PREMIUM VERTICAL LATHES

BOST Machine Tools Company

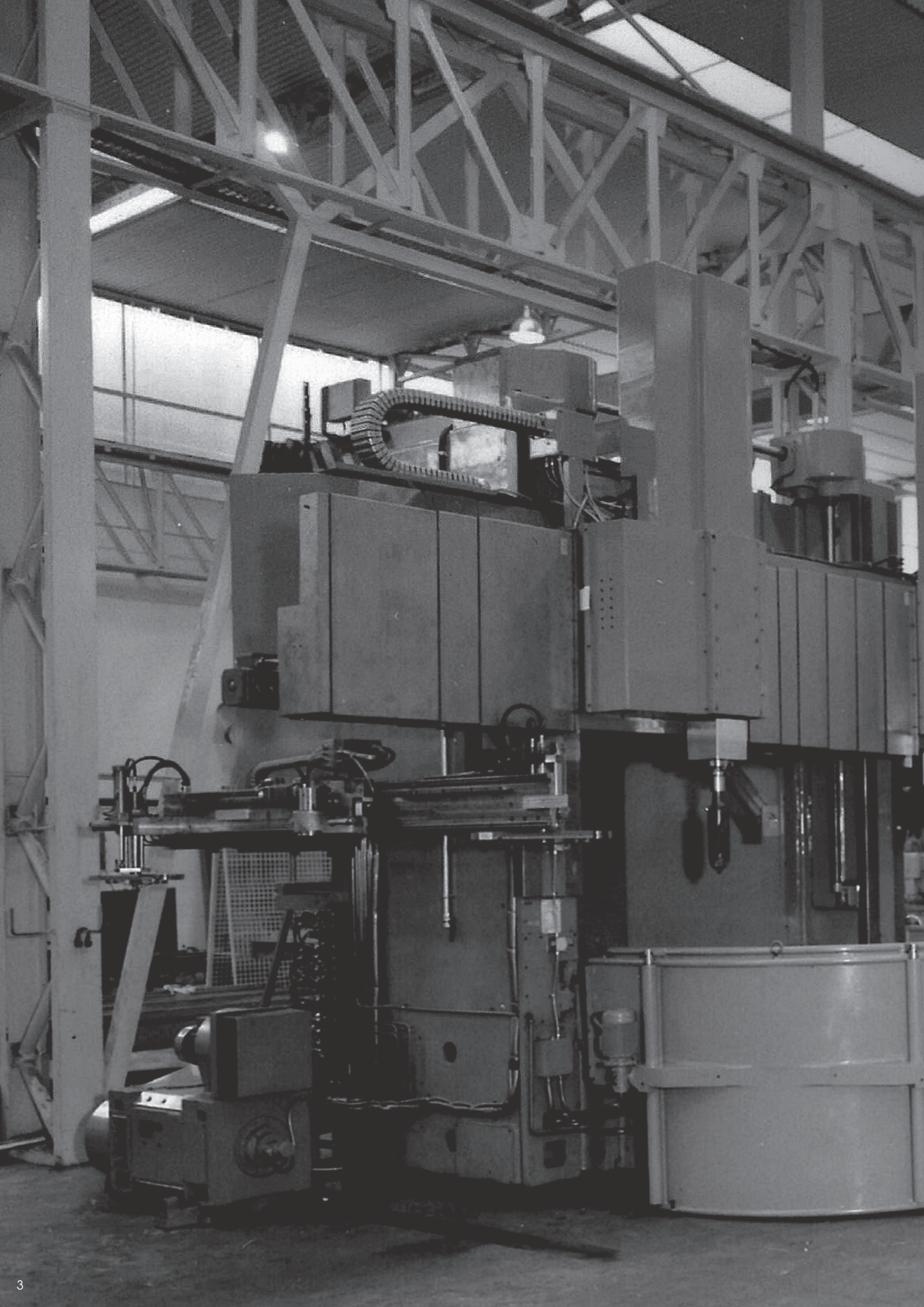
Dear customer,

At Bost we are proud of our employees who feel a real passion for machine tools and focus daily their hard work in continuous development of our modern company with an expanding network of stable customers.

On the following pages you will find an overview of all our current Premium Vertical Lathes as a result of our 5 decades of expertise, innovation and development. Every year we keep expanding our range of machines that are built using robust and stable structures together with the latest state of the art and the most advanced cutting edge technology.

Precision with tradition! This is what you get from Bost and the Basque Country, one of the oldest and most historic regions of industrial traditions in Europe.

Karlos Aranbarri
President & CEO



EXPERIENCE

5 decades of experience building technologically advanced custom-made machine tools

1972-2022
50 years standing close to our customers all over the world

1972 Bost is founded

50 years ago, 5 good friends who felt a deep passion for machine tools, founded Bost, which means "five" in the Basque language.

1979 First facilities expansion

In 1979, we carried out our first facilities expansion doubling the production area.

1981 First CNC machine built

Bost had been one of the first machine tool manufacturers in Europe building its first CNC machine in 1981.

1991 New production shops

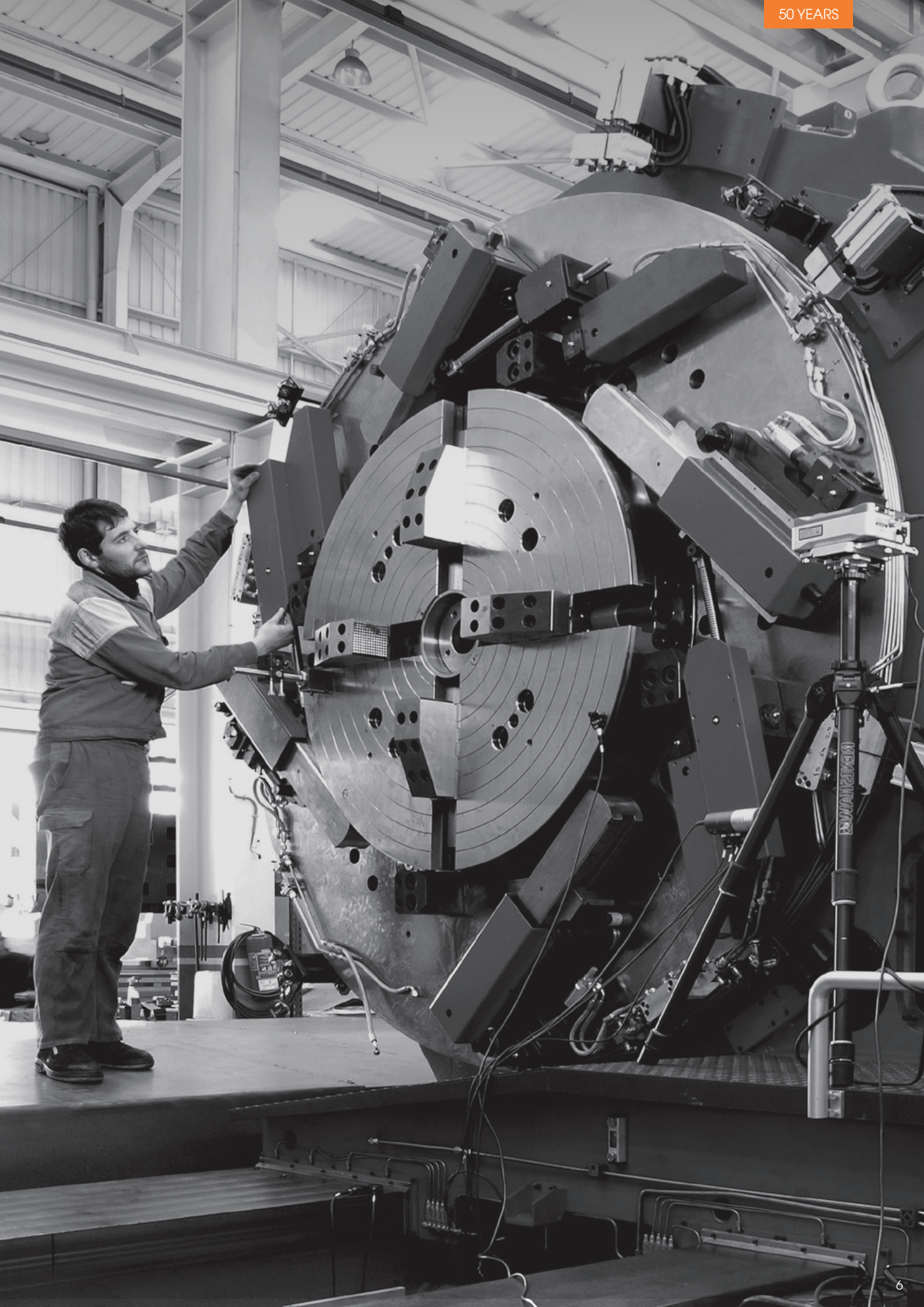
In 1991, our main assembly shop for Large Vertical Lathes was built as a result of the need to manufacture larger machines.

