



Standard Practice for Thermal Rating and Installation of Internal Combustion Engine Packages for use in Hazardous Locations in Marine Applications¹

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1. Scope

1.1 This practice covers the method of testing, rating and installation of internal combustion engine packages for use in hazardous areas in marine applications. The thermal rating of the engine is determined by the actual readings of engine and exhaust system temperatures within hazardous areas, as defined by references in 2.2 and 2.3 of this practice, or as designated by the authority having jurisdiction, or both. The goal of this practice is to thermally rate engine packages, and provide additional installation recommendations, in order to reduce the risk of igniting the ignitable mixtures that may be present within the hazardous areas of marine vessels.

1.2 Only a marine engine suitable for the service, designed and constructed in conformance with the requirements of 3.1.2, is considered.

1.3 The system of units in this practice shall be SI (metric) form, along with the standard (English) system equivalent placed in parentheses, for example, 20°C (68°F).

1.4 *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

F683 Practice for Selection and Application of Thermal Insulation for Piping and Machinery

2.2 *NFPA Standards:*³

NFPA 70 The National Electric Code (NEC), 2008

2.3 *IEC Standards:*⁴

IEC 60092 Electrical installations in ships—Part 502: Tankers—Special features

2.4 *CFR:*⁵

CFR 46 United States Code of Federal Regulations, Title 46, Shipping

2.5 *EN Standards:*⁴

EN 1834-1 Reciprocating internal combustion engines. Safety requirements for design and construction of engines for use in potentially explosive atmospheres.

3. Terminology

3.1 *Definitions:*

3.1.1 *hazardous location*—area in which an explosive gas atmosphere is or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of electrical apparatus and other potential heat sources. These areas are defined by the authority having jurisdiction, or in accordance with NFPA 70 (NEC) Articles 500, 501 and 504; or NEC Articles 500 and 505; or IEC 60092-502, or a combination thereof.

3.1.2 *marine engine*—a compression-ignition engine designed and constructed for operation in the marine environment, regardless of horsepower, to the applicable standards or rules of a recognized classification society in Title 46, Code of Federal Regulations, Part 8, or a comparable engine design and construction standard.

3.1.3 *ignitable mixture*—a mixture of gas, such as natural gas, or similar volatile hydrocarbon gas with normal air, that will propagate flame or explode when exposed to an ignition source.

3.1.4 *ignition temperature*—(*explosive atmosphere*)—the lowest temperature at which an ignitable mixture may be ignited.

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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.

³ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, <http://www.nfpa.org>.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁵ 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>.