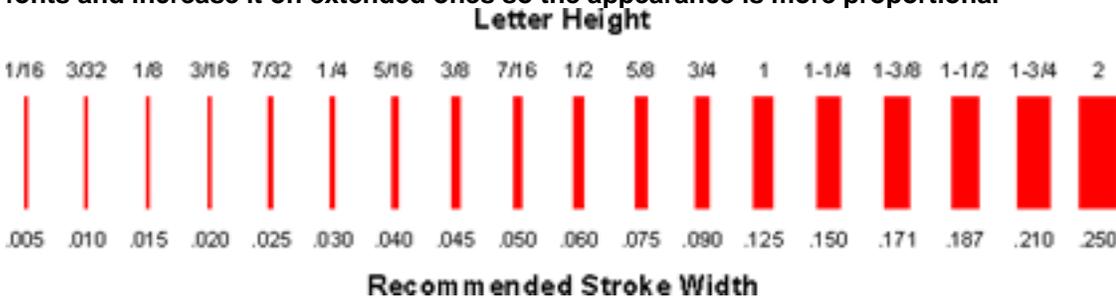


Engraving Tools FAQ'S

How do I select the right cutter width?

Choosing the right cutter width is one of the most important aspects in producing engraving that is properly proportioned and visually appealing.

Cutter width is selected based on character height and font style. In general, single stroke characters should have a stroke width that is approximately 12% of the character height. For example, a quarter inch (.250") letter should have a .030" tip ($.250 \times .12 = .030$ "). It may be desirable however to decrease tip width on condensed fonts and increase it on extended ones so the appearance is more proportional



Why are there different cutters for different materials?

The reason there are specific cutters for different materials is to maximize the quality of the cut and the life of the cutter. The primary difference from one cutter to another is the clearance angle and, in some cases the included angle of the tool.

Cutters for soft materials have a greater clearance angle and a correspondingly finer cutting edge, while cutters for hard materials have a lesser clearance and a broader cutting edge. Cutters with finer edges produce clean, burr-free engraving in soft materials, but are more fragile and they will become dull very quickly if used to engrave hard materials. Conversely, cutters with broader cutting edges are made to hold up and effectively cut harder materials, however they won't yield optimum cuts in softer materials.

Consider the difference between a kitchen knife and an axe. The knife has a fine, delicate edge and works well for cutting a tomato. Try and cut down a tree with it, however and the edge will be quickly destroyed. The axe on the other hand will do a great job on the tree, but fails miserably on the tomato.

How do I know when my Diamond Tipped Scribing Tools becomes dull?

When a diamond graver is manufactured, the diamond is ground and lapped to a conical point. During the engraving operation, the point of the tool penetrates the surface of the material and slices cleanly through it as the character is formed. A graver that is in good condition will produce a crisp, brilliant cut using moderate spindle pressure.

Through use, the point of the diamond becomes rounded. When this occurs, it does not penetrate the material as easily or as deeply and tends to tear through the metal which results in a rough and less brilliant cut. As the condition worsens, it will require greater spindle pressure and multiple passes to achieve acceptable results.

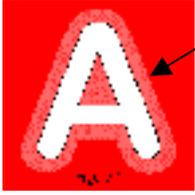
On color coated materials, a dull diamond can cause to coating to be smeared into the cut creating an uneven, blotchy appearance. On clear coated materials, the visual effect may not be as obvious, but it can adversely effect oxidizing. Since oxidizer solutions will only work on clean bare metal, those areas containing residue from the coating will not blacken and, once again, the appearance will be uneven and patchy.

What causes ridges in the bottom of the cut on multiple line engraving?

The first and easiest to correct is caused by using a cutter that is not wide enough to touch or overlap the adjacent pass. Simply use a cutter with a larger tip and the problem will be eliminated. Another possible reason is that the material is not flat on the engraving table or there may not be enough pressure being applied on the spindle to follow any inconsistency in the material when performing nose cone riding engraving. Solution

to the respective problems, secure the material in a better fashion or apply more pressure through the spring tensioner.

What causes shadowing and how do I eliminate it?



Shadowing is a "halo" effect that frequently occurs around the engraved character when the depth nose is used. It's one of the more common problems faced by engravers, but once the specific cause is identified it's usually easy to correct.

The three most common causes of shadowing are; (1) too much spindle pressure, (2) a dirty, defective or improperly seated depth nose and misaligned spindle.

Refrain from doing nose cone riding engraving on any metal or metal surface finish material.

What causes burrs or rough edges on the edge of the cut?

Burrs and rough edges can be caused by several different factors including dull or improperly sharpened cutters, improper speed and feed rates or material that is not "free cutting."

