crib set in place on the bricks at a horizontal distance of 1 inch (25.4 mm) from the surface of each intersecting wall.

b) The excelsior within the crib is to be ignited at several points using a fireplace match or the equivalent. At ignition, flame is to progress steadily through the dry excelsior to the alcohol wetted portion, and at this point flames are to move rapidly through the remaining excelsior to provide uniform application of ignition flame beneath the crib.

10.3 Immediately following ignition, the photographic recording equipment is to be energized.

10.4 A continuous voice or written record of the fire growth is to be provided to indicate times of all significant events such as flame attachment to the wall, flame projection, flameover and smoke development.

10.5 The test is to be terminated at 15 minutes, unless safety considerations dictate an early termination.

10.6 The damage resulting from the test is to be photographed and described.

REPORT

11 General

11.1 Materials

11.1.1 The report is to contain information as to materials mounting and conditioning, and the layout of specimens and attachments in the test room.

11.2 Humidity and temperature

11.2.1 Relative humidity and temperature within the test building prior to the test are to be recorded.

11.3 Temperature development

11.3.1 Time history of temperature development within the room and at the doorway is to be reported starting 1 minute prior to the test.

11.4 Time history of fire growth

11.4.1 Provide photographs, a video tape, an audio tape of the observations, and a written report as test records. These records are to indicate:

a) The time of ignition of the test material,

b) The extension of the flame front and time of occurrence,

c) The time of flameover, if any, and

d) Time and progression of smoke development.

11.5 Specimen conditions

11.5.1 Observations on the condition of the test specimen after the test shall be observed and recorded. Photographs showing the extent of the damage of the materials at the conclusion of the test are also to be supplied.

APPENDIX A
GUIDE TO MOUNTING METHODS

A1 Introduction

A1.1 This guide is intended as an aid in determining the method of mounting various building materials in the standard fire test room. These mountings are described for test method uniformity and convenience; they are not meant to imply restriction in the specific details of field installation. They are intended to be used for general material testing where the specific details of the field installation either have not been established or are so broad that any single installation method is not representative of the full range of installation possibilities.

A1.2 Mounting methods are grouped within this guide according to materials to be tested, broadly described either by usage or by form of the material.

A1.3 For some building materials, none of the described methods apply. In such cases, other means of attachment will be devised. Wherever possible, these specimens are to be mounted by using the same method of attachment as that contemplated in the field installation.

A1.4 When backing materials are used, they are to be supported on a frame support system.

A1.5 When calcium silicate board or gypsum wallboard is specified as a backing substrate, the material is to be:

a) 1/2 inch (13 mm) thick, calcium silicate board supplied in 4 by 8 foot (1.22 by 2.44 m) sheets with a density of 46 pounds per cubic foot (736 kg/m^3), or

b) 5/8 inch (15.9 mm) thick gypsum wallboard "Type X" supplied in 4 by 9 foot (1.22 by 2.74 m) sheets, having a density of 42.2 pounds per cubic foot (675 kg/m^3), and uncoated.

When metal screws are used in combination with washers, and wing nuts are specified for fastening, they are to be standard 1/4 inch (6.4 mm) outside diameter by 20 TPI round-head steel machine screws, 1/4 inch outside diameter by 20 TPI steel wing nuts, and 2 inch (50.8 mm) outside diameter by 0.014 inch (0.356 mm) thick flat steel washers with a 9/32 inch (7 mm) inside diameter hole. Fastening screws are to be installed as shown in Figure A1.1. The fastening pattern for rigid wall materials is shown in Figure A1.2, and for flexible wall materials is shown in Figure A1.3. The fastening pattern for all ceiling materials is shown in Figure A1.4.

