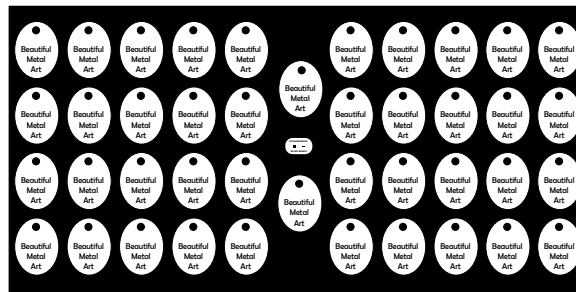


# Metal Parts Design Guidelines

To better understand how to layout your artwork, please read the next section illustrating how our process works. This is a quick overview of our etching process.

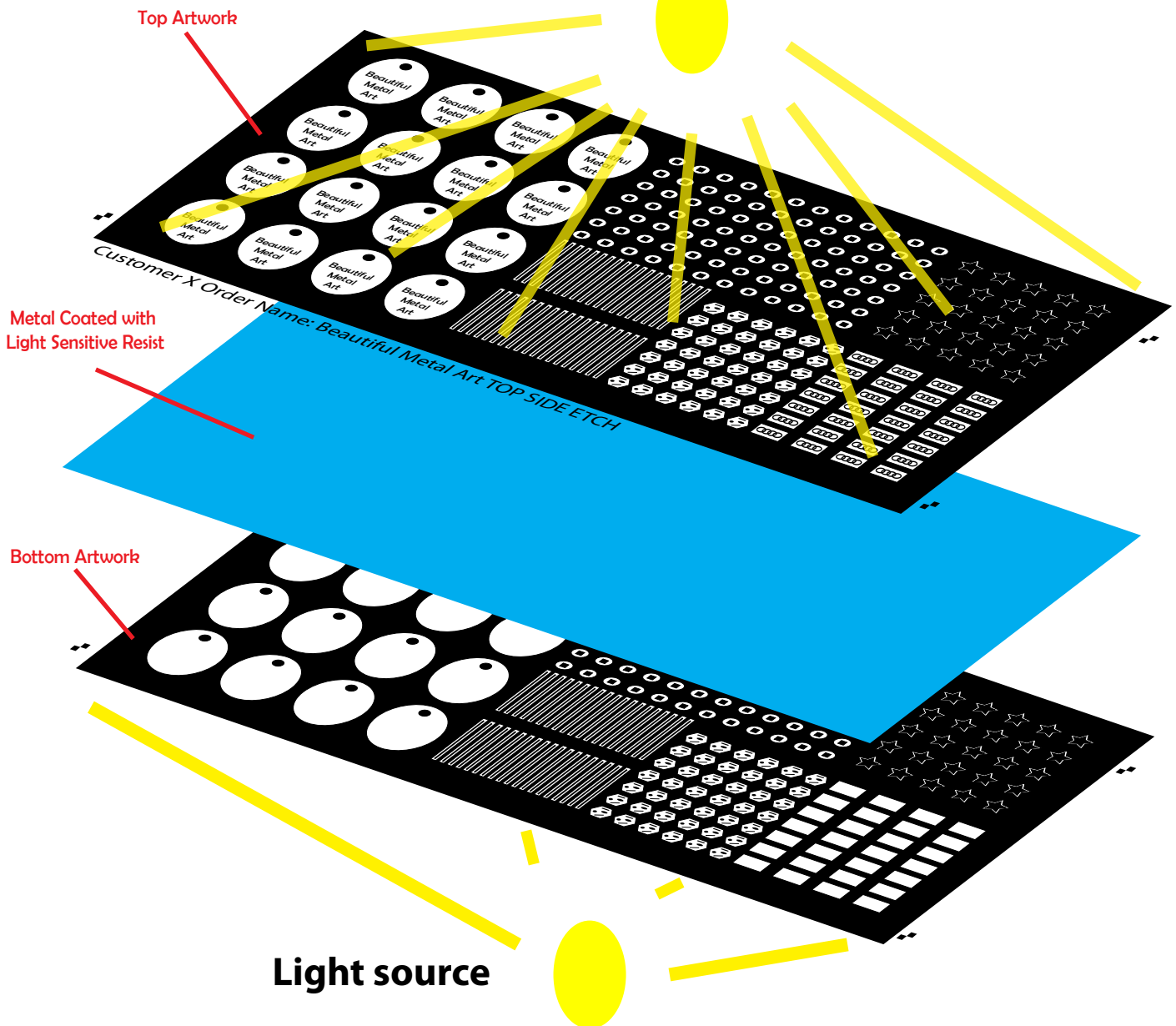
Then, using our design templates and easy to follow step by step instructions you can create your very own metal art!



