

iNews

IBARMIA NEWS JOURNAL
N° 06 - 2022

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GOING BIGGER,
GETTING CLOSER

BE READY

To meet the requirements imposed
to XXI century's industry by highly
volatile markets.



DEAR READER

WELCOME TO OUR JOURNAL



Si los tiempos recientes algo nos han enseñado, es que la realidad puede llegar a ser más adversa que lo que podemos imaginar y que muchos y relevantes factores que la configuran están fuera de nuestro control. Mientras, el denominado progreso humano imprime una velocidad vertiginosa a la sociedad actual, generando cambios permanentes que nos obligan a gestionar nuestros negocios con el inseparable acompañamiento de la incertidumbre. Todo ello requiere adaptación y la adaptación flexibilidad, y es ahí donde nuestras máquinas y soluciones juegan un rol relevante en la fabricación mecánica moderna, porque prepararse para esta realidad adquiere una relevancia estratégica que nos asegure la sostenibilidad, pudiendo dar respuesta a una industria que demanda piezas entregadas con mayor agilidad, y calidad, fabricadas de forma sostenible a un coste siempre contenido. Hoy la rentabilidad se empequeñece, a pesar de que su logro es una necesidad vital para nuestras empresas, pero no es menos cierto que nunca antes se contó con tanta tecnología y capacidades para alcanzarla mediante la automatización, digitalización, conectividad... que maximizan la productividad a niveles antes nunca conocidos. Como puedes comprobar en esta publicación, cada día en IBARMIA nos empeñamos en estar preparados para esa realidad cambiante y sería un gusto, apreciado lector, acompañarte en esa continua adaptación.

Saludos.



If recent times have taught us anything, it is that reality can actually be worse than we could have imagined, and that many and important factors that shape it are beyond our control. Meanwhile, human progress carries along current society at a breakneck speed, creating permanent changes that mean we have to manage our businesses with an uncertainty that is unavoidable. All this requires adaptation and flexibility, and it is here where our machines and solutions play an important role in modern mechanical manufacturing, because being prepared for this reality requires strategic relevance that sustainability assures us. In this way we can respond to an industry that demands parts delivered with greater speed and quality, manufactured in a sustainable way at an always contained cost. Today profits are being squeezed, in spite of there being a vital need for our businesses, but it is also true that there has never been so much technology and capacity to achieve profitability by means of automation, digitalisation and connectivity which maximise productivity to levels never known before. As you can see in this publication, every day at IBARMIA we endeavour to be prepared for that changing reality and it would be a pleasure, dear reader, to accompany you on that continuous adaptation.

Kind regards.



Duela gutxiko garaiek zerbait irakatsi badigute, errealitatea pentsa dezakeguna baino bortitzagoa izan daitekeela da, eta errealitatea osatzen duten faktore asko eta garrantzitsuak, gure kontrolatik kanpo daudela. Bitartean, giza aurrerapena deritzonak abiadura bizia ematen dio egungo gizarteari, gure negozioak bana ezin zaigun ziurgabetasunarekin kudeatzera behartzen gaituzten etengabeko aldaketak sortuz. Horrek guztiak egokitzapena eskatzen du, eta egokitzapenak malgutasuna, eta hor gure makina eta soluzioek rol nabarmena jokatzen dute fabrikazio mekaniko modernoan; izan ere, errealitate honetarako prestatzeak garrantzi estrategikoa hartzen du, iraunkortasuna ziurtatuko diguna, eta arinago eta kalitate handiagoz entregatutako piezak eskatzen dituen industria bati erantzun ahal izango diona, modu jasangarrian eta beti ere kostu neurtuan fabrikatuta. Gaur egun errentagarritasuna txikitu egiten da, nahiz eta errentagarritasun hori lortzea ezinbestekoa izan gure enpresentzat, baina egia da baita, inoiz ez zela hainbeste teknologia eta gaitasun izan hori lortzeko, automatizazioaren, digitalizazioaren, konektagarritasunaren bidez... produktibitatea lehen ezagutzen ez zen mailetara igoz. Argitalpen honetan ikus dezakezue, egunero IBARMIA errealitate aldakor horretarako prest egoten saiatzen gara, eta gustu handia litzateke, irakurle estimatua, etengabeko egokitzapen horretan laguntzea.

Agurak.



Si ces derniers temps nous ont appris une chose, c'est que la réalité peut parfois être encore plus dure que ce que nous pouvons imaginer et qu'un grand nombre de facteurs notables qui la caractérisent sont hors de notre contrôle. Pendant ce temps-là, le dénommé progrès humain confère une vitesse vertigineuse à la société actuelle, en générant des changements permanents qui nous obligent à gérer nos affaires avec le corollaire inéluctable de l'incertitude. Tout ceci nécessite une adaptation et l'adaptation requiert de la flexibilité, et c'est là que nos machines et nos solutions jouent un rôle pertinent dans la fabrication mécanique moderne, car ce préparer à cette réalité demande une pertinence stratégique qui nous garantisse la durabilité, en pouvant répondre à une industrie qui demande des pièces livrées plus rapidement, et de grande qualité, fabriquées de manière durable à un coût toujours préservé. Aujourd'hui, la rentabilité diminue, bien qu'il soit vital d'y parvenir pour nos entreprises, mais il n'en est pas moins certain que jamais auparavant nous n'avons disposé d'une telle technologie et d'autant de capacité pour atteindre la rentabilité par l'automatisation, la numérisation, la connectivité... qui maximisent la productivité à des niveaux jamais connus jusqu'ici. Comme vous pouvez le vérifier dans cette publication, chaque jour chez IBARMIA nous nous efforçons d'être prêts à affronter cette réalité changeante et ce serait un plaisir, cher lecteur, de vous accompagner dans cette adaptation permanente.

Cordialement.



Koldo Arandia
PRESIDENT & CEO
OF IBARMIA



Die letzten Jahre lehrt uns, dass die Realität unerwartet hart sein kann und diese beeinflussenden Faktoren außerhalb unserer Kontrolle liegen. Der menschliche Fortschritt prägt die heutige Gesellschaft in einem schwindelerregenden Tempo, erzeugt permanente Veränderungen und zwingt unsere Unternehmen, ohne eine klare Sicht und somit mit Unsicherheit zu führen. All dies erfordert Anpassung und Anpassung erfordert Flexibilität, und genau hier spielen unsere Maschinen und Lösungen eine wichtige Rolle. In der modernen Fertigung erlangt diese Realität eine strategische Bedeutung, die die Wettbewerbsfähigkeit sicherstellt und in der Lage sein muss, auf eine Branche zu reagieren, die Bauteile mit größerer Reaktionsfähigkeit und Qualität herstellt, und zwar in nachhaltiger Weise und zu stets tragbaren Kosten. Kosteneffiziente Fertigung ist eine große Herausforderung geworden und mehr denn je eine lebenswichtige Notwendigkeit. Doch ebenso ist nicht weniger zutreffend, dass es noch nie so viele Technologien und Möglichkeiten gab, um sie durch Automatisierung, Digitalisierung, Vernetzung... auf ein nie gekanntes Fertigungseffizienz zu bringen. Wie Sie in dieser Publikation sehen können, bemühen wir uns bei IBARMIA auf diese sich verändernde Realität vorbereitet zu sein, und es wäre uns eine Freude, Sie, lieber Leser, bei dieser kontinuierlichen Anpassung zu begleiten.

Mit freundlichen Grüßen.



如果说近期来时间带给了我们什么启发，那就是现实中所能面临的极端逆境完全可以超出我们的想像，而其中交织错杂的各种因素并非我们所能掌控。与此同时，所称谓的人类进步飞速推动着当今社会的发展，期间产生的连绵不断的变化迫使我们在经营事业时不可预期的伴随着不稳定性。

所有这些都要求具有适应力和适应的灵活性，这正是我们的机床和解决方案在现代机械加工中所发挥的重要角色。因为为这一现实做好准备才能获得确保可持续性发展的战略意义，以响应要求更高敏捷度，更高质量交付零件，以始终可控的成本进行可持续生产的行业。

如今利润进一步缩减，尽管盈利是我们企业的基本所需，而事实上通过自动化，数字化和连通性所实现的如此全面的技术和能力配置确实是以往无法比拟的...使生产力最大化至前所未有的水平。

正如您在本刊中所看到的，在IBARMIA我们每天都在努力准备着以应对这个多变的时代，这将是我们的荣幸，亲爱的读者们，能够在这一持续的适应过程中伴随着您。

致以最诚挚的问候

IBARMIA.

THE
POINT

EST 1953

IBARMIA ROOTS

P/1

BASQUE INDUSTRY / BASQUE COUNTRY_ ABOUT IBARMIA'S LOCATION

JUNE 2022, BASQUE COUNTRY_ IT IS TIME TO SEAL THE CONFIDENCE IN OUR POTENTIAL



Arantxa Tapia Otaegi
MINISTER FOR ECONOMIC DEVELOPMENT AND INFRASTRUCTURES. BASQUE GOVERNMENT



YES, Euskadi hosts the 31st edition of the International Machine Tool Biennial with more motivation, more energy, more innovation and greater willingness, if possible, to close deals and business. It is time to seal the confidence in our ecosystem and to collaboratively address the challenges of the future.

Remember the decision that had to be taken in the spring of 2020 not to hold the event that was due to take place at that time. That cancellation caused great sadness in a context of high concern about what the pandemic would mean for the health, social and economic impact of the Basque Country.

Two years later, strengthened by the experience, although bruised by the limitations in which the business activity has developed, -especially marked by the restrictions on international mobility-, the Basque Country is facing a new era. The institutions have learnt what no manual had taught us; the "trial and error" method has been a constant with a permanent premise, which over time has proved to be correct, and that is that the health and the economy of a society are two sides of the same coin that we are obliged to protect.

This new era is common to the whole of Europe, although each country will have to face it from its own particularities. The Basque Government notes and learns from the lessons of the pandemic and Russia's invasion of Ukraine. It is time to seal the trust in our ecosystem and to collaboratively address the challenges of the present and the future. A triple transformation that has accelerated in terms of digitalization, energy and climate, and with a social transformation that challenges institutions and companies.

We describe ourselves as a big-little country. A small country with enormous potential. A country with a manufacturing industry that bets and aspires to remain so. An industry

based on sectors that we can call traditional, but which we cannot describe as mature. It is true that the machine tool is part of the DNA of the Basque industry and that it takes us back to millenary concepts, if we look at aspects related to the use of materials and the importance of tools in our manufacturing process. However, the future of Basque industry lies precisely in a cutting-edge, modernized, technological and digitally competitive machine tool.

Bilbao Exhibition Center will host a wide-ranging exhibition of the potential of the machine tool. We will see what is tangible, i.e. high-precision machines, surprising in size and admirable in design. We will understand the intangible, what servitization means and the solutions that Basque companies are able to offer to customers located anywhere in the world. This year, in addition to seeing and understanding, we will be able to feel once again what the machine tool sector really represents in our country. A business network that, in addition to manufacturing and machinery, is made up of a team of thousands of men and women who are aware that the welfare of society depends to a large extent on their industrial commitment.

The International Machine Tool Biennial 2022 is our business event par excellence. See and touch. Understand, learn and show. Feel and enjoy. A week of advanced industry, eager to welcome local and international suppliers and customers. An opportunity to show the world the industrial and technological potential of the Basque Country.



BASQUE INDUSTRY



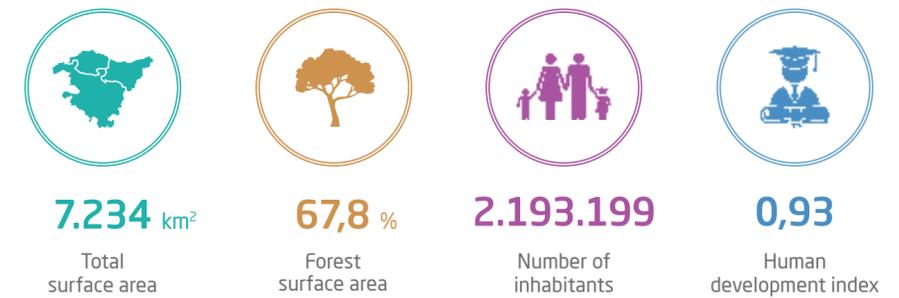
BRTA
BASQUE RESEARCH & TECHNOLOGY ALLIANCE

ALIANZTA TEKNOLOGIKO HANDI BAT EUSKADIKO INDUSTRIARI LAGUNTZEKO

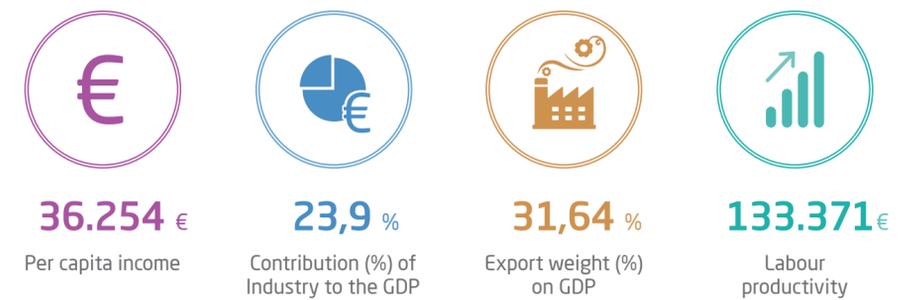
UNA GRAN ALIANZA TECNOLÓGICA PARA APOYAR A LA INDUSTRIA DE EUSKADI

brta.eus

AN IDEAL LOCATION TO MANUFACTURE MACHINE-TOOLS AND MUCH MORE_



A region with a vast industrial tradition, hard working men and women, responsible and committed, a rich component and support industry, a market leading technology environment, mild climate and protected from natural disasters, well connected with the world by road, sea and air, a government sensitive to the importance of industry. From here, from this ideal environment, we approach the world.



