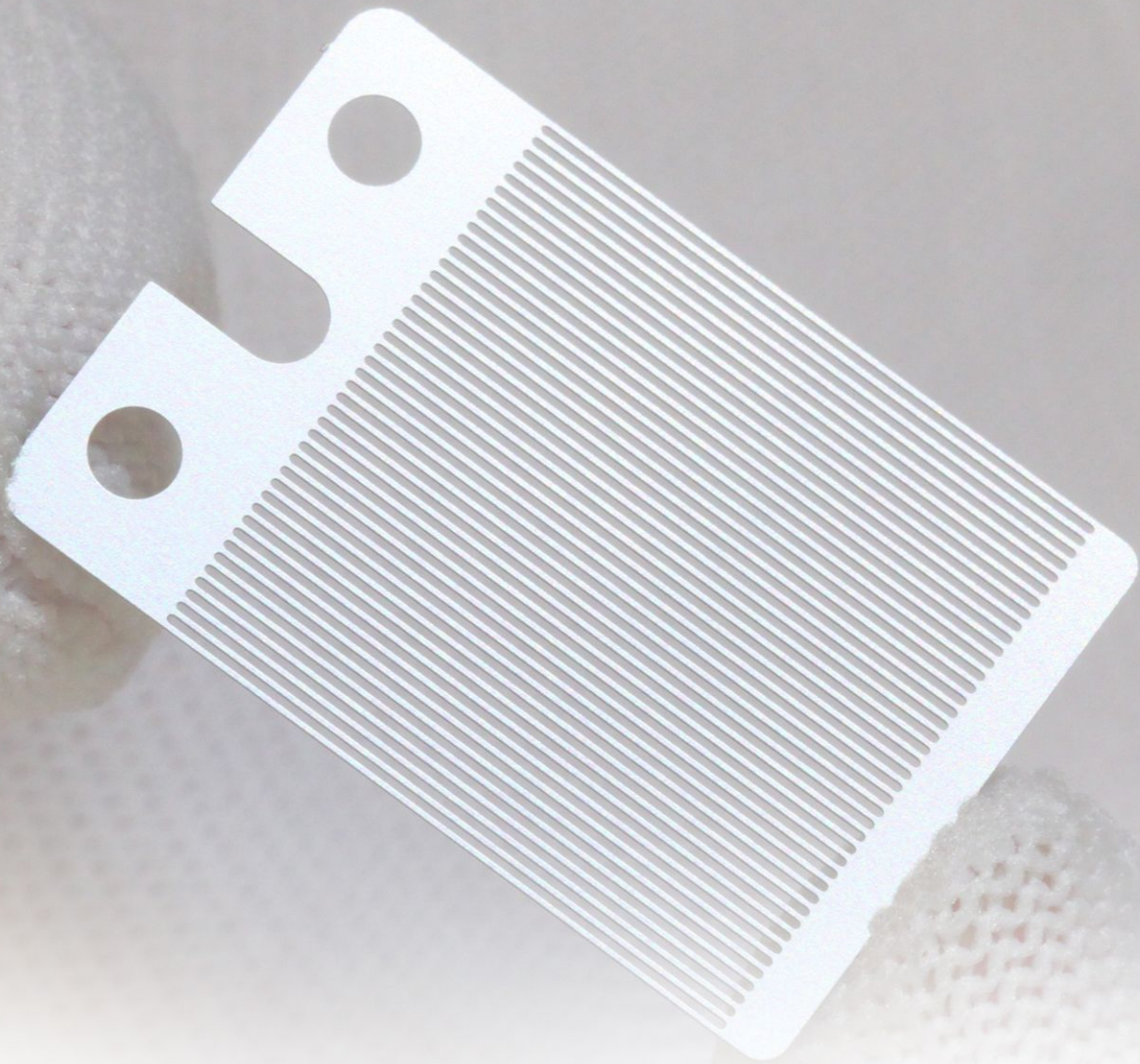




MECA\CHIMIQUE

Excellence in etching & electroforming

**Chemical etching and electroforming :
Two processes, endless possibilities**

CHEMICAL ETCHING: ACCURACY – QUALITY – VERSATILITY



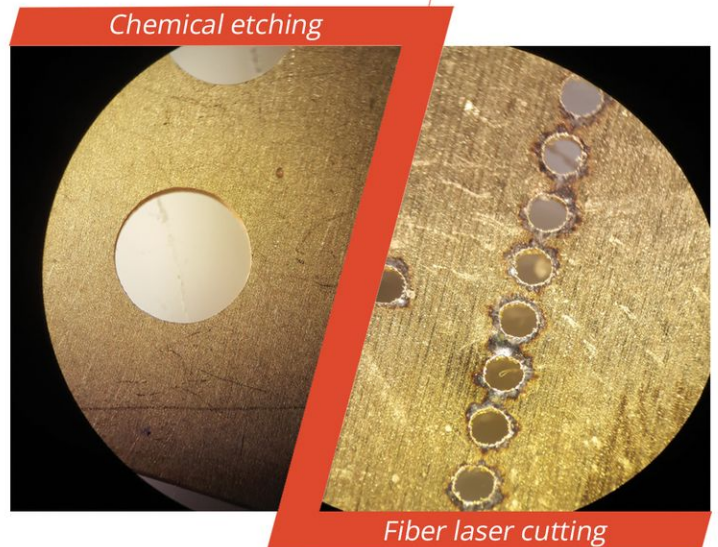
A PROCESS PROVIDING MULTIPLE POSSIBILITIES: YOU DRAW, WE MAKE IT!