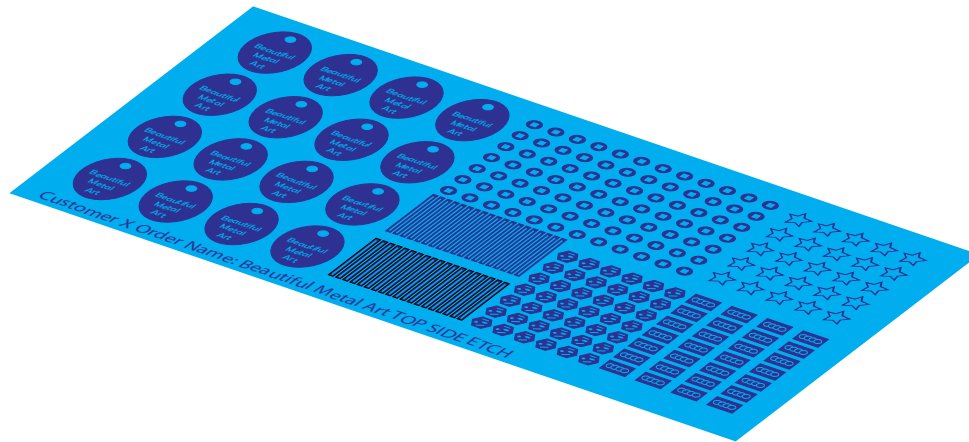
## How our process works

- We etch from both sides of the metal, therefore we need two artworks: top and bottom
- Your artworks are printed onto a mylar film. Black areas will be etched, clear areas will not.
- Metal coated with light sensitive “resist” is sandwiched between top and bottom artwork.
- The film emulsion makes intimate contact with the resist surface.
- Light shines down on the metal through the artwork

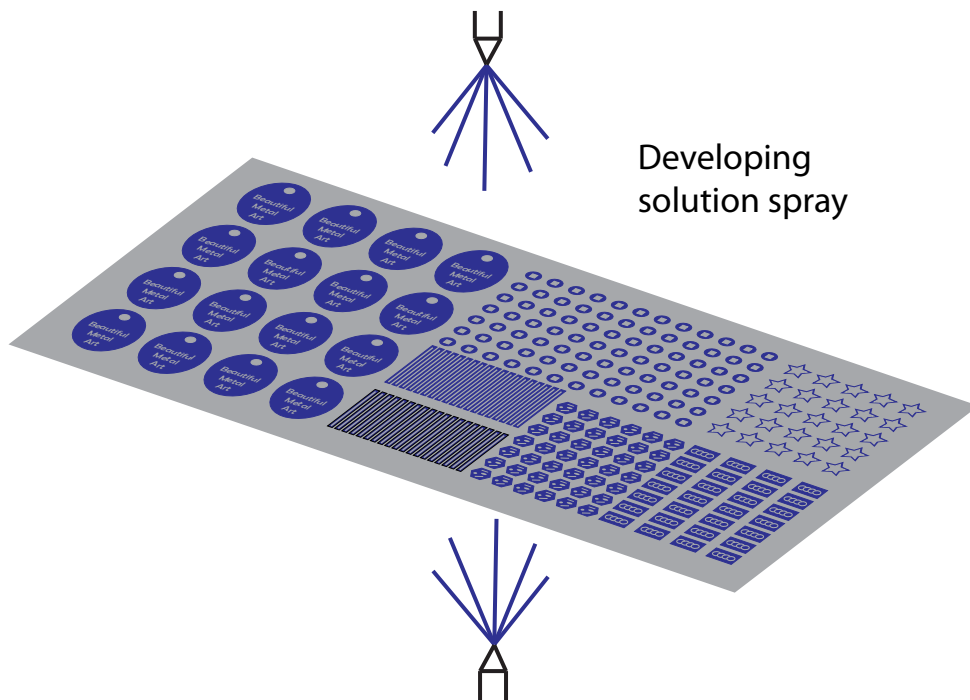
Light source



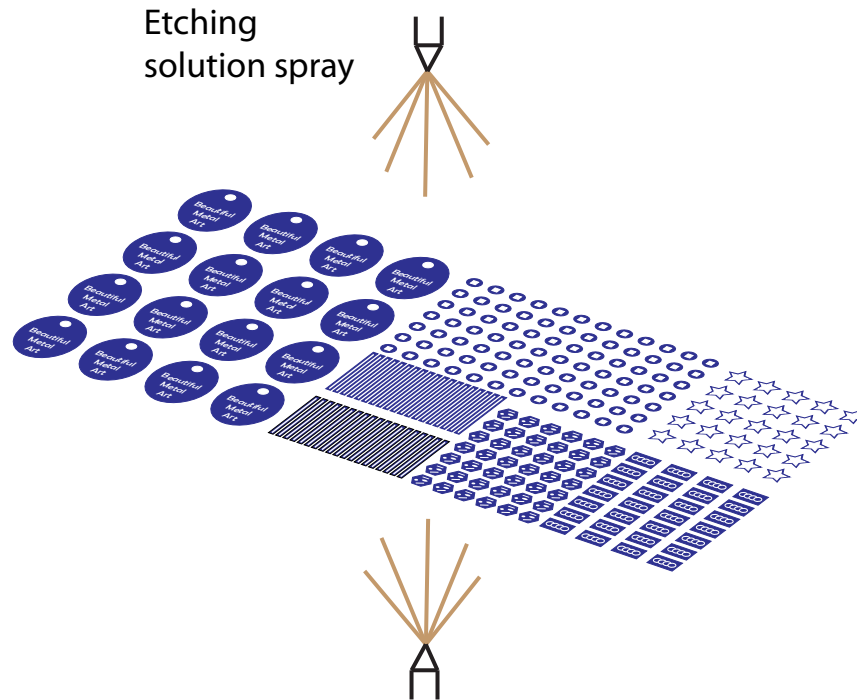
Resist coated metal has been imaged,  
and is ready for developing