BASQUE COUNTRY

IBARMIA PRODUCT

P/2

ABOUT OUR MACHINING SOLUTIONS AND
TECHNOLOGICAL DEVELOPMENTS

RFR

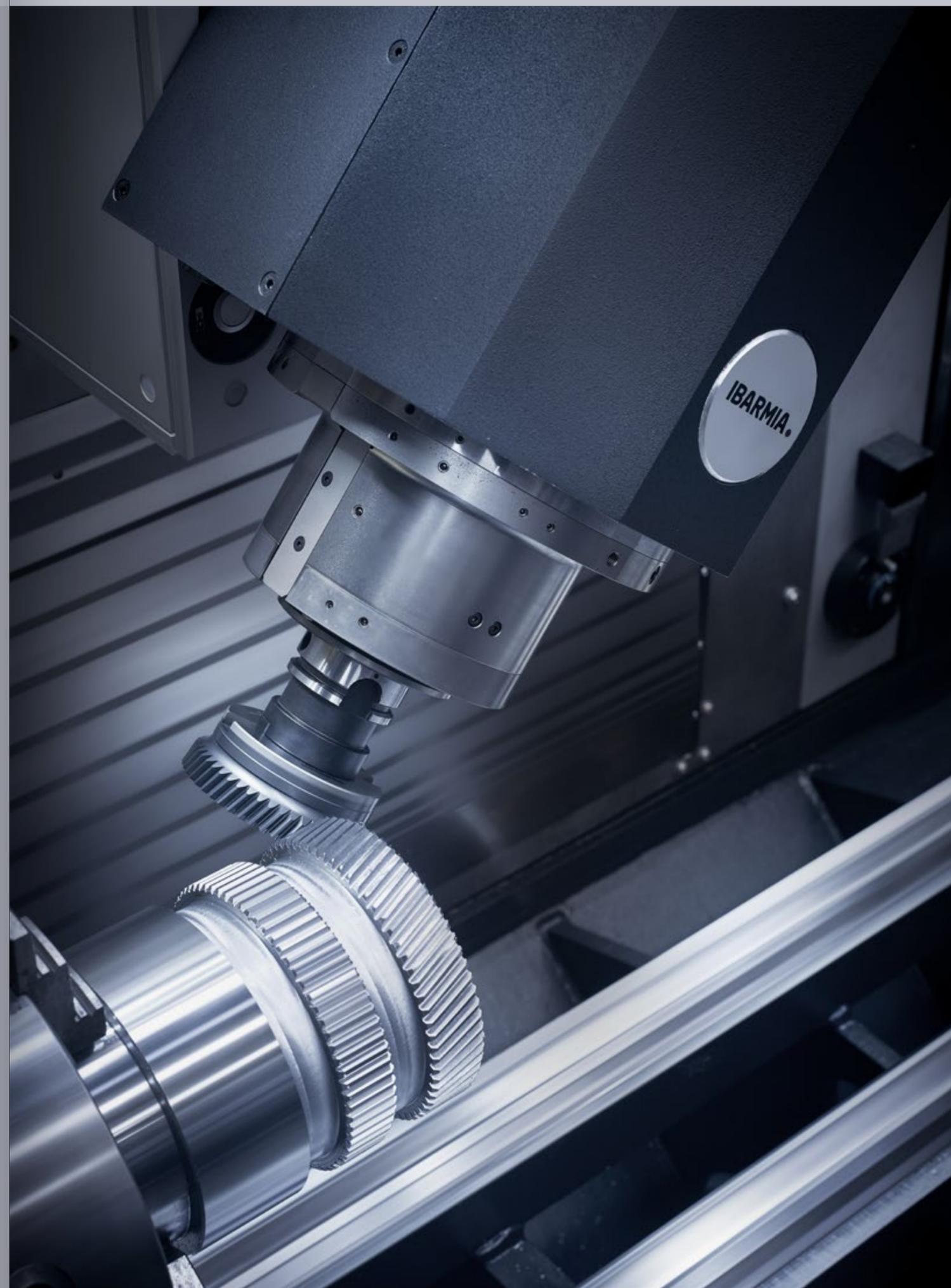
READY FOR REALITY

Since the world changing fast and industry must constantly adapt to new requirements, IBARMIA offers technological solutions based on its machine programs, focused on the peculiarities of today's different industrial markets.

IBARMIA SOLUTIONS FOR

CHANGING,
DEMANDING &
THRIVING

MARKET ENVIRONMENTS



IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

READY FOR REALITY_ AN OVERVIEW TO IBARMIA MACHINE PROGRAMS

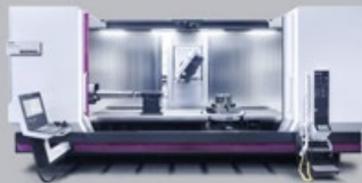
The basis of our adapted solutions for the current market. See on pages 30-31 for knowing more about the IBARMIA MACHINE PROGRAMS.



Z SERIES MOVING COLUMN MACHINING CENTERS

For the largest variety of sizes and shapes, pendulum work and swing up to ø2000 mm.

RFR Solutions for changing environments on pages 10-19



T SERIES 5 AXIS UNIVERSAL MACHINING CENTERS

For large diameters up to ø3600 mm and automatic pallet changing.

RFR Solutions for demanding environments on pages 20-25



C SERIES MACHINING SOLUTIONS FOR LARGE RINGS

Turning, drilling centers for flange and bearings up to ø8500 mm.

RFR Solutions for thriving environments on pages 26-28 and 44-46



Agustín J. Saenz
TECNALIA
DIRECTORY STRATEGY, TECHNOLOGY AND MARKET

FUTURE RECIPES AND TRENDS IN MANUFACTURING

By referring to the most prestigious consultants' analyses and reports on trends in the manufacturing of the future, we can find many common topics:

Mass digitalisation, the 'smart factory' aims to have a more intelligent and connected product, increase flexibility of industrial processes and be much more efficient in sales and logistics processes. Augmented Reality, Virtual Reality, AI, 5G, Edge computing with new sensor systems, Digital twins, cybersecurity, and all kinds of online services that give the customer more flexibility and efficiency will be crucial for maintaining profitable and sustainable business models in the short term.

- The socio-environmental impact of industrial processes must be considered, measured, and optimised as a key factor for competitive advantage. Due to the growing awareness of investment capital and the increasingly demanding regulations, sustainability, carbon neutrality, intelligent optimisation of energy consumption and circular economy will be determining factors for manufacturing companies.

- Data driven maintenance will be a focus of critical economic profit and margins. The new remote monitoring sensors, multiple connected devices and the IoT capacities make it possible to carry out maintenance service tasks preventative, predictive and prescriptive in an autonomous way.

- Robots, cobots, automation and dark factories. People will still be the key factor of any company, but more as collaborators with advanced automation systems capable of offering high-efficiency and flexibility. Hyperautomation is a clear trend.

- The rise of Web3 and distributed computing technologies, such as blockchains and NFT (non fungible tokens), bring opportunities for the improvement of supply chains. Many of the products that are manufactured in the future will be sold with their NFT digital certificates.

Machine tools, the manufacturing sector and industry are key in the competitiveness of a country. I know that the machine tool sector, and IBARMIA in particular, make a great economic and human effort in order to convert successive trends into reality, but the challenge is increasingly greater. The speed of change and the critical mass necessary to address it are growing strongly. The recipe for success has three main ingredients: A significant and constant investment in R&D&I, intercompany collaboration and the conviction that, as the great chef Andoni Luis Aduriz says, "dreams come true, but first they must be dream".



Creating Growth Improving Society

The reason we exist summarised in two dots.

For companies: We walk along with companies in their growth to generate high impact opportunities for the machine-tool industry. And we do so through technological innovation.

For society: Because generating profit for companies only makes sense if it brings value to society and improves people's lives.

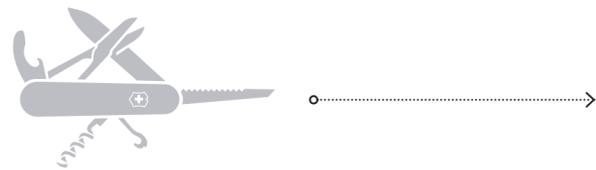
tecnalia.com



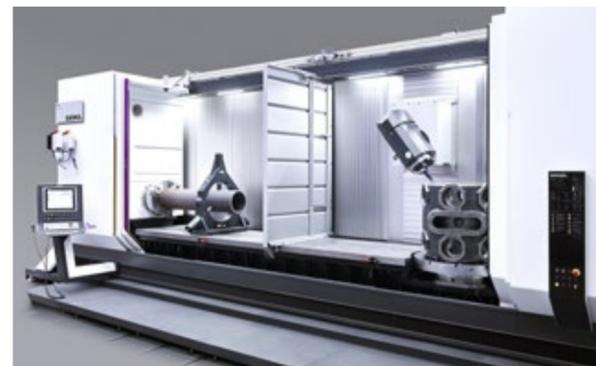
IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

ZVH MULTIPROCESS IN #50 BODY SIZES_ THE SWISS KNIFE OF THE MACHINE TOOL WORLD



Every change entails an opportunity and the new reality demands companies capable of adapting to different jobs at high speed. To do so, they need machines that can provide a wide range of solutions in the same space: work areas that can be transformed into the exact production tool required for a given job at a given time without having to adapt any of their basic architectural features.

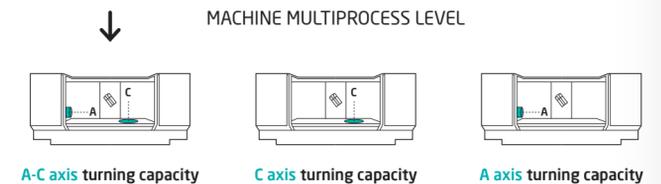
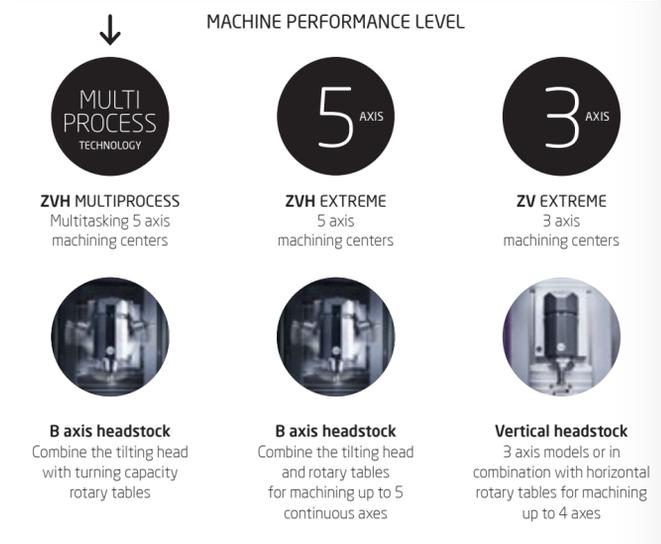
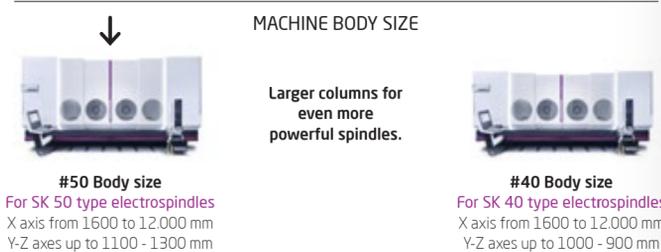


→ FOR A CHANGING ENVIRONMENT

Because the world is undergoing rapid change. The Covid-19 pandemic created a new reality in which travel restrictions made video-conferencing into the most widespread intra- and inter-company communication media, the manufacturing industry is reversing a global trend by bringing outsourced functions back into the company and unexpected events are causing an unusual shortage of raw materials that affects the delivery times of key components and stressing logistics systems to unsuspected limits. In brief, we are doing business in a turbulent environment where numerous companies with competitive strategies based on long-term contracts are now facing instability and

machines designed and built to perform very specialised tasks no longer make sense in the production line. This new reality demands companies capable of adapting quickly to different jobs, which means that they must be provided with highly-versatile machining centres. Fortunately, the solution has a name: ZVH MULTIPROCESS by IBARMIA, 5 axis moving-column machining centers with built-in turning capacity. When we mention the IBARMIA moving-column platform we are talking about the program that embodies the very essence of IBARMIA as a project, the totally customer-oriented approach, which for a large parts hinges on the extremely flexible Z SERIES

MACHINE CONFIGURATION ROUTE



IBARMIA PRODUCT

travelling-column platform that enables configuration of innumerable types of machine on the basis of the same structural components.

That's where our slogan "create your own machine" begins to make sense: highly-technical solutions with great added value 100% adapted to the specific needs of each customer/case.

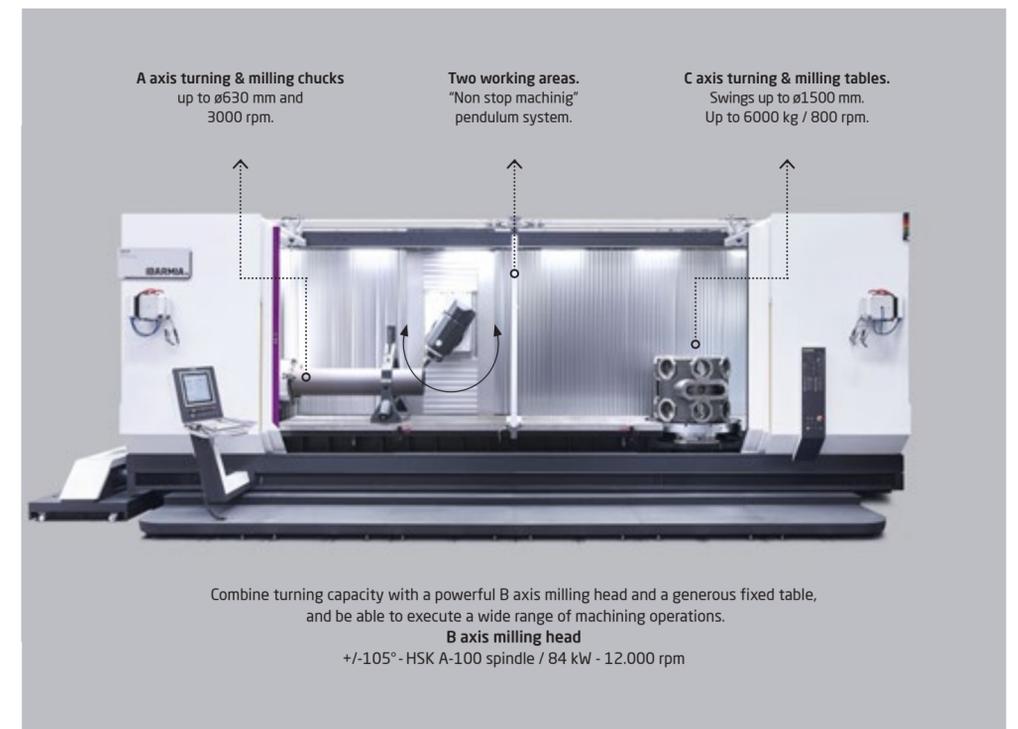
In this respect, the basic features of our travelling-column centres could be summed up in two words: flexibility and versatility. The first enables us to implement the second: in other words, we design and manufacture the machine that best meets the demands of the current socio-economic context.

Flexibility

By flexibility we mean the extremely high configurability of the program: the bed, slide, column and spindle form the basic structure of any IBARMIA moving-column machining center, an architecture on the basis of which you can integrate endless configurable options. If you order a la carte, the structural bodies adapt to the power of the fitted electro-spindle - ISO 40 or ISO 50. Next you can define the longitudinal travel within the range of 1600 to 12.000 mm, no less. You can incorporate a vertical spindle (ZV models) or opt for the powerful continuous B-axis tilting head with torque motor as the 4th axis (ZVH models): this, in the end, is the key element that endows these machining centres with their character and high performance which, in combination with the wide range of rotary worktables available as the 5th axis, enables them to cope with workpieces of countless sizes and geometries.

Multipurpose

Thus, the machines grow in order of complexity and performance to reach the top of the range: ZVH MULTIPROCESS, models that - to cut a long story short - add turning capacity to their working rotary tables. Now that you need a machine for "just about anything", take advantage of the program's flexibility to configure a machine tool that enables you to cover the widest range of machining options. Let's go over the criteria again: It must be able to operate on the widest variety of materials possible, so you choose an ISO 50 spindle drive. The available range of spindle motors provides a perfect balance between torque and power. The choice of worktable is no less critical: it must be large enough to address a wide range of workpiece sizes: single long parts, serial batches, working with coordinate cubes, etc. The range starts at 1600 mm then steps up to 2200 mm, a size that already meets most of your needs. The next longitudinal travel dimension jumps to 3000 mm, after which you can divide the worktable into two separate areas by means of a dividing wall. Let's talk about our "Non-stop machining" option that enables the operator to prepare the workpiece on one of the two separate



areas while the machine is busy milling on the other. If you select 6000 mm of longitudinal travel and add the option of a dividing wall, you get two L 3000 in a single machine.

