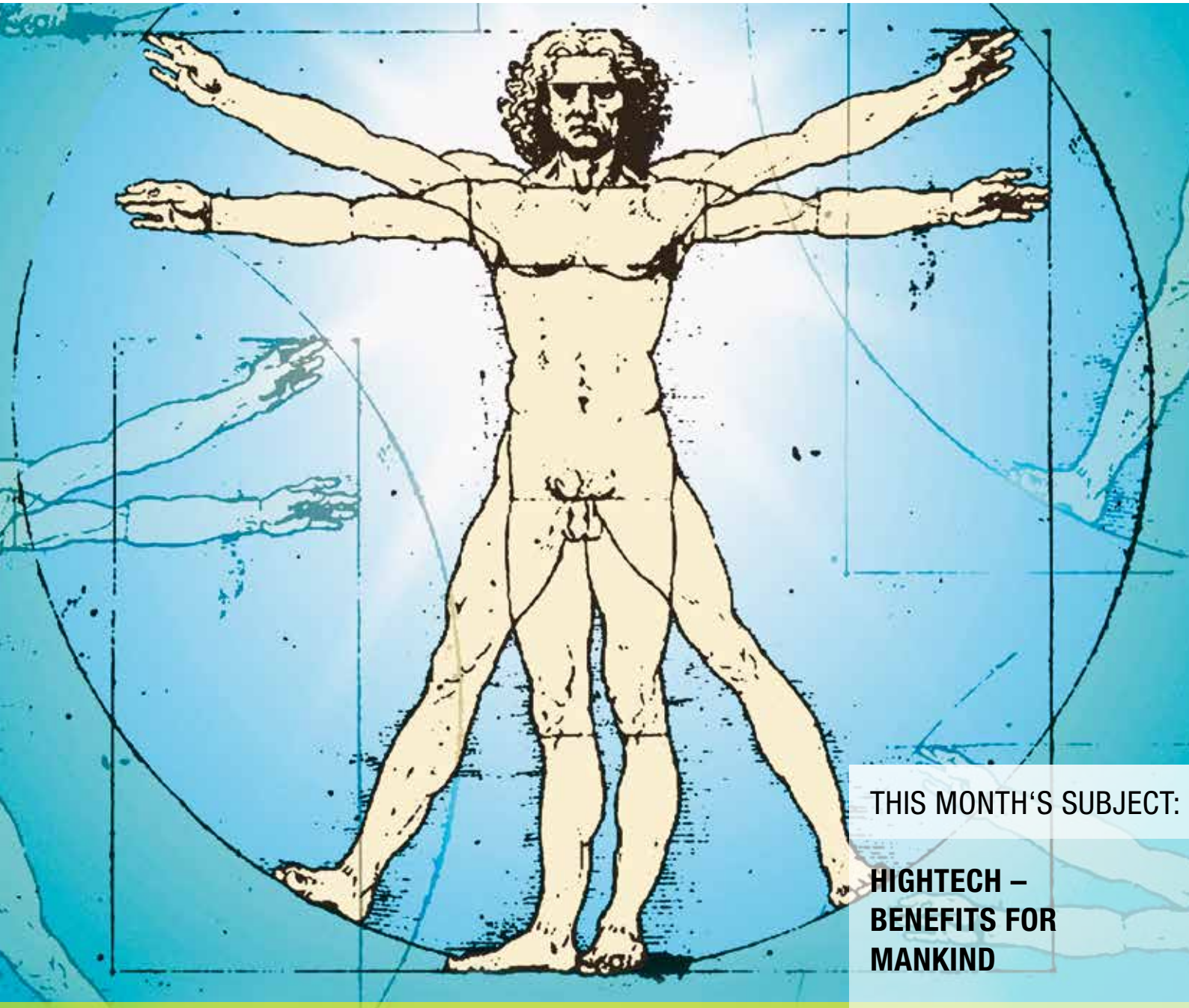
Edition 2/06

world of tools

HORN

HORN'S CUSTOMER MAGAZINE



THIS MONTH'S SUBJECT:

HIGHTECH – BENEFITS FOR MANKIND

- Economical machining of high alloyed steels
- Toolholders - From the blank material to the standard or special tool
- Machining to the outer limits
- HORN USA – Dimension systems provide key to success

Ladies and Gentlemen

Materials such as titanium alloys, high alloyed stainless steels, composite materials, reinforced synthetic materials and ceramics allow developments in the medical equipment technology which were impossible to imagine just a few years ago. Key properties of these materials are their mechanical properties, corrosion resistance, sterility, surface structure and bio-compatibility. However, these properties can only benefit mankind if the materials are machined with suitable tools using the correct machining strategy.

Major requirements are application related tool design using the carbide grade most applicable to the material being machined. Consideration must be given to geometrical restrictions in the macro and the micro areas of the tool and a cutting edge and cutting edge preparation which can absorb the load of the cutting forces. Our long term experience in process, tool, and material development and the knowledge of our employees guarantee successful evaluation and execution considering all necessary parameters. Additionally the in-house coating facility allows us to define the best possible wear resistance for these specific requirements. With our additional recommendations regarding process parameters we aim to assist in optimizing specific applications to reduce tool, material and machining costs.

