

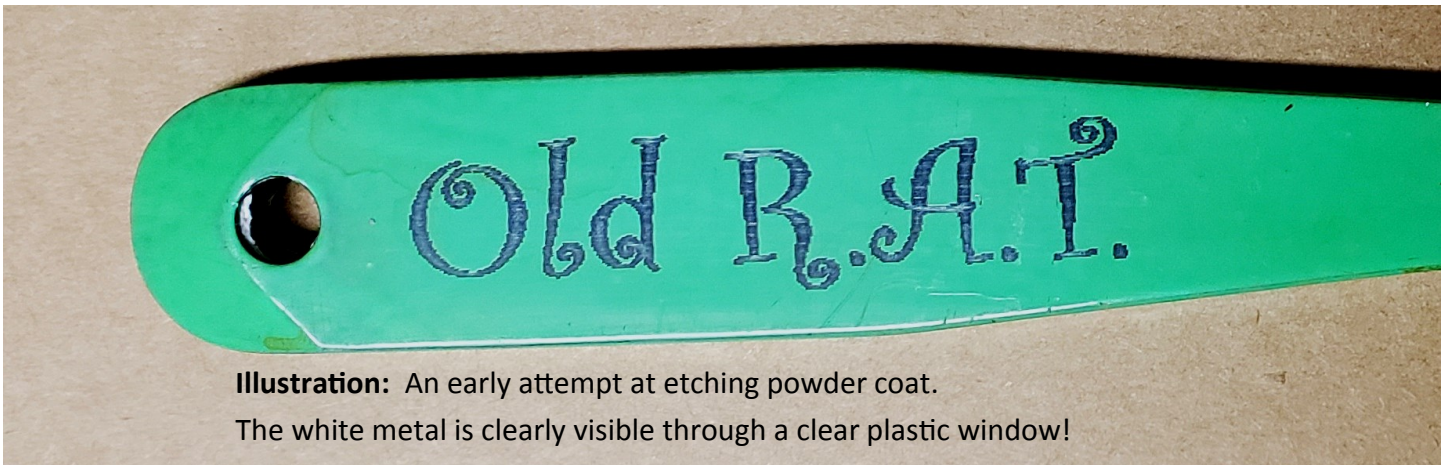
## Personalizing Our Throwing Knives by Etching the Handles

We have been playing around with personalizing our throwers for some time. We originally tried etching the powder coat with our 2 Watt laser as the first step. We thought that we could then blacken the exposed metal by using the electro-chemical etching kit. This technique is similar to how we etch our logo on the knife blades. It didn't work!

After some hand wringing and trying to figure out what went wrong, we concluded that we only laser etched away the powder coat pigment, leaving a clear thermo-plastic window. I tested this idea by buffing the powder coat. We were right, the metal was visible through a shiny clear plastic layer (refer to Illustration below).

We next considered blackening the metal before powder coating. We now had a black background. Unfortunately, since we used the same black oxide that we use to blacken our blades, the powder coat bond was not strong. This led to chipping of the powder coat on minor scratches. I had to refurb my 5160s after a very short time of throwing. In engineering parlance this is referred to as a really stupid idea! Powder coat over **oxide**, seriously!

In our frustration, we came across the idea of burning pigment into the powder coat. Fortunately, I found an old container of epoxy pigment (shown below) and gave it a try. It worked!



**Illustration:** An early attempt at etching powder coat.  
The white metal is clearly visible through a clear plastic window!



First effort using my 5160 Darts with the pigment technique.



Our old container of black pigment.

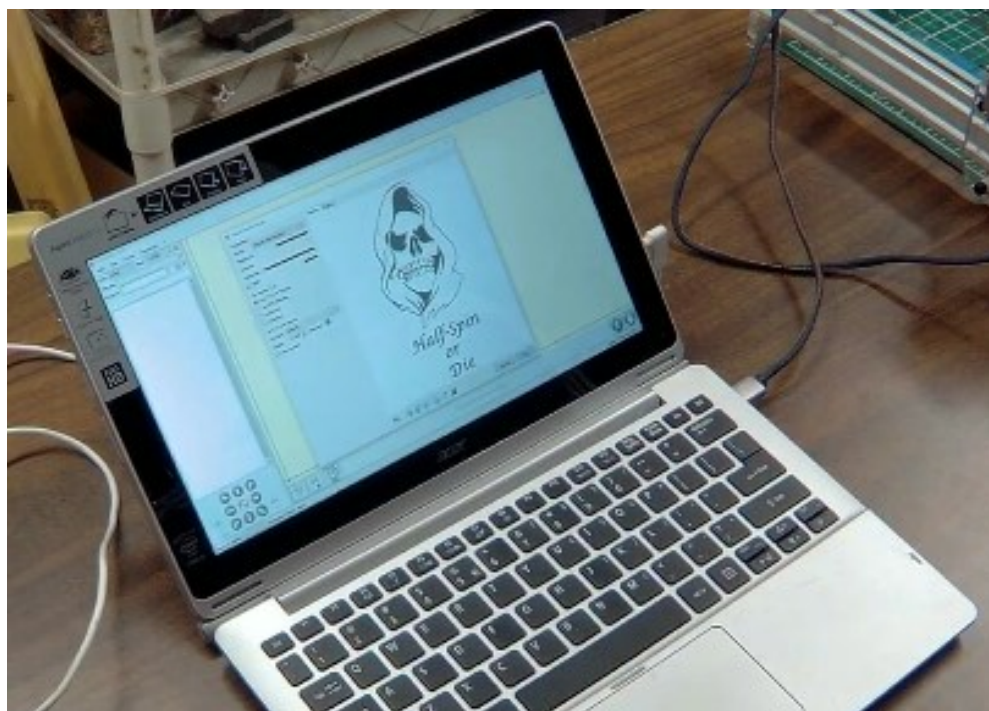
### Steps in the process:

1. Using a drawing program, make or load a picture or drawing. Adjust the aspect ratio of the picture to fit the knife handle before loading it in LaserGRBL.
2. When the image (and text, if you want) looks like you want it to, save it as a picture (we save as a .png file) The images used by Bearded R.A.T. are on the right.
3. Load LaserGRBL software and select a picture or drawing for etching. Set width and height to fit the handle.



