

PHOTOETCHING (CHEMICAL MILLING)

The demand for smaller, lightweight electronic systems, micromechanical components and devices is increasing across several different industries.

Designers are looking to produce smaller, higher precision parts, and this put economic and technical limits to the traditional metal machining methods.

Photoetching, also known as chemical milling or etching, is a chemical process used to create complex and highly accurate precision components from a wide range of metals by using digital tools rather than expensive and complex steel tools.

Silga, a leading company in the PCB's production, can offer to his Customers products made by Photoetching on Hi-Tech production lines and by using the well established chemical, mechanical and electronics know how.

Typical Applications include

- Busbars
- Antennae
- Heating elements
- Micro-connectors and contacts
- Battery terminals
- EMI/RFI shielding
- Lead frames
- Micromechanic components
- Contact springs

Materials

- Steel and stainless steels
- Copper and copper alloys
- Aluminium
- Other metals and alloys

A wide range of surface finishings is also available to increase wear resistance, conductivity and to enhance other properties, including gold, silver, nickel, tin and other coatings.

Specifications

- Etching tolerance (*):

metal thickness < 0,25 mm:	+/- 0.025mm
metal thickness >= 0,25 mm:	+/- 15% of metal thickness
- Location tolerance (*):

	+/- 0.025mm
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(*): depending on sheet size

The process is under control and the parts are inspected in accordance with our internal Quality Standards and with customer's specifications.

The above information is the result of analysis and tests performed internally. It is not intended as a guarantee of results.

Chemical etching vs. mechanical machining

Compared to standard mechanical methods of metal machining (i.e. stamping), photoetching allows to eliminate the cost for complex hard tools and the extra costs related to difficulties on non standard materials, low thickness and complicate shapes.

In some cases the geometric complexity and precision tolerances offered by photoetching make it the only technology suitable to fulfill the requirements.

Unlike traditional metal machining processes, metal's characteristics (hardness, fragility, thickness) are almost irrelevant.

Another big advantage of photoetching is the quick prototyping process and the easy changing of the tools in case of design modification.

Moreover, the process offer the possibility to have the so called "half-etching", with lines partially etched which allow the bending of the metal to get 3D shapes, as well as the engraving of letters, numbers and logos with no extra costs.

Photoetched Plated Connectors

The synergy between Silga's two Divisions (Electronics and Galvanic) make it possible to offer stress and burr free photo-etched connectors treated with a wide range of surface finishings ensuring high reliability and compliance with the different customer requirements, i.e. low contact resistance, low roughness, biocompatibility, ...

Benefits

- High Accuracy
- No expensive hard tooling
- Burr and stress-free
- No modification of metal properties
- Easy and low-cost design modification
- Short Lead-times
- 3D shapes
- Possibility to etch logos, part numbers or serial numbers

Application fields

- Electronics
- Precision Mechanics
- Automotive
- Energy
- Medical and Healthcare
- Filtration
- Aerospace

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