The chemical etching process enables the manufacture of countless different parts. Possibilities are almost unlimited. The complexity of the patterns, the fineness of shapes or the fragility of the metal is not an issue. Engraving the metal's surface also is achievable.

This manufacturing process is compatible with most metal alloys, such as copper, brass, nickel, stainless steel, steel, Arcap, Inconel, Kovar, Invar, copper-beryllium, silver, bronze, Maillechort, aluminium. We machine in a thickness range of 0,010 up to 2mm. The accuracy obtained is excellent and proportional to the metal strip thickness.

PERFECT CUTTING QUALITY: NO BURR, NO BREAK POINT, NO HEAT-AFFECTED ZONE (HAZ)!

The chemical etching process prevents burr, stress, break point and heat-affected zone (HAZ). The internal structure of the material remains unchanged even at the cutting edge. Unlike other machining processes, no stress is put on the metal sheet. Mechanical, electrical and magnetic properties remain unchanged.



Chemical etching

Fiber laser cutting

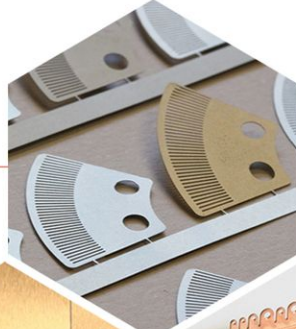


A COST EFFECTIVE, FLEXIBLE AND FAST MANUFACTURING PROCESS FROM SAMPLE TO SERIES

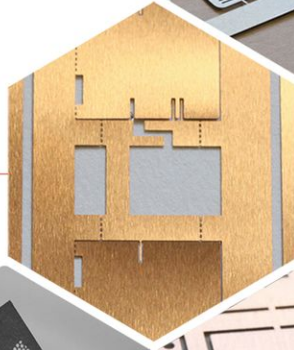
The chemical etching process does not require any costly and time consumable tooling. A photo-tool is used on which a negative and accurate image of the part to manufacture is applied. Such tooling can be made quickly and is inexpensive. Once it has been created, the photo-tool can be used many times. In case of design modification, the photo-tool is easy to modify. Such versatility, linked to low tooling cost, is very suitable for samples or small and medium series.

