

FACTS

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SHOW THE PROFILE

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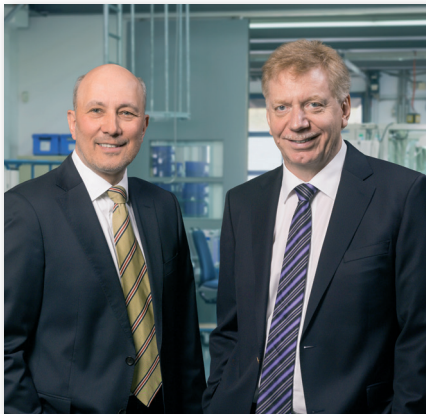
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LOCAL AVAILABILITY GLOBALLY



Dr. Oliver Lemmer (left) and
Dr. Toni Leyendecker,
executive board of CemeCon AG

Industrial companies are becoming increasingly international – and tool manufacturers are following. This means that we want to – and we must – make our high-quality coatings available worldwide, both through job-shop coating and through technology transfer. To this end, we are continuously developing our global network – with our own large coating centers in Germany, the USA and China as well as with technology partners in many different countries. In this way, our premium coatings go exactly where they are needed, and we are always close by – worldwide. The EMO – a leading trade fair for mechanical engineering and metal processing – is a must attend event for us as an international manufacturer of premium coatings and first-class coating technology. Visit us in Milan at the EMO from October 5-10, 2015: **Hall 6, Booth M20.**

PREPARE TO BE INSPIRED!

Yours sincerely,


Dr. Toni Leyendecker


Dr. Oliver Lemmer

Imprint

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INFORMATION 24/7 – WORLDWIDE IN REAL TIME

CemeCon is known for its high quality plant technologies and high-performance, extremely smooth coatings. In addition, the comprehensive service package ensures high customer satisfaction. An important part of this is order tracking. Customers of CemeCon AG can quickly and easily view the current status of their coating orders via the Internet.

In this digital age, the ability to track orders online at any time has become routine. Order tracking found its way into daily routine of CemeCon AG long ago. Using

the CemeCon password protected website, customers can log in and view the status of their orders. In addition to the order data and delivery dates, the system also

provides information regarding the current location: one view shows the processing status of the tool – receipt of goods, preparation/pretreatment, coating system, quality control, or already shipped. CemeCon continuously updates the information. Customers can always determine the progress of their orders reliably online – always in real time, in any time zone, regardless of their office hours.

“Outstanding customer service is an important element in our company philosophy. We have put together a comprehensive, complete service package that includes for example, a collection and delivery service for job-shop coating orders, transport packaging for maximum protection, digital order processing using a modern ERP system, and electronic order confirmation and invoicing. Order tracking is the ideal complement to this package,” says Bernd Hermeler, Head of Marketing, Sales and Service of CemeCon AG.

The screenshot shows the CemeCon website's 'Order Tracking' section. The header features the CemeCon logo and navigation links: Coating Service, Coating Technology, Coating Competence, and Company. A left sidebar lists various services, with 'Order Tracking' highlighted. The main content area is titled 'Order Tracking' and includes a breadcrumb trail: CemeCon > Coating Service > Order Tracking. Below the title, it states 'Information around the clock – worldwide in real time' and explains that the system provides real-time status updates for coating orders. A login section titled 'Order Tracking Login' contains fields for 'Username' and 'Password', a 'Login' button, and a direct link to the tracking system: <https://ordertracking.cemecon.de>. A 'Any Questions?' sidebar on the right offers contact options: 'To your direct contact' and 'Contact form'.

Order tracking gives customers of the CemeCon AG the ability to check the current status of their coating orders via the Internet.

WORLDWIDE ON-SITE FOR YOU

With an extensive network of its own coating centers, licensed partners, and sales offices, CemeCon operates globally with a local presence to offer comprehensive services to manufacturers, regrinding companies and universities in order to help them obtain rapid access to the most advanced coating technology worldwide.



The demand for high-performance coatings for machining technology is growing globally every year at an enormous rate: Coatings increase tool performance in nearly all applications and, often, are the only economical way to process modern materials.

CemeCon has had an international presence for many years: The company provides German coating technology – machinery and job-shop coating – to tool manufacturers, job-shop enterprises, and universities worldwide. This is accomplished by large coating centers, such as the headquarter in Würselen, Germany and the ones in Suzhou, China and Horseheads, NY (USA) that produce custom premium coatings. We also have a large number of partners that are able to offer licensed CemeCon coatings locally.

Dr. Toni Leyendecker, CEO of CemeCon AG: "We observe and analyze the developments on the various continents and countries very closely. Often, a modern production

CemeCon worldwide:
Coating centers, partners
and sales offices.

