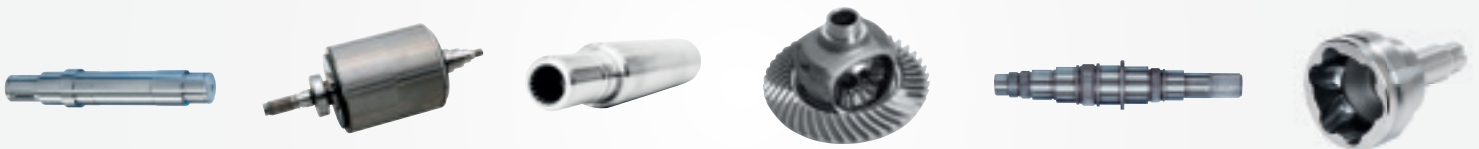


# VT SERIES

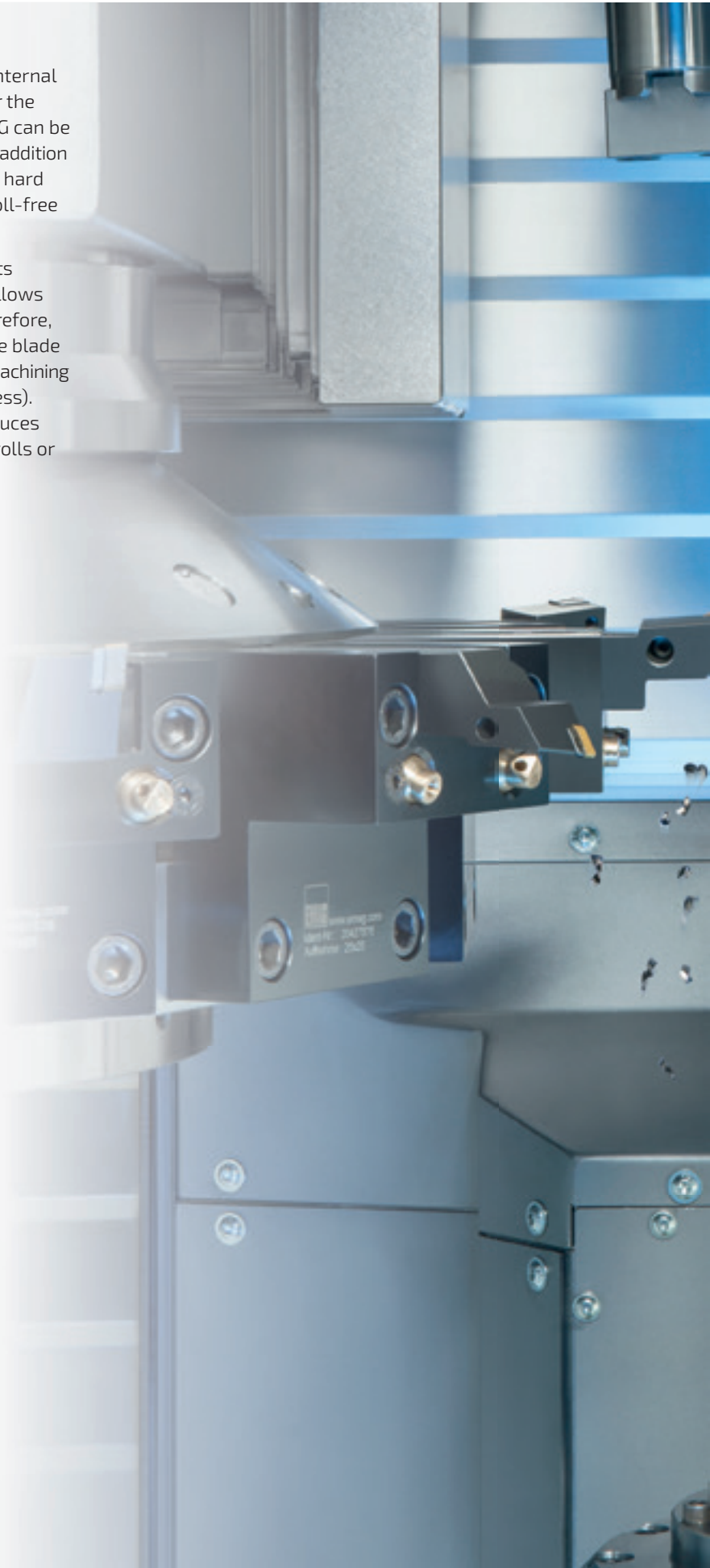


VT 2 | VT 4

## POWERFUL 4-AXIS SIMULTANEOUS MACHINING

From shaft machining for electric motors, modern internal combustion engines, and hybrids to components for the powertrain – the highly flexible VT Series from EMAG can be used for a whole range of manufacturing solutions. In addition to turning and hard turning technology (for soft and hard machining), the VT Series can also be used with scroll-free turning tools.

Scroll-free turning delivers a whole series of benefits compared to the classic turning process. Firstly, it allows significantly higher feed rates per rotation; and, therefore, it reduces cycle times. Secondly, the use of the entire blade increases the service life of the tools and reduces the machining time (for example, 5 to 6 times faster finishing process). Another point in favor of the VT Series is that it produces significantly better surface finish quality with no scrolls or a defined tp material ratio.

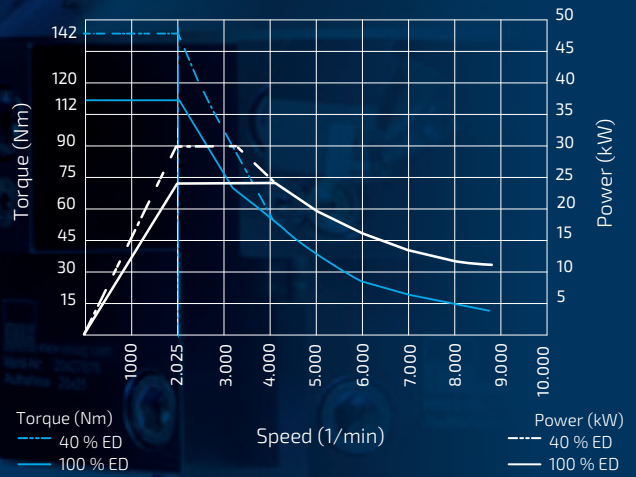




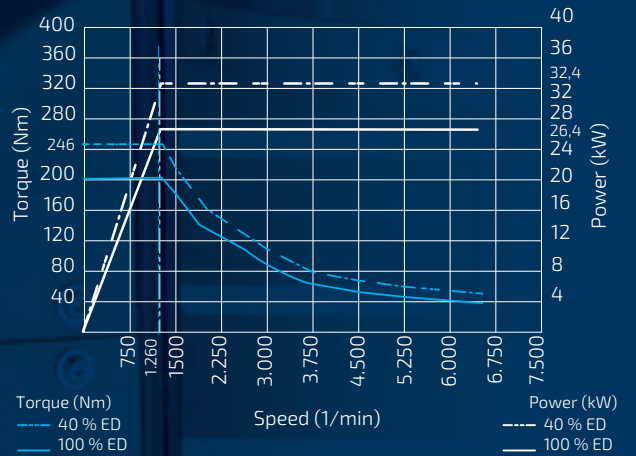
## DESIGNED FOR MAXIMUM PRODUCTIVITY

In addition to 4-axis machining, the powerful working spindle, in particular, delivers maximum productivity.

### VT 2 MAIN SPINDLE PERFORMANCE DIAGRAM



### VT 4 MAIN SPINDLE PERFORMANCE DIAGRAM



Machines shown with optional decorative sheet kit

## THE VT SERIES FROM EMAG

# MAXIMUM PERFORMANCE FOR SHAFT PRODUCTION

The strengths of the VT Series include four axes, short distances and a powerful main spindle. The full effect of these can be felt, in particular, when machining large quantities.

Fast processes are required for machining large quantities of shafts. Both the machining process and the loading and unloading processes must be completed extremely quickly. The VT Series machines guarantee this high performance.

A key factor is the machining of parts from two sides. This greatly reduces the machining time. Two tool turrets, each with eleven tool positions that can be equipped with turning tools, driven tools, or a Y-axis, ensure machine flexibility.



### POWERFUL MAIN SPINDLE

The main spindle on the VT 2 has a rating of 30,1 kW, the one on the VT 4 has a powerful 32 kW at a duty cycle of 40%. This means that even hard machining does not present a problem.