Like all complex applications, machining of medical equipment requires close co-operation with the end user as well as consideration of all manufacturing processes to achieve the maximum success. Only by careful technical and economic evaluation as well as the classification of all process related parameters can we develop finished products which can be competitively manufactured in a high salary economy like Germany.

Our company‘s policy of continuous investment in improved technology and methods is intended to prepare us for all market and product specific requirements. The demands of medical technology are very high and our ability to develop technically and economically competitive solutions for it is evidence of our capabilities. These benefits of this future oriented material and tool development program are equally applicable to high specification machining applications in other industry sectors.

We hope that we can confirm this with the different reports from the medical industry in this edition.

Lothar Horn
CEO
Hartmetall-Werkzeugfabrik Paul Horn GmbH
Tübingen

world of tools
HORN'S CUSTOMER MAGAZINE

Practical matters

Products

Trade Fairs/Special Exhibitions

About us

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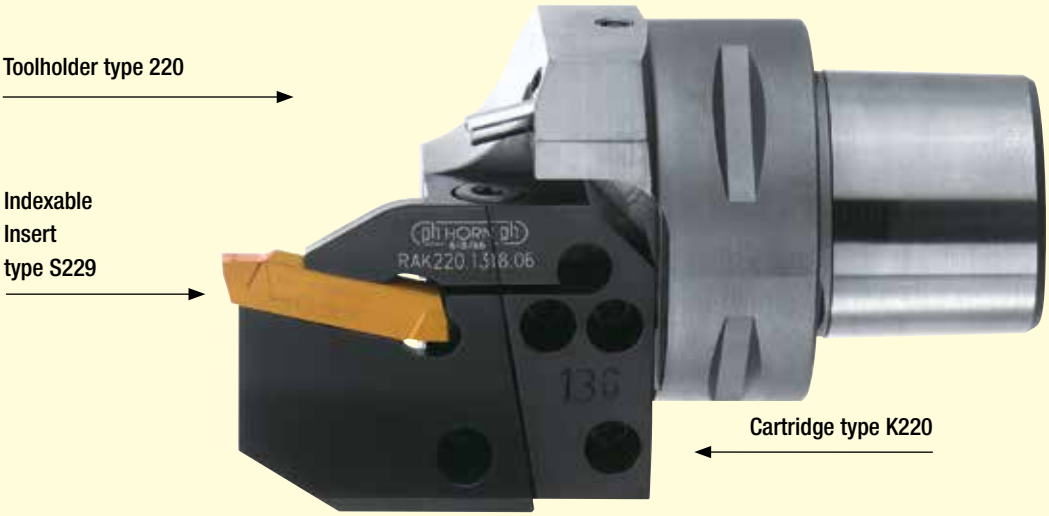
The main cutting edge with chipbreaker is entirely aligned and set to centre height

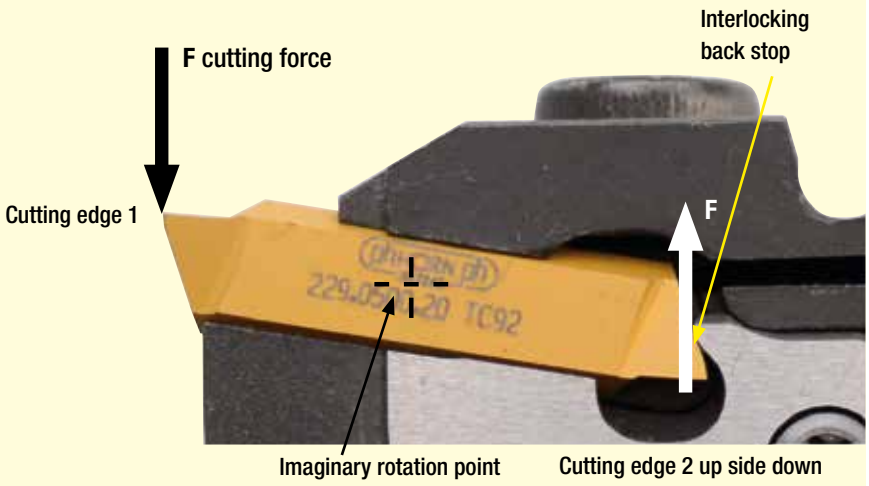


Modular Toolholder system type 220 with indexable insert type S229

ECONOMICAL MACHINING OF DIFFICULT HIGH ALLOYED MATERIALS

Tool system for turning applications optimises production of parts for the medical industry

High alloyed steels and titanium alloys are being used more and more in medical applications. This requires application-related design of tooling systems to ensure economical manufacturing processes. Individual components must be developed so that synergy within the system provides an efficient combination of all parameters. A good example for this is the indexable insert type S229 in combination with the type 220 modular tool system.



Clamping situation of the Indexable Insert Type 229

The insert pocket: guarantees stability

The hexagonal cross section insert is securely supported in the cartridge by a matched pocket seat over its entire length and the contact length of 22mm makes very rigid screw assisted clamping possible. This is particularly valuable in deep grooving and part-off applications with a straight end face. The second cutting edge is designed up side down to improve the clamping rigidity and inherent edge positioning repeatability of the whole system.