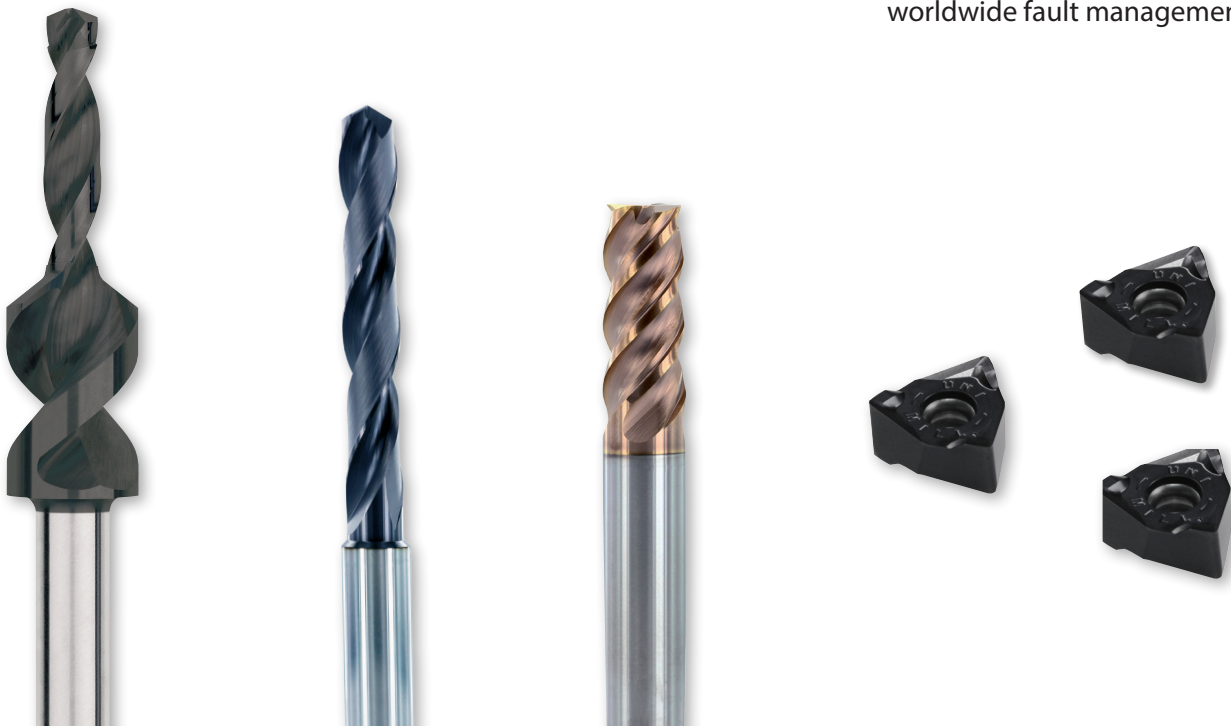


is on its way to be established or is on an expansion course. More and more international companies meet the demand by building or expanding innovative production facilities for all imaginable types of products. Examples include chemical factories, automobile and electronics production facilities. Such rapid development requires machines, tools, and – last but not least – high-performance CemeCon coating technologies.”

The most recent examples, for instance, are in Japan or the USA. CemeCon is continuously expanding its leadership position in the area of CVD diamond coating technology and is also enlarging in the area of PVD coatings. The Application Development Center at the Horseheads, New York site has recently been extended to become a diamond coating center.

Dr. Toni Leyendecker: “Consistent quality is the key to success for German and European companies

that produce globally. CemeCon’s local customer-oriented service and support is always ready to offer its customers quality coatings – consistent with what they are accustomed to receiving in Germany. In addition to the highest quality in job-shop coating and coating engineering, after the system purchase, we also supply our turnkey customers with comprehensive, individual after-sales services. This includes the installation of the machines and integration into the production work flow, operator training, and various maintenance packages as well as worldwide fault management.”



SUCCESSFUL PARTNERSHIP

Lafer SpA is the largest Italian coating center that provides PVD and CVD premium coatings. CemeCon sputter technology has been used for cutting tool coatings for almost a quarter of a century. Due to its market success Lafer extended its job coating production by two more CC800®/9 XL machines.

The job coating market in Italy is highly competitive. Lafer with its location in Piacenza right in the industrial heartland of northern Italy is running the country's biggest job coating center. Premium coatings for cutting tools are a major part of the business both for servicing the tooling industry and for the recoating of gear cutting tools for which Lafer is operating a reconditioning shop.

CemeCon has supported Lafer from the very beginning with

a comprehensive service package. As Andreas Jürgens, head of Technology Transfer at CemeCon explains, this includes a 24h hotline support, yearly visits at the customer's workshop for checking and calibrating the equipment, permanent process upgrades and lots of training activities. The service department in Würselen has 16 experts for the hardware and the software of the coating equipment and the related peripheral units.

