

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

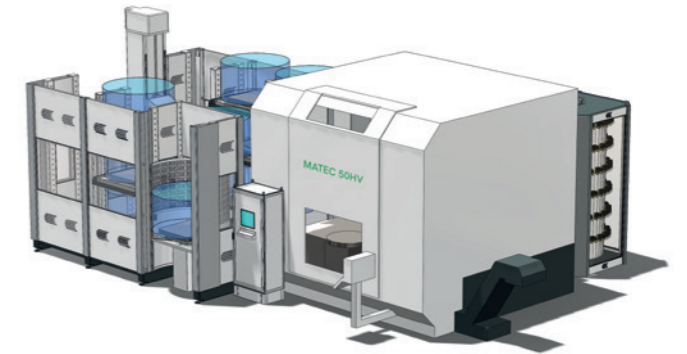
Machine and automation data can be remotely evaluated and visualised. Furthermore, MATEC offers one-stop software solutions for machine control and automation by HEIDENHAIN, SIEMENS and BOSCH. In close collaboration with your engineers, we will realise options such as measuring programs with graphics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



Automation M-Box

Your most efficient approach to manufacture complex parts and moulds

M-Box 12

- 5-Drawer system
- Industrial robot Fanuc M10 ID/12, 12 kg, with robot control unit Fanuc R-30
- Storage space 600 x 800 mm for workpieces with a height of 135 mm
- Workpiece diametre 5 - 550 mm



M-Box 35

- 5-Drawer system
- Industrial robot Fanuc M20 ID/35, 35 kg, with robot control unit Fanuc R-30
- Storage space 600 x 1,200 mm for workpieces with a height of 135 mm
- Workpiece diametre 5 - 750 mm

Equipment for both models:

- Gripper system make Schunk
- Pneumatics make Festo
- Discharge nozzle
- Drawer system (8 drawers)
- Connection to machine
- 4 Robotics software options:
 - Soft float
 - Singularity avoidance
 - Collision guard
 - Remote iPendant
- Light curtain make Sick
- Electrical cabinet
- Warning lamp tower with buzzer
- RoboCAM automation software
- Robot pneumatics cabinet
- Floor laser scanner make Sick



Automation M-Box

Your most efficient approach to manufacture complex parts and moulds

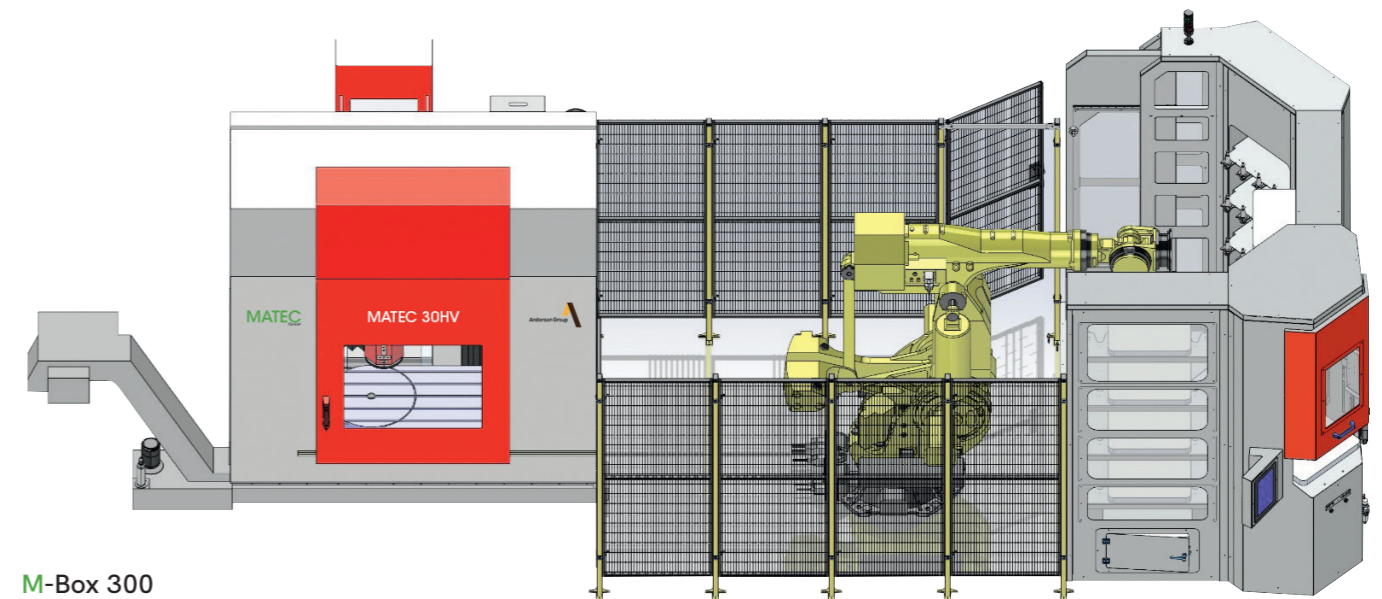
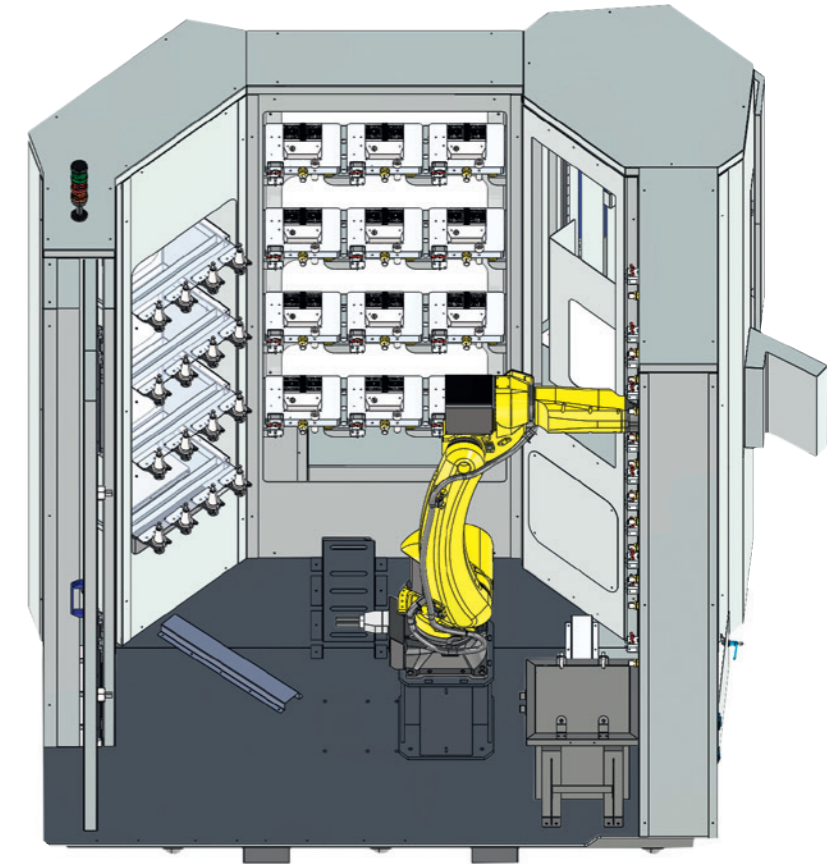
M-Box 25

