



OUTDOOR PROJECTS

From the editors of *Popular Woodworking*
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Page **1** Adirondack Love Seat

Page **7** Crisscross Picnic Table

Page **12** Stylish Patio Planter

Page **15** Outdoor Finishes



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Portable, storable and effective, this kit will change the way you work.

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Cross-rail supports are sacrificial.

Wood not included.



Use on any flat surface

The workpiece and offcut are fully supported throughout the cut, improving control. These innovative saddles have dozens of practical applications in the workshop or on a job site.



Adirondack Loveseat

It's just as comfortable as it looks.

BY TOM CASPER

About

This Adirondack two-seater is based on one built by Jack Priest. We've changed the arms and their supports a bit, as well as the back's profile, but that's what Adirondacks are all about. Once you've got the basic structure down, it's easy to customize an Adirondack any way you want.



Adirondack chairs represent all that's best about American design: they're practical, with no unnecessary parts; they're accessible, because just about anyone who can cut wood can make one; and they're perfectly suited to their setting, the great outdoors.

An Adirondack's low seat and broad arms invite you to slow down and take it easy. Most Adirondacks are single chairs, of course. A two-seater is something special. Sharing the Adirondack experience with a friend makes it all the better.

MATERIALS AND TOOLS

This project is built from western red cedar construction lumber, which is

commonly available at home centers and lumberyards. You'll need two 8'-long 2x6 boards, and nine pieces of 5/4 lumber that are 1" thick, 5½" wide and 12' long. Dust from cutting western red cedar can be irritating, so wear an appropriate dust mask and work in a well-ventilated shop or outdoors. Use rust-resistant deck screws to assemble the project. You'll need about 100 1½" screws and 50 1¼" screws. You'll also need two inside-corner braces and 100 screw-hole plugs.

You'll use a tablesaw, bandsaw (or jigsaw), router table, ¾" roundover bit, 30° chamfer bit, cordless drill and a file for the project. A miter saw is also handy.

MAKE THE LEGS AND SEAT

The love seat sits on three back legs: two on the sides (A1, Fig. A) and one in the center (A2). They're virtually identical, except for one important detail: the notch for the lower back rail (A5) is positioned farther back on the center leg than on the outer legs (Fig. H). To ensure that all the legs come out the same, make one paper pattern based on the measurements given for the outer back leg (A1). Trace around the pattern on three leg blanks cut to the same length, omitting the notches. Then draw the notches directly on the legs. In addition, set your miter saw to 18° and cut a miter on a scrap piece of 1x6. Use this piece to draw

the angled lines that indicate the location of the front legs. Draw these lines on both sides of each outer leg.

Saw the legs (Photo 1). Smooth the saw cuts with a file or #80-grit sandpaper wrapped around a block.

Make the seat slats (A3). Discard pieces with large knots—they'll weaken the slats. Drill holes for screws and plugs in the ends and middle of all the slats using a $\frac{3}{8}$ " diameter combination countersink/counterbore bit (Photo 2). Make the plug holes about $\frac{1}{4}$ " deep. Round the top edges of the slats, and all other exposed edges as you build the project, using a $\frac{3}{8}$ " roundover bit mounted in a router table.

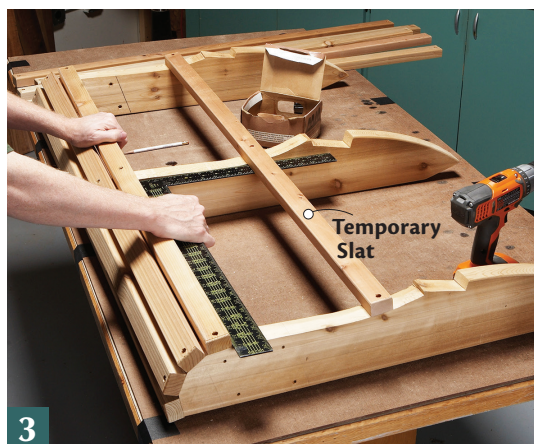
Line up the front edges of all three legs. Temporarily fasten a slat to the middle of each leg. Glue and screw the first four slats (Photo 3).

Make the two pieces that comprise each front leg (B1 and B2) from one long board. Rip the board to remove its rounded edges. This makes a better-looking joint when you glue the pieces together. Cut one end of the blank at 18°, then cut the inner leg to exact length (Fig. E). Cut the outer leg to length, then glue and screw together the leg pieces (Photo 4). Note that the two front legs are mirror images of each other.

Apply glue to the front legs and clamp them to the back legs. Use the lines you drew to position the front legs. Drill holes in the front legs for screws and plugs, then run in the screws (Photo 5).

Make the back seat slat (A4, Fig. F) and lower back rail (A5, Fig. G). Note that the inside curve on each end of the lower back rail consists of three flat sections, to receive three back slats. The straighter these sections are, the stronger your joints will be. After sawing, use a file to straighten these cuts, if necessary. Use a file to flatten the rail's center straight section, too. Drill holes for screws and plugs in the back seat slat and lower back rail, then round over the edges of both parts with a $\frac{3}{8}$ " router bit. Don't round over the inner edge of the lower back rail, where the back slats (D1, D2) go.

Remove the seat slat you temporarily



1. Begin building the love seat by sawing out the back legs from a western red cedar 2x6. You'll get the most accurate cuts by using a bandsaw, but you could use a jigsaw.

2. Joinery is simple: just screws and glue. You'll cover every screw hole with a plug later. As you build the love seat, drill holes for the plugs and screws simultaneously with a combination bit.

3. Assemble the seat. Fasten the first four seat slats, which are made from 5/4 cedar boards. Check for square as you go. Temporarily add a slat to space the legs the correct distance.

4. Screw and glue together the front legs. Use a water-resistant glue to assemble all the parts of the project.

5. Glue and screw the front legs to the seat assembly. Then add the rest of the seat slats and the lower back rail, which sits in the notches on the back legs. Assembly is much easier if you work on a large, flat surface, such as a door.