"It's mostly a small change in the cleaning process, the surface preparation of carbide substrates or in selecting the right coating process for the right application that makes the difference" outlines Primo Civar-di, head of the coating production at Lafer. And he continues "you immediately realize that CemeCon is running its own job coating center".

CemeCon operates one of the worldwide biggest job coating productions with more than 40 sputter-



Lafer is satisfied with CemeCon's highclass technology and the comprehensive service. Two more CC800®/9 XL were added to the production. (Photo: Lafer)

ing machines and diamond systems in Würselen. The experience of handling up to 80.000 cutting tools a day makes it easy to talk to a customer who is engaged in job coating in his language. "We are not just selling equipment, we transfer coating process technology to our customers" adds Dr. Christoph Schiffrers, sales manager at CemeCon. Having job coating, machine building and R&D at the same place in Würselen makes it easy to form the right team to give the customer the right information at the right time.

The most recent example of this technology transfer is Lafer's upgrade to the premium HYPERLOX® coating. HYPERLOX® is an AlTiN with exceptionally high aluminum content. It outperforms conventional TiAlN recipes in terms of hardness and heat resistance. Dry hobbing is a very successful application and dedicated HYPERLOX® recipes allow thick coatings on indexable



Successful Lafer team (Photo: Lafer)

inserts. CemeCon production experts trained the Lafer staff and supervised the start of production of the new coating products in Italy.

"CemeCon sputtering technology as a unique selling point and the continued support we have received throughout all these years

are the foundation of our successful business. That's why Lafer went for the first CemeCon sputter coating equipment almost a quarter of a century ago and why we recently added two new CC800®/9 XL to our production" concluded Luigi Parenti who is a senior member of the owner's family of company Lafer.

LAFER IN DETAIL



Lafer SpA, which is located in Piacenza, was founded in 1989. Lafer is thanks to its continuous growth today Italy's largest coating center. 77 highly skilled people on an area of 4,000 m² provide high quality PVD and CVD coatings for cutting tools, components and molds. The Lafer Method means that customers can rely on 25 years of experience and that we will suggest the best way to proceed to solve any problem. The R&D department continuously works on new technologies to improve the quality of the offered coatings and the excellence Lafer SpA is known for. Lafer is servicing the forging, cold forging, plastic molding, food and beverage industries, aeronautics, automotive, racing, medical and in general mechanics.

www.lafer.eu



SHOW THE PROFILE

A company that produces turned parts with complex contours by a grooving process must rely on high-performance profiling tools. With its flat form tools, Leistritz Produktionstechnik GmbH offers a system that is not only precise, but also greatly shortens setup times with its very simple blade change. Dedicated coatings from CemeCon give the profile plates an expanded tool life and improve surface finish qualities.

An increase in productivity and quality, short setup times, easy handling, and high flexibility – the flat form tools from Leistritz provide many advantages to turned

parts manufacturers. “Our system is unique: With a tool changeover, the holder stays in the machine and only the profile plate is exchanged – quickly and easily - without read-

justing the machine. Thanks to the integrated fixing pin, the polished plate fit ensures a highly precise changeover accuracy of the profile plates. The user can always position the blade with great precision,” explains Reinhold Setzer, product manager at Leistritz Produktionstechnik GmbH.

DEDICATED TOOL WITH PREMIUM COATING

Leistritz is a typical general supplier – for carrier tools with a shaft holder or machine holders for specific types of machines, blanks made of carbide and HSS, or polished finish and coated profile plates that perfectly match customer requirements. The on-site Leistritz profile center performs the profile setup and ensures highly precise cutting geometry. “To further improve our sophisticated profile plates with high-performance coatings and to provide our customers with a critical competitive advantage, we have been collaborating successfully with CemeCon for years,” says Reinhold Setzer.



Thanks to the contribution made by premium coatings from CemeCon, the flat form tools from Leistritz create extremely precise profiles.

And it is precisely this combination that makes the difference: Polished to perfection, the profiles ensure the highest process reliability. In conjunction with the high-performance sputter coatings from CemeCon, the tool life and surface quality of the processed parts are greatly improved. Marco Furrer, sales manager at CemeCon: "Leistritz always has access to our latest developments. We coordinate the appropriate coating with the customer regarding the respective application to further enhance the productivity of the tool."

But our service does not stop with the coating. Reinhold Setzer adds: "We feel that we are in good hands with CemeCon. The personal attention we receive from CemeCon staff contributes significantly to this feeling. With order tracking, we always have quick and easy access to information about the status of our orders. A special plus is the flexible processing of rush orders."



