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(c) *Copies on file.* A copy of the specification listed in paragraph (a) of this section shall be kept on file by the manufacturer, together with the certificate of approval and this specification. It is the manufacturer's responsibility to have the latest issue of the specification on hand together with the certificate of approval and approved plans when manufacturing under this specification subpart.

(1) The Coast Guard specification may be obtained from the Commandant (CG-521), U.S. Coast Guard, 2100 2nd St., SW., Stop 7126, Washington, DC 20593-7126.

[CGFR 69-72, 34 FR 17500, Oct. 29, 1969, as amended by CGD 82-063b, 48 FR 4783, Feb. 3, 1983; CGD 88-070, 53 FR 34537, Sept. 7, 1988; CGD 95-072, 60 FR 50467, Sept. 29, 1995; CGD 96-041, 61 FR 50734, Sept. 27, 1996; USCG-1999-5151, 64 FR 67185, Dec. 1, 1999; USCG-2009-0702, 74 FR 49238, Sept. 25, 2009]

§ 164.008-2 Conditions of approval.

(a) Bulkhead panel material shall be of such quality as to successfully meet the requirements for an incombustible material as set forth in subpart 164.009 of this part.

(b) Bulkhead panels used in Class B-15 construction and as a component in Class A-30 or Class A-15 construction shall meet the thermal insulation requirements of §164.008-4(a) for at least 15 minutes, and the integrity requirements of §164.008-4(b) for at least 30 minutes.

(c) Bulkhead panels for use as a component in Class A-60 construction shall meet the thermal insulation requirements of §164.008-4(a) for at least 15 minutes and the integrity requirements of §164.008-4(b) for at least 60 minutes.

(d) The product shall be so marked as to be readily identifiable to an inspector in the field. The marking shall include the Coast Guard approval number.

(e) The specimen to be tested shall be representative of the typical installation on board a vessel and any limitations shall be shown on the sketch required by §164.008-7(a)(7).

(f) The bulkhead panel shall successfully pass the retests required by §164.008-6.

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§ 164.008-3 Testing procedure.

(a) *Tests.* All tests, including the retests, shall be conducted at the National Bureau of Standards or other laboratories designated by the Coast Guard.

(b) *Preparation of test specimen.* (1) The test specimens shall be conditioned to approximately constant weight with the air being maintained at a relative humidity of 40 to 70 percent and a temperature of 15° to 25 °C. (59° to 77 °F.). After conditioning, but before testing, the temperature of the specimen should not exceed 40 °C. (104 °F.).

(2) The specimens shall be mounted in the furnace in a vertical position in such a way as to give an exposed surface of at least 4.65 square meters (50 square feet) and a height of at least 2.44 meters (8 feet).

(3) The specimen shall be supported at the top and secured on the vertical sides and at the bottom in a manner representative of conditions in service. If provision for movement at the edges of a bulkhead panel is made for a particular construction in service, the specimen should simulate these conditions.

(4) The method of securing shall be such that there is no possibility of misinterpretation of test results due to the passage of flame at the edges of the specimen when the method of fixing is not the subject of the test.

(c) *Furnace control.* (1) The furnace temperature shall be determined by at least four mineral insulated thermocouples having rapid response and distributed so as to represent fairly the furnace temperature and to insure as uniform heating as possible. The thermocouples shall be arranged so that the hot junction is approximately 10 cm. (4") from the nearest point of the specimen.

(2) The furnace temperature shall be continuously controlled so as to follow the standard time-temperature curve within the accuracy specified in paragraph (c)(4) of this section.

(3) The standard time-temperature curve is defined by a smooth curve drawn through the following points:

At the beginning of the test, 20 °C. (68 °F.).
At the end of the first 5 minutes, 538 °C. (1,000 °F.).

At the end of the first 10 minutes, 704 °C. (1,300 °F.).

At the end of the first 30 minutes, 843 °C. (1,550 °F.).

At the end of the first 60 minutes, 927 °C. (1,700 °F.).

For a further definition of the time-temperature curve, see Appendix I of the ASTM Standard E119, "Fire Tests of Building Construction and Materials".

(4) The accuracy of the furnace control shall be such that the area under the mean time-temperature curve is within 15 percent of the area under the standard curve during the first 10 minutes of the test, within 10 percent during the first one-half hour, and within 5 percent for any period after the first one-half hour. At any time after the first 10 minutes of the test the mean furnace temperature shall not differ from the standard curve by more than 100 °C. (180 °F.). Consideration will be given to adjusting the results for variation of the furnace exposure from that prescribed. If corrections are made, they shall be in accordance with the procedures set forth in ASTM E-119.

(5) The pressure in the furnace shall be equal to that in the laboratory at about one-third of the height of the specimen.

(d) *Temperature of unexposed surface.* For the unexposed surface temperature measurement, a thermocouple of 0.5 mm. (0.020") diameter wires shall be soldered centrally with high temperature solder to one surface of a disc of copper 12 mm. diameter and 0.2 mm. thick. The discs shall be covered with an oven-dry asbestos pad 50 mm. × 50 mm. and 4 mm. thick. The disc and the pad may be fixed to the surface of the specimen by pins, tape or a suitable adhesive, depending on the nature of the specimen material. The asbestos pad shall have a density of approximately 1,000 kg./m.³ and thermal conductivity of 0.11 kcal./m./hr. × C. at 100 °C. (212 °F.).