1994 First multitasking machine

Bost made history in 1994 developing a revolutionary concept of a turning and milling machine for large crankshafts.

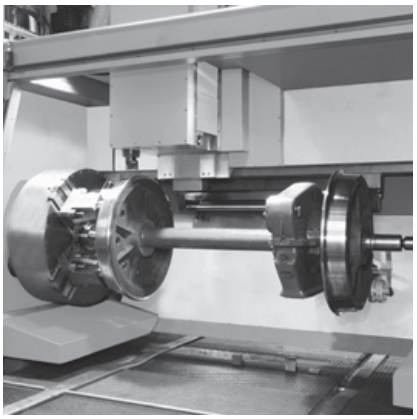
1995 Roll grinding machine

Our expertise in grinding, which is implemented on our Premium Vertical Lathes, began in the mid 90s when we developed our heavy duty roll grinding machine for a worldwide well known roll manufacturer.



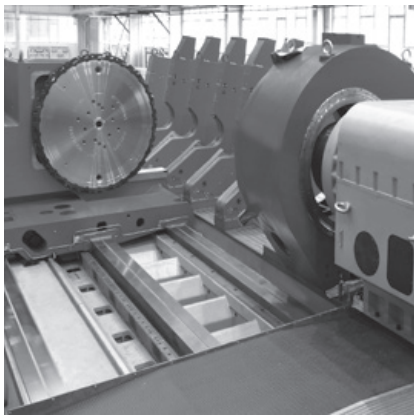

BOST

Today Bost is well known worldwide as a Premium VTL manufacturer and one of the key players in this field



1998 Wheelset reprofiling lathe

As part of the complete manufacturing program developed for the rail industry, Bost developed the first Wheelset Reprofiling Lathe in 1998.

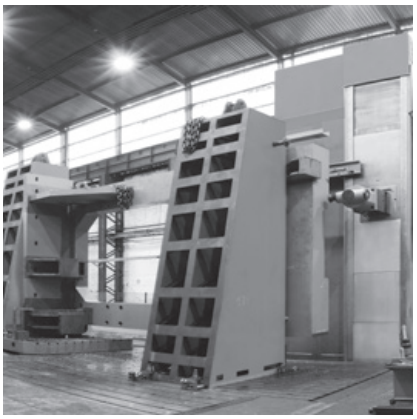


2005 Crankshaft rough milling

After many years of experience working with the main heavy duty crankshaft producers in the world, Bost was asked to produce a first crankshaft rough milling machine in 2005.

2006 New range of modern VTLs

2006 was an important milestone for our company as we introduced our new range of modern VTLs in the market. Every year we keep innovating and improving the core of our business, our Premium VTLs.

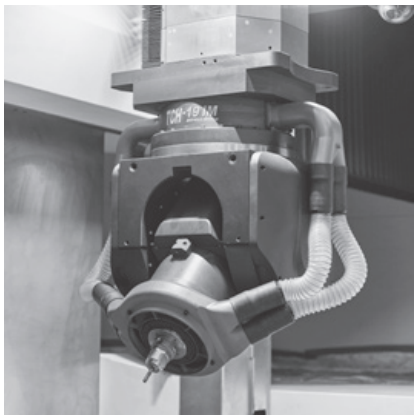


2009 New range of modern HBMs

A new range of modern hydrostatic Horizontal Boring Machines was developed in 2009.

2013 Landing gear bespoke machines

2013 meant the beginning of Bost in what is now one of our main sectors, aerospace.



2018 VTL C Aero

Bost established a close collaboration with a prestigious European rocket manufacturer for the machining of composite materials.

SECTORS

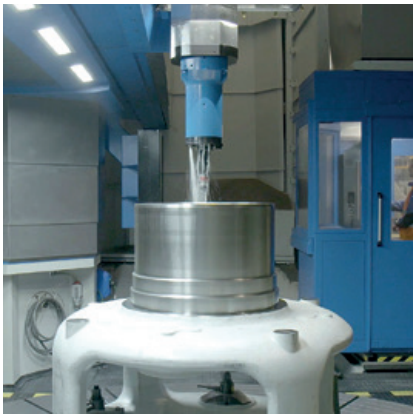
WINDMILL

Green energy requirements are growing, as it becomes one of the fastest growing energy sources in the world.

Bost VTL C & VGM C series are ideal for the production of **planetary carriers, gear rings, housings** and **large diameter slewing bearings**. Combining several different machining technologies in one machine, we design Premium Vertical Lathes from start to finish and implementing them as a single unit tailored to the individual needs of the customer.

Planetary gearbox

Planetary Carrier being machined in a VTL 55 CY 4.500 TYPC from one of our key customers, who is a market leader for offshore installations.



Large bearings

Description of rotor, yaw and blade **bearings** of a windmill turbine.

HYDRO

71% of the Earth's surface is covered by water and generating electricity from the power of water represents large amounts of clean, renewable energy. Bost VTLs are specially suited for the production of both, **Francis** and **Pelton turbines**, with the ability to equip the machine with different accessories for 5 axes simultaneous machining capabilities.

Turbines for hydro power generation
Different components of hydropower equipment are produced in our high accuracy multitasking Vertical Lathes.

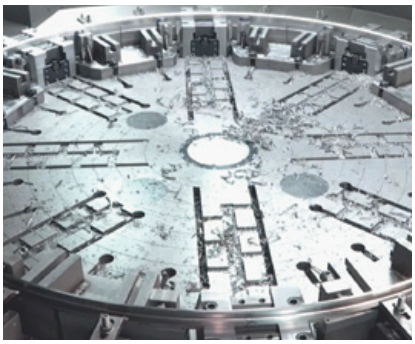
NUCLEAR

Nuclear power is a resilient source of energy and provides one third of all low carbon electricity. There is a growing realization that nuclear has to be part of the energy mix if countries have any chance of achieving their decarbonization targets, while continuing to provide reliable baseload electricity.

