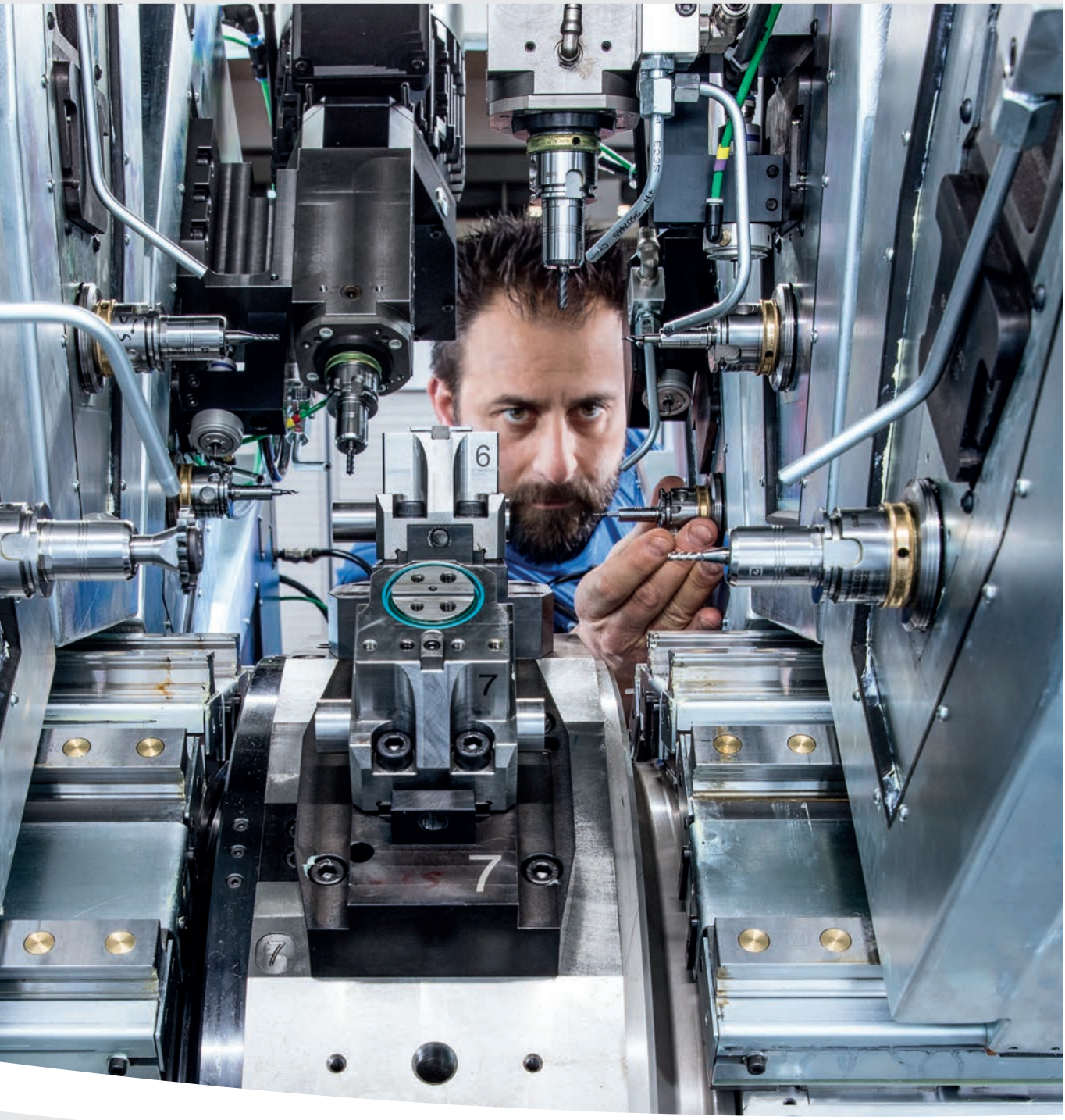
Mikron Machining

MIKRON



Enables productivity and quality gains in the manufacturing processes of our customers.

