

GUIDANCE FOR THE APPROVAL AND TYPE APPROVAL OF MATERIALS AND EQUIPMENT FOR MARINE USE

**Guidance for the Approval and Type Approval of Materials and Equipment for
Marine Use** **2012 AMENDMENT NO.1**

Notice No.46 15th June 2012

Resolved by Technical Committee on 10th February 2012

ClassNK
NIPPON KAIJI KYOKAI

Notice No.46 15th June 2012

AMENDMENT TO THE GUIDANCE FOR THE APPROVAL AND TYPE APPROVAL OF MATERIALS AND EQUIPMENT FOR MARINE USE

“Guidance for the approval and type approval of materials and equipment for marine use” has been partly amended as follows:

Amendment 1-1

Part 1 METALLIC MATERIALS

Chapter 1 APPROVAL OF MANUFACTURING PROCESS OF ROLLED STEELS

1.4 Approval Test

1.4.3 Details of Test

Table 1.1-2 has been amended as follows.

Table 1.1-2 Approval Test Items for Rolled Steels

Rolled steels		Kind of test (See Note ⁽¹⁾)																					
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)
Rolled steels for hull	KA	○	○			○	○		○	○		○											○
	KB	○	○			○	○		○	○		○	○										○
	KD	○	○			○	○		○	○		○	○										○
	KE	○	○			○	○		○	○		○	○		○	○	○	○	○	○			○
	KA32, KA36, KA40	○	○			○	○		○	○		○	○					○	○	○			○
	KD32, KD36, KD40	○	○			○	○		○	○		○	○					○	○	○			○
	KE32, KE36, KE40	○	○			○	○		○	○		○	○		○	○	○	○	○	○			○
	KF32, KF36, KF40	○	○			○	○		○	○		○	○		○	○	○	○	○	○			○
Rolled steels for boilers	KP42 ~ KPA56	○	○			○	○		○	○		○								○		○	
Rolled steels for pressure vessels	KPV24~KPV50	○	○			○	○		○	○		○	○				○			○		○	
Rolled steels for low temperature service	KL24A~KL9N60	○	○			○	○		○	○		○	○		○	○	○	○	○			○	
Rolled stainless steels	KSUS304~KSUS347	○	○			○	○		○	○		○									○	○	
Round bars for chains	KSBC31~KSBC70	○	○			○	○		○	○		○								○		○	
	KSBCR3, KSBCR3S, KSBCR4, KSBCR4S, KSBCR5	○	○			○	○		○	○		○	○	○	○					○		○	
Rolled steel bars for boiler	KPS42B~KPS46B	○	○			○	○		○	○		○										○	
Rolled carbon steel bars	KSFR41~KSFR78	○	○			○	○		○	○		○										○	

Part 3 WELDING CONSUMABLES

Chapter 1 APPROVAL OF WELDING CONSUMABLES

1.4 Approval Tests

Sub-paragraph 1.4.2 has been amended as follows.

1.4.2 Contents of Approval Tests

Contents of the approval tests are to be in accordance with the requirements in **6.2** through ~~6.86.9~~, **Part M of the Rules** except the following (1) and (2).

1.7 Change in the Approval Content

1.7.2 Content of the Tests

Sub-paragraph -2 has been amended as follows.

2 The additional approval tests under the provision of **1.7.1-1** aforementioned, are to be done in accordance with the followings :

(1) Change of Grade

The additional tests are to be done in accordance with the requirements of **6.1.3-6, Part M of the Rules**.

(2) Addition of Welding Position

Tests, of which test assemblies are specified to be prepared for additional welding positions in the provisions of **6.2** through ~~6.86.9~~, **Part M of the Rules**, are to be done.

(3) Enlargement of Maximum diameter of Electrode or Wire

Tests required to be tested at the largest diameter electrode or wire under the provisions of **6.2** through ~~6.86.9~~, **Part M of the Rules**.

(4) Addition of Shield Gas

Additional tests are to be done in accordance with the requirements of **6.3.3, 6.4.3, and 6.7.3, Part M of the Rules**.

(5) Others

As deemed necessary, the test required by the Society basing on the nature and extent of the change, are to be done.

Part 4 NON-METALLIC MATERIALS AND COATING MATERIALS FOR HULL

Chapter 4 APPROVAL OF COATING SYSTEM

4.1 General

4.1.1 Application

Sub-paragraph -1 has been amended as follows.

1 The requirements of this chapter apply to tests and inspection for approval of coating system specified in **B2.1.8-2(1)** or **B2.1.8-3(1)**, **Guidance for the Survey and Construction of Steel Ships Part B** or **2.1.9-2(1)**, **Part 2, Guidance for the Survey and Construction of Passenger ships**.

4.2 Application Procedures

Paragraph 4.2.1 has been amended as follows.

4.2.1 Application for Approval

Manufacturer who intends to obtain approval is to submit the application, ~~in duplicate~~, stating the type and uses of the coating system ~~accompanied by the reference materials and data, each in duplicate, as shown~~ **(Form 4-8)**, three copies of the documents specified in 4.2.2 and three copies of the test plan to the Society (one of its branches).

4.4 Approval Test

Paragraph 4.4.2 has been amended as follows.

4.4.2 Test Procedure and Acceptance Criteria

1 The coating system for seawater ballast tanks, etc. is to be approved in accordance with the following ~~requirements tests~~. Epoxy based systems tested prior to 1 July 2008 need satisfy only the criteria for blistering and rust from the following ~~requirements tests~~. Where deemed appropriate by the Society, these ~~requirements tests~~ may be omitted.