Nuclear power plants
Our customers use Bost heavy duty CNC VTLs for the machining of **mechanical** and **structural parts** used on the nuclear power plants. Bost heavy duty VTLs are also used in the production of **storage containers** for spent nuclear fuel components for shipping and handling in a nuclear environment.

AEROSPACE

Bost works together with major OEM companies and 1st Tier suppliers in the aerospace industry delivering machines for the production of **nozzle casings** and **structural components** for space applications; **landing gear** or turbine elements such as **engine casings, discs, blisks** and **rings**. Aircraft manufacturing requirements are changing as they are becoming lighter and quieter with the implementation of CFRP parts, exotic alloys, more titanium and aluminum being used. New components made with tougher high-temperature materials require new tools and the design development to overcoming challenges faced using technology like Ultra High Pressure Coolant up to 350 bar and an ultra stable machine structure. Bost works in close collaboration with our customers to overcome these challenges.



Aircraft engine components
Machining of different high-strength, heat-resistant alloy steels such as Ti6A14V, Ti6AL2Sn4Zr6Mo, Inconel 718, Hastelloy(A,B), Waspaloy and analogs.

MINING

Mining **dump trucks** and **large excavator components** are produced on our Bost Premium VTL C series, such as the **slewing bearings** used for the rotation of the excavator turntables. Our customers also produce heavy duty **slurry pumps** for mill discharge and hydro-transport applications, achieving outstanding efficiency and reliability, thanks to the machine design and performance.

Slewing bearings
Large **slewing bearings** ensure that excavators in all sizes can perform difficult work on construction sites around the world.

OIL & GAS

Oil & Gas demands a very robust and strong machine structure, combined with multi-tasking machining solutions with capabilities such as turning, milling, grinding, tapping, etc. Hydrostatic guideways become a key factor when we talk about **valves** and **pumps** produced in stainless steel, duplex & super duplex, low alloy and high alloy castings. Our VTLs are also oriented for the manufacturing of **compressors** and **blowers** used for providing gas pressure required to transport gas with pipelines and to lift oil in gas-lift operations.

We achieve high accuracy and very good surface quality thanks to the hydrostatic system and the system's damping properties and precise movements that eliminate the requirement of post-machining for many components.

Multitasking
Bost right angle XL Facing head installed in a VTL 25 CY moving table Vertical Lathe.

DEFENSE

Defense manufacturers can choose from a variety of Bost models that are specially crafted for their needs, ranging from our VTH C to VTL C AERO series. Our machines match the specific requirements and high standards of nuclear submarine and military aircrafts.

INDUSTRIAL/HEAVY ENGINEERING

The demand for industrial large and heavy workpieces follows the trend towards a higher complexity and flexible machining concepts, such as components for telescopes, vacuum chambers which simulate space conditions or tunneling machines.

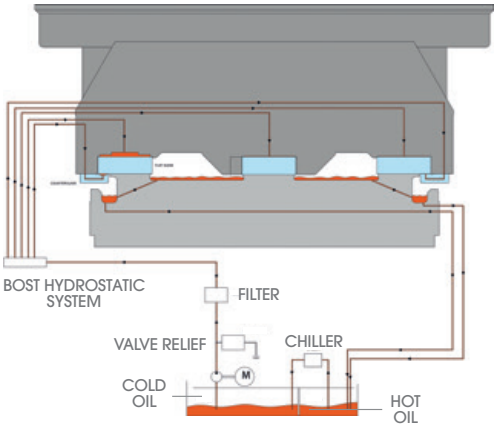
INNOVATIVE DESIGN

BOST HYDROSTATIC SYSTEM

Bost robust and stable machine construction philosophy is linked to our hydrostatic guideways technology. Bost´s hydrostatic system provides infinite bearing life since it is a non-contact system using pressurized oil. The hydrostatic guide-way system with flow control valves guarantees a constant flow volume and therefore high oil pocket stiffness.

The oil cushion of the hydrostatic guides offers high vibration dampening properties together with the following advantages:

- Longer machine life due to the non-contact of the guides, hence the absence of abrasion.
- Better surface quality.
- Higher metal removal rates for materials which are considered difficult to machine.
- Better machining conditions in intermittent cuts.
- Advantages over linear guides in terms of speed and accuracy due to their very low friction coefficient.
- Low tool wear and improved cutting performance.



SYMMETRIC RAM DESIGN

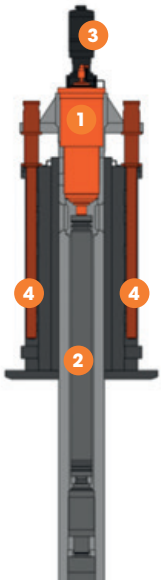
BOST RAM concept offer a range of innovative technologies for robust and accurate high precision machining and its symmetric design offers high thermo-stability and stable geometric precision.

VERTICAL LATHES VTL C

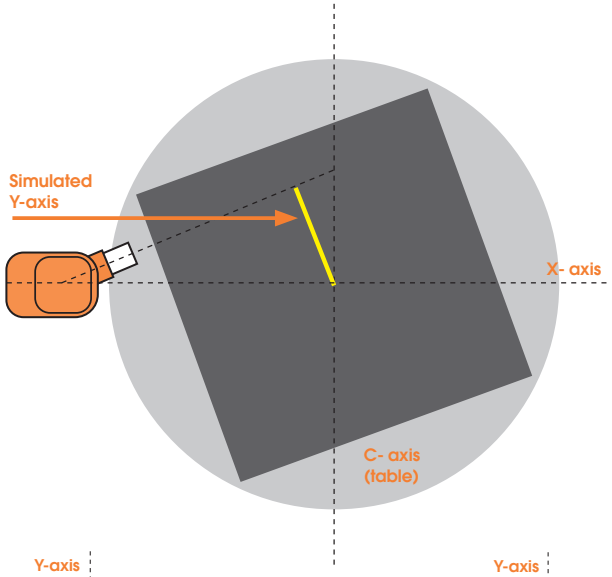
RAM mm	power kW (S1,100%)	torque Nm (S1,100%)	max stroke mm
310 X 310	37	1.410	1.400
360 X 360	63	2.043	2.000
410 X 410	63	2.043	2.500
480 X 480	82	3.116	3.500

GRINDING MACHINES VGM C

RAM mm	power kW (S1,100%)	torque Nm (S1,100%)	max stroke mm
500 X 500	63	2.043	1.500



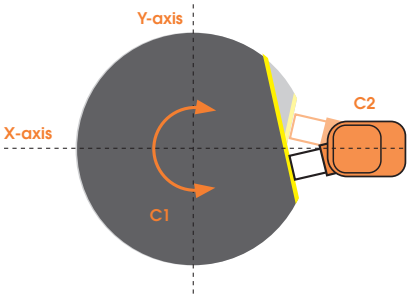
1. Powerful water cooled milling motor and gearbox cartridge system
2. Carbon fiber power transmission shaft
3. Ballscrew located in the centre
4. Double hydraulic symmetric counter balance



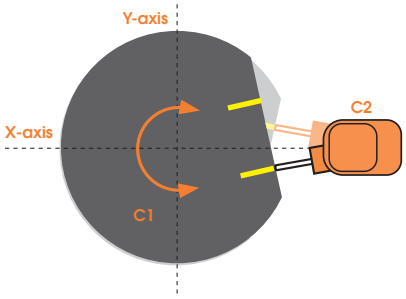
VIRTUAL Y AXIS

Simultaneous interpolation of the rotary table C axis combined with the CY axis in the BOST MH900 milling head enables virtual Y axis working mode.

