

MIL-STD-1629B(SHIPS)
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(See 5.5)

MILITARY STANDARD

**FIRE PERFORMANCE REQUIREMENTS AND
APPROVED SPECIFICATIONS FOR INTERIOR
FINISH MATERIALS AND FURNISHINGS
(NAVAL SHIPBOARD USE)**

FSC 196P

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14 November 1975

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, D.C. 20362

Fire Performance Requirements and Approved Specifications for
Interior Finish Materials and Furnishings (Naval Shipboard Use)
MIL-STD-1623B(SHIPS)

1. This Military Standard is approved for use by the Naval Sea Systems Command and is available for use by all Departments and Agencies of the Department of Defense.

2. Recommended corrections, additions, or deletions should be addressed to Commander, Naval Ship Engineering Center, Department of the Navy, Center Building, Prince George's Center, Hyattsville, Maryland 20782.

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FOREWORD

The purpose of this standard is to establish fire performance criteria and provide a list of approved specifications for interior finish materials and furnishings to be used on new and existing Naval ships and submarines.

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.

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1.1 **Scope.** This standard provides fire performance requirements and approved specifications for seven categories of interior finish materials and furnishings for use on new and existing surface ships and submarines.

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

2. REFERENCED DOCUMENTS

2.1 The issues of the following documents in effect on the date of invitation for bids form a part of this standard to the extent specified herein.

GOVERNMENTAL**SPECIFICATIONS****FEDERAL**

L-F-450 - Flooring, Vinyl Plastic.
 L-F-475 - Floor Covering Vinyl, Surface (Tile and Roll), With Backing.
 HH-I-551 - Insulation Block and Boards, Thermal (Cellular Glass).
 SS-S-118 - Sound Controlling Blocks and Boards (Acoustical Tiles and Panels, Prefabricated).
 SS-T-312 - Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl-Asbestos.
 ZZ-M-42 - Mats, Floor, Dental-Chair, Rubber.
 CCC-A-680 - Artificial Leather (Cloth Coated), Vinyl Resin, Expanded Layer, (Upholstery).
 CCC-C-436 - Cloth, Ticking Twill, Cotton.
 CCC-C-700 - Cloth, Coated, Vinyl Coated (Artificial Leather).
 CCC-C-1703 - Cloth, Drapery, Glass Fiber.
 CCC-W-408 - Wall Covering, Vinyl-Coated.
 LLL-F-1238 - Floor Covering, Linoleum.

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MIL-I-742 - Insulation Board, Thermal, Fibrous Glass.
 MIL-M-910 - Mats, Floor, Standing.
 MIL-I-2781 - Insulation, Pipe, Thermal.
 MIL-I-2818 - Insulation Blanket, Thermal, Fibrous Mineral.
 MIL-I-2819 - Insulation Block, Thermal.
 MIL-D-3134 - Deck Covering Materials.
 MIL-D-3135 - Deck Covering Underlay Materials.
 MIL-P-15280 - Plastic Material, Unicellular (Sheets and Tubes).
 MIL-I-15475 - Insulation Felt, Thermal, Fibrous Glass Semirigid.
 MIL-M-15562 - Matting, Floor, Rubber, Insulating for High Voltage Application.
 MIL-I-16411 - Insulation Felt, Thermal, Glass Fiber.
 MIL-D-16680 - Deck Covering Magnesia Aggregate Mixture.
 MIL-P-17171 - Plastic Sheets, Laminate, Decorative, High Pressure, Thermosetting.
 MIL-D-17951 - Deck Covering, Lightweight, Nonslip, Silicon Carbide Particle Coated Fabric and Sealing Compound.
 MIL-T-18830 - Tile, Plastic, Fire-Retardant.
 MIL-M-19018 - Mats, Floor, Rubber or Plastic, Light Gray; for Shipboard Shower Stalls.
 MIL-C-19565 - Coating Compounds, Thermal Insulation Pipe Covering -- Fire- and Water-Resistant, Vapor-Barrier and Weather-Resistant.
 MIL-C-19993 - Coating Compound, Fibrous Glass Thermal Insulation Board, Water Vapor Barrier.
 MIL-C-20079 - Cloth, Glass; Tape, Textile, Glass; and Thread, Glass.
 MIL-R-20092 - Rubber Sheets and Molded Shapes, Cellular, Synthetic, Open Cell (Foamed Latex).
 MIL-G-20241 - Gasket Material, Wool Felt, Impregnated, Adhesive, Pressure Sensitive.
 MIL-A-21016 - Adhesive, Resilient Deck Covering.

