

PCMI Spring conference Verona

horizontal wet chemical process lines



Presenter



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Topics

- TSK company introduction
- Relation TSK- RENA- Höllmüller
- Working business fields
- Product portfolio
- Process flow chart
- Line concept
- Etching homogeneity overall, etching top and bottom
- Vacuum etching with FeCl_3 etching @ top side.
- maintenance friendly manifold cleaning systems
- Regeneration systems
- Drawer etching machine
- Final cleaning process
- Customized Solutions

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Company

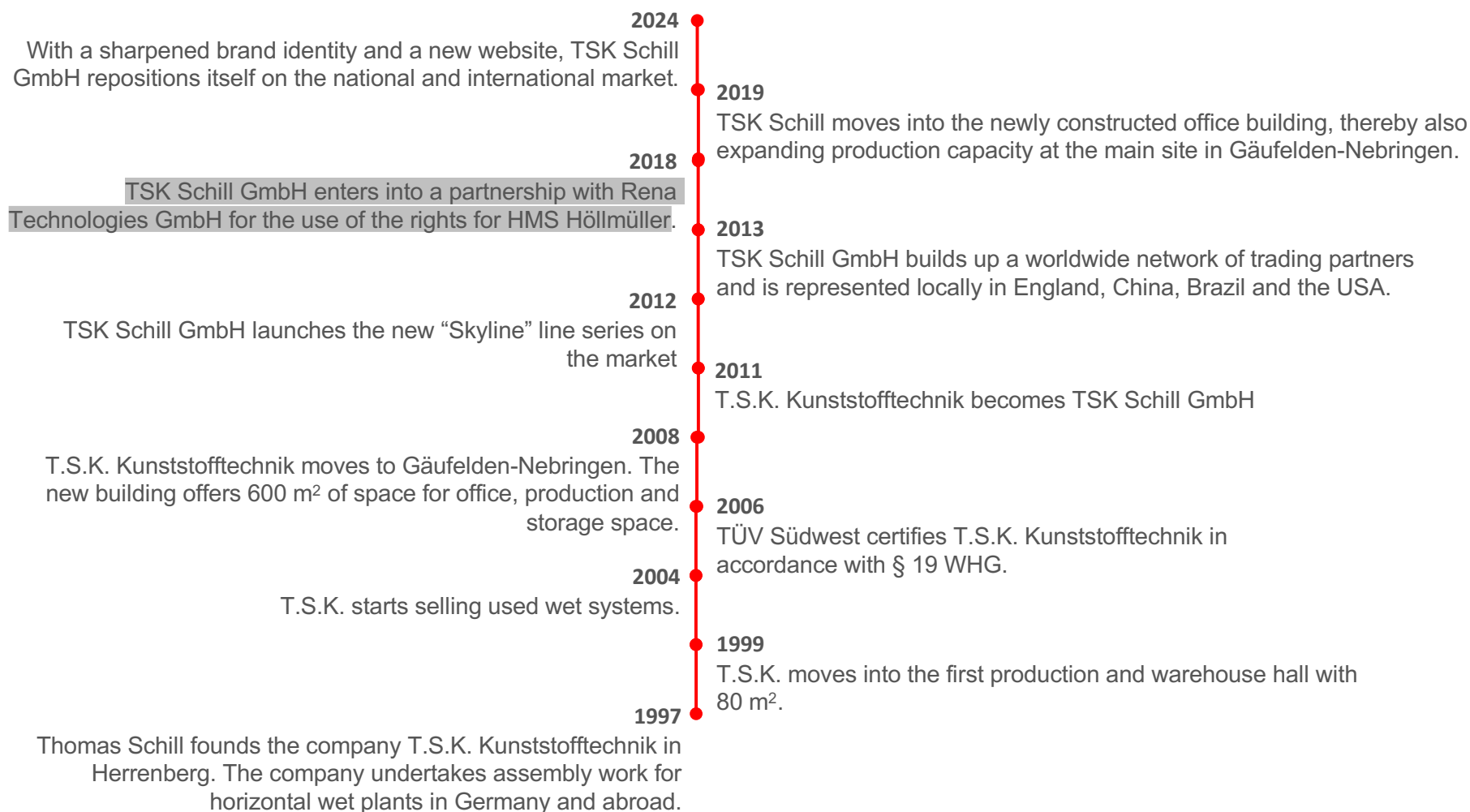
TSK Schill GmbH

Renowned in the construction, sales and service of systems for horizontal wet chemical processes. TSK specializes in systems for PCB production, printed circuits, molded part etching, as well as for high-current and high-frequency applications and solar systems for the national and international market. The highest level of expertise in design, construction and production as well as many years of experience in design and service make us the first point of contact for high-quality and durable systems for horizontal wet-chemical processes.

With several production sites in Germany, we stand for reliability, flexibility, customer proximity and enormous expertise through in-house specialists, many of our experts have been familiar with wet chemical processes for more than 40 years. We attach particular importance to stable and reliable relationships with customers and suppliers, for whom we are always available with personal contact persons. The highest precision is our daily claim.

