C SERIES
MACHINING SOLUTIONS FOR LARGE RINGS

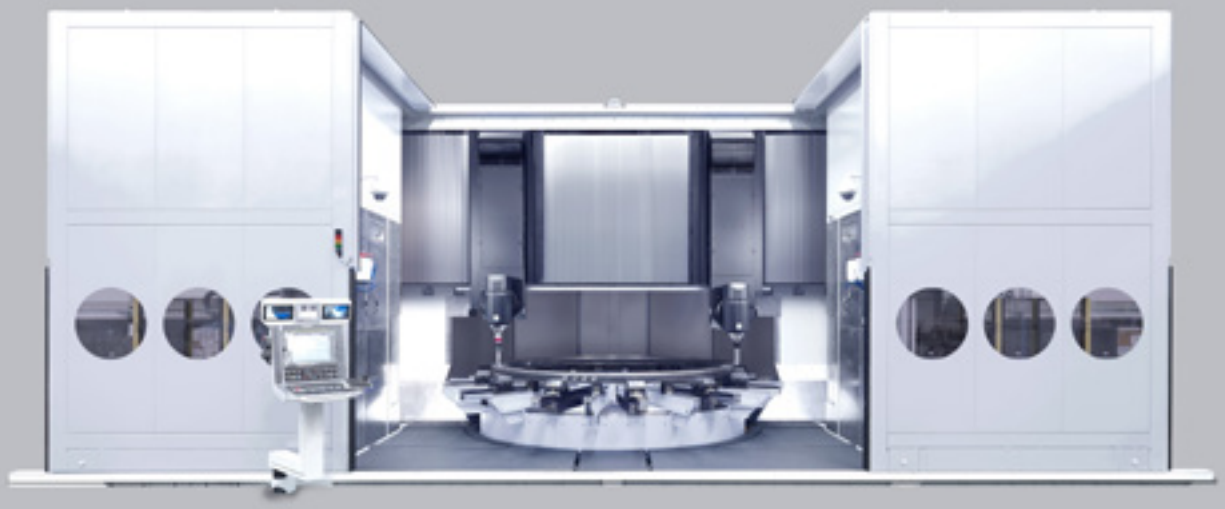
IBARMIA.
YOUR MACHINE TOOL POINT

TURNING CENTERS & DRILLING CENTERS

Machining solutions program for large flanges and bearings up to ø12.000 mm, integrating machines and fixturing devices for complete precision processing.

C SERIES

C SERIES



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C SERIES

C SERIES

YOUR MACHINE TOOL POINT

IBARMIA.

INTRO

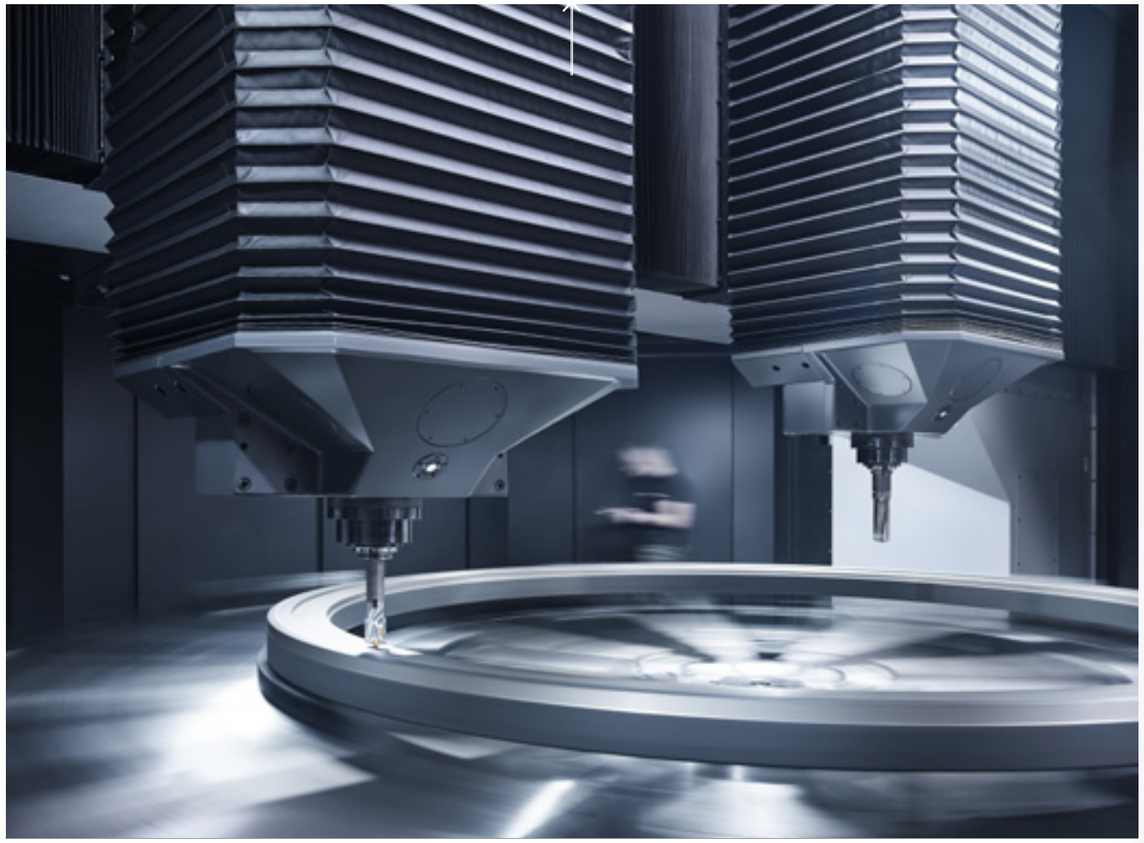
Meeting the demand for specialized machines in niche markets is no simple task. Low demand often prevents manufacturers from investing in high-tech, tailored solutions. At IBARMIA, we embrace this challenge by offering a comprehensive range of machining solutions for large-diameter rings—up to 12 meters—positioning ourselves as a leading manufacturer in this specialized market.