Figure A1.1

Material fastening technique

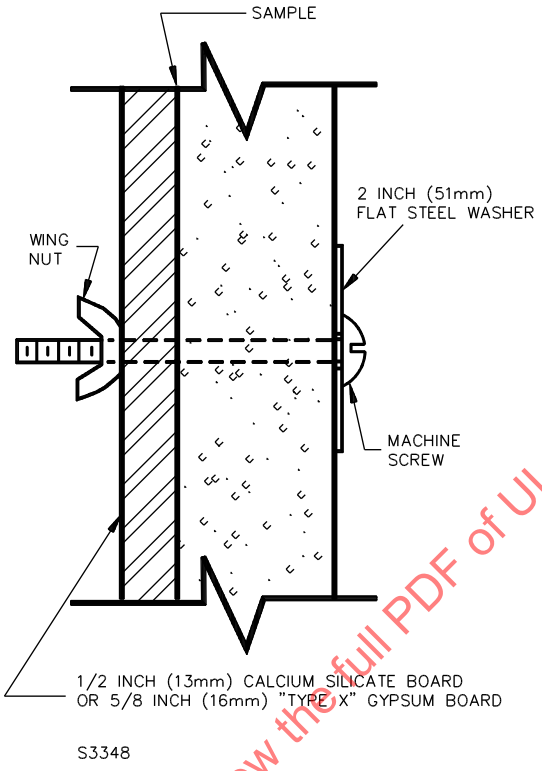
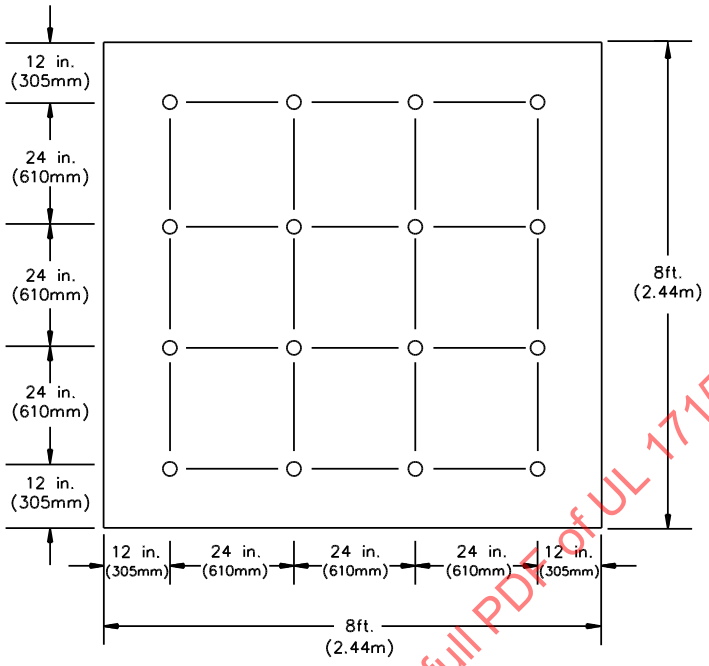


Figure A1.2

Typical mounting technique rigid wall materials



Note: When required, additional fasteners may be used to hold the specimen flush to the wall.

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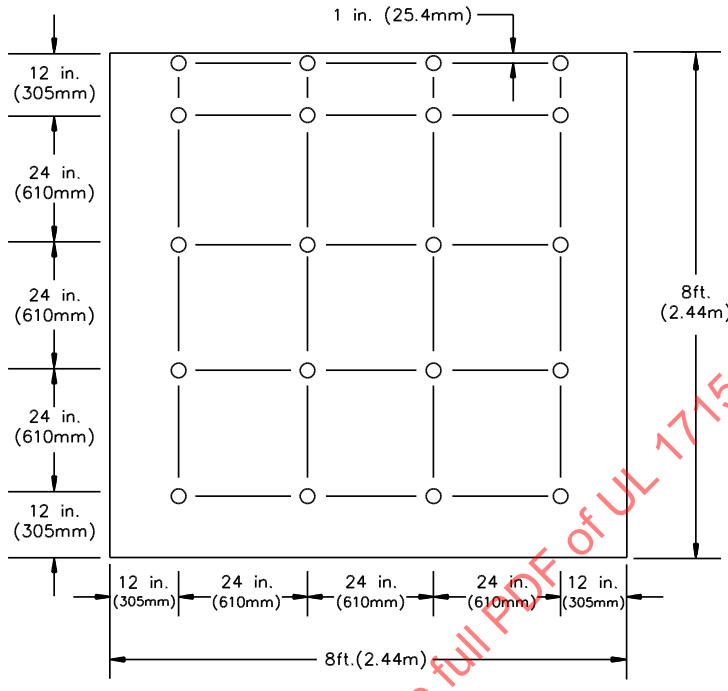
Figure A1.3

Typical mounting technique flexible materials



Note: When required, additional fasteners may be used to hold the specimen flush to the wall.