- (1) For protective coatings for dedicated seawater ballast tanks, **Annex 4.1** and **Annex 4.2** apply.
- (2) For protective coatings for double-side spaces of bulk carriers of 150 *m* in length and upwards other than dedicated seawater ballast tanks, **Annex 4.2** applies.

2 The coating system for cargo oil tanks is to be approved in accordance with the tests specified in Annex 4.3 and Annex 4.4.

~~23~~ The Society may accept an equivalent test as a substitute for the tests specified in **-1** and **-2** subject to Administration acceptance. Any equivalent test is to be in accordance with the following:

- (1) The test procedure is to be based on recognized international or national standards, well

established with proven experience.

- (2) The test procedure is to adequately address the technical intent of the tests required in **Annex 4.1** ~~or~~, **Annex 4.2**, **Annex 4.3** or **Annex 4.4**.
- (3) Test results are, wherever possible, to be compared against the acceptance criteria of **Annex 4.1** ~~or~~, **Annex 4.2**, **Annex 4.3** or **Annex 4.4**. In cases where this is not possible due to the parameters of the equivalent test used, the acceptance criteria of the equivalent test are to be selected so that they provide the closest equivalent to those in **Annex 4.1** ~~or~~, **Annex 4.2**, **Annex 4.3** or **Annex 4.4**.
- (4) Epoxy based systems approved by such an equivalent test are to be applied in accordance with all of the surface preparation and application requirements specified in “*PERFORMANCE STANDARD FOR PROTECTIVE COATINGS FOR DEDICATED SEAWATER BALLAST TANKS IN ALL TYPE OF SHIPS AND DOUBLE-SIDE SKIN SPACES OF BULK CARRIERS*” (*IMO Performance Standard for Protective Coatings for Seawater Ballast Tanks, etc. / IMO resolution MSC.215(82) as may be amended*) or the “*PERFORMANCE STANDARD FOR PROTECTIVE COATINGS FOR CARGO OIL TANKS OF CRUDE OIL TANKERS*” (*IMO Performance Standard for Protective Coatings for Cargo Oil Tanks / IMO resolution MSC.288(87) as may be amended*).

Form 4-8 has been added as follows.

Form 4-8

**Application for Approval of Coating System (for Seawater Ballast Tanks, etc. / Cargo Oil Tanks)
(Initial / Renewal)**

Date:

ClassNK

Applicant:

Office

We applied for approval of the following coating system specified below in accordance with the requirements of B2.1.8-2 or B2.1.8-3, Part B of the Guidance for the Survey and Construction of Steel Ships or 2.1.9-2, Part 2 of the Guidance for the Survey and Construction of Passenger Ships.

Address of Manufacture			
Coating System	System	Epoxy Based System	× Shop Primer
	Brand name		
Desired Date of Factory Survey			
Schedule and place of approval test			
Person in charge (Department, Phone No. and Fax No.)			
Documents to be submitted (1) or (2), and(3)		(1) Approval test plan (unnecessary in the event of (2) below):3 (2) Test report (Please attach the type approval certificate or approval certificate, if there is an acceptable type approval certificate or approval certificate.) or evidence of five years of field exposure :3 (3) Relevant documents : 3 each (a) Historical records of the company (the manufacture) (b) Data of facilities of manufacturer (c) Documents on the quality control system of the company (manufacturer), (copy of Quality Manual) (d) Description of materials comprising coating system (names and trade names of materials) (e) Table of chemical composition of coating (f) Record of service of field exposure (g) Marking (h) Specification of the coating system (include the items specified in B2.1.2-7(2), Part B of the Guidance for the Survey and Construction of Steel Ships, in principle) (i) Other documents which the society considers necessary	

Annex 4.3 has been added as follows.

Annex 4.3 Gas-tight Cabinet Test

1.1 Test condition

The vapour test is to be carried out in a gas-tight cabinet. The dimensions and design of the air tight gas cabinet are not critical, provided the requirements of (6) to (10) below are met. The test gas is designed to simulate the actual crude oil cargo tank environment in ballast condition as well as the vapour conditions of the loaded tank.

- (1) The exposure time is 90 days.
- (2) Testing is to be carried out using duplicate panels; a third panel is to be prepared and stored at ambient conditions to act as a reference panel during final evaluation of the test panels.
- (3) The size of each test panel is 150 mm × 100 mm × 3 mm.
- (4) The panels are to be treated according to IMO Resolution MSC.288(87), Table 1, 1.2 and the coating system applied according to Table 1, 1.4 and 1.5.
- (5) The zinc silicate shop primer, when used, is to be weathered for at least 2 months and cleaned by low pressure fresh water washing. The exact method of shop primer preparation before being over coated is to be reported, and the judgment issued for that specific system. The reverse side and edges of the test piece are to be coated appropriately, in order not to influence the test results.
- (6) Inside the gas-tight cabinet a trough is to be present. This trough is to be filled with 2 ± 0.2 l of water. The water in the trough is to be drained and renewed prior to each time the test gas is refreshed.
- (7) The vapour spaces inside the gas-tight cabinet are to be filled with a mixture of test gas as per Table 4.3-1. The cabinet atmosphere is to be maintained over the period of the test. When the gas is outside the scope of the test method, it is to be refreshed. The monitoring frequency and method, and the date and time for refreshing the test gas, are to be in the test report.

