

**INCH-POUND**

**MIL-STD-1623E(NAVY)**

**w/CHANGE 1**

**19 April 2010**

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**SUPERSEDING**

**MIL-STD-1623E(SH)**

**20 June 2006**

**DEPARTMENT OF DEFENSE  
DESIGN CRITERIA STANDARD  
FIRE PERFORMANCE REQUIREMENTS AND  
APPROVED SPECIFICATIONS FOR INTERIOR  
FINISH MATERIALS AND FURNISHINGS  
(NAVAL SHIPBOARD USE)**



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FOREWORD

1. This military standard is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

2. 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](mailto: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.daps.dla.mil/online>.

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SUMMARY OF CHANGE 1 MODIFICATIONS

1. The reference to MIL-PRF-17951 in [table I](#), deck coverings, treads non-skid, was deleted and replaced with MIL-PRF-24667. MIL-PRF-17951 was cancelled and superseded by MIL-PRF-24667 on 8/7/2008.
2. The change to [table I](#), insulating board, is proposed to correct an error. In the existing document, the requirement for MIL-I-742 core material, insulating board, Type I, was inadvertently mixed up with fire performance requirement for MIL-I-742 faced insulating board system (Type I). This error, if not corrected, could lead to mis-interpretation of acceptance criteria during qualification testing.
3. The reference to MIL-PRF-2818 in [table I](#), insulating blanket, was deleted because there is no acceptable commercial specification readily available to replace it. Determining the suitable commercial replacement specification, or modifying an existing commercial specification to make it suitable for NAVSEA use, will require a significant amount of testing/tasking to establish compliance of a commercial specification with a variety of requirements typical of such a specification.
4. Added requirements for on-deck insulation to [table I](#).
5. Replaced reference to MIL-PRF-32161 Appendix A with MIL-STD-3020 in [table I](#), high temperature fire/thermal/acoustic insulation. MIL-STD-3020 is the new standard for all fire resistance test methods for N-Class divisions. Added MIL-STD-3020 to list of applicable documents in Section 2.
6. The following modifications to MIL-STD-1623E have been made:

<u>Paragraph</u>	<u>Modification</u>
Foreword	Changed
2.2.1	Changed
2.4	Changed
Table I	Changed
6.4	Changed

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## 1. SCOPE

1.1 Scope. This design criteria standard provides fire performance requirements and approved specifications for various categories of interior finish materials and furnishings for use on Naval surface ships and submarines.

1.2 Applicability. This design criteria standard applies to materials for bulkhead sheathing, overhead sheathing, furniture, draperies and curtains, deck coverings, insulation, and bedding applications. The fire performance requirements of this design criteria standard supersede those contained in the applicable specifications.

1.3 Limitations. Although the development of limits for toxic products of combustion is of major concern, the information generally available is not refined to the degree to allow inclusion of finite limits in this standard at this time. Components and materials not previously approved by the Navy will be evaluated for fire gas toxicity, off-gassing, health hazards, dermal irritation/sensitization, and other pertinent factors as determined by the Naval Technical Authority.

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this standard. This section does not include documents cited in other sections of this standard 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, 4, or 5 of this standard, 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.

#### FEDERAL SPECIFICATIONS

CCC-C-436	-	Cloth, Ticking Twill, Cotton
L-P-1040	-	Plastic Sheets and Strips (Polyvinyl Fluoride)

#### FEDERAL STANDARDS

FED-STD-191	-	Textile Test Methods
FED-STD-501	-	Floor Coverings, Resilient, Nontextile: Sampling and Testing

#### COMMERCIAL ITEM DESCRIPTIONS

A-A-52085	-	Cloth, Drill, Cotton
A-A-55188	-	Blankets, Bed, Wool, Shrink Resistant and Mothproofed
A-A-59502	-	Plastic Sheet, Polycarbonate
A-A-59517	-	Cloth, Coated or Laminated, Polyvinylchloride (Artificial Leather)

#### DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-I-742	-	Insulation Board, Thermal, Fibrous Glass
MIL-I-2781	-	Insulation, Pipe, Thermal
MIL-PRF-2819	-	Insulation Block, Thermal
MIL-D-3134	-	Deck Covering Materials
MIL-PRF-3135	-	Deck Covering Underlay Materials

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MIL-DTL-15562	-	Matting or Sheet, Floor Covering Insulating for High Voltage Application
MIL-I-16411	-	Insulation Felt, Thermal, Glass Fiber
MIL-P-17171	-	Plastic, Laminate, Decorative, High Pressure
MIL-D-18873	-	Deck Covering Magnesia Aggregate Mixture
MIL-C-20079	-	Cloth, Glass; Tape, Textile Glass; and Thread, Glass
MIL-PRF-20092	-	Rubber or Plastic Sheets and Assembled and Molded Shapes, Synthetic, Foam or Sponge Open Cell
MIL-A-21016	-	Adhesive, Resilient Deck Covering
MIL-D-21631	-	Deck Covering, Latex Concrete
MIL-I-22023	-	Insulation Felt, Thermal and Sound Absorbing Felt, Fibrous Glass, Flexible
MIL-PRF-22344	-	Insulation, Pipe, Thermal
MIL-C-22395	-	Compound, End Sealing, Thermal Insulation Pipe Covering -Fire-, Water-, and Weather-Resistant
MIL-P-22581	-	Plastic Tiles, Vibration Damping, Type III
MIL-A-23054	-	Acoustical Absorptive Board, Fibrous Glass Perforated Fibrous Glass Cloth Faced
MIL-PRF-23653	-	Plastic Tiles, Vibration Damping
MIL-PRF-24172	-	Insulation, Plastic, Cellular Foam, Rigid, Preformed and Foam-in-Place
MIL-DTL-24191	-	Plastic Sheet, Cell or Continuous Cast, Acrylic, Shipboard Application (Illumination and Signal Lighting)
MIL-C-24500	-	Cloth, Drapery, Bunk Curtain, Slipcovers, and Labels, Fire Retardant
MIL-L-24518	-	Laminate, Vinyl Film-Aluminum, Decorative
MIL-PRF-24613	-	Deck Covering Materials, Interior, Cosmetic Polymeric
MIL-PRF-24667	-	Coating System, Non-Skid, for Roll or Spray Application
DOD-I-24688	-	Insulation Panel, Thermal and Acoustic Absorptive, Open-Cell Polyimide Foam
MIL-T-24708	-	Thermal/Acoustic Insulation Barrier Material: Polyimide Foam
MIL-PRF-24712	-	Coatings, Powder (Metric)
MIL-PRF-32161	-	Insulation, High Temperature Fire Protection, Thermal and Acoustic
MIL-PRF-32170	-	Deck Tiles, Wear-Resistant
MIL-PRF-32171	-	Deck Coatings, High Durability

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DEPARTMENT OF DEFENSE STANDARD

MIL-STD-3020 - Department of Defense Standard Practice for Fire Resistance of U.S. Naval Surface Ships

(Copies of these documents are available online at <https://assist.daps.dla.mil/online> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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 05Z6 PD 5-04A - Mattress, Innerspring, Flame-Resistant, Shipboard

(Copies of this document are available from the Commander, Naval Sea Systems Command, ATTN: SEA 05Z, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160).

CODE OF FEDERAL REGULATIONS (CFR)

46 CFR 164.009 - Noncombustible Materials for Merchant Vessels

(Copies of this document are available from the Superintendent of Documents, U.S. Government Printing Office, Washington DC 20401 or online at [www.gpoaccess.gov/index.html](http://www.gpoaccess.gov/index.html).)

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.

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC-135 - Dimensional Changes of Fabrics After Home Laundering

(Copies of this document are available from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.)