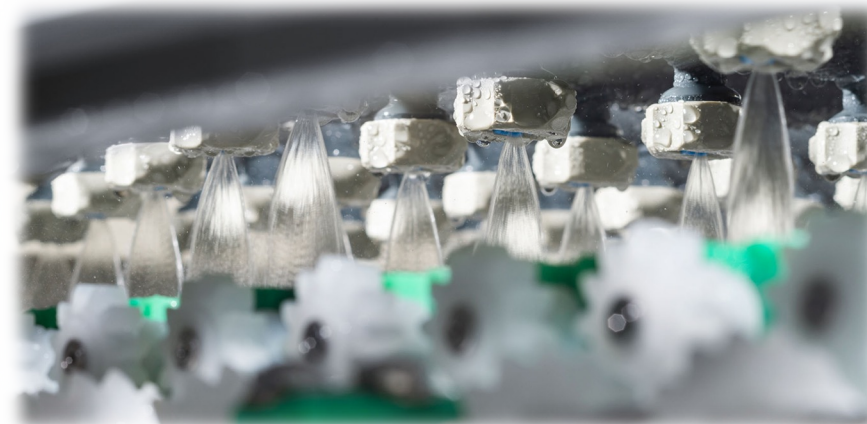
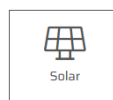
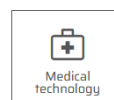
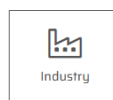
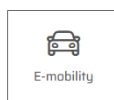


TSK-History



Industry overview

Our Systems for your sector:



Number of customers:

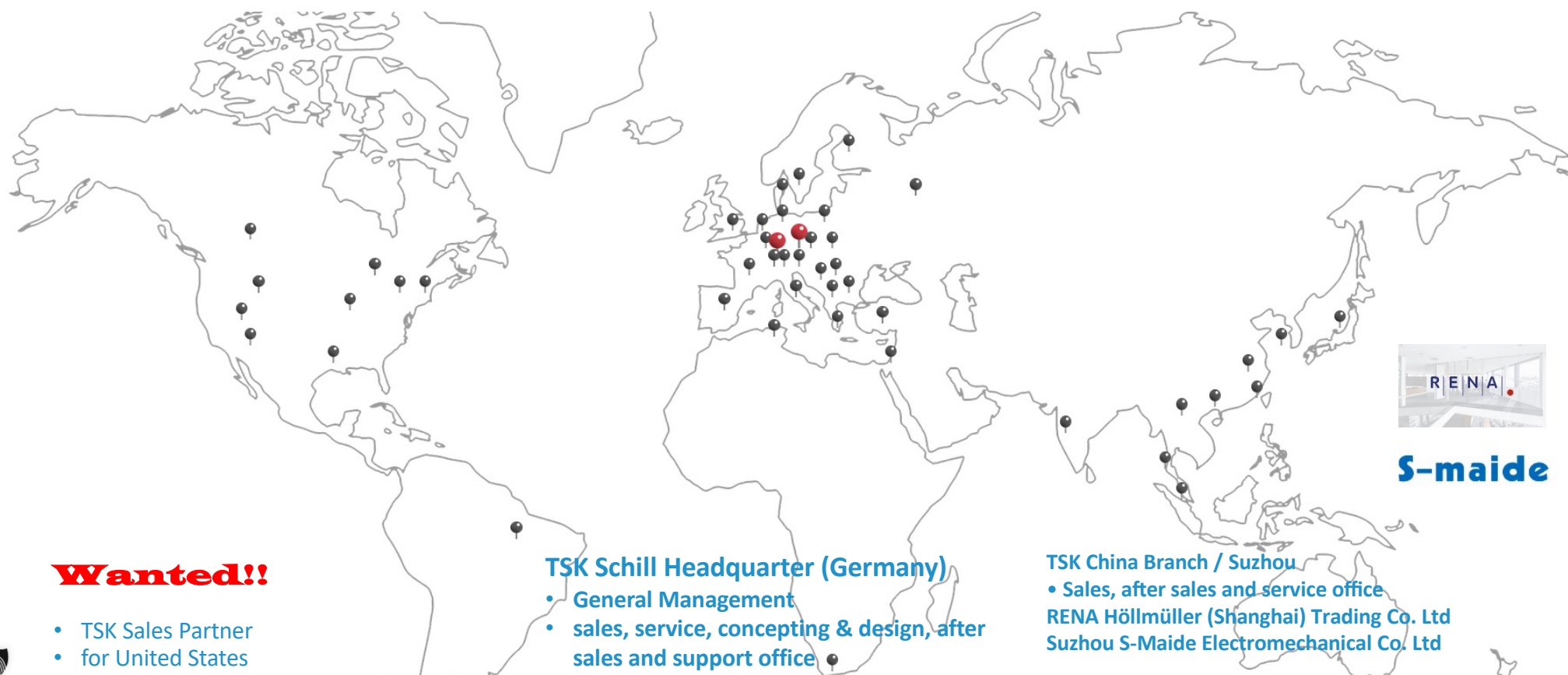
468 customers in 48 countries worldwide

Certifications:

Certificate – (WPAR) based on DVS 2281- DVS 2282
WHG certified
Extruding certificates



TSK-Line-up worldwide



Wanted!!

