

PRECISION MAKES THE DIFFERENCE

ECONOMICAL SERIAL PRODUCTION

Complex geometries can be created precisely and shape-giving in a short process time with a wide range of metals. By using several tool electrodes in parallel, workpieces can be machined synchronously. With multiple use of the electrodes, the tool costs per piece are significantly reduced compared to alternative manufacturing processes. In this way, shorter process times can be achieved overall. The new processing method is the world leader in the field of precise electrochemical metal processing.

STRESS-FREE MATERIAL PROCESSING

Completely contactless and without thermal or mechanical influences, workpieces can be produced with maximum stability and without microcracks. The manufactured metal parts are absolutely burr-free. Roughing, finishing and polishing are done in a single operation. Produce without process-related tool wear, with an image accuracy and repeatability in the lower micrometer range and a surface quality of up to 0.03 µm.

HIGH PRECISION TECHNOLOGY

PECM. PEMTEC IS THE FIRST CHOICE.

Today, PEMTec is one of the technology leaders in precise electrochemical machining of metals.

As a globally active mechanical engineering company, PEMTec has further developed PECM technology into an unique and in series industry proven standard: the „Pemmen“®.

Today, „pemmed“ components already fly into space and return safely. Exactly according to the specifications of many industrial sectors, PEMTec's PECM technology is constantly finding new applications.

Worldwide, more and more high-precision workpieces are machined with PEMTec machines in the metalworking industry. Whether automotive, aerospace or medical technology – the machines developed and built by PEMTec offer unique opportunities for new economic efficiency in the production of precision parts compared to conventional manufacturing techniques.

From standard machines to individual customer applications to fully automated series production: With PEMTec's high-tech solutions, precision becomes the new success factor for your company.

THE COMPACT SOLUTION FOR METALS PEM 3.1 SX



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Experience the world of PEMTec

Simply record code with your mobile phone camera.
<https://pemtec.de/en/machines/pem-3-1-sx>

PEM Tec SNC

6 rue Jules Verne
BP 60147
F-57603 Forbach Cedex

T +33 (0) 3 87 13 09 00

F +33 (0) 3 87 13 09 98
www.pemtec.fr

PEM Tec GmbH

Saarburger Str. 37-39
D-54329 Konz-Könten

T +49 (0) 65 01 60 80 95

F +49 (0) 65 01 60 80 96
www.pemtec.de

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PEM Tec
HIGH PRECISION TECHNOLOGY

STRESS-FREE METAL MACHINING

The PEM 3.1 SX combines the proven, material-friendly PECM technology as a compact all-in-one machine with a small footprint. The new machine concept combines new machine components, flexible and very intuitive software and an adaptive electrolyte system. The newly designed generator meets all the requirements for processing the components quickly and repeatably. The system becomes even more powerful with the optional PLC-controlled X/Y adjustment aid and the optional loading automation.

THE ADVANTAGES AT A GLANCE

- Compact all-in-one machining solution with a small footprint
- Machining of a very wide range of metals regardless of their hardness
- High-precision mapping of the finest geometries and structures
- Roughing, finishing and polishing sequentially (in one operation)
- No melting, no micro-cracks, no formation of external phases

APPLICATION EXAMPLES



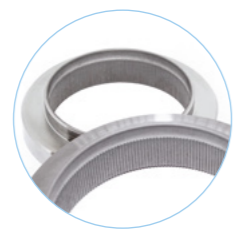
Valve plate
Material: 1.4034 /1.4112
Depth: 1.82 mm
Processing time: 448 sec.
Multiple machining: 24 times in series
Ra: 0.07 µm



Spur gearing
Material: 1.4034
Depth: 1.7 mm
Processing time: 8 min.
Multiple processing: 4-fold, 2 min / part
Ra: 0.15 µm



Aveole
Material: Inconel 713c
Depth: 20 mm
Processing time: 45 min.
Ra: 0.8 µm



Strain wave gear
Material: 100Cr6
Depth: 7 mm
Processing time: 23 min.
Ra: 0.4 µm

