

FACTS



**THE DRILL COATING
HYPERLOX[®] Plus
EXTREMELY SMOOTH AND
UNIVERSALLY APPLICABLE**

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FROM TINALOX® TO HYPERLOX® Plus



Dr. Toni Leyendecker,
CEO CemeCon AG

In our first FACTS appeared in 1997, we presented our current drill coating at the time, TINALOX®. Seventeen years later, CemeCon is developing HYPERLOX® Plus – the latest drill coating, that we will present to you in this edition on pages 6 and 7. Consistent with the properties of the coating – smooth and universally applicable – we have also improved the layout of FACTS. We want to draw attention to the essentials by using bright, attractive colors and clear lines: Our premium coatings, high-end technology and advanced applications. However, those who want to deliver premium, must also have a premium production line. For this reason, CemeCon has been completely upgraded. Would you like to know how? The details can be found on page 18.

PREPARE TO BE INSPIRED!

Yours sincerely,

Dr. Toni Leyendecker

Imprint

Published by

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Circulation English version: 8,000
Circulation German version: 9,000

Photographs

Photographs unless otherwise indicated: CemeCon.
Title photo and page 6:
HLPhoto/fotolia.com

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A PLUS IN PERFORMANCE

HPN1 Plus is a premium coating material made by CemeCon from the power nitride coating material class. And the name tells it all: The HiPIMS coating allows cutting inserts to cope with difficult to machine materials more quickly and economically than the competitors, due to the layer thickness.

After hard, super-hard and super nitride materials, power nitrides from CemeCon now forms the newest and highest-performance generation of coating materials. Using the innovative HiPIMS method, HPN1 Plus for cutting inserts scores points due to its high layer thickness with outstanding machining parameters and wear resistance. For more de-

manding applications, an increase of up to 30 percent in tool life is even possible compared to other coatings (see inset).

“Even materials that are difficult to machine, such as nickel-based alloys and austenitic stainless steel, can be milled, drilled, punched, or turned more efficiently and with a

better quality – both wet and dry – using our HPN1 Plus,” explains Inka Harrand, Product Manager for Cutting Inserts at CemeCon.

The HPN1 nano-structured coating material is available in two different thicknesses: HPN1 with 3 µm and HPN1 Plus with 6 µm. Different steels, cast iron materials as well as difficult to machine materials can be easily machined, because the coating can be adapted easily to the application. Inka Harrand: “We are also working on the development for exceptionally thick coatings of 10 µm and more, in order to expand our range of applications and to provide our customers with a more cost-efficient processing.”

HPN1 Plus

Life-time/min

PROPERTIES

Layer: 6 µm
Composition: (Al, Ti, Cr)N
Layer structure: nano-structured
Microhardness: > 30 GPa
Young's modulus: 368 GPa
Max. operating temperature: 1.000°C

1.4301 (X5CrNi1810)
 Turning tool with carbide inserts CNMG1204
 $a_p = 2,5 \text{ mm}$
 $v_c = 200 \text{ m/min}$
 $f_z = 0,25 \text{ mm}$



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WHAT IS WHIRLING?

In order to accurately and quickly manufacture screw conveyors, cylinders, and spindles, a special level of expertise is required. For over 60 years, Burgsmüller GmbH had met those specific requirements with their patented whirling technology. The company optimizes its cutting inserts with premium coatings from CemeCon and achieves increases in performance again and again.

Time-savings from 40 to 50 percent compared with conventional cutting manufacturing methods, the best surface qualities, and the highest precision as a result of the process – every end-user's heart starts racing at the prospect. Burgsmüller GmbH combines these advantages in its patented whirling technology. "The efficiency of our method,

which is specifically developed for manufacturing helically-shaped geometries, can be hardly surpassed. In contrast to turning, the workpiece rotates just slowly and therefore, the tool very quickly rotates eccentric to the workpiece. The combination of high cutting speed, very favorable chip formation and low heat input into the workpiece thus enables an

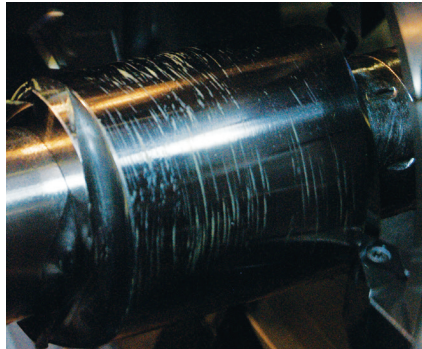
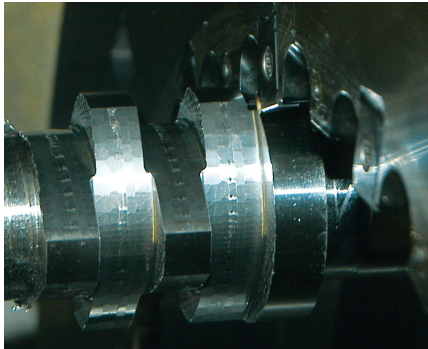
extremely fast processing of inner and outer contours with maximum precision and roughness values R_z from 2 to 8 μm into almost grinding quality," says Jens Biel, managing director at Burgsmüller.

