Etching Artwork Guidelines

If you have the means, ability, and patience to create your own designs and provide your own digital artwork les, this section is a must-read. Otherwise, contact one of the artists with your source material to help you get started, and you can skip this section.

PEI oers in house design and artwork services for customers not able to provide etch-ready artwork at a modest one-time charge. We can completely set up your project from design to photo tool. If you wish to prepare and provide your own etching artwork, here are the specications, which need to be adhered to. All submitted etching artwork is subject to approval by the Art Department manager. We may contact you to make adjustments in your artwork to make it suitable for our process; we can make these modications to your art if you wish; additional artwork charges will apply. If you'd like to use your artwork as-is, we will give your artwork a best eort to make it work, although customers submitting their own artwork as-is are responsible for the outcome of the final product.

Etch-ready artwork is dened as digital le(s), which need no modication to be used on the photo tool. Only Adobe Illustrator vector based les, with a CS5 preview, are acceptable for etch-ready artwork. Raster images, such as JPG's and TIFF's, copied and pasted into an Illustrator le do not qualify as etch-ready artwork.

Artwork submitted as etch-ready must be vector based CMYK artwork at 100%, all in 100% black and white, right reading, at a minimum of 300 DPI. Depending on artwork setup, black will either etch through, or, half etch into the metal surface, while areas which are white on both sides of the tool, remain the full metal thickness. All text must be converted to outlines. Front, back, and screen print masks must be in perfect registration, and remain on separate layers and clearly identied on each layer, front, back, with Pantone Matching System numbers for the printing masks as well.

Process Overview

Before we can begin to prepare an artwork le for etching, you need to understand the process, and artwork preparations for it. There are some basic features, considerations, and adjustments, which all artwork must contain to be able to withstand the etching process.

A photo tool is dened by two pieces of film, emulsion to emulsion, to create a sandwich, in which a photo sensitized metal sheet can be inserted, and by applying a UV light in a vacuum frame, the image is transferred from the photo tool, on both sides of the metal sheet in registration, to the emulsion on the metal surface. This exposed sheet is then developed on both sides, very much like a photograph, or printing plate.

The result is a metal sheet with the protective emulsion removed from the areas which are intended to be etched, while the area which is intended to retain the full metal thickness are protected by the photo resist.

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The sheet is then subjected to chemistry on a conveyor that travels through the etching machine, which sprays and dissolves the exposed metal that runs through several etching chambers. The etched sheet is then taken to what is termed the “stripping” portion of the process. The stripping process removes the remaining photo resist from the sheet, baring the entire surface for secondary operations such as plating, cut o, and assembly of three dimensional parts.

For all etched metals, there is an etch factor which is either added or subtracted to the artwork, to arrive at the desired size. Outside edges shrink, while pierced through areas enlarge. On the average, an etch loss for decorative etching is about 20% of the metal thickness. For example: the etch loss of .020” metal is .008” (stock x 20% x 2) we have taken into account this loss when coming up with the following standards. The only exception to this rule is when the artwork is set up to etch completely to the edge. Since resist is not present on both sides of the sheet, the rate of etching increases to 30% of the metal thickness.

Piercing and Half Etching

The photo tool is the controlling factor for piercing or half etching the metal sheet. To pierce or half etch a specic area, the lm retains the black emulsion on both sides of the front and back lm sandwich. These two areas must align within .001” for decorative purposes. Areas which are intended to be pierced, must have a line width of no less than 1.5 times the thickness of the metal to be etched. For example: to pierce an area on .020” metal, the minimum width of the artwork on both sides must be .030”. This allows consistent piercing across the sheet. Calculating the minimums begins with the target metal thickness. Establishing your metal thickness is key to correctly adjusting your artwork.

Half etching is dened by etching into the surface of the sheet without piercing. Simply put, half etch is achieved by putting lines or larger black areas on one side of the photo tool only. Half etch may be applied to both sides of the photo tool, as long as the artwork is separated front to back by 1.25 x the metal thickness. There is no standard maximum to the width of the half etch areas, although there is a minimum. Lines or emulsion areas smaller than .005” will not consistently expose to the photo resist, and will create rejects; lines under this size are unacceptable. For most decorative half etch work, a .006” line is the thinnest line, which, will consistently image. Use the .005” line only if absolutely necessary.

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Photo Tool Artwork Requirement Guide

Etch Through, or Piercings

No less than 1.5 times the metal thickness at the smallest point of the etch through area on any metal thickness.

Half Etch Lines

No less than .005", or .35 point line. Use .0055-.006, or .4 point line weight and above for normal circumstances.

