

AA-S-1048  
March 10, 1967  
SUPERSEDING  
AA-S-271C (in part)  
Nov. 6, 1964  
(See section 6)

## FEDERAL SPECIFICATION

### SHELVING, STORAGE AND DISPLAY, STEEL, CLIP TYPE

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers requirements for storage and display shelving, fabricated from steel, with vertically adjustable shelves secured by means of clips, studs, or a combination of both.

#### 1.2 Classification.

1.2.1 Kinds, classes, and types: The shelving shall be of the following kinds, classes, and types, as specified (see 6.2).

Kind 1 - Plain shelves.

- Class 1 - Light loads.
- Class 1A - Intermediate loads.
- Class 2 - Heavy loads..
- Class 3 - Extra heavy loads.

Kind 2 - Sloped shelves.

Kind 3 - Cornice shelves.

Kind 4 - Tire and wheel shelves.

- Type I - With back panel and two end panels.
- Type II - With back panel and one end panel (one end open).
- Type III - With two end panels (open back).
- Type IV - With one end panel (open back and one end).
- Type V - Open or skeleton shelving (without end or back panels).

1.2.2 Sizes. Free standing units of assembled shelving shall be of the following nominal sizes, as specified (see 6.2 and 6.7).

Height, overall.

- 36 to 39 inches.
- 48 to 51 inches.
- 60 to 63 inches.
- 72 to 75 inches.
- 84 to 87 inches.
- 96 to 99 inches.
- 108 to 111 inches.
- 120 to 123 inches.
- 132 to 135 inches.
- 144 to 147 inches.

Width, overall.

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24 inches.  
30 inches.  
36 inches.  
42 inches.  
48 inches.

Depth, overall.

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12 inches.  
15 inches.  
18 inches.  
24 inches.  
30 inches.  
36 inches.

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## 2. APPLICABLE DOCUMENTS

2.1 Specifications and Standards. The following specifications and standards, of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

### Federal Specifications:

QQ-C-320	- Chromium Plating (Electrodeposited).
QQ-N-290	- Nickel Plating (Electrodeposited).
QQ-P-416	- Plating, Cadmium (Electrodeposited).
QQ-S-781	- Steel, Strapping, Flat.
QQ-Z-325	- Zinc Coating, Electrodeposited, Requirements for.
UU-P-268	- Paper, Kraft, Untreated, Wrapping.
PPP-B-1055	- Barrier Material, Waterproofed, Flexible.
PPP-B-601	- Boxes, Wood, Treated-Plywood.
PPP-B-621	- Boxes, Wood, Nailed and Lock-Corner.
PPP-B-636	- Box, Fiberboard.
PPP-C-650	- Crates, Wood, Open and Covered.
PPP-T-60	- Tape: Pressure-Sensitive Adhesive, Waterproof, for Packaging.
PPP-T-97	- Tape: Pressure-Sensitive Adhesive, Filament Reinforced.

### Federal Standards:

Fed. Std. No. 123	- Marking for Domestic Shipment (Civilian Agencies).
Fed. Std. No. 595	- Colors.

(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, DC, 20402.)

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at time General Services Administration Regional Offices in Boston, New York, Washington, D.C., Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, and Seattle, Wash.)

(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.)

### Military Specifications:

MIL-C-104	- Crates, Wood; Lumber and Plywood Sheathed, Nailed and Bolted.
MIL-P-116	- Preservation, Methods of.
MIL-A-8625	- Anodic coatings, for Aluminum and Aluminum Alloys.

### 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 otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

Official Classification Committee (OCC):

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Uniform Freight Classification Rules.

(Application for copies should be addressed to the Official Classification Committee, 1 Park Ave., at 33rd St., N.Y., 10016.)

American Trucking Association (ATA):

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National Motor Freight Classification Rules.

(Application for copies should be addressed to the American Trucking Association, 1616 P St., N.W., Washington, D.C., 20036.)

(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).

### 3. REQUIREMENTS

3.1 Preproduction sample. When specified (see 6.2), before production is commenced, a sample of the required shelving conforming to this specification shall be submitted or made available to the contracting officer or his authorized representative for approval in accordance with 4.2. Approval of the preproduction sample authorizes commencement of production, but does not relieve the supplier of responsibility for compliance with all provisions of this specification. The preproduction sample shall be manufactured in the same facilities to be used for the manufacture of the production items.

3.2 Standard product. The shelving covered by this specification shall be the regular commercial product of the manufacturer except for changes necessary to comply with the specification requirements.