C SERIES

1_ GENERAL VIEW

MACHINING **LARGE RINGS**

IBARMIA's journey began with the production of industrial drilling machines, driven by a commitment to innovation and continuous improvement. Since 1986, the company has also been producing high-productivity machining centers. In 1998, these two product lines converged in a natural evolution, combining over 40 years of expertise in drilling machine manufacturing with three decades of high-performance machining center development. This extensive experience, coupled with exceptional engineering capabilities and manufacturing flexibility, has positioned IBARMIA as a leader in machining large flanges and bearings of up to 12 meters in diameter.



MACHINE TIPOLOGIES

01

TURNING CENTERS

Portal-structure turning centers
designed to handle any workload, from the center of the table to a maximum diameter of ø12.000 mm

Page 08

02

DRILLING CENTERS

Portal-structure drilling centers
designed to handle any workload, from the center of the table to a maximum diameter of ø8000 mm.

Page 12

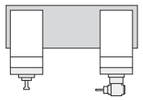
TURNING CENTERS_ PERFORMANCE LEVELS

RAM
With fixed or interchangeable turning turrets
In various configurations.

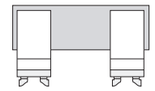
RAM
With live spindle
For drilling, tapping milling operations.

01

Performance tailored to turning head configurations:
Multitasking machines featuring live spindles integrated into the RAM, combined with interchangeable heads, or vertical lathes equipped with interchangeable turning turrets.



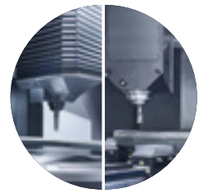
Live spindles combined with interchangeable heads



Fixed and or interchangeable turning turrets

... DIFFERENT CONFIGURATIONS AVAILABLE
View on page 10

DRILLING CENTERS_ PERFORMANCE LEVELS

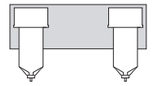


V Classic / V Extreme
Vertical heads
Belt & Pulley / electrospindle transmission.

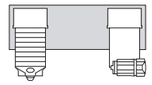
H Extreme
B axis headstock
With electrospindle transmission

02

Performance tailored to drilling head combinations:
Featuring vertical heads with various transmission options for basic drilling operations, and/or tilting heads for seamless vertical-horizontal drilling with the same tool.



2 x V Extreme heads



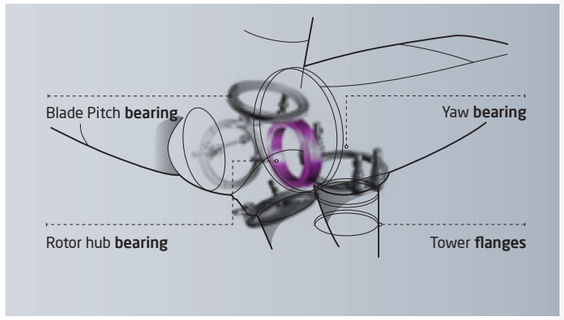
V Classic / H Extreme

... DIFFERENT CONFIGURATIONS AVAILABLE
View on page 14

C SERIES

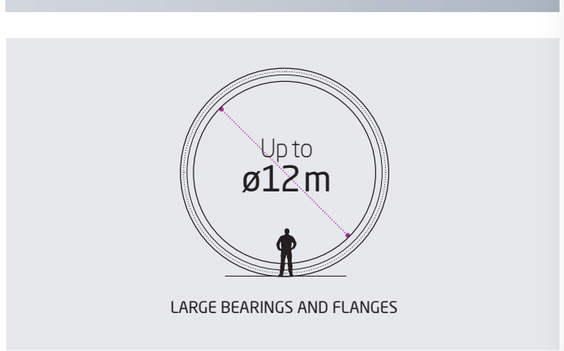
2_MAIN FEATURES

PORTAL-STRUCTURE TURNING CENTERS DESIGNED TO HANDLE ANY WORKLOAD, FROM THE CENTER OF THE TABLE TO A MAXIMUM DIAMETER OF ø12.000 mm



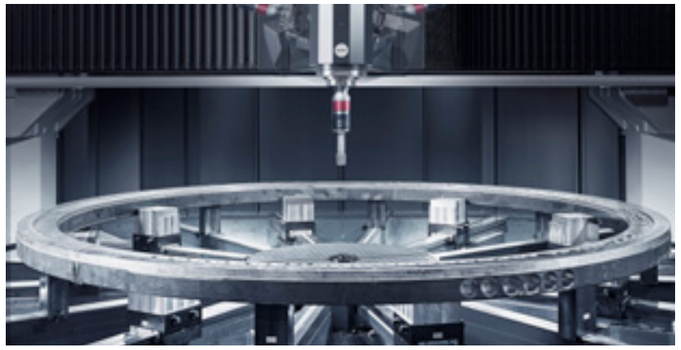
1_ RING IN HORIZONTAL POSITION

IBARMIA's solutions accommodate the morphology of these parts, which are optimally positioned horizontally. The workpiece is placed on a central rotary table that precisely indexes the degrees between the centers of adjacent holes. These in-house manufactured rotary tables use bearings or hydrostatic supports, depending on the diameter and weight of the workpieces.
In both configurations, a double pinion gear system drives the toothed crown, facilitating the rotation beneath the rotary table. Positioning accuracy is ensured by a high-precision encoder on the table's rotational axis.



LARGE BEARINGS AND FLANGES

ENGINEERING EXPERTISE AND MANUFACTURING FLEXIBILITY POSITION IBARMIA AS A LEADER IN MACHINING LARGE FLANGES AND BEARINGS



2_ FIXTURING DEVICES

Customers in these applications require more than just a machine—they need a complete solution. Solving piece fixturing challenges is therefore essential. With 25 years of experience, IBARMIA has developed a variety of s elf-centering fixturing devices, both manual and automatic. The flexibility and simplicity of changing jaws and support positions for workpieces of different diameters significantly enhance productivity, a feature highly appreciated by our customers.

Single
One Head

Dual
Double Head

3_ CONTROL AND MONITORING TOOLS

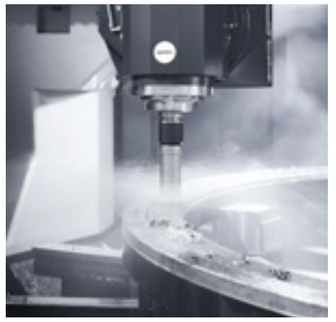
IBARMIA integrates advanced tool wear monitoring systems. Automatic tool magazines facilitate the use of twin tools, allowing for more autonomous production. Ensuring uninterrupted processes by preventing downtime caused by broken tools is critical in these applications.