Soft cutting geometry

Alloy constituents such as chrome, nickel, cobalt, molybdenum and titanium limit the ability to form chippings. This can lead to excessive wear of the cutting edge and flanks of the insert. Horn has tackled this problem with HORN-geometry .3 with positive chipformer, developed to assist the flow of swarf away from the cutting zone. The combination of positive rake geometry with reduced feed rate results in thinner swarf which is more easily evacuated, significantly enhancing performance on grooves up to 25mm depth.

Quality feature Coating

A characteristic of many high alloyed and difficult steels is poor heat transfer by the swarf which means that the temperature in the cutting area remains at a high level. Moreover, delivering sufficient coolant to the cutting zone can be difficult. In these circumstances the performance of the tool coating has a critical role in temperature and wear resistance. It is here that TiAlN coatings with their homogenous surface structure and Supernitride coatings with their high surface hardness and high oxidation temperatures offer significant advantages.

Tool system for CoCr Steel

The insert type S229 confirms the advantages of an application designed tool system for manufacturing balls and acetabular (socket cup) components used in artificial hip implants. HORN was contacted by one manufacturer of these components because he was dissatisfied with the tool life of the original tools.
Right from the beginning our specialists focused on the width of the insert and its influence on the machining time and tool life. After consideration of the ratio between the insert width and the ball head and acetabular component the ideal width of the insert was specified as 4mm.

Tool life trebled

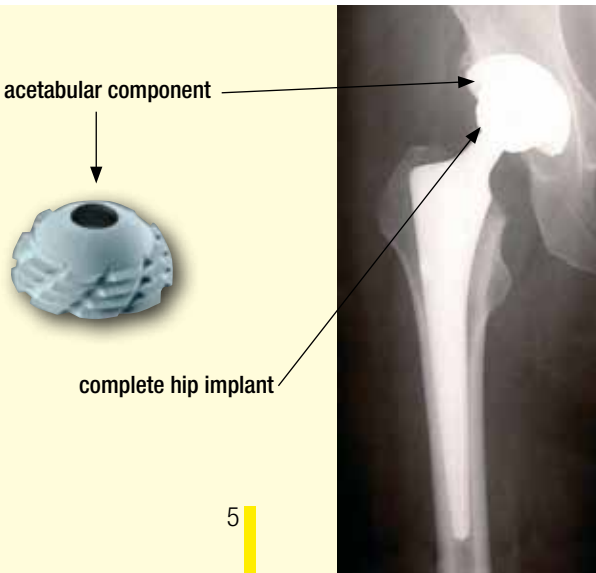
The implant parts are machined on a Nakamura TW10 CNC lathe from bar. The emulsion (8%) is brought directly onto the cutting edge through spray nozzles which are integrated in the toolholder. After several cutting tests a stable manufacturing process was found using a cutting speed of vc=50 m/min and a feed rate of f= 0 0,08mm. With this cutting data in combination with a Supernitride coating type TH36 and a CVD edge preparation of the cutting edge we could meet and even exceed the expectations of the customer. The tool life changed from 7 up to 25 ball heads. On the acetabular components which are approximately 40 % larger in size it was possible to machine 3 components per cutting edge and reduce machining time; total improvement on the components of 250 %.

Solutions for difficult to machine materials

The more exotic the materials are the more it is evident that the difficulties of machining them increase as well. This requires even more specialised tool solutions to achieve a cost efficient and economical manufacturing process. Therefore special tools are not only recommendable but are almost the only solution. The design of the tools needs to be developed in a close co-operation and dialogue with the end user. Only this approach can provide the means to extend tool life, reduce machine down time and improve the production reliability, leading to more efficient and economical manufacturing processes.

Picture bottom left:
Machining process of a hip implant ball head. Semi finished product with parting off surface (below), polished finished product (above)

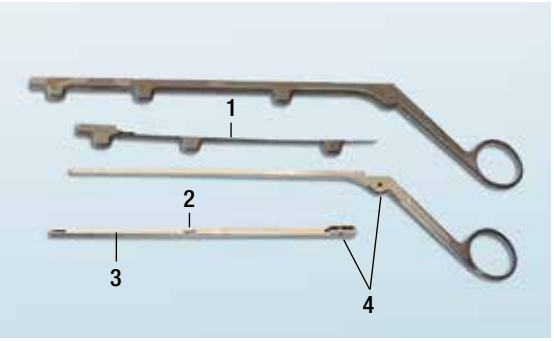
Picture bottom right:
Hip implant ball head with acetabular component after surgery



Detachable Laminectomy Punch with movable top part. The punches are manufactured with shaft lengths from 50 up to 200mm. The width on the tip of the shafts varies between 1 to 6mm

MILLING FOR SURGICAL INSTRUMENTS

HORN Tool system bring medical equipment in shape



Part of a Laminectomy Punch.

