emco industrial training

Designed for your profit

Looking to the **future**

[**25 years** of EMCO Industrial Training]



From the industry, for the industry:
25 years of EMCO Industrial Training.

Over the past 25 years, EMCO Industrial Training has trained both company employees and specialists from around the world in the use of state-of-the-art CNC machines. In honor of this, we wanted to provide a short summary.

This is not a review, but rather a profile which looks at the power of ideas around the world. Ideas which have benefited thousands of highly trained skilled workers throughout the metal machining industry over the past two and a half decades, and which will continue to guarantee training concepts which are perfectly tailored to individual companies' specific manufacturing requirements.
With over 60 years' experience developing and producing high-tech machines for the machining industry, the EMCO Group has first-hand knowledge of the secrets of successful professional training. For the user, this means learning to use industry-standard machine tools safely and being able to incorporate this expertise seamlessly into his company's manufacturing processes.

"From the industry, for the industry!" This motto has made EMCO Industrial Training the world's market leader in the training sector. In this booklet, you are invited to join us on a journey we began 25 years ago; a journey which has led us from some of the most famous companies in the world to the most fascinating countries and cultures; a journey that has produced the world's leading training technology, and which has had just one destination from the start: the future!

Best wishes
Your EMCO Industrial Training Team

Future. Creation.
Training centers and partners.

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1982.
The future begins!

- *Range of lathes modified: the EMCOTURN 120 superseded the C6 CNC, and the EMCOTURN 220 version was introduced for training in manufacturing*
- *From the F1P CNC, the VMC 100 was developed: a new milling machine which included an automatic tool changer*
- *Introduction of the EMCOTronic TM02 control as a further development of the existing T1/M1 control*
- *F3 CNC machine replaced by the VMC 200*
- *Development of a CAD/CAM system for "EMCODraft" training*
- *In-house development of an FMS with C5 / F1, the EMCOTURN 120 and VMC 100, including Mitsubishi robots*
- *Further development of the academic training system based on the EMCOTronic TM02*

- *Interchangeable control systems were born when the EMCOTronic control was replaced with PC technology, which created a quantum leap in CNC training: for the first time, different controls could be simulated on one single machine.*
- *Market introduction of the PC TURN 50, PC MILL 50, PC TURN 120 and PC MILL 100*
- *WinCAM replaced EMCODraft*
- *Programming workstations replaced by the WinNC controls with EMCOTronic TM02, Sinumerik 810/820, GE Fanuc Series 0*
- *WinNC controls expanded through the stand-alone graphics simulator 3D-View*

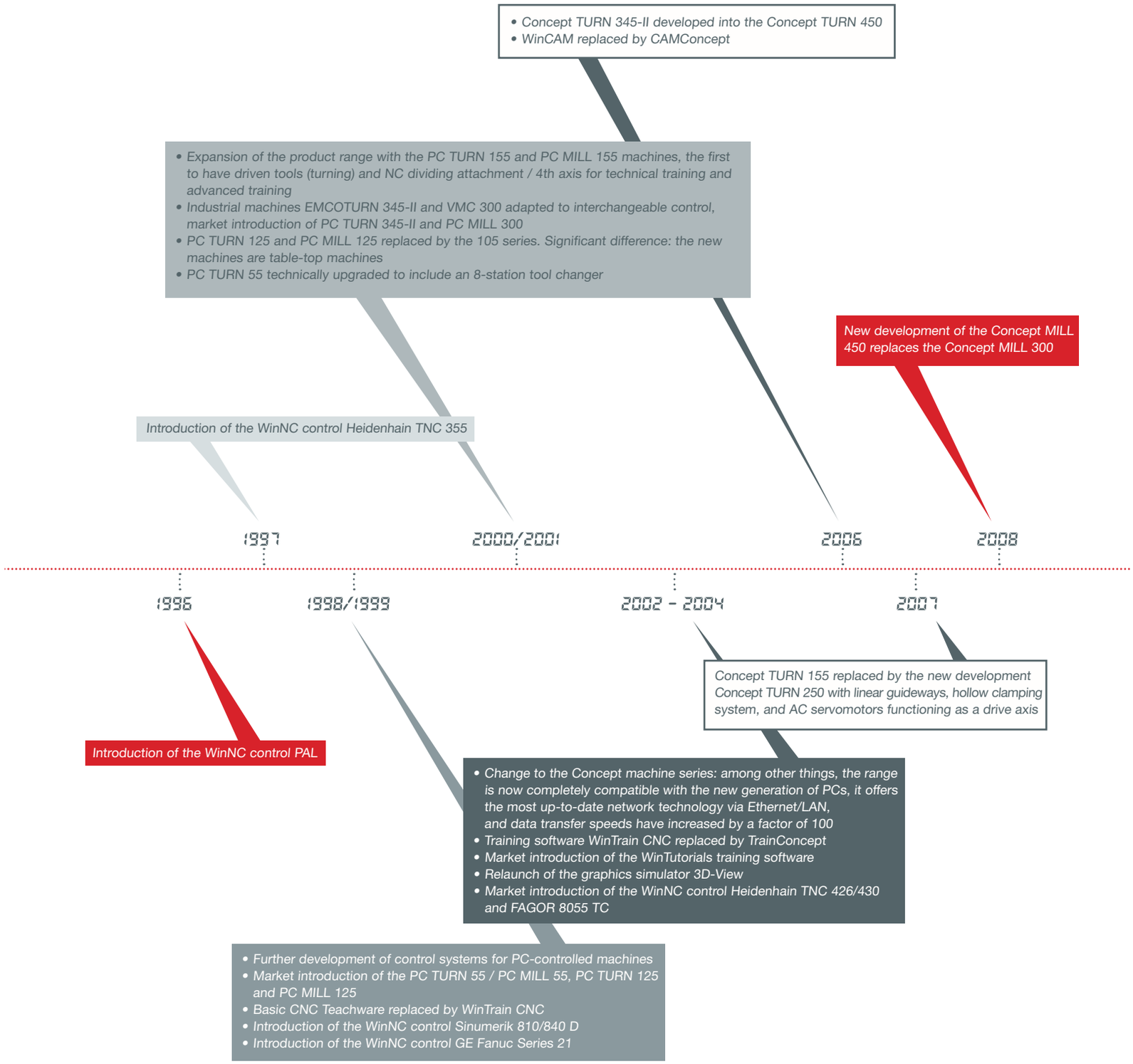
- *Machines specifically for training purposes were first manufactured in the form of the EMCO Compact 5 CNC lathe and the EMCO F1 CNC milling machine. These were later joined by the Compact 5 PC*
- *Training support material for these machines was also produced*

1982/1983 — 1985/1986 — 1988/1989 — 1990 - 1992 — 1993 - 1995

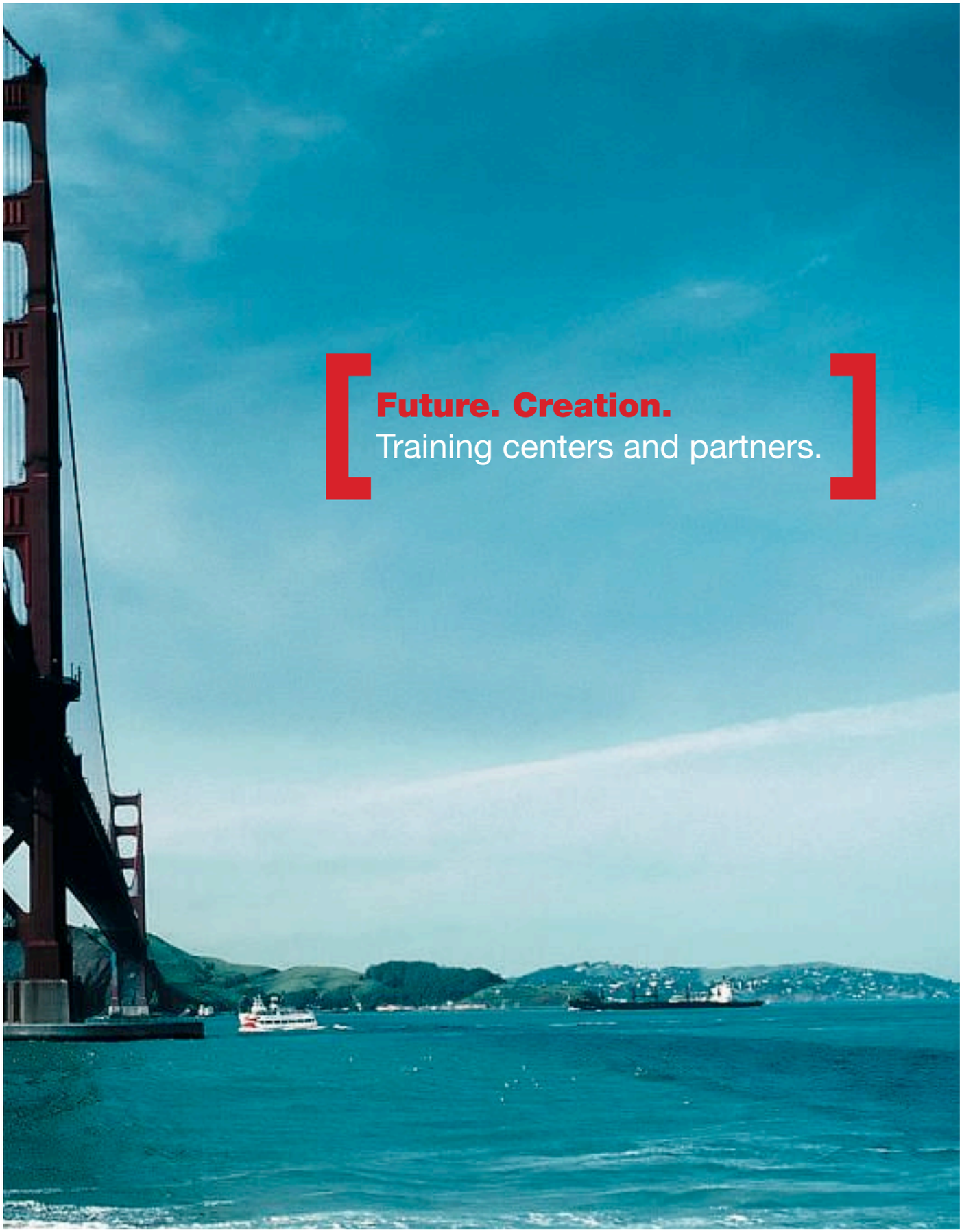
- *EMCOTURN 140 / 240 machines replaced by the EMCOTURN 242*
- *Expansion of the product range with the UNIMAT PC lathe for individual users*
- *Relaunch of EMCODraft Version 7*
- *Market introduction of EMCOTronic programming workstation software and C5/F1 as the forerunner to the current WinNC controls*
- *Market introduction of the independent training software EMCO Basic CNC Teachware*
- *Market introduction of EMCO Quickplan, production scheduling software*

