



Standard Specification for Fiber-Reinforced Polymer (FRP) Gratings Used in Marine Construction and Shipbuilding¹

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1. Scope

1.1 This specification provides the testing and performance requirements for fiber-reinforced polymer (FRP) gratings used in marine construction and shipbuilding as an equivalency to the specification of steel gratings rated for a maximum load of 94 lbf/ft² (4.5 kN/m²).

1.2 The purpose of this specification is to ensure that all FRP gratings are designed and tested appropriately to ensure personnel safety. It does not address the ability of the gratings to support either moving or stationary equipment during or after a fire exposure.

1.3 This specification addresses fire conditions based on Test Methods E119 fire exposure and does not address hydrocarbon pool or jet fire exposures.

1.4 This specification is intended for use by all persons designing, manufacturing, testing, inspecting, and maintaining FRP gratings.

1.5 *Units*—The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.6 This specification does not constitute regulations or ship classification rules, which shall be consulted where applicable.

1.7 *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:²

B117 Practice for Operating Salt Spray (Fog) Apparatus

¹ This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.03 on Outfitting and Deck Machinery.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

D2047 Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine

D4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

D4329 Practice for Fluorescent Ultraviolet (UV) Lamp Apparatus Exposure of Plastics

E84 Test Method for Surface Burning Characteristics of Building Materials

E119 Test Methods for Fire Tests of Building Construction and Materials

E695 Test Method of Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading

2.2 Other Standards:

46 CFR 159 Shipping—Approval of Equipment and Materials³

NVIC 02-06 Follow-Up Programs for Fire-Safety Type-Approved Products⁴

NVIC 9-97 Change 1—Guide to Structural Fire Protection⁵

3. Terminology

3.1 Definitions:

3.1.1 *compression molding*, *v*—manufacturing process involving match die molds that compress the fiber reinforced matrix, generally under pressure and heat, to produce the finished product.

3.1.2 *fiber-reinforced polymer, FRP*, *n*—composite material made of a resin matrix reinforced with fibers.

3.1.2.1 *Discussion*—The fibers are usually made of glass or carbon fiber, while the polymer is usually an epoxy, vinyl ester, or polyester thermosetting plastic. The term “polymer” is sometimes replaced by “plastic.”

3.1.3 *fire integrity*, *n*—ability of a structure to retain functionality after a fire.

³ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

⁴ Available from United States Coast Guard (USCG), U.S. Coast Guard Headquarters, 2703 Martin Luther King Jr. Ave. SE Stop 7509, Washington, DC, 20593-7509, <http://www.uscg.mil/hq/cg5/cg5214/docs/NVIC02-06.pdf>.

⁵ Available from United States Coast Guard (USCG), U.S. Coast Guard Headquarters, 2703 Martin Luther King Jr. Ave. SE Stop 7509, Washington, DC, 20593-7509, <http://www.uscg.mil/hq/cg5/nvic/pdf/1997/n9-97ch1.pdf>.