Table 4.3-1 Test Gas Composition

<u>N₂</u>	<u>83 ± 2 % vol.</u>
<u>CO₂</u>	<u>13 ± 2 % vol.</u>
<u>O₂</u>	<u>4 ± 1 % vol.</u>
<u>SO₂</u>	<u>300 ± 20 ppm</u>
<u>H₂S</u>	<u>200 ± 20 ppm</u>

- (8) The atmosphere in the test cabinet is at all times to be 95 ± 5 % relative humidity.
- (9) Temperature of the test atmosphere is to be 60 ± 3 °C.
- (10) A stand for the test panels is to be made of a suitable inert material to hold the panels vertically spaced at least 20 mm between panels. The stand is to be positioned in the cabinet to ensure the lower edge of the panels is at least 200 mm above the height of the water and at least 100 mm from the walls of the cabinet. If two shelves are in the cabinet, care is to be taken to ensure solution does not drip on to the lower panels.

1.2 Test results

1 Prior to testing, the following measured data of each coating composing the coating system, including the zinc silicate shop primer when used under the coating system, are to be reported:

- (1) infrared (IR) identification of the base and hardener components of the coating;
- (2) specific gravity⁽¹⁾ of the base and hardener components of the paint; and
- (3) mean dry film thickness (DFT) (by using a template).⁽²⁾

2 After completion of the test duration, the panels are to be removed from the cabinet and rinsed with warm tap water. The panels are to be dried by blotting with absorbent paper and, then, evaluated for rust and blistering within 24 h of the end of the test.

3 After testing, the measured data of blisters and rust are to be reported.^{(3) (4) (5)}

(Remarks)

⁽¹⁾ ISO 2811-1/4 (1997. *Paints and varnishes. Determination of density*)

⁽²⁾ Six equally distributed measuring points are used on panels size 150 mm × 100 mm.

⁽³⁾ ISO 4628-1 (2003. *Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Part 1: General introduction and designation system*)

⁽⁴⁾ ISO 4628-2 (2003. *Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Part 2: Assessment of degree of blistering*)

⁽⁵⁾ ISO 4628-3 (2003. *Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of common types of defect – Part 3: Designation of degree of rusting*)

1.3 Acceptance criteria

1 The test results based on 1.2 are to satisfy the following criteria in Table 4.3-2, the poorest performing of the duplicate test panels is to be used in the report.

Table 4.3-2 Acceptance Criteria

<u>Item</u>	<u>Acceptance criteria for epoxy-based systems</u>	<u>Acceptance criteria for alternative systems</u>
<u>Blisters on panel</u>	<u>0</u>	<u>0</u>
<u>Rust on panel</u>	<u>Ri 0 (0%)</u>	<u>Ri 0 (0%)</u>

2 When evaluating test panels, blistering or rusting within 5mm of the panel edge are to be ignored.

1.4 Test report

The test report is to include the following information:

- (1) coating manufacturers' name and manufacturing site;⁽⁶⁾
- (2) dates of test;
- (3) product name/identification of each coat and, where applicable, zinc silicate shop primer;
- (4) batch numbers of each component of each product;
- (5) details of surface preparation of steel panels, before shop primer application, and treatment of the shop primer before over coating where relevant and at a minimum including the following:
 - (a) surface treatment, or treatment of weathered shop primer, and any other important information on treatment influencing the performance; and

- (b) water soluble salt level measured on the steel prior to application of the shop primer;^{(7) (8)}
- (6) details of coating system, including the following:
- (a) zinc silicate shop primer if relevant, its secondary surface pre-treatment and condition under which applied, weathering period;
 - (b) number of coats, including the shop primer, and thickness of each;
 - (c) mean dry film thickness (DFT) prior to testing;⁽⁹⁾
 - (d) thinner if used;⁽⁹⁾
 - (e) humidity;⁽⁹⁾
 - (f) air temperature;⁽⁹⁾ and
 - (g) steel temperature;⁽⁹⁾
- (7) details of schedule for refreshing the test gas;
- (8) test results according to 1.2; and
- (9) results according to 1.3.

(Remarks)

⁽⁶⁾ It should be noted that the test is valid irrespective of production site, meaning that no individual testing of product from different production sites is required.

⁽⁷⁾ ISO 8502-6 (2006. Preparation of steel substrates before application of paints and related products – Tests for the assessment of surface cleanliness – Part 6: Extraction of soluble contaminants for analysis – The Bresle method)

⁽⁸⁾ ISO 8502-9 (1998. Preparation of steel substrates before application of paints and related products – Tests for the assessment of surface cleanliness – Part 9: Field method for the conductometric determination of water-soluble salts)

⁽⁹⁾ Both of actual specimen data and manufacturer's requirement/recommendation.

Annex 4.4 has been added as follows.

Annex 4.4 Immersion Test

1.1 Test condition

The immersion test⁽¹⁾ is developed to simulate the condition in a crude oil tank in loaded condition.

