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 SUPERSEDING  
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INTERIM FEDERAL SPECIFICATION  
 BOOKCASE, WOOD, GENERAL OFFICE

This Interim Federal Specification was developed by the Federal Supply Service, General Services Administration, Washington, D. C. 20406, based upon currently available technical information. It is recommended that Federal agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

1. SCOPE

1.1 Scope. This specification covers one type of bookcase fabricated of wood for general office use.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

Federal Specifications:

L-P-378 - Plastic Sheet and Strip, Thin Gauge, Polyolefin.  
 L-P-508 - Plastic Sheet, Laminated, Decorative and Nondecorative.  
 L-T-0041 - Table Top and Furniture Assemblies (Plastic Thermosetting Resin Laminate).  
 FF-S-107 - Screws, Tapping and Drive.  
 FF-S-111 - Screw, Wood.  
 MMM-A-130 - Adhesive, Contact.  
 PPP-B-636 - Boxes, Shipping, Fiberboard.  
 PPP-F-320 - Fiberboard; Corrugated and Solid, Sheet Stock (Container Grade), and Cut Shapes.  
 PPP-T-42 - Tape, Pressure-Sensitive, Adhesive; (General Packaging Application).  
 TT-L-57 - Lacquer, Rubbing, Clear, (for Wood furniture).

Federal Standards:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies).

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.

(Single copies of this specification and other Federal specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, D. C., Atlanta, Chicago, Kansas City, MO., Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

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Military Standards:

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

U.S. Department of Commerce publications:

- PS51 - Hardwood and Decorative Plywood.
- CS236 - Mat-Formed Wood Particleboard.

(Copies of the Commercial and Product Standards may be obtained upon application, accompanied by money order, coupon, or cash to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Prices may be obtained from the Superintendent of Documents.)

National Motor Freight Traffic Association, Incorporated, Agent:

National Motor Freight Classification.

(Application for copies should be addressed to the American Trucking Association, Inc., Tariff Order Section, 1616 P Street, N.W., Washington, D.C. 20036.)

Uniform Classification Committee, Agent:

Uniform Freight Classification.

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

American Society for Testing and Materials (ASTM) Standard:

- ASTM D 905-49 - Standard Method of Test for Strength Properties of Adhesives in Shear by Compression Loading.

(Copies may be obtained upon application to American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

3. REQUIREMENTS

3.1 Preproduction sample. Unless otherwise specified (see 6.2), before production is commenced, a sample of the finished item and each component part conforming to the requirements of this specification shall be offered for approval of the contracting officer or his authorized representative. Approval of the preproduction sample authorizes the commencement of production, but does not relieve the contractor of responsibility from compliance with all other applicable provisions of this specification.

3.2 Materials. The materials used in construction of the bookcase shall be of the kind and quality specified herein.

3.2.1 Adhesives. The adhesives to be used and their permitted application shall be as shown in Table I.

TABLE I. Adhesives

Application	Kind of Adhesives
All glueblocks, assembly joints, glued laminated stock, and edge joining of lumber-core panels.	Any adhesive that will develop an average block shear strength of not less than 2800 pounds per square inch when tested as specified in 4.3.1.1.
All plywood gluing, edge-joining of veneer plies, cross-banding, edge banding, and plastic laminating.	Any adhesive that will conform to or exceed the test requirements of the Type II bond, as described in Product Standard PS51 for Hardwood and Decorative Plywood.

### 3.2.2 Finishing materials.

3.2.2.1 Filler. The filler shall be compatible with the finish system and shall not cause failure to finish panels in tests specified in 4.3.1.1.

3.2.2.2 Stain. The stain shall consist of an organic dye in an organic solvent and shall not cause failure to the finish panels in ultraviolet resistance test specified in 4.3.1.1.

3.2.2.3 Lacquer. The lacquer shall be in accordance with the applicable requirements of type I or type II of TT-L-57 when tested as specified in 4.3.1.1.

3.2.3 Wood. The permissible woods for the component parts shall be as shown in Table II.

3.2.3.1 Solid wood. The solid wood used for exposed parts shall be bright, well sanded and free from brashness, discoloration, worm holes, honeycomb, splits, and shake. A few small burls, pin-knots averaging not more than two per square foot, mineral streaks a maximum of 1/16 inch by 4 inches, or 1/8 inch by 2 inches in area and averaging not more than one per square foot, will be permitted. The wood used for unexposed parts, including lumber-core, may contain small defects such as pin-knots, sapwood, or mineral streaks provided the strength of the part is not affected. All component wood parts shall be uniformly kiln dried to a moisture content of from 5 to 8 percent.

3.2.3.2 Plywood. All hardwood plywood shall be constructed according to the requirements of Product Standard PS51 and as specified herein. The construction shall be either lumber-core or veneer core. Bondage shall be not less than Type II. Cross-banding plies shall be not less than Grade 2 quality and not less than 1/20 inch thick. Face and back veneer plies shall be not less than 1/28 inch thick, except for walnut which shall be not less than 1/32 inch thick, before sanding. All exposed faces, including inside faces of side and both sides of back panels, shall have Grade 1 veneer plies, matched for color and grain to present a uniform appearance. Grade 2 veneer plies may be used on the face of unexposed panels and underside of shelves. Lumber-core panels shall be Regular Grade except that no end-butt joints will be permitted and the wood for laying up the cores shall be of full length strips not more than 4 inches wide. Veneer plies shall be full lengths and shall be applied in balanced construction form with no ply joints less than 1 inch from the edge of any panel. All face veneers shall be edge-glued. Full length veneer strips shall be a minimum of 3-1/2 inches wide. Trim-off allowance of 3/16 inch shall be permissible on panel sides. Plywood will be permitted which otherwise meets the provisions of PS51 but consists of an even number of plies, with the two center plies running in the same direction.