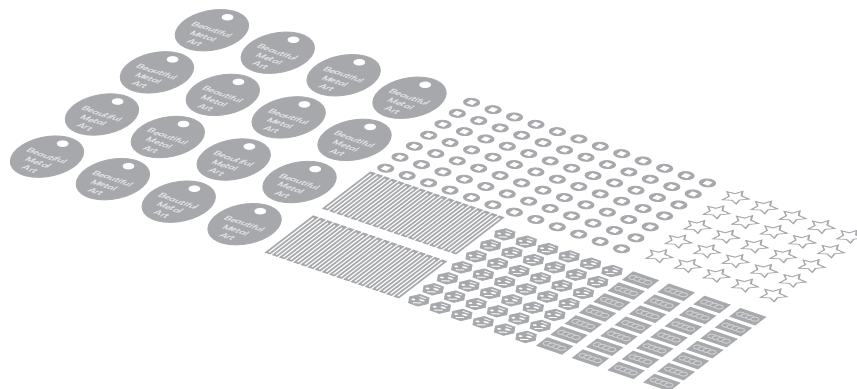
Resist exposed to light will stick to the metal. Anything not  
exposed will wash away in the developing solution. This exposes  
the bare metal underneath.



Acid is sprayed onto sheet from both sides. It eats the exposed metal. The resist covered metal is protected.



The resist is chemically stripped off. The pieces are then cleaned, sorted, inspected and packaged.



# Metal Parts Design Guidelines

Some details to remember:

- We require vector designs, and accept PDF files (from Adobe Illustrator, Corel Draw, and similar)
- Black areas will be etched away. White (clear) areas will be metal.
- Create all etched features in grayscale 100% black, RGB mode (Adobe Illustrator)
- Minimum feature size should be no smaller than the thickness of metal. For example, 0.020" thick piece, smallest feature size is 0.020".
- Add etch compensation to your designs. See the guidelines below.
- Leave about .10" between your parts. This will minimise damage in the etching process.
- Arrange similar parts near each other on the sheet. Examples on the following pages.
- ‘Outline’ all text- (break it down to shapes, not fonts)
- Choose between 6x6, 12x12, and 12x24 sheet size (see Sheet Layout page for more information)

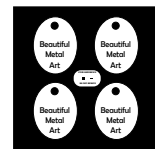
**For best results, use our  
design guide templates.**

**6x6**

**12x12**

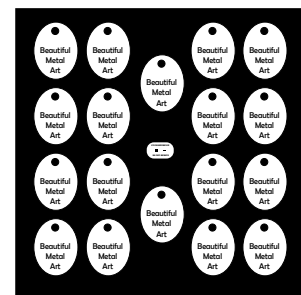
**12x24**

**6x6**



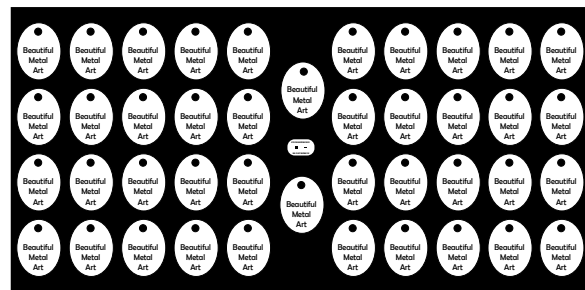
**12x12**

**(11.5 x 11.5 usable area)**



**24x12**

**(23.5 x 11.5 usable area)**

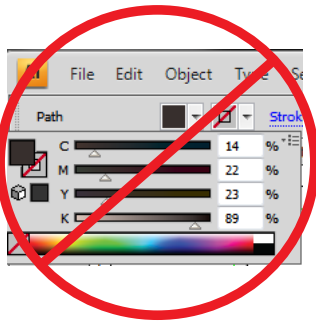


# Design process example

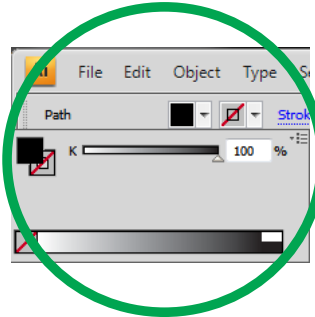
## Step 1: Create Design

Document must be in black and white.  
Etched features must be 100% black:

**NO!**



*If using Adobe Illustrator, set document mode to RGB and create all etched features in grayscale, 100% black*

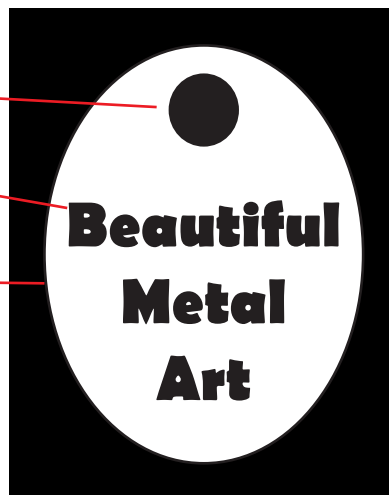


**Black areas will etch away...**  
**Clear (white) areas will be metal.**

*Hole etched through*

*Text etched on top surface only*

*Body of piece*



# Step 2: Add etch Compensation

As the acid eats down into the metal, it eats to the sides as well. (Figure 1)