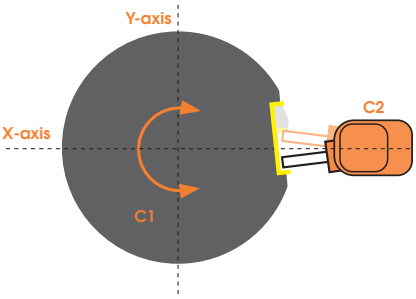
BOST MH900 virtual Y axis milling head is designed with high performance capabilities, delivering 50 kW, 2.000 Nm and 4.000 min^{-1}.



Facing a part on a vertical turning lathe without a Y-axis



Drilling off center on a vertical turning lathe without a Y-axis



Milling a groove or pocket on a vertical turning lathe without a Y-axis

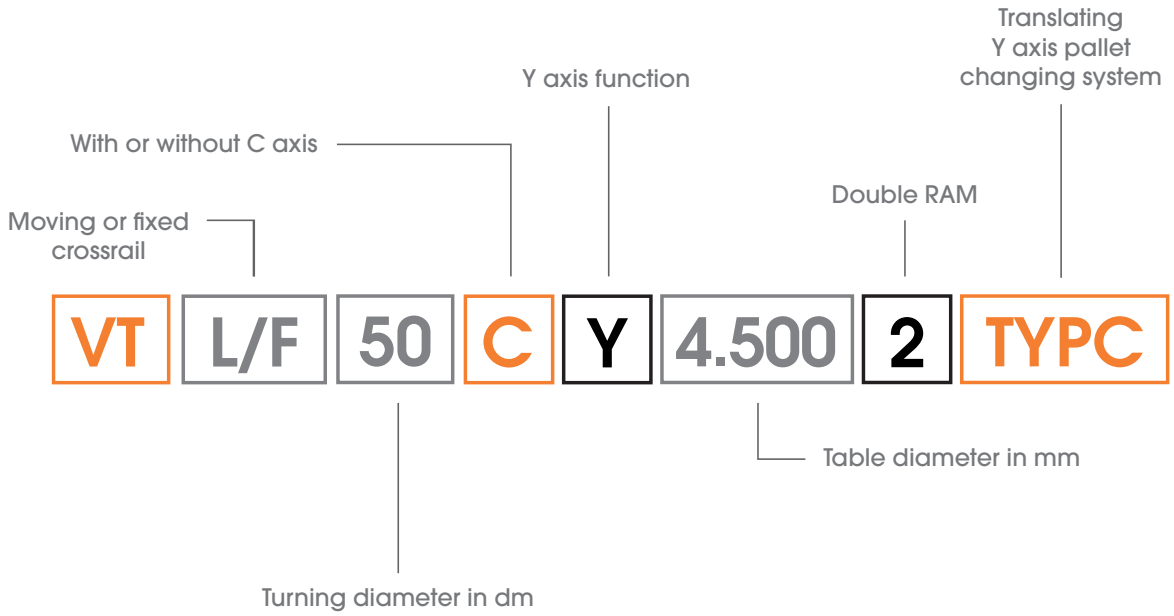
PREMIUM MACHINE CONSTRUCTION

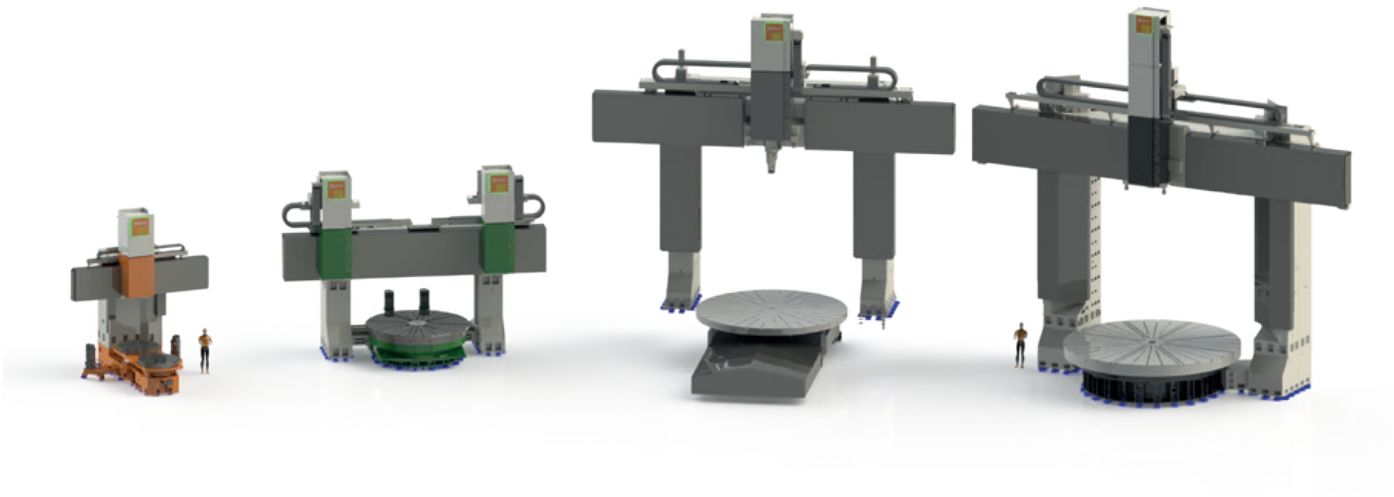
BOST machine price + average maintenance cost in 10 years is lower than traditional machines price + 10 years maintenance costs.

We are able to achieve this thanks to our machine construction philosophy, based on top quality electric, pneumatic and hydraulic components and installations. By using rigid piping installations as part of our standard way of working, combined with our system for the centralized maintenance cabinet for user friendly maintenance and reduced costs.

VTL C MODULAR CONSTRUCTION
Let´s build your machine together!

The VTL C Series enable the construction of tailor made multi-tasking vertical turning, milling, drilling & grinding centers with a turning table range from 1.000 mm up to 8.000 mm and workpiece heights up to 8.000 mm with the most modern state of the art design.