- Pallets and tool change
- Industrial robot Fanuc M20 ID/25 with robot control unit Fanuc R-30 IB
- Pallet coupling make Schunk
- Capacity for 24 pallets and 16 tools
- 24 Pallet storage places for pallets, 320 x 260 mm (without pallets)
- Max. installation height from top edge of pallet: 350 mm
- Handling weight of pallet with clamping fixture and workpiece: 25 kg
- 16 tool places for SK40, SK50 (without mount)



Equipment:

- Gripper system make Schunk
- Pneumatics make Festo
- 4 Robotics Software Options:
 - Soft float
 - Singularity avoidance
 - Collision guard
 - Remote iPendant
- Electrical cabinet
- Warning lamp tower with buzzer
- RoboCAM automation software
- Robot pneumatics cabinet
- Industrial PC
- Cleaning station



M-Box 300

- Available pallet sizes: from 630 x 630 mm or 800 x 800 mm. Max. 15 pallets.
- Industrial robot Fanuc M-900 IB/700

Optionally available:

- Workpiece handling
- Tool handling

Pallet automation

Maximum flexibility with workpiece and pallet change

Performance class HSK63 | HSK100

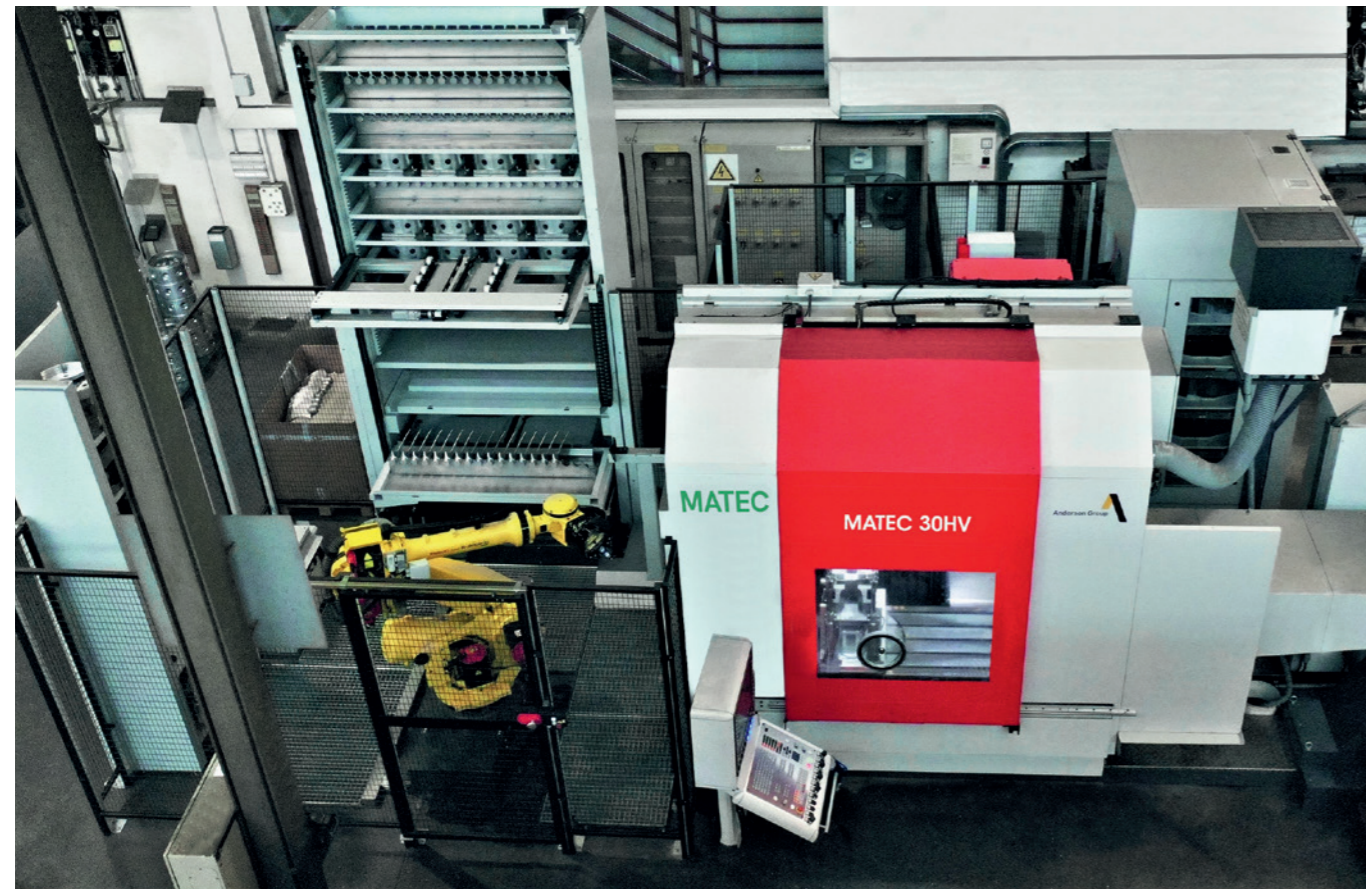
Specification

MATEC 30HV

- 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



Round pallet storage unit with pallet handling function.