LONGER WHIRLING WITH HPN1

Quality tools are essential in order to fully benefit from the many advantages of this method. Therefore, Burgsmüller is also configuring its own tool systems. "We have been working with CemeCon for years to prepare our cutting inserts optimally for the respective cutting task," said Jens Biel. In the past, Burgsmüller used mainly the CemeCon coating TINALOX® SN² very successfully with excellent results in whirl milling.



Michael Hahn (left), whirler, with Jens Biel, managing director at Burgsmüller. (Photo: Burgsmüller GmbH)



60 percent when compared with that of TINALOX® SN².

“We can reduce the unit costs even further with HPN1. That is why we will shift other cutting inserts to the HPN1 HiPIMS coating,” adds Jens Biel.

During the whirl milling of the heat-treatable steels, the HPN1-coated cutting inserts achieve the best results. (Photos: Burgsmüller GmbH)

HPN1 coating increases TOOL LIFE by up to 60 PERCENT.

During the processing of different heat-treatable steels, service lives varied significantly in one application. Helmut Schauenberg, Sales Manager at CemeCon: “That’s why Burgsmüller started working with CemeCon to find the best coating for precisely these applications. The most efficient solution resulted

in selecting our innovative HiPIMS technology.” The HPN1 coating produced showed significantly better results on cutting inserts for the machining of stainless martensitic chromium steel (1.4112, X90CrMoV18) and nitrided steel (1.8550, 34CrAlNi7). The tool life was increased in this example by 40 to



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A milestone in the company history of the Burgsmüller GmbH was the development of the patented whirling and milling technologies for manufacturing helically-shaped geometries. Using this technology, today products such as spindles, bolts, pump rotors, screw conveyors and screw elements, crank shafts and cam shafts are manufactured globally. In addition to the production of wear parts for plastics processing (extruders) and contract production of helically-shaped geometries, the company also develops and builds machines and equipment for using its whirling technology in Kreiensen and adapts them to the individual manufacturing tasks.

NEWLY DEFINED SMOOTHNESS

Insufficient chips evacuation, heat shock and cold welds – if this causes you to break out in a cold sweat, you should consider smooth, droplet free coatings for drills with even more wear volume. With HYPERLOX® Plus serenity returns to the metal cutter faces – thanks to the tremendous wear volume and unprecedented smoothness.

Evacuation chips – and therefore temperature – from inside the hole, is one of the basic challenges during drilling operations. An extremely smooth surface is essential for the success of the tool, particularly in the flute. “With application-optimized

premium coatings, we can make a major contribution to the drill always maintaining a ‘cool head’, even when machining high-tech materials. For this reason, we have developed HYPERLOX® Plus which, in my opinion, is currently the best

drill coating in the market,” says Manfred Weigand, Product Manager Round Tools at CemeCon.

A LOT HELPS A LOT

The HYPERLOX® coating material is excellently suited to processing all types of steel. With HYPERLOX® Plus, CemeCon now has a high performance coating in the program, which combines extreme smoothness with high layer thickness and, therefore, it is tailor-made for the highest requirements in machining.

A thicker than normal coating protects the substrate from negative influences that occur in the cutting process, such as high temperatures, while also offering a high wear volume. Manfred Weigand explains: “Originally, our customers have applied HYPERLOX® Plus to the cutting inserts, in both wet and dry processing. We are also offering this

The new HYPERLOX® Plus drill coating ensures excellent chip evacuation and a long tool life – even when drilling high-tech materials.



coating material for drills – and we are receiving the best feedback on its performance.”

OPTIMIZED WEAR DURING MACHINING

Carefully designed geometries are at the core of high-performance drill precision. These tools receive an additional performance boost with modern coating solutions. The coating requirements are varied: They have to have outstanding adhesive properties, be extremely hard and at the same time tough. However, on the basis of a successful drill coating, high oxidation, and wear resistance are combined with unique smoothness. The term smoothness is more than just a set phrase: An optimal, trouble-free chip removal – the base is the droplet-free sputter

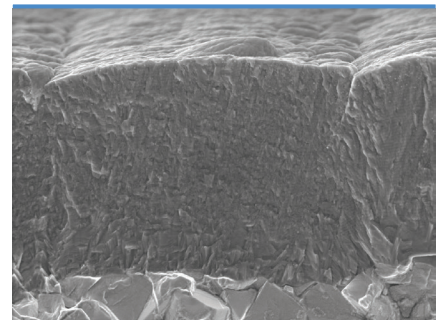
technology – is only possible with very smooth flutes, last but not least, the bore hole quality is defined by smooth guide chamfers. Cold welds are also history thanks to smooth rake faces.

Manfred Weigand: “In order to perform in demanding drill applications – whether it is high-speed drilling or deep-hole drilling – with the high industry standards for quality and economic efficiency, innovative coatings are required. With the new HYPERLOX® Plus, the end-user receives a universally applicable coating material, which thanks to the flawless surfaces rapidly removes the chips and significantly extends service life of the drill. For example in 42CrMoV4 heat-treated steel, the tools achieved significant increases in tool life.”



With **HYPERLOX® Plus**, CemeCon has a high-performance coating in the program, which combines a **EXTREME SMOOTHNESS** with a **HIGH COATING THICKNESS**. Therefore, it is tailor-made to the **HIGHEST REQUIREMENTS** in drilling.