- (1) The exposure time is 180 days.
- (2) The test liquid is to be made as per the following. To prevent the risk of H₂S release into the test facility, it is recommended to use a stock solution for steps (a) to (d), then fill the test containers and complete the test solution with steps (e) and (f).
 - (a) start with distillate Marine Fuel, DMA Grade⁽²⁾ density at 15 °C: maximum 890 kg/m³, viscosity of maximum 6 mm²/s at 40 °C;
 - (b) add naphthenic acid up to an acid number⁽³⁾ of 2.5 ± 0.1 mgKOH/g;
 - (c) add benzene/toluene (1:1 ratio) up to a total of 8.0 ± 0.2 % w/w of the DMA;
 - (d) add artificial seawater⁽⁴⁾ up to a total of 5.0 ± 0.2 % w/w to the mixture;
 - (e) add H₂S dissolved in a liquid carrier (in order to get 5 ± 1 ppm w/w H₂S in the total test liquid);
 - (f) thoroughly mix the above constituents immediately prior to use; and
 - (g) once the mixture is completed, it is to be tested to confirm the mixture is compliant with the test mixture concentrations.
- (3) The test liquid is to be added to a container with an inside flat bottom until a column of the test liquid of height of 400 mm is reached, resulting in an aqueous phase of 20 mm. Any other alternative test set-up, using an identical test liquid, which will also result in the immersion of the test panel in 20 mm of the aqueous phase, is also accepted. This can be achieved by using, for instance, inert marbles.
- (4) The temperature of the test liquid is to be 60 ± 2 °C and is to be uniform and maintained constant with recognized methods such as water or oil bath or air circulation oven capable of keeping the immersion liquid within the required temperature range.
- (5) Test panels is to be positioned vertically and fully immersed during the test.
- (6) Testing is to be carried out using duplicate panels.
- (7) Inert spacers which do not cover the test area are to be used to separate test panels.
- (8) The size of each test panel is 150 mm × 100 mm × 3 mm.
- (9) The panels are to be treated according to IMO Resolution MSC.288(87), **Table 1, 1.2** and the coating system applied according to **Table 1, 1.4** and **1.5**.
- (10) The zinc silicate shop primer, when used, is to be weathered for at least 2 months and cleaned by low pressure fresh water washing. The exact method of shop primer preparation before being over coated is to be reported, and the judgment issued for that specific system. The reverse side and edges of the test piece are to be coated appropriately, in order not to influence the test results.
- (11) After the full immersion test period is completed the panels are to be removed from the test liquid and wiped with dry clean cloth before evaluation of the panels.
- (12) Evaluation of the test panels is to be done within 24 h after completion of the test.

(Remarks)

⁽¹⁾ Related test method is derived from, but not identical to, standard ISO 2812-1 (2007. *Determination of resistance to liquids – Part 1: Immersion in liquids other than water*)

⁽²⁾ ISO 8217 (2005. *Petroleum products - Fuels (class F) - Specifications of marine fuels*)

⁽³⁾ ISO 6618 (1997. *Petroleum products and lubricants - Determination of acid or base number*)

- Colour-indicator titration method)

⁽⁴⁾ ASTM D1141 – 98 (2008. Standard Practice for the Preparation of Substitute Ocean Water)

1.2 Test results

1 Prior to testing, the following measured data of each coating composing the coating system, including the zinc silicate shop primer when used under the coating system, are to be reported:

- (1) infrared (IR) identification of the base and hardener components of the coating;
- (2) specific gravity⁽⁵⁾ of the base and hardener components of the paint; and
- (3) mean dry film thickness (DFT) (by using a template).⁽⁶⁾

2 After testing, the measured data of blisters and rust are to be reported.^{(7) (8) (9)}

(Remarks)

⁽⁵⁾ ISO 2811-1/4 (1997. Paints and varnishes. Determination of density)

⁽⁶⁾ Six equally distributed measuring points are used on panels size 150 mm × 100 mm.

⁽⁷⁾ ISO 4628-1 (2003. Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Part 1: General introduction and designation system)

⁽⁸⁾ ISO 4628-2 (2003. Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Part 2: Assessment of degree of blistering)

⁽⁹⁾ ISO 4628-3 (2003. Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of common types of defect – Part 3: Designation of degree of rusting)

1.3 Acceptance criteria

1 The test results based on 1.2 are to satisfy the following criteria in Table 4.4-1, the poorest performing of the duplicate test panels is to be used in the report.

Table 4.4-1 Acceptance Criteria

<u>Item</u>	<u>Acceptance criteria for epoxy-based systems</u>	<u>Acceptance criteria for alternative systems</u>
<u>Blisters on panel</u>	<u>0</u>	<u>0</u>
<u>Rust on panel</u>	<u>Ri 0 (0%)</u>	<u>Ri 0 (0%)</u>

2 When evaluating test panels, blistering or rusting within 5 mm of the panel edge are to be ignored.

1.4 Test report

The test report is to include the following information:

- (1) coating manufacturers' name and manufacturing site;⁽¹⁰⁾
- (2) dates of test;
- (3) product name/identification of each coat and, where applicable, zinc silicate shop primer;
- (4) batch numbers of each component of each product;
- (5) details of surface preparation of steel panels, before shop primer application, and treatment of the shop primer before over coating where relevant and at a minimum including the following:
 - (a) surface treatment, or treatment of weathered shop primer, and any other important information on treatment influencing the performance; and

- (b) water soluble salt level measured on the steel prior to application of the shop primer;^{(11) (12)}
- (6) details of coating system, including the following:
- (a) zinc silicate shop primer if relevant, its secondary surface pre-treatment and condition under which applied, weathering period;
 - (b) number of coats, including the shop primer, and thickness of each;
 - (c) mean dry film thickness (DFT) prior to testing;⁽¹³⁾
 - (d) thinner if used;⁽¹³⁾
 - (e) humidity;⁽¹³⁾
 - (f) air temperature;⁽¹³⁾ and
 - (g) steel temperature;⁽¹³⁾
- (7) test results according to 1.2; and
- (8) results according to 1.3.