From top: Forged main part with 3 clamping sections. These are removed with the system 628 (1). The system 628 mills the opening section in the main part (4). On the movable top part (slide) the system 613 mills the flat surface (3). The system 313 mills the T-slot of the guide (2) and the system 628 the opening section (4)

For over 40 years Tontarra Medizintechnik has been known world wide as the manufacturer of specialised instruments for orthopaedic and intervertrebal disc surgery. Its wide range of products is subject to numerous variations. This, combined with ever increasing pressure on costs and delivery demand manufacturing processes which are difficult to implement at its current plant located in Wurmlingen, near Tuttlingen in Baden Württemberg. As a result the company is developing a new 2 500 m² factory, due to open at the end of 2006, which will benefit from the latest developments in manufacturing technology.

Sophisticated manufacturing of Laminectomy Punches

The company works closely with surgeons to develop improved equipment but batch quantities are often small. Nevertheless production must meet the highest quality standards with fast turnaround regardless of the difficulties encountered in machining the materials used. These include a wide range of stainless steels, corrosion resistant chrome-nickel steels as well as the additional high alloyed steels.

Among the products are punches required for laminectomy procedures. A laminectomy is performed to relieve pressure on the nerves by removing bone and cartilage within the spinal column. It decreases pain and improve function for patients with lumbar spinal stenosis, a condition that compresses the nerves around the spinal cord due to a narrowing of the spinal column. The procedure utilises punches which are produced in different lengths. There are detachable and non detachable versions, with different shaft designs and shaft areas – and also in different colours.

The machining specialists at Tontarra Medizintechnik are continuously confronted with new challenges manufacturing the laminectomy punches as detached or non detached versions. The main part is purchased as forged blank which has to be finished machined. It incorporates three clamping pads to aid fixture location. The moving top part, the slide,

is completely machined from flat material and has to move with very high precision within a groove in the main part.

Four HORN tool systems in use

On average the width of the guide is 0,9 + 0,02mm and this was previously machined using a solid carbide disc mill of 50 mm diameter. For this time and cost intensive manufacturing step HORN sales engineer Gisbert Voß recommended use of the type 313 Mini Milling System. The HORN system offered a simpler set-up, better machining performance and better tool life with improved process stability. Before the 313 system begins work, a type 613 six-tooth cutter is used to mill the surface of the slide. For the milling operation of the opened section in the main part and the location and removal of the clamping pads system 628 with increased depth of cut is a reliable choice. All 3 clamping supports on the main part of the laminectomy punch need to be removed after the machining process. Taken overall, HORN tooling is used for about one third of all manufacturing steps on the forceps around.

All machining operations are performed highly productive in one set up on two identical 5-axis machining centres supplied by Hermle. The machines are equipped from a centrally located System 3R pallet robot. Its capacity of 60 pallets is sufficient to produce different products particularly in the night shift in a fully automized process. Product specific clamping and fixturing devices for the components have been developed by Tontarra and are fixed using an intermediate aluminium fixture plate on the pallets.

Tontarra equips the tool pallets with product specific fixturing devices as in the picture for a Laminectomy Punch. The groove milling tool type 613 machines the inside of the main part

Successful strategy and tool system change

For almost 6 years all complicated applications at Tontarra have been optimized with tool solutions from HORN. Especially the change from the solid carbide saw blade to the system 313 Mini milling tooling has provided a significant and reliable improvement, according to manufacturing foremen Jürgen Marchisella and Dietmar Knöpfle. „Due to the very competent advice from Gisbert Voß we could introduce a strategy and tool change in a very short time without interruption of the manufacturing process“ recalls Jürgen Marchisella. When machining the guide slots the HORN tools work very precisely without any vibrations. Because of this it was possible to increase the cutting data to use the full performance of the machining centres, enhancing efficiency. In view of this we have been positively surprised by the 400 per cent improvement in tool life offered by the system 313 combined with increased process stability.“

Jürgen Marchisella and Dietma Knöpfle from Tontarra discuss additional machining applications for HORN tools with our sales engineer Gisbert Voß

Sample Threads

Bone screws are designed according to physiological considerations. To meet the most critical requirements, non symmetrical threads are designed with almost trapezoidal profiles and concave shaped flanks

WHIRLING FOR HEALTH

Economical machining of difficult materials for the medical industry

Equipment and components for the medical industry are often manufactured from stainless steels or titanium also because of their biological compatibility. These materials are difficult to machine, particularly when producing a thread profile. The thread whirling process offers remarkable technological and economical advantages for this application.

