

ANNEX 13

**RESOLUTION MSC.399(95)
(adopted on 5 June 2015)**

AMENDMENTS TO THE GUIDELINES FOR THE APPLICATION OF PLASTIC PIPES ON SHIPS (RESOLUTION A.753(18)), AS AMENDED BY RESOLUTION MSC.313(88)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.753(18), by which the Assembly, at its eighteenth session, adopted Guidelines for the application of plastic pipes on ships, to assist maritime Administrations to determine, in a rational and uniform manner, the permitted applications of such materials,

NOTING that the Assembly requested the Committee to keep the guidelines under review and amend them as necessary,

RECALLING FURTHER resolution MSC.313(88), by which the Committee adopted amendments to the *Guidelines for the application of plastic pipes on ships* (resolution A.753(18)).

RECOGNIZING that the continual development of plastic materials for use on ships and improvement of marine safety standards since the adoption of resolutions A.753(18) and MSC.313(88) necessitates the periodic revision of the provisions of the *Guidelines for the application of plastic pipes on ships* in order to take into account technological developments and maintain the highest practical level of safety,

HAVING CONSIDERED, at its ninety-fifth session (3 to 12 June 2015), amendments to the *Guidelines for the application of plastic pipes on ships*, proposed by the Sub-Committee on Ship Design and Construction, at its second session,

1 ADOPTS amendments to the guidelines for the application of plastic pipes on ships (resolution A.753(18)), as amended by MSC.313(88), the text of which is set out in the annex to the present resolution; and

2 INVITES Governments to apply the annexed amendments when considering the use of plastic piping on board ships flying the flag of their State.

ANNEX

AMENDMENTS TO THE GUIDELINES FOR THE APPLICATION OF PLASTIC PIPES ON SHIPS (RESOLUTION A.753(18)), AS AMENDED BY MSC.313(88)

1 In the table of contents, the entry for "2.2.3 Smoke generation" is replaced by the following:

"2.2.3 Smoke generation, containment and toxicity"

2 In the table of contents, the entry for "2.2.4 Toxicity" is deleted and the ensuing entries are renumbered accordingly.

3 In the table of contents, the entry for "4.6 Penetrations of fire divisions" is deleted and the ensuing entries are renumbered accordingly.

4 In the table of contents, the entry for "Appendix 3 – Test method for flame spread of plastic piping" is replaced by the following:

"Appendix 3 – Test methods and criteria for flame spread, smoke generation and toxicity of plastic piping"

5 In paragraph 2.1.1.4, the following text is added at the end of the last sentence:

"(e.g. pipes for vacuum and pressure systems)".

6 In paragraph 2.1.8.2, the following sentence is added at the end:

"This may require additional support of the piping systems."

7 In paragraph 2.2.1.2, between the words "outflow of flammable liquids" and "and worsen the fire situation" the words "or spread of fire through duct piping" are added.

8 In paragraph 2.2.2.1, between the words "piped tunnels and ducts," and "should have low flame spread" the words "if separated from accommodation, permanent manned areas and escape ways by means of an A class bulkhead," are added.

9 In paragraph 2.2.2.1, the reference "resolution A.653(16) as modified for pipes" is replaced by the reference "appendix 3".

10 In paragraph 2.2.2.2, the reference "resolution A.653(16)" in the first sentence is replaced by the reference "appendix 3".

11 In paragraph 2.2.2.2, the reference "resolution A.653(16)" in the second sentence are replaced by the reference "the 2010 FTP Code, annex 1, part 5".

12 In paragraph 2.2.2.2, between the words "modifications are" and "listed in appendix 3" in the last sentence, the word "also" is added.

13 In paragraph 2.2.2.3, the reference "IMO resolution A.653(16) (surface flammability criteria of bulkhead, wall and ceiling linings)" is replaced by the reference "appendix 3".

14 The title of section 2.2.3 is replaced by the following:

"2.2.3 Smoke generation, containment and toxicity"

15 In paragraph 2.2.3.1, the reference "SOLAS regulations II-2/34.7 and 49.2 are" is replaced by the reference "SOLAS regulation II-2/6 is".

16 Paragraph 2.2.3.2 is replaced by the following:

"2.2.3.2 Piping materials shall fulfil the requirements of the 2010 FTP Code, annex 1, part 2, on smoke and toxicity test. Procedure modifications are necessary due to the curvilinear pipe surfaces. These procedure modifications are listed in appendix 3".

17 Section 2.2.4 and paragraph 2.2.4.1 are deleted and the ensuing sections and paragraphs of part 2 are renumbered accordingly.

18 Section 4.6 and paragraphs 4.6.1 and 4.6.2 are deleted and the ensuing sections and paragraphs of part 4 are renumbered accordingly.

19 In appendix 1, note 2 to paragraph 1, the words "as set out in paragraphs 7.1, 7.2 and 7.3 of the annex to Assembly resolution A.754(18)" are replaced by the words " as set out in paragraphs 7.1 to 7.4 of part 3 of annex 1 to the 2010 FTP Code".

20 In appendix 1, paragraph 2, the sentence "One of the ends should allow pressurized nitrogen to be connected." is deleted.

