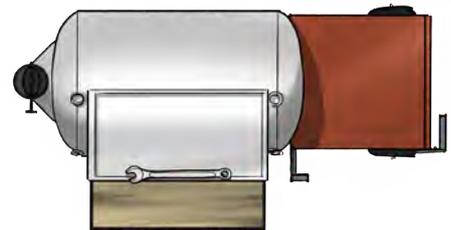
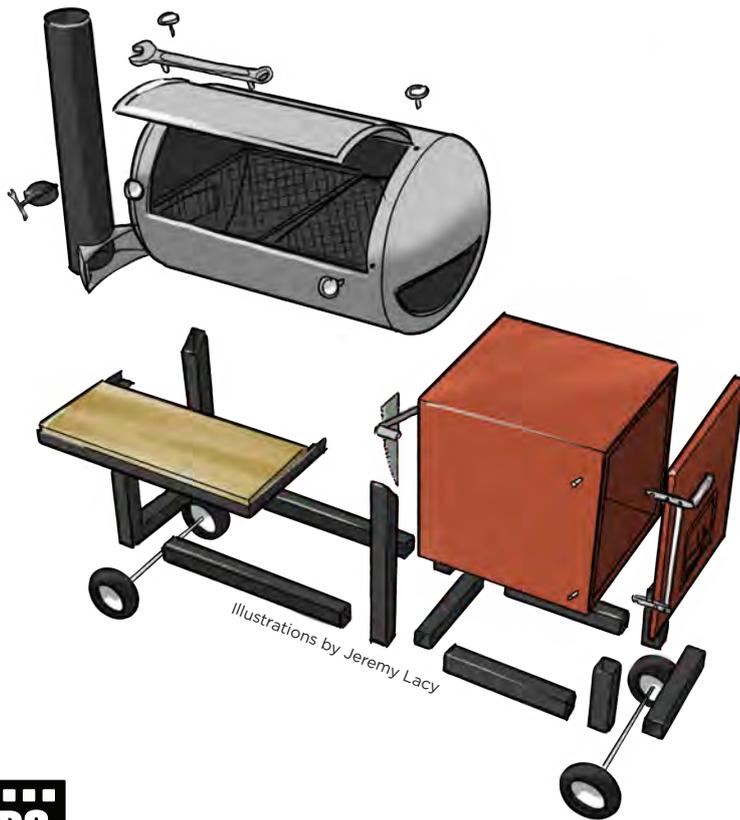


Project Spotlight

BUILDING A SMOKER FROM A COMPRESSOR TANK

By Jimmy DiResta



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Summer is just around the corner, which opens up plenty of opportunities for outdoor gatherings. And outdoor gatherings often include cooking and eating. In this issue of *ARC*, Jimmy DiResta recycles an old compressor tank to build a meat smoker, with a firebox and flue to regulate the intensity of the heat and smoke inside the main chamber.

It's an elaborate build, but the result is a piece of backyard hardware that will produce plenty of culinary delights - not just in the summer months, but all year long. Be safe, enjoy the summer months, and bon appetit!



Illustrations by Jeremy Lacy

STOP SAFETY FIRST

Before you start any project involving welding, make sure you have the right Personal Protective Equipment (PPE), which includes, at least, an ANSI-approved welding helmet, safety glasses, appropriate welding gloves for the process you're using, and a flame-resistant shirt, jacket, or sleeves to protect from UV rays and burns. You should also keep a fire extinguisher close at hand. Use adequate ventilation when welding. Use an approved respirator if exposure to welding fume cannot be controlled, or if welding outside and natural air movement is not sufficient to keep welding fume out of your breathing zone.