If you decide to proceed on the "more with less" principle you would decide on a MULTIPROCESS model based on the moving-column structure we mentioned above, adding a B-axis spindle and integrating the lathe function, which can be vertical, horizontal or both at the same time.

The latter is evidently the most versatile of all the options. The program also provides the option of integrating pick-up magazines for changing tools and special spindles. To sum up, you have found a machine tool that is, in fact, several at once. Now put it to work.

Go out and get the contract: whatever the deliverable may be, your ZVH MULTIPROCESS will be capable of producing it. Clamp it to the horizontal rotary chuck and rotate it at high speed for turning operations. Harness the powerful electro-spindle mounted in the head of the B-axis to perform all the required milling and drilling jobs.

What if it happens to be a large-diameter workpiece? Clamp it on the high load-capacity turning table of the vertical axis and rotate it for turning operations, again combining the B-axis spindle for machining

up to 5 continuous axes on the same part in one single workpiece set-up.

Clamp several workpieces onto a tombstone attachment and secure it to the integrated rotary turntable to rotate each face and machine the parts using the B-axis spindle just as you would with a horizontal machining centre.

Avoiding the use of a clamping system that could be cumbersome, harness the high load-capacity fixed table to clamp the parts at your convenience and machine them using the B-axis at various angles.

Install a dividing wall to combine different jobs, increasing productivity because you opt for a machine equipped with an automatic pallet changer. Remove the wall again when you need to use the total worktable area.

It can be adjusted to any order, so you can opt for various jobs that would previously have required specific machines that you may not have had. Do them all on the same machine and in a single workpiece set-up, change quickly from sector to sector, machining different materials with high-torque and high-speed electro-spindles.

In brief, obtain a remarkable improvement in the efficiency of your workshop. Your new machine will reduce the configurations required to tackle a wide variety of jobs, cut

machining times and ease the difficult task of workpiece change-overs.

A leap into the future from a present that demands it.

"IT IS NOT THE STRONGEST OR FASTEST THAT SURVIVES, IT IS THE ONE THAT IS ABLE TO ADAPT BEST TO THE CHANGING ENVIRONMENT IN WHICH IT FINDS ITSELF"

Charles Darwin "Origin of Species"



IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

Travels:

- X: 2200 mm
- Y: 800 mm
- Z: 1100 mm
- B: +/-105°
- C: 360°
- A: 360°

Horizontal multitasking lathe:

- Chuck ø280 mm.
- 1400 kg with tailstock.
- Up to 52 kW / 820 Nm / 2000 rpm

Vertical multitasking lathe:

- Rotary table/plate ø800 mm
- Swing ø1200 mm
- Up to 3000 kg (milling) / 500 rpm
- Milling head**
- B axis tilting head (+/-105°).
- HSK A-100 tool holder.
- 84 kW / 452 Nm / 12.000 rpm.

- Highlights**
- 5 axis machine with vertical and horizontal turning capacity.
- Advanced gear machining functions (skiving-hobbing) valid for straight and helicoidal gears.



A compact single machine that provides a solution for any type of work you may want to catch.

Travels:

- X: 3000 mm
- Y: 1100 mm
- Z: 1300 mm
- B: +/-105°
- C: 360°
- A: 360°

Horizontal multitasking lathe:

- Chuck ø380 mm.
- 3000 kg with tailstock.
- Up to 100 kW / 1800 Nm / 1800 rpm

Vertical multitasking lathe:

- Rotary table/plate ø1200 mm
- Swing ø1500 mm
- Up to 6000 kg (milling) / 500 rpm
- Milling head**
- B axis tilting head (+/-105°).
- HSK A-100 tool holder.
- 84 kW / 452 Nm / 12.000 rpm.

- Highlights**
- 5 axis machine with vertical and horizontal turning capacity.
- Integrated pick up station to hold angular heads.



A multifunctional machine that will be your ally for giving the most flexible response.

Travels:

- X: 6000 mm
- Y: 1000 mm
- Z: 1100 mm
- B: +/-105°
- C: 360°
- A: 360°

Horizontal multitasking lathe:

- Chuck ø380 mm.
- 3000 kg with tailstock.
- Up to 100 kW / 1800 Nm / 1800 rpm

Vertical multitasking lathe:

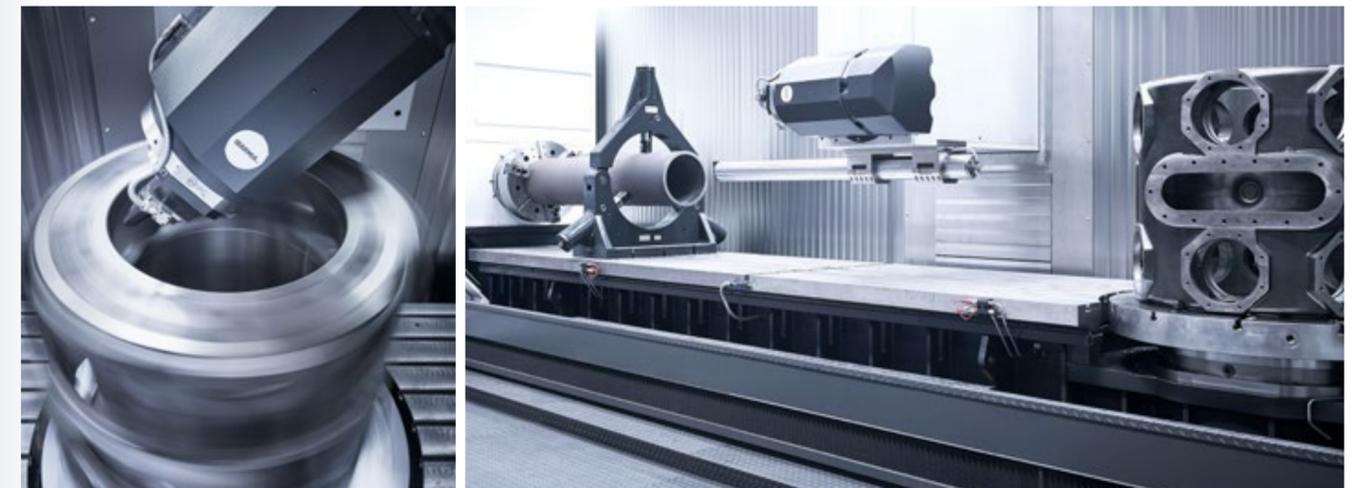
- Rotary table/plate ø1200 mm
- Swing ø1500 mm
- Up to 6000 kg (milling) / 500 rpm
- Milling head**
- B axis tilting head (+/-105°).
- CAPTO C8 tool holder.
- 84 kW / 452 Nm / 12.000 rpm.

- Highlights**
- 5 axis machine with vertical and horizontal turning capacity.
- Integrated pick up station to hold Long Boring Bars for internal turning operations.
- Pendulum working capacity.



Probably, the most flexible set up in the market, integrating vertical & horizontal turning in a 5 axis pendulum working capacity machining center.

IBARMIA PRODUCT



IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS



01 B axis tilting head
Powerful and accurate continuous tilting head with torque motor and direct measuring on the rotary axis. +/-105° tilting range. Electrospindles up to 84 kW - 700 Nm - 12.000 rpm.

02 A axis horizontal turning chucks
• Chuck ø from 180 to 380 mm.
• Max load from 250 to 1500 kg.
• Max speed from 1800 to 3000 rpm.
• Max power from 24 to 78 kW.
• Max torque from 100 to 1400 Nm.

03 C axis vertical turning tables
• Table ø from 525 to 1200 mm.
• Max load from 600 to 6000 kg.
• Max speed from 500 to 800 rpm.
• Max power from 34 to 83 kW.
• Max torque from 324 to 4000 Nm.

04 High load capacity fixed table
for other jobs.



A WHOLE WORKSHOP IN A SINGLE MACHINE

ZVH MULTIPROCESS_ SAMPLE APPLICATIONS



Aerospace compressor housing



Crankshaft



Aeronautical component



Toothed shaft



Pipe support



Landing gear main adapter



David Trabal
FANUC IBERIA
MANAGING DIRECTOR

FANUC & IBARMIA: 28 YEARS OF PARTNERSHIP

We have been working together with Ibarmia for more than 28 years and we are very proud of having been able to collaborate in numerous projects all around the world.

This partnership with a reference Company such as Ibarmia, it is only possible offering the best products and best service and for that, we at FANUC, keep working day by day in a continuous improvement that allows us to offer our customers and partners all they need to be successful in their projects.

In FANUC Headquarter in Japan, new factories have been built to increase our production capacity. In FANUC Europe, we have increased the number of employees, parts stock as and our capability of product repairs. We offer a 99,95% availability for service parts within Europe which helps us to further minimize downtime of your machines. In fact, the MTBF (Mean time between failure) of our CNC is more than 30 years, while the MTBF of our robots is more than 25 years.

We are very happy for having collaborate with Ibarmia in projects that include all Machine models that Ibarmia offers: ZVH, ZV, STAR, T...

In these projects, The application engineers from FANUC have worked side by side with the engineers from Ibarmia for the machines to work optimally. In FANUC, we listen to the needs of our customers and work to give them quick responses through European Development Center in Germany.

All this learning as a result of the close relationship with our customers has allowed us to carry out a continuous evolution of the FANUC products and in the case of CNCs, continue to offer the most advanced technology on the market. Our products evolve with our customer requirements and now we offer a new iHMI which allows a much more easier interaction with the operator.

Anywhere in the world where a Ibarmia Machine is installed, FANUC will offer Service Support to the end customer.

Thanks to the strong relation through the CNC business, a few years ago we also started to collaborate in additional projects including robotization. This is an important added value to the solutions provided by Ibarmia to their customers and allows Ibarmia to offer complete systems. We hope to continue growing together with Ibarmia and will work daily to increase their satisfaction by providing high quality and reliable products, the latest technology, timely delivery and quick service.



THE FACTORY AUTOMATION COMPANY



High-performance machining with FANUC CNC



WWW.FANUC.ES

IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

ZVH 45/L1500 STAR EDITION_ THE WINNING SET-UP FOR A CHANGING MARKET

Companies need flexibility to adapt to the new reality in a context of rapidly-changing market conditions. The ZVH 45/L1500 STAR provides flexibility and capacity in a highly-compact configuration with a wide range of production options. It consists of a machining center that combines safety, ergonomics, advanced technology and communication capacity with a design adapted to the industrial reality that enables you to configure automated solutions.



→ FOR A CHANGING ENVIRONMENT

IBARMIA's extensive experience in moving column machining centres has given rise to the STAR platform - a range of machines designed to respond to the market's main needs. 3, 4 or 5 axes, versatile electro-spindle for milling different materials, various geometries, short or long production runs, compact dimensions to save workshop space and flexibility to mount a variety of rotational or peripheral measuring devices, etc.: in other words, the perfect platform to cover the widest range of milling and boring requirements and options.

The STAR platform enjoys all the advantages of IBARMIA's moving-column architecture: robust, stable construction with the option of placing large workpieces on the table, a powerful, accurate and highly-reliable B-axis, an outstandingly usable work area, exhaustive thermal analysis of the machine to predict behaviour and obtain the highest precision and optimised structural dimensioning are just a few of its most outstanding features. Furthermore, the architecture is based on an exhaustive analysis of the real needs of machine operators in terms of workpiece size, machine travel, working conditions, power consumption, ergonomics, safety, workshop space, machine dimensions, etc.

Market conditions are changing more rapidly than ever before. This means that having a specific machine for every kind of material

and workpiece is no longer an option in most machining factories and workshops and that it is almost as impossible to assume the delays that the delivery times of such specific machinery inevitably entail.

In this new reality, machining companies need standard machines that can be quickly adjusted to the different jobs they are required to perform. Only in this way can the workshop address the enormous range of operations and workpieces that the market demands.

The STAR platform meets this need and the latest addition to its range is the new ZVH 45/L1500 STAR Edition, IBARMIA's most competitive setup:

- SK 40 / HSK A-63.
- 1500 mm (59") of X-axis travel.
- 800 mm (31.49") of Y-axis travel.
- 806 mm (31.73") of Z-axis travel.
- +/-105° B axis continuous tilting head.
- C 360° ø800 mm (31.49").
- 12.000 rpm, 46 kW electrospindle.
- Tool magazine for 60 tools.
- CNC FANUC or HEIDENHAIN.
- 19" touchscreen.

It provides flexibility and capacity in a highly-compact configuration with a wide range of production options if it is integrated into an unattended manufacturing facility.

A HIGHLY-COMPACT MACHINE READY TO BE QUICKLY ADJUSTED TO MANY DIFFERENT REQUIREMENTS

IBARMIA PRODUCT

FLEXIBILITY AND CAPACITY IN A SET-UP THAT OFFERS A WIDE RANGE OF MACHINING POSSIBILITIES



IBARMIA not only provides the machine but can also work with the customer to set up an advanced automated system based on the ZVH 45/L1500 STAR machining centre. The generous accessibility to the work area enables integration of automated systems for inserting/removing the workpieces to improve productivity and manufacturing quality, all of which can be enhanced by synchronizing other manufacturing and measurement processes including pre/post procedures, etc.

Structure

- The moving column concept ensures zero-gravity design: the milling conditions remain constant at all points along the Y-axis.
- Maximum stability and stiffness thanks to the proportionate spacing between guides and the design of the monobloc bed.
- High performance: rapid acceleration and travel on the X / Y / Z-axes on linear guides with runner blocks preloaded with a double row of recirculating ball-bearing units that enable speeds of up to 40 m/min.

B-axis head

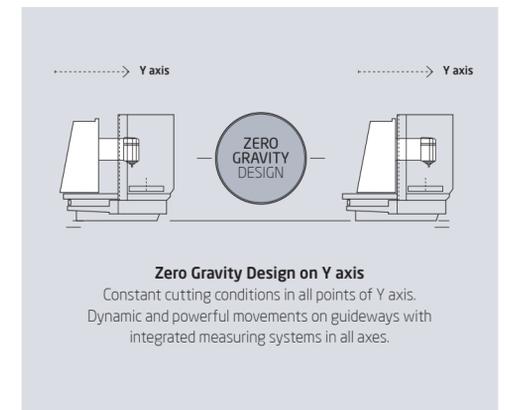
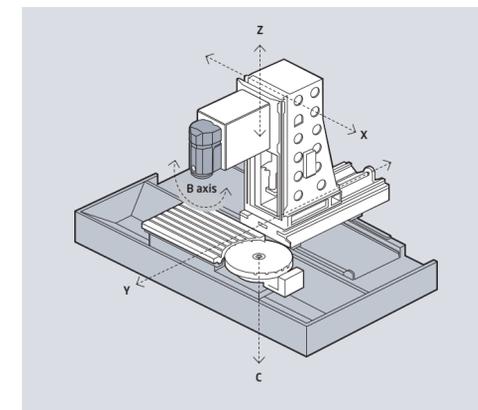
Head swivel range of +/-105°. Transmission by means of a torque motor mounted on the rotary axis itself, incorporating direct measurement on the axis. High performance: automatic recovery after collision and guaranteed precision in both positioning and repeatability.

This is an internationally-recognised, backlash-free direct measurement B-axis system with high-speed rotation and excellent positioning accuracy.

Flexibility

It has the capacity to machine a wide range of shapes and sizes on a variety of materials. Ideal for subcontractors who work in various sectors such as the aerospace, energy, automotive industries, etc.