ASTM INTERNATIONAL

ASTM D635 - Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position, Standard Test Method for

ASTM D6413 - Flame Resistance of Textiles (Vertical Test), Standard Test Method for

ASTM E84 - Surface Burning Characteristics of Building Materials

ASTM E162 - Surface Flammability of Materials Using a Radiant Heat Energy Source, Standard Test Method for

ASTM E648 - Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source, Standard Test Method for

ASTM E662 - Specific Optical Density of Smoke Generated by Solid Materials, Standard Test Method for

ASTM E1264 - Acoustical Ceiling Products, Standard Classification for

ASTM F1066 - Tile, Floor, Vinyl Composition, Standard Specification for

ASTM F1700 - Solid Vinyl Floor Tile, Standard Specification for

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(Copies of these documents are available from ASTM International, 100 Barr Harbor Avenue, PO Box C700, West Conshohocken, PA, USA 19428-2959 or online at [www.astm.org](http://www.astm.org).)

ELECTRIC BOAT CORPORATION

EB Corp. Spec 4013 - Anti-Sweat and Refrigerant Insulation Systems (Sheets and Tubes)

(Copies of this document are available from Electric Boat Corporation, a General Dynamics Company, Department 447, Material Services, 75 Eastern Point Road, Groton, CT 06340-4899.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 267 - Fire Characteristics of Mattresses and Bedding Assemblies Exposed to Flaming Ignition Source

(Copies of this document are available from NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471 or online at [www.nfpa.org](http://www.nfpa.org).)

UNDERWRITERS LABORATORIES, INC. (UL)

UL 94 - Tests for Flammability of Plastic Materials

UL 723 - Test for Surface Burning Characteristics of Building Materials

(Copies of these documents are available from COMM 2000, 1414 Brook Drive, Downers Grove, IL 60515 or online at [www.ul.com](http://www.ul.com).)

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. DEFINITIONS

This section is not applicable to this standard.

4. GENERAL REQUIREMENTS

This section is not applicable to this standard.

5. DETAILED REQUIREMENTS

5.1 Materials. Interior finish materials and furnishings shall meet the requirements set forth in [table I](#). Thickness for bulkhead sheathing, overhead sheathing, and furniture indicate maximum limits in both application and fire tests.

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Category	Material	Specification	Fire test	Test limits	
Bulkhead sheathing <sup>1/</sup>	High pressure laminate	MIL-P-17171, Type IV	ASTM E84 or UL 723	Flame spread index	25 MAX
				Smoke developed index	15 MAX
	Fabric-backed vinyl	Commercial	ASTM E84	Flame spread index	25 MAX
				Smoke developed index	75 MAX
				Vinyl thickness	0.035 inch MAX
	PVC film-aluminum laminate	MIL-L-24518	ASTM E84 or UL 723	Flame spread index	25 MAX
				Smoke developed index	75 MAX
				PVC film thickness	0.011 inch MAX
	High pressure laminate pre-bonded to aluminum	MIL-P-17171	ASTM E84 or UL 723	Flame spread index	25 MAX
				Smoke developed index	15 MAX
				Aluminum thickness	0.050 inch MAX
	PVF film-aluminum laminate	L-P-1040, Type II, Grade A, Class 1	ASTM E84 or UL 723	Flame spread index	25 MAX
				Smoke developed index	75 MAX
				PVF film thickness	0.004 inch MAX
Aluminum thickness				0.063 inch MAX	
Plastic tile	MIL-PRF-23653	ASTM D635		<sup>9/</sup> , <sup>10/</sup>	
Plastic sheet	MIL-P-22581	ASTM D635		<sup>9/</sup> , <sup>10/</sup>	
Overhead sheathing <sup>2/</sup>	Acoustical ceiling products	ASTM E1264 Class A (all surfaces)	ASTM E84	Flame spread index	25 MAX
				Smoke developed index	50 MAX
	Acrylic light-diffusing panel/windows (lighting fixture only)	MIL-DTL-24191	ASTM D635	Flame rate	1.35 inch/minute MAX
				ASTM E662 <sup>20/</sup>	Smoke density
	Fibrous glass opaque suspended ceiling panel	Commercial	ASTM E84	Flame spread index	25 MAX
				Smoke developed index	35 MAX
				Panel thickness	0.750 inch MAX

