



cecimo

European Association of
the Machine Tool Industries

CECIMO DIGITISATION CAMPAIGN



**Examples of digital
transformation in the European
machine tool industry**

Digital solutions for a digital world



Dear readers,

For long, the best manufacturers used to be the ones that build the best capital goods. This is certainly changing. European machine tool builders increasingly digitise business processes, connect products and launch data-driven services. We witness an unprecedented level of innovation that boosts intelligent production and changes our business. This rapid transformation is the reason why CECIMO and its national associations have decided to develop a compendium with the involvement of European machine tool builders. The compendium collects various business practices already on the market from our companies across Europe, showcasing the digital evolution of our sector.

With this initiative that brings together dozens of pioneer European machine tool builders, we aim to increase the digital awareness of our sector. For many of our companies, mainly SMEs, the issues surrounding connectivity, industrial data and servitisation are often new topics and we need to disseminate good practices. This will help accelerate the uptake of new business models in our sector. To remain competitive, we also need to showcase our customers the benefits and added value of new solutions developed by machine tool builders with clear results. Another reason behind this initiative is the fact that, as trade associations, we must inform policy-makers at European and national levels about the evolution of our sector through business cases. This will help convey strong messages to public authorities about our priorities and needs in the digital era.

Having gathered several practices from our companies, we already have key takeaways from our sector. First, the European machine tool sector is very heterogeneous, and each business needs to think about its own digital strategy based on varying customer demands. We see that the digital understanding and maturity differ largely from one company to another in the European machine tool industry. While some companies focus on predictive maintenance and web platforms, some others develop solutions pertaining to remote assistance and training. Second, we understand that digitisation is not a revolution but an evolutionary process. Each company has its own digital path and gradually invests in new business models and services. Third, digitisation is about increasing collaboration, getting closer to customers more than ever and developing the customized solutions that create value for each machine tool user.

Let me also remind you that this initiative will remain alive and we invite other European machine tool companies to get involved and share their good practices with us. Many exciting opportunities as well as new challenges face the European machine tool industry and it is important for our stakeholders to stay well-informed about the latest trends from our sector. I hope that you will find this initiative valuable and learn more about the rapid transformation going on in the European machine tool industry.



Filip Geerts
Director General

BLM GROUP sets itself up as a global partner for the whole tube processing, from laser cutting to cold saw, bending, end-forming, measurement, with thousands applications all over the world.

Our customers' challenges

The customer needed to bend tubes that had been previously processed with a laser tube cutting system. The final position of the laser cuts along the tube was normally wrong because of tube elongation due to bending operations. So the customer needed to proceed with different attempts before getting a correct result. There was a loss of material and a long time before starting the real production.

Our solutions

An integrated production process in which a pipe bending system and a Laserube system interact, exchanging information, to get a correct part at the first attempt.

From a single three-dimensional model of the part, bended and laser cut, the programming software generates the part programs for each system. Furthermore, the bending system knows (or is able to detect) the parameters, that identify the elastic behaviour of the tube in process (meaning springback and elongation), and transfers this information to the laser system. The laser system through this data is able to automatically modify the theoretical part program to obtain the proper positioning of the laser features after bending. Then the bending system completes the work and produces a precise part at the first attempt.



“In the machine tool business, there is a lot of data that we capture and process to improve the solution that we generate for our customers. Data plays an instrumental role in integrating various functions and in generating a state-of-the-art product for the use of our clients.”

Giovanni ZACCO
Market Development Manager

What improved:

- The correction of the part programs to get a correct result is completely automatic.
- Material savings: no more attempts are needed, the part is correct from the first time.
- Time saving: the first piece is immediately correct.

DANOBATGROUP develops and supplies:

- advanced machines ensuring high accuracy, reliability and productivity, designed to be able to handle the most complex machining processes;
- specialized solutions for the manufacture of high value-added components;
- fully automated solutions and turnkey lines; and
- advanced services based on information and communication technologies.

Our customers' challenges

Machine tool users are obliged to increase productivity, efficiency and flexibility of machine and manufacturing process.

The use of specific hardware and sensors, and of the latest enabling technologies in the field of big data, cloud and secure computing improve the availability and support of the machine and reduce significantly expensive downtimes. It also improves operating costs offering the necessary indications:

- react quickly to problems starting machine diagnostic and failure recovery,
- initiate actively updates and maintenance work,
- optimize machining processes.



Our solutions

DANOBATGROUP has launched a set of services, based on machine monitoring and big data, to analyse the machining process and machine behaviour. Using on-premise or cloud devices (tablet, mobile phone), users can check the status of the machine, anticipate possible failures and optimise the process.

Main features:

- Real-time monitoring
 - * Condition monitoring offers live status monitoring of the main and vital parameters of the machine constantly under control (CNC, PLC and sensors signals integrated in the machine).
 - * Available for any control (Heidenhain, Fanuc, Siemens, Fagor, etc) using communication standards such as MTConnect, OPC-UA, etc.
 - * SAVVY DATA SYSTEMS is easy to use, modular and scalable, which facilitates the gradual introduction of this technology in the manufacturing workshop.
- Reporting
 - * Summarize activity of the machine to inform operators, supervisors and managers of punctual events or trends useful for quick decision making.
 - * Easy-to-interpret visual report that gives them at-a-glance real-time information about: machine status, alarms, machine utilization, power monitor, machining processes, etc.
- Analytics based on real and historical machine data, DANOBATGROUP has the capability to perform:
 - * Diagnosis and troubleshooting.
 - * Predictive maintenance.
 - * Machining process optimization.



“We will continue to invest in new solutions for customers to convert complex machine-generated data into insights for decision-making and overall process efficiency. Data-driven solutions play an instrumental role for the competitiveness of our business.”

Antxon LOPEZ USOZ
Innovation and Development
Manager

What improved:

- Reduction unplanned downtime: 32%.
- Increase machining process capacity: 8%.
- Reduction in Energy use: 16%.
- Improved product life: 7%.

Fagor Automation

Fagor Automation has 35+ years of experience in developing and manufacturing CNC and feedback systems for machine tools. It is known for agility in providing customized solutions to its clients' needs. Its vast commercial and service network spans 50+ countries.

Our customers' challenges

Our clients today need to be increasingly more competitive in order to remain leaders in their sectors. To do this, it is essential to be flexible when adapting to their production means and to be able to assign their resources in real time in order to adapt to the demand.

In addition, the optimization of the energy, tools and raw materials required by the production process can be very important when strengthening their leadership.