- *In-house development of the EMCOTRONIC T1/M1 CNC control, a compact system with integrated stepper motor control. Used for metal and wood CNC cutting machines, as well as laser cutters*
- *Expansion of the product range to larger CNC-controlled machines, such as the Compact 6 CNC with EMCOTronic T1 for turning, and the F1P CNC with EMCOTronic M1 for milling*
- *Industry orientation through EMCOTURN 140/240 for turning, and F3 CNC for milling*
- *Training system for academic training based on the EMCOTronic T1/M1*

EMCO Industrial Training success story began in 1982 when special products for the training sector were developed for the first time. So much has happened over the last 25 years, and the progress of technology has been breathtaking. EMCO Industrial Training has always kept its finger on the pulse, setting new standards in the training sector again and again. Join us on a journey through the years and discover the biggest milestones of a concept that benefits companies and trainees around the world – yesterday, today, and tomorrow.






Future. Creation.
Training centers and partners.



The **future** is for everyone:

The training concept from **EMCO Industrial Training**

What do the world's leading crystal manufacturer and the Austrian railway companies have in common? What links the Chamber of Commerce to the precision machining of precious metals? And what do process automation and furniture fittings have to do with one another? Three questions – one answer: EMCO Industrial Training.

Regardless of the industry and irrespective of individual concerns or philosophies, EMCO Industrial Training concept provides the best possible conditions for successful training. It is based on a modular principle which can easily be adapted to the needs and requirements of particular companies and partners.

The training concept not only includes Concept machines and software which simulate the industrial demands in the best manner possible, but also training resources designed to complement them perfectly – the courseware.

Multimedia classroom WinTutorials tailored to the individual machines and control systems have been developed to back up the workshop training. Whether for individual workpieces, or an entire 4-stroke engine, realistic function models make the CNC training more effective, and increase students' motivation.

Unlimited consulting services are another key element in EMCO Industrial Training whole concept. From determining individual clients' requirements with regard to machines, software, and courseware, through the provision of advice on project planning and financing, to joint project implementation with high-quality training provided by individual instructors on machine operation and programming using training materials: EMCO Training guides the clients through every stage of the project. It also guarantees unlimited, continuous support and advice throughout the training process.

EMCO Industrial Training is currently the leading provider of CNC training systems. Renowned businesses and training establishments around the world regard the modular system as a significant investment in the future. We would like to introduce some of our well-known partners to you in this chapter.

In theory and practice: **The EMCO training center**

On September 15, 2006, the EMCO group opened a new exhibition center at its headquarters in Hallein in Salzburg, Austria. For the first time, the EMCO group's entire product range is on display in an attractive space of around 1,300m². The training rooms, with their state-of-the-art equipment, form an important part of the exhibition center as these are where customers, instructors, and trainees from around the world gain the most up-to-date knowledge on CNC programming and machine use. The training space has 9 networked computer workstations, CAD/CAM and CNC programming stations. It also has a laboratory layout equipped with workstations for instructors and students. Here, user-training takes place for programmers, machine operators, and service personnel along with product training for retailers and sales staff. It is also used for technical equipment testing and the creation of client-specific manufacturing solutions.



Consolidated knowledge: „Grundlagen über numerisch gesteuerte Werkzeugmaschinen (CNC)“
(The Basics of Computer Numerical Control (CNC) Machine Tools)

Specialized training materials are an essential basis for sophisticated professional training. The lack of learning support material available for CNC technology in the 1980s led Josef Daxl, the head of the vocational school in Schärding, to create a reference book for this area of training. EMCO supported this project from the very beginning. As CNC technology was developing so rapidly, the book had to be revised several times over the following years. Now, the book has become one of the most important pieces of training reference material for CNC technology available in German.

Grundlagen über numerisch gesteuerte Werkzeugmaschinen (CNC) (The Basics of Computer Numerical Control (CNC) Machine Tools) ISBN 978-3-7002-1399-4; SB-Nr. 2922



Even beginners can manufacture their first workpieces already after just two days.

WIFI's plan for a successful economy: **Highly-qualified skilled workers**

The closest possible relationship between theory and practice is needed if trainees are to become expertly trained, skilled industrial workers. Each area has an effect on the other, and practical success depends heavily on the fundamentals learnt in theory. The same is true in reverse: without any practical experience, theory will remain vague.

The lack of integrated training systems, along with rapid technological development in the field and strong competition within the industry, has caused the current shortage of skilled workers.

To counteract this, the Wirtschaftsförderungsinstitut (Institute for Promoting Economic Activities, or WIFI) in Salzburg put focused measures in place, of which EMCO's integrated training concept Industrial Training was one. EMCO provided 8 lathes and 4 milling machines with easy-to-use computer controls to bring WIFI's metal machining workshops fully up to date. These machines allow the easy manufacturing of work-pieces while also providing purposeful training in metal-work for skilled workers. And this was exactly what was required of the investment. The training program ensures that tasks and learning processes are adapted to the trainees' existing skills.

Trainee skilled workers with no prior knowledge can independently manufacture their first test piece in two days, while users with advanced knowledge are able to strengthen their skills during this time.

The current training program at WIFI Salzburg offers qualifications for CNC machine operators, CNC experts, and CNC metal machining technicians. In the first year alone, more than 200 people (with and without prior experience) trained for and sat exams for skilled industrial workers in the newly adapted premises at WIFI Salzburg.

Training with vision. **Fully-qualified CNC skilled workers thanks to BFI Niederösterreich and EMCO**

The Sigmundsherberg training factory owned by BFI Niederösterreich (South Austrian Educational Center) is considered one of the centers of excellence of Austrian CNC training thanks to its modern training system. Excellent co-operation with EMCO Industrial Training has greatly contributed to this recognition.

“Above all, we see the importance of a full and complete training program,” says Johann Palkovich, the training factory’s manager, of the demands which are made. It is exactly this requirement that EMCO Training fulfills with its concept of modular training.

The Sigmundsherberg training factory has been reliant on EMCO for around 20 years. “The delivery of machines, the areas of offline/external programming workstations and, of course, the supply of training materials are of the most importance to us,” says Johann Palkovich.

The Sigmundsherberg training factory and EMCO are constantly working to meet the economic and training requirements of the industry and of the job market. Both companies and workers benefit from this philosophy, since this means that the trainee skilled workers’ preparation and training is geared towards specific production needs.

The training method

Along with metal machining technology training, EMCO TrainConcept training software can be used as a general introduction to metalworking techniques as it is not specific to a particular machine or control method. This means that the basics can be taught more effectively, weak points can be remedied more easily, and advanced study or a review of the course content can be carried out more efficiently. “The greatest possible extent of applied learning is achieved through the program’s supporting graphics, which include videos, animations, simulations, drawings, text, and photos,” explains the CNC and CAD departments manager Johann Dolezal.

The teaching aid EMCO Vision has been introduced to support the trainers in teaching CNC programming theory. Dolezal says: “From our experience with our course participants, we value the comprehensible and clear layout of the documents together with the clear teaching format.”

Practical application

An essential part of the comprehensive CNC training at the Sigmundsherberg training factory is the project-based application of the new knowledge using a CNC machine. Each trainee is responsible for an individual part of the whole project. The starting point for the project is a diagram of the workpiece. From creating a task schedule, including choosing the correct tools, the project progresses onto the definition of the work process, tool measuring, and then to the CNC programming with a final operational test.

EMCO’s training software WinTutorials supports instructors during the project. This multimedia software demonstrates, among other things, the manufacture of essential components of a functioning one cylinder 4-stroke engine, from the diagram of the parts, to the task schedule, and tool selection through to a working CNC program.



EMCO’s training software provides training based on practical experience.



ÖBB uses more than 50 EMCO machines to provide training nationwide.



A great connection for the future: **ÖBB and EMCO Industrial Training**

The Österreichische Bundesbahnen (Austrian railways) don't just take people from A to B. They take especially young people much, much further. As a state-owned company and one of Austria's largest businesses, ÖBB has great corporate social responsibility, which it demonstrates in many areas, particularly in apprenticeship training.

EMCO Industrial Training has been ÖBB's apprenticeship training partner since the mid-1980s. EMCO Industrial Training offers ÖBB the best machines for conventional turning and milling as well as CNC turning and milling, which allow apprentices to be trained up to be true specialists in their craft.



An apprenticeship with ÖBB is an ideal career start for today's young generation. Training is accredited by the state, and those who complete it really set themselves apart from the crowd. This is possible thanks to the excellent equipment available to trainees.

ÖBB is currently carrying out nationwide training using more than 50 machines from EMCO Industrial Training. This number is likely to increase yet again in the future, as ÖBB made a long-term investment in its trainees in the form of 8 new machines from EMCO Industrial Training in 2007 alone.

ÖBB is one of the largest companies to train apprentices in Austria, with around 500 apprentices beginning their training each year in eleven different technical fields. Around 1,700 trainees are currently at various stages of their training with ÖBB, primarily in the areas of mechanical engineering and electrical engineering. Seven more railway apprenticeship schemes are planned for the future.

High-tech training at Swarovski. **Investing in the future with EMCO Industrial Training**

Swarovski is the world's leading producer of multi-faceted crystal. Its success lies in the continuous development of technology and the best possible advanced training for employees. Swarovski has set its course for the future by building a training center worth 4.3 million at its site in Wattens, Austria.