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Category	Material	Specification	Fire test	Test limits	
Overhead sheathing <sup>2/</sup> continued	PVC film-aluminum laminate	MIL-L-24518	ASTM E84 or UL 723	Flame spread index	25 MAX
				Smoke developed index	75 MAX
				Aluminum thickness	0.063 inch MAX
	PVF film-aluminum laminate	L-P-1040, Type II, Grade A, Class 1	ASTM E84 or UL 723	Flame spread index	25 MAX
				Smoke developed index	75 MAX
				PVF film thickness	0.004 inch MAX
				Aluminum thickness	0.05 inch MAX
	Furniture	Vinyl upholstery	A-A-59517, Class 4, Condition a	ASTM D6413	Char length
After flame					2 sec MAX
Flaming droplets					None
Upholstery fabric		Commercial	ASTM D6413	Char length	3 inch MAX
				After flame	2 sec MAX
				Flaming droplets	None
Polychloroprene cushioning <sup>15/</sup>		MIL-PRF-20092, Type II, Class 5	ASTM E162	Flame spread	10 MAX
			ASTM E662 <sup>20/</sup>	Smoke density	200 MAX
			MIL-PRF-20092 Appendix A	Net peak HRR	150 kW MAX
				Avg specific extinction area	300 m <sup>2</sup> /kg MAX
High pressure laminate for table tops <sup>4/</sup>		MIL-P-17171, Type I	ASTM E84	Flame spread index	75 MAX
				Smoke developed index	50 MAX
				Laminate thickness	0.062 inch MAX
Polycarbonate		A-A-59502, Type II	UL 94	Flammability	V-0
Draperies and curtains <sup>5/</sup>	Polyaramid/novoloid	MIL-C-24500, Type II <sup>13/</sup>	ASTM D6413	Char length	3 inch MAX
				After flame	1 sec MAX
				After glow	25 sec MAX
			ASTM E662 <sup>20/</sup>	Smoke density	20 MAX
	Polyaramid	MIL-C-24500, Type I <sup>13/</sup>	ASTM D6413	Char length	5 inch MAX
				After flame	1 sec MAX
				After glow	25 sec MAX
			ASTM E662 <sup>20/</sup>	Smoke density	20 MAX
	Fibrous glass	Commercial	ASTM D6413	Char length	1.5 inch MAX
				After flame	1 sec MAX
				After glow	2 sec MAX
			ASTM E662 <sup>20/</sup>	Smoke density	20 MAX

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Category	Material	Specification	Fire test	Test limits	
Deck coverings <sup>7/</sup>	Vinyl tile	ASTM F1066 and ASTM F1700	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
			ASTM E662 <sup>20/</sup>	Smoke density	450 MAX
	Fire-retardant plastic	Commercial	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
			ASTM E662 <sup>20/</sup>	Smoke density	450 MAX
	Vinyl sheet	Commercial	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
			ASTM E662 <sup>20/</sup>	Smoke density	450 MAX
	Rubber tile	Commercial	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
			ASTM E662 <sup>20/</sup>	Smoke density	450 MAX
	Vinyl tile or sheet with backing	Commercial	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
			ASTM E662 <sup>20/</sup>	Smoke density	450 MAX
	Treads non-skid	MIL-PRF-24667	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
			ASTM E662 <sup>20/</sup>	Smoke density	450 MAX
	Epoxy non-skid	MIL-PRF-24667	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
			ASTM E662 <sup>20/</sup>	Smoke density	450 MAX
	Underlay	MIL-PRF-3135	FED-STD-501, method 6411	Char length	10 inch MAX
				Combustion time	4.0 minute MAX
				Ignition time <sup>7/</sup>	20 sec MIN
	Terrazzo	MIL-D-3134, Type I, Class 1, Type I, Class 2	FED-STD-501, method 6411	Char length	10 inch MAX
				Combustion time	4.0 minute MAX
				Ignition time <sup>7/</sup>	20 sec MIN
Latex mastic	MIL-D-3134, Type II	FED-STD-501, method 6411	Char length	10 inch MAX	
			Combustion time	4.0 minute MAX	
			Ignition time <sup>7/</sup>	20 sec MIN	
Latex concrete	MIL-D-21631	FED-STD-501, method 6411	Char length	3 inch MAX	
			Combustion time	4.0 minute MAX	
			Ignition time <sup>7/</sup>	20 sec MIN	

