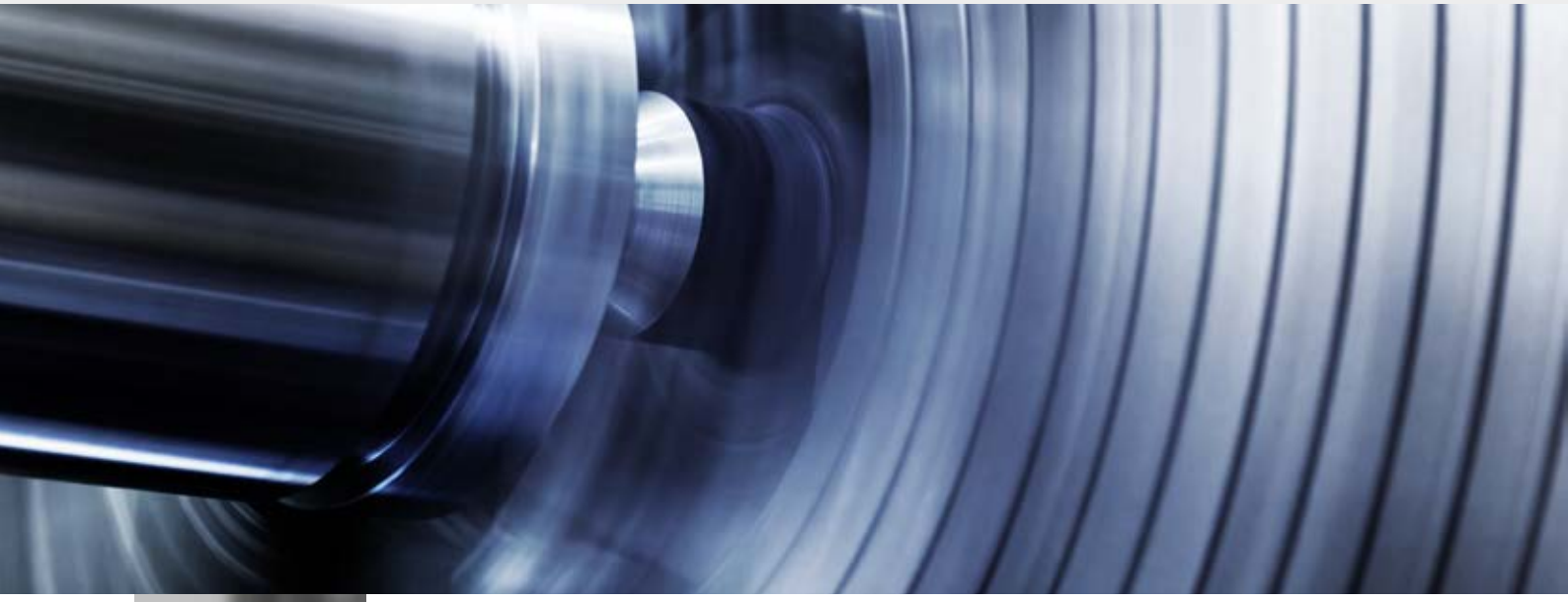
COMPANY PROFILE

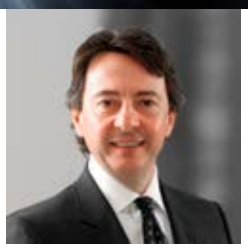
INNSE BERARDI Machine Tools

INGERSOLL Machine Tools

MACHINE TOOLS FOR INNOVATIVE BUSINESSES

Camozzi Group
Products, components and solutions
for industrial automation, machine tools,
textile machinery and processing
of raw materials through digitalization





Lodovico Camozzi
Chairman and CEO
of the Camozzi Group

I am proud to announce the formation of the new Camozzi Machine Tools Division, which brings together the resources and expertise of two Camozzi Group companies, Ingersoll Machine Tools and Innse-Berardi. Both companies already enjoy worldwide reputations in the development of production machinery and systems. The synergy of their combined operations will lead to advances in critical fields such as industrial digitalization, additive manufacturing, fiber placement, tape laying and boring/milling.
As a global organization, the Camozzi Machine Tools Division provides the security to ensure that manufacturing and production technologies continue to advance to meet the new and evermore complex needs of our customers.

CAMOZZI MACHINE TOOLS DIVISION

INNSE BERARDI Machine Tools

INGERSOLL Machine Tools

The new Camozzi Machine Tools Division brings together two of the most advanced companies – **Innse-Berardi and Ingersoll Machine Tools** – to create a partnership that can offer leading-edge technologies for machine tools and the very best support around the world.

The new partners complement each other perfectly. Ingersoll Machine Tools will remain a centre of competence for additive manufacturing and aerospace, while Innse-Berardi will maintain its expertise in the general mechanical engineering, defence, energy and rail sectors – and both will continue to manufacture heavy machining products. The partners will continue to be reference points for their respective customers, bolstered by support from each other.

Customers will benefit from this partnership through a greater product range, improved services and **accelerated innovation**, plus wider technical and manufacturing expertise.