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TABLE II. Varieties of wood

Exposed parts		Unexposed parts			
Veneers <u>5/</u>	Solid parts (only one for any one item <u>5/</u> )	Solid	Veneers	Corestock <u>1/</u>	Crossbands
Birch	Birch	Ash	Alder (red)	Alder	Alder
Cherry	Cherry	Beech	Ash	Basswood	Aspen
Mahogany <u>2/</u>	Hickory	Birch	Aspen	Butternut	Basswood
Pecan	Mahogany <u>2/</u>	Cherry	Basswood	Cherry	Beech
Walnut	Maple	Hackberry	Beech	Chestnut	Birch
Philippine	Pecan	Hickory	Birch	Cottonwood	Butternut
hardwoods <u>3/</u>	Walnut	Magnolia	Butternut	Douglas Fir <u>4/</u>	Cherry
Maple	Philippine	Mahogany	Cherry	Magnolia	Chestnut
Hickory	hardwoods <u>3/</u>	Maple	Cottonwood	Mahogany	Cottonwood
		Oak	Magnolia	Maple (soft)	Magnolia
		Pecan	Mahogany	Ponderosa-	Mahogany
		Sweetgum	Maple	pine <u>4/</u>	Maple (soft)
		Sycamore	Oak	Redwood <u>4/</u>	Oak
		Tupelo	Sweetgum	Sitka Spruce <u>4/</u>	Sweetgum
		Walnut	Sycamore	White Pine <u>4/</u>	Tupelo
		Philippine	Tupelo	Yel. Poplar	Walnut
		hardwoods <u>3/</u>	Walnut	Sycamore	Yel. Poplar
			Yel. Poplar	Willow	Sycamore
			Philippine	Philippine	Willow
			hardwoods <u>3/</u>	hardwoods <u>3/</u>	Philippine
					hardwoods <u>3/</u>

1/ Only one of the species listed shall be used in any one panel.

2/ American and African Mahogany only.

3/ Red luan group only.

4/ Vertical grain only.

5/ Like species shall be used in any one piece of furniture.

3.2.4 Particleboard. The particleboard shall be in accordance with any of the following types, grades and classes in Commercial Standard CS236:

Type I, grade A (high density), class 1;

Type I, grade B (medium density), class 2, except that panels less than one inch thick shall have a minimum average screw holding capacity of 235 pounds on the edges and 285 pounds on the faces;

Type II, grade A (high density), class 2.

The thickness of the particleboard shall be as hereafter specified. The moisture content of the particleboard shall not exceed 9 percent at time of laminating.

### 3.2.5 Hardware.

3.2.5.1 Footsockets. The footsockets shall be made of minimum 0.024 inch thick stamped brass or brass finished, anodized aluminum. They shall be 1-3/8 inches high and shall have a flat closed bottom with rounded bottom edges.

3.2.5.2 Screws. The screws used in assembly shall be in accordance with FF-S-111 in the size and type specified or Type A of FF-S-107.

### 3.2.6 Plastic laminate.

3.2.6.1 Decorative face sheets. The decorative face sheets shall conform to style D, type I, grade HP, class I, finish D (other), of L-P-508 and the nominal thickness shall be 1/16 inch. The color of the plastic laminate shall be as specified in 3.5.2.

3.2.6.2 Nondecorative backing sheets. The nondecorative backing sheets shall conform to style ND, type V, grade HP of L-P-508 and the nominal thickness shall be 1/32 inch.

### 3.3 Construction.

3.3.1 Design. The design of the bookcase shall be as shown in Figure 1. The bookcase shall provide 2 areas for accommodating books and one adjustable shelf shall be furnished with each bookcase. The overall dimensions of the bookcase shall be 29-1/2 inches high by 36 inches wide by 14 inches deep. The top shall be flush with both end panels and shall overhang the front and back 5/8 inch.

3.3.2 Tolerances. The following tolerances will be permitted, except where otherwise specified herein:

#### 3.3.2.1 Overall tolerances for bookcase:

- (a) Height - plus 1/4 inch minus 1/8 inch.
- (b) Depth - plus 1/4 inch minus 1/8 inch.
- (c) Width - plus 1/4 inch minus 1/8 inch.

#### 3.3.2.2 Component part tolerances:

- (a) Dimension of any solid wood part (width and thickness) plus 1/16 inch minus 1/32 inch.
- (b) Dimension of any plywood part (thickness only) - plus 1/16 inch minus 1/32 inch.
- (c) Dimension of any particleboard part (thickness only) - plus 1/16 inch minus 1/32 inch.
- (d) Any dimension, not otherwise specified - plus or minus 1/8 inch.