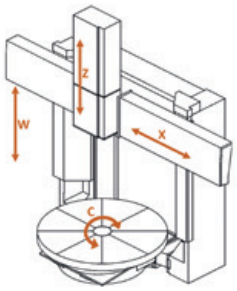


- VTL 10 C 800 RPC with moving crossrail and rotating pallet changing system
- VTF 51 C 4.000-2 with fixed crossrail and double RAM
- VTL 62 CY 6.000 AERO with moving crossrail, moving table and carbon fiber aspiration system
- VTL 75 C 7.000 with moving crossrail

PRODUCT RANGE

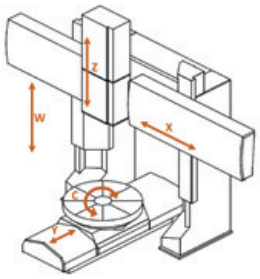
HYDROSTATIC VERTICAL LATHES

VTL C



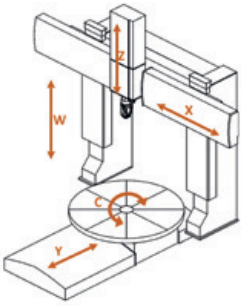
HYDROSTATIC VERTICAL LATHES
WITH MOVING TABLE

VTL CY



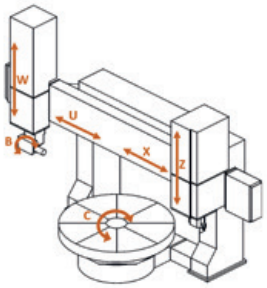
VERTICAL LATHES FOR COMPOSITES
AND ALUMINIUM MACHINING

VTL C/CY AERO



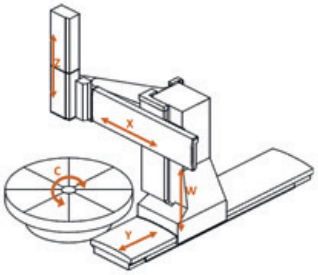
HYDROSTATIC VERTICAL GRINDING
MACHINES FOR BEARINGS

VGM C



HYDROSTATIC SINGLE COLUMN
HEAVY DUTY VERTICAL LATHES

VTH C



Vertical lathes
VTL C series

The flexible design of the VTL C series combine manufacturing modules, providing the customer with a solution tailored to suit their individual needs. Our Vertical Lathes, built with all hydrostatic guideways, provide high machining accuracy together with a long service life. Bost design style is based on generously proportioned structural components, which ensure high geometric precision and high thermo-stability. Bost VTLs can be equipped with a comprehensive range of dedicated machining heads and several pallet changing systems with different levels of automation.

VTF 51 C - 4.500 with double RAM and fixed crossrail

Bost VTLs can be equipped with single or double RAM, offering numerous machining table variants and flexible tool magazine configurations.

Complete machine enclosure

Possibility of equipping the machine with full enclosure protection and oil mist extraction system.

Technical specifications

Table diameter	mm	1.000 - 8.000	in	40 - 315
Swing diameter	mm	1.200 - 10.000	in	48 - 390
Turning height	mm	max. 8.000	in	max. 315
Table load	kg	max. 350.000	tons	max. 344
S1 Main drive power	kW	2x30 - 2x131	hp	2x40 - 2x175


BOST

Vertical Lathes with moving table

VTL CY series

Adding a moving table the VTL CY series provide the maximum flexibility for full 5 sided machining of complex components, being able to machine eccentric features in any position and with a single set up. The Y axis also allows a safe and ergonomic loading and unloading of large and heavy workpieces.

Robot ATC

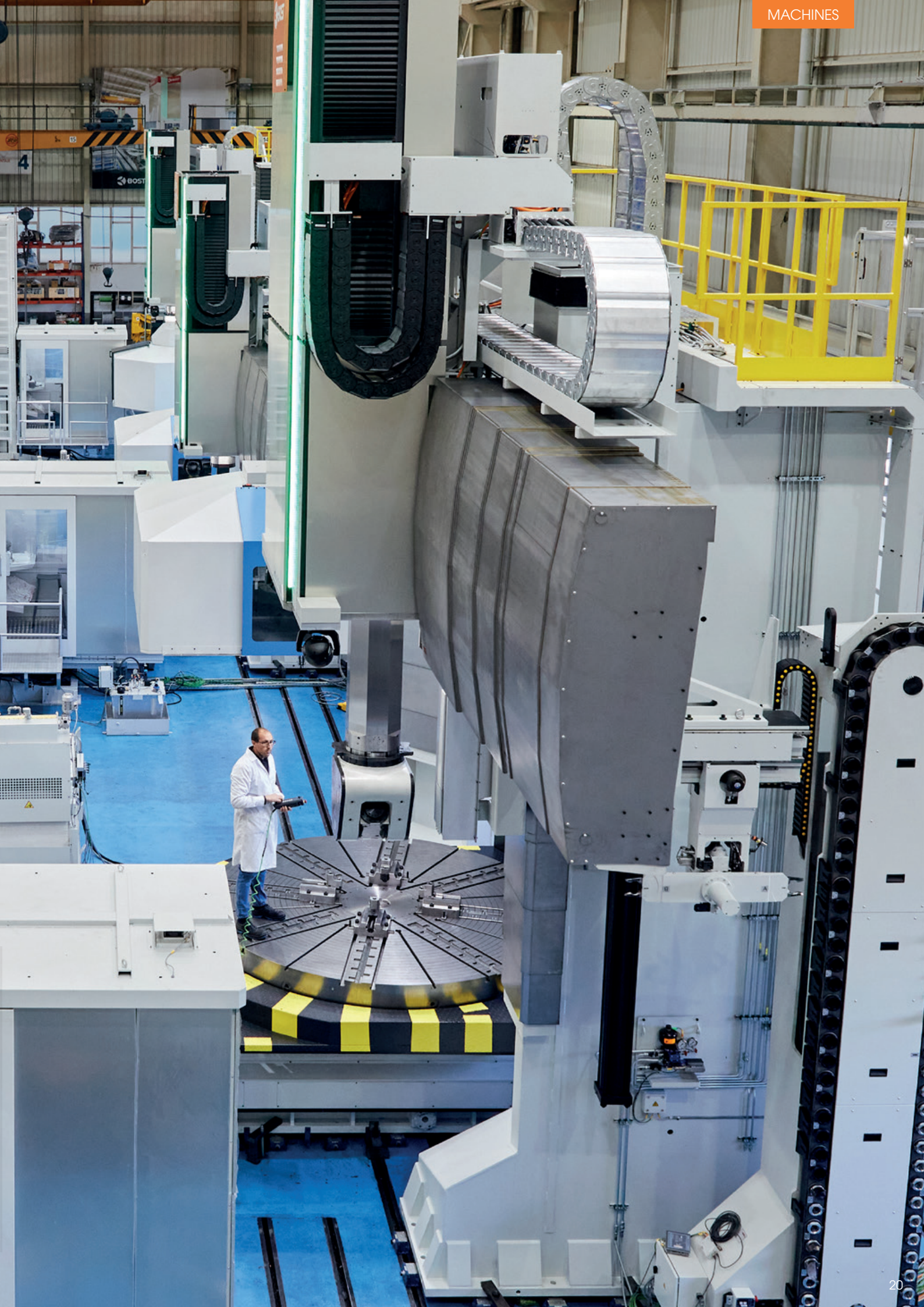
We have a wide experience with robot tool changing systems, combining different tool tapers up to 400 positions.

Parallel measuring system

Dramatic measuring time reduction and much better repeatability error greatly improves the final accuracy of machining thanks to RAM built-in automatic CMM vertical axis. Working offset and tool wear correction are made automatically using our own measuring cycles, with the possibility to generate workpiece measuring protocols.

Technical specifications

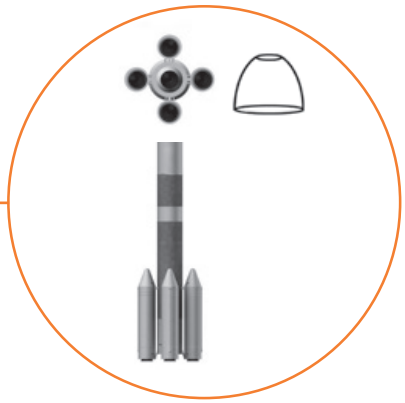
Table diameter	mm	1.000 - 8.000	in	40 - 315
Swing diameter	mm	1.200 - 10.000	in	48 - 390
Table displacement, "Y" axis	mm	1.000 - 6.000	in	19 - 236
Turning height	mm	1.000 - 10.000	in	max. 315
Table load	kg	max. 350.000	tons	max. 344
S1 Main drive power	kW	2x37 - 2x131	hp	2x50 - 2x175



Vertical Lathes for composites

VTL C Aero series

The Vertical Lathes of the VTL C Aero series are specially designed for machining CFRP and GFRP aerospace components. This machines range is built with the combination of high dynamic linear guides and high performance electrospindles in the milling head. We can offer customized dust aspiration and air filtration specific solutions developed by Bost for the aerospace industry.