The new division is an unrivalled supplier of innovative engineering process technologies for complex manufacturing applications. Its reputation is further enhanced by the partners' long and successful records of excellence in all the industry sectors they serve.

130 YEARS OF EXPERIENCE

3 CONTINENTS

5 KEY AREAS

340 EMPLOYEES

MORE THAN 10 000 INSTALLED MACHINES WORLDWIDE

157 000 SQUARE METERS PRODUCTION AREA

FEATURES & BENEFITS
A team-key approach

Ingersoll and Innse-Berardi work together seamlessly within the Camozzi Machine Tools Division while retaining the individual identities they have built up over many decades.

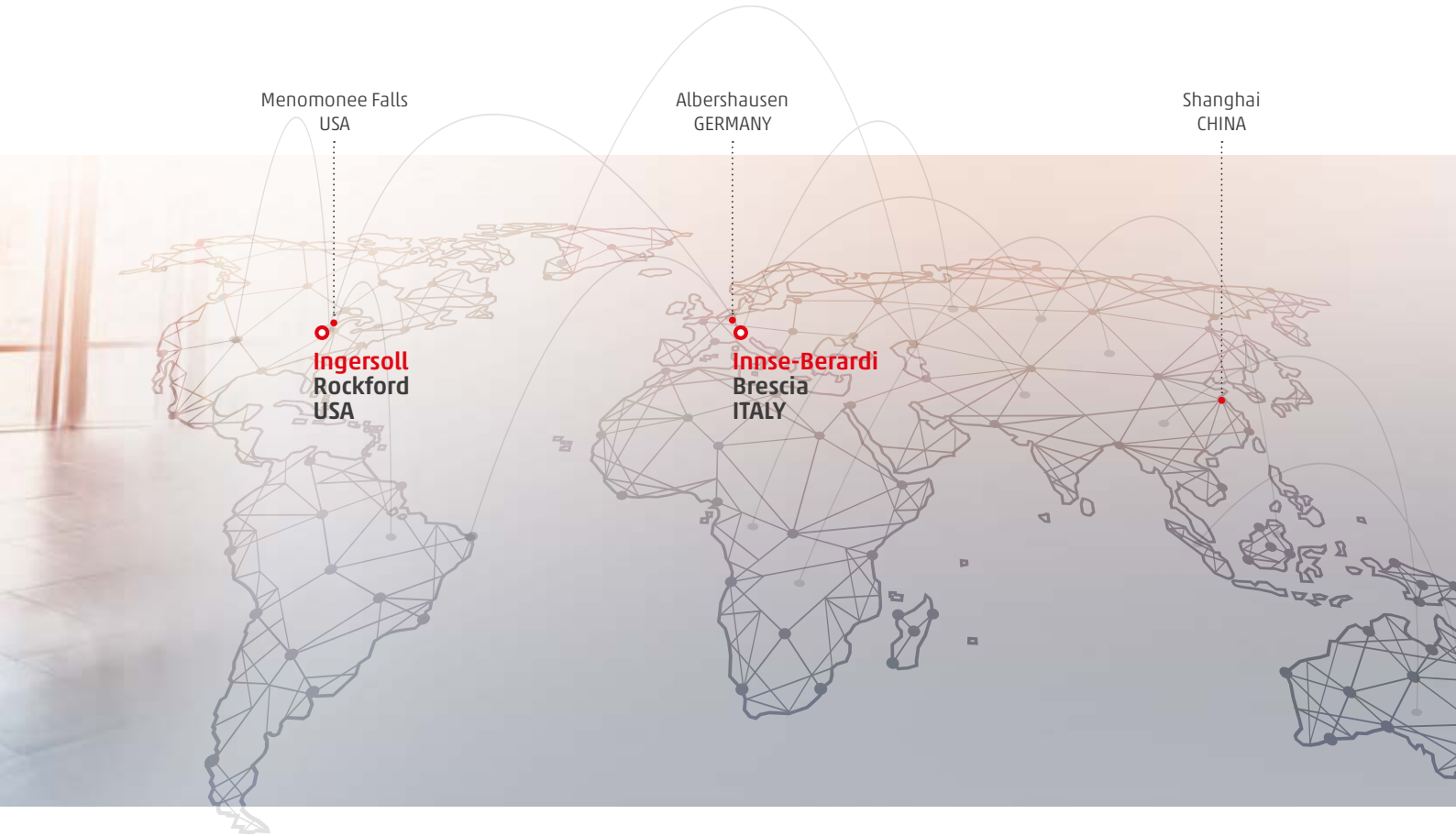
Both companies offer each other's products and services, including high performance, heavy milling and machine tools; composite and additive manufacturing; industrial digitalization, communications and integration; and contract manufacturing services. Harmonizing their worldwide manufacturing, direct sales and agents' resources, the respective turn-key capabilities of Ingersoll and Innse-Berardi mesh together to provide what the company refers to as a **'team-key' capability** – with the promise to be able to meet virtually any customer need anywhere on the globe. This team-key approach is further borne out thorough the transfer of process knowledge gained from using its own machines in its Contract Manufacturing Department. Having learned how to achieve optimal performance from its own machines, the business can pass that knowledge on to customers, allowing them to fully utilize their new machine's capabilities.

