

Research program:
“Process and product performance in micro-EDM milling”

Annex C

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Research project

The research will take into account all the features representative of the typical industrial components that can be fabricated by micro-EDM, such as hole, pocket, wall, pin, free form.

For each of these features the most important manufacturing issues will be studied, first by a large bibliographic analysis and then by specific experimental tests performed using a Sarix SX200 micro-EDM milling machine.

The main research activities are reported below.

- For each of the features previously mentioned, the micro-EDM technology limits will be studied in terms of: downsizing limits, aspect ratio, accuracy, repeatability and surface finishing.
- Analysis of the effects of different workpiece materials properties, not only in terms of physical, thermal and mechanical properties, but also in terms of metallurgical characteristics (e.g. grain size).
- Analysis of the process performance by taking into account topics like machining time, material removal rate and tool wear ratio.
- Sensitivity analysis for the definition of a relation among process parameters, final products quality, manufacturing time and tool wear.
- Study about the environmental impact and the sustainability of micro-EDM technology, paying particular attention to the possibility of avoiding the use of dielectric fluid during EDM process (dry or near-dry EDM).