MATEC GmbH

# THE MODULAR EVOLUTION

## ONE-STOP AUTOMATION SOLUTIONS

Workpiece automation | Pallet automation
Complete machining from the bar

# Automation
## The way towards a successful future

**Targets**
Higher productivity, minimum downtimes, better competitiveness and, last but not least, considerable reduction of the unit cost are generally sought. Honest and straightforward advice and a good cooperation of all the partners involved guarantee the desired success. If you tell us what you are aiming at, we will develop the most profitable solution for you.

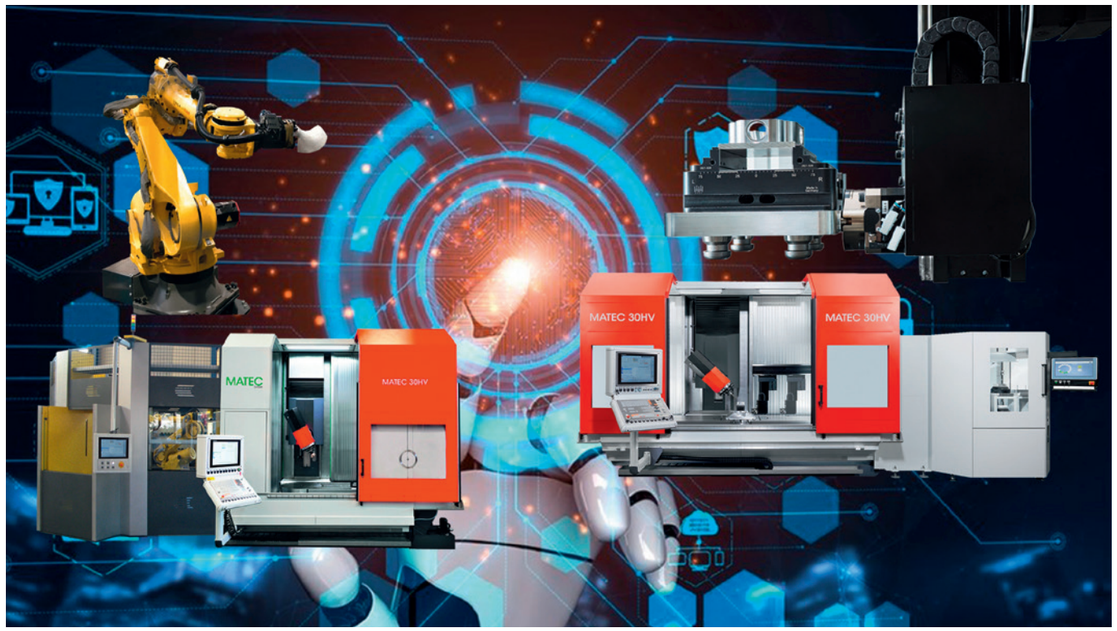
**Economic efficiency calculation**
Nothing else is as individual as automation systems. The thing that really matters is the overall concept. As regards material flow, production machine, machining process, tool provision and workpiece handling, objectivity down to the last detail is essential.

**Flexible automation module**
The easy to use MATEC module comprises a freely configurable automation menu for individual adaptation of the machining process.

**Flexibility**
Flexibility largely depends on the selected machining concept and the suitable machining centre. With its "Modular machine series", MATEC offers the foundation for optimum flexibility. We combine different kinds of automation systems – from pallet changing systems to bar loaders. Furthermore, we can realise automation solutions with automation systems provided by the customer.

**Automation / Availability**
MATEC moving-column centres are offered both as single-station systems and as two-station systems. When being equipped with an exchangeable partition wall, the machine has two separate and independent work areas. One of them is used for automation while the other one can be used for the individual production of short-term jobs at any time. Thanks to the lateral attachment of the automation system, free access to all work areas is guaranteed.

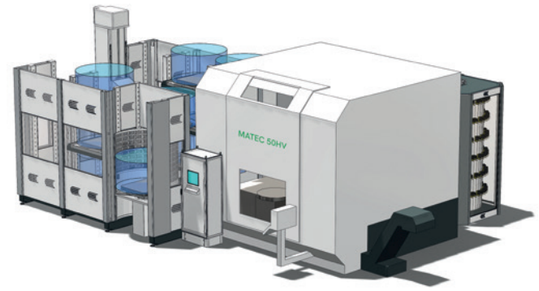
**Digital network**
Machine and automation data can be remotely evaluated and visualised. Furthermore, MATEC offers one-stop software solutions for machine control and automation by HEIDENHAIN, SIEMENS and BOSCH. In close collaboration with your engineers, we will realise options such as measuring programs with graphics or features based on customized requirements.






# MATEC
## Kinds of automation

**Pallet automation**
As a matter of principle, all modular MATEC centres can be equipped with a pallet changer.
Design and type depending on workpiece dimensions and weight or on the selected production machine.
Pallet sizes from 150 x 150 mm with the MATEC 30HV to 4,000 x 3,000 mm with the gantry centre MATEC 40PP.




**Workpiece automation**
High-flexibility automation solutions.
6-axis robots with automatic gripper change open up entirely new process sequences for automated workpiece handling. Simple realisation of auxiliary and additional tasks.
Design based on workpiece size and weight as well as storage capacity.


**Multi-flexible solutions**
Automation cell for pallet handling, workpiece handling and tool management.
Design based on customer requirements.