Further, the integration of specialist knowledge and experience extends beyond the companies, to include customers' own personnel. This concept creates an enduring team that works in close collaboration, sharing knowledge and expertise not just on a single job, but across an on-going series of projects. The Camozzi Machine Tools Division brings together Ingersoll's expertise in additive manufacturing and aerospace machining and Innse-Berardi's strength in the medium and heavy mechanical engineering sectors, to create a truly global presence in **all key world markets**.

KEY SECTORS FOR THE DIVISION

- Global aerospace industries
- Medium and heavy mechanical engineering
- Energy and power generation
- Naval
- Mining and earthmoving
- Raw materials processing
- Machining and metals processing
- Additive manufacturing
- Transport and rail
- Defence

GLOBAL REACH



The benefits of this partnership of two engineering giants include a greater product and service portfolio, constant innovation, and wider contract manufacturing expertise. And, while each company retains its individual market identity, their manufacturing, direct sales and agents' resources, and respective turn-key operations, come together to create a high performance 'team-key' capability.

This team-key philosophy also extends to creating seamless partnerships with customers' personnel, enabling the division to meet virtually any conceivable customer need **anywhere in the world**. Further, it facilitates the transfer of process knowledge with on- and off-site customer training and identifies the best ways to handle customer components, thus increasing efficiency and reducing working times.

As such, the division can leverage the availability of its expertise, whether it is for a single project, a series of related projects or long-term strategic developments. It sets the benchmark for excellence and capability across a wide range of industrial fields around the world. The partnership enables the division to broaden its existing offering in five key areas:

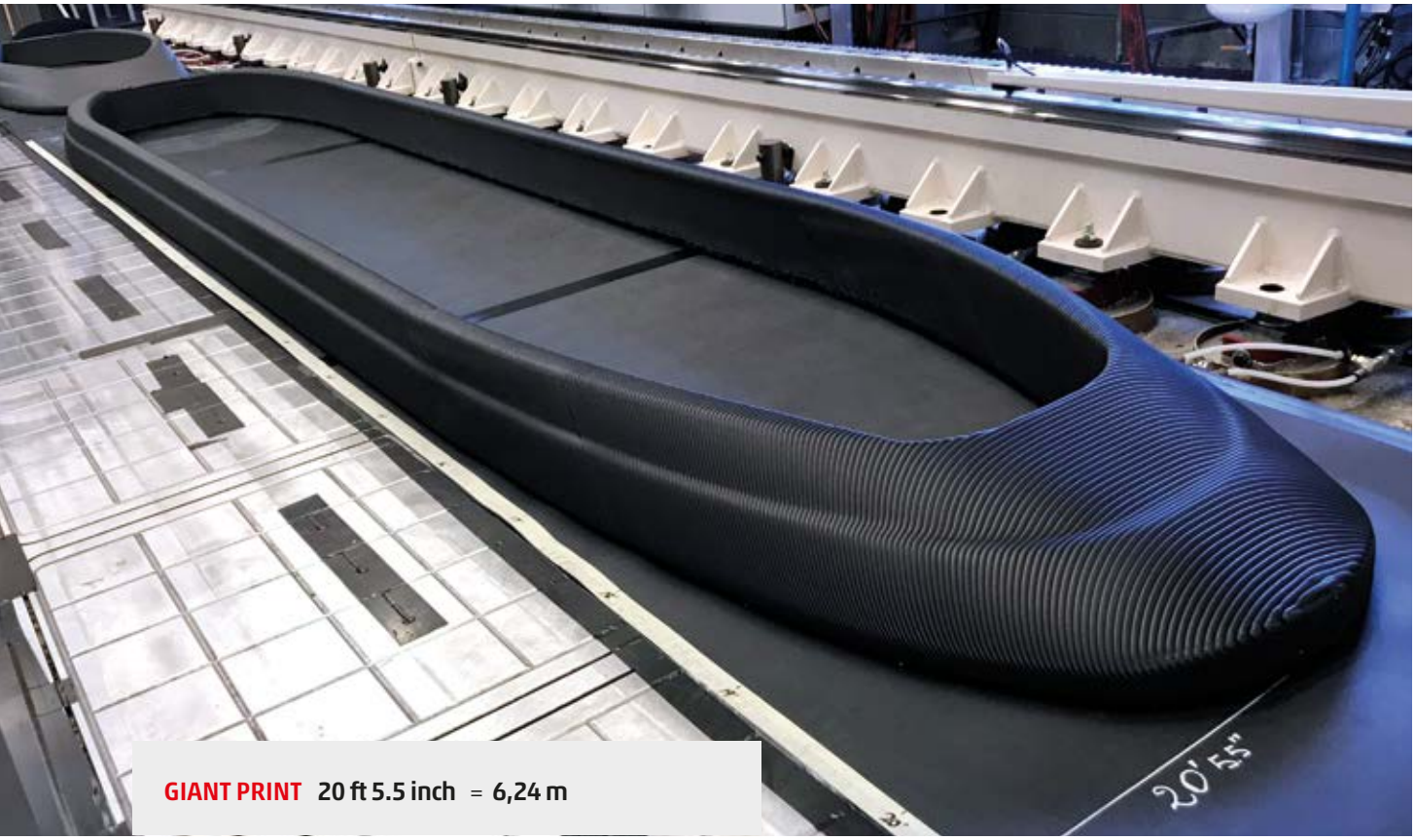
- **ADDITIVE MANUFACTURING**
- **FIBER PLACEMENT**
- **VERTICAL MACHINES**
- **HORIZONTAL MACHINES**
- **SPECIAL MACHINES**

