

# MESMOPROC



## Welcome to MESMOPROC

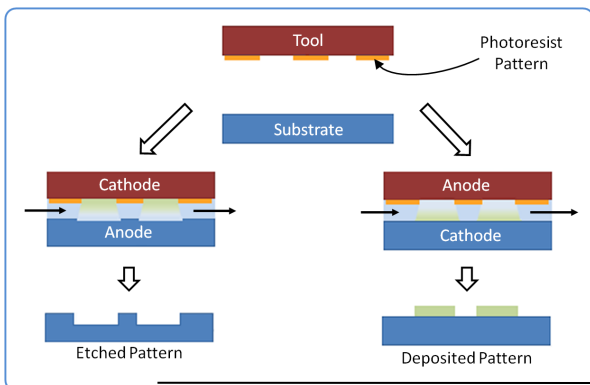
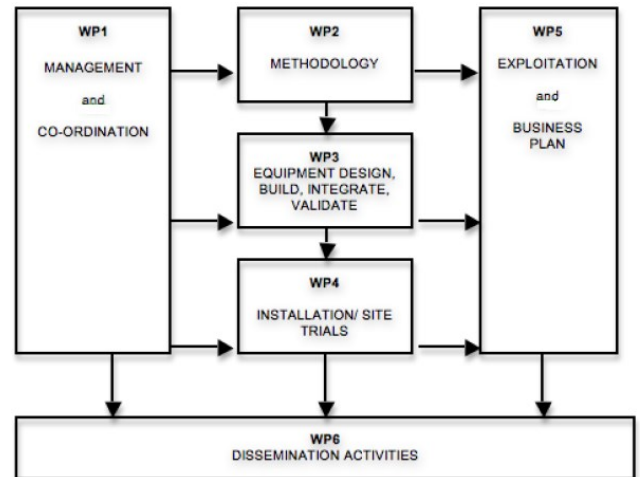
### "MASKLESS ELECTROCHEMICAL SURFACE MODIFICATION PROCESS"

The Mesmoproc project aims to achieve the first application of an innovative new process that combines electrochemical reactor engineering with innovative ultrasound agitation to enable selective metallisation of microscale devices, components and printed circuit boards without requiring the use of repetitive conventional photolithography stages. It will implement a new invention, *Enface* - electrochemical *nano* and *micro* fabrication via sustainable chemistry and engineering, to transfer patterns onto substrate surfaces. In the *Enface* process copper is first etched off the copper from selected areas and thereafter copper is deposited directly on those areas which remain metallised. The ability of *Enface* for selective copper etching and plating in micro-sized areas has already been proven. *Enface* uses a patterned tool to transfer patterns selectively, which eliminates the need for photolithography of substrates, thereby offering the potential for a much simpler process. The project will implement first industrial plants within partner SMEs' facilities in both the metal finishing and printed circuit board-manufacturing sectors. Key factors influencing the potential uptake of the developed technology are the increasing costs of raw materials, energy, treatment and disposal of waste, where significant potential savings have been identified. These costs are all projected to continue to rise due to a combination of legislation, in the instance of waste, and escalating world demand, primarily from Eastern manufacturing areas, in the case of materials. As a result, there is both a competitive need and an opportunity for significant cost benefits in the reduction of direct manufacturing overheads in industrial sectors that are of critical importance across Europe.

### Expected Results

A key expected output from the work will be a novel low cost, resource efficient and more sustainable process that is implemented via industrial scale units matched to targeted sector manufacturing plants. The new technology will enable enhanced efficiency operation via a much shorter and simpler process that uses fewer materials and less energy, while offering reduced waste generation and carbon dioxide emissions. Additional outputs will include arising IPR; detailed trial data; techno-economic modelling and a life cycle assessment to determine environmental impact. The main result indicators will be:

- A simplified manufacturing process compared to currently used conventional lithographic processes
- Reduced use of both valuable materials and associated toxic/ hazardous chemicals
- Waste minimisation/ diversion from landfill
- Reduced energy and water consumption



### ENFACE PROCESS

- EnFace has the ability to perform pattern transfer without the use of a mask
- The process introduces the idea of bringing the electrodes together in close proximity
- EnFace uses less process steps than photolithography
- Less materials and energy are used
- It is a safer process to carry out due to the use of less hazardous substances
- More environmentally friendly than other methods

### CONTACT

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