With its workshops, teaching rooms and laboratories, the new training center is designed to accommodate a total of 250 trainees. At the moment, 50-70 trainees a year are taught both theory and practice. Around 60% of these are mechanical engineers. Trainees in this area are taught the basic principles of metal machining in factories, machine tools, grindery, and CNC and CAD training by ten full-time instructors over a period of 22 months. The high demand for excellent training also requires suitably equipped premises. Swarovski chose EMCO Industrial Training to supply most of its conventional and CNC machine tools.

The deciding factor in the decision-making process was the comprehensive training concept provided by EMCO Industrial Training. From machines to software solutions, from the training resources to the servicing and on-site support, every part is interwoven.

"Our partner, EMCO, is the best choice as it offers a complete service, we have contact with the same people every time, and this personal contact is a great help in our joint projects," says Georg Bergmeister, the manager of the apprentice workshops.

A total of around 50 EMCO machines are in use in Swarovski's training department. For milling, trainees rely on the machines EMCO FB3, EMCO FB4, EMCO FB4 TNC, PC MILL 155 and EMCO PC MILL 300. Turning is carried out using the conventional turning machines EMCO MAXIMAT V13 and EMCOMAT 17D. Training in fields of CNC is carried out on EMCO Concept TURN 55, EMCO PC TURN 155, EMCOTURN 345 and EMCO Concept TURN 450. The bigger machines are equipped with C axes and driven tools. The software used is WinNC.

As the largest employer in the region, Swarovski also has a duty of corporate responsibility. There are currently 6,700 people employed at the headquarters in Wattens alone. High-quality training is an important factor in ensuring that residents of Tirol benefit from rewarding and secure jobs over several generations. In selecting EMCO to be the main supplier for its training center, Swarovski has chosen a partner which supports this philosophy through its own convictions, and which meets high expectations.





SWAROVSKI

Founded in 1895 by Daniel Swarovski.
The following belong to the Group: Tyrolit, Swareflex, Signity, Swarovski Optik
Crystal division: Precision manufacture of multi-faceted crystal parts; creation of finished crystal products such as jewelry, accessories, and other objects.



Trainees explain the workings of EMCO Industrial Training Concept machines to visitors at an open day.

Rapid learning success through user-friendly technology. **Successful training at Heraeus with EMCO Industrial Training**

As a family business, Heraeus has acted responsibly towards employees, society, and the environment for generations. This can be seen in its high proportion of trainees at around 6%. Heraeus attaches particular importance to providing training to innovative, qualified, and highly-motivated junior staff. The company's challenging products and materials demand specific expertise from its employees. This includes skills associated with computer-controlled machine tools, for example for manufacturing pharmaceutical precision parts, quartz products for the semi-conductor industry, or targets for thin film technology.

EMCO Industrial Training has been a trusted partner in the development of these skills for more than 20 years. Thanks to its modular structure, EMCO Industrial Training CNC training program is highly compatible with the current technical standards of various control manufacturers. Through the unique combination of programming stations and computer-controlled machine tools, the concept combines theory and practice. This ensures that Heraeus's trainees are fully qualified to the high technical standards required for the company's many machines and operating systems. "It is important for Heraeus to develop the trainees' knowledge of theory as well as providing practical experience," says Joachim Müller, the company's training manager. Just a few days after starting their apprenticeship, the trainees manufacture a contour for an aluminum cylinder head as part of a project to produce a 4-stroke engine in their first year of training.

"The trainees spent time familiarizing themselves with the machines, and manufactured the first parts for their project within a short period of time," explains Jürgen Reichert, one of the training supervisors. "Of course, we need to cover a few more modules before we can exploit the full potential of EMCO machines," Mr. Reichert commented, "but we are on the right track."

Heraeus, the precious metals and technology group headquartered in Hanau, Germany, is a global, private company active in the business of precious metals, sensors, dental health, quartz glass, and specialty lighting sources. With revenues exceeding EUR 10 billion and more than 11,000 employees in more than 100 companies worldwide, Heraeus has stood out for over 150 years as a globally recognized precious metals and materials specialist. (www.heraeus.com)

Experts in metal cutting technology.
EMCO Industrial Training for Blum apprentices

Julius Blum GmbH is a global enterprise specializing in the manufacture and distribution of furniture fittings. It mainly produces hinge, lift and pull-out systems for home furniture, primarily for the kitchen. Blum's clients are large and small furniture manufacturers, from industrial enterprises to cabinetmakers.



Blum has been training apprentices to become successfully qualified in various professions since 1970. 238 apprentices are currently being trained in eight high-tech areas. 19 of these are at Blum USA, which has the same high standards of training. Whether training as a plastics technician, electronics technician, machine technician, tool maker, metal machining technician, design engineer, or a productions engineer, these areas offer exciting career opportunities. Since Blum also offers apprentices training in machining technology, this model Austrian company and EMCO have been successful partners for years. EMCO Industrial Training provides up-to-date equipment for CNC turning workstations, such as the EMCOTURN 325-II. This is of great importance in the training of metal machining technicians.

For Michael Beer, an instructor at Blum, the high degree of precision offered by EMCO Concept machines, their simple controls, and the perfectly designed learning support materials are important contributing factors to the achievement of the high standards set by the company for its training programs. The numerous successful Blum trainees who participate in international professional competitions only serve to underline this point further.



The Blum group, 100% family-owned, achieved a turnover of 1.0834 billion euros in the financial year 2006/2007. Out of 5,000 employees around the world, 4,000 are employed at the headquarters in Höchst in Vorarlberg, Austria. Blum's metal machining systems are distinguished by their sophisticated function, unique design, and long service life.

More success – automatically:
EMCO Industrial Training for Festo

The German private company FESTO AG & Co. KG is the market leader in process automation and is currently training 350 apprentices at two locations in Germany in various technical and business programs or BA courses.

As in many other industries, customer demands in Festo's area of business are on the increase, which means that increasingly highly qualified employees are needed. This is also reflected by the above-average trainee proportion of 7.2%.

If these skilled workers are to contribute to the success of the business, they require in-depth and interesting basic training. In this area, Festo has relied on EMCO Industrial Training training concept for years. The EMCO FB3's user-friendly technology is used in basic training for milling. This machine gives trainees a quick and simple introduction to this type of manufacturing from their first workpiece onwards.

Based on the positive results and the success of its trainees, Festo is currently converting its entire basic training department to carry out mechanical training using the EMCO FB3. The compact nature of this machine makes it possible to offer the trainees excellent machine capacity and makes the best possible use of the space available.



Festo – An innovative leader in industrial and process automation
With around 100 new products per year and 2,800 patents worldwide, Festo helps drive improved production in process automation. 12,000 people are employed in 176 countries serving over 300,000 clients around the world. A solution can be provided for any task – using pneumatic, servo pneumatic and electrical drive systems, as well as providing the appropriate services. Festo Didactic provides vocational and advanced training for qualifications in automation processes.

We are the champions: **EMCO supports the successful Austrian team at WorldSkills**

Austria is the world's most successful nation at skiing. But did you know that we also have a great team in different area? No, we don't mean a football team (there was one, but that was 50 years ago). We're talking about the countless young people scooping up more and more prizes for Austria at the WorldSkills competition.



WorldSkills is an official, international competition which takes place every two years. During the four-day competition, around 700 young people under the age of 22 compete to challenging international standards in around 48 skill categories. They compete for gold, silver, and bronze medals, and, of course, for the title of World Champion in their chosen area.

These competitions can also be seen as an excellent opportunity to compare the different training systems with each other. Here, the dual apprenticeship training system, which is restricted to a few central European countries, meets the purely academic system (primarily followed in Northern Europe and Asia), and the mainly company-specific training system of the USA and other countries.

The Austrian Chamber of Commerce has been a member of WorldSkills since 1958, and has sent participants to the world championships on a regular basis since 1961. Its qualifications for this are based on the following conditions:

Nationwide pre-selection to determine the best in each category

Consistent, generous support from the training companies and the Chambers of Commerce

Commitment, support, and professional training from experts in each area

Coaching provided by a team adviser

Seminars lasting several days which involve new sports psychology methods, ensuring team spirit and physical fitness for the four days of the competition

High quality professional training for young people is a core element of EMCO's business philosophy, and its headquarters in Hallein has therefore supported WorldSkills Austria for a number of years. As part of this support, EMCO Industrial Training makes equipment available for the Austrian pre-selections in the fields of CNC. EMCO has been the official venue for these pre-selections for several years now. In 1997 and 2003 (both in St. Gallen), and in 2005 (Helsinki) they were also the official provider of machines at the world championships.