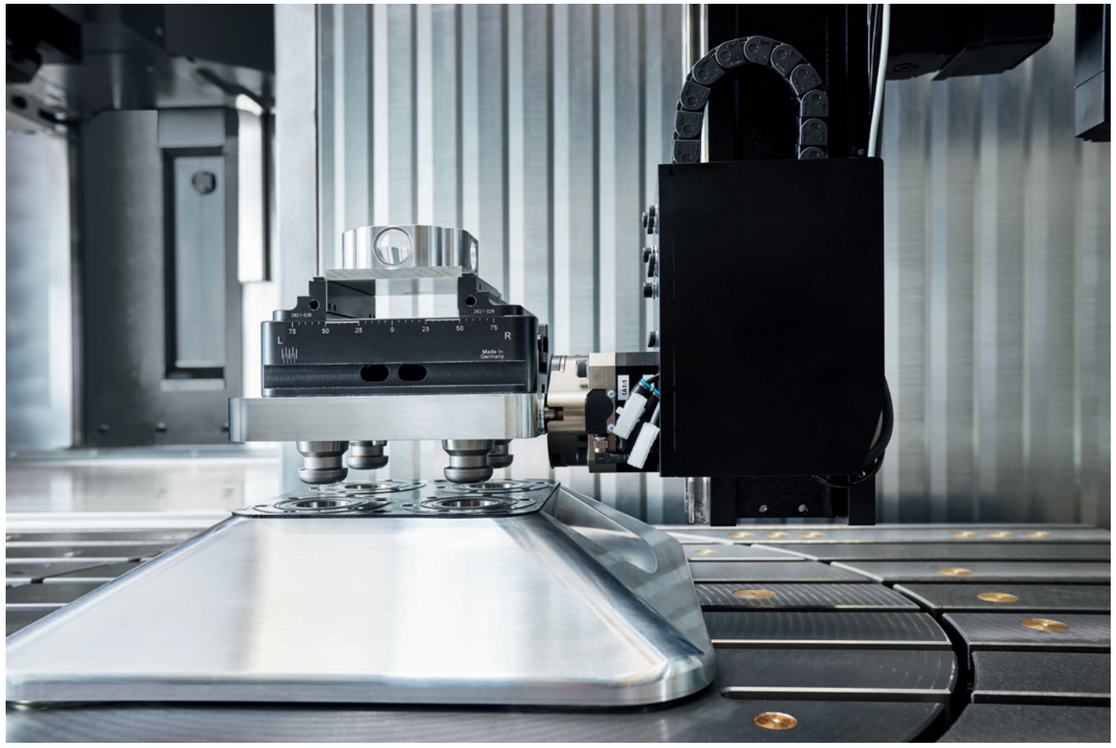

**Complete machining from the bar**
6-sided machining of complex workpieces.
Modular expansion up to a mill turn centre with further additional functions such as high-capacity sawing unit, transfer station, additional CNC axes, unloading automation and many other features.
Bar capacity up to Ø 150 mm.

# Pallet automation
## Our modular series – with intelligent automation
## Performance class HSK63 | HSK100

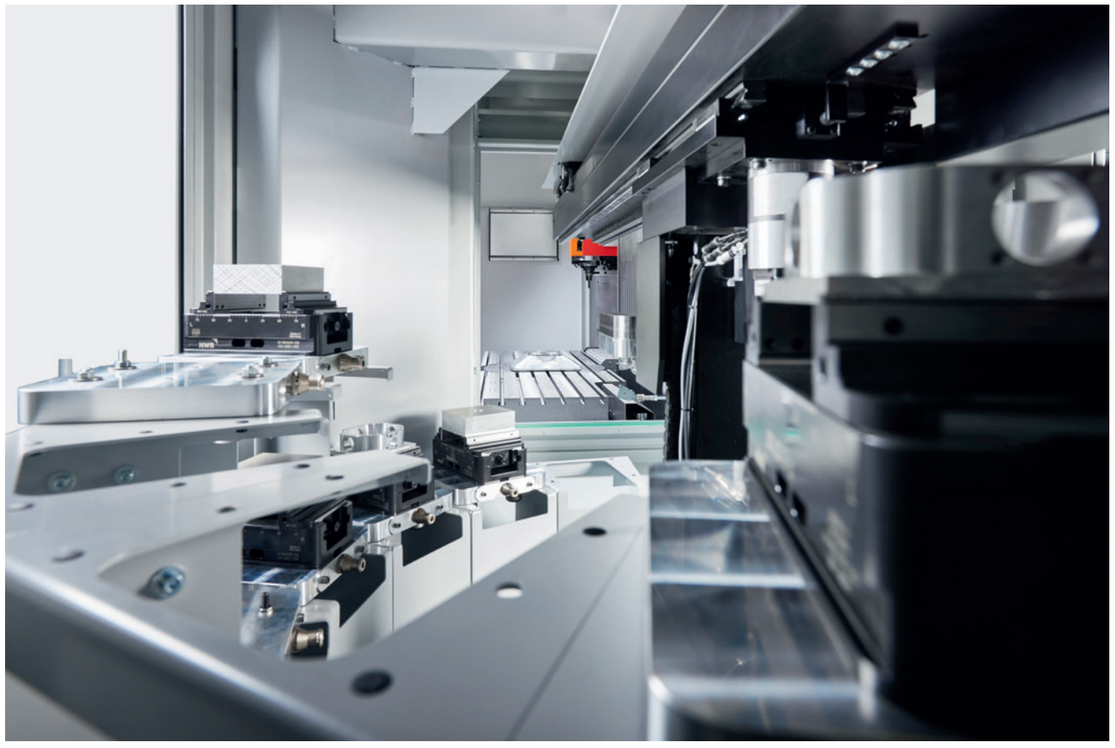
**Pallet changer with round storage unit**
(example: customized solution)

- Space-saving round pallet storage unit with 24 storage places on two levels
- Pallet size 320 x 320 mm
- MATEC 30HV machining centre with swivel head
- CNC rotary table with Ø 800 mm and turning function (e.g. 800 1/min.)
- 5-sided machining with a total of 268 tool places
- Rotary table with fixture quick-change system
- Rotary distributor for media transfer
- Automation module

**High flexibility**
A zero-point clamping system is used a the basic pallet clamping system on the rotary table. Set-up changes from automated to manual production are realized in no time. The entire work area is thus available.

