

INCH-POUND

MIL-P-17171E(SH)

25 May 1990

SUPERSEDING

MIL-P-17171D(SH)

13 December 1977

(See 6.6)

MILITARY SPECIFICATION

PLASTIC, LAMINATE, DECORATIVE,
HIGH PRESSURE

This specification 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.

1. SCOPE

1.1 Scope. This specification establishes the requirements for protective, high pressure, decorative plastic laminates used to cover furniture and bulkhead surfaces, and for high pressure, decorative plastic laminates factory bonded by the laminate manufacturer to aluminum panels used for non-structural bulkheads and overheads.

1.2 Classification. The sheet material shall be of the following types and grades, as specified (see 6.2).

Type I - General purpose.

Type IV - Fire retardant.

Grade 1 - Nominal thickness 0.050 inch.

Grade 2 - Nominal thickness 0.062 inch.

Type V - Fire retardant composite.

Grade 1 - Laminate plus 0.045 inch aluminum sheathing.

Grade 2 - Laminate plus 0.050 inch aluminum sheathing.

Grade 3 - Laminate plus 0.060 inch aluminum sheathing.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 9330

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

MIL-P-17171E(SH)

2.1.1 Specification, 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 listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

MILITARY

MIL-L-19140 - Lumber and Plywood, Fire-Retardant Treated.

STANDARDS

MILITARY

MIL-STD-1186 - Cushioning, Anchoring, Bracing, Blocking and Waterproofing; With Appropriate Test Methods.
 MIL-STD-1623 - Fire Performance Requirements and Approved Specifications for Interior Finish Materials and Furnishings (Naval Shipboard Use).
 MIL-STD-2073-1 - DoD Materiel Procedures for Development and Application of Packaging Requirements.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, BLDG. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of the documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3951 - Standard Practice for Commercial Packaging. (DoD adopted)
 E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials. (DoD adopted)

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

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

LD 3 - High-Pressure Decorative Laminates. (DoD adopted)

(Application for copies should be addressed to the National Electrical Manufacturers Association, 2101 L Street, NW, Washington, DC 20037.)

UNDERWRITERS LABORATORIES INC. (UL)

UL 723 - Test for Surface Burning Characteristics of Building Materials.

(Application for copies should be addressed to the Underwriters Laboratories Inc., 333 Pfingston Road, Northbrook, IL 60062.)

MIL-P-17171E(SH)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. 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 Material. Type I and IV material shall consist of layers of fibrous sheet material, such as paper impregnated with thermosetting resins and consolidated under heat and pressure to form a rigid, cured material. Type V shall consist of high pressure plastic laminates factory bonded to aluminum sheathing. Asbestos and components containing asbestos are prohibited.

3.2 Form. The material shall be in the form of rectangular laminated/composite sheets.

3.3 Color and pattern. The color and decorative pattern of the laminate material shall be as specified (see 6.2).

3.4 Surface finish. The surface finish of the laminate material shall be as specified (see 6.2).

3.5 Dimensions and tolerances. Size of the laminate/composite sheets shall be as specified (see 6.2). The maximum size shall be 5 by 12 feet. Tolerances in length and width dimensions shall be minus 0 plus 1/2 inch. Thickness shall conform to table I.

TABLE I. Thickness.

Type	Grade	Laminate thickness (inch)	Aluminum sheathing thickness (inch)
I	-	0.050 ± 0.005	-
IV	1	0.050 ± 0.005	-
	2	0.062 ± 0.005	-
V	1	0.015 ± 0.003	0.045, -0, +0.002
	2	0.015 ± 0.003	0.050, -0, +0.002
	3	0.015 ± 0.003	0.060, -0, +0.002

3.6 Physical properties. Physical properties shall conform to the requirements of table II.

MIL-P-17171E(SH)

TABLE II. Physical property requirements.

Requirement	Test	Type I ^{1/}	Type IV		Type V
			Grade 1 ^{2/}	Grade 2 ^{3/}	(all grades)
Impact resistance Evidence of surface damage or break, height of drop, minimum	4.4.1	50 inches	45 inches	55 inches	45 inches
Dimensional change, percent, maximum Machine direction	4.4.2	0.5 percent	0.5 percent	0.5 percent	0.5 percent
Cross machine direction		0.9 percent	0.9 percent	0.9 percent	0.9 percent
Resistance of surface to boiling water	4.4.3				
Blistering of surface		no effect	no effect	no effect	no effect
Impairment of finish		no effect	no effect	no effect	no effect
Wear resistance, number of cycles, minimum	4.4.4	400	400	400	400
Radiant heat resistance, exposure time without permanent discoloration, crazing, seconds, minimum	4.4.5				
		125	75	125	125

^{1/} Corresponds to NEMA type GP 50.

^{2/} Corresponds to NEMA type FR 50.

^{3/} Corresponds to NEMA type FR 62.

3.7 Light resistance. The decorative surface of the laminate material shall show not more than a slight change in color (see 4.4.6).

