

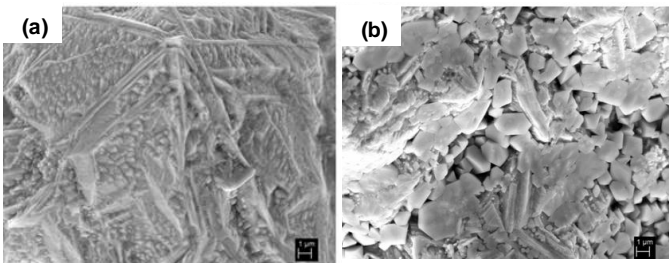


# HIGHLY EFFICIENT & HIGH QUALITY ELECTROPLATING PROCESS

## Available for License

### Basic overview

This technology uses magnetically enhanced electrolysis to **reduce power consumption**, allowing **improvement of surface quality or increasing plating rates**. This novel technique, developed by CRANN researchers, consists of electrodes with a self-driven convective system. This can be used to produce **focused deposition** in tens of microns, to reduce porosity or enhance smoothness thin films.



Porosity-inhomogeneity can be controlled by using this technology. Samples shown here were grown (a) with and (b) without our prototypes.

### Advantages

- **High quality finish** - very pure, non porous.
- **Smaller feature size** - (10s of  $\mu\text{m}$ ).
- **Power saving** ~ up to 20% reduction in voltage.
- **High throughput** – increased deposition rate.
- Room temperature operation - save cost of heating electrolyte.
- Reduced requirement for additives.
- A reduction of side-reactions.
- Elimination of dendrite growth.

### Technology and Patent Status

The core technology behind this technique uses magnetic fields to improve the mass transport in the electrochemical cell, influencing the relation between cell voltage and current density. In addition, the end product has improved deposit morphology.

This technology is currently in lab-scale prototype stage.

A patent has been filed on this technology.

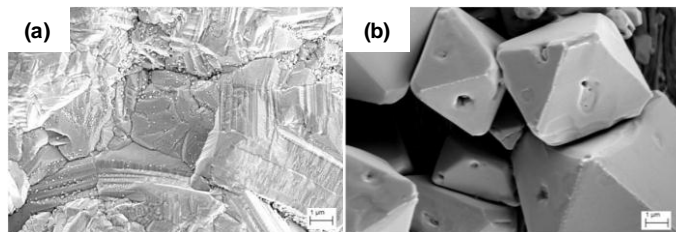
### Applications

This is a platform technology with a wide range of applications, where thin layers of metal are produced with controlled porosity and improved throwing power.

Relevant to:

- Semiconductor industry
- Medical device industry
- Automotive industry

The technology is also suitable for electrolysis processes in the base metal industry. It works across diverse metals such as Zn, Cu, Ag, Au and Chromium (III) ( $\text{Cr}_2\text{O}_3$ ).



Samples of copper electroplated at high current densities, in the presence of additives during long term deposition, (a) with TCD technology (b) without TCD technology - our method allows plating at high currents to obtain smooth deposits in conditions that would otherwise produce a powdery deposit.

### The opportunity

This technology is available for license. We are also interested in working with a development partner. Also, as there are a significant number of broad market opportunities it may also be suitable for a start-up company.

A second opportunity relates to design and installation of tailored made solutions for companies in the electroplating industry, whereby a specific magnetic arrangement could be delivered to the end user.

