

# Engineering intricate metal parts through photo etching



[www.shimifrez.com](http://www.shimifrez.com)



Micro nozzle heads (pin holes)

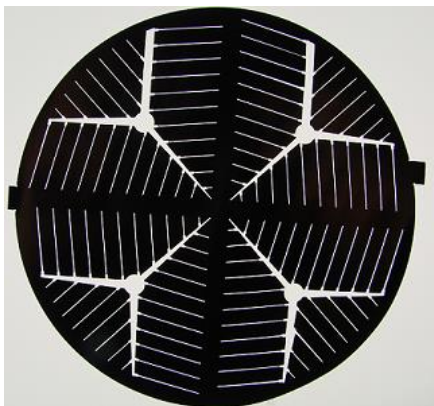
Shimifrez is manufacturer of a precision photo chemically machined metal parts. Instead of stamping, or laser cutting Photo Chemical etching produces highly accurate and identical components for small and large batches. Chemical etching has No effect on magnetic properties, or deformation whether stresses or thermal resulting a Burr free component.

Virtually all aerospace, medical devices and computer chips, contain a precision metal part. Shimifrez was established 30 years ago specifically to manufacturer high precision chemically etched components. With over 6000 components fabricated for different industries and sectors.

Instead of investing in hard tooling, Shimifrez offers low tooling costs and a fast turnaround thus speeding up your product's time to market and flexibility along the way.

State of the art production machinery and trade secrets ensure components work to the most exacting tolerances. Components can be manufactured in Stainless Steels, Brass, Nickel alloys, Beryllium copper, Metglas, Cobalt kovar, Invar, phosphor bronze and aluminum.

Shimifrez also offers a rapid-response service to deliver components to several precision industries such as the [aerospace/satellite](#), automotive, computer/telecommunications, [medical](#) and electronics sectors. The demand now exists for relatively thin (< 0.5mm, 0.019" thick) and as thin as 0.0005 inches, complex design, intricate components at an economical price can be easily etched



Sputtering Mask for photo voltaic applications

### **Photo Etching Advantages**

Photo etching is especially useful in the **prototyping stage** of the design process, when several variations of a new design can be produced and tested at the same time with little additional cost. The chemical milling cost of tooling for a typical part is only several hundred dollars , versus



Microelectronic parts

several thousands of dollars for preparation of stamping tools and dies. Not taking into account of the revisions and modifications to existing designs can also be accomplished with the same speed and low cost benefits.

### Stress-free blanking

On ferrous and non-ferrous metal with no chemical or physical alteration to the material. Stamping can alter magnetic and other physical properties, such as hardness, strength and formability in certain materials. Laser cutting leaves a heat-affected area at the parts edge. Photo etching easily and economically reproduces intricate part geometries with extremely fine resolutions. Brittle and fragile materials subject to breakage during the stamping process can be photo etched without difficulty.

- 1) **Speed.** A photo-tool (tooling) for your custom part can typically be produced in one or two days, allowing your samples to get shipped as few as three days.
- 2) **Design changes , when your design is subject to change** Design changes are easy to introduce during the process,
- 3) **Precision.** Photo Etching offers the flexibility to produce unusual configurations to tight tolerances (within 0.0005").
- 4) **Cost.** Most photo-tools cost in the range of few hundred dollars, which is thousands of dollars less than hard tools to produce similar parts. Other features such logos part numbers can be incorporated at no extra cost

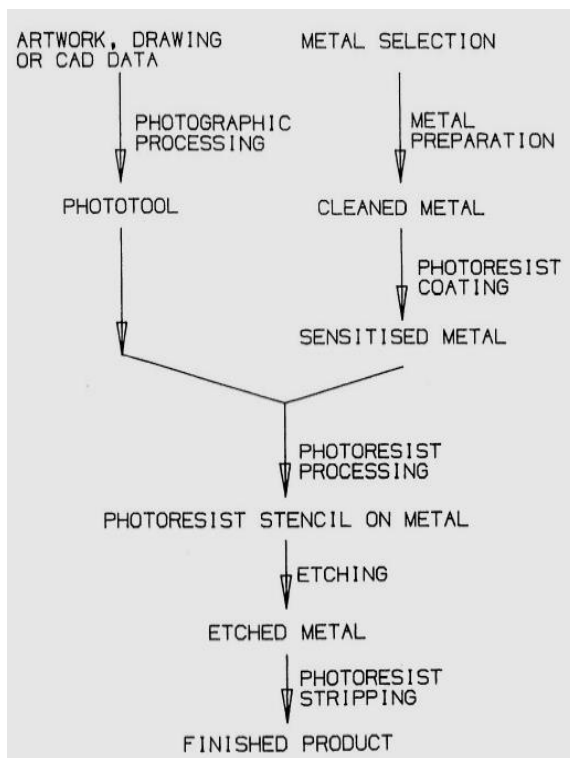


Photo-Etching process

### Photo etching process

The PCM manufacturing process begins by cleaning the metal and coating it with a light-sensitive resist. The coated sheet is then exposed to ultra violet light through the photo master from both sides, hardening the photo resist where exposure takes place. The unexposed areas are developed away, thereby removing the resist and leaving the metal bare where etching will occur. Etching solution is sprayed under pressure onto

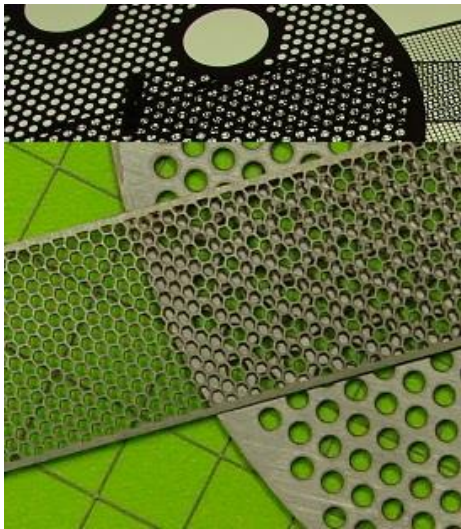


EMI/RFI shield enclosures

the top and bottom surfaces, accurately producing the component by removing the unwanted metal. The resist is then removed to leave burr- and stress free components.

### **Board level RFI/EMI shielding**

Shimifrez EMI/RFI board level shielding parts assure the performance and maintainability of communications equipment, medical, radar, computers, control systems, telecommunications, consumer and industrial electronics. EMI/RFI shields provide isolation of board-level components, and reduce the disturbance that affects an electrical circuit due to either electromagnetic induction or a radio frequency disturbance. Photo etched board level shielding offers true flexibility of design. Through holes and slots can be added for heat dissipation for no additional cost.



Fine mesh/grids (sieving and filtering applications)

### **Screens and meshes**

Unlike stamping, photo-etching yields a burr-free product resulting in cleaner yet more efficient screens. The screens feature tighter tolerance hole sizes and greater dimensional stability than woven wire mesh, this makes them ideal where requiring frequent cleaning. Benefits of Etched mesh

- No mechanical stresses built into product
- Etched screens have no burrs or rough edges
- Properties of metals are consistent and not altered
- Modification to tooling can be done quickly and economically.
- There is no limit to quantity, small lots for development, as well as production quantities can be produced cost effectively.
- Any shape and complex apertures can be etched