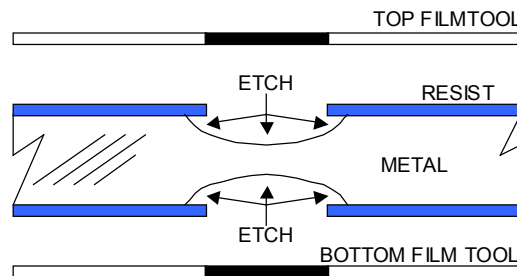
The finished piece will have "undercut" when compared to the artwork (Figure 2)

Therefore you should compensate all features and text accordingly so the finished features do not blur together, and are sized correctly. A good rule of thumb is reduce/enlarge features by 1/2 the metal thickness, but no more than 0.007"

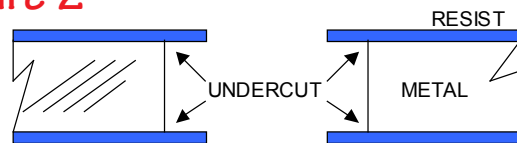
For example, this cross section shows the artwork, photo-resist, and metal.

Piece is 0.010" thick, and therefore the etch compensation will be 0.005" (0.0025" per side)

**Cross-section Figure 1**



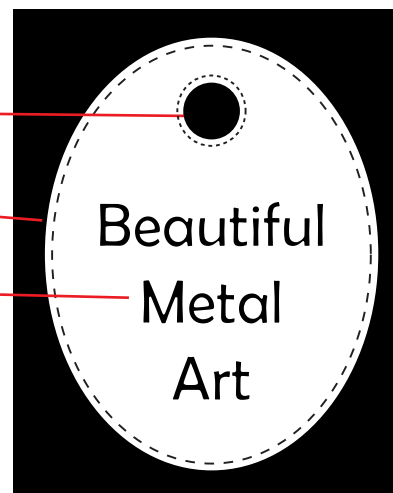
**Cross-section Figure 2**



*Reduce inner feature size*

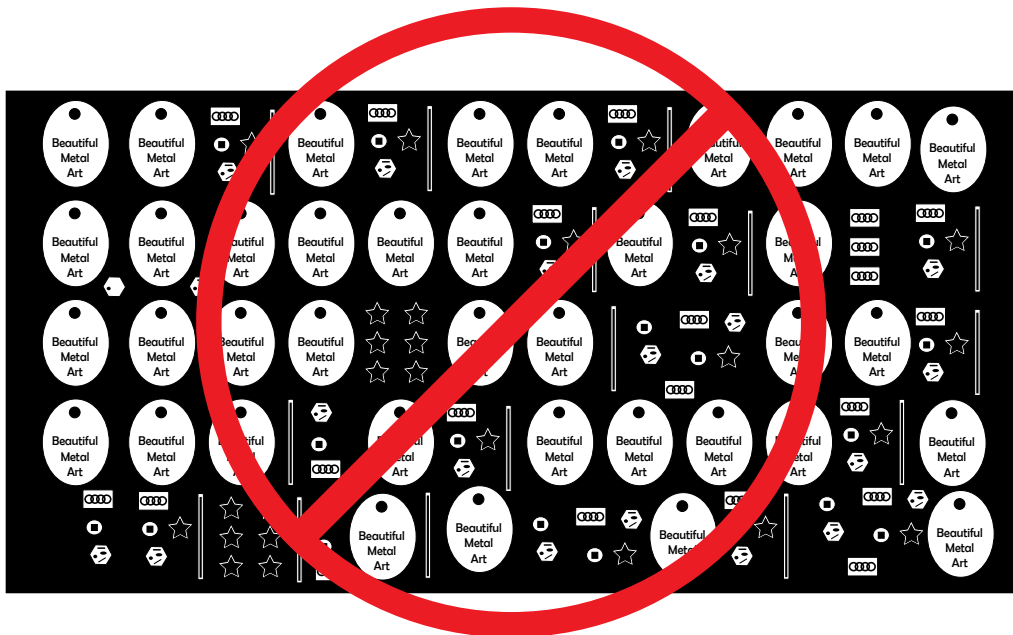
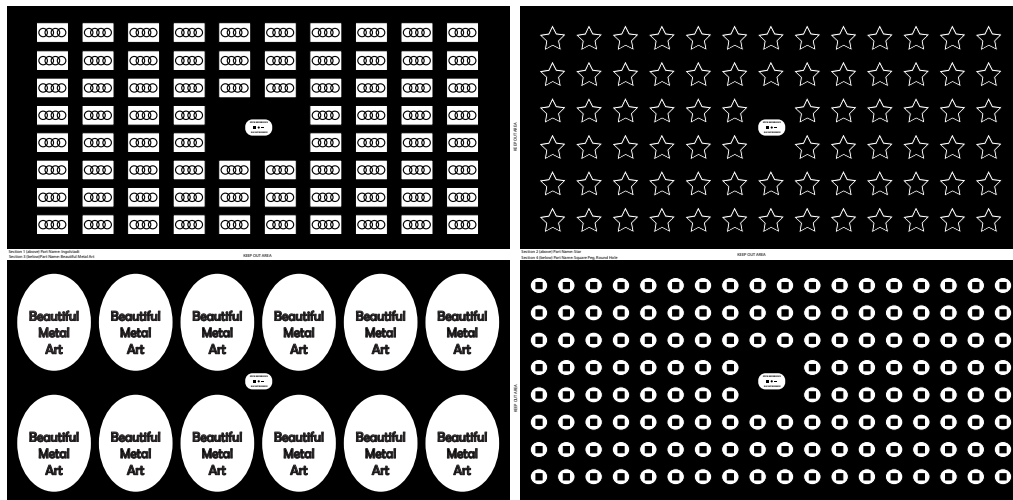
*Outer features enlarged*