(e) *Flame penetration.* (1) Where cracks or openings are formed during the test, an ignition test as prescribed in §164.008-4(b) shall take place immediately after the appearance of cracks or damage, followed by similar tests at frequent intervals. The purpose of the test is to indicate whether cracks and

openings formed during the test are such that they would lead to passage of flame.

(2) The cotton wool used for the tests prescribed in §164.008-4(b) shall consist of new undyed soft fibers without any admixture of artificial fibers, and shall be free from thread, leaf, and shell fiber dust. A suitable material for this purpose is sold in the form of rolls for surgical use. A pad shall be cut measuring 10 cm. × 10 cm. approximately 2 cm. thick and weighing between 3 and 4 grams. It shall be oven-dried prior to the test. The pad shall be attached by means of wire clips to a 10 cm. × 10 cm. frame of 1 mm. diameter. A wire handle approximately 75 cm. long attached to the frame would facilitate its use on the specimen.

(3) When testing for cracks or openings during the test, the pad shall be held in a vertical position facing the crack or opening with the aperture located in a central part of the cotton wool. The pad may be reused if it has not absorbed any moisture or become charred during the previous application.

(f) *Temperature observations.* (1) All observations shall be taken at intervals not exceeding 5 minutes. The surface temperatures on the unexposed side of the test specimen shall be measured by thermocouples located as follows:

(i) One thermocouple located approximately in the center of each quadrant of the steel plate (four thermocouples total).

(ii) One thermocouple close to the center of the test specimen, but away from the joint, if any.

(iii) At least one thermocouple at the vertical joint of the test specimen.

(iv) Further thermocouples at the discretion of the testing laboratory or Coast Guard for the purpose of determining the temperature at points deemed likely to give a greater temperature rise than any of the above mentioned thermocouples.

(2) The average temperature rise on the unexposed surface shall be obtained by averaging the readings of the thermocouples mentioned in paragraphs (f)(1) (i) and (ii) of this section.

(g) *Other observations.* Throughout the test, observations shall be made of

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all changes and occurrences, which are not criteria of performance but which may create hazard in case of a fire; for example the emission of appreciable volumes of smoke or noxious vapors from the unexposed side of the test specimen. The specimen shall be examined after the test for changes that have taken place and the information shall be noted in the test report.

(h) *Duration of testing.* The test shall be continued for at least 30 minutes to meet the requirements of §164.008-2(b) or at least 60 minutes to meet the requirements of §164.008-2(c). In either case, the test shall be continued until the maximum surface temperature rise values noted in §164.008-4(a) have been reached, or until cracks which lead to flaming as specified in §164.008-4(b) are formed.

§ 164.008-4 Test requirements.

(a) Thermal insulation: The insulation value of the specimens for the full scale test shall be such that the average temperature of thermocouples on the unexposed surface described in §164.008-3(f)(2) will not rise more than 139 °C. (250 °F.) above the initial temperature, nor will the temperature at any point on the surface, including any joint, rise more than 225 °C. (405 °F.) above the initial temperature at the end of 15 minutes. When failure is due to excessive temperature rise on the joint, consideration will be given to alternate joint construction. The results obtained on the small scale test (2'x2' (60 cm. x 60 cm.) shall be recorded.

(b) The test shall determine the length of time, up to one hour, that the bulkhead panel, including the joint can withstand the passage of flame. Cracks and openings shall not be such as to lead to flaming of a cotton wool test pad as prescribed in §164.008-3(e)(3) held facing the aperture at about 25 mm. for a period of 30 seconds. If no flaming occurs, the pad shall be removed and re-applied after a suitable interval.

§ 164.008-5 Test report.

(a) The test report required by §164.008-7 (e) and (g) shall include at least the following:

- (1) Name of manufacturer.
- (2) Purpose of test.
- (3) Test conditions and date of test.

(4) Description of the panel tested giving size, thickness, density, detail of joint and method of assembling in test furnace.

(5) Complete time-temperature data, including initial temperature, for each thermocouple together with curves of average temperature for the unexposed surface of the insulation and the thermocouple recording the highest temperature. In addition, for §164.008-7(g)(2) complete time-temperature data consisting of a numerical time-temperature table for each furnace and each surface of insulation thermocouple together with the initial temperature of each thermocouple.

(6) A log setting forth the observer's notes relative to deflections, smoke or gas emission, glow, flame emission, and any other important data. The time of each observation should be noted.

(7) Complete observations on the appearance of cracks and data on the testing of the cracks as specified in §164.008-4(b).

(8) Photographs of both sides of the panel before and after testing.

(9) Summary of test results.

(b) [Reserved]

[CGFR 69-72, 34 FR 17500, Oct. 29, 1969; 34 FR 19030, Nov. 29, 1969]

§ 164.008-6 Retests.

(a) Manufacturers of approved bulkhead panels shall maintain quality control of materials used, manufacturing methods, and the finished product utilizing appropriate quality control testing so as to meet the requirements of this specification, and any other conditions outlined on the certificate of approval. Bulkhead panels are not inspected at regularly scheduled factory inspections; however, approved bulkhead panels are subject to retest for continued compliance with the requirements of this subpart on the following basis:

(1) The Coast Guard may detail a marine inspector or other Coast Guard designated inspector at any time to visit any place where bulkhead panels are manufactured to conduct any inspections or examinations deemed advisable and to select representative samples for further examination, inspection, or tests. The inspector shall