FIGURE A
EXPLODED VIEW

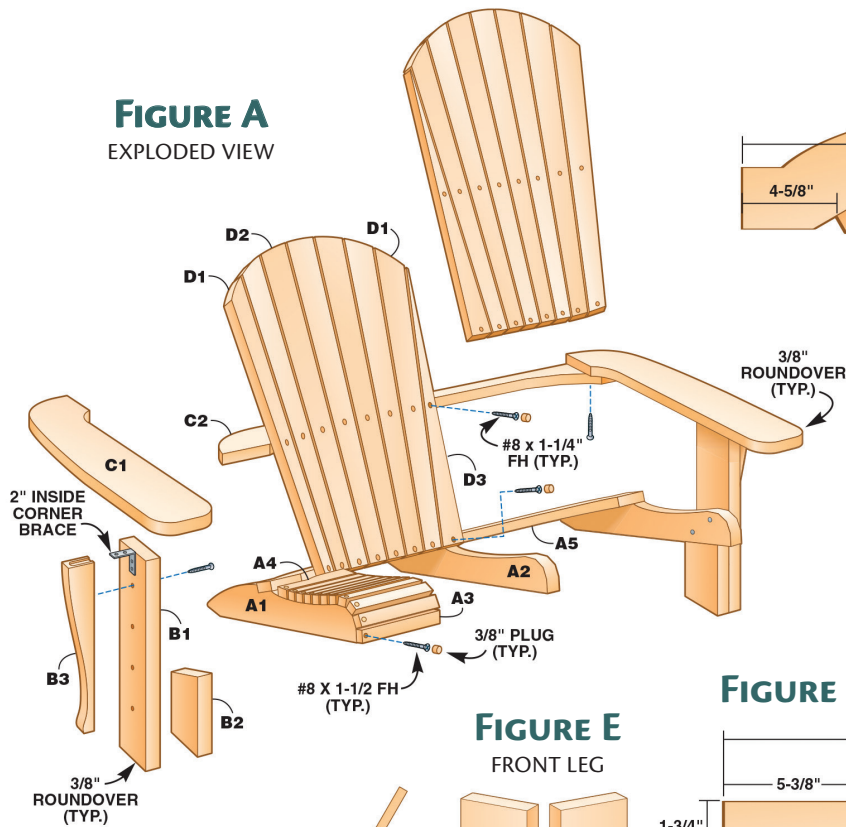


FIGURE D
CROSS SECTION

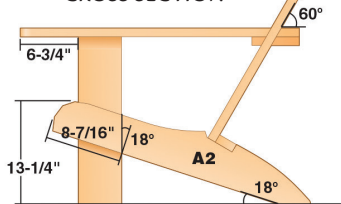


FIGURE E
FRONT LEG

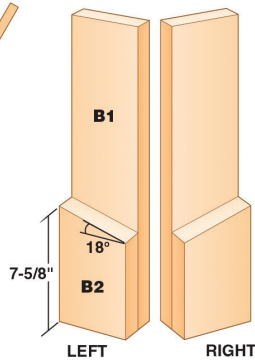


FIGURE B
SLAT LOCATION

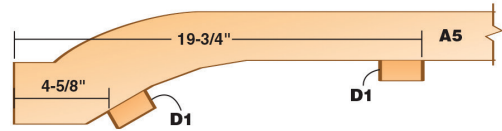


FIGURE C
ARM & BACK RAIL ASSEMBLY

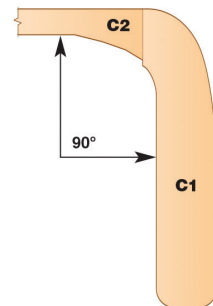


FIGURE F BACK SEAT SLAT

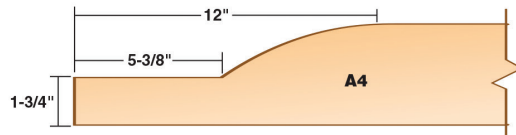


FIGURE G LOWER BACK RAIL

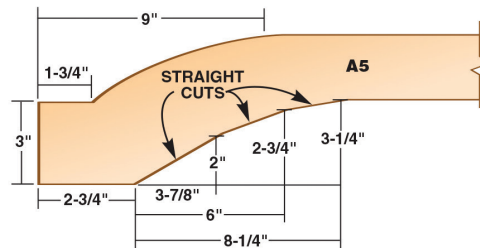


FIGURE H BACK LEGS

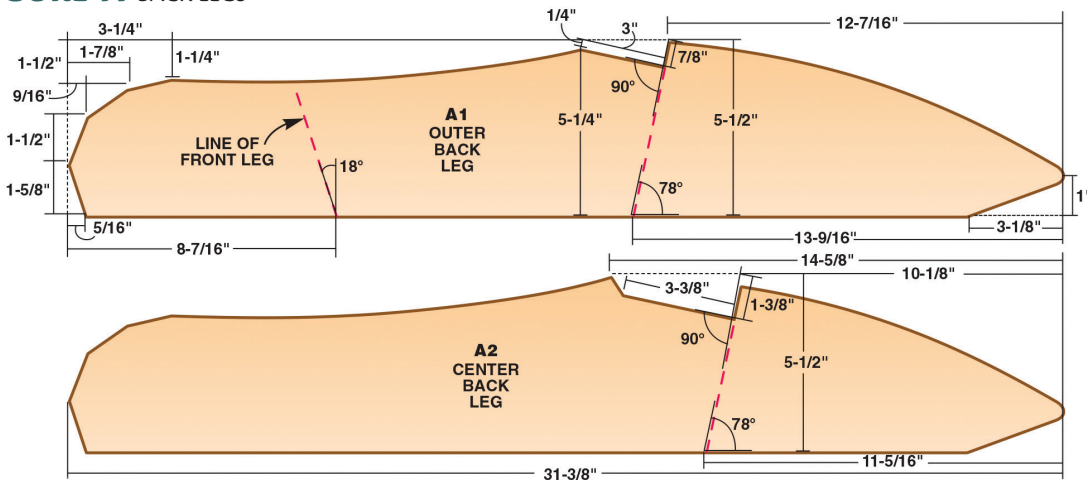
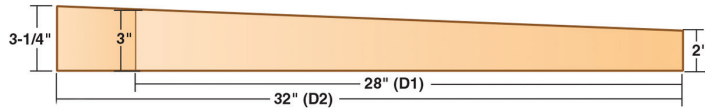
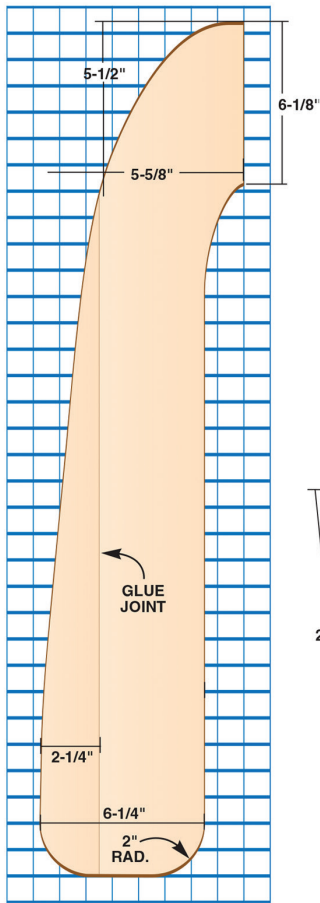
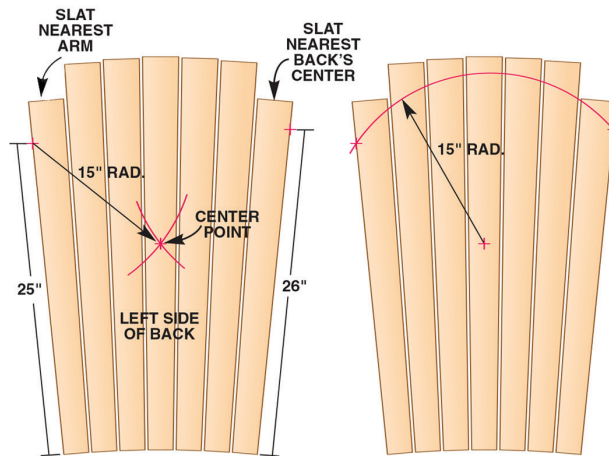