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TABLE I. Material requirements – continued.

Category	Material	Specification	Fire test	Test limits	
Deck coverings <sup>7/</sup> continued	Magnesium aggregate	MIL-D-18873	FED-STD-501, method 6411	Char length	3 inch MAX
				Combustion time	4.0 minute MAX
				Ignition time <sup>7/</sup>	20 sec MIN
	Electrical grade mat or sheet	MIL-DTL-15562 <sup>6/</sup>	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
				ASTM E662 <sup>20/</sup>	Smoke density
	Carpet	Commercial	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
				ASTM E662 <sup>20/</sup>	Smoke density
	Spray-on non-skid	MIL-PRF-24667	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
				ASTM E662 <sup>20/</sup>	Smoke density
	Powder coating	MIL-PRF-24712	ASTM E162	Flame spread	20 MAX
				Dripping	None
	Interior cosmetic polymeric	MIL-PRF-24613	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
				ASTM E662 <sup>20/</sup>	Smoke density
	Deck tiles, wear resistant	MIL-PRF-32170	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN
ASTM E662 <sup>20/</sup>				Smoke density	450 MAX
Deck coating, high durability	MIL-PRF-32171	ASTM E648	Critical radiant flux	0.45 w/cm <sup>2</sup> MIN	
			ASTM E662 <sup>20/</sup>	Smoke density	450 MAX
Insulation	Insulating board	MIL-I-742, Type I (faced board)	ASTM E84	Flame spread index	25 MAX
				Smoke developed index	15 MAX
				Thickness	<sup>14/</sup>
		Type I (Core only)	46 CFR 164.009	Pass <sup>8/</sup>	
		Type II (unfaced board)	46 CFR 164.009	Pass <sup>8/</sup>	
	Pipe insulation	MIL-I-2781	ASTM E84	Flame spread index	0 MAX
				Smoke developed index	0 MAX
	Pipe insulation	MIL-PRF-22344	ASTM E84	Flame spread index	25 MAX
Smoke developed index				50 MAX	