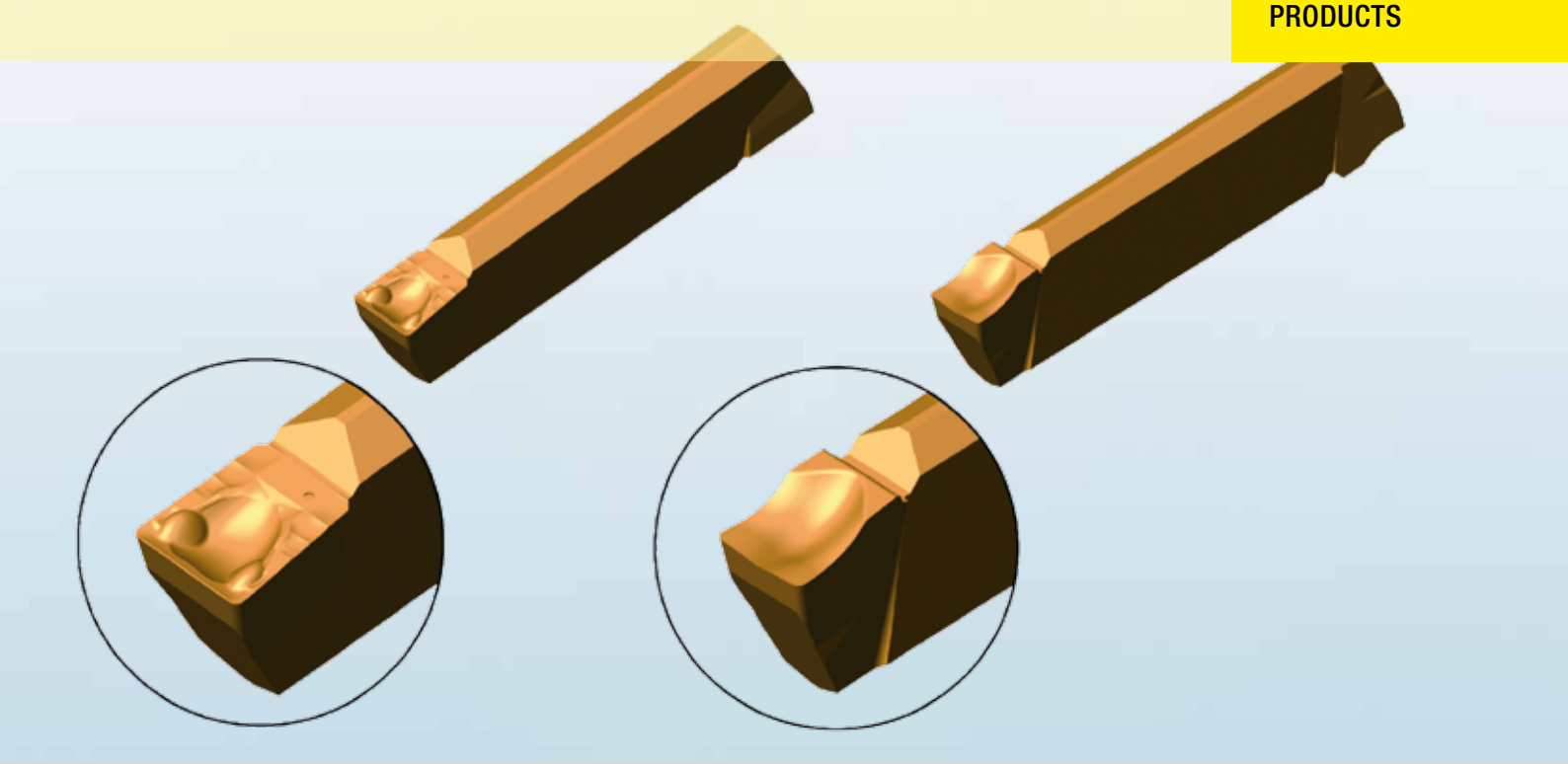
The whirling of external threads on lathes is comparable with use of overgrooving heads on machining centres to produce external threads by circular interpolation by relative motion of the cutting edges. The whirling head equipped with several carbide inserts is positioned opposite the lathe collet and inclined to match the helix angle of the thread to be manufactured. The head rotates with high revolutions and cuts the thread. The C-axis of the lathe rotates in the opposite direction at lower revolutions according to the pitch of the thread. During this operation only one tooth cuts the material at a time. The thread form is machined in one continuous cycle including machining the bar diameter down to the OD of the thread. When the necessary thread length is reached the whirling head moves away radially and the workpiece in axial direction.

Low cutting forces, high quality

Whirling of external threads is very useful for small thread diameters because of the thin swarf thickness. The risk of shearing of the component is negligible due to the very low cutting forces. Additional advantages are threads with very small or no burrs, high precision and high surface quality. Workpieces such as surgical bone screws can be manufactured very economically in large quantities.

Whirling heads usually have three or more cutting edges depending on the diameter. These are ground with the complete profile of the thread to be manufactured. Because of the small size of the heads HORN uses indexable inserts of type S302 with an inscribed circle of 10mm. It takes considerable effort to set the cutting edge diameter and run out of the profile of the cutter; these are very important, especially on small thread diameters. However it is also necessary to achieve the best possible run out, profile precision and precise location of the inserts to obtain the best machining results.

Whirling head type M302 with 6 cutting edges fixed on the whirling unit of the lathe



MACHINING IN OUTER LIMITS

Difficult and high alloyed materials for products of today and tomorrow

Example standard geometry .5 and Geometry .F on indexable grooving insert type S224

Continuously developed and improved manufacturing processes for special materials e.g super alloys and nickel-cobalt alloys allow modern manufacturing to combine the advantages of each individual alloy element and use them in the best way.