Its extensive list of standard equipment plus the combination of axes and swivelling tables provide an unlimited working field that ensures efficient return on investment



IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

Accuracy

We have performed a study on heat sources and their influence on dilation of the machine's structural members. This deformation, which is detrimental to positioning accuracy of the tool tip, has been verified and measured.

This machine is endowed with a series of measures to minimise the thermal effect:

- Thermal compensation of the electro-spindle.
- Thermal compensation on the Z-axis on the basis of the temperature of the Y-axis.
- Validation of the compensation laws by finite element models and empirical testing.

Optimised space-occupation design.

An efficient design that enables a milling centre with these travel distances to occupy the least possible workshop space by applying solutions such as keeping the swarf extractor within the machine's plan view dimensions, placing its tanks under the milling table, an ultra-compact 60-unit tool magazine and a compact switchgear cabinet that fits inside the maximum design perimeter.

Automation and digitalization.

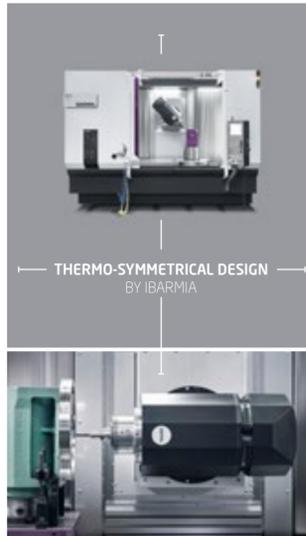
The ZVH 45/L1500 STAR model incorporates all the technological functions available at IBARMIA: autotuning, electro-spindle and linear axis compensation, machining support cycles, etc. It is also equipped with all the connectivity options that enable its status to be monitored at all times to enable comparison of the machine's current fingerprint with its starting status and objective-based process optimisation (cycle time, energy efficiency, tool wear, etc.).

In view of its versatility, this machine is the perfect fit for an automated facility from both the tooling and the workpiece loading/unloading points of view.

An ergonomic design

The design of the STAR 1500 pays special attention to the machines' internal parts and to enhancing the operator's ergonomics and safety. Here at Ibarmia we take these aspects very seriously as hallmarks of quality and regard them as differentiating factors. We have prioritised the ergonomics and operator safety with special emphasis on the excellent accessibility due to the generous front-loading area. The following are the most outstanding aspects:

- Maximized door-opening for the table to allow the operator enough space to load-unload workpieces with the roof open for entry by crane.
- The table-height ergonomics, especially optimised for the workpiece loading and unloading process.
- Well-identified operating controls placed in easily-accessible places.
- Display screens placed at ergonomically-sound heights and swivelling main control panel. Easily and conveniently-operated controls, pushbuttons and keypads.

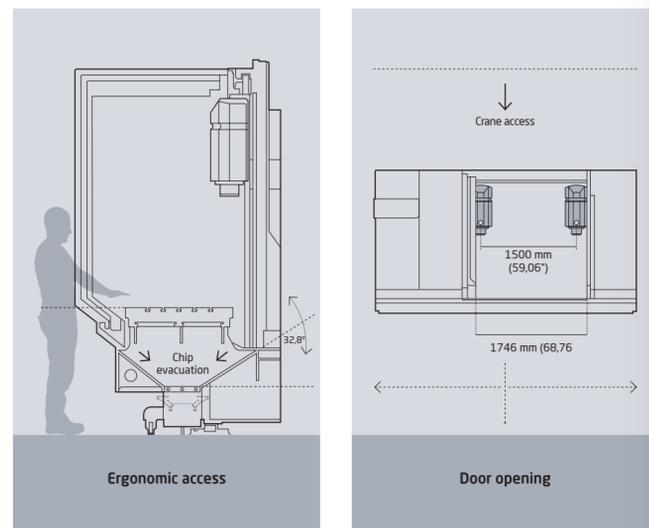
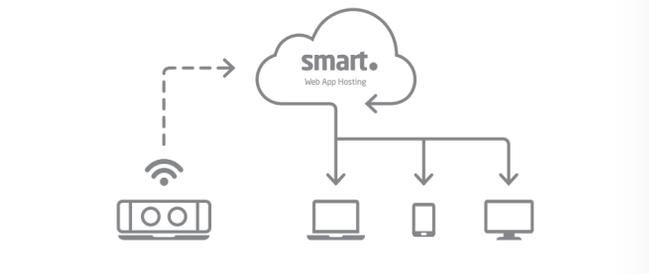
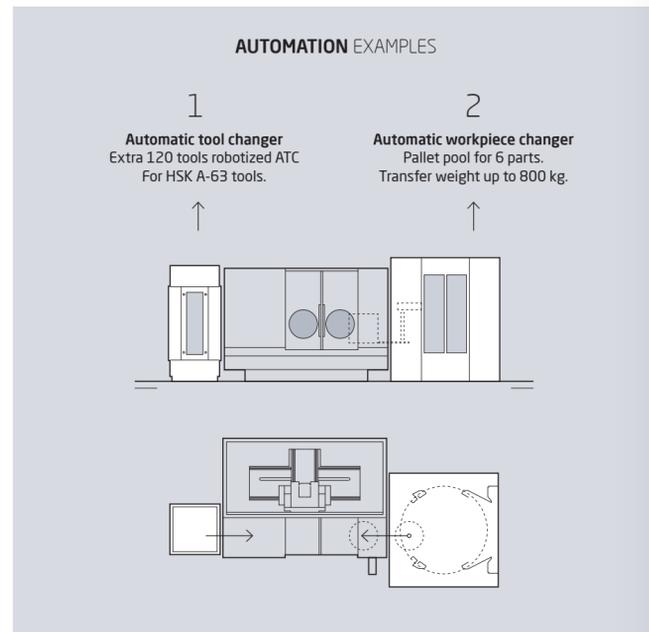


Up to 50% improvement in thermal accuracy

Thanks to the Machine design by FEM method



- Machining area equipped with two lamps that ensure 500 lux at the tool tip. Lamp in the ATC to ensure adequate lighting for maintenance tasks.
- Scheduled maintenance facilities grouped together on the outside of the machine at an easily-accessible height to enable the operator to check the required points with ease.
- Compact design that enables operator control all the machine's parameters. The swarf outlet orifice and the swarf chute to the basket are practically next to the control



IBARMIA PRODUCT



SUSTAINABLE MACHINE DESIGN CONCEPT

panel. In addition to the large windows for process control, the operator has the machine's main parts and processes within his/her field of vision.

- The machine's status is indicated by an illuminated column and acoustic warning signals.
- The option automating door-opening for cases with very high use frequency or special applications.

The use of ecodesign principles to reduce the machine's environmental impact.

Integration of ecological aspects in the design phase enables us to focus resources where they will have the greatest effect, and the use phase becomes even more important in the case of the STAR 1500, the smallest and lightest machine in our manufacturing range. We are able to assess the influence of the improvements we have implemented by calculating the environmental impact of the machine throughout its life cycle as follows:

- Manufacturing and assembly accounts for approximately 10-15% of the total environmental impact of the life cycle depending on the type of machine.

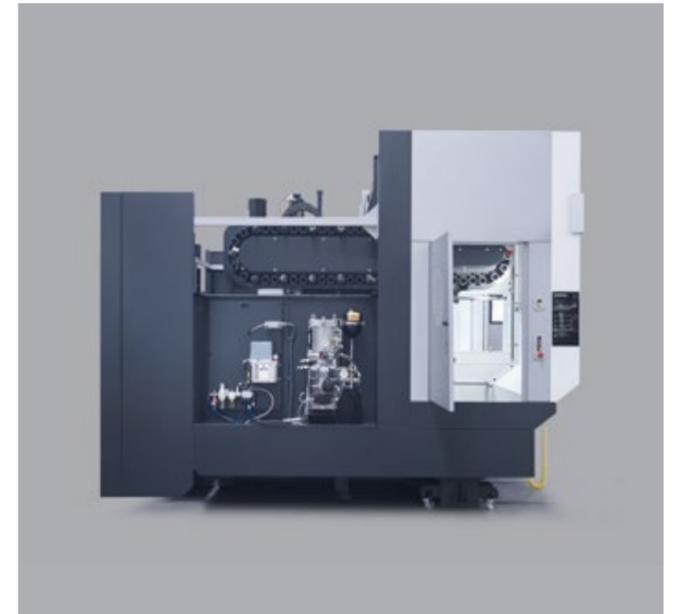
In the case of the STAR, the design of the structural members is highly optimised and oriented to the real applications in which the machine will subsequently be engaged.

- The transport or distribution phase can have an impact of up to 3-7% of the total in the event of sea transport to a country such as India or China.

We avoid land and sea transport and obtain a reduction in packaging for contracts in the Chinese market thanks to local



A HIGHLY USER CENTERED MACHINE DESIGNED TO MINIMIZE IT'S ECOLOGICAL FOOTPRINT



manufacturing of the STAR 1500 model in our plant in that country. In these cases the impact of transport is considerably lower.

- However, the impact is particularly high in the usage phase which accounts for 85-90% of the total. Consumption of electric power is by far the most influential factor.

Any reduction in electrical consumption has two facets: one is the purely environmental aspect and the other the economic aspect for the customer, even more so in the current context of runaway energy costs.

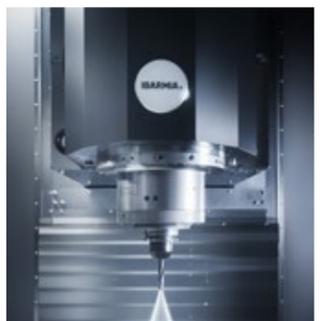
The STAR 1500 has a static magazine (it does not move with the trolley) which means that it represents a weight that does not have to be moved and therefore reduces the energy demand compared to other machines. This has an obvious impact on the machine's use phase by reducing the power consumption.

Moreover, the transmission systems are dimensioned in line with the workload and materials that the machine will be required to process, thus increasing the efficiency of the its performance dynamics.

- Recycling or the end-of-life phase has the opposite effect, contributing a positive impact of roughly 7%.

It is equipped with sensors to detect abnormal functioning of the electro-spindle, monitor the passage of bearing lube oil and monitor bearing temperature in order to extend the life of the components.

Furthermore, IBARMIA provides a wide range of options designed to reduce the environmental impact of its machines and we have incorporated a good number of these for major customers.



We support the European Initiative "Blue Competence" which gathers companies sensible about the environment.



IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

T SERIES THE NEW GENERATION OF T12 AND T16 MACHINE MODELS

The IBARMIA philosophy embraces the concepts of product improvement, high added value technology and the ability to develop tailor-made projects according to the customer's specific needs. Therefore, with the aim of tackling the markets by providing an upgraded solution for today's most demanding applications and processes, the New Release of the T12 and T16 models has emerged.



→ FOR A DEMANDING ENVIRONMENT

The range of the T-Series consists of 5-axis universal machining centres with turning diameters up to ø3600, diverse automatic pallet changer solutions and multiple customization options. This range of machines allows large part turning or processing in a single setup. Additionally, high productivity and precision are guaranteed by the multifunction technology and diverse machine automation options.

The T-Series owes its name to the T shape of the machine bed. The column moves along the top side while the rotary table moves on the vertical line. The column, bed and spindle head are made of steel which provides great rigidity and stability due to the well-studied nervure and thermal treatment applied. Additionally, the housing of the rotary table and milling spindle is made of cast iron. All the structural elements are designed applying the Finite Element Method studies and manufactured following rigorous quality standards. The chip evacuation system is located on both sides of the bed which guarantees an efficient chip removal. Finally, the total closing of the working area with steel protections and an attractive design covering the roof leads to an outstanding machine design and performance.

All Ibarmia T Series models can be conceived as T Multiprocess or T Extreme versions. Additionally, the series can be configured with Universal B axis heads with a rotation

plane at 45° (THC Headstock) or an A axis forkhead for negative angle machining (THR Headstock).

Regarding the diverse automation systems, T12 and T16 models can be fully automated with a self-designed Rotopallet or with a high-capacity Pallet Pool. However, bigger machines models, T22 T30 and T36, are automated with an in-house developed Automatic Pallet Changer with a maximum weight on pallet from 6 t to 12 t.

Among T-Series we highlight the multi-purpose T12 and T16 machine models with Rotopallet. A compact solution to process parts up to ø1600 swing and 6 t weight. The Rotopallet consists of a quick pallet change system executed by a double fork in the machine front. This increases the autonomy and production by considerably minimizing the floor space. While one of the parts is being machined the operator prepares the subsequent part reducing all the set-up times. This loading position can also be turned manually for a more ergonomic access to the workpiece.

Nowadays, in hand with the machine automatization systems, the machining cycle time of each part to be machined is becoming more and more important in multiple workshops. In various industries, every second counts and can lead to a great loss of money if the machining times are not optimized.

T SERIES_ NEW WORKING VOLUME

T12 → Max piece, NOW
ø 1250 mm
h 1600 mm
Max load
4500 kg

T16 → Max piece, NOW
ø 1600 mm
h 1700 mm
Max load
6000 kg

T22 Max piece
ø 2200 mm
h 1750 mm
Max load
10.000 kg

T30 Max piece
ø 3000 mm
h 1950 mm
Max load
20.000 kg

T36 Max piece
ø 3600 mm
h 2150 mm
Max load
25.000 kg

T SERIES_ HEADSTOCK AVAILABE

IBARMIA can provide two types of spindle heads to adapt the machine to specific jobs.



THC_ B axis head
Maintain the same tool center point across the full range.
-15°/+195°



THR_ A axis head
Fork type spindle head ideal for machining negative angles.
-45°/+135°

Continuous milling heads with torque motor and direct measuring on the rotary axis.

T SERIES_ MODELS AVAILABE

The T SERIES program offers two levels of performance for the mosy demanding jobs.



T MULTIPROCESS

Universal machining center for 5-axis vertical milling and turning operations.



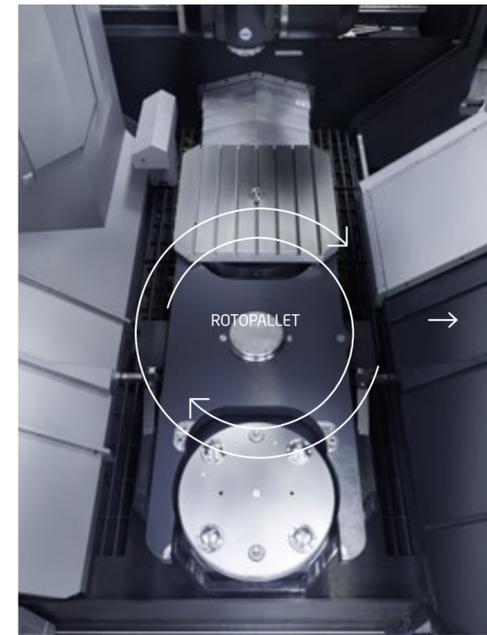
T EXTREME

Universal machining centres for 5-axis-5-sided milling operations.

IBARMIA PRODUCT

The T12 and T16 machine models stand out for their high load capacity and their high adaptability to special requirements. In this New Release, pushed by markets/processes demands, the machine dynamics have been increased and several features have been upgraded, designing a machine that is Ready For Reality. With this new generation of T12 and T16 models, IBARMIA will position alongside the giants of the machine tool industry providing a product of high technological value, top performance and competitive price.