MATERIALS

- 80-gallon air compressor tank
- 30 feet of 2-inch x 2-inch tube (1/8-inch thick)
- 6 squares of 3/8-inch plate (22 inches x 22 inches)
- 6 squares of 1/4-inch plate (24 inches x 24 inches)
- Approximately 20 feet of 1/2-inch x 1/2-inch angle
- 4-foot x 4-foot expanded stainless steel mesh
- Approximately 25 feet of 1-inch x 1-inch stainless steel angle
- 4 barbecue thermometers
- 1 5-foot long x 6-inch diameter smoke tube
- 4 small tractor wheels

WELDING/CUTTING EQUIPMENT AND TOOLS

- Lincoln Electric 180 (Weld-Pak® 180, Pro-MIG® 180, Easy MIG® 180)
- Lincoln Electric LE31MP™
- Lincoln Electric 20 Plasma Cutter
- Lincoln Electric Port-A-Torch® or Cutwelder®
- Welding Helmet, Gloves, Chipping Hammer, Wire Brush, Magnet (Lincoln Electric Auto-Darkening Welding Helmet Kit Model# KH978 or KH977)
- Metal hacksaw, Angle Grinder, Band Saw



Step 1:

Cut off the base and other extremities to take the tank down to its basic pill shape. Use a non-toxic paint remover and abrasive pads on your grinder to remove paint and other residue from the surface of the tank. Use a hack saw to cut the 2x2 square tubing to create the framework that will carry the legs, and square up the bottoms of the individual pieces with a disc sander. Tack the frame pieces together. Build two H frames – one for the left and one for the right – then connect the two.

Step 2:

Use the band saw to cut the radius on the struts of one of the H frames, then use that H frame as a template to cut the struts of the opposite frame so that each is a mirror image of the other. Position the tank on the struts, then weld the supporting struts to the bottom of the tank.

Step 3:

Tape off the area on the upper part of the tank that will serve as the smoker door. Cut the left and right sides of the door, then tack the ¼-inch by 1-inch flange to each side. After tacking, run a full bead on both sides. Tack and weld the same flange along the bottom, then cut the top and bottom of the door. (Following this sequence will prevent the curvature of the door panel from changing after it's cut away from the rest of the tank.) Use the band saw to cut the hinge to the desired width, then tack and weld the hinge to connect the top edge of the door to the upper edge of the door opening.

Step 4:

Use the cutter/notcher/bender to make the frames for what will be the firebox. Leaving the seam in the middle of two flats rather than a corner will make it easier to weld the frame together. Tack and weld the flat steel panels into the frame to create the firebox. Insert insulation in the space between the panels of each wall to mitigate heat buildup between the double walls of the box.

▶ A detailed drawing and cut list for this project can be downloaded at arcmagazine.pub.



Step 5:

Cut away a semicircle at one end of the tank to accommodate the firebox. Measure the same semicircle on the side of the box, then cut the same measurement on a sheet of flat steel to create a valve for the opening on the side of the box to regulate the flow of heat and smoke. Position bolts on the edge of the firebox and the center of the valve panel to accommodate the lever mechanism that will raise and lower the valve. Line up the opening of the firebox with the opening at the end of the smoker chamber and weld the two pieces together. You'll probably need to assemble an additional set of legs underneath the firebox to accommodate the extra weight on one side of the chamber.

Step 6:

Cut an opening on the side of the chamber opposite the firebox to accommodate the tubing that will act as the flue. Drill a hole in the flue to accommodate the damper door control rod, then use a strip of 4 x 4 lumber to hold the damper door in place while welding the door to the rod. Fit up the flue with the opening at the end of the tank and weld the two assemblies together. Cut an airflow port into the lower half of the panel that will become the firebox door. Insert insulation into the door and weld the hinge to attach the door to the rest of the box.

Step 7:

Cut a length of steel rod and drill holes in the center to create the washers for the latching and locking mechanism. Weld each of these washers to either end of a connecting rod, then weld axle rods to the edge of the firedoor to hold the rod. Position locking posts on the side panel of the firebox to line up with the latching/locking assembly on the edge of the door. Cut the nuts and axles to size and put a weld at the end of each to cap them off. Weld an axle rod to the locking/latching mechanism to serve as a handle. Likewise, weld a handle to the door of the smoker.

Step 8:

Cut the stainless steel mesh to fit the inside the chamber, then cut and weld the L-shaped steel to frame up the mesh. Use a recycled C-clamp to construct an adjustable vent for the airflow port on the firebox door. Cut a strip of 1/8-inch steel in a curved configuration with a jagged edge to act as a ratcheting mechanism to control the firebox valve. Attach the tractor wheels to the feet to mobilize the entire assembly, and attach the barbecue thermometers to the exterior of the chamber.