

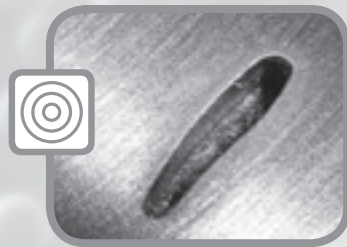
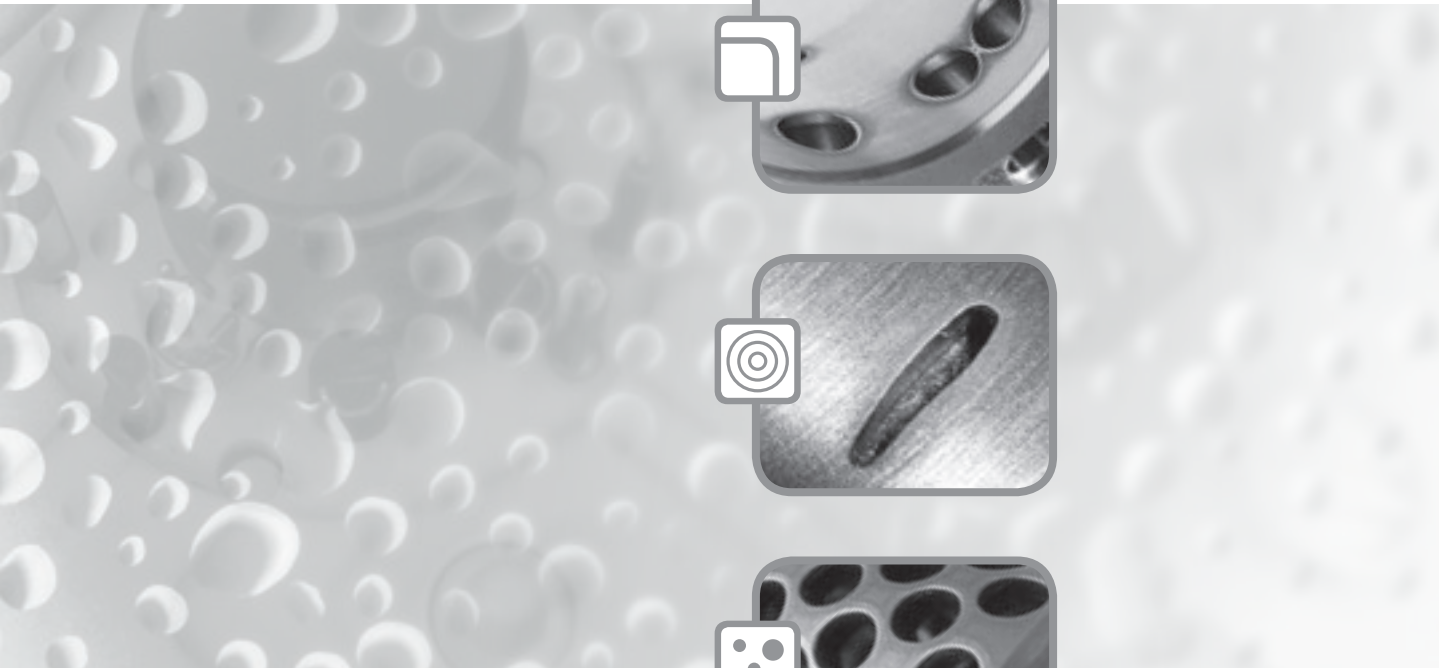
INDUSTRIE TECHNOLOGIE

**SITEC**



ELECTROCHEMICAL MACHINING – COST-EFFECTIVE IN SERIES PRODUCTION





We have more than 25 years of experience in the optimal use of electrochemical machining (ECM) within a flexible production process and the development and production of ECM fixtures and ECM equipment.

The results of our practice-oriented, interdisciplinary research and development are the basis of system solutions for your demanding tasks. Process technologies from **deburring, drilling, sinking up to gallery forming** and handling concepts from manual up to automated will offer you a high variety in use.

Acting as technology-oriented company, you will get support from us at any time in developing your specific solution.

Cerified according to: ISO 9001  
ISO 14001  
ISO/TS 16949

**MECHANICAL ENGINEERING** | SERIES PRODUCTION

## THE PROCESS AND ITS BENEFITS

**Electrochemical machining (ECM) is a stock-removing production process.**

In particular, hardly accessible spots on gear, engine, hydraulic and pneumatic components can be deburred precisely and economically. Further, the process offers the possibility to incorporate and/or generate complicated shapes even in the interior of components.

