

**ECM Developments provides a specialist electrochemical machining capability to aerospace, automotive, defence, nuclear, oil and gas, medical and other industries.**

Electrochemical Machining is a rapid, highly cost-effective machining process that eliminates heat and mechanical stress during machining. The ECM tool (cathode) is positioned close to the work piece (anode) and a low-voltage, high-amperage direct current is passed between them via an electrolyte flowing through the anode-cathode gap. Material is removed by anodic dissolution in the form of metal hydroxides that are carried away from the machining gap by the electrolyte.

Electrochemical machining can be used as a metal removal or de-burring process on virtually any metal, no matter how hard or difficult to conventionally machine it is. Metal removal rates during ECM are consistent, irrespective of metal type, condition or hardness.

Capability available from ECM Developments covers contract electrochemical machining and manufacturing partnerships, process innovation and development, application engineering and design and manufacture of tooling and machining systems.

- ECM produces a burr free edge and a high surface finish requiring no further processing
- The process is simple to operate with good levels of productivity and fast turn round.
- Tooling and running costs are low. No tool wear occurs during ECM.
- Work-pieces may be processed by ECM either before or after heat treatment.

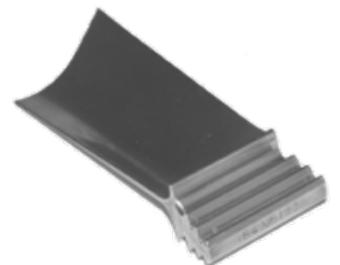
**Typical ECM applications:**

- Forming internal chambers and transfer ports.
- Polygon shaped holes.
- Low approach angle holes.
- De burring of inaccessible features and intersecting holes.
- Forming shallow channels for lubrication or micro fluidic devices
- Forming complex three dimensional shapes such as aerofoil and turbine blades.
- **Precision Electrochemical Burr removal and edge rounding (ECD)**

Electrochemical de burring (ECD) targets specific burr sites on precision machined components, converting them into consistent, rounded edges.

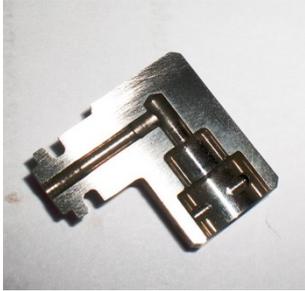
All metals at any hardness level can be processed, as can difficult to access intersecting holes and machined break through features. Edge rounding can be varied to suit component functionality and micro features can be treated.

Non consumable tooling is used to target specific burr sites and cycle times are short with high levels of predictable quality.



High quality de burring of difficult to access features such as intersecting bores in performance critical components machined from stainless steel and nickel alloys are good examples of ECD application:

VALVE BORE ECD



MICRO BORE ECD



## ECM Developments

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