Our solutions

In order to meet the needs of our clients, Fagor Automation offers complete solutions that integrate everything from motors to CNCs. By mastering all the technology of the entire system, we are able to offer, in real time, all the information on the production process being carried out on each machine at any given moment.

In today's digital revolution, information is the basis on which the pyramid is built that enables us to cut production costs, increase production plant efficiency and ultimately position our clients as leaders in their sectors.



“Having access to information in real time is key to success in the digital era. This is what we give our customers with our complete solutions.”

Jose PEREZ BERDUD
CEO

What improved:

With the information provided by the CNCs from Fagor Automation, it is possible to:

- increase productivity within 10% to 20%.
- reduce energy costs more than 10% .
- reduce maintenance costs by more than 12%.

FILL Gesellschaft m.b.H.

Fill your future

Fill, founded in 1966, is a leading international machine engineering company with more than 700 employees. Still completely family-owned, the company produces the best processes in all these business fields: Automotive, Aerospace, Sport, Energy and Timber & Construction (www.fill.co.at).

Our customers' challenges

Weak supply chain relations, lack of product information, discontinuity in communication and no automated data sourcing and processing had bad influences on customer's flexibility and reaction time with changing conditions. The data analysis and migration as well as the resulting changes in production planning and in the manufacturing process had to be carried out manually. Internal and external product, process and quality data (provided by different companies) are taken into consideration, so both the vertical and the horizontal supply chain is affected.

Our solutions

The main goal was to develop a solution that enables the customer to transform his production into a data driven production system. Different communication technologies are used. For the horizontal integration, Web services are used to communicate between different companies. For the vertical integration, the OPC technology is used to collect automatically all relevant data from machines. Operators are able to put data into the system via adequate HMI and assistance systems (touchscreens, scanners etc.). All data is stored automatically in a SQL database. A unique data matrix code is used to identify the produced parts at any time and place, e.g. with mobile devices the related data is available. This solution is called MWF Machine Workflow.



“The networking of systems (human – machine – product) allows a global optimization of the value added net. It is no longer necessary to schedule optimizations of the product or process in advance, this can be effected immediately when influencing factors are changing.”

Wolfgang RATHNER
CEO

What improved:

- Both external and internal data are automatically integrated in the production system.
- Autonomous production planning and control - shorter reaction time by changing conditions and therefore less waste, better availability and performance that yields in an optimized OEE index.
- Production status is available at any time (e.g. production step, quality).
- Mobile devices are used via wireless connectivity.
- Assistive systems are used for manual data sourcing.



Fives

Ultimate machines, Ultimate factory

Fives, an industrial engineering Group, designs and supplies machines, process equipment and production lines for the world's major industrial players. Fives' Metal Cutting | Composites business line is specialized in the supply of machine-tools and complete manufacturing solutions in a broad range of industrial sectors.

Our customers' challenges

This application follows customer desire to acquire a powerful application connected to FIVES machines:

- Document the machine.
- Provide a link between the operator and the machine.
- Provide a link between the operator and the support service.

Our solutions

Fives launches a powerful connected application dedicated to its machine tools offer. This application is available on any media type to reinforce the links between the service supporting the user and the machine.

This application gives access to the entire technical documentation of the machine via a 3D interface. It allows viewing remotely the state of the machine in real time. The information available enables the customer to optimize the availability of its production equipment. A predictive maintenance component prevents failures.

A remote communication component allows the user to contact Fives' experts by video transmission. Fives technicians can at request have access to the set of parameters of the machine, to its cameras and realize diagnostics and troubleshooting without delay.



“With this new application, Fives has the will to meet many customers' expectations to improve equipment's performance and maximize profit.”

Clément CAUCHOIS
Manufacturing Director



What improved:

- Remote machine status display for easy production management.
- Use of predictive maintenance tools to reduce the number of unplanned shutdowns.
- Remote diagnosis to reduce the duration of unplanned shutdowns.

GF Machining Solutions

All about you



GF Machining Solutions is the world's leading provider of machines, automation solutions and services to the tool and mold-making industry and to precision components manufacturers. Present on 50 sites worldwide, its 3,000 employees generated CHF 902 million sales in 2015.

Our customers' challenges

As plastic-injected parts miniaturize and involve more high-performance features, the mold-making industry must tighten precision and quality requirements and increase productivity, agility and flexibility while optimizing costs against a globalized competitive context and a complex technology mix at the factory.

The main issues, then, are the difficult compounding of different technologies due to limited precision and scarce expertise in multi-stage machining processes, and, all segments included, the access to full-system information for predicting and controlling all equipments' capabilities and performances.

Our solutions

GF Machining Solutions has developed a specific mold-industry solution enabling different levels of intelligence and connectivity on its devices. A multi-process execution suite associates the WorkShop Manager automated cell control software with computer-aided design and manufacturing modules facilitating the best integration of machines, robots and measurement systems. This T.R.U.E. PRECISION suite creates, simulates and executes optimized machine codes by factoring in the real electrode geometry after milling the local offsets for the cavities to be made by electrical discharge machining.

During manufacturing, the rConnect connectivity infrastructure and applications help workshop managers monitor and remotely control machine status and provides real-time process and critical component information and statistics, addressing also the needs of the wider aerospace, automotive and medical production segments.



"We pioneer complete, intelligent, connected manufacturing solutions targeting fully predictive processes, readily tunable to meet specific, fast-changing requirements of the most advanced industries."

Roberto PEREZ
Head of Global Industry 4.0

What improved:

- T.R.U.E. PRECISION is a simple, digital bridge between design and the shop-floor, reducing lead-time for achieving best strategies for machining productivity and costs. The result: improved, accurate, automated mold manufacturing.
- GF Machining Solutions' monitoring and connectivity solutions increase equipment efficiency and save costs related to manual operations and imperfect communications.

Holonix srl

Everybody talks about Industry 4.0.
We do it!



The goal of Holonix is to aid companies in innovating their products, processes and services, in terms of production, logistics, maintenance, assistance and so on, by implementing an Internet of Things approach that creates added value in product lifecycle knowledge.

Our customers' challenges

Our customer wants to be in connection with their machines, analyse their KPIs, receive the alarm in Real Time, check the operating status in order to be informed about maintenance intervention and about the machine's performances.

