Engraving Overview
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Engraving Overview - Part 1:
UNDERSTANDING EQUIPMENT AND MATERIALS

Engraving Tools

Engraving Cutters - The term engraving cutter is an all-encompassing one that covers a multitude of different tools used in a variety of different engraving applications. If we are to get the most out of our equipment, it's important that we know what's available and where they are used.

Diamond Gravers - The most common engraving tool used in the trophy and awards industry is the diamond graver which is a non-rotating, diamond-tipped tool that is used to scratch lettering into metal - usually brass or aluminum. It consists of a steel shank which has a diamond set in one end that is ground and lapped to a conical point. It is used without a depth nose and, as downward spindle pressure is applied, the point penetrates the surface of the metal and scribes a fine line as the character is formed. Diamond gravers are not available in different tip sizes so we are limited to a rather fine, delicate line of about ten thousandths (.010) in width. A common practice used to enhance the effect of scratch engraving is to trace the letters two or three times. This tends to broaden the stroke and smooth it out. The use of multiple line fonts is also a good way to add dimension to this type of engraving and the lettering can be blackened with oxidizer to give it contrast.

Rotary Cutters - Rotary engraving is a term that is commonly applied to the type of engraving done on plastics and metals where we cut into the surface of the material. As the name implies, it is done with a rotating cutting tool in a motorized spindle. The rotary cutter is generally a single-flute tool (one with only one cutting edge) that works much like a router bit and produces a cut of specified depth and width. Depending upon how they are made and sharpened, rotary cutters can be used to engrave a wide variety of materials with plastic and metal being the most common.

Burnishers - Burnishing is a method of engraving on metals that tends to bridge the gap between scratch engraving and rotary engraving. It is capable of producing wider line widths than a diamond graver without having to rout deeply into the metal. It is a surface marking technique that is generally done on coated metals. It is most commonly used to produce decorative effects on trophy and plaque plates.

The tool used for burnishing is called a "burnisher" which is a rotating tool that is used in a motorized spindle. It is usually a carbide or carbide tipped-tool that is ground with four facets that form a cutting edge to the desired tip size. A burnisher is not a cutter. Its function is to remove the surface coating from the material and expose the bare metal.

Specialty Cutters - In addition to the standards listed above, there are many other cutter variations that are used for specialty applications.

Parallel Cutters - Cutters whose cutting edge is parallel to the shank of the tool. They produce a straight cut and are used for cutting out shapes or making cut-outs in panels.

Profiling Cutters - Cutters that have a narrow angle and are used for cutting through material in similar applications to the parallel cutter, but produce a slight bevel on the edge of the material.

Ballnose Cutters - Have a radius at the tip rather than a flat. They produce a cut with a rounded bottom and are typically used for reverse engraving.

Dovetail Cutters - Produce a cut that has a reverse bevel and are used for making signs that have removable legend strips.

Quarter-Round Cutters - Provide more clearance than half-round cutters.

Rotating Diamonds - Faceted diamond tools that are used in rotating spindles to engrave glass.

Rubber Stamp, Seal, Pens - These are variations of standard cutters that are manufactured and sharpened for specific applications such as engraving rubber stamp matrix, notary seals, coated pens, etc.

Engraving Materials

Plastics
Definition: Sign material consisting of a plastic core overlaid with a surface cap of a contrasting color.
Different kinds:
1) Phenolic
2) Flexible Types of flexible engraving plastic:
A) Laminated products
B) Micro-surface products
C) Coextruded products

General characteristics of flexible engraving plastic:
1) Can be shear cut (some manufacturers recommend saw cutting gauges thicker than 1/16")
2) Can be hot-stamped or screen-printed
3) Can be chemically bonded or glued
4) Heat bendable
5) Some are suitable for outdoor use

Metals
Brass
1) Trophy brass
2) Leaded or engraver's brass

Aluminum
1) Lacquered aluminum
2) Anodized aluminum

Pewter

Stainless Steel

Other Engraving Materials
Glass
Wood
Simulated stone, e.g. FOUNTAINHEAD®, AVONITE®

Material Fabrication
Definition: Any alteration of sheet stock material into a smaller size or different shape.

Doing it yourself vs. buying materials pre-cut to size
Advantages
1) More flexibility
2) Faster turn around time
3) Greater control over cost
4) Greater control of quality
Disadvantages
1) Initial start-up expense
2) Safety considerations
3) Will affect your inventory control

Equipment and Techniques
Suggested "Starter Package" for the do-it-yourselfer:
1) Table shear
2) Beveler
3) Corner rounder
4) Hole punch

Future items for your consideration:
1) Table saw (safety saw)
2) Router
3) Drill press

Engraving Overview - Part 2:
ENGRAVING TECHNIQUES, EFFECTS, AND ENHANCEMENTS

FONTS AND TYPE STYLES - The lettering used in printing and engraving are referred to as fonts. The proper use of fonts determines to a large extent the overall appearance of the finished product.