(Remarks)

⁽¹⁰⁾ It should be noted that the test is valid irrespective of production site, meaning that no individual testing of product from different production sites is required.

⁽¹¹⁾ ISO 8502-6 (2006. Preparation of steel substrates before application of paints and related products – Tests for the assessment of surface cleanliness – Part 6: Extraction of soluble contaminants for analysis – The Bresle method)

⁽¹²⁾ ISO 8502-9 (1998. Preparation of steel substrates before application of paints and related products – Tests for the assessment of surface cleanliness – Part 9: Field method for the conductometric determination of water-soluble salts)

⁽¹³⁾ Both of actual specimen data and manufacturer's requirement/recommendation.

Part 6 MACHINERY

Chapter 2 TYPE APPROVAL OF USE OF MACHINERY AND EQUIPMENT

2.4 Approval Tests

2.4.2 Details of Tests

Sub-paragraph -11 has been amended as follows.

- 11** Flexible hose assemblies are to be approved in accordance with the following tests.
- (1) For metallic flexible hose assemblies, the following tests correspondingly in accordance with *ISO 10380* are to be included.
 - (a) Pressure test
 - (b) Burst test
 - (c) Fatigue test
 - (d) Bend test
 - (e) Leakage test
 - (f) Other tests as deemed necessary by the Society
 - (2) For non-metallic flexible hose assemblies, the following tests are to be included:
 - (a) Pressure test and burst test correspondingly in accordance with *ISO 1402* (The minimum burst pressure is to be not less than four times the design pressure.)
 - (b) Hydraulic impulse test (Correspondingly in accordance with *ISO 6802* where with flexing during operation or *ISO 6803* where without flexing during operation.)
 - (c) Fire resistance test correspondingly in accordance with *ISO 15540* and *15541* ~~for those hoses used in~~ for flammable oil and sea water pipes where failure may result in flooding. However, this does include hoses installed on exposed open decks.
 - (d) Other tests as deemed necessary by the Society.

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 15 June 2012.

Part 2 EQUIPMENT

Chapter 9 APPROVAL OF USE OF FIBER REINFORCED PLASTIC (FRP)

9.4 Approval Tests

9.4.2 Testing Procedures and Criteria

Sub-paragraphs -3 and 4 have been amended as follows.

3 Flame Spread and Surface Flammability

The requirements of flame spread and surface flammability for FRP are given in **Table 1.3.1, Annex C1.1.7-5, Part C of the Guidance for the Survey and Construction of Steel Ships**. The conditions, procedures and criteria of the test procedures are to be in accordance with the following (1) or (2);

- (1) When ~~Tested~~ flame spread characteristics according to ASTM E-84, with a flame spread rating is not to exceed 20; or
- (2) When ~~Tested~~ surface flammability by the “Test for Surface Flammability” carried out in accordance with the FTP Code defined in 3.2.23, Part R of the Rules for the Survey and Construction of Steel Ships~~IMO Resolution A.653(16), Recommendation on Improved Fire Test Procedures for Surface Flammability of Bulkhead, Ceiling and Deck Finish Materials, and meeting~~ the criteria established for materials used for bulkheads, linings, or ceilings are to be complied with.

4 Smoke Generation

The requirements of smoke generation for FRP are given in **Table 1.3.1, Annex C1.1.7-5, Part C of the Guidance for the Survey and Construction of Steel Ships**. The conditions, procedures and criteria of the test procedures are to be in accordance with the following (1) or (2);

- (1) When ~~Tested~~ according to ASTM E-84, with a smoke developed rating is not to exceed 10; or
- (2) When ~~Tested~~ smoke generation by “Smoke and Toxicity Test” carried out in accordance with the FTP Code defined in 3.2.23, Part R of the Rules for the Survey and Construction of Steel Ships~~the IMO Fire Test Procedures Code (FTPC), Resolution MSC.61(67), Part 2 Smoke and Toxicity Test, and meeting~~ the criteria established for materials used as bulkheads, linings, or ceilings are to be complied with.

Part 4 NON-METALLIC MATERIALS AND COATING MATERIALS FOR HULL

Chapter 1 APPROVAL OF FIRE PROTECTION MATERIALS

1.2 Definitions

Paragraph 1.2.12 has been amended as follows.

1.2.12 FTP Code

1 “FTP Code” means as defined in 3.2.23, Part R of the Rules.

2 In applying the FTP Code, the following requirements are to be complied with:

(1) Section 1.12, 1.13 and 7.6.1 of APPENDIX 1, PART 3, ANNEX 1 to the FTP Code

In approval tests for “A” class divisions, the following details are to be indicated on the test report. Furthermore, the Certificate of Approval for Fire Protection Material is to refer to the drawing number of the detail drawings used in the approval test:

(a) Type, thickness, density and number of layers of insulation material;

(b) Size, types, materials and fixing methods of pins and washers;

(c) Spacing between pins;

(d) Maximum spacing between pins and adjacent joints;

(e) Stepping of joints for multi-layers, if applicable;

(f) Insulation and pinning details on and around stiffeners;

(g) Details of wire mesh, aluminium tape, etc., if used in the test;

(h) The information required by 2.1.3, 2.2.3, 6.1 and 9.10 of APPENDIX 1, PART 3, ANNEX 1 to the FTP Code.