Our solutions

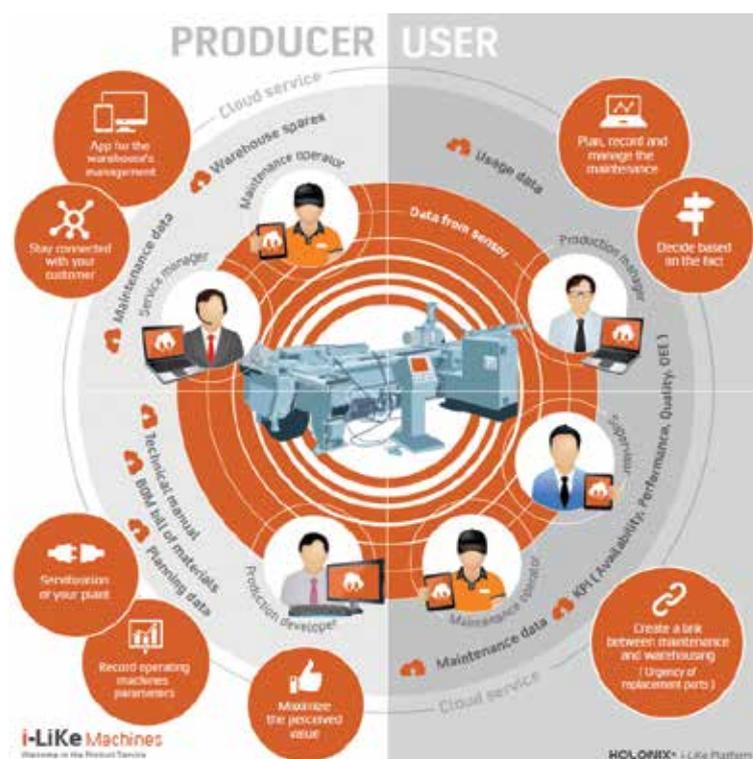
Holonix developed, designed and built for manufacturers and users of industrial machines that makes the machines smart and communicating, beyond Machine to Machine (M2M) communication to Machine to Human (M2H) communication.

The innovative Holonix system allows the manufacturer and the user to stay connected, logging machine operating parameters and usage data, maximizing their perceived value, recording KPIs, ensuring ever greater competitiveness and enhancing customer loyalty.



"We are glad to introduce Internet of Things technology in the machine tool industry, in order to keep in contact producers and users, to create an added value and to make machines connected and intelligent. This is the industry of the future, this is Industry 4.0".

Jacopo CASSINA
CEO



What improved:

- Remotely monitor of the machine operating status.
- Real time alarms in case of malfunctioning or production stoppage.
- Connection between the machines' producer and the users.
- User and producer possibility to plan maintenance operation.

KOVOSVIT MAS is a major producer of machine tools and castings from grey and ductile cast iron in Czech Republic and Central Europe. The company has 78 years' tradition and won many awards for its technical contributions towards the development of machine tools.

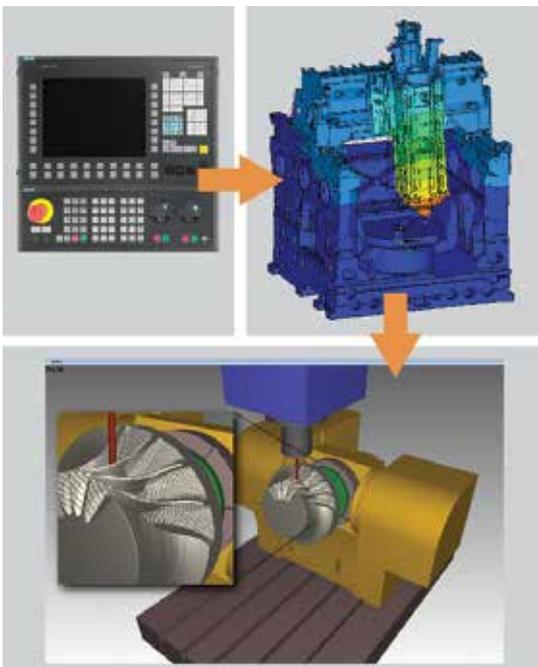
Our customers' challenges

The main trends of the individual markets are somehow similar. Customers pressure is focused on reduction of machine delivery time. In connection with these market demands, we try to shorten subdelivery from our suppliers and the running time of machine assembly.

Furthermore, we become conscious of increasing demands for multi-function machining centers, which join almost all cutting operations into one machine. And this is the way, where we are going in developing new products. Customers often require special solutions and customization that we are able to solve thanks our strong development center.

Our solutions

Providing an advanced technological support to KovoSvit MAS customers stands in the foreground of the KovoSvit MAS company activities. Optimization of the 5 axes machining tasks and increasing the productivity can successfully be achieved by a deep understanding of the machine tool and its interaction with machining process. The MCU 700 machine tool virtual model ("digital twin") has been developed, allowing to predict the machine tool dynamic behaviour incl. the force interaction with the workpiece along the tool path. Optimization tasks by using the virtual model allow to substantially reduce the 5 ax machining times for complex technologies (e.g. blade wheels), or to increase the machining quality and precision. Thus, the virtual model helps to significantly reduce the machining costs.



"Our production is focused on multi-axis machines enabling complex machining and machines produced on the basis of specific requirements of the customer."

Petr KUCHAR
General Manager

What improved:

- Advanced thermal compensation for higher accuracy and geometric stability.
- Saving of energy with special options in the power management of machine tool.
- Online remote diagnostic for faster and more efficient analysis and solution failure of machine.
- MAS MACHINE MONITOR for online monitoring of machine utilization in the manufacturing process.

Loire-Gestamp

At Loire Gestamp we are dedicated to designing and building all sorts of hydraulic presses and press lines: Hydro-Forming, Tryout, Cold and Hot stamping Lines. Our machines are designed and built in accordance with our clients' technical specifications, from 2,000 to 100,000 kN.

Our customers' challenges

The key challenge faced by our customers is to improve the OEE (Overall Equipment Effectiveness), while reducing the energy consumption. The OEE is composed by three indicators. The objective is to improve all of them:

- Availability: The time the line is producing parts.
- Efficiency: The line frequency producing parts.
- Piece Quality and Traceability.

Having the information in real time of all plants would help making better global decisions. The more efficient plant practices could be extended to the rest of the plants.

Our solutions

An industrial PC inside the press electrical cabinet gathers the line process information, pulling information from the PLCs through OPC communication protocol. This information is buffered inside the industrial PC and synchronized with the servers. In the cloud servers we develop a Real Time Visualization and Big Data Analysis. Thanks to this valuable information, the predictive maintenance is done to increase the availability of the line. Also, the process deviations and performance are monitored to maintain the efficiency and quality of the process.