ADDITIVE MANUFACTURING MACHINES

Ingersoll
MasterPrint Continuous Filament

Designed, built and tested at the company's Development Center in Rockford, Illinois, **MasterPrint** is Ingersoll industry-leading solution for additive manufacturing of complex geometry, durable, wide and high, thermoplastic parts. MasterPrint is currently the **world's largest 3D-printer** and offers fast, reliable, cost-effective performance, integrating a 5-axis mill head for finishing operations.

MasterPrint has the ability to 3D print and mill parts both with chopped fiber and continuous filament materials.
It can also overprint existing workpieces.



GIANT PRINT **20 ft 5.5 inch = 6,24 m**

MasterPrint Continuous Filament is available in gantry and robotic configurations, both with Siemens 840D CNC - the standard control for the manufacturing industry.

Programming, simulation, optimization and diagnostics are seamlessly performed through Ingersoll proprietary SW Suite.

MasterPrint cuts cost, and streamlines the manufacturing process. Large parts are printed and then machined to final their shape with the same machine.

Manufacturing costs can be reduced by up to 75% and lead times shortened from months to days.

MasterPrint is available also as hybrid with multiple modules operated under the same gantry.

FIBER PLACEMENT MACHINES

The Division now offers the Ingersoll range of automated fiber placement machines for the manufacturing of complex and ultra-high performance composite parts, such as aircraft wings.

Ingersoll machines combine computer numerically controlled (CNC) systems with horizontal rotation of both the headstock and tailstock. This enables precise and efficient deposition of **composite fibers** and trimming on mandrels of all sizes.

Mongoose is Ingersoll Machine Tools' iconic Fiber Placement Machine first introduced in 2009.
Since then Mongoose has become the aerospace industry preferred solution for the carbon fiber layup of tight concave parts and complex geometry convex tools. Its recent evolution, **Mongoose Hybrid**, features AFP (Automated Fiber Placement), ATL (Automated Tape Layer), trimming and inspection on the same machine platform to cover any need of composite manufacturing.

The Mongoose series includes a variety of configurations, including gantry and robotic, each suited to different part geometries and that can be used with a wide variety of resins and fibers.
As such Mongoose's flexibility can provide a solution to almost any application requirement.