Rocket engine nozzles are propelling nozzles used in rocket engines to expand and accelerate combustion products to high supersonic velocities. Europe's new Ariane 6 nozzles, composed by CFRP and aluminum conical parts are completely machined in Bost Vertical Lathes installed in different customers.

Technical specifications

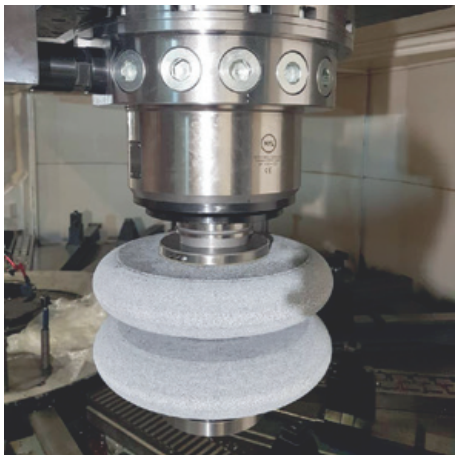
Table diameter	mm	1.000 - 8.000	in	40 - 315
Swing diameter	mm	1.200 - 10.000	in	48 - 390
Turning height	mm	max. 8.000	in	max. 315
S1 Main drive power	kW	2x30 - 2x131	hp	2x40 - 2x175
Electrospindle	min^{-1}	up to 30.000	min^{-1}	up to 30.000


VTF 20C AERO
BOST

Vertical Grinding for large bearings

VGM C series

Following the highly demanding standards for the production of large slewing bearings and as an evolution of our dedicated Vertical Lathes, we have developed the VGM C Grinding Vertical Machines. The machine configuration designed in a way that the right hand side RAM is used for turning, drilling and milling, while the left hand side RAM has is specifically designed for grinding. The machine is equipped with a magnetic table.



Customized configuration of grinding equipment is available

These machines can be equipped with double grinding wheel specific head (ultra robust HSK 125A/160B taper) for double row slewing bearings, B axis electrospindle grinding head with wheels up to 650 mm and tailored dressing systems, among other accessories. Additional options for hard metal boring and workpiece measurement increase the possible applications of the machine series considerably. Our engineers have developed "user-friendly" dedicated grinding cycles by working closely with our customers. This special software using para-metric programming simplifies the use of the machine.

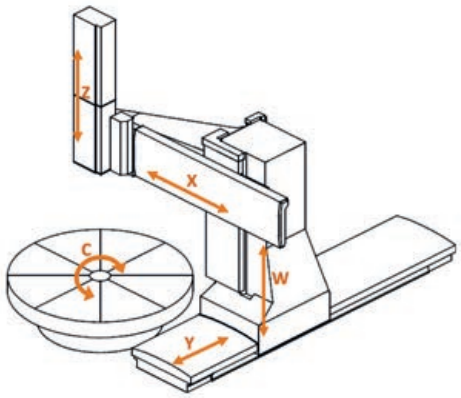
Technical specifications

Table diameter	mm	1.000 - 8.000	in	40 - 315
Swing diameter	mm	1.200 - 10.000	in	48 - 390
Turning height	mm	max. 2.000	in	max. 79
Table load	kg	max. 350.000	tons	max. 344
S1 Main drive power	kW	2x30 - 2x131	hp	2x40 - 2x175
Grinding wheel	mm	up to 650	in	up to 25,5

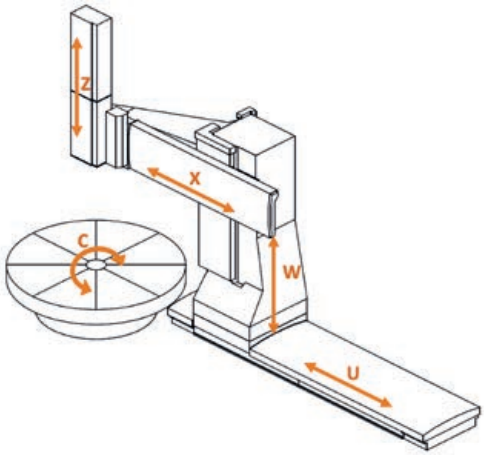
Vertical Lathes with single column

VTH C series

VTH C series are single column Vertical Lathes for the production of heavy duty workpieces. These machine models can be configured with a moving table in the Y axis (VTH CY) in order to have completely free access for the loading/unloading or with a moving table in the X axis (VTH CU) in order to achieve big machining diameters up to 16.000 mm. The huge flexibility of this machine architecture makes it ideal for submarine production or heavy engineering parts.



VTH CY
Heavy duty single column vertical lathe with Y axis allowing free access for the loading/unloading.



VTH CU
Heavy duty single column vertical lathe with U axis for achieving large turning diameters.

Technical specifications

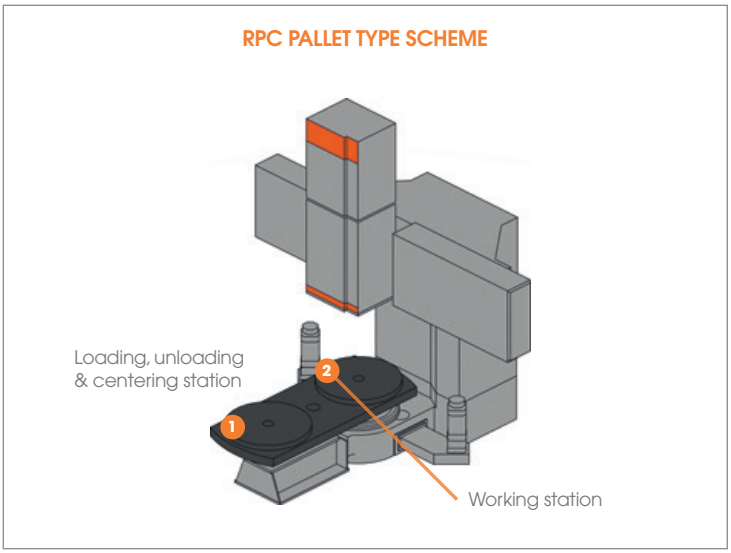
Table diameter	mm	6.000 - 8.000	in	236 - 315
Swing diameter	mm	max. 16.000	in	max. 630
Turning height	mm	max. 8.000	in	max. 315
Table load	kg	max. 350.000	tons	max. 344
S1 Main drive power	kW	2x131	hp	2x175

*Column displacement in the "Y" or "U" axis depending on the machine configuration.