HYPERLOX® Plus



PROPERTIES

Coating material class:
Supernitride

Composition:
AlTiN, high Al-content

Microhardness:
3.700 HV_{0,05}

Max. operating temperature:
1.100°C

Color:
Black-anthracite



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WHEN HARDNESS IS GOOD FOR TEETH

Manual production of dentures is a thing of the past: In the meantime, both the materials and the requirements for precision and process reliability require fully automated workflow. With HARDLOX-coated micro-instruments from vhf tools AG, the complex geometries of inlays and onlays, crowns and bridges can be implemented with the highest quality.

Dental laboratories machine chromium-cobalt alloys, zirconium oxide and titanium amongst other things. Since these materials are hard, abrasive and tough at the same time, the tool and machining method must be optimally adapted to the existing conditions. "At least, that is

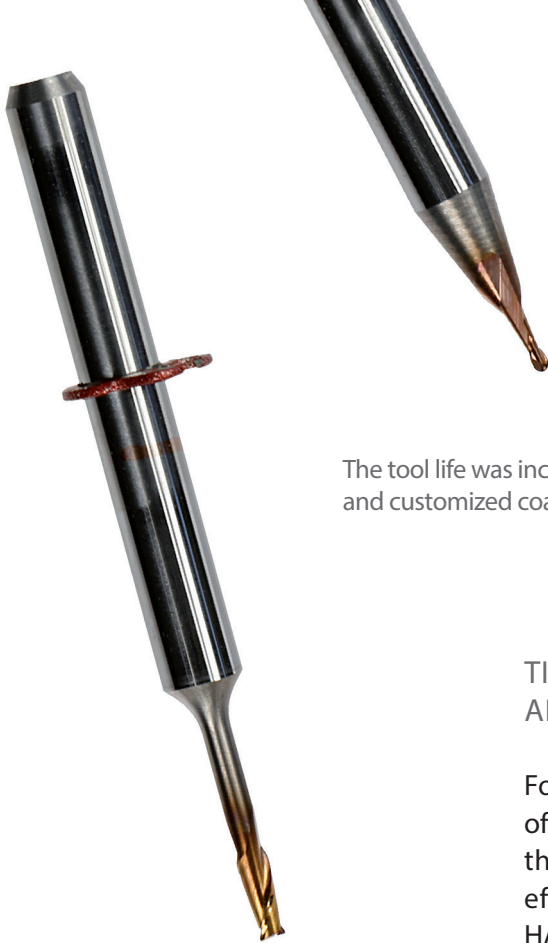
if you want to achieve the maximum service life with uniform precision. For optimal process assurance, we have redeveloped the tool design for our chromium-cobalt milling tool with more stable geometries among other things," explains Lars Grünewald, COO of vhf tools AG and

Head of Purchasing for cutting tools at vhf camufacture AG from Ammerbuch, Tübingen.

In order to provide the tool with a customized coating solution, vhf tools AG turned at this project to the premium coating company Ce-meCon. Both companies have been cooperating successfully together for many years. "Our benchmark was already quite high with 4.5 hours processed reliably operation time per coated milling tool," adds Lars Grünewald. "in the beginning

With HARDLOX, the milling cutters achieve the best results from vhf tools when machining hard materials.





The tool life was increased again by using new geometry and customized coating.



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TIGHT TOLERANCES ARE A MUST

For milling cutters with a diameter of 0.6 mm, the coating must be as thin as possible while remaining efficient. "That's why we offer a HARDLOX variant with 1.5 µm (thin) as well as 3 µm coating thickness, so that the influence on the cutting edge geometry can be minimized as much as possible. CemeCon has established a production environment that is dedicated to micro-tools. The outermost cleanliness and optimized handling takes extra care of micro-tools," explains Marc Semder, Area Sales Manager at CemeCon.

Lars Grünewald: "We have yet again increased a very good tool life with the new geometry and optimized coating: 6 hours operation time are now processed reliably in the current state. Based on these excellent results we are extending the range of products to diameters of 1 mm and 1.2 mm – of course also coated with HARDLOX (3 µm)."

we tested also HYPERLOX® and TINALOX® SN². However, the first tests using the power nitride HARDLOX on 'old' geometries considerably increased tool life and surface roughness, providing hope for even better results with the completely reworked tools!"

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The vhf tools AG, with headquarters in Ammerbuch was founded in May 2007 as separate manufacturing company of the vhf group for carbide tools and currently employs around ten employees. On six- and seven-axle precision grinding machines, most of the vhf-tool range is manufactured at the site and steadily improved.

Founded in 1988, the vhf camfature AG as eldest member of the vhf Group has more than 170 employees today. It develops and manufactures precise, durable and fast milling machines for many applications, such as sign making, aluminum, plastics and wood processing as well as dental technology. The ever-expanding range of special and standard tools is distributed by vhf camfature AG worldwide.

PRECISE DRILLING OF CFRP

Due to the low weight and high performance, lightweight materials, such as carbon-reinforced plastics, are increasingly being used in aircraft and automotive manufacturing. In order to optimize machining, CemeCon AG is working with the Technical University of Hamburg-Harburg on a project to develop diamond-coated drilling tools in machining of carbon-fiber-reinforced-plastics structural components.