~~“FTP Code” means the “International Code for Application of Fire Test Procedures” as adopted by the Maritime Safety Committee of the International Maritime Organizations by the Resolution MSC.61(67), as amended.~~

~~In applying “FTP Code”, the following requirements are to be complied with:~~

3 In cases where the provision 8.2 of FTP Code is applied, notwithstanding the requirement in preceding -2(1), the following (1) to (6) are to be complied with:

(1) Section 1.6 and 7.5.1 of IMO Resolution A.754(18)

In approval tests for “A” class divisions, the following details are to be indicated ~~on~~ the test report. Furthermore, the Certificate of Approval for Fire Protection Material ~~is to refer~~s to the drawing number of the detail drawings used in the approval test:

(a) Type, thickness, density and number of layers of insulation material;

(b) Size, types, materials and fixing methods of pins and washers;

(c) Spacing between pins;

(d) Maximum spacing between pins and adjacent joints;

(e) Stepping of joints for multi-layers, if applicable;

(f) Insulation and pinning details on and around stiffeners;

(g) Details of wire mesh, aluminium tape, etc., if used in the test;

(h) The information required by 2.1.3, 2.2.3, 6.1 and 10.4 of IMO Resolution A.754(18).

~~((2) to (6) are omitted.)~~

Section 1.3 has been amended as follows.

1.3 Requirements

1.3.1 (omitted)

1.3.2 “A” Class Divisions

1 The test procedures for “A” class divisions are in accordance with “Test for “A” and “B” Class Divisions” specified in **1.13.3**.

~~**2** The materials constituting “A” class divisions are to be made of non-combustible material specified in **1.2.1** except adhesives. For approval, the certificates issued by the Society or the test results of fire tests, non-combustibility test and test for surface flammability of components are to be submitted.~~

1.3.3 “B” Class Divisions

1 The test procedures for “B” class divisions are in accordance with the provisions specified in **1.3.2-1**.

~~**2** For approval, the certificates issued by the Society or the test results of components are to be submitted in accordance with **1.3.2-2**. The materials constituting “B” class divisions are in accordance with the provisions specified in **1.3.2-2**. However, combustible veneers may be permitted as a portion of the division provided that they are tested in accordance with “Smoke and Toxicity Test” and “Test for Surface Flammability” specified in **1.13.2** and **1.13.5** respectively.~~

1.3.4 Continuous “B” Class Divisions

1 The test procedures for continuous “B” class divisions are in accordance with “Test for Continuous “B” Class Divisions” specified in **1.13.4**.

~~**2** For approval, the certificates issued by the Society or the test results of components are to be submitted in accordance with **1.3.2-2**. The materials constituting continuous “B” class divisions are in accordance with the provisions specified in **1.3.2-2**.~~

1.3.5 (omitted)

1.3.6 (omitted)

1.3.7 (omitted)

1.3.8 (omitted)

1.3.9 Fire Retardant Coatings

1 The test procedures for fire retardant coatings are in accordance with the provisions specified in **1.3.5**.

~~**2** The approval of fire retardant coatings is made to actual coating systems, taking into consideration of the combination of the under coating and the top coating, on the basis of the coatings classified according to the kinds of synthetic resins used.~~

~~**2** The test procedures for fire retardant coatings are in accordance with the provisions specified in **1.3.5**. The tests are conducted to a combination which provides the maximum quantity of organic material in the coating system used.~~

~~**3** When inorganic coatings are used for under coatings, only the coatings system with top coatings of organic materials is the subject of approval.~~

1.3.10 (omitted)

1.3.11 (omitted)

1.7 Notice of Approval

Paragraph 1.7.1 has been amended as follows.

1.7.1 Notice of Approval

The Society issues the *Certificate of Approval for Fire Protection Material* in accordance with the FTP Code after having approved the material by the general judgment on the basis of the results of examination of the submitted documents and the results of the confirmatory survey of manufacturer for approval and approval tests.

1.10 Periodical Test

1.10.2 Periodical Tests for Approved Materials Other Than Fire Retardant Coatings

Sub-paragraph -2 has been amended as follows.

2 The tests specified in **1.3.1** ~~through~~ **1.3.8** as well as **1.3.10** and **1.3.11** are to be carried out. However, ~~the tests may, however,~~ be omitted in accordance with the provision 5.2 or 8.3 of the FTP Code if the Society considers appropriate.

1.10.3 Periodical Test for Fire Retardant Coatings

Sub-paragraph -2 has been amended as follows.

2 The tests specified in **1.3.9** are carried out. However, ~~the tests may, however,~~ be omitted in accordance with the provision 5.2 or 8.3 of the FTP Code if the Society considers appropriate.

Section 1.13 has been amended as follows.