BOST

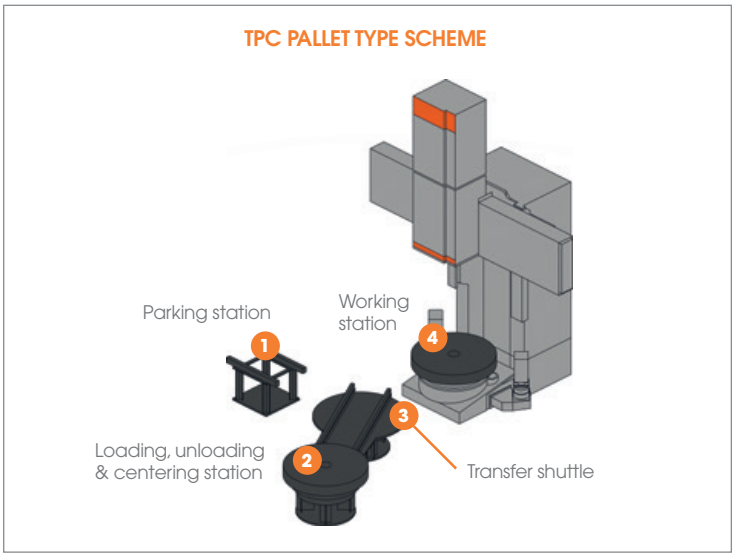
RPC Rotating Pallet Changing System

RPC Rotating Pallet Changing System consists of a 180° rotating revolver type solution with two pallets. The inner pallet position is used for workpiece machining and the outer pallet position is used for loading/unloading and workpiece centering. This is a highly recommended solution when the footprint space is limited and the workpieces weight is less than 5.000 kg.



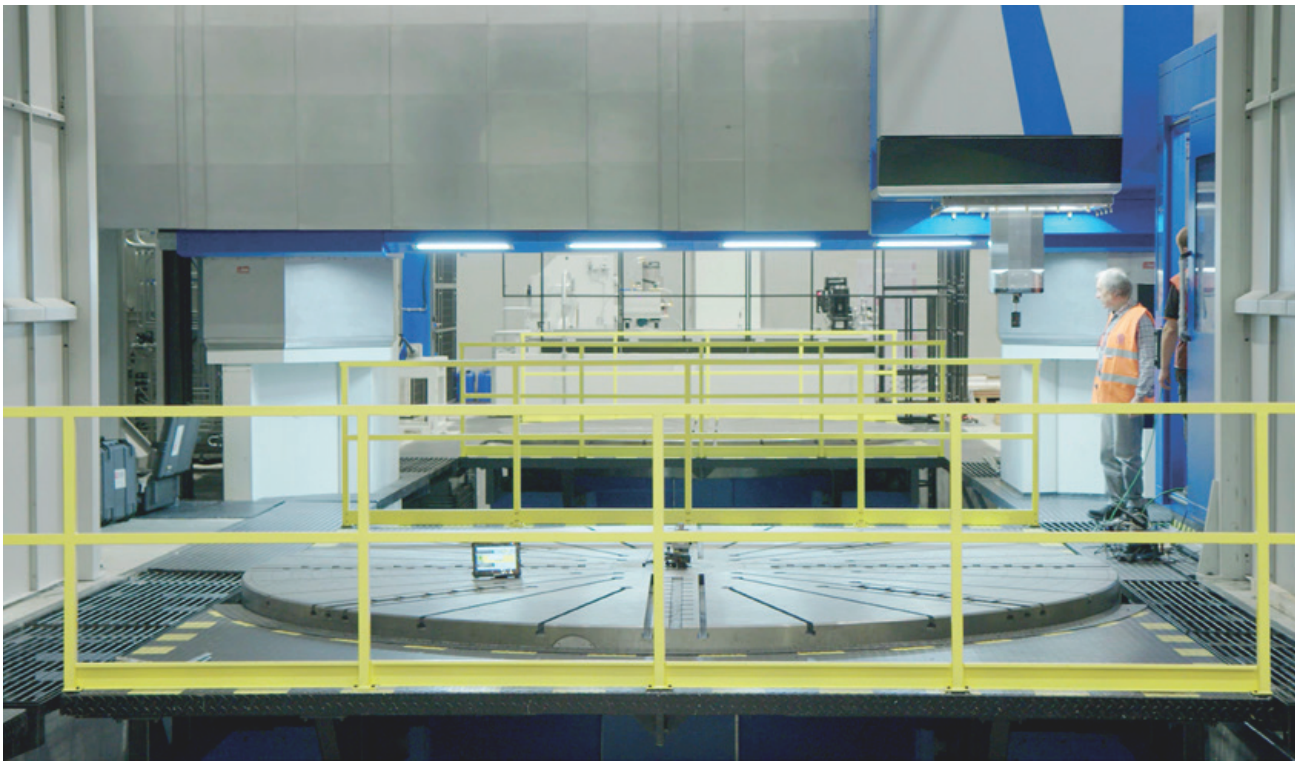
TPC Translating Pallet Changing System

TPC Translating Pallet Changing System consists of a pallet translating solution with two or more pallets. The installation is composed by one working station used for workpiece machining, one transfer station and one or more parking stations for different production capacities. The system can be equipped with pallets composed by manual or hydraulic jaws driving system.

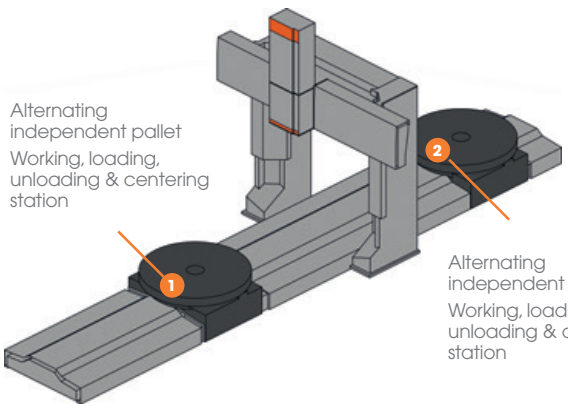


TYPC Translating Y axis Pallet Changing System

TYPC Translating Y axis Pallet Changing System consists of two independent saddles moving along a Y axis, for working in a pendular way. Both tables are real Y axis working units with the possibility of loading/unloading/centering the workpieces, depending on which table is being used each time. This system avoids the positioning error between the centering and the working station as no transfer shuttle is required.



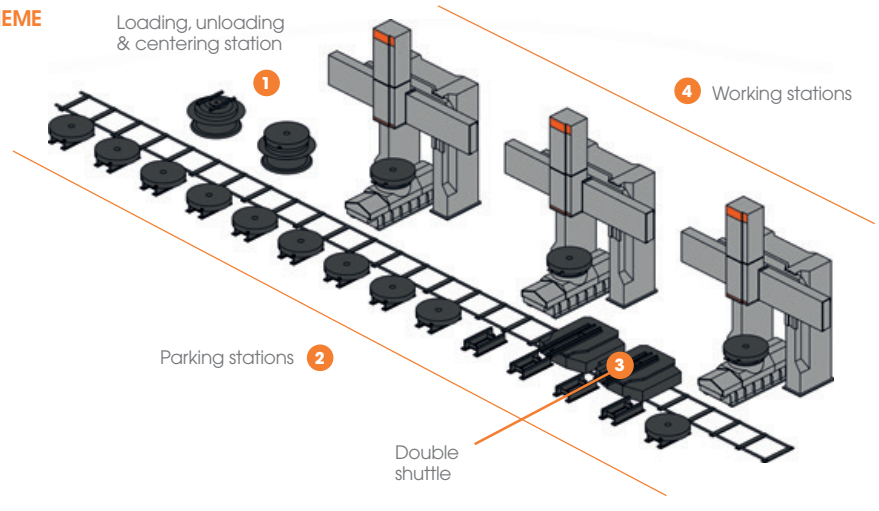
TYPC PALLET TYPE SCHEME



FMS Flexible Manufacturing System

Bost Vertical Lathes can be integrated into a complete FMS with one or several loading stations, single or double pallet transfer system, central tool handling and storage. Our FMS Flexible Manufacturing System allows for fully automated and unmanned production. The complete manufacturing process is planned, monitored and documented by user-friendly central FMS production management software. Each automation system is customer specific and designed and delivered as a turn-key solution.