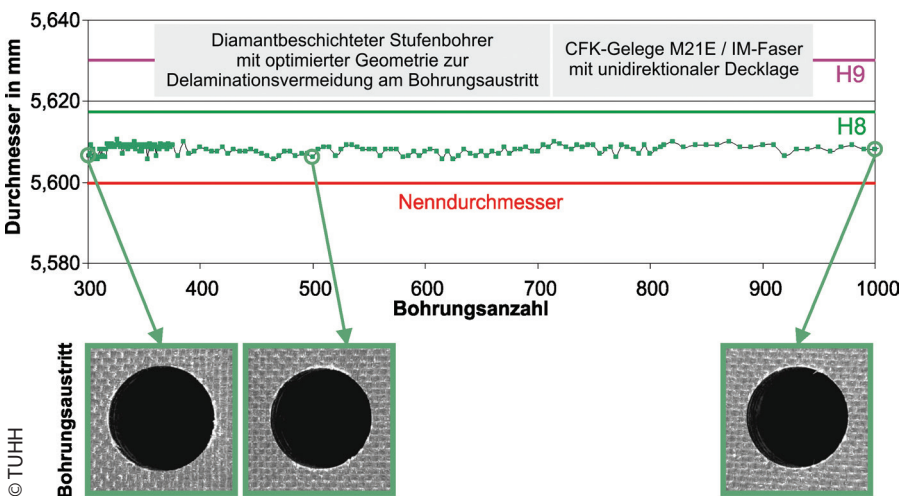
Components made of carbon-fiber-reinforced-plastics (CFRP) for the aircraft industry are usually connected using rivets. Precision holes with tight tolerances and high surface quality of the bore are a prerequisite for this. Additionally, the hole entrances and outlets must be free from delamination and fiber projections. "Diamond-coated carbide tools have proven to be effective when drilling CFRP. However, the surface roughness of all previous diamond coatings can cause tool vibration and chatter marks in counter sinking, which often lead to rejects on large components,

„explains Prof. Wolfgang Hintze, Institute of Production Management and Technology (IPMT) of TUHH.

Therefore, CemeCon adapted to multi-layer coating in cooperation with the project partners. CCDia®AeroSpeed® meets the requirements in machining of CFRP. It is characterized by its extremely smooth and finest crystalline surface topography as well as excellent adhesion. It does not affect the micro-geometry of the tool and has sharper cutting edges to conventional diamond coatings. "So the carbon-reinforced plastics fibers



Prof. Dr.-Ing. Wolfgang Hintze, TUHH (Institute of Production Management and Technology – M-18, Denickestrasse 17 – building L).



With the optimized diamond layer, the H8 tolerance of about 1,000 holes is maintained when drilling carbon-reinforced plastics over the entire duration of machining.

can be better cut, and it results in the best roughness values inside the bore as well as in the sinking. However, more importantly: The tool can work vibration and chatter-free," says Manfred Weigand, Product Manager of Round Tools.

The combination of CCDia®AeroSpeed® and optimized tool geometry provides other advantages: When compared to conventional tools, it reduces tooling costs by up to 40 percent and cuts setup times by up to 75 percent.

ABRASION? DIA DUR!

For economical machining of abrasive materials, such as graphite, diamond-coated tools are the right choice due to their high wear resistance. In order to provide sophisticated milling cutters for the tool and die production, the tool manufacturer, InovaTools, based in Kinding-Haunstetten, has developed the special DIA DUR diamond coating with CemeCon, which is based on the CCDia®CarbonSpeed coating material. Norbert Geyer, Head of Coating/Technology at InovaTools, spoke with FACTS about the advantages:

WHY USING GRAPHITE FOR ELECTRODE PRODUCTION?

Norbert Geyer: In tool and mold construction, more intricate structures and higher precision are always required. Thanks to low vibrations during graphite machining it is rather suitable for milling for very fine molds. It also eliminates costly and inefficient deburring tasks. In addition, graphite is extremely stable against heat and it is almost



Norbert Geyer, Production Head of Coating/Technology at InovaTools. (Photo: InovaTools)



The smooth and extremely abrasion-resistant DIA DUR coating optimizes the milling cutter for graphite machining. It is individually tailor-made for the tools. (Photo: InovaTools)

deformation-free – sublimation only takes place at 3,825 degrees Celsius, that is to say, the transition from a solid to a gaseous state. Thus, the electrodes are particularly suitable for the production of molds.

WHAT ARE THE DIFFICULTIES OF GRAPHITE MILLING?

Norbert Geyer: Users should take the operation of graphite machining seriously. The delicate molds of a graphite electrode must be milled using low cutting forces in combination with lowest tolerances. Otherwise, defective contours and surface qualities may occur. In addition, graphite is very brittle and highly abrasive.

HOW DOES THE END-USER MEET THESE REQUIREMENTS?

Norbert Geyer: Modern CNC machines can produce extremely accurate 3D contours in the exact μm range. However, quality tools with tight tolerances are a prerequisite. Therefore, our end mills (h5 shank tolerance) are ground with an extreme exactness on Rollomatic precision grinding machines with a radius tolerance of $\pm 3\mu\text{m}$. The run out accuracy of the end mills with full and corner radii are 0.005 mm. We guarantee this precision with a 100 percent final inspection of

CONTINUED ON PAGE 12



In the modern production of InovaTools, the high-precision tools are ground. (Photo: InovaTools)

the tools. For this, we make precise true-running measurements of concentricity and dimensional accuracy on a Werth measuring machine with sapphire supports. Our customers can also receive the inspection report by request.