3.8 High temperature resistance. The decorative surface of the laminate material shall show not more than a slight change (see 4.4.7).

3.9 Conductive heat resistance (type I and type V only). The decorative surface of type I laminate material shall show not more than a slight change in color or surface texture. The decorative surface of type V composite material shall be unaffected (see 4.4.8).

MIL-P-17171E(SH)

3.10 Stain resistance. The decorative surface of the laminate material shall be unaffected from reagents (test materials) 1 through 23 and shall have not more than a moderate effect from reagents (test materials) 24 through 29 (see 4.4.9).

3.11 Machinability. The laminate material shall not crack, chip, or delaminate when drilled, countersunk, tapped, sawed, or machined (see 4.4.10).

3.12 Fire performance. The material shall meet the fire performance requirements specified in MIL-STD-1623 (see 4.4.11).

3.13 Workmanship. The decorative surface of the material shall contain no defects such as scratches, dents, heat marks, blisters, and wrinkles. The material shall be uniform in quality and appearance.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of the manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Quality conformance inspection. Quality conformance shall consist of the examination and tests specified in table III (see 6.3).

MIL-P-17171E(SH)

TABLE III. Quality conformance inspection.

	Requirement	Test
Impact resistance	table II	4.4.1
Dimensional change	table II	4.4.2
Resistance of surface to boiling water	table II	4.4.3
Wear resistance	table II	4.4.4
Radiant heat resistance	table II	4.4.5
Light resistance	3.7	4.4.6
High temperature resistance	3.8	4.4.7
Conductive heat resistance	3.9	4.4.8
Stain resistance	3.10	4.4.9
Machinability	3.11	4.4.10
Fire performance	3.12	4.4.11
Workmanship	3.13	4.3

4.2.1 Sampling.

4.2.1.1 Lot. For the purpose of sampling, examinations, and tests, a lot shall consist of all sheets of the same type and size produced under essentially the same conditions and offered for delivery at one time.

4.2.1.2 Sampling for examination. Samples shall be selected at random from each lot in accordance with table IV for the examination specified in 4.3.

TABLE IV. Sampling for examination.

Number of sheets in lot	Number of sheets to be examined
1 to 25	6
26 to 90	13
91 to 150	20
151 to 280	32
281 to 500	50
501 to 1800	80
1801 and over	125

4.2.1.3 Sampling for tests. Unless otherwise specified (see 4.4.1, 4.4.9, and 4.4.11), tests shall be conducted on samples from the first lot of sheets and on samples from every tenth lot thereafter.

4.3 Examination. Each sample sheet shall be examined for form, dimensions, tolerances, color and pattern, surface finish, and workmanship to determine and evaluate visual defects.

MIL-P-17171E(SH)

4.4 Tests.

4.4.1 Impact resistance. Impact resistance tests shall be conducted in accordance with NEMA LD 3 on samples for lots not subject to other tests (see 4.2.1.3).

4.4.2 Dimensional change. Specimens shall be tested in accordance with NEMA LD 3.

4.4.3 Boiling water resistance. Specimens shall be tested in accordance with NEMA LD 3.

4.4.4 Wear resistance. Specimens shall be tested in accordance with NEMA LD 3.

4.4.5 Radiant heat resistance. Specimens shall be tested in accordance with NEMA LD 3.

4.4.6 Light resistance. Specimens shall be tested in accordance with NEMA LD 3.

4.4.7 High temperature resistance. Specimens shall be tested in accordance with NEMA LD 3.

4.4.8 Conductive heat resistance. Specimens shall be tested in accordance with NEMA LD 3.

4.4.9 Stain resistance. Stain resistance tests shall be conducted in accordance with NEMA LD 3 on samples from lots not subject to other tests (see 4.2.1.3).

4.4.10 Machinability. Machinability of specimens shall be demonstrated when worked in accordance with NEMA LD 3.

4.4.11 Fire performance. Fire performance tests shall be conducted at a laboratory acceptable to the Naval Sea Systems Command (NAVSEA) at 12-month intervals in accordance with MIL-STD-1623. UL 723 test method may be used in lieu of ASTM E 84. When specified (see 6.2), each type IV laminate shall be identified and tested for flammability as required by the testing agency to retain the rating.

4.5 Inspection of packaging. Sample packages and packs, and the inspection of the preservation, packing, and marking for shipment, stowage, and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition.)

5.1 Preservation. Preservation shall be level A or commercial, as specified (see 6.2).

MIL-P-17171E(SH)

5.1.1 Level A. Laminated sheets (see 3.2) shall be individually wrapped or interleaved to protect them from abrasion using not less than 30 pounds basic weight kraft paper or plastic film.

5.1.2 Commercial. Preservation shall be in accordance with ASTM D 3951.

5.2 Packing. Packing shall be level A, B, C, or commercial, as specified (see 6.2).

5.2.1 General requirements for levels A, B, and C. Shipping containers shall contain identical quantities of identical sheets and shall be of minimum weight and of uniform size. Shipping containers shall be provided with fiberboard pads, liners, or other media to provide protection to all corners and edges of the packed sheets from damage during handling, shipment, storage, and stowage.

