

Samley 705/2

The RUBEROID Co.

SOUTH BOUND BROOK
NEW JERSEY

RESEARCH LABORATORIES

March 10, 1966

20-EL-6-3000

PLAINTIFF'S
EXHIBIT
GF-2145

Commandant Merchant Marine Technical
United States Coast Guard
Washington, D. C.

Gentlemen:

I am hereby applying to obtain Coast Guard approval of an incombustible material within United States Coast Guard specifications Subpart 164.009 date: 17 Aug. 1949, 6th Amendment 8 Sept. 1965. The material involved is an asbestos-hydrous calcium silicate type pipe and block insulation.

The following requested information is submitted as requested in section 164.009-4 of the specification.

164.009-4 (a) (1) - Trade Name "Calsilite"

164.009-4 (a) (2) - Samples of Calsilite block (12" x 12") are included herein. Samples submitted are 1", 1 1/2", 2", 2 1/2", 3", 3 1/2", 4" thick. The material is also available in pipe covering which is the same composition as block. Samples are not included because of the wide range of sizes available.

164.009-4 (a) (3) - The material is manufactured to one density as (12.5 lbs./ft.³). Block is manufactured up to 4" thick in 6" and 12" widths. Pipe covering is available in half sections for pipe up to 24" IPS in all thicknesses up to and including 3". Attached is a brochure describing Calsilite properties and uses.

164.009-4 (a) (4)

The composition of the insulation is as follows:

Diatomaceous Silica	51.0%
Hydrated Lime	35.0
Asbestos Fibre	14.0
	100.0%

164.009-4 (a) (5) Manufactured at Gloucester City, New Jersey

It is my understanding that the submitted samples and information will be reviewed by the Coast Guard. If it is suitable for testing, we will be advised. At that time the cost of testing and samples to be submitted will be specified.

We will await your further advice on this matter.

Sincerely,

THE RUBEROID CO.

GAF 14047

WCS/bcd

CC: Messrs: Davis, Henry,
Hughes

W. C. Schwingen
W. C. SCHWINGEN
CHIEF CHEMIST, SPECIAL PROJECTS

UNITED STATES COAST GUARD
Washington

Specification
for
INCOMBUSTIBLE MATERIALS
for
Merchant Vessels

Subpart 164.009
Date: 17 Aug. 1949
6th Amendment 8 Sept.
1965

164.009-1 APPLICABLE SPECIFICATIONS

164.009-1(a) There are no other specifications applicable to this subpart.

164.009-2 MATERIAL

164.009-2(a) Incombustible materials may be of any type such as board, sheet, loose material, etc.

164.009-2(b) The following materials will be considered as automatically meeting the requirements of this subpart. No tests will be required, and no specific approvals will be granted.

164.009-2(b)(1) Sheet glass, block glass, clay, ceramics, or uncoated glass fibers.

164.009-2(b)(2) All metals except magnesium or magnesium alloys.

164.009-2(b)(3) Portland cement, gypsum, or magnesite concretes with aggregates of only sand, gravel, asbestos fibers, expanded vermiculite, expanded or vesicular slags, diatomaceous silica, perlite, or pumice.

164.009-2(b)(4) Asbestos millboard meeting the requirements of Federal Specification NH-M-351a. This specification may be purchased from the Business Service Center, General Services Administration, Washington, D. C., 20407.

164.009-2(b)(5) Woven asbestos cloth meeting the requirements of ASTM Standard Specification D 1571, Grades AAA and AAAA. This standard may be purchased from the American Society for Testing Materials, 1916 Race St., Philadelphia, Pa., 19103.

164.009-2(b)(6) Woven or knitted glass fabric containing not more than 2.5 percent lubricant.

164.009-2(c) All materials not listed in paragraph 164.009-2(b) of this section shall be checked for density, content of moisture and volatile matter and shall pass the heated tube test for incombustibility noted in paragraph 164.009-3(d).

164.009-2(d) Fibrous-type insulation materials shall pass the reheating test noted in paragraph 164.009-3(e) in addition to the heated tube test.

164.009-3 INSPECTION AND TESTING

164.009-3(a) Tests. All tests shall be conducted at the National Bureau of Standards or other laboratories designated by the Coast Guard. Tests conducted shall include density, moisture and volatile content, and heated tube test.

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164.009-3(b) Density Measurement.

164.009-3(b)(1) The smallest sample for density measurements of solid materials shall be 12" x 12" by the submitted thickness. Length and width measurements shall be made to the nearest 1/32", thickness to the nearest .01", allowance being made of any non-flatness of the major surfaces of the specimen. Measurements of dimensions of fibrous insulations shall be made to the nearest 1/16" on a nominal 12" cube assembled from sheets of the thickness received. The average of at least 4 measurements of each dimension shall be reported. The weight shall be determined with a scale of balance sensitive and accurate to 0.3 percent or less of the total weight. The dimensional and weight measurements shall not be made until the sample has been conditioned one week, or longer if required to reach constant weight, in an atmosphere at $73^{\circ} \pm 2^{\circ}\text{F.}$, and $50\% \pm 5\%$ relative humidity.