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- MIL-D-21631 - Deck Covering, Latex Concrete (For Ammunition Ships).
- MIL-I-22023 - Insulation Felt, Thermal and Sound Absorbing Felt, Fibrous Glass, Flexible.
- MIL-I-22344 - Insulation, Pipe, Thermal, Fibrous Glass.
- MIL-C-22395 - Compound, End Sealing, Thermal Insulation Pipe Covering -- Fire-, Water-, and Weather-Resistant.
- MIL-P-22581 - Plastic Sheet, Vibration Damping.
- MIL-D-23003 - Deck Covering Compound, Nonslip, Lightweight.
- MIL-A-23054 - Acoustical Absorptive Board, Fibrous Glass, Perforated Fibrous Glass Cloth Faced.
- MIL-I-23128 - Insulation Blanket, Thermal, Refractory Fiber, Flexible.
- MIL-P-23653 - Plastic Tiles, Vibration Damping.
- MIL-S-24062 - Sprayable Vibration Damping Material for Light Steel Plate.
- MIL-I-24172 - Insulation, Plastic, Cellular Polyurethane, Rigid, Preformed and Foam-in-Place.
- MIL-P-24191 - Plastic Sheet, Cast, Acrylic, Shipboard Application (Illumination and Signal Lighting).
- MIL-D-24483 - Deck Covering, Spray-On, Nonslip.
- MIL-C-24500 - Cloth, Drapery, Bunk Curtain, Slipcovers, and Label, Polyaramid and Polyaramid/Novoloid Fiber Blends, Shipboard Use.
- MIL-L-24518 - Laminate, Vinyl Film-Aluminum, Decorative.
- MIL-C-24525 - Carpet, Fiberglass, Tufted Single Level Loop Pile (Without Attached Cushioning).

STANDARDS

FEDERAL

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

PUBLICATIONS

UNITED STATES COAST GUARD

- U.S.C.G. 164.009 - Test for Incombustibility.

(Application for copies should be addressed to the U.S. Coast Guard Headquarters, 400 Seventh Street, S.W., Washington, D.C. 20591.)

NBS Technical Note 708
NBS Smoke Density Chamber

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.)

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

NONGOVERNMENTAL

AMERICAN IRON AND STEEL INSTITUTE (AISI)
Steel Products Manual

(Application for copies should be addressed to the American Iron and Steel Institute, 150 East Forty Second Street, New York, New York 10017.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- E 84 - Surface Burning Characteristics of Building Materials, Test for.
- E 162 - Surface Flammability of Materials Using a Radiant Heat Energy Source, Test for.

(Application for copies should be addressed to the American Society for Testing and Materials 1916 Race Street, Philadelphia, Pennsylvania 19103.)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using federal agencies.)

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3. REQUIREMENTS

3.1 **Materials.** Interior finish materials and furnishings shall meet the requirements set forth in table I. Thicknesses for bulkhead sheathing, overhead sheathing, and furniture indicates maximum limits in both application and fire tests.

Table I - Material requirements.

Category	Material	Specification	Fire test	Maximum test limits
Bulkhead sheathing ^{1/}	High pressure laminate for vertical surfaces	MIL-P-17171, type IV	ASTM E 84	Flame spread _____ 25 Smoke developed _____ 15 Thickness _____ 0.062 inch
	Fabric-backed vinyl	CCC-W-408, type II	ASTM E 84	Flame spread _____ 25 Smoke developed _____ 15 Thickness _____ 0.025 inch
	Vinyl film-aluminum laminate	MIL-L-24518	ASTM E 84	Flame spread _____ 25 Smoke developed _____ 75 Thickness film _____ 0.011 inch Thickness aluminum _____ 0.063 inch
	CRES panel	AISI type 304, finish 4	Not applicable	Not applicable
Overhead sheathing ^{2/}	Fibrous glass opaque suspended ceiling panel	SS-S-118, type III	ASTM E 84	Flame spread _____ 25 Smoke developed _____ 35 Thickness _____ 0.750 inch
	Acrylic light-diffusing panels/windows (lighting fixture only) ^{3/}	MIL-P-24191,	ASTM E 84	Flame spread _____ 250 Smoke developed _____ 450 Thickness _____ 0.250 inch
	Vinyl Film-aluminum laminate; perforated	MIL-L-24518	ASTM E 84	Flame spread _____ 25 Smoke developed _____ 15 Thickness film _____ 0.011 inch Thickness aluminum _____ 0.063 inch
	CRES panel	AISI type 304, finish 4	Not required	Not required
	Aluminum exposed grid suspension framework	Commercial	Not required	Not required
Furniture	Vinyl upholstery	CCC-A-680, class 2, treatment (a) 1	FED-STD-191, method 5903	Char length _____ 3 inch After flame _____ 2 sec
	Vinyl upholstery	CCC-C-700 class 4, treatment a (1)	FED-STD-191, method 5903	Char length _____ 3 inch After flame _____ 2 sec
	Aromatic polyamide upholstery	Commercial	FED-STD-191, method 5903	Char length _____ 5 inch After flame _____ 1 sec
	Treated cotton ticking	CCC-C-436, type II, class 2	FED-STD-191, method 5903	Char length _____ 5 inch After flame _____ 2 sec

See footnotes at end of table.

