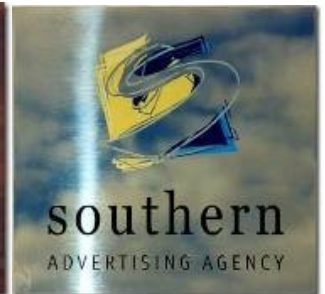


Chemical Etching



A guide for sign designers and sellers.

This guide is intended to explain the etching process and some of the techniques that we use so that you can design the best possible etched signs for your customers and offer them much better signs than your competitors can. At the end is a more technical section with details about artwork & materials, but first let us introduce the product.



Chemical etching is also known as chemical engraving, and is a way to make attractive signs using metals such as brass and stainless steel.



Like engraving we can manufacture traditional signs in brass and stainless steel, but because it is a photographic process we are able to reproduce complex logos, even photographs. Traditional engraving is ideal for some jobs, but for signs that involve a lot of detail, high definition, or for hard to engrave materials like stainless steel, chemical etching is more versatile and more economical.

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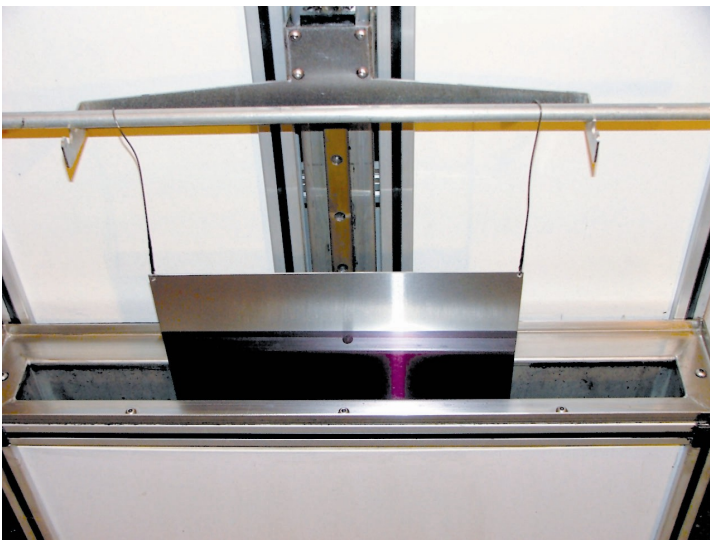
Chemical Etching

The Process

Chemical etching may use some complicated processes but the principle is quite simple. It is also known as chemical engraving, and like engraving it involves making holes in bits of metal, and then usually putting paint in the holes. The only difference is that the hole is dug into the metal using acids instead of metal tools, and being a photographic process, much finer detail can be achieved.

To get started you need some artwork. All of our artwork is sent to us from our customers by email, all we do is give it a good check over & add some cut marks, then produce an actual size film from the artwork using our imagesetter.

Meanwhile, a piece of the required metal, usually stainless steel or brass is cut from stock, inspected & cleaned. It is dipped into a light sensitive paint called a photoresist, photo because it is a photographic material, resist because it is resistant to acids. Simple.



After being stoved in an oven at a precise temperature, the coated piece of metal meets the film in an exposure frame. The film is held on top of the coated metal by a vacuum and exposed to ultra violet light. The coated metal is then immersed into a developer which removes photoresist leaving an exact copy of the image on the surface of the metal.

The image is carefully inspected for any faults, even a tiny pinprick of resist or bare metal caused by a speck of dust will be reproduced into the surface of the metal during etching.



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The Process—continued.....

Most etchers reach this stage by making a screen and then screen printing a thick resist onto the metal, but this produces a blurred image, some even use cut vinyl. Our processes allow for much finer detail and much more precise reproduction of graphic images.



The above shows an example of 0.25mm high Times Roman text which was etched using our standard processes. Under a microscope it could be seen to be perfectly reproduced. This may not be much use for making signs, there is not much call for text that is so small you need a magnifying glass to read it, but it is because our processes allow such fine detail that the finished signs look so much sharper and higher quality than etched signs made by more crude methods.



Our high definition processes allow for some useful techniques such as half tones to reproduce photographs. Remember that at this stage the image is made of either bare metal which will be etched away by the acid, or protected areas that will not. Etching is just making holes in the metal, and a photograph can be made from lots of tiny holes.

The above picture shows a photograph that has been reproduced using half tones. Each black dot that makes up the picture was a tiny hole in the photoresist, and each metal dot was a tiny speck of photoresist which prevented the acid from eating away the metal.

The sign is now ready to meet the acid that will eat away any bare metal areas to produce the holes.

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The Process—Acid Trip

The metal is taken to the etching room, which is always expected to be the exciting part but is actually the most simple. The metal is sprayed with acid in a machine at a very carefully controlled temperature and for a precise time. Easy as that. The acid is not some fuming cauldron of life threatening evil such as you would find in a James Bond film, our main etchant is Ferric Chloride which is also used to purify drinking water.