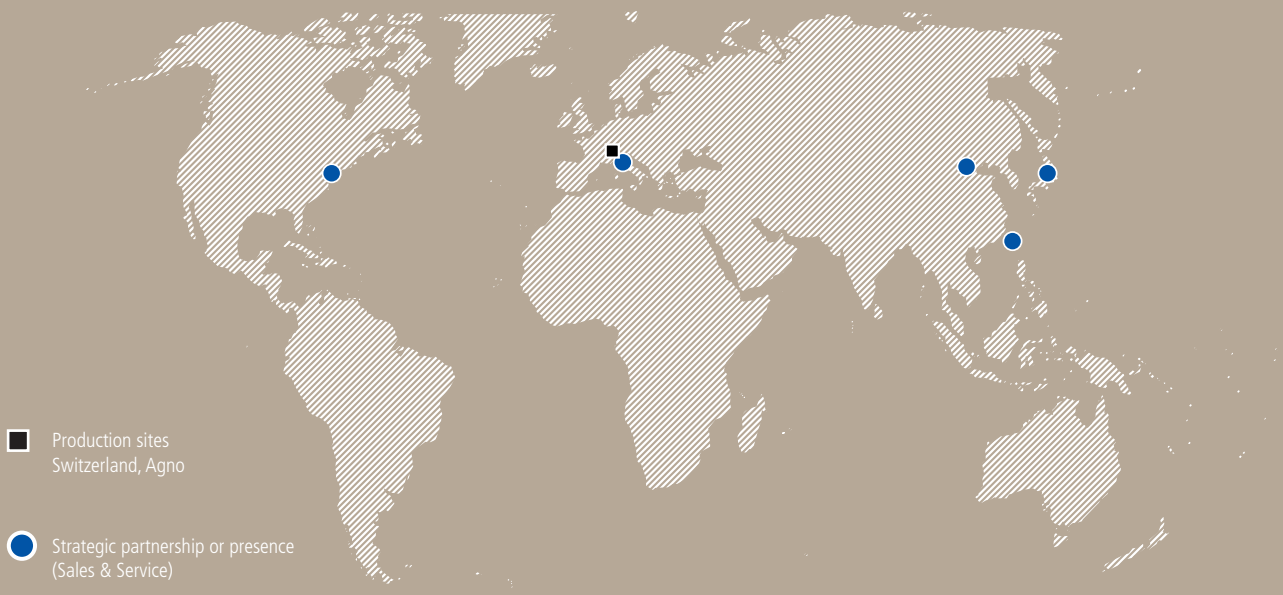
MIKRON

Mikron Machining

Mikron Machining is the leading supplier of high performance machining systems which enable productivity and quality gains in the manufacturing processes of our customers.

Mikron's high performance machining systems and solutions support industrial production companies in a wide variety of sectors by reducing unit costs, space requirements and staffing costs, and by increasing manufacturing quality. Mikron's ultimate goal is to enable its customers to improve their production processes, product quality and profitability. With its gear-cutting machines and tools, Mikron, a company rooted in the Swiss culture of innovation, contributed significantly to the industrialization of Swiss watchmaking in the first half of the last century. Today, Mikron markets machining solutions for the highest precision manufacturing processes, supported by digital services and technologies. Pro-active and long-term customer services supplement the high-tech offering.

Highly productive transfer systems for the manufacturing of complex high-precision components made of metal such as turbocharger housings, injection nozzles and ballpoint pen tips.



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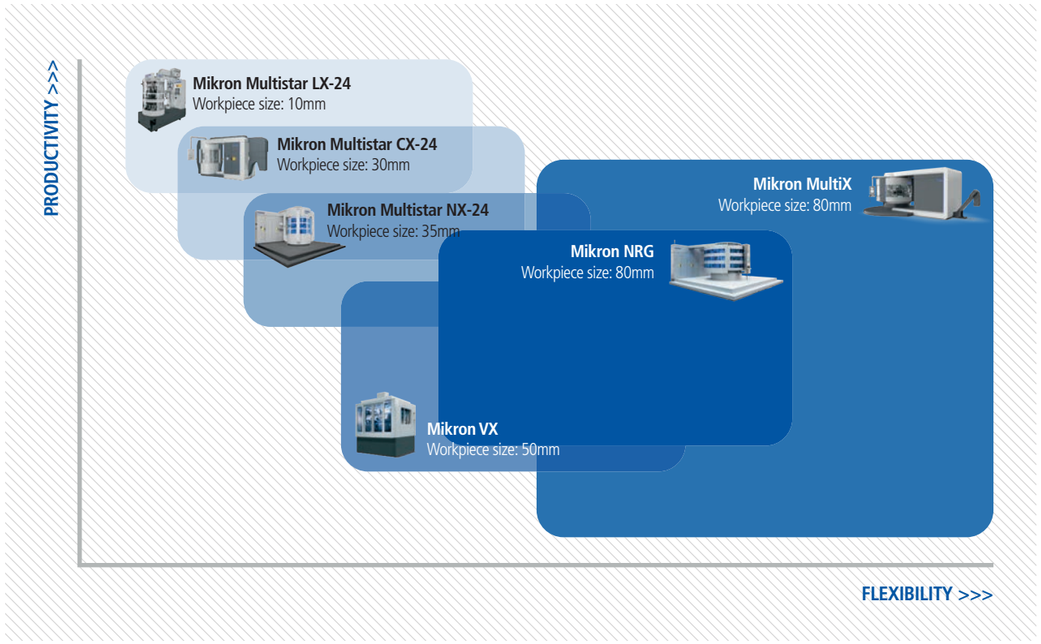
Machining Systems

Efficient production solutions

High performance turnkey production solutions from A to Z to enable productivity and quality gains in the manufacturing processes of our customers.



With over 100 years of experience, rooted in Swiss innovation and quality culture, we are a long term process and technology partner to industry leaders. We show passion for precision and reliability in all we do.

Blank
- Cast
- Bar
- Wire
- etc.