Technical data

Work area	Unit	MATEC 30HV				
X-axis	mm	1,300	1,500	3,000	3,000	3,000
Y-axis	mm	600	825	825	1,125	1,125
Z-axis	mm	800	1,100	1,100	1,100	1,300
Distance spindle nose machine table (vertical)	mm	675	975	975	980	1,180
Distance spindle centre machine table (horizontal)	mm	175	175	175	180	180
1-Axis swivel head						
Swivel radius	mm	300				
Swivel angle	Degrees	+/- 105				
Direct path measuring system	sek.	+/- 3"				
Torque clamped unclamped	Nm	4,200 2,400				
Main spindle (standard) Motor spindles available in other performance classes as an option						
Tool holder		HSK 63 SK40*				
Speed	1/min.	9,000				
Power at 25 40 100 % DC	kW	19 16 11				
Torque at 25 40 100 % DC	Nm	115 100 75				
Tool magazine (travelling)						
Tool places	pcs.	48 60 ** 80 **				
Tool places with auxiliary magazine max.	pcs.	280 (can be extended according to customer requirements) **				
Tool length	mm	340 450				
Tool Ø (all places occupied)	mm	70				
Tool Ø (secondary places free)	mm	140 200*				
Tool weight max.	kg	10				
Tool changer (travelling)						
Changing system		Double gripper				
Tool change position		in every X- and Y- position				
Axis drives						
Ball screw drive (standard)		Ball screw drive				
Rapid traverse Feed rate	m/min.	48 (up to Y = 825 mm) 30 (with Y = 1,125 mm)				
Machine table						
Table length Y= 825 1,025 1,125 mm	mm	1,515	1,700	3,500	3,500	3,500
Table width Y= 825 1,025 1,125 mm	mm	635	835	835	1,155	1,155
T-slots according to DIN 650	mm	18 ^{H7}				
Number of T-slots with Y= 600 825 1,125 mm	pcs.	5	7	7	11	11
Slot spacing for Y= 600 825 1,125 mm	mm	125	125	125	100	100
Table load max. (dowelled)	kg m ²	500	1,000	1,000	1,500	1,500
CNC rotary table						
Faceplate (integrated) Ø	mm	630	800	800	1,150	1,150
Drive type (positioning axis)		Worm drive				
Speed max.	1/min.	25	25	25	6.25	6.25
Table load (centric) max.	kg	1,000	1,500	1,500	2,000	2,000
Torque, unclamped	Nm	3,000				
Torque, clamped	Nm	7,000				
Direct path measuring system	arc sec.	+/- 5"				

* Option

** Tool change with shuttle (option)

Pallet automation 5-Axis universal machining centres MATEC FUV620 | FUV720 Performance class HSK63

Pallet Changer with Round Storage Unit

- Space-saving round pallet storage unit with 6 storage places
- Pallet size 400 x 400 mm
- MATEC FUV620 | FUV720 machining centre with CNC rotary turntable Ø 650 mm
- Rotary table with fixture quick-change system
- Rotary distributor for media transfer
- Automation module



5-Axis gantry machining centre MATEC FUV800 | FUV800B Performance class HSK63 | HSK100

Specification

MATEC FUV 800 | FUV800B

- Machining centre with CNC rotary swivel table Ø 800 mm
- Tool capacity 32 up to 120 tools with additional storage
- 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
- Alternatively: pallet rack | round storage, size optional



Technical data

Work area	Unit	FUV620	FUV720	FUV800	FUV800B
X-axis	mm	620	720	800	800
Y-axis	mm	520	600	920	920
Z-axis	mm	460	520	650	650
C-axis		360°			
B-axis		-50° +110°		-	
A-axis		-		-120° +120°	
Distance spindle nose	mm	200 - 660	150 - 670	100 - 750	
Main Spindle Motor Spindle (Standard)		FUV620 FUV720			
Tool holder		HSK63 SK40		HSK63 SK40	HSK100 SK50
Speed	1/min	12,000	15,000	18,000	12,000 (15,000 18,000 20,000)
Power	kW	15.5 (14) 33.0	18.0 55.5	18.0 55.5	14
Tool Magazine					
Tool pockets	pcs.	48 (60 120)		32 (40 60 64 80 120)	32 (40 60)
Tool length max.	mm	250		300	300
Tool Ø	mm	75 127		75 127	110
Tool weight max.	kg	7		7	15
Axis Drives					
Rapid traverse	m/min	48		36 (48)	
Speed max. B C-axis	m/min	12.5 25		110 170	
Speed max. A C-axis				60 90	
Machine Table					
Clamping surface	mm	Ø 650		Ø 720	800
T-slots	mm	5 x 14 ^{H7} x 100		5 x 14 ^{H7} x 100	
Table load max.	kg m ²	300		1,200	
Space Requirement					
Length	mm	4,200	4,300	3,450	
Width	mm	4,250	4,250	5,310	
Height	mm	3,000	3,060	3,600	
Weight	kg	8,500	10,320	21,000	



Pallet automation

Our modular series – with intelligent automation

Performance class HSK63 | HSK100

Pallet changer with round storage unit

(example: customized solution)

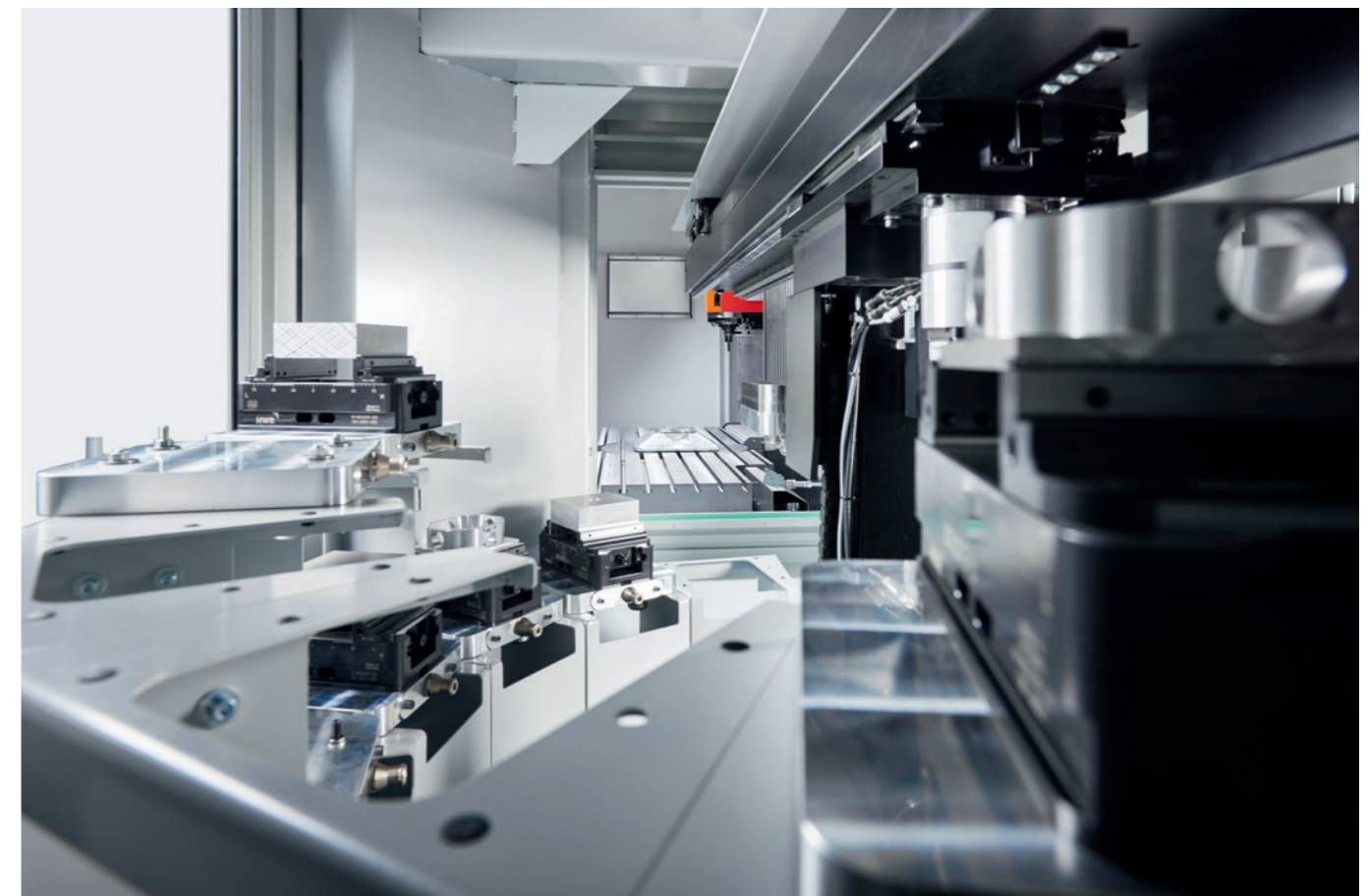
- Space-saving round pallet storage unit with 24 storage places on two levels
- Pallet size 320 x 320 mm
- MATEC 30HV machining centre with swivel head
- CNC rotary table with \varnothing 800 mm and turning function (e.g. 800 1/min.)
- 5-sided machining with a total of 268 tool places
- Rotary table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

