

Efficiency for growth

Key drivers to reduce machining
times of wind turbine components.

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Reduced cycle time

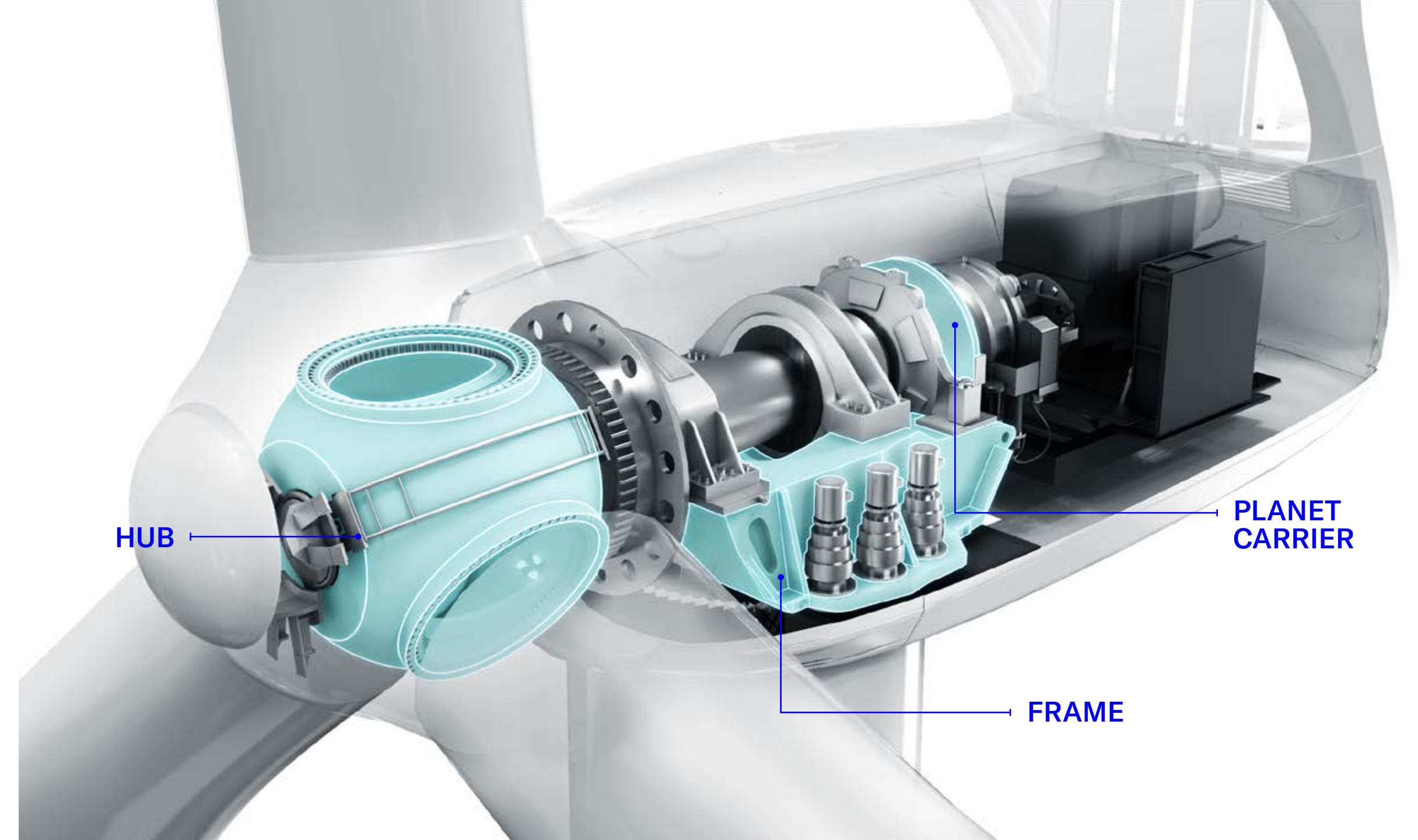
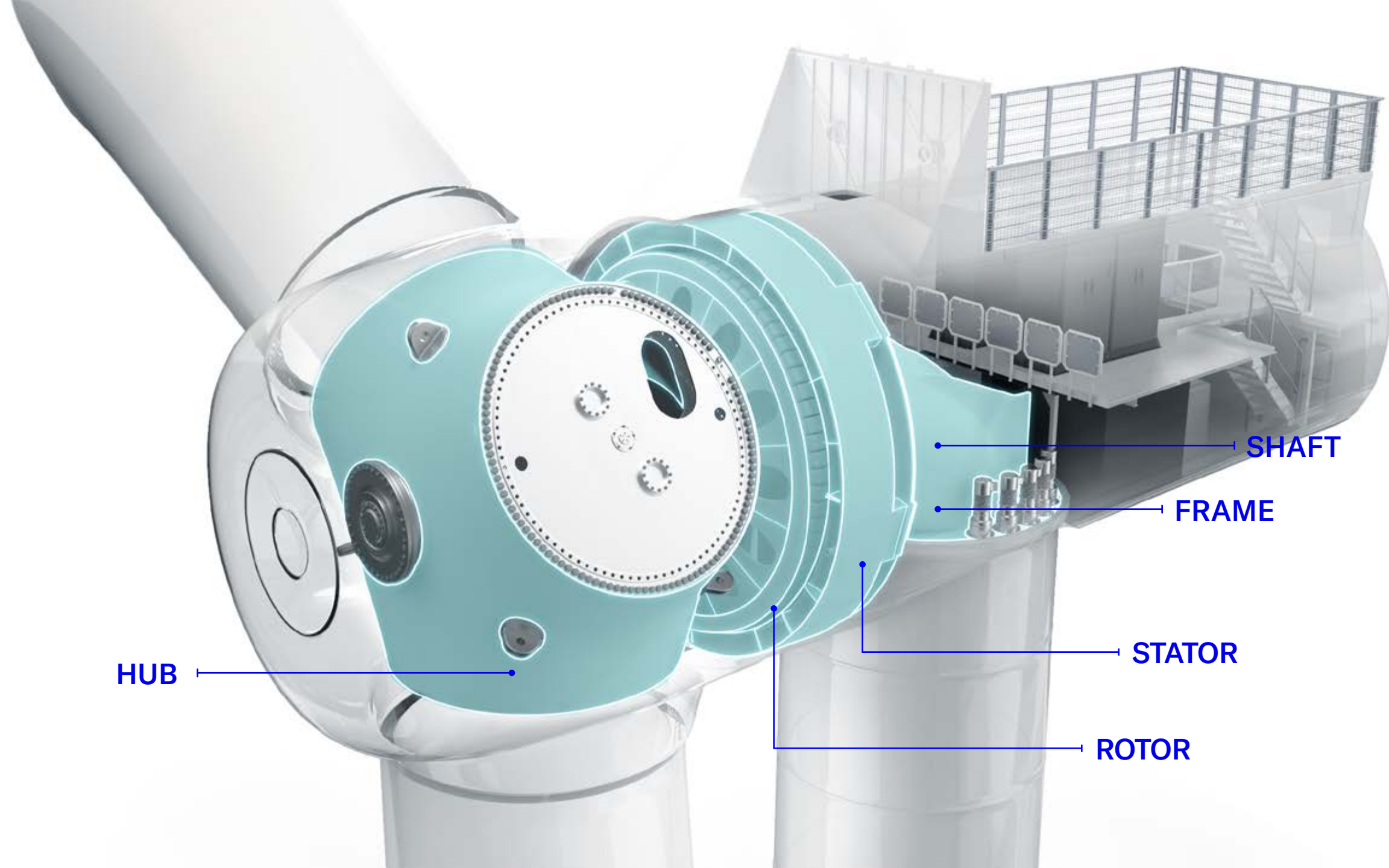


The sector is committed to wind power generated by increasingly larger and more powerful wind turbines, which have quadrupled in size in just a decade to meet the increase in energy production from renewable sources. This is an important challenge for manufacturers of machinery to be used for machining the wind turbines' structural parts such as nacelles, hubs, rotor housings, rotors and shafts.