THE T12 AND T16 MODELS HAVE BEEN RENEWED AND FURTHER UPGRADED BEING ADAPTED TO THE CURRENT PROCESSING



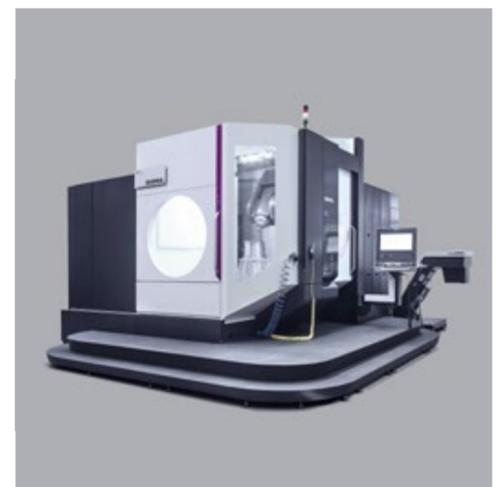
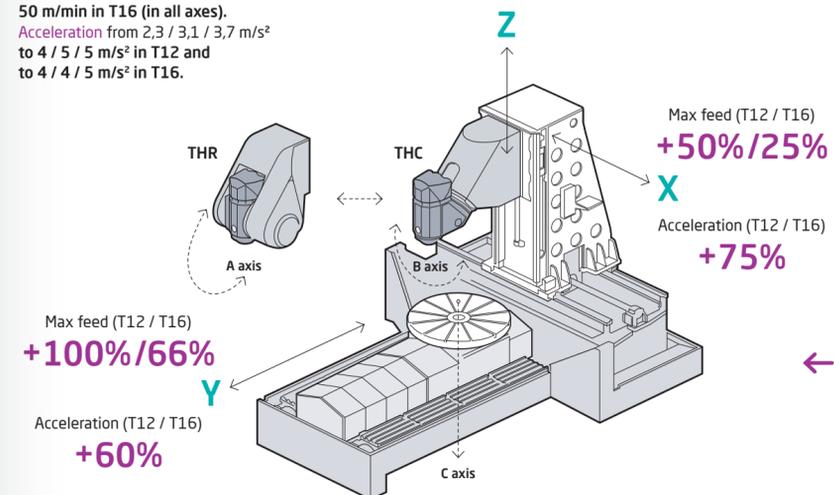
Rotopallet APC system for T12 & T16
A rotary double fork device on the frontside of the machine makes a quick change of two pallets.



T12 & T16 MODELS_ DYNAMIC UPGRADE OF THE LINEAR AXES

• X / Y / Z axes
Max feed from 40 / 30 / 40 m/min to 60 m/min in T12 and 50 m/min in T16 (in all axes).
Acceleration from 2,3 / 3,1 / 3,7 m/s² to 4 / 5 / 5 m/s² in T12 and to 4 / 4 / 5 m/s² in T16.

Max feed (T12 / T16) **+50%/25%** Acceleration (T12 / T16) **+35%**



The dynamic upgrade of the linear X-Y-Z feed axes is based on a complete redesign of the kinematic chain with the aim of achieving feed speeds of up to 60 m/min on the T12 model and 50 m/min on the T16 model. Through the use of more powerful motors in a direct drive transmission, the accelerations are increased up to 4, 5, 5 m/s² on the X-Y-Z axes accordingly.

This dynamic enhancement also includes additional cooling measures on the standard machine equipment, while the optional thermal package further improves the machine's performance and precision requirements. The dynamic structural stiffness of the machine has been optimized

IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

by means of Finite Element Method studies and the control parameters have been tweaked in the tune-up phase to achieve a refined and precise machine performance. All these upgrades are available for the diverse control platforms.

The second main improvement focuses on the machine rotary table. The current Multiprocess models are equipped with direct-drive rotary tables with a high turning capacity of 2250 kg at a maximum speed of 500 rpm in T12 model. In this New Release, in order to provide more dynamics without losing the load capacity, the Extreme version of machines will also include Direct Drive Technology rotary tables based on the 800x800 and 1000x1000 standard tables. For the T12 model, the rated speed has been increased to 20 rpm with a load of 4 tons and 35 rpm with a load of 2 tons. The maximum speed can be up to 50 rpm on the T12 model and 40 rpm on the T16 model.

In addition to the improved dynamic performance, the torque motor technology offers several advantages compared to the mechanical transmissions. In particular, the zero-torque backlash during clockwise and counterclockwise rotation, the zero wear to the transmission and the lack of damage in case of collision can be considered as important benefits.

Furthermore, based on the 60-positions standard chain tool magazine the tool maximum length has been increased from 450 mm to 600 mm. In addition, the tool change process has been optimized to minimize the dwell times. Moreover, further improvements have been incorporated to the globoidal change cam box and the tool change door opening-closing system has been redesigned. These actions result in a chip-to-chip tool change time of 7 seconds for the T12 model and 8 seconds for T16 model.

To maximise the working volume, on the T12 model the maximum turning diameter has been increased up to 1250 mm, the maximum workpiece height has been extended from 1250 mm to 1600 mm and the Y-axis travel has been enlarged till 1300 mm in the standard version. However, on the T16 model, the maximum workpiece height is increased from 1450 mm to 1700 mm and the Y-axis travel is enlarged from 1300 mm to 1600 mm. In addition, the positioning accuracy performance has been improved resulting in a 6 µm positioning error with a repeatability of 5 µm under controlled thermal conditions.

In short, IBARMIA'S T12 and T16 models have been renewed and further upgraded being adapted to the current processing tendencies and the new market demands. Coupled with the Rotopallet solution and the upgrades of the New Release the new generation of T12 and T16 machines are standing as a strong machine-tool alternative in terms of performance, technology and quality.



T12 & T16 EXTREME Rotary tables
Now with Direct Drive Technology

Machining capacity and dynamics in a single rotary table design.

T12 & T16 MODELS DYNAMIC UPGRADE OF THE EXTREME MODELS ROTARY TABLES

Nominal speed from 1,5 rpm to 35 rpm in T12 and 30 rpm in T16
Maximum speed from 8 rpm to 50 rpm in T12 and 40 rpm in T16



T12 & T16
Tool max Length, from 450 to 600 mm
+35%

T12 & T16
Tool Change Time (Chip to Chip) now
7s & 8s

Tool change time upgrade project:

- Servo-driven tool change arm possible.
- Improved door opening and closing system.
- Tool change according to length and weight possible.



Bernhard Aicher
DR. JOHANNES HEIDENHAIN GMBH
CNC CONTROLS
SENIOR PRODUCT MANAGER

OCM: THE NEXT GENERATION IN TROCHOIDAL MILLING

What if you could apply the performance benefits of trochoidal milling to a much wider spectrum of machining tasks? Discover the Optimized Contour Milling (OCM) function for HEIDENHAIN TNC controls. OCM shortens your machining time and mitigates tool wear for milling any pocket or island. You can conveniently program OCM right on your control.

With Optimized Contour Milling, HEIDENHAIN has created an algorithm for TNC controls that applies the trochoidal milling concept to a much wider range of machining tasks. OCM calculates the optimal tool paths for open and closed pockets or islands of any shape. It also includes cycles for finishing workpiece floors and side walls.

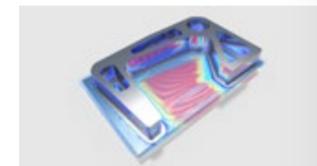
Mill using the entire edge and consistent cutting conditions.

Like trochoidal milling, OCM limits the wrap angle and permits milling along the entire cutting edge. As with other HEIDENHAIN functions, the user can program OCM contours directly on the TNC control. The control then automatically calculates the best tool paths for ensuring consistent cutting conditions. Because machining is performed with optimal cutting data, machining speeds increase dramatically and the rate of tool wear drops noticeably.

Impressive results by comparison

To test the performance of this new milling strategy, we milled a 1.4104 stainless steel demonstration piece with an island and various pockets. The island itself contained four differently shaped pockets. The original blank measured 250 mm x 150 mm x 30 mm, and the milling depth on all sides was 22 mm, performed by a carbide end mill (diameter: 10 mm, cutter length: 22 mm).

Thanks to OCM's optimal tool paths, the conventional 5.5 mm infeed could be increased to the full pocket depth of 22 mm. The cutting speed increased from 157 m/min to 251 m/min, and the feed rate per tooth rose by 0.06 mm to 0.15 mm. As a result, OCM lowered the overall machining time by a factor of three in contrast with conventional milling strategies, from 21:35 minutes down to just 6:59 minutes.



HEIDENHAIN

HEIDENHAIN

+

TNC 640

El control numérico inteligente totalmente equipado

El TNC 640 de HEIDENHAIN ofrece todas las funciones para el mecanizado completo. Incluye ciclos de fresado, taladrado, rectificado, torneado, y ciclos especiales de torneado por interpolación y hobbing. Programe estas tecnologías de forma sencilla e intuitiva con funciones Klartext y ciclos. Al mecanizar, el perfecto control de movimiento

del TNC 640 y opciones como OCM para calcular la estrategia óptima de fresado trocoidal garantizan óptimos resultados en el mínimo tiempo. Para lograr estos resultados de forma fiable y segura, la monitorización dinámica de colisiones DCM protege contra daños en la máquina y tiempos muertos.

Descubra las potentes funciones

www.heidenhain.com/tnc640

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www.farresa.es

FARRESA ELECTRONICA S.A.

www.farresa.es

IBARMIA PRODUCT



Latest technology electrospindles
 High dynamics and powerful spindles
 up to 84 kW, 12.000 rpm, 700 Nm. →



Engine compressor housing



Double helical gear



Impeller shaft



Ram Bop

T MULTIPROCESS_Multitasking concept
 High dynamics and accurate positioning tables for turning and milling advanced operations. Up to 500 rpm in T12 and T16 models; up to 4500 kg- 2250 kg (milling-turning) in T12 and 6000 kg-3000 kg in T16.
 The MULTIPROCESS technology combines the following processes in one machine: turning, milling, drilling, grinding, tapping, advanced gear machining (skiving-hobbing) and boring.

T MULTIPROCESS / EXTREME_SAMPLE APPLICATIONS



Fluid end



Engine block



Impeller



Industrial mold

T EXTREME_5 axis advanced machining
 Machining up to 5 continuous axes in one clamping, combining tilting heads with heavy load capacity and high dynamics rotary tables, now with Direct Drive Technology in T12 and T16 EXTREME models.

IBARMIA PRODUCT

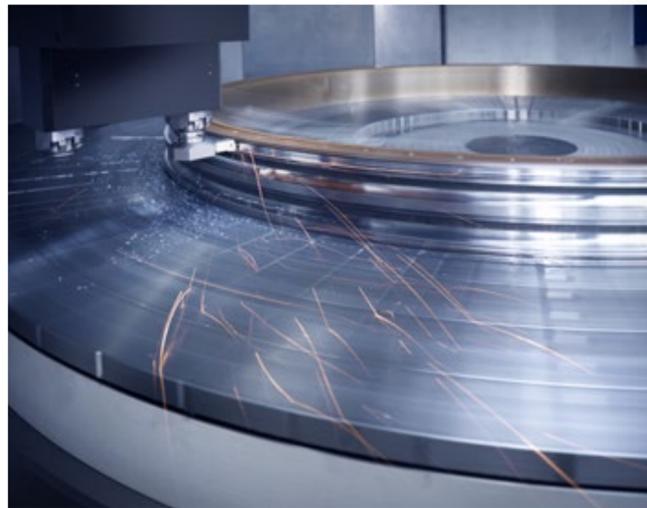
ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

CLD MULTIPROCESS_ THE WINNING HORSE FOR THE ONE MILLION€ RACE

Currently, the wind sector's main demand is focused on the construction of OFFSHORE wind farms. The construction of these offshore wind farms, however, has been faced with several technical issues, principally that of having a better guaranteed wind flow and the potential to construct increasingly large wind turbines which allow more kinematic energy to be converted into electrical energy per rotor turn.



→ FOR A THRIVING ENVIRONMENT



Also focus on the design of increasingly large wind turbines. Although the majority of them are in the prototype approval phase, some have already started to install a new generation of wind turbines of up to 15 MW, with 250 m rotor diameter and 120 m blade length. Each manufacturer launches their model with performance features that aim to outperform its competitors.

The manufacture of large wind turbines is directly linked to the need to manufacture large components, such as the flanges and bearings. C SERIES is IBARMIA's main proposal as a complete solution for the machining of flanges (for the construction of wind towers) and bearings (for controlling the rotation of the blades, nacelle and rotor), with technical solutions for carrying out the operations of turning, drilling, threading, boring, milling, hard turning and/or grinding of these types of parts.

Today, this machine family is dimensioned for the machining of flanges of up to 8 m in diameter and bearings of up to 6.5 m in diameter.

But the real need of the market, given this new demand for mega wind turbines, is evolving to require flanges of up to 11 m in diameter.

The machining of flanges of up to 11 m in diameter is quite a challenge, both in design and in performance, in terms of the machinery necessary for completing the machining phase. Within the machining phase, there are two main operations: turning and drilling. Don't forget that at these dimensions the gross weight of a flange can reach up to 40-50 Tn and, to achieve the final product, roughly 85% of the material must be removed. Of this 85% of the material, approximately 90% is removed during the turning operation and 10% during the drilling operation.

IBARMIA PRODUCT

Flange turning

The main requirements in the turning phase are: the handling of the gross weight of the flange as well as the swarf removal. To manage the weight, the lathe must have a turning head that combines the capacity to support heavy weights and at the same time be capable of rotating at the necessary speed to apply the ideal cutting conditions. As regards management of the swarf, the volume to remove is considerable, as many tonnes are involved which must be cleanly and constantly extracted to prevent long machine stoppages for cleaning.

Flange drilling

The main requirement is the maximum drilling capacity and the availability of angle heads. For flanges of up to 11 m in diameter, drilling operations of up to 120 mm diameter are required for fixing holes (between 150 and 200 operations per flange). Nowadays, the larger diameter flanges require M90 fixing bolts for which holes of at least 100 mm diameter must be made. As regards the maximum metrics to implement on the flange, an M55 maximum is established. The new aspect is the need, in addition to the usual vertical operations (principally for the fixing and manipulation of the flange), for horizontal operations (earth connections, fixing of stairways, etc.) for which the machine must be equipped with angle heads, unusual up until now in the world of the flange.

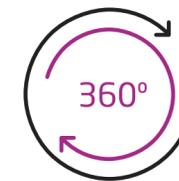
CLD MULTIPROCESS

With these new flange and bearing dimensions, we are faced with a new scenario in the design of future production plants. For occupational and plant space reasons, everything points to a change of trend and a reassessment of production in the sector: moving from the usual drill/ratio of 1:3 to a multifunction machine in which all the processes can be completed in the smallest number of clampings possible. A reduction in the number of clampings has a direct impact on quality, deadlines and production costs.

Faced with this new virtual market opportunity, IBARMIA is placing its own bet with the CLD MULTIFUNCTION model, a winning horse. A machine developed in collaboration with the principal world leaders in the sector. A flexible technical solution capable of adapting to production needs according to work peaks. A solution capable of combining, in a single work centre, the solutions for practically all the required machining processes (turning, drilling, thread cutting, boring, milling, hard turning and grinding) all customisable on demand, thus reducing the number of machines and clampings necessary in the manufacture of flanges and bearings:

- Rough turning - Horizontal drilling/thread cutting and boring - Finish turning - Vertical drilling/thread cutting and boring - Milling - Straight head grinding - Fork head grinding - Hard turning.