3.3 Material. All component parts of the shelving shall be fabricated from commercially available steel of a temper, alloy, and quality to insure that the end item shall be free of blemishes, scale, cracks, and other defects or imperfections which may impair the appearance, strength, or finish of the end item. Material thickness or diameter, as applicable, shall not be less than used in the manufacturer's commercial shelving.

3.4 Design and construction. The shelving shall be of the clip design wherein the shelves are secured to supporting posts by means of positive engaging clips, studs, or a combination of both.

All shelving of the same kind, class, type, and size, including parts and assemblies thereof, furnished under any one contract or purchase order shall be identical.

3.4.1 Illustration. Figure 1 is included herein for convenience of identification only and is not intended to restrict exact details of design and construction.

3.4.2 Assembly. Unless otherwise specified (see 6.2), shelving shall be furnished knocked down. Assembly of shelves to supporting posts shall be as specified in 3.4. Attachment of bracing and optional features as may be specified, such as end and back panels, doors, bid dividers and the like, shall be accomplished by means or clips or nuts and bolts, without the need to modify or rework any component parts.

3.4.3 Assembled dimensions. Except as otherwise permitted (see 3.5.4.3),

the following tolerances shall apply to the overall assembly dimensions indicated in 1.2.2, applicable to a single free standing unit of shelving:

Height - Plus or minus 1/4 inch.

Width - Plus 1-9/16, minus 1/16 inch.

Depth - Plus or minus 3/8 inch.

When set up side by side in a rack, the overall rack length shall conform to the following:

Minimum length = Product of the applicable unit width in 1.2.2, minus 1/16 inch, times the number of units in the rack.

Maximum length = Product of the applicable unit width in 1.2.2, plus 1/4 inch, times the number of units in the rack, plus 1-9/16 inch.

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The unobstructed opening between supporting posts (cross bracing, side and back panels, excepted) shall not be more than 4-1/2 inches smaller in depth nor more than 2-1/8 inches in width than the applicable width and depth dimensions in 1.2.2.

3.4.4 Load capacity, plain shelves. Plain shelves shall sustain the applicable uniformly distributed load indicated in table I when tested in accordance with 4.4.1 and 4.4.1.1, without any visible evidence of damage or distortion of any shelf or any other component of the assembly under test, after the test load has been removed (see 6.3).

Table I. Load capacity, plain shelves

Shelf size, inches		Pounds per shelf			
Width	Depth	Class 1	Class 1a	Class 2	Class 3
24	12	700	1000	1200	2000
24	15	700	1000	1150	2100
24	18	700	900	1000	2200
24	24	700	900	1000	1700
24	30	700	800	900	1600
24	36	700	800	900	1500
30	12	600	900	1200	1800
30	15	600	900	1200	1750
30	18	600	800	1100	1700
30	24	600	800	1050	1650
30	30	600	750	1000	1600
30	36	550	650	900	1600
36	12	400	800	1000	1500
36	15	400	750	1100	1650
36	18	450	750	1000	1800
36	24	450	700	1000	1700
36	30	450	700	860	1500
36	36	450	500	700	1300
42	12	300	350	700	850
42	15	300	350	600	900
42	18	350	400	525	1300
42	24	300	350	700	1200
42	30	300	350	700	1100
42	36	300	350	650	1050
48	12	300	320	400	560
48	15	300	320	400	750
48	18	300	320	400	650
48	24	300	400	520	1000
48	30	300	400	500	1150
48	36	250	390	420	1000

### 3.5 Details of components.

3.5.1 Posts. Posts shall be provided with mounting holes the entire length of the posts, to receive shelf clips or studs, and to permit adjustment of shelf height on not more than 2 inch increments. Additional holes shall be

provided as may be required for attachment of all other component parts of shelving units, when such-components attach to posts. Posts shall be provided at the front and rear corners of all units, whether free standing or arranged in single or double faced racks. Common posts may be used at the front and rear corners of single faced units when arranged side by side in a rack (see 6.2 and 6.5). Two posts shall be provided at the rear corners of each unit when placed back to back to form a double faced unit or double faced rack.

3.5.2 Shelf clips. Shelf clips conforming to 3.4 shall be provided in sufficient quantity to secure each shelf to all four supporting posts. The shelf clips shall be designed to preclude the possibility of accidental disengagement of the clips from the posts or the shelves under load conditions.



3.5.3 Sway braces. Except when angle braces are specified (see 6.2 and 6.4), open ends and backs of all free standing units shall be provided with cross braces, except that sway plates may be substituted at the open ends of units, in lieu of cross braces. When units of shelving are mechanically secured together side by side in a rack, or back to back in a double faced arrangement, the use of common cross braces or sway plates for adjoining backs and ends, as applicable, will be acceptable.