- TSK Sales Partner
- for United States

TSK Schill Headquarter (Germany)

- General Management
- sales, service, concepting & design, after sales and support office
- production, manufacturing and assembly
- additional production sites and capacities
 - Görlitz, Germany
 - Luban Poland

TSK China Branch / Suzhou

- Sales, after sales and service office
- RENA Höllmüller (Shanghai) Trading Co. Ltd
Suzhou S-Maide Electromechanical Co. Ltd

S-maide

Reference customers



ROHDE & SCHWARZ



DYCONEX AG



Heraeus



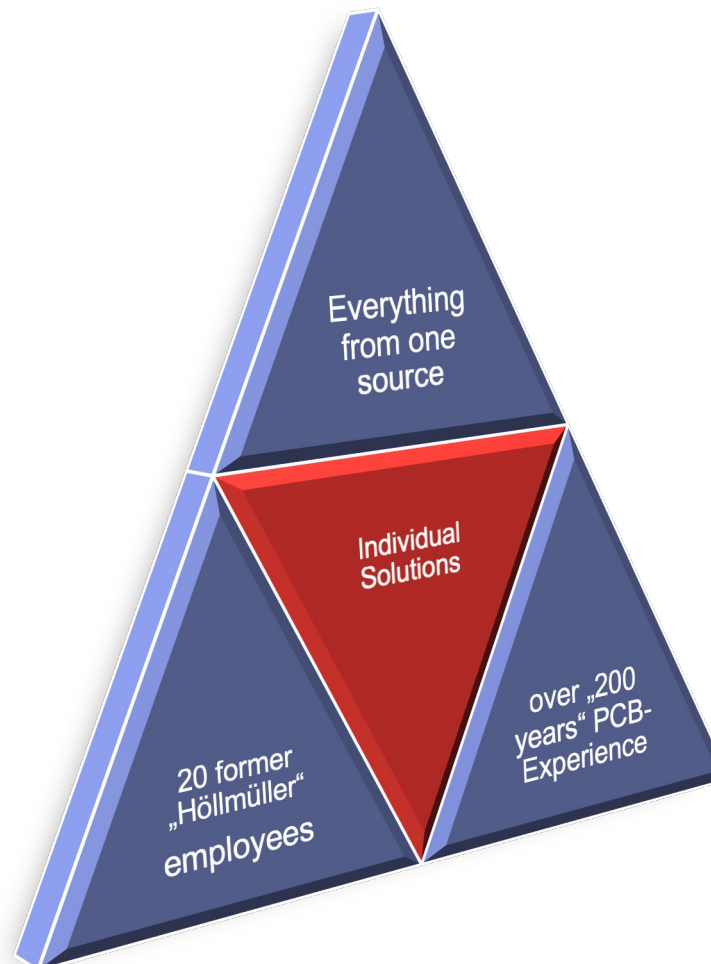
Contact/Imprint

TSK SCHILL GMBH

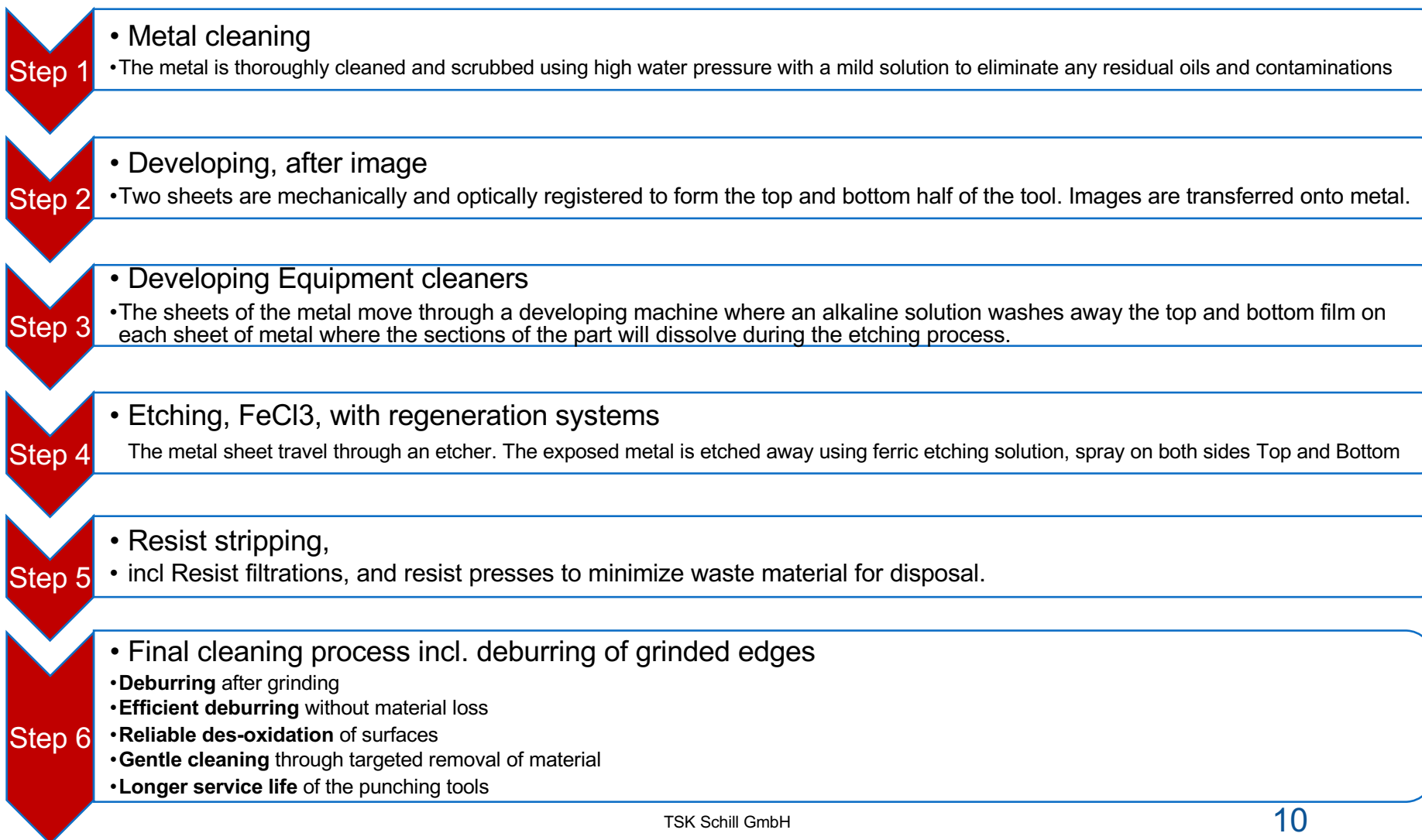
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Product Portfolio