### EMAG TOOL TURRET

The VT Series features two of EMAG's own tool turrets. Each turret has eleven tool positions plus a tool gripper for loading and unloading. The use of driven tools or a Y-axis is also possible.

### DIRECT POSITION MEASURING SYSTEMS

The use of linear axes with incremental glass scales enables maximum machining precision to be achieved.



## INTEGRATED PICK-UP AUTOMATION

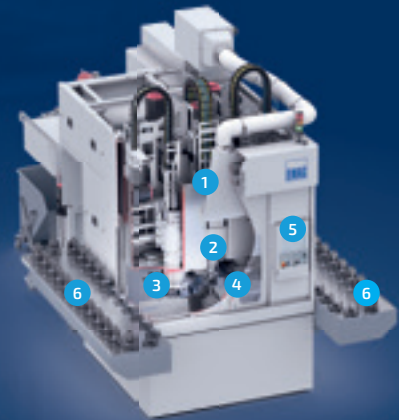
The VT Series has parts storage facilities for raw and finished parts. They are loaded automatically using the workpiece grippers integrated in the turret.

## 4-AXIS MACHINING

The use of both tool turrets allows machining to take place from two sides. This significantly reduces the machining time.

## THINK VERTICAL:

Detailed information about the VT Series pick-up turning machines



- 1 Machine body made of Mineralit®
- 2 Main spindle
- 3 Tool turret 1
- 4 Tool turret 2
- 5 Control system (Fanuc 31i or Siemens 840D sl)
- 6 Automation

TECHNICAL DATA	VT 2	VT 4
Chuck diameter	160 mm 6 in	250 mm 10 in
Swing diameter	210 mm 8 in	270 mm 11 in
Max. workpiece diameter	100 mm 4 in	200 mm 8 in
Max. workpiece gripper diameter	100 mm 3.9 in	125 mm 4.7 in
Max. workpiece length	400 mm 15.7 in	630 mm 25 in
X-axis travel	332 mm 13 in	395 mm 15.5 in
Z-axis travel	625 mm 24.5 in	810 mm 32 in
Y-axis travel (optional)	± 25 mm ± 1 in	± 25 mm ± 1 in
Main spindle		
» Power rating, 40%/100%	30.1/23.9 kW 41/32.5 hp	32.4/26.4 kW 43/35 hp
» Torque, 40%/100%	142/112 Nm 105/83 ft-lb	246/200 Nm 181.5/148 ft-lb
» Max. speed	6,000 rpm	4,500 rpm
Turret tool positions	2 x 11 (2 x 1 gripper)	2 x 11 (2 x 1 gripper)
Rapid-traverse rate, X/Y/Z	30/15/30 m/min 1,181/591/1,181 ipm	30/15/30 m/min 1,181/591/1,181 ipm
Max. revolutions of driven tools	12,000 rpm	9,600 rpm
Torque of Lifetool, 40%/100%	20/16.5 Nm 15/12 ft-lb	44/33 Nm 32.5/24 ft-lb