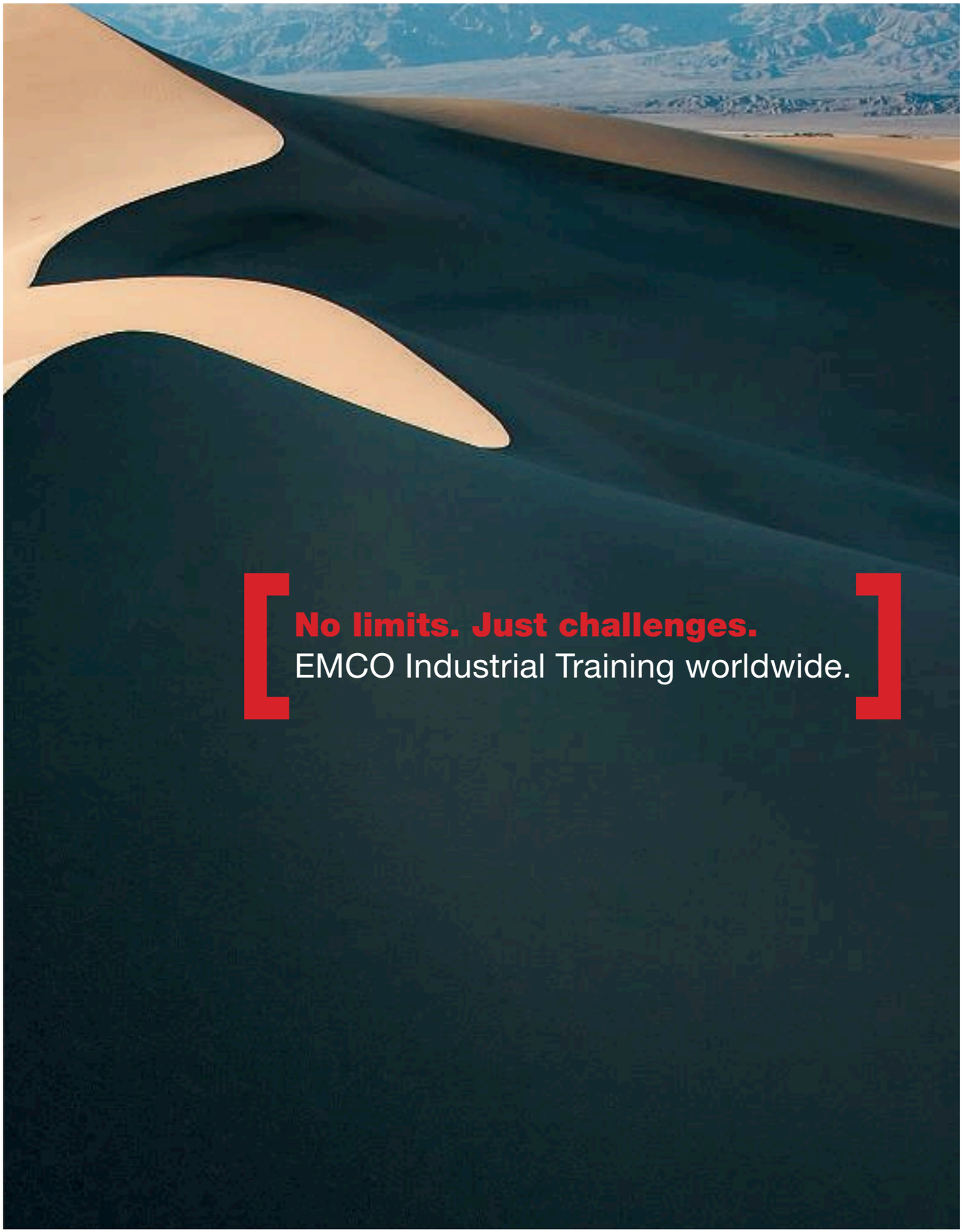
Austria wins again

The Austrian team's participation at WorldSkills has developed into a real success story over the last few decades.

Austria been ranked as the top nation several times (Lyon 1995, St. Gallen 1997, Montreal 1999).
A proud 73% of the participants between 1961 and 2007 received medals or certificates.

This was only possible thanks to the consistent and generous support of the Austrian training companies, the Austrian Chamber of Commerce, and the commitment of many experts who volunteered to coach and assist our candidates before and during the competition. EMCO is proud to have been able to contribute to this success story in one way or another.


25


No limits. Just challenges.
EMCO Industrial Training worldwide.



Around the **world!**

[Cultural exchange **at the highest level**]

Today, EMCO offers training systems for industrial manufacturing around the world. Schools, industrial training workshops, and businesses on every continent have been supplied with suitable machines and user expertise over the years.

Industrial Training is naturally an attractive area of business for EMCO. However, clients primarily see it as a worthwhile investment in the future. EMCO is aware of this at every stage and, for this reason, acts in a considerate and responsible manner. This becomes particularly important when you consider that EMCO Industrial Training implements projects in countries which are experiencing difficult political and/or economic periods, or which have just recently experienced such times.

However, this alone does not make the area of Industrial Training one of the greatest challenges which specialists from the EMCO training department face over and over again. The typical build-up to a project can take between 2 and 4 years. A time of intensive preparation, it is used mainly for developing detailed concepts and winning over clients, foreign ministries, international financial institutions and other decision-making bodies. The various approaches to and expectations of different initial situations also form a particularly exciting part of projects like these. Tact and understanding, diplomacy and lobbying are just as important as the quality of machines and teaching materials to the successful conclusion of a business transaction worth millions.

Even if the common underlying factor of every project, whether based in Brazil, Ireland or in the Philippines, is the

need for up-to-date expertise, customers are increasingly requesting an entire package tailored specifically to their needs, and which encompasses all stages from financial planning to implementation. Specifically, this involves preparing curriculums, providing modern training documents, setting comprehensive training and examination guidelines, complying with the award system, developing training and advanced training programs for teachers, and providing equipment, including entire laboratory and classroom facilities.

Above all, it involves compliance with requirements and guidelines if the project is to be successfully implemented within the country's existing systems.

Projects this size usually consist of 4 phases. The more closely these are examined, the clearer it is to see how extensive, time-intensive, and complicated equipping a training center can be, and exactly how much interdisciplinary knowledge is needed.



EMCO's Technical Assistance Experts train staff.

[Phase 1]
Acquisition phase *(time period: 2-4 years)*

Development of project content and financing solutions. Undergoing the necessary approval process in Austria and in the country where the project will be implemented (ministries of finance, planning, budgeting, the Oesterreichische Kontrollbank, OECD, etc., contract negotiation (technical, financial), and conclusion of the contract.

[Phase 2]
Planning of preparation, purchasing and production *(time period: 3-10 months each, depending on complexity of the project)*

Technical planning for potential new buildings or renovation of buildings, and planning the installation of machines and facilities (laboratories, extractors, gas supply, high-capacity compressor units, machine bases, etc.). Recruitment and internal preparation of the Technical Assistance Experts, all additional purchases made and machines manufactured at EMCO.

[Phase 3]
Deliveries and installation *(time period: 3-10 months)*

Delivery of all equipment to the project country by ocean freight. The project manager co-ordinates all activities, customs clearance, local onward transport from the port to the various schools, universities, and training centers (often spread out across the country), unloading, inventories, installation, and final inspection with the client.

[Phase 4]
Training and technical assistance
(time period: 6-36 months)

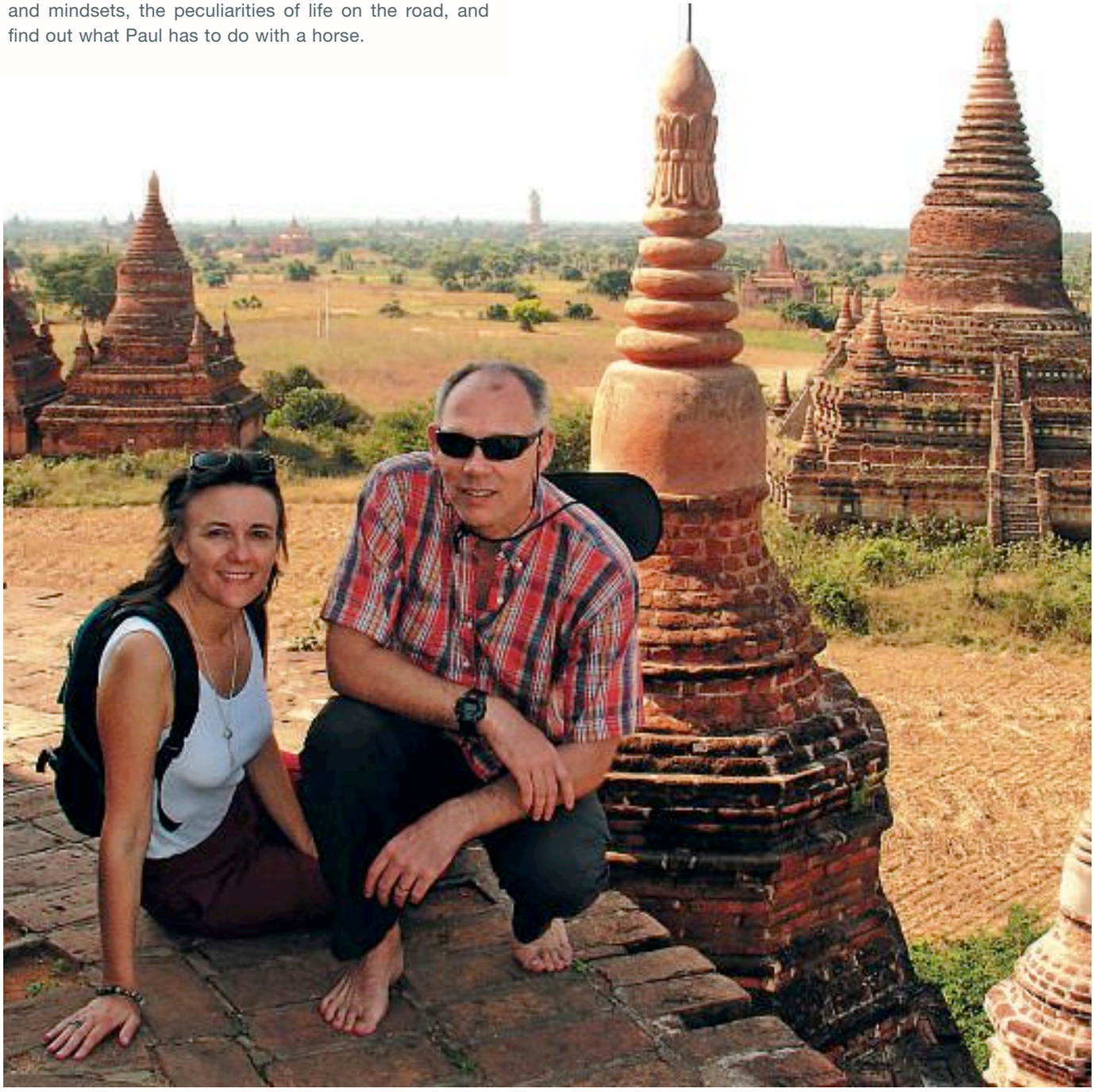
Personnel training (central aim of the project) by EMCO technical assistance experts. Foreign personnel may also attend several months of training in Austria (at EMCO or in co-operation with Austrian training organizations).

After the fourth phase, the EMCO technical assistance experts often stay several months (even years) in the country where the project was set up, in order to assist with the further development of training, and to help establish a maintenance system.

These are all tasks which require a particular level of commitment. And what is more: they require extraordinary people. Openness, the ability to deal with stress, a global way of thinking, a passion for the subject, and willingness to integrate are just a few of the qualities a person must posses in order to take part in and develop a project like this.