1. Font Selection - Fonts range from the simplest, single-line Gothic to very ornate and elaborate styles such as Roman and Old English. By matching the appropriate style to the application we can achieve the proper degree of aesthetics and utility. Roman lettering would be out of place on a valve tag, but ideal for a presentation item like a plaque. Gothic is good for a machinery plate, but not decorative enough for a gift item. (Figure 1)

Good   Bad   Good   Bad

ON / OFF   ON / OFF   *In Loving Memory...*   In Loving Memory...
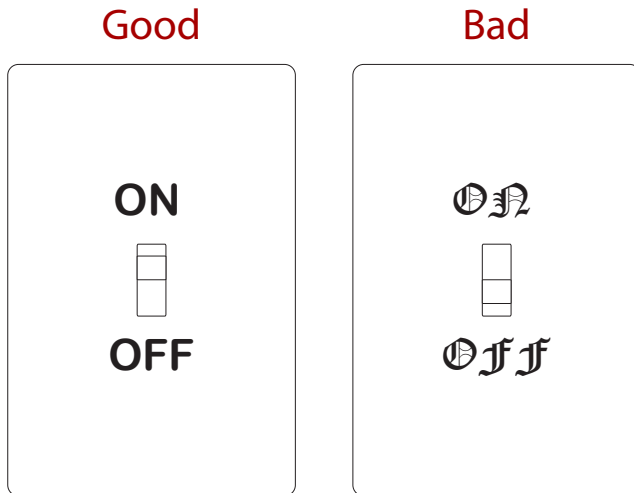
2. Proportion - Font size and attributes should be aesthetically pleasing and proportional. A bold font that is too condensed looks crowded and is difficult to read. One that is too light in proportion to its height looks equally unappealing. The best way to keep fonts in proportion is to size them according to the space available (height and width) and then apply the appropriate attributes keeping things readable and pleasing to the eye. (Figures 2 & 3)

Figure 2
Font Selection

FONT
FONT
FONT

Figure 3
Proportion

A   A   **A**
Light   Regular   Heavy

3. Justification - This term applies to the horizontal position and spacing of text on a plate or sign. (Figure 4)

Figure 4
Justifcation
(a.k.a. Alignment)

Left Justified
Right Justified
Center Justified
Full   Justification

Center Justification - The most common style in the awards and engraving industry. The center of each line of text is positioned on the vertical centerline of the plate or page. This balances the text but leaves a "ragged" appearance in relation to the margins.
Left Justification - Is where the first letter of each line starts at the left margin.
Right Justification - has the last letter of the line of text at the right margin.
Full Justification - has the first letter of the line on the left margin and the last has the letter on the right margin.

There are no hard and fast rules as to which is best or most desirable, but as for rules of thumb, centering seems to work for trophy and plaque plates, left or right justification lends itself to more creative effects for architectural signage applications and full justification is often preferred in mechanical or technical applications.

4. Kerning - Before computers, typesetters and engravers had to be concerned with the space between letters or "kerning". Most characters in our alphabet can be placed along side each other with equal spacing and the look is uniform, while others, due to their shape, need to have their spacing adjusted in order to maintain uniformity and a pleasing appearance. Most computer engravers have an kerning option, so there's no reason not to have perfect spacing. (Figure 5)

Figure 5
Kerning

WAVE WAVE

5. Color filling - One method of further enhancing the appearance of our fonts and lettering is color filling. By adding color and contrast we can improve the readability and add eye appeal and decoration to many of our engraved products.

Diamond drag or burnished brass plates can easily be oxidized which creates black letters on a brass background. The letters on rotary engraved metal and plastic plates can be filled with paint or other materials. Color filling is a finishing touch that can both utility and value.

6. Single and Multi Line Fonts - Fonts generally fall into two categories. Single line fonts are fonts in which the line (or stroke) that makes the shape of the character is one width and can be cut with a cutter the same width as the line. These fonts are very simple and are frequently used for more basic jobs such as switch plates, valve tags or basic name badges. Multi line fonts (or fill fonts) are fonts where the stroke of the character does not remain constant. These fonts are more "fancy) and can be found on awards, architectural signage, name plates, etc. In the example below, see that the top of the multi-line "O" is only one cutter wide, while the side if the character is almost seven cutters wide. This example is making the assumption that a much smaller tool is being used for the multi-line font to achieve the detail and variation in width. Most engraving software will compute the fill pattern for you based on the tip size of the tool. You can see that the multi-line font will take much longer (approximately 7-8 times longer) to cut than the single line font. Let the application and the customers' needs determine which style of font to use.
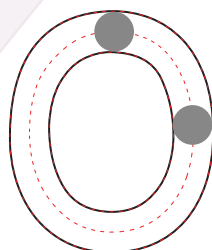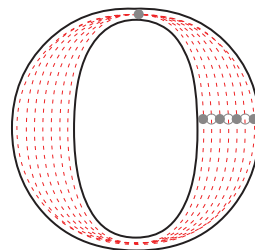
Figure 6

Single Line Font
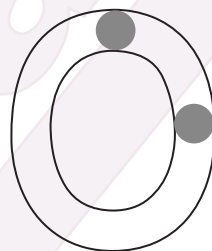
Multi-Line Font
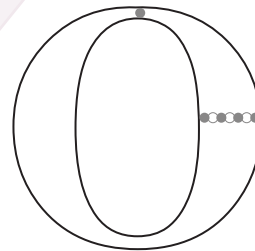
Single Line Cutting Path

Multi-Line Fill Path

A few fundamental guidelines to help the new engraving or award retailer.

Define Your Market
Keep stress levels to a minimum.
Control costs.
Determine your strengths and weaknesses.

Join Trade Organizations
Practical training.
Product knowledge.
Industry education.
"Rub elbows" with others.

Advertise
Regional market: Yellow Pages
National market: Yellow Pages, trade journals, industry publications
Be specific to attract buyers.

Choose a Good Supplier
Service means more than fast delivery.
Learn to recognize the differences between suppliers.

Manage Your Inventories
Get the best buy on frequently purchased items and buy only what you need of less frequently used items.
Group your orders.

Avoid Complacency
Recognize market changes.
Watch for opportunities.
What are your competitors doing?

Be Professional
** PRESENTING YOURSELF IN A BUSINESSLIKE MANNER GIVES A GREATER PERCEIVED VALUE TO WHAT YOU HAVE TO OFFER **
Need to overcome the "new kid on the block" or "Mom and Pop" image.
Be a business person.
Stress a quality product and professional service.
Sell what you do best!