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INCH-POUND
MIL-PRF-32489
14 January 2014

PERFORMANCE SPECIFICATION

PILLOW, FLAME RESISTANT, SHIPBOARD

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers flame resistant shipboard pillows for use aboard U.S. Navy vessels.

1.2 Classification. The pillows covered by this specification are of the following types and classes as specified (see 6.2).

1.2.1 Types. The types of pillows are as follows:

a. Type I - Feather or feather/down filled

b. Type II - Foam filled

c. Type III - Fiber filled

1.2.2 Classes. The classes of pillows, based on firmness, are as follows:

a. Class 1 - Soft

b. Class 2 - Medium

c. Class 3 - Medium-firm

d. Class 4 - Firm

Comments, suggestions, or questions on this document should be addressed to: Commander, Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to CommandStandards@navy.mil, with the subject line "Document Comment". Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil.

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1.3 Part or identifying number (PIN). PINs to be used for pillows acquired to this specification are created as follows:

M	**32489**	**-**	**X**	**X**
Prefix for Military Specification	Specification Number	-	Type (see code below)	Class (see code below)

Type Code		Class Code	
Type	Code	Class	Code
I	A	1	1
II	B	2	2
III	C	3	3
		4	4

Examples: 32489-A1
32489-B4

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-32075 - Label: For Clothing, Equipage, and Tentage, (General Use)

(Copies of this document are available online at http://quicksearch.dla.mil.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

NAVAL SEA SYSTEMS COMMAND (NAVSEA) PUBLICATIONS

S9510-AB-ATM-010 - Nuclear Powered Submarine Atmosphere Control Manual

(Copies of the chapter titled “Material Control Program” are available by email request to CommandStandards@navy.mil.)

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2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

ASTM INTERNATIONAL

ASTM D1424	-	Standard Test Method for Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus
ASTM D3574	-	Standard Test Methods for Flexible Cellular Materials—Slab, Bonded, and Molded Urethane Foams
ASTM D3775	-	Standard Test Method for Warp (End) and Filling (Pick) Count of Woven Fabrics
ASTM D3776/D3776M	-	Standard Test Methods for Mass Per Unit Area (Weight) of Fabric
ASTM D4522	-	Standard Performance Specification for Feather and Down Fillings for Textile Products
ASTM D4524	-	Standard Test Method for Composition of Plumage
ASTM D5034	-	Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
ASTM D6413/D6413M	-	Standard Test Method for Flame Resistance of Textiles (Vertical Test)
ASTM E162	-	Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source
ASTM E662	-	Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

(Copies of these documents are online at www.astm.org.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 9705	-	Fire Tests – Full-Scale Room Test for Surface Products
ISO/IEC 17025	-	General Requirements for the Competence of Testing and Calibration Laboratories

(Copies of these documents are available online at www.iso.org.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 289	-	Standard Method of Fire Test for Individual Fuel Packages

(Copies of this document are online at www.nfpa.org.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Pillows furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.2 and 6.3).

3.2 Materials. The construction, materials, and treatments comprising the finished pillow shall meet the requirements herein. All materials and any treatments contained in the pillow shall consist of flame resistant and non-toxic materials (see 3.3.7).

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3.2.1 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3 Performance requirements. The pillow and the pillow components shall meet the following performance requirements.

3.3.1 Construction. At a minimum, the pillow shall consist of a ticking and be filled with an insert. The ticking, or outside case, shall be made of one piece of 100 percent cotton ticking. The case shall be seamed inside-out, leaving one end open. The end opening shall be seamed after turning the case right side out and filling the pillow. The closing seam shall be sewn with the seam allowance folded to the inside prior to stitching. Stitching shall be not less than ¼ inch from the edges of the material except that the stitching on final closure shall be not less than ⅛ inch from the folded edge. One end of the identification label and instruction label shall be securely stitched into the closing seam or the seam opposite the closing seam of the pillow. There shall be no exposed raw fabric edges in the finished pillow (see 3.5 and 4.5.8). The construction of both sides of the pillow shall be identical. The top and bottom of the pillow shall be smooth, with no wrinkles or folds in the ticking.

3.3.1.1 Ticking. The pillow ticking shall be in accordance with the physical requirements of Table I. The yarn shall be made from cotton which has been carded, drawn, and spun into singles yarn. The cloth shall be treated with a permanent flame resistant treatment if required to make the finished pillow meet the fire performance requirements of this specification (see 3.3.5). The ticking color shall be unbleached white.