Nowadays there are more than 30 lines monitorized in Gestamp gathering more than 2000 variables at 10 Hz in each line. That is, the amount of collected data is around 36 million values per minute.



“The Industry 4.0 revolution is a concept change rather than technological improvement.”

David Ramos FERNANDEZ
Industry 4.0 Technical Director

What improved:

- Energy Efficiency: 15% press power consumption reduction thanks to the analysed data.
- Availability: from preventive maintenance to predictive maintenance. Many line stops avoided.
- Efficiency: cycle time optimization. Alert and study why it deviates: make opt if possible.
- Piece Quality and Traceability: quality check and labelling of each part storing this info.

Mandelli Sistemi SpA

The Values of Performance: Power, Agility, Versatility, Endurance



Mandelli Sistemi, founded by Renato Mandelli in Northern Italy in 1932, is a manufacturer of high quality five axis machining centres dedicated to the industries, where accuracy, efficiency and long lasting performance can generate real competitive advantages.

Our customers' challenges

In the mature business of machine tools, the challenge today is that of increasing the efficiency of the production means and of developing systems with speedy reaction to a constantly changing, volatile demand of products and services. In this game digitalization and the effective use of information play a key role for collecting and analysing a huge amount of data and for letting smart systems to take real-time decisions.

Our solutions

iPum@-suite4.0 is the Mandelli Digital Package of new solutions/options/Apps focused on the Smart Factory concept as a practical and efficient solution to the new Industry 4.0 and IIoT (Industrial Internet of Things) paradigms. iPum@-suite4.0 has been created according to 6 basic notions: "innovativeness", "imagination", "intelligence", "ingenuity", "inspiration" and "intuitiveness" smartly implemented in the machine tool "arena" to assure that the users get the most out of their machining environment.

iPum@-suite4.0 is based on five main directives:

- iControl: connection/remote control.
- iScada: sensorization of the machining centre.
- iSmartcut: dynamic recalibration of the machining parameters (speed/feed).
- iPredict: development of a self-diagnosis system for predictive maintenance.
- iReality: use of virtual reality to enhance interaction between the operator and the production system.



“Creating value for Shareholders, Customers, Employees, Suppliers is how we measure the company success: our primary capital is consistency between Thought, Word and Action.”

Saverio GELLINI
CEO

What improved:

- Increase of Technical Availability by optimizing the machine parameters and reducing MTTR thanks to early diagnosis of potential failures.
- Improvement of the operational and educational level of manpower through a smart use of complex tools.
- Creation of global performance awareness by sharing experiences and data with the different production facilities.

Mario Carnaghi SpA

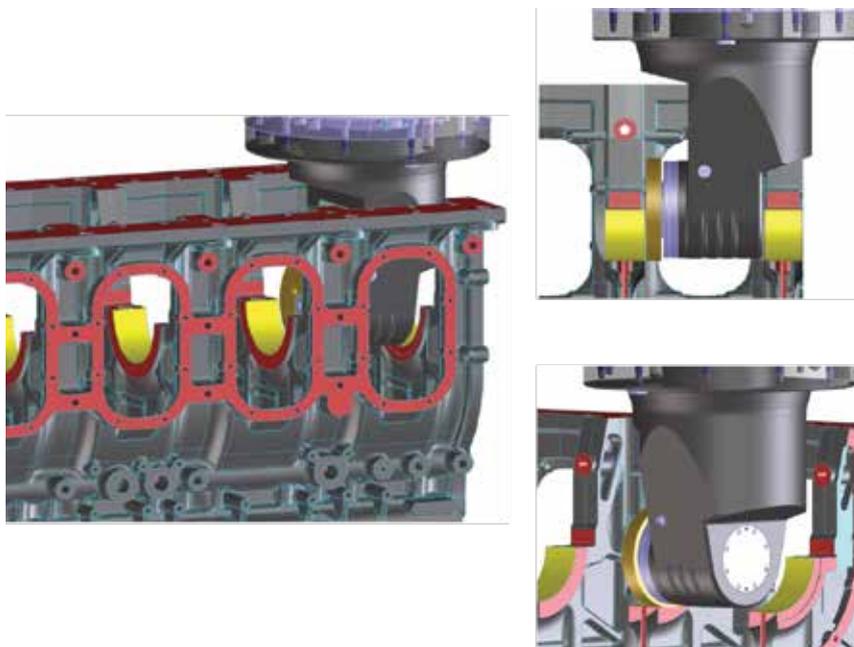
Mario Carnaghi SpA, founded in 1929, designs, produces and delivers vertical turning lathes and milling machines of medium and big size. Our company delivers its products worldwide aiming at customer's satisfaction.

Our customers' challenges

Our task was to improve the quality of the machining of the holes of big diesel engines for the crankshaft and for the main shaft. Their standard production used to machine those holes with a single bar with multiple milling tools to perform the machining of 7-9 bench supports. But the weight of the bar created a slight deformation. Therefore, the concentricity of the benches wasn't achieved anymore. On the opposite, the request to improve the tolerances of those measures was even far away than before.

Our solutions

We have developed, by using sturdy structures and an extra-sized hydrostatic ram head, together with the attachment supplier, a new approach to those machining "à plongé" along the vertical axis. The machine stiffness, the hydrostatic axes and the use of special attachments (long and narrow to enter into the distance of adjacent bench supports) have solved positively customer's requirements. Especially the concentricity, that is a must for engines machining, has been achieved without loss of accuracy with full customer satisfaction.



"In the digital and global era, generating efficient and precise solutions that save time for the use of our customers is taken as a priority by our company."

Riccardo FIORANI
Sales Manager

What improved:

- Customer achieved higher machining precision, repeatability and concentricity at first.
- The process time has been reduced by 30% with respect to the former machining time.
- The placement of the workpiece upon the table has been reduced by 10%.
- The machine can work in hidden time.



M.T. srl

Research and Innovation Made in Italy

M.T. operates in the field of the design and manufacturing of static and driven toolholders for CNC turning centers, as well as a prime contractor for third party mechanical machining.

Our customers' challenges

M.T. was already leader in terms of delivery times, both for standard as well as for special products. In fact, we are able to deliver the products in one working week, compared to the 6/8 weeks necessary to our competitors.

In order to continuously improve the relationship with our customers, with a catalogue of now more than 6.000 different products, it was necessary to better integrate the manufacturing flow, in order to be able to provide our customer with more accurate and precise information.