TWO DIFFERENT PROCESSES FOR MANY APPLICATIONS

Aeronautics



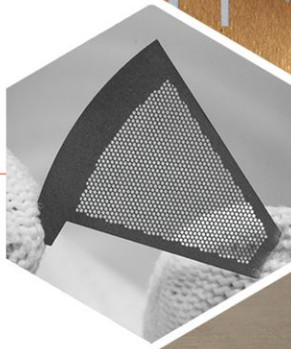
Space



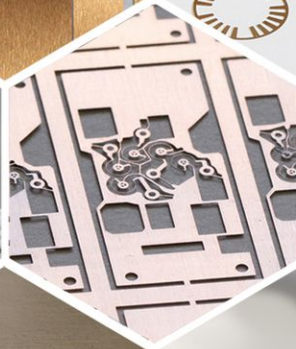
Micromechanics



Filtration



Electronics



Luxury



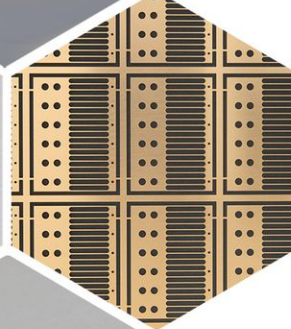
Fashion jewelry



Healthcare



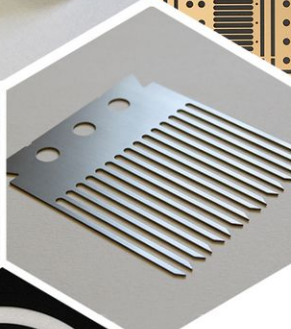
Defence



Decoration
Design



Agribusiness



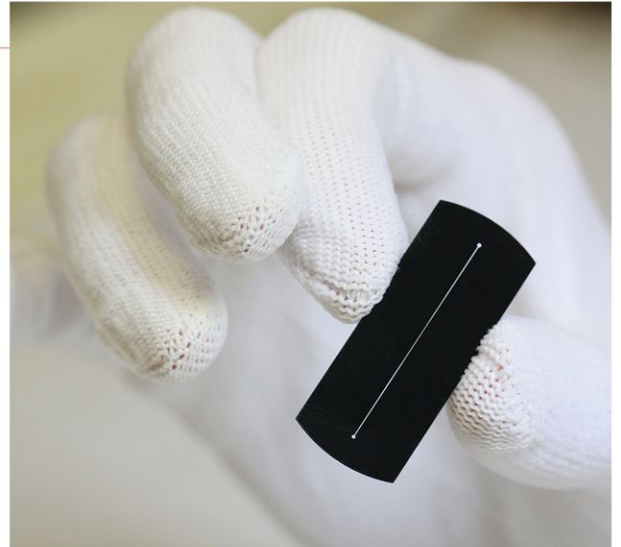
Optics



ELECTROFORMING: TREMENDOUSLY ACCURATE – THIN – SMALL

NO OTHER MANUFACTURING PROCESS CAN ACHIEVE SO FINE DESIGN

Electroforming enables to achieve smaller opening than the material thickness. Indeed, such additive process enables to build the part atom-by-atom which ensures unrivaled micrometric accuracy. Close-tolerance of $\pm 3 \mu\text{m}$ with 3 to up to $80 \mu\text{m}$ thickness.

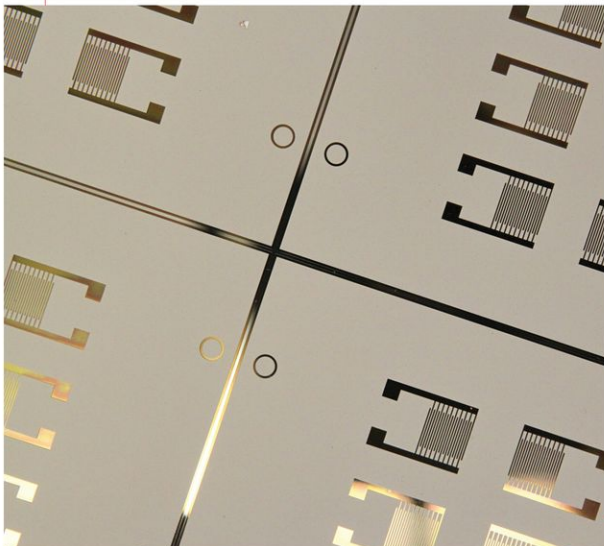


A PROCESS WHICH COMBINES HIGH ACCURACY, PERFECT SHAPE AND FLEXIBILITY

Like chemical etching, electroforming provides a perfect cutting quality: no burr, no break point, no heat-affected zone (HAZ). This process uses nickel or copper material and it is possible to add an optical black surface treatment.

Like chemical etching, electroforming involves a photo-tool which is quick to manufacture and inexpensive. This tool can be used many times and is easy to modify in case of design change.

When chemical etching is no longer accurate enough, here comes electroforming.



A PROCESS PROVIDING A HIGH BRIGHTNESS SURFACE

Depending on the growth parameters applied during manufacturing, it is possible to achieve a surface finishing from matt to perfectly bright.

ADDITIONAL SERVICES IN SURFACE TREATMENT



ANTI-REFLECTIVE BLACK COATING

Our anti-reflective black coating has outstanding performance in the visible spectrum (hemispheric reflectance $< 1,5\%$). Our black copper oxidation process is qualified for space, military and medical applications. The black treatment can be carried out on one or both sides.



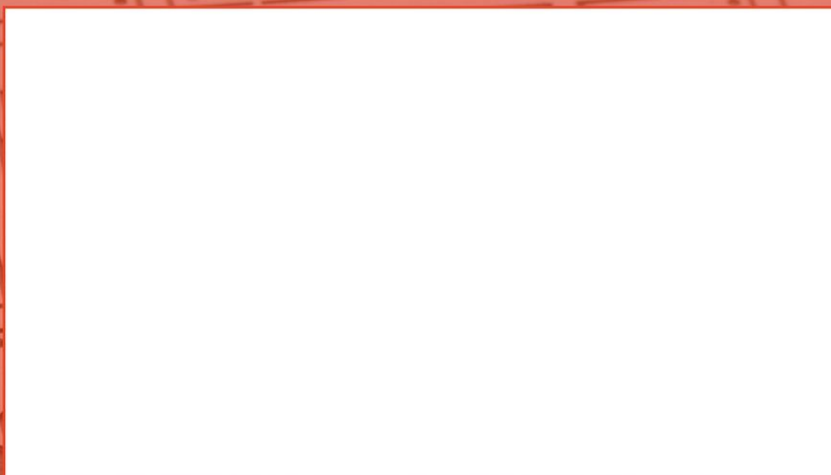
GILDING

Our gilding process, reserved for industrial applications, is approved by the European Space Agency (ESA). The treatment can be carried out on sheets or on individual parts. Its chemical formulation is sustainable regarding the evolution of the REACH regulation.



NICKEL PLATING

We offer electrolytic nickel-plating using nickel sulfamate without any organic additives in order to maintain the best deposit ductility. We also carry out low phosphorus chemical coating which guarantees perfect homogeneity over the entire surface of the part.



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The logo consists of a stylized red swoosh above the text 'PCMI' in a bold, sans-serif font. Below 'PCMI' is the text 'Photo Chemical Machining Institute' in a smaller font.