TABLE I. Physical requirements of ticking.

Characteristic	**Requirement**	
	Type I	**Types II and III**
Weight (oz/yd^2, min.)	1.6	2.6
Yarns per inch (min.)		
Warp	170	100
Filling	120	75
Breaking strength (pounds, min.)		
Warp	65	60
Filling	45	50
Tearing strength (pounds, min.)		
Warp	4.0	2.0
Filling	3.0	1.8

3.3.2 Filler. The pillow filler materials shall be in accordance with one of the following, depending on the pillow type specified (see 1.2.1 and 6.2).

3.3.2.1 Feathers (type I only). The feathers shall be in accordance with the requirements of ASTM D4522 and may consist of whole, small, waterfowl feathers that are a maximum of 2.5 inches in length, including down, and shall meet the following requirements.

3.3.2.1.1 Feather composition. Feather composition and size shall be determined in accordance with 4.5.2.1.1.

3.3.2.1.2. Oxygen number. The oxygen number for plumage shall be no more than 5.0 when tested in accordance with 4.5.2.1.2.

3.3.2.1.3 Turbidity. The maximum allowable turbidity shall be 11.8 inches (300 millimeters) when tested in accordance with 4.5.2.1.3.

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3.3.2.2 Foam (type II only). Pillows containing foam type filling shall use open cell flexible foam cushioning. When the foam insert consists of an inner foam piece, it shall be completely encased by the outer foam layer. If any part of the pillow insert is made from slow recovery, viscoelastic type foam, it shall have a compression recovery time of 4 seconds (minimum) when tested as specified in 4.5.2.2.1. The minimum foam density for viscoelastic foam shall be 3.0 pounds per cubic foot (lb/ft^3). The minimum foam density for other foams shall be as required to meet the pillow firmness requirements of 3.3.4.

3.3.2.2.1 Foam component fire performance. The foam component(s) shall be tested for its fire performance in accordance with 4.5.2.2.2. The maximum flame spread shall be 10 and the maximum smoke density shall be 200. The foam shall exhibit no melting, dripping, or flaming droplets when tested in accordance with 4.5.2.2.2.

3.3.2.3 Fiber (type III only). The filling for Type III pillows shall be 100 percent prime grade virgin fiber new and unused. The use of any form fiber waste shall be prohibited (e.g., undrawn fiber, mixture of deniers, lusters, or cross sections, and waste from any stage of fiber production; whether drawn, undrawn, or mixed or garneted fiber). The fiber shall be of a denier and cut length as required to meet the firmness requirement of 3.3.4.

3.3.2.3.1 Fiber component melting or dripping. Any fiber used for filling pillows shall not exhibit melting or dripping when tested in accordance with 4.5.2.4.

3.3.3 Dimensions. The finished pillow shall be rectangular in shape and shall be 20±0.5 inches in width and 26±0.5 inches in length. The thickness of the Classes 1, 2, and 3 pillows shall be 7.0±0.5 inches; Class 4 pillows shall be 5.5±0.5 inches. The pillow shall be measured in accordance with 4.5.3.

3.3.4 Firmness. The pillow firmness shall be determined in accordance with the requirements of Table II when tested in accordance with 4.5.4.

TABLE II. Pillow firmness requirements.

Class	Firmness	Indentation force (lbs)
1	Soft	1.4 to 2.0
2	Medium	2.1 to 3.0
3	Medium-firm	3.1 to 6.0
4	Firm	6.1 to 14.0

3.3.5 Fire performance. The finished pillow shall meet the following fire performance requirements when tested in accordance with 4.5.5:

a. The pillow shall have a maximum net peak heat release rate less than or equal to 50 kilowatts.

b. The pillow shall have an average extinction area less than or equal to 975.5 square feet per pound (ft^2/lb) [200 square meters per kilogram (m^2/kg)].

c. The maximum drip flaming time from any pillow tested shall not exceed 5 seconds (whereby drip flame time is the time in seconds that any flaming material continues to flame after reaching the test platform or floor).

d. Two pillows shall be tested and both shall individually satisfy the performance criteria.

3.3.6 Off-gassing. The finished pillow shall be tested for off-gassing in accordance with the requirements of 4.5.6. The Navy will review the results and assign a usage category. The required usage category is “Permitted” or “Limited” (see 4.5.6 and 6.5).

