LEADERS IN QUALITY
ELECTRO-CHEMICAL ETCHING
EQUIPMENT & SUPPLIES
Electro-Chemical Etching

THE MODERN METHOD OF NON-DESTRUCTIVE MARKING

Electro-Chemical Etching does not cause distortion, sharp indentations, or unbalance in delicate parts. This process is widely accepted as a modern and economical way to mark on conductive metal surfaces. Manufacturers who produce nearly anything from fine cutlery to saw blades and Aerospace Components prefer this method of permanently identifying their parts.

STRESSLESS

Electro-Chemical Etching is most applicable where hardened, thin and delicate, or already assembled parts must be marked permanently. There is no external force required to make any indentation or mark. Simple, fast & safe, The Electro-Chemical Etching Process is actually the reverse of electro-plating. A low pulsating voltage, low amperage current is passed through the open aperture of a paper or fabric stencil. The polarity is reversed from that used for electro-plating. A permanent surface etch 0.0001” deep is easily made in less than one (1) second.

DEEP ETCHING

In some industries such as Automotive or Aerospace, specifications call for DEEP ETCHING in applications where the marked surface of the part may experience some wear or the mark must be deep enough into the part to allow it to be clearly read once painted or anodized. Millennium Signatures Marking Systems produces heavy duty Power Units that are equipped with timers and current control features such as our Electronic Pulse Control or EPC feature combined with a higher output allowing marking results of potentially up to 0.0010” or 0.0012” deep depending on the material and techniques used.

CONTRAST

On most metals you have the control to produce a clean professional looking mark in one of three (3) possible colours or contrasts, Black, White (Clear) or Grey.

SAFE AND EASY TO USE

The Electro-Chemical Etching Process is so easy to use that personnel need no special skills or training to use effectively. It is so fast that most permanent surface markings are made in less than one (1) second. The low currents used are harmless so it is absolutely safe.

Any conductive metal part especially those, which are hardened or may not be subjected to additional stresses or deformation resulting from stamping, vibro pens or electric arc marking.

IDEAL APPLICATIONS INCLUDE

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<td>Special Drills</td>
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<td>Stainless Steel Parts</td>
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SAMPLE PART MARKING

If you have parts that you would like to mark, we would be happy to test mark them and put our experience to work for you. Stamping, Engraving & Laser Part Marking Services also available.
**Power Units**

Solid State Circuitry and modern design provides long lasting service using a minimal amount of energy. Our advanced technology is just one reason why Millennium Signatures Marking Systems is a World Wide Leader in Electro-Chemical Etching systems and supplies.

**MS-150-C GENERAL PURPOSE UNIT**

AC and DC output with 6-position switch. Settings A through F regulate the marking voltage, ranging from 5 volts progressively through 8 volts, 11 volts, 14 volts, 17 volts and ultimately 20 volts on the F setting. Electrolytic Stencil Cleaning Current is available through the yellow output jack. When connected to a cleaning tray it serves as an effective method of removing a build up of oxide out of the open aperture of fabric stencils as to improve marking quality and extend stencil life. Additionally, if the Black (Monode) lead is moved to the Yellow output jack a high output side of the transformer is activated that will provide DEEP ETCH results to approx .003” depth below the surface.

**MS-311 DEEP ETCH UNIT**

Ideal for Grid Marking or DEEP ETCH applications AC and DC output with a 6-position selector switch. Settings A through F regulate the marking voltage, ranging from 5 volts progressively through 8 volts, 11 volts, 14 volts, 17 volts and ultimately 20 volts on the F setting when on the LOW setting. This heavy duty unit can be switch to a HIGH range that doubles the voltages on all settings to a maximum or 40 volts. This unit is best suited for manual production marking where more power is needed for extreme depth. This unit will accommodate surface marking requirements from 0.0001” to more aggressive marking of 0.006” below the surface.