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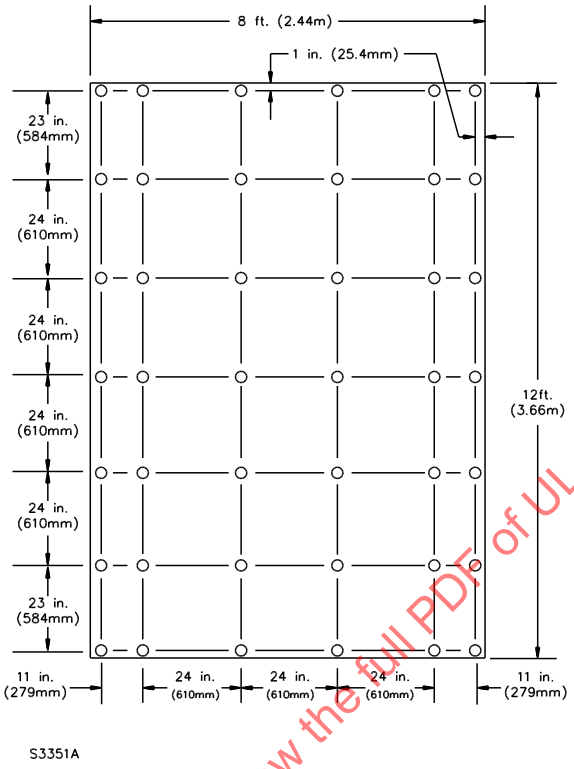
Figure A1.4

Typical mounting technique ceiling materials



A2 Acoustical Materials and Other Board Materials

A2.1 Based on the type of field mounting required by the acoustical product, either wood furring strips or metal runners are to be used to support acoustical material.

A3 Batt or Blanket-Type Insulating and Other Flexible Materials

A3.1 Batt or blanket and other flexible materials shall be capable of supporting themselves, or shall be supported by round-head machine screws in combination with wing nuts and flat washers, as specified in A1.5. The screws are to be inserted through the material in such a way as to fasten the material to the substrate board.

A4 Building Units

A4.1 Materials within this category include organic or inorganic materials, or both, formed or laminated into blocks, boards, planks, slabs, or sheets of various sizes, thicknesses, or shapes. Building units which have the structural integrity to support themselves require no additional mounting to a substrate board support. Building units which require individual components and are not self-supporting shall require the component to be fastened to the substrate board as specified in A1.5.

A5 Coatings or Spray Applied Materials

A5.1 Coating materials, such as cementitious mixtures, mastic coatings, and sprayed fibers, are to be mixed and applied to the substrate board as specified in the manufacturer's instructions at the thickness, coverage rate, or density specified by the manufacturer.

A5.2 Materials intended for application to a wood surface are to be applied to a substrate made of trade size 1 by 4 inches [nominal 3/4 by 3-1/2 inches (19 by 89 mm)] nominal "C" and better VG Douglas fir

flooring (FSC 70 to 90) or to other species for which the surface burning characteristics are to be measured according to the requirements in the Standard for Test for Surface Burning Characteristics of Building Materials, UL 723.

A5.3 Coating materials intended for application to particular combustible surfaces other than wood are to be applied to the specific surface for which they are intended. The coating material and combustible material are to be attached to the substrate board as specified in A1.5.

A5.4 Coating materials intended only for field application to nonflammable surfaces are to be applied to 1/2 inch (13 mm) thick calcium silicate board.

A6 Plastic Materials

A6.1 Plastic materials include foams, reinforced panels, laminates, grids, and transparent or translucent sheets. Such material is to be attached to the substrate materials as specified in A1.5 by using round-head machine screws in combination with flat washers and wing nuts.