High flexibility

A zero-point clamping system is used as 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.

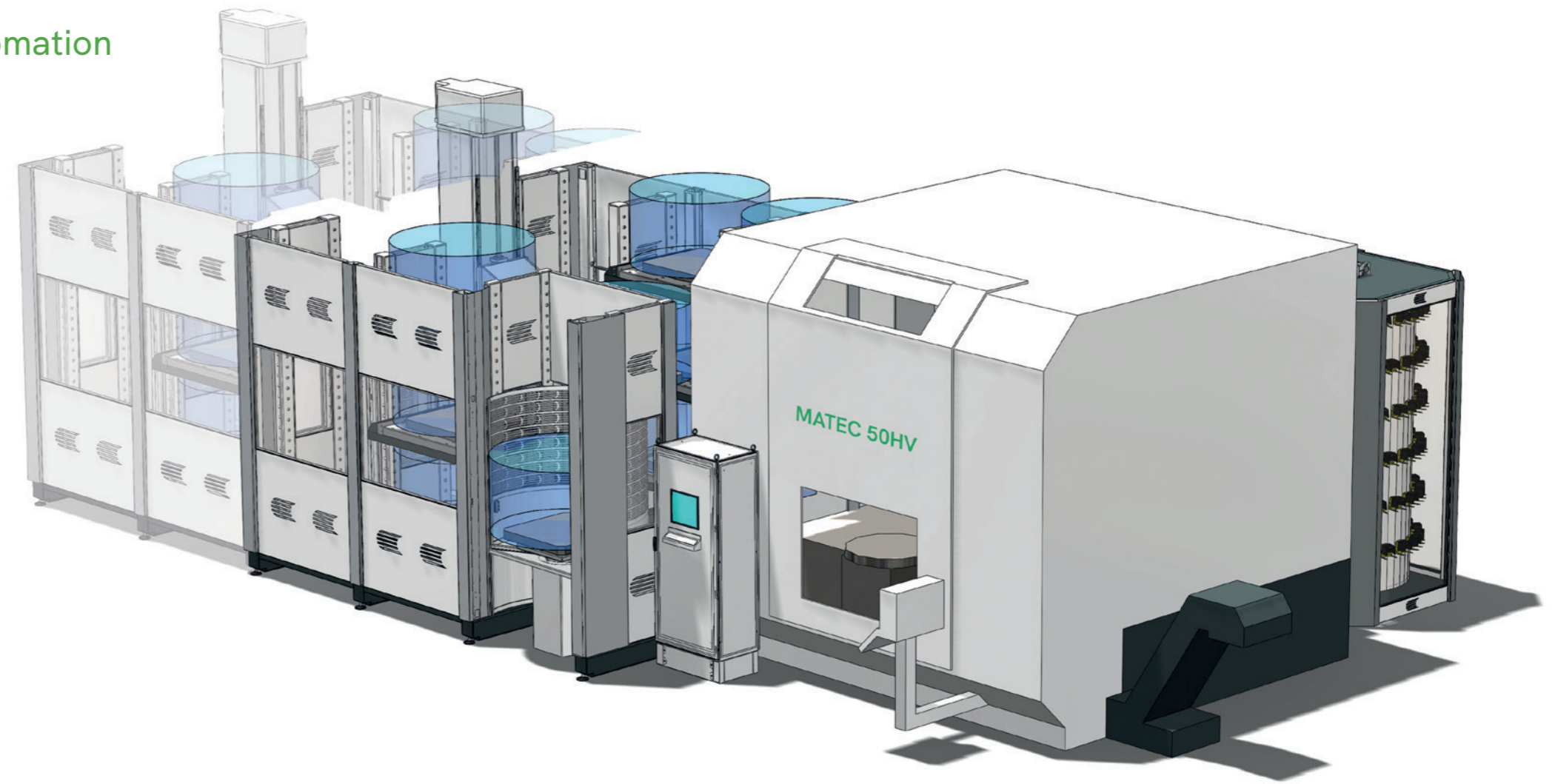
Pallet automation

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

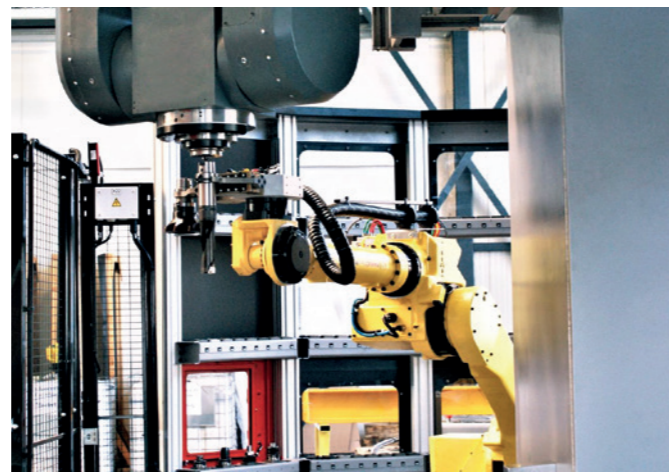
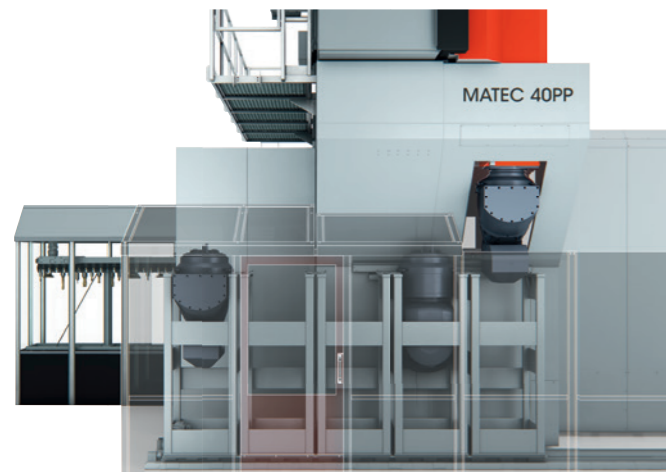
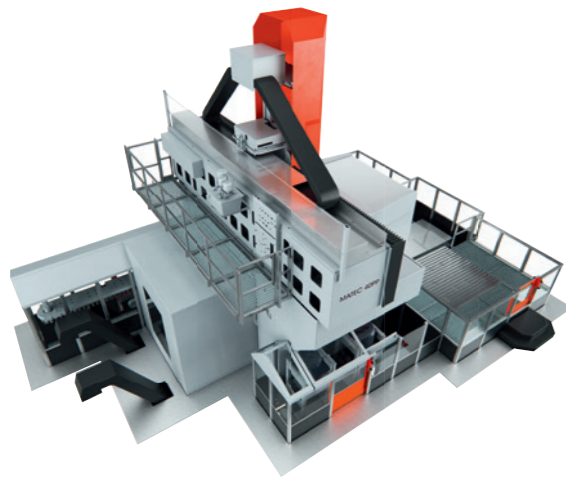