### LaserGRBL settings we used:

- Number of passes: 2
- Speed: 1200 mm/min
- Quality: 10 lines/mm
- Direction: Vertical
- Power: Full



4. Shake a thin, even layer of pigment onto the area to be etched.

### Note:

We applied the pigment using a salt shaker with a fine mesh dome, from a "Tea ball", taped over the top. It worked great!



- Carefully place the knife in position under the laser and align (we use a grid for this purpose). Make sure that you don't disturb the pigment powder.

**Note:**

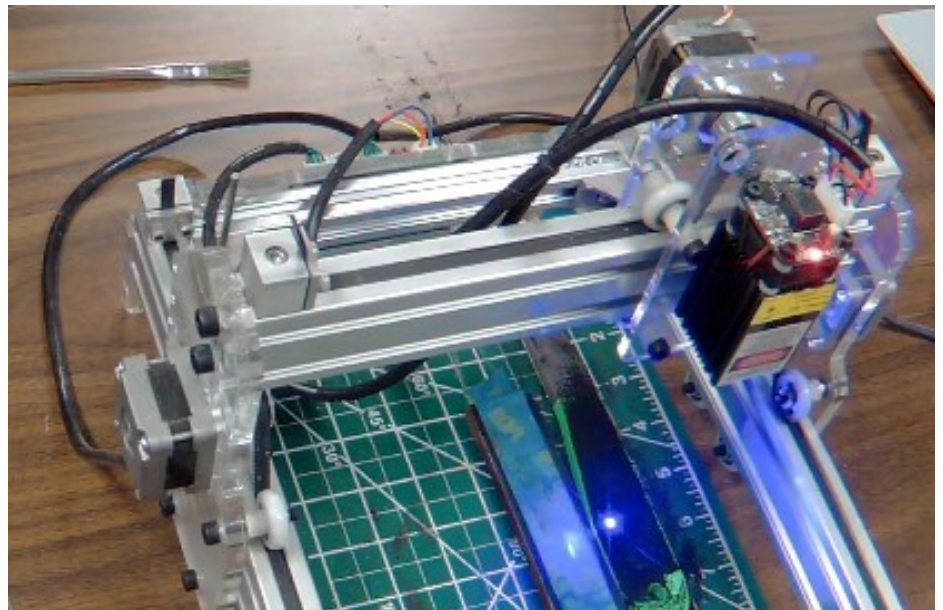
Verify alignment with positioning beam before starting. Don't forget to turn off the positioning beam before beginning the etching process. I forget this step all the time!



- Start the laser and go away for a while. Our two passes took approximately 30 minutes.

**Note:**

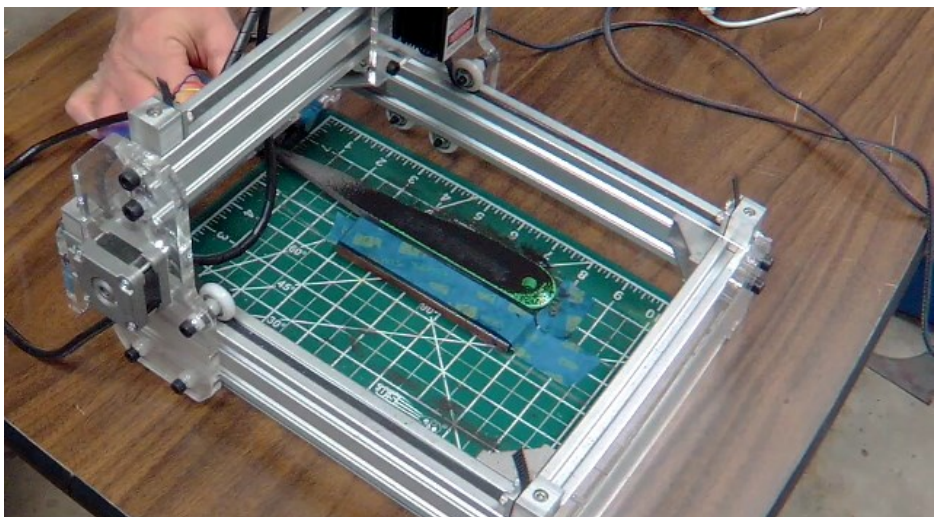
We performed two passes to make sure the powder would stick in the clear thermo-plastic of the powder coat. One pass with our 2W laser settings gave a lighter shade of black(?)



- When the process is complete, remove and clean up remaining pigment.

**Note:**

Clean up consists of removing loose pigment with a brush, then brushing the black area with a tooth brush and cleaning solution (we use Simple Green) before rinsing and drying.



# Results



## Comments on the process:

- The image must be black and white! No shades of gray!
- If you can make the background transparent, it works even better.
- When adjusting an image, crop as close as you can to the image edge. It makes alignment easier.
- We used epoxy pigment, but any black pigment (such as toner for laser printer) should do.
- The laser etching process is similar to our logo mask etching technique, but does not expose the metal.
- If you know how to use LaserGRBL, you can optimize your own settings. We're still learning.
- Most important! Don't mistake us for people who know what they're doing!!!
- We will probably find other stuff to laser into them for the next refurb cycle.
- We have posted a video of the process on our YouTube channel: **No Spin RAT**