3.5.3.1 Cross braces. Cross braces shall consist of a pair of 1 inch wide by minimum 12 gage (0.109 inch) rolled edge strips. At the supplier's option, the two strips may be joined at the center in a manner to allow hand pivoting of the unit for attachment to posts. For shelving over 99 inches high, two pairs of braces shall be provided at the open ends and backs requiring braces. The cross braces shall be of such length as required for attachment to posts on not less than 28 inch vertical centers.

3.5.3.2 Angle braces. When angle braces are required, two angle braces shall be furnished for each shelf at the open ends of free standing units and at the open ends of racks. Alternatively, when angle braces are required, cross braces or two sway plates may be furnished in lieu of angle braces at each open end of units within a rack. In addition, angle braces shall be furnished for each open face of single and double faced shelving units. Two angle braces per shelf face shall be furnished in accordance with the following:

- (a) All-shelves in units having less than five shelves.
- (b) The top two shelves, the bottom two shelves, and one intermediate shelf of the units having more than five shelves.

The angle braces shall be designed for attachment to the shelf flange and post.

3.5.3.3 Sway plates. When sway plates are furnished in lieu of angle or cross braces, the plates shall be minimum 18 gauge (0.047 inch) steel, minimum 4-3/4 inches high, by a length equal to the shelf depth. Not less than three plates shall be furnished for each free standing unit of shelving, and not less than two plates for each unit of shelving in a rack, when mechanically secured together, end to end. The plates shall be for attachment between the posts at the top and bottom of the open end(s) of each unit of shelving.

3.5.4 Shelves. Shelves, in the quantity per unit of shelving specified (see 6.2), shall conform to the following applicable requirements.

3.5.4.1 Kind 1, plain shelves. Plain shelves shall be flanged down on all sides not less than 1-1/8 nor more than 1-3/8 inches, with not less than one additional return flange at each side. All shelves shall be reinforced as may be required to meet load requirements specified herein. Each shelf shall also be provided with holes spaced not more than 3 inches on centers, for attachment of bin dividers. In addition, all holes required to complete the assembly of shelving shall be provided in each shelf so that drilling or redrilling of holes at assembly shall not be required.

3.5.4.2 Kind 2, sloped shelves. Sloped shelves shall be designed to elevate the shelf back not less than 2 nor more than 6 inches. All sides of the shelf shall be flanged up not less than 1-1/8 nor more than 1-3/8 inches and shall have an additional flange turned down flat, to the inside of the shelf, a distance not less than 1/4 inch. All turned up flanges of the installed shelves shall be vertical. All holes required for plain shelves shall apply to sloped shelves (see 3.5.4.1). Sloped shelves shall conform to the load requirements for class 1, plain shelves (see 3.4.4 and table I).

3.5.4.3 Kind 3, cornice shelves. Cornice shelves shall be for single or double face use, as specified (see 6.2), as counter tops and ledge tops, Cornice shelves shall be formed to provided a single or double face overhang, as applicable, of not less than 7/8 inch beyond the corner posts, and a down face of not more than 2 inches. The overhang of cornice shelves shall not be considered when determining overall dimensions of erected shelving. When used as ledge tops, the overall height of assembled units may be increased up to 1-1/4 inches. The cornice shelves shall not be provided with bin divider holes, but shall conform to the load capacity requirements for the applicable class plain shelves used with the cornice shelves.

3.5.4.4 Kind 4, tire and wheel shelves. Unless otherwise specified (see 6.2), tire and wheel shelves shall conform to the same load requirements as kind 1, plain shelves. A tire and wheel shelf shall consist of a pair of sloping members joined by side supports. The sloping sections of the shelves shall have all edges turned down.

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3.5.5 Back panels. When required (see 6.2), back panels shall be provided, having mounting holes in the back panel to match mating holes in posts, or mating holes near the ends of the back and front vertical flanges of shelves, and one or more additional vertical rows of holes for attachment to shelves. Back panels shall extend to the floor to inclose the base at this point. For backs over 87 inches high, overlapping of two back panels will be acceptable in lieu of one continuous panel top to bottom.

3.5.6 End panels. When required (see 6.2), end panels shall be provided with either bolt holes punched to match mating holes in posts, or alternatively, end panels shall be spot welded to posts on not less than 9 inch centers. End panels shall extend to the floor to inclose the base at this point. For ends over 87 inches high, overlapping of two end panels will be acceptable in lieu of one continuous panel top to bottom.