Whereas until the 1980s exotic materials like Inconels and Hastalloys were only well known in the aerospace industry, today you can find numerous nickel and cobalt alloys and CoCr steels in all industries. Several of these new materials offer high wear and temperature resistance and are very difficult to machine. The use of simple tools cuttings tools is therefore immediately limited.

As a innovative tool manufacturer we are obliged to supply our customers with the correct tools for these applications. However it is insufficient to develop only the appropriate carbide grades. It is important to view the tool as a complete system because only then can it be considered as a highly reliable and economical means of machining modern materials.

„Ingredients“ and their effects

Considering the variety of the stainless steels in the material group 1.4xxx the relatively free machining steels like 1.4305 are located very close to the difficult to machine steels like 1.4311. Both materials seem to be almost identical in their chemical composition - which define the use - having approximately 18% Cr, 10% Ni and up to 2% Mo. Chemical components which are important for the stainless and wear resistance characteristics are a negative influence for machining because of the increased temperature during the chip forming process. A positive influence for swarf control is the presence of around 2% sulphur in 1.4305 steel. These materials are well suited to use on automatic lathes and multispindle machines.

To avoid long curled swarf when machining steels with little or no sulphur the feed rate should be specified at a higher level. This guarantees that the chip formers on a grooving or turning insert can work successfully.

Stainless materials, specifically austenitic steels, display work hardening properties. For this reason the feed rate and stock removal need to be higher than usual to allow the cutting edge to cut through the hardened section. With the correct insert geometry it is possible to guarantee very good swarf control. Materials from the material main group 2 e.g. 2.4668 (NiCr19Fe19Nb5Mo3) also known as Inconel alloy 718 are difficult to machine due to their very high temperature and wear resistance. With a 55% share of Ni and more than 20% Cr the stainless, acid and wear resistant characteristics of the material is exemplary. However, during machining it is almost impossible to break the swarf because the wear resistance causes a very high cutting temperature.

In numerous tests it was shown that the window of possible cutting speeds is very narrow. The best cutting speed for milling Inconel 718 e.g. with the HORN DS Solid Carbide Endmills and the grade TS3K was identified between 30 - 35 m/min. Even a small increase up to 40 m/min leads immediately to a heavy front rake wear, increased temperature of the tool and ultimately the destruction of the milling cutter. In a continuous cutting process such as a grooving application the point contact and heat build-up can cause plastic deformation of the carbide grade and cutting edge. If the cutting speed is too low this may cause built up edges which also reduce the toollife significantly. The best results were achieved using as coolant and for the swarf evacuation emulsion with more than 12% oil additives or specific coolant oils.

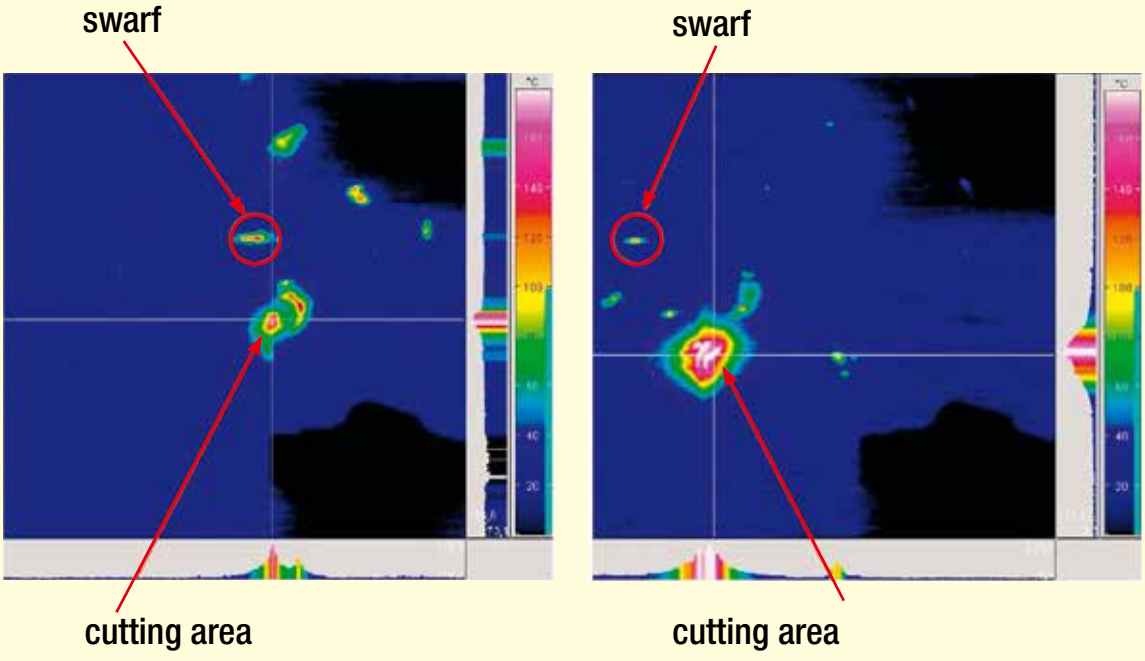
Many times there are also materials available which are not specified and listed in the material groups according DIN. Consulting the special edition of the HORN Material Guide helps to find the first cutting data recommendations for these materials.