4_ WORKING AREA ENCAPSULATION AND COOLANT THROUGH SPINDLE

The use of tools with hard metal inserts for turning or drilling/tapping deep holes requires coolant through the spindle for two key reasons: to reduce the high temperatures generated during drilling and to use pressure to push chips out of the hole. High-pressure pumps (up to 70 bar) are employed for this purpose. Combined with high feed rates, these pumps expel chips with considerable force, making full encapsulation of the machine essential to prevent chips and coolant from escaping the working area.

5_ AUTOMATIC CHIP EVACUATION

Managing the large volume of chips generated during machining is a significant challenge, especially for large machines in intensive use (typically operating across three shifts). To address this, IBARMIA's design minimizes flat surfaces where chips could accumulate, directing them toward a central channel. Paddles rotating with the rotary table push the chips to an external evacuator, ensuring efficient chip management.

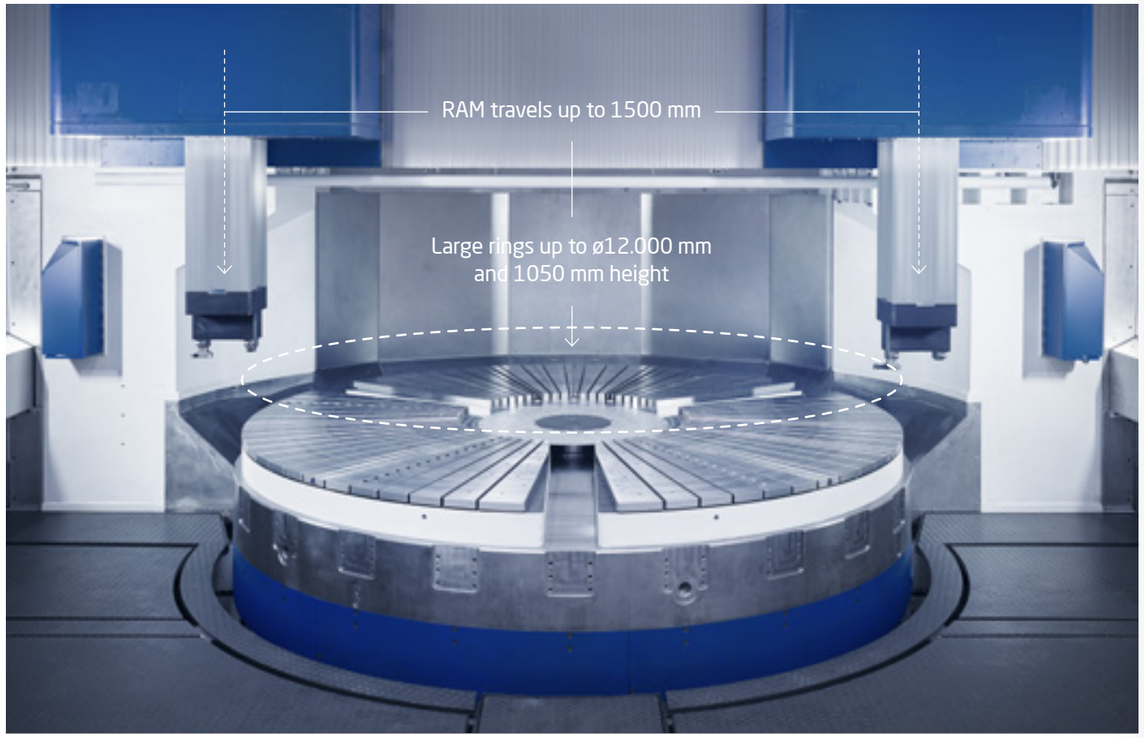


A MACHINE CONFIGURED TO PERFORM ALL PROCESSES REQUIRED FOR THE COMPLETE MACHINING OF LARGE CIRCULAR PIECES UP TO ø12.000 mm

3_ C SERIES PERFORMANCE LEVELS

TURNING CENTERS

For workpieces over 3,000 mm in diameter, the IBARMIA TURNING CENTER features a portal structure with cast iron components and rotary tables supported hydrostatically. Typically equipped with a dual RAM system, it can also be configured with a single RAM. Clamping options include manual systems with independent or self-centering jaws, as well as automatic self-centering or magnetic clamping devices.
A broad selection of tool or turret change systems is available, ranging from manual tool holders to automatic tool changers utilizing CAPTO or KM systems.



MAIN SPINDLE

SIZE 1
For large rings from ø3000 mm to ø4000 mm.

Increments of 500 mm

Max load:
25.000 kg
(piece & clampling fixture)

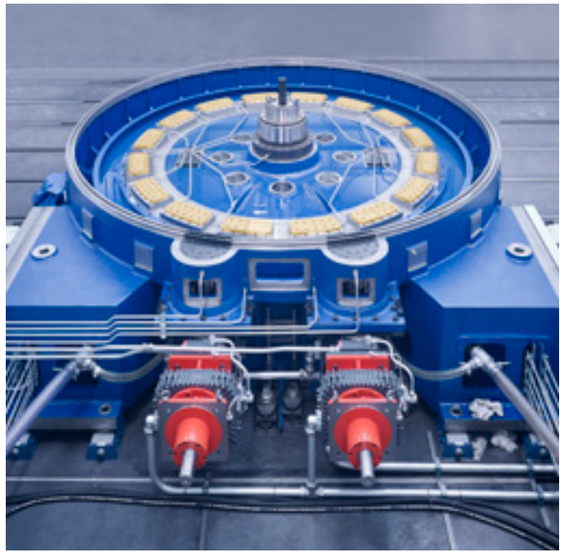
SIZE 2
For large rings from ø4500 mm to ø6000 mm.

Max load:
35.000 kg

SIZE 3
For large rings from ø6500 mm to ø8500 mm.