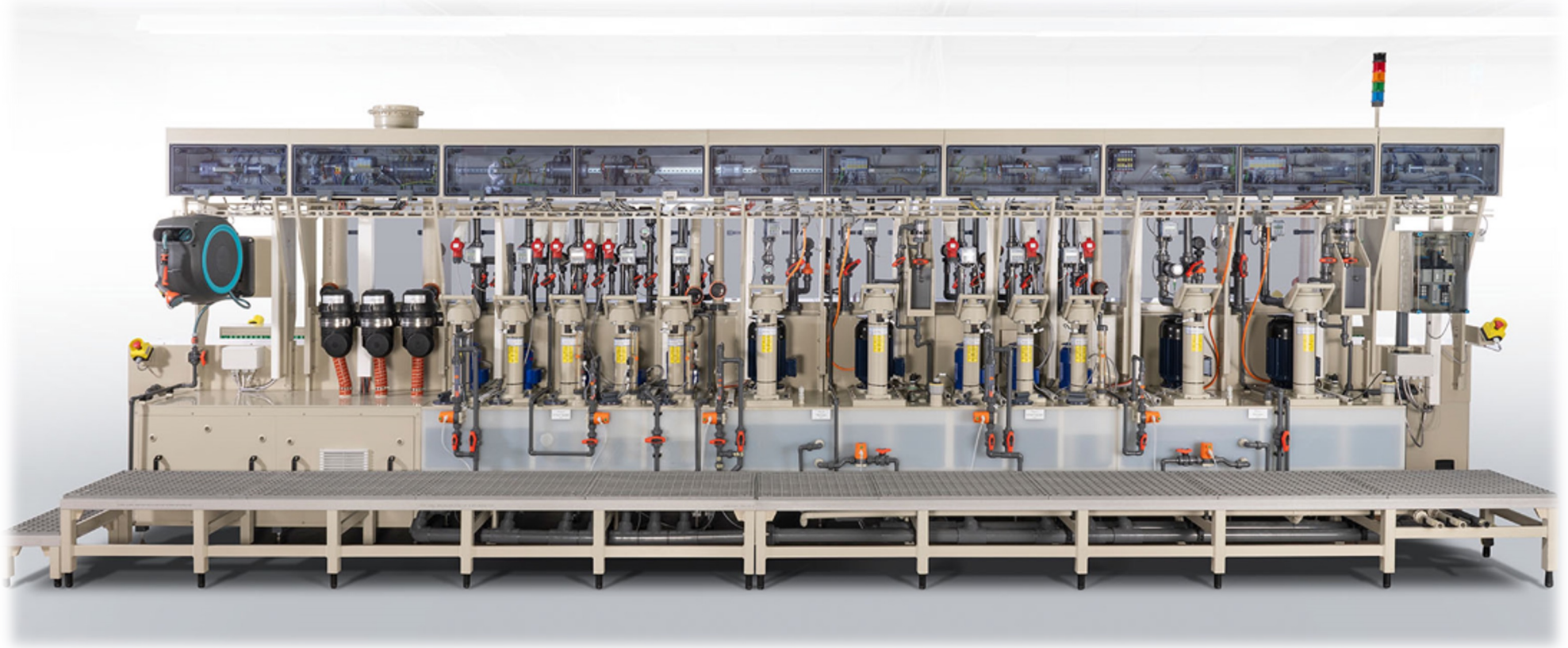
TSK Line Concept



Clear and structured