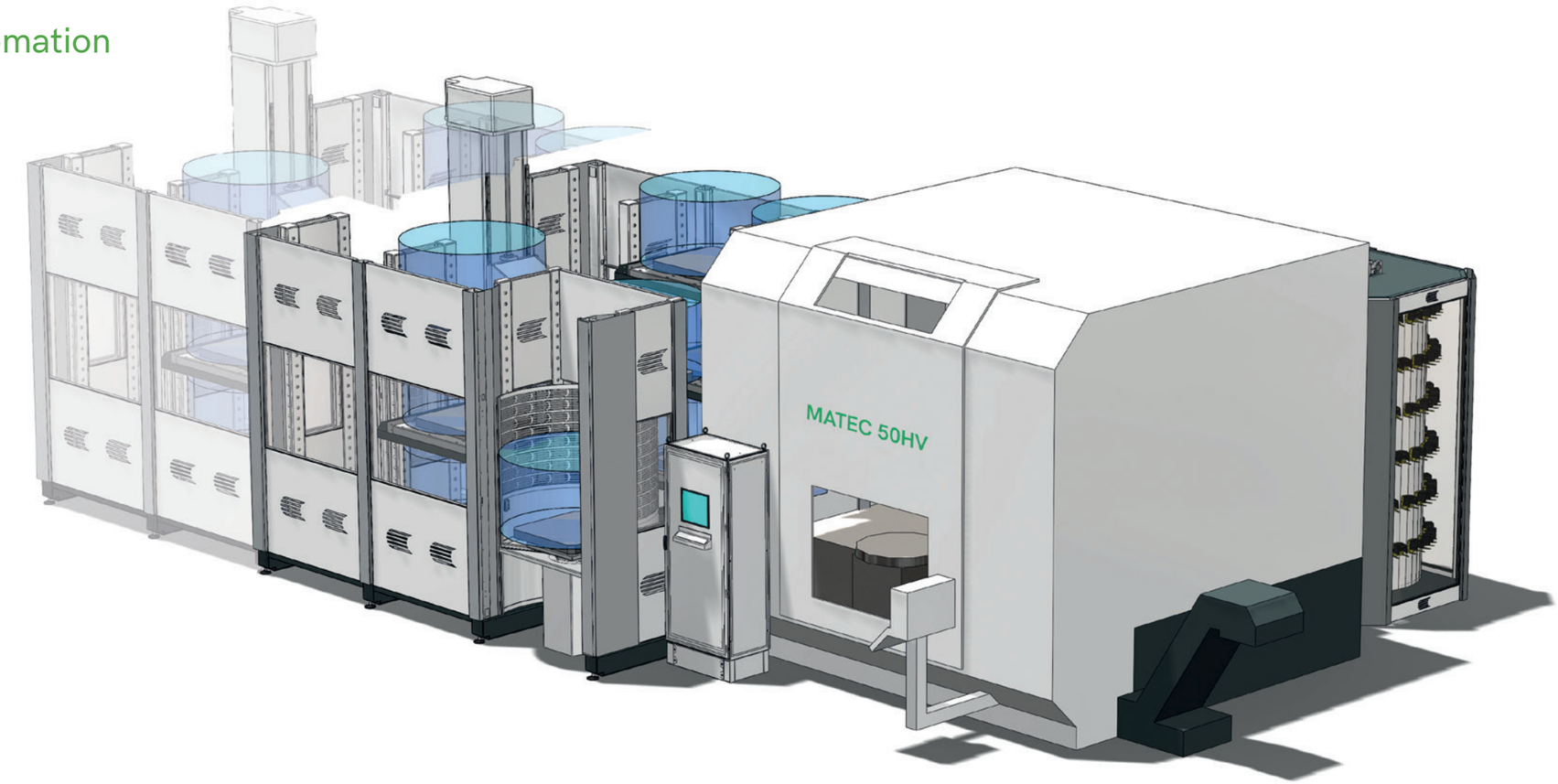
Basic fixture for automation on the rotary table. Workpiece pallet clamping via zero-point clamping system.
Pallet sizes ranging from 150 x 150 mm to 800 x 800 mm.



Round pallet storage unit with pallet handling function.

# Pallet automation
## Our modular series – with intelligent automation
## Performance class HSK63 | HSK100

**Pallet automation** (customer solution)
- Pallet size 1,000 x 1,000 mm
- Pallet storage unit with 9 places (modular expansion available)
- Expandable to a pallet pool with further places
- Workpiece size L x B x H 1,000 x 1,000 x 1,000 mm
- Max. pallet load 1,500 kg
- Rotatable loading and unloading station
- Manual workpiece clamping



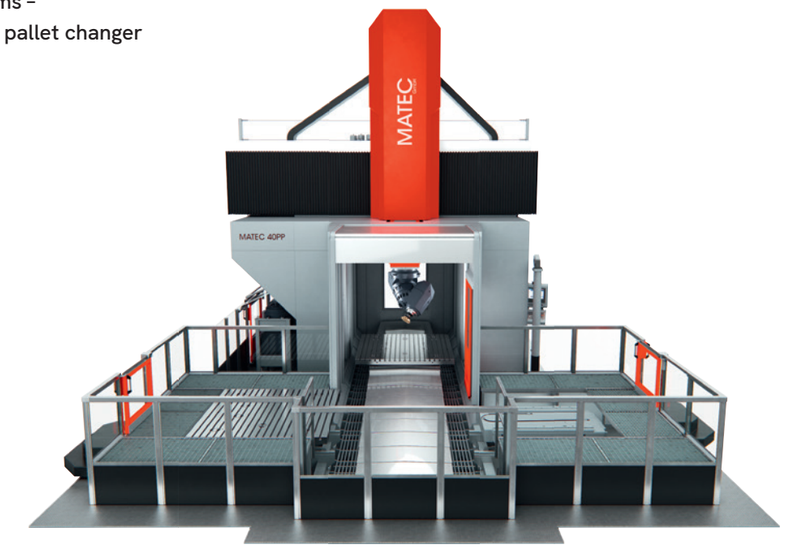


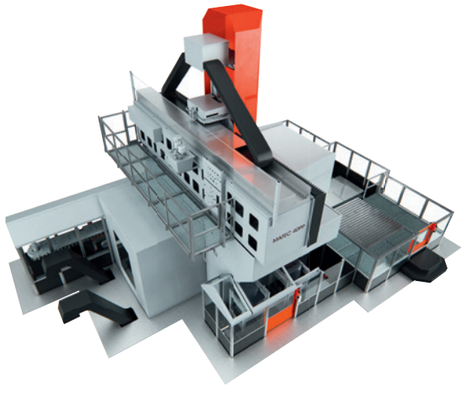
**MATEC 50HV machining centre**
X-axis 2,000 mm
Y-axis 1,125 mm
Z-axis 1,300 mm