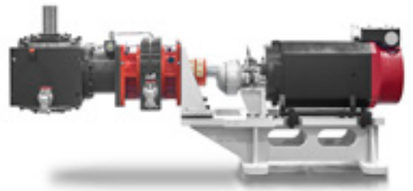
Max load:
50..000 kg

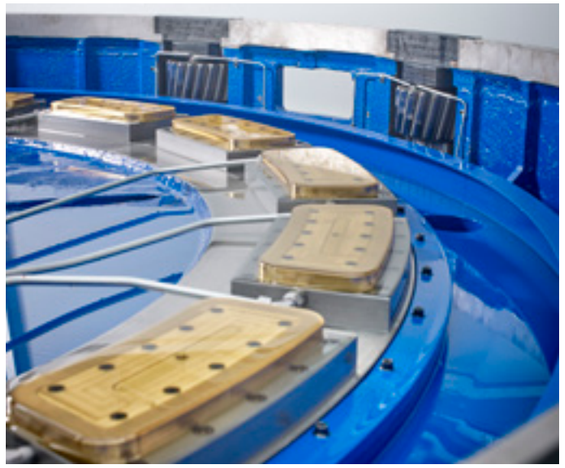
SIZE 4
For large rings up to ø12.000 mm.



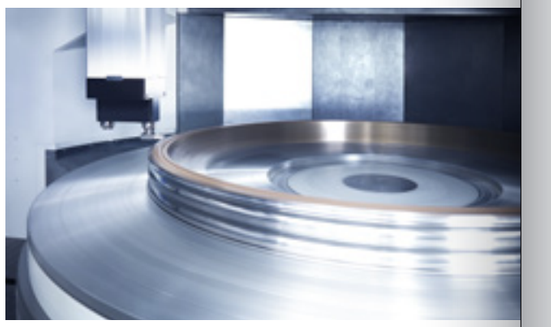
The transmission system employs a robust dual-motor setup that drives two electronically preloaded gears. In the turning/milling configuration, positioning is achieved via a directly mounted hollow encoder, eliminating the need for additional transmission components. This design ensures exceptional load capacity and optimal rotational speed, facilitated by radial load bearings and a hydrostatic guidance system for the upper turning plate.

- **Drive system: Double motor.**
- **Transmission: 2 gears & crown.**
- **Up to 60 rpm.**





RAMs WITH AUTOMATIC CHANGE OF TURRETS AND TOOL HOLDERS FOR COMPLETING THE MOST DEMANDING TURNING PROCESSES



3.1 HIGH PERFORMANCE TURNING CENTERS

POWERFUL RAM CONCEPT

High-precision, robust RAM heads with high cutting capacity. Equipped with prismatic and hydrostatic guides on the X and Z axes to minimize vibrations. Available in sections of 320x320 mm (standard) and 400x400 mm (optional). A fixed crossbar enhances machine rigidity, allowing travels up to 1,500 mm. The automatic changing of turrets and tool holders enables the completion of the most demanding machining processes, with customizable tool magazines tailored to specific requirements.

RAM TYPES_ Travels from 600 to 1500 mm

RAM
Fixed turning turrets

RAM
Interchangeable turning turrets
In various configurations.

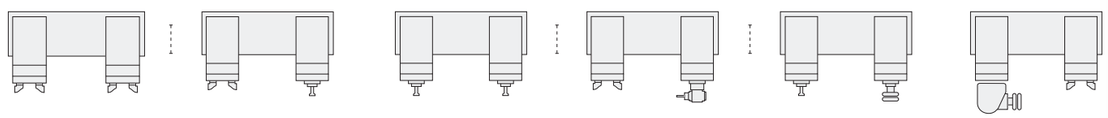
MACHINE CONFIGURATION EXAMPLES

RT / HT
Double fixed turning turrets.

FDT
Interchangeable turning turrets combined with single or dual live spindle.

PDT
Upgrade to angular heads.

GT
All the technologies for drilling, turning and grinding operations.



MULTI-FUNCTION TURNING CENTERS DESIGNED TO ADDRESS THE GENUINE NEEDS OF THE MARKET, WHERE FINISHING OPERATIONS FOR THIS TYPE OF WORKPIECE ARE CRITICAL

RAM with live spindle
For drilling, tapping and milling operations.

Angular head
For horizontal in-out/ out-in drilling and/or tapping operations.
RAM with live spindle is required.

3.2 INTEGRAL MANUFACTURING

CLD MULTIPROCESS

At the forefront of our turning centers, the CLD MULTIPROCESS models integrate live RAMs into high-performance lathes, enabling operations that were previously unattainable on a single machine. Beyond turning, these machines can perform drilling, tapping, milling, boring, and even grinding operations, thanks to a versatile tool and head change system.

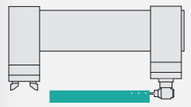
Straight grinding head
RAM with live spindle is required.

Fork grinding head
Working range +/-95°.

Turning (1)
The flange is transferred from the forge to the machining center, where the turning heads will machine the ring size.

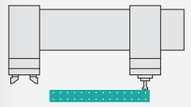
1

Horizontal drilling / Tapping
Using the angular head, the horizontal Plug & Grease Holes are drilled or tapped, both with in-out or out-in operations.



2

Vertical Drilling / Tapping
Using the RAM with live spindle, the Fixing & Lifting Holes are drilled and tapped.

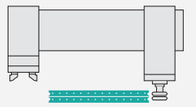


3

Turning (2)
The turning heads are used to machine the Ball Bearing Races.

4

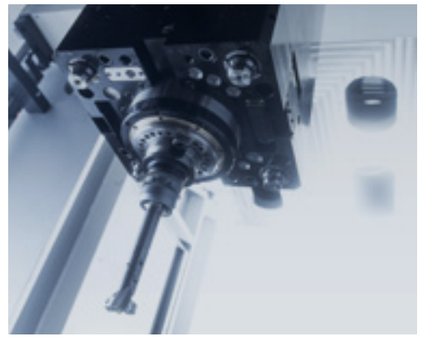
Grinding or Hard Turning
The Straight grinding Head will then grind the Ball Bearings Races.



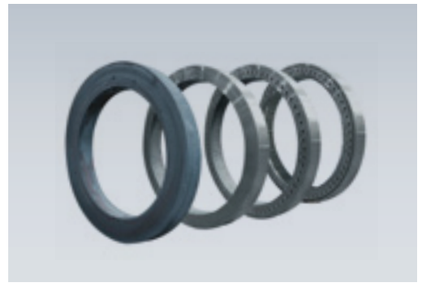
5

Grinding or Hard Turning
The Fork grinding Head is used to grind the Roller Bearings Race (process can be substituted with the hard turning process).