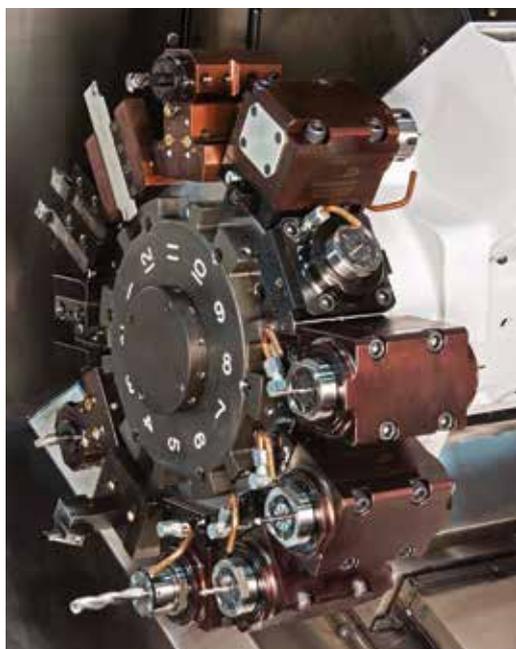
Our solutions

M.T. started, in 2014 with a manufacturing factory, a total integration project in a 4.0 industry view, by adopting a slim and optimized organisation of logistic chain, warehouses, production management and assembly, in order to build a closer relationship with its customers to better satisfy their needs and in shorter time compared to our competitors.

Furthermore, the know how developed during the years, the research of innovative solutions and the constant attention to new manufacturing and management technologies permit to the customer specific needs to merge ad hoc solutions crated by M.T.

“Integration of manufacturing processes is one of the main pillars underpinning the Industry 4.0 thinking. To this end, we are more and more investing in this area and enabling real time management and control solutions for our customers.”

Gianluca Marchetti
CEO



What improved:

- Real time manufacturing management and control.
- Part programs integrated management.
- Warehouse management.
- Testing equipped by three-dimensional measuring machines working directly on 3D models and allowing dimensional control outside of machine in masked time.
- Assembly share all data in real time with technical department, production and warehouse.

Nicolás Correa S.A.

*Passion for Service, Know-How
and Technology working for you*



Production of large Milling, Milling-Turning and Boring machines. We provide one of the widest range of large milling machines in the market with more than 800 Bridge type and 600 travelling columns machines installed all over the world.

Our customers' challenges

Low quality maintenance and low capability of our customers to solve minor problems on the machine. The reality shows that most of the machine operators never read machine manual. Plus, producing in 2-3 shifts implies different knowledge among operators. Therefore, we can estimate a loss of production - mainly during the first 2 years of the machine due to the above causes.

Our solutions

The current tele-service system cannot solve the problem since it implies a computer connected to the machine, which normally can only be utilized by the production supervisor. Moreover, you cannot take control of the machine if there is nobody working on the computer.

Nicolás Correa has developed a different system called "Direct Tele-service". The operator can directly contact our service centre from the CNC itself. Service engineer can take control of the CNC remotely even with his mobile phone to check alarms, warnings, signals, entering in the machine PLC etc.



"Industry 4.0 has a huge impact on the way we communicate with our customers. We are ready to support customers' machine operators remotely, and provide the solution they need anytime and anywhere, which is all about digitisation."

Javier GARCIA
Marketing & Applications
Engineering Director

What improved:

- Machine break-downs reduced by 10%. (Those break-downs caused by a simple alarm or warning).
- Production Managers can monitor every machine using their mobile or tablet from home.
- Operators are always supported on-line anytime.
- Tele training to the operator can be done in certain situations.

OMERA is an Italian manufacturer of machines for sheet metal forming. The company, founded in 1951, designs and manufactures hydraulic and mechanical presses, trimming-beading machines, automatic production lines, iron-cutting shears and punching machines. The technical know-how and the continuous evolution in oil-hydraulics, mechanics, electronics and componentry engineering, allow Omera to develop customized solutions for each specific requirement, following a strategy devoted to a total customer satisfaction.

Our customers' challenges

PRODUCTIVITY: Higher cost efficiency per workpiece, reduced time to global investment break-even point, improved time to market.

FLEXIBILITY: Flexible approach to market demands, higher product quality, wide material formability, reduced job changes machine downtime, optimized tooling and automation, increased lifetime of die.

ENERGY MANAGEMENT: Energy demanding processes, power downsizing, long terms reduction of global costs investment.

RELIABILITY: Low failure risks, high main time to failure index, reduced maintenance machine downtime, low maintenance costs and spare stock investments.

Our solutions

OMERA has developed an innovative Servo-Press with a new servo-hydraulic drive concept. Basically, the solution consists of a hydraulic radial piston motor, driven by a variable axial piston pump coupled with an asynchronous motor and a flywheel.

Axial piston pump rotates at constant speed, thus it is possible to use a flywheel as Energy Storage, in order to remove power peaks and supply a large amount of Kinematic Energy.

The high torque density of hydraulic components and low inertia allow to develop a very compact design, reducing the motor size, assuring cost savings, and reliability. Moreover, the size of the brake can be sized only according to inertia, taking advantage of the safe shut off of the motor.

Full torque disposal at zero speed allows to optimize coining phases and enables trial strokes at full energy and load conditions. New working capabilities are possible such as reverse drawing, allowing deep drawing operations even in presses equipped with low torque motors.



“MOBILIS IN MOBILE. Many years have passed since Jules Verne formulated the famous motto for the Nautilus submarine in “20’000 Leagues under the sea”. The same basic concept holds true for technicians and engineers engaged in the continuous development of products and solutions for a dynamic market.”

Franco FABRIS
Technical Sales Manager

What improved:

- Productivity:
 - Crankshaft Mode at full load: up to 20% respect to Link Drive Mode.
 - Link Drive Mode with constant drawing speed: productivity improvement from 5 to 10%.
 - Simplified pendulum mode: productivity improvement from 10 to 15%.
- Production quality: high repeatability and accuracy.
- Flexibility, Energy Management, Reliability.

Prima Power

Laser and sheet metal machinery



Prima Power is a leading specialist in laser and sheet metal working machinery with manufacturing facilities in Italy, Finland, North America and China, and sales and service presence in over 80 countries across the globe. Prima Power is part of Prima Industrie Group.

Our customers' challenges

Our Customers, world class manufacturers in the metal door sector, called us to improve their sheet metal panel bending process. The main challenges faced by our Customers were long programming and production times, high cycle times, and lack of production data. Our customers needed to significantly improve their throughput and to collect and analyse machines and production data to enhance performance and efficiency in the management of inventory and orders.