A7 Wall Covering Material

A7.1 Wall coverings such as vinyl coatings, wallpaper and similar materials are to be mounted on 5/8 inch (15.9 mm) "Type X" gypsum wallboard using the adhesive and application technique specified by the manufacturer.

APPENDIX B
GUIDE FOR SUPPLEMENTAL INSTRUMENTATION

B1 Introduction

B1.1 General

B1.1.1 This appendix describes certain supplemental instrumentation and equipment that is to be used to obtain supplemental data relative to room fire test developments.

B1.2 Calorimeters

B1.2.1 The calorimeter is to be of the Gardon type, with a flat black surface and a 180 degree view angle, and is to be maintained above the dew point by water supplied at a temperature of 150 to 170°F (65.6 to 76.7°C) and at a flow rate of at least 0.1 gallon per minute (0.379 L/m). The full-scale output range is to be 5 Btu/ft^3/s (50 kW/m^2) for the floor calorimeters.

B1.2.2 Calorimeters R_1 and R_2 are to be mounted within 5 inches (127 mm) of each other and 12 inches (305 mm) above the floor surface, facing upward in the geometric center of the room.

B2 Thermocouples

B2.1 Specification

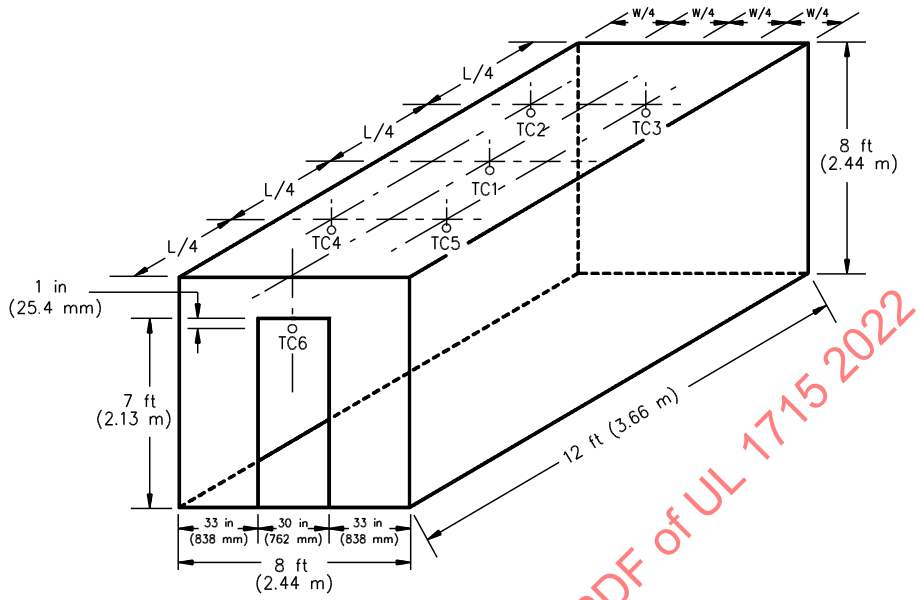
B2.1.1 A No. 24 gauge wire, 0.020 inch (0.51 mm) diameter, bare chromel-alumel thermocouple is to be used at each required location. The thermocouple wire within 1/2 inch (13 mm) of the thermocouple junction is to be run along expected isotherms to minimize conduction errors. The insulation between the chromel and alumel wires is to be stable at a temperature of no less than 2000°F (1100°C), otherwise the thermocouple wires are to be separated.

B2.2 Locations for room

B2.2.1 One thermocouple is to be located 4 inches (102 mm) below the ceiling at the room center, and one at the center of each of the four quadrants. The thermocouples are to be mounted on supports, with their junctions at least 4 inches from a solid surface. There are to be no attachments to the wall or ceiling (see Figure B2.1).

Figure B2.1

Room thermocouple locations



B2.3 Location for doorway

B2.3.1 One thermocouple is to be located in the interior plane of the door on the door center line, 1 inch (25.4 mm) below the top of the door (see Figure B2.1).

B2.4 Location in the collection and dust system

B2.4.1 One thermocouple is to be located 11 feet (3.4 m) downstream of the hood and 1 inch (25 mm) from the center of the duct (see Figure B2.2).