3.5.7 Shelf boxes. When required, and unless other sizes are specified (see 6.2), shelf boxes shall furnished in the specified quantity per 36 inch shelf width, depth, and height, selected from the following:

- (a) Quantity per 36 inch shelf width - 3, 4, 6, or 8 boxes.
- (b) Shelf depth - 12 or 18 inches.
- (c) Vertical center distance between shelves - 4, 6, or 8 inches.

The boxes shall be provided with rear stops to prevent accidental removal of boxes. Box sides shall be perforated or embossed on 1 inch centers to receive and hold box dividers in the vertical position without tilting. The box front shall be equipped with a drawer pull and label holder.

3.5.7.1 Box dividers. Unless otherwise specified (see 6.2), not less than two removal box dividers shall be furnished with each shelf box. The dividers shall be furnished with label holders.

3.5.7.2 Flush bars. When shelf boxes are required, two flush bars shall be furnished for each shelf requiring shelf boxes. The flush bars shall be of a thickness to prevent boxes from lodging behind post logs.

3.5.8 Bin fronts. When required (see 6.2), bin fronts in the specified quantity and height shall be provided. The bin front shall span the full width of the shelf opening. The height above shelf surface shall be 1-1/2 to 2, 2-1/2 to 4-1/2, or 5 to 6 Inches, as specified (see 6.2).

3.5.9 Shelf dividers, plain shelves. When required (see 6.2), shelf dividers for plain shelves shall furnished in the quantity per shelf, and vertical center distance between shelves specified. The dividers shall be secured to shelf bin divider holes, top and bottom, by threaded fasteners or clips. For heights 10 Inches and less, front and rear edges may be folded flat. Heights from 12 to 36 inches shall have the front edge formed to a bead of not less than 5/16 inch diameter, with the rear edge formed the same or flanged 1/2 inch at right angles. For heights over 36 inches, the front edge shall have a bead not less than 1/2 inch diameter, with the rear edge formed the same, or flanged 1/2 inch at right angles.

3.5.10 Doors. When required (see 6.2), doors shall be furnished for the number of units and size units specified. For openings up to 24 inches wide, single doors shall be provided with the doors hinged at the right-hand side. For openings over 24 inches wide, double doors shall be provided. For units over 87 inches high, two or more doors of standard size shall be used in tiers. Hinges shall be fast pin type with concealed mounting, or shall be spot welded to the doors and door posts. Doors up to 5 feet high shall have not less than two hinges per door. Doors over 5 feet high shall have not less than three

hinges per door. The right-hand hinged door shall be provided with a door handle interconnected to a three point latching mechanism.

3.5.10.1 Door locks. When required (see 6.2), either a flat key lock (furnished on the door), or a paracentric type key lock (as a part of the door handle), shall be furnished for each unit requiring a door or doors. Unless otherwise specified (see 6.2), all locks shall be keyed alike, with two keys furnished for each lock.

3.5.11 Base-closure. When required (see 6.2), a channel shape base closure strip shall be provided with each unit to close any open space between the bottom shelf and the floor.

3.5.12 Label holders. When required (see 6.2), continuous strip label holders shall be furnished for each shelf, or individual label holders shall be furnished in the specified quantity per shelf. The label holders shall be for mounting on the down flange of the shelf.

3.5.13 Drawer inserts. When required (see 6.2), drawer inserts shall be furnished in the specified quantity per 36 inch wide unit of shelving. The drawer inserts shall be for use in shelving spaced on 12 inch vertical centers. The number of drawers per drawer insert, and the shelf depth shall be selected from the following:

- (a) Number of drawers per insert - 12, 18, 24 or 32.
- (b) Shelf depth - 12 or 18 inches.

Unless otherwise specified (see 6.2), all drawers in any one drawer insert shall be of equal size. The drawers shall be housed within an open front sheet metal enclosure. A fixed shelf shall be provided for each horizontal row of drawers within the drawer insert. Each drawer shall be provided with a rear stop to prevent accidental removal of the drawer. The drawer sides shall be perforated or embossed on 1 inch centers to receive and hold drawer dividers in the vertical position without tilting. The drawer front shall be equipped with a drawer pull and label holder. Not less than two drawer dividers shall be furnished with each drawer. The dividers shall be provided with label holders.

3.6 Finish. After fabrication and before assembly, component parts of the shelving shall be finished in accordance with the following requirements.

3.6.1 Clips and fasteners. Clips and fasteners shall be either zinc plated in accordance with type II, class 2 of QQ-Z-325; cadmium plated in accordance with class 1, type II of QQ-P-416; or painted in accordance with requirements specified herein.