Soraluce is responding to an increasing machine volume by offering [solutions with a high stock removal capacity](#), [maximizing the cutting capacity of the equipment](#), and thus [guaranteeing optimum levels of productivity](#).

Soraluce develops advanced milling and multitasking solutions (milling and turning), which reduce machining times and improve process efficiency. Solutions adapted to the customer's production needs and designed to respond to each specific application.





Onshore vs offshore?

Advanced solutions to achieve high productivity and versatility in the milling and turning processes of structural components of **direct drive or gearbox wind turbines**.



Soraluce knowledge for machining key parts.

Requirements

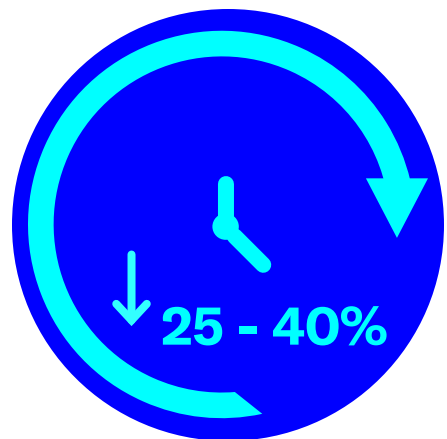
- Large components and expanding 8-10-12-14-16 MW.
- Heavy machining.
- High productivity.
- Efficient processes.
- Multitasking processes.

Key drivers to cut cycle time

Soraluce is pleased to share its keys drivers to reducing cycle time in the machining of industrial structural wind turbine components.

Machining time optimization, reducing downtime, minimal operator intervention, etc. Solutions that guarantee great reliability with **high machine availability rates > 95%**, as well as high precision and ease of use.

We develop solutions that **reduce machining times by between 25% and 40%** compared to traditional solutions, offering a personalized service adapted to the needs of each production requirement.



1 Select the solution that best adapts to your volume scenario

2 Add smart technology and maximize the cutting capacity of your equipment

3 Harness multitasking advantages

4 Boost efficiency

5 Optimize tool management

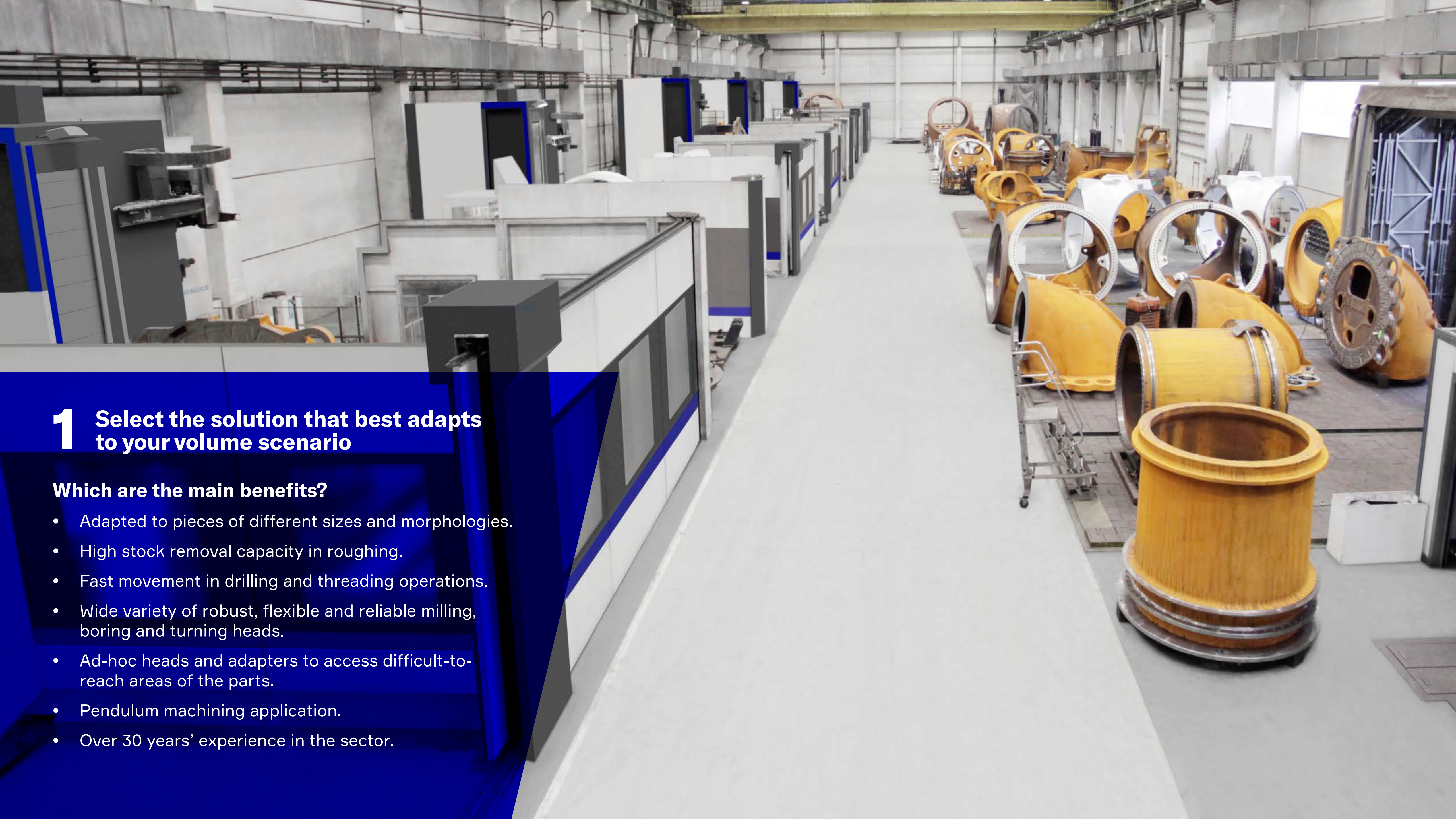
6 Explore ways to increase productive capacity