Performance potential of the cutting tool

The successful complete system named „cutting tool“ consists of a perfect combination of the three most important individual parameters: Carbide, geometry and coating. Each parameter plays a critical role in machining modern materials successfully.

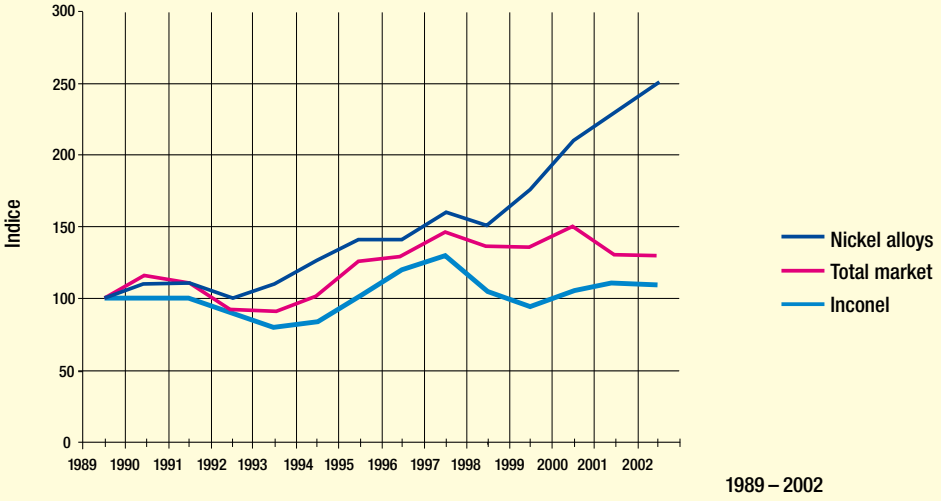
Carbide

The base grade, a powder metallurgical material, consists in the beginning mainly of Wolframcarbide and Cobalt. The wear resistance of the substrate increases with the hardness of the material - and the hardness of the material increases with the reduction of the cobalt share. Traditional ISO K-, M- or P-grades are not suitable for machining high alloyed materials. Micro- and ultra micrograin substrates are more reliable than the traditional grades due to



The thermographic image on the left shows the high share of the heat transmission via the swarf on a new tool

The right hand image demonstrates the lower transfer of heat and the higher cutting temperature when using a worn tool



Development of the market for special alloys using the example of Nickel alloys and Inconel

their hardness, edge stability and toughness. Super ultra micrograin and nano grades with grain sizes below 0,3µm are currently under test. As soon as it is possible to produce them reliably it will provide an additional option.

Geometry

To achieve effective swarf control when machining highly alloyed materials it is vital to develop specific cutting data for each insert geometry so that they can be used in the most efficient way. Swarf control for machining modern materials has virtually nothing in common with that required for classical materials. Because of that it is important to define relief angles and top rakes that are able to withstand the increased workload on the cutting edge.

Coatings

A hard layer of around 3 µm thickness prevents immediate wear of the carbide. Optimum results have been obtained with TiIAlN coatings capable of withstanding maximum temperatures of 800 up to 1000 °C. Because of the hard layer the surface friction values reduces significantly in comparison with a uncoated substrate. Technological developments can be expected from new coating processes and layer structures. An important aspect of this will be played by improved oxidation resistance as well as surface quality and friction values.

The surface quality and structure of the coating have a important influence on the cutting forces and consequently on the life of the tool. To achieve in the micro area a topographically flat surface HORN now operates its own coating facility using sputter technology from CemeCon.

Normally on a new tool 70% of the heat developing from the cutting process is transfered into the swarf and moved away. This share reduces as wear on the cutting edge increases. Especially with heat and wear resistant materials the tool temperaure can increase very quickly because of the increasing wear on the cutting edge due to the local temperature rising above the working temperature of the coating, and resulting in failure of the tool.

Conclusion

A perfect combination of the 3 parameters carbide, geometry and coating guarantees a economical machining of difficult to machine and high alloyed materials. The technological development of each individual parameter supports this. It is also our target for the future to choose for each application situation the correct combination of substrate, geometry and coating to provide the most economical machining processes for the modern materials.

COMPLETE MACHINING OF TOOLHOLDERS

Walter Wiedenhöfer, production manager, Rainer Bergmann, department manager for jigs & fixtures and Werner Fritz, department manager for the toolholder section (from right to left), are tasked to deliver approximately 10.000 jobs annually on time and with high precision to our customers

From the blank to the standard and special toolholder

More than 10.000 job sheets are processed annually in the HORN „toolholders“ department. In the edition 1/05 the article „From a blank to an individual customer solution“ provided some information about the manufacturing of our toolholder systems. Further details of the insert location part of our tools will be explained in more detail here.

Toolholders, fixpoints of our tool systems

Toolholders are used to carry the (indexable) inserts which are needed for the different turning and milling applications. Within the HORN factory 10.000 job sheets per year contain everything between 1 up to 100 pieces per sheet and the average can be specified with 15 pieces per job.