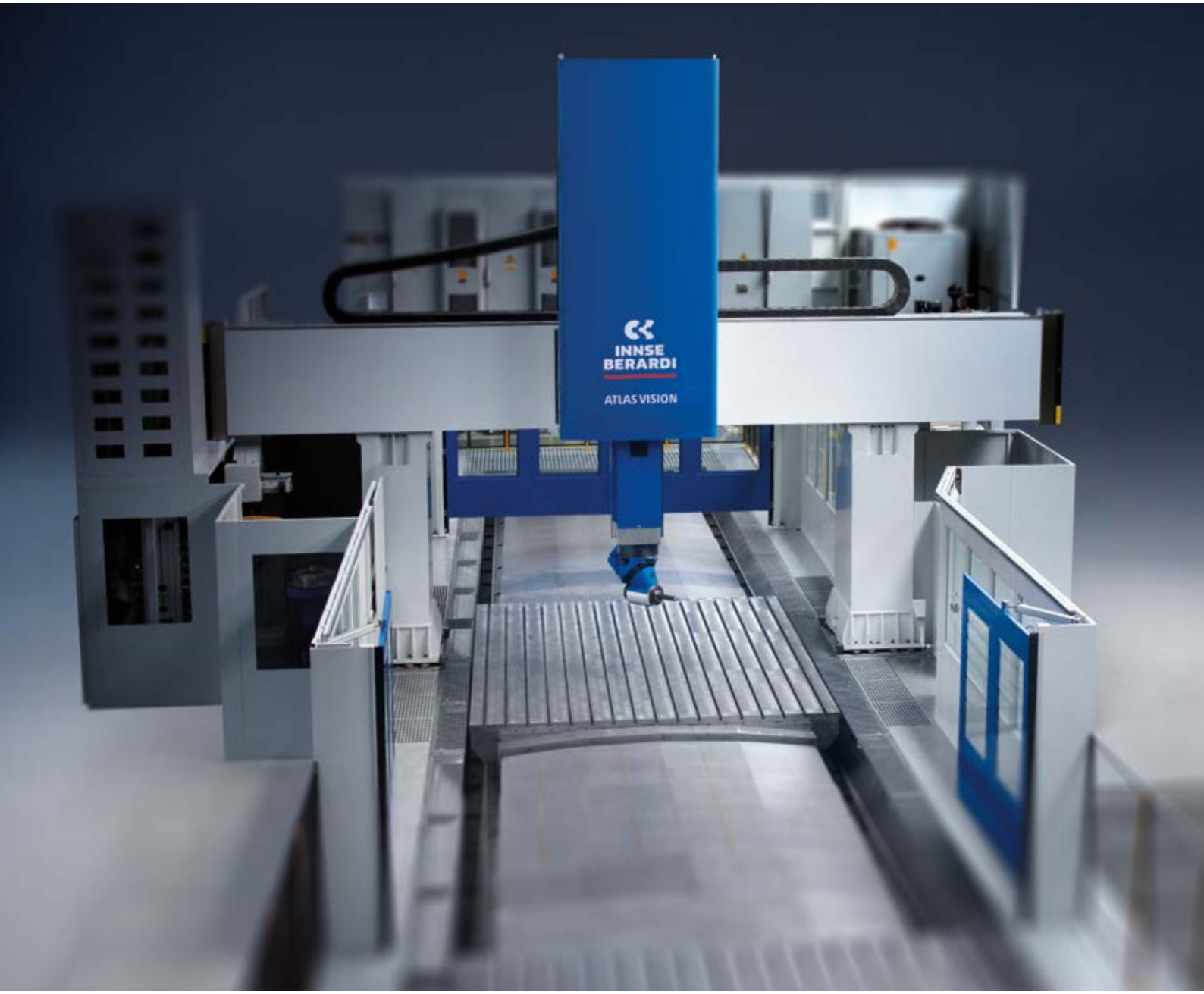
Ingersoll
Mongoose Hybrid

Ingersoll
Mongoose

VERTICAL MACHINES

The vertical machining solutions produced by both partner companies in the Division, comprise the **Atlas Hydro** and **Atlas Vision** series from Innse-Berardi, and Ingersoll's **MasterMill** and **MasterSpeed** series.

These families of gantry-and table-style vertical milling machines minimize operational costs and maximize performance. Building on Ingersoll's and Innse-Berardi's long-term global success in this field, the division's latest vertical machines combine the most recent technological, ergonomic and safety features. The designers have also ensured that these machines are easier to operate than ever before.



Ingersoll
MasterSpeed Gantry

Camozzi's wide range of large vertical milling machines means there is an **optimum solution** for every application.