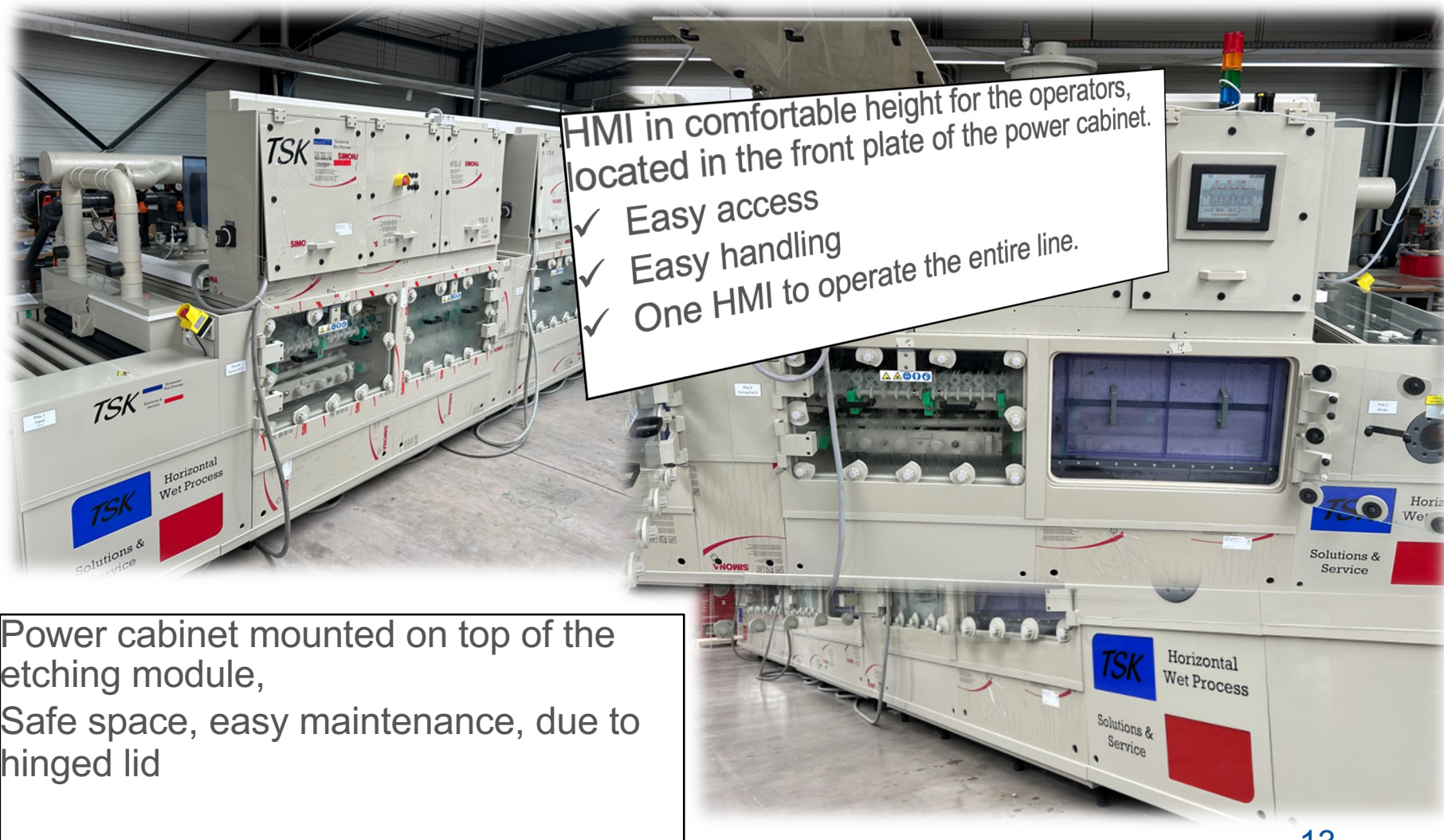
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TSK Line Concept