**MS-400-CC AUTOMATED SERIES**

AC and DC output with 6-position switch. Voltage ranging from 5 volts progressively through 8 volts, 11 volts, 14 volts, 17 volts and ultimately 20 volts. The pulsing current generated by this unit results in a cleaner extraction of material and deeper results. The EPC feature (Electronic Pulse Control) and the cycle timers have proven effective for consistent depth and quality from part to part and greatly extends the life of Fabric Stencils. This unit is equipped with the necessary circuitry to support the AM-10-A and AM-30-T semi and fully automated etching systems.
MS-510-DE HEAVY DUTY UNIT

Ideal for AEROSPACE applications. Six (6) high power settings, six (6) low power settings. AC and DC Output Voltage ranging from 5 volts progressively through 8 volts, 11 volts, 14 volts, 17 volts and ultimately 20 volts. The pulsing current generated by this unit results in a cleaner extraction of material and deeper results. The EPC feature (Electronic Pulse Control) and the cycle timers have proven effective for consistent depth and quality from part to part and greatly extends the life of Fabric Stencils. This unit is equipped with the necessary circuitry to support the AM-10-A and AM-30-T semi and fully automated etching systems. This unit is best suited for manual production marking where more power is needed for extreme depth. This unit will accommodate surface marking requirements from 0.0001” to more aggressive marking of 0.010” or even 0.012” below the surface in some cases.

What does a Basic Kit include?

For information on additional component configurations and/or accessories please see the OPTIONAL ACCESSORIES section to come within this information kit.
All of the Electrolyte Solutions manufactured by Millennium Signatures Marking Systems are completely safe to use. The solutions are all based on a mild sodium solution and do not contain harsh chemical or anything acidic or corrosive. All formulations have continuously updated MSDS sheets available.

While the solutions are said to be non-corrosive as they can be safely handled and not pose respiratory threat or danger when in contact with the skin, there is the potential that the surface area of your part in close proximity to the location of the mark could develop a light oxidization. This directly due to the sodium content of the electrolyte and this oxidization affect can be nearly undetectable or more advanced based on environmental conditions. This side effect of the process can be completely prevented by the proper use of one of our Neutralizer products that when properly used will instantly neutralize the sodium in any traces of the solution that may be left on the surface of the part after marking. Though who are new to the process and/or those who have failed to properly neutralize their parts after marking may find that this side affect is more noticeable during times of the year when higher levels of humidity are present.

For more information on Neutralizers and Rust Protective Solutions, please see the NEUTRALIZERS & RUST PROTECTIVE OILS section to follow within this information kit.

Special Applications and Formulations
Within the Aerospace & Nuclear industries specifically there is application for special formulations that are required such as NON-CHLORIDE Electrolytes as an example. We have detailed information available on a variety of such formulations. Please do not hesitate to contact our sales office and inform us of any special applications that might require such formulations and we will be happy to help you in identifying the proper Electrolyte for your specialized application.

We Recommend the Following Electrolytes:

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<thead>
<tr>
<th>METAL or ALLOY</th>
<th>ELECTROLYTE</th>
<th>POWER UNIT SETTING</th>
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<tbody>
<tr>
<td>Aluminum (black mark)</td>
<td>X4R-413</td>
<td>DC</td>
</tr>
<tr>
<td>Aluminum (deep etch)</td>
<td>X4R-411, C-10</td>
<td>DC</td>
</tr>
<tr>
<td>Cadmium</td>
<td>F-20, X4R-414</td>
<td>AC</td>
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<tr>
<td>Bronze-Brass</td>
<td>B-10, B-20, F-60</td>
<td>AC</td>
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<tr>
<td>Carbides</td>
<td>MSC#3, MSC#4, C-10, C-30</td>
<td>AC</td>
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<tr>
<td>Chromium</td>
<td>X4R-411</td>
<td>AC</td>
</tr>
<tr>
<td>Cobalt</td>
<td>F-10, F-30</td>
<td>AC</td>
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<tr>
<td>Iron</td>
<td>F-10, F-20, F-30</td>
<td>AC</td>
</tr>
<tr>
<td>Lead</td>
<td>F-30</td>
<td>AC</td>
</tr>
<tr>
<td>Monel</td>
<td>MSC#4, X4R-411, C-10</td>
<td>AC</td>
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<tr>
<td>Nickel</td>
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<td>AC</td>
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<tr>
<td>Tin</td>
<td>B-20, F-10</td>
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<td>Titanium</td>
<td>T-10, T-20</td>
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<tr>
<td>Zinc</td>
<td>F-20, B-10</td>
<td>AC</td>
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<td>Black Oxide</td>
<td>X4R-415, B-70, B-5, MSC#3, GR-11</td>
<td>AC</td>
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<tr>
<td>Stainless Steel</td>
<td>MSC#4, MSC#7, X4R-411</td>
<td>AC</td>
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Laboratory Tested & Certified

If required, we can not only produce your electrolyte to meet your specification in most cases we routinely provide the service of having batches of a specific formula analyzed and certified at an independent Laboratory to confirm that the solutions meet industries specific needs. To have this service provided additional costs would apply.