3.3.7 Toxicity. When evaluated in accordance with 4.5.7 [the Health Hazard Assessment (HHA)], the finished pillow shall have no adverse effect on the health of personnel when used for its intended purpose (see 4.5.7 and 6.6).

3.4 Labels. Each pillow shall have a combination identification and care instruction label and bar code label.

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3.4.1 Identification and care label. The identification and care label, which shall be in accordance with MIL-DTL-32075 Type VI, Class 16, shall be permanently attached to the pillow at one end. As a minimum, each pillow shall have a label showing the following information:

a. Manufacturer's identification (Example: M32489-A1) (see 1.3)

b. Contractor's name (Example: ABC Company)

c. Contract or order number (Example: SPM1C1-11-D-0000)

d. Date of manufacture (Example: 05-01-2011)

e. Item name and number (Example: Pillow, Flame Resistant, Shipboard, Type I, Class 1, MIL-PRF-32489)

f. Lot number (Example: Lot 10)

g. Care requirements (Example: Launder using…)

The lettering shall be permanent and legible and be a height that is easily readable. The care requirements portion shall state the manufacturer's instructions for cleaning (laundering). The acquisition agency may have additional marking requirements (see 6.2).

3.4.2 State label requirements. When specified (see 6.2), each pillow shall have a label attached that is in conformance with the legal requirements of the state in which it is manufactured. When allowed under state law, the information required under regulations may be combined in the identification and care label.

3.4.3 Bar code label. Each pillow unit shall be individually bar-coded with a pressure sensitive label. The bar code element shall be a 13-digit national stock number (NSN). There shall be a 12-digit Universal Product Code (UPC) assigned by the Government for all NSNs. The initials "UPC" shall appear beneath the code. The bar codes for NSN and UPC shall be medium to high density, clearly legible and readable by scanner, and shall be located so that they are completely visible on the item when packaged as specified (see 5.1). Attachment of the label shall cause no damage to the pillow.

3.5 Workmanship. The finished pillow shall be constructed as specified; shall be clean without dirt, grease marks, or stains; and shall be free from defects such as unfinished or loose seams, feathers, or down leakage, or poking through the ticking (see 3.3.1 and 4.5.8).

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 Qualification inspection. Qualification inspection shall consist of all the tests specified in Table III as appropriate for the applicable type.

4.2.1 Retention of qualification. Periodic control inspection for the retention of qualification shall be made at 2-year intervals from the date of the originally approved qualification for the component fire performance requirements specified in 3.3.2.2.1 for foam fillers (Type II only) and 3.3.2.3.1 for fiber fillers (Type III only) and the fire performance requirement specified in 3.3.5.

4.2.2 Change approval. A change in material, production processes, or production equipment used in the manufacture of the finished pillow, which has been qualified, shall require written approval of NAVSEA. Incorporation of any changes, which have not been so approved, shall require requalification of item in question.

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TABLE III. Qualification inspection.

Characteristic	Requirement	Tests
Ticking	3.3.1	4.5.1
Filler	3.3.2	4.5.2
Dimensions	3.3.3	4.5.3
Firmness	3.3.4	4.5.4
Foam component fire testing (Type II only)	3.3.2.2.1	4.5.2.2.2
Fiber component fire testing (Type III only)	3.3.2.3.1	4.5.2.4
Fire performance	3.3.5	4.5.5
Off-gassing	3.3.6	4.5.6
Toxicity	3.3.7	4.5.7
Labels	3.4	4.5.8
Workmanship	3.5	4.5.8

4.3 Conformance inspection.

4.3.1 In-process examination. Visual examinations shall be made during the manufacture of the pillow to ensure construction details are in accordance with the requirements specified in section 3. Examinations shall be made prior to the final closing of the pillow ticking where such details cannot be examined after final ticking closure. Dimensional examinations shall be made after final closure of the pillow ticking. Materials and components that can be classified as a defect in accordance with Table IV shall be removed from production.

TABLE IV. Conformance inspection.

Characteristic	Requirement	Tests
Ticking	3.3.1	4.5.1
Filler	3.3.2	4.5.2
Dimensions	3.3.3	4.5.3
Firmness	3.3.4	4.5.4
Fire performance	3.3.5	4.5.5
Labels	3.4	4.5.8
Workmanship	3.5	4.5.8

4.3.2 Inspection of end item. Inspections shall be in accordance with Table IV as appropriate for the specific type. A failure of any sample shall constitute a failure of the entire lot.

