

## PLYWOOD PRODUCT AND PERFORMANCE STANDARDS

Panels for construction and industrial applications can be manufactured in a variety of ways – as plywood (cross-laminated wood veneer), as composites (veneer faces bonded to reconstituted wood cores), or as non-veneer panels (including waferboard, oriented strand board, and certain specific classes of particleboard).

Some grades of veneered panels are manufacturing specifications under the performance testing provisions of U.S. Product Standard PS 1-83 for Construction and Industrial Plywood, developed cooperatively by the plywood industry and the U.S. Department of Commerce. Other veneered panels, as well as an increasing number of performance-rated composite and non-veneer panels, are manufactured under the provision of American Plywood Association PRP-108, Performance Standards and Policies for Structural-Use Panels, that establish performance criteria for specific designated construction applications.

These APA Performance-Rated Panels are easy-to-use and specify because the recommended end-use and maximum support spacings are clearly indicated in the APA trademark. By broadening the range of panel configuration and composition, APA Performance-Rated Panels allow more efficient use of raw materials. APA PRP-108 Performance Standards are recognized by the National Evaluation Service and FHA, PRP-108 and/or the PS 1 grade conformance are given in the lower portion of the APA trademark. Veneered panels, depending on glueline classification, veneer species and thickness, etc., are in many instances identical to panel grades as defined in Product Standard PS 1-83.

### Grade Designations

Structural panel grades are generally identified in terms of the veneer grade used on the face and back of the panel (e.g., A-B, B-C, etc.) or by a name suggesting the panel's intended end-use (e.g., APA RATED SHEATHING, APA RATED STURD-I-FLOOR, etc.).

Veneer grades define veneer appearance in terms of natural unrepaired growth characteristics and allowable number and size of repairs that may be made during manufacture. The highest quality veneer grades are N and A. The minimum grade of veneer permitted in exterior plywood is C-grade. D-grade veneer is used in panels intended for interior use or applications protected from permanent exposure to weather.

### Sanded, Unsanded, and Touch-Sanded Panels

Panels with B-grade or better veneer faces are always sanded smooth in manufacture to fulfill the requirements of their intended end-use applications, such as cabinets, shelving, furniture, built-ins, etc. APA RATED SHEATHING panels are unsanded since a smooth surface is not a requirement of their intended end-use. Still other panels such as APA UNDERLAYMENT, APA RATED STURD-I-FLOOR, APA C-D PLUGGED, and APA C-C PLUGGED require only touch-sanding for "sizing" to make the panel thickness more uniform.

Unsanded and touch-sanded panels, and panels with B-grade or better veneer on one side only, usually carry the APA trademark on the panel back. Panels with both sides of B-grade or better veneer on one side only usually carry the APA trademark on the panel back. Panels with both sides of B-grade or better veneer, or with special overlaid surfaces (such as high density overlay), usually carry the APA trademark on the panel edge.

### Exposure Durability

APA trademarked panels may be produced in four exposure durability classifications — Exterior, Exposure 1, Exposure 2, and Interior.

Exterior panels have a fully waterproof bond and are designed for applications subject to permanent exposure to the weather or to moisture.

Exposure 1 panels have a fully waterproof bond and are designed for applications where long construction delays may be expected prior to providing protection, or where high moisture conditions may be encountered in service. Exposure 1 panels are made with the same exterior adhesives used in exterior panels. However, because other compositional factors may affect bond performance, only exterior panels should be used for permanent exposure to the weather.

Exposure 2 panels (identified as interior type with intermediate glue under PS 1) are intended for protected construction applications where only moderate delays in providing protection from moisture may be expected.

Interior panels, which lack further glueline information in their trademarks, are manufactured with interior glue and are intended for interior applications only.

