## 600-T-2

## Materials

In the absence of specifications, the following standards will apply. Where more than one method or material is listed, AWI woodworkers will supply their choice from the alternatives.

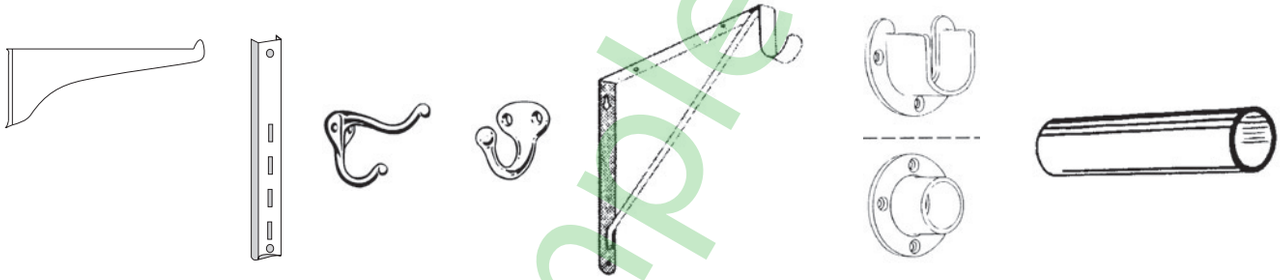
| Materials | Premium | Custom | Economy |
|---|---|---|---|
| Cleats, Shelves, & Dividing Partitions | Lumber and/or panel product | Lumber and/or panel product | Lumber and/or panel product |
| Lumber Grade | Grade I | Grade II | Grade III |
| Lumber Species [unless specified] | Mill option | Mill option | Mill option |
| Panel Product: unless specified, mill may select from the following materials suitable for the Grade of work, furnishing only one type of material to each project or project phase or area, as agreed in advance between buyer and seller | Medium density fiberboard, or thermoset overlay on medium density particleboard, or veneer core product | Medium density fiberboard, or UV filled medium density particleboard, or veneer core product | Medium density fiberboard, or medium density particleboard, or veneer core product |
| Panel Product face [unless specified] | Mill option | Mill option | Mill option |

## 600-T-3

## Hardware



Rods, flanges, hooks, standards, brackets, and other hardware *can* be supplied by most woodworkers, but *will not be supplied* unless specified in the bid documents.



*Hardware Options - Figure 600-01*

## 600-T-4

## Assembly

A. Closet and utility shelving shall be unassembled.

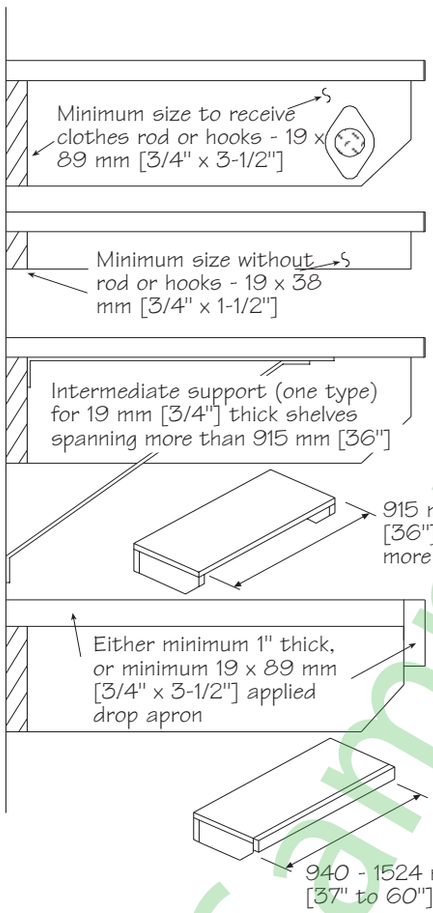
B. Lengths

1. Shelves and dividers – furnished in lengths suitable for job fitting

2. Cleats – furnished in lineal footage

C. Widths

Material shall be furnished cut to width.




*Sizes - Figure 600-02*

## 600-T-5

## Minimum Sizes and Thickness

A. Ends and back cleats to receive clothes rod or hooks shall be 19 x 89 mm [3/4" x 3-1/2"] minimum.

B. Ends and back cleats which do not receive clothes rod or hooks shall be 19 x 38 mm [3/4" x 1-1/2"] minimum.

C. Shelf thickness shall be a minimum of 19 mm [3/4"] if not specified, or shall be as specified by the design professional in relation to anticipated load.