4.3.3 Lot. A lot shall consist of all units of the same type that are produced under similar conditions and are ready for inspection or shipment at one time. Unless otherwise specified (see 6.2), the lot size shall be expressed in the number of finished pillows.

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4.3.4 Sampling for inspection of end item. At a minimum, samples shall be randomly selected from each lot, as specified (see 6.2). At a minimum, the sampling rate shall be 2 units on lots of 500 or less, 3 units on lots of 501 to 1,200, 4 units on lots of 1,201 to 10,000, and 5 units on lots from 10,001 to 35,000. The inspections shall be as specified in 4.3.2.

4.4 Test sample preparation. Unless otherwise specified (see 6.2), samples for individual tests shall be prepared in accordance with the specified test method.

4.5 Test procedures. The following test procedures shall be used to determine compliance with the performance requirements specified in 3.3.1 through 3.3.7.

4.5.1 Ticking examination. The ticking properties shall be determined in accordance with the following verifications.

4.5.1.1 Fabric weight. The fabric weight for the ticking shall be determined in accordance with ASTM D3776/D3776M, Option C.

4.5.1.2 Yarns per inch. The yarns per inch shall be determined in accordance with ASTM D3775.

4.5.1.3 Breaking strength. The breaking strength of the ticking fabric shall be determined in accordance with ASTM D5034.

4.5.1.4 Tearing strength. The tearing strength of the ticking fabric shall be determined in accordance with ASTM D1424.

4.5.2 Filler examination. The pillow filler material shall be determined in accordance with the following, depending on pillow type specified (see 1.2.1 and 6.2).

4.5.2.1 Feather examination (type I only). The properties of feathers of Type I pillows shall be determined in accordance with the following.

4.5.2.1.1 Feather composition examination. Feather compositions shall be determined in accordance with ASTM D4524.

4.5.2.1.2 Oxygen number testing. The oxygen number shall be determined in accordance with ASTM D4522.

4.5.2.1.3 Turbidity testing. The turbidity shall be determined in accordance with ASTM D4522.

4.5.2.2 Foam testing (type II only).

4.5.2.2.1 Foam density. The foam density shall be determined in accordance with ASTM D3574. The sample dimensions for this determination shall be as specified in 3.3.3 and may be achieved by lamination of two or more layers. The slow-recovery properties of the viscoelastic foam shall be determined as follows:

a. Using the apparatus specified by Test B1, Indentation Force Deflection Test—Specified Deflection, of ASTM D3574, compress the foam sample to a deflection of 5 percent and allow the specimen to rest in this state for 1 minute (+10/-0 seconds).

b. Compress the sample at any convenient rate to a deflection of 65 percent and hold it for a period of 1 minute (+10/-0 seconds).

c. Remove the indentor and record the time in seconds that it takes for the unrestrained foam to recover to the 5 percent deflection state. The average time for three tests shall be recorded as the compression recovery time.

4.5.2.2.2 Foam component fire testing. The flame spread shall be determined in accordance with ASTM E162. The smoke density shall be determined in accordance with ASTM E662 and shall be determined in both the flaming and non-flaming modes. If the foam component is comprised of more than one type of foam, all types of foam used in the construction of the pillow shall be tested individually. The foam shall be tested without the addition of any other component such as a fire barrier or other covering.

4.5.2.3 Fiber examination (type III only). The fiber for Type III pillows shall be visually inspected to ensure conformance to the requirements of 3.3.2.3.

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4.5.2.4 Fiber component melting or dripping testing. The candidate fiber fill shall be tested in accordance with ASTM D6413/D6413M as modified below:

a. Sampling. The sample making up the test specimen shall be 0.88 ounces (25 grams) of the candidate fiber material, which shall be placed in a wire mesh basket constructed from a 6-inch square piece of steel woven wire cloth with nominal 0.062-inch (1.6-millimeter) square openings corresponding to an open area of approximately 25 percent. The top surface of the fiber fill shall be gently tapped to ensure that the bottom surface of the fiber fill is flush with the wire mesh.

b. Procedure. Follow the general procedures of the test method except that the sample basket shall be clamped as required so that it can be centered above the burner and positioned 0.75 inch (19 millimeters) above the top surface of the burner. The exposure time for this test shall be 12 seconds. After 12 seconds, the flame source shall be removed from beneath the sample. Any melting, dripping, or flaming of the material during the exposure period shall be noted.