### Group Number

Plywood can be manufactured from over 70 species and are divided on the basis of strength and stiffness into five Groups under U.S. Product Standard PS 1-83. Strongest species are in Group 1, the next strongest in Group 2, and so on. When face and back veneers are not from the same species Group, the higher Group number is used, except for sanded panels  $\frac{3}{8}$  inch-thick or less and decorative panels of any thickness. These are identified by face species because they are chosen primarily for appearance and used in applications where structural integrity is not critical. Sanded panels greater than  $\frac{3}{8}$  inch are identified by face species if C- or D-grade backs are at least  $\frac{1}{8}$  inch and are no more than one species group number larger. Some species are used widely in plywood manufacture. Check with Requarth Lumber for availability if a particular species is desired.

## STORING AND HANDLING

Plywood, like any other panel product, requires proper handling and storage. Despite its sturdy cross-laminated construction, face veneers, panel edges, and panel corners are vulnerable to damage and should always be protected. Plywood is manufactured at a low moisture content and, while small changes in moisture content will not appreciably affect its dimensions, large changes should be avoided since they may encourage checking of the face veneer with consequent impairment of its qualities as a paint base. It is good practice to store plywood, which is to be used for interior finish, under conditions that approximate those it will experience in service.

Points to watch when handling plywood are:

- Store plywood panels flat and level.
- Keep finish faces inward and cover stacks to protect from bumping and abrasion.
- Protect panel edges and corners. This is especially important with T&G plywood.
- Carry panels on edge (always being careful not to damage faces, edges, and corners).
- When plywood is used as a finishing material, deliver to job site at the last possible moment. Protect panels from sunlight, water, or excessive humidity.

## Sawing

### Hand sawing

For handsaw work, panels should be sawn face (good side) up with the angle between saw teeth and panel surface as flat as possible. This prevents face veneer splintering. Generally, an 8 or 10 point cross-cut saw or a 10 point panel saw gives the best results.

### Hand power sawing

A sharp carbide tip combination blade set to protrude no more than 12.5 mm through the panel and firm panel support will give excellent results with a hand power saw. Panels should be sawn face down.

### Table power sawing

Panels kept face up on a table power saw are cut cleaner. A combination blade filed with less than normal hook is best for most work. The blade should be set to protrude no more than 12.5 mm. In general, a blade of 250 mm diameter or more works best. A table extension will help in handling full-sized panels. When using a radial arm saw, the orientation of the plywood panel will depend on the type of cuts being made. The instruction manual accompanying the radial arm saw should be consulted.

## Drilling

Hand brace and bit, power drill, or drill press all work easily with plywood. Holes of large diameter are best cut with a brace and expansion bit rather than with a high-speed drill. For power drilling, spur bits give good results. Reversing the panel as soon as the bit point is through and completing the cut from the other side will ensure a clean cut without splintering. Small holes are readily cut with either hand or power drills. As a general rule, the larger the hole the slower the drill speed. Clean cuts can be obtained with all methods of drilling if the panel has firm support and is backed with scrap wood to prevent splintering.

## Routing

Routers can be used to V-groove, shiplap, or rebate edges of panels. Special bits are available for moulding and chamfering. Use sharp bits and work carefully across panel. Deep cuts in panel edges should be made in two stages. For specific instructions, see router manufacturer's literature.

## Bending

When dry, plywood panels can easily be bent into mild simple curves. Plywood can be bent more sharply when the bend is perpendicular to the direction of the face grain to obtain smaller radii. For sharper curves, the panels must be soaked or steamed. Saw-kerfing the back of the panel to make it bend more easily is not recommended if the plywood is to be used structurally. Compound curves are virtually unobtainable with a single plywood panel and should not be attempted.

## Edge Finishing

Planes used on plywood edges are working on grain that goes in both directions because of cross lamination of the plies. For this reason, a sharp plane with shallow set is recommended. A light jack plane will work well on most jobs and planing in from the ends towards the center helps prevent the ends from splintering. Power tools will help get a smooth edge. A power saw with a carbide tip blade can produce a smooth edge if the first cut is made more generous than is necessary and the edge is then cut to size with a hollow-ground blade. With a jointer, it is best to feed the wood into the jointer head slowly. With a disc sander, feed the panel slowly against the sander at a slight angle so that the area of edge contact is on the downward side of the rotating disc.