Pre-machining
- Mikron RP-32
- Mikron TR-42
- Mikron TF-120

Loading Systems
- Pick & Place
- Robot
- Belt conveyor
- Vibrator
- Pallet

Machining
- Precise complete
- machining
- on Mikron systems
- Dedicated Mikron
- cutting tools

Unloading Systems
- Automatic
- Manual
- Deburring
- Washing

Customized high-performance machining solutions with:

- Loading and unloading system
- Pre-processing system
- Dedicated Mikron cutting tools

Major market segments

Application samples

ELECTRIC ELECTRONICS

AUTOMOTIVE

CONSUMER GOODS

WRITING

HYDRAULIC PNEUMATIC

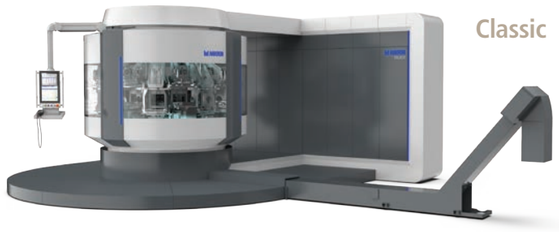
PHARMA MEDICAL

INDUSTRIAL BUILDING

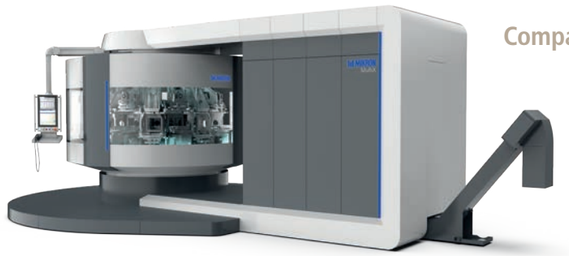
OTHERS

Mikron MultiX

New unrivalled possibilities - The platform for dedicated easy reconfigurable machining solutions



Classic



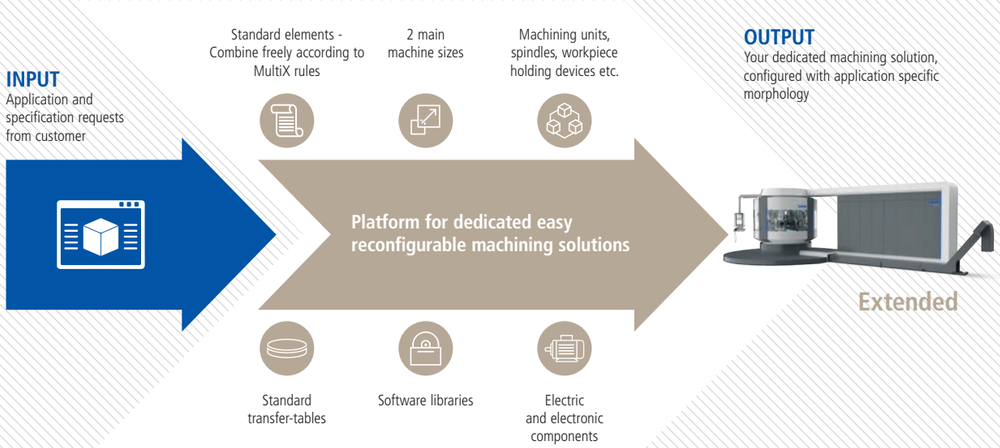
Compact

Winner EMO
Innovations award 2019

WINNER BEST OF INDUSTRY AWARD 2020

Platform

Combine freely the platform elements and configure your machining solution optimized for your specific needs.

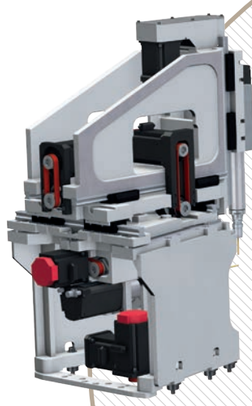


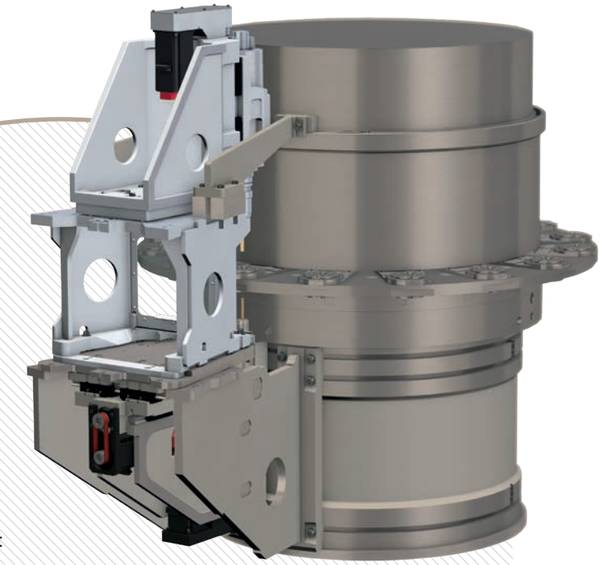
Configured for your specific needs such as:

productivity, precision, stiffness, reconfigurability, size, cost, power… Freely combine the platform elements and set up your machining solution.

