

MIL-STD-1629B(SHIPS)
14 November 1975
SUPERSEDING
20 May 1974
(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. SCOPE AND APPLICATION

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.

MILITARY

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 com-pound ^{8/} | MIL-C-19565 | | |
| | Fibrous glass coating com-pound ^{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:
Navy - SH
(Project 19GP-N001)