3.6.2 Door handles. When applicable, door handles shall be chrome plated in accordance with class 1, type I or II of QQ-C-320, or, at the supplier's option, the handle coating shall conform to the following requirements:

- (a) For die-cast aluminum handles - anodized per type I or II of MIL-A-8625.
- (b) For die-cast bronze or brass - nickel plate per class 1, type VII of QQ-N-290.
- (c) For die-cast zinc alloy - nickel plate per class 1, type X of QQ-N-290.

3.6.3 Paint finish. Surfaces not having an electrodeposited coating or anodized finish shall be cleaned, treated, and painted in accordance with the manufacturer's regular practice. Unless otherwise specified (see 6.2), the finished enamel coating shall approximate color No. 26134 of Fed. Std. 595. The finished coating shall be smooth and free of streaks, drops, sags, blisters, pinholes, checks, peeling, or areas of no film.

3.7 Erection instruction. Printed erection instructions, detailing complete detailed instructions for the erection of the shelving supplied, shall be furnished in each box of connecting hardware (see 5.1.1.3).

3.8 Workmanship. The component parts of the shelving shall be free of cracks, tears, burrs, and sharp edges. Assembly of the shelving shall be accomplished without the need to modify or rework any component part. The assembled shelving shall present a neat appearance with all component parts firmly attached and without visible evidence of misalignment or out of square conditions.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contractor 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.

4.2 Preproduction sample inspection. When a preproduction sample is required, it shall be examined for defects in tables III and IV, dimensions specified, and tested as specified in 4.4.1 and 4.4.1.1.

4.3 Sampling for inspection. Sampling for inspection shall be made in accordance with the provisions set forth in MIL-STD-105, unless otherwise Indicated hereinafter.

4.3.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected and tested in accordance with all requirements of referenced specifications, drawings, and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

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4.3.2 Inspection of the end item. The lot shall be all knocked-down shelving of the same kind, class, type, and size offered for inspection at one time. The sample unit shall be one complete unit of knocked-down shelving.

4.3.2.1 Visual examination of knocked-down shelving. Knocked down units shall be examined for defects in table II. The inspection level shall be II and the acceptable quality level (AQL) shall be 2.5 for major defects and 10.0 for total defects, expressed in terms of defects per hundred units.

Table II. Visual examination of knocked-down shelving

Examine	Defect	Classification	
		Major	Minor
Finish	Type of surface finish or color not as specified-----	x	
	Rust under paint-----	x	
	Poor adhesion, i.e., peeling, blistered or flaky-----	x	
	Tacky or soft runs or sags-----	x	
	Area of no film-----	x	
	Discoloration, stain, steaks, drop, pinholes, or checks-----		x
	Color separation -----		x
	Foreign matter imbedded in finish-----		x
	Noticeable Touchup-----		x
	Color shade varies between components--		x
Design, construction, and workmanship	Any component missing -----	x	
	Any component broken, fractured, or cracked-----	x	
	Sharp edge, silver, or burr-----	x	
	Any component malformed, buckled, warped, bent out of shape, or damaged--	x	
	Any hole or slot missing or in wrong location-----	x	
	Panel visibly out of square-----	x	
	Flanging, stiffening, beading, or reinforcement not as specified-----	x	

4.3.2.2 Examination of assembly. Sample units from the inspection lot defined in 4.3.2 shall be assembled and examined for defects in table III. The inspection level shall be S-2 and the AQL shall be 4.0, expressed in terms of

defects per hundred units. This examination need not be repeated during the life of the contract, provided the first inspection lot is acceptable under the inspection level and AQL noted above, and provided units in subsequent lots are identical in all respects to the units in the first inspection lot.



Table III. Examination during assembly

Examine	Defect
Assembly or erection	Does not assemble as specified.
	Components poorly fit, i.e., loose or requires unusual force to assemble.
	Any clip, stud, or fastener inoperative or does not perform design function.
	Any component missing.
	Any component requiring modification to complete assembly.
	Any component buckled or misaligned.
	Assembly out of square.
Erection instructions	Missing, illegible, incorrect, or incomplete.
Locks and keys (when applicable)	Keys or locks not type specified.
	Locks not keyed alike.
	Less than two keys per lock.
	Lock does not function as intended.
Dimension	Height, width, or depth dimensions not within specified tolerance.
	Clear opening between posts less than specified.

4.3.2.3 Testing the end item. When a preproduction ample is not required, the initial production unit shall be tested as specified in 4.4.1 and 4.4.1.1 without any evidence of failure.