6



Live spindles & Interchangeable heads
Integrated within the RAMs, live spindles are crucial components. They provide direct solutions for vertical milling, drilling, threading, and boring operations, and serve as transmission elements for drilling and grinding interchangeable heads.

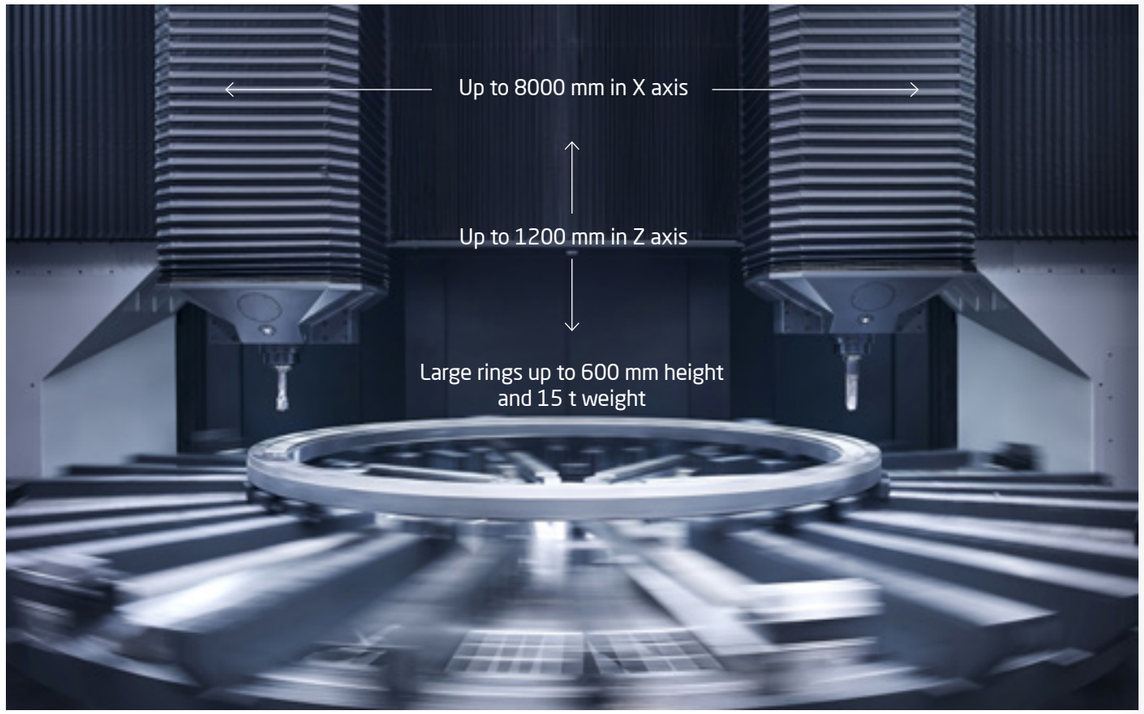


AT BOTH PERFORMANCE LEVELS, IBARMIA OFFERS INTEGRAL SOLUTIONS, INCLUDING BOTH MACHINES AND FIXTURING DEVICES

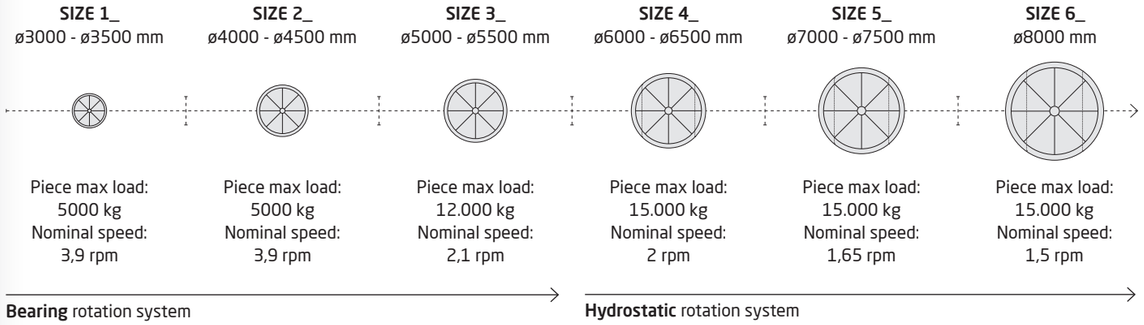
4_ C SERIES PERFORMANCE LEVELS

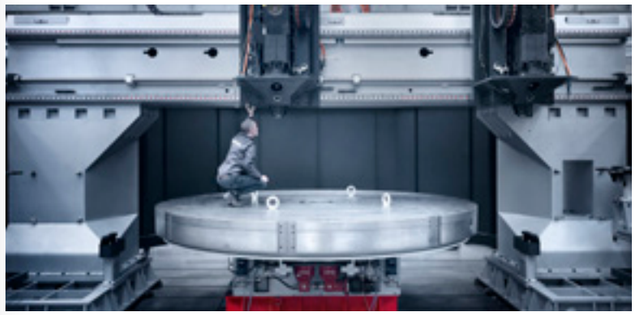
DRILLING CENTERS

In 2005, IBARMIA introduced a groundbreaking machine that transformed the market, establishing the company as a leading supplier to major flange and bearing manufacturers worldwide. The new generation of drilling centers can be equipped with various tooling and magazine options. The dual-head configuration—for drilling, thread cutting, and milling operations—is available in three versions: V CLASSIC, V EXTREME, and H EXTREME.



DRILLING CENTERS_ CHARACTERISTICS





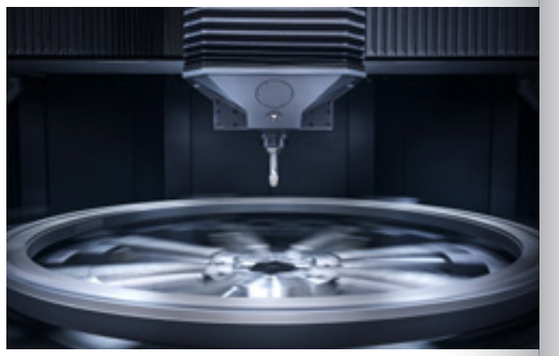
Rotary table_ ransmission is achieved via dual motors driving two electronically preloaded gears. Position measurement is conducted by a directly mounted hollow encoder, eliminating the need for additional transmission components.