*Text and half-etched features  
slightly thinner*



# Step 3: Create sheet layout

- Use our design templates to create sheet layout
- Arrange each part design into it's own section. One design per section only.
- Keep .10" between parts, and note keep out areas



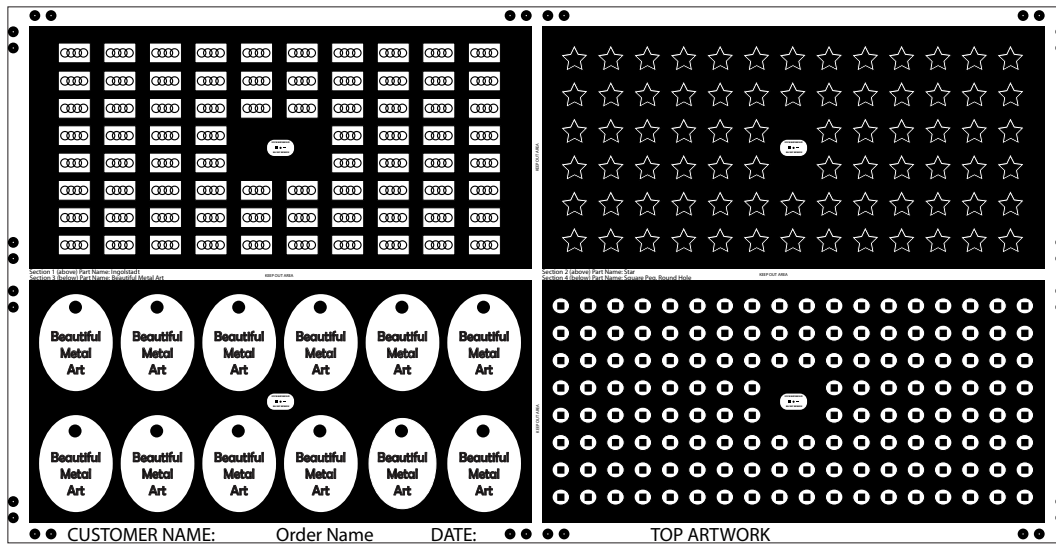
Miss-matched pieces will cause inconsistent etching and poor quality.



# Step 3½: Label your sheet

## 24 X 12 Layout example

With a properly labeled sheet and designs,  
you can re-order your pieces with ease  
and you will not need to resubmit new artwork.



## Label the sheet as follows

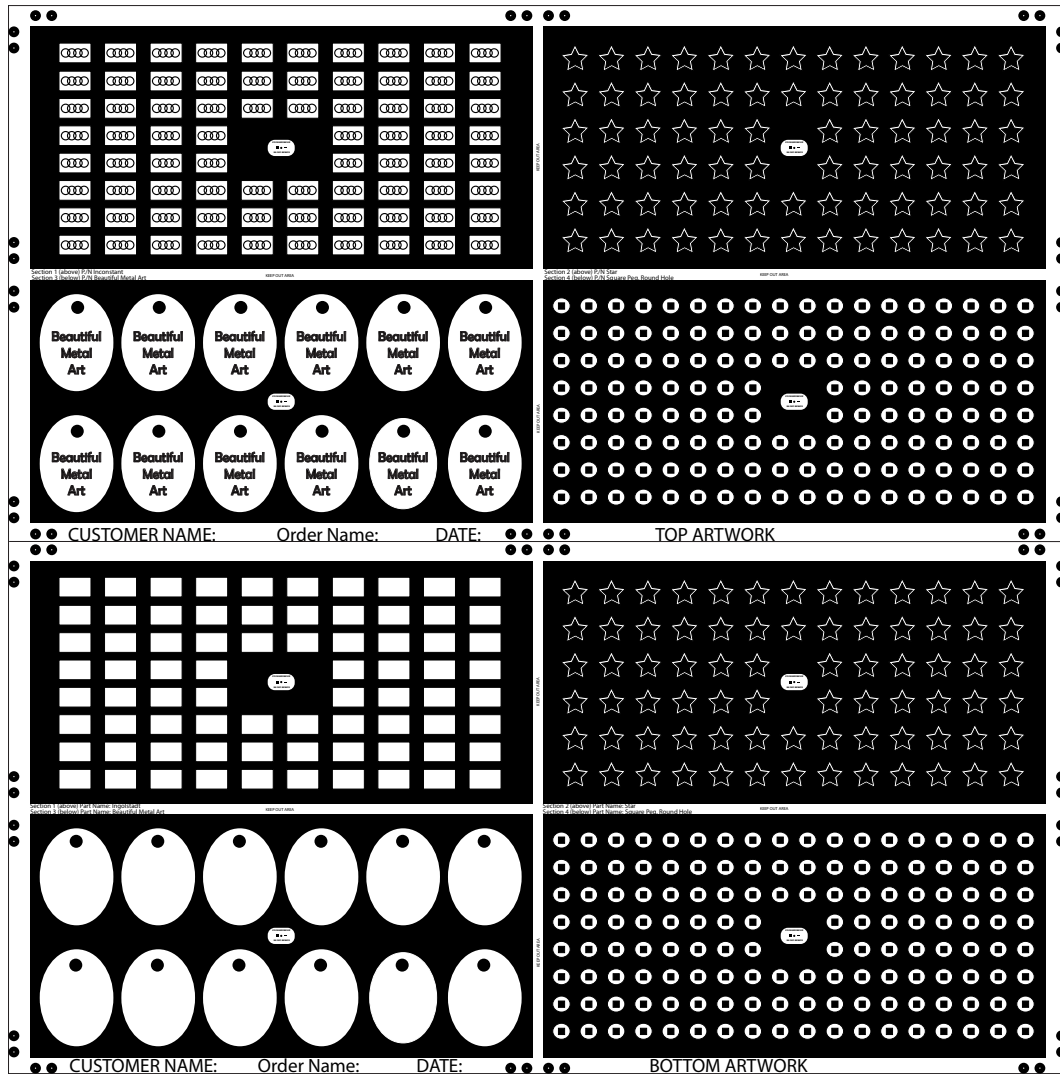
- Label each section as shown - remember like parts in each section
- Label the sheet with your company name, Order Number, Date and "Top Film" or "Bottom Film"