The benefits are clear to see:

- No mechanical or thermal impacts on the workpieces
- Defined generation of radii and edge chamfers
- Generation of complex geometrical structures
- Process reproducible and process-reliable
- Machining of difficult-to-machine materials

We accompany our customers right from the beginning through the whole introduction of the production process.

The technical development, the machining of the first samples and the production of prototypes is all performed in our ECM application centre.

Challenge us!



- Burr on intersection
- Work piece positioned on fixture and contacted

- Process starts-up by applying the operating voltage
- Defined metal dissolution begins

- Process ended
- Work piece is free of burr

## ELECTROCHEMICAL MACHINING - PROCESS CYCLE

### PRE-TREATMENT

Optional pre-cleaning of component to remove oil or loose burr

- Immersion bath
- Ultrasound

### ECM - LINE

Electrochemical treatment to obtain burr-free chamfered edges

### AFTER-TREATMENT

Obligatory desalting of component

Optionally, additional preservation possible

## ECM FIXTURES – THE HEART OF THIS INNOVATIVE TECHNOLOGY

Machining quality is largely dependent on the ECM fixtures.

When electrochemical form deburring only work piece edges containing burrs are machined. Here the fixture takes up the work pieces in an aligned position and geometrically reproduces the elements being deburred. Several points of a work piece can be machined according to different requirements (selective machining) and, depending on the size of the work piece and the task being performed, also several parts simultaneously.

The different machining concepts allow an extremely efficient production. A main benefit lies in the non-contact machining of the work pieces.

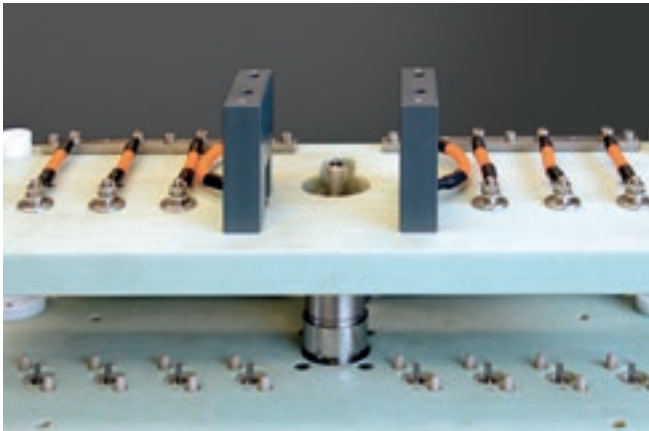
This means that the fixture is not exposed to process-related wear and tear; it is also completely made of corrosion-proof material.

You too can benefit from the experience we have gained in several decades of the construction of fixtures.

We will assess your machining task and then prepare a concept for the fixture.

We can prepare sample machining work in our application centre where you can see the performance capability of the process. The design, construction and production of the fixtures is carried out on our premises in close coordination with the machining concept. Of course we can also supply you with the required fixtures for your existing equipment.

Should an investment in the equipment not be worthwhile for you, then we will gladly machine your parts in our component production facility.



Simultaneous machining of 8 work pieces



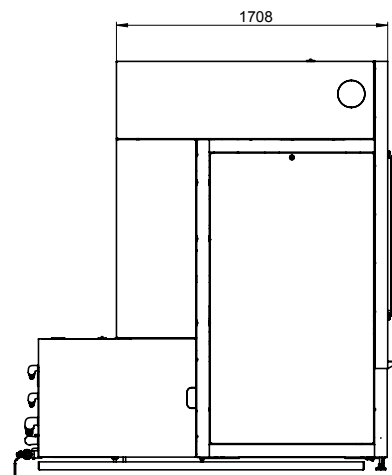
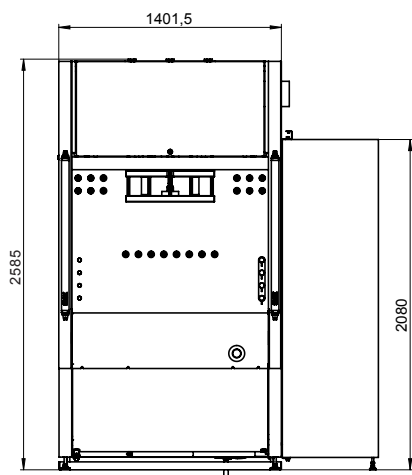
Machining of several points on one work piece