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Category	Material	Specification	Fire test	Test limits		
Insulation continued	Anti-sweat pipe insulation <sup>15/</sup>	EB Corp Spec 4013	Room/corner test (see applicable specification, Appendix A)	Flame spread	1 ft. on horizontal pipe runs MAX	
				Ignition of target array	None	
				Melting, dripping or flaming droplets	None	
				Heat release rate (material only)	11,384 Btu/minute (200 kW) MAX	
	Block insulation	MIL-PRF-2819	ASTM E84	Flame spread index	0 MAX	
				Smoke developed index	0 MAX	
	Insulating felt	MIL-I-16411	46 CFR 164.009	Pass <sup>8/</sup>		
	Insulating blanket	<sup>21/</sup>	46 CFR 164.009	Pass <sup>8/</sup>		
	On-deck insulation	<sup>22/</sup>	46 CFR 164.009	Pass <sup>8/</sup>		
	Glass cloth	MIL-C-20079 (All tests before and after treatment)				
		Type I, Classes 1, 3, 5, 7, 9	46 CFR 164.009	Pass <sup>8/</sup>		
		Type I, Class 2	ASTM E84	Flame spread index	20 MAX	
				Smoke developed index	10 MAX	
		Type I, Classes 4, 6, 8, 10	ASTM D6413 or FED-STD-191 Method 5903.2	After flame and afterglow	0 sec MAX	
				Char length	0 inch MAX	
				Flame travel	1.5 inch MAX	
		Type II, Classes 1, 3, 4	46 CFR 164.009	Pass <sup>8/</sup>		
		Type II, Class 2	ASTM E84	Flame spread index	20 MAX	
				Smoke developed index	10 MAX	
	Cellular foam (Reefer spaces only)	MIL-PRF-24172	ASTM E84 (before and after humid aging)	Flame spread index	25 MAX	
Smoke developed index				250 MAX		
Foam thickness				1.0 inch MAX		
Melting, dripping, or flaming droplets				None		

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Category	Material	Specification	Fire test	Test limits	
Insulation continued	End sealer	MIL-C-22395	MIL-C-22395, fire resistance	Burn after removal of a test flame	30 sec MAX
	Thermal/sound absorbing felt <sup>15/</sup>	MIL-I-22023 Type I and Type II	ASTM E84	Flame spread index	25 MAX
				Smoke developed index	50 MAX
		Type III	MIL-I-22023 Appendix A	Flash-over time	> 10 minute MIN
	Thermal/acoustic panel <sup>15/</sup>	DOD-I-24688, Type I	ASTM E662	Smoke density	5 max
				DOD-I-24688 Appendix A	Flash-over time
		Type II, Class 1 and 2	DOD-I-24688 Appendix A	Flash-over time	> 10 minute MIN
	High temperature fire/thermal/acoustic insulation <sup>15/</sup>	MIL-PRF- 32161, Type I, II, and III	ASTM E84	Flame spread index	25 MAX
				Smoke developed index	50 MAX
		Type I	MIL-STD-3020	Full-scale fire resistance test	<sup>11/</sup>
	Thermal/acoustic barrier <sup>15/</sup>	MIL-T-24708, Type I	ASTM E162	Flame spread index <sup>12/</sup>	25 MAX
			ASTM E662 <sup>20/</sup>	Smoke density	150 MAX
		Type I, Class 3	MIL-T-24708 Appendix	Flash-over time	> 10 minute MIN
Acoustic board	MIL-A-23054	ASTM E84 or UL 723	Flame spread index	30 MAX	
			Smoke developed index	100 MAX	
Bedding	Mattress, innerspring	NAVSEA 05Z6 PD 5- 04A	<b>Component testing:</b>		
			<i>Upholstery Ticking, Border Ticking, Flange, Tape<sup>16/</sup> and Pocketing Material<sup>16/</sup></i>		
			ASTM D6413	Initial flammability:	
				Char length	5 inch MAX
				After flame	2 sec MAX
Molten and/or flaming drops	None				

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TABLE I. Material requirements – continued.