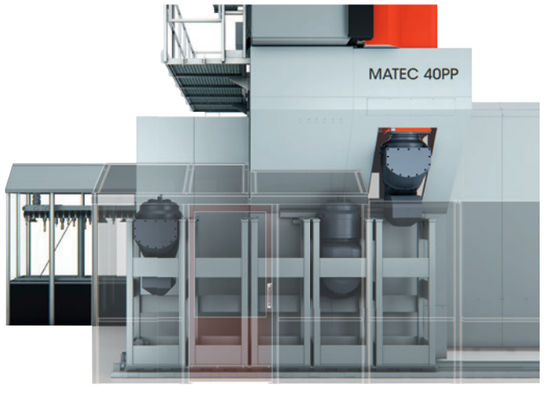
- Tool holder HSK100
- Motor spindle 12,000 1/min
- Drive power 96 kW
- Torque 521 Nm
- 480 tool places
- CNC rotary table Ø 1,000 mm
- Transport load 5,500 kg

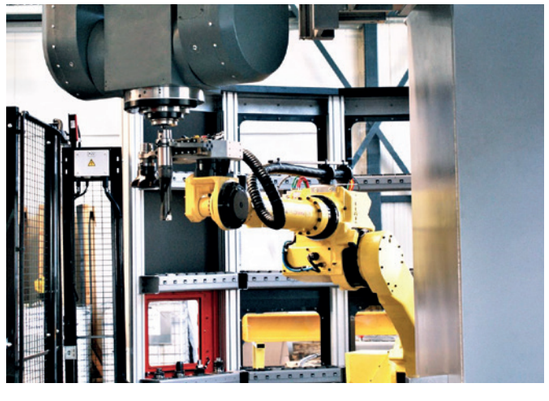
# Pallet automation
## Gantry centres MATEC 30PP | 40PP
## Performance class HSK63 | HSK100