Smooth multi-layer diamond coatings are our answer to wear. Since

no other material is as hard and wear-resistant as diamond (10,000 HV0.05). It is completely chemically resistant at the typical temperatures in graphite machining, making cutting tools highly efficient due to its low adhesion tendency and high temperature conductivity, even when manufacturing delicate 3D contours. The coating technology

has evolved tremendously since its inception and CemeCon is the leading company in this field – especially in regards to diamond coatings. That is why we have been working together for years with the premium coating company from Würselen for the highest quality and performance. A result of this cooperation is our extremely abrasion-resistant DIA DUR coating, which is individually tailored to our needs.

WHY IS DIA DUR COATING SO SPECIAL?

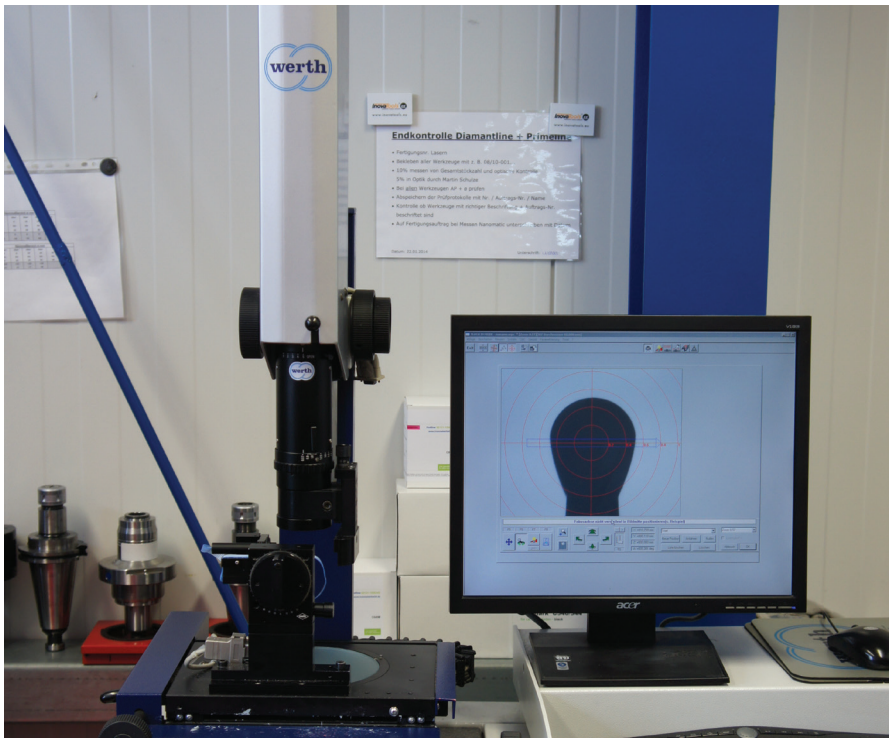
Norbert Geyer: DIA DUR is based on the multi-layer coating material CCDia®CarbonSpeed from CemeCon and it was tailored individually to our tools. The unique material properties of the patented multi-layer diamond coatings offer significant performance potential in milling of highly abrasive graphite. The coating has an excellent adhe-

INOVATOOLS GMBH IN DETAIL

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InovaTools was founded as Eckerle & Ertel in 1990 by Georg Eckerle and Ditmar Ertel in the heart of Bavaria. Today, the innovative company from Kinding-Haunstetten has 180 employees with eight subsidiaries worldwide and numerous representatives in 40 countries. The range of services now includes the complete production of high-quality standard and special tools for various industries, such as dental technology, tool and mold construction, medical technology, mechanical engineering, aerospace and automotive industry – from design to grinding through to the coating. Regrinding service, flat and cylindrical sharpening, and turning and milling work complete the range of services.





The 100 percent final inspection of the tools guarantees the tightest tolerances. (Photo: InovaTools)

sion to the specially selected low-stress and deformation-free carbide with 6 percent cobalt content. The main advantages for the user is not least that they have a special coating thickness without sacrificing the cutting sharpness. This is because the coating was always divided into several relative thickness classes based on the functional diameter.

WHAT ARE THE ADVANTAGES FOR THE ENDUSER?

Norbert Geyer: We achieve very long tool lives with DIA DUR coating. An example: In a comparison test, in this case, milling of EK85 graphite, the 12 mm end mill from InovaTools shows significantly lower wear compared to an un-

coated tool and a diamond-coated milling cutter from the market environment. Accordingly, the tool life was increased by a factor of 19. Consequently, the cost-effectiveness is increased, meaning the profits are higher.

IN WHICH DESIGNS ARE YOUR DIAMOND-COATED END MILLS AVAILABLE?

Norbert Geyer: InovaTools provides the tools in diameters from 0.2 mm up to 12 mm. In this case, the user has two lines available: the HQ line and SQ line. For different working depths, we have different neck lengths in the program. Diamond coating routers complete the product program.



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The unique material properties of the patented **MULTI-LAYER DIAMOND COATINGS** offer significant **PERFORMANCE POTENTIAL** during the milling of highly abrasive graphite.

PALBIT S.A.:

CC800[®]/9: THE RIGHT SYSTEM

For over 50 years, Palbit S.A. has specialized in cutting inserts in the Portuguese town Branca/Albergaria-a-Velha. Palbit steadily expands its product and service range in order to meet the requirements for lower costs, machinability of new materials and best surface qualities. With its own CC800[®]/9 coating line, the company is always on the cutting edge.