After it has been etched the metal is still protected by the photoresist image. The etched areas are cleaned & rinsed, ready for the next stage which is usually painting. The following picture shows an etched brass sign that has not been painted. You can see that the text at the bottom has been etched into the metal, and the diamond shape has been etched away leaving the text standing up.



The actual etching stage is all very simple, you can even etch copper using vinegar, and processes such as that using hand cut wax images have been used to etch metals for thousands of years. All the clever stuff is involved in creating the image before etching, or...

... what you do with the metal now that you have made holes in it.

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The Process — Painting by Numbers

Most signs need just a bit of colour putting in the etched design to finish them off, and that usually means paint.



We are clever bunnies & use the etching mask to get the paint only in the etched bits, but we can be even more clever than that. The paint is usually sprayed on, so we can airbrush coloured highlights, blend colours into each other, even have colours touching by using all sorts of clever masking techniques.



This is usually the stage where the most creative work is done, all without touching the surface of the metal, so a beautiful mirror polish remains perfect.

The sign on the left has airbrushed blends in the top logo and the stars on the EU flag have been printed on raised etching rather than using the traditional separation line. The horizontal stripes extend around the edges of the sign. This sort of attention to detail vastly improves the quality of signs.

We have too many methods of masking and painting to mention. We have decades of experience of adapting logos and designs to fit into metal surfaces, each one is carefully considered at the design stage.



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The PROCESS—The Cutting Edge

All that remains is to trim the sign on a guillotine, drill some holes if required, and following a final inspection send it off to the customer. Brass signs can be lacquered, and once again we can show what clever bunnies we are by such things as combining mirror polish & satin to make very striking designs.



The above sign has some airbrushed colour blends, no separation lines between the black and the colours, and a satin background with parts of the logo and the stripes in mirror polish.

Some matching screws and caps finish off the sign nicely. We supply brass screws with brass or chrome plated brass caps in polished or satin finish. We supply brass fixings because steel screws would rust, producing unsightly stains on the surface of the signs.

That in a nutshell is the etching process. There is some very clever chemistry involved, a lot of the techniques are quite complicated, but it is basically making holes in bits of metal and filling them with paint, all very simple.

Chemical Etching

The Technical Stuff

1. Quotes.

To get us working for you and your customer we first need to get the job quoted. The best way to do this is by email, and we reply to most email enquiries in less than an hour. We don't need full details, just the size, quantity, and number of colours. Most of our customers get used to our pricing and work out simple prices themselves, and we have a pricing graph to help with this.

If you are not sure how the logo will work on an etched sign you can send something for us to look at or point us at your customer's website, we don't need working quality artwork at this stage. Quite often we can suggest some design tips at the time of quoting if we can see the logo & have an idea of what the sign is to be used for.

2. Artwork.

You can prepare the artwork in whatever way you are used to. Most of our customers use Illustrator, Coreldraw or Signlab, all of which make excellent artwork files for us to use. When it is all approved by your customer, save a version as an Ai or eps file with all text converted to paths/outlines, this prevents text from changing which it has a nasty habit of doing when converted from one program to another. If the job involves colours such as Pantone, use these colours when setting up the artwork if possible, we can then take any colour references from your artwork if you forget to tell us what they are.

3. Specification.

Our standard materials are 316 marine grade stainless steel or brass, in satin or mirror polish. Most etchers still use 304 grade stainless steel because they don't have the technical know how to etch 316, or because it is cheaper. 304 stainless is no use for outdoor signs in the UK climate, it rusts, so always tell your customer that you will use 316 grade as one of your selling points, it may just win you a job if your competitor is offering 304.

We need to know which material to use, and how it will be fixed, most often a choice between screws & caps or a 3M VHB adhesive. Always confirm the size of the plate, we get at least one job per week where the artwork is set to the wrong size & if we know what size it should be that can save an expensive mistake. The biggest plates we like to etch are 800 x 600mm. We used to etch huge panels but installed nice new kit to etch things up to this size much more quickly and efficiently.

We need to know any colour references such as Pantone, BS or RAL. As mentioned earlier you can include these in your artwork too so we can double check if any references are missing or don't seem correct.

Last of all we need to know a delivery date to work to. We like to complete all jobs in just a few days, but if something goes wrong & we have to start again it helps to know if there is a deadline to work to.

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More Technical Stuff

4. Finally, and most important of all is some sort of confirmation that we have received your order. Our most organised customers always send an order & artwork by email, and a confirmation by fax. If we receive a fax and no artwork turns up, at least we are aware that we should be doing something & we can give you a call. If you rely on the email alone and yours is one of the billions of emails that are junked by a server somewhere in the world every day then we will know nothing about it.

We always confirm receipt of orders by email, so if you haven't sent a copy by fax and haven't had a reply from us, you should ring to make sure that we have your job under way as we may be blissfully unaware of it.

That is all you need to know to be able to design & sell etched signs. If you have a job that is a bit more tricky & you need to ask any questions just give us a call or email us with the details. We are here to help you provide your customers with an excellent service, and to do so with as little fuss as possible so you can sell our products profitably and with confidence.



All of the photographs used in this guide are genuine photographs of our products and have not been faked or improved in any way.