Stencils

PAPER STENCILS

Our PAPER STENCIL product is specially designed and manufactured to allow customers to quickly and easily create their own temporary stencils on demand, ideal for applications with variable information. Stencil Paper can be used to create etching stencils with the use of either a typical impact style typewriter or with our Model 9300 Series Stencil Imprinter. The Stencil Imprinter is a computer controller Dot Matrix device very similar in design to a conventional Dot Matrix Printer commonly used for regular paper and identical in terms of operation. The Imprinter serves as a slave to your computer and can print text and images from pretty much any application software including Microsoft Word, Corel Draw and/or AutoCAD to name a few.

The Stencil Imprinter is outfitted with a custom Heavy Duty 24-Pin Print Head designed to offer the ideal impression on both the standard and DEEP ETCH Stencil Paper products. The Imprinter is also outfitted with a slightly different carriage assembly and a special ribbon assembly. The ribbon assembly is the only consumable, periodically requiring replacement much like a conventional printer over time aside from the Stencil Paper itself.

The Stencil Paper is available in three different styles.

A) Heavy Duty (DEEP ETCH) Paper available in two widths 2-1/2” wide and 3-3/4” wide and both are available in 100’ and 600’ rolls.
   ♦ P/N D-I-27  Box of 100 sheets of 2-1/2” wide X 7” long pre-cut sheets (for typewriters)
   ♦ P/N D-I-B 2600 100’ Roll of 2-1/2” wide Stencil Paper
   ♦ P/N D-I-B 3600 100’ Roll of 3-3/4” wide Stencil Paper

B) Standard grade (Light Blue) Tractor-Feed Stencil Paper also available in two widths, 2-1/2” wide and 3-3/4” wide and both are available in 100’ and 600’ rolls. This paper is outfitted with the holes located down each side of the paper to allow for positive locating and feeding of the paper when using the Model 9300 Series Stencil Imprinter.
   ♦ P/N D-I-2600-TF 100’ Roll of 2-1/2” wide standard grade Stencil Paper with Tractor-Feed
   ♦ P/N D-I-3600-TF 100’ Roll of 3-3/4” wide standard grade Stencil Paper with Tractor-Feed

C) Heavy Duty (DEEP ETCH) Tractor-Feed Stencil Paper is also available in the same two widths, 2-1/2” wide and 3-3/4” wide and both are also available in the 100’ and 600’ rolls. This paper is outfitted with the holes located down each side of the paper to allow for positive locating and feeding of the paper when using the Model 9300 Series Stencil Imprinter.
   ♦ P/N HD-2600-TF 100’ Roll of 2-1/2” wide Heavy Duty Stencil Paper with Tractor-Feed
   ♦ P/N HD-3600-TF 100’ Roll of 3-3/4” wide Heavy Duty Stencil Paper with Tractor-Feed
When an impression is made on the Stencil Paper using either a Typewriter or the Model 9300 Series Stencil Imprinter, a stencil could last anywhere from 3 or 4 markings to potentially around 20+ markings if applying a basic surface etch and it is all depending on the technique used, environment and handling of the stencil. When DEEP ETCHING, each image is usually only good for one marking.

Tractor Feed Stencil Paper is available in two widths 2-1/2” wide and 3-3/4” wide. The dimensions mentioned are the actual usable (blue) portion of the paper and does not include the white tractor feed portion.

Stencil Paper should be stored in a cool dry and dark location. Avoid leaving the paper in bright ultraviolet light for any long periods of time if not necessary.

Model 9300 Series Stencil Imprinter

The (NEW) Model 9300 Series Stencil Imprinter is manufactured by EPSON a world leader in the manufacture of Dot Matrix Printers. This HEAVY DUTY Printer has been equipped with a Custom Modified Print Head and Ribbon Assembly giving it the ability to impress high quality images on our Die Impression Stencil Paper Products (above). This Stencil Imprinter connects to any PC via Parallel Port Connection and operates as a slave to any application software. This NEW design operates quickly and quietly allowing high quality stencils to be created on demand.