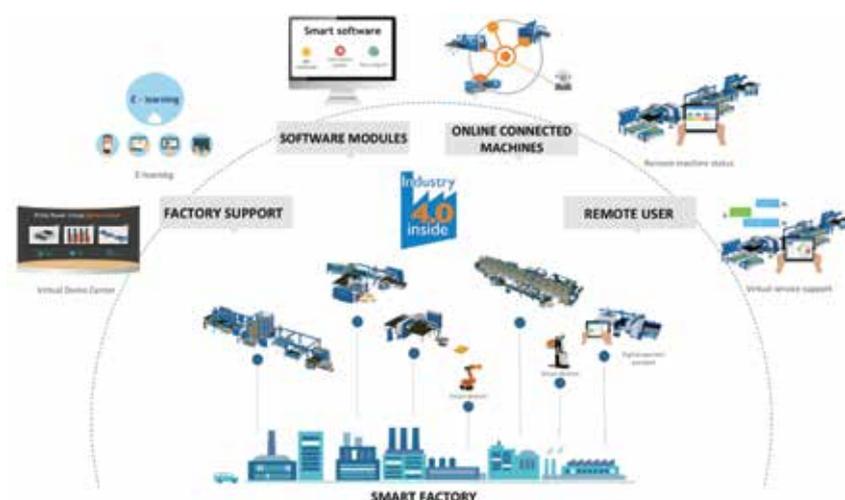
Our solutions

We offered our customers our "Industry 4.0 Inside" sheet metal panelling solution, featuring automatic processes, machine connectivity and data collection and analysis.

The customers benefited from a very easy handling of orders: ERP connection and high level of synchronism between different sheet working steps. We offer connection to any customer ERP, so communication between our systems and the company's organization was seamless and effective.

Thanks to our powerful CAM software, with highly efficient post processors and automatic nesting and tooling, our customers could automatically generate optimized part programs.

The connected reporting on performance and production data offered by our solution allowed our customers to create a highly efficient inventory process for raw material and finished parts and a continuous improvement of the production process thanks to the analysis of the data.



"Prima Power has a clear and practical vision on Industry 4.0 comprising three key modules: intelligent machines and factories, smart software, and remote machine diagnostics and maintenance. Improved throughput, increased production efficiency, higher flexibility in production batches are just some of the huge benefits for customers that choose our digital manufacturing solutions."

Matteo BENEDETTO
Vice President, Marketing

What improved:

- Reduced programming time (from 8-10 hours/day to 1.5-3 hours/day) .
- Minimized throughput time:
 - Completely automated manufacturing process.
 - Low material handling.
- High Flexibility:
 - Large stacking area allowing kit production.
 - Possibility to add parts from external sources.
- Quality and quantity of production data allowing very deep analysis for process improvement.

REGGinspection srl

High Quality Inspection Systems

REGG Inspection designs and manufactures high quality inspection systems for the automotive, aerospace and medical industry.



Our customers' challenges

The needs of our customers are to supervise and manage the performances of the inspection machines installed in real time and with a backlog.

In addition to the production statistics, the system enables to prevent the machine failures and increases the machine uptime.

Our solutions

This application gathers all the machine data via wifi modules installed on each machine.

The SW collects all data into a database and offers an intuitive human-machine interface for an easy use of the system.

The system is ready to interface with all company information systems.

“For long, advanced manufacturing companies have generated their revenue on selling assets. Nevertheless, with the fourth industrial revolution, the sector is going under a rapid transformation. Collecting, storing and processing the data along the value chain create new avenues of growth for manufacturing businesses.”

Riccardo D'AMBROSIO
CEO



What improved:

- 10-15% increase uptime/efficiency.
- 5-10% Lower maintenance.
- Real time production monitoring.
- Improved management of production.

Renishaw

Your partner for
innovative manufacturing

RENISHAW 
apply innovation™

Renishaw is one of the world's leading engineering companies, with expertise in measurement and healthcare. The company supplies products for use in applications, as diverse as jet engine and wind turbine manufacture, through to 3D printing, dentistry and brain surgery.

Our customers' challenges

Manufacturers must improve productivity in CNC machining to remain competitive. Automating traditional workpiece and tool setting activities, as well as giving machine tools greater sensing capabilities for in-process control, allows manufacturers to reduce costs, improve product quality and reduce cycle time.

In the past, advanced probing systems required operator training in order for users to be able to benefit from them. Being able to get up and running with easy-to-use programming routines is important for the acceptance and mainstream use of the technology.

Our solutions

Renishaw developed a suite of products to simplify the use of on-machine probing using digital technology, so that users can implement process control more easily.

GoProbe software and training materials simplify a complex programming language by addressing the user interface and user training requirements for machine tool probing. A mobile phone app allows the user to generate a single line of machine code which they can run immediately for automated process control tasks, for example workpiece setup. E-learning courses can be downloaded from the Internet and the mobile apps are freely available from the Apple app store and Google Play.

Also, builders of machine tools with PC-based controllers can embed Renishaw's Set and Inspect on-machine app into their systems, providing a common, simplified interface and workflow.



"We are developing easy-to-use apps which minimise the need for operator training and enable quicker adoption of advanced technology for improved productivity in CNC machining operations."

Tarquin ADAMS
Communications Manager

What improved:

- Significantly lowers barriers to technology adoption.
- Improved process capability when automated controls are implemented routinely.
- Reduced time for machine setting tasks delivers increased manufacturing efficiency.
- Reduced training overheads.

Schneeberger Linear Technology

Essentials for the best

We provide linear motion solution to the major OEM in the global Machine Tool Industry, the Semiconductor Equipment Industry, the Medical Equipment Industry, the Robotics and Automation System builders, the Optronics and Metrology Equipment builders and others. We offer a full range of solutions from highly standardized all the way to fully customized mechatronic components and assemblies.



“We are able to provide three benefits at the same time: cost savings combined with increased reliability and precision.”

Rosalia HALLER
Corporate Communications

Our customers' challenges

On a technical level our customers need to increase productivity and the precision of their Equipment. We are supporting their quest with our application engineering support and product solutions. Our customers have to provide their solutions and equipment on time, so to ensure that the timely production of their customers ramps up.

Our solutions

- We developed mechatronic products: the traditional linear motion components or linear bearing components were purely mechanical products; today we offer mechatronic products, incorporating electronic feedback as an integral part of the component. This enables our customer to save time and cost in building their products and at the same time increase the precision and reliability of their products.
- We moved from components to assemblies: the traditional business approach was to provide solutions on the component level; today we provide full customized solution on the assembly level with all relevant function including motion control algorithms fully tested and certified.