Schematic diagrams –
MATEC 30PP with pallet changer



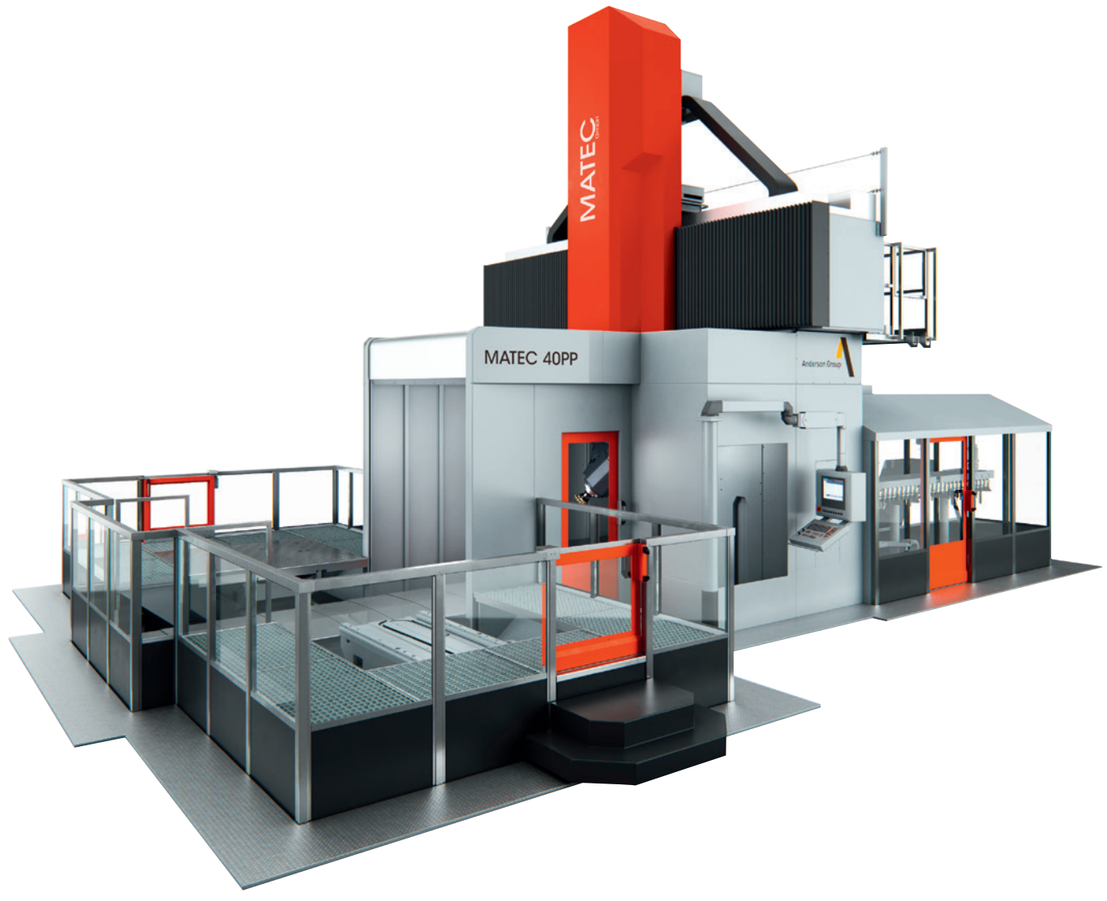





# MATEC 30PP
## 5-axis gantry series
## Stationary gantry | Moving table

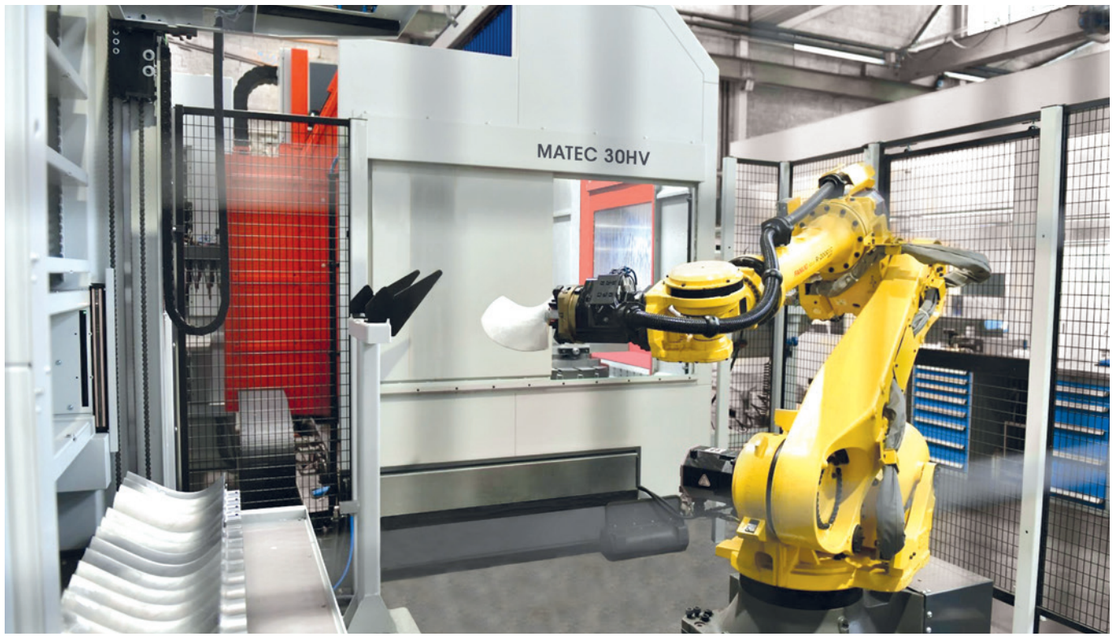


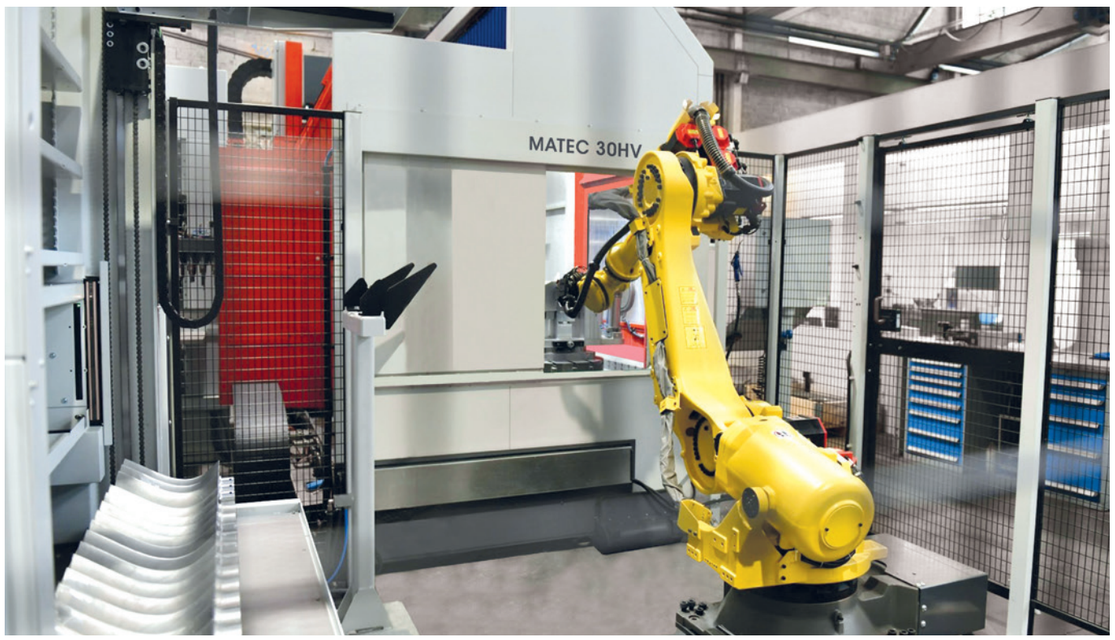

**Specifications**
**MATEC 30PP | MATEC 40PP**
up to 5 replaceable heads (more heads on request)

- X-axis: up to 7,000 mm
- Y-axis: up to 4,800 mm
- Z-axis: up to 2,100 mm
- Pallet size 2,000 x 2,000 to 6,000 x 3,000 mm, corresponds to the workpiece size, for a tool length of 250 mm
- 2-axis universal head (infinitely variable), optional with 2-axis fork head
- Speeds up to 30,000 1/min
- Motor spindle up to 159 kW
- Torque up to 690 Nm
- Axis drives with ball screw, optional rack and pinion drive or linear drive
- Tool capacity 40 bis 680 places or tool handling with robot for up to 250 tools
- Pallet changer for 2 to 4 pallets
- Workpiece weight 1 t/m$^2$, optionally higher payload
- Fully enclosed work area, prepared for mist collection
- Manual pallet exchange

## Workpiece automation
## Performance class HSK63 | HSK100

Simple operation.
High flexibility.
Small footprint.