Selective machining of a work piece to produce different chamfers

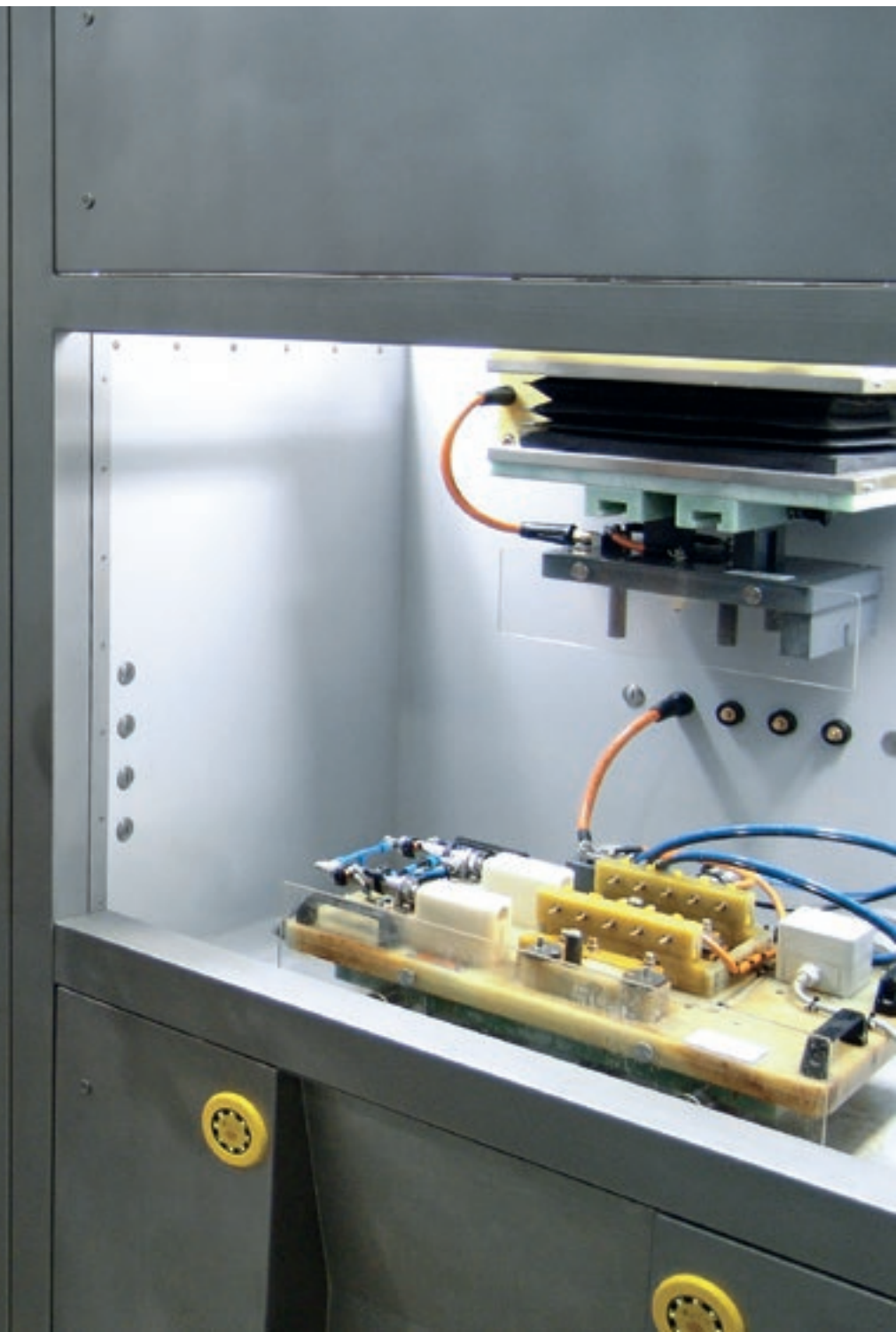
## ES128P - STANDARD LINE WITH MODULARISED GENERATOR EQUIPMENT

<b>Dimensions</b>	
width	2,010 mm
depth	2,425 mm
height	2,585 mm
<b>Workspace</b>	
width	1,200 mm
depth	800 mm
<b>Electrolyte tank</b>	
filling capacity	850l
<b>Generator technology</b>	
output voltage	0 bis 45VDC
output current	0 bis 1,200A
<b>Installation data</b>	
power supply	3 AC 400V +PE +N
power frequency	50/60Hz



Technical changes reserved.