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Table I - Material requirements (con.).

Category	Material	Specification	Fire test	Maximum test limits
Furniture (con.)	Neoprene cushioning and mattresses	MIL-R-20092, type II, class 4	ASTM E 162	Flame spread index _____ 10
	High pressure laminate for table tops ^{3/}	MIL-P-17171, type I	ASTM E 84	Flame spread _____ 75 Smoke developed _____ 50 Thickness _____ 0.062 inch
Draperies and curtains ^{4/}	Fibrous glass	CCC-C-1703	FED-STD-191, method 5903 NBS chamber	Char length _____ 1.5 inch After flame _____ 1 sec After glow _____ 2 sec DM corrected _____ 20
	Polyaramid	MIL-C-24500, type I	FED-STD-191, method 5903 NBS chamber	Char length _____ 5 inch After flame _____ 1 sec After glow _____ 5 sec DM corrected _____ 20
	Polyaramid/Novoloid	MIL-C-24500, type II	FED-STD-191, method 5903 NBS chamber	Char length _____ 3 inch After flame _____ 1 sec After glow _____ 5 sec DM corrected _____ 20
Deck coverings ^{6/}	Vinyl-asbestos tile	MIL-T-18830 ^{5/}	FED-STD-501, method 6411	Char length _____ 10 inch Combustion time _____ 4.0 min
	Vinyl tile	SS-T-312, ^{5/} type III	FED-STD-501, method 6411	Char length _____ 10 inch Combustion time _____ 4.0 min
	Vinyl sheet	L-F-450 ^{5/}	FED-STD-501, method 6411	Char length _____ 10 inch Combustion time _____ 4.0 min
	Rubber roll	SS-T-312, ^{5/} type II	FED-STD-501, method 6411	Char length _____ 10 inch Combustion time _____ 4.0 min
	Vinyl tile or sheet with backing	L-F-475 ^{5/}	FED-STD-501, method 6411	Char length _____ 10 inch Combustion time _____ 4.0 min
	Conductive linoleum	LLL-F-1238, ^{5/} type II, grade H	FED-STD-501, method 6411	Char length _____ 10 inch Combustion time _____ 4.0 min
	Treads non-skid	MIL-D-17951	FED-STD-501, method 6411	Char length _____ 8 inch Combustion time _____ 4.0 min
	Epoxy non-skid	MIL-D-23003	FED-STD-501, method 6411	Char length _____ 6 inch Combustion time _____ 4.0 min
	Latex underlay	MIL-D-3135	FED-STD-501, method 6411	Char length _____ 8 inch Combustion time _____ 4.0 min
	Terrazzo	MIL-D-3134, type I, class 1 type I, class 2	FED-STD-501, method 6411	Char length _____ 7 inch Combustion time _____ 4.0 min
	Latex mastic	MIL-D-3134, type II	FED-STD-501, method 6411	Char length _____ 7 inch Combustion time _____ 4.0 min
	Latex concrete	MIL-D-21631	FED-STD-501, method 6411	Char length _____ 3 inch Combustion time _____ 4.0 min

See footnotes at end of table.

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Table I - Material requirements (con.).

Category	Material	Specification	Fire test	Maximum test limits
Deck coverings (con.)	Magnesium aggregate	MIL-D-16680	FED-STD-501, method 6411	Char length _____ 3 inch Combustion time ___ 4.0 min
	Standing rubber mat	MIL-M-910	Not required	Not required
	Electrical grade rubber mat	MIL-M-15562 ^{5/}	FED-STD-501, method 6411	Char length _____ 10 inch Combustion time ___ 4.0 min
	Shower mat	MIL-M-19018	Not required	Not required
	Fibrous glass carpet	MIL-C-24525	ASTM E 162 Without pad	Flame spread index _____ 25
	Spray-on non-skid	MIL-D-24483	FED-STD-501, method 6411	Char length _____ 6 inch Combustion time ___ 4.0 min
	Barber shop mat	ZZ-M-42	Not required	Not required
Thermal ^{7/} insulation	Insulating board	MIL-I-742	U.S.C.G. 164.009	Pass
	Pipe insulation	MIL-I-2781	ASTM E 84	Flame spread _____ 0 Smoke developed _____ 0
	Block insulation	MIL-I-2819	ASTM E 84	Flame spread _____ 0 Smoke developed _____ 0
	Insulating blanket	MIL-I-23128	U.S.C.G. 164.009	Pass
	Insulating felt	MIL-I-16411	U.S.C.G. 164.009	Pass
	Insulating block	HH-I-551	U.S.C.G. 164.009	Pass
	Insulating blanket	MIL-I-2818	U.S.C.G. 164.009	Pass
	Insulating felt	MIL-I-15475	U.S.C.G. 164.009	Pass
	Weather resistant coating compound ^{8/}	MIL-C-19565		
	Fibrous glass coating compound ^{8/}	MIL-C-19993		
	Glass cloth	MIL-C-20079, type I (all classes) Before & after treatment type II (all classes) Before & after treatment	See applicable spec	Pass

