

Do It Yourself

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Contemporary Dining Chair: Sculpted Seat and Legs

From "[Wood Works](#)"

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The curved back of the chair has been made, and the stock for the seat has been cut and prepped. In this segment, the seat is sculpted to its final form and the contoured, tapered legs are created. Finally, the chair is assembled and glued up.

Materials:

MDF templates for the seat and legs (shown earlier)

Table saw; cross-cut sled

Tenoning jig

Band saw

Disc sander

Cordless drill

Plunge router

Table router; flush-bearing bit

Grinding tool; sculpting blade

Variable-speed sander

Random-orbital sander

Chisel

Pattern-maker's rasp

Sandpaper (various grits, 36 - 220)

Slow-setting resin glue

Clamps

Safety glasses or goggles



The hand-sculpted seat and contoured legs add visual interest to this piece as well as structural continuity with the curved back.

Safety Alert: *Always* wear safety goggles or safety glasses when working with wood, power-tools, saws, drills, routers, etc.

Contoured Legs and Sculpted Seat

- Cut the stock for the legs to the following dimensions: 18 inches long x 3 inches wide x 1-3/4 inches thick.

- The legs will sit back from the front edge of the seat about 1-1/4 inches. For strength, the legs are joined to the seat using a combination of half-lap and mortise-and-loose-tenon joinery (**figure A**). The long-grain of the half-lap, in combination with two side-by-side tenons, forms a strong, durable joint.
- At the band-saw, cut parallel notches on opposite sides of the seat. The notches should be 1/2-inch deep by 3 inches long (**figure B**).
- To square the cuts, take the seat-stock back to the table saw. Using the same process that was used earlier to cut out the large notch for the chair-back, pass the stock back and forth over the blade to remove about 1/16-inch of wood to trim the notch square (**figure C**). Repeat the process on the second notch. To maintain the reference from the front of the seat, flip the stock and repeat the process using the stop-blocks at the same setting.
- Next, cut the notches in the top of the legs by using the cross-cut sled and stop-block at the table saw. Raise the blade of the saw to 1-1/4 inches. Use the tenoning jig on the table saw to finish the notch-cuts (**figure D**).
- To complete the joinery in the two legs, two mortises will be cut in each. The small custom jig (shown earlier). Secure the custom jig into the notch as shown using double-stick tape and clamps. With the jig secure, use the slots as guides to drill several holes into the mortises (**figure E**). Tape on the drill bit will help to guide the depth of each cut.
- Remove the jig and use a sharp chisel to clean up the walls of the mortises.
- Cut the matching mortises in the seat using a plunge router, and square the corners of the mortises using a chisel (**figure F**).



Figure A



Figure B



Figure C



Figure D



Figure E

- Mill up tenons of bubinga to the following dimensions: 2 inches wide x 1/4-inch thick x 1-1/2 inch long. Once the tenons are cut, it's a good idea to test-fit the legs while the stock is still square in case any adjustments need to be made.
- Following a successful dry-fit, the legs can be cut to their final shape -- first tapering them, then cutting the curve. Begin by transferring the lines of the leg-tapering template to the stock (**figure G**). Trace the line on one side, flip the stock and trace on the opposing side.
- Cut the tapers on the legs at the band saw, following your layout lines (**figure H**). The taper goes from 1-3/4 inches down to 7/8-inch.
- Use the second template to lay out the lines for the curve (**figure I**). Cut the curve *on the back of the leg* using the table saw. Once the curves have been cut, sand them smooth using the disc sander.
- Once the legs are finished, the seat can be sculpted. The two seat templates are used to rough out the basic design and leading edge. Be sure to place all templates so that they centered on the glue line.
- Begin with the profile template (**figure J**), and use the router (with short carbide bit and bearing at the top) to establish the shape.
- With the second seat-template attached, cut the seat to shape at the band saw (**figure K**).
- Once the curved seat has been cut, flush up the edges at the table router using the template as a guide (**figure L**). Multiple passes are required for this step because of the density of the bubinga hardwood.
- The third and last seat template outlines the area of the seat that will be hand-sculpted (**figure M**).
- With the curved layout mark drawn, rough out the area using a grinding tool with sculpting-blade attachment (**figure N**). Work both sides of the seat-top, leaving a slight rise in the center. Shape



Figure F



Figure G



Figure H



Figure I



Figure J

only the top of the seat. The bottom remains flat except for some decorative shaping around the outside edge. The goal is to use the tool to carve out the bulk of the area while maintaining the defining peaks.

- Next, use a variable speed sander with coarse 36-grit paper to smooth the seat, and follow up with a random-orbital sander with 50-grit (**figure O**). Work your way up to 220-grit sandpaper until the top surface is soft to the touch.
- Use a pattern-maker's rasp to define the front curve on the bottom of the seat (**figure P**).
- At the router table, shape the outer edge of the underside of the seat using a 1-inch radius bit. Rout the edge in 3 passes.
- With all elements complete, the chair can be glued up. To attach the legs, apply slow-setting resin glue to the mortises, tenons and face of the half-lap. Once the legs are in position, add clamps (**figure Q**).
- To attach the back, place the seat on crates, tap the back in place using a dead-blow hammer, and add more clamps (**figure R**). Check the position of the back using a level, and carefully make any necessary adjustments by gently tapping with the dead-blow.
- Allow the glue to dry for 12 hours.

In the segment that follows, the back is secured further using screws, and the hardware is concealed with decorative ebony caps. Finally, a wood finish is applied.

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Figure K



Figure L



Figure M



Figure N



Figure O



Figure P



Figure Q



Figure R