Note: It is the responsibility of the design professional to engineer the shelf size, thickness, and support systems to meet the load-carrying needs of the project. The following shelf deflection information may assist in that process. The deflection of 1/4" is used for illustration purposes. The Standard sets no minimum or maximum allowable deflection. The key factor in the equation is the Modulus of Elasticity (E). Tables of E-values for solid wood are published by the U.S. Department of Agriculture in *The Wood Handbook - Forest Products Society*. No. 7269. Tables of E-values for many panel product core materials are published by the Composite Panel Association.

## Shelf Deflection Information

The Department of Wood Science in the Division of Forestry at West Virginia University conducted a study for the Architectural Woodwork Institute regarding the deflection of wood shelving materials under various amount of stress. The following table represents their findings with the various products tested.

The table shows total uniformly distributed load requirements necessary to cause deflection of 1/4" in shelves 8 and 12" wide with spans (i.e., unfixed, supported at each end) of 30", 36", 42", and 48". Load required to deflect shelves more or less than 1/4" may be estimated by direct proportion. For example, the uniformly distributed load required to cause a deflection of 1/8" is one-half that of the value in the table. For widths different than 8 or 12" (the values used in the table), load required to cause a 1/4" deflection may also be determined by direct proportion. A 6" wide shelf, for example, will deflect twice as much as a 12" wide shelf under the same load.

The following equation shows how deflection is related to shelf dimensions, width, thickness, span, load per inch of span and E-value, (a material property which measures stiffness or resistance to deflection). The higher the E-value the less the deflection. When a shelf is made with several materials, each with its own E-value, a composite E-value must be determined. The study was developed in Imperial measure and metric equivalents are not provided for this example.

To compute deflection:

$$D = \frac{0.1563wl^4}{Ebh^3}$$

In which the values are:

D = deflection (in inches)

w = load per lineal inch of span

l = span (length)

E = modulus of elasticity

b = base (width)

h = depth (thickness)

## Shelf Deflection of 1/4" by Estimated Total Distributed Load in Pounds

| Material | Thickness | Span | 30" | | 36" | | 42" | | 48" | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Width | 8" | 12" | 8" | 12" | 8" | 12" | 8" | 12" |
| Yellow-Poplar | lumber | 3/4" | 322 lbs. | 483 lbs. | 189 lbs. | 284 lbs. | 117 lbs. | 175 lbs. | 78 lbs. | 117 lbs. |
| Red Gum | | | | | | | | | | |
| Sweet Gum | | 1-1/16" | 912 | 1368 | 528 | 790 | 332 | 498 | 221 | 332 |
| Hard Maple | lumber | 3/4" | 356 lbs. | 534 lbs. | 209 lbs. | 313 lbs. | 133 lbs. | 206 lbs. | 88 lbs. | 133 lbs. |
| Pecan | | | | | | | | | | |
| Red Oak | | 1-1/16" | 1021 | 1536 | 592 | 888 | 373 | 560 | 249 | 374 |
| Birch | lumber | 3/4" | 400 | 600 | 232 | 348 | 146 | 219 | 98 | 146 |
| Hickory | | 1-1/16" | 1134 | 1701 | 660 | 990 | 414 | 621 | 277 | 415 |
| Medium density particleboard (raw or covered with "melamine") | | 3/4" | 78 | 117 | 46 | 69 | 29 | 43 | 19 | 28 |
| | | 1" | 185 | 277 | 109 | 164 | 69 | 102 | 45 | 66 |
| Medium density fiberboard (raw or covered with "melamine") | | 3/4" | 100 | 150 | 58 | 87 | 36 | 54 | 25 | 38 |
| | | 1" | 237 | 356 | 137 | 206 | 85 | 128 | 59 | 90 |
| Birch faced plywood, veneer core | | 3/4" | 145 | 218 | 86 | 129 | 54 | 81 | 36 | 54 |
| Birch faced plywood, medium density particleboard core | | 3/4" | 125 | 188 | 72 | 109 | 46 | 68 | 31 | 46 |
| Medium density particleboard covered two sides and one edge with nominal 0.028" high pressure decorative laminate | | 3/4" (core) | 174 | 261 | 100 | 139 | 64 | 96 | 42 | 63 |
| Medium density particleboard covered two sides and one edge with nominal 0.050" high pressure decorative laminate | | 3/4" (core) | 234 | 350 | 137 | 205 | 86 | 129 | 58 | 87 |
| Medium density particleboard with 1/8" solid lumber edge | | 3/4" | 89 | 139 | 53 | 79 | 33 | 50 | 22 | 33 |
| Medium density particleboard with 3/4" solid lumber edge | | 3/4" | 100 | 150 | 60 | 90 | 42 | 63 | 25 | 38 |
| Medium density particleboard with 3/4" x 1-1/2" solid lumber dropped edge | | 3/4" | 384 | 435 | 216 | 241 | 132 | 152 | 92 | 107 |

NOTE: All medium density particleboard is ANSI 208.1-1998 Type M-2.
The information and ratings stated here pertain to material currently offered and represent results of tests believed to be reliable. However, due to variations in handling and in methods not known or under our control, neither the AWI nor the AWMAC can make any warranties or guarantees as to end results.