FMS PALLET TYPE SCHEME



iBOST 4.0 KEY FEATURES

Smart feeds
BOST adaptive control intelligent system adapts programmed cutting conditions in real time and is able to monitor the machining process with the aim of detect tool breakage, tool wear and missing tools.

Smart damping
iBOST Smart damping function reduces the vibrations extending the tool life and improves the obtained surface quality.

Anti-collision system
Collision Avoidance provides 3D real time crash monitoring. The system prevents machine moving components from unexpected accidents with machine heads or tooling. The system is available in JOG/ MDA/AUTO operating modes.

Automatic Calibration System & Automatic tools measuring
Automatic measuring probe and tooling calibration system.

Thermal Control and Machine self Tuning
Machine self geometrical tuning through hydrostatic oil delta temperature control and active hydraulic/mechanic system for compensation of main structures geometries.

Machine Modes
Different access levels can be defined depending on the request for each customer.

Total productive maintenance
Programmed preventive maintenance tasks to ensure the best performance of the machine components.

Digital Twin
Virtual commissioning and advanced simulation of the machine thanks to digital twin dynamic 3D models.

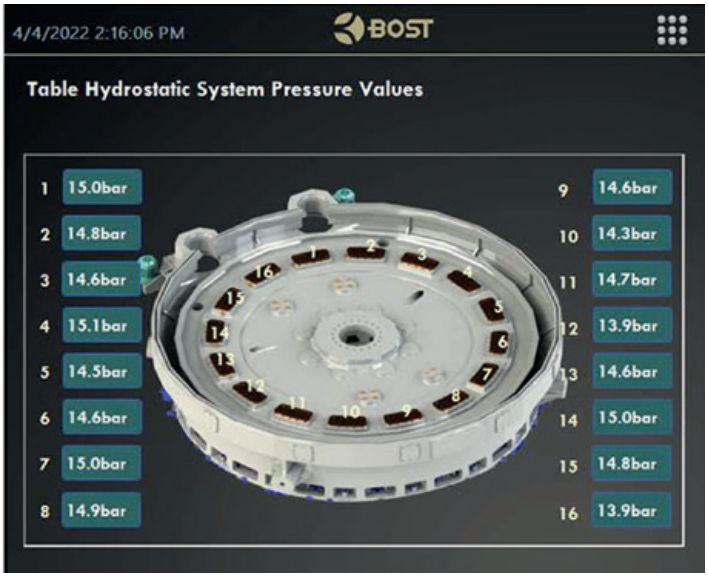
High level of energy efficiency
Programmed hydrostatic heating cycle performance, stand by mode and low power consumption pumps, motors and drives.

Emergency stop and retract
Machine axes emergency retract cycles in a secure way during voltage power failures.

Intelligent load adjustment and Machine Dynamic Optimization (KPI control)
Intelligent load adjustment allows the machine parameters to be adapted depending on the weight of the workpiece to be machined.

Tailored easy programming
Friendly user interface for customized machining and measuring cycles.

Customer Support through Teleservice
Remote access to the CNC using Industrial Ethernet Switch and SINEMA RC Software through a safe VPN connection.




VTL 32 CV
BOST
Almacén de cabezales
RAPIDO

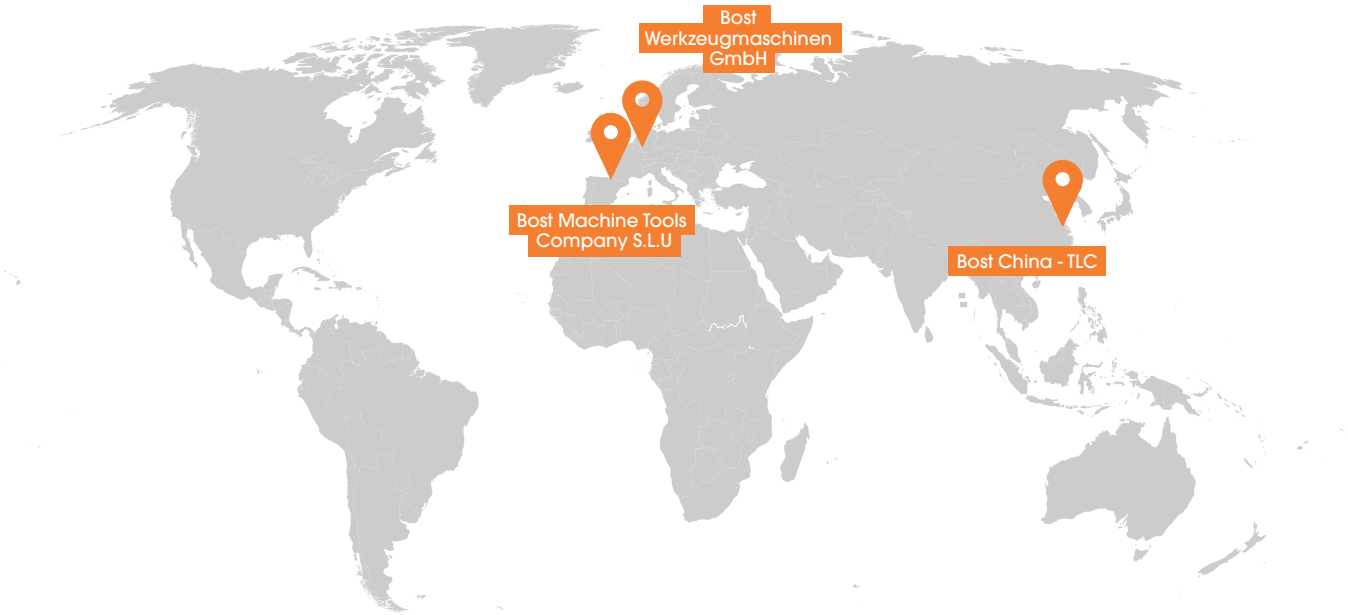
Come visit us

Our factory is located in the Basque Country, in the North-East of Spain, less than 40 km from France and 20 km from San Sebastian, Donostia in the Basque language.

The long tradition around machine tools in the Basque Country makes that all of our supply chain network is very close to our factory. This allows us to have a really close relationship with our key partners, which is very important for building customized machine tools.

Donostia/San Sebastián region´s economy is mainly focused on knowledge-based industries, like science, technology and innovation. This region has been an innovation-driven throughout its history and today is also a world-famous food destination, being located in an area with the most Michelin stars per square meter in the world and is home to the rebirth of Basque cuisine.

The city is hub for strong innovative companies boasting 5,000 researchers, 34 research centers, cutting-edge technology, talent attracting infrastructures, 4 universities, an innovation week, world famous SSIFF San Sebastian International FIAPF A category Film Festival, etc.



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BOST Premium VTLs

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