LEISTRITZ PRODUKTIONSTECHNIK IN DETAIL



Leistritz Produktionstechnik GmbH is part of Leistritz Group. The company's history started in 1975 with the manufacture of mufflers for the VW Beetle. Today in two locations – Nuremberg and Pleystein – Leistritz develops, produces, and distributes systems for the production of internal and external threads, profiling and key seating machines, carbide tools and tube assemblies and pipes.

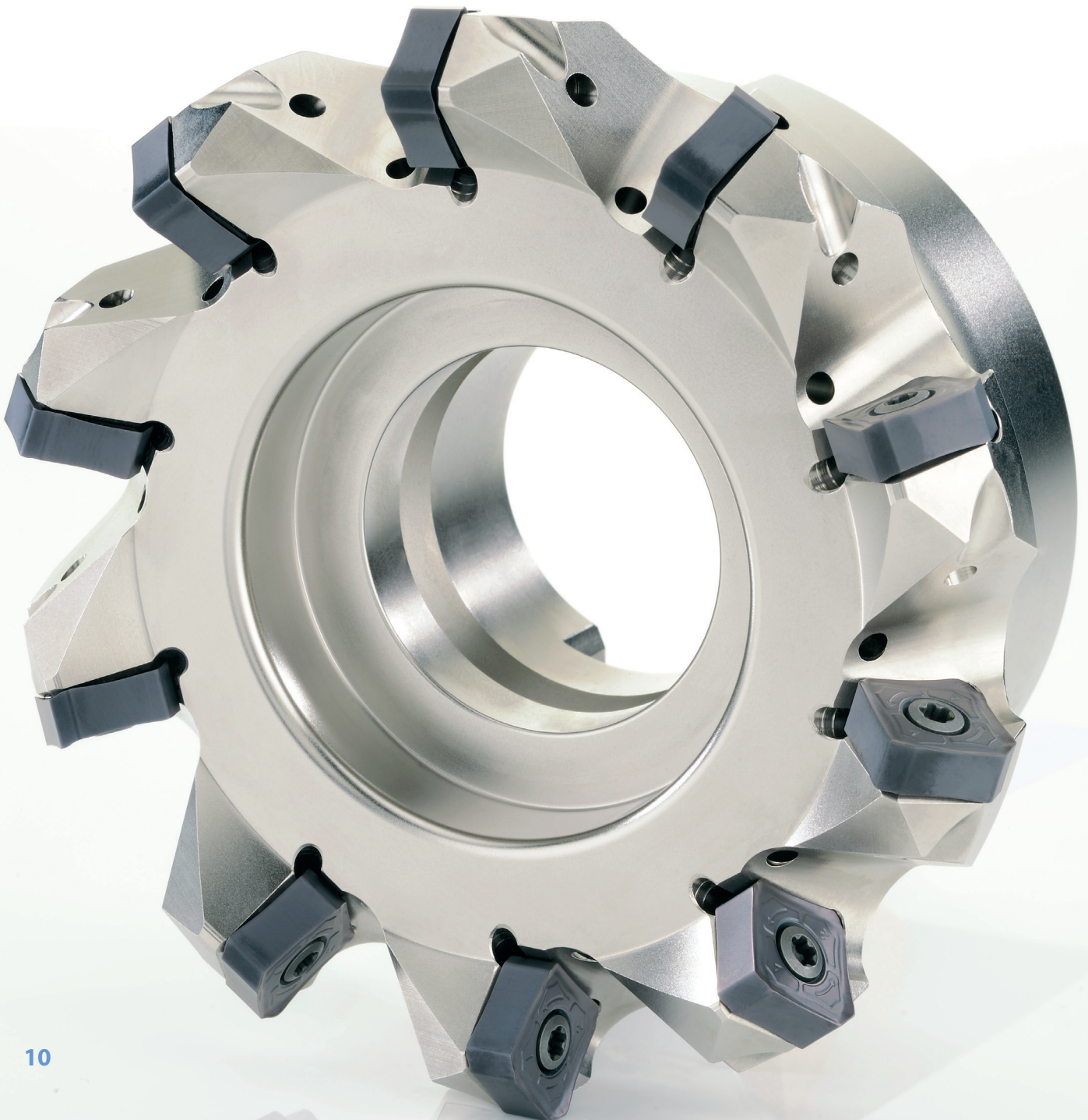
With the invention and patenting of the exchangeable profile plate, Leistritz achieved a milestone in the history of profile tools. Since then, the company has continuously developed and expanded the tool system. Another important pillar in addition to the construction of key seating machines is the production of CNC vortex machines with complete loading and unloading systems. Vortex technology is a special area in machining for complex tasks, such as steering worms, ball screw spindles, or extrusion worms.

www.leistritz.com/production

"Besides the excellent **QUALITY** of the coatings, we also appreciate the **COLLABORATION** with CemeCon, particularly the personal **SERVICE**, high **FLEXIBILITY** and **ORDER TRACKING**."