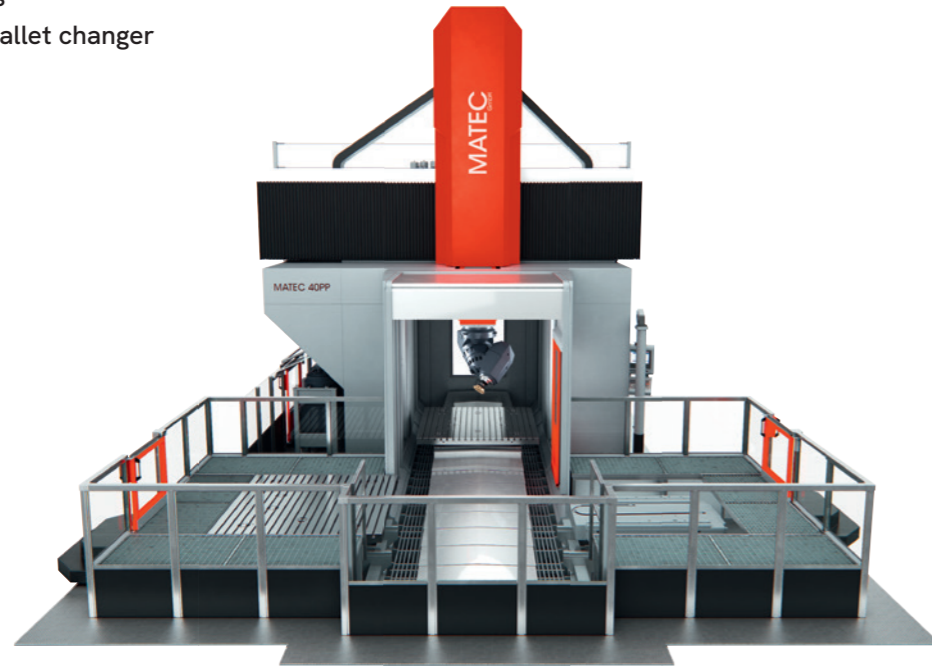
- Tool holder HSK100
- Motor spindle 12,000 1/min
- Drive power 96 kW
- Torque 521 Nm
- 480 tool places
- CNC rotary table Ø 1,000 mm
- Transport load 5,500 kg

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

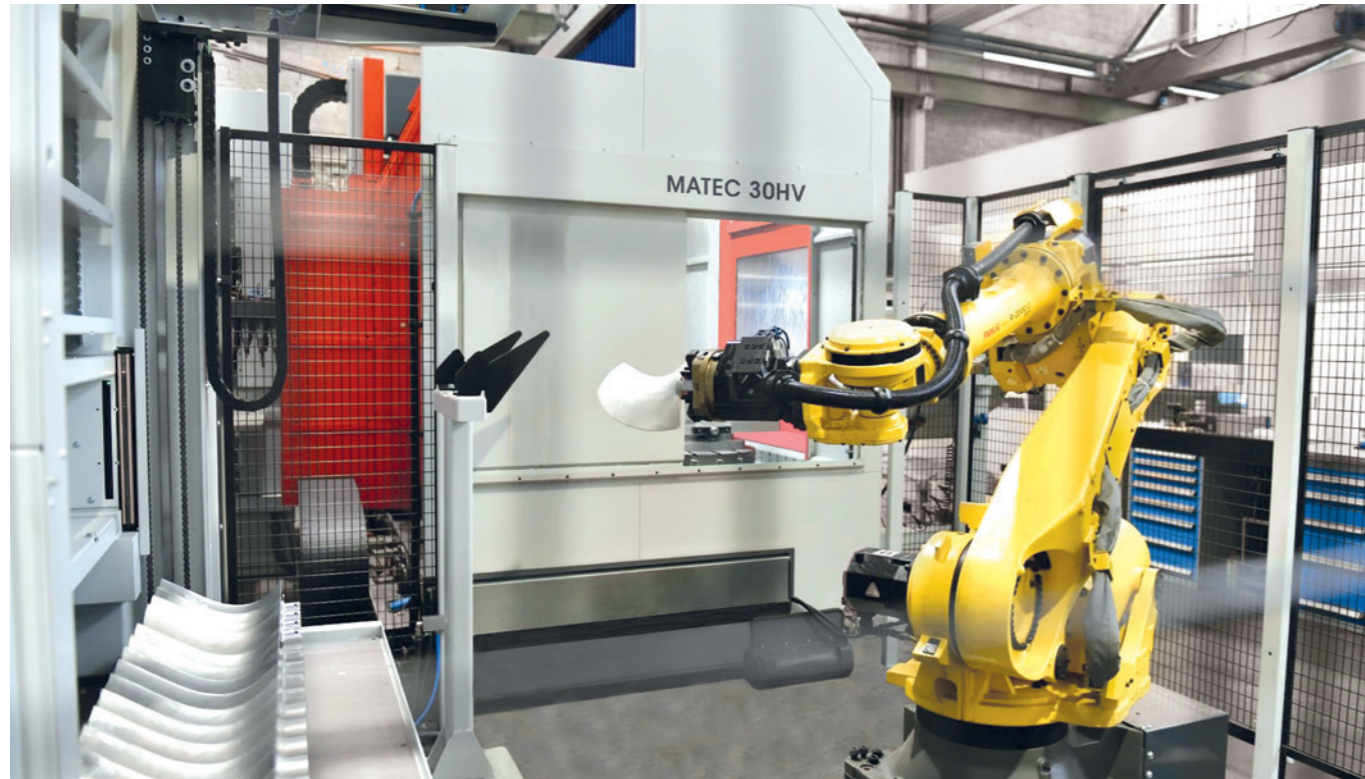
up to 5 replaceable heads (more heads on request)

