Designation: E 648 – 03

An American National Standard

Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source[1]

This standard is issued under the fixed designation E 648; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This fire-test-response standard covers a procedure for measuring the critical radiant flux of horizontally mounted floor-covering systems exposed to a flaming ignition source in a graded radiant heat energy environment in a test chamber. A specimen is mounted over underlayment, a simulated concrete structural floor, bonded to a simulated structural floor, or otherwise mounted in a typical and representative way.

1.2 This fire-test-response standard measures the critical radiant flux at flame-out. It provides a basis for estimating one aspect of fire exposure behavior for floor-covering systems. The imposed radiant flux simulates the thermal radiation levels likely to impinge on the floors of a building whose upper surfaces are heated by flames or hot gases, or both, from a fully developed fire in an adjacent room or compartment. The standard was developed to simulate an important fire exposure component of fires that develop in corridors or exitways of buildings and is not intended for routine use in estimating flame spread behavior of floor covering in building areas other than corridors or exitways. See Appendix X1 for information on proper application and interpretation of experimental results from use of this test.

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 The text of this standard references notes and footnotes that provide explanatory information. These notes and footnotes, excluding those in tables and figures, shall not be considered as requirements of this standard.

1.5 *This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions but does not by itself incorporate all factors required for fire-hazard or fire-risk assessment of materials, products, or assemblies under actual fire conditions.*.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific hazard statements are given in Section 7.

2. Referenced Documents

2.1 *ASTM Standards:*

C 1186 Specification for Flat Non-Asbestos Fiber-Cement Sheets[2]

E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process[3]

E 136 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C[4]

E 171 Specification for Standard Atmospheres for Conditioning and Testing Flexible Barrier Materials[5]

E 176 Terminology of Fire Standards[4]

3. Terminology

3.1 *Definitions*—See Terminology E 176 for additional definitions.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *blackbody temperature, n*—the temperature of a perfect radiator—a surface with an emissivity of unity and, therefore, a reflectivity of zero.

3.2.2 *corridor, n*—an enclosed space connecting a room or compartment with an exit. The corridor includes normal extensions, such as lobbies and other enlarged spaces, where present.

3.2.3 *critical radiant flux, n*—the level of incident radiant heat energy on the floor covering system at the most distant flame-out point. It is reported as W/cm^2 ($Btu/ft^2 \cdot s$).

3.2.4 *flame-out, n*—the time at which the last vestige of flame or glow disappears from the surface of the test specimen, frequently accompanied by a final puff of smoke; Time 0 is the

[1] This test method is under the jurisdiction of ASTM Committee E05 on Fire Standards and is the direct responsibility of Subcommittee E05.22 on Surface Burning.

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[2] *Annual Book of ASTM Standards*, Vol 04.05.

[3] *Annual Book of ASTM Standards*, Vol 14.02.

[4] *Annual Book of ASTM Standards*, Vol 04.07.

[5] *Annual Book of ASTM Standards*, Vol 15.09.

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