4.3.3 Examination of preparation for delivery. An examination shall be made to determine that packaging, packing, and marking as required by section 5 are complied with. Defects shall be as indicated in table IV. The sample unit shall be one shipping container fully prepared for delivery, except that it need not be sealed. Defects of closure shall be examined on shipping containers fully prepared for delivery. The lot shall be all containers offered for inspection at one time. The inspection level shall be S-2 and the AQL shall be 4.0, expressed in terms of defects per hundred units.

Table IV. Examination of preparation for delivery

Examine	Defect
Markings (exterior and interior containers)	Missing, incomplete, illegible, of improper size, location, sequence, or method of application.
Materials	Component missing or damaged.

Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, inadequate stapling, bulging, or distortion of container.
Erection instructions	Missing.
Contents	Contents per container are more or less than required.
Weight	Weight per shipping container exceeds requirements.

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#### 4.4 Tests.

4.4.1 Load capacity, plain shelves. When free standing units of shelving are furnished, one unit shall be set up in accordance with the supplier's erection instructions. When shelving is of the type utilizing common posts at the corners of units within a rack, two units of shelving shall be set up side by side in accordance with the supplier's erection instructions. Not less than three shelves per unit shall be utilized in the performance of this test. One shelf shall be located near the bottom of the unit(s). The second shelf shall be located near the top of the unit(s). The third shelf shall be located at a convenient intermediate location to receive the test load(s).

4.4.1.1 Loading. The applicable load in table I shall be uniformly distributed over the entire surface of the intermediate shelf of shelves. The load shall be developed using common brick (approximate size 2-1/4 by 8 inch) placed with the long dimension parallel to the length of the shelf, and in as many layers as required to develop the required load. Alternatively, the load may be developed using sand or other loose material, wetted if necessary to develop the required weight. Sand or loose material shall be retained on the shelf by means of any type frame which surrounds the perimeter of the shelf. After not less than 15 minutes the test load shall be removed. All components of the tested unit(s) shall then be examined for compliance with 3.4.4.

#### 5. PREPARATION FOR DELIVERY

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

5.1.1 Level A. Shelving and parts of shelving of like description, except shelf boxes and connecting hardware, shall be nested or grouped together and securely strapped with flat steel strapping conforming to type 1, class A or B, grade 2 of QQ-S-781. Alternatively, small components such as flush bars and angle braces weighing less than 10 pounds may be secured with minimum 1-inch width tape conforming to type IV or PPP-T-97 or annealed wire. All sections of the shelving, except bin fronts, boxes, flush bars, braces, corner posts, and label holders, shall be interleaved with minimum 50-pound basis weight kraft paper conforming to grade B of UU-P-268 to prevent damage to the finished surfaces. Cushioning or corner protectors shall be used on the edges under the strapping. The bundled shelving shall then be individually wrapped in waterproof barrier material conforming to type C-1 or C-2 of PPP-B-1055 and secured with tape conforming to class I of PPP-T-60, or type IV of PPP-T-97.

5.1.1.1 Shelf boxes. Not more than twelve shelf boxes shall be packaged in a snug fitting fiberboard box conforming to style optional, V3c or V3s of PPP-B-636. The fiberboard box shall be closed and waterproofed by means of tape in accordance with the appendix of the box specification.

5.1.1.2 Hardware. Connecting hardware required for assembly of one complete shelving unit shall be packaged together as specified in 5.1.1.1 or in accordance with method IC-2 of MIL-P-116.

5.1.1.3 Erection instructions. The erection instructions shall be placed in a paper envelope and packaged in the same box as the connecting hardware.

5.1.1.4 Keys. Keys, when furnished, shall be attached to a door handle and secured with tape specified herein.

5.1.2 Level C. Shelving shall be packaged to afford adequate protection against damage during shipment from the supply source to the first receiving activity. The supplier may use his standard practice when it meets this

requirement.

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

5.2.1 Level A. Shelving, packaged as specified in 5.1, shall be packed as specified in 5.2.1.1 or 5.2.1.2.

5.2.1.1 Loads weighing less than 1,000 pounds. Shelving components comprising one complete unit, or multiples of one complete unit, weighing less than 1,000 pounds shall be blocked, braced, and cushioned within snug-fitting shipping container conforming to type I, II, or IV, style A of PPP-C-650, overseas type-type 3 load of PPP-B-601; or class 2, style 2, type 3 load of PPP-B-621. Each shipping container exceeding 250 pounds gross weight shall be provided with skids in accordance with the appendix of the applicable container specification. Closure and strapping shall be in accordance with the appendix of the applicable container specification.