Materials used mainly in the aerospace industry, have previously been subjected to extreme performance and endurance tests. This also applies to the cutting tools which are used. For example, aluminum alloys need special tool geometries to avoid built-up edges and adhesions.

STRONG IN ALUMINUM MACHINING

“In recent years, aluminum-cutting with higher material removal

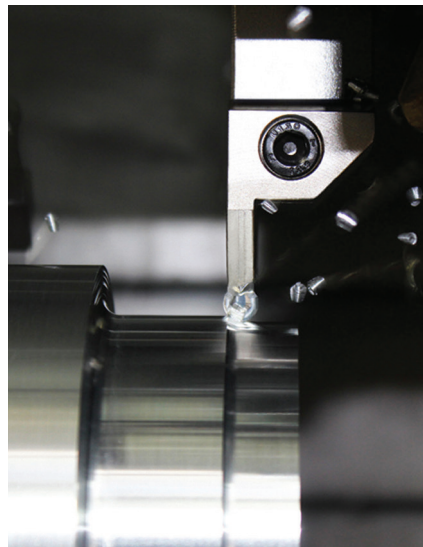
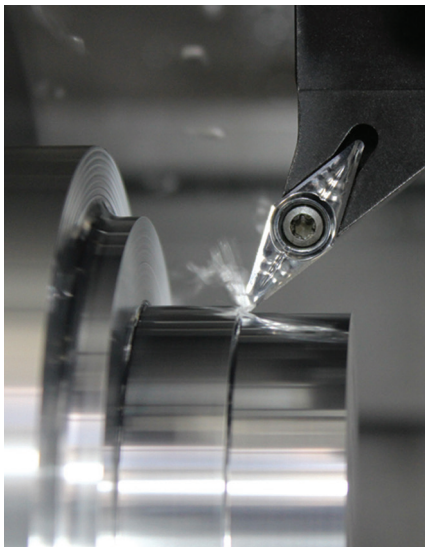
rates have slashed down the costs in aircraft production. It is usually more economical to mill complex structures from the solid due to the higher speeds and feeds that are possible today, than to assemble them from several components.” explains Daniel Figueiredo, Director of Research & Development at Palbit. The new ALUPro 76090/77090 product groups and the new LN line for turning operations are significant contributions to the successful machining of aluminum. “Coatings based on CC AluSpeed[®] are a key



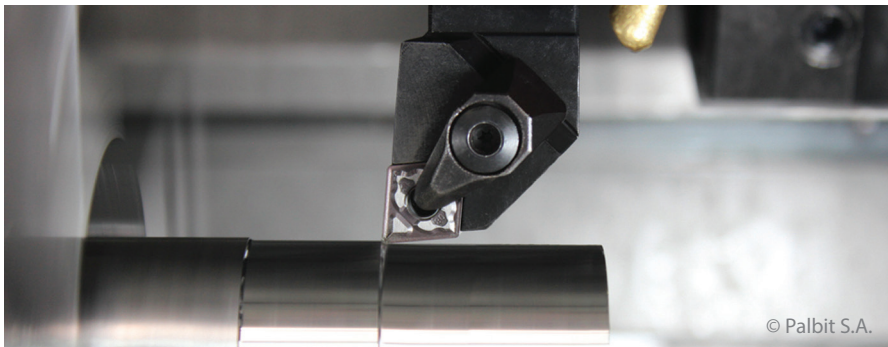
step forward for us in this sector – and provides the metal cutter the best machining results”, said Daniel Figueiredo.

TOOLBOX FOR SUPERALLOYS

In recent years, only a few materials have left such a strong impression in the machining industry, as titanium or the superalloys, INCONEL[®], HASTELLOY[®] and WASPALOY[®]: Engine components, turbine or structural components in aircraft as well as medical applications, orthopedic bone screws or fasteners are just a few applications where these high-temperature resistant materials have their firmly established place. “This opens up an entirely new field of activity for those who



The material tests indexable inserts of Palbit achieve the best results when turning aluminum with coatings based on CC AluSpeed[®]. (Photos: Palbit S.A.)



Palbit benefits from the performance of the new nano-structured coatings from CemeCon when machining titanium and superalloys.

know how to successfully machine these materials," according to Dr. Beate Hüttermann, Executive Director of Sales at CemeCon.

The improved performance of the new Palbit cutting inserts are based on the exact evaluation of the cutting processes: Heat generation and dissipation, impact of the mechanical forces during the cutting process, chip forming and removal, chemical reaction with the materials and wear and failure mechanism of tools. "In order to reach the full

potential of the indexable insert, we have worked quite closely with CemeCon again. This allows us to benefit from the performance of the new generations of nano-structured coatings, such as HYPERLOX® Plus and HPN1 Plus," according to Daniel Figueiredo. For the new tools, Palbit used among other things dedicated coatings, which offer very good stability in high temperatures, and also provide improved adhesion. The notch wear is reduced greatly, in combination with the corresponding coating solution.

Palbit has relied upon CC800®/9 technology for many years, as well as CemeCon's extensive service, and it operates its own coating line. "As a result, Palbit is connected closely to our innovation cycle and quickly receives the latest developments and improvements in system technology and coating recipes," explains Dr. Beate Hüttermann.