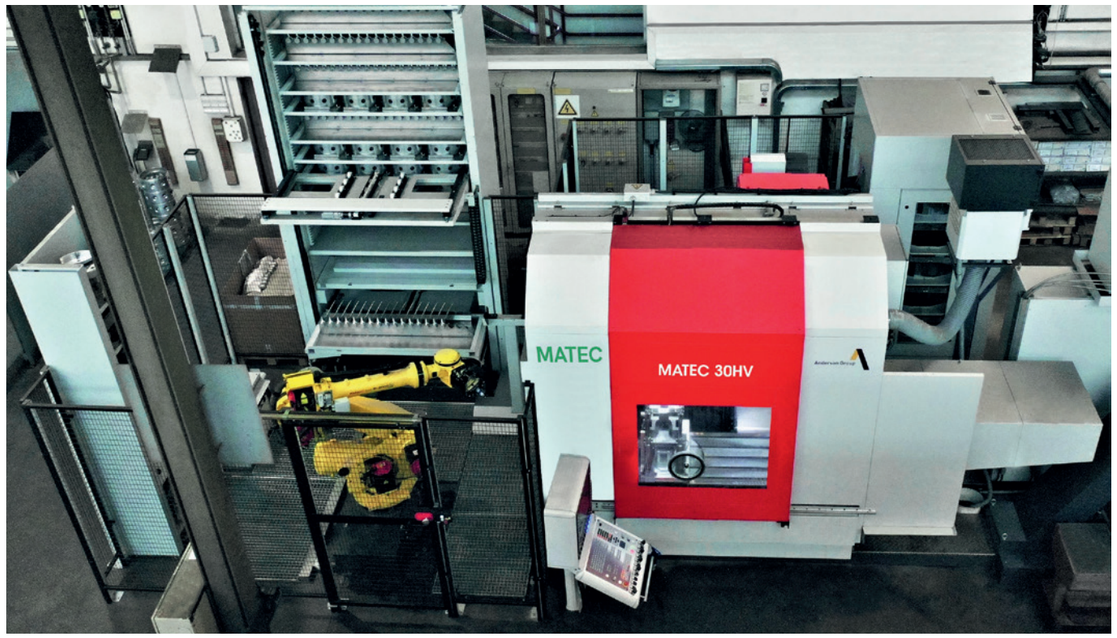




5-axis series production of turbine blades.



## Automation solution that combines minimum footprint with maximum storage capacity

Optimum adaptation to the available floor space for production.




Customized solution.

**Specifications**
**MATEC 30HV | MATEC 50HV**

- X-axis: 1.300 to 8.000 mm
- Y-axis: 600 to 1,630 mm
- Z-axis: 800 to 1,850 mm
- Built-in rotary table Ø 630 to 2,200 mm
- 1-axis swivel head (infinitely variable)
- Speeds up to 42,000 1/min
- Motor spindle up to 92 kW
- Torque up to 690 Nm
- Tool capacity 48 or 268 tools with add-on magazine
- Fully enclosed work area; prepared for mist collection
- 6-axis robot, size based on the required payload or workpiece weight
- High rack with workpiece drawers, individually adjustable to the specific workpiece height
- Alignment stations for different workpieces

# Workpiece automation
# Our standard series – with intelligent automation
# MATEC 30SHV | 30S | 30SD with swivel table
# Performance class HSK63

## The ideal combination of high-productivity series machines and efficient automation.

The machines of the MATEC swivel table series solely consist of the modules of our sturdy long-bed machine series. In series production, they are therefore preferentially used where high cutting capacity is required and for the end machining of long components.

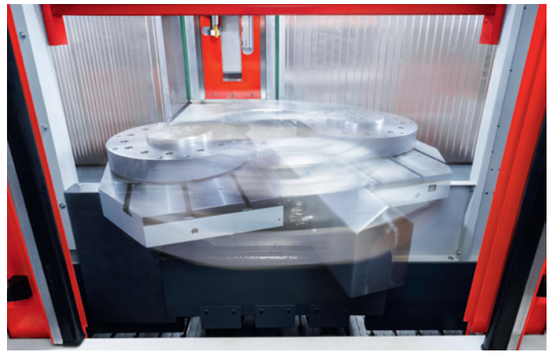
The machine is offered in three basic versions:
- MATEC 30SHV with swivel head
- MATEC 30S Single-spindle version with fixed head
- MATEC 30SD Double-spindle version with fixed head

For all machine versions, the production principle of the MATEC swivel table series is based on a 0–180° pendulum swivel table with two separate work areas. The work area is changed by a 180° rotation of the swivel table.

A lifting door with safety glass separates the machining areas. This design enables loading and unloading to take place during machining while the machine is producing in the other machine area.

For multi-sided machining, numerous standard rotary tables in single- or two-axis versions as well as special fixture bridges, even with multiple clamping, are available.

For automation, usually fast robot systems are used. If required, theses systems can also take on auxiliary and additional tasks such as brushing, deburring, washing and marking in a cost-effective manner. Automation principle optionally with pallet or workpiece handling – or both.



Swivel table 0-180° in pendulum movement.


MATEC 30S Single-spindle version.


MATEC 30SD Double-spindle version.
Reduction of the piece time by 50% I double production.




**MATEC 30SHV**
- Swivel table
- Swivel head ± 105°
- X-/Y-/Z-axis 2000/600/800 mm

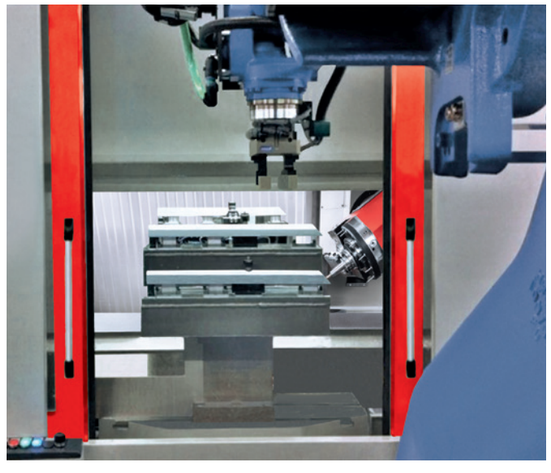
Multi-sided or end machining on long workpieces with a length of up to 800 mm

**Automation sample: MATEC 30SHV**
Plant interlinked in a line with upstream and downstream process steps.
3-sided machining of profiles. MATEC manufacturing cell with loading and unloading during machining operations.
Additional processes: deburring, washing and drying at the loading station.