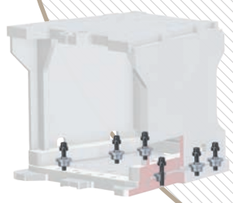
- **Simple reconfiguration** for a new application with an revolutionary patent pending concept.
- **Distinct versatile technical features**: Direct machining from the bar (turning or milling), up to 3 machining units working simultaneously at each station, multispindle-lathe and transfer machine capabilities in one single machining system.
- **A set of diverse machining units in different sizes** to serve all the requirements you might need. The machining units differ in size, number of axis, size of compatible spindles, strokes, stiffness and can be exchanged within the platform and re-used in various different configurations.
- **Scalable**: Start producing with a single cycle Mikron MultiX configuration and add supplementary cycles according to volume growth.
- **3 machine layouts**, according to customer demand.

Save your investment reconfiguration for a new application

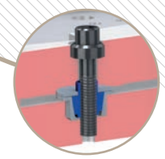




Remove the unit support box (with machining units) and reposition with highest repeatability.



The positioning repeatability and accuracy is guaranteed by zero point clamping systems under every box.



Simple Reconfiguration for a new application with a revolutionary patent pending concept. Save the investment and reconfigure the machining system, once the application for which the system was initially configured is no longer needed.

All standard machining-units are exchangeable and very precisely repositionable on all Mikron MultiX types in a very short time - they fit for any configuration you need.

Build your next dedicated machining solution by simply exchanging the units. Different toolholders are available and multiple tools can be mounted on each unit.

Software adaption in a few clicks
Modular software and Mikron HMI designed to be extremely user-friendly and adaptable to every configuration.

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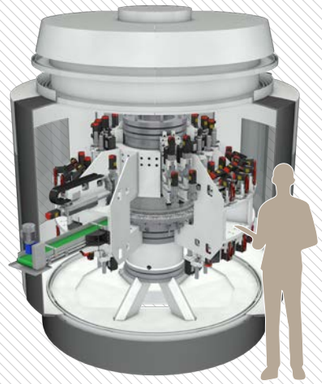
Mikron MultiX

New unrivalled possibilities - The platform for dedicated easy reconfigurable machining solutions

2 configuration examples… of thousands of possibilities for you

SPEED

MIKRON MultiX S-24



Sleeve
Automotive industry

CONFIGURATION WITH FOCUS ON SPEED AND PRODUCTIVITY. MAINLY FOR THE HIGH VOLUME PRODUCTION OF SMALL PARTS

- 24 stations
- 3-axis machining units
- Double cycle
- Rotating collets / Turning units
- Typical part size Ø20x60mm

Application samples for similar Mikron MultiX configurations

Nozzle body

Sleeve complex

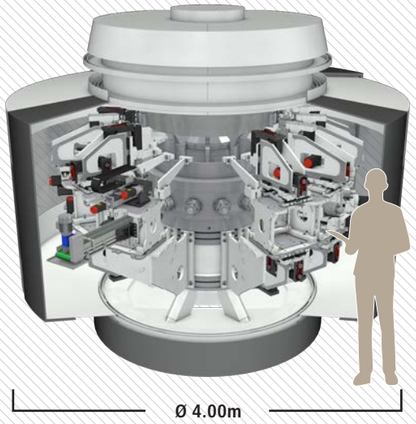
Watch bracelet

Injector plate

Screw

POWER

MIKRON MultiX P-16



GDI pump housing in 4 different variants
Automotive industry

CONFIGURATION FOR HIGH VOLUME PRODUCTION OF FIST SIZE PARTS. INDEXING THROUGH VERY STIFF AND REPEATABLE HIRTH COUPLING.

- 16 stations
- 3-axis machining units
- Spindle with HSK-63 / -40 / -32
- Automatic tool changer
- Typical part size Ø40x80mm

Application samples for similar Mikron MultiX configurations

Lock plug

Valve

Crankshaft

Injector plate

CONTROL

FANUC Series 30i, ideally suited for complex high-speed, precision machining, equipped with multiple axis and multi-path functionalities.

MIKRON HMI - SOFTWARE

The modular Software and the Mikron HMI is designed to be extremely user-friendly and adaptable to every configuration – it makes operating, configuring and re-configuring your machine easy and efficient. Many Software options lead to a constant cycle time optimization and supports you in all different stages.

- For best adaption: Standardization of mechatronic platform elements, customizable components
- For best performance: Production scheduling, temperature monitoring, reduced inactivity
- For best quality: SPC monitoring, automatic correctors management
- For highest security: System data backups

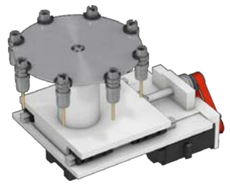
miS 4.0 ready Collect data, monitor machine performance as well as conditions and predict maintenance tasks.

The miS4.0 module is an IPC that collects, stores and normalizes data, allowing you to have complete overview and control of your production and machines.