- 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 up to 680 places or tool handling with robot for up to 250 tools
- Pallet changer for 2 to 4 pallets
- Workpiece weight 1 t/m², optionally higher payload
- Fully enclosed work area, prepared for mist collection
- Manual pallet exchange

Workpiece automation Performance class HSK63 | HSK100

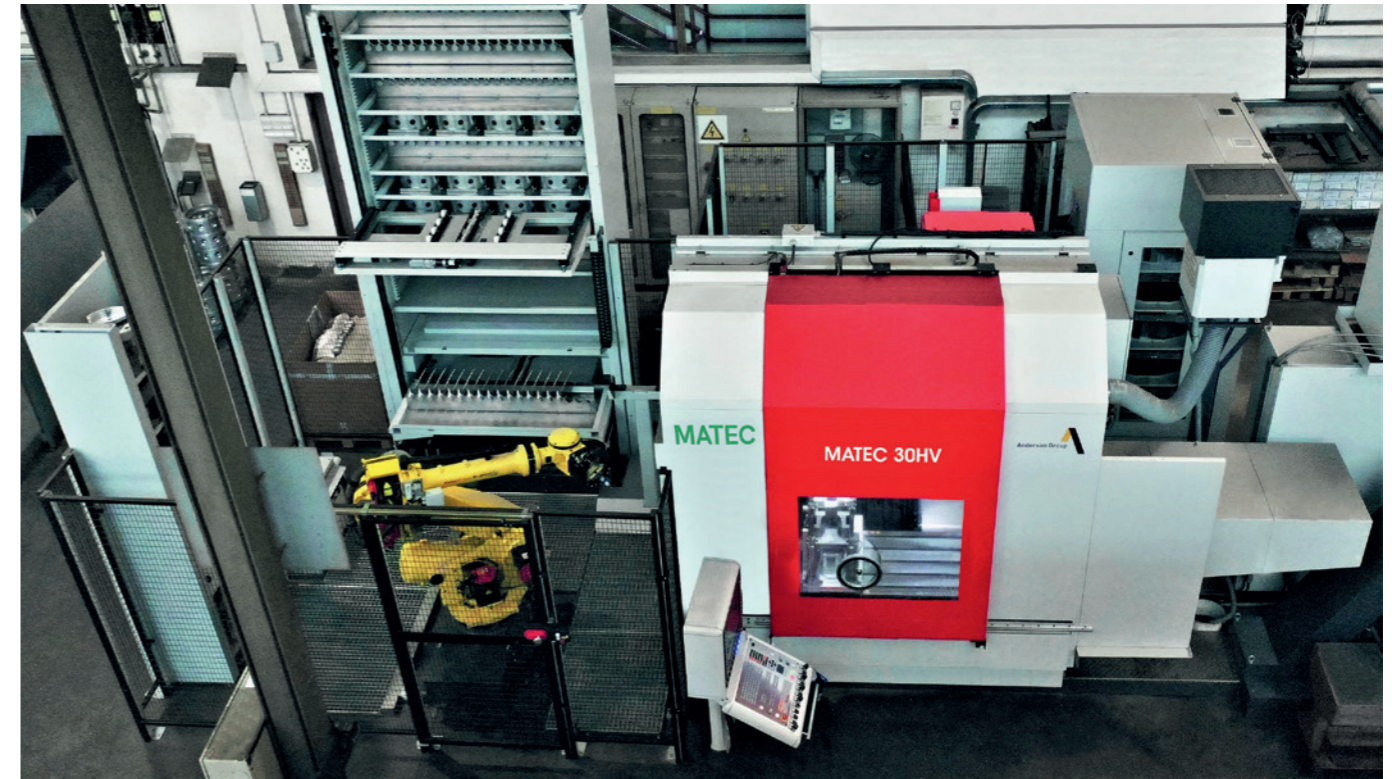
Simple operation.
High flexibility.
Small footprint.



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:

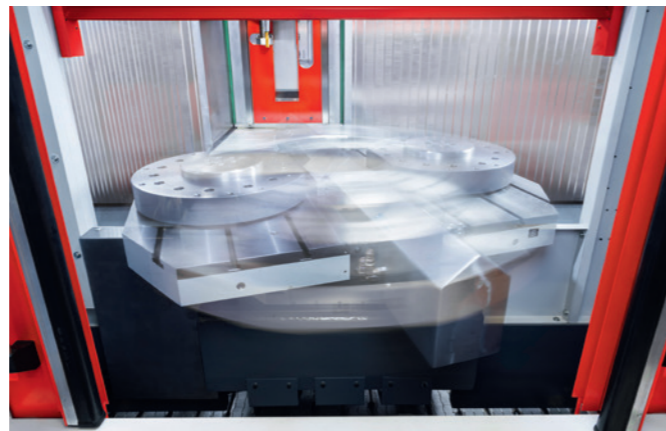
- MATEC 30SHV with swivel head
- MATEC 30S single-spindle version with fixed head
- MATEC 30SD double-spindle version with fixed head

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, these 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% | double production.

MATEC 30SHV

- Swivel table
- Swivel head $\pm 105^\circ$
- X-/Y-/Z-axis 2,000 / 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.