The saddle_ Features a fixed headstock that facilitates vertical movement along the Z axis, complemented by a self-regulating hydraulic counterbalance system.

Crossbeam_ Provides transversal movement along the X axis through a dual rotating ball screw system; for diameters exceeding ø6000 mm, a single ball screw with a rotating nut is used.

Measuring systems_ Direct measurement on the X axis is performed using linear scales. The Z axis employs an encoder for direct measurement, with an optional linear scale available.

THE PORTAL CONSTRUCTION ALLOWS COVERING EVERY RANGE FROM THE CENTRE OF THE ROTARY TABLE TO THE LIMIT OF THE AXIS AT THE END OF THE CROSSBEAM



4.1 PERFORMANCE LEVELS

TRANSMISSIONS

The portal machine architecture allows for the installation of either one or two spindle heads. Vertical operations can be performed using the V CLASSIC (Belt & Pulley transmission) or V EXTREME (electro-spindle transmission) heads, while horizontal operations utilize the H EXTREME head (view on next page). Combinations of the H EXTREME head with either the V CLASSIC or V EXTREME heads are feasible. Additionally, angular heads can be directly mounted onto the tool holder.

DRILLING CENTERS_ Transmissions

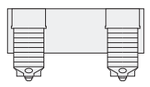
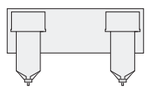
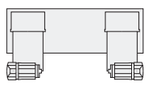
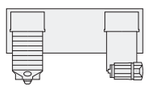
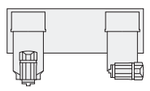
V Classic
Vertical head with belt & pulley transmission (standard).

V Extreme
Vertical head with electrospindle transmission (option).

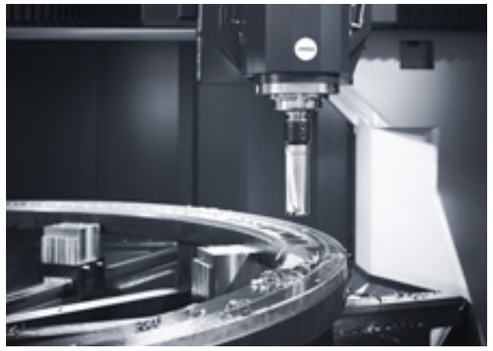
Belt & Pulley (Standard)
Parameters depending on the main spindle motor: Siemens, Fanuc, and Fagor controls available.

Electrospindle (Option)
Tool holders_
SK 50 / BT 50 / HSK A-100
Total available power from
700 rpm
Power in S1 (100%); S6 (40%)
52 kW / 73 kW
Torque in S1 (100%); S6 (40%)
500 Nm / 700 Nm
Maximal rotation speed
7000 rpm

DRILLING CENTERS_ Configurations available

CPD VV Classic	CPD VV Extreme	CPD HH Extreme	CPD VH Classic	CPD VH Extreme
				
Double head 2 x V Classic	Double head 2 x V Extreme	Double head 2 x H Extreme	Double head V Classic / H Extreme	Double head V Extreme / H Extreme

THE MAIN ADVANTAGE OF THE IBARMIA TILTING HEAD IS ITS CAPABILITY TO PERFORM BOTH VERTICAL AND HORIZONTAL DRILLING OPERATIONS USING THE SAME TOOL HOLDER



4.2 B AXIS H EXTREME HEADSTOCK

ADVANCED MACHINING OPERATIONS

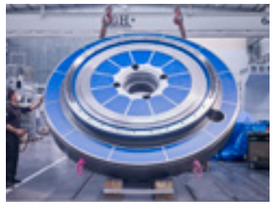
The integration of electrospindle transmission with tilting heads enables advanced machining operations within this range of drilling centers. For horizontal tasks, the H EXTREME spindle head—featuring electrospindle transmission and a tilting range of +/-105º is ideal for both in-out and out-in drilling and tapping operations. Milling capabilities are also achievable, contingent upon the specifications of the rotary table.

DRILLING CENTERS_ Headstocks

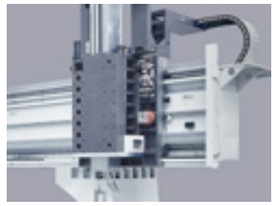
H Extreme
Tilting torque: 800 Nm (S1).
Tilting clampling force: 6000 Nm.

5.1 TURNING CENTERS_ CHARACTERISTICS & CONFIGURATION

CL Structure_ The machine's portal structure features a fixed crossbeam and a double saddle with headstocks housing the RAM. The rigid crossbeam connects the columns, forming a closed system that ensures structural integrity. Transversal movement of the saddle (X-axis) is achieved through a hydrodynamic guiding system (with an optional hydrostatic upgrade) and a ball screw driven by a belt or rack-and-pinion transmission. Columns, saddles, and headstocks are constructed from normalized GG-30 cast iron and furnace-stabilized. These components are designed to absorb significant loads and stresses, utilizing finite element analysis for optimal rigidity. Optionally, the columns can be produced from the same material as the crossbeam.

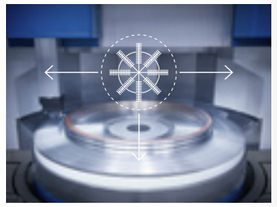


Main spindle_ The upper plate's rotation is guided by a radial load bearing combined with a hydrostatic system.

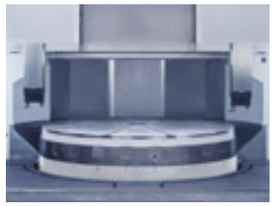


Cross-beam_ The high-rigidity fixed crossbeam is constructed from GG-30 cast iron for hydrodynamic guiding systems or from welded steel for hydrostatic guiding systems.

RAM_ Constructed from forged steel, the RAM is available in sections of 320 x 320 mm or 400 x 400 mm, with travel distances up to 1500 mm.



Measuring systems_ Direct measuring by linear scales and/or by encoder.



Cast iron made turning plate.

Totally encapsulated working area and safety windows.

• Working area lightning with lamps inside the working area and led under crossbeam.
• Watter and air guns.