The computer driven Model 9300 Series Stencil Imprinter offers many features that would otherwise be impossible using a standard typewriter for creating your stencils. While a standard typewriter can be very effective for the most basic applications, you are limited to text sizes, straight-line imprinting and no ability to imprint graphics among others.
Model 9300 Series Stencil Imprinter - Benefits
♦ Speed and efficiency
♦ On-screen error correction
♦ Allows variable information to be input from databases
♦ Computer driven allowing for all the benefits of saving layouts and auto serialization etc.
♦ Imprinter allows for vector based graphics as well as text to be imprinted together.
♦ No need to learn any new software, use an existing commercially available software you are already familiar with.

Replacement Ribbons

Millennium Signatures produces replacement ribbon cartridges designed to suit the Model 9300 Series Stencil Imprinter. These ribbons are inkless and contain a unique fabric and lubricant that work in combination with the customized properties of the Print Head and Carriage assembly to provide a high quality imprint that is ideal for the Chemical Etching Process. Ribbon replacement is mechanically no different from a standard Dot Matrix Printer. No tools required.

LONG LIFE FABRIC STENCILS

Our Long Life FABRIC STENCIL product is custom manufactured to suit your marking applications by Millennium Signatures Marking Systems. The Long Life Fabric Stencils are made using a unique photographic process that produces the required stencil artwork onto a very durable almost plastic like fabric sheet. The artwork capabilities with Fabric Stencils are much more advanced than what can be produced using the Paper Stencil product.

Customers can supply their own high quality digital artwork or they can have artwork made to suit by our in-house Graphic Artwork Department. The artwork can consist of pretty much anything from a Logo to a Schematic Diagram. The quality of the final image will be far superior to what could be achieved with a Paper Stencil due to the sharpness and fine details of the image that can be maintained when processing the stencils using a photographic process.

Long Life FABRIC STENCILS are best suited for applications that require the marking to be exceptionally cosmetic or attractive to the eye and/or in applications where the same information is going to be used over and over again for large quantity of pieces or different products on an ongoing basis.

Millennium Signatures is capable of producing these sheets made to order in pretty much any combination of sizes up to a maximum of 10” X 10”. You can produce thousands of conventional surface markings (0.0001” – 0.001”) with each image on the sheet (regardless of sheet size). Fabric Stencils are NOT recommended for Deep Etch applications as the life of the stencil will be dramatically reduced due to the amount of current (Voltage) that is required to pass through the stencil and the heat that is generated as a direct result.
Fabric Stencils Cont’d

The way that the Fabric Stencil are produced allows the stencils themselves to be priced based on sheet size as opposed to the number of images on each sheet. Therefore if you purchase a Fabric Stencil sheet that is 2-1/2” wide X 7’ long and you have an image that can fit comfortably on that sheet three (3) times down the center of the sheet (as in example below), you can easily achieve thousands of high quality surface etch impressions per image (Example A). In some cases it might be more beneficial if you require a few different image sizes to suit various different sized parts, you could purchase a single sheet with the artwork requirement located as many times as possible on that sheet in the different sizes that you require. In either case the price would remain the same as the sheet size has remained consistent. (Example B)

The number of images on the sheet is determined by the size of each image and adequate space left around those images. There has to be enough insulating fabric around each image to ensure that the Monopad and Carbon Head Assembly does not come in direct contact with the surface of the part or a black marking (smug or smear) could be etched permanently on the part around the image itself. To prevent this there has to be a reasonable amount of insulating fabric around each image somewhat limiting the number of images that can be produced on each sheet size

Example A:

![Sample Image](image)

Stencil Size - 2-1/2” X 7”

Example B:

![Sample Image](image)

Stencil Size - 2-1/2” X 7”

**LONG LIFE FABRIC STENCIL CAPS**

Cap Stencils are made from the same material as the Long Life Fabric Stencils supplied in sheet form only they are individual impressions that are formed (molded) to suit the characteristics of the carbon head used. The cap stencils are supplied with monopad material built into the cap and they are designed to fit snug onto the head and are common in automated and manual applications.
Optional Accessories

**H-100 Holder & Carbon Head (Available Separately)**
The H-100 Holder is universal and accommodates all different sizes of Carbon Head Assemblies. Carbon Heads are made of a Bonded Graphite Carbon, which can be easily machined for modification to suit parts if necessary.