4.5.3 Dimension examination. The length, width, and thickness of the pillow shall be measured and the results recorded as pass or fail. Length and width measurements of the filled and closed pillow shall be determined from end of seam to end of seam, and measured in a straight line parallel to the end-to-end center line; thickness shall be measured as the distance between two parallel planes between the top and bottom. When measuring pillow thickness, the pillows shall be fluffed by holding the pillow by opposite ends and shaking vigorously, followed by a 15-minute settling period prior to measuring the thickness.

4.5.4 Firmness testing. The pillow firmness shall be determined using the equipment and procedures of Test B1, Indentation Force Deflection Test—Specified Deflection, of ASTM D3574. The test specimen shall consist of a finished pillow. The firmness shall be the force required to obtain a 25 percent deflection from the initial thickness. The procedure note for super-soft foam shall be followed.

4.5.5 Fire performance testing. The pillow shall be tested in accordance with the requirements of the NFPA 289 test method modified as follows.

4.5.5.1 Test specimens. Specimens tested shall be new pillows. At least two specimens shall be tested and all shall individually pass the requirements.

4.5.5.2 Sample measurements and conditioning. Prior to testing, each pillow shall be measured and conditioned in accordance with the items listed below:

a. Each sample pillow shall be placed on a flat and level surface for measurement of the length, width, and thickness. These dimensions shall be recorded.

b. All test samples shall be conditioned at 70±5 °F (21±3 °C) and 50±5 percent relative humidity for a minimum of 24 hours. Only one pillow at a time shall be removed from environmental conditioning prior to testing.

c. The pillow mass shall be measured just prior to testing. This value shall be the initial weight. The pillow weight shall be measured in accordance with standard commercial practice with a minimum resolution of 0.25 pound (0.1 kilogram).

4.5.5.3 Test apparatus. Each test article shall be mounted atop a support frame as shown on Figure 1. The intent of the frame is to allow direct and unimpeded flame impingement from the burner to the bottom surface and sides of the pillow being evaluated. The dimensions of the frame shall conform to Figure 1.

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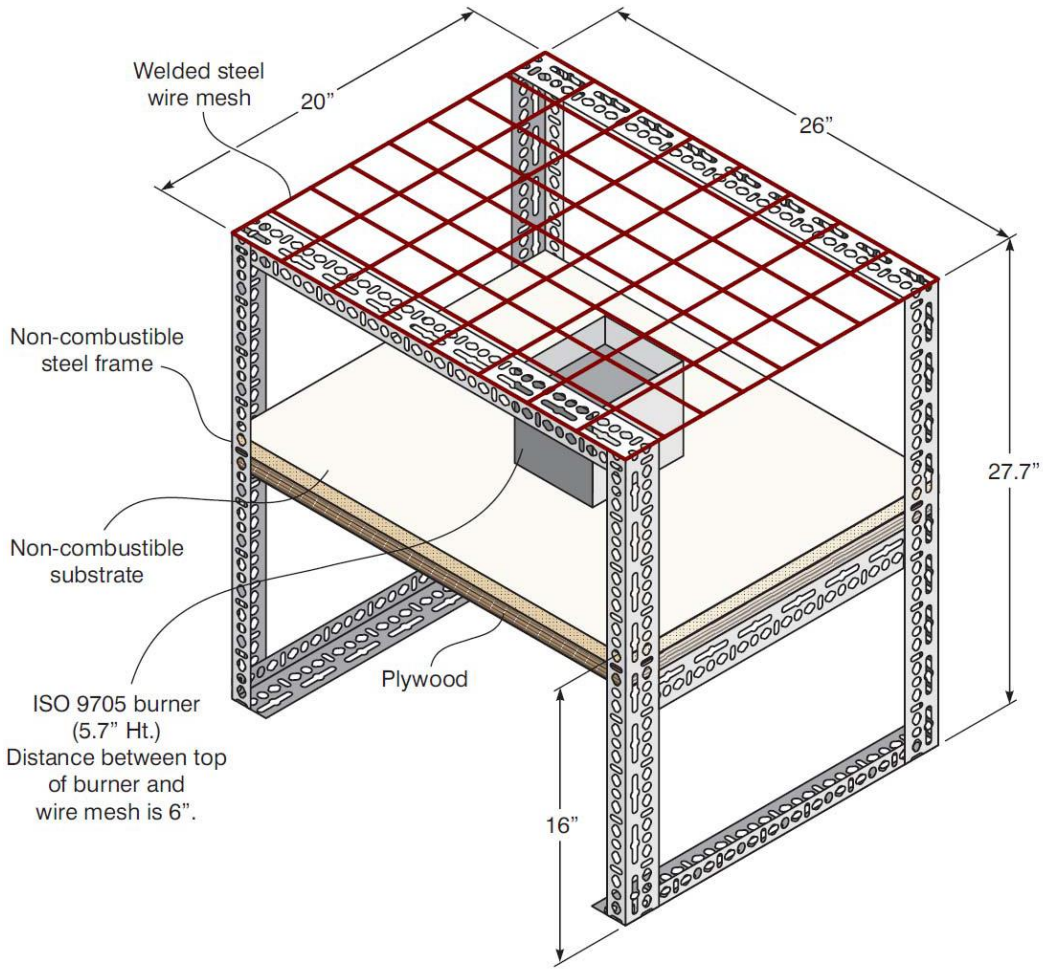

