

Material testing on smoke density and toxicity according to IMO-Regulations

International Maritime Organization (IMO) 2010 FTP Code Part 2

For coating materials used on board ships, e.g. paintings, adhesives, laminates, carpeting etc. which are applied on bulkheads, linings, decks, ceilings and floors the criteria for smoke density and toxicity have to be satisfied – if it is required.

The test procedure and the classification of the tested material is conducted according to the „International Code for Application of Fire Test Procedures (FTP Code)“:

- IMO 2010 FTP Code Part 2, IMO-Resolution MSC.307(88)

Testing procedure

In a test chamber according to DIN EN ISO 5659-2 square shaped specimens are irradiated with 25 kW/m² without pilot flame, 25 kW/m² with pilot flame and with 50 kW/m² without pilot flame. The generated smoke is captured within the test chamber. After obtaining the maximum smoke density, the samples for the assessment of toxicity are extracted from the gases and analyzed by a FTIR spectrometer.

Smoke density and toxicity chamber according to EN ISO 5659-2



Evaluation of measurement data of a test



Testing criteria

The test is used to determine whether the tested materials produce neither exceptionally large amounts of smoke nor release toxic substances in a considerable degree in the event of a fire. Products showing one or more of the following characteristics have to be classified as ineligible for use aboard ships.

Testing criteria for smoke density:

- Surface coatings for bulkheads, walls, linings etc. must not exceed a value for D_m of 200 in any test condition.
- Primary deck coverings shall not exceed a value for D_m of 400 in any test condition.
- Floor coverings must not exceed a value of 500 for D_m in any test condition.
- Plastic pipes and electrical cables shall not exceed a value of 400 for D_m in any test condition.

Testing criteria for toxicity:

Gas constituent	Limit
CO	1450 ppm
HCl	600 ppm
HF	600 ppm
HBr	600 ppm
HCN	140 ppm
NO _x	350 ppm
SO ₂	120 ppm
SO ₂ (for floor coverings)	200 ppm

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Sampling

Specimens must be representative for the product to be tested. For this reason sample material is taken from current manufacturing or from stock.

The sampling must be recorded in a sampling protocol to ensure the traceability of the sample material. The protocol must give information on name and function of sampler (QM), date, place and type of sampling etc.

Alternatively the sampling can be conducted by an expert of the Test Laboratory for Fire Protection of DMT GmbH & Co. KG.

Specimens

For fire tests according to IMO 2010 FTPC Part 2 eighteen specimens with the following dimensions are required:

- 75 mm x 75 mm x overall thickness (≤ 25 mm)

Required documents

The following documentation is required prior to the commencement of testing:

- Written order including invoice address
- Specimens
- Technical specifications data sheet (incl. bulk density, mass per unit area, material thickness, manufacturer, trade name etc.)
- Material safety data sheet
- Detailed description of product and composition of material
- Sampling protocol (except for exploratory testing) and coating protocol
- Delivery note incl. specification of type of testing and exact denotation of samples

Do you require further information?

Our team is eager to offer you advice and support. Contact us!