

4. This investigation should be based on a critical examination of pieces of material made available as a result of modification or demolition of existing ships. It would of course be necessary to know the initial level of the mechanical or chemical properties of the materials being studied. It would be useful to assemble documentary material on this subject and to investigate whether particular changes in properties lead to an increase or decrease in fire hazard properties including flame-spread characteristics.

28 November 1968  
Agenda item 9

RESOLUTION A.165(ES.IV)

Superseded by A.214(VII)

PROVISIONAL GUIDELINES ON TEST PROCEDURES  
FOR DECK COVERINGS

The Assembly,

*Noting* Article 16(i) of the Convention on the Inter-Governmental Maritime Consultative Organization concerning the functions of the Assembly,

*Noting also* Regulations 41 and 54 and proposed Regulation 105 of Chapter II of the International Convention for the Safety of Life at Sea, 1960, concerning deck coverings,

*Noting further* Recommendation 11 of the International Conference on Safety of Life at Sea, 1960,

*Desiring* to ensure uniformity in the test procedures for deck coverings,

*Having considered* the Provisional Guidelines adopted by the Maritime Safety Committee at its seventeenth session,

*Adopts* the Provisional Guidelines on Test Procedures for Deck Coverings, the text of which is set out in the Annex to this Resolution,

*Invites* all governments concerned to take appropriate steps to give effect to the Guidelines as soon as possible,

*Requests* the Maritime Safety Committee to continue the study on this subject,

*Authorizes* the Maritime Safety Committee to amend the Guidelines if necessary in the light of such study.

ANNEX

PROVISIONAL GUIDELINES ON TEST PROCEDURES  
FOR DECK COVERINGS

*Foreword*

1. The present guidelines are intended to provide information to Administrations, laboratories and other interested bodies concerning the assessment of requisite properties of deck coverings. The work of the Organization in this field has not yet been finalized, and there are certain difficulties in the interpretation of relevant provisions of the 1960 Safety Convention. Accordingly, these guidelines are of provisional character.

2. The fire resistance aspects of deck coverings or primary deck coverings are mentioned in Chapter II of the International Convention for the Safety of Life at Sea, 1960, in three distinct situations, namely:

- (a) in cargo ships over 4000 gross tons (Regulation 54);
- (b) in passenger ships (Regulation 41);
- (c) in future passenger ships (Proposed Regulation 105).

In developing the test procedures for deck coverings described in 5. below, full account has been taken of the construction practice normally connected with these three situations. For example, in cargo ships there is ordinarily no fire insulation associated with the deck, whereas in the case of future passenger ships the process of evaluating fire risk of spaces will establish the minimum requirements for deck insulation.

In those design situations where fire protection is provided beyond minimum requirements, the Administration should determine the applicability of this test procedure.

3. Regarding (b) and (c) above, deck covering materials which are permanently attached to the upper surface of the deck and therefore cannot be readily removed in the event of fire should be classified as "primary deck coverings". Furthermore, only those permanently fixed deck coverings having a nominal thickness of at least 3 mm. should be considered as in need of fire testing.

4. The term 'will not readily ignite' would imply that the deck coverings should have a suitable behaviour against fire not only from below but also from above the deck. Since, however, the first case, i.e. fire from below, would in general be the more severe, the required property of deck coverings would appear in most cases to be adequately evaluated by a test in which the specimen is subjected to a fire from below.

5. The outline of test equipment and procedure given in paragraphs 7-16 below is suggested as one possible means of determining whether or not deck coverings 'readily ignite'. The test suggested is not intended for evaluating the effectiveness of the deck covering as a portion of the required insulation of an "A" or "B" Class division. For this purpose a different type of test is required.

6. Regarding the other two hazards mentioned in the proposed Regulation 105(h) i.e. the exudance of either toxic and/or explosive gases when the deck covering is heated, much more specialized knowledge is needed before a suitable standard can be established. Administrations should therefore have regard to the fact that when the proposed new Part H of the 1960 Safety Convention comes into force they will be required to give consideration to the possibility of evaluating test procedures for these two hazards.