7 Customize your solution

8 No stopping

9 Integrate your machine in your production management system

10 Lean on our expertise



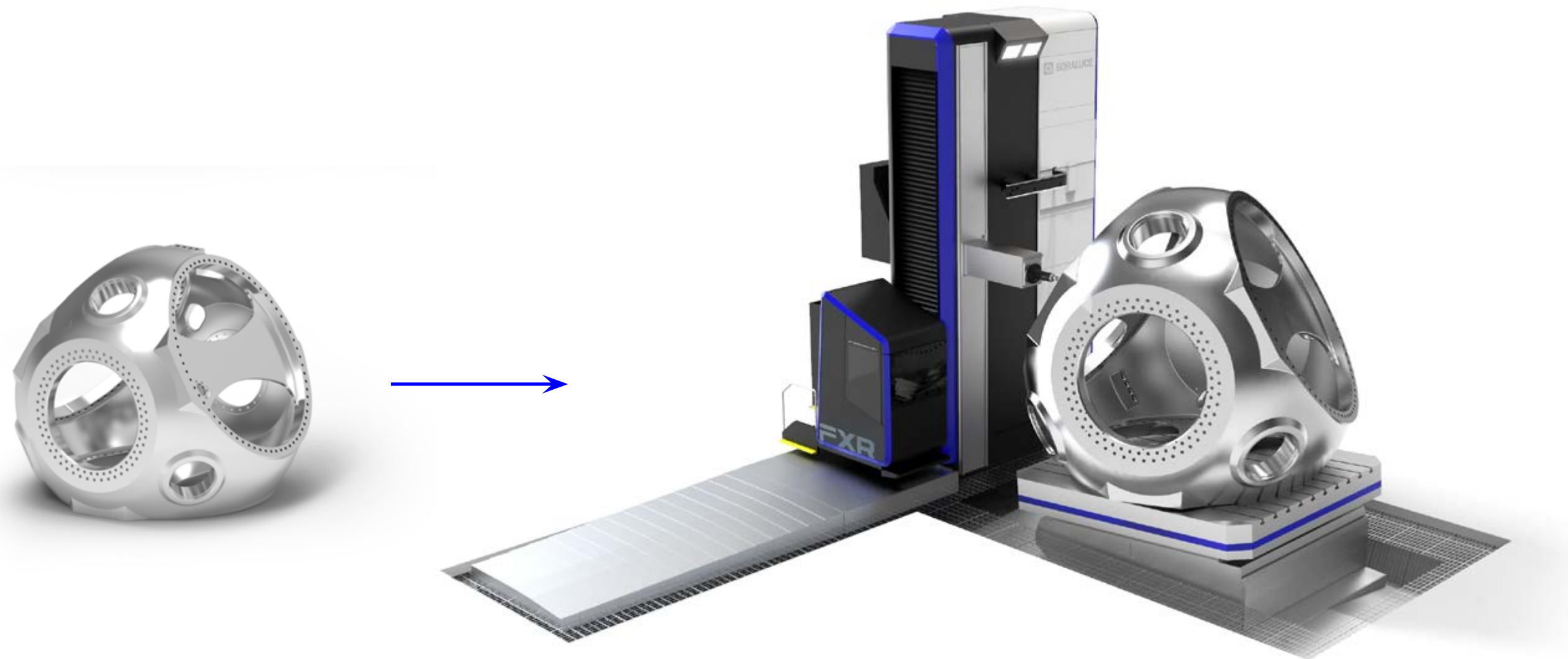
1 Select the solution that best adapts to your volume scenario

Which are the main benefits?

- Adapted to pieces of different sizes and morphologies.
- High stock removal capacity in roughing.
- Fast movement in drilling and threading operations.
- Wide variety of robust, flexible and reliable milling, boring and turning heads.
- Ad-hoc heads and adapters to access difficult-to-reach areas of the parts.
- Pendulum machining application.
- Over 30 years' experience in the sector.

1 Select the solution that best adapts to your volume scenario

HUB



The optimal solution

Floor type milling boring machine with tilting rotary-travelling table.

Which are the main benefits?

- Tilting table up to 10°, facilitating the use of high-power heads and quills > 100 kW / 10,000 Nm: the maximum power of the machine is harnessed.
- Machining of the hub in 2 set-ups; reduced handling and centering times, along with great precision.

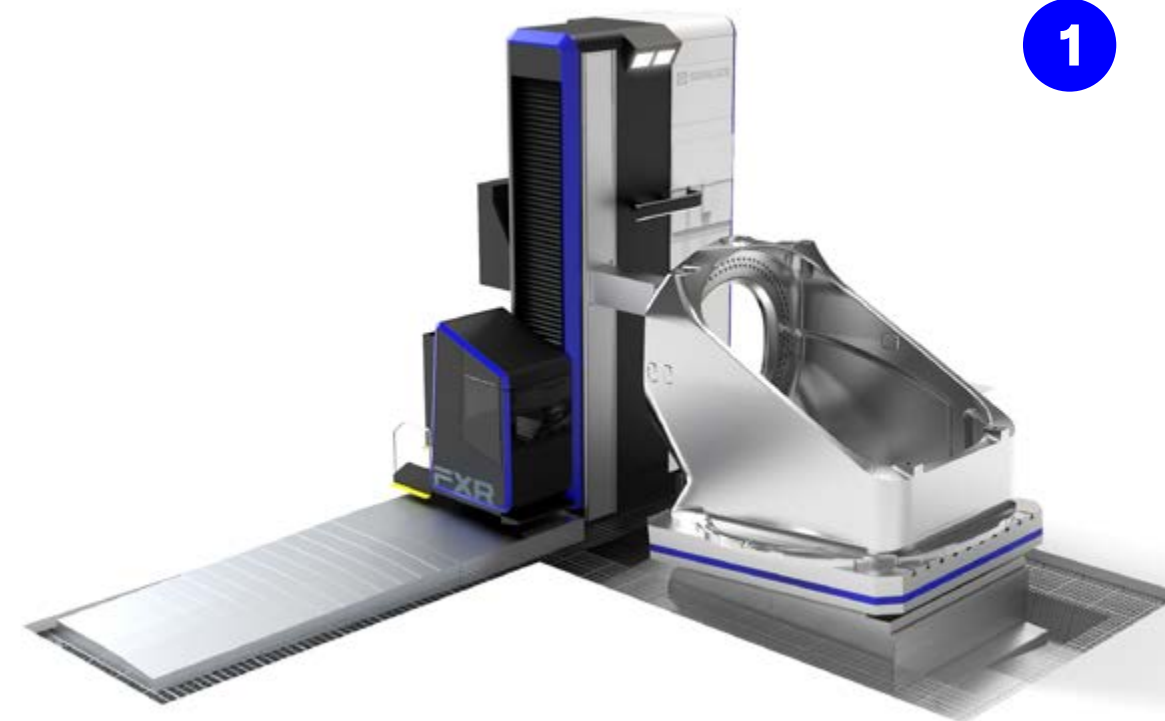
Floor type milling boring machine with tilting rotary-travelling table

Hub.