164.009-3(c) Content of moisture and volatile matter.

164.009-3(c)(1) Transfer a weighed sample cut from the density specimen, previously conditioned to equilibrium at $73^{\circ} \pm 2^{\circ}\text{F.}$ and $50\% \pm 5\%$ relative humidity, to a previously weighed widemouth weighing bottle provided with a glass stopper. Remove the stopper and heat the bottle and sample at $105^{\circ} \pm 5^{\circ}\text{C.}$ for four hours, insert the stopper, cool, and weigh. Calculate the content of moisture and other volatiles as percent of the final dry weight of the sample.

164.009-3(d) Heated tube test.

164.009-3(d)(1) Three specimens, each $1\frac{1}{2}" \times 1\frac{1}{2}" \times 2"$ shall be prepared from the sample submitted and dried at a temperature of $105^{\circ} \pm 5^{\circ}\text{C.}$ for four hours before the test. Each specimen shall be assembled using a sufficient number of layers to obtain the prescribed $1\frac{1}{2}"$ thickness, except that thin flexible materials may be rolled into a cylindrical shape approximately 2" long and $1\frac{1}{2}"$ in diameter or made into a solid $2" \times 1\frac{1}{2}" \times 1\frac{1}{2}"$ by layers. A hole which will accommodate a thermocouple of 0.020" wire shall be made to the center of the specimen into which a thermocouple of the above size shall be inserted to register the internal temperature. An additional thermocouple of the same size shall be located on the surface of the specimen centered on one side to show the temperature at the surface for indicating any difference in temperature recorded by the two thermocouples.

164.009-3(d)(2) The test shall be conducted in an apparatus similar to that described in Figure 164.009-3(d). This apparatus shall be capable of developing and maintaining a temperature of 750 degrees C. in the heated tube.

164.009-3(d)(3) The heated tube shall be brought up to and maintained at a temperature of 750 degrees C. as evidenced by a thermocouple of 0.020" wire which is inserted from the top of the heated tube and located 6" below the top of the heated tube. During the initial heating and during the test, an air flow of 0.1 cubic foot per minute shall be supplied from the bottom of the tube at standard atmospheric temperature and pressure. When the inserted thermocouple has reached a steady 750 degrees C., the temperature recorded by a thermocouple located at the wall of the heated tube and shown as T_1 on Figure 164.009-3(d) shall be noted and maintained throughout the test.

164.009-3(d)(4) When the heated tube has reached 750 degrees C., the inserted thermocouple shall be removed and the sample with thermocouples attached shall be suspended as rapidly as possible in the heated tube with its long axis vertical by a 0.020" diameter steel wire around the outside of the specimen. The bottom of the suspended specimen shall be 7" below the top of the inner tube. Energize the platinum wire to operate at an apparent temperature of 800 + 50 degrees C. Readings of the temperature at the three thermocouples shall be taken and recorded not less than every 15 seconds or greater than every minute and the test shall continue for 15 minutes unless failure occurs before that time.

164.009-3(d)(5) In order to pass this test, each of the three specimens shall meet the conditions noted below for the duration of the 15 minute interval. For fibrous-type insulation materials these conditions will only be applicable to the last 13 minutes of the 15 minute interval.

164.009-3(d)(5)(i) The specimen shall not flame, except that flame from painted or paper coated surfaces may be permitted for not longer than 30 seconds during the first two minutes.

164.009-3(d)(5)(ii) The specimen shall not glow brighter than the walls of the heated tube. If glowing at all, the glow shall not increase when the specimen is removed from the heated tube.

164.009-3(d)(5)(iii) The temperatures as indicated by the thermocouples located at the center and on the surface of the specimen shall not rise more than 20 degrees C. above the heated tube air temperature.

164.009-3(d)(5)(iv) During the test, the specimen shall not give off flammable vapors in such quantity so as to be ignited by the energized platinum wire.

164.009-3(e) Reheating test.