A MACHINE CONFIGURED TO ACCOMMODATE ALL THE PROCESSES REQUIRED IN THE COMPLETE MACHINING OF LARGE CIRCULAR PIECES



The finishing operations in this type of pieces are critical and reducing the number of set-ups avoiding errors is vital. This new range of multifunction centers, integrating live spindles into the RAMs and interchangeable head system has been designed to respond to real market needs.

RAM TYPES



RAM 1
With fixed turning turret



RAM 2
With live spindle

Sizes: 320x320 and 400x400 mm
Travels: 600-1500 mm

INTERCHANGEABLE HEADS



Turning heads
Various configurations available



Angular head
RAM with live spindle is required

Live spindles combined with interchangeable heads
Turning, Milling, Drilling, Threading, Boring and Grinding operations in only one set up.



Straight grinding head
RAM with live spindle is required



Fork grinding head
Working range +/-95°



Live Spindles integrated inside the RAMs are a key element, both as the direct solution to vertical milling, drilling, threading or boring operations and transmission element to drilling and grinding interchangeable heads.



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

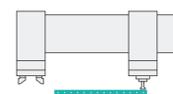
Using the angular head, the horizontal Plug & Grease Holes are drilled or tapped, both with in-out or out-in operations.



2

Vertical Drilling / Tapping

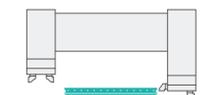
Using the RAM with live spindle, the Fixing & Lifting Holes are drilled and tapped.



3

Turning (2)

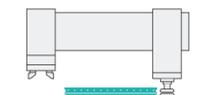
The turning heads are used to machine the Ball Bearing Races.



4

Grinding or Hard Turning

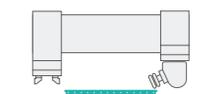
The Straight grinding Head will then grind the Ball Bearings Races.



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



IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

CPD DRILLING SOLUTIONS

In 2005, IBARMIA developed a machine that revolutionised the market and became the supplier of the main flange and bearing manufacturers at a global level. The new generation of drilling centers can be equipped with different tooling and magazine options. The two head configuration (for drilling/thread cutting and milling operations) is available in 3 versions: V CLASSIC, V EXTREME and H EXTREME.

- V CLASSIC, vertical head with main transmission by means of belt-pulley.
- V EXTREME, vertical head with main transmission by means of a powerful electrospindle of 500 Nm and 7000 rpm.
- H EXTREME, is the main innovation introduced in CPD drilling centres. The successful tilting head used in the Z SERIES is applied to the CPD model as an smart solution for covering the demand of horizontal operations (external-internal / internal-external) principally for the bearing manufacturers, at the same time as ensuring the execution of the traditional vertical operations. The tilting head helps to reduce the machining cycle times as well as the number of clampings. A reduction in the number of clampings has an impact on the quality of the workpieces and machining times.



V Classic
Vertical head with belt & pulley transmission



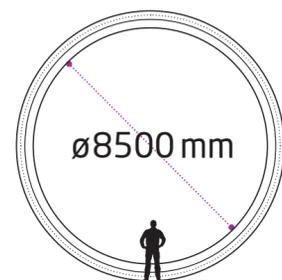
V Extreme
Vertical head with electrospindle transmission



H Extreme
B axis continuous tilting head with electrospindle transmission



MACHINES IN PORTAL ARCHITECTURE TO COVER ANY RANGE OF WORK FROM THE CENTER OF THE TABLE TO A MAXIMUM DIAMETER:



Yürki-Erik Voss
SIEMENS MTS DIVISION
SALES MANAGER

SINUMERIK. 60 YEARS WITH ONE, THE DIGITAL NATIVE CNC.

Siemens has just celebrated 60 years of CNC control. When looking back, many things have changed over these years, where the functionality takes most relevance. From the first very basic controls – from our today's perspective – towards approximately 30 years to first full digital controls like 840D powerline and 840D solution line. And, of course, intermediate milestones like ShopMill or ShopTurn, the first programming interfaces that allowed to interact in a graphical way directly with the machine without using G-code.

But the latest and greatest news is the introduction of SINUMERIK ONE, the first digital native CNC offering a lot more opportunities for the future. SINUMERIK ONE stands for the digital twin, as we have coded the digital twin directly into the heart of it, allowing in a way never seen before, to simulate the product and the production process with an unrivaled accuracy. We use the same code for simulation that will be in the physical machine later on. This, of course, offers a huge advantage about optimization and productivity, both for manufacturers and machine operators. The digital twin allows to simulate the part -the part program itself-, to optimize it cycle-timewise and quality-wise, so, at the time you first touch the machine, you have a readymade NC program that need a lot less setup time, less time to produce a part and to bring the whole production process up to speed. In the end, it's all about productivity gains. And on the other side, beyond SINUMERIK ONE, digitalization for Siemens is of course our products around SINUMERIK Edge, allowing high speed interfaces into the control, adding functionality without burdening the control, connecting the machines to the cloud, and by that, gaining a transparency, that allows optimization of the whole production setup. But these 60 years of exiting journey, wouldn't have been possible if we couldn't have implemented all these innovations in our own production facilities. Today, we use all these different elements of digitalization based on SINUMERIK in our factories like Bad Neustadt or Tuebingen, not only to gain productivity ourselves but also ensure that what we sell really works. From these lines, I take the opportunity, dear iNews reader, to invite you there and show what works and probably doesn't work, to share experiences, and by that help you to learn from the mistakes we made, to benefit from what we generated already, and to provide us the opportunity to get your feedback and to improve for the sake of the next 60 years of SINUMERIK to come.



SINUMERIK ONE The beginning of a new era

[siemens.com/sinumerik-one](https://www.siemens.com/sinumerik-one)

The CNC system is revolutionizing everything that came before. All it takes is a small spark to set great things in motion. When you think about machine tools in the future, you will be thinking about machine tools "plus X". "Plus X" is what digitalization brings to your machines in order to implement previously unimagined possibilities, ideas, and business models. **SINUMERIK ONE** delivers "plus X." The virtual and real worlds working seamlessly together allows you to easily implement innovations.

SINUMERIK ONE, the digital native CNC, brings your ideas to life.

More information on our website. Use the attached Bidi code.



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- modular spindles with high power density
- special-purpose solutions electrical drive technology
- compact and highly dynamic 2-axis heads
- fast, efficient and professional service support worldwide



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BIEMH

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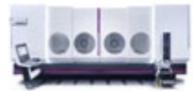
Z SERIES
MOVING COLUMN
MACHINING
CENTERS



For the largest variety of sizes and shapes, pendulum work and swing up to ø2000 mm, unlimited flexibility makes this platform a must have for any machine shop.

MACHINE CONFIGURATION ROUTE

01 CONSTRUCTION SIZES



#40 Body size
For SK 40 type electrospindles
X axis from 1600 to 12.000 mm
Y-Z axes up to 1000 - 900 mm



#50 Body size
For SK 50 type electrospindles
X axis from 1600 to 12.000 mm
Y-Z axes up to 1100 - 1300 mm

02 HEADSTOCKS

B axis tilting head with torque motor and direct measuring on the rotary axis. High dynamic and powerful electrospindles available.



ZVH
B axis headstock
Continuous tilting head
Range: +/-105°



ZV
Vertical headstock
High dynamics spindle
up to 20.000 rpm

03 MACHINE PERFORMANCE LEVEL



MULTI PROCESS TECHNOLOGY
ZVH MULTIPROCESS
Multitasking 5 axis machining centers



5 AXIS
ZVH EXTREME
5 axis machining centers



3 AXIS
ZV EXTREME
3 axis machining centers

Combine the B axis tilting head with turning capacity rotary tables (ZVH MULTIPROCESS), or with the wide range of rotary tables available for machining up to 5 axis (ZVH EXTREME). Machine up to 4 axis by using a vertical head combined with horizontal rotary tables (ZV EXTREME).

IBARMIA ADAPTS THE MACHINE TO YOUR SPECIFIC REQUIREMENTS

Our range of machines is designed to cover the widest range of production requirements either in standard configurations and personalised solutions.

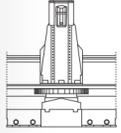
T SERIES
5 AXIS UNIVERSAL
MACHINING
CENTERS



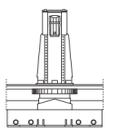
Universal machining centers for 5 axis machining of big diameter parts focused on high productivity by integrating multitasking technology and automation systems.

MACHINE CONFIGURATION ROUTE

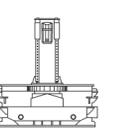
01 CONSTRUCTION SIZES (max swing / piece max height)



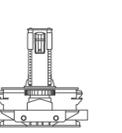
ø 3600 mm
h 2150 mm
T36



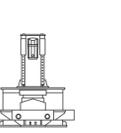
ø 3000 mm
h 1950 mm
T30



ø 2200 mm
h 1750 mm
T22



ø 1600 mm
h 1700 mm
T16



ø 1250 mm
h 1600 mm
T12

02 HEADSTOCKS

Powerful tilting heads with torque motor and direct measuring systems on the rotary axis. Up to 84 kW-12.000 rpm.



THC
B axis headstock
Continuous tilting head
Range: -15°/+195°



THR
A axis headstock
Continuous tilting head
Range: -45°/+135°

03 MACHINE PERFORMANCE LEVEL



MULTI PROCESS TECHNOLOGY
T MULTIPROCESS
Multitasking 5 axis universal machining centers



5 AXIS
T EXTREME
5 axis universal machining centers

B or A axis continuous tilting heads available in combination with high load capacity turning plates or rotary tables (T MULTIPROCESS or T EXTREME) for 5 axis machining of big diameter complex parts.

C SERIES
MACHINING
SOLUTIONS FOR
LARGE RINGS



Machine program that offers integral solutions (machines and fixturing devices) for the complete machining of large flanges and bearings up to ø8500 mm

CONFIGURATION ROUTE BY MACHINE TIPOLOGIES

01 TURNING CENTERS



Turning centers in portal structure for covering any range of work from the center of the table to maximum diameter ø8500 mm

01 DRILLING CENTERS



Drilling centers in portal structure for covering any range of work from the center of the table to maximum diameter ø8000 mm

02 HEADSTOCKS



RAM
With live spindle for drilling, tapping milling operations



RAM
Fixed turning turrets in various configurations



V Classic / Extreme
Vertical heads Belt & Pulley or electrospindle



H Extreme
B axis headstock with electrospindle

03 MACHINE PERFORMANCE LEVEL

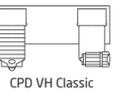


MULTI PROCESS TECHNOLOGY
CLD MULTIPROCESS
Multitasking vertical turning centers

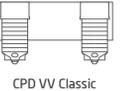


-V- LATHE TECHNOLOGY
CLD EXTREME
Vertical turning centers

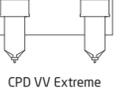
Performance level depending on heads combination



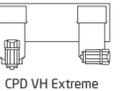
CPD VH Classic



CPD VV Classic



CPD VV Extreme



CPD VH Extreme



CPD HH Extreme

Multitasking machines by integrating live spindles into the RAMs (CLD MULTIPROCESS) or vertical lathes that can be equipped with interchangeable turning turrets (CLD EXTREME).

IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

AUTOMATION PORTFOLIO_ IN IBARMIA MACHINE PROGRAMS



Manufacturing more, doing it better and investing less time in the processes is summarised as an improvement in production efficiency, an essential requirement to keep meeting the challenges imposed by today's market and for which industrial automation is a key factor.

Events such as digitalisation and Industry 4.0 are phenomena that were already on the way of course, before we decided to narrow them down and specifically label them. Whether the current situation has been imposed out of necessity or necessity has resulted from the current situation, the truth is we are being peppered with concepts derived from commercial and or political interests (which amount to the same thing), whose meeting with day-to-day reality is more diffuse than it may first appear.

On the road towards these new paradigms, it turns out that some were already on the way, some wanted to set off but did not find the way to do it, and lastly, those whose need were rather relative. In summary, a complete amalgam of realities.

Objectively, however, all around is compressed and tense; we are growing in number... and needs whose satisfaction requires extreme competitiveness and imposes, in turn, a pace on all the processes never known before. Thus, although the map of industrial realities is widely varied, it is undeniable that the fact of having to do more, better and in less time, is something that needs to be addressed by the whole industry sector.

Taking this to our sector, we all understand that automation is a driver and one of the fundamental points of what is called Industry 4.0, the variety of which can be translated into every possible aid or assistance to the operator, the very extreme of which fully independent operation of the machine and production without the operator. Be that as it may, and as four arms are better than two, automation is a key element of Advanced Industry aligned with the reality of the current market.

IBARMIA has a range of perfectly balanced products designed to respond to the various needs of the markets at which this aforementioned amalgam of realities is aimed. Let's have a look at the various integrated support processes in IBARMIA's Z SERIES and

THE FLEXIBLE MANUFACTURING IS A KEY ELEMENT IN THOSE INDUSTRIES ALIGNED WITH THE CURRENT MARKET

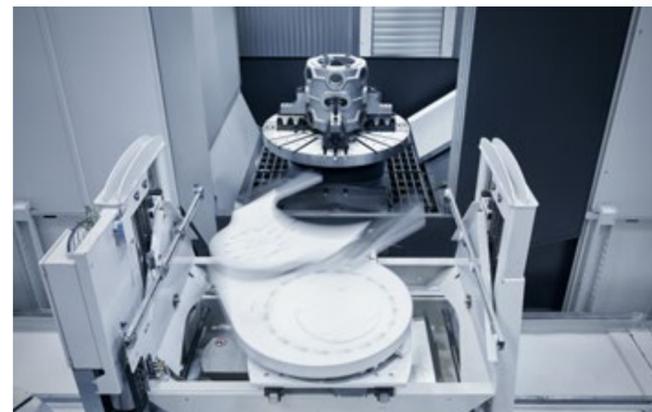
T SERIES programs that, as the range itself, vary depending on the industrial reality at which they are targeted.

The automation processes that we can distinguish in our machinery range are the following:

- 1_ **Pallet management:** systems for storage and automatic change of working tables
- 2_ **Workpiece management:** workpiece loading and unloading.
- 3_ **Management of special tools and heads:** storage and automatic change of special tool and heads.

In view of the processes and as regards the degrees of automation, we can talk about two assistance levels. On a first level, that of shared ergonomics, operator and machine assisting each other. On the second level, production cells that operate completely autonomously, whether a single automated machine or an autonomous system made up of several automatically assisted machines.

Going back to the subject of diversity, we can summarise that the range of IBARMIA's automation solutions is as varied as the requirements of the customers, which is no small thing.



IBARMIA PRODUCT

Z SERIES MOVING COLUMN MACHINING CENTERS



T SERIES 5 AXIS UNIVERSAL MACHINING CENTERS



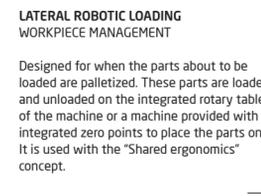
AN AUTOMATION PORTFOLIO FOCUSED ON THE IBARMIA MACHINE PROGRAMS WITH THE WIDEST PRESENCE IN THE GLOBAL MARKET



WORKPIECE & PALLET MANAGEMENT



FRONTAL ROBOTIC LOADING WORKPIECE MANAGEMENT
Designed for working in unattended and dedicated machine/s. This configuration can supply multiple machines with one or more robots on a lineal rack.