## Include reference marks

- Etch reference in the center of each section
- All circular alignment marks around perimeter
- Note Keep Out Areas
- All as shown in our design templates

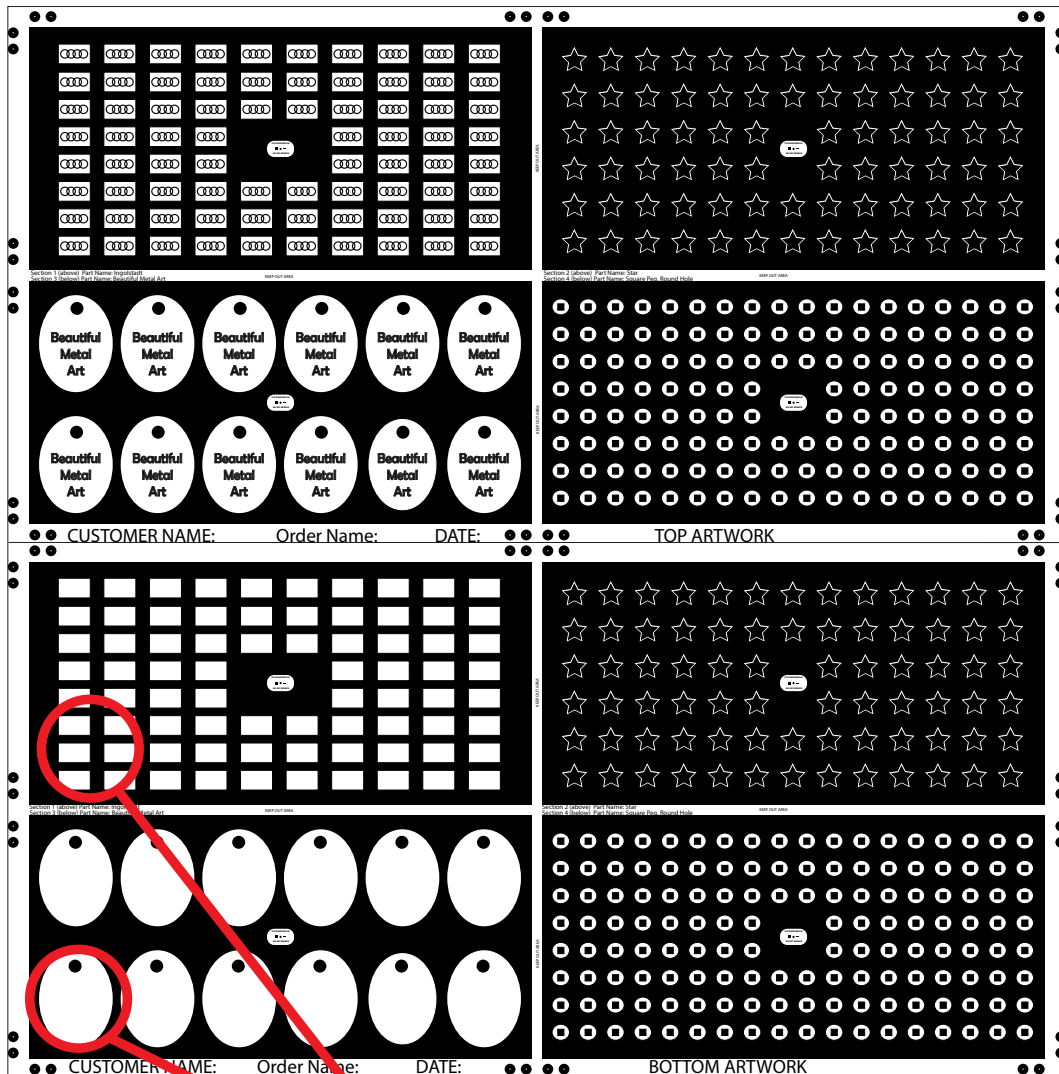
## Step 4: Create Top and Bottom artwork

Make Copy of artwork,  
Creating 2 artworks total:  
one for Top and one for Bottom