164.009-3(e)(1) Two specimens of the material, each 12" x 12" x 6", shall be prepared so that when placed one on top of the other they form a cube one foot on a side. A piece of steel weighing approximately 1/2 pound consisting of a 1-7/16" length of 1 1/2" shafting with a thermocouple attached to its side shall be heated uniformly throughout its mass to more than 900 degrees C. The temperature of the steel shall be observed as it cools in room air, free of drafts and it shall be inserted between the two specimens in the center of the faying surfaces when the surface temperature reaches 900 degrees C. In the case of rigid or semi-rigid type materials, hollows shall be cut in the two faying surfaces in the shape of the shaft so that contact of the two surfaces will be made. Three thermocouples shall be installed between the two faying surfaces at 1", 2" and 3" from the shafting, and a 1/8" steel plate one foot square shall be placed on top of the cube to insure a uniform pressure between the two specimens. Readings of the three thermocouples between the specimens and the thermocouples attached to the shafting shall be made at intervals not greater than 5 minutes for the first two hours and 10 minutes thereafter. The test shall continue until such time as the temperatures indicated by all four thermocouples are less than 200 degrees C., or until it is indicated that the material has failed to pass the test.

164.009-3(e)(2) In order to pass this test, all of the following conditions shall be met:

164.009-3(e)(2)(i) There shall be no indication of flame or glow on the exterior of the cube during the test.

164.009-3(e)(2)(ii) The shafting temperature at any reading shall not be greater than at any previous reading.

164.009-3(e)(2)(iii) None of the three thermocouples between the faying surfaces shall at any instant indicate a temperature of more than 10 degrees C. above the temperature of the shafting at that time.

164.009-3(f) Spot check tests.

164.009-3(f)(1) Incombustible materials are not inspected at regularly scheduled factory inspections; however, the Commander of the Coast Guard District in which the plant is located may detail a marine inspector at any time to visit any place where incombustible materials are manufactured to conduct any inspections or examinations deemed advisable and to select representative samples for further examination, inspection, or tests. The marine inspector shall be admitted to any place where work is done on incombustible materials or component materials.

164.009-3(f)(2) Manufacturers of approved incombustible materials shall maintain quality control of materials used, manufacturing methods, and the finished product so as to meet the requirements of this specification, and any other conditions outlined on the certificate of approval, but the Coast Guard also reserves the right to make spot-check tests of approved incombustible materials at any time on samples selected by a marine inspector at the place of manufacture or samples obtained from other sources in the field. The manufacturer will incur no expense for such tests, but the results shall be binding upon the approval of his product. The manufacturer will be advised in advance of the time of testing of the samples selected and may witness the tests if he so desires.

164.009-4 PROCEDURE FOR APPROVAL

164.009-4(a) If a manufacturer desires to have an incombustible material approved, a request shall be presented to the Commandant of the Coast Guard together with the following:

164.009-4(a)(1) The trade name of the material.

164.009-4(a)(2) A sample of the material at least 1 foot square in each thickness and density of the material as manufactured.

164.009-4(a)(3) The range of thicknesses and/or densities in which it is proposed to manufacture or use the material together with any information or recommendation the manufacturer may have as to maximum or minimum thicknesses or densities.

164.009-4(a)(4) A statement of the composition of the material and the percentage of each component in each density.

- 164.009-4(a)(5) The location of the place where the material will be manufactured.
- 164.009-4(b) The information and samples furnished pursuant to paragraph (a) of this section will be examined by the Coast Guard. If the material appears to be suitable for testing, the manufacturer will be so advised. The size of the samples to be submitted for testing and the cost will be specified at this time.
- 164.009-4(c) If the material is indicated as being suitable for testing, the manufacturer shall submit the following to the Coast Guard:
- 164.009-4(c)(1) Samples of the material as specified.
 - 164.009-4(c)(2) A statement that the material as offered for testing and as described pursuant to 164.009-4(a)(4) of this section is completely representative of the product which will be manufactured and sold under U. S. Coast Guard approval if such approval is granted.
 - 164.009-4(c)(3) If the manufacturer desires to witness the test, he should so indicate at this time.
 - 164.009-4(c)(4) A commitment that he will reimburse the National Bureau of Standards for the cost of the tests when billed by them.
- 164.009-4(d) The National Bureau of Standards will then be authorized to conduct the tests noted in section 164.009-3, and four copies of the report will be submitted to the Coast Guard.
- 164.009-4(e) A copy of the test report will be forwarded to the manufacturer, and he will be advised if his material is approved under this subpart. If approved, any stipulations of the approval will be specified. This information will be published in the Federal Register, and an approval certificate will be issued to the manufacturer.
- 164.009-4(f) If the manufacturer desires to have the tests conducted at some laboratory other than the National Bureau of Standards, this information shall be supplied at the time of the initial contact with the Coast Guard. If the proposed laboratory is acceptable to the Coast Guard, the manufacturer will be so advised and any special testing requirements will be made at this time. The Coast Guard shall be notified in advance of the date of the test so that a representative may be present. The laboratory shall submit four copies of the test report to the Coast Guard together with representative samples of the material taken before and after testing. The test report and samples will be examined by the National Bureau of Standards for compliance with this subpart. The test report shall include the following information together with any other pertinent data:
- 164.009-4(f)(1) Complete time-temperature data for each thermocouple for both the heated tube and reheating tests.