Innse-Berardi
Atlas Vision

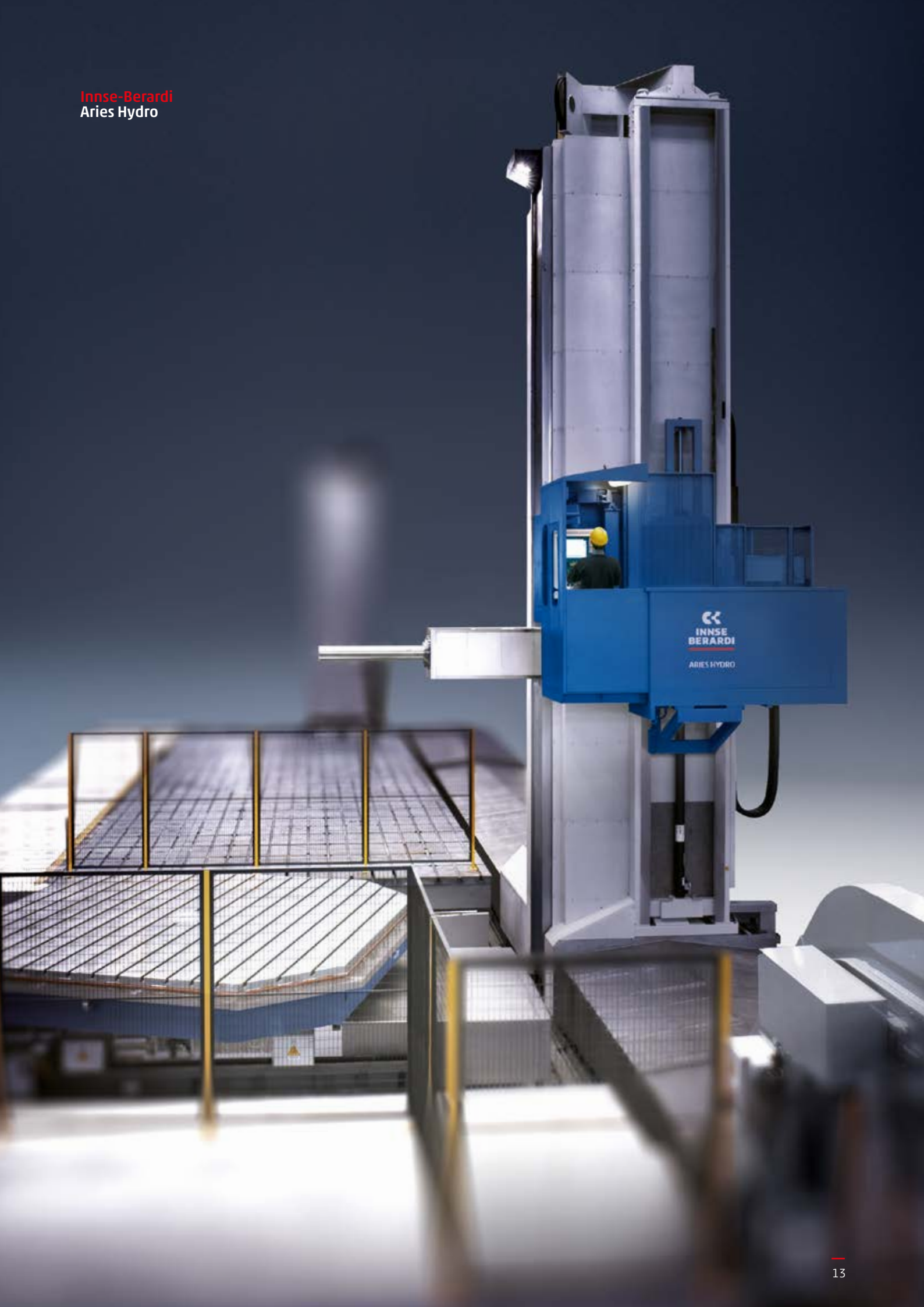
HORIZONTAL MACHINES

Ingersoll and Innse-Berardi both have a long history of making world class horizontal milling machines. Their horizontal machining solutions consist of the **Aries Hydro** and **Aries Vision** series (Innse-Berardi) and the **PowerMill** and **SuperProfiler** series (Ingersoll). These horizontal machining centers are in widespread use around the world, from high-power, high-torque machines for titanium and other hard metals to agile, high-speed machines for machining aircraft components and parts made from the latest composite materials.

Both technologies (horizontal and vertical machines) can be utilized for high speed and heavy-duty applications and feature roller guideways (PowerMill, SuperProfiler, MasterMill and MasterSpeed from Ingersoll and Aries and Atlas Vision from Innse-Berardi) or can be used for heavy applications requiring hydrostatic technology (Aries and Atlas Hydro, Innse-Berardi).

Ingersoll
PowerMill

Innse-Berardi
Aries Hydro



SPECIAL MACHINES
Custom solutions for every demand

Innse-Berardi
FCR

Ingersoll
Scalper

The Division is set up to help customers increase and optimize their production processes. Its highly experienced manufacturing and machine tool engineers work closely with experts from client companies to analyze their current and future requirements and expectations.
They then define a set of objectives and build custom machines that meet the specific needs of the company.

This can involve traditional techniques, state-of-the-art technologies and emerging new solutions, such as the **Industrial Internet of Things** (IIoT), big data, cloud computing and machine-to-human (M2H) communications.

Examples of Camozzi tailor-made solutions include:

- **Horizontal multi-spindle drilling machines**, used to produce deep holes in the tube sheets of heat exchangers in nuclear and chemical plants
- **Machining centres** for generator rotors and for turbine rotors
- **Scalpers** for medium to high production of aluminum and titanium ingots

DIGITAL SOLUTIONS

The design, manufacture and global support of modern high performance machine tools requires extreme dedication to always advancing technology and a commitment to total customer service.

The Division is continuously searching for ways to improve the performance of its machining centers, while lowering operating costs and fully supporting users.

To this end, Camozzi Machine Tools works with its sister company **Camozzi Digital** to develop state-of-the-art ICTs (Information Communication Technologies, such as the IIoT, Industry 4.0, big data solutions and cloud computing) and applies them to machining, manufacturing and production.

INDUSTRY 4.0

CLOUD
MICROSOFT AZURE

IBNET
Innse-Berardi
Production Management

IBNet is a Camozzi solution for end-to-end production management, providing centralized control for all aspects of production, from materials supply, to machine availability and quality monitoring.

IBRM Innse-Berardi Remote Maintenance
IoT Platform by Microsoft®

IBRM provides a suite of software tools that protectively delivers real-time real-world plant monitoring, remote management and control, and predictive plant maintenance.