Chip Conveyor with integrated coolant tank. The chip extraction is realized by paddle turning around the rotary table.

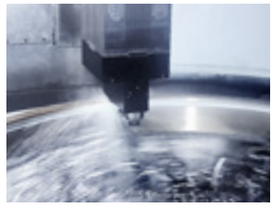
C SERIES

C SERIES

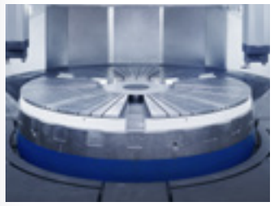
• Climatised electrical cabinet.
• Automatic programable central lubrication system.

Fix and rotating control panel in the left side for an optimum interaction with the operator. 19" touch screen.

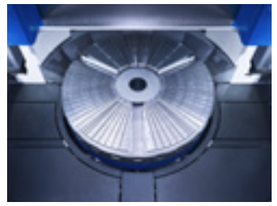
Tool magazine_ Different tool magazines available depending on the machine configuration.



External coolant system and coolant through spindle up to 70 bar.



Three clamping system available: 1: Manual clamping fixture; 2: automatic & hydraulic sefl centering clampling fixture; 3: magnetic clamping fixture (in the picture).



Floor opening system that is kept open while the machine is operating, to facilitate the chip evacuation and reduce cleaning times.

Horizontal drilling-tapping operations available.

Milling operations available.

Grinding operations available.

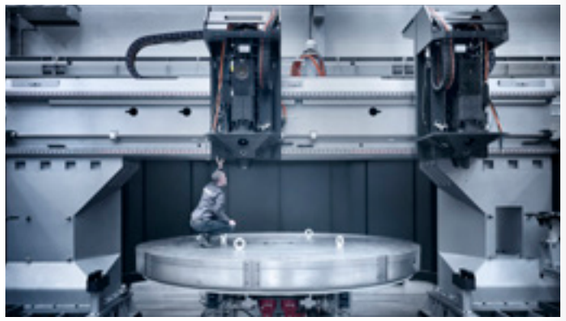
Different steam and mist aspiration systems on demand.

Different tool measuring, spindle control and piece inspection systems integrated in the machine.

• Surveillance cameras within the working area controlled from the dashboard console.
• Full stainless steel lined working area, including protection bellows.

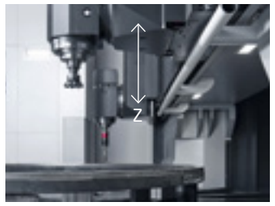
5.2 DRILLING CENTERS_ CHARACTERISTICS & CONFIGURATION

CP Structure_ The portal structure features double columns, a crossbeam, and single or double headstocks, all heavily ribbed, steel-welded, normalized, and furnace-stabilized. The rotary table bed and plate are crafted from cast iron. These monoblock structures are engineered to absorb operational stresses. Oversized guideways ensure maximum rigidity and efficiency during demanding machining operations. Axis movements are driven by digital motors and ball screws over linear guides with preloaded rolling runners. The columns, saddle, headstocks, and crossbeam are heavily ribbed, steel-welded, normalized, and furnace-stabilized. Finite element analysis is utilized in their design to ensure these components effectively absorb loads and stresses.

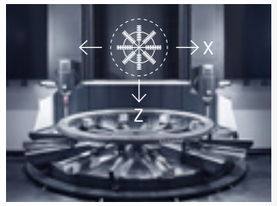


Rotary table_ Features a dual-motor transmission system driving two electronically preloaded gears. Position measurement is conducted by a directly mounted hollow encoder.

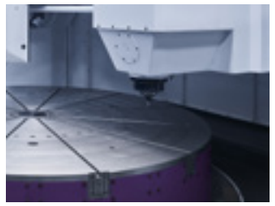
Crossbeam_ Facilitates transversal movement along the X-axis via a dual rotating ball screw system. For diameters starting from ø6.000 mm, a single ball screw with a rotating nut is employed.



Saddle_ Equipped with a fixed headstock that facilitates vertical movement along the Z-axis. Features a self-regulating hydraulic counterbalance system for enhanced stability.

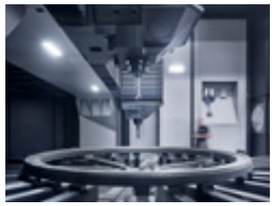


Measuring systems_ Direct measuring by linear scales and/or by encoder.



Cast iron made rotary table.

Totally encapsulated working area and safety windows.



• Working area lightning with lamps inside the working area and led under crossbeam.
• Watter and air guns.

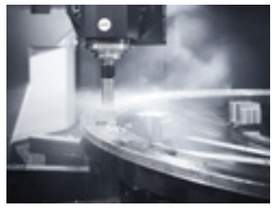
Chip Conveyor with integrated coolant tank. The chip extraction is realized by paddle turning around the rotary table.

C SERIES

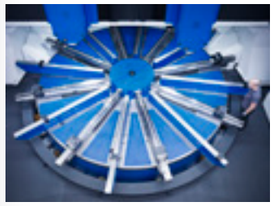
• Climatised electrical cabinet.
• Automatic programable central lubrication system.

Fix and rotating control panel in the left side for an optimum interaction with the operator. 19" touch screen.

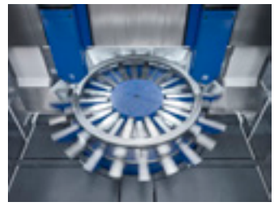
Tool magazine_ Automatic tool changer powered by a double gripper.



External coolant system 12 bar. Coolant through spindle 22 bar.

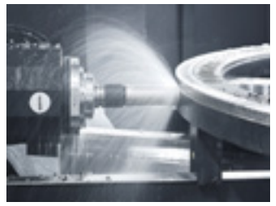


Three clamping system available: 1: Manual clamping fixture; 2: automatic & hydraulic sefl centering clampling fixture (in the picture); 3: magnetic clamping fixture.



Floor opening system that is kept open while the machine is operating, to facilitate the chip evacuation and reduce cleaning times.

• Drilling capacity up to ø80 mm.
• M Tapping capacity up to M60.
• Threading by Interpolation.



Depending on the rotary table characteristics:
• Milling capacity.

Depending on the rotary table characteristics:
• Milling capacity.

Different steam and mist aspiration systems on demand.