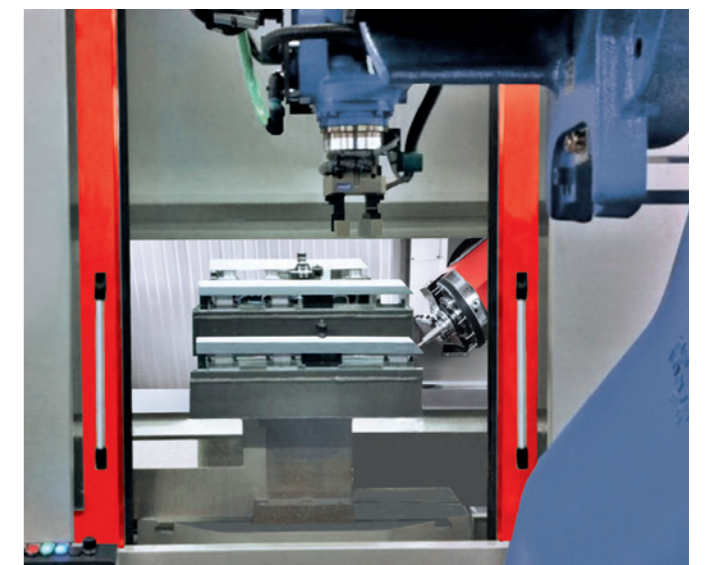
Additional processes: deburring, washing and drying at the loading station.

Automation

- 6-Axis robot
- 2 x Drawer-type magazine with six drawers
- Drawers can be loaded externally
- Alignment and positioning station

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

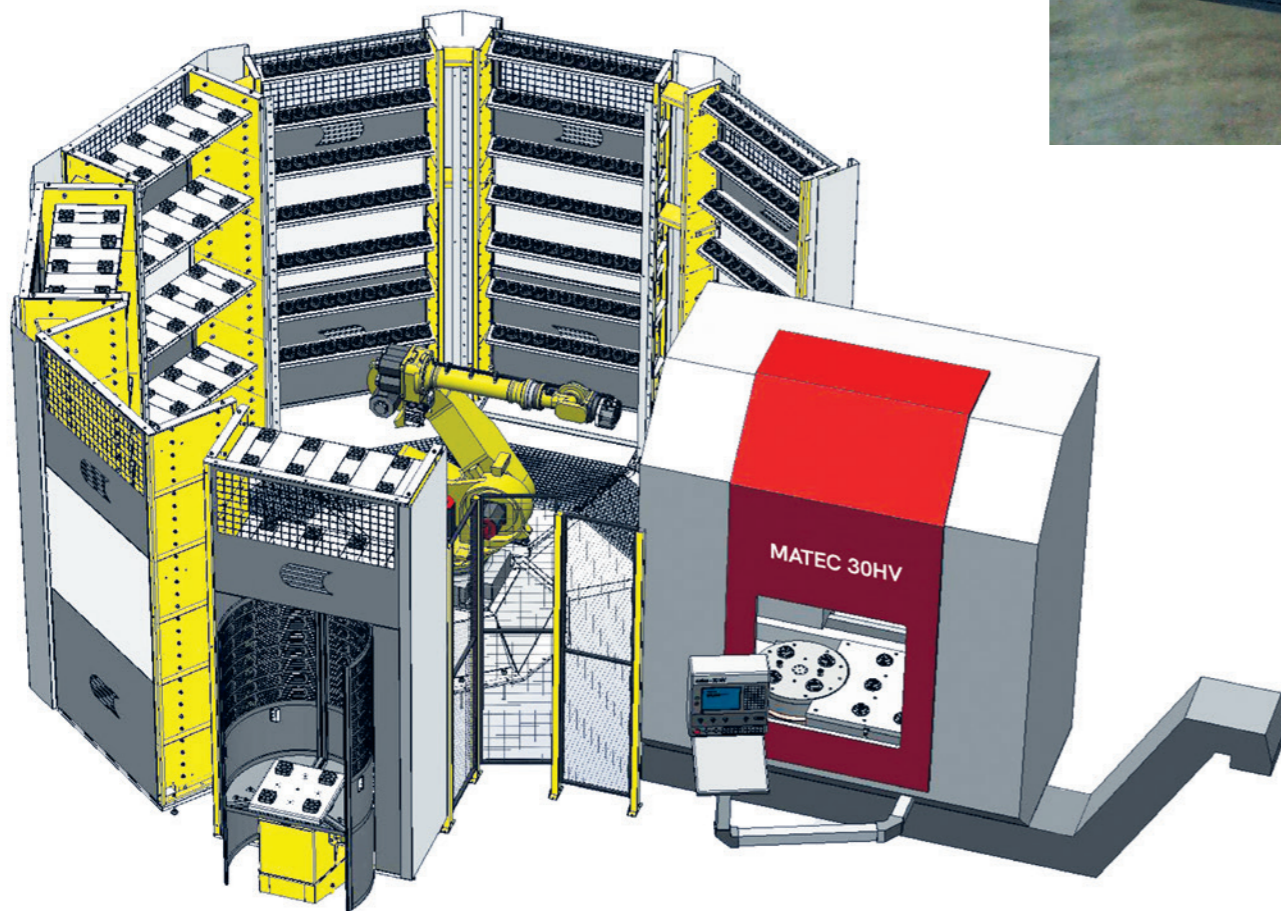
Two workpieces clamped in each work area. Machining of both ends by means of swivel head.



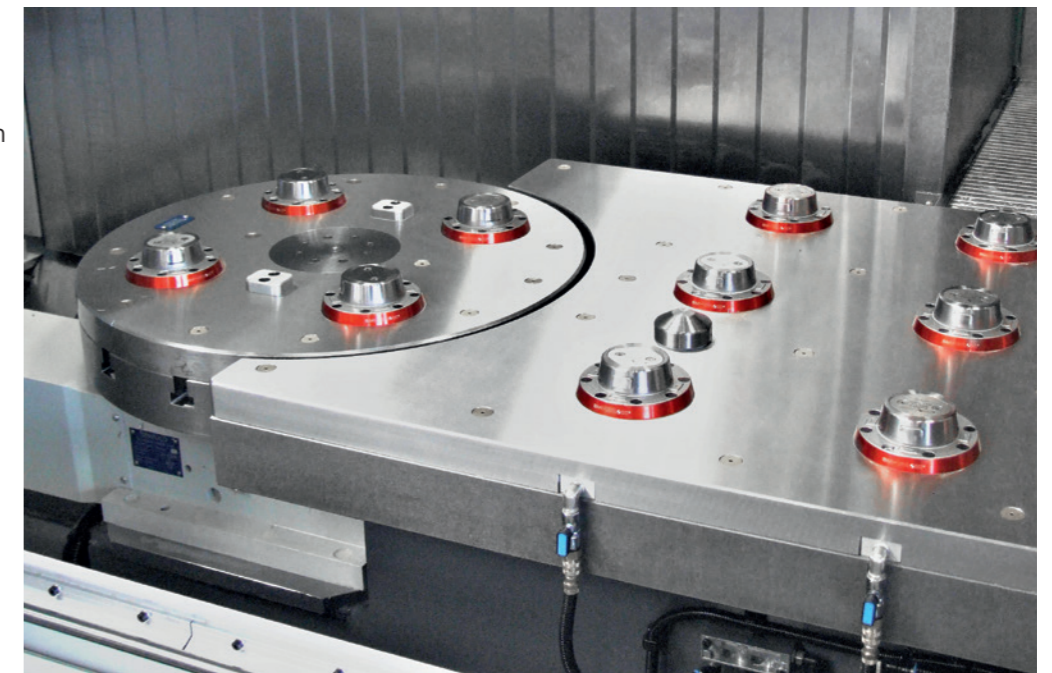
Multi-flexible solutions
Our modular series –
with intelligent automation
Performance class HSK63 | HSK100