FIGURE J ARM**FIGURE K**

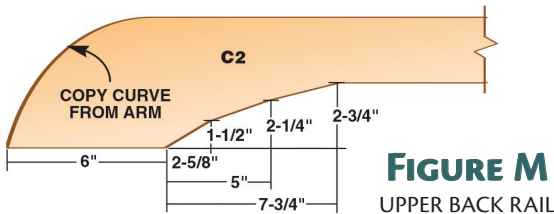
BACK SLATS & TAPERING SLED

**FIGURE L**

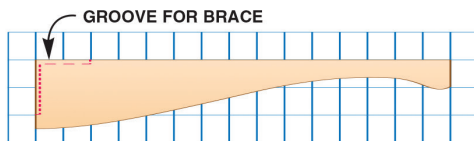
DRAWING THE BACK'S CURVE

1. Mark the two outer slats, then draw an arc from each mark to find the center point.

2. Draw an arc of the same radius from the center point.

**FIGURE M**

UPPER BACK RAIL

**FIGURE N**

CORBEL

Supplies

- 100 ■ 1½" rust-resistant deck screws
- 50 ■ 1¼" rust-resistant deck screws
- 2 ■ Inside-corner braces
- 100 ■ ⅜" diameter cedar screw-hole plugs
- 1 ■ 30° Chamfer Router Bit

Adirondack Love Seat

Overall Dimensions: 58"W x 37"D x 34½"H

NO.	ITEM	DIMENSIONS (INCHES)			MATERIAL
		T	W	L	
SEAT					
❑ 2	(A1) Outer back legs	1½	5½	31¾	2x6
❑ 1	(A2) Center back leg	1½	5½	31¾	2x6
❑ 10	(A3) Seat slats	1	1½	47	5/4
❑ 1	(A4) Back seat slat	1	3¾	47	5/4
❑ 1	(A5) Lower back rail	1	5½	47	5/4

FRONT LEGS

□ 2	(B1) Outer legs	1½	5	19½	2x6 (A)
□ 2	(B2) Inner legs	1½	5	7⅞	2x6
□ 2	(B3) Corbels	1	2½	15	5/4

ARMS

□ 2	(C1) Arms	1	8	32⅜	5/4 (B)
□ 1	(C2) Upper back rail	1	5½	53	5/4
□ 1	(C3) Assembly support	1½	5½	18½	5/4

BACK

□ 4	(D1) Outer back slats	1	3	28	5/4 (C)
□ 10	(D2) Inner back slats	1	3¾	32	5/4 (D)
□ 2	(D3) Center slats	1	3½	25	5/4

A. Cut B1 and B2 from 30" long blank.

B. Glue up from two pieces, 5" and 3" wide.

C. Cut two pieces from one 5½" x 28" blank.

D. Cut two pieces from one 5½" x 32" blank.

screwed to the back legs. Glue and screw the lower back rail in position. Screw the back seat slat next to it, but don't glue it. Add the rest of the seat slats. Space them about $\frac{1}{4}$ " apart. Temporarily clamping some slats in position makes it easier to space them. Remove the back seat slat.

ADD THE ARM ASSEMBLY

Rip two $\frac{5}{4}$ pieces for each arm (C1) and glue them together (Photo 6). Cut each blank to length, then saw out the curves (Fig. J). Sand the glue joint, then round over both sides of the arm with a $\frac{1}{4}$ " roundover bit. Don't round the curved section where the arm overlays the back rail.

Make the upper back rail (C2). This piece has three straight sections on either side (Fig. M), like the lower back rail. Trace the curves of the arm pieces on the ends of the rail. Cut out the rail using a bandsaw, with the table set at 90° , and straighten the flat sections with a file. Rout a 30° bevel on the inside edge of the rail (Photo 7). Leave a $\frac{1}{8}$ "-thick blunt edge to guide the bit's bearing.

Glue and screw the arms to the upper back rail. Note that the inside edge of each arm is square to the back rail (Fig. C), and that the screws go from underneath the back rail and into the arms (Fig. A).

Cut two temporary support pieces (C3) to hold and level the arm assembly. Prop the assembly on these pieces and the front legs (Photo 8). Once the assembly is correctly positioned front-to-back and side-to-side (Fig. D), clamp it to the front legs, so it can't shift.

FIT THE BACK SLATS

Make a set of back slats (D1 and D2). You can rough-cut two slats from one $5\frac{1}{2}$ " wide $\frac{5}{4}$ board using a bandsaw. Build a tapering jig and cut each slat using the tablesaw (Photo 9 and Fig. K). The exact angles on the slat's ends are not important.

Drill screw-and-plug holes in the lower ends of the outer slats (D1). Mark the positions of these slats on the lower back rail (Fig. B).

Clamp the slats in position (the top



6. Glue the arms together from two pieces of $\frac{5}{4}$ material. To make a tight, invisible joint, first remove the rounded edges of this construction lumber by ripping the boards on the tablesaw.

7. Rout a 30° bevel on the upper back rail using a router table. The love seat's back slats lean against this piece; with an accurately made bevel, you'll get tight, strong joints.

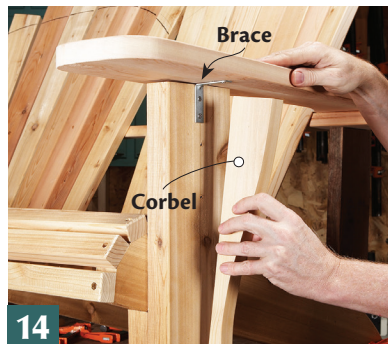
8. Add the arm and upper back rail assembly. Stand it on two supports and adjust its position until the bevel you routed is in line with the lower back rail. Check this with a straightedge.