LATERAL ROBOTIC LOADING WORKPIECE MANAGEMENT
Designed for when the parts about to be loaded are palletized. These parts are loaded and unloaded on the integrated rotary table of the machine or a machine provided with integrated zero points to place the parts on. It is used with the "Shared ergonomics" concept.



VERTICAL ROBOTIC LOADING WORKPIECE MANAGEMENT
Designed for when the parts are loaded from the upper part of the machine using a crane. It is used with the "shared ergonomics" concept. Operator and automation work together.



ROTOPALLET FOR T12 & T16 PALLET MANAGEMENT
A rotary double fork device on the frontside of the machine makes a quick change of two pallets. It allows the machining of the part on the working area while the operator prepares another piece on a palletized table on the loading/unloading zone.

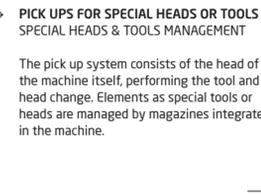


PALLET POOL FOR T12 & T16 PALLET MANAGEMENT
This pallet change and management system is external to the machine (purchase peripheral). It completely integrates with the machine via a communication interface and the pallets can be introduced in the machining zone using a direct transfer or interleaving the rotopallet system.



PALLET POOL FOR T22-T30-T36 PALLET MANAGEMENT
A pallet change and management system in which a static transfer manages up to 4 pallets. In case there were to be 4 or more pallets the transfer would change to integrate a lineal rack.

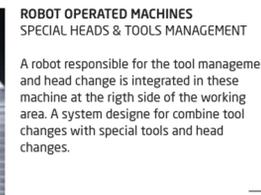
SPECIAL TOOL & HEADS MANAGEMENT



PICK UPS FOR SPECIAL HEADS OR TOOLS SPECIAL HEADS & TOOLS MANAGEMENT
The pick up system consists of the head of the machine itself, performing the tool and head change. Elements as special tools or heads are managed by magazines integrated in the machine.



ROBOT OPERATED MACHINES SPECIAL HEADS & TOOLS MANAGEMENT
Large tool magazines managed by arm robots, which are ideal to combine tool changes with special tools and head changes.



ROBOT OPERATED MACHINES SPECIAL HEADS & TOOLS MANAGEMENT
A robot responsible for the tool management and head change is integrated in these machine at the right side of the working area. A system designe for combine tool changes with special tools and head changes.



Both machine types can be equipped with Shelf-type large tool and head magazines managed by a robot. In the case of Z SERIES machines, thanks to their compact structure, IBARMIA develops several solutions to manage special tools and heads by pick up stations integrated in the machine, which allows to reach a maximum level of customization in this machine program.

IBARMIA PRODUCT



ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

FELXIBLE MANUFACTURING TECHNOLOGY



Examples of pick up stations integrated in moving column centers to increase these machines flexibility : 01_Pick up for special heads; 02_Pick up for angular heads; 03_Pick up for long boring bars.



Above and below these lines, automatic pallet changers integrated on SERIES T models: 1_ IBARMIA's own development APC for T36, T30 an T22 models; 2_ Pallet change and management system for T16 and T12 models.



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diameter 4m
(larger also possible)

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IBARMIA PRODUCT

ABOUT OUR MACHINING SOLUTIONS AND TECHNOLOGICAL DEVELOPMENTS

ECOLOGY INTEGRATED INTO THE MACHINE DESIGN PHASE

Ecology and Economy can go hand-in-hand, integrating "green" parameters into the design phase, as well as adopting measures that reduce the environmental impact, to achieve a perfect balance between both "eco" concepts.



SUSTAINABLE MACHINE DESIGN CONCEPT

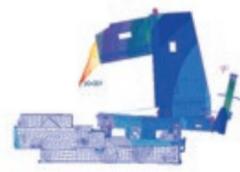
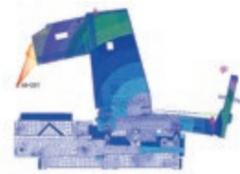
The Environmental aspect is increasingly present in all areas of current society. Many products are designed taking into account their Environmental Impact during the useful life of the products. Machine Tools are not exempt from this phenomenon, even though from our position as manufacturers, we are still not detecting a general demand from the market.

For several years now, IBARMIA has been taking steps to reduce the Environmental Impact of the product that it manufactures, and we are working on the integration of the "eco" aspects in the design phase.

It is key that Ecodesign is considered in the design phase, in the same way as other variables such as cost, the service provided by the supplier, delivery times and the quality of the components are taken into account.

Parameters such as energy efficiency, the materials with which the components are manufactured, recyclability, proximity of manufacture, etc. are design inputs that must also be weighed up during decision-making in the machine's conception.

And in this design phase, it is important to include the calculation of the machine's Environmental Impact throughout its entire life cycle, in the same way as the transmissions, safety functions or compensation of a head are calculated. And these calculations give indications as to where the focus should be put to reduce the impact of the product.



The development of thermo-design aspects during the machines structural design allows a maximum optimization of their energetical performance.

- The **manufacture and assembly** of the machine has an impact in a range of 20-25% on the total impact, depending on the type of machine. The materials used, an efficient design with the right and necessary material and the source or place of manufacture of the components, are key factors in this phase.

- The **transport** phase can have an impact of up to 5% of the total in the case of sea transport to a country such as India or China, for example. Bearing in mind that IBARMIA can manufacture machines of 200 Tn for the wind sector, the impact that local manufacture has on our plant in China is evident for projects that we sell in that market, which do not require land or sea transport, packaging, etc.

- But the impact is particularly high in the **usage phase**, 70-75% of the total impact, with electrical consumption being the most influential factor.

Any reduction in electrical consumption has 2 facets: one is the purely environmental aspect and the other the economic aspect for the customer, still more in the current circumstances with runaway energy costs.

This integration of the "eco" aspects in the design phase allows us to focus resources where the measures can really have a greater effect. Some areas to pursue:

- **Lean Machine Concept**, without lubrication. The right and necessary mass, located in the appropriate place. The machine conceived as an athlete which must have fibre and muscle where needed. In addition to relying on Tecnaia for the static, dynamic and thermal calculations of the machine, we have used estimation engineers and software in order to reinforce our commitment to optimising the product.

- **Dimensioning of motors and regulators**. A good mechanical design optimises the size of the drives and regulators, so that the size of the motor is right and necessary, with transmission designs that increase the efficiency of the dynamics of the machine. We always work as a team with our suppliers in order to achieve more.

- **Putting the focus on components that have to move**. Questioning the materials with which they are manufactured and looking for lighter materials. The leap that has been taken, for example with 3D printers, is evident, this is a path of no return: lighter materials without losing performance, geometries that were difficult and expensive to achieve up until now are presently feasible to produce with a much lower environmental impact.

- **Reconsidering the machine design** in order to remove components from the moving parts, and switching them to the fixed part.

- **Monitoring critical parameters** of critical components, in order to anticipate their failure. A component that is not damaged, does not need repairing, replacing nor dismantling, and thus avoids transport costs and

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IBARMIA PRODUCT



SUSTAINABLE MACHINE DESIGN CONCEPT

movement of technicians for repairs. And of course the life span of the component is extended as well. IBARMIA machines, for example, incorporate sensors that detect anomalous operation of the electro-spindle, optical sensors that control the flow of oil that lubricates the bearings, and a sensor that monitors the bearing temperature.

A technological cycle is also being worked on that protects another critical component, the rotary table, with the aim predicting premature failure.

- Committing to the development of technological cycles, such as the self-adjustment of the index plate that we have developed together with Tecnalia, in which we automatically adapt the dynamic parameters of the rotary table, adjusting it to the inertia or weight on the table at any time. This provides a more effective drive. Greater efficiency means lower energy consumption.

- More technological cycles, such as the balancing of the rotary table, where we simply balance the turning table of IBARMIA's multiprocess machine. Good balancing will prevent the appearance of vibrations and will increase the life of the components and the premature stoppage of the machines.

- Remote assistance. All IBARMIA machines are prepared so that our technicians can connect to them remotely, so our technicians do not have to travel. In this regard, the Covid19 pandemic has forced us to take a giant leap forward, up to the point that our technicians have been able to remotely start up several machines in China from Azkoitia, with the local support of much less experienced technicians. The installation of cameras at strategic points and the remote connection to the NC of machines has made this possible.

Furthermore, IBARMIA is offering a wide range of options designed to reduce the Environmental Impact, which we have integrated into a good number of machines, among which we can highlight, for example:

- MQL lubrication, both internally through the tool centre and externally, with an enormous impact as it does away with coolant, pumps and storage tanks. We avoid the recirculation of fluids thus saving the energy required for this, we avoid the degradation of coolant and generation of fungi and bacteria, and the disposal of coolants that are no longer fit for use.

- Lubrication by means of grease, which reduces the amount of lubricant. Guideways and spindles can be greased.

- LED illumination on the head itself. Illuminating just the machining point, we concentrate the light energy where it is most needed.

- Oil separators, preventing oil from degrading the coolant and better recycling treatment of the fluids can be carried out.

- Establishment of different machine energy levels, so that it automatically switches to a lower consumption level when there is no

activity, and the development of smart functions for automatic shutdown and starting.

- Equipment for suction of mist for those customers who want to work in a cleaner atmosphere, depending on the filtration capacities and machined material. Special solutions for working with magnesium or graphite, or the possibility of establishing different suction levels with powers adapted to needs.

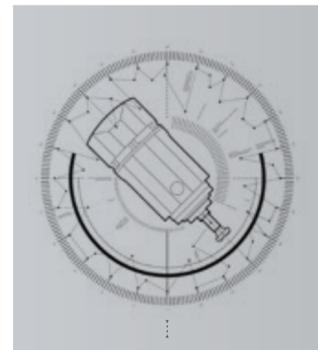
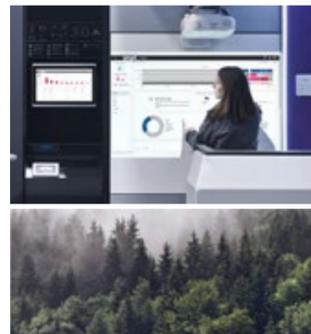
In short, the integration of eco-design parameters in the conception of the machine allows us to achieve an increasingly environmentally friendly product. But, furthermore, this gain in efficiency of the product will reduce energy consumption, which will be seen on the invoices to be paid by the customer. Ecology and Economy can be perfectly compatible, a higher cost in the machine equipment is amortised during its use phase.



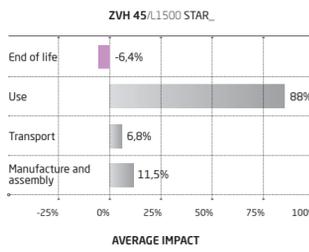
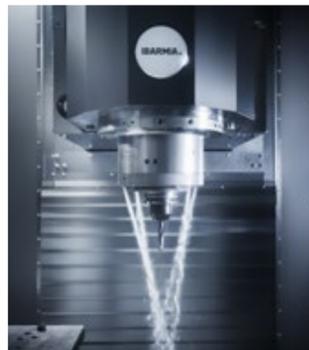
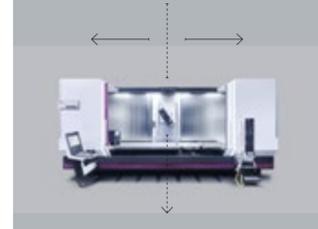
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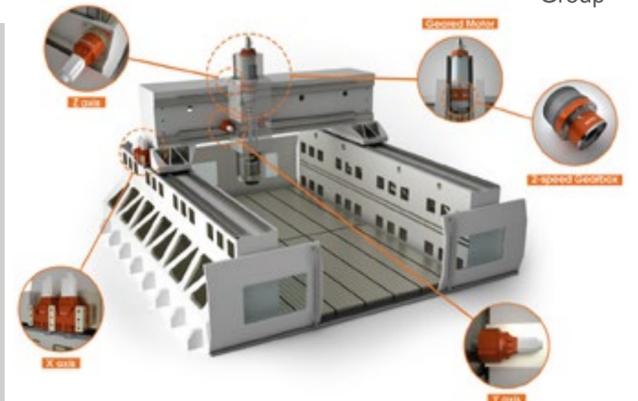
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IBARMIA SERVICE

ABOUT OUR SERVICE PHILOSOPHY DURING THE LIFE CYCLE OF YOUR IBARMIA MACHINE

IBARMIA SERVICE POINT ENSURING MAXIMUM PERFORMANCE

Our aim is to accompany our customers over the entire life-cycle of the machine, ensuring maximum performance and productivity. The aim is not only to resolve incidents and minimise downtimes, but to give support to our customers so they can get maximum performance from their IBARMIA machine.



IBARMIA SERVICE POINT

We work to ensure that our customers get the best solutions for real day-to-day needs (ReadyforReality) and avoid having to devote additional resources. We take charge of maintaining the machine in optimal condition so that our customers can get the maximum performance from their IBARMIA machines.

Proximity to the customer, maintaining a close and direct relationship is vital for knowing what they really need in their day-to-day work. Good support for repairs and incidents is vital but IBARMIA service goes further and seeks to be near the customer so it can understand their real needs, and can offer realistic solutions that improve the performance of its IBARMIA machine and consequently its production processes.

In the current changing digital environment, we want to continue improving the customer experience and adapt the department to the real needs of our customers. We are working on a new high-quality transformation project that will elevate IBARMIA's service to offer a unique experience to customers and distributors.

The needs resulting both from the current economic situation and the situation and specific need of each customer has led us to reinvent/innovate already existing services so we can be closer to our customers, even when this cannot be in person, in order to provide more efficient quality services.

Below we present some services that we have reinvented in order to adapt to the current changing environment, keeping as close to our customers as we always have:

MAINTENANCE CONTRACTS

Our maintenance contracts are designed to facilitate the day-to-day work of our customers, by ensuring high productivity and reliable performance of the machine.

We offer various types of contract that cover the various levels of need of each manufacturer: from a basic service up to premium level, where the manufacturer benefits from preferential treatment in terms of advice and priority response in the event of an incident with the machine. We also offer customised contracts, which offer a service tailored to each customer.

MAINTENANCE SPARES KIT

For those customers who want to do their own maintenance on their machines, and in line with our aim of facilitating their day-to-day work and ensuring that the machine is maintained in optimal condition, we have created our maintenance spares kit service.

This maintenance spares kit includes all the required elements for the necessary maintenance interval. This ensures an optimal lifespan for each component and consequently an optimisation of the the machine availability time.

With the aim of facilitating the user's work and saving time required to prepare and

determine the material for appropriate maintenance of the machine, the kit contents includes all the elements that the machine needs in the corresponding maintenance interval (2000 h, 4000 h, etc.), without the need for preparation times and analysis by the customer. We make your day-to-day work easier.

AUGMENTED REALITY

We have incorporated technology based on augmented reality into our support service, by means of a collaborative tool designed for providing remote technical support in real-time for the diagnostic and resolution of incidents. This improves the quality of the technical support, both of our own technicians at the plant and remote assistance offered to our customers and distributors.

In this area, we have started to work with the Innovae tool, which allows technicians in the field, and even customers, to be connected with experts in real-time, anytime and from anywhere, by means of an advanced remote assistance tool based on augmented reality.

This tool allows us to reduce times for diagnostic and incident resolution as well as production downtimes easily and effectively, thus avoiding experts having to travel.

The Remote Technical Assistant (ATR) from Innovae is specifically designed so that the technician in the field can receive remote assistance support - visual instructions and technical support - in real-time to increase the efficiency of technical interventions and remote industrial maintenance tasks.