## Sanding

When finish-sanding the panel face, work with the grain using even pressure and regular strokes. Use fine sandpaper for final easing and smoothing the edges and for rubbing down between coats of paint.

**How to Read Plywood Grades**

**Veneer Grades**

- N** Smooth surface “natural finish” veneer. Select, all heartwood or all sapwood. Free of open defects. Allows not more than six repairs, wood only, per 4' x 8' panel. Made parallel to grain and well matched for grain and color.

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- A** Smooth, paintable. Not more than 18 neatly made repairs, boat, sled, or router type, and parallel to grain permitted. May be used for natural finish in less demanding applications.

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- B** Solid surface. Shims, circular repair plugs, and tight knots to 1" across grain permitted. Some minor splits permitted.

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- C1** Improved C veneer with splits limited to 1/8" width and knotholes and borer holes limited to 1/4" x 1/2". Admits some broken grain. Synthetic repairs permitted.

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- C** Tight knots to 1 1/2". Knotholes to 1" across grain and some to 1 1/2" if total width of knots and knotholes is within specified limits. Synthetic or wood repairs. Discoloration and sanding defects that do not impair strength permitted. Limited splits allowed. Stitching permitted.

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- D** Knots and knotholes to 2 1/2" width across grain and 1/2" larger within specified limits. Limited splits are permitted. Stitching permitted. Limited to Exposure 1" or 2" Interior panels.

**PLYWOOD — HARDWOOD**

**Birch Plywood**

	1/4" VCA3	1/2" VCA2	3/4" VCA2
4' x 4'	Special order	Special order	34BIR44
4' x 8'	14BIR	12BIR	34BIR

**Red Oak Plywood**

	1/4" VCA2	1/2" VCA2	3/4" VCA2
4' x 4'	Special order	Special order	34ROAK44
4' x 8'	14ROAK	Special order	34ROAK

**Poplar Plywood**

	1/4" VCB2	1/2" VCB2	3/4" VCB2
4' x 4'	Special order	12POP44	34POP44
4' x 8'	14POP	12POP	34POP

**Lauan Mahogany Plywood**

	1/4"
4' x 8'	14LAU

**For other related products, see the following:**

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VC = core plies of hardwood veneers

# PLYWOOD

## PLYWOOD — SOFTWOOD

### AB Exterior Plywood — Fir

For use where appearance of one side is less important, but where two solid surfaces are necessary. Manufactured with 100% waterproof phenolic glue.

	1/4"	1/2"	19/32"	23/32"	1"
4' x 8'	14AB	12AB	58AB	34AB	1AB
4' x 10'		Special order	Special order	34AB10	Special order

### AC Exterior Plywood — Fir

For use where appearance of only one side is important in exterior applications such as soffits, fences, and structural uses. Manufactured with 100% waterproof phenolic glue.

	1/4"	11/32"	5/8"	15/32"	23/32"
2' x 4'	14AC24	Special order	Special order	12AC24	34AC24
4' x 4'	14AC44	Special order	Special order	12AC44	34AC44
4' x 8'	14AC	38AC	58AC	12AC	34AC

### Sturdifloor — Southern Yellow Pine & Fir

Commonly used for subflooring. (For OSB Sturdifloor see OSB Section below.)

	23/32" SYP	23/32" FIR
4' x 8'	34S	34SFIR

### CDX Southern Yellow Pine (SYP)

Commonly used for roof and wall sheathings. Can stand moisture and exposure during building construction, but is designed to be covered or secured in protected locations.

	11/32"	15/32"	19/32"	23/32"
4' x 8'	38CD	12CD	58CD	34CD

### CDX Fir

Can stand moisture and exposure during building construction, but is designed to be covered or secured in protected locations.