9. Taper the back slats using a jig for your tablesaw. Mount toggle clamps on the jig to keep your fingers away from the blade.

10. Spacing the love seat's back slats requires careful measuring and marking. Begin by temporarily installing the four slats that define the two halves of the back.



11. Fasten the middle slats next. Then install two slats between the middle and outer slats. Adjust these slats up or down to make the spacing even.



12. Draw a curve across the back using a shopmade trammel. That's just a stick with a nail at one end and a pencil stuck in a hole on the other end. Remove the slats and cut the curve on each piece.

13. Rout grooves on the ends and inner edge of the corbels, the wing-shaped pieces that support the love seat's broad arms. These grooves hide metal braces under the arms.

14. Fasten the corbels to the legs with glue and screws. The brace allows you to safely lift the love seat by its arms.

15. Once every part is in place, glue plugs in each screw hole. Cut the excess with a flush-cutting saw.

ends of the centermost slats touch each other) and mark locations for the screws that'll go into the upper back rail. Remove the slats, drill the screw-and-plug holes, then attach—but don't glue—the slats in place (Photo 10).

Install one of the inner back slats (D2) midway between the outer back slats. It should be vertical. Fit the remaining slats (Photo 11). Make the gap between them about $\frac{1}{4}$ ". After these slats are fitted, mark their screw-and-plug holes and cut off any excess length at the bottom. Then install the slats with screws, but don't use glue. Repeat this process on the other side of the back.

Make a trammel and find the center point of each half of the back (Fig. L). Turn the trammel around and draw each curve (Photo 12).

Mark the position of all slats and remove them. Bandsaw their top ends and round over all their edges. Glue and screw the slats back in place. Cut a piece of paper to fit the gap between the two back sections. Fold the paper in half and use it as a pattern to make two pieces (D3) to fill the gap. Install these pieces.

SUPPORT THE ARMS

Connect the arms and legs with inside corner braces (Fig. A). Use #10 or #12 pan head screws to install them.

Cut two corbel blanks (B3). Rout stopped grooves on the inside edge of each blank to accommodate the corner brace and screw heads (Photo 13). Saw the corbel's shape (Fig. N) and round over its outside edges. Make sure each corbel's top fits tight under the arm. Drill screw-and-plug holes through the front legs and screw and glue the corbels to the front legs (Photo 14).

FINISHING STEPS

Install the back seat slat. Glue plugs in all the screw holes. Cut and sand them flush.

Apply two coats of exterior oil finish. It's best to do this outside, for good ventilation. Sit and enjoy! **PW**

Crisscross Picnic Table

Table seats up to 8 and no one has to straddle a leg.

BY CHAD STANTON



Every summer, my uncle Bob tends the grill at our family gatherings and is the last one to the picnic table. He always gets stuck with a middle seat. We'd cheer him on as he groaned and struggled to get into it—a lot of fun, but not a pretty sight.

Last fall, at our Labor Day feast, I resolved to build a new picnic table with seats that every person could slip right into. I call it the Crisscross, after the shape of its base. This one's for you, Bob.

THE WOOD

I started designing the table for standard 2x6 lumber, but one day a buddy suggested that I use a new material: thermally modified wood. It's Southern yellow pine that's been heated to a very high temperature, making it rot-resistant. The process also gives the wood a beautiful chocolate color, inside and out, which nicely complements our home's cedar shakes and the artificial stone below it. The boards are amazingly flat and stable. I had to try it!

My friend builds decks for a living. He had a bunch of thermally modified wood left over from a job—enough to build this table. I gladly offered to buy it and had a great time working with it, although I did have to alter my plans a bit. The wood I used is thinner and narrower than standard material. (It's 1¼" thick and 5" wide; standard boards are usually 1½" thick and 5½" wide.)

You'll need about 24 pieces of 8' long 2x6s to build this table. The cutting list will work fine if you're using standard lumber, but your top will be nine boards wide, rather than ten. Let's get going!

BUILD THE CROSS STRETCHERS

Begin by making the crisscross stretchers (A). Saw them to length, cutting angles on their ends (Photo 1). Cut da-dos in the middle of each piece using a router or a tablesaw (Fig. B).

Make the pieces that go between the stretchers: the end spacers (B) and middle spacers (C). Using an exterior yellow glue, glue and screw these pieces to two of the stretchers. Sand all the mating surfaces first, so the glue will adhere better. (Note that the middle

