



Guideline No.: A-04(201510)

A-04 MARINE RUBBER FLOORING

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Foreword:

This Guide is a part of CCS Rules, which contains technical requirements, inspection and testing criteria related to classification and statutory survey of marine products.

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MARINE RUBBER FLOORING

1 Application

The Guideline apply to the approval and inspection of low flame spread marine rubber flooring used on ships and offshore installations.

2 Normative references

Regulations 3, 5 and 6, Chapter II-2, SOLAS 1974 and Amendments thereto

PART TWO and PART FIVE of IMO FTP Code 2010

Annex 2 of IMO FTP Code 2010

3 Terms and definitions

3.1 The terms and definitions given in SOLAS apply to this guideline.

3.2 For the purpose of this guideline , the following additional definition has been included:

(1) Residual indentation: the difference between the flooring's initial thickness and its thickness 150min after the recovery from static load extrusion.

4 Drawings and documentation to be submitted

4.1 The applicant is to submit the following documents and information to CCS for review when applying for works approval by CCS:

(1) Basic information of the manufacturer: history and current status of the manufacturer, production history and application of related products, the designation, intended purpose, specifications and capacity of main production and testing equipment, technical and inspection personnel, product trademark, etc.;

(2) Details of products for which the approval is being applied, including product name, specifications/model, etc.;

(3) List of (qualified) raw material suppliers, including, the name, model/specifications, acceptance method and source of the materials;

(4) Brief illustration of production process: production process flow chart indicating the inspection/test control points;

(5) Documents related to quality assurance system.

4.2 The type test plan, technical specifications for delivery and acceptance and/or enterprise standards are to be submitted to CCS for approval.

5 Selection of marine rubber flooring for type test

Each type of the marine rubber flooring that the applicant applies for approval by CCS is to be type tested. Difference in formula, process, color and/or kind is to be considered as difference in type. For marine rubber floorings of the same type and of different thicknesses, the products of maximum thickness may be selected as the specimens for type test and the test results may cover the products of smaller thickness.

6 Type test

6.1 Type test is to generally include the following items:

- (1) Basic performance test
- (2) Special performance test
- (3) Asbestos testing

6.2 See Table 6.2 for basic performance type tests.

Table 6.2

No.	Test item	Technical requirements	Test method
1	Appearance quality	The surface of marine rubber flooring is to be neat, aesthetic and free of apparent colour difference. Defects such as cracks, penetrating holes and air pockets are not allowed.	Visual inspection

Continued Table 6.2

No.	Test item		Technical requirements	Test method
2	Dimension		Permissible thickness tolerance: 0-0.2; width and length tolerance of bulk materials: $\pm 0.5\text{mm}$; rolled materials width tolerance: $\pm 0.5\text{mm}$, length tolerance: $\pm 0.2\%$; the length difference between the two diagonal lines is to be no greater than 0.5mm	EN 428
3	Hardness		86~92 degrees	GB/T 531
4	Tensile strength		$\geq 8\text{MPa}$	GB/T 528
5	Wear resistance		$\leq 250\text{mm}^3$	GB/T 9867
6	Hot air ageing 70 °C×24h	Change rate of tensile strength	-20%~10%	GB/T 528
		Hardness change	≤ 5 degrees	GB/T 531
7	Low temperature resistance (-20 °C×24h)		Free from cracks.	Method C in GB/T11026-1989
8	Oxygen index		①	GB/T 10707
9	Residual indentation	Thickness of test specimen < 3mm	≤ 0.20	EN 433
		Thickness of test specimen $\geq 3\text{mm}$	≤ 0.25	
10	Resistance to cigarette burns		≥ 3 grade	EN 1399
11	Tear strength		$\geq 20\text{KN/m}$	GB/T 529

Continued Table 6.2

12	Flammability test of surface material	PART 5 of IMO FTP Code 2010	PART 2 and PART 5 of IMOFTP Code 2010
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Note:

①Oxygen index value is to be no less than the measured oxygen index of the test specimen which satisfies the surface material flammability test and the fume and toxicity test of the surface material simultaneously.

② According to the regulations in Annex 2 of IMO FTP Code 2010, when both the conditions, i.e. the total thermal release Q_t is not in excess of 0.2MJ and the thermal release rate peak Q_p is not in excess of 1.0kW (these two values are to be determined in accordance with Part 5, Annex 1 of IMO FTP Code 2010), are satisfied simultaneously, the marine rubber flooring may be considered compliant with the requirements on fume and toxicity test as specified in Part 2 of IMO FTP Code 2010 and further tests are not required.

6.3 The information of type test of floorings with requirements on special properties such as oil, acid and alkali resistance, insulation or electrical conductivity, etc. is given in Table 6.3.

Table 6.3

No.	Test item		Technical requirements	Test method
1	Resistance to oil, 15 # engine oil, 23 ℃×24h	Mass change rate	-2%~5%	GB/T 1690
		Volume change rate	0~10	
2	Resistance to acid and alkali, ageing factor Calculated by tensile product, 23 ℃×24h	Sulfuric acid (volumetric concentration, 20%)	≥0.8	GB/T 528
		Hydrochloric acid (volumetric concentration, 20%)		
		Sodium hydroxide (volumetric concentration, 20%)		

Continued Table 6.3

No.	Test item		Technical requirements	Test method
3	Resistance to seawater, mass concentration of sodium chloride: 3%, 23 ℃×24h	Mass change	≤5%	GB/T 1690
		Volume change	≤10%	
4	Insulation	Electric strength	≥2000 V/mm	GB/T 1695
		Insulation resistivity	≥1010Ω·cm	GB/T 1692
5	Electrical conductivity	Surface resistivity	≤108Ω	GB/T 1692

6.4 Asbestos testing

Marine rubber floorings of different models intended to be approved are to comply with asbestos-free requirements; an Asbestos-free Declaration is to be provided and asbestos testing is to be carried out in accordance with ISO 22262-1:2012.

7 Unit/batch inspection

7.1 The unit/batch inspection unit/batch inspection of marine rubber floorings after approval is to be carried out in the sequence from item 1 to item 11 in Table 6.2. The raw material suppliers are to be checked prior to the inspection to confirm they are approved suppliers.

7.2 The dimensional and visual inspection of each piece or roll of products is to be carried out batch by batch; when performance tests are carried out, the products of the same formula, process and kind of each 10000m² are to be grouped into the one same batch and the test specimens are to be randomly sampled from each batch of products. The test specimens for all test items are to be sampled from the same piece or roll.

7.3 All products qualified through inspection or external packages of such products are to be clearly identified with CCS marks on at least one location.

7.4 Upon completion of unit/batch inspection, CCS product certificates or equivalent documents may be issued for the qualified products.