Burnishing

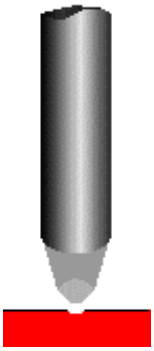
Description:
Burnishing is a surface marking technique intended for coated metals - usually lacquered brass - where the coating is removed to expose the bare metal. It is a method of rotary engraving on metals that tends to bridge the gap between diamond drag (scratch engraving) and routing. The biggest advantage of burnishing is that it enables the engraver to produce wider line widths than are obtainable with a diamond graver without having to cut deeply into the metal. Burnishers can be used with single and multiple line fonts, and are excellent for producing detailed line and logo work on metal. Burnishing offers the ability to create enhanced effects on both lettering and graphics and is relatively simple process.

Application:
The most common application is on the brass plates on trophies and plaques. This "trophy brass" is a relatively hard material that yields excellent burnishing results. It is available in various gold tones with clear or colored lacquer coatings. When burnishing the gold material, the lacquer is removed exposing the bare metal. The burnished areas can then be oxidized or blackened resulting in a gold plate with contrasting black letters. (See "Color Filling Fact Sheet"). When burnishing the colored materials, the result is a colored plate with contrasting gold letters without the need for further treatment.

Burnishing can also be done on materials other than brass. However, much of the success or failure depends on the hardness of the material. Since burnishing is a surface marking technique, it is critical that the tip of the burnishing tool does not penetrate the surface of the material by an appreciable amount. Hard materials tend to prevent deep penetration of the burnisher forcing the tool to work on the surface as it was designed. However, on softer materials the tool is able to penetrate deeper and can produce ragged edges and unacceptable results. Many of the colored aluminum products on the market fall into this category and are not ideal choices for burnishing although some can be burnished effectively using a diamond burnisher. There are also harder aluminum products available with clear or black anodize treatments that can be effectively burnished.

It is also possible to burnish metals such as steel and stainless steel. Since the burnishing tool produces a swirled pattern, the mark is visible and may be suitable for some marking applications not requiring a sharp, well defined character. Generally speaking, however, these metals do not have coatings and therefore, the burnishing can not be blackened to add contrast.

Burnishing Tools:



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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. Two of the facets form an angled chisel edge on the center of the tool. The other two facets are ground perpendicular to the chisel edge, equidistant from the center of the tool and determine the width of the tip. Antares carbide burnishers are available in widths from .005" up to the full diameter of the tool in increments of .005" (.005", .010", .015", etc.).

Diamond Burnisher

Burnishers can also be made as diamond-tipped tools (diamond burnishers or rotating diamonds) similar to those used in glass engraving. These tools produce a more brilliant effect and have a longer life, but are considerably more expensive. Diamond burnishers are standardly available in tip sizes of .005", .010", .015", .020" and .030". Larger sizes are available as special orders.

When selecting a tip size, follow the same guidelines that are used for standard engraving cutters. For example, if you were to use a .030" cutter when engraving plastic, you would use a .030" burnisher when burnishing a brass plate with the same font and letter size. Since burnishing is generally done with small, multiple-line fonts, the most common tip sizes are between .005" and .030".

Burnishers are quite durable and are capable of producing thousands of characters. Like cutters, they do become dull, however, and require periodic resharpening. As a burnisher dulls, the chisel edge becomes rounded. This produces rough edges and if allowed to continue, will result in the surface coating being smeared in to the burnished stroke and can hamper oxidizing.

Process:

Since the purpose of burnishing is to remove the coating from the surface a the material, the key to achieving successful results lies in the amount of downward pressure that is exerted on the tool. A burnishing tool is not a cutter and if too much pressure is applied, the tool will be forced into the material resulting in a rough, ragged stroke. Ideally, the tip of the tool should "float" over the surface with only enough pressure to remove the coating without digging into the metal.

To set the machine for burnishing, remove the depth nose and lower the spindle to its down position. Next, screw the knob into the spindle, slide the burnisher down through the knob until the tip contacts the plate and then tighten the set screw in the knob. Raise the spindle and then increase the "depth" a few thousandths of an inch by either adjusting the down stop on the spindle or sliding the burnisher further through the knob. Since the bases and tables of all machines are not perfectly level and material thickness can vary, it is important to set the tool at the lowest point on the plate. This will ensure that the tip of the tool will remain in contact with the entire surface of the plate.

On computerized machines where the Z-axis (up and down) is controlled by air and spring pressure, both should be set to their lowest setting. The motor speed should be relatively fast and the engraving speed should be at about the middle of its range. A slower engraving speed will produce a smoother finish in the burnished stroke.

The set-up procedure is identical for both pantographs and computerized engraving machines, however on a pantograph the correct pressure is determined by the "touch" of the operator. It is a technique that is easy to develop and the results should be equally as good as those achieved on a computer. One trick that some pantograph operators use is to remove the spindle return spring. This allows the spindle to drop on its own and float over the material. The weight of the spindle alone is sufficient to produce the desired results, but you must remember to lift the spindle when moving from character to character.

One way to simplify the burnishing process and achieve consistent results is through the use of a spring loaded burnishing attachment. These devices are used in place of the conventional knob and have an internal spring that applies the correct amount of pressure. These attachments usually require a burnisher that is longer than normal, so be sure to specify that you are using one of these attachments when ordering to ensure you get the proper length tool.