# Step 5: Half Etched Features

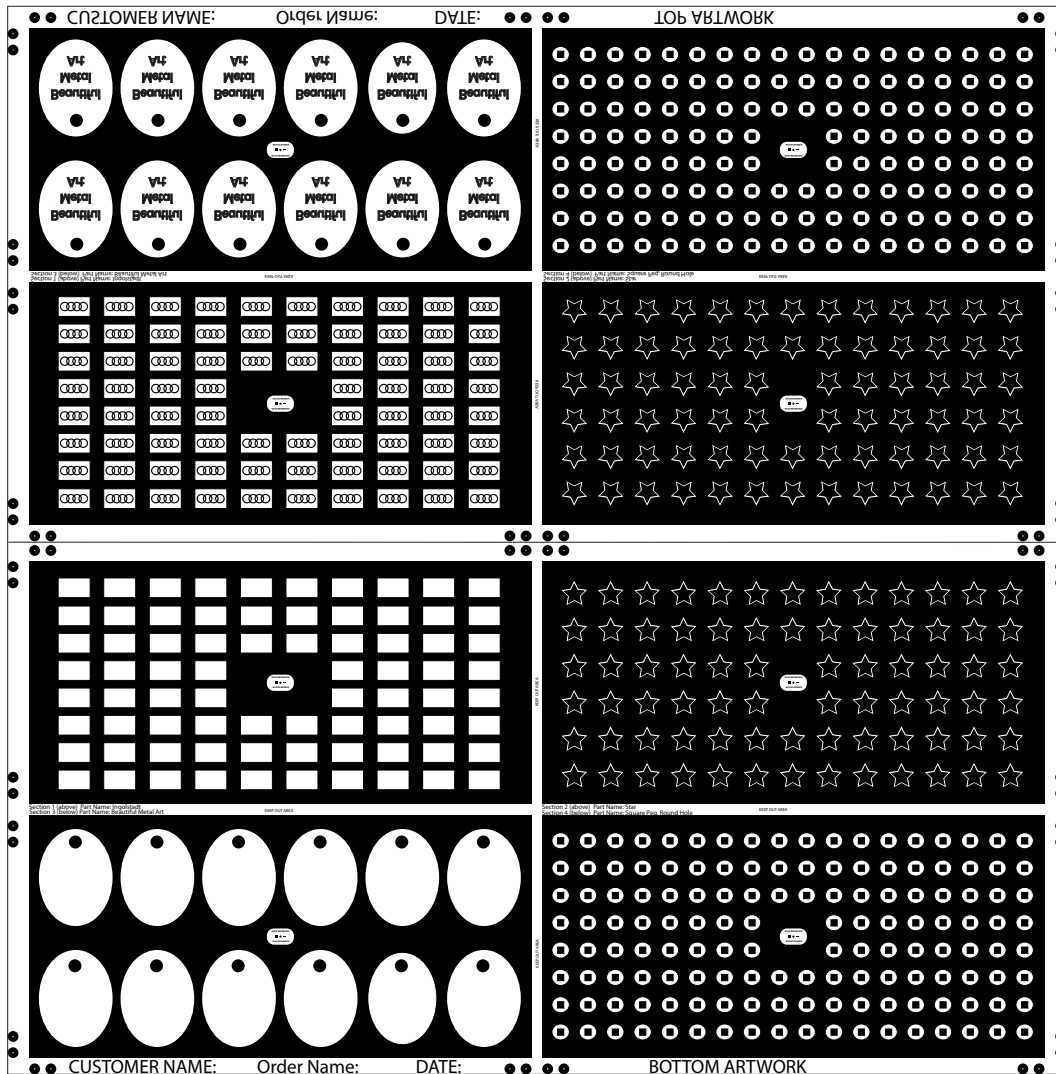
If some features are only half-etched, then those features should only appear on one artwork



Remove half-etch features  
from the non-etched side  
(Etched only on top surface in this example)

## Step 6: Mirror Top artwork

Our film emulsion must have intimate contact with the resist coated metal. Therefore the top artwork must be mirrored.



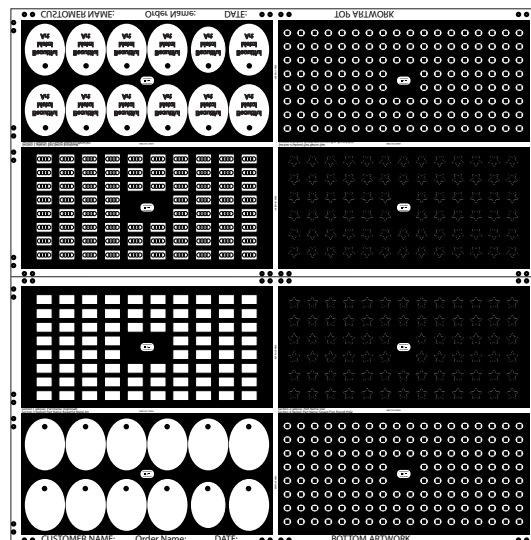
# Step 7: Prepare file and submit

Top and bottom artwork to be in one PDF file as shown in our design templates.