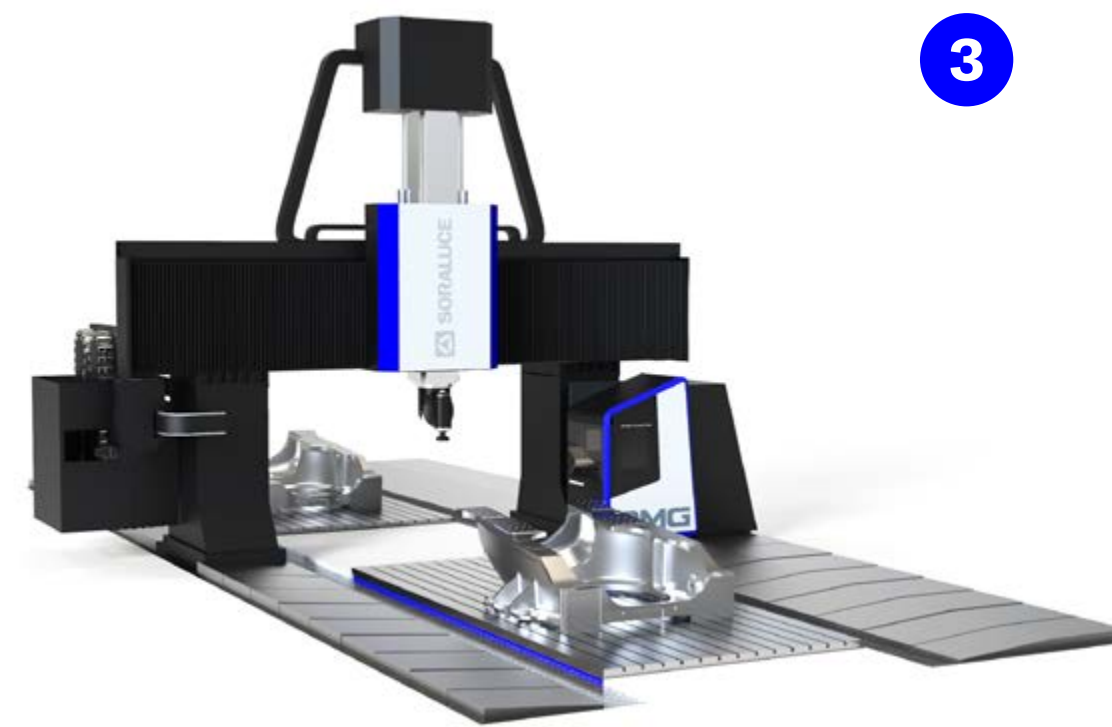
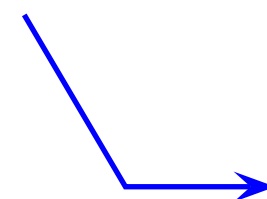
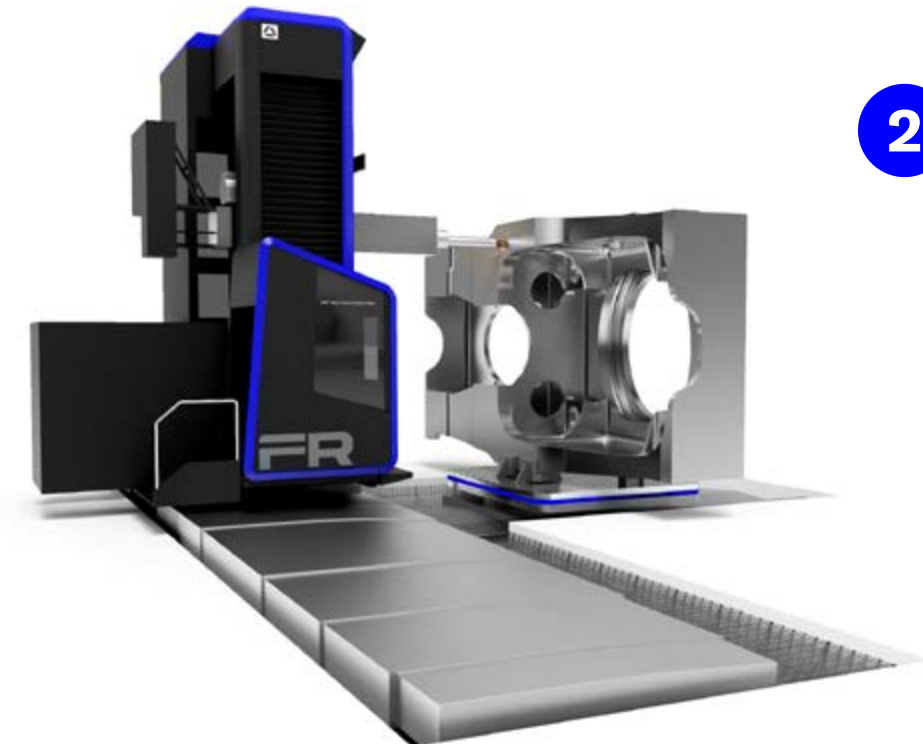
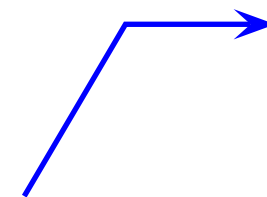


1 Select the solution that best adapts to your volume scenario

DIRECT DRIVE FRAME



GEARBOX FRAME



The optimal solution

Floor type milling boring machine with rotary-travelling table (optionally tilting) or gantry milling machines for larger frames.

Which are the main benefits?

Solutions for direct drive and gearbox frames.

- 1 Direct drive frame machining with tilting table up to 10°; no need for special fixturing.
- 2 Floor type solutions enabling flexibility and easy chip evacuation.
- 3 Gantry solutions for large frames: machining in the natural position of the part, simplified part handling, avoiding possible deformations.

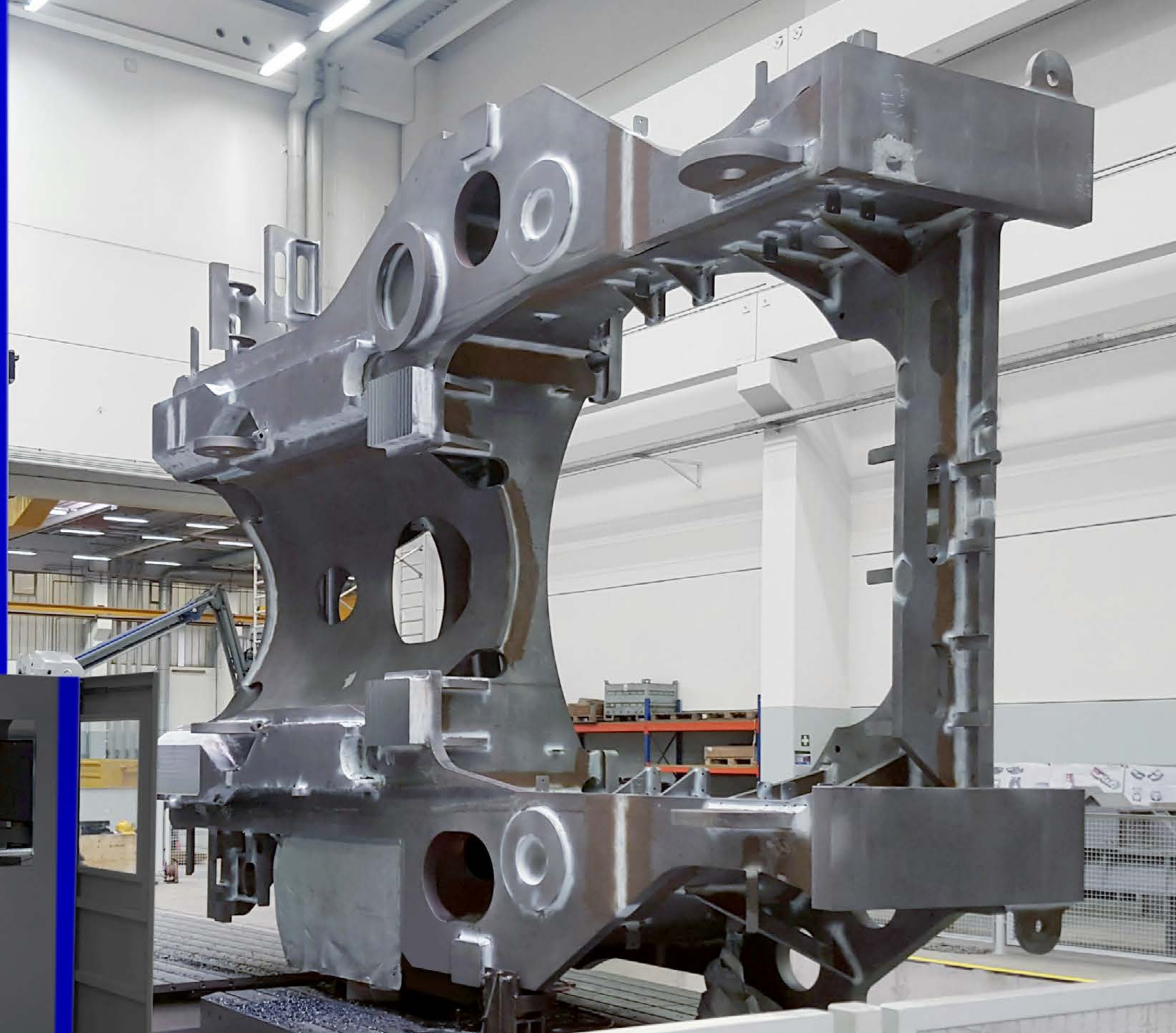
A high-angle photograph of a large industrial floor-type milling boring machine. The machine is primarily white with blue accents. A large, complex workpiece, colored yellow and grey, is mounted on a rotating table. The machine is situated in a factory environment with other industrial equipment visible in the background. A blue semi-transparent banner is overlaid on the left side of the image, containing white text.