The most common cause and easiest to fix is the dull cutter. Cutters last a long time, but in time the cutting edge becomes worn and rounded. With a sharp cutter, the cutting edge enters the material and slices through it producing a crisp, clean cut with smooth edges. The cutting edge of a dull cutter pushes into the material, but instead of slicing cleanly through it, has a tendency to tear it which causes the burrs and rough edges. The easy solution is to replace or sharpen the cutter.

What is the difference between burnishing and rotary engraving?

Burnishing is a surface engraving technique that bridges the gap between diamond drag and deep-cut rotary engraving. It is an excellent way to produce broad stroke engraving on some metals that may be difficult or impossible to engrave with a standard engraving cutter.

The burnisher is a carbide or diamond-tipped, faceted tool that is generally used on coated metals such as lacquered brass or anodized aluminum. It is a rotating tool that is designed to remove the coating and expose the bare metal. Unlike the diamond graver which produces a narrow line width, the burnisher is available in mostly the same widths as rotary engraving cutters so it is possible to achieve line widths and visual effects as you would with standard cutters and fonts.

What is a burnishing attachment?

A burnishing attachment is a spring-loaded device that is used in conjunction with the burnishing tool to control the pressure of the tool against the material. There are two parts needed i.e.

* EZ-Rider Burnishing adapter (tool) *PART # BT-EZBA-01*

* Burnishing tool, 1/8" shank x 4.5" length *PART #BT-125- 010, BT-125- 015 and BT-125- 030*

The whole key to successful burnishing is to maintain a light and uniform pressure on the burnisher across the entire surface of the plate. The pressure has to be great enough to allow the tool to remove the coating from the material, but light enough to prevent the tool from digging into the material itself.

The burnishing attachment replaces the normal cutter knob and has an internal spring that allows the tool to "float" over the surface and apply just the right amount of pressure.

Is there any special care or maintenance required for engraving tools?

Engraving cutters are quite durable and with proper care should last quite a long time. When cutters are not in

use, they should be stored in their plastic tubes or a rack with their protective caps in place to protect the cutting edge. It's also a good idea, especially in areas where there is high humidity, to wipe the cutter shanks occasionally with a light oil to help prevent rusting or oxidation.

The most important thing is to make sure you always have sharp cutters. Sharp tools are essential for producing high quality engraving. As cutters dull, quality goes down and production time goes up if you're having to spend more and more time cleaning up the engraving with a tooth brush.

What is nose cone and non-nose cone riding engraving?

Nose cone riding is the technique referred to when the spindle "rides" on the surface of the material during the engraving process. The nose cone is the part of the spindle that comes in contact with the material. Normally nose cone engraving is done on laminated plastics consisting of two layers, i.e. black/white. Using this technique alleviates the problem of uneven depth engraving.

Non-nose cone riding is the technique referred to when mostly engraving metals, metal foil surface or highly polished surface material. Contradictory to the nose cone riding method, it is only desired for the cutter to touch the material to avoid any damage to the finish of the item.

Do I need to apply any kind of coolant/lubrication while engraving various materials?

Coolants or lubricants are used to reduce friction while engraving which in turn provides a cleaner cut and tool longevity. Only metals i.e. brass (not engravers leaded brass), aluminum and stainless steel requires to be lubricated while being deep engraved.

Fore mostly, it is important to inspect the equipment being used, to determine if liquids were to be applied, that it will not damage any electronic parts on the equipment. If such a determination is made then it is advised to utilize chilled air as a substitute, or hand apply small amounts of the cooling substance as the machine progresses to complete the job.

If the aforementioned is not a concern then a "mister lubricating system" is a professional and convenient method of cooling. This type of equipment mixes compressed air and liquid and dispenses only a fine mist directly onto the cutter, eliminating leaving large amounts of liquid on the material. A hand dispenser can also be used, however this requires constant supervision.

Note: Tips, images and graphs are property of www.antaresinc.net

Engraving

Accessories List including Images

Effective 7/20/00

Standard Engraving Tools

Solid Micrograin Carbide Cutter



Designed for engraving on acrylic, Plexiglass, Lexan, phenolic, brass, and aluminum. The smaller sizes are best suited for the sharpest detail, and the larger sizes are used for thick single strokes or for fill areas. Provided with brass cutter knob.

Part No.	Size	Price
C2-125-010K	1/8" shank x 4.5" length x .010" tip	\$14.99
C2-125-015K	1/8" shank x 4.5" length x .015" tip	\$14.99
C2-125-030K	1/8" shank x 4.5" length x .030" tip	\$14.99
C2-125-060K	1/8" shank x 4.5" length x .060" tip	\$14.99
C2-125-090K	1/8" shank x 4.5" length x .090" tip	\$14.99
C2-125-125K	1/8" shank x 4.5" length x .125" tip	\$14.99

Micrograin Carbide Tipped Cutter



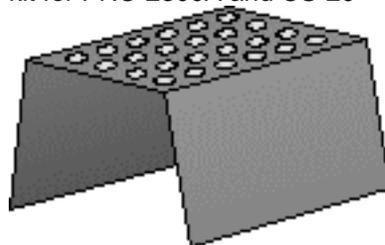
Designed for engraving on acrylic, Plexiglass, Lexan, phenolic, brass, and aluminum. The smaller sizes are best suited for the sharpest detail, and the larger sizes are used for thick single strokes or for fill areas. Provided with brass cutter knob.