Half Etch Line Spacing

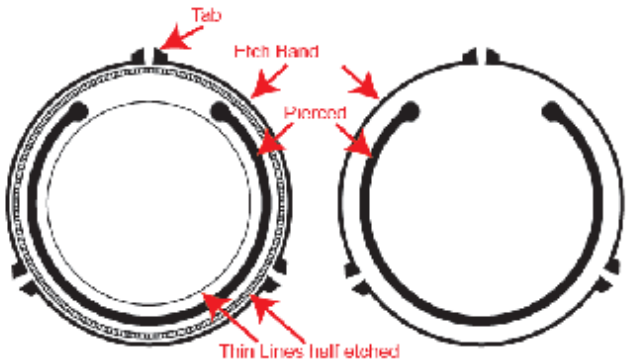
No less than 1.5 times the depth of the etching.

Bar Weights

Any full metal thickness bar, which is pierced on both sides, must be no less than 1. 5 x the metal thickness.

Etch Band

Each piece must include an etch band in order to release it from the sheet while being etched. The etch band consists of a black band surrounding the etched part and must appear on the front and back of the etching artwork. Etch bands must be no less than 1.5 times the metal thickness in width. For maximum versatility, the etch band is most eective as a 100% black CMYK ll on the bottommost layer. Etch bands must not include a stroke.



Front

Back

Screen Print Mask

Illustration of Finished Piece

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Tabbing Requirements

All pieces need to be tabbed into the sheet to prevent them from falling out of the sheet while being processed, and support the piece inside the sheet. After etching and plating, the pieces are clipped from the sheet at these points. Varying metals and thickness require specic tabs. Please contact our art department for the correct tab based on your metal thickness and planned process. We will provide you with the appropriate tab in an Adobe Illustrator format, which can be copied and pasted directly on to your design. The number of tabs will vary depending on your chosen process as well. Size of the piece also gures into the equation. Please see the specics below as a general guide for using tabs:

Any piece 1" in diameter or less may have only one tab.

Any piece 1" to 2.75" in diameter must have a minimum of 2 tabs, one placed at 0 degrees, and the other at 120 degrees.

Any piece 2.75" to 3.5" in diameter must have a minimum of 3 tabs, placed at 0, 120, and 240 degrees.

For sizes over 3.5", and tabbing for pieces meant to be silk screen printed, please contact the Art Department for the correct number and placement of tabs.

Silk Screen Printing Mask Artwork

Silk screen masks are generated at the completion of the front and back artwork, and overlaid on separate layers for each color on top of the etching artwork. All areas to be printed are to be 100% CMYK black, with a separation of no less than .005" from any half etch line or outside edge of the etching artwork. Minimum registration is plus or minus .001". Each color is to be on it's own separate layer and labeled with the appropriate Pantone Matching System color. We use the PMS Solid/Coated book as a guide, so make your color selections from that book if available.

Silk screen color cannot be printed into recessed or etched areas; all areas meant to be screen printed must remain full metal thickness.

Each color is printed on it's own mask, typically from light to dark. White is usually laid down first, and the darkest color value is used as a trap. Colors may be overprinted, so please bear this in mind when setting up your artwork. Alternatively, most colors can be printed directly on the metal, but take on a bit of the substrate color. Printing on gold gives the color a bit more yellow, and printing on a silver-like nish as in imitation rhodium tends to add a gray hue to the color. To eliminate this eect, use a white undercoat for optimum color brilliance.

Colors can be printed in a gloss or matte nish. These nishes can be combined for dierent eects providing that they are on separate masks.

The smallest line, space, or dot that can be printed is .007". Please be sure your screen-printing art meets these requirements in order to be repeatable.

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PEI Decorative Artwork Guidelines

Supplying 4 color process images for inclusion on your design

You may want to include a photo, or a graphic for inclusion in your nal design. Typically, these are reproduced as polyurethane domed decals for smaller runs, or as red-on decals on porcelain, which are then adhered to the etched and plated portion of your design. These techniques may be combined with screen-printing if desired. Please provide us with a high-resolution image, 300 DPI or greater, along with a clear illustration of the desired cropping for the nal piece.

Designing Artwork for Additional Processes

The application of additional processes, such as post polishing, and others require additional compensations for specic operations. If you are considering these types of secondary operations to your design, please contact the Sales or Design department for additional information.

For more exacting etching artwork specications, please see the artwork guide for our Precision Division at the following link: http://www.photofabrication.com/explore/document-center/

Once you've completed your design, please submit it to us for review. At this point, your design is ready for the second step; photo tooling!

Photo Tooling

Once you are happy with the design and quotation phase of your project, we then proceed to the photo tooling stage. During this process, the original les, which make up your design are closely nested together, to optimize the yield per sheet, and stepped and repeated onto at least two large pieces of lm. Films for additional post etch processing, such as silk-screen printing, are also generated at this point. Once the tooling is completed, the design is ready for production!

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