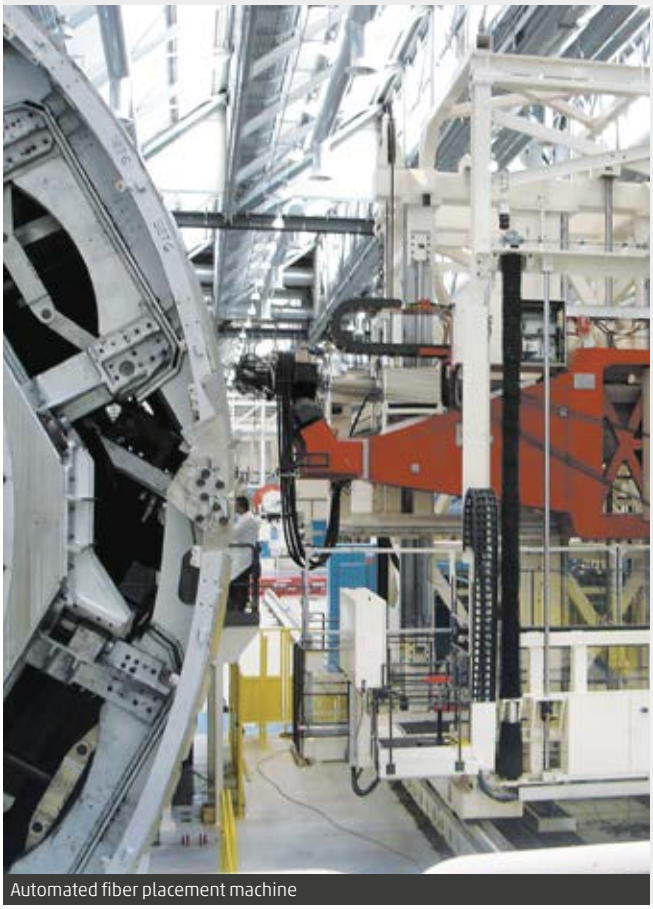
Application sectors:
AEROSPACE & GENERAL MECHANICAL

Aircraft manufacture requires highly specialized machine tools, many of which have been developed and refined by world-renowned experts in the Division. These include automatic fiber placement and tape laying machines, high speed milling and profiling machines, and a range of special machines capable of producing all parts of an aircraft's body, wings and fitments.

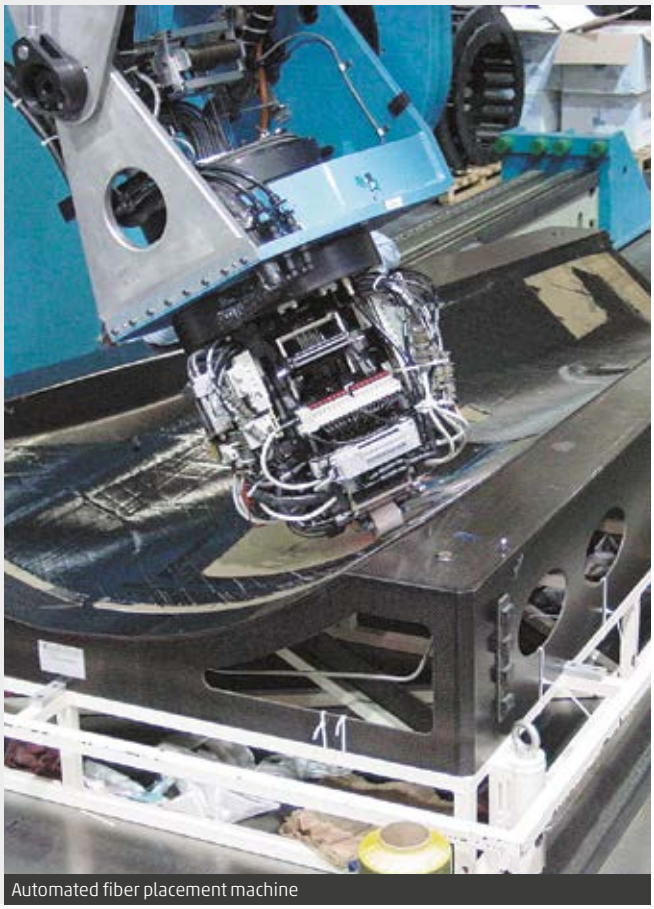
The Division also supplies a wide range of other industries with machine tools for making products such as pumps, gearboxes, centrifuges, frames for paper mills and printing presses, plus fabrications and forged parts.

AEROSPACE

Automated fiber placement machines, automated tape laying machines, high velocity milling machines and profiler, specialized drilling machines, 5-axis milling machines for hard metal.



Automated fiber placement machine



Automated fiber placement machine

GENERAL MECHANICAL

Lathes, portal milling machines, turning and milling machines, horizontal milling-boring machines, machining centers.

Horizontal milling-boring machines for general mechanic components

Horizontal milling-boring machines for general mechanic components

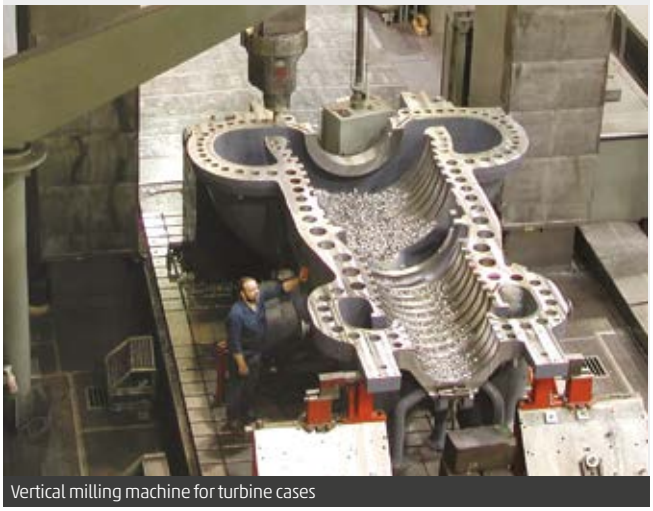
Application sectors: **ENERGY, NAVAL, MINING & RAIL**