21 In appendix 1, note 2 to paragraph 2, the following sentence is added at the end:

"At least largest and smallest diameter or wall thickness should be tested for approval."

22 In appendix 1, paragraph 7 is deleted.

23 Appendix 3 is replaced by the following:

"Appendix 3

**Test methods and criteria for flame spread, smoke generation
and toxicity of plastic piping**

Flame spread, smoke generation and toxicity of plastic piping should be determined by the 2010 FTP Code, annex 1, parts 2 and 5 with the modifications listed below.

Tests should be made for each pipe material and should take into account differences in wall thickness.

When conducting testing of plastic piping, testing need not be conducted on every pipe size. Testing should be conducted on pipe sizes with the maximum and minimum wall thicknesses intended to be used. This will qualify all piping sizes for a specific piping material provided that the wall thickness falls within the tested range.

1 Test Specimen Preparation

1.1 For homogenous thermoplastic pipes, the test specimens may be produced as flat plates in the required wall thickness(es).

1.2 The test sample should be fabricated by cutting pipes lengthwise into individual sections and then assembling the sections into a test sample as representative as possible of a flat surface. A test sample should consist of at least two sections. All cuts should be made normal to the pipe wall. The test sample should be 800 mm \pm 5 mm long for tests to 2010 FTP Code, annex 1, part 5. The test sample should be 75 mm \pm 1 mm square for tests to 2010 FTP Code, annex 1, part 2.

1.3 The number of sections that must be assembled together to form a test sample should be that which corresponds to the nearest integral number of sections which should make a test sample (with an equivalent linearized surface width between 155 mm and 180 mm). The surface width is defined as the measured sum of the outer circumference of the assembled pipe sections that are exposed to the flux from the radiant panel.

1.4 The assembled test sample should have no gaps between individual sections.

1.5 The assembled test sample should be constructed in such a way that the edges of two adjacent sections should coincide with the centreline of the test holder.

1.6 For testing flame spread the individual test sections should be attached to the backing calcium silicate board using wire (No.18 recommended) inserted at 50 mm intervals through the board and tightened by twisting at the back.

1.7 The individual pipe sections should be mounted so that the highest point of the exposed surface is in the same plane as the exposed flat surface of a normal surface.

1.8 The space between the concave unexposed surface of the test sample and the surface of the calcium silicate backing board should be left void.

1.9 The void space between the top of the exposed test surface and the bottom edge of the sample holder frame should be filled with a high temperature insulating wool if the width of the pipe segments extend under the side edges of the sample holding frame.

2 Test Methods

Flame spread of plastic piping should be determined by the 2010 FTP Code, annex 1, part 5. The smoke density and toxicity of gases produced by plastic pipes should be determined by the 2010 FTP Code, annex 1, part 2.

3 Criteria

Flame Spread

Parameters	Criteria
CFE(kW/m ²)	≥20.0
Q _{sb} (MJ/m ²)	≥1.5
Q _t (MJ)	≤0.7
Q _p (kW)	≤4.0
Burning Droplets	No burning droplets

Smoke and Toxicity

Smoke: the D_m value shall not exceed 400 in any test condition

Toxicity: the average value of the gas concentration measured under each test condition shall not exceed the following limits:

Species	Concentration (ppm)
CO	1450
HCl	600
HF	600
HBr	600
HCN	140
SO ₂	120
NO _x	350

4 Exemption of the test in accordance with part 2 of the 2010 FTP Code

Piping with both the total heat release (Q_t) of not more than 0.2 MJ and the peak heat release rate (Q_p) of not more than 1.0kW (both values determined in accordance with the 2010 FTP Code, annex 1, part 5) are considered to comply with the requirements the 2010 FTP Code, annex 1, part 5 without further testing (see the 2010 FTP Code, annex 2, paragraph 2.2)."

24 In appendix 4, in the fire endurance requirements matrix, the following new row is added at the end of the matrix:

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32	Central vacuum cleaners	NA	NA	NA	0	NA	NA	NA	NA	0	0	0
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25 In appendix 4, footnote 10, the reference "paragraph 3(f) of regulation 13F" is replaced by the reference "paragraph 3.6 of regulation 19".

26 In appendix 4, in location definitions, in the definition of location A – Machinery spaces of category A, the reference "regulation II-2/3.19" is replaced by the reference "regulation II-2/3.31"

27 In appendix 4, in location definitions, in the definition of location B – Other machinery spaces and pump-rooms, the word "pumps," is deleted.

28 In appendix 4, in location definitions, in the definition of location B – Other machinery spaces and pump-rooms, between the words "boilers," and "steam and internal combustion engines" add the words "fuel oil units,".

29 In appendix 4, in location definitions, in the definition of location J – Accommodation, service and control spaces, the reference "regulation II-2/3.10, 3.12, 3.22" is replaced by the reference "regulations II-2/3.1, 3.45, 3.18".

30 In appendix 4, in location definitions, in the definition of location K – Open decks, the reference "regulation II-2/26.2.2(5)" is replaced by the reference "regulation II-2/9.2.2.3.2(5)".
