

Flammability of Marine Carpet

The regulations and rules for carpet aboard vessels for domestic and international waters are assessed by the U. S. Coast Guard or other Notified Bodies. A Notified Body is a body authorized by the National Administration of a Member State to carry out work in accordance with Marine Equipment Directive (MED), and is a signatory to SOLAS (Safety of Life at Sea). Any vessel going into international waters must comply with the provisions of the SOLAS Treaty.

Vessels in U.S. Domestic Waters

The rules for vessels in domestic waters, such as casinos and houseboats, are contained in the Code of Federal Regulations, Title 46, Subchapter Q, Part 164 and require compliance to specific flammability and smoke density criteria.

Carpets constructed from 100% wool face fiber are exempt from this requirement. The testing shall be performed by a third-party ISO 17025 accredited laboratory. The testing criteria are listed below:

- Critical Radiant Flux, the carpet must receive a test result of greater than 0.80 watts per square centimeter when tested in accordance with ASTM E648 “Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source”.
- Smoke Density, the carpet must receive a test result of less than 450 when tested in accordance with ASTM E662 “Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials”.

Vessels in International Waters: Marine Carpet in Cabins

The carpet installed in cabins of marine vessels must only pass *Part 2 - Smoke and Toxicity* (Table 1) as published in the International Maritime Organization Fire Testing Procedures (IMO FTP Code 2012 Edition). Testing must be performed by an approved independent laboratory specified by the Coast Guard or Notified Body.

Table 1

Part 2 - Smoke and Toxicity	
Smoke Density Max. (ISO 5659*)	≤ 500
Carbon Monoxide (CO)	≤ 1450 ppm
Hydrogen Bromide (HBr)	≤ 600 ppm
Hydrogen Chloride (HCl)	≤ 600 ppm
Hydrogen Cyanide (HCN)	≤ 140 ppm
Hydrogen Fluoride (HF)	≤ 600 ppm
Sulfur Dioxide (SO ₂)	≤ 120 ppm
Oxides of Nitrogen (NO _x)	≤ 350 ppm

Vessels in International Waters: Marine Carpet in General Areas

The carpet installed in general areas (e.g. corridors and stairway enclosures) of marine vessels must comply with *Part 2 - Smoke and Toxicity* (Table 1) and *Part 5 - Surface Flammability* (Table 2) as published in the International Maritime Organization Fire Testing Procedures (IMO FTP Code 2012 Edition).

Table 2

Part 5 Surface Flammability			
Critical Radiant Flux kW/m ²	Heat for Sustained Burning MJ/m ²	Total Heat Release MJ	Peak Heat Release (kW)
≥ 7.0	≥ 0.25	≤ 2.0	< 10.0

Note 1. This apparatus is different from that used in ASTM E648, in that the specimen is positioned vertically along the short axis, and the floor of the apparatus is open.

Note 2. If 10 burning drips fail to self-extinguish prior to reaching the floor, the test is considered a failure regardless of the results of the remaining criteria.

*Plastics – Smoke Generation – Part 2: Determination of Optical Density by a Single Chamber Test

Manufacturers who receive type-approval from the Coast Guard or Notified Body must have a quality control program, usually referred to as a Follow-Up Procedure (FUP). The quality control system must be audited by an approved third-party to comply with the IMO FTP Code. Annual audits and/or product testing are mandatory for continued compliance. Special labeling with destructive labels is required for each roll to be shipped. The logo, called the Wheel Mark, as it resembles a ship's wheel, must be requested at the time of submission to the Coast Guard and/or Notified Bodies. The wheel mark signifies the certification shall be accepted in other countries or ports other than the US.