164.009-4(f)(2) A log setting forth the observer's notes relative to smoke or gas emission, glow, flame emission, and any other important data. The time of each observation should be noted.

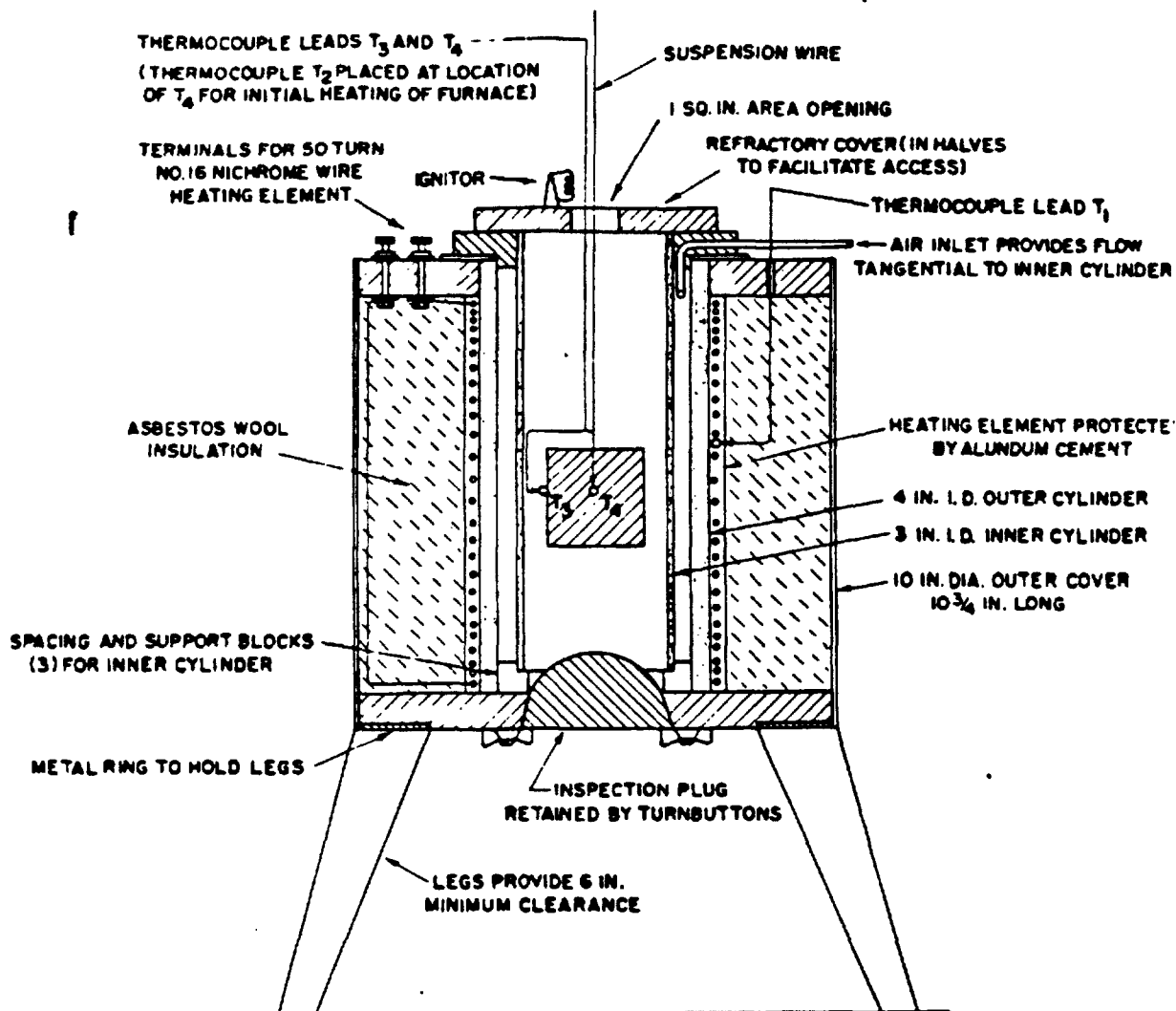
NOTES:

1. This specification was published in the Federal Register of 17 August 1949.
2. The 6th amendment to this specification was published in the Federal Register of 8 September 1965

Dist: (SDL NO. 81)

A: None
B: n(5); b(1); c(10); d(1); e(1); p(1)
C: m(10)
D: i(2); k(1)
E: m(1)
F: p(1)
List 112

32867 TREAS. CGHQ. WASH., D.C.



SECTION THROUGH FURNACE

FIGURE 164.009-3(d)

GAF 14054