5.2.1.2 Loads weighing 1,000 pounds and over. Components of shelving comprising one complete unit, or multiples of one complete unit, weighing 1,000 pounds or over shall be blocked, braced, and cushioned within a snug-fitting shipping container conforming to type V, style A of PPP-C-650, or type I, class 1 or 2, style A of MIL-C-104. Closure and strapping shall be in accordance with the applicable container specification or appendix thereto.

5.2.2 Level B. Shelving, packaged as specified in 5.1, shall be packed as specified in 5.2.1, except for loads weighing less than 1,000 pounds, shipping containers shall conform to type I or II, style B, or type IV, style A of PPP-C-650; domestic type, style A or B of PPP-B-601; or class 1, style 2, type 3 load of PPP-B-621. For loads weighing 1,000 pounds and over, shipping containers conforming to PPP-C-650 shall be style B, and shipping containers conforming to MIL-C-104 shall not require waterproof crate liners.

5.2.3 Level C. Shelving, packaged as specified in 5.1, shall be packed in a manner to insure carrier acceptance and safe delivery at destination at the lowest transportation rate for such supplies. Containers and packing shall comply with Uniform Classification Rules or National Motor Freight Classification Rules.

### 5.3 Marking.

5.3.1 Civil agencies. In addition to any special marking required by the contract or order, interior packages and shipping containers shall be marked in accordance with Fed. Std. No. 123.

5.3.2 Military agencies. In addition to any special marking required by the contract or order, interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

## 6. NOTES

6.1 Intended use. The shelving is intended for use in parts depots, warehouses, tool rooms and other storage facilities, for the storage and display of various items of supply.

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) Kind, class (when applicable), type, and size required (see 1.2.1 and 1.2.2).
- (c) When a preproduction sample is required (see 3.1).
- (d) When erected shelving is required (see 3.4.2).
- (e) Number of racks, when applicable (see 3.5.1 and 6.5).
- (f) When angle braces are required (see 3.5.3).

- (g) Quantity of shelves required per unit of shelving (see 3.5.4).
- (h) Whether single or double face cornice shelves are required (see 3.5.4.3)
- (i) Tire and wheel shelf load requirements, if other than specified (see 3.5.4.4).
- (j) When shelf boxes are required, specify quantity per shelf, shelf depth, and vertical center distance between shelves (see 3.5.7).
- (k) When additional box dividers are required (see 3.5.7.1).
- (l) When bin fronts are required, specify quantity and height required (see 3.5.8).
- (m) When shelf dividers are required, specify quantity per shelf required and vertical center distance between shelves (see 3.5.9).
- (n) When doors are required (see 3.5.10).
- (o) When door locks are required (see 3.5.10.1).
- (p) When door locks are not to be keyed alike (see 3.5.10.1).
- (q) When base closure is required (see 3.5.11).

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- (r) When label holders are required, specify type and quantity per shelf (see 3.5.12).
- (s) When drawer inserts are required, quantity per unit, and size (see 3.5.13:
- (t) Color, if other than specified (see 3.6.3.2).
- (u) Applicable levels of packaging and packing (see 5.1 and 3.2).

6.3 Selection of class of shelving. In selecting a class of shelving, the type of load and degree of impact loading anticipated should be considered apart from the rated capacity of the shelf class.

6.4 Bracing. Angle braces should not be specified except when unobstructed accessibility to open ends and backs is essential.

6.5 Rack installation. When shelving is intended for installation in a rack, the number of racks required for each size should be specified. This is necessary since one acceptable concept requires four posts for each unit of shelving in a rack. Another acceptable concept utilizes common posts for adjoining units in a rack; therefore, two posts are required for each unit in a rack, plus two additional posts to support the shelves at the end of a rack.

#### 6.6 Definitions.

6.6.1 Unit. The term "unit" applies to one free standing unit or erected shelving.

6.6.2 Rack. The term "rack" applies to two or more units of shelving arranged side by side.

6.6.3 Double faced. The term "double faced" applies to a back to back assembly of shelving accessible from both exposed sides. The term also applies to any arrangements of units where both faces of unit or rack of shelving is accessible.