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Since 1952 Palbit S.A., based in Branca/Albergaria-a-Velha in Portugal, has produced cutting inserts. The company offers its customers a comprehensive product portfolio for their machining needs: cutting inserts for milling cutters, drilling, turning tools and special tools. State-of-the-art machinery and a highly qualified staff enable Palbit to create complete tooling solutions for all requirements. A network of sales partners and its own branches in 60 countries make Palbit a truly global supplier of cutting tools.

ENDLESS INNOVATIONS

With one of Europe's oldest universities and a polytechnical institute, the Portuguese city of Coimbra is an ideal breeding ground for innovations. Since 2001, the coating service provider, TEandM, has swum there on the wave of success with the CemeCon technology.

TEandM has used CemeCon technologies since 2001 to make among other things nano-structured coatings for extremely demanding applications. "Since then we have developed and patented 17 coating families," said Dr. Ricardo Alexan-



TEandM scores with extremely smooth and wear-resistant coatings – thanks to premium technology from CemeCon.

dre, R&D Manager of TEandM. The particular advantages of CemeCon technology for TEandM are, "that it can optimally adapt and reproduce the coating structure. So we could and we can develop real coating innovations and reproduce them at any time at the same high quality!" adds Dr. Ricardo Alexandre.

ULTRA SMOOTH IS THE NEW STANDARD

Self-lubricating coatings from TEandM have been successfully used for a long time. However, so far, they have been mostly limited to applications up to 450°C. For this reason, Dr. Ricardo Alexandre explains: "We have shifted these limits with two products to 650°C and 950°C. Firstly, this makes many applications possible and it also often saves additional lubricant."

Even when the company was founded, TEandM also recognized the market need for extremely smooth and resistant coatings for highly-polished surfaces. "In order to



Self-lubricating coatings from TEandM are operating successfully.

TEandM IN DETAIL



Tecnologia e Engenharia de Materiais, S.A.

The innovative company, TEandM, was founded in Coimbra, Portugal in 2000. On a production area of around 5,000 m², high-quality coatings are created for various industrial applications. TEandM uses thermally sprayed as well as PVD and CVD coatings primarily to protect workpieces and components against wear, corrosion, oxidation and, among other things, to provide them with lubricating properties.

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achieve the technical properties of the CemeCon coating materials, the droplet-free PVD method works best," explains Dr. Christoph Schiffers from CemeCon. "Thanks to its own coating line with the CC800®/9 coating system as its core, TEandM excels with current technology and faster responsiveness, even with time-critical jobs."

POWERFUL WITH STAMPING

The TEandM coatings are used for stamping and forming tools which are exposed to maximum

loads: For example, high-strength steels from 900 up to 1,200 MPa are processed with these tools with a 4 to 6 millimeter thickness. Therefore, the demanding combination of strong film adhesion, high hardness and extreme toughness are critical in the selection of the coating. "We also benefit here from sputter technology. Since it is only possible with this technology for our UltralImpact® to bear up during scratch tests with 120 N, where conventional TiAlN solutions would have already failed at 40 N," says Dr. Ricardo Alexandre.



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PREMIUM COATINGS – TECHNOLOGY AT YOUR FINGERTIPS

One of the primary goals of tool manufacturers is increasing the performance of their tools. Coating materials tailor-made for the respective machining are proven and widely used means for this

purpose. But the technology behind it is often unknown. For a better understanding of the technology, RWTH Aachen Surface Engineering Institute (IOT) had its annual seminar on "PVD/CVD Thin Film Technology"

this year from May 21 to 23. The seminar provides an insight into the different methods as well as current trends and research focus areas, in addition to how components and tools can be optimized and under which conditions this can be done.



At the CemeCon production site in Würselen, seminar participants have first-hand experience of premium coating technology.

CemeCon AG has already been a partner of this seminar for several years, in order to combine the theory with practice. In this way, CemeCon offers participants insights into the practice of the coating industry. The participants got a feeling of the CemeCon way towards a reliable workflow giving a consistent and repeatable coating quality. The visitors can recognize what is necessary for the technical production as well as what is possible in optimizing cutting tools with smooth sputtered or diamond coatings.

HIGH-END PRODUCTION FOR PREMIUM QUALITY

The production of premium coatings is only possible with first-class technology in an optimal environment. Therefore, CemeCon has completely upgraded its production over the past 18 months and is continuously developing it. In the coming issues of FACTS, the upgrade is also examined in detail bit by bit.



In order to improve the quality of the coatings, CemeCon has upgraded and optimized the production.

The environment must be dust-free to ensure an excellent coating quality. Since particles on the tools can considerably damage the coating adhesion and structure. Every coated dust particle can later lead to defects. Dr. Oliver Lemmer, Executive Board member at CemeCon: "As part of our production optimization, we have succeeded further in reducing the particle contamination." The individual blasting systems were separated into a "blasting center", with improved ventilation. Eight new high-speed doors separate the individual production areas and

reduce dust circulation. In addition, CemeCon stores the tools prepared for coating in a special dust-proof room.

Another contribution to high-quality optimization is the new technical test equipment. New measuring devices for the R&D department as well as for the incoming and outgoing inspection in PVD and diamond production determine the precision of the diameter, the run out, the cutting edge roundness, the geometry and the coating thickness, and thus permit a ridged and

precise tool screening during quality control. "Since environment-related conditions, such as temperature and humidity, can even affect the results, we perform the measurements in specially air-conditioned rooms with tool exchange doors," says Dr. Oliver Lemmer.