3.3.3 Joinery. Unless otherwise specified herein, all joints shall be tenoned and grooved and shall be accurately milled and fitted. Adhesives, specified in 3.2.1, shall be applied to the joint and the joint shall be held under pressure until the adhesive has properly set. Nails or brads shall not be used for holding the joint while adhesive is setting. Starved or insufficiently glued joints will not be acceptable. When particleboard is used for the core material, sheet metal screws shall be used for attachment.

### 3.3.4 Components.

3.3.4.1 Top. The top shall be a plastic laminate assembly consisting of particleboard, specified in 3.2.4, surfaced with plastic laminate face sheets, specified in 3.2.6.1, and backing sheets, specified in 3.2.6.2. The assembly shall be constructed in accordance with type IV of L-T-0041. The nominal thickness of the top shall be 1-3/16 inches. All edges of the top shall be banded with exposed solid wood strips, specified in 3.2.3, lap or butt-joined at the corners. All banding strips shall be full length, straight grained, and shall be a minimum of 5/16 inch thick. Alternatively, the banding strips may be tongued into the particleboard core top. When this method is used, the minimum thickness of the banding strip shall be 5/16 inch, excluding the tongue. All banding strips shall be applied before application of the plastic laminate. The grain pattern of banding strips shall be horizontal. The adhesives, specified in 3.2.1, shall be used for the banding and plastic laminate assembly. Alternatively, adhesive conforming to the requirements of MMM-A-130 may be used for the plastic laminate assembly. All corners of the top shall be rounded to a 3/16 inch radius, minimum. All top edges of the top shall be chamfered a minimum of 1/16 inch at a 45 degree angle. The bottom edges of the top shall be eased.

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3.3.4.2 Panels. All panels shall be 5 ply minimum plywood construction (3.2.3.2) or particleboard (3.2.4). Softwoods are acceptable as inner plies for hardwood faced plywood panels. Panels shall be faced two sides with Grade 1 veneer plies, specified in 3.2.3.2, except for the bottom panel which may have Grade 2 veneer plies on the underside. The grain pattern shall be vertical. All panels shall be a minimum of 3/4 inch thick. All exposed edges of the panels shall be banded with solid hardwood, specified in 3.2.3.1. When particleboard is used for the core material, the panel bottom edge shall be banded with solid hardwood, specified in 3.2.3.1, or with flat face "Tee" molding Ronthor Reiss No. R-105-699 or equal.

3.3.4.3 Shelf. The shelf shall be of 5 ply, minimum, lumber core or multi-ply veneer core hardwood plywood, specified in 3.2.3.2, or particleboard, specified in 3.2.4. The front edge of the shelf shall be banded with solid hardwood, specified in 3.2.3.1. The shelf shall be veneer faced two sides as specified in 3.2.3.2 and shall be 5/8 or 3/4 inch thick. It shall be approximately the full width of the inside of the bookcase and a minimum of 11-1/2 inches deep. Each shelf end shall have cutouts to accommodate the supports to prevent shelf movement. All edges shall be eased.

3.3.4.4 Base rail. The base rail shall be of solid exposed wood, specified in 3.2.3.1, and it shall be 1-5/8 inches wide by 1 inch thick.

3.3.4.5 Legs and mounting cleats. The legs shall be of one piece of solid exposed wood specified in 3.2.3.1. The legs shall be 1-3/4 by 3 inches at the top and taper to 1-1/2 inches square at the upper edge of footsocket. Each leg shall be uniformly tapered on the back face and both side faces and shall be furnished with a footsocket, specified in 3.2.5.1. The footsocket shall be tightly fitted flush with the outside faces of the leg and secured with a minimum of one brass escutcheon pin or screw on the inside of the leg. Mounting cleats of solid hardwood shall be 3/4 inch, minimum, thick by 4 inches wide and shall extend approximately the full depth of the case between the base rail and the back panel. A leg, centered widthwise and flush with the clear end, shall be secured to each end of the mounting cleat by two, 1/4 inch lag screws, 2-1/2 inches long, minimum.

3.3.5 Assembly of components. The major components specified in 3.3.4 shall be joined and assembled as specified herein. The base rail and back panel shall be tenoned into the end panels. The top surface of the bottom panel shall be flush with the top edge of the base rail. The bottom panel shall be tenoned into the base rail, end and back panels. The back panel shall lap the bottom panel. The top shall be secured by cleats glued and screwed to the inside face of each end panel and the back panel and screwed to the underside of the top. Cleats used for securing the top to the end panels shall be of exposed solid hardwood, specified in 3.2.3.1, 3/4 inch square, and the front end shall be beveled approximately 45 degrees. These cleats shall inset the end panel front edge between 1/2 and 1 inch and shall extend the full depth of the case. The cleat used for securing the top to the back panel may be of unexposed solid hardwood, 3/4 inch square, and shall extend the full distance between the end panel cleats. The sheet metal screws for securing cleats shall be not less than No. 10 size and shall be spaced not more than 6-1/2 inches apart starting 1 inch, maximum, from the end. Screws shall penetrate the top, back panel, and end panels a minimum of 3/4 of their thickness. There shall be a vaneline a maximum of 1/16 inch in width and depth at the point of joinery of the top and the end panel. The vaneline shall run the entire length of the joint. There shall be three sets of holes drilled into the inside face of each end panel to accommodate shelf supports. One set of the holes shall be positioned to permit a clear space of 12-1/4 inches + 1/4 inch from the bottom of the shelf to the top of the bottom panel. One set of holes shall be positioned to permit a clear space of 12-1/4 inches + 1/4 inch from the underside of the top to the top surface of the shelf. One set of holes shall be positioned to permit the clear space to be equally divided + 1/4 inch when the shelf is in place. Four drop-leg type steel shelf supports shall be furnished with each bookcase. The minimum dimensions of the supports shall be 1/4 inch diameter by 3/8 inch long stem and 1/2 inch wide by 3/4 inch long leg. The leg cleats shall adjoin the end panel, base rail, and back panel. A minimum of two screws shall be toed through the edge of the leg cleat into the end panel. A minimum of 4 No. 12 size screws shall secure each leg cleat to the underside of the case bottom. Cleats, extending approximately the entire distance between the leg cleats, shall be glued and screwed (two ways) to the back panel, the base rail and the underside of the bottom panel.