1.13 Test Procedures

1.13.1 Non-Combustibility Test

Test procedures are to be in compliance with “Non-Combustibility Test” carried out in accordance with the FTP Code. ~~Test procedures of the non-combustibility test are in accordance with the requirements of Part 1, Annex 1 of FTP Code.~~

1.13.2 Smoke and Toxicity Test

Test procedures are to be in compliance with “Smoke and Toxicity Test” carried out in accordance with the FTP Code. ~~Test procedures of the smoke and toxicity test are in accordance~~

~~with the requirements of Part 2, Annex 1 of FTP Code.~~

1.13.3 Test for “A” and “B” Class Divisions

~~Test procedures are to be in compliance with the requirements for “A” and “B” class divisions specified in “Test for “A”, “B” and “F” class divisions” carried out in accordance with the FTP Code. Test procedures of the test for “A” and “B” class divisions are in accordance with the requirements of Part 3 (except Appendix 2), Annex 1 of FTP Code. However, the approval of fire doors of marginally larger dimensions than the standard specimen size (2,440mm width and 2,500mm height) is to be in accordance with the following: specified in Part 3, Annex 1 of the FTP Code is to be in accordance with MSC.1/Circ.1319 “Recommendation for the Evaluation of Fire Performance and Approval of Large Fire Doors” and IACS Unified Interpretation FTP3.~~

- ~~(1) MSC.1/Circ.1319 “Recommendation for the Evaluation of Fire Performance and Approval of Large Fire Doors”.~~
- ~~(2) In cases where the provision 8.2 of the FTP Code is applied, IACS Unified Interpretation FTP3 in addition to the preceding -1.~~

1.13.4 Test for Continuous “B” Class Divisions

~~Test procedures are to be in compliance with the requirements for continuous “B” class divisions specified in “Test for “A”, “B” and “F” class divisions” carried out in accordance with the FTP Code. Test procedures of the test for continuous “B” class divisions are in accordance with the requirements of Part 3 (except Appendix 1), Annex 1 of FTP Code.~~

1.13.5 Test for Surface Flammability

~~Test procedures are to be in compliance with “Test for Surface Flammability” carried out in accordance with the FTP Code. Test procedures of the test for surface flammability are in accordance with the requirements of Part 5, Annex 1 of FTP Code.~~

1.13.6 Test for Primary Deck Coverings

~~Test procedures are to be in compliance with the requirements for primary deck coverings specified in “Test for Surface Flammability” carried out in accordance with the FTP Code. Test procedures of the test for primary deck coverings are in accordance with the requirements of Part 6, Annex 1 of FTP Code. However, in cases where the provision 8.2 of FTP Code is applied, test procedures are to be in compliance with “Test for Primary Deck Coverings”.~~

1.13.7 Test for Fire-Restricting Materials for High-Speed Craft

~~Test procedures are to be in compliance with “Test for Fire-Restricting Materials for High-Speed Craft” carried out in accordance with the FTP Code. The test procedures of the test for fire-restricting materials for high-speed craft are to be in accordance with the requirements of Part 10, Annex 1 of FTP Code.~~

1.13.8 Test for Fire-Resisting Divisions for High-Speed Craft

~~Test procedures are to be in compliance with “Test for Fire-Resisting Divisions of High-Speed Craft” carried out in accordance with the FTP Code. The test procedures of the test for fire-resisting divisions for high-speed craft are to be in accordance with the requirements of Part 11, Annex 1 of FTP Code.~~

Section 1.14 has been amended as follows.

1.14 Omission of Testing and Approval

1.14.1 Non-Combustible Materials

The following materials are considered being non-combustible, and they may be installed without testing and approval.

- (1) Glass
- (2) Concrete
- (3) Ceramic products
- (4) Natural stone
- (5) Masonry units
- (6) Common metals and metal alloys (except magnesium and magnesium alloys)

1.14.2 “A” Class Divisions

The following products are considered being equivalent to class “A-0” bulkheads and class “A-0” decks, and they may be installed without testing and approval.

- (1) Class “A-0” bulkhead: A steel bulkhead with dimensions not less than the minimum dimensions given below:
 - (a) Thickness of plating: 4 mm
 - (b) Stiffeners: 60 mm × 60 mm × 5 mm spaced at 600 mm or structural equivalent~~Section modulus: 23 cm³~~
- (2) Class “A-0” deck: A steel deck with dimensions not less than the minimum dimensions given below:
 - (a) Thickness of plating: 4 mm
 - (b) Stiffeners: 95 mm × 65 mm × 7 mm spaced at 600 mm or structural equivalent~~Section modulus: 57 cm³~~

1.14.3 Primary Deck Coverings

Non-combustible materials are considered to comply with the requirements of tests specified in **1.13.6**. However, due consideration is to be given to the method of application and fixing (e.g., glue).

Section 1.15 has been amended as follows.

1.15 Omission of Tests

1.15.1 Smoke and Toxicity Test

The following materials are considered to comply with the requirements of tests specified in **1.13.2** subject to the approval by the Society.

- (1) Non-combustible materials
- (2) Fire retardant veneers, fire retardant surface floorings and primary deck coverings with both the total heat release (Q_t) of not more than 0.2 MJ and the peak heat release rate (\dot{Q}_p) of not more than 1.0 kW (both values determined in accordance with the requirements of “Test for Surface Flammability” tests specified in **1.13.5**). However, these materials meeting this provision may be exempted from testing in accordance to standard ISO 1716 about calorific

value.

1.15.2 Test for Surface Flammability

1 Non-combustible materials are considered to comply with the requirements of “Test for Surface Flammability”~~tests~~ specified in **1.13.5**.

2 Primary deck coverings classified as not readily ignitable in accordance with ~~the provisions~~ “Test for Primary Deck Coverings” specified in **1.13.6** are considered to comply with the requirements of “Test for Surface Flammability”~~tests~~ specified in **1.13.5** for fire retardant surface floorings.