Floor type milling boring machine with tilting rotary-travelling table

Direct Drive Fame.

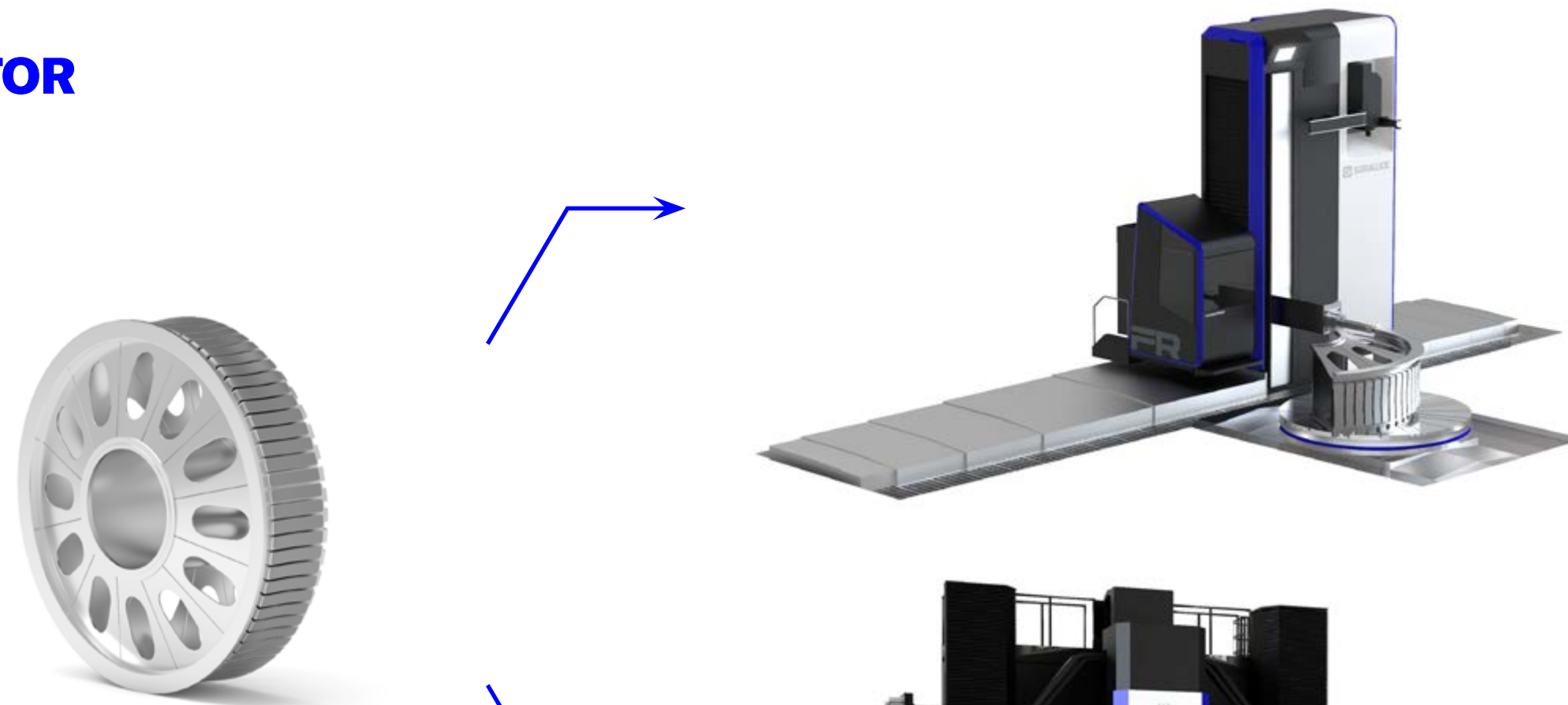
Floor type milling boring machine with rotary-travelling table

Gearbox Frame.

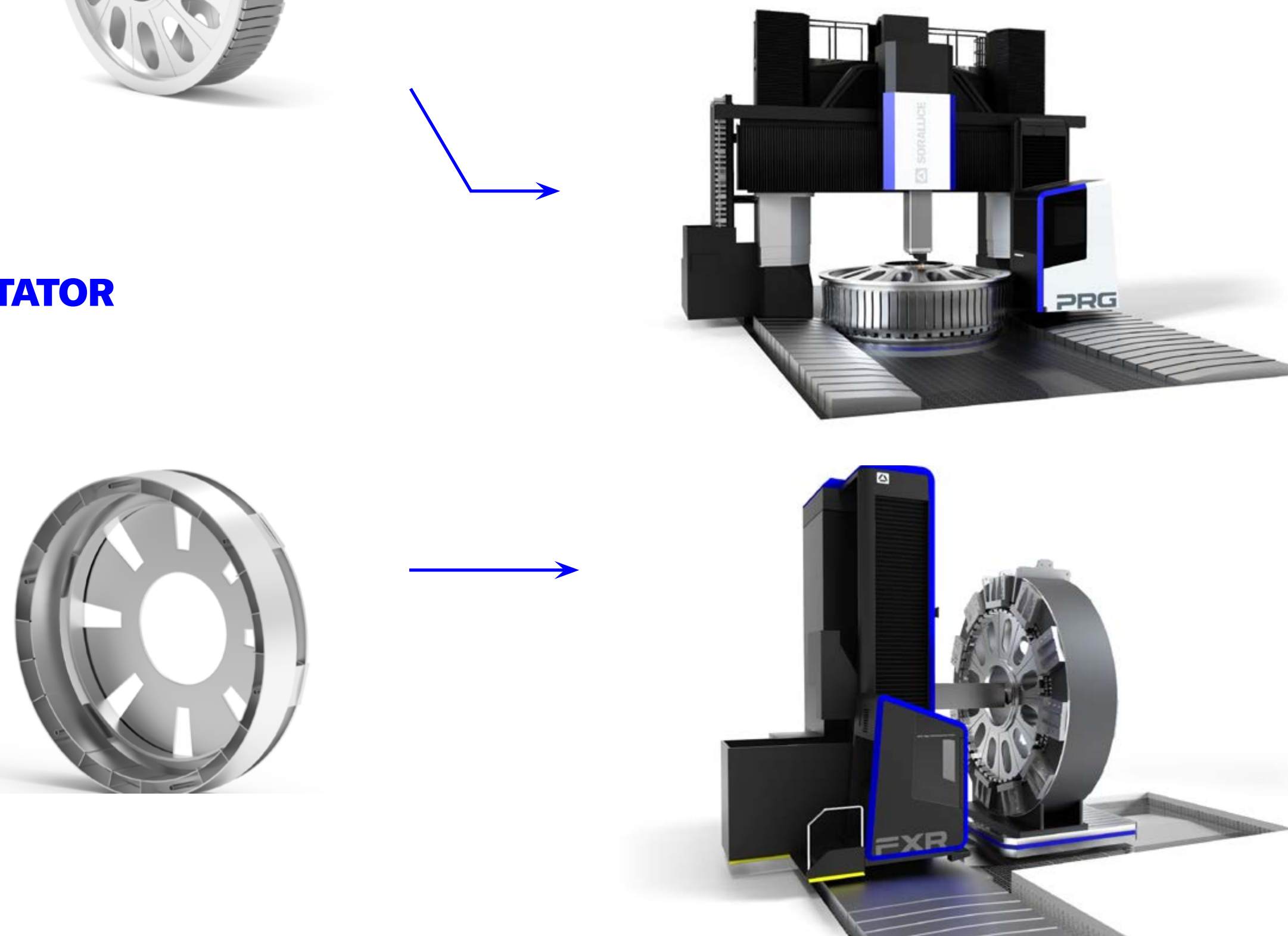


1 Select the solution that best adapts to your volume scenario

ROTOR



STATOR



The optimal solution

Multitasking solution (milling and turning); floor type or gantry machine.