Category	Material	Specification	Fire test	Test limits				
Bedding continued	Mattress, innerspring continued	NAVSEA 05Z6 PD 5- 04A continued	FED-STD-191 Method 5556 and ASTM D6413	Flammability after 15 launderings:				
				Char length	5 inch MAX			
				After flame	2 sec MAX			
				Molten and/or flaming drops	None			
			<i>Cushioning and insulator pad</i>					
			ASTM D6413	Char length	5 inch MAX			
				After flame	2 sec MAX			
				Molten and/or flaming drops	None			
			ASTM E162	Flame spread <sup>18/</sup>	10 MAX			
			ASTM E662 <sup>20/</sup>	Smoke density <sup>18/</sup>	200 MAX			
	Molten and/or flaming drops	None						
	<b>Finished mattress testing:</b>							
	NFPA 267 (with Navy exceptions)	Net peak HRR	150 kW MAX					
		Avg specific extinction area	300 m <sup>2</sup> /kg MAX					
		Burning droplets or flaming material <sup>19/</sup>	None					
	Mattress, polychloroprene <sup>15/</sup>	ASTM E162	Flame spread	10 MAX				
		ASTM E662 <sup>20/</sup>	Smoke density	200 MAX				
		MIL-PRF- 20092 Appendix A	Net peak HRR	150 kW MAX				
			Avg specific extinction area	300 m <sup>2</sup> /kg MAX				
			Burning droplets or flaming material <sup>19/</sup>	None				
	Treated cotton mattress ticking (non-launderable) <sup>3/</sup>	CCC-C-436, Type II, Class 2	ASTM D6413	Char length	5 inch MAX			
				After flame	2 sec MAX			
				Flaming droplets	None			
Mattress cover, cotton drill (launderable) <sup>3/</sup>	A-A-52085, Type I, Class 2	ASTM D6413	Char length	5 inch MAX				
			After flame	2 sec MAX				
Blanket <sup>17/</sup>	A-A-55188	Aircraft Material Fire Test Handbook , Chapter 18, Recommended Procedure for the 4-Ply Horizontal Flammability Test for Aircraft Blankets	Flame time	5 sec MAX				
			Drip flame time	5 sec MAX				
			Holing, flame penetration, or burn- through permitted	None				

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TABLE I. Material requirements – continued.

NOTES:

- <sup>1/</sup> Maximum test limits are based upon material bonded to a non-combustible substrate.
- <sup>2/</sup> Maximum test limits are based upon material attached to, or supported by, a non-combustible substrate.
- <sup>3/</sup> Use with polychloroprene mattress only.
- <sup>4/</sup> Wherever a flame spread index higher than 25 is indicated, the material is acceptable since there is no other acceptable material available with a lower flame spread index.
- <sup>5/</sup> An 8-ounce weight shall be used for materials tested in accordance with ASTM D6413.
- <sup>6/</sup> Cement test specimen with MIL-A-21016. Permit cement to dry a minimum of 72 hours before conducting fire test.
- <sup>7/</sup> Materials tested in accordance with method 6411 of FED-STD-501 shall exhibit ignition time no less than 20 seconds. Ignition time is defined as the time in seconds from the initial application of the burners on the sample until the first self-sustaining flame (ignition) is observed issuing from the top surface of the sample.
- <sup>8/</sup> Materials tested in accordance with 46 CFR 164.009 shall pass all requirements for noncombustibility.
- <sup>9/</sup> Specimen shall not burn to the 4-inch mark after the first or second ignition.
- <sup>10/</sup> No wire gauze shall be mounted beneath the specimen and only three (3) specimens cut from the same tile shall be tested. Each of the three (3) specimens shall pass. If any do not pass, the procedure in ASTM D635 which specifies tests in groups of ten (10) specimens (cut from the same tile) shall be followed.
- <sup>11/</sup> (a) The fire-containment assembly, with attached insulation, shall have withstood the fire endurance test without passage of flame for a time period equal to that for which the classification is desired, and (b) Transmission of heat through the assembly during the fire endurance test period shall not have raised the average temperature on its unexposed surface more than 250 °F (139 °C) above its initial temperature, nor the temperature of any one point on the surface, more than 325 °F (181 °C) above its initial temperature. The test shall be performed in both vertical and horizontal configurations.
- <sup>12/</sup> Type I shall be tested twice. One with the glass cloth cover facing the heat source, and one with the flexible polyimide foam facing the heat source.
- <sup>13/</sup> Material shall be tested as received and after five (5) launderings as per AATCC 135 Procedure IIIB in both warp and fill directions.
- <sup>14/</sup> Test at maximum thickness contemplated for use.
- <sup>15/</sup> Where test methods are non-standard, but are called out from within the specification or an Appendix to that specification, the test methods will be referenced as such.
- <sup>16/</sup> Only molten and/or flaming drops requirement applies to tape. Only initial flammability requirements apply to pocketing material.
- <sup>17/</sup> The A-A-55188 limits the use of blankets to wool material only. The fire performance requirements apply to alternative materials which are subject to approval by Naval Technical Authority.
- <sup>18/</sup> When materials are not identical on both sides, each side shall be tested as a different specimen (does not apply to cushioning).
- <sup>19/</sup> This means no flaming droplets or flaming material which fall from the test mattress during the fire test, shall continue flaming after reaching the test platform or floor.
- <sup>20/</sup> Where test method ASTM E662 is invoked, tests shall be conducted in both non-flaming and flaming modes.
- <sup>21/</sup> MIL-PRF-2818 has been cancelled without replacement. When this product is required, vendor/contractor shall submit recommended product specification to the Naval Technical Authority for approval prior to use.
- <sup>22/</sup> MIL-D-23134 has been inactivated. When this product is required, vendor/contractor shall submit recommended product specification to the Naval Technical Authority for approval prior to use.

