

We develop green advanced manufacturing technologies meeting the demand of the fourth industrial revolution

Established in 2006, the Electrochemical Green Engineering (EGE) Group draws from several disciplines across science, technological and engineering fields.

This multidisciplinary approach, together with its strong expertise in electrochemistry, gives the EGE Group a unique position to conduct research in advanced manufacturing for industry and academia.

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Electrochemical Green Engineering Group

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# Electrochemical Green Engineering Group

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Research in advanced manufacturing and electrochemical technologies to support the fourth industrial revolution.



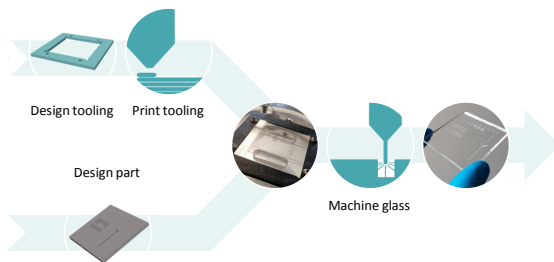


## Spark Assisted Chemical Engraving

Spark Assisted Chemical Engraving (SACE) is a hybrid technology combining chemical and thermal processes. The technology preserves the optical transparency of glass while machining burr- and crack-free without leaving any deposits on the surface. Structures with aspect ratios of up to 1:10 can be realized.

### Idea-to-realization

The high flexibility and the extremely low tooling costs make SACE ideally suited for ultra-customized part fabrication. Work-piece support is designed from part CAD file and 3D printed.



## Applications

Machining of SiO-based non-conductive material (e.g. glass, quartz, silicon, vitreous enamel).

The burr and micro-crack free process makes it suitable to downstream processing (e.g. glass-to-glass bonding).

As glass is optically transparent, chemically inert and sterilisable a large number of applications exists.

### Medical industry

- Microfluidic devices
- Multi layer mixer
- Lab-On-Chip
- Chemical (mixer chips, micro-reactor)

### Watch industry

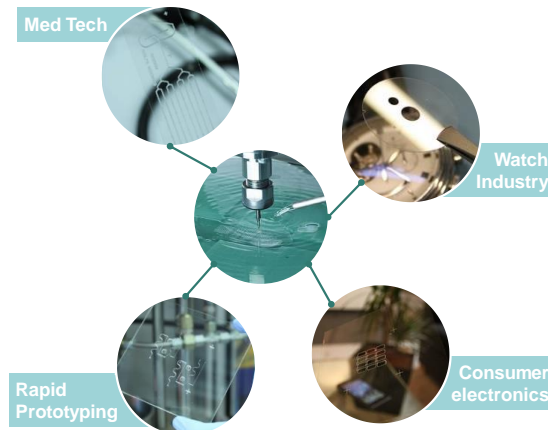
- Watch dial glass
- Mechanical parts
- Decoration

### Electronic industry

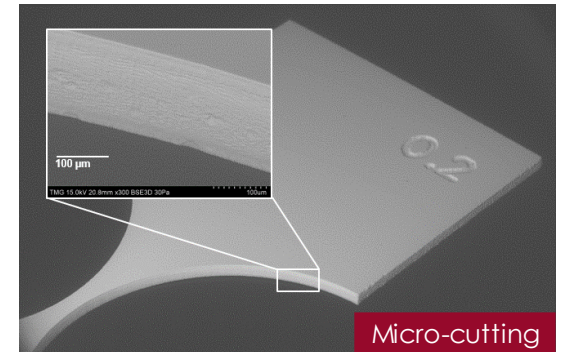
- Drilling for Through Glass Vias (TGV)
- Optical PCB
- Micro-electro-Mechanical-Systems (MEMS)

### Rapid prototyping

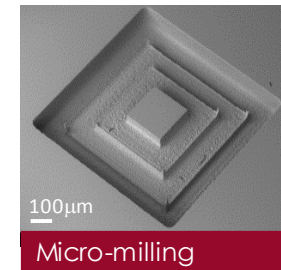
- Industrial R&D
- Fundamental research
- Batch size-1 production



## Key features



Micro-cutting



Micro-milling

- Burr and micro-crack free machining
- 2.5D machining
- High aspect-ratio machining (up to 1:10)
- Ultra low tooling costs



Micro-drilling

## Contact Us

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Innovative glass micro-machining with high flexibility, accuracy and efficiency