Part No.	Size	Price
C2-171-010K	11/64" shank x 6.5" length x .010" tip	\$19.99
C2-171-015K	11/64" shank x 6.5" length x .015" tip	\$19.99
C2-171-030K	11/64" shank x 6.5" length x .030" tip	\$19.99
C2-171-060K	11/64" shank x 6.5" length x .060" tip	\$19.99
C2-171-090K	11/64" shank x 6.5" length x .090" tip	\$19.99
C2-171-125K	11/64" shank x 6.5" length x .125" tip	\$19.99
C2-171-171K	11/64" shank x 6.5" length x .171" tip	\$19.99

Engraving Tool Starter Kit

Convenient starter kit that offers a perfect combination of tools and accessories. Includes one metal organizer for 1/8" tools, and one each of: C2-125-010K, C2-125-015K, C2-125-030K, & C2-125-DGK.

Part No.	Size	Price
US-TL125-KIT	Starter kit for PNC-2300A and CS-20	\$79.99



High Speed Steel Engraving Tools



Engraving cutters manufactured from high speed steel. These tools are not as durable as carbide cutters, but are highly effective in applications requiring greater tip resiliency such as deep, fine cuts in metal. Designed for engraving on brass, aluminum, and soft metals. Provided with brass cutter knob.

Part No.	Size	Price
HS-171-005K	11/64" shank x 6.5" length x .005" tip	\$17.99
HS-171-010K	11/64" shank x 6.5" length x .010" tip	\$17.99
HS-171-015K	11/64" shank x 6.5" length x .015" tip	\$17.99
HS-171-030K	11/64" shank x 6.5" length x .030" tip	\$17.99

Diamond Tipped Scribing Tools



Non-rotating tools designed for scratch engraving on trophy brass and aluminum. Provided with brass cutter knob.

Part No.	Size	Price
C2-125-DGK	1/8" shank x 5" length	\$14.99
C2-171-DGK	11/64" shank x 7" length	\$16.99
ZDC-D2000	1/8" shank x 7" length, high precision	\$74.99

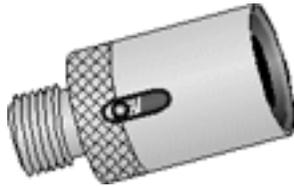
ADA Cutter Tools



ADA cutter tools are designed to cut the highly precise icons and Braille patterns required for ADA signage. Provided with brass cutter knob.

Part No.	Description	Price
RP-125-BRL020K	.020 Braille dot cutter	\$21.99
RP-125-COL020K	.020 Cut out tool	\$16.99

Burnishing Tools



The EZ-Rider Burnishing tool installs quickly and allows your burnishing tool to glide on the metal surface for an even, smooth finish.

Part No.	Description	Price
BT-EZBA-01	EZ-Rider burnishing adapter	\$49.99
BT-125-010*	Burnishing tool, 1/8" shank x 4.5" length x .010" tip	\$13.99
BT-125-015*	Burnishing tool, 1/8" shank x 4.5" length x .015" tip	\$13.99
BT-125-030*	Burnishing tool, 1/8" shank x 4.5" length x .030" tip	\$13.99

*Must have BT-EZBA-01, EZ-Rider Burnishing Adapter to use these tools

Adhesive Sheets

Part No.	Description	Price
AS-10	Adhesive sheet hold-down system (pkg. of 10)	\$34.99

Chip Removal System

The built-in electric filter of this system provides ultra effective filtration for dust extraction. This self-contained system is clean and easy-to-use and includes an extended vacuum hose and necessary fittings. The accumulator separates dust from debris and is ideal for reclaiming precious metals.

Part No.	Description	Price
US-CHIPSYS-A	Chip removal system (half horsepower)	\$649.99
US-ACCUM-A	Collection accumulator for chip removal system	\$129.99

Additional Accessories

Part No.	Description	Price
DGA-BEDLVL-KIT	Bed leveling kit for PNC-2300 and PNC-2300A	\$ 49.99
ZV-23A	Vacuum table for PNC-2300 & PNC-2300A	\$159.99
ZV-23C	Center vise for PNC-2300 & PNC-2300A	\$274.99
C2-125-KNOB	Threaded brass knob for 1/8" shank engraving tools	\$ 2.49
C2-171-KNOB	Threaded brass knob for 11/64" shank engraving tools	\$ 2.49
ZC-23-635	Bottom load 1/4" collet for PNC-2300 & PNC-2300A	\$ 29.99