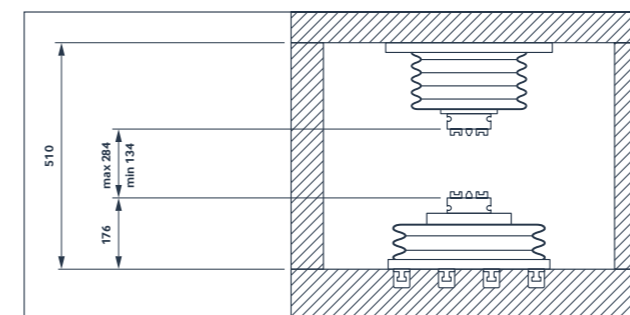
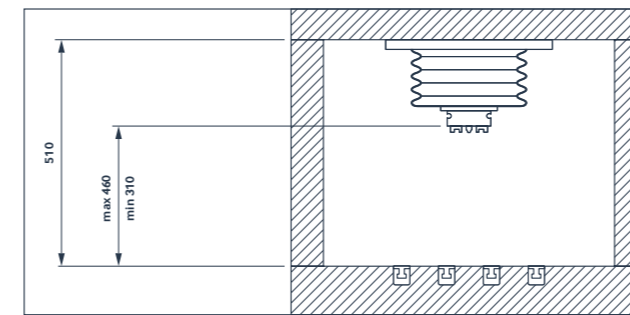
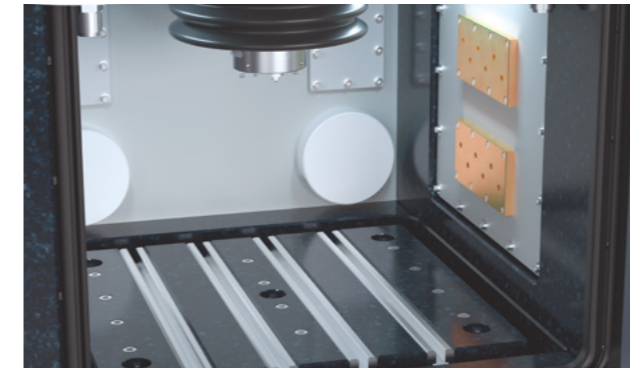
THE MACHINE FOR METALWORKING: PEM 3.1 SX

THE POSSIBILITIES

- Reproducibility of complex component geometries and structures
- Multiple machining of workpieces possible in one operation
- Wide range of electrode materials for optimum process conditions
- Polished surfaces directly from the process, up to Ra 0.05 µm
- Zero melted layers nor cracks in the microstructure
- Automated loading for autonomous operation optionally possible

THE WORKING CHAMBER

- Interior 590 x 680 mm (W x D)
- Natural granite cell with an usable working height of 310 - 460 mm
- PLC controlled X/Y adjustment aid, resulting in an usable working height of 134 - 284 mm (enlargement by a further 125 mm possible, without standard worktable)



TECHNICAL DATA

- Compact machine design with all necessary modules in an enclosed all-in-one-concept
- Machine decoupled by air suspension elements
Footprint 1.630 x 2.790 x 2.590 mm (W x D x H) plus door opening
- Machine table 540 x 520 mm (W x D) with T-slots for universal applications
- PECM axis travel 150 mm
- PECM machining module in natural granite
- Free programmable process stroke between 50 µm and 3 mm
- Universal reference clamping system designed for 3R Macro and/or EROWA ITS 100 clamping systems
- HMI user interface via 21.5" touch display
- Latest advancement in PECM power technology with more than 1.600 A pulse current Pulsstrom

MACHINE OPTIONS

- Motor-controlled X/Y adjustment aid for workpiece alignment:
 - XY travel ± 10 mm
 - Positioning accuracy ± 0.9 µm
 - Positioning speed 30 mm/s
 - Controlled by PLC
 - Max. axial load capacity 1 kN
 - Optional interface for automatic workpiece set-up via RFID or QR code
- Standard interface for automation
- Automated workpiece loading system, e.g. EROWA Robot Compact 80
- CEEP Unit – stabilizes the PECM process and ensures even better processing results
- C-axis, as a freely programmable rotary axis
- Machine feet with active damping
- Microfiltration as an extension of the filtration capacity
- Fully integrated dechroming