3.4 Method of finishing. The wood surfaces of the bookcase shall be finished as specified herein and finished surfaces shall comply with the requirements of 3.5. All wood surfaces normally exposed to view, including inside face of side, back and bottom panels, shall be finish sanded smooth and all corners and edges eased, thoroughly cleaned, and finished as specified.

3.4.1 Exposed surfaces. All exposed surfaces shall be finished as follows:

1. Sap stain to equalize color.
2. Apply selected colorant to produce color specified. Stain, specified in 3.2.2.2, and colorant shall conform to tests specified in 4.3.1.1.
3. Wash coat with adhesive sealer. Sealer shall withstand toughness and adhesion test specified in 4.3.1.1 without whitening or cracking.
4. Scuff sand, using sandpaper grit of fineness needed to produce proper surface.
5. Fill to degree necessary to match standard reference panel. The filler, specified in 3.2.2.1, shall conform to the test specified in 4.3.1.1.
6. Seal with adhesive type sealer. Sealer shall withstand toughness and adhesion test specified in 4.3.1.1 without whitening or cracking.
7. Sand, using sandpaper grit of fineness needed to produce proper surface.
8. Shade to tie-in color variation, if necessary. Shading shall conform to the test specified in 4.3.1.1.
9. Top coat with lacquer, (2 coats). The lacquer, specified in 3.2.2.3, and finish shall be of a quality to meet the requirements specified in 4.3.1.1.

NOTE: Operation number 8 may be performed where shown or after operation number 5.

The natural grain of the wood shall not be clouded by the finishing materials. Bleaching agents or materials shall not be used. The application of materials, the drying time, sanding, cleaning and rubbing shall be controlled to produce items of smooth, uniform exposed surfaces without blisters, pits, wrinkles, runs, tackiness or more than a trace of orange peel.

3.4.2 Unexposed wood surfaces. All unexposed wood surfaces shall be machined smooth and cleaned, and given a coat of adhesive sealer.

3.5 Color and appearance of finish.

3.5.1 Exposed wood. Color and appearance of the finish of exposed wood surfaces shall be walnut and shall conform to the standard reference panel for the plastic laminate surface adopted by Federal Supply Service, General Services Administration for color, texture, and gloss (see 6.3).

3.5.2 Plastic laminate. Finish of plastic laminate surfaces shall be walnut textured, and shall conform to the standard reference panel adopted by Federal Supply Service, General Services Administration for color, appearance, and gloss (see 6.3).

3.6 Identification marking. Each bookcase shall be permanently and legibly marked in an inconspicuous place with the specification number, Federal Stock Number, contract number, date of manufacture and the manufacturer's name or trademark, so that the source of supply may be readily determined.

3.7 Workmanship. The methods of construction, veneering, finishing and assembly and the finished appearance of the bookcase shall be in strict accordance with the requirements of this specification. Where specific requirements are not given, good commercial practice of the contract furniture industry shall be used. Bookcases shall conform to the level of quality established herein.

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## 4. QUALITY ASSURANCE PROVISIONS

4.1 General quality assurance provisions.

4.1.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 assure that supplies and services conform to prescribed requirements.

4.1.2 Government verification. All quality assurance operations performed by the contractor shall be subject to Government verification at unscheduled intervals. Verification shall consist of surveillance of the operations to determine whether the practices, methods, and procedures of the written inspection plan are being properly applied, and Government product inspection, to measure quality of product offered for acceptance. Deviation from the prescribed or agreed-upon procedures, or instances of poor practices that might have an effect on the quality of the product will be immediately called to the attention of the contractor. Failure of the contractor to promptly correct the deficiencies discovered shall be cause for suspension of acceptance until the correction has been made or until conformance of product to prescribed criteria has been demonstrated. To avoid interference with operations, the contractor shall designate a responsible official, or officials, to whom the Government inspector will report such instances.

4.2 Preproduction sample inspection. Examination and testing shall be made on the completely fabricated item for all provisions of this specification.

4.3 Sampling for inspection and acceptance. Sampling and inspection shall be performed in accordance with the provisions set forth in MIL-STD-105, except where otherwise indicated hereinafter.