#### *Description of specimen*

7. The deck covering, as intended to be applied in practice with appropriate underlay where necessary, should be applied to a mild steel plate 6 mm. thick. The overall size of the steel plate should be such that it exceeds the opening of the furnace by 25 mm. + 5 mm. on all sides. Two identical specimens should be prepared for test on each type of deck covering.

### *Conditioning of specimen*

8. The test specimens should be conditioned to have an approximate constant weight with an atmosphere of relative humidity between 40-70 per cent at a temperature of  $20 \pm 5^{\circ}\text{C}$ .

### *Description of furnace*

9. The tests should be performed on a furnace with a rectangular horizontal opening with no side measuring less than 400 mm. internally. The internal depth of the furnace should be such as to prevent the direct impingement of flames if any to the underside of the specimens but not less than 100 mm. The furnace should be lined with suitable refractory material of an insulating nature to prevent undue loss of heat from the walls.

### *Measurement of furnace temperature*

10. The temperature conditions within the furnace during a test should be determined by means of at least four rapid response thermocouples positioned symmetrically within the opening to ensure as uniform heating as possible. The hot junctions of the thermocouple should be approximately 50 mm. from the underside of the deck specimen.

### *Furnace control*

11. The furnace temperatures should be continuously controlled so as to follow the standard time/temperature curve defined by a smooth curve drawn through the following points:

At the end of the first	5 minutes	$538^{\circ}\text{C}$
" " " " " "	10 "	$704^{\circ}\text{C}$
" " " " " "	15 "	$760^{\circ}\text{C}$

The accuracy of the furnace control should be such that the area under the curve of the mean furnace temperature should not vary by more than  $\pm 10$  per cent of the area under the standard curve.

### *Test flame*

12. A test flame, 15-20 mm. in length, issuing from a tube having an orifice of 3 mm. should be used to measure the ignitability of the deck covering. The flame should be of luminous type produced by the combustion of a hydrocarbon gas.

### *Test procedure*

13. The specimen should be placed to close the furnace opening with the deck covering uppermost. Precautions should be taken to prevent escape of furnace gases around the edges of specimen influencing its behaviour. The test should be of 15 minutes duration.\*

14. The tendency of the deck covering to ignite should be measured by the application of the test flame, specified in paragraph 12, every 2 minutes for a period of 10 seconds. The test flame should be moved over the horizontal surface of the specimen, with the orifice approximately 5 mm. from the surface and held at an angle of approximately  $45^{\circ}$  to the horizontal. Two specimens should be tested for each type of material.

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\* The test duration may be adjusted as a result of further work on this test.

*Observations during test*

15. The following observations should be made during a test:
- (a) time of occurrence of any flaming, its duration and spread;
  - (b) occurrence of smoke and other products of combustion and a relative evaluation of their severity;\*
  - (c) damage suffered by the deck covering.

*Classification of deck covering*

16. The deck covering should be classified as "not readily ignitable" if with neither specimen is there any continuous flaming during the test. Any flaming continuing for 10 seconds or more after the local application of the test flame should be considered as continuous flaming.

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RESOLUTION A.166(ES.IV)

GUIDELINES ON THE EVALUATION OF FIRE  
HAZARD PROPERTIES OF MATERIALS

The Assembly,

*Noting* Article 16(i) of the Convention on the Inter-Governmental Maritime Consultative Organization concerning the functions of the Assembly,

*Noting also* Recommendation 11 of the International Conference on Safety of Life at Sea, 1960,

*Desiring* to ensure uniformity in evaluating fire hazard properties of materials,

*Having considered* the Guidelines adopted by the Maritime Safety Committee at its seventeenth session,

*Recommends* that until such time as further technical studies have been completed leading to uniformity of test procedure, Administrations should apply the following guidelines in deciding the flame-spread characteristics of surface and finishing materials:

- (a) In evaluating the flame-spread of material, Administrations should employ the national test method commonly used for building materials provided the procedure is considered capable of providing information on the behaviour of surfaces under fire conditions which may be met in an actual fire aboard ship;

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\* Methods of measurement for smoke density and other products of combustion are under investigation.