Gerald Sturm has been an international project manager for EMCO International Training since 1992, and, during this time, has developed large-scale training projects mainly in Indonesia and the Philippines. This means that he often spends several years in these countries. He has been working for EMCO in Gabon since April 2007. A man who has been around the world several times has a lot of stories to tell, of course. In the following interview you can read about his experiences of different cultures and mindsets, the peculiarities of life on the road, and find out what Paul has to do with a horse.

“Farmhouse bacon in Manila.” **An interview with Gerald Sturm, international project manager at EMCO**



Gerald Sturm and his wife try to immerse themselves as fully as possible in the cultures of different countries.

Mr. Sturm, you have supervised various projects around the world for EMCO Industrial Training and have often been far from home for several years at a time. How do you find the frequent moves to strange countries?

It's a little bit like a journey into a dark tunnel; you never know what awaits you at the other end. Will it be a little haven where you feel at home straight away, or will it be just the opposite? But the desire for adventure keeps me going, and whatever happens, it is certainly exciting. At the beginning you have to steer your way cautiously to be sure that you are heading in the right direction.

While we are on the subject, what are the biggest challenges that you face during the course of a project?

It's always the same at the beginning: my personal belongings get stuck in customs for weeks, sometimes months, and I don't have any dishes, clothes, or books. Despite this, I still have to put 110% effort into my work because of the constant pressure of deadlines. And on top of this, there is no one I can ask for advice. Especially when you have to deal with the really big problems and important decisions all on your own, the situation becomes a real test of strength. This makes it all the more important to set up a network of contacts as quickly as possible, so you can draw on it for information and help. That's not always easy to do; you can't just pull up a seat with the locals in Jakarta, Tripoli or Manila.

Don't you find the language barriers to be a real problem? I suppose you couldn't really learn every new language.

Actually, you can get quite far using English. But it is still important to learn a few simple phrases quickly in a new language. I always learn how to say "please" and "thank you" first. These are the two most important words. But the language isn't really that much of a problem. More often, it is the unbelievably slow bureaucracy or the drawn-out customs clearance procedures that make it really difficult. Constantly shifting political influences also mean that key personnel involved in the project keep changing. You often have to start again from scratch with new colleagues, because they have no idea what the project involves. Of course, this involves the use of interpersonal skills. You really can't achieve much alone; I depend on people to support me. When you just don't get along together, it can be really difficult.

You often hear that the ability to improvise is the most important skill needed for developing large international projects. Can you tell us about that?

Here's a typical problem: there are 40 tons of machinery and all kinds of material standing around, and it's my job to somehow unload it all, undamaged, from the containers



and get it into the buildings. There are no suitable machines to be found anywhere, especially if we happen to be working in quite a remote place where there is no infrastructure. Once, in the Philippines, about 70 young girls from a Catholic girls' school helped us with the unloading. They were so happy that they were allowed to do something useful for once. Without their help, the work would have taken several hours longer. There was also a typhoon on its way, which could have meant being stuck there for a week. Those girls really were sent from heaven. But, oh my God, so much squealing …

Have you ever lost hope that a project would be completed successfully?

Never fully. Although each project has what I call its "dark moments," when all I want to do is pack it in, run home, and hide myself away. But things don't stay the same, they are constantly changing. You have to see a project as a living thing which the people involved try to influence and make their own mark on at various stages and in various ways. As a project manager, I am in the middle of all this, and am exposed to all the tension. So you have to be quite an optimistic person to want to take on such a task.

What do you have to do in the “dark moments” to carry on?

I “re-boot” the computer in my head to give my mind a fresh start after a short feeling of depression. And then I always see how to carry on again. It has always seemed to work. I think of a line from a lovely song: “don’t worry, there is sunshine after rain.”



After successful negotiations in Japan

Do you sometimes miss Austria? What do you miss the most?

Sometimes I get real withdrawal symptoms. Then I have to eat some potato salad or some Austrian bacon with a glass of schnapps. Music can also be a big help, anything from modern folk to classical, from wind music to folk is allowed. In an emergency, nothing is ruled out. For a while, “Paul mit sein Gaul…” (Paul and his horse) was my favorite. But only at full volume and when I was at home alone! Those wonderful Austrian tourism posters are as precious as gold. Most of all, I miss the mountains, the fresh air, riding through Salzburg on my bike on Sunday mornings, the church bells, good bread, and fresh, hot meat loaf. And of course, I can’t forget the changing seasons and the snow.

Do you ever feel like you have no country and no home?

Not at all. I still feel connected with my home – Vorarlberg in a narrow sense and Salzburg and Austria in a wider sense.

How does your family find the constant traveling?

My wife comes with me on longer postings. She enjoys traveling even more than I do. It is quite difficult to stay in regular contact with the rest of the family. My mother always says she worries that we will be caught up in one of the many natural disasters. When the dreadful tsunami happened, one of our many friends from around the world told everyone by e-mail that we were staying in the affected area in Thailand. We were actually a couple of thousand kilometers away. Family, friends, and acquaintances sent anxious e-mails from various parts of the world. My brother even called the Foreign Office’s emergency center. Four days later, when we finally had access to the Internet, we didn’t even know there had been a tsunami. I had seen just one picture on the front page of a local newspaper and thought it was of an earthquake.

What do you and your family do to fit in as quickly as possible with the local customs and become integrated?

It can often be tiring to try and learn as much as possible about the country and its people and to immerse yourself in a completely different culture in addition to the challenges of the day’s work. But traveling in the country can help a great deal with this. My wife and I always try to travel around our host country as much as we can. You can experience a lot in this way.

Are there cultures in which you feel more at ease and those in which you feel less comfortable?



I always dreamed about North and South America, and the indigenous cultures there when I was younger. When I came to Asia, I was surprised most of all by how diverse it is, and the things there are to discover. I am essentially open to all cultures, but I don't throw myself into them completely. I continue my own, Austrian way of life, and keep a certain distance from any culture. In a way, I am an onlooker, and try to approach a new culture as impartially as possible, and to take a lot in.

Which country left the greatest impression on you?

Basically, every country has its own characteristics and its good and bad points. I am constantly fascinated by human diversity with its many different forms of language, music, dance, social structure, religion, attitude, cuisine, nature, architecture, etc. Of course, you mustn't forget the negative aspects: social injustice, poverty, conflict, crime, pollution, the unscrupulous exploitation of nature, misgovernment, poor education, ignorance, and "cultural" prejudice.

Indonesia left a strong impression on me, as it was my first project location. It is a perfect example of diversity, partly due to its size and its geography, which encompasses around 15,000 islands. It has more than 400 languages, various cultures, and is unbelievably rich in natural beauty.

Libya was also a wonderful experience. Fantastic people and an unforgettable atmosphere in the desert, starry skies that make you dream. Sometimes it was like a tale from "Arabian Nights," with the image of "brother leader" Muammar Gaddafi floating above everything.

In the Philippines I was introduced to the fine art of political and social manipulation, and saw a traditional Good Friday crucifixion ceremony with my own eyes. A terrifying experience. And I had a couple of the most extreme experiences of my life in Africa. That's why I can't really say which country left the strongest impression on me. I have had amazing experiences and gotten to know some lovely people. On the other hand, I have experienced difficult times in each place. But these contrasts are what make the countries, the people, and even life itself exciting.

Do you see the journey from project to project as a task for life or as a phase in your life? In other words, do you ever want to settle down?

Of course, I will settle down one day. But I'd like to carry on for a while longer, if I can.

Gerald Sturm's profile

Date of birth: 16 March 1964
Part of EMCO Industrial Training since: 1992

Projects:

1992-1993	Indonesia. CNC training project: Trainer
1994-1996	Indonesia. CNC training project: Technical Assistance Team Leader
1996-1998	Libya. Engineer-training project at the technical university in Tripoli. Training for Libyan oil company engineers and other national companies (not for EMCO, for Voest Alpine Oilfield Services in Linz): Project Manager
1998-2001	Indonesia. Three-year training project in the skills of mechanics, electronics and welding: Project Manager
2002-2007	Philippines. CNC training project: Project Manager
since April 2007	Gabon. Project involving technical training in the specialist areas of woodworking, electrical engineering, automotive (mechanics, electrics), mechanics, welding, etc.: Project Manager

Brazil: **Perfect training solutions for all requirements**

Thousands of young people are trained each year in Brazil using EMCO machines. EMCO Industrial Training is aware of the social responsibility this creates, and therefore always sets out to provide training of the highest possible quality. We would like to present two of the most significant projects of the last few years.

The Paula Souza Project in Sao Paolo

The Centro Paula Souza is a non-profit organization which has been training skilled workers for a wide range of industrial sectors for over 35 years. In total, around 105,000 people are currently taking part in Paula Souza's training programs, which place great emphasis on character building, teamwork, and the development of leadership qualities in addition to purely technical skills.

With a total of 109 schools and 20 colleges for technical training alone, this area forms a huge part of the organization's overall program. So it can continue to offer students the quality of training that is demanded by international competition today, the Centro Paula Souza makes regular investments in modern equipment. And this is exactly what it did in December 2005, when it was publicly announced that 17 CNC training establishments were to be set up in the state of Sao Paolo.

Through Didatech, EMCO's long-term, trusted partner in Brazil, EMCO was awarded the contract for this project, and provided the schools with a total of 20 CNC turning and milling machines. The package consisted of fifteen machines from the Concept TURN 55 range and five Concept MILL 55 machines.

The SENAI project in Sao Paolo

SENAI stands for National Industrial Training Service, and is a non-profit organization with a public contract, supported by private industry. It is dedicated to vocational and advanced training, as well as the promotion of trade and industry. As an agency of the Brazilian Federal Association for Industry (CNI), it carries out this task throughout Brazil: over the last 50 years, more than 21 million skilled workers have trained with SENAI for the widest possible range of industrial sectors. EMCO Industrial Training has been a partner of SENAI Brazil for several years.