	15/32"	19/32"	23/32"
4' x 8'	12CDFIR	58CDFIR	34CDFIR

### Plyform

Used for concrete forms.

	23/32"
4' x 8'	34PF

### Marine Plywood

Commonly used in boat construction.

	3/4"
4' x 8'	34MAR

## MEDIUM DENSITY OVERLAY (MDO) AND ORIENTED-STRAND (OSB) PANELS

### MDO Exterior G1S

Commonly used for signs and cement forms. Overlay applied to one side. Provides smooth surface for painting.

	3/8"	1/2"	3/4"
4' x 8'	38MD1	12MD1	34MD1

### MDO Exterior G2S

Commonly used for signs and cement forms. Overlay applied to two sides. Provides smooth surface for painting.

	3/8"	1/2"	3/4"
4' x 8'	38MD2	12MD2	34MD2

### Sturdifloor — OSB

Commonly used for subflooring. (For Plywood Sturdifloor see Plywood Section above.)

	23/32" OSB
4' x 8'	34SBTG

### AdvanTech Subfloor

Engineered, tongue and groove panels. No sanding required due to moisture absorption. Greater weatherability than plywood.

	3/4"
4' x 8'	34ADV

### Oriented-Strand Board (OSB)

	7/16"	1/2"	5/8"
4' x 8'	716SB	12SB	Special order

### Plywood and Oriented Strand Board

Although different in composition and appearance, plywood and oriented strand board are manufactured according to the same performance standards. These standards apply uniform performance criteria to both products for their designated end uses — wall sheathing, roof sheathing, subflooring (APA Rated Sheathing), and single-layer flooring (APA Rated Sturd-I-Floor). The standards are recognized by all of the major model building codes.

**Hardboard**

Tempered hardboard is stronger and more dense than standard hardboard.

	Standard	Tempered
1/4" x 4' x 8'	14HB	14THB
1/8" x 4' x 8'	18HB	18THB

**Tempered Pegboard**

	1/8"	1/4"
4' x 8'	18PEG	14PEG

**Impregnated Sheeting**

Used for wall sheathing.

	1/2"
4' x 8'	12IMP

**Homosote**

Used with a variety of flooring materials to deaden impact noise and reduce sound transmission. It is installed over wood floors, and new or old wood sub-flooring. Particularly useful for bulletin boards, arts and crafts boards, workbench tops, and hobby projects.

	1/2"
4' x 8'	12HOM

**Nova Cork**

Cork covered paneling is available at Requarth Lumber. Nova Cork is a factory prefinished interior paneling composed of natural virgin cork laminated to both sides of Homosote fiberboard.

**Particle Board**

Manufactured from reconstituted wood particles and resin.

	3/8"	1/2"	5/8"	3/4"
4' x 8'	38PB	12PB	58PB	34PB

**Particle Board Shelving**

	8'	10'	12'
11 1/2"	128NPB	1210NPB	1212NPB
15 1/2"	168NPB	Special order	1612NPB
23 1/2"	Special order	Special order	2412NPB

**Sound Board**

Provides a means of deadening sound in any residential or commercial building where control of noise is an important consideration. It can also be used as a sound deadening component in ceilings and floors.

	1/2"
4' x 8'	12SOU

**Wafer Board**

	1/4"
4' x 8'	14WBD

**Soffit Panels (Plywood)**

Description	Stock #
Cedar Plywood 4" x 8' 3/8" Rough Sawn Plain	38C
Fir Plywood 4" x 8' 11/32" Rough Sawn Plain	38F
SYP Plywood 4" x 8' 3/8" Rough Sawn Plain	38Y

**Cork Bulletin Boards**

Description	Stock #
18" x 24"	1824C
24" x 36"	2436C
36" x 48"	3648C
48" x 96"	4896C

**Upson Board**

Description	Stock #
4" x 8' 3/16" Pebbled	316UPS

**Plybead**

	3/4"
4" x 8' Yellow Pine, 1.6" OC	38PLY