**Custom Heads** – Made to suit your specific application. Reservoir tubes designed to hold electrolyte and provide gravity drip feed of the solution to the Monopad and designed to fit within the H-100 Holder are also available.

**Rocker Head Assemblies** – Rocker Heads are ideal for etching larger surfaces and specifically for Grid Marking applications. Grid Stencils are available in a host or different size and shape grid patterns in sheets up to 10” X 10”. Robust one-piece designs make the product low maintenance and long lasting.

**Deep Etch Monopads (10/Pkg.)** Deep Etch Monopads are made of a special contaminant free thick felt produced specifically for this process with a cotton wick attached allowing electrolyte to disburse evenly throughout the pad. Monopads are available in a variety of sizes to suit standard heads and customs sizes are produced to suit custom designed head assemblies as required.

**Screen Cloth Holders** – For those system users that prefer the Screen Cloth Marking Head Design, we have a variety of standard sizes available. This product is optional to the Deep Etch Monopads and Carbon Heads shown above. This product is **NOT** as effective for Deep Etch applications.
**Replacement Screen Cloth Inserts** – Packages of Stainless Steel Screen Cloth Replacement inserts are available in various standard sizes. Contact our Customer Service Department for more information on specifics. This product is optional to the Deep Etch Monopads and Carbon Heads shown above. This product is **NOT** as effective for Deep Etch applications.

**Gator Clip** – Standard alligator style clip designed to suit banana plug style connectors. Replacement for standard ground clip provided with basic etching kits. The Chemical Etching Process is dependant on good continuity and therefore a solid ground connection is important. You can ground direct to the product (best if possible) or to a ground plate or fixture supporting your product.

**Large Ground Clamp** – This larger, stronger clamp can be adapted to existing ground leads or ordered complete with a new wire cord set. The Chemical Etching Process is dependant on good continuity and therefore a solid ground connection is important. You can ground direct to the product (best if possible) or to a ground plate or fixture supporting your product.

**Wire Cord Sets** – Available in 2, 3 and 4 wire cord sets depending on the Power Unit and additional accessories such as cleaning trays, or Semi-Automated Marking Heads to be used. Standard cord set length is 3ft. Sets offering additional length are available including a 6ft set. Additional length can be a real advantage when working with larger products such as aircraft landing gear etc.

**Finger Ground** – This great little device makes some etching applications a lot easier given that you can wear a very comfortable thimble (like) ground contact on the tip of your finger. It is ideal for use when working with small parts allowing your to hold and orientate the part in one hand grounding with your finger ground while you apply the etch with your hand marker in the other.
Bench Fixture Grounding Bar – The ground bar is designed for use with the MS-1220-BF and / or MS-2045-BF Bench Fixtures (below). Ideal for applications where etching is to be done around the outer circumference of a part or when you want to precision fixture and orientate your part (Placement Method) and then apply the ground to complete the marking process.

Knife Ground – Optional ground bar configuration that is better suited for some placement etching applications.

MS-1220-BF - Equipped with a 1-1/4” X 2” Carbon Block. This Bench Fixture can be machined to create a nest for placement marking. The fixture comes complete with a locating plate for precision placement or as a guild for Roll Marking small cylindrical components.

MS-2045-BF – Equipped with a 2” X 4-1/2” Carbon Block. This Bench Fixture can be machined to create a nest for placement marking. The fixture comes complete with a locating plate for precision placement or as a guild for Roll Marking slightly larger sized cylindrical components.

Positive Feed Electrolyte Pump – Delivers an exact amount of electrolyte directly to the marking head and only while marking as the pump is activated by the motion of the AM-10-A so that when the system stops processing parts, the feed of electrolyte to the head stops also. No spillage or flooding due to operator neglect with this feature. To change electrolytes simply remove drawtube from old bottle and place into new bottle and manually crank knob a few times to clear old solution and prime the pump with new formula.
**AM-10-A Semi Automatic Etching System** – The Models MS-400-CC or MS-510-DE Power Unit must be used in conjunction with the AM-10-A. These units when properly set will automatically cycle the AM-10-A so that all the operator has to do is load and unload the parts. The system can also be activated manually via foot pedal. Cycle time on this unit is approximately 1200 parts per hour. This system is also exceptionally effective at ensuring that the mark quality is consistent from one part to the next as all aspects of the process are controlled. Long Life Fabric Cap Stencils are most effective with this system.