SENAI is also particularly dedicated to the social integration of people with disabilities. In the last few years, a specific technical training concept has been developed to enable this group of people to work in high-tech fields such as CNC programming. A public tender for CNC machines was announced, to which EMCO Industrial Training was able to respond via its Brazilian partner, Didatech. EMCO was the only company able to meet the tender criteria in terms of price and technical specification. Other important factors which contributed to the tender being accepted were the height-adjustable keyboards (an important element for wheelchair users), and the generous, ergonomic design of the machines' work space.



Through its machines and excellent training, EMCO Industrial Training is proud to be able to make a contribution to the social inclusion of people with disabilities.

Turkey: **Stronger together**

EMCO Industrial Training secrets to success also lie in strategic partnerships with international enterprises which provide EMCO with sales support through regional subsidiaries. An excellent example of this is the CIM project in Turkey, which EMCO was primarily able to carry out thanks to its partner, Festo Didactic.

This project involved providing 10 vocational training schools with CIM (Computer Integrated Manufacturing) systems. The excellent teamwork between Festo Turkey, the Festo Didactic headquarters in Denkendorf (Germany), and EMCO, made it possible to gain the approval of the Turkish Ministry of Education.

The project was put out for tender in September 2005; after hard negotiation the contract was signed toward the end of 2007. Despite the long delay, the new training areas for the schools, which were spread across the whole country, were successfully opened in September 2007. By this point, the machines had been commissioned, delivered and installed, and the teachers had even been given machine-specific training in Germany.

Turkish politicians and CNC technology trainers are now convinced that the training system in Turkey has made considerable progress in the area of industrial automation technology through this project.



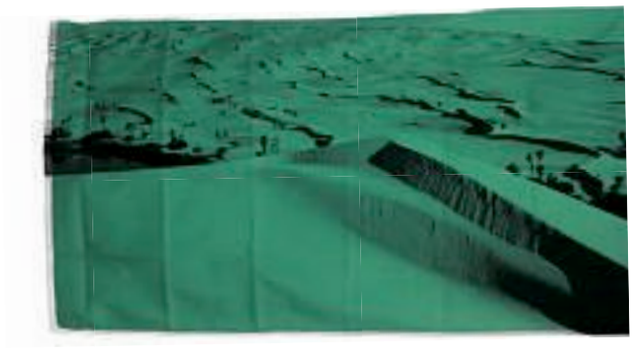


The Philippines: **Austrian expertise as an investment in the future**

EMCO Industrial Training is able to look back on countless large-scale training projects it has set up on several continents which have established it as a trusted partner of government and educational organizations. This reputation certainly helped it to win approval for the TESDA project in the Philippines in February 2002.

TESDA stands for Technical Education and Skills Development Authority, and is an official project by the Philippine government which aims to improve the country's vocational training to meet international standards. In this context, EMCO equipped a total of 7 centers for CNC training. The entire solution included curriculums, modern training documents, in-depth training and examination guidelines, an award system, training and advanced training for teachers, co-operating with local industries, and, of course, the necessary equipment, including the installation of laboratories and classrooms.

The fact that this project was accomplished despite initial difficulties was thanks to the tireless efforts of the EMCO Industrial Training employees and their continued willingness to adapt to the new challenges posed by the international markets.



Libya: **Academic training with EMCO**

After a preparation period of over 3 years, EMCO was able to finalize a particularly significant project with the Libyan government in May 2007. The department of technology at the Al Fateh University in Tripolis was equipped in co-operation with a local partner.

In March 2004, EMCO's partner in Libya submitted a budget proposal for the Al Fateh University project to the Libyan government. The technical faculty's industrial and mechanical departments were to receive a completely new laboratory for metal work, to enable their academic training to keep pace with the rapid developments being made in the metal machining industry.

After lengthy negotiations, EMCO and its Libyan partner were finally awarded the contract, and immediately set to work developing the project. By the end of 2007, the machines, which totaled 66 tons of high-quality equipment, had been manufactured, packaged, and shipped from the headquarters in Hallein. Meanwhile, the laboratory at the university in Tripoli was made ready for the installation and start-up of the machines, as well as for intensive training on the equipment.

The largest part of the delivery consisted of 21 high-tech machines, which spanned all three of EMCO's key areas. From the conventional turning machine EMCOMAT 20D with its digital display, and the Concept TURN and Concept MILL 155 with interchangeable CNC control, to the high-performance turning machine MAXXTURN 65 with an automatic chip conveyor, at least one product was included from each area of conventional training machines and CNC industrial machines. Software solutions such as the CADCAM software "Esprit" were also provided. Two Agie Charmilles vertical eroding machines and Kistler cutting force measurement systems completed the package.

Thanks to the wide range of machines which EMCO manufactured and delivered, high quality, industry-specific training is now available at the metal machining department of the Al Fateh University.

Qatar: **EMCO for educational excellence**

In 2003, the distinguished Texas A&M University opened a campus in Qatar. EMCO Industrial Training is responsible for CNC training of the highest quality there.
The Texas A&M University campus in Qatar, or TAMUQ for short, is located in Education City, an association of training and research institutions which are part of the Qatar Foundation for Education, Science and Community Development.

TAMUQ has been offering courses in four different fields since 2003: electrical, chemical, mechanical, and petroleum engineering. In 2007, the 55,000m^2 TAMUQ complex in Education City was finished, a research program was set up, and education was raised to graduate level. During this process, the mechanical engineering training department was equipped with the latest CNC technology. Thanks to excellent support from its local partner, EMCO was able win out against some very well-known competitors from the USA and Europe. As an American university, TAMUQ initially had its sights set on American partners, but EMCO's excellent value for money persuaded them otherwise.

Co-operation was extremely professional and goal-oriented from the very beginning, which meant that there were just six months between the offer being made and the machines being delivered – an astonishingly short period of time given the project's complexity.



The products provided needed to be of consistently high quality and include high-spec features. The MAXXTURN 65, the MAXXTURN 110, and the FAMUP MCX 1200 provide TAMUQ with first-class machines which can be used for both training purposes and industrial manufacturing.

Ireland: **Quality campaign for CNC training**

In 2005, the Irish Department of Education and Science decided to provide budgets for the renovation and modernization of more than 500 vocational schools providing metalwork and technological training.

Along with conventional turning machines and wood-working machines, the equipment guidelines set out by the Department of Education and Science also specified CNC turning machines among the table-top equipment. The decision was made following a public tender on the grounds of the best offer.

Due to the high competitiveness of EMCO machines, EMCO Industrial Training has been able to supply and install more than 75 Concept TURN 55 machines with CAD/CAM WinCAM and CAMConcept controls to date. In addition, several conversion kits to upgrade existing machines to the latest technology and CNC controls were provided.

The aim of the Irish government's quality campaign was to ensure that all machines meet current technical standards so that training can be provided in accordance with the new, revised curriculum. It also aimed to improve safety standards in the schools. Around 70% of



the machines in use prior to 2005 had no CE marking to guarantee adequate safety levels.



Estonia: **Excellent prospects for CNC technicians**

The Tallinna Tööstushariduskeeskus, or THK for short, is Estonia's largest technical training center. It was founded 25 years ago, originally under Russian management. Estonia began providing training again at this institution on September 1, 1999, and, since then, has been making huge investments in increasing technical training.

EMCO Industrial Training, in co-operation with FESTO Didactic, is a partner of this institution, and has provided the training department with 30 conventional and 4 CNC lathes and milling machines. The software used during courses is TrainConcept. Overall, this was a huge project involving the investment of around 1 million euros.

The branches of metal machining are experiencing a resurgence in Estonia after a period in which young people decided that they wanted to study Business Studies and IT. Consequently, there was unemployment caused by the saturation of the job market in these areas coupled with a lack of skilled CNC workers and good engineers. However, since countries in Scandinavia, Central Europe, and Russia are investing more strongly in Estonian mechanical engineering due to tax benefits, the country desperately needs highly qualified skilled workers.

THK's training workshops were opened in 2006 and represent an ambitious pilot project in Estonia's efforts to provide the economy with the skilled workers it needs.

The beginning of a new era: **EMCO and the Florence-Darlington College predict the manufacturing model of the future**

The Florence-Darlington College in the US state of South Carolina ushered in a new era for manufacturing in September 2007, when it opened the Southeastern Institute of Manufacturing and Technology. EMCO Industrial Training is their expert partner in this ambitious project in the field of CNC manufacturing.

The Florence-Darlington Technical College aims to provide the highest level of support to high-tech enterprises in South Carolina at all stages of the manufacturing process and helps them face the challenges of the 21st century. Along with the Southeastern Institute of Manufacturing and Technology (SIMT), the College is now creating new opportunities for the entire region.

SIMT was set up on the basis of a study carried out by Dr. Gould (the President of the College) and his colleagues, which examined the development of manufacturing. According to this, it is predicted that there will be fewer, but more highly qualified manufacturing workers in the future. This requires improved methods of further education, increased levels of automation, more efficient production lines, and optimized logistics systems. The consequences will be higher costs, which will, in turn, lead to less scope for product development as investors' expectations grow and schedules become tighter.



Jack Roach, SIMT's director adds: "These developments pose great challenges to entrepreneurs. SIMT does not see itself primarily as a center for education, but more as a facility providing support to manufacturers in their progress from concept to market."

The newly opened institution's range of services includes:

Providing partners with rapid prototyping services. These will shorten preparation periods and allow potential clients to appraise product design more quickly.

Develop manufacturing plans for firms that are just moving beyond the research and development stage of their product.

Assisting firms in setting up automated production lines, and helping firms to hire and train workers to bring their new production operations on line.

SIMT's main keys to success are its partnerships with leading high-tech manufacturers from around the globe. In 2005, Dr. Gould and Jack Roach came to EMCO with their vision of the future of manufacturing.

EMCO immediately realized how important SIMT could be on a regional, national, and even international level. It therefore joined the project from the beginning with enthusiasm. Similarly, after analyzing the competition, Dr. Gould declared that EMCO was one of the few machine tool manufacturers to be truly dedicated and committed to CNC training. EMCO would not have been the market leader in CNC training for 25 years if this were not true.