Part 6 MACHINERY

Chapter 6 APPROVAL OF USE OF PLASTIC PIPES

Section 6.4 has been amended as follows.

6.4 Approval Tests for Process of Manufacture

The approval tests for process of manufacture are to be carried out in the presence of the Society's surveyor by the method under the testing standard specified in **6.9** or the method considered to be equivalent by the Society. However, when tests are carried out by the authorized organization or any organization considered appropriate by the Society, those on testing items other than strength test, electric conductivity test, heat dependence test of material, flame spread test and surface flammability test as well as ~~and~~ fire endurance test may be carried out in the absence of the Society's surveyor.

Section 6.6 has been amended as follows.

6.6 Announcement of Approval

6.6.1 Announcement of Approval

The plastic pipes approved by the Society are to be marked with the following.

- (1) (omitted)
- (2) (omitted)
- (3) Nominal pressure, [G] for these with low flame spread characteristics and surface flammability, [D] for those with electric conductivity, material of which pipe or fitting is made
- (4) (omitted)

6.9 Testing Procedures and Criteria

Paragraph 6.9.1 has been amended as follows.

6.9.1 Criteria for Approval Test for Process of Manufacture

The requirements and the criteria for the approval tests are, in principle, referred to **Table 6.6**. For application of the tables, see below:

- (1) (omitted)
- (2) Flame spread and surface flammability, fire endurance and durability against test in **Table 6.6** are to be carried out, where they are required in the **Annex D12.1.6-2, Part D of the Guidance for the Survey and Construction of Steel Ships**.
- (3) (omitted)
- (4) (omitted)

Table 6.6 has been amended as follows.

Table 6.6 Requirements and Criteria of Approval Test for Process of Manufacture of Plastic pipes

Test item	Testing method	Criteria
(omitted)		
Flame spread and surface flammability	IMO Res. A.753(18) Appendix 3	To have low surface flame spread characteristics Not to exceed ing the average values listed in the FTP Code, Annex 1 Part 5.
	ASTM D 635	HB
(omitted)		

Note:

“FTP Code” means as defined in 3.2.23, Part R of the Rules for the Survey and Construction of Steel Ships ~~the “INTERNATIONAL CODE FOR APPLICATION OF FIRE TEST PROCEDURES”, as adopted by the Maritime Safety Committee of the International Maritime Organization by resolution MSC.61(67) adopted on 5 December 1996.~~

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 1 July 2012.

Part 2 EQUIPMENT

Annex 1 PROCEDURES FOR PROTOTYPE TESTS FOR TYPE APPROVAL AND PRODUCTION TESTS OF LIFEBOATS

Chapter 2 PROCEDURES FOR PRODUCTION TESTS OF LIFEBOATS

2.1 Strength and Performance Tests

Paragraph 2.1.3 has been amended as follows.

2.1.3 Release gear test for lifeboats launched by falls [5.3.4]

The connection of each release gear which is fixed to lifeboats launched by falls is to be subjected to a load equal to the weight of the lifeboat with its full complement of persons and equipment (or two times the weight of the lifeboat with its full complement of persons and equipment in the case of single fall systems). There is to be no damage to the release gear or its connection to the lifeboat.

Annex 2 PROCEDURES FOR PROTOTYPE TESTS FOR TYPE APPROVAL AND PRODUCTION TESTS FOR RESCUE BOATS

Chapter 2 PROCEDURES FOR PRODUCTION TESTS OF RESCUE BOATS

2.1 Strength and Performance Tests

Paragraph 2.1.4 has been amended as follows.

2.1.4 ~~Functional Test of~~ Release gear test for rescue boats launched by falls [5.3.4]

The connection of each release gear which is fixed to rescue boats launched by falls is to be subjected to a load equal to the weight of the rescue boat with its full complement of persons and equipment (or two times the weight of the rescue boat with its full complement of persons and equipment in the case of single fall systems). There is to be no damage to the release gear or its connection to the rescue boat.

EFFECTIVE DATE AND APPLICATION (Amendment 1-3)

1. The effective date of the amendments is 1 July 2012.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to life-saving appliances for ships the keels of which were laid or which were at *a similar stage of construction* before the effective date.
(Note) The term “*a similar stage of construction*” means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 *tonnes* or 1% of the estimated mass of all structural material, whichever is the less.

Part 2 EQUIPMENT

Chapter 9 APPROVAL OF USE OF FIBER REINFORCED PLASTIC (FRP)

9.4 Approval Tests

9.4.2 Testing Procedures and Criteria

Sub-paragraph -5 has been added as follows.

5 Toxicity Test

Requirements related to the toxicity tests for FRP products are specified in Table 1.3.1, Annex C1.1.7-5, Part C of the Guidance for the Survey and Construction of Steel Ships. The conditions, procedures and standards for such tests are to be in accordance with the following:

- (1) Tested toxicity is to comply with the standards of the “Smoke and Toxicity Test” carried out in accordance with the FTP Code defined in 3.2.23, Part R of the Rules for the Survey and Construction of Steel Ships.

EFFECTIVE DATE AND APPLICATION (Amendment 1-4)

1. The effective date of the amendments is 1 January 2013.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to fiber reinforced plastic (FRP) used for ships the keels of which were laid or which were at a *similar stage of construction* before the effective date.
(Note) The term “*a similar stage of construction*” means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is the less.