



ASTM E119

Excerpts of ASTM E 119 - 98 Standard Test Methods for Fire Tests of Building Construction and Materials

1. Scope

- 1.1 The test methods described in this fire-test-response standard 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 It is the intent that classifications shall register performance during the period of exposure and shall not be construed as having determined suitability for use after fire exposure.

4. Significance and Use

- 4.1 This test method is intended to evaluate the duration for which the types of assemblies noted in 1.1 will contain a fire, or retain their structural integrity or exhibit both properties dependent upon the type of assembly involved during a predetermined test exposure.
- 4.2 The test exposes a specimen 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. The exposure, however, may not be representative of all fire conditions which 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. It does, however, provide a relative measure of fire performance of comparable assemblies under these specified fire exposure conditions. Any variation from the construction of conditions (that is, size, method of assembly, and materials) that are tested may substantially change the performance characteristics of the assembly.
- 4.3 The test standard provides for the following:
 - 4.3.1 In walls, partitions, and floor or roof assemblies:
 - 4.3.1.1 Measurement of the transmission of heat.
 - 4.3.1.2 Measurement of the transmission of hot gases through the assembly, sufficient to ignite cotton waste.

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TEST SPECIMEN

9. Test Specimen

- 9.1 The test specimen shall be truly representative of the construction for which classification is desired, as to materials, workmanship, and details such as dimensions of parts, and shall be built under conditions representative of those obtaining as practically applied in building construction and operation. The physical properties of the materials and ingredients used in the test specimen shall be determined and recorded.
- 9.2 The size and dimensions of the test specimen specified herein are intended to apply for rating constructions of dimensions within the usual general range employed in buildings. If the conditions of use limit the construction to smaller dimensions, a proportionate reduction is permitted to be made in the dimensions of the specimens for a test qualifying them for such restricted use.

CONDUCT OF FIRE TESTS

10. Fire Endurance Test

- 10.1 Continue the fire endurance test on the specimen with its applied load, if any, until failure occurs, or until the specimen has withstood the test conditions for a period equal to that herein specified in the conditions of acceptance for the given type of construction.
- 10.2 For the purpose of obtaining additional performance data, the test may be continued beyond the time the fire endurance classification is determined.

11. Hose Stream Test

- 11.1 Where required by the conditions of acceptance, subject a duplicate specimen to a fire exposure test for a period equal to one half of that indicated as the resistance period in the fire endurance test, but not for more than 1 h, immediately after which subject the specimen to the impact, erosion, and cooling effects of a hose stream directed first at the middle and then at all parts of the exposed face, changes in direction being made slowly.
- 11.2 *Exemption* -- The hose stream test shall not be required in the case of constructions having a resistance period, indicated in the fire endurance test, of less than 1 h.
- 11.3 *Optional Program* -- The submitter elects, with the advice and consent of the testing body, to have the hose stream test made on the specimen subjected to the fire endurance test and immediately following the expiration of the fire endurance test.

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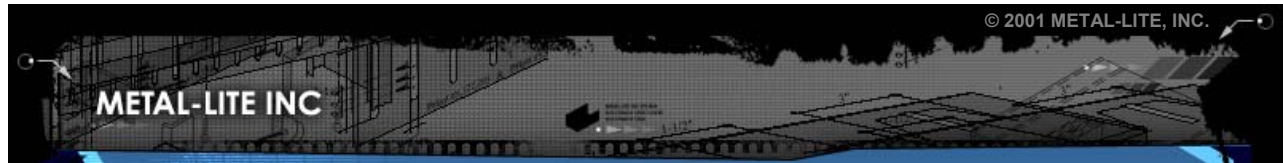


- 11.4** *Stream Equipment and Details* -- The stream shall be delivered through a 2 1/2-in. (64-mm) hose discharging through a National Standard Playpipe of corresponding size equipped with a 1 1/8-in. (28.5-mm) discharge tip of the standard-taper smooth-bore pattern without shoulder at the orifice. The water pressure and duration of application shall be as prescribed in Table 1.
- 11.5** *Nozzle Distance* -- The nozzle orifice shall be 20 ft (6 m) from the center of the exposed surface of the test specimen if the nozzle is so located that when directed at the center its axis is normal to the surface of the test specimen. If otherwise located, its distance from the center shall be less than 20 ft. by an amount equal to 1 ft (305 mm) for each 10 deg of deviation from the normal.

TABLE 1 CONDITIONS FOR HOSE STREAM TEST		
Resistance Period	Water Pressure at Base of Nozzle, psi (kPa)	Duration of Application min/100 ft² (9 m²) exposed area
8 hr and over	45 (310)	6
4 hr and over if less than 8 hr	45 (310)	5
2 hr and over if less than 4 hr	30 (207)	2 1/2
1 1/2 hr and over if less than 1 1/2 hr	30 (207)	1 1/2
1 hr and over if less than 1 1/2 hr	30 (207)	1
Less than 1 hrs, if desired	30 (207)	1

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TESTS OF NONBEARING WALLS AND PARTITIONS

17. Size of Sample

17.1 The area exposed to fire shall be not less than 100 ft² (9 m²), with neither dimension less than 9 ft (2.7 m). Restrain the test specimen on all four edges.

18. Conditions of acceptance

18.1 Regard the test as successful when the following conditions are met:

18.1.1 The wall or partition has withstood the fire endurance test without passage of flame or gases hot enough to ignite cotton waste, for a period equal to that for which classification is desired.

18.1.2 The wall or partition shall have withstood the fire and hose stream test as specified in Section 10, without passage of flame, of gases hot enough to ignite cotton waste, or of passage of water from the hose stream. The assembly shall be considered to have failed the hose stream test if an opening develops that permits a projection of water from the stream beyond the unexposed surface during the time of the hose stream test.

18.1.3 Transmission of heat through the wall or partition during the fire endurance test shall not have been such as to raise the temperature on its unexposed surface more than 250 F (139 C) above its initial temperature.

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