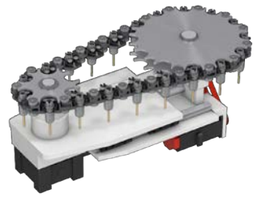
- Production Monitoring
- Condition Monitoring
- Failure Analysis
- Mikron cloud and IoT platform (SAP Leonardo)

AUTOMATIC TOOL CHANGERS

- ATC with 4 positions, integrated in spindle
- HSK-F40



- ATC with 8 positions on disk, in horizontal unit place embedded
- HSK-A40



- ATC with 20 positions on chain, in horizontal unit place embedded
- HSK-A32

MIKRON

Mikron Multistar

The fastest transfer machine in the world

CASE HISTORY SOCKET on Mikron Multistar CX-24

The challenge

- High Volume production of approx. 12 million pieces/year
- Part Dimension: Ø 2.54mm L 15mm
- Raw material (brass) supply from wire coil
- Approximately 20 operations such as turning, milling, drilling, reaming, deburring, forming, 100% extraction force measurement integrated in the process
- Tolerances: External Ø (turned) ±0.01mm, Internal Ø (reamed) ±0.01mm, length between machined surfaces ±0.02mm

The traditional solution

Production area: **136.2 m²**

Machines: **16**

Employees: **3.2 + 3.2 + 3.2**

Cost/part

Raw material from bar-stock

Mikron: The innovative solution

Production area: **38.64 m²**

-71%

Machines: **1 Mikron Multistar CX-24 & 1 Mikron TF-120**

-94%

Employees: **0.5 + 0.5 + 0.5**

-85%

Cost/part

-45%

Raw material from wire coil

Mikron Multistar CX-24

Models available

- Mikron Multistar NX-24 (100% programmable)
- Mikron Multistar CX-24
- Mikron Multistar LX-24

- Workpiece size: diameter from 0.4 up to 35 mm and max. length of 60 mm
- Machine with 12 or 24 stations
- Compact construction
- Full CNC or mechanically driven versions
- Available with one, up to 4 simultaneus cycles, depending on the part complexity and the required volumes
- In single cycle output up to 150 parts/minute
- Quick and simple tool change

Typical Multistar workpieces made from steel, aluminum, brass, beryllium-bronze & copper

Mikron NRG

The new generation of transfer machines

CASE HISTORY ADAPTER on Mikron NRG

The challenge

- 5 different "Adapter Plate" models. Length from 15 to 35mm
- Material: AlMgSi starting from bar Ø 57mm
- Operations: from 30 to 40 according to the type
- Target tolerance: ± 6µm with Cpk 1.33
- Yearly volume: 750'000 pcs on 3 shifts

The traditional solution

Production area: **193 m²**

Machines: **7**

Employees: **18**

Cost/part

5 double- spindle machining centers with motorized tools
2 measuring systems (100% control)
Productivity: 750'000 pcs/year

Mikron: The innovative solution

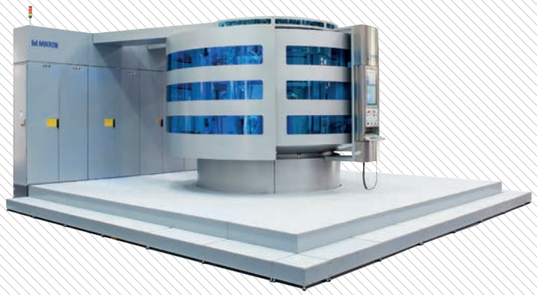
Production area: **127 m²** -34%

Machines:**1 Mikron NRG** -86%

Employees: **3** -66%

Cost/part -57%

Efficiency: 92%, Precision: ± 4.5 µm
System integrated with: bar saw Mikron TB-200, robotized measuring station, palletized system, bar loader, filtration
Productivity: 1'500'000 pcs/year



Mikron NRG

- Full CNC high-precision rotary transfer machine
- Workpiece dimension: up to 80 x 80 x 80 mm and Ø 65 x 100 mm
- Compact and modular construction with 12 stations, anytime adaptable to individual production needs
- ATS (Advanced Thermal Stabilization): the temperature of all elements remains stable
- Up to 3 machining units per station
- Up to 30 machining units work simultaneously
- Up to 22 automatic tool changers (ATC) on board
- Up to 96 cutting tools on board
- Machining on 6 faces in one clamping
- Milling or drilling on one station with three units simultaneously
- Per spindle interpolation with up to 5 CNC-axis

Mikron VX

Machining on 6-sides, from bar, wire or blank

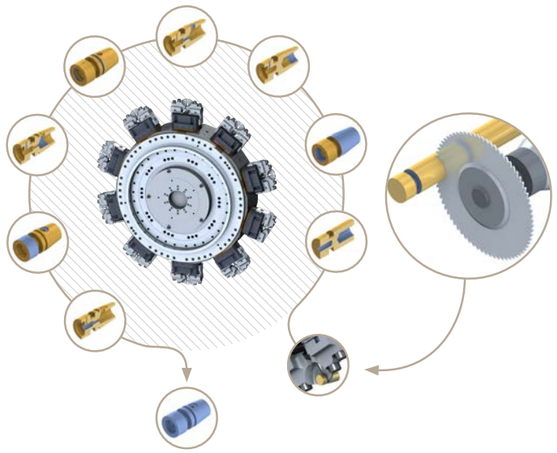
INDIVIDUAL LINKS for luxury watch bracelets

Produced from stainless steel on a Mikron VX-10 machining system, working directly from bar.