**Automation**
- 6-axis robot
- 2 x drawer-type magazine with six drawers
- Drawers can be loaded externally
- Alignment and positioning station


View or the work areas with the safety partition wall at the centre of the swivel table open. 6-axis robot in unloading position.

Two workpieces clamped in each work area. Machining of both ends by means of swivel head.

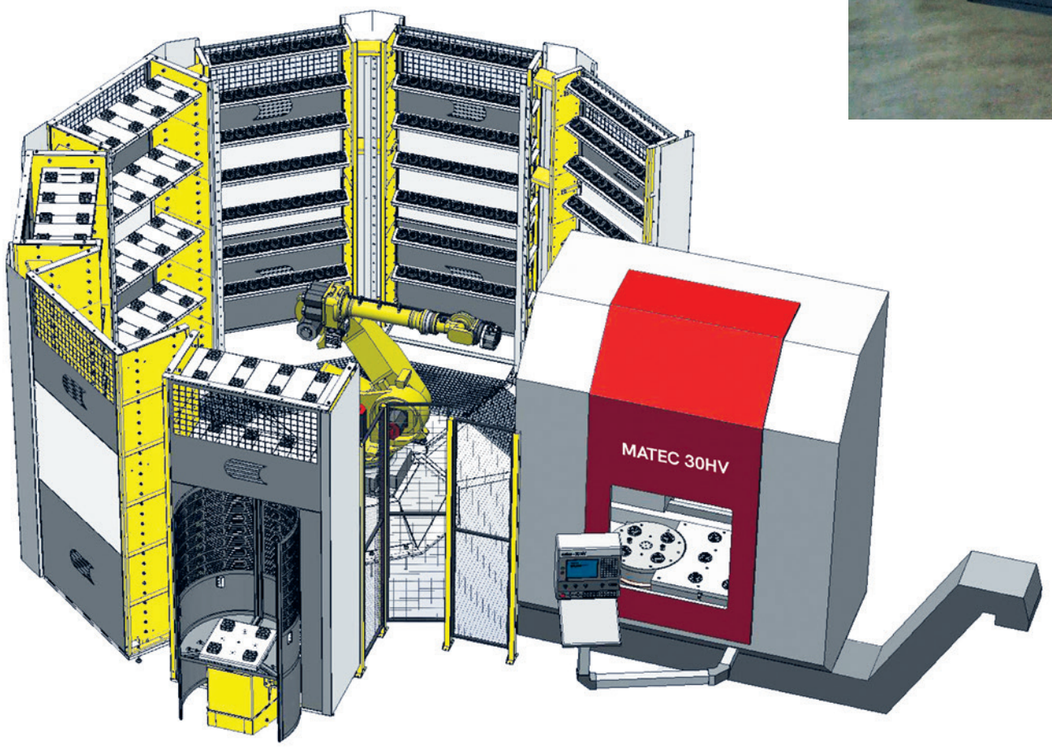


# Multi-flexible solutions
# Our modular series – with intelligent automation
# Performance class HSK63 | HSK100

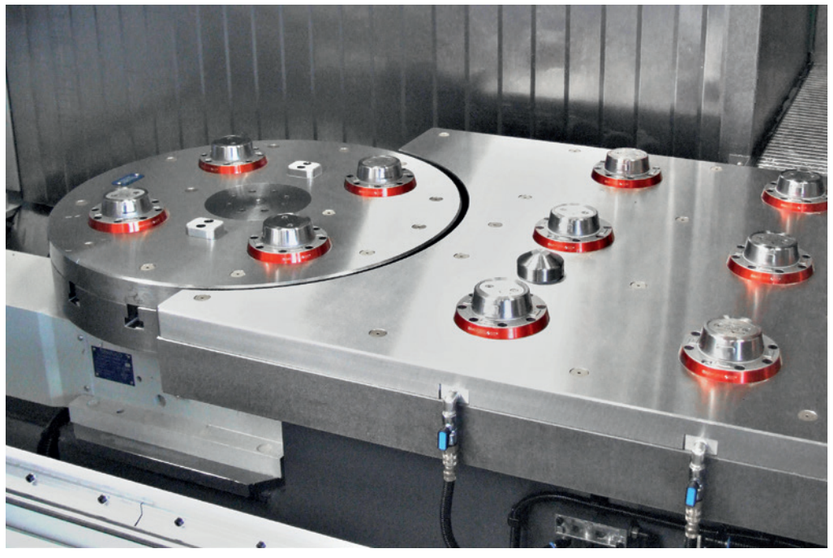
**Automation cell** (customer solution)

- Pallet rack
- Pallet set-up station
- Workpiece storage unit
- Tool magazine
- 6-axis robot with gripper change

- Workpiece automation
- Pallet automation
- Tool management


Rotary table and fixed machine table with zero-point clamping system with uniform grid for the storage of uniform pallets, both on the rotary table and on the machine table.



# Multi-flexible solutions
# The flexible kind of automation

Gantry loaders and linear systems are high-efficiency automation systems for series production. Gantry systems are intended to unite all the process and manufacturing technologies of a product in one synchronised production line, from machine to machine. In the broadest sense, this encompasses all process steps – from the blank up to packaging.

The automation requirements are as individual as the type of the products to be manufactured. Production concepts range from individual machines up to fully automated production lines. So a vast range of suitable technical modules and automation components must be provided.

Product-specific aspects such as workpiece dimensions, workpiece weight, machining sequence and manufacturing technology determine the production concept to be used. Integrated additional equipment for quality assurance as well have an impact on the concept.