Which are the main benefits?

- Rotor machining in sections or in one piece.
- Vertical or horizontal rotor and stator machining.
- Milling and turning on the same machine.
- Wide variety of in-house made milling and turning tables up to 200 Tn and 240,000 Nm.
- High torque multitasking heads; head and spindle orientation at any angle, enabling machining with different tool orientations.
- High-power heads and quills > 100 kW / 10,000 Nm
- Wide range of high cutting capacity turning heads.
- Supports for long boring bars of Ø 100-250 mm and length up to 2,500 mm.
- Ad-hoc fixturing with passive damping system that minimize deformations and guarantee the high precision required.

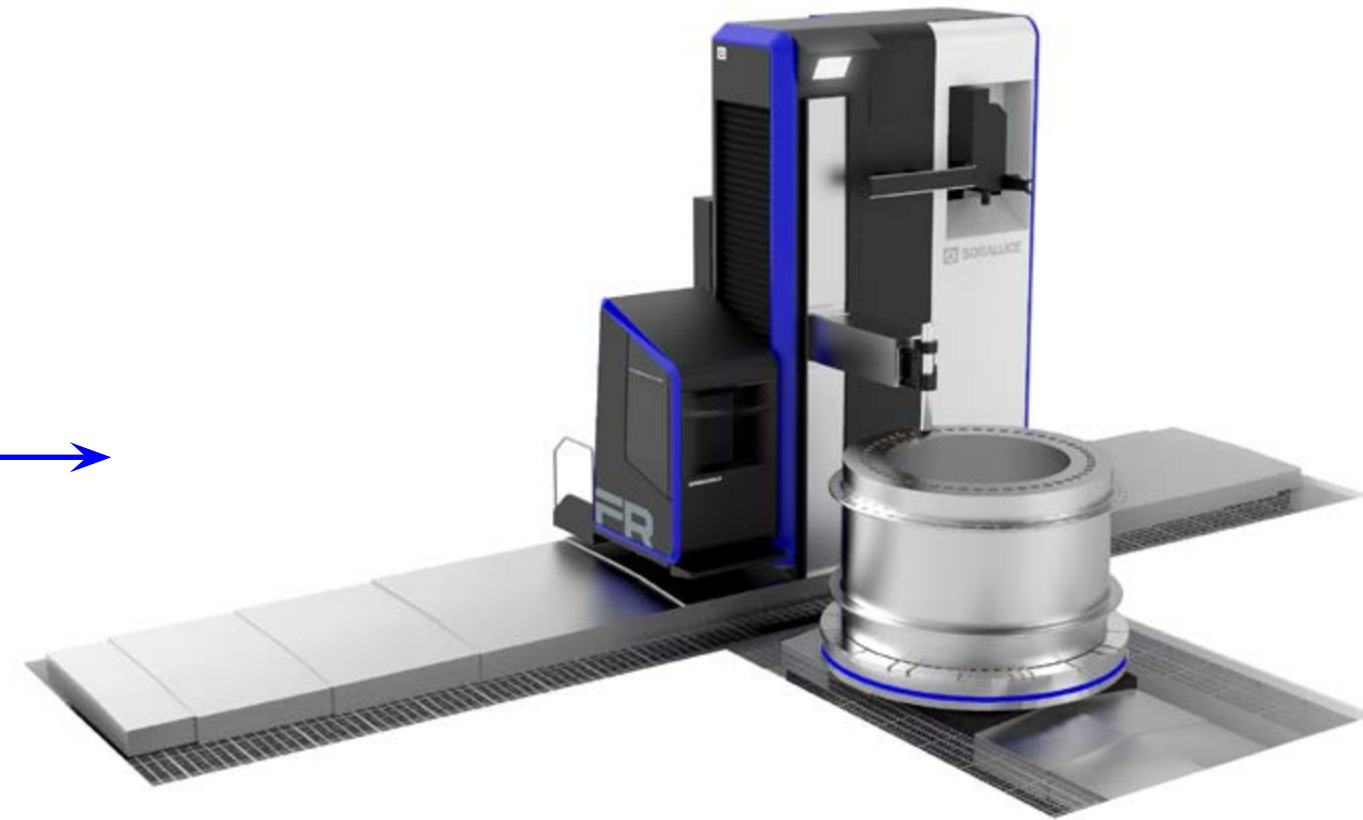
**Floor type multitasking
solution (milling and
turning)**

Stator.

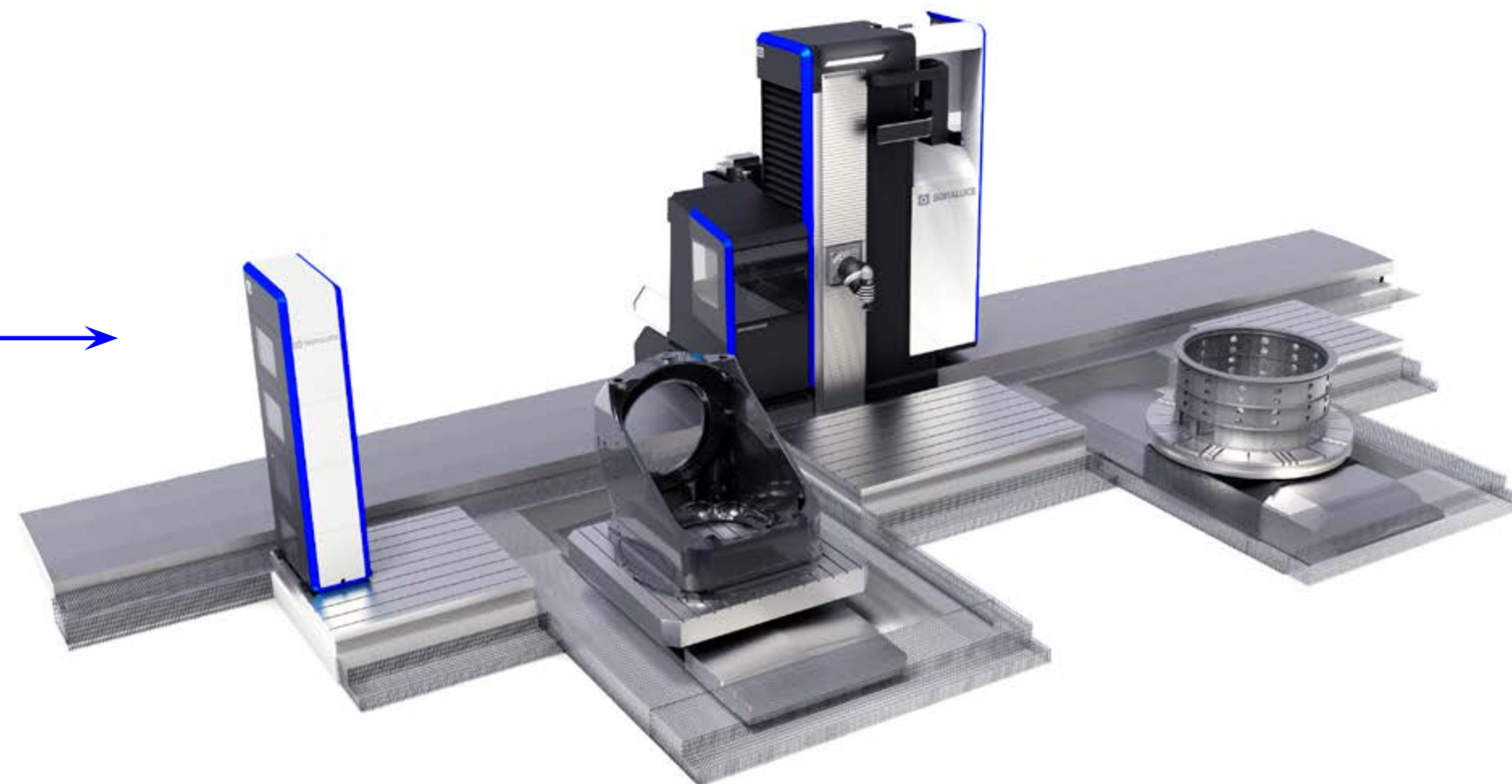


1 Select the solution that best adapts to your volume scenario

DIRECT DRIVE SHAFT



PLANET CARRIER



The optimal solution

Multitasking floor type machine.

Which are the main benefits?

- Milling and turning on the same machine.
- Wide variety of in-house made milling and turning tables up to 200 Tn and 240,000 Nm.
- High torque multitasking heads; head and spindle orientation at any angle, enabling machining with different tool orientations.
- Wide range of high cutting capacity turning heads.
- Supports for long boring bars of \varnothing 100-250 mm and length up to 2,500 mm.

2 Add smart technology and maximize the cutting capacity of your equipment

Smart technology to reduce machining times between **25% and 40%**.



Active damping system to eliminate chatter during machining process.
Best stock removal rate!

- **100% cutting capacity** throughout the workpiece volume.
- **Reduced cycle time by up to 40%.**
- Especially effective when using large tools.



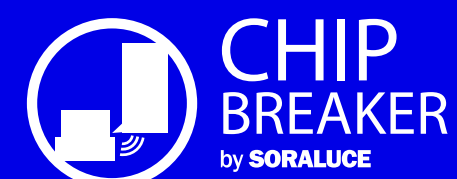
Smart and automatic setting of defined cutting parameters according to actual machine power consumption.

- **30% time saved in roughing** process!
- **Unattended machining**; no need for learning passes



Harmonic oscillation of spindle speed.

- **Stable cutting conditions** when using tools with large overhangs.
- **Chatter free.**

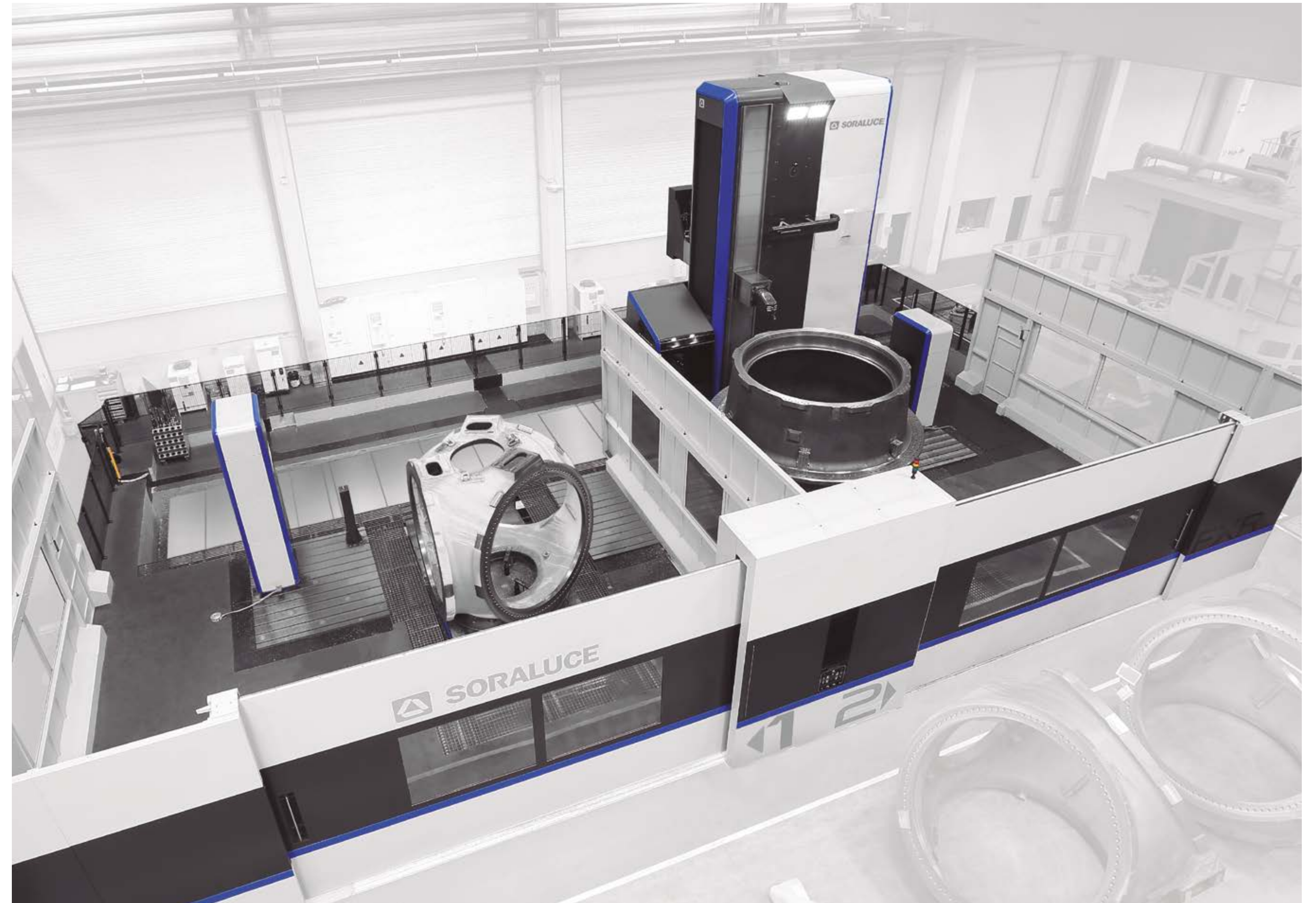


Programmable oscillation in the movement of the tool for breaking long chips generated during the turning operation.

- Facilitates automatic removal of chips, ensuring **continuous production.**

3 Harness multitasking advantages

- One machine, multiple processes: milling, boring, turning, grinding and gear cutting.
- Large and customizable solutions.
- Applicable to any workpiece size; load range 20 - 200 Tn.
- Wide variety of in-house made milling and turning tables up to 200 Tn and 240,000 Nm.
- High torque multitasking heads; head and spindle orientation at any angle, enabling machining with different tool orientations.
- Wide range of high cutting capacity turning heads: external, internal, combined.
- Supports for long boring bars of \varnothing 100-250 mm and length up to 2,500 mm.



4 Boost efficiency

Benefits	Dynamics
Linear Guiding	↑↑↑
Prismatic Guiding	↓
Hydrostatic Guiding	↑↑

High dynamics solutions

- Machines with linear guiding system.
- Time reduction in empty machine movements, with high feeds on all axes (25,000 mm / min in rapid advance) and high spindle revolutions up to 7,000 rpm.
- Soraluce is a pioneer in the use of linear guiding systems in large machines and heavy-duty applications.
- **Especially advantageous in drilling and threading operations.**

Synchronous movements

Development of cycles that allow the **synchronization of various operations** in order to optimize cycle times:

- Simultaneity of axes and spindle movement during approach movements.
- Table movements during tool changing process.
- Tool loading during machining cycle running.



POWERED by
Soraluce Software Factory

5 Optimize tool management

Smart tool magazine management

Maximize productivity and facilitate machining by managing a large number of tools to guarantee minimum intervention by the operator.

- Machine tool magazine.
- Out-of-machine robotized tool magazine for large and heavy tools or angular heads (it avoids reducing the dynamics of the machine).

Tool control

Status of the different tool magazines and grippers (spindle, cart arm, tool arena, machine tool magazines and robot grippers).

Wear control

Tool management arrangement with wear detection and control system.



> 500 tools.

Automatic loading and unloading of tools and auxiliary angle heads.

6

Explore ways to increase productive capacity



BIMATEC SORALUCE

Pendulum solution

Uninterrupted machining.

The optimal solution

Machines incorporating multiple workstations. Workpieces can be handled while the machine continues operating at a different station.

Which are the main benefits?

- Non-stop machining; zero downtime.
- Customized working area.



7

Customize your solution



HEADS

Customized heads and adapters with automatic changing systems to machine workpieces in difficult-to-reach areas.



FIXTURES

Let us advise you on designing and manufacturing quick clamping fixtures.

ENGINEERING SERVICE

Machining engineering service to analyze and improve time studies.

8 No stopping

Advanced Soraluce Head Service **Your machine is always operative!**

Continuous support and service strategy oriented towards head maintenance, with a wide range of available spare heads.
Head interchangeability, with minimal downtime.

Head service center near you.



Replacement heads service

We have replacement heads available in 24 hours so that your machine is always operative, even when head maintenance operations are being carried out.

150
Spare heads available



9 Integrate your machine in your production management system

Maximize your capacity thanks to the information collected automatically.

- Equipment connected to corporate management systems, such as ERP, MES, GMAO or others.
- Connected to other machines in the production workshops.
- Webserver development to manage data traffic between the ERP/ MES and the operator.
- Interface development on the machine CNC.
- Barcode reader to view the manufacturing order.
- Production analysis: No. of machined workpieces, consumption, reason for machine stoppage, etc.
- Advanced transmission.
- Guaranteed security.
- Use of standards such as MTConnect® or OPC-UA®.



10 Lean on our expertise

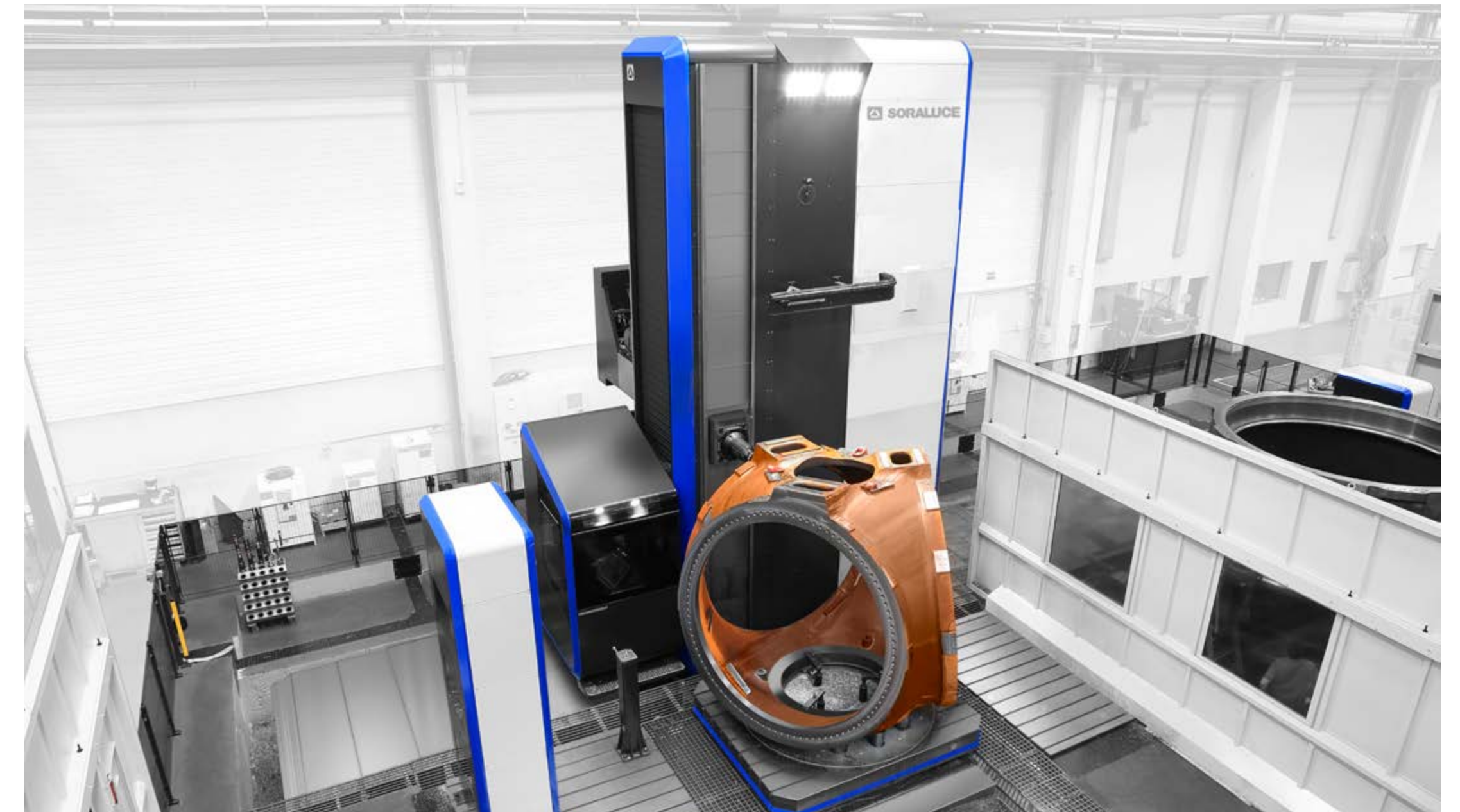


Our commitment to multitasking and cutting-edge technology allows us to face new machining challenges every day. With the SORALUCE FXR 16000 solution we cover the machining of a wide variety of critical components, optimizing machining times and processes and maintaining quality milestones.

Imanol Miner, Mekatar Technical Director, Mekatech.

SORALUCE FXR 16000 Multitasking center.

- Milling and turning in a single machine: it allows for machining of structural parts such as hubs and frames, as well as large revolution workpieces.
- Large traverses: 16,000 mm longitudinal travel, 6,500 mm vertical travel and 1,900 mm cross travel.
- Milling power: 70 kW.
- Two working areas:
 - (1) Rotary-travelling milling table 3,000 x 2,500 mm, V: 2,500 mm and 60 Tn loading capacity.
 - (2) Rotary travelling turning table \varnothing 3,500 mm, maximum swing 7,000 mm, V: 2,500 mm, up to 106 kW power, 120 rpm and 50 Tn loading capacity.
- High degree of customization: custom-designed turning head for new target parts.



How can we help you?

info@bimatec.de

Let a specialist contact and advise personally.