» Production rate: 8 pcs/min
» Production of different lengths from the same wire, automatically sorted

Complete machining on 6 sides

Mikron VX-10, pre-machining directly on wire or on bar stock



Other possible segments: eyewear components, automobile applications, lock industry, electrical contacts, mobile phone and laptop computer components, medical applications.

Mikron VX-10

» Full CNC high precision rotary transfer machine with 10 or 12 workstations for the production of variable batch sizes.
» Maximum workpiece dimensions up to 40x40x80 mm (optional 40x40x160)
» Vertical table, thermostable main motor with inner cooling for maximum precision
» Table positioning: ± 2 µm
» Complete machining on 6 faces from coil, bar or blank
» 4-axis pre-machining of bar before clamping

MIKRON

Pre-machining Equipments

Pre-machining Equipment Manufacturing of blanks on Mikron wire processing machines.

Mikron machining systems are designed to produce precision workpieces directly from wire coil or bar stock.
However, it is often expedient to manufacture small blanks on Mikron wire processing machines to achieve a higher output rate on the transfer machines in the downstream process.

WIRE SHEARING MACHINE

Mikron TR-42/2
Mikron TR-42/4
Reliable accuracy, high production machine
for straightening and shearing of wire material.

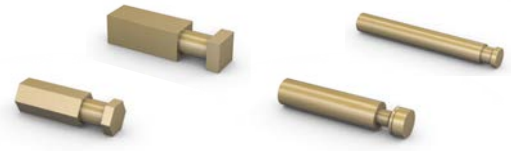
WIRE CUTTING MACHINE

Mikron TF-120
Machine for straightening and sawing of wire material.

- » High productivity, up to 200 pieces/minute, according to material and size, by using 2 saws simultaneously
- » High cutting accuracy, repeteability ±0.05 mm
- » Possibility to cut up to 4 pieces simultaneously, depending on material and size
- » Direct piece loading from the TF-120 to the Multistar
- » Easy programmable machining cycles, such as cutting speed and output rate
- » Straightening and sawing of wire material

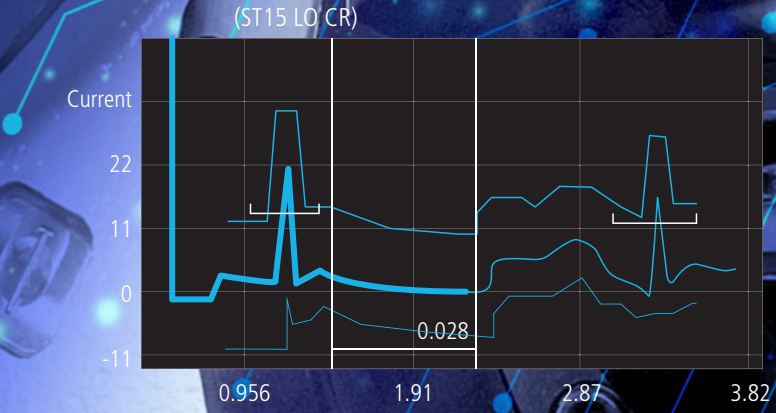
WIRE CUTTING MACHINE + PRE-TURNING UNIT

Mikron TF-120 + pre-turning unit
Pre-turning operation from wire with turning head.



Mikron miTool

The next level
of tool monitoring



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Mikron miTool

The next level of tool monitoring

Mikron miTool monitoring becomes crucial to avoid unexpected machine downtime, machine breakage, tool damage, material scrap and the likely issues. Surface finish and tolerances can be improved with the detection of tool wear and damaged and expensive tools can be changed before any severe damage takes place.

Mikron miTool is easy to install and customers benefit greatly in terms of efficiency and expenditure.

- Prevention of damage due to tool breakage or tool overload
- Sensorless with automated learning of load limits (Option to integrate vibration and temperature sensors)
- For turning, milling and drilling and smallest tool sizes (up to 1.5 mm diameter)
- Powerful algorithm for efficient monitoring after the first workpiece. It has a built-in learning function, allowing it to compensate for differences in processes.
- The system maximizes the service lives of both the tools and Mikron high performance machines

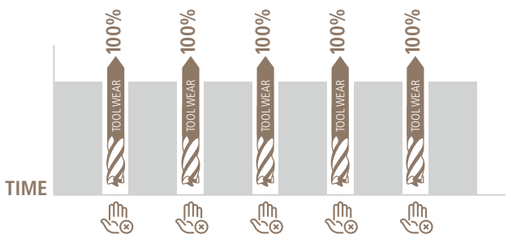
WHAT MAKES Mikron miTool SO SPECIAL FOR YOU

- Highest sensibility and quality of data points deliver the finest and exact monitoring curves
- Intuitive icon driven graphical interface for easiest use and monitoring by operators
- Intelligent algorithm for advanced process optimization and cutting tool wear identification
- Mikron miTool is able to storage data and history for each tool configuration and monitoring curve
- Dashboard with statistical overview for each tool allows the optimization of the entire production process
- Mikron miTool permits all modifications (set up, regulations…) without machine stop
- Automatic actions programmable for each channel e.g. save data in database, send notification, preventively stop the machine
- Perfectly integrated into Mikron high performance systems