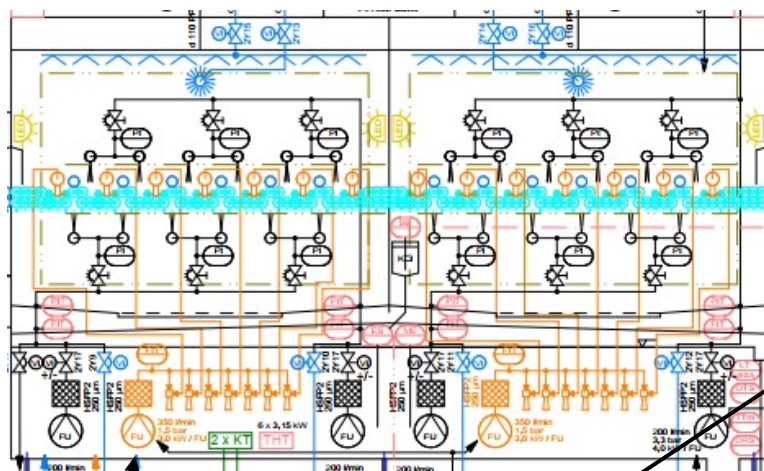


Easy to maintain

TSK Line Concept



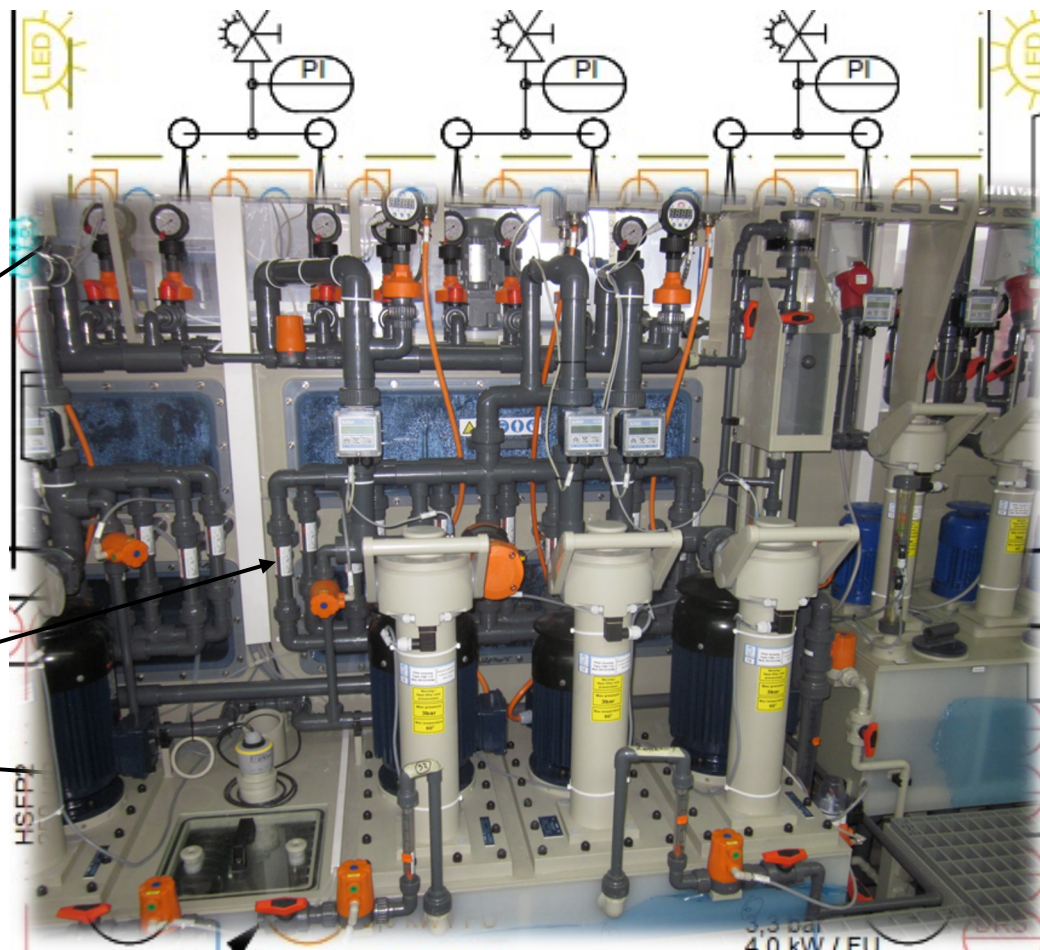
Vacuum Etching



Driver pump

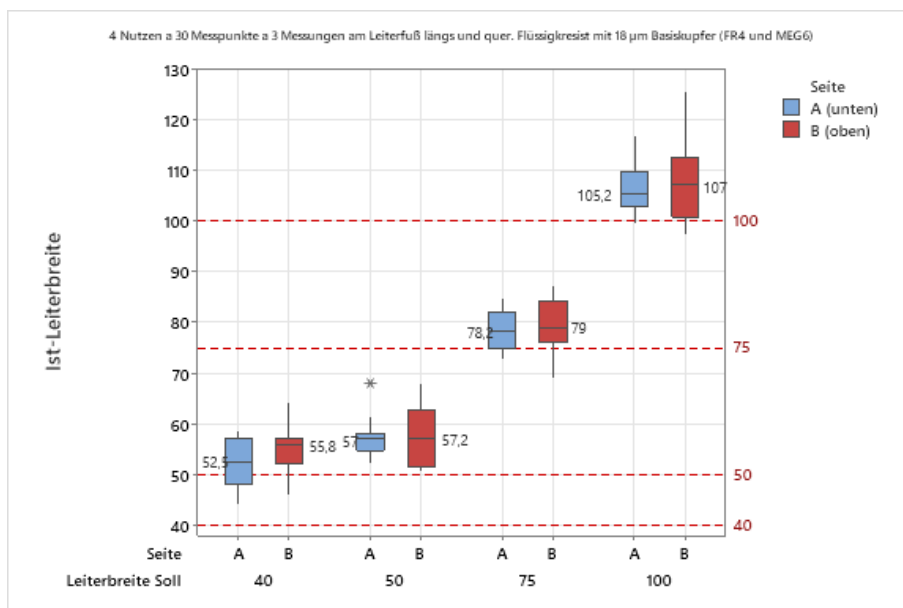
Vacuum nozzles

Venturi pump system

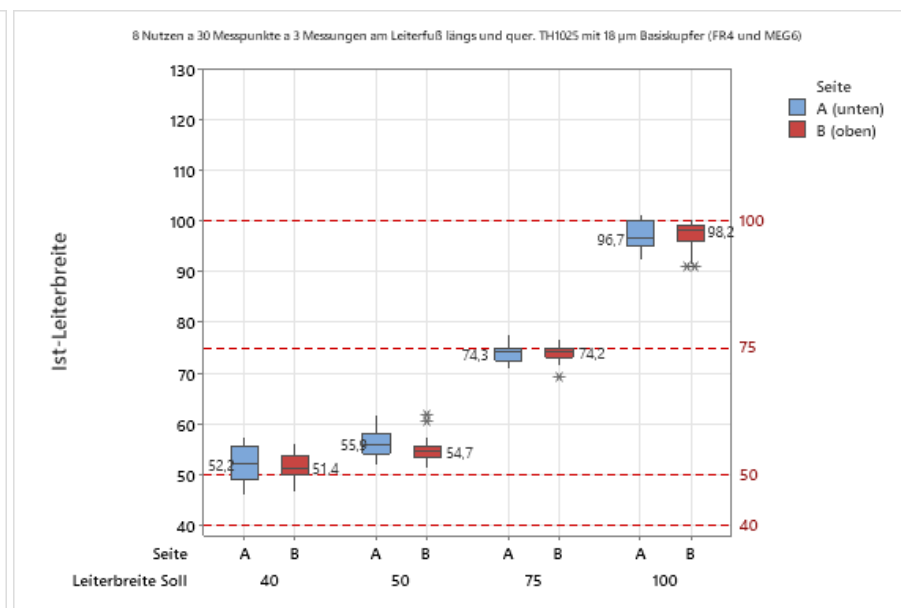


Etching uniformity

Comparison conventional Etching vs vacuum technique



conventional etching technique



Vacuum etching technique
With very less deviation
in the quality (cpk) result after etching

Maintenance friendly, spray manifold cleaning system



<https://www.youtube.com/watch?v=EAewu6vwwbk>

TSK Schill GmbH

Nozzle Block Cleaning

Nozzle in etching machines are the core of the etching process and are contaminated with chemicals both inside and out. The spray nozzles are arranged to produce a homogeneous spray pattern.

Leaking Nozzle Connections

Clogged or damaged nozzles are not visible during the process.

Preventive maintenance of nozzle blocks is therefore very unpleasant and is often neglected by operators and maintenance personnel.

This motivated TSK Schill GmbH to look for a solution.

The answer was a nozzle block cleaning booth.

It is therefore recommended to clamp nozzle blocks in specially designed cleaning chambers and operate them with water. The rinse water is kept in a sump as circulating water and is pumped through the nozzle blocks during cleaning by a submersible pump.

- The transparent housing covers provide maintenance personnel and the operator with an unobstructed view of all spray nozzles.
- They can clean, replace, maintain, and repair them if necessary.
- All this without chemicals, in a safe environment while disassembled.

This application demonstrates the service philosophy that the employees of TSK Schill GmbH have internalized

"we make it work,,

Regeneration systems

For chemical regeneration systems we offering 2 options

1. We offer interfaces to connect to external systems, e.g. KSD
2. TSK Schill GmbH use its own developed, sustainable, well proved and reliable metrology and dosing system.
 - I. Redox metrology, potential in the solution.
 - II. Density metrology, weight of solution .
 - III. Conductivity, of the solution
 - IV. PH meter of the solution

Each of these systems are controlled in the unique programmed TSK Software and operate in Siemens PLC control systems, for the smallest tolerances and thresholds, keeping the process solution in spec.