4.3.1 Inspection of materials and components. In accordance with 4.1, the supplier is responsible for insuring that materials and components used were manufactured, tested, and inspected in accordance with the requirements of referenced subsidiary specifications and standards to the extent specified, or if none, in accordance with this specification.

4.3.1.1 Testing of components. In addition to the quality assurance testing provision of the subsidiary specification, testing of the components shall be performed in accordance with Table III for the characteristics shown therein. The values specified in section 3 of this specification apply to the average determinations made on a sample unit for test purposes as specified in the applicable test method. When the sample size for components covered by the subsidiary specifications is not specified, the sample size for each characteristic shall be in accordance with inspection level S-2 of MIL-STD-105 except that for lot sizes of 501 (units of products) and over the sample size shall be 5. The lot shall be unacceptable if one or more sample units fail to meet any of the requirements specified.

TABLE III. Instructions for testing components and materials

Component	Characteristic	Requirement Reference	Test Method	Sample Unit
Adhesive	Block shear test	3.2.1	ASTM D 905-49 1/ 2/ 3/	1/2 pint
Wood finish system (stain, sealer, filler, and lacquer)	Spot test - alcohol	3.2.2 and 3.4.1	4.3.3.3 and 4.3.3.3.1 of TT-L-57	
	Print resistance	3.2.2 and 3.4.1	4.3.3.4, 4.3.3.4.1, 4.3.3.4.2 and 4.3.3.4.3 of TT-L-57	



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TABLE III. Instructions for testing components and materials (continued)

Component	Characteristic	Requirement Reference	Test Method	Sample Unit
Wood finish system (stain, sealer, filler, and lacquer) 4/ (con't)	Cold check resistance	3.2.2 and 3.4.1	4.3.3.5, 4.3.3.5.1, 4.3.3.5.2, and 4.3.3.5.3 of TT-L-57	1/2 pint of each
		3.2.2 and 3.4.1	4.3.3.6 of TT-L-57	
	Ultra-violet resistance	3.2.2 and 3.4.1	4.3.3.7 of TT-L-57	
	Toughness and adhesion	3.2.2 and 3.4.1	4.4.1 herein	

- 1/ The following modifications apply when testing casein-type adhesive. The test blocks shall be placed under pressure between 10 and 20 minutes after spreading the adhesive, the adhering pressure shall be 175 + 25 pounds per square inch, and the test blocks shall be held under pressure for at least four hours.
- 2/ The following modifications apply when testing animal adhesive. The moisture content of the wood shall be from 6 to 9 percent. The joints shall be conditioned at a relative humidity of 40 + 4 percent.
- 3/ Whenever a specimen fails at a load of less than 2,800 pounds per square inch and the failure occurs 50 percent or more in the wood, the specimen shall be disregarded in computing the average. In case the shearing strength of one or more specimens is 2,800 pounds per square inch or higher, the variation among individual specimens is 10 percent or more (based on the strongest joint) the test shall be run again, provided the average is less than the required 2,800 pounds per square inch.
- 4/ The test shall be made on completely finished wood panels of the same wood used in production. The finish shall be in accordance with procedures used in producing furniture.

#### 4.3.2 End item inspection.

4.3.2.1 Visual examination of the end item. The lot size shall be expressed in units of completed end item. The inspection level for purposes of determining the sample size shall be level I of MIL-STD-105. The unit product shall be one completed end item. The defects found during the examinations shall be classified in accordance with Table IV. The acceptable quality level (AQL) shall be 4.0 for major defects and 6.5 for total defects (major and minor combined) per hundred units.

TABLE IV. Classification of End Item Defects

Examine	Defect	Classification	
		Major	Minor
Finish and appearance of exposed wood parts visible in normal use position	Does not match standard reference panel with respect to color.	X	
	Discoloration (Bleeding) over 1 square inch.		X
	Spotted, affecting appearance.		X
	Light or dark colored areas, affecting appearance.	X	
	Area of no film over 1 square inch in area.	X	
	Glue stain or glue line clearly showing, affecting appearance.		X
	Excess glue not removed.		X
	Finish peeling, flaking, blistered, cracked, checked or wrinkled.	X	

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TABLE IV. Classification of End Item Defects (Continued)

Examine	Defect	Classification		
		Major	Minor	
Finish and appearance of exposed wood parts visible in normal use position	Finish cut or rubbed through to wood.		X	
	Open grain. Finishing material not filling pores.		X	
	Orange peel, affecting appearance.		X	
	Damage or scratch, less than 1 inch long or 1 inch square.		X	
	Damage or scratch, over 1 inch square or 1 inch long.	X		
	Finish tacky, i.e., not completely dry.		X	
	Rough or gritty surface or foreign matter imbedded in finish.		X	
	Light colored edge not touched up.		X	
	Burn-in or repairs not neatly accomplished.		X	
	Unstained (white) wood visible when item is in normal use position.		X	
	Quality of plywood and laminated wood on exposed surfaces	Not harmonious grain match between panels on any one item.		X
		Species of wood not as specified.	X	
		Number of plies not as specified.	X	
Open joint in face veneer.		X		
Face veneer butt-matched.			X	
Uneven core surface telegraphing.			X	
Any cross break in veneer.		X		
Sanded through face ply.		X		
Waves of uneven sanding, affecting appearance.			X	
Machine mark, affecting appearance.			X	
Veneer blister.			X	
Veneer chipped or splintered.			X	
Any loose or unsound knot.			X	
Conspicuous patch.			X	
Decay, affecting appearance.			X	
Veneer joint less than 1 inch from edge of panel.		X		
Unfilled void at exposed edge.		X		
Lumber-core not "clear edge" where required.		X		