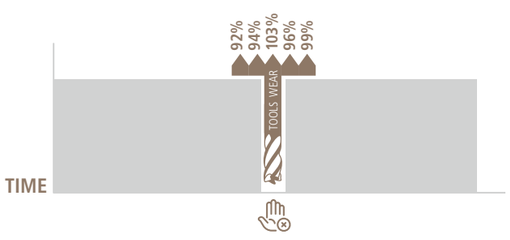
Attractive pricing and fast return on invest

Intelligent powerful algorithm for optimal intervals to change several cutting tools at the same time leads to higher machine efficiency and economy (less machine stops).

5 CUTTING TOOLS CHANGED AT 5 STOPS



5 CUTTING TOOLS CHANGED AT 1 STOP



Number of machine stops for cutting tool changes

Case History Mikron miTool

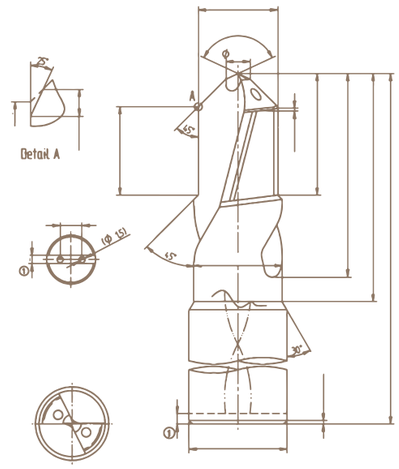
on Mikron VX

The challenge

The customer produces 6.13 mio parts per year (OEE 80%) for the automobile industry on Mikron VX.
Target: Reduce tooling costs, improve part quality and increase machine efficiency.

Productivity	17.4 Pc/min
Daily working time	1'440 min/day
Annual working days	306 days/year

OEE 80%	
6'133'709	Pc/year



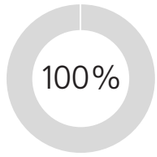
Cutting tool costs Station 5	211.00 chf/Cutting tool

CUTTING TOOL MONITORED WITH Mikron miTool STATION 5 (SEE DRAWING ABOVE):

EXISTING / TRADITIONAL TOOL MONITORING STATION 5

Tooling costs per year

TOOL LIFE 10'000 PC	
N°. of tools per day	2
N°. of tools per week	12
N°. of tools per year	613



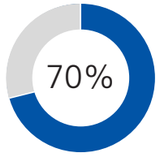
Time to change the cutting tool

TOOL LIFE 10'000 PC	
Time for tool change per day	10 minutes
Time for tool change per week	60 minutes
Time for tool change per year	3'067 minutes

TOOL MONITORING WITH Mikron miTool STATION 5

Tooling costs per year

TOOL LIFE 14'000 PC	
N°. of tools per day	1.4
N°. of tools per week	8.6
N°. of tools per year	438



Savings on time to change the cutting tool

TOOL LIFE 14'000 PC	
Time for tool change per day	7 minutes
Time for tool change per week	43 minutes
Time for tool change per year	2'191 minutes
Δ daily	-3 minutes
Δ weekly	-17 minutes
Δ yearly	-876 minutes

Approx **37.000 CHF** savings / year
with one cutting tool monitored
(cutting tool cost/pc 211.00 CHF).
The machine is **876 min** more in production

MIKRON

Mikron Service Solutions

Flexible and modular

We ensure quick, competent and uncomplicated service and support for our customers. We work together with you to design a service solution profile tailored to your individual needs.

REACTIVE

Technical Support – repair your machine
- Helpdesk
- Remote Diagnostics
- Augmented Connection
- Service Assignment

PREVENTIVE

Service & Maintenance – prevent machine stops
- Technical Evaluation
- Preventive Maintenance
- Spindles & Groups Overhaul
- Extended Warranty
- Software Backups

4.0
PREDICTIVE

miS4.0 – predict your machine maintenance
- Production Monitoring
- Condition Monitoring
- Failure Analysis
- Mikron cloud and IoT platform
- Mikron miTool – The next level of monitoring

PROACTIVE

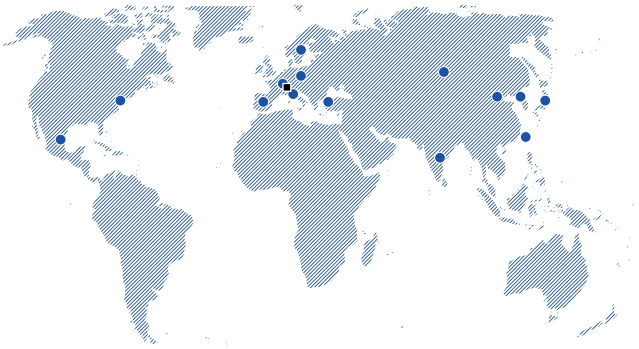
Business Support – keep & improve machine productivity
- Process Monitoring (OEE Improvement)
- Training
- Energy Consumption
- New Applications & Simulations
- Engineering
- Interactive Troubleshooting
- Startup & Production Support
- Service Level Agreements

SPARE PARTS

Spare Parts – reliable supply of original Mikron spare parts
- Original Mikron spare parts
- Xchange Modules

SECOND LIFE

2nd life – guarantee continuous use of your investment
- Machine Overhaul
- Retooling
- Safety & Environments
- Updates & Upgrades
- Retrofitting



Contact your Service Center today, we gladly be of assistance.