6.7 Nonstandard shelving. Thirty inch width shelving and 15 inch depth shelving is nonstandard for DoD use.

6.8 Supersession. This specification supersedes that portion of AA-S-Z71c covering style D, clip-type shelving.

#### CUSTODIANS:

Army - GL  
Navy - YD  
Air Force - 69

#### Review activities:

Navy - DY  
Air Force - 69

#### User activities:

Army - CE, ME, SM  
Navy - SA, MC

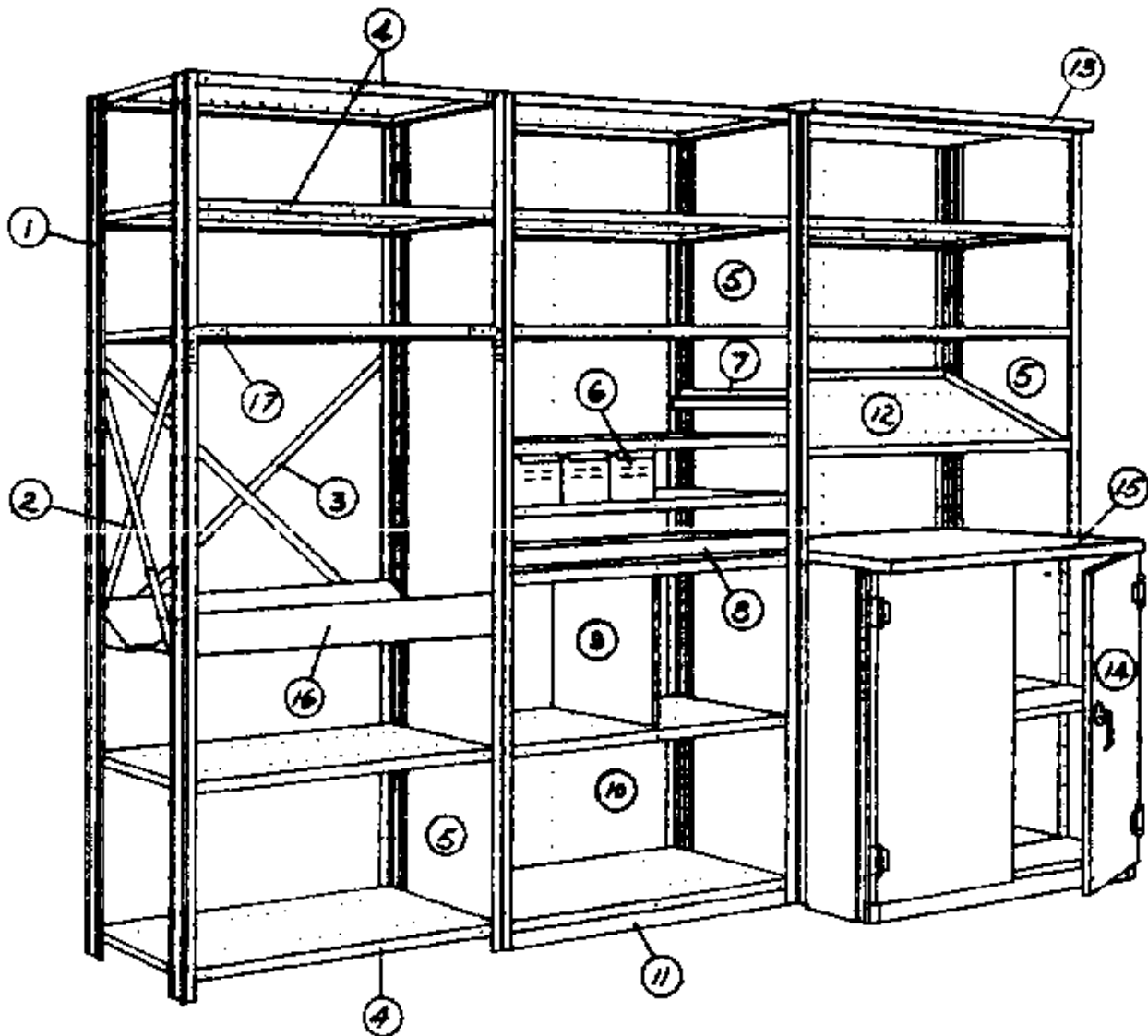
#### Preparing activity:

Army - GL

#### CIVIL AGENCIES INTEREST:

AGR - AMS  
COM - NBS  
DC  
GSA - FSS  
HEW  
JUS - FPI  
VA

Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current Federal Supply Classification Listing of DOD Standardization Documents.



- |                    |                         |                 |
|--------------------|-------------------------|-----------------|
| 1 Post             | 6 Shelf box             | 11 Base closure |
| 2 Side cross brace | 7 Flush bar             | 12 Sloped shelf |
| 3 Back cross brace | 8 Bin front             | 13 Ledge top    |
| 4 Plain shelf      | 9 Shelf divider         | 14 Door         |
| 5 End panel        | 10 Back panel           | 15 Counter top  |
|                    | 16 Tire and wheel shelf |                 |
|                    | 17 Angle brace          |                 |

Figure 1. Shelving, Storage And Display, Steel.



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