5.2.1.1 Navy fire-retardant treated lumber and plywood. Unless otherwise specified (see 6.2), all lumber and plywood (including laminated veneer material used in shipping containers and pallet construction) shall be fire-retardant treated material conforming to MIL-L-19140 as follows:

Levels A and B	- Type II - weather resistant.
	Category 1 - general use.
Level C	- Type I - non-weather resistant.
	Category 1 - general use.

5.2.2 Levels A, B, and C containers. Sheets preserved as specified in 5.1 shall be packed in shipping containers for the level of packing specified (see 5.2) in accordance with table VII, appendix C of MIL-STD-2073-1. Unless otherwise specified (see 6.2), container selection shall be at the contractor's option.

5.2.2.1 Caseliners, closure, and gross weight.

5.2.2.1.1 Caseliners. Unless otherwise specified (see 6.2), level A shipping containers shall be provided with waterproof caseliners in accordance with MIL-STD-1186.

5.2.2.1.2 Closure. Container closure, reinforcing, or banding shall be in accordance with the applicable container specification or appendix thereto, except that weather-resistant fiberboard boxes shall be closed in accordance with method V and reinforced with non-metallic or tape banding and domestic fiberboard boxes shall be closed in accordance with method I using pressure-sensitive tape.

5.2.2.1.3 Weight. Wood, plywood, and cleated type containers exceeding 200 pounds gross weight shall be modified by the addition of skids in accordance with MIL-STD-2073-1 and the applicable container specification or appendix thereto.

5.2.3 Commercial. Sheets preserved as specified (see 5.1) shall be packed for shipment in accordance with ASTM D 3951 and herein.

MIL-P-17171E(SH)

5.2.3.1 Container modification. Shipping containers exceeding 200 pounds gross weight shall be provided with a minimum of two, 3- by 4-inch nominal wood skids laid flat, or a skid- or sill-type base which will support the material and facilitate handling by mechanical handling equipment during shipment, storage, and stowage.

5.3 Marking.

5.3.1 Levels A, B, C, and commercial. In addition to any special marking required (see 6.2), interior packs and shipping containers shall be marked (including bar coding) in accordance with MIL-STD-2073-1, appendix F.

6. NOTES

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

6.1 Intended use. Type I and type IV sheet material are intended as a decorative and protective covering for work surfaces of tables, desks, counters, and sinks. Type I, in nominal 0.050-inch thickness, should be specified for furniture surfaces and table tops. Type IV, in nominal thicknesses of either 0.050 or 0.062 inch, should be specified for bulkhead sheathing. Type V composite material is intended for use on bulkheads and overheads. Type V, grade 1 composite material is intended for use in honeycomb sheathing systems. Type IV and V exhibit better fire performance characteristics than type I.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- (a) Title, number, and date of this specification.
- (b) Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- (c) Type and grade required (see 1.2).
- (d) Color and decorative pattern required (see 3.3).
- (e) Surface finish (see 3.4).
- (f) Size of sheet required (see 3.5).
- (g) When UL fire rating is required (see 4.4.11).
- (h) Level of preservation and packing required (see 5.1 and 5.2).
- (i) When fire-retardant treated lumber and plywood is not required (see 5.2.1.1).
- (j) Container selection, if other than contractor's option (see 5.2.2).
- (k) When caseliners are not required (see 5.2.2.1.1).
- (l) Special marking required (see 5.3.1).

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID's are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DoD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

MIL-P-17171E(SH)

<u>Reference Paragraph</u>	<u>DID Number</u>	<u>DID Title</u>	<u>Suggested tailoring</u>
4.2	DI-T-5329	Inspection and test reports	----

The above DID's were those cleared as of the date of this specification. The current issue of DoD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMS DL), must be researched to ensure that only current, cleared DIDs are cited on the DD Form 1423.

6.4 Acceptance levels. The acceptance levels for examination during sampling should be as listed in table V.

TABLE V. Acceptance levels for examination of sampling.

Number of sheets in lot	Number of sheets to be examined	Defects in sheets acceptance number
1 to 25	6	0
26 to 90	13	1
91 to 150	20	2
151 to 280	32	3
281 to 500	50	5
501 to 1800	80	7
1801 and over	125	10

- 1/ All defective items should be replaced with acceptable items prior to lot acceptance.
- 2/ Inspect sample size until reject criteria is reached. If reject criteria is reached, reject the lot or inspect the entire lot.
- 3/ If entire sample is inspected and reject criteria is not reached, the lot may be accepted.

6.4.1 Visual defects. If the total number of visual defects exceeds the applicable acceptance number of table V, this should be cause for rejection of the lot which the samples represent.

6.5 Subject term (key word) listing.

Bond
Cure
Resin
Thermosetting

MIL-P-17171E(SH)

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:
Navy - SH
(Project 9330-1034)