An on-site intervention may require the involvement of different technical profiles. That is why ATR improves communication between the service centre and the entire technical team and immediately provides information to operators during the intervention, thus providing a better service. This avoids unnecessary journeys, improves the performance of the technicians on site and reduces the time of the interventions.

When distance is a factor in training, the tool is also used for training customers, technicians and distributor teams.

Furthermore, the tool is compatible with any device (mobile, tablet, PC, smart glasses), and does not require the prior installation of an application. This means that the customer can start to use this service without the need for prior investment.

TRAINING - IBARMIA ACADEMY

Trained operators perform better and help to increase productivity, which means minimised downtimes and optimised operations. For this, the IBARMIA ACADEMY training programme is focused on the specific needs of each customer. The training content is adapted to each case.

Within our IBARMIA ACADEMY programme, we offer theoretical and practical training, which, based on needs in each case, is given in the customer's plant, at the IBARMIA

IBARMIA SERVICE

facilities or online, both by means of virtual desktops, which allow simulators to be shared, and with ATR tools.

The content of our standard training programme is focused on the use and maintenance of the machine, as well as on its different applications with very specific content focused on the process.

It is a known fact that customers who provide their operators with the knowledge and skills in use of the machine achieve maximum performance from their centres. Effective use of the capabilities minimises unplanned downtime, and allows the potential that our machines offer and the different options installed on them to be fully exploited.

ECO OPTIONS

Continuing with our commitment to sustainability and energy efficiency, we are investing heavily in prolonging the useful life of our oldest machines. We believe that IBARMIA machines have a long way to go and can contribute to sustainability, not only with good preventive maintenance, but through the incorporation of new functions that allows them to continue operating at maximum performance.



Our commitment to sustainability is to get our machines that are already active to perform at the same level as the new machines, with the new functions that have been developed over the years. The majority of our options are designed so that the machines that are already in operation can be equipped with the same efficiency improvements that are being applied to new machines.

We have developed a range of ECO options that can be installed in the majority of currently active machines. The aim of these ECO options is to minimise energy consumption through functions such as micro-lubrication, LED lighting, oil extractors, standby functions, automatic shutdown functions, etc.

Furthermore, our smart functions also allow machines that are already on the market to be equipped with new developments such as rotary axis calibration, adaptive feed control, dynamic axis setting, remote display with cameras and remote assistance.

For the majority of these functions, investment is minimal in comparison with the return that they can offer through updating your machine with the new options that are being developed



"IBARMIA TECHNICIANS HAVE A NAME AND SURNAME; WE HAVE A DIRECT LINE WITH SERVICE EXPERTS"

Antonio Sánchez Guerra
BARMIA customer



Good maintenance has many benefits:

- Increased availability: reduction of unplanned inactivity times.
- Increased reliability: minimises manufacturing defects.
- Increased the useful life of the machine.
- Increased productivity throughout the entire life-cycle.



The augmented reality tool allows us to reduce times for diagnostic and incident resolution as well as production downtimes easily and effectively, thus avoiding experts having to travel.

- **40%** increase in productivity in complex tasks.
- **80%** increase in retention of knowledge.
- **50%** reduction in training time for assembly tasks.
- **15%** reduction in diagnostic and problem resolution time.
- **Up to 25%** Reduces expert journeys.



Thanks to SMART POINT, our cloud-based data monitoring system, you will enjoy constant remote assistance from IBARMIA, being able to anticipate machine breakdowns, maximizing its availability and having a total control maintenance with constant info about greasing dates, consumable exchange dates and component health status etc.

IBARMIA SERVICE

ABOUT OUR SERVICE PHILOSOPHY DURING THE LIFE CYCLE OF YOUR IBARMIA MACHINE



SUSTAINABLE MACHINE DESIGN CONCEPT



Micro-lubrication function

LED lighting system

Automatic shutdown functions

Rotary axis caibration

Eco functions that allows to our machines to continue operating at maximum performance.

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TOOLS ACCESSORIES

YOU & IBARMIA

P/3

ABOUT OUR SOLUTIONS
FOR THE MOST DEMANDING CUSTOMERS

GRI FLANGES IRAETA_ THE LARGEST FLANGES FOR WIND TURBINE SUPPORT STRUCTURES



In 2005, IBARMIA developed a new concept of high-productivity drilling centre that revolutionized the market for drilling large flanges. It arose from an order for a machine with gantry architecture and one of its main requirements was that it had to be as strong as a tank because at IRAETA they frequently "destroyed" their machine tools by constant use.



And that was the beginning of a successful partnership between the former FORJAS DE IRAETA - now known as GRI FORJAS IRAETA - and IBARMIA. This project was the turning point in a relationship that has lasted until the present day: the IRAETA Group is still one of IBARMIA's customers in Euskadi, Brazil and China.

GRI FORJAS de IRAETA, located in the Txiriboga de Zestoa district, opened the doors of its first production centre in Zestoa (Spain) in 1961. It was committed from its very beginnings to large-scale investment and rapid growth with the aim of providing its customers with a worldwide solution to their needs. Today it is a global benchmark for provision of castings and flanges, with a strong commitment to quality and service.

GRI FORJAS de IRAETA now belongs to the IRAETA ENERGY EQUIPMENT (IEE) group that has recently been listed on the Shenzhen Stock Exchange in China.

The latest cooperation project between GRI FLANGES and IBARMIA began in early 2021. The goal of the commission for the Zestoa plant was to provide a technical response to the need to manufacture flanges up to 8 m in diameter for the offshore wind-power industry for which the client was at a loss for a solution that would enable them to handle workpieces of such dimensions. The final proposal for the design, manufacture and installation of the required machining line included separate drilling and turning centres (CPD 8000 VV CLASSIC and LDV 8000 RT respectively). Thanks to installation of this new line, the machining processes required to transform the forged ring into the target flange were handled



GRI IRAETA: A GLOBAL BENCHMARK FOR PROVISION OF LARGE FLANGES WITH A STRONG COMMITMENT TO QUALITY AND SERVICE

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Manufacturing process_ Once the forging process has been completed the flange is transferred to the turning center to remove the excess material from the raw flange to final size. Later, the drilling center drills the fixing points to join the modules of the tower.



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ABOUT OUR SOLUTIONS FOR THE MOST DEMANDING CUSTOMERS

by two machines. This processing mainly requires machining (producing the final flange dimensions) and vertical drilling (holes for the bolted connections).

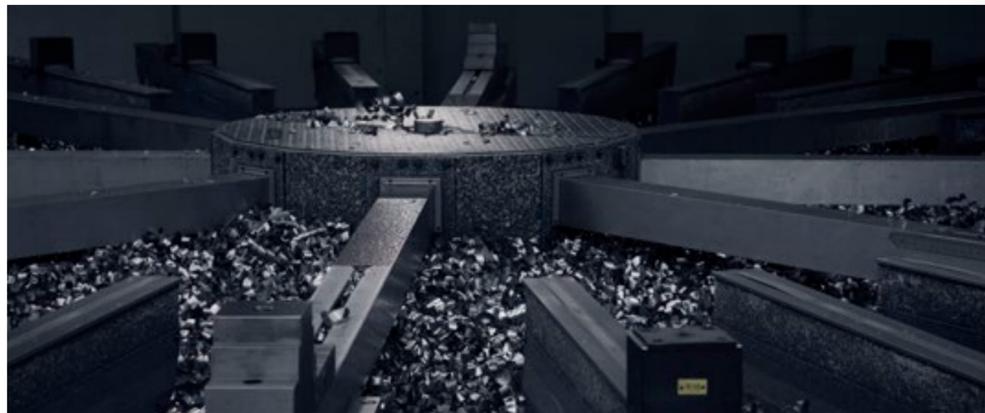
Installation of the two machines at the customer's facilities began in November once the preliminary preventive coordination tasks with the customer and coordination with the carriers in charge of transporting the loads - in some cases of considerable dimensions, especially the lathe - had been completed.

We defined two different working strategies for each model in response to the questions that arose with respect to the execution of the project. In the case of the drill, we decided to perform assembly and commissioning on IBARMIA's premises, leaving the metalwork and safety closures to be completed in the client's facilities. Unlike the drill, the lathe was directly manufactured on the customer's premises and the work done at IBARMIA's facilities in Azkoitia was confined to a few subassemblies. Part of the engineering team were permanently stationed in a dedicated on-site work centre in order to perform exhaustive daily monitoring of the manufacturing process to ensure the success of the operation, providing prompt responses in real time to the assembly team's queries.

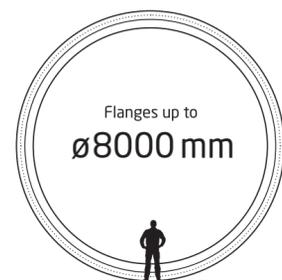


IBARMIA and GRI technicians during the final touches to the turning center prior to commissioning tests of the machine.

Below these lines, The first flanges manufactured in the new installation next to the drilling center.



TODAY, THE NEW MACHINING LINE IS PRODUCING PROBABLY THE LARGEST FLANGES TO BE FOUND ON THE WIND TURBINE SUPPORT STRUCTURE MARKET.



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IBARMIA WORLD

P/4

ABOUT THE IBARMIA PROJECT

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 two of the biggest markets of the world: **Germany and China**. This tendency will be kept in the future, with further development of these two areas of the world and others to come.



IBARMIA_ CONSOLIDATING IN THE MAIN MARKETS, EXPANDING TO NEW ONES

1_ BASQUE COUNTRY, SPAIN_ HEADQUARTERS IN AZKOITIA
PRODUCTION PLANT

With a vocation of stability and long-term view, these years of growth have also been years of consolidation of IBARMIA's presence in the traditional markets.

At the same time, efforts have been made to open and strengthen new expansion areas, specially in eastern Europe and Asia, so that customers are able to get not only the right product but the proper service locally as well. The Marketing team has been reinforced to be able to give a better support to the existing sales network and develop new activities, in cooperation with the branches and dealers, leading a transformation of the company towards a new dealer and customer relationship model.

Finally, an additional layer of strategy has been added to the customer focused areas. The goal is to ride the needed growth in a sustained and sustainable way so that the company keeps the momentum based on the opportunities and balances unequal evolution of the different markets by means of broadening and deepening its cooperation network.

2_ QINGDAO-SHANGHAI, CHINA_ SHANDONG IBARMIA CNC MACHINE MANUFACTURING CO., LTD.
PRODUCTION PLANT & COMMERCIAL DELEGATION

IBARMIA's Chinese branch has gone through a complete renovation process during the last few years.

From the change of the Shareholder structure, becoming a 100% IBARMIA owned company, to a change of location, from Jinan to Qingdao, all this with one focus in mind: keep on working close to customers and following their needs.

Local supply chain management and manufacturing capabilities have been strengthened to answer the demand of local customers for localization of components and subassemblies, developing even the capability to manufacture part of the machine range adapted to the local needs in terms of specifications and price in such a demanding market.

In the meantime, Sales and Services teams have been renovated and reinforced so that customer satisfaction is guaranteed through professional attention. And it has been relocated as well to Shanghai so that faster accessibility and better connections are guaranteed for a faster reaction time.

Taking into account that a big portion of all this has been done during strict travel restriction times, this gives an idea of the big leap that, with a titanic effort, has been done.

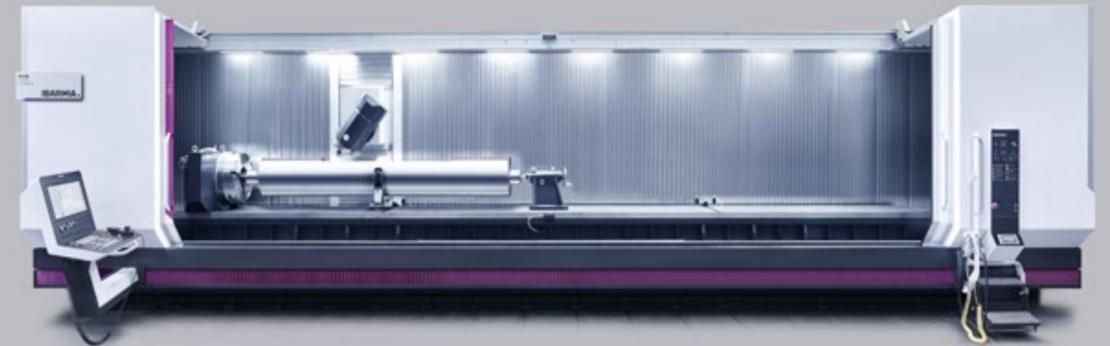
3_ EISLINGEN/FILS, GERMANY_ IBARMIA WERKZEUGMASCHINEN GMBH
COMMERCIAL DELEGATION

Germany keeps being one of the most attractive markets in the machine tool business.

A strong machine tool consumption combined with the opportunity to work hand by hand with highly demanding customers gives the chance to keep on working in getting new business while having a first level chance to optimize product and application knowledge. Keeping the commitment to get closer to customers the local branch has kept growing, adding to the Sales and Services capabilities, Engineering capabilities in order to be able to adapt the working area to different demands from customers.

Moreover, with the idea of keeping a close attention to customers, the German branch will keep on developing becoming the Central European Hub for IBARMIA, from where not only German customers, but Central and Eastern countries will be attended so that a closer support is guaranteed.

RECOGNIZED SPECIALISTS IN MOVING COLUMN MACHINING CENTERS



WHO WE ARE
IBARMIA manufactures machining centers of high technology adapted to customer specific requirements.



COMPETING IN THE GLOBAL MARKET



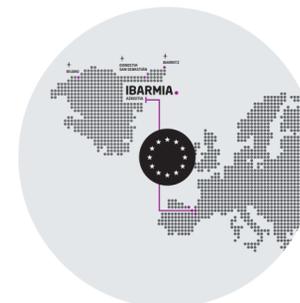
A YOUNG TEAM WITH HIGH FORMATION



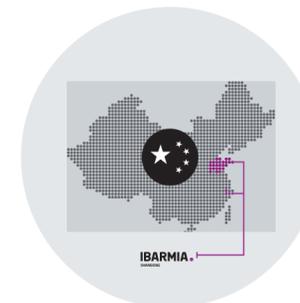
INTEGRATED MANUFACTURING



TRADITION VS MODERNITY



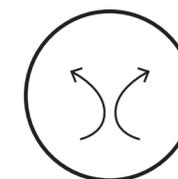
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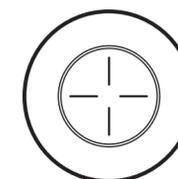
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PRODUCTION CENTER
IBARMIA Shanghai
SALES OFFICE
(Shandong-Shanghai) P.R. of China



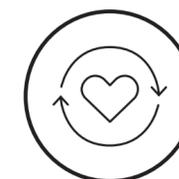
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TOTAL FLEXIBILITY



PRECISION TECHNOLOGY



USER CENTERED DESIGNS



IBARMIA WORLD

ABOUT THE IBARMIA PROJECT

IBARMIA COMMUNITY

With a strategy based on customer proximity, our main goal is to respond to all the stakeholders that are part of IBARMIA. With this purpose, we are creating a strong COMMUNITY that will be the basis for building the future of IBARMIA.

OPENTUNITY event held in November 2021 was the beginning of a new era for us, the first post-COVID reunion organized by IBARMIA for all our employees and their families, suppliers and service providers, dealers and sales network, customers. As a result of this encounter, the IBARMIA COMMUNITY concept was born, and since then, we keep working from and for the community, cause we are a community.



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