What improved:

- The customer saves cost and time not only in the development process of his product but also in every single product built over the entire life cycle of the product.
- ... at the same time, the customer's product shows higher reliability, less down time and therefore higher productivity and output
- ... at the same time, the customer's product shows higher precision, increased process control and parts production with tighter tolerances.

SPERONI

Since 1963: future proof technology!

SPERONI is an Italian family business that has supplied products and services for over 50 years. Since 1963, it has been a reference point for innovation, precision, longevity and value in the international field of measurement, tool pre-set and tool management.

Our customers' challenges

In today's competitive world, our customers require efficient solutions that allow to eliminate downtime and increase their machine tool output. Today's market also calls for quick solutions and rapid time-to-market, a condition that can be respected only by placing particular attention to each detail in the manufacturing process. This challenge calls for investments that allow improving every step of production in order to have the best working conditions to yield more output without unnecessary wastes or expenses.

Our solutions

SPERONI's universal tool presetting and measuring systems accurately detect and measure all the dimensional requirements of the cutting tool for the machining process, allowing the quick and precise adjustment of the inserts to the nominal values/dimensions and certifying all the measurements against the set tolerances.

Since the 1970's SPERONI proved that a quality tool presetting system is an indispensable player in the production process in order to obtain tangible increases in productivity which results in the reduction of manufacturing costs.



“Industry 4.0, smart factory, factory of the future, etc.; all slogans that need to be made into a company strategy and mission! SPERONI with its solutions and services is dedicated to support its customers towards understanding and implementing these revolutionary changes”

Andrea SPERONI
CEO

What improved:

- Tangible time and cost savings.
- Precision and repeatability of measurements.
- Reduction of machine tool downtime.
- High return on investment.
- Increased productivity and streamlined production process.

Based on many years of experience in manufacturing of multi-spindle machining centers, we are proud to offer highly efficient and precise machines as well as valuable services. 13 years of data driven service experience ensure our market leader position.

Our customers' challenges

The majority of our customers are driven by the highest possible OEE (overall equipment effectiveness) paired with production cost minimization strategies.

In general the risks and challenges they are facing are:

- low productivity and machine availability;
- unplanned machine downtimes;
- high maintenance and service costs;
- less transparency on machine utilization, operator behaviour and process KPI's;
- just little information about the current machine condition and the wear of machine components;
- fixed capital in e.g. spare parts.

Our solutions

SW offers a service portfolio that supports the customer along the entire life cycle of the machines.

All machines are connected to the SW-Cloud. All data is sent cyclically or event based to the SW Service Center. Condition based data driven services are focusing on critical or expensive components like spindles, axes, tool changer, etc. Performance based services ensure a better material flow as well as optimize the machine utilization.

Increased transparency of the current machine and component condition helps to be in time prepared for maintenance measures and provides the possibility to optimize the maintenance processes from reactive to predictive.

Additionally a secure remote access solution helps to reduce the response time and often to avoid travel time.



“Digitization in industry sector is the most powerful trend which came up in the last years. And nothing will stop it.”

Jochen HEINZ
Head of Industrial Data Services

What improved:

- Increased transparency and reduced costs in production and maintenance.
- Early warnings in case of critical machine component wear.
- Higher productivity and machine availability.
- Optimized use of resources to protect customers investment.
- Approx. 70 % of all issues are remotely analysed and, if possible, fixed online.

TOS VARNSDORF a.s.

A Czech traditional manufacturer of machine tools founded in 1903. The company manufactures and sells machine tools including technology supplies. The company has its own design group and a massive production base. Our machines solve requirements of our customers for machining workpieces from 1m³. The company provides warranty and post-warranty services including technical and technological support.

Our customers' challenges

The current customers consider the price as a critical parameter for the delivery of machines and technologies with the highest quality and parameters. Therefore, we have focused on the complete process of machining, especially on the ways to reduce the customers' total costs of operating our machines.

The combination of the machine tool with a 3D measuring centre is an ideal way to achieve significant cost reductions with increased productivity. It reduces the time needed for workpiece transport to the 3D coordinate measuring machine and makes the measurement process directly on the machine more efficient and precise. Moreover, our system allows avoiding the costly 3D coordinate measuring machine completely.

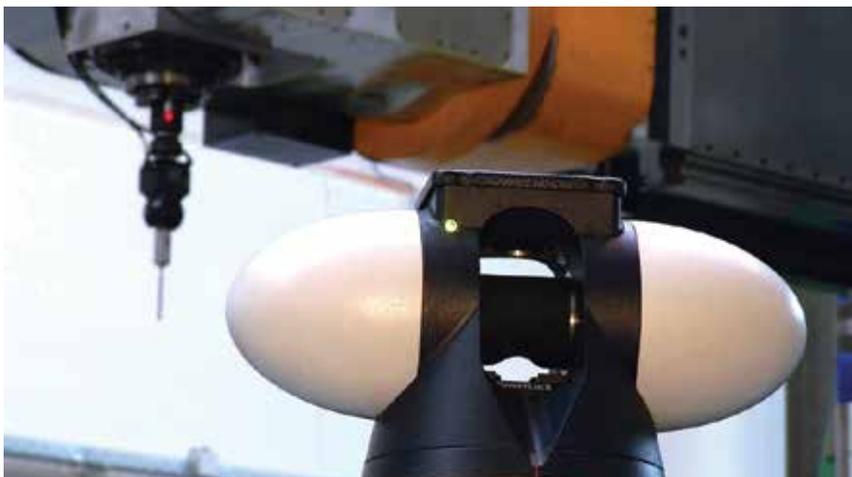
Our solutions

The in-process measurement system is based on independent measurement of the tool/probe position using a position measuring laser device – laser tracker. This equipment enables real measurement since it is not connected to the machine.

The standard measuring system on the machine cannot measure any machine distortions since it is distorted together with the machine. Therefore, the laser system is resistant to any machine inaccuracies.

When the measurements are being made, the machine is controlled by the metrology software that is linked to the standard machine control system via an interface. Thanks to this link, it is possible to transfer the deviations measured to the machine system as corrections. Then it is possible to perform final machining without a need to change the NC program and remove the deviations.

The system installation does not require any interventions in the mechanical design of the machine; only the touch probes and electrical connections must be made. It is also necessary to install the metrology software including controls, a touch probe and the laser tracker.



“This system opens completely new possibilities for changing the machining process, brings substantial cost savings to our customers on the 3D coordinates measuring machine and increases the productivity of the whole process in an unprecedented way.”