**AM-10-A Carbon Head Assembly** – Carbon Heads that are supplied with the necessary plexi-mounting block and adjustment features for use in the AM-10-A and AM-30-T Semi / Fully Automatic Etching Systems. The Carbon Head and mount are supplied with an electrolyte feed tube that will deliver solution right through to the Monopad. Heads can be supplied in various configurations, with custom contours, steps or guilds etc.

**Carrying Case** – High quality hard wood vinyl covered carrying case is custom designed and perfectly suited for housing your Chemical Etching Unit and Accessories. Great features include a hole located in the rear panel for the power cord to pass through and a built in Stainless Steel Ground Plate allow this carrying case to instantly become a work station and keeps all of your supplies and accessories secure in one location.

**Cleaning Tray** – Designed as an electrolyte bath to clean stencils. This device uses reverse polarity to draw oxide and metal particles out of the open aperture of Fabric Stencils, quickly and effortlessly. For more details on proper care and cleaning of Long Life Fabric Stencils refer to the **Stencil Care** section found under **TECHNIQUES** on page 14 or consult our customer service department (905) 689-1800

**Foot Pedal** – The Foot Pedal serves as a very useful tool in both manual and automated applications. The foot pedal allows the operator to work at his or her own pace on the AM-10-A semi-automatic unit by using the foot pedal to activate the cycle. In manual applications the foot switch also makes providing power to the part simple when trying to hold and precision mark a part. Excellent feature when working with a ground plate, in most cases preventing direct contact with the ground from occurring.
Technique

The Electro-Chemical Etching Process is very safe and simple to use. Despite that a very basic Black or White surface etch of 0.0001” to 0.001” depth can pretty much be done by anyone and achieve the best results, if your needs require a deeper etch ranging right up to (potentially) as deep as 0.012” below the surface is pretty much an identical process however the proper techniques can greatly improve the clarity and depth of your results as well as time and efficiency.

With over 30 years of experience manufacturing the Electro-Chemical Etching process we have worked with pretty much every different material and with specifications from all industries. By following the recommendations listed below or contacting our sales and/or technical staff we will definitely help you improve your marking results.

**AC / DC CURRENT**

Using the AC Current Setting will provide you with what is considered to be a **BLACK** mark. These results are dependent on the type of material being marked and that the proper electrolyte solution is being used. When operating any of the Millennium Signatures Power Units on the AC current setting, you are in effect extracting material from the surface and re-depositing a black oxide leaving the product with a permanent, stressless mark that will reflect exactly the image of your Paper or Fabric stencil.

While the AC current setting is usually most successful in getting the cosmetic results required for most applications given the contrast of the black mark, the AC setting does not provide as an aggressive reaction with the electrolyte and so therefore it is difficult to achieve greater marking depths on this setting. While the DC current setting creates a much more aggressive reaction with the electrolyte offering greater marking depth, it does not produce an oxide and therefore can be used to achieve any one of the following four results. (1) If depth is not necessarily required but you are marking a bright and highly reflective material such as a polished stainless steel, the DC setting will actually give you what is considered to be a **CLEAR** mark as it does not have colour but it results in a matte finish etch against the high polished surface which provides a more easily readable result. In such a case it might seem reasonable to mark such a material with the AC setting providing a black mark, however if the surface is highly reflective the black image although very much there and permanent tends to get lost in the reflection and is not easily visible. (2) If greater marking depth is required and the marking is going be subject to a coating, paint or anodizing then the best results to achieve the depth effectively would be on the DC setting. (3) In the event that depth is desired but you also want to have the black mark for the purpose or greater contrast and better visibility, you should use the DC current setting to etch down to the desired depth and then without disturbing the registration of the stencil and the part switch over to the AC current setting for an additional few seconds and you will end up filling the cavity with oxide resulting in a deep and highly visible mark. (4) In a case where the parts to be marked are Black Oxide coated, the black mark achieved on the AC setting would be mostly undetectable and so switching to the DC setting and using the proper electrolyte (X4R-415 in most cases) will give you the appearance of a **WHITE** mark against the black surface of the part.