TABLE IV. Classification of End Item Defects (Continued)

Examine	Defect	Classification	
		Major	Minor
Quality of solid wood on exposed and unexposed surfaces	Species of wood not as specified.	X	
	Components not fabricated of one piece solid wood where required.		X
	More than 1 species of wood used for exposed wood components of any one item.		X
	Direction of grain not as specified.		X
	Check or split over 1 inch in length.	X	
	Wood warped, affecting appearance or serviceability.		X
	Loosened grain or shake on exposed surface.		X
	Loosened grain or shake on unexposed surface.		X
	Honeycomb.		X
	Loose or unsound knot.		X
	Hole on exterior surface, affecting appearance.	X	
	Wave of uneven sanding.		X
	Machine mark on exposed surface, affecting appearance.		X
	Any mineral streak on exposed surface over 1/16 inch by 4 inches or 1/8 inch by 2 inches.		X
	Any manufacturing defect or defect native to the wood filled in with plastic wood or other filler material.		X
Quality of particleboard	Not material specified.		X
	Not material specified.	X	
Quality of laminated plastic	Color or grain character of face sheet not as specified.	X	
	Face or backing sheet missing.	X	
	Top surface not proper finish.		X
	Sheet containing area of no adhesion.		X
	Face sheet damaged, dented, cracked, marred, or discolored.	X	
	Scratch or nick in face sheet, affecting appearance.		X
	Evidence of telegraphing.		X

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TABLE IV. Classification of End Item Defects (Continued)

Examine	Defect	Classification	
		Major	Minor
Construction, assembly and attachment of unexposed and exposed parts	Component missing.	X	
	Component in wrong location, except attaching implements.		X
	Component loose or insecurely fastened where rigidity is required.		X
	Component out of alignment or out of square affecting serviceability.		X
	Poor fit of component part on mating part.		X
	Wood component not glued as specified.		X
	Solid wood used in place of veneer or vice versa.		X
	Wood component damaged or not properly machined.		X
	Routing not uniform or uneven.		X
	Edges not "eased off" where required.		X
	Any loose or unsound glued joint.		X
	Wood joint not as specified.		X
	Glue joint open - exposed part: 1/16 inch or less.		X
	Over 1/16 inch.	X	
	Glue joint open - unexposed part: 1/8 inch or less.		X
	Over 1/8 inch.	X	
	Top panels warped 1/8 inch or more width or length.	X	
	Overhang of top panel uneven or not as specified.		X
	Any leg split.	X	
	Footsocket not as specified.		X
	Footsocket missing.		X
	Footsocket improperly placed.		X
	Footsocket not secured properly.		X
	Legs uneven.		X
	Not as specified or not as shown on drawings or figures.	X	
	Component not size or shape specified.		X
	Component not type or design specified.		X
Component not assembled as specified.		X	

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TABLE IV. Classification of End Item Defects (Continued)

Examine	Defect	Classification	
		Major	Minor
Workmanship and attachment of screws, bolts, and nuts	Any attachment device not type or size as specified.		X
	Material not as specified.		X
	Spacing of screws not as specified.		X
	Screw point visibly bulging wood.		X
	Wood at insertion point not countersunk when specified.		X
	Screws or bolts broken off.		X
	Screw or bolt in wrong location.		X
	More than 1 screw, bolt, or nut missing.	X	
	More than 1 bolt, screw, or nut not drawn up tightly.	X	
	Threads on nuts or bolts stripped.		X
Identification marking	Text incomplete.		X
	Missing, incorrect or illegible.		X
	Marking in wrong location.		X

4.3.2.2 Assembly examination. An examination of the assembly of the shelf and shelf supports to the bookcase shall be made for defects in ease of assembly and fit of components. The lot size shall be expressed in units of bookcases. The inspection level shall be S-2 of MIL-STD-105. The unit of product shall be one bookcase. Defects shall be scored in accordance with Table V. The acceptable quality level (AQL) shall be 4.0 defects per hundred units.

(NOTE: Unassembled shelves and bookcases selected by the Government inspector, shall be fully assembled by the contractor. The inspector shall witness the assembly of the shelf and shelf supports to the bookcase and shall observe the ease of assembly and fit of components).

TABLE V. Assembly defects

Examine	Defect
Shelf assembly and fittings for bookcase	Shelf not adjustable to positions as specified.
	Holes for shelf supports out of alignment.
	Shelf support does not fit into hole.
	Shelf support too loose in hole, i.e., falls out easily.
	Shelf wobbles on shelf support (when in horizontal plane).
	Shelf does not fit neatly on support.

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4.3.2.3 Dimensional examination. The lot size shall be expressed in units of completed bookcases. The inspection level shall be S-2 of MIL-STD-105. The unit of product shall be one completed bookcase. Any external overall dimensions that are not within the specified tolerance shall be classified as a defect. The acceptable quality level (AQL) shall be 4.0 defects per hundred units.