Milos HOLAKOVSKY
Sales Manager

What improved:

- Performing a quick in-process check of the workpiece.
- Measurements are resistant to any machine inaccuracies.
- The time needed to transport the workpiece to the 3D coordinate measuring machine is eliminated.
- The deviations measured are directly transferred to the machine control system as corrections for the final machining.
- On a sample workpiece (machine frame column), the total machining time was reduced by 4,230 min (-31.5% of the original process) while meeting the required geometrical accuracy of 0.016 mm.

TOSHULIN a.s.



TOSHULIN is a traditional machine tool manufacturer. For decades we have been one of the leaders in the very demanding worldwide market for vertical lathes. Our products are characterized by high accuracy, high quality and adaptability to client needs.

Our customers' challenges

Current trends in machine tool markets point toward a multifunctional complex machine which is able to provide a number of operations at one setup. This brings very high requirements for innovations and development of new technologies as well as validation of newly designed machines, integrated automation or newly developed functions.

Simultaneously our customers expect short lead times and very good reliability of our machines.

Our solutions

We used a new modern method while commissioning a newly developed machine. The main benefit for the client is time saving. This new machine is equipped with complex tool magazine which allows changing the machine configuration automatically using different types of tool holder and spindles. During the procedure of this automatic tool exchange a great number of mechanical movement, pneumatic and hydraulic functions and a number of electrical functions have to be executed.

Validation of automatic tool exchange is always performed physically after the machine is fully assembled. In this case we have used a method of virtual commissioning which is based on Siemens PLM software tools. We connected the virtual machine model to real CNC control system and we simulated the behaviour of this machine. Our virtual model includes not only mechanical parts, but also hydraulic and pneumatic elements of the machine.



“Trends such as digitisation, automation and internationalization of markets shift demands to diversified products with increased performance. We answer to this demand with providing our customers with high-performing and multifunctional machines that can carry out complex tasks at one setup.”

Dagmar HERRING
General Manager

What improved:

- Software optimization during development phase enables error avoidance on the real machine.
- Collision avoidance by simulating real machine behaviour in advance.
- Optimization of interaction of different systems, elements and functions that have been applied.
- Time reduction that was spent on commissioning of the machine.

TRUMPF GmbH + Co. KG

TruConnect – Your Smart Factory

The high-technology company TRUMPF (employees: 11,000; sales: 2.81 billion Euros) offers production solutions and drives digital connectivity through consulting, platform and software offers. TRUMPF is the world technological and market leader for machine tools used in flexible sheet metal processing, and for industrial lasers.

Our customers' challenges

The number of variants of punching tools produced in the punching tool production of TRUMPF in Gerlingen, Germany, is enormous. Theoretically it is possible to configure 31 million standard variants.

The flexibility is especially important, since up to 45% of the customer individual tools are needed on the same or the following day of the order. This required a completely new approach for the production and the customer interaction process to fulfill the requirements in the best possible way.

Our solutions

The key to the integrated punching tool production at TRUMPF is a new way of customer interaction. Via a new web platform customers can automatically configure and order punching tools. After the online ordering process CAD-files are automatically produced and computed into machine programs. This way the customer order is now also the start of the production process without manual interference.

To ensure a consistent flow of information all blanks are labelled with a DataMatrix Code, which enables the linking of the blank to a specific customer order. Via scanners on the different machines it is possible to directly load the correct production program for the customer individual tool. This enables a robust digitalized process from order to shipment.



“The facility in Gerlingen has in fact become 100% digital. What used to take four days, is now done within a maximum of four hours.”

Mathias KAMMUELLER
Managing Director and Head of
the Machine Tool division

What improved:

- Reduction of the number of complaints by 71%.
- Increase of the adherence to schedule by 240%.
- Increase of the labour productivity by 71%.



EMO

Hannover

18-23·9·2017

The world of metalworking

Connecting systems for intelligent production!



CREDITS

CECIMO
Digitisation Campaign

Publisher
Filip Geerts

Editor
Emir Demircan

Copyediting and production
Giorgia Zia



cecimo

European Association of
the Machine Tool Industries

Avenue Louise 66,
1050 Brussels, Belgium
Tel: +32 (0)2 502 70 90
Fax: +32 (0)2 502 60 82
www.cecimo.eu

Member Associations

Austria: FMTI
Fachverband Metalltechnische
Industrie
www.fmti.at

Belgium: AGORIA
Federatie van de Technologische
Industrie
www.agoria.be

Czech Republic: SST
Svazu Strojírenské Technologie
www.sst.cz

Denmark: The Manufacturing Industry
a part of the Confederation of Danish
Industry
ffi.di.dk

**Finland: Technology Industries of
Finland**
www.teknologiateollisuus.fi

France: SYMOP
Syndicat des Entreprises de
Technologies de Production
www.symop.com/fr

Germany: VDW
Verein Deutscher
Werkzeugmaschinenfabriken e.V.
www.vdw.de

Italy: UCIMU
Associazione dei costruttori Italiani
di macchine utensili robot e
automazione
www.ucimu.it

Netherlands: FPT-VIMAG
Federatie Productie Technologie /
Sectie VIMAG
www.fpt-vimag.nl

Portugal: AIMMAP
Associação dos Industriais
Metalúrgicos, Metalomecânicos e
Afins de Portugal
www.aimmap.pt

**Spain: AFM - Advanced Manufacturing
Technologies**
Asociación española de fabricantes
de máquinas-herramienta, accesorios,
componentes y herramientas
www.afm.es

Sweden: MTAS
Machine and Tool Association of
Sweden
www.mtas.se

Switzerland: SWISSMEM
Die Schweizer Maschinen-, Elektro-
und Metall-Industrie
www.swissmem.ch

Turkey: MIB
Makina Imalatçileri Birliği
www.mib.org.tr

United Kingdom: MTA
The Manufacturing Technologies
Association
www.mta.org.uk

cecimo is the European Association representing the common interests of the Machine Tool Industries globally and at EU level. We bring together 15 National Associations of machine tool builders, which represent approximately 1300 industrial enterprises in Europe (EU + EFTA + Turkey), over 80% of which are SMEs. CECIMO covers 98% of total Machine Tool production in Europe and about 36% worldwide. It accounts for almost 150,000 employees and a turnover of nearly €24 billion in 2016. Approximately 75% of CECIMO production is shipped abroad, whereas around half of it is exported outside Europe. CECIMO assumes a key role in determining the strategic direction of the European machine tool industry and promotes the development of the sector in the fields of economy, technology and science.