FIGURE 1. Illustration of the test frame for the Navy-modified NFPA 289 pillow fire test method.

4.5.5.4 Metal mesh. The metal mesh atop the frame (i.e., the surface on which the pillow is placed) shall consist of 26 by 20 inches (0.66 by 0.51 meter) of wire mesh constructed from 12Ga welded steel wire with 2-inch by 4-inch (0.05-meter by 0.1-meter) openings. The mesh shall be secured to the frame with wire tie downs or equivalent.

4.5.5.5 Test frame. The test frame shall be constructed from slotted angle iron or equivalent. The top shelf of the frame (i.e., location where metal mesh is mounted) shall be 27.7 inches (0.70 meter) above the laboratory floor. The burner shelf (i.e., platform on which the burner rests) shall be 16 inches (0.41 meter) above the laboratory floor. The dimensions given and the use of the required burner ensure the required separation distance of 6 inches (0.15 meter) between the emitting surface of the burner and the bottom of the pillow.

4.5.5.6 Burner platform. The entire platform shall be capable of supporting the weight of the burner as well as any debris that falls from the pillow being evaluated. The top surface of the platform on which the burner rests shall be constructed from a non-combustible material [1-inch (25.4-millimeter) Marinite board or equivalent]. A structural support underlayment, such as 0.75-inch (19-millimeter) plywood, shall be placed beneath the non-combustible material. The burner platform system is attached to the metal support frame. The burner shelf shall be designed such that it is large enough to collect debris that may separate from the pillow during the fire test.

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4.5.5.7 Burner. The burner shall be supplied with natural grade propane, 95 percent purity. The burner used shall be constructed from steel and shall have internal dimensions of 6.7 inches (0.17 meter) square. The burner shall have an internal height of 5.7 inches (0.145 meter) and shall be filled as shown on Figure 2. It should be noted that the burner as described is in general accordance with the burner described in ISO 9705 annex titled Recommended Ignition Sources.