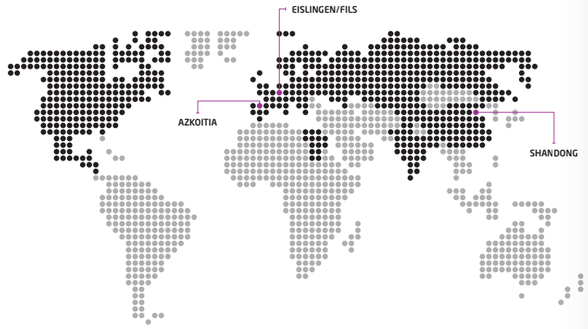
Different tool measurement systems on demand integrated.

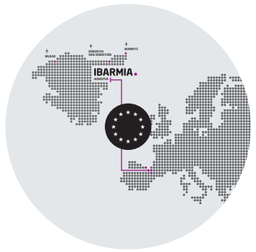
• Surveillance cameras within the working area controlled from the dashboard console.
• Full stainless steel lined working area, including protection bellows.

IBARMIA

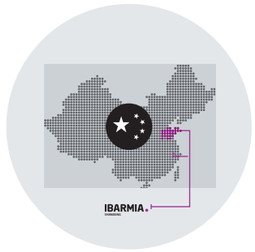
GOING BIGGER, GETTING CLOSER

The last few years at IBARMIA have been intense in growth for the company. Determined to stay close to customers, the company has kept deepening the roots in the biggest markets of the world. This tendency will be kept in the future, with further development of these two areas of the world and others to come.

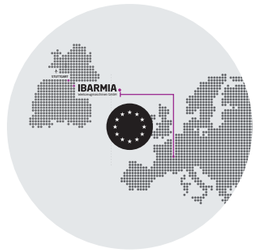




IBARMIA Azkoitia
PRODUCTION CENTER
(Gipuzkoa) Spain



IBARMIA Qingdao
PRODUCTION CENTER
IBARMIA Shanghai
SALES OFFICE
(Shandong-Shanghai) P.R. of China



IBARMIA Eislingen/Fils
SALES & SERVICE OFFICE
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70 IBARMIA. YEARS EST.1953

90% EXPORT

COMPETING IN THE GLOBAL MARKET

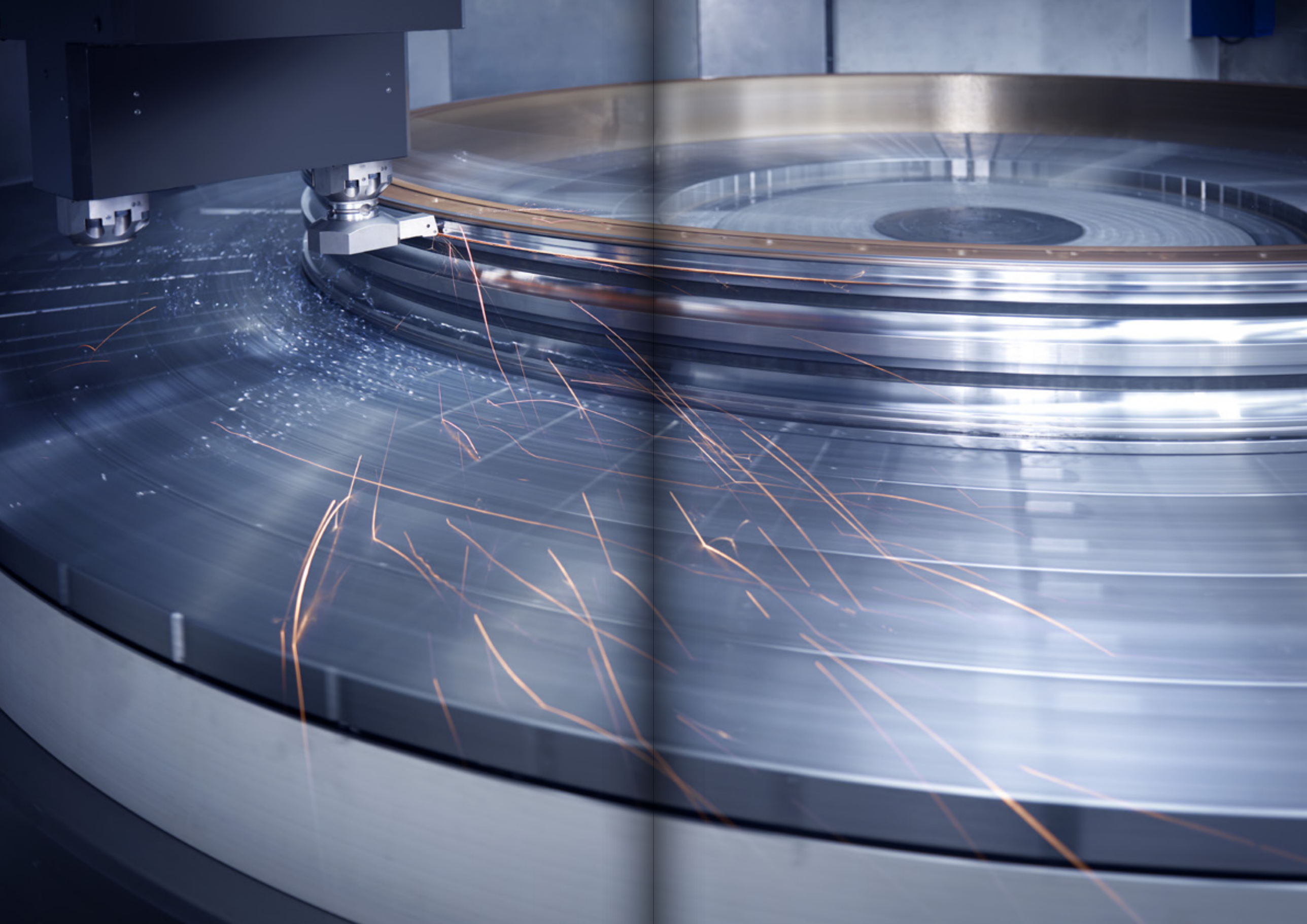
QUALIFIED YOUNG TEAM

A YOUNG TEAM WITH HIGH FORMATION

IN INTEGRATED

INTEGRATED MANUFACTURING

TOTAL FLEXIBILITY



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