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

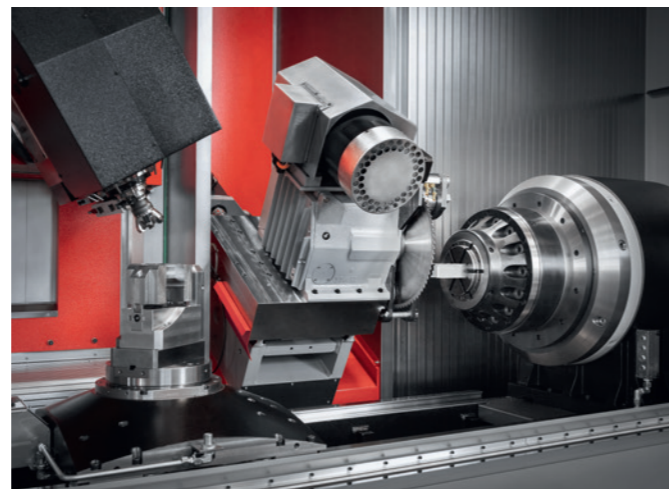
Performance class HSK63 | HSK100

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



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.



Technical details

- Moving-column machining centre with swivel head
- Automatic bar feeder
- CNC rotary table, horizontal, with collet chuck, passage \varnothing 160 mm
- Tailstock for workpiece support
- 2-Axis CNC sawing unit, saw blade \varnothing 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:	$\pm 105^\circ$ infinitely variable
Positioning accuracy:	$\pm 3''$

Tool magazine

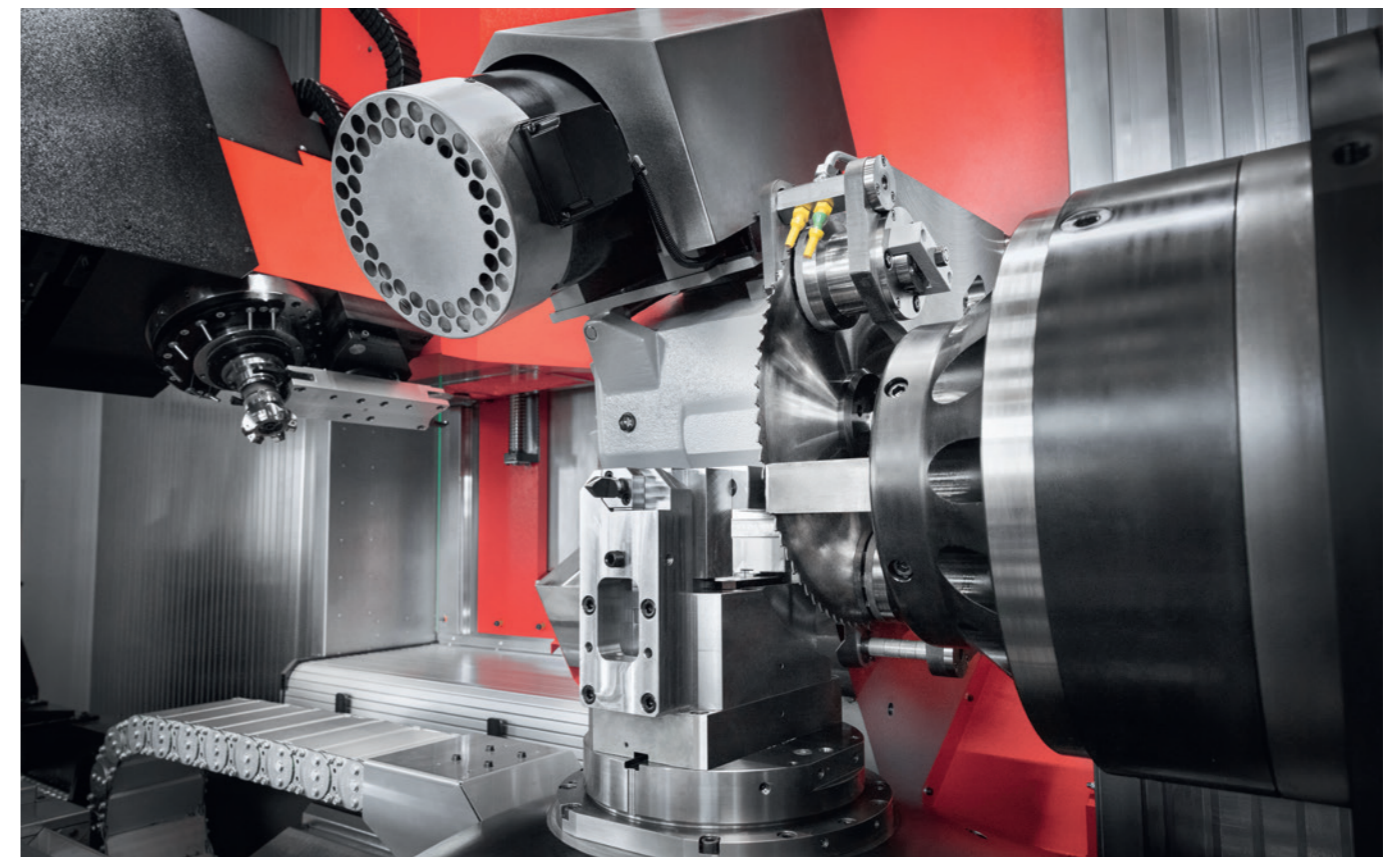
Tool system:	SK40 HSK63
Tool magazine, travelling:	48 places
Tool \varnothing :	max. 200 mm
Tool length:	max. 340 mm

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.



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

Company headquarters

MATEC GmbH
Wilhelm-Maier-Str. 3
D-73257 Köngen
Germany
Tel.: +49 7024 983 85 - 0
sales@matec.de
www.matec.de

Branch office Switzerland

MATEC SCHWEIZ AG
Alte Steinhauserstrasse 3
CH-6330 Cham
Switzerland
Tel.: +41 58 058 55 00
sales@matec-schweiz.ch
service@matec-schweiz.ch
info@matec-schweiz.ch
www.matec-schweiz.ch



Technische Änderungen vorbehalten. Abbildungen können Optionen enthalten.