4.3.3 Inspection of preparation for delivery requirements. An examination shall be made to determine that packaging, packing, and marking requirements of section 5 of this specification are complied with. Defects shall be scored in accordance with Table VI. The sample unit shall be one shipping container, fully packed, selected just prior to the closing operation. Closed shipping containers shall be examined for closure defects. The lot size shall be expressed in number of shipping containers. The inspection level shall be S-2 of MIL-STD-105 and the acceptable quality level (AQL) shall be 4.0 defects per hundred units.

TABLE VI. Preparation for delivery defects

Examine	Defect
Markings (exterior and interior)	Incorrect; incomplete; illegible; omitted; of improper size, location, sequence, or method of application.
Materials	Any nonconforming component; component missing, damaged, or otherwise defective.
Workmanship	Inadequate application of components: such as incomplete closure of container, loose or inadequate sealing, strapping or stapling; bulged or distorted containers.

#### 4.4 Test methods.

4.4.1 Abrasion resistance. Abrasion resistance shall be measured using a Taber Abraser equipped with Taber Abraser Wheel No. S-33 and Behr-Manning 5/0-180A finishing paper with a load of 500 grams on each wheel.

4.4.1.1 Loss in weight. Three weighted finish panels shall be subjected to a minimum of 100 revolutions of the abraser. Panels shall be weighed after the test period and the average loss in weight calculated.

4.4.1.2 Break through. Three finish panels shall be subjected to a minimum of 250 revolutions of the abraser. Panels shall be examined for evidence of "break through" of the film. Failure of 2 panels shall constitute failure of the test.

4.4.2 Solvent resistance. Pools containing 3 cubic centimeters each of the following solvents shall be placed on fully cured finish panels. Each pool shall be covered with a 2-1/2 inch diameter watch glass and allowed to remain for the time indicated:

Ethyl alcohol, 100 proof	6 hours
Acetone	1 hour
Distilled water	6 hours

The finish shall then be examined for evidence of discoloration or checking. After removal of the solvent and a period of 30 minutes the finish shall be examined for evidence of permanent discoloration or softening.

4.4.3 Cleaning compound resistance. A pool containing 3 cubic centimeters of a 5 percent solution of trisodium phosphate shall be placed on a fully cured finish panel and covered with a 2-1/2 inch diameter watch glass. After 12 hours the finish shall be examined for evidence of permanent discoloration or softening.

4.4.4 Toughness and adhesion test. The toughness and adhesion test shall be made by using Bell Laboratories Adhesion Tester, U.S. Testing Company, Model Number 1001, in accordance with instructions for using, as provided for by the manufacturer of the tester (see 6.4). The panel shall be marred both parallel and perpendicular to the grain. The resulting indentation shall be examined for whitening or cracking.

## 5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A, B, or C as specified (see 6.2).

5.1.1 Level A. Each bookcase shall be enclosed in a bag or shroud. The bag or shroud shall be constructed from material conforming to L-P-378, type I, grade A, finish 1, a minimum of 1 mil thick. The shelf supports shall be wrapped or bagged and secured in the bottom of the bookcase with tape conforming to PPP-T-42. The shelf shall be wrapped in 1 mil thick material as specified herein and secured within the bookcase.

5.1.2 Level B. Each bookcase shall be packaged as specified in paragraph 5.1.1.

5.1.3 Level C. Each bookcase shall be packaged in accordance with the suppliers standard practice, providing that this insures protection for the bookcase during shipment and provides for safe delivery to its destination.

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

5.2.1 Level A. Each bookcase packaged as specified in 5.1.1 shall be further protected with fiberboard edge protectors. These edge protectors shall have an angular cross-section with each leg of the angle a minimum of 2 inches long and shall be cut to form two "U" shaped pieces. They shall protect the entire surface of the ends of the bookcase top and shall extend a minimum of 12 inches inward toward the center from each end. The thickness of the edge protectors shall be 3/4 inch minimum and may be obtained by laminating any combination of single, double or triple wall fiberboard sheets. The bookcase shall then be placed in a close-fitting box conforming to PPP-B-636, class weather resistant, grade V3c. This box shall be provided with a single sheet of V3c material at the bottom. The dimensions of this sheet shall be the same as the inside dimensions of the bottom of the box. Close, seal and strap the box in accordance with the appendix to PPP-B-636.

5.2.2 Level B. Each bookcase packaged as specified in 5.1.3 shall be packed as specified in 5.2.1 except that the box and bottom pad shall be in accordance with PPP-B-636, class-domestic, grade 200 minimum. The bottom sheet shall conform to PPP-F-320, class domestic, grade 200 minimum. Closure shall be in accordance with the appendix to PPP-B-636.

5.2.3 Level C. Each bookcase packaged as specified in 5.1.3 shall be packed in containers that will assure carrier acceptance and safe arrival at destination in compliance with the Uniform Freight Classification rules or the National Motor Freight Classification rules.

5.3 Marking. Marking shall be in accordance with 5.3.1 or 5.3.2 as specified (see 6.2).

5.3.1 Civil agencies. In addition to the special marking required by 5.3.3 and any special markings required by the contract or order, all marking shall comply with Fed. Std. No. 123.