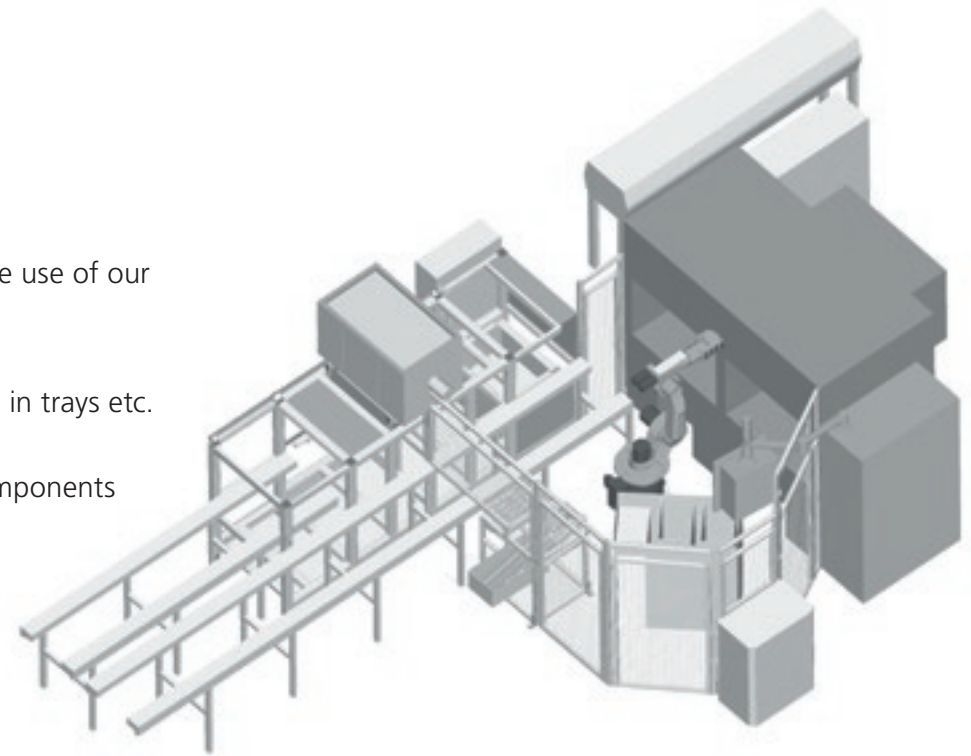




## AUTOMATED PROCESS CHAIN

On request, the ES128P can be integrated in your production process – make use of our long-term experience gained in the field of automation.

- Automated loading and unloading by means of robot onto WPC-systems, in trays etc.
- Flexible manufacture of various types possible
- Integrated after-treatment such as air-blasting, flushing, preserving of components as ready-to-install variant or for other production processes
- Acquisition, storage, and assessment of process data



## APPLICATION EXAMPLE

### DRILLING



Sleeve shaft

Machining task:  
30 holes  $\varnothing$  3,5 mm with defined chamfer outside and inside, wall thickness approx. 3 mm  
Material: 16MnCr5 (1.7131)  
Process time: 100 s for all holes  
Repeat accuracy:  
 $\pm 0,10$  mm (position and diameter)

### SINKING



Gear

Machining task:  
defined chamfer on over 100 cogs  
Material: 37MnB4 (1.5524)  
Process time: 25 s  
Repeat accuracy:  
 $\pm 0,02$  mm

### GALLERY FORMING



Housings

Machining task:  
aspect ratio  $\geq 2,0$   
Material: iron-nickel-basis-alloy  
Process time: 100 s  
Repeat accuracy:  
high removing of material  $\pm 0,01$  g

### DEBURRING



Hub

Machining task:  
chamfer max. -0,3  
Material: 42CrMo4 (1.7225)  
Process time: 16 s

### DEBURRING



Fuel injector

Machining task:  
chamfer -0,3 to -0,5  
Material: X2CrNi18-9 (1.4307)  
Process time: 18 s

## SERVICE PARTNERS. QUICK AND PROFESSIONAL.

We will also provide you with our comprehensive service after the commissioning of your equipment. The SITEC customer service offers you an immediate support service day and night. Through the regular maintenance and prompt repair of your equipment, we can guarantee you a high degree of availability of your machine.



### Spare parts service

- central spare parts management
- definition of spare part packages
- provision of special spare parts as arranged

### Product-Support

- 24 h call-out service
- immediate assistance by phone
- remote diagnosis using our Tele-Service
- service calls for maintenance or disturbances
- preventative maintenance work

### Process-Support

- training
- production assistance
- technology adaptation
- process optimisation
- equipment retrofitting



# SITEC

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## MECHANICAL ENGINEERING

- Automated assembly lines
- Laser-machining centres
- ECM-lines

## SERIES PRODUCTION

- Laser-machining
- Electrochemical machining
- Mechanical machining
- Supplier management