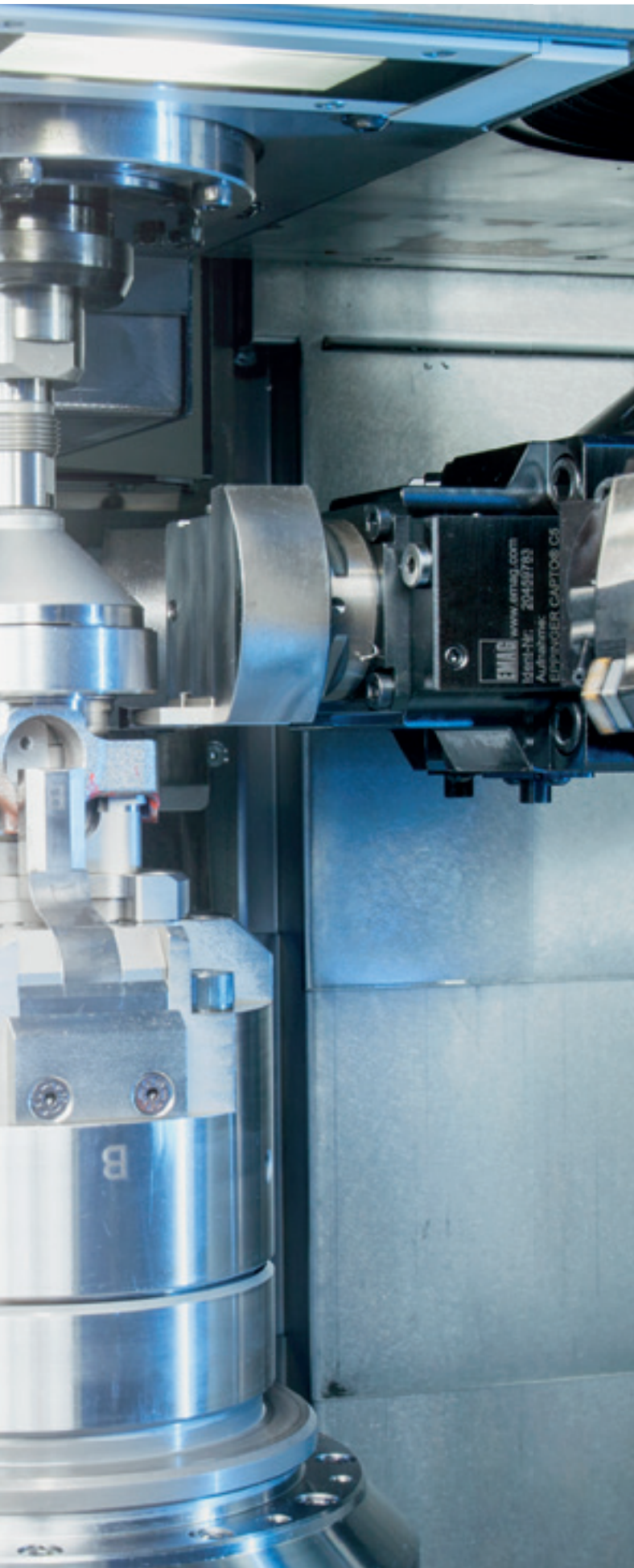
# VT 2 SD | VT 4 SD

## THE "BOTTOM SPINDLE" VERSION

### Ideal for components such as pistons, CV joints and tripods

VT 2 SD and VT 4 SD were specially developed for components that have a defined internal contour. The result is machining units that deliver extremely fast cycle times. A chuck tailored to the internal contour of the component enables the machine to be loaded very quickly. The chuck then slides into the component like a hand into a glove and is secured by the tailstock mounted above it. The component can be loaded, positioned correctly and clamped in a matter of seconds. The familiar 4-axis machining and simultaneous loading and unloading of the machine then ultimately ensure extremely short cycle times.





## CV JOINT MACHINING EXAMPLE

CV joints have a pre-milled, clearly defined internal contour. This means that the workpiece can be clamped in the raceway contours.

The workpiece gripper places the component on a customized chuck where it is secured and positioned using gravity and tailstock pressure.

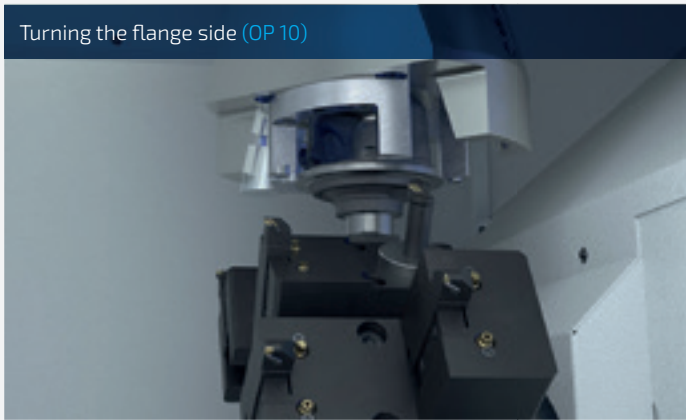
The complete 4-axis external machining then takes place. This makes cycle times of 45 seconds possible.



