BRIAN OLTROGGE

Brian Oltrogge is the owner of Grunblau Machine, LLC and Grunblau Design Studio. Brian was trained as an architect and has taught at various institutions, including LTU, Cranbrook, RPI and College for Creative Studies in Detroit. Over the last 25+ years, he has worked as an architectural designer and fabricator whose work has been featured in various architectural publications, including Dwell Magazine. His work is also included in the permanent collection at the Museum of Modern Art. Brian uses Youtube as a platform for showcasing his ideas and expressing his creative energy in the hopes of educating and inspiring others to follow their passion and make something!

SKILL LEVEL: Beginner
TIME COMMITMENT: 6–8 hours

TOOLS AND MATERIALS

- Patterns
- Spectrum® 625 X-TREME™ plasma cutter
- Multimatic® 220 AC/DC multiprocess welder
- 36" x 48" 16-gauge steel (or similar thickness)
- 3/8" all-thread/ threaded rod (approx. 18" to 20" long)
- 3/8" acorn nut
- 3/8" coupler nut
- 3/8" standard nut
- 1/4" washer
- Dead blow hammer
- 6" diameter cutting disk (used as pattern for base)
- Sheet metal pliers (or a couple crescent wrenches)
- Bandsaw (or laser cutter)
- Flap wheel

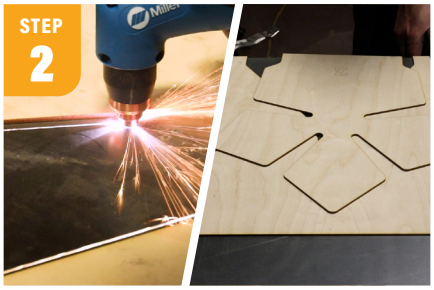
WARNING: READ AND FOLLOW ALL LABELS AND THE OWNER'S MANUAL.

HOLIDAY METAL TREE SCULPTURE

This metal tree sculpture will bring the winter spirit and holiday joy for years to come.

STEP BY STEP

Print and/or cut out the patterns for the tree. For this project, I used a laser cutter, but you could use a bandsaw.



Take your 36" x 48" gauge steel and affix or clamp the patterns to the material. Note that the physical patterns are offset for the Miller® drag tip (30 or 40 amp). Each part requires two patterns — one for the inner profile and one for the outer profile. Pierce and slowly drag along the profile using your plasma cutter. Repeat until all pieces are cut out.

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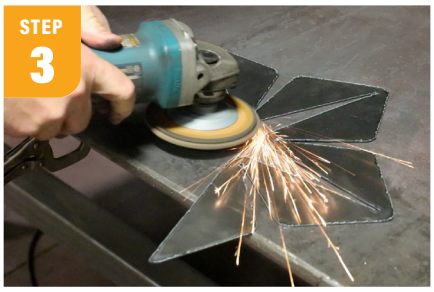
STEP 3



Using a flap wheel, grind and deburr the underside.

STEP 4

Using a piece of angle iron and a dead blow hammer, pre-crease the folds as shown. This step will make the bends more crisp. Since the metal is so thin, most work can be done with your hands.

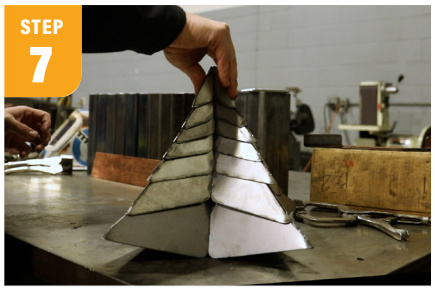
STEP 5

Begin bending the sheets into shape using either sheet metal pliers or a crescent wrench.

STEP 6

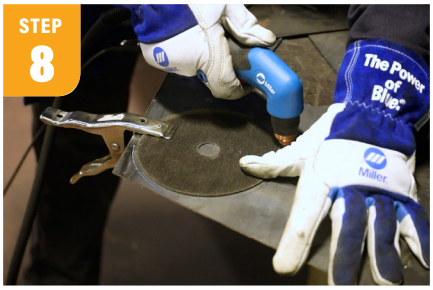
When the folds line up, tack weld them into place using your Multimatic 220 AC/DC. Tack on the top side for the inner folds and on the bottom side for the outer folds. Repeat this process for all of the pieces.

STEP 7



Once the shape is almost complete, finish welding the seam together and place a tack on the tip. Attempt to make the same tack on the tips of each star. When done, each piece should nest on top of each other as shown. These shapes will be rotated 45 degrees to create a tree.

STEP 8



To create the base for the tree, cut a 6" diameter circle from the 16-gauge steel.

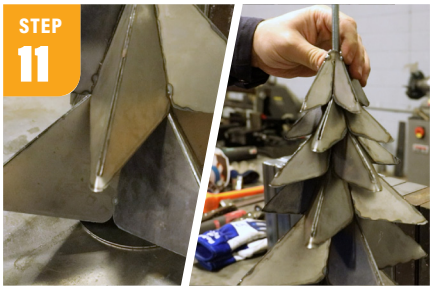
STEP 9

Next, weld a 3/8" coupler nut in the center of the disk/base. This will accept the 3/8" all-thread that will form the structure of the tree.

STEP 10

Then, place a nut on the all-thread in order to lift the tree off the ground. A 1/4" washer is a tight fit on the all-thread and will provide uniform support to the bottom section.

STEP 11



Stack each section of the tree on the rod, rotating each section 45 degrees to the section below. By stacking on the rod — rather than welding each section together — you can easily unstack and store. However you could also weld each section together and forego the rod if that's your preference!

STEP 12

With the sections appropriately added and compressed with a standard nut at the top, the rod is marked. Use a hacksaw (or portaband) to cut the rod to length.

STEP 13

Top the rod with an acorn nut. How it is finished is up to you — some like the raw steel look while others might paint it green or white. I can imagine an orange rusted version might look great or even a copper tree with a green patina.