Reinhold Setzer,
Product manager at Leistritz Produktionstechnik GmbH

HPN1 Plus with 6 μm for
highest PRODUCTIVITY



TOP PERFORMANCE WITH HiPIMS

The requirements for PVD coatings for indexable inserts are constantly increasing: HiPIMS is the high-performance response from CemeCon. Manufactured using innovative methods, our premium coatings enable a longer and permanently consistent tool life for highly productive machining. They are even harder, tougher and more resistant to oxidation than conventional coatings.

With the patented HiPIMS process, CemeCon achieves metal ionization at nearly 100 percent. This results in coatings that are particularly hard and durable at the same time. HiPIMS also reliably guarantees evenly distributed coatings on complex tool geometries. Another plus: The innovative process combines the advantages of the sputter and arc technology – extremely smooth surfaces and excellent adhesion. This results in high-performance coating solutions for indexable inserts that ensure efficient manufacturing in demanding applications.

“HiPIMS offers enormous possibilities: New coatings, up to now HPN1, HPN1 Plus, and HARDLOX offer great advantages to the user of cutting tools, particularly when machining difficult materials such as stainless steel, titanium, or nickel-based alloys. Additionally, by using HiPIMS we can further improve the performance of our proven coatings, such as HYPERLOX®,” said Inka Harrand, product manager for Cutting Inserts at CemeCon.

CemeCon provides coatings for cutting inserts in various dedicated

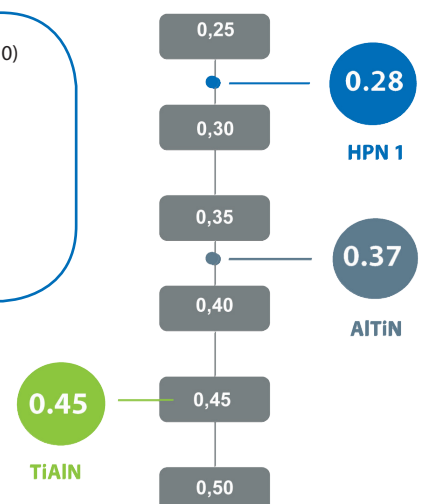


The tools are coated in an optimal fashion in the production line for indexable inserts by using various combinations of pre- and post-treatment methods, coating materials, and tolerances.

layer thicknesses, for example, HPN1 with 3 µm or HPN1 Plus with 6 µm. As a result, HiPIMS coatings score high with excellent machining parameters and very high wear resistance.

1.4541 (X6CrNiTi 18-10)
Flat milling with
cutting insert tool
Air cooling
 $v_c = 220 \text{ m/min}$
 $f_z = 0,3 \text{ mm}$
 $a_p = 0,5 \text{ mm}$

Wear after 75 min (VB in µm)



IMPROVED PRODUCTIVITY

Titanium alloys are once again on the march, particularly in the aerospace industry. A multilateral research project was initiated at the Institute of Production Engineering and Machine Tools (IFW) of Leibniz University in Hannover at the request of a large machining company to increase productivity in the rough milling of materials that are difficult to machine. In collaboration with the coating experts at CemeCon and other companies in the tool industry as well as a typical user, an optimized tool concept was developed for rough milling titanium alloy Ti64 (Ti-6Al-4V).

The combination of light weight, high strength, excellent corrosion resistance and good electrochemical compatibility with CFRP makes titanium and titanium alloys the ideal construction material for the aerospace industry. Yet, these characteristics that make the lightweight construction material so attractive

are precisely what impairs the machinability, besides other properties such as poor thermal conductivity, low modulus of elasticity, disturbed chip formation and material build-up. In particular, the tendency for adhesion leads to rapid tool failure. The components often require a large machining volume with a long