TECHNICAL DATA	VT 2 SD	VT 4 SD
Chuck diameter	160 mm 6 in	250 mm 10 in
Swing diameter	210 mm 8 in	270 mm 11 in
Max. workpiece diameter	100 mm 4 in	200 mm 8 in
Max. workpiece length	365 mm 14 in	630 mm 25 in
X-axis travel	336 mm 13 in	395 mm 15.5 in
Z-axis travel	530 mm 21 in	810 mm 32 in
Y-axis travel (optional)	± 25 mm ± 1 in	± 25 mm ± 1 in
Main spindle		
» Power rating, 40%/100%	23.4/17.9 kW 31/24 hp	37.2/31.4 kW 50.6/42.7 hp
» Torque, 40%/100%	246/188 Nm 181.5/139 ft-lb	261/221 Nm 192.5/163 ft-lb
» Max. speed	6,000 rpm	4,500 rpm
Turret tool positions	2 x 11 (2 x 1 gripper)	2 x 11 (2 x 1 gripper)
Rapid-traverse rate, X/Y/Z	30/15/30 m/min 1,181/591/1,181 ipm	30/15/30 m/min 1,181/591/1,181 ipm
Max. revolutions of driven tools	12,000 rpm	9,600 rpm
Torque of Lifetool, 40%/100%	20/16.5 Nm 15/12 ft-lb	44/33 Nm 32.5/24 ft-lb