EMCO's superior quality and innovative approach left a lasting impression on Dr. Gould and Jack Roach. They allowed EMCO to equip the institution's centerpiece, the 34 million dollar Advanced Manufacturing Center measuring more than 16,400 m^2, with innovative CNC training and manufacturing centers. It functions as a training center and also as a technology center for businesses who are about to begin

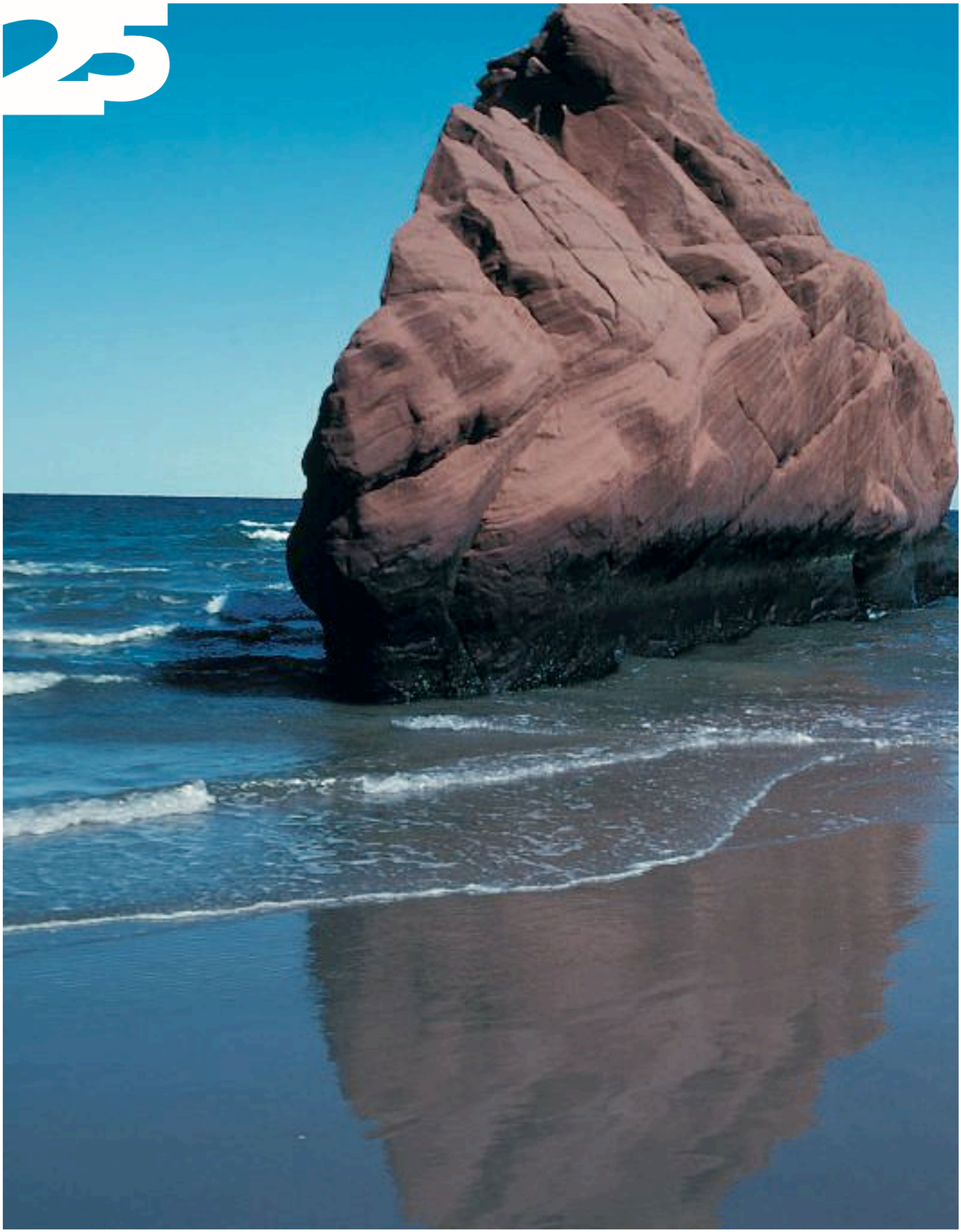
commercial manufacturing. The equipment allows both training for skilled workers and also innovative product development. CNC machines, high-speed milling centers, multi-axis machines, a rapid prototyping center, a virtual reality center, and CAD/CAM systems can be used by companies that do not wish to invest time or money in setting up manufacturing process systems of their own.

The center is equipped with five Concept MILL 155 machines, five Concept TURN 155 machines, two Concept MILL 300 machines, two Concept TURN 450 machines, a MAXXTURN 95, a HYPERTURN 665, an EMCOTURN 420, and an EMCOTURN E65. In addition, it boasts a fully equipped training room with 25 workstations, which can all make use of multiple CNC control systems, CNC control elements, and CNC controls.

EMCO Industrial Training partnership with SIMT is still fairly new, but has already made a very promising start and has received nothing but positive feedback. “Very few places in the world will be able to do all the things we will be doing,” said Jack Roach.



SIMT offers its students and companies an innovative environment in every respect.




The best plan for the future:
Excellent training. EMCO Industrial
Training products.



Machines with **added value.**

The concept of the **interchangeable control**

EMCO Industrial Training provides universally applicable training which can be tailored to individual requirements, and which allows the skills learned to be applied quickly to industrial CNC manufacturing.

The idea of the interchangeable control, which EMCO Industrial Training has integrated into all its Concept machines, has proved extremely effective in achieving this. This allows the user to be trained to use the different CNC controls commercially available in the industry on one single machine. People who have trained on EMCO machines are then able to work on almost any CNC machine in a wide range of companies.

All that is needed to change to a different control unit is to start up the appropriate software and change the control-unit-specific keyboard module, which takes just a minute. In this way, up to eight controls can be taught on one single machine from the Concept range. Of course, EMCO Industrial Training is also constantly working on new WinNC control units, so that Concept machines can continue to be upgraded quickly and easily with the latest CNC controls.

In times of intense competition and a shortage of skilled workers, this is a great advantage; not just for future specialists, but also for businesses. As well as opening up a wide range of professional opportunities and perspectives for CNC technicians, this creates a pool of expertly trained staff that companies can draw upon, regardless of the machines and control systems used.

Trainees learn the basics of metal machining using the reliable conventional EMCO machines provided – with and without cycle control. By using Concept machines, which are all fitted with the globally unique interchangeable control concept, they acquire expertise in industrial manufacturing with CNC turning and milling machines. The next few pages continue on the theme of education, and will introduce to you a selection of EMCO's new developments which are mainly used for training purposes.

Quality training at an industrial level: **EMCO Concept TURN 250**

EMCO Industrial Training Concept TURN 250 is an efficient 2-axis CNC turning machine with interchangeable controls which caters for a range of training needs as well as sophisticated turning and milling possibilities.

Typical EMCO Concept Turn 250 users are industrial training establishments which also manufacture goods, manufacturing companies with apprentices and trainees, factories, watchmakers and jewelry manufacturers, new trainees with specific needs, as well as expert CNC technicians who would like further training.

In addition to CNC programming, training in metal machining technology is becoming more and more important. This is why the Concept TURN 250, which replaced the Concept TURN 155, is designed to provide high-quality training in industrial metal machining. Its many features, combined with excellent machining performance, means that its range of applications can be compared to that of much larger machining centers.

This means that training can be given on cutting parameters, depth, feed rate, or rotational speed, taking into account optimum chip formation and the surface to be achieved, for a wide range of materials. Furthermore, with its comprehensive technical specifications, the Concept TURN 250 also allows crucial tests and training to be carried out on the correct choice of tool. An important point when you consider the huge choice of tools and geometries which overwhelms many of today's CNC beginners.

Two in one: **EMCO Concept TURN 450**

The Concept TURN 450 by EMCO Industrial Training is based on the successful EMCOTURN E45. It is equal in function and performance to a modern industrial machine. Its interchangeable control system makes it perfectly suited for training use.

The Concept TURN 450 is a great all-rounder. Like all Concept machines, it can be used as a stand-alone industrial machine as well as for manufacturing training. It can also be integrated with a CIM system. The Concept TURN 450 also offers a full suite of automated features, ensuring that it can be used in any situation.

Above all, this machine is extremely economical thanks to its versatility. Not only is it less expensive to purchase than other machines in the same category, it also beats its competitors' follow-up costs thanks to its interchangeable control and industry-oriented design.

In terms of technology, this powerful machine with digital drive technology offers extraordinary performance, including perfect thermostability, constant precision, and excellent contour capabilities even after many years of use. It can be fitted with a C-axis and driven tools. As for all EMCO Industrial Training Concept machines, a wide range of software simulations and teaching/learning support materials are also available for the Concept TURN 450.





Highly versatile. Easy to use.
The EMCOMILL C40 Linear

The EMCOMILL C40 Linear follows on from the successful FB4 and is primarily aimed at production-oriented users. It stands out thanks to its high efficiency, precision, and universal application: qualities that make it the perfect machine for practical training using state-of-the art technology.

Ease of use is the EMCOMILL C40 Linear's defining characteristic. The swivel-mounted ergonomic control panel, the swivel-mounted chip tray, the coolant system with external coolant tank, the reversible main spindle, and the infinitely variable main spindle and feed system are just a few examples of its many features which help make the manufacturing process much easier.

Multiple uses

Through its sturdy, solid construction, universality, high machining power, and dynamics, the EMCOMILL C40 Linear provides the customer with an enormous advantage: it can handle workpieces of up to 600kg as well as the precision manufacture of smaller pieces.

This versatility enables the user to acquire expertise in a wide range of modern metal machining techniques. The EMCOMILL C40 Linear provides excellent training in the selection of the right cutting parameters, from depth and feed rate, to rotational speed, taking into account optimum chip formation and surfaces.