FIGURE A
EXPLODED VIEW

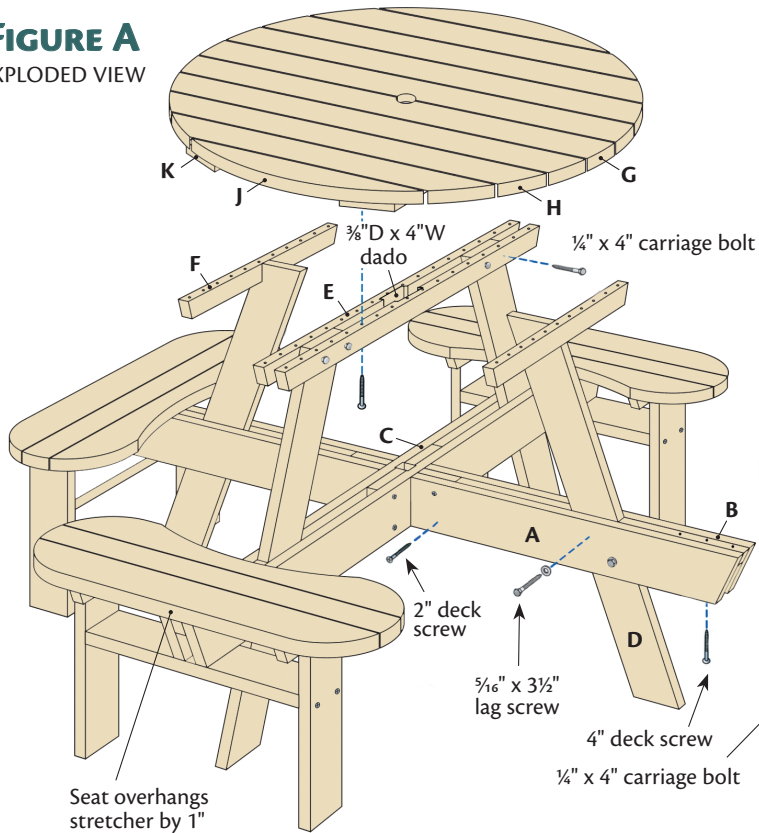


FIGURE E SEAT LAYOUT

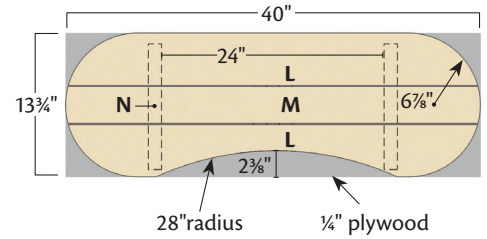


FIGURE B
STRETCHER DETAILS

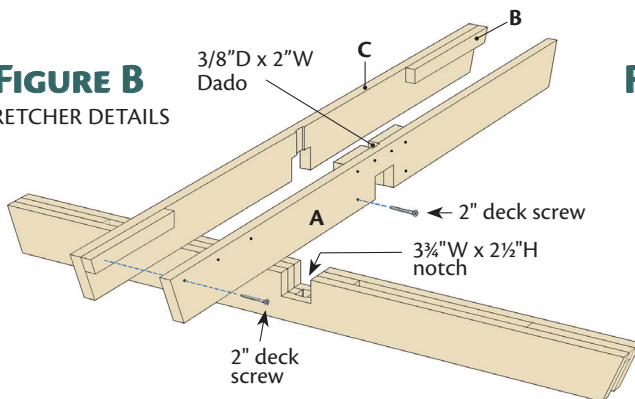


FIGURE D
TOP LAYOUT

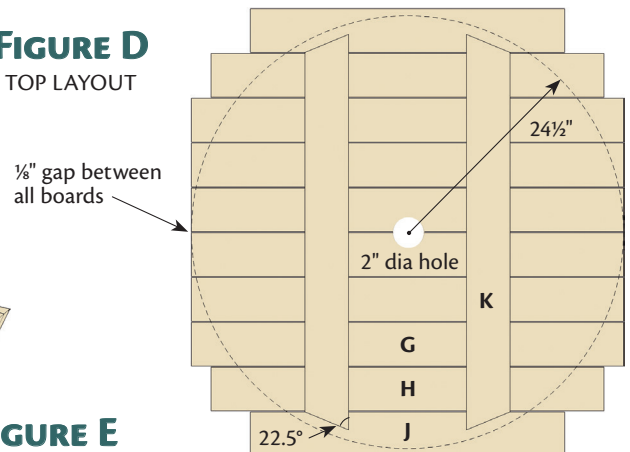


FIGURE C
STRETCHER DETAILS

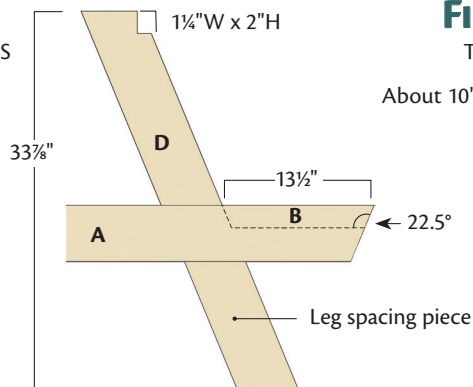
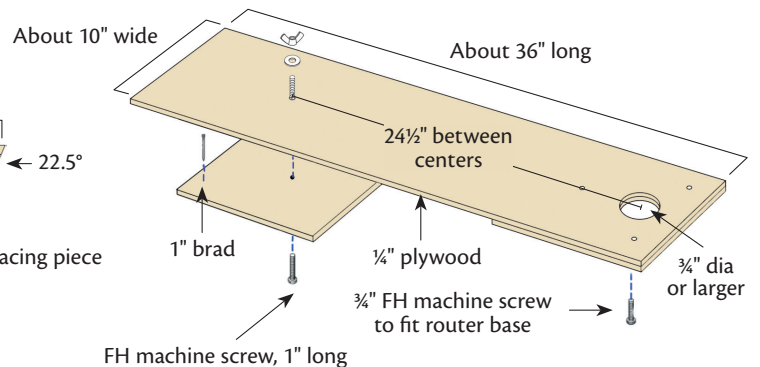


FIGURE E
TRAMMEL





1

1. Cut the four crisscross stretchers of the base to the same length. Miter their ends at 22½°. All miter saws have a detent for this commonly used angle.

2. Glue and screw the stretchers together. Note the dadoes in the middle of each stretcher. These cutouts are needed to create a square hole large enough for an umbrella pole.

3. Cut half-lap notches in the center of each stretcher assembly. It's best to use a crosscut sled, as shown here, to prevent this large piece from wobbling.

4. Add two legs to each stretcher assembly. Use spacing pieces to make sure the legs are set at the correct angle and position. Use a long level to make sure the tops of the legs are even.



2

Supplies

- 1 ■ Box of 4" deck screws
- 1 ■ Box of 2" deck screws
- 8 ■ 5/16" x 3 1/2" lag screws and washers
- 16 ■ 1/4" x 3" carriage bolts, with nuts and washers
- 4 ■ 1/4" x 4" carriage bolts, with nuts and washers

1 ■ 1/2" Double Flute Straight bit with 1 1/2" long flutes; Freud item No. 12-122; freudtools.com

1 ■ 5/8" OD x 17/32" ID Bushing (for Porter-Cable style mount); Woodcraft Item No. 144692; woodcraft.com



3

Crisscross Picnic Table

Overall Dimensions

6'7" square x 31"H, top is 49" dia.

NO.	ITEM	DIMENSIONS (INCHES)		
		T	W	L
4	(A) Cross stretchers	1 1/4	5	76 3/4
4	(B) End spacers	1 1/4	2	13 1/2
4	(C) Middle spacers	1 1/4	5	4 1/2
4	(D) Legs	1 1/4	5	33 7/8
2	(E) Long braces	1 1/4	2	47 1/4
2	(F) Short braces	1 1/4	2	27
6	(G) Top boards*	1 1/4	5	49 1/2
2	(H) Top boards	1 1/4	5	45
2	(I) Top boards	1 1/4	5	36
2	(K) Top cleats	1 1/4	5	45 1/4
8	(L) Outer seat boards	1 1/4	5	40
4	(M) Middle seat boards	1 1/4	3 1/2	40
8	(N) Seat cleats	1 1/4	2	12
8	(P) Seat legs	1 1/4	5	16 3/4
4	(Q) Leg stretchers	1 1/4	5	24

*If you're using 5 1/4" wide material, only 5 boards are needed.