# DIFFERENTIAL HOUSING MACHINING EXAMPLE

## PERFECT EXTERNAL MACHINING IN A SINGLE CLAMPING



### TURNING THE EXTERNAL DIAMETERS

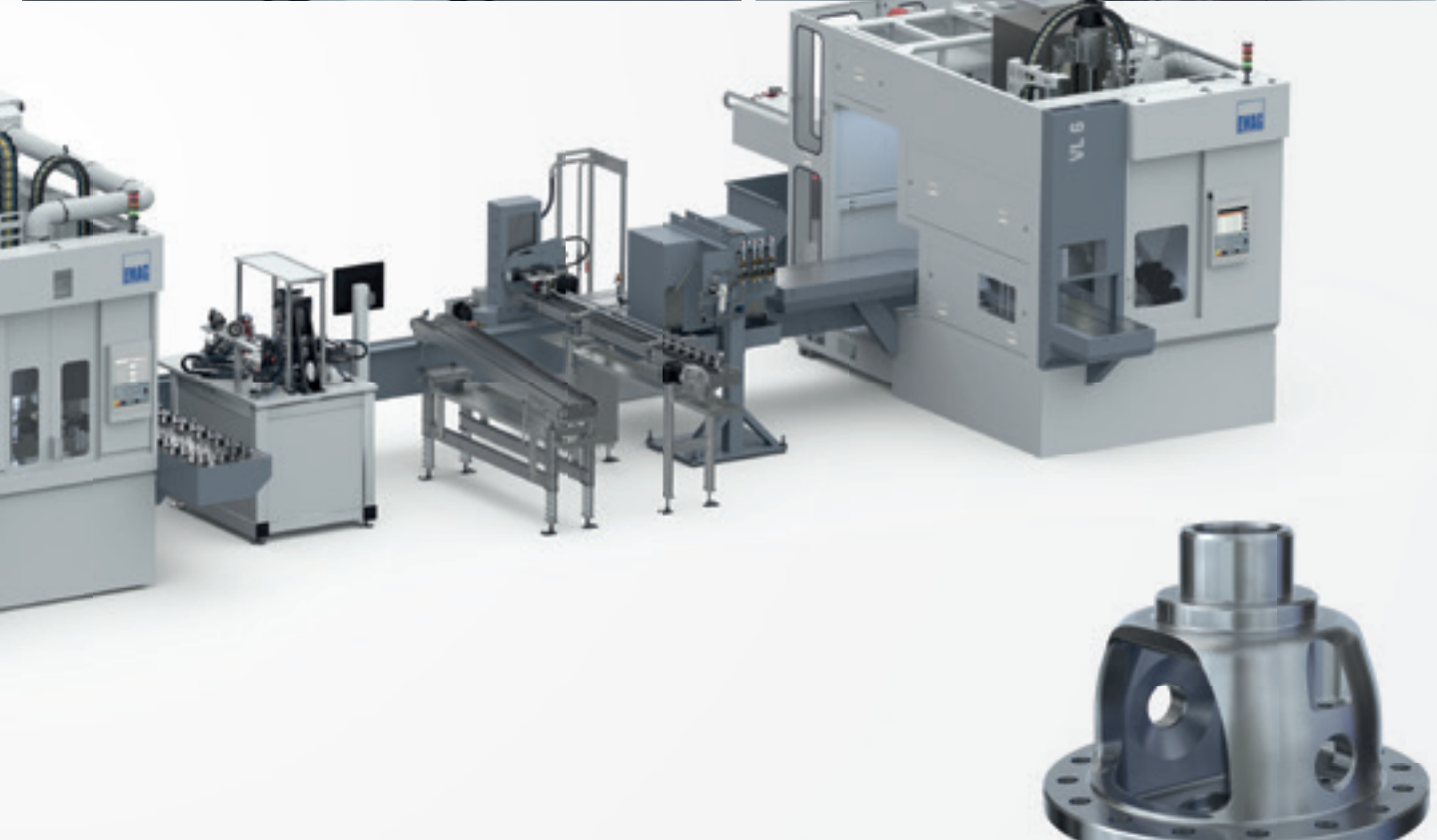
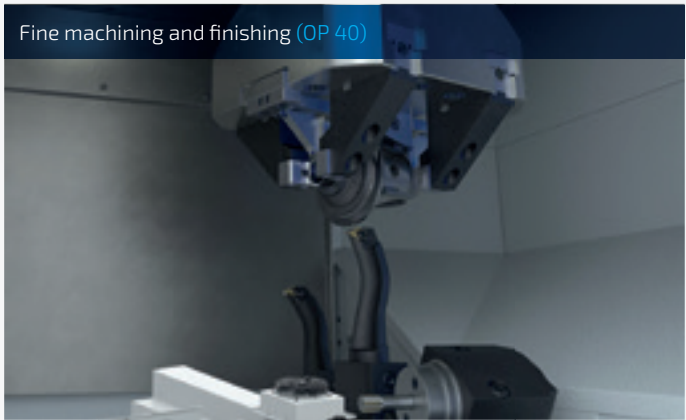
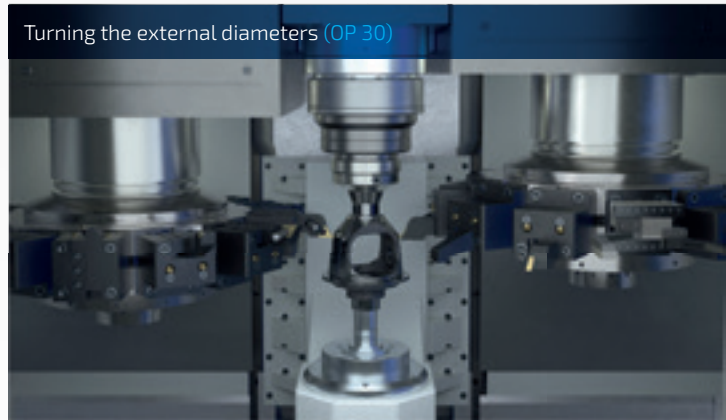
The complete external machining of the differential housing is completed on a VT 4 in this machining example. The use of the VT 4 enables 4-axis machining of the housing, which not only significantly reduces the machining times but also ensures high quality.

Machining in a single clamping operation rules out the possibility of reclamping errors, and the high rigidity of the two tool turrets and the clamping fixture ensures high tolerances.





# ING OPERATION



## PRODUCTION LINE FOR DIFFERENTIAL HOUSINGS

This central component remains indispensable for all types of drive concept – whether internal combustion engine, electric motor or hybrid engine. Its numbers, therefore, continue to rise steadily. This manufacturing solution has been developed for maximum productivity and process reliability.