The Division can supply world-leading machines, including lathes, portal milling machines, turning and milling machines, horizontal milling-boring machines, machining centres and specialist machines. These are used to produce equipment for the energy, marine, mining and rail industries, including: turbines, Pelton wheels, distribution stators, low, medium and high pressure casings for compressors, motors and reactors; ships' propellers, driveshafts and diesel engine blocks; railway bogies and axles, diesel and electric motors, switch points and frogs; steel industry mill stands and rolls; and mining and earthmoving equipment.

ENERGY

Lathes, portal milling machines, turning and milling machines, horizontal milling-boring machines, machining centers, dedicated machines.

Rotor slotter for turbine rotors

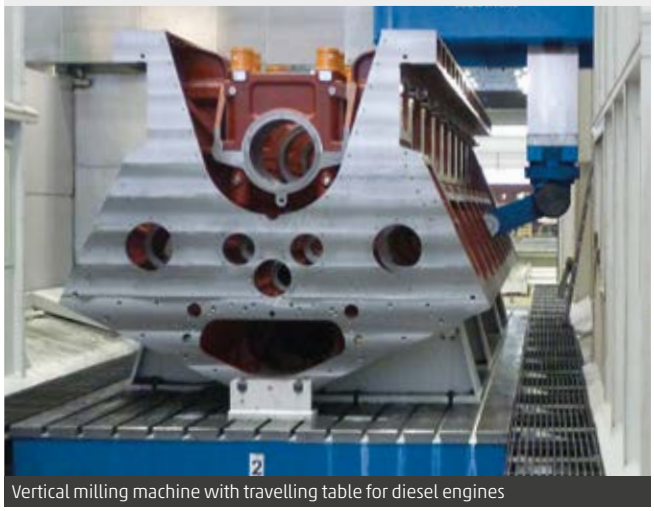


Vertical milling machine for turbine cases

NAVAL

Lathes, portal milling machines, horizontal milling-boring machines, machining centers, dedicated machines.

Horizontal milling-boring machine for propellers



Vertical milling machine with travelling table for diesel engines

RAILWAYS

Portal milling machines, horizontal milling-boring machines, machining centers, dedicated machines.

Vertical milling machine for railway boggies

Vertical milling machine for railway engines

Vertical milling machines for customer in railway industry

EARTH MOVING

Portal milling machines, horizontal milling-boring machines, machining centers.

Horizontal milling-boring machine for gear boxes

Vertical milling machine for components of earth movers

EXCELLENCES

Through its founding partners, Camozzi Machine Tools Division has a rich and diverse history at the cutting edge of technology and the advancement of human achievement.

Ingersoll machines are used to produce large and critical parts for the next generation crew vessels that will take astronauts into orbit and beyond. Together with the **National Science Foundation and AURA**, it has built the mount and main rotator drive and other components for the world's largest solar telescope – the Daniel KInouye Solar Telescope – on Hawaii, which is capable of ultra-high resolution observations of the sun.

On a more earthly level, an Ingersoll machine installed at an aircraft manufacturer holds the record for the world's fastest titanium removal rate, while Innse-Berardi supplied a double Atlas Vision portal to produce components for a new energy production system for nuclear fusion - the ITER project.

Experienced in-house engineers and developers keep the Division at the forefront of machine tool technology. For instance, they are creating **IIoT and Industry 4.0 interfaces** that are redefining the capabilities and expectations of manufacturing and production machinery. And they are pushing the communications and control envelope even further by pioneering artificial intelligence solutions for advancing machine tool performance.

Innse-Berardi
Radial plate machining

SERVICE AND SPARE PARTS

With more than 10.000 machines installed worldwide, the Camozzi Machine Tool aftermarket service Team has the skills, focus, and staff globally to support you and your machine tool assets throughout the life of ownership. From spare parts to actual technology enhancements, we offer a wide range of customer profit, quality, and productivity focused solutions. We are prepared to react and or collaborate with you as needed.

Additional solutions include but are not limited to:

- **RETROFITTING, REVAMPING**
- **REBUILDS, RECONDITIONING**
- **MACHINE(S) RELOCATION**
- **REMOTE DIAGNOSTICS**
- **PREVENTATIVE MAINTENANCE**
- **PREDICTIVE MAINTENANCE***
- **TRAINING**
- **APPLICATIONS ENGINEERING**
- **PRODUCTION SUPPORT**
- **CONTRACT MANUFACTURING**

*4.0 Solution provided utilizing IBRM/IBNET

INNOCENTI CWB MACHINE
BEFORE REVAMPING

INNOCENTI CWB MACHINE
AFTER REVAMPING

Revamping also renews the design

Camozzi Machine Tools
Productivity booster

MIX COMUNICAZIONE - MI

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