Drawer etching machine for prototype's

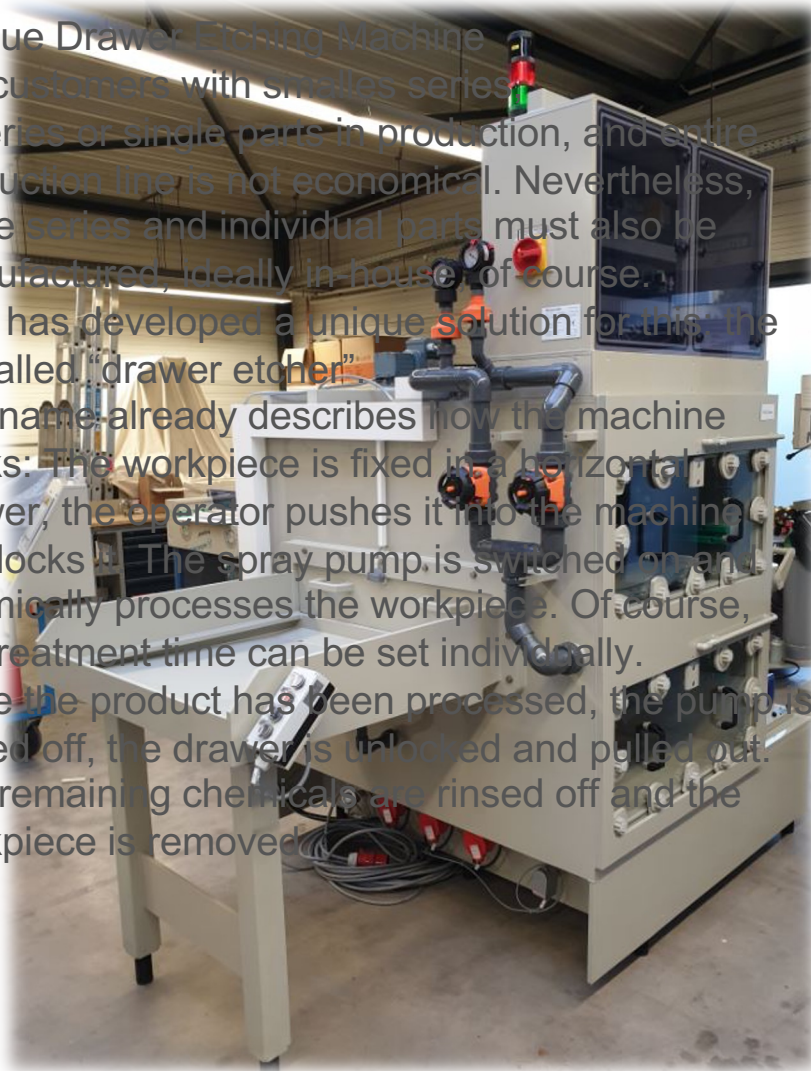
Unique Drawer Etching Machine

For customers with small series 0-Series or single parts in production, and entire production line is not economical. Nevertheless, these series and individual parts must also be manufactured, ideally in-house, of course.

TSK has developed a unique solution for this: the so-called "drawer etcher".

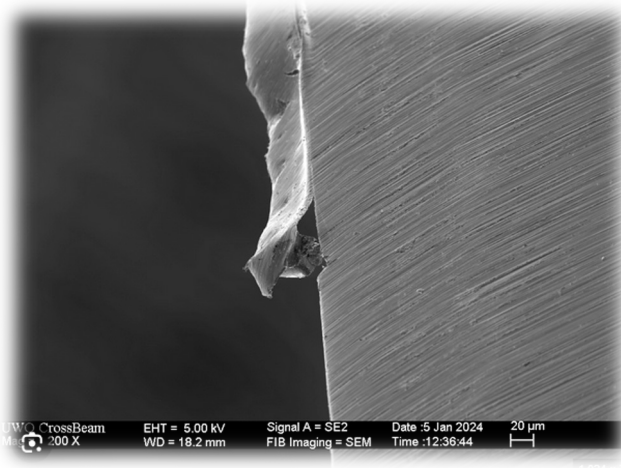
The name already describes how the machine works: The workpiece is fixed in a horizontal drawer, the operator pushes it into the machine and locks it. The spray pump is switched on and chemically processes the workpiece. Of course, the treatment time can be set individually.

Once the product has been processed, the pump is turned off, the drawer is unlocked and pulled out. The remaining chemicals are rinsed off and the workpiece is removed.



Final clean

- Everyone is aware of, these annoying burrs, after grinding?
- everyone knows oxidizing boards after processing



Thorough pumice brushing

The process of pumice brushing optimizes the cutting edges in the production of punching dies and base plates. Pumice brushing thoroughly cleans the sheets, removes burrs and frees surfaces from oxide layers. The process improves the quality of the punching tools and thus their punching results, and it also ensures a longer service life of the tools in mass production. In pumice brushing, the material is specifically treated with pumice stone flour and water. The mixture used has a gently abrasive effect, i.e. abrasive, and removes and smooth the burr at the cut edges evenly. Pumice brushing systems from TSK delivers excellent results reliably and permanently.

- **Efficient deburring without material loss**
- **Reliable de-oxidation of surfaces**
- **Gentle cleaning through targeted removal of material**
- **Longer service life of the punching tools**

All-round carefree service

To ensure that our machines continue to work perfectly even after many years, we offer our customers a high-performance and experienced service. Whether maintenance, wear, repair or modernization, the TSK service always ensures reliable production.

Customized solutions



Customized-made special processes

We offer test setups for new technology; we thoroughly test each process and are constantly working on further improvements. For special requirements, we develop solution-oriented machines, such as glass plate cleaning for special processes beyond the standard. With our accessories, we offer numerous additions and options so that you can customize your system. This keeps your production running smoothly and you remain flexible in the long term.

These flexible and customized solution, offer you in your research or developing phase, the highest flexibility at lowest CapEx.

Same works if such a prototype need to be scaled up for production purposes, the CapEx is still interesting. During mass production, when the upgraded machine is set for, even OpEx are kept in budget.

Do you have any questions?



Thank you for your attention

TSK Schill GmbH is your reliable and fair partner - today and in the future, and we give you, our promise!