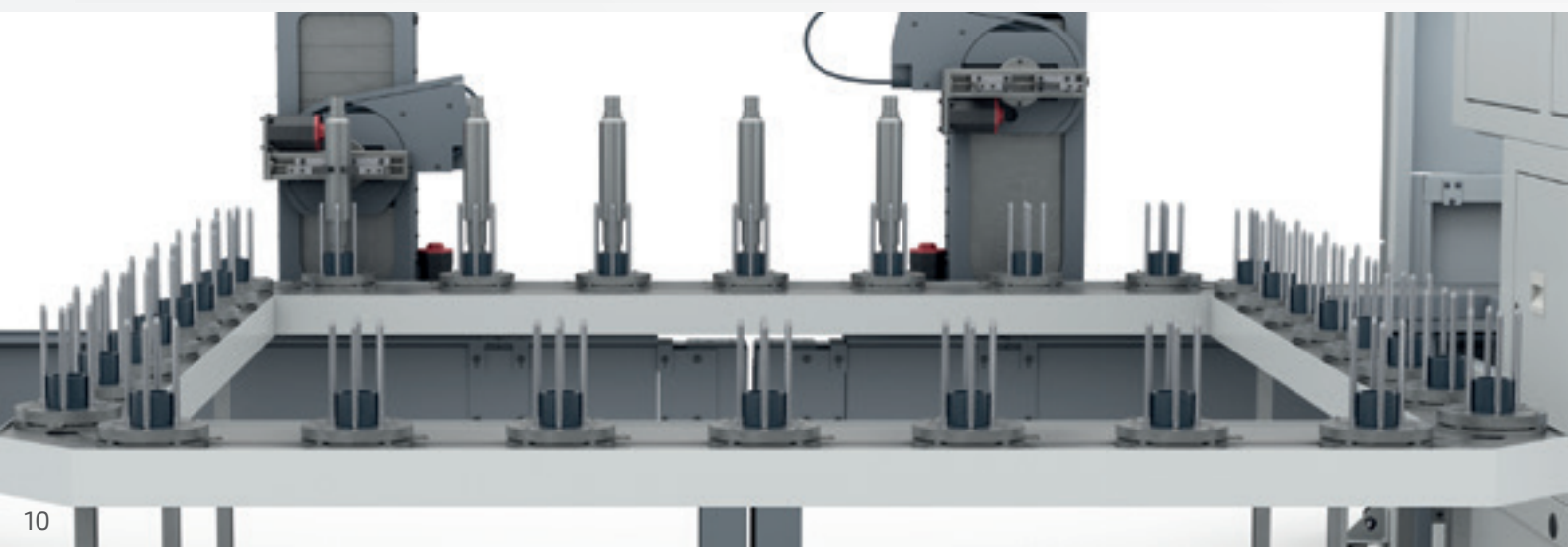
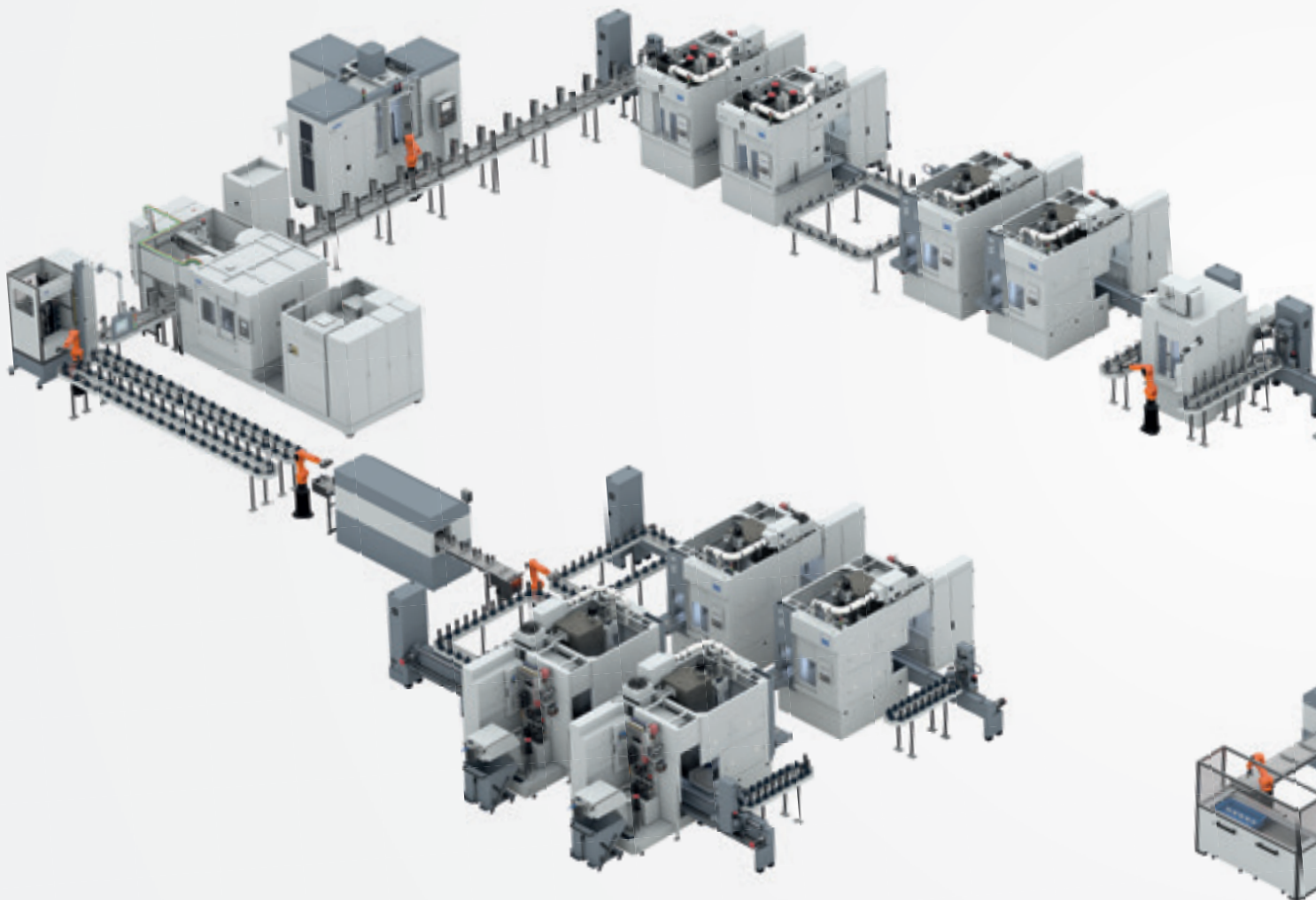
It only uses machines from the EMAG Group Modular Solutions system: in other words, modular machines that feature maximum efficiency, including their comparatively low investment cost.