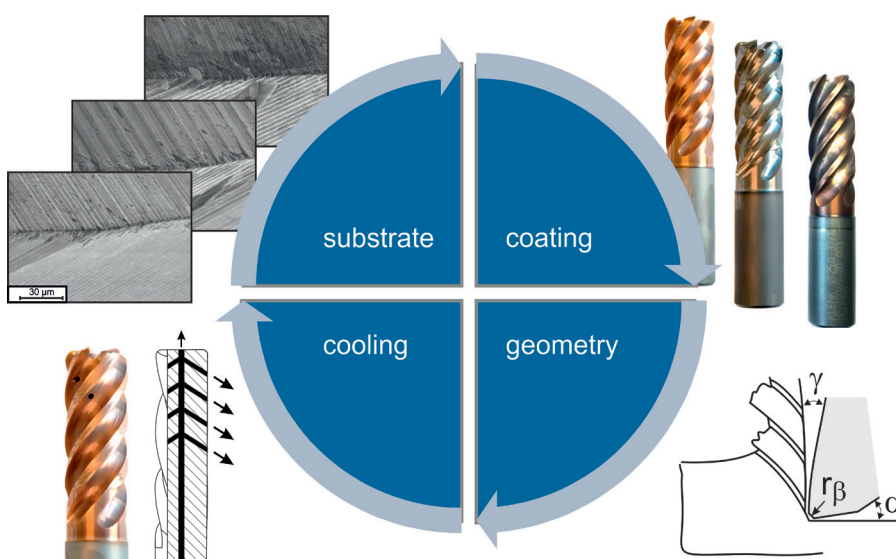
tool life, since the wall thicknesses are very thin and the forms are very complex.

"We used β -annealed Ti64 in our application, the milling of door frames. This variation demonstrated an even greater resistance. To improve productivity, we looked at the entire milling process from all perspectives: Tool macro- and micro-geometry, substrate material, cooling lubricant supply and coating," explained Dennis Nespor, head of the Machining Department at IFW.

PERFECTLY MATCHED TO EACH OTHER

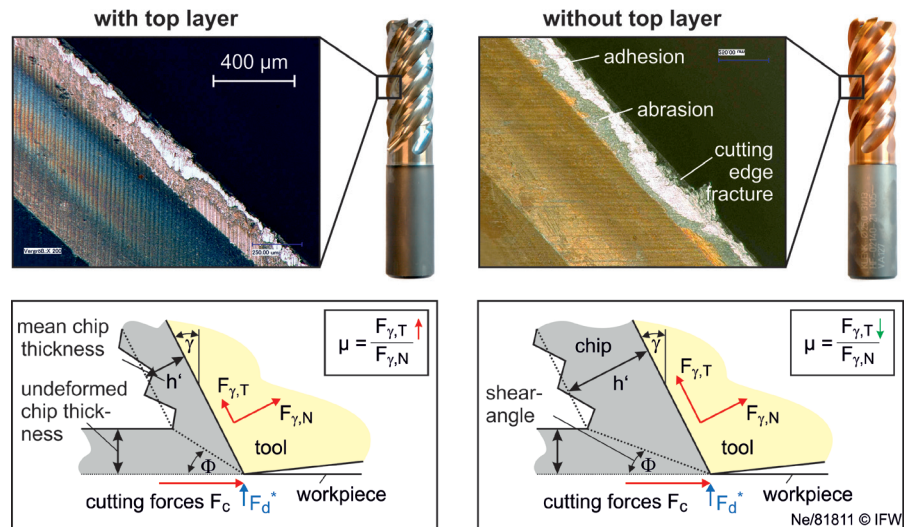
For best results, the carbide has to be as hard and tough as possible. Additional cutting edges, which must also be very sharp, were added to the tool geometry. A centralized-decentralized cooling concept was also adopted in the tool.

Another important component in the overall concept is the coating.



To improve productivity in titanium machining, the team optimized the various perspectives in the milling process. (Photo: IFW)

Manfred Weigand, product manager for Round Tools at CemeCon: "We tested various coating systems and preparation processes. Our HARDLOX high-performance coating stood out very clearly from the other coatings – for example, in comparisons of flank wear." The use of the innovative HiPIMS (High Power Impulse Magnetron Sputtering) manufacturing process results in a combination of extreme hardness, very smooth surfaces, mechanical resistance, excellent adhesion and extreme toughness. "We were able to increase tool life by 85 percent compared to uncoated tools and increased productivity by 30 percent compared to other coatings. Another plus: With the low degree of roughness, galling was also significantly reduced," added Manfred Weigand. The use of an adhesion-reducing protective coating further reduces cold welding and leads to 40 percent fewer breakages over



With the protective coating, adhesions were reduced and so were breakages at the cutting edge. This can be traced back to the improved friction performance on the face. (Photo: IFW)

the same usage time. The reason for this is the improved friction performance on the face.

Prof. Berend Denkena, Head of IFW: "The results speak for themselves. The interplay of all factors allowed

us to nearly double the productivity of the processing procedure and to significantly reduce costs. A win for everyone involved: The carbide and tool manufacturers, the coating companies and, of course, the users."