## 600-T-6

## Smoothness of Exposed Surfaces

| Smoothness Table | Premium | | Custom | | Economy | |
|---|---|---|---|---|---|---|
| | Transparent | Opaque | Transparent | Opaque | Transparent | Opaque |
| **Sharp edges (Arris)** | Eased with fine abrasive | | Eased with fine abrasive | | Mill option | |
| **Top flat surfaces** | 150 grit | | 120 grit | | 100 grit or 15 KCPI | |
| **Moulded surfaces** | 120 grit | | minimum 20 KCPI | | | |
| **Shaped surfaces** | 120 grit | | minimum 20 KCPI | | | |
| **Turned surfaces** | 120 grit | | 100 grit | | | |
| **Sanding cross scratches** | None allowed | Not to exceed 6.4 mm [.25"] | None allowed | Not to exceed 6.4 mm [.25"] | | |

NOTE: No tearouts, knife nicks, or hit-or-miss finish allowed. No knife marks allowed where sanding is required. Surface variations as a result of multiple tool passes treated as turned surfaces above. Glue and filler, if used, must be inconspicuous and sanded as smoothly as the surrounding surface. Sanding before final stain and/or finish should be a consistent grit and scratch pattern, as it influences blend of color and sheen between components. Top Flat Surfaces are those which which can be sanded with a drum or wide belt sander. Turnings are customarily sanded on the lathe, and will exhibit cross scratches.
Before finishing, all exposed portions of architectural woodwork shall have handling marks or effects of exposure to humidity or moisture removed by a thorough uniform final sanding. The sanded surface shall then be cleaned and dust free, prior to proceeding with the first step in the finishing process. Veneer sand-through, with veneer sanded to the point where cross banding or core is visible, and/or core telegraphing (variation from a true plane in excess of 0.25 mm [0.010"] in any 76 mm [3"] span) is not allowed in any Grade.



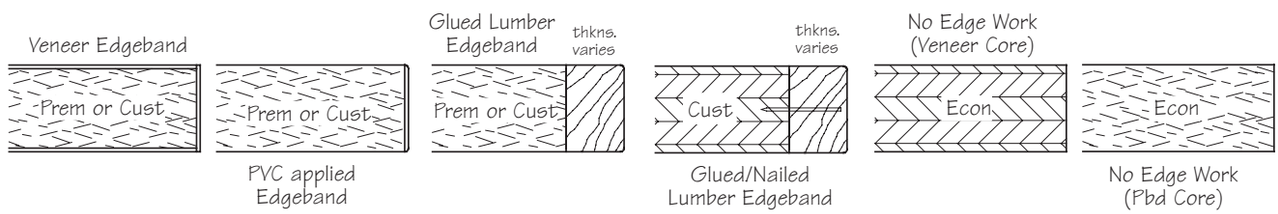
## 600-T-7

## Exposed Edges

In the absence of specifications, the following standards will apply. Where more than one method or material is listed, AWI// AWMAC woodworkers will supply their choice from the alternatives.

| Exposed* Edge Table | Premium | Custom | Economy |
|---|---|---|---|
| Solid lumber cleats | Sanded to 120 grit and eased edges | No edge work required | No edge work required |
| Solid lumber shelves | Sanded to 120 grit and eased edges | Sanded to 100 grit | |
| Panel product cleats | Edgeband to match face, eased edges | Edgeband to match face, eased edges | |
| Panel product shelves: Applied edge treatments, where required, to be compatible with shelf face. Mixed species always allowed when final finish is to be opaque paint or overlay material. | PVC or veneer edge bands or solid lumber edges, glued under pressure | PVC or veneer edge bands or solid lumber edges, glued under pressure, or glued and nailed (lumber) | |

NOTE: * *Exposed* is defined as visible when first installed in normal use position. Gaps between ends or back of shelf and surrounding wall or case of up to 3.2 mm [1/8"] are allowed. Such edges are not considered visible.
Sequence of lamination shall be at the option of the woodwork manufacturer.




*Edge Details - Figure 600-03*