Submit your file and order information to: [order@greatlakeseng.com](mailto:order@greatlakeseng.com)

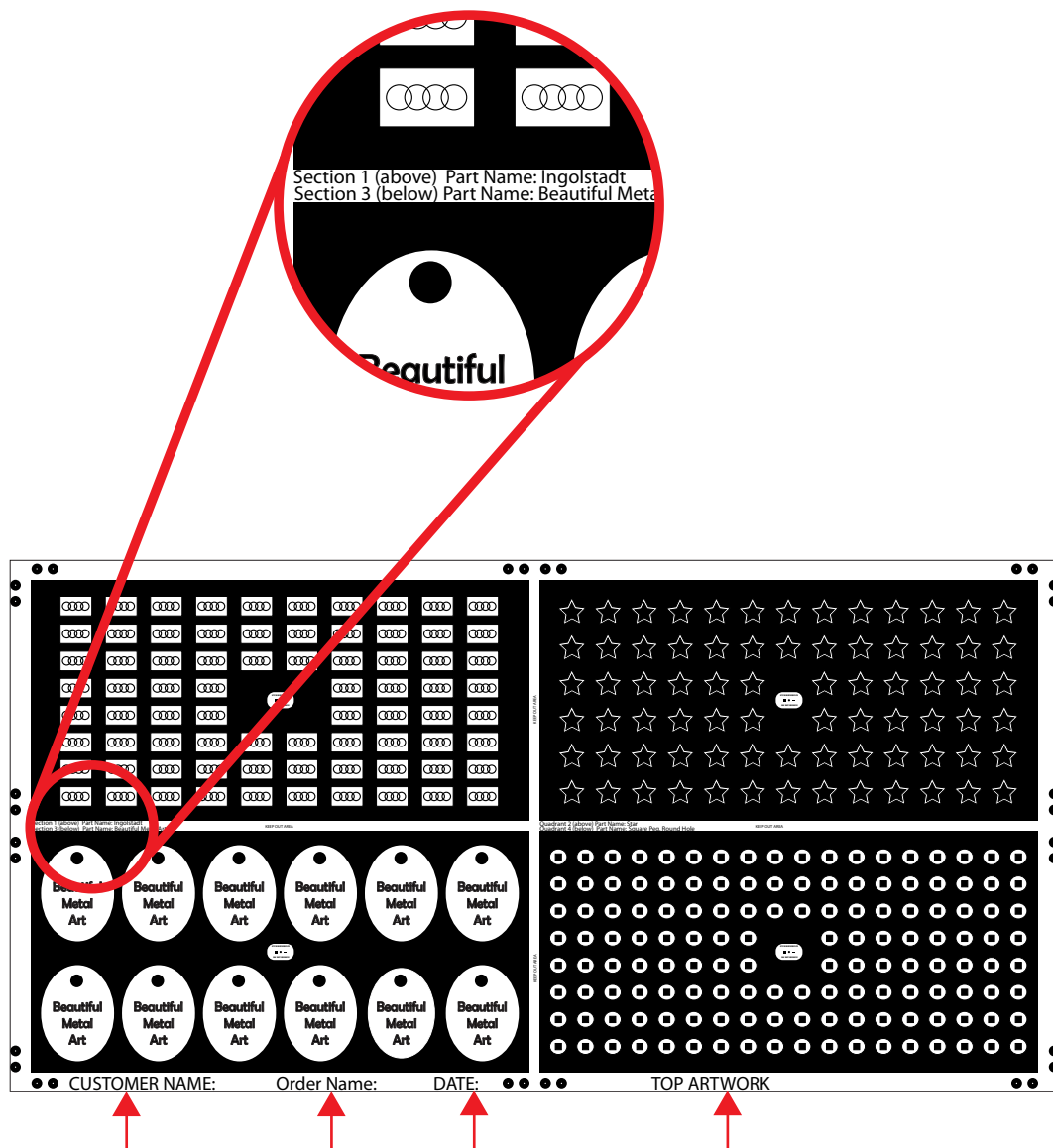
Include the following information:

- Your Company Name
- Your Name
- Bill to and Ship to addresses
- Desired shipping method (ground, overnight, etc)
- Type of metal desired
- Thickness of metal desired
- Quantity (in sheets or pieces)



# Ordering and Reordering parts

Be sure to have a labeling/numbering scheme for your orders, and label the artworks. Then if you need to reorder the same designs, we can easily reference the artwork we have on file, and you will not need to resubmit another artwork.



Note artwork labels

# Order Check list

- \_\_\_ Use our design templates: 6x6, 12x12, or 12x24 with Etch reference and alignment marks.
- \_\_\_ Vector drawings in PDF format (from Adobe Illustrator, Corel Draw, and similar)
- \_\_\_ Black areas will be etched away. White (clear) areas will be metal.
- \_\_\_ All etched features in grayscale 100% black. RGB mode (Adobe Illustrator)
- \_\_\_ Minimum feature size should be no smaller than the thickness of metal.
- \_\_\_ Add etch compensation
- \_\_\_ .10" between your parts
- \_\_\_ Each design in its own section on sheet (designs not mixed together)
- \_\_\_ 'Outline' all text- (break it down to shapes, not fonts)
- \_\_\_ Label the sheet with part names, order numbers, etc.
- \_\_\_ Create Top and Bottom artwork together in one file as shown
- \_\_\_ Remove half-etch features from opposing artwork
- \_\_\_ Mirror the top artwork (for example, text should appear wrong reading on top artwork.
- \_\_\_ Submit order to [order@greatlakeseng.com](mailto:order@greatlakeseng.com) with the following:
  - \_\_\_ Your Company Name
  - \_\_\_ Your Name
  - \_\_\_ Bill to and ship to addresses
  - \_\_\_ Desired shipping method (ground, overnight, etc)
  - \_\_\_ Thickness of metal desired
  - \_\_\_ Type of metal desired
  - \_\_\_ Quantity (in sheets or pieces)