THE INSTITUTE OF PRODUCTION ENGINEERING AND MACHINE TOOLS (IFW) IN DETAIL



Prof. Dr.-Ing.
Berend Denkena,
Head of IFW



Dipl.-Ing. Dennis Nespor,
Head of the Machining
Department at IFW

The **Institute of Production Engineering and Machine Tools** (IFW) is part of the Leibniz University at Hannover. It deals with all aspects of production machining technology – from the machining process to machine development to include production planning and organization. In addition to basic research, the daily effort at the IFW also comprises applied research and development in close cooperation with industrial companies.

www.ifw.uni-hannover.de

IFW

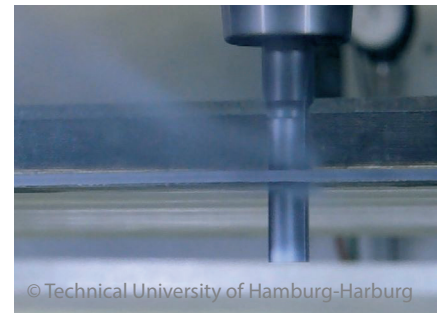
RELIABLE MILLING OF CFRP

When drilling precise holes in carbon fiber reinforced plastic (CFRP), the multi-layer diamond coating CCDia®AeroSpeed® has already proven its great performance. CemeCon has now also validated the coating for milling processing. It produced excellent results here as well.

The specific combination of various fiber and resin materials using special reinforced structures results in CFRP's high strength at a low weight. The inhomogeneous material structure with highly abrasive fibers poses special challenges for the machinist. Productive and reliable processing solutions are demanded. The multi-layer coating CCDia®AeroSpeed® was exactly matched for CFRP processing. Even while drilling, it provides the highest precision and process reliability. Now it demonstrates

what it can do with milling as well. CCDia®AeroSpeed® offers an extremely smooth and very fine crystalline surface structure and excellent adhesion. With its extreme smoothness, it ensures good chip removal and removes friction and heat quickly from the contact zone. Thereby significantly reducing thermal stress and preventing delamination.

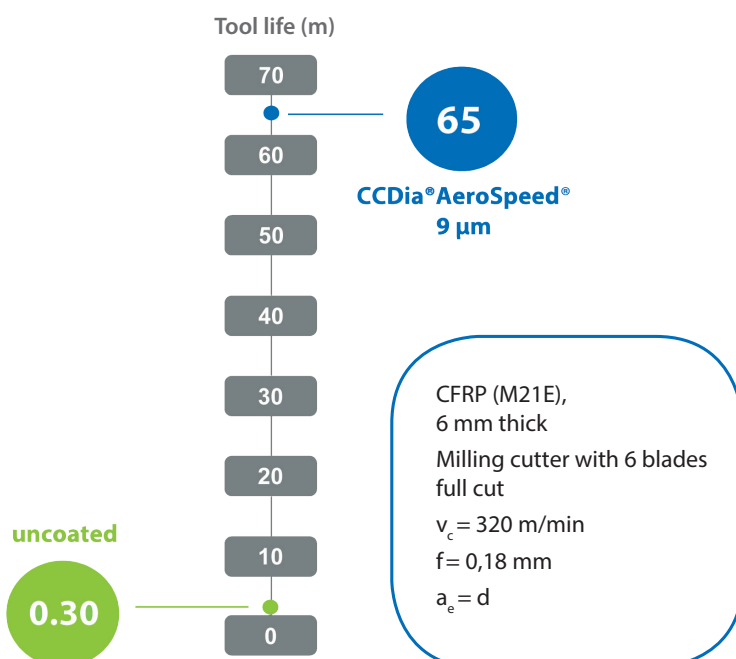
Very sharp cutting blades are another advantage: Blades coated with CCDia®AeroSpeed® separate



CCDia®AeroSpeed® shows excellent results in CFRP milling.

the abrasive fibers of CFRP much better than conventional diamond coatings. There are no fiber projections and the excellent quality of the milled surfaces can be reproduced anytime.

Compared with uncoated tools, they are clearly superior in regard to tool life; CCDia®AeroSpeed®-coated milling cutters last for a much longer time! The patented multi-layer structure gives crack-preventing properties to the diamond coating. That results in significantly higher process reliability. In the future, these high-value milling cutters with top quality diamond coating could replace several processing steps, for example, rough lathing of CFRP followed by water jet cutting.



GETTING INSPIRED BY TECHNOLOGY

CemeCon once again held one of its most exciting events this year: "Girls' Day". For the second year in a row, CemeCon offered schoolgirls a thrilling day of fun and action, providing them insights into the world of tool coating. Fifteen girls, aged 10 to 15 years, brought their active interest in technology and their openness to help create a successful event.

Against the backdrop of a forecasted shortage of skilled employees and the fact that technical professions still mainly attract only men, "Girls' Day" was introduced nationwide in 2001. This annual day of action aims to inspire young women to enter technical professions and to increase the number of women employed in so-called "men's jobs."

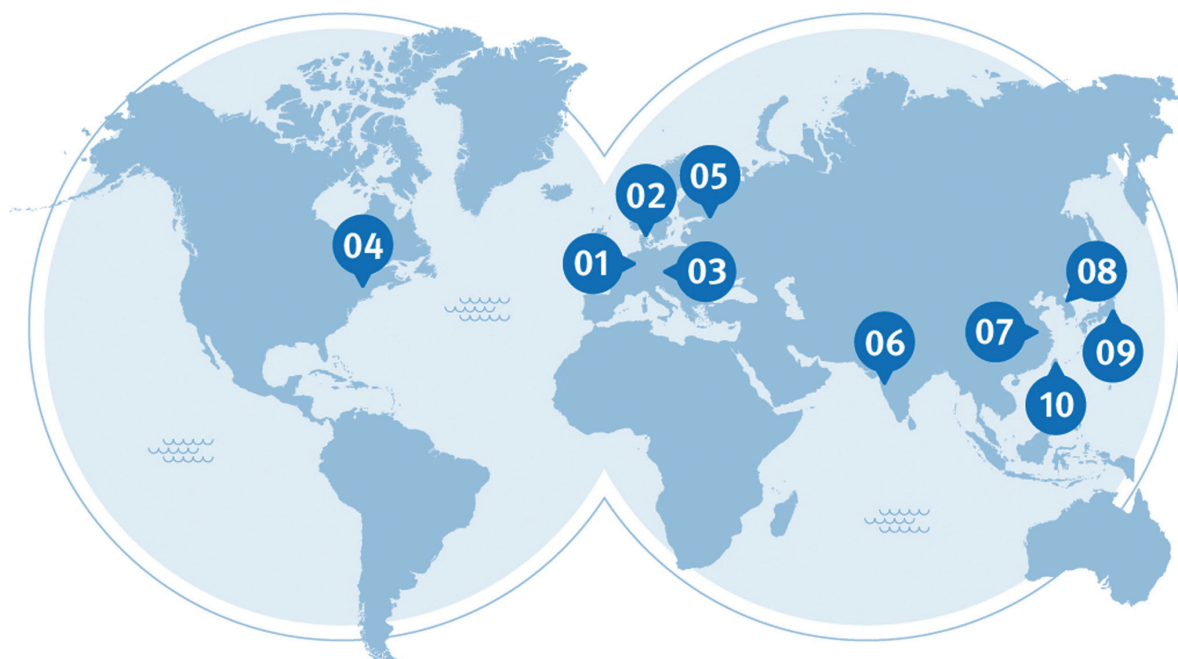
"Girls' Day" at CemeCon allowed the participants to learn about the

company and gain practical knowledge about coating technologies. In addition to a tour in which they got to take a look at the coating facilities, the girls made coated rings for themselves in the development department and gained closer insight into the work of the employees in coating development. Similarly, the advantages of CemeCon's robust diamond coatings were highlighted. Then they actively participated in another experiment: Looking at their

own hair and fingernails under a microscope was something completely new to many of them. They were also fascinated by the technical pretreatment in the coating process. Markus Tillmann, line supervisor in the Diamond Department at CemeCon: "Perhaps we succeeded in inspiring a few of them to enter a technical profession and then, in just a few short years, they will be in demand as experts in the tool coating industry – possibly even at our company."



They took many positive impressions with them from "Girls' Day" at CemeCon. Schoolgirls from 10 to 15 years of age took a look behind the scenes with coating experts in Würselen.



CEMECON COATING PARTNERS – WORLDWIDE

- | | |
|--|---|
| 01 CemeCon AG, <i>Germany</i> | 07 Baoding CemeCon Coating Technology Co., Ltd. <i>Suzhou, China</i> |
| 02 Cemecon Scandinavia A/S, <i>Denmark</i> | 08 HuaKorea Ltd., <i>Korea</i> |
| 03 CemeCon s.r.o., <i>Czech Republic</i> | 09 Correns Corporation, <i>Japan</i> |
| 04 CemeCon Inc., <i>USA</i> | 10 DKSH Taiwan Ltd., <i>Taiwan</i> |
| 05 ZAO Rosmark-Steel, <i>Russia</i> | |
| 06 M+V Marketing and Sales Pvt. Ltd, <i>India</i> | |



OUR NEXT EVENTS 2015 / 2016

29. SEPTEMBER - 1. OCTOBER 2015
Toolex
Sosnowiec (Poland)

5. - 10. OCTOBER 2015
EMO Milano
Milan (Italy)

12. - 15. OCTOBER 2015
V2015
Dresden (Germany)

28. - 31. OCTOBER 2015
Tooltech
Seoul (Korea)

16. - 19. MARCH 2016
Grindtec
Augsburg (Germany)