Against this backdrop, our automation systems are designed based on the philosophy of perfect planning down to the last detail. Our solutions range from small manufacturing cells up to tailor-made systems. As far as complex loading systems such as gantry solutions combined with multi-axis robots, conveyor belts, high-bay racks or measuring stations, etc. are concerned, we collaborate with leading manufacturers and incorporate their components in the overall concept.

It is for you to choose the desired degree of automation for your production.
We will implement your planning for you to achieve an economic and efficient production.

# Special solutions
# Machining from the bar
# Performance class HSK63 | HSK100

Highly productive manufacturing cells for efficient production.
Complete machining through additive machining units and integrated automation.
Technical data based on modular group.


**Technical details**

- Moving column machining centre with swivel head
- Automatic bar feeder
- CNC rotary table, horizontal, with collet chuck, passage Ø 160 mm
- Tailstock for workpiece support
- 2-Axis CNC sawing unit, saw blade Ø 490 mm | 16 kW
- Transfer slide with horizontal CNC rotary table and clamping station
- 3-Axis workpiece gripper for workpiece removal
- Removal system for workpieces and remnants

**Application range of High-Production-Line**

- Materials from high-strength steel to plastics
- Elongated workpieces with multi-sided machining
- Profiles of different dimensions
- Shafts, tubes, traverses and the like
- Single part or small batch production from solid material

**Technical data**

**Traverse paths**

| | |
|---|---|
| X-axis: | 3,000 mm |
| Y-axis: | 825 mm |
| Z-axis: | 1,100 mm |

**Swivel head**

| | |
|---|---|
| Swivel angle: | ± 105° infinitely variable |
| Positioning accuracy: | ± 3" |

**Tool magazine**

| | |
|---|---|
| Tool system: | SK40 \| HSK63 |
| Tool magazine, travelling: | 48 places |
| Tool Ø: | max. 200 mm |
| Tool length: | max. 340 mm |

**Main spindle drive**

Motor spindle HSK63

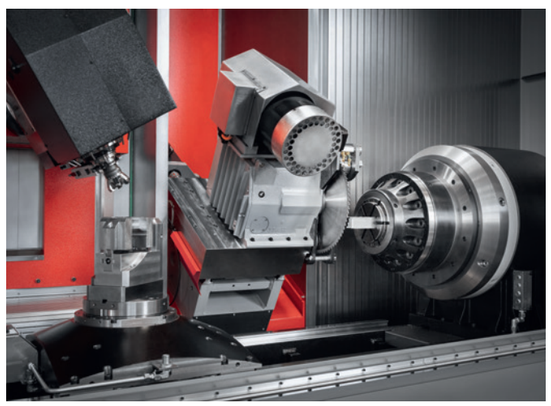
| | |
|---|---|
| Speed: | 15,000 1/min |
| Drive power: | max. 30 kW |
| Torque: | max. 230 Nm |

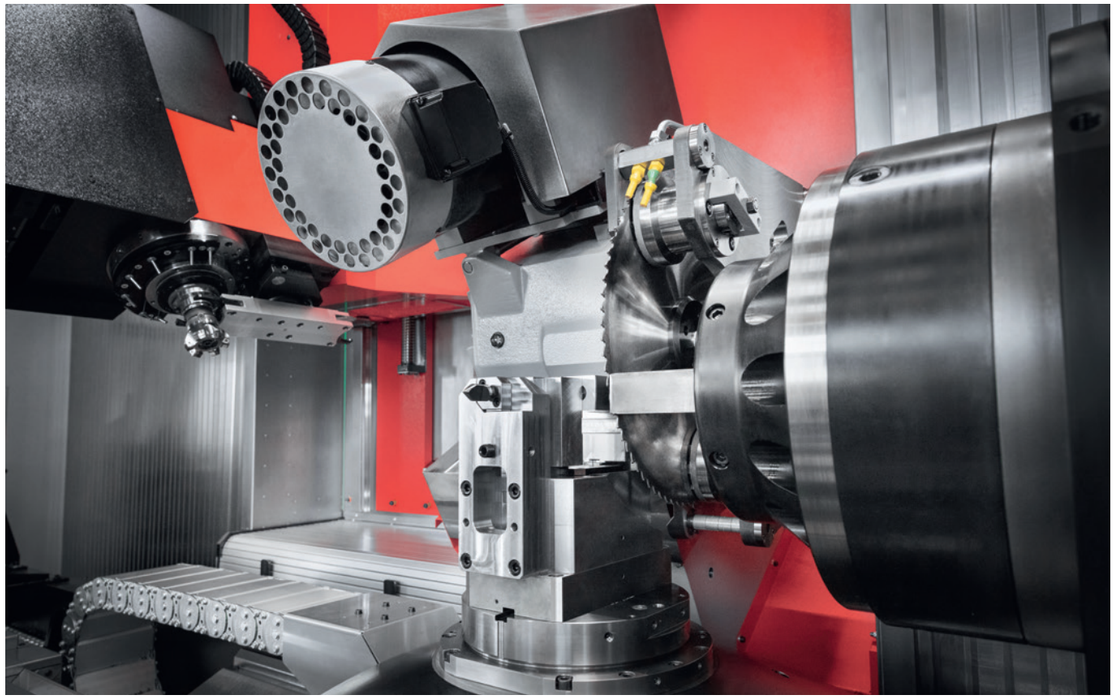
**Rapid traverse \| Feed rate**

48 m/min.

**Concept**

With this machine concept, all process steps from feeding the bar profile, 6-sided machining in two clamping positions and automatic unloading are combined in a single machine.
This results in a fully automatic production process. This in turn guarantees the highest precision and repeatability over the entire production period.
The concept is thus not only able to optimise production, but also to generate savings in the mid double-digit range.





Transfer station with vice on linear axis "U" and rotary axis "C", 2-axis CNC sawing unit.

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