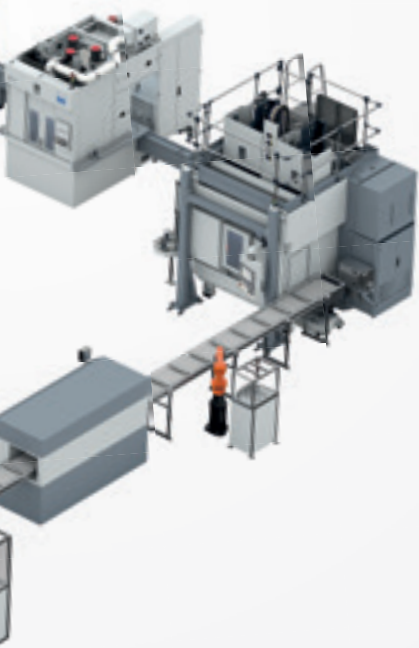
## E-MOBILITY SOLUTIONS

# PRODUCTION LINE FOR ELECTRIC MOTOR SHAFTS

**The production situation for building cars with electric motors is changing. In the future, the components will be manufactured in millions – and the relevant component cycle times must be reduced significantly to ensure efficient mass production is possible.**

EMAG develops complete solutions for electric motor manufacturing to ensure that the whole process can be completed quickly, precisely and reliably. The high efficiency of the line is achieved not least by the VT Series turning machines installed, which in this case are used for the hard machining of the external diameter.





## EASILY LINK WITH THE TRACKMOTION AUTOMATION SYSTEM

Just like the VL Series, the VT Series can also be linked perfectly using EMAG's TrackMotion automation system. The combination of "modular" machines, different EMAG technologies and the TrackMotion automation system makes everything possible. Even complex production lines like the one shown here for rotor shafts can be built. It is hard to conceive a simpler, more reliable and more effective solution.



## OTHER MACHINING SOLUTIONS

In addition to the manufacturing solution for rotor shafts, EMAG supplies a wide range of solutions for machining workpieces, which are used in electric drive units. EMAG has a whole host of machining technologies at its disposal for this purpose: from hobbing, soft or hard turning of flange and shaft parts, milling and drilling, laser welding and thermal joining, induction hardening and grinding to electrochemical machining.



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