5.3.2 Military agencies. In addition to the special marking required by 5.3.3 and any special markings required by the contract or order, all marking shall comply with MIL-STD-129.

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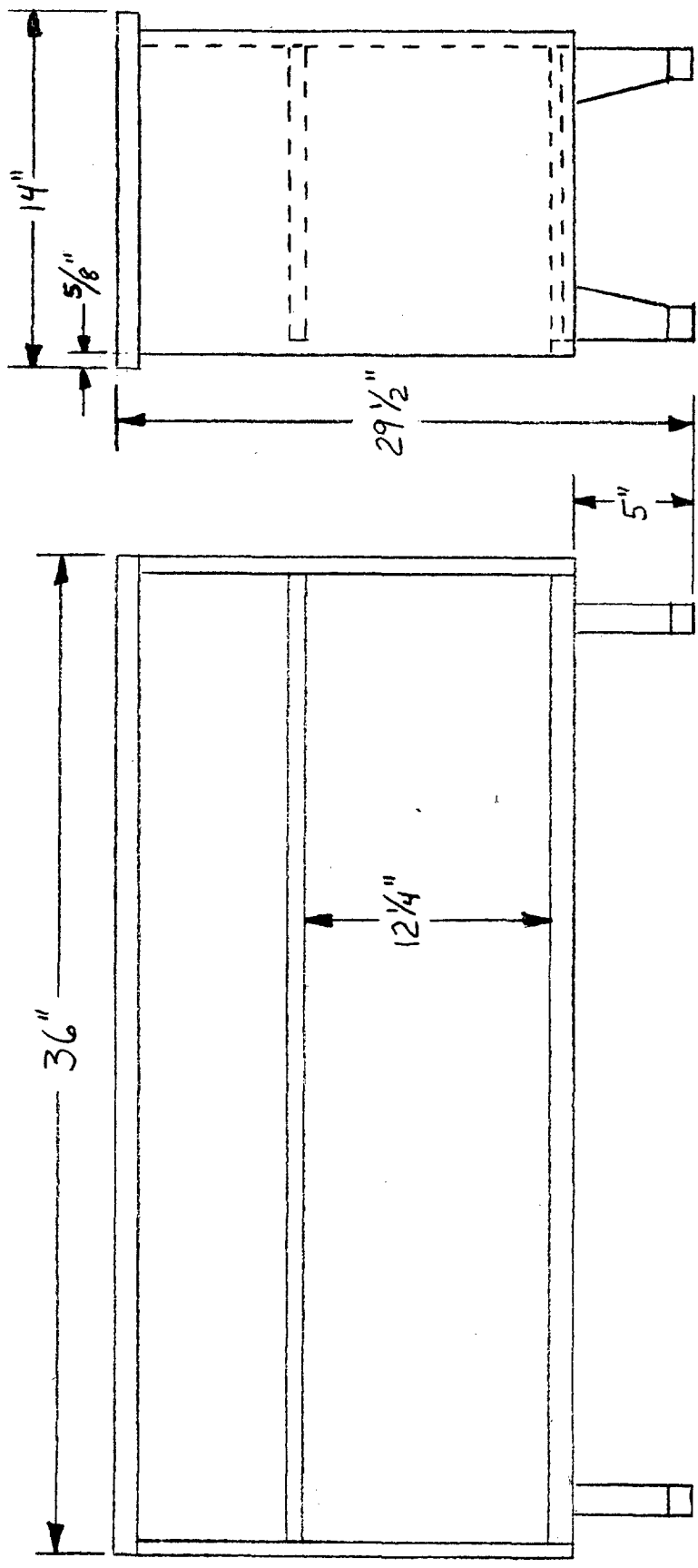


Figure 1 Bookcase



5.3.3 Special marking. In addition to the markings specified herein, arrows or prominent marks shall be placed on the sides of each shipping container to indicate the position in which the container shall be handled during shipment. The word "UP" shall be placed at the point of the arrow in characters a minimum of 2 inches high. The front panel of each shipping container shall be marked in one inch (minimum) characters as follows:

UP FURNITURE UP  
FRAGILE-HANDLE WITH CARE

The top panel shall be marked as follows:

FURNITURE  
FRAGILE-HANDLE WITH CARE  
TOP  
THIS SIDE UP

## 6. NOTES

6.1 Intended use. The bookcases covered by this specification are intended for general office use.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

- (a) Title, number and date of this specification.
- (b) When preproduction sample is not required (see 3.1).
- (c) Selection of applicable level of packaging required (see 5.1).
- (d) Selection of applicable level of packing required (see 5.2).
- (e) Marking requirements (see 5.3).

6.3 Standard sample. Sample panels of the standard color for walnut finish are obtainable, without charge, from the Business Service Center, Regional Office Building, General Services Administration, Washington, D. C. 20407, or from the Business Service Center of the nearest GSA Regional Office.

6.4 Bell Laboratories Adhesion Tester. Information about the Bell Laboratories Adhesion Tester, Model No. 1001, may be obtained from U.S. Testing Company, Inc., 1415 Park Avenue, Hoboken, New Jersey.

### Preparing activity:

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