> The PEM process. The benefits in detail.

- Precise machining of virtually any metal
- Simultaneous machining of macro and microstructures
- High surface quality – high reproduction accuracy (2–5 µm)
- Production of surface qualities with a CLA of ≤ 0.05 µm as standard (depending upon the surface quality of the electrodes used; in many cases, even lower values are possible, depending upon the process, material and electrode)
- Short machining times: feed rates of between 0.1 and 2 mm per minute are possible, depending upon the material and application
- Contact-free machining
- Macro and micro deburring
- As a rule, no reworking of the workpiece is required, since no material deposits or coatings are formed
- Virtually unlimited choice of (conductive) electrode material
- The electrode can be formed from a part of the existing workpiece
- No process-related electrode wear
- Dimensional accuracy in series production
- No microstructure changes in the workpiece, since the process does not give rise to any thermal or mechanical stresses
- Ideally suited to small or large production runs and to prototype manufacture
- Inexpensive process
- No microcracking, hence extremely high corrosion resistance
- Absolutely burr-free
- Processing of metals of any hardness
- Roughing/smoothing/polishing in a single step
- Machining of superalloys such as Inconel and Hastelloy, and of powder-metallurgy steels

> The history of precision

The story begins in 1995 in the Saarland, at the PEM-Technologiegesellschaft für elektrochemische bearbeitung mbH in Dillingen/Germany. Five years later, the first PEMCenter leaves the factory. PEMTec SNC is founded 2003 in Forbach. The operative part of business begins and 2006 the first PECM machine, developed solely by PEMTec is sold.

2009 sees the completion of an international distribution network. The sales of fully automated facility concepts begins one year later. In 2012, PEMTec's distribution network is again expanded through cooperation agreements with strategic partners.

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The art of precision

PEMTec
Precise
Electrochemical
Machining

PEMAQUA

Standalone electrolyte treatment.

Automated microfiltration with back-washing.

An integral programmable controller monitors and communicates with the PEM components.

Conductivity, pH and temperature values of the electrolytes controlled according to the demanding process requirements.

Chrome-6-reduction

PEMMECHANIC

Granite frame:
Inherently rigid frame, resistant to ageing and corrosion, utmost precision, insulating, does not absorb moisture.

Feed axis:
Precision linear guidance, stick-slip-free movement, play-free recirculating ball screw.

Vibrator assembly:
Zero maintenance, zero play, zero wear.

PEMCONTROL

User-friendly operating and control software.

Swift short-circuit detection and tripping.

PEMPOWER

Constant-current power supply with highly dynamic control.

Modular and forward-thinking overall concept.

Modular, cascadable system structure.

High stability and precision.

Monitored overload control.

Shaping of complex parts. The example shows a crown wheel with a involute tooth geometry.

Machining of polished convex and concave surface geometries in one step without any rework.

Valve plate: machining of surface reset, calotte geometries and defined radius in a single work process.

Manufacture of punch inserts with highly complex geometries; undercuts and the provision of lubrication grooves are possible.

> Roughing, smoothing, undercutting, sinking and polishing of **highly complex geometries**, in a single work process. With high speed, dimensional accuracy and surface quality. Irrespective of the hardness of the metals and alloys. In a contact-free, cold process with no thermal or mechanical impact. **PEM**Tec achieves what no other metal machining tool can do.

The art to machine workpieces in excellent quality is what we simply call **pemming**.

Although the material is removed atom by atom, the final workpiece is produced from the blank within a matter of minutes. The process, a further development of electrochemical cavity sinking, is suitable for the inexpensive manufacture of prototypes, small and large production runs, and simultaneous processing of micro and macrostructures.

Leading companies in the automotive, medical devices, aeronautics and aerospace industries and in many other sectors are already placing their confidence in **PEM**Tec applications. **Don’t be left behind. Place your confidence in PEM**Tec **NOW!**

PEMTec
Precise
Electrochemical
Machining