4



5



6



7



8



9



10

5. Fit the stretcher assemblies together. Use handscrews or blocks to hold one assembly upright while you drop the second assembly in place.

6. Add braces to the legs for attaching the top. The long braces have dadoes cut in them to accommodate the umbrella pole.

7. Assemble the top. Place 8d nails between the boards to create equal gaps. Clamp the boards to keep them from shifting, then fasten cleats across the boards.

8. Fasten the base to the top. It's easiest to do this on a bench, with the base upside down. Before you begin, though, make sure you can get the table out through your shop's door—it's big!

9. Rout the top into a circle, using a plunge router mounted on a plywood trammel. First, plunge holes on both sides of each board to prevent splintering (see inset). Then rout the full circle.

10. Make the seats. Fasten three seat boards together with cleats, like the top. Then nail a plywood template to the top of each seat and rout around the template, using a guide bushing in your router.



11



12



13

11. Fasten the seats to the base. This operation is much easier if the table is upside down, but you'll definitely need help turning it over.

12. Add the legs and a stretcher. Now the seats will support plenty of weight—and even a few rambunctious kids jumping on them.

13. Rout a hole in the center of the table for an umbrella pole. Make a template with a hole in it to guide your router. Add the umbrella and pour the lemonade!

spacers are aligned with the sides of the dados you just cut.) Glue and screw a second stretcher on top of the spacers (Photo 2). You should now have two identical stretcher assemblies.

These assemblies will nest together with large half-lap joints. Draw these joints in the center of each assembly. When you lay out the joints, be sure that one notch will be on the top of the assembly and the other notch on the bottom. The angled ends are your guide as to which side is top and which is bottom. Cut the notches on the tablesaw (Photo 3). You can use a standard blade or a dado blade. (If you use a dado blade, don't take off too much in one bite.)

Make the legs (D, Fig. C). Notch the top of each leg as shown. Round over the bottom ends of the legs with a router. To help assemble the legs, make a pair of spacing pieces that are the same width and length as the portion of the leg that extends below the cross stretchers. You can use offcuts from the legs or pieces of plywood to make these pieces. Clamp the spacers to the bottom of the legs and insert the legs through the stretcher assembly (Photo 4).

Fine-tune the position of the legs by lining up their ends with a long level or straightedge. Once the legs are aligned, clamp them in place. Run two lag screws through the stretchers and the legs (Fig. A).

FINISH THE BASE

Join the two stretcher assemblies together (Photo 5). For maximum strength, use glue and screws. If you intend to take the table apart for moving or storage (or just to get it out of the shop!), skip the glue and screws.

Make the long braces (E) and short braces (F). Cut dados in the center of the long braces (Fig. A). These dados are oversized so you don't have to be extremely fussy when positioning the braces. Glue and screw all four braces to the legs (Photo 6).

ADD THE TOP

Cut the top boards (G, H and J) to length. Assemble them in a symmetrical pattern (Fig. D), using 8d nails or

$\frac{1}{8}$ " spacers between the pieces.

Clamp the top pieces together (Photo 7). Make the top cleats (K) and glue and screw them to the top boards. Remove the clamps and place the base on the top. Fasten the base to the top (Photo 8). Get some help and turn the table over onto the floor.

You can use a jigsaw to cut the top into a circle, but a plunge router equipped with a long $\frac{1}{2}$ " dia. straight bit will create a smoother surface. To guide the router, make a plywood trammel (Fig. E). Mark the center of the top and nail the loose square piece to the table. Remove the subbase from your router and fasten the router to the trammel. Place the trammel on the square piece nailed to the table.

Set the router to make a plunge cut all the way through the top. To prevent the edges of the boards from splintering as you rout around the circle, make a series of plunge cuts on both sides of each board (Photo 9). Then reset the router to cut one-third of the way through the top and rout a full circle. Reset the router to make deeper cuts and keep routing until you've cut all the way through. Use a $\frac{1}{8}$ " dia. roundover bit to ease the top's edge.

ADD THE SEATS

Make the seat boards (L and M) and seat cleats (N). Glue and screw the cleats to the boards (Fig. F). Make sure the cleats are parallel to each other—a plywood spacer would help here.

Make a $\frac{1}{4}$ " plywood template for shaping the seats. Nail the template to a seat assembly (Photo 10). Use a plunge router equipped with a $\frac{5}{8}$ " o.d. guide bushing and a $\frac{1}{2}$ " straight bit to rout around the template. Round over the seats' edges.

Fasten the seats to the base (Photo 11). Make the seat legs (P) and fasten them to the cleats. Make the leg stretchers (Q) and fasten them between the legs (Photo 12).

Drill or rout a hole in the tabletop for the umbrella pole (Photo 13). If you use a router, make a template with a $2\frac{1}{8}$ " dia. hole and nail it to the top. Use the same guide bushing and bit as you used for the seat. **PW**

Stylish Patio Planter

Strong, simple joinery provides lasting beauty.

BY BRAD HOLDEN



Handsome Patio Planter

Overall Dimensions: 18 1/8" T x 12 1/2" W x 47" L

NO.	ITEM	DIMENSIONS (INCHES)			MATERIALS
		T	W	L	
2	(A) Side top rails	1	3 3/4	44	Cedar decking 5/4 x 6 (A)
2	(B) Side bottom rails	1	3 3/4	44	Cedar decking 5/4 x 6 (A)
2	(C) End top rails	1	3 3/4	9 1/2	Cedar decking 5/4 x 6 (A)
2	(D) End bottom rails	1	3 3/4	9 1/2	Cedar decking 5/4 x 6 (A)
26	(E) Inside slats	5/8	3 5/16	9 7/8	Cedar 1x4 (B, D)
8	(F) End slats	5/8	3 5/16	9 7/8	Cedar 1x4 (C, D)
2	(G) Ledgers	1	1	43 3/4	Cedar decking 5/4 x 6
10	(H) Bottom boards	3/4	3 1/2	9 5/8	Cedar 1x4
4	(J) Legs	1 1/2	1 1/2	18 1/8	Cedar 2x4
16	(K) Tenons	3/8	1 1/4	1 3/4	BeadLOCK tenon stock (E)

- A. Rout a centered 5/16" W x 3/8" D groove in one edge.
 B. Rout 5/16" x 5/16" rabbets on both edges.
 C. Rout 5/16" x 5/16" rabbet on one edge.
 D. Rout 5/16" x 5/16" tenons on both ends.
 E. Miter one end of each loose tenon.

If you've been thinking about beautifying your patio, and you want to do it in a weekend, I've got just the thing. This sturdy planter is made from readily available materials with simple joinery, waterproof glue, and exterior stain for maximum durability.