See footnotes at end of table

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Table I - Material requirements (con.).

Category	Material	Specification	Fire test	Maximum test limits
Thermal ^{7/} insulation	Pipe insulation	MIL-I-22344	ASTM E 84	Flame spread _____ 25 Smoke developed _____ 50
	Urethane foam ^{8/} (Reefer spaces only)	MIL-I-24172		
	End sealer ^{8/}	MIL-C-22395		
	PVC - Nitrile	MIL-P-15280	ASTM E 84 NBS chamber	Flame spread _____ 25 DM corrected _____ 250 Thickness _____ 0.5 inch
Acoustic ^{8/} materials	Acoustic board	MIL-I-22023		
	Acoustic insulation	MIL-A-23054		
	PVC graphite	MIL-P-23653 class 1, 2		
	Epoxy-sand (sheet)	MIL-P-22581		
	Epoxy-sand (sprayable)	MIL-S-24062		
	Felt-chromate	MIL-G-20241	Not required	Not required
	Vibration damping plastic tiles	MIL-P-23653, class 3		

^{1/} Maximum test limits are based upon material bonded to a non-combustible substrate.

^{2/} Maximum test limits are based upon material attached to, or supported by, a non-combustible substrate.

^{3/} Wherever a flame spread higher than 25 is indicated, the material is acceptable since there is no other acceptable material available with a lower flame spread.

^{4/} An 8-ounce weight shall be used for materials tested in accordance with method 5903 of FED-STD-191.

^{5/} Cement test specimen with MIL-A-21016. Permit cement to dry a minimum of 72 hours before conducting fire test.

^{6/} Materials tested in accordance with method 6411 of FED-STD-501 shall exhibit ignition time no less than 30 seconds. Ignition time is defined as time in seconds to ignite the sample after the application of the burners.

^{7/} Materials tested in accordance with U.S.C.G. 164.009 shall pass all requirements for incombustibility.

^{8/} Where no fire test limits appear, technical data was not available as of the date of this standard. However, the specifications listed are the only materials available.

4. FIRE TEST PROVISIONS

4.1 Responsibility for testing. Unless otherwise required in the applicable material specification, the manufacturer is responsible for conducting fire tests as specified herein. Except as otherwise specified, the manufacturer may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the tests set forth herein where such testing is deemed necessary to assure compliance to prescribed requirements.

4.2 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

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three specimens shall be tested on material of the same lot with results averaged (arithmetic means). The following tests apply:

4.2.1 Surface flammability.

4.2.1.1 ASTM E 84 (Tunnel test).

4.2.1.2 ASTM E 162 (Radiant panel).

4.2.1.3 FED-STD-501, method 6411.

4.2.2 Vertical flame resistance.

4.2.2.1 FED-STD-191, method 5903 - A minimum of five specimens from each of the warp and filling directions on material of the same lot shall be tested and their results averaged (arithmetic means).

4.2.3 Smoke generation.

4.2.3.1 ASTM E 84 (Tunnel test).

4.2.3.2 NBS Technical Note 708 (NBS Smoke Chamber).

4.2.4 Test for incombustibility.

4.2.4.1 U.S.C.G. 164.009 (Heated Tube Test).

5. NOTES

5.1 This standard will be updated periodically as additional data becomes available.

5.2 Approved adhesives were not considered a fire hazard and the category was deleted from this standard.

5.3 This standard will be implemented by the requirements of the applicable material specifications.

5.4 The materials specified in this standard reflect the present state-of-the-art.

5.5 THE MARGINS OF THIS STANDARD ARE MARKED "#" TO INDICATE WHERE CHANGES (ADDITIONS, MODIFICATIONS, CORRECTIONS, DELETIONS) FROM THE PREVIOUS ISSUE HAVE BEEN MADE. 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 AND RELATIONSHIP TO THE LAST PREVIOUS ISSUE.

Preparing activity:
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