



Standard Test Methods for Determining Effects of Large Hydrocarbon Pool Fires on Insulated Marine Bulkheads and Decks, Constructed of Steel¹

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1. Scope

1.1 These test methods described in this fire-test response standard are used for determining the fire-test response of insulated marine steel bulkheads and decks. The insulation is either homogeneous or composite construction.

1.2 It is the intent that tests conducted in accordance with these test methods will indicate whether bulkheads and decks will continue to perform their intended function during the period of fire exposure. These test methods shall not be construed as implying suitability for use after fire exposure.

1.3 These test methods prescribe a standard fire exposure for comparing the relative performance of different bulkhead and deck assemblies under controlled laboratory conditions. The application of these test results to predict the performance of actual assemblies when exposed to large pool fires requires a careful engineering evaluation.

1.4 *Limitations*—These test methods do not provide the following:

1.4.1 Full information on the performance of assemblies constructed with components or of dimensions other than those tested.

1.4.2 An evaluation of the degree to which the assembly contributes to the fire hazard through the generation of smoke, toxic gases, or other products of combustion.

1.4.3 Measurement of flame spread over the surface of the test assembly.

1.4.4 The erosive effect that the velocities or turbulence, or both, generated in large pool fires has on some fire protection materials.

1.4.5 Full information on the performance of assemblies at times less than 5 min because the rise time called out in Section 6 is longer than that of a real fire.

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

1.6 This standard measures and describes 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 the materials, products, or assemblies under actual fire conditions.

1.7 This test method is based on the fire exposure as defined in Test Methods E 1529 (issued by the Committee on Fire Standards, E05).

1.8 *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.*

2. Referenced Documents

2.1 ASTM Standards:

E 119 Test Methods for Fire Tests of Building Construction and Materials²

E 176 Terminology of Fire Standards²

E 511 Test Method for Measuring Heat Flux Using a Copper-Constantan Circular Foil, Heat-Flux Gage³

E 1529 Test Methods for Determining Effects of Large Hydrocarbon Pool Fires on Structural Members and Assemblies²

3. Terminology

3.1 *Definitions of Terms Specific to These Test Methods*—Refer to Terminology E 176 for definitions of terms associated with fire issues used in these test methods.

4. Summary of Test Methods

4.1 The fire environment within the furnace shall develop a total heat flux of $204 \pm 16 \text{ kW/m}^2$ ($65\,000 \pm 5000 \text{ Btu/ft}^2\text{-h}$) and an average temperature of $1093 \pm 111^\circ\text{C}$ ($2000 \pm 200^\circ\text{F}$) within 5 min from the start of the test. The fire environment shall be controlled by reproducing the furnace temperatures recorded during the furnace calibration method specified in Section 7. This temperature shall be maintained throughout the remainder of the fire test as shown in Fig. 1.

4.2 Performance is defined as the time period during which bulkheads and decks will continue to perform their intended

¹ These test methods are under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and are the direct responsibility of Subcommittee F25.02 on Insulation/Processes.

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² *Annual Book of ASTM Standards*, Vol 04.07.

³ *Annual Book of ASTM Standards*, Vol 15.03.