You'll need two 12' cedar 5/4 x 6 deck boards for the rails, one 8' cedar 2x4 for the legs, and six 10' cedar 1x4s for the slats and bottom boards. When you're at the home center, dig through the lumber piles to find the straightest boards with the fewest knots.

BUILD THE SLATTED PANELS

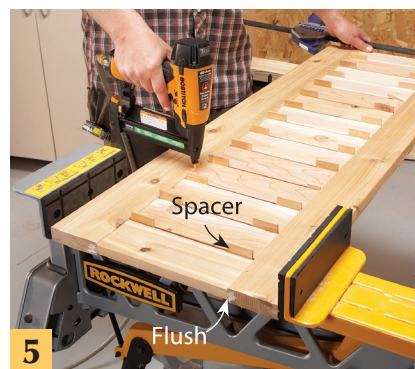
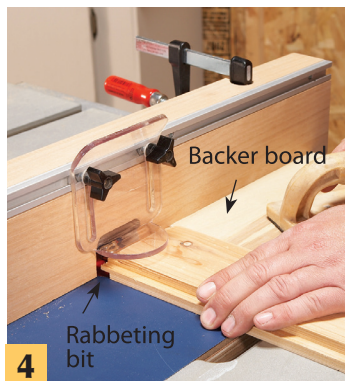
Start by cutting the rails to length (A–D, Fig. A and Cut List). Joint and square one edge, and then rip the rails to final width (Photo 1). Where possible, rip off any loose knots.

Rout a centered groove, 5/16" wide x 3/8" deep, on one edge of all the rails (Photo 2). Slightly chamfer the top edges of the bottom rails (but not the ends), to promote water runoff.

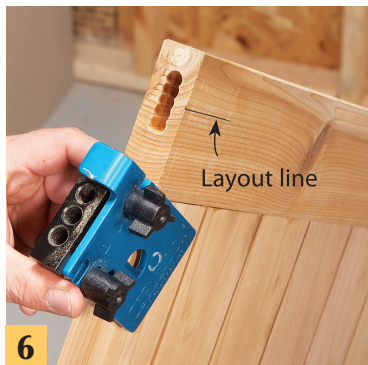
To make the slats, plane the 1x4s to 5/8" thickness and crosscut them into workable lengths. Joint one edge and then rip each length 3 5/16" wide.

Rout 5/16" x 5/16" rabbets on both edges to make the inside slats (E and Photo 3). Leave about 8 lineal feet with only one rabbeted edge, to make the end slats (F). The outer edge of each end slat is square. Because these slats go on opposite ends of the panel, the rabbets are on the front face on half of them and on the back face of the other half. Often, the 1x4s will have one good face and one not-so-good face. So, when you cut the end slats to final length, make sure that half of them are rabbeted on the "good" face and half are rabbeted on the "bad" face. This ensures that only the "good" faces will show on the completed planter. Cut all of the slats to final 9 7/8" length.

Use a rabbeting bit to rout centered 5/16" x 5/16" tenons on both ends of each slat (Photo 4). Adjust the bit's height and make test cuts on scrap stock to dial in the thickness; use the fence to set the length. Use a squarely-cut backer board with a screwed-on handle to support the workpiece and prevent blowing out the back edge.

[illegible]

1. Start by ripping the rails to width from 5/4 cedar boards.
2. Rout a centered groove in one edge of each rail, to house the slats.
3. Rout rabbets on both edges of the inside slats, but on opposite faces so that the ends look like a "Z." The end slats are rabbets on only one edge.
4. Rout tenons on the ends of each slat, using a rabbeting bit. Make one pass on each face. Use a backer board to guide the workpiece and prevent blowout.
5. Assemble the panels. Spacers between the slats create uniform gaps. Glue the end slats flush with the ends of the rails. Nail the rest at the top and bottom.



6. Create mortises for loose tenons in the rails, using a BeadLOCK jig or other mortising tool. BeadLOCK tenon stock fits the unique mortises shows here.

7. Mark the legs for mortising by transferring the layout lines from the panels. Each leg will have mortises on two adjacent faces.

8. Glue and clamp the legs to the side panels. Swab glue in the mortises and on the ends of each panel. Install the BeadLOCK tenons; then install the legs.

9. Complete the planter by gluing the end panels between the assembled sides.

10. Apply an exterior stain to add color and protection from the rain and sun. Periodically reapply stain to maintain the finish.

Assemble each panel inside-face up. But before you start, mill a pile of $\frac{1}{8}$ " x 1" x 2" spacers. Lay the rails on a flat work surface. Then, starting with an end slat, slide each slat into position in the rails' grooves. Slip spacers between the slats at the top and the bottom. Install the remaining end slat to finish the job. Make sure both end slats are flush with the ends of the rails, that the assembly is square, and that the inside faces of all the pieces are oriented correctly.

Remove the end slats, apply waterproof glue, such as Titebond III and then glue them into the rails, flush with the ends. Make sure all of the internal slats are evenly spaced. Then nail them to the rails (Photo 5).

I used a BeadLOCK jig to drill the centered $\frac{7}{8}$ " deep mortises (Photo 6). Layout is simple. Just mark the mid-point of each mortise on each rail, $1\frac{1}{4}$ " from the top edge on the top rails and $1\frac{3}{4}$ " from the bottom edge on the bottom rails. The jig comes with shims that allow centering the mortises in stock of different thicknesses.

Use the offcuts from the 5/4 x 6 rails to make 1" x 1" ledgers (G) to support the planter's bottom boards (H). Glue and nail a ledger to the inside of both side panels, positioned at the height you want. You can mount the ledgers on the bottom rail and stack bricks to position the pots, or you can let the height of the pots or the amount of soil that you plan to use determine the ledgers' location.

MAKE THE LEGS

Make the legs (J) by ripping a 40" length of 2x4 into two pieces that are $1\frac{1}{16}$ " wide. Plane the sawn faces to square the stock. Then cut the legs to final length and round over all the edges.

Lay one of the panels on a flat surface and position one leg so it protrudes $\frac{3}{4}$ " at the panel's top and $1\frac{1}{8}$ " at the bottom. Transfer the mortise layout marks from the panel to the leg. Then use the marked leg to transfer the layout lines to the other legs (Photo 7). Be sure to locate the mortises so that the legs' good sides will face out. Install the

appropriate shims in the BeadLOCK jig to center the mortises, and then drill.

