

Deep Engraving in Stainless Steel

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Deep engraving in stainless steel can be a challenging and slow process. However, it is also highly profitable for those who have the right heavy-duty machines and accessories. Here is a quick, step-by-step example of how to deep-engage a stainless steel electrical plate using a Vision 2550 Router. We also used a paint-fill after engraving to enhance the look of the letters and numbers.

For this project, we used our Vision Pro software and a tool path with a depth of .016" and four passes (we engraved four times to get the proper look and depth and to get maximum tool life) on the material. The cutting tool used was a 2 Flute Ball Nose End Mill with a .030" tip. It was bottom-loaded into a split-collet spindle.

Step 1/Photo 1: Clamp the part securely to the table. The part cannot move at all during engraving or the quality will be poor and the cutting tool can easily break. The area to be engraved should also be completely flat or the engraving depth will be inconsistent.



Step 2/Photo 2: For this example, we set the Home position in the center of the area to be engraved to minimize potential variances in depth. We then set the surface of the tool on the material.



Step 3/Photo 3: When deep-engraving into hard metals, always use a coolant. Here, we used a few drops of cutting oil and smeared it over the area to be engraved. Another great option is to use a Unist lubrication system, which applies a steady amount of a vegetable-based coolant onto the surface. Vision now offers Unist Systems as an option for their CNC routers.



Step 4/Photo 4: Send the job to the engraver. Use a very slow feed rate and high RPMs when deep-engraving into stainless steel. Here, we used an XY and Z feed rate of .1 inches per second and a spindle speed of 18,000 RPMs. Clean debris off the material using a brush, vacuum, or compressed air.



Step 5/Photos 5, 6 and 7 (Optional): To enhance the text and increase contrast, you can flood the engraved area with paint and let dry for a minute. Put a dab of alcohol on a cloth. Wrap the cloth around something with a rigid edge (such as a piece of scrap metal or plastic) and wipe back and forth removing any excess paint.