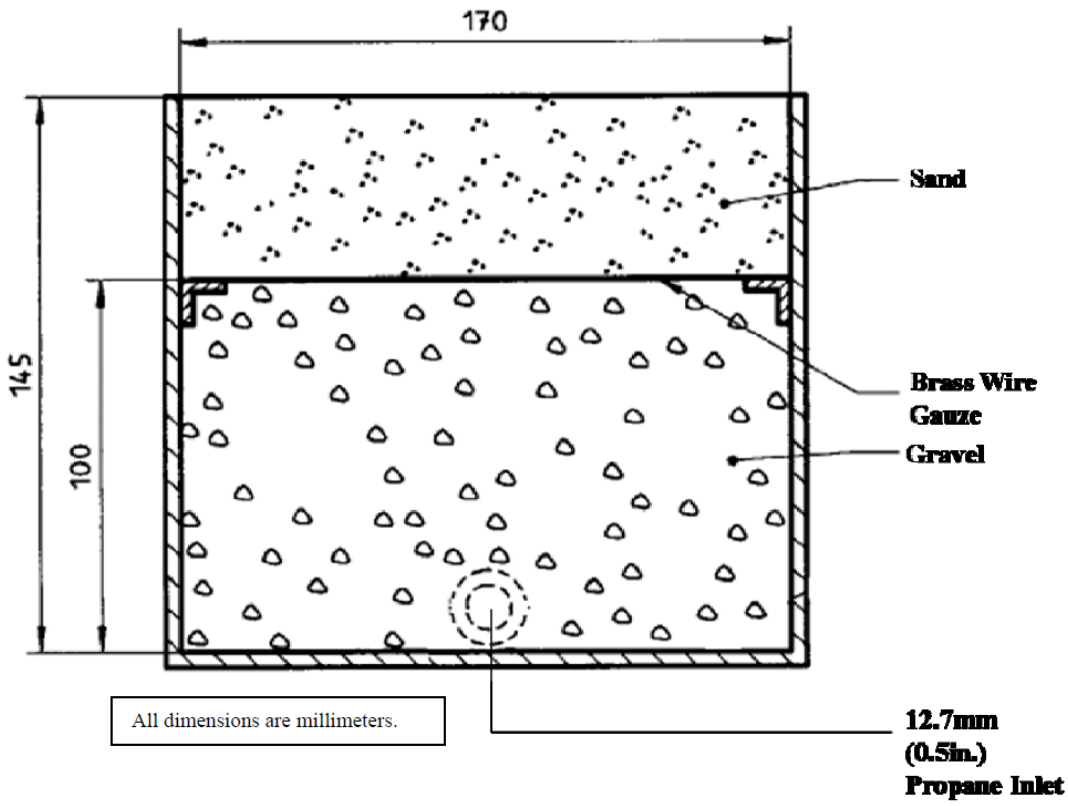

FIGURE 2. Navy-modified NFPA 289 ignition source.

4.5.5.8 Calibration procedure. The test equipment shall be calibrated as follows:

a. Hood calorimeter calibration. Prior to testing, the hood calorimeter shall be calibrated in accordance with the chapter of NFPA 289 titled Calibration. The burner shall be verified to produce the fire exposure of 10±3 kilowatts. During this calibration, as well as during all testing, the hood calorimeter shall be set to a nominal flow rate of 2,750 cubic feet per minute (1.29 cubic meters per second) unless for fire safety reasons it needs to be increased.

b. Burner adjustment. Just prior to testing, the exposure burner shall be set to the desired gas flow rate [i.e., 4.74×10^{-4} pound (0.215 gram) per second propane, 0.25 standard cubic foot (7.08 cubic decimeter) per minute] corresponding to a fire exposure size with a total heat output of 10 kilowatts. This fire should be permitted to burn for a minimum of 2 minutes to verify exposure fire magnitude including the resultant flame height. Once the 10-kilowatt fire conditions have been verified, gas flow shall be secured. Upon cooling, the burner can be moved into position on the test frame.

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4.5.5.9 Test procedure. The test procedure shall be as follows:

a. Determine the initial pillow weight as required above.

b. Each test pillow shall be centered atop the open mesh support frame shown on Figure 1. The intent of this frame is to allow direct flame impingement to the bottom surface and sides of the pillow by the 10-kilowatt ignition source.

c. Once the pillow is in position, the hood calorimeter, test video, and data acquisition systems shall be activated and a minimum of 2 minutes of background data shall be collected prior to testing.

d. After background collection is complete, a pilot flame shall be introduced at the edge of the burner as gas flow to the burner is activated. Once the burner is ignited, the pilot flame shall be removed. The pillow shall be continuously exposed to the 10-kilowatt exposure fire for a period of 10 minutes.

e. During the test, the extent of melting and drip flaming time shall be recorded.

f. The 10-kilowatt exposure duration for all tests shall be 10 minutes. During testing, both still photographs and video shall be collected.

g. After the 10-minute duration is complete, the 10-kilowatt exposure fire shall be secured. Combustion shall be allowed to continue until one or more of the following conditions are reached:

(1) All flaming combustion has ceased.

(2) 30 minutes have elapsed from the time the burner was ignited.

h. Once all flaming has ceased, the data acquisition system associated with the modified NFPA 289 test method shall be permitted to collect data for an additional 2 minutes.

i. Prior to removal of the pillow from the test stand, the pillow shall be photographed and observations regarding its condition documented.

j. A post-test mass shall be measured with a minimum resolution of 0.25 pound (0.1 kilogram) and recorded.