For the premium coating company, CemeCon, quality improvement is a continuous process that takes place on many levels. We will present details about this in the next issue of our customer magazine, FACTS.

TRAINING TODAY TO BECOME A SPECIALIST OF TOMORROW

Trainees of today are the experts of tomorrow and the basis for the success of a company. CemeCon has been educating successfully for more than 15 years.

“At that time, it started with two trainees as industrial management assistants.” explained Andrea Krifft, Human Resources. “Currently, we have six trainees: Two industrial management assistants, a mechatronics technician, two machine- and systems-operators and an IT specialist in the area of application development.”

From the beginning, the trainees grow into the rapidly developing technology of a company which leads in its field. You pass through several company departments, which is not only interesting but also

very beneficial: The aim is to obtain an overall insight into the company's internal procedures and to be able to later decide upon one area on this basis.

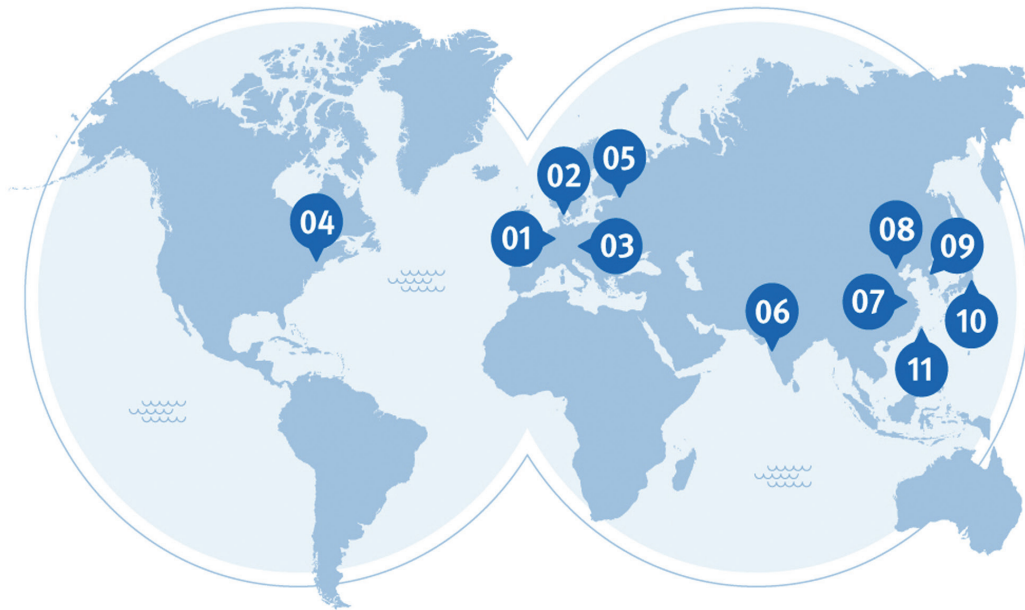
Andrea Krifft: “The quality of our products depends largely on the employees. We train our trainees with the intention to grow the spezialist of tomorrow. Therefore, we can be assured that not only do we get highly-qualified professionals, but also employees who are intimately familiar with the internal procedures, our innovative technology and our first-class products.

“Many former trainees are working at CemeCon today in the areas of production, accounting, administrative services and logistics. For special training areas, the company has collaborative arrangements with local training workshops.

For pupils and students, there is the possibility to get a feeling for CemeCon in advance in the form of an internship or as part of the “Girls’ Day” information event. The goal here is to open up new career fields, particularly for young women, and make working in a high technology environment attractive to them.



CemeCon provides training both in the commercial area, such as Jana Heiliger (left) and in technical professions, such as Domenic Gölde (right).



CEMECON COATING PARTNERS – WORLDWIDE

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

Further information about our **world-wide contact partners** you can find on our website www.cemecon.de.



CEMECON EVENTS 2014

<p>SEPTEMBER 8TH - 13TH 2014 IMTS Chicago (USA)</p>	<p>SEPTEMBER 30TH - OCTOBER 2ND 2014 TOOLEX Katowice (Poland)</p>	<p>OCTOBER 30TH - NOVEMBER 4TH 2014 Jimtof 2014 Tokyo (Japan)</p>
<p>SEPTEMBER 15TH - 20TH 2014 PSE Garmisch-Partenkirchen (Germany)</p>	<p>SEPTEMBER 30TH - OCTOBER 1ST 2014 5th Aachen High Performance Cutting (HPC) Conference Aachen (Germany)</p>	<p>NOVEMBER 4TH - 6TH 2014 DGM-Seminar: Moderne Beschichtungsverfahren Dortmund (Germany)</p>
<p>SEPTEMBER 16TH - 20TH 2014 AMB 2014 Stuttgart (Germany)</p>	<p>OCTOBER 1ST - 3RD 2014 The A Coatings Thessaloniki (Greece)</p>	<p>NOVEMBER 5TH - 6TH 2014 11. Schmalkalder Werkzeugtagung Schmalkalden (Germany)</p>
<p>SEPTEMBER 16TH - 20TH 2014 ToolTech Seoul (Korea)</p>	<p>OCTOBER 14TH - 15TH 2014 Frästagung 2014 Nürtingen (Germany)</p>	<p>DECEMBER 11TH - 12TH 2014 RSD 2014 Gent (Belgium)</p>