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5.2 Fire test provisions.

5.2.1 Responsibility for testing. Unless otherwise required in the applicable material specification, the manufacturer is responsible for conducting fire tests as specified herein. All tests specified in this document shall be conducted by an independent testing laboratory that is accredited to ISO/IEC 17025 or equivalent procedure. 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. The Government reserves the right to witness the tests, and/or perform any of the tests set forth herein where such testing is deemed necessary to assure compliance to prescribed requirements.

5.2.2 Methods of testing. Fire tests shall be conducted on materials as specified in [table I](#) and the notes therein. All fire test procedures shall be in accordance with prescribed standards and test methods and, unless otherwise specified herein, no less than three specimens shall be tested on material of the same lot with results averaged (arithmetic means). Tests as listed in [table II](#) shall apply.

TABLE II. Fire tests.

Specification	Description
<i>Surface flammability</i>	
ASTM D635	Burn rate test
ASTM E84	Tunnel test
ASTM E162	Radiant panel
ASTM E648	Flooring radiant panel
FED-STD-501, Method 6411	Floor covering, fire resistance
UL 94	Flammability of plastics
<i>Vertical flame resistance</i>	
ASTM D6413*	Flame resistance of textiles
<i>Smoke generation</i>	
ASTM E84	Tunnel test
ASTM E662	Specific optical density of smoke
<i>Test for noncombustibility</i>	
46 CFR 164.009	Heated tube test
<i>Fire endurance</i>	
NFPA 267**	Fire characteristics of mattresses
UL 1709**	Hydrocarbon pool fire exposure test

\* A minimum of five specimens from each of the warp and fill directions on materials of the same lot shall be tested and their results averaged (arithmetic mean).

\*\* Only one specimen.

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## 6. NOTES

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

6.1 Intended use. This standard contains requirements necessary to establish fire performance criteria and to provide a list of approved specifications for interior finish materials and furnishings to be used on Naval surface ships and submarines.

6.2 Acquisition requirements. Acquisition documents should specify the title, number, and date of this standard.

6.3 Subject term (key word) listing.

Ceiling products, acoustical

Char

Combustion

Curtains

Deck coverings

Draperies

Fire resistance

Flame

Flame spread

Flashover

Furniture

Heat release

Ignition

Insulation, thermal

Sheathing, bulkhead

Sheathing, overhead

Smoke

6.4 Change notations. The margins of this standard are marked with vertical lines to indicate modifications generated by this change. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

Custodian:  
Navy – SH

Preparing activity:  
Navy – SH  
(Project 19GP-2008-001)

Review activity:  
Navy – YD

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.daps.dla.mil/online>.