4.5.5.10 Fire testing provisions. All fire tests specified in this document shall be conducted by an independent testing laboratory that is accredited to ISO/IEC 17025. Accreditation shall be obtained from a recognized accreditation body such as American Association for Laboratory Accreditation (A2LA) or International Code Council's International Accreditation Services (IAS). The scope of accreditation shall include specific flammability and fire tests required for qualification. All other fire test provisions shall be as specified (see 6.2 and 6.7).

4.5.6 Off-gassing. The pillow shall be tested for off-gassing at a Government approved testing facility in accordance with S9510-AB-ATM-010 chapter titled "Material Control Program" (see 3.3.6 and 6.5).

4.5.7 Toxicity. An HHA shall be conducted to ensure conformance to 3.3.7, as required by the qualifying activity. The Navy and Marine Corps Public Health Center (NMCPHC) will evaluate the pillow using the administrative HHA data provided by the manufacturer/distributor to the NMCPHC.

4.5.8 Visual examination. The pillow shall be examined for the presence of the proper labeling as identified in 3.4 and for defects noted in 3.5. If any sample has a defect, it shall indicate a failure to meet this requirement.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The pillow covered by this specification is intended for use aboard naval ships and vessels.

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6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Type and class required (see 1.2, 3.3.2, and 4.5.2).

c. The specific issue of individual documents referenced (see 2.2.1 and 2.3).

d. Additional marking requirements (see 3.4.1 and 3.4.2).

e. Number of samples required (see 4.3.3 and 4.3.4).

f. Test sample preparation (see 4.4).

g. Additional fire testing provisions (see 4.5.5.10 and 6.7).

h. Packaging requirements (see 5.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL No. 32489 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Commander, Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to CommandStandards@navy.mil. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at https://assist.dla.mil.

6.4 Noncompliance. If a sample fails to pass its conformance inspections, the lot should be rejected and the manufacturer should notify the cognizant inspection activity of such failure and take corrective action on the materials, processes, or both, as warranted. Acceptance and shipment of the product should be discontinued until corrective action, suitable to the contracting activity, has been taken. After the corrective action has been taken, conformance inspections should be repeated on the lot. In the event of failure after re-inspection, information concerning the failure should be furnished to the contracting activity by the inspection activity.

6.5 Material certification. Materials to be installed in submarines are to be controlled to prevent off-gassing, which contaminates the submarine's atmosphere and can result in health hazards to personnel or deleterious effects on machinery. These controls are administered through the Submarine Material Control Program, which is described in the Nuclear Powered Submarine Atmosphere Control Manual, S9510-AB-ATM-010 chapter titled "Material Control Program." Under the Submarine Material Control Program, all materials considered for use on submarines require certification and assignment of a usage category. Under the certification process, candidate materials are selected by Navy activities or contractors, and a request for certification is submitted to the Naval Sea Systems Command, SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard, DC 20376-5160 or emailed to CommandStandards@navy.mil. The certification request is accompanied by detailed information, including descriptions of the material, method of application, usage, and storage. A chemical analysis is conducted, which is normally accomplished through off gas testing. The off gas test is required to be conducted in a Government approved laboratory designated by the preparing activity. Information pertaining to this test requirement may be obtained from the Naval Sea Systems Command, SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard, DC 20376-5160 or emailed to CommandStandards@navy.mil. Based on the chemical analysis results, a usage category is assigned to the material defining whether, and to what extent, the material may be used on submarines.

6.6 Toxicity evaluation. The NMCPHC requires sufficient information to permit an HHA of the product. Upon completion of the HHA, a copy will be provided by the NMCPHC to the Government for evaluation.

6.7 Additional fire testing provisions. NAVSEA reserves the right to witness the tests, and perform any of the tests set forth herein where such testing is deemed necessary to assure compliance to prescribed requirements of the qualification tests.

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6.8 Subject term (key word) listing.

Batting

Down

Feathers

Foam

Ticking

Custodians:
Army – GL
Navy – SH
Air Force – 99

Review activities:
Army – AV, MI
Navy – CG, NU
Air Force – 03
DLA – CT

Civil agency:
GSA – FAS

Preparing activity:
Navy – SH
(Project 7210-2012-002)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil.