



## MILL Series

Universal precision machining centers  
for high-performance cutting –  
from small parts to large workpieces

# Strong, dynamic & precise

As versatile as your manufacturing requirements

|                       |         |
|-----------------------|---------|
| Range of applications | [04–05] |
| Machine design        | [06–07] |
| Extension options     | [08–17] |
| Services              | [18–19] |



The CHIRON MILL series is the optimal solution for highly productive cutting and machining applications. Whether your focus is on flexible single-unit production, or high volume precision manufacturing – its modular design offers numerous configuration possibilities. Every standard MILL series machine can be assembled into the perfect individualized solution.

#### Your benefits:

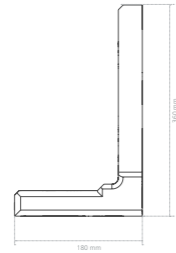
- Large, flexible work areas
- High milling capacity and powerful drives
- Lower cost per piece
- Highest precision and processing quality
- High stability
- Fast set-up
- Simple operation
- Easy maintenance

**MILL 1250**  
Machining center with NC swivel head and  
CHIRON standard rotary table for individual  
set-ups.

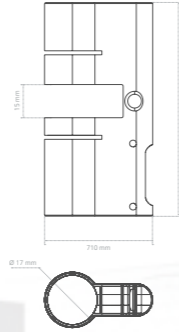
# From small parts to large workpieces - Complete precision machining, with the lowest cost per piece

|                         |         |
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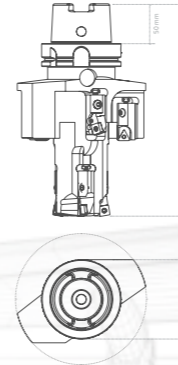
**Machine construction**  
Machining of long profile components, e.g. take-up angle for textile machines (length: 1,700 mm)



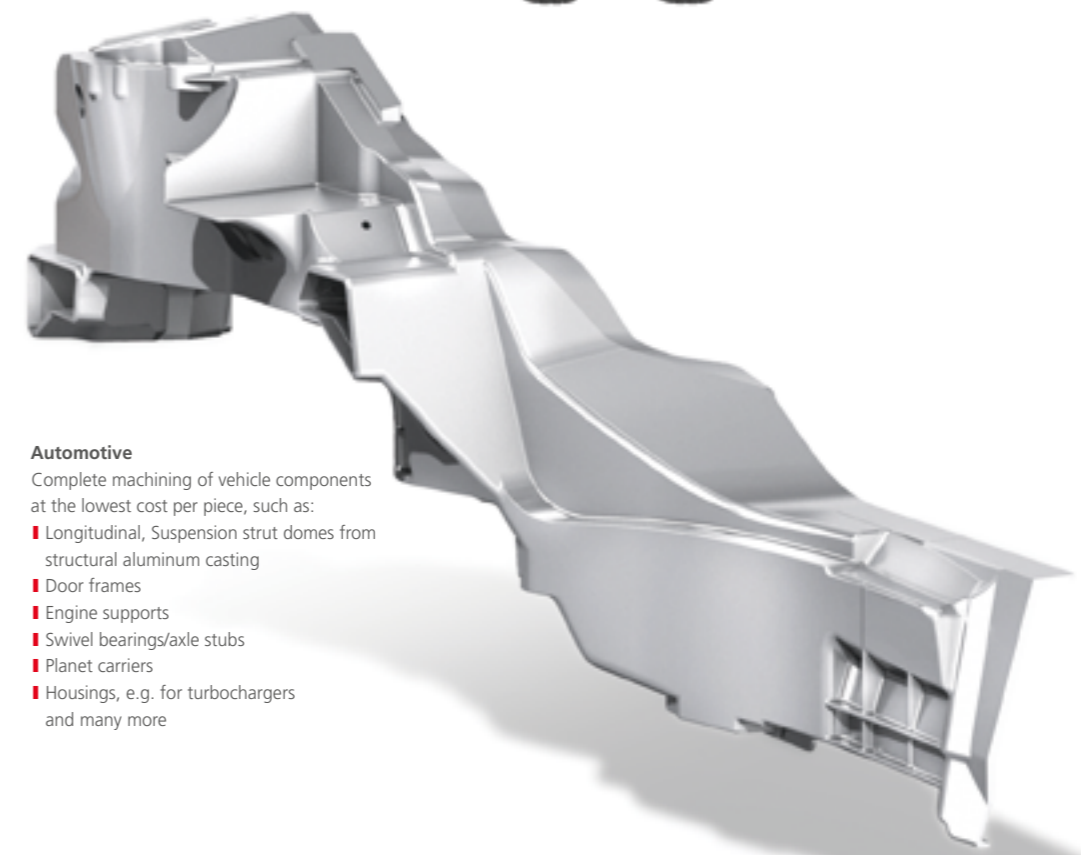
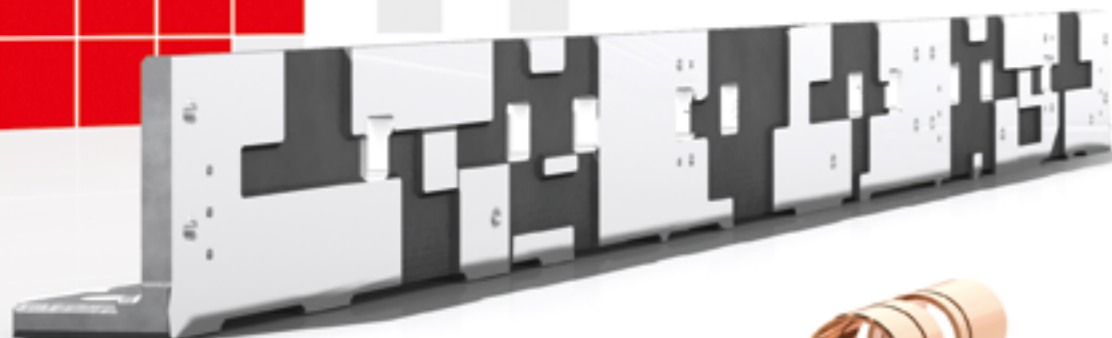
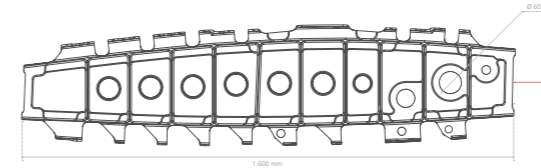
**Machine construction**  
Complete machining of casings for locking cylinders made of brass



**Machine construction**  
Milling, drilling, thread cutting and turning in one set-up, e.g. complex multi-step tools made of steel



**Aerospace**  
Wing Rib (large cubic workpiece; Length: 1,600 mm, with a high cutting proportion as a supporting structure part for medium-haul jets)



## We love perfection ...

That's why we view every detail as an exciting challenge. Whether automotive, aerospace, mechanical engineering, medical or precision technology – the high-quality machining centers of the CHIRON MILL series reduce processing times, while powerfully carrying out their manufacturing tasks in the smallest possible space. Implement your production ideas quickly with micron-level precision.

**Market leaders trust us.**

## Automotive



Complete machining of vehicle components at the lowest cost per piece, such as:

- ▶ Longitudinal, Suspension strut domes from structural aluminum casting
- ▶ Door frames
- ▶ Engine supports
- ▶ Swivel bearings/axle stubs
- ▶ Planet carriers
- ▶ Housings, e.g. for turbochargers and many more



# High-tech modules for any application

Perfectly tuned for flexibility

## Spindles & spindle systems:

-  Proven single-spindle machining centers in the vertical traveling column design.
-  Machining centers with NC swivel head with programmable positioning anywhere within the range of -110° to +110°.

## Tool changing systems:

-  Automatic tool change using the pick-up procedure as fast as 1.5 s (24 / 40 / 60 tool places SK 40 / HSK 63).
-  Background magazine for the provision of 92 to 163 tools during machining.

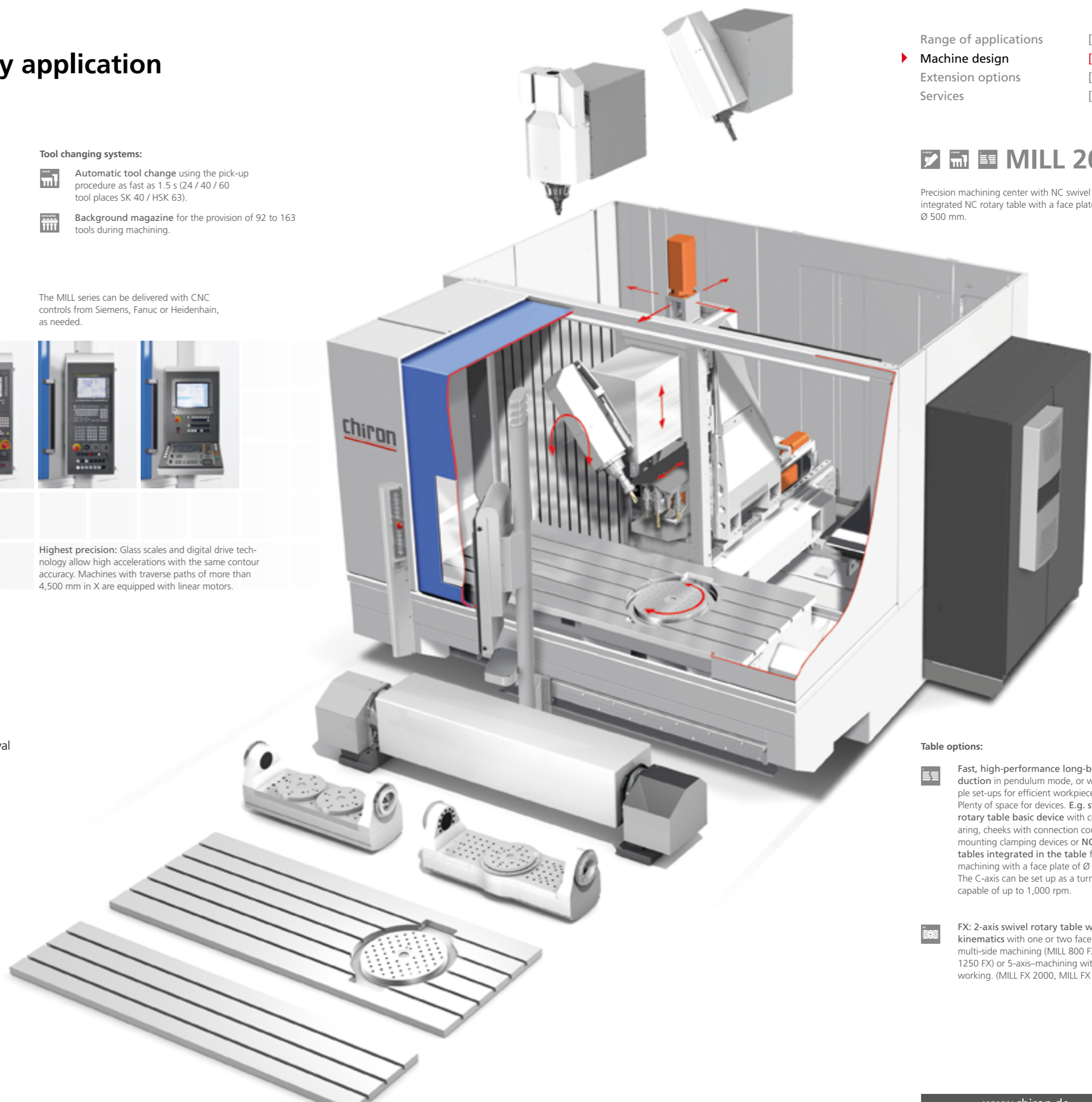
The MILL series can be delivered with CNC controls from Siemens, Fanuc or Heidenhain, as needed.

**Highest precision:** Glass scales and digital drive technology allow high accelerations with the same contour accuracy. Machines with traverse paths of more than 4,500 mm in X are equipped with linear motors.



## Modular concept:

- Vertical traveling column principle
- Long travel with compact external machine dimensions
- Sturdy machine bed with integrated coolant and chip removal
- High rigidity and thermal stability
- Motor spindles with water cooling
- Precision glass scales on all axes
- Dynamic direct drives and precision guides
- Highest productivity with the High Dynamics package
- Robust CHIRON rotary axes
- Fully enclosed work area, stainless steel covers
- Smooth, steep walls for ideal chip flow
- Ergonomic operating and loading concept
- Service friendly access to all auxiliary units
- Foundation-free set-up
- High durability, low maintenance





|                       |         |
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## MILL 2000

Precision machining center with NC swivel head, integrated NC rotary table with a face plate of Ø 500 mm.

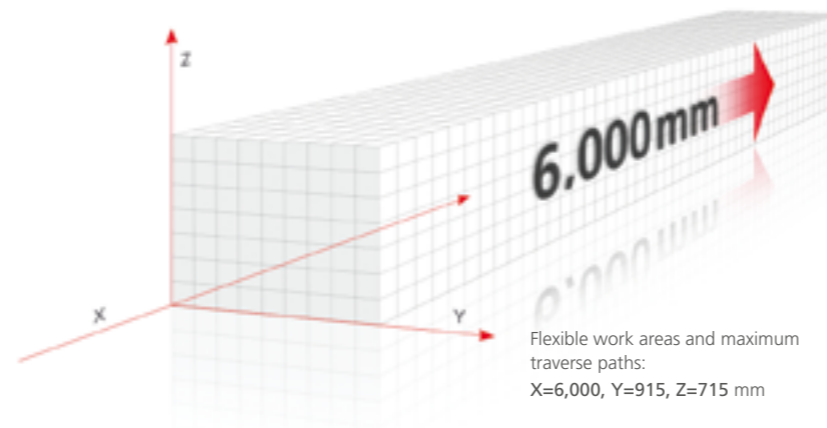
## Table options:

-  Fast, high-performance long-bed production in pendulum mode, or with multiple set-ups for efficient workpiece machining. Plenty of space for devices. E.g. **standard rotary table basic device** with counterbearing, cheeks with connection coupling for mounting clamping devices or **NC rotary tables integrated in the table** for multi-side machining with a face plate of Ø 500 mm. The C-axis can be set up as a turning spindle capable of up to 1,000 rpm.
-  **FX:** 2-axis swivel rotary table with AC kinematics with one or two face plates for multi-side machining (MILL 800 FX and MILL 1250 FX) or 5-axis-machining with pendulum working. (MILL FX 2000, MILL FX 3000).

# The right machine for each component

Variants and extension options

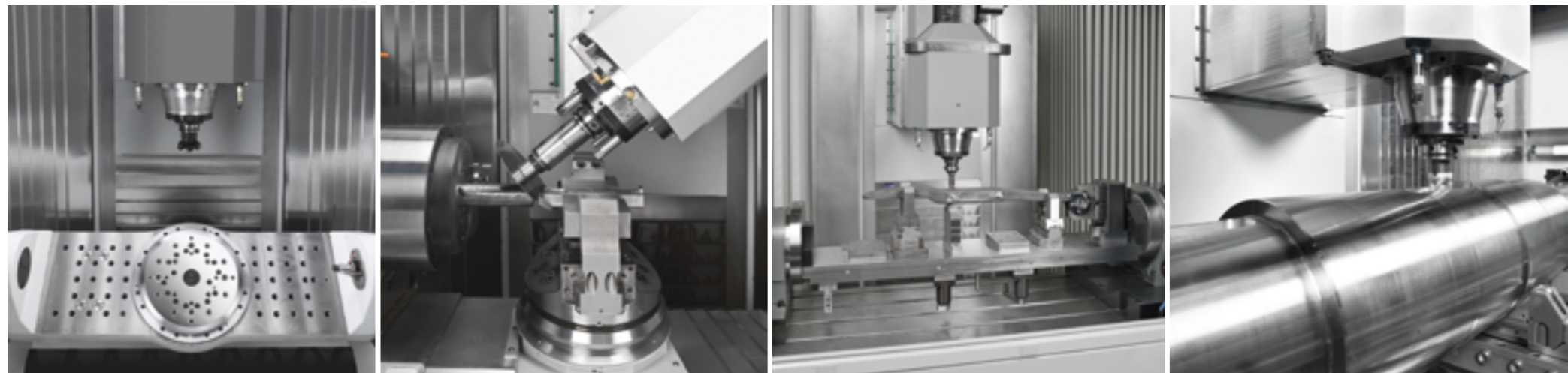
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MILL 800   MILL 1250   MILL 2000   MILL 3000   MILL 4500   MILL 6000

|        |       |    |  |  |  |  |  |
|--------|-------|----|--|--|--|--|--|
| FZ     | CHAIN | L  |  |  |  |  |  |
| S-HEAD | CHAIN | L  |  |  |  |  |  |
| FZ     | CHAIN | FX |  |  |  |  |  |
| S-HEAD | CHAIN | MT |  |  |  |  |  |

Table options  
Automatic tool changer  
Spindles & spindle systems



## Process advantages:

|                                     |                          |
|-------------------------------------|--------------------------|
| ■ Maximum path X–Y–Z                | 6,000-915-715 mm         |
| ■ Maximum power                     | 75 kW (40% ED)           |
| ■ Maximum spindle speed             | 20,000 rpm               |
| ■ Maximum torque                    | 280 Nm                   |
| ■ Chip-to-chip time starting        | from 2.9 s               |
| ■ Maximum axis acceleration X–Y–Z   | 1.1 g – 1.2 g – 1.7 g    |
| ■ Rapid feed as fast as             | 75 m/min                 |
| ■ Maximum milling capacity in St 60 | 900 cm <sup>3</sup> /min |
| ■ Max. number of tools              | 163                      |
| ■ Tool taper                        | SK 40 / HSK 63           |
| ■ Maximum tool weight               | 8 kg                     |
| ■ Maximum tool diameter             | 160 mm                   |
| ■ Max. tool length                  | 370 mm                   |



## MILL FX 800

Fast and compact precision machining center with a 2-axis swivel rotary table for 5-axis simultaneous and complete machining. Workpieces can be machined with high surface quality in one set-up.



## MILL MT 800

The fastest 6-sided complete machining with swivel head and turning spindle for milling and turning from the bar.



## MILL 2000

Powerful long-bed production in pendulum mode with standard rotary table basic device. Work areas of long-bed machining centers larger than X 2,000 mm can be divided into two areas by a central splash guard. NC Control is mobile for ergonomic setting mode.



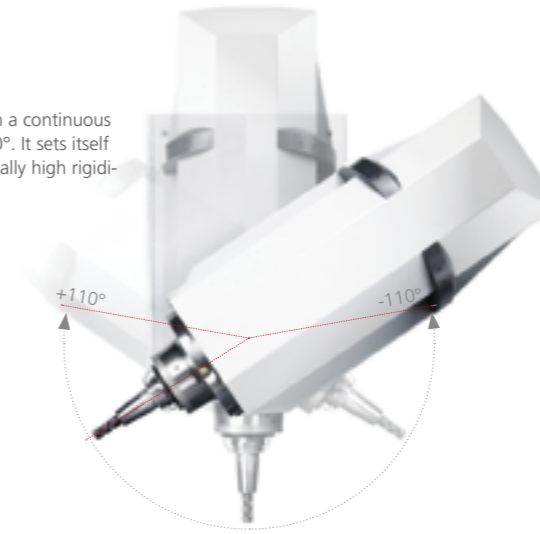
## MILL 2000

Fast, high-precision machining center with NC swivel head and CHIRON standard rotary table basic device for individual set-ups.

# A powerful and flexible large work area

for fast, economical production

NC swivel head with a continuous swivel range of  $\pm 110^\circ$ . It sets itself apart by its exceptionally high rigidity and speed.



|                       |         |
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## MILL 4500

High-precision machining center with fixed table, NC swivel head and mounted chip-proof central splash guard for fast long-bed production in pendulum mode or with multiple set-ups.

Large figure:  
Fixed table with vacuum system (optional)

**Crane loading:** Easy loading of large, heavy devices and workpieces.

**The front doors** are wide opening, allowing **great accessibility** and easy loading. Automatic door activation can be added as an option.

## MILL 1250

High-precision machining center with NC swivel head and CHIRON standard rotary table basic device for individual set-ups.

## MILL 6000

High-precision machining center for fast long-bed production. Workpieces of up to 6 m in length can be easily clamped and processed economically.

### Your advantages with CHIRON fixed table or long-bed machining:

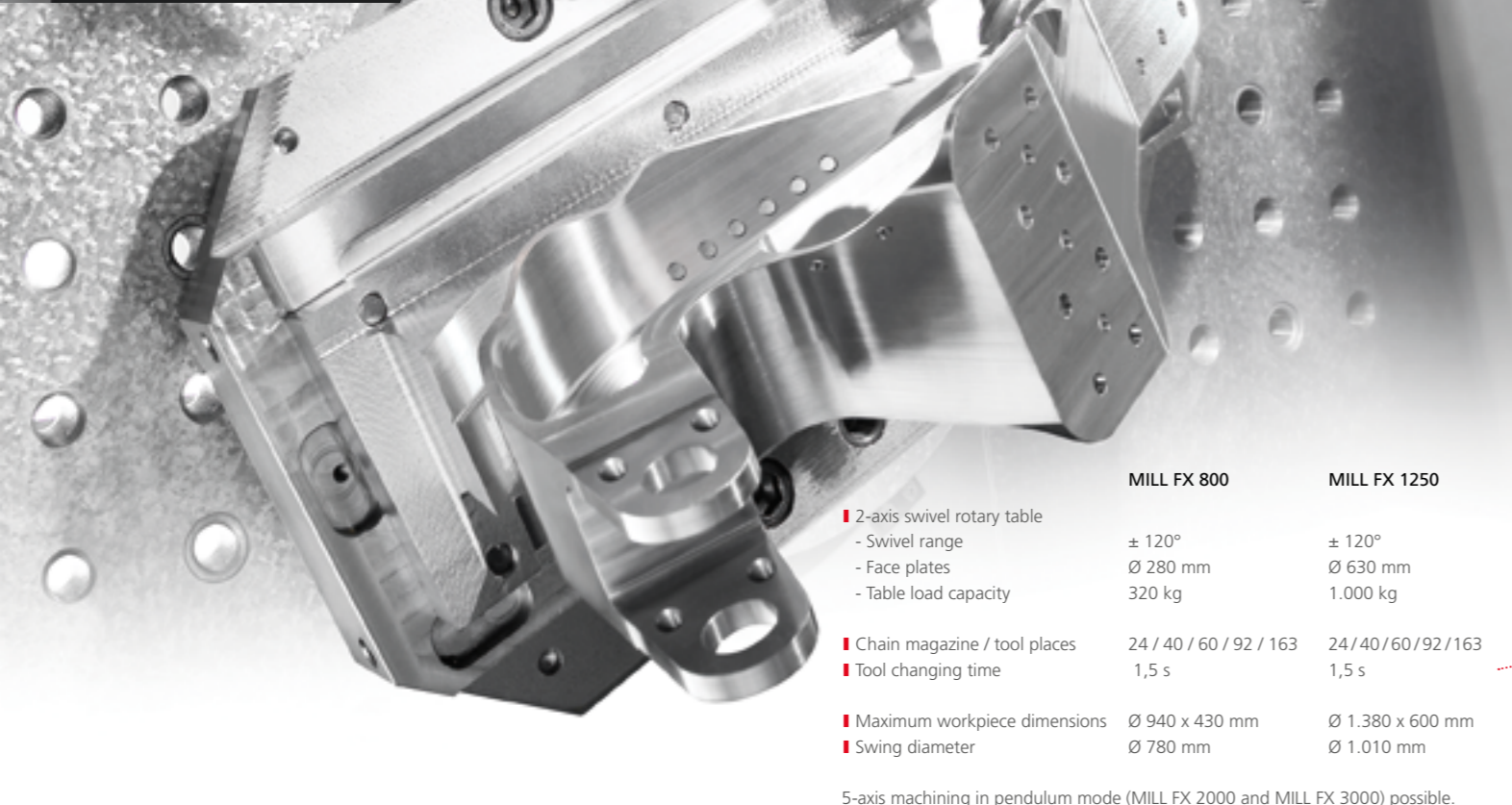
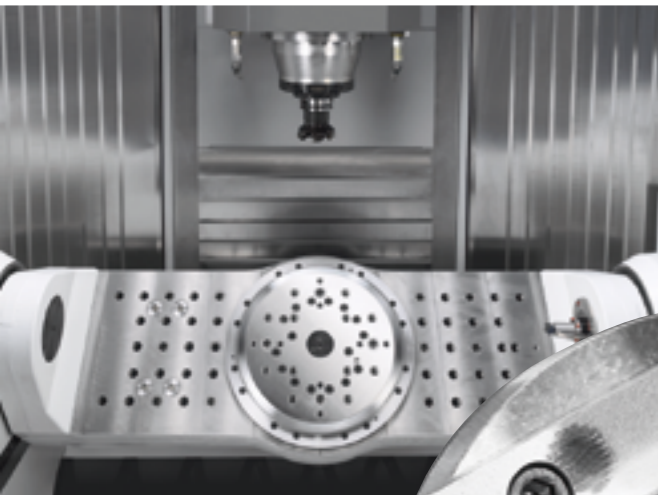
- 3-axis basic machining center based on the vertical traveling column principle
- Long travel with compact external machine dimensions
- Sturdy machine bed
- High rigidity and thermal stability
- Clear, easily accessible work area
- Simple loading with lifting gear (cranes, lift trucks, etc.)
- Work area for larger workpieces or multiple set-ups
- Automatic tool change using the pick-up method
- Chip-to-chip time starting from 2.9 s
- Reduction of down-time due to loading and unloading during machining in pendulum mode or multiple set-ups
- Expandable to 4 axes with the basic device, or to 5-axis machining with the 2-axis tilt rotary table and/or NC swivel head in combination with an integrated NC rotary table
- Machine tool construction "Designed and Made in Germany"

# The highest precision

Complete machining with CHIRON Five axis

## MILL FX 800

Fast precision machining center with 2-axis tilt rotary table for economical complete machining with five simultaneously controlled axes.



- 2-axis swivel rotary table
  - Swivel range
  - Face plates
  - Table load capacity

- Chain magazine / tool places
- Tool changing time

- Maximum workpiece dimensions
- Swing diameter

### MILL FX 800

± 120°  
Ø 280 mm  
320 kg

24 / 40 / 60 / 92 / 163  
1,5 s

Ø 940 x 430 mm  
Ø 780 mm

### MILL FX 1250

± 120°  
Ø 630 mm  
1.000 kg

24 / 40 / 60 / 92 / 163  
1,5 s

Ø 1.380 x 600 mm  
Ø 1.010 mm

5-axis machining in pendulum mode (MILL FX 2000 and MILL FX 3000) possible.

Stationary 3D probing system for tool length measurement, tool breakage checks, as well as machine compensation.

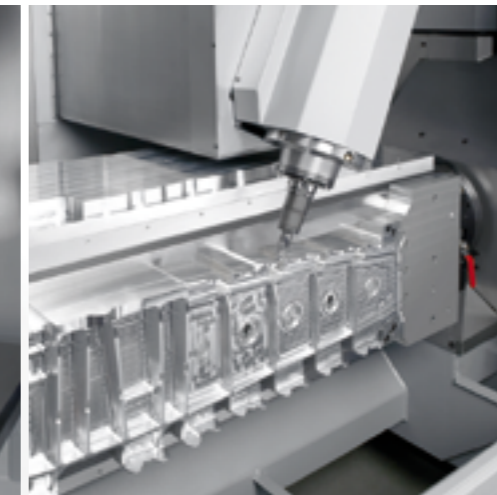
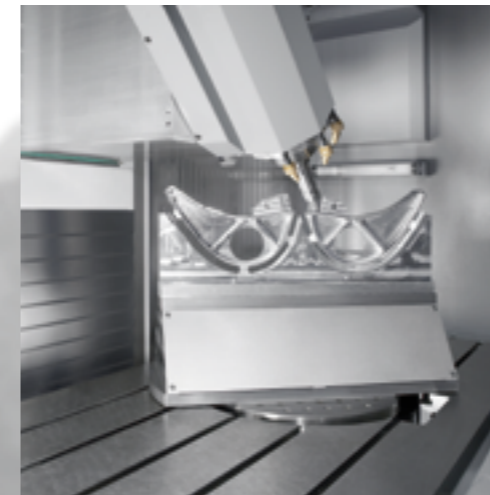


Five-axis machining with the CHIRON rotary table program:

- Solid and reliable technology – developed and manufactured by CHIRON
- Backlash-free pretensioned precision gear with high overload capacity and large holding torque
- Rotation option due to high-precision torque drives

## MILL 1250

Combination of a NC swivel head and NC rotary table integrated in the fixed table with a face plate of Ø 500 mm. The C axis can be designed as a NC rotary table or as a turning spindle with a speed of up to 1,000 rpm.



Combination of a NC swivel head and the basic device. Achieve maximum productivity using the High Dynamics package.

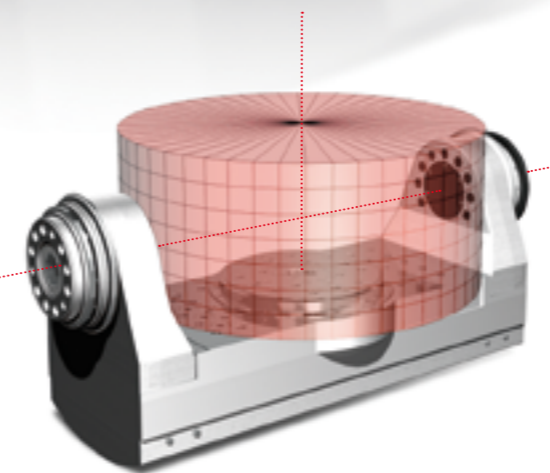
## MILL 3000

## MILL 2000

Combination of a NC swivel head and a standard rotary table basic device. The swivel plate can be customized according to our customers' requirements; for instance 4-sided due to a clamping cube.

### Your advantages with CHIRON FX:

- Long travel with compact external machine dimensions
- Sturdy machine bed
- High rigidity and thermal stability
- Highest precision in positioning and simultaneous operation
- Clear, easily accessible work area
- Simple loading with lifting gear (cranes, lift trucks, etc.)
- Spindle speeds of up to 20,000 rpm
- Excellent surface quality
- Integrated CHIRON 2-axis swivel rotary table with direct measuring systems
- Integrated 6-way energy supply for clamping device on the face plate
- Zero-point clamping systems can be integrated
- Fourth axis with a pivoting range of up to +/- 120°
- 5th axis with TORQUE drive up to 1,000 rpm for turning work
- Automatic machine compensation due to the 3D touch probe TS27
- Machine tool construction "Designed and Made in Germany"



# Precision by the meter

6-side complete machining with CHIRON MillTurn

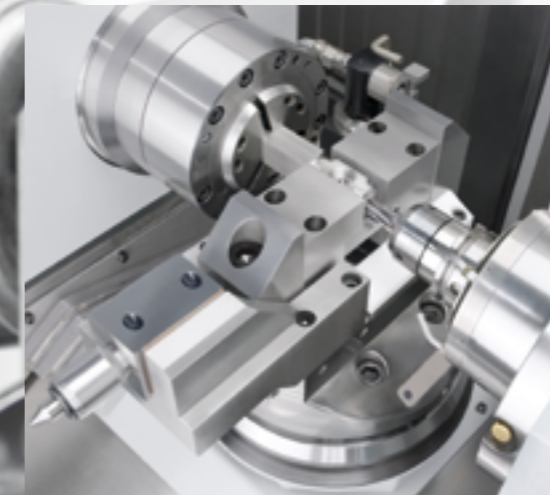
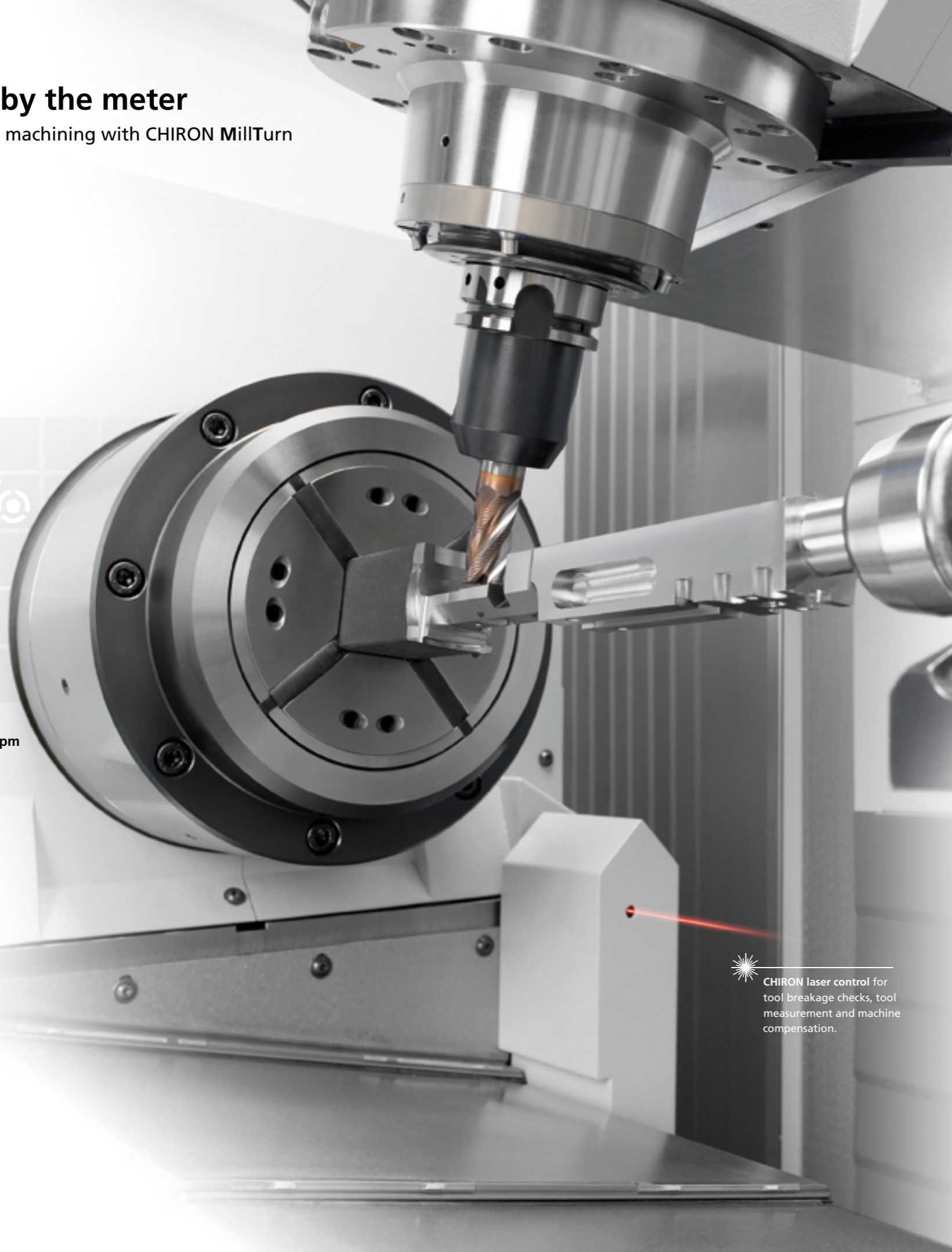
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## MILL MT 800

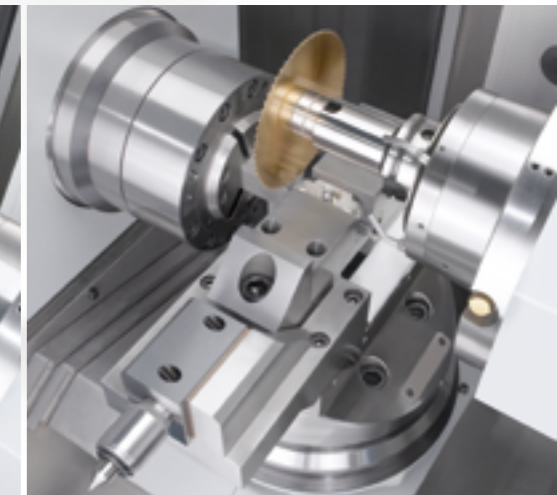
Multi-functional machining center for drilling, milling and turning. The combination of swivel head and turning spindle allows the automatic machining of complex parts with high precision.



Turning up to 4,500 rpm



Drilling and thread cutting



Separation of the workpiece



CHIRON laser control for tool breakage checks, tool measurement and machine compensation.

### Your advantages with CHIRON MT:

- Multi-functional machining, incl. back side of workpiece
- Milling, turning, drilling, thread cutting and measuring – all carried out on one machine
- Reduction of the throughput time due to 6-sided complete machining from the bar (Passage up to 100 mm)
- Customized material feeding solutions (bar loader / bar loading magazine)
- Job processing and machining times as well as in-plant logistics processes are reduced considerably
- The machining quality is greatly enhanced thanks to the reduced number of reclamping operations.
- Direct path measurement system in all axes
- High running autonomy
- Sturdy machine bed, high cutting capacity and precision
- Machine tool construction “Designed and Made in Germany”



# Faster and more productive

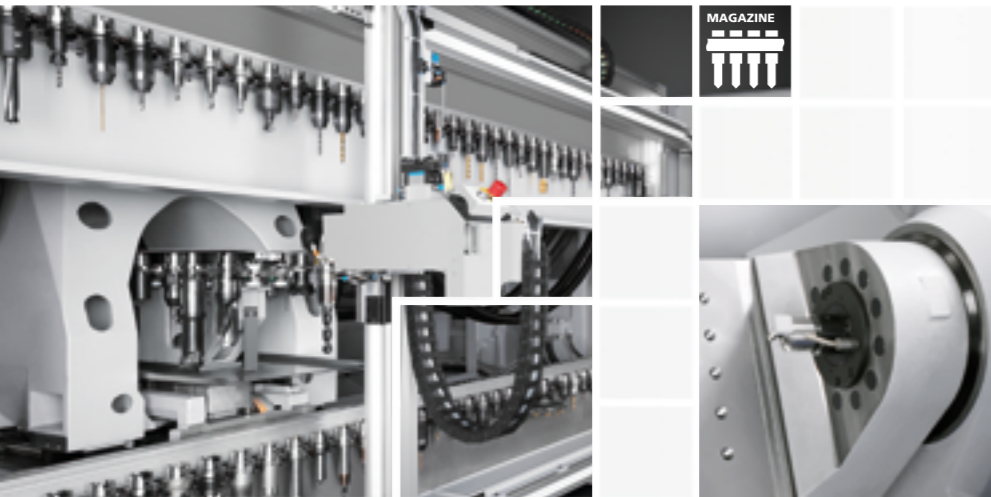
Options create greater efficiency

Using the **High Dynamics package**, achieve faster and more productive manufacturing of body and lightweight structural parts.

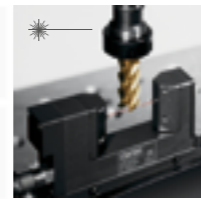
Interpolation and positioning with short chip-to-chip times are key features of the High Dynamics package for the MILL series. A weight optimised machine structure with generously sized drives and axes offer outstanding performance in acceleration and rapid feed rates. Ideal for machining lightweight automotive body components or aerospace structural components.

Acceleration X / Y / Z: 1.1 g / 1.2 g / 1.7 g  
Rapid feed rate: 75 m/min

|                       |         |
|-----------------------|---------|
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Background magazine for the provision of up to 163 tools.

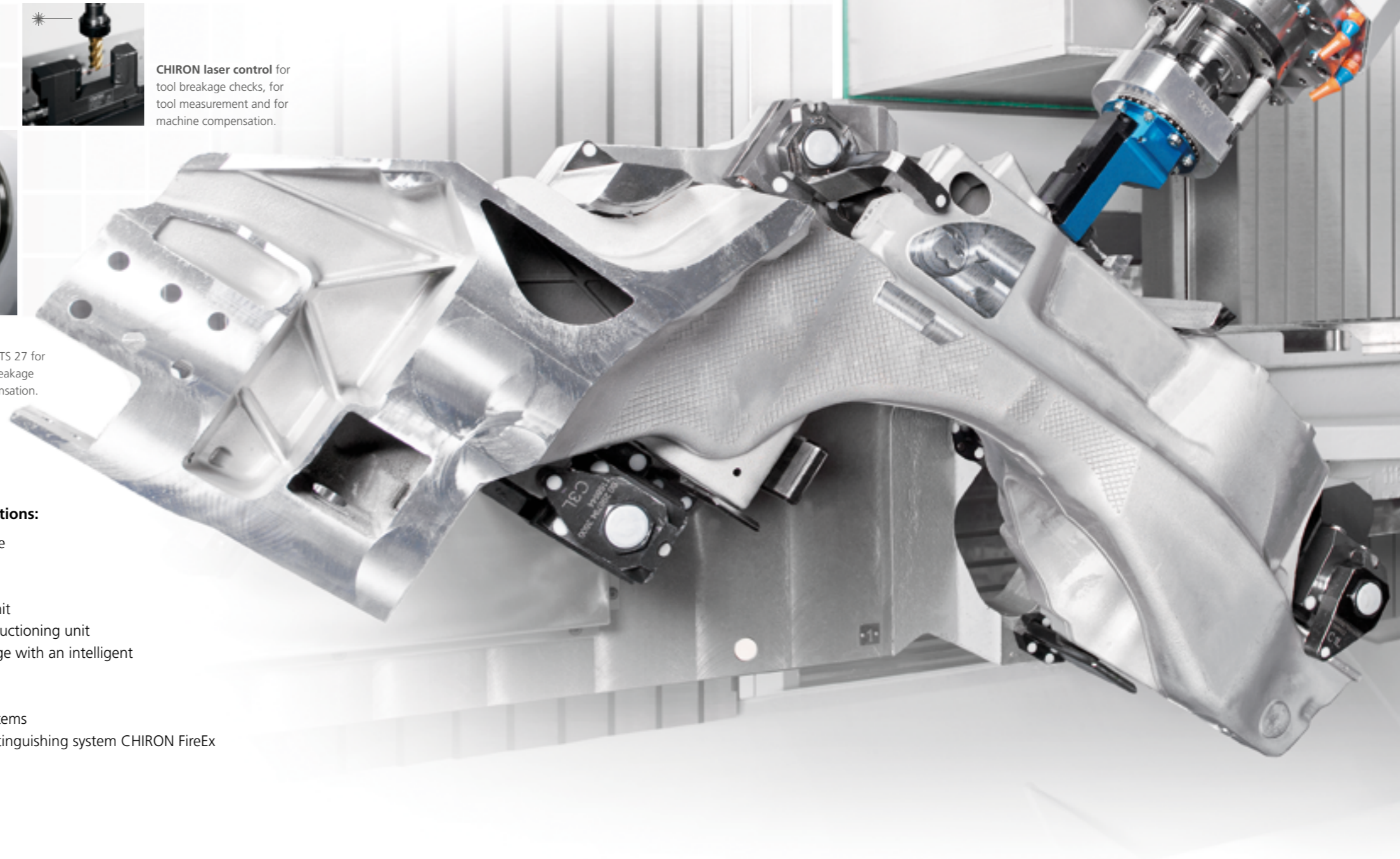


**CHIRON laser control** for tool breakage checks, for tool measurement and for machine compensation.

**Stationary 3D probing system TS 27** for tool length measurement, tool breakage checks as well as machine compensation.

#### Series MILL – further options:

- High Speed Plus package
- High Dynamics package
- Reinforced spindle drive
- Work area suctioning unit
- Connection for central suctioning unit
- Energy-efficiency package with an intelligent energy-saving control
- Automatic doors
- Zero point clamping systems
- Oil package with fire-extinguishing system CHIRON FireEx
- Robot interface and much more



# Turnkey customization completely from one source

Individual automation and engineered solutions for greater productivity

|                       |         |
|-----------------------|---------|
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## Automation PRO – Customized automation solutions:

- Machine-integrated spindle grippers
- Portal and articulated-arm solutions
- Load and unload devices
- Pallet changing systems
- Pallet storage for raw and finished parts
- Interlinked systems and much more



Space-saving integration of an articulated arm robot for removing finished parts.

**Customized automation solutions including:**  
Autonomous production due to the use of a pallet changer/storage with loading and unloading portal robot.

## CHIRON turnkey solutions

- Comprehensive process design
- Expert engineering
- Experienced project management
- Validation of statistical process capability
- Ensuring targeted productivity
- Production assistance during the initial phase
- Operation and programming training
- CHIRON Service available around the world



### From the planning stage to serial production

Today, manufacturing excellent machining centers alone is not enough. The user rightly expects a solution, which is as individual as it is intelligent. Starting from one specific machining task, a „Turnkey process“ is developed around the workpiece based on quantity structure and constraints. The CHIRON TURNKEY makes it possible to optimally solve complex tasks.

Together with perfectly adapted technology modules, CHIRON engineers create the most economical solution from one source to meet the customer’s special needs. This ensures decisive competitive advantages for CHIRON customers. CHIRON not only offers the machining solution itself, but also the support to keep manufacturing running at an optimal level.

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