ASSEMBLE AND FINISH

BeadLOCK supplies tenon stock that you simply cut to length to create the $1\frac{3}{4}$ " long loose tenons (K). Miter one end of each tenon—the end that goes in the leg. Install the loose tenons when you glue and clamp the legs to the side panels (Photo 8). After the glue has set, repeat the process to glue and clamp the end panels between the side panels (Photo 9).

Apply the finish (Photo 10). I used a lightly pigmented exterior oil-based stain. The pigment provides a measure of UV protection, so the finish lasts longer.

Place the bottom boards on the ledgers, leaving $\frac{1}{4}$ " to $\frac{1}{2}$ " between them for drainage.

Line the planter with heavy-duty plastic, poke some drainage holes, and fill it with soil; this is the perfect setup for a miniature herb garden. Or skip the soil and create instant color by filling the planter with potted flowers. **PW**

Outdoor Finishes

Simple to super durable.

BY BRAD HOLDEN

Outdoor finishes have one thing in common; they all require maintenance. Of course, paint is unequaled at protecting the wood from its two biggest enemies: moisture and ultra-violet (UV) light. Moisture causes the wood to rot, and sunlight bleaches out its natural color. Still, who wants to cover-up beautiful wood with paint? If you want the wood to show through on your outdoor projects, you need a clear finish.

There are three basic clear finishes for outdoor furniture: exterior oil, exterior varnish, and an epoxy sealer with an exterior varnish topcoat. Application ease and service life are the two major differences among these finishes.

Of the three clear exterior finishes, exterior oil is by far the simplest finish to apply. Just flow it on, let it soak in and wipe off the excess. Unfortunately, oil offers the least amount of protection and it must be reapplied every season. Exterior varnish, on the other hand, is more difficult to apply: up to 8 coats have to be carefully brushed on. While exterior varnish offers excellent protection from moisture and UV light, it has to be recoated every few years to maintain that protection. An epoxy sealer with an exterior varnish topcoat is the most durable outdoor finish and can last for many years. However, the initial application does take longer than exterior varnish.

EXTERIOR OILS

An exterior oil finish is definitely the simplest, quickest way to treat an outdoor project. On the downside, it'll only give you about a year of protection from the ravages of outdoor life. Oil finishes don't provide a protective film that sits on top of the wood like varnish does. Instead oil soaks into the wood fibers and dries. Exterior oils have added trans-oxide pigments for UV protection and mildewcides to protect against mold and mildew. You'll find colors ranging from dark brown to light amber.

Application is simple: a garden sprayer and a rag are all you need. First, flood the surface of your project with oil. I use an inexpensive hand pump garden sprayer. It's fast, easy and cost efficient. Let the oil soak in according to the manufacturer's directions, then wipe it off. That's it—done! Depending on local conditions, you'll have to reapply about once per year. The built-in UV protection should keep your wood looking natural for many years (as long as you keep up with the applications).



EXTERIOR VARNISH OR URETHANE

Exterior varnish or urethane (both finishes are technically “varnishes”) builds a protective layout over the wood. It offers superior protection and durability over an oil finish. Often, the term “Spar” is found in the name, but this does not indicate any additional or special ingredient. The term “Spar” originates with its use as a coating for the spars on sailing ships. All exterior varnishes are formulated to protect again moisture and UV radiation.

Exterior varnish is applied with a natural bristle brush in multiple coats. Manufacturers recommend eight thin coats for maximum protection and a deep lustrous finish. Sand the hardened varnish lightly between each coat.

Exterior varnishes cure to a more flexible film than ordinary varnish. The flexible coat isn't as likely to crack from seasonal wood movement caused by humidity extremes in an outdoor environment.

Exterior varnish will usually last 2-3 years before it starts to look chalky. As soon as you see a chalky film start to develop, it's time to freshen the finish. Simply sand the topcoat smooth and apply a new coat of varnish. Don't put this important maintenance step off too long or cracks will develop in the finish allowing moisture to penetrate and degrade the wood. That'll necessitate a complete strip and refinish to restore the furniture. You don't want to go there.



EPOXY WITH EXTERIOR VARNISH

An epoxy sealer with exterior varnish topcoats is the most durable, but also the most labor-intensive finish you can apply to outdoor furniture. This is the finish favored by builders so you know it's going to last a long time. Epoxy and exterior varnish enjoy a symbiotic relationship: The epoxy forms an impenetrable moisture barrier that prevents seasonal swelling and shrinking of the wood. This dimensional stability in turn gives longer life to the exterior varnish because it no longer has to stretch and shrink with the wood. The exterior varnish returns the favor by providing UV protection, without which the epoxy would rapidly deteriorate.

Apply three thin coats of epoxy. The best way to get thin, even coats is to use a foam roller cut in half. It works kind of like a squeegee. Epoxy cure times vary depending on their formulation and the ambient temperature. Be sure to use an epoxy with a long enough open time (approximately 30 minutes), so it doesn't set up before you're done putting it on. For large projects, mix the epoxy in small batches so you can finish an area before the epoxy sets. Also, for optimal flow out and penetration into the wood fibers, make sure the epoxy you use doesn't contain any thickeners. Always read and follow the instructions that come with your epoxy. If possible, apply the epoxy undercoat prior to assembling the parts. You can recoat without sanding while the previous coat is still soft but not sticky. If the epoxy seems uneven or bumpy, allow it to harden. Then, sand it smooth and apply the next coat.

Before applying the varnish topcoats, I use a card scraper or sanding block with #120 grit sandpaper to level the cured epoxy. The sanded surface also provides some tooth for the spar varnish to adhere to.

Rinse the sanded epoxy with clean water and dry with paper towels. The rinse water should not bead on the surface. Beading indicates that contaminants from the epoxy curing process are still on the surface and could interfere with the varnish bond. To remove the contaminants, wipe down with mineral spirits and dry with paper towels or a rag. Follow this with eight coats of exterior varnish, sanding lightly between coats. **PW**



Sand out any unevenness and defects in the cured epoxy before applying the exterior varnish topcoats.



Suggested Supplies

EXTERIOR OIL

- Penofin penetrating oil finishes; Original Blue Label Oil Wood; www.penofin.com
- Hand-Held 1.5 Litre Pressure Sprayer; www.leevalley.com; \$29.95

EXTERIOR VARNISH OR URETHANE

- Varathane, Clear Gloss Oil-Based Exterior Spar Urethane; www.rustoleum.com

EPOXY WITH EXTERIOR VARNISH

- West System® 105 Epoxy Resin (32 fl oz); www.leevalley.com; \$62.50
- West System® 205 Fast Hardener (7 fl oz); www.leevalley.com; \$33
- West System® Pump Set of 3; www.leevalley.com; \$24.50

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