**HEAT**

One of the key factors involved when **NOT** achieving the desired marking depth or doing so with very poor efficiency or mark quality is the breakdown or deterioration of your Monopads and or Paper/Fabric Stencils. The most likely cause of this deterioration is Heat.
The most effective technique allowing you to minimize the heat that is produced while deep etching is to either hold your paper stencil firmly in place or for really deep etch applications it is even suggested that you tape the stencil securely in the proper location and gently rock the carbon head assembly with the monopad attached lifting the head assembly a centimeter or two from the part every few seconds allowing the heat being generated by the reaction to dissipate. There is no need to press the marking head assembly against the part with any force. The marking head assembly with a monopad properly dampened with the proper electrolyte solution just needs to make contact with the surface of the part through the stencil and any additional or aggressive force may only disturb the registration of the stencil or deplete the amount of electrolyte solution being held in suspension by the monopad.

It is also strongly suggested that for really deep etching applications considered to be where achieving marking depths of 0.005” below the surface or deeper two monopads on located directly on top of the other and secured to the Carbon Head with an “O” Ring Clip will provide better results. The two pads will allow more electrolyte to be held in suspension and maintain less heat. If the monopads get too dry, the amount of heat will increase and not only produce poor marking results, but will deteriorate the Paper/Fabric Stencil and Monopads quickly.

After marking several parts the operator will start to notice the discolouration of the monopads. The pads trap micro particles of metal that have been removed in the process as well as some oxide that is produced at the same time. The pads will become flat and lose their absorbency. Once these pad(s) become relatively soiled or no longer hold much solution, they should be removed and washed out by hand. Washing these Monopads is simple and only takes a few seconds. Simply hold the pads under some warm running water at the sink and using some common liquid soap work to lather with your fingers for a few minutes, then rinse the pads thoroughly and allow them to dry completely before re-using. When you get to the point where the absorbency of the pad can not be restored with washing and the pad is heavily soiled with metal particles and will not clean up at all, it is time to discard the pad(s) and start again with fresh supplies.

**Important**  
Monopads are made with a very pure material that contains no oils or waxes etc. It is important if you wish to achieve quality results that you use the proper Monopads as opposed to other materials such as regular felt to hold transfer the electrolyte as most other materials do contain colourings, waxes, oils etc., which have proven break down the reaction process and produce poor quality results.

**STENCIL CARE**

**Paper Stencils** are considered to be disposable and require no special care, however a little tip that will help with your marking results especially on standard surface etching applications. Do a short test etch on a sample piece of metal using the DC current setting on a low to medium voltage output to allow the initial reaction and voltage passing through the open aperture of the stencil, in effect cleaning out the aperture and putting the stencil in excellent condition to leave perfect mark the second time on the good part.

**Fabric Stencils** are designed to produce many hundreds and often thousands of quality markings. There are some things that can be done to properly maintain the stencils. Always make sure that the marking surface is free of solvents or other harsh chemicals that may damage the stencil. Watch to make sure that your part does not have any burrs or metals cutting that might put even a tiny slice in the sheet stencil material. After marking it is a good idea to rinse the stencil under a tap and wipe clean on both sides with a soft non-abrasive cloth and allow to dry. In between parts while marking periodically inspect the stencil to ensure that the open aperture (image) portion of the stencil is still relatively white or semi-transparent and not turning black as the aperture fills with excess oxide created in the process.
Stencil Cleaning Trays are quick and easy way to maintain your stencils. The tray plugs into the CLEANER jack on the front of all power units and it is a shallow tray that is to be filled with the marking electrolyte to create a bath. Using reverse polarity the oxide and contamination in the stencil is drawn out of the stencil and trapped in a Cleaning Tray Pad on the bottom of the tray. This is the very best way to care for your stencil and also requires the least amount of effort and can quickly be done in between parts throughout a marking session.

Stencil Repair should it be required may be possible using a standard nail polish as is available in any drug store. In the event that you should manage to get a small perforation in the stencil or a scratch, crease or some similar such damage should break down the insulating ability of the stencil and markings that reflect that damage show through on your part, the easiest thing to do would be to cover that area with a thin even coating of nail polish.

Customer Service & Technical Support

We are here to help. Should you have questions concerning the process be sure to contact our Customer Service or Technical Support departments as we have knowledgeable people who are happy to assist you in getting better results.

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