Training with optimum performance:
The EMCO Concept MILL 450

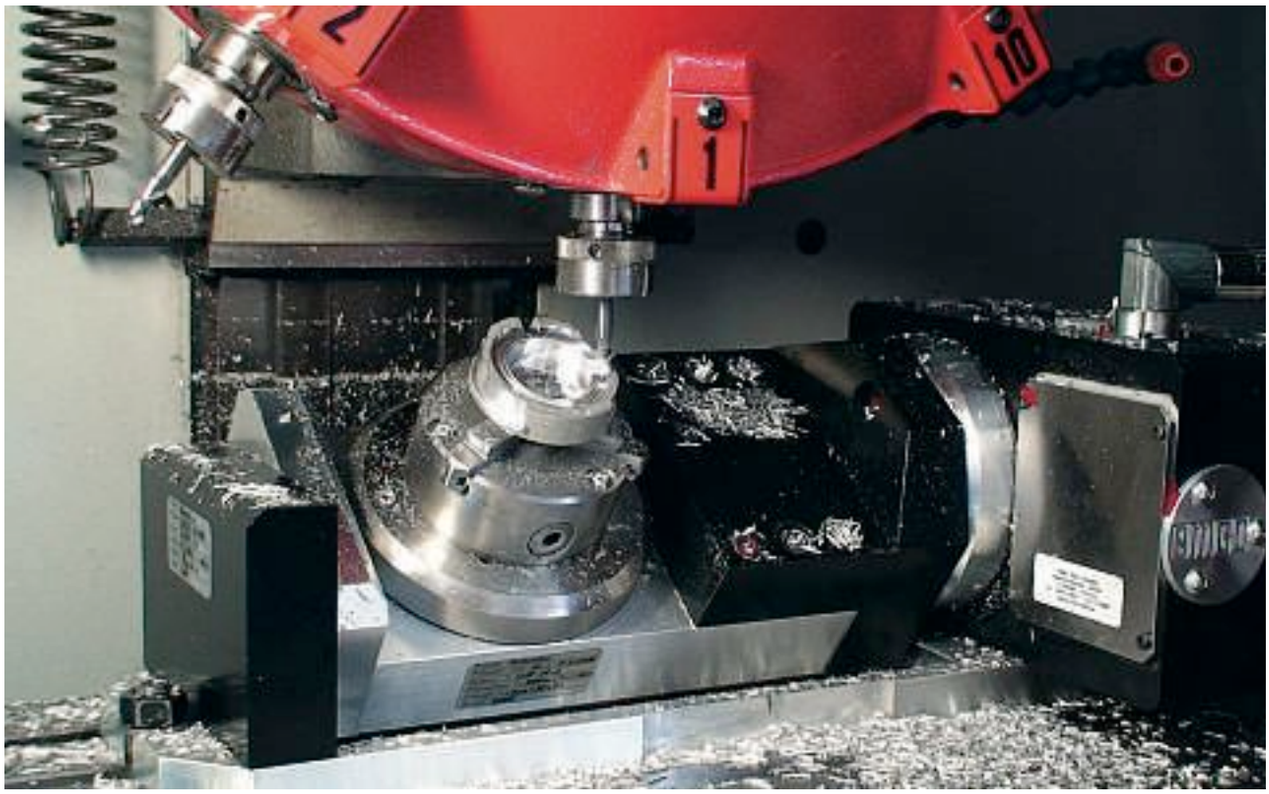
The new Concept MILL 450 from EMCO Industrial Training is a CNC vertical machining center with interchangeable control, the latest drive technology, and the highest level of performance. For training at industrial level.
This machine was based on the successful EMCOMILL E600, which was adapted for training purposes and equipped with the EMCO WinNC interchangeable control unit. The new Concept MILL 450 corresponds to the EMCOMILL E600 in terms of performance, size, and working area. This allows the user to learn modern metal machining skills on a machine that meets industrial standards.
Above all, the refined machine design ensures perfect training conditions. With a powerful direct-drive main spindle (10,000 rpm and 13 kW), a high feed rate coupled with immense power, a modern fixed 20-tool magazine, a fast two-arm changer, and the EMCO WinNC control unit, the Concept MILL 450 can be used not only for CNC milling training, but also as a fully-functioning production machine.
Multimedia classroom WinTutorials tailored to the machines and control systems have been developed to back up the workshop training. These enable all the milled parts of a fully-functioning 4-stroke engine to be manufactured on the Concept Mill 450, for example.
Due to its enormous power, this machine is also ideal for steel machining. Typical users are industrial training establishments which also manufacture goods, manufacturing companies with apprentices and trainees, factories, watchmakers, and jewelry manufacturers. It is also ideal for both beginners and advanced trainees with more demanding requirements.





All Inclusive:
The EMCO Concept MILL 155 with 5th axis

The EMCO Concept MILL 155 with its 5th axis is ideal for use in both advanced training and the manufacture of small pieces. Using the rotating and swiveling unit, even complex workpieces can be machined on various sides in just one clamping cycle. EMCO Industrial Training achieves the latest technical and qualitative industry standards with the Concept MILL 155, whilst keeping its costs much lower than those in the industry. A particular highlight is the rotating and swiveling unit which acts as a fully-functioning 5th axis based on Sinumerik 810/840D. It offers a level of performance only previously seen in industrial machines.



Using the 5th axis, even complex workpieces can be machined on various sides in clamping them just once.

It is typically used in the advanced training aspect of complete machining, teaching and learning industrial and commercial machining, adult learning and further professional training. In the area of manufacturing, the Concept MILL 155 is mainly used by the jewelry and watch making industry, prototype producers, patternmakers, and mold producers.

The machine is controlled through an integral PC. In line with the Concept of the interchangeable control, various different industrial controls can be loaded onto this PC. EMCO Industrial Training Concept MILL 155 can be fully automated and integrated into a CIM (Computer Integrated Manufacturing) system, or an FMS (Flexible Manufacturing System). The integrated PC with Windows operating system and spare Ethernet ports means that the Concept MILL 155 also represents an extra workplace in a network, which allows the machine to be converted at minimal cost and effort into a manufacturing cell with robot loading and unloading, and remote control. This provides ideal training for mechatronics technicians while allowing industrial CIM systems to be used professionally.

Since CNC training using realistic function models is more exciting and efficient than a training concept based solely on theory, EMCO Industrial Training has developed multimedia classroom WinTutorials tailored to the machines and control systems to back up the workshop training through practical projects.

The Concept MILL 155 clearly illustrates EMCO Industrial Training core expertise: the development of training concepts which make learning the course content and applying this knowledge easier.



Take it easy. **EMCOMAT E-160 with EASY CYCLE control**

The EMCOMAT E-160 is a cycle-controlled lathe ideal for the commercial and industrial manufacturing of one-off parts as well as for the production of prototypes and molds. Small series, which require repeat accuracy, can also be produced more efficiently.

As with all EMCO cycle-controlled lathes, the EMCOMAT E-160 provides an economic alternative when conventional machines reach their limits and CNC machines are too complex.

One particular feature of this machine is the combination of high-powered cutting performance and a unique, user-friendly handling system:

the EASY CYCLE Teach-in control.

No CNC knowledge is required for this control; the user is walked through the programming steps and can view a graphic simulation of the part. Beginners and occasional users find it clear to understand and easy to operate.

EASY CYCLE offers a total of three operating methods:

manual operation,
teach-in mode,
and the program sequence.

In manual operation, the slide can be moved manually by means of a changeover switch, or electronically by means of a handwheel. Entry and processing of cycles is supported graphically in direct exchange with manual machine operation.

During teach-in mode, operating cycles can be arranged in sequence. A graphic simulation of the sequence is carried out directly after data entry. The cycles are processed immediately after entry. Of course, the operating cycles can be stored and recalled.

The programming sequence allows cycle or DIN programs to be processed individually or in a sequence.

Programming follows DIN standards and DIN programs can be created directly. In addition, test graphics enable single cycles or the cycles and DIN programs that have been created to be simulated graphically.

The EMCOMAT E-160 has a great impact in the area of training, as it enables the basics of metal machining and programming to be taught simply and effectively.

One for all. **CAMConcept from EMCO Industrial Training**



CAMConcept is an innovative software for complete CAD/CAM and CNC training, from design to manufacture. It incorporates the combined experience of WinNC and WinCAM controls.

Its many applications have made EMCO Industrial Training tried and tested CADCAM control WinCAM a great success. Therefore, there was great interest in developing it further to keep pace with the new CAMConcept. But it was not just to appeal to training centers. The industry also benefits from an innovative training system which creates NC control codes.

CAMConcept is simple to use and has a clear, well structured layout. All core CAD program functions are available. Graphic displays of CNC cycles allow quick programming, while simulations and collision checks ensure that control programming is safe. The 3D simulations make it perfect for training at programming stations, and also for making complex turning and milling workpieces simple to produce any time.

CAMConcept is made up of CAD, CAM, and CNC elements. With its many functions and user-friendly operation, it is currently the leading software system in the field of training.

An overview of CAMConcept:

CAD

All core CAD functions are available, which replace many complex CAD programs for training

DFX drawings are simple to import and use as production tools

CAM

Programming for all CNC machines with clear operating cycles

Teaches cycle programming for the industrial use of dialog controls

Drawings of stages of the work process are transferred quickly to the machined parts

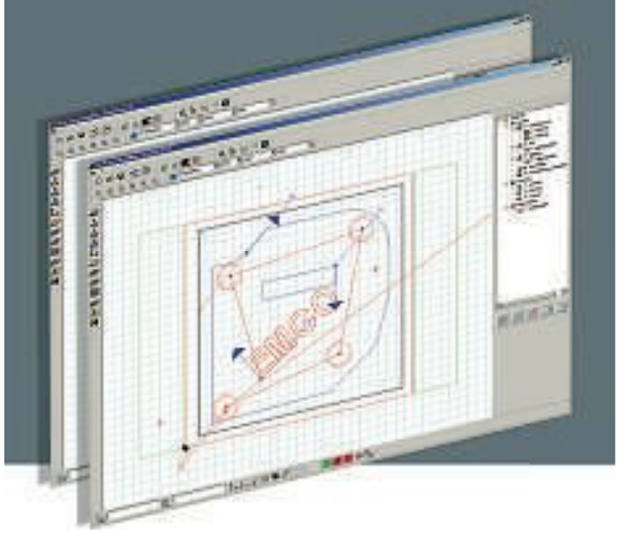
CNC

Workpieces produced through direct control of the CNC machine

Views of the machine's functions, positions, and status when the program is running

Simulation of workpiece processing and the finished piece for program control and training

New projects can be drafted, programmed, and edited during production



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