■ **Production sites**
Switzerland, Agno

● **Strategic partnership or presence**

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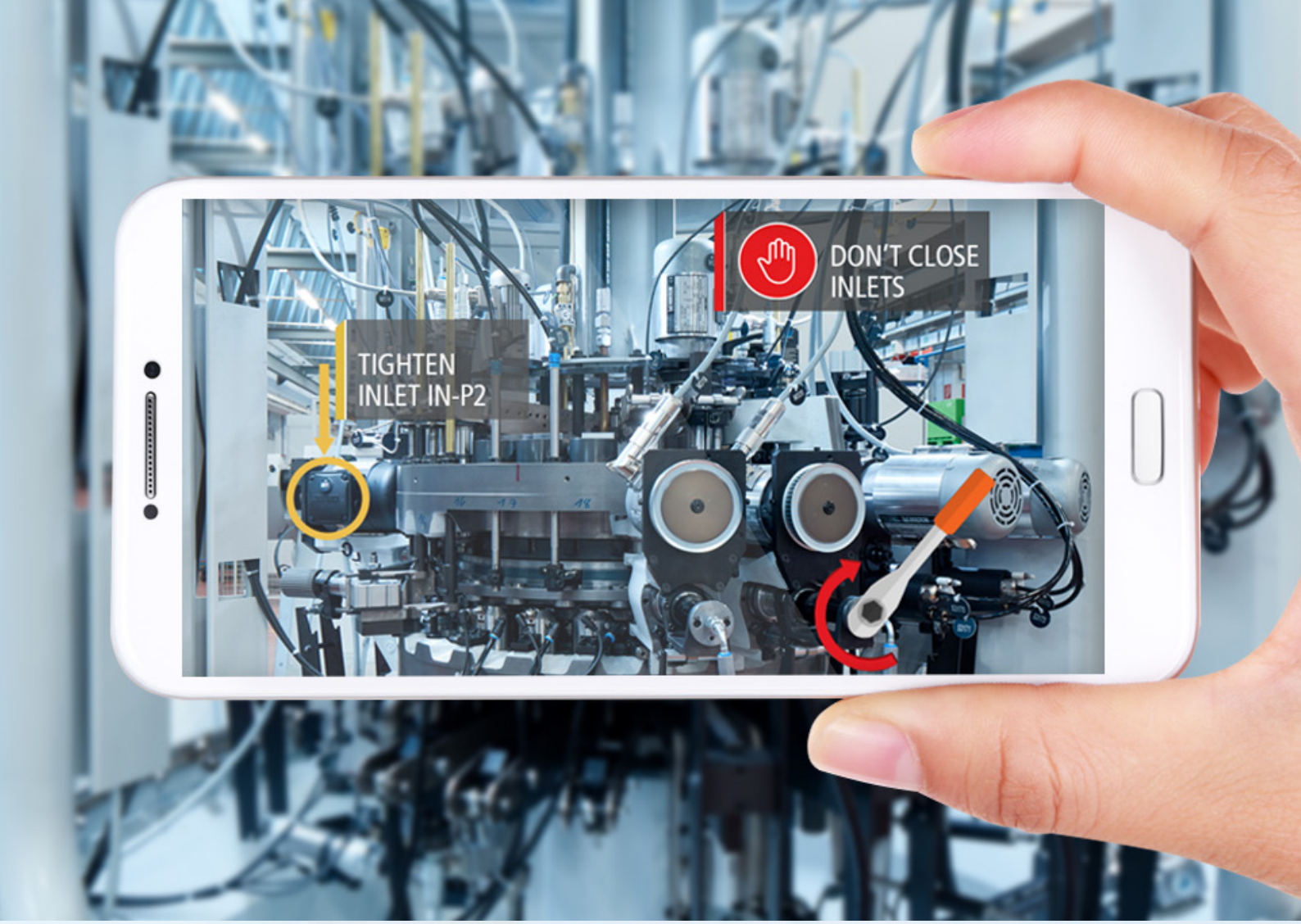
services.mm.msh@mikron.com
OH: 08.00 - 17.30


DON'T CLOSE
INLETS
TIGHTEN
INLET IN-P2

KJP002
UNIT READY
UNIT IS WORKING
UNIT NOT WORKING
Unit Data
Tool Info
NO TOOL
TOOL ERROR
TOOL OK
CHIP ERROR
TOOL OPEN
Tool Check
Nordmann Channel 3
6.522416
Fixture
FIXTURE NR.
3
95%
20%
Jog inc
0
ENABLE
Functions
Production
Programming
Event History
Tools Life Chart
Tree View
Applications
Tools DB
Bosch CNC
MIKRON

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SQS
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