The ratio between standard and special toolholders (which are application-specific and manufactured in small quantities) ties 50:50. Depending on the form and processes needed tool holders run through 3 separate manufacturing lines, namely complete manufacturing; cut off of blanks and semi finished materials; and manufacture of carbide shanks with steel brazed head.

Complete manufacturing on 7-axis machining centres

In this manufacturing process the toolholders are machined on 5- and 7-axis machining centres in one set up with a precision of ± 7µm. The very tight tolerances save additional grinding processes, time and costs. The consideration of cost reductions starts when placing the order for the raw materials. It is more economical to concentrate only on a few stock sizes and accept the higher amount of chip removal than to carry numerous different sizes which are close to the tool dimensions. This philosophy also reduces the effort and the cost of designing fixturing and clamping devices for the machines.

Turning and Grinding of semi finished materials and sawn blanks

In this manufacturing process stock round material of alloyed and high alloyed steels is cut to length with a band saw after which it is machined on CNC lathes including broaching if needed. After this insert pockets are milled on a machining centre. Depending on the specification it may be necessary to include a

grinding operation on the shank. Flexibility is provided by using several lathes and machining centres of the same type and design in combination with a zero point clamping system. This offers a very simple exchange of parts between machines without losing precision and without excessive set up time. This is the basis for time and cost optimised highly flexible use of the machining capacity.

Carbide shank with steel brazed head

Stocked basic carbide material is ground with the product related offset on the heads. Purpose-developed software allows grinding of round, eccentric and special forms. Because of the precision and reduction of down times the grinding wheel is dressed in the machine. After grinding of the offset the clamping faces are ground, the heads are brazed on the carbide shank and the connection and the stability of the brazed section is tested. The insert seats on the front face of the steel heads are machined on 4-axis lathes equipped with integrated deburring units. After that the heads are induction hardened, annealed and the remains of the brazing solder are removed with a blasting process.

Expert knowledge saves time

Each holder is centrally designed in the Technical Office. From there the 3 D data is transferred into the Planning section in the manufacturing area to create the CNC programmes. The CNC program is used by the worker to set up the machine. Because of the individual knowledge and know-how of the employees in this area the programmes are frequently modified to improve the manufacturing process machining data. It is very useful having this continuous communication between the people on the shop floor and the people in the Technical Office as it improves the exchange of detailed information, assists understanding of the requirements of each side and ultimately optimizes the production of toolholder systems.

Toolholders in various forms and dimensions are flowing daily through the manufacturing lines in the toolholder manufacturing section

Starting from the blank material the toolholders are machined in one set up on multi-axis machining centres

Jig & Fixture Manufacturing, Specialists for the extraordinary

All of the equipment needed by the grinding section and toolholder section are developed, designed and manufactured by the 20+ employees in the Jig & Fixture Manufacturing Department. To avoid delay in development, design and manufacturing process of customer ordered items the Jig & Fixture Department machining facilities are completely independent. The people in the department organise and program the manufacturing steps themselves with quality assessed and documented using high precision video controlled measuring machines. For example the run out tolerance of a special shank has a maximum of 0,005mm.

Focus on productivity improvement

Our toolholder manufacturing and the jig & fixture departments operate a two shift system. Individuals in both areas are fully involved in the manufacturing process from programming through the machine set up process and manufacturing of the prototypes. This provides a high level of job satisfaction as they can display their competence and organisational talents; this benefits the company in terms of reducing the down time and set up time of the machines and improving the productivity. This gives HORN a lean organisation with access to the latest machine technologies, helping us to achieve our aim of delivering high precision products to our customers with short delivery times.

General view of the toolholder production section

Much interest was shown in our products at METAV

Retrospective

METAV Munich and METAV Düsseldorf

Lothar Horn reports: „We have experienced a lot of interest and I expect that the participation in both exhibitions will be well worthwhile. There is an increase request for products from the domestic market but we can also identify a lot of interest from export markets, particularly from Western Europe and Asia. METAV Düsseldorf is still one of the most important platforms for us to present our product range. We have also noticed that visitors are increasingly knowledgeable, in addition to which the number of international visitors has increased significantly.

METAV 2006
4. – 7. April München
20. – 24. Juni Düsseldorf

The number of international visitors increases significantly

METAV Munich had a total number of approx. 25.000 visitors. 518 Exhibitors from 18 countries were present. In Düsseldorf 925 exhibitors from 21 countries showed their products. The total number of visitors was counted to 47.500.

NORTEC, Hamburg

From January 25th until 28th, 2006 the NORTEC Show took place in Hamburg a special trade show for production technology. For the 10th time it was possible for tool manufacturers, trade companies and supplier companies to present their companies and products.

Paul Horn GmbH exhibited new products and product line enhancements on a combined stand together with AWT-Application Technology Werner von Have, our distributor for the Northern German area. „We are delighted that so many visitors came to our stand, and that made a substantial number of new contacts," said Werner von Have on the last day of the exhibition.

In total 12.000 visitors took the opportunity to get the latest information about the products of the 400 exhibitors.

HORN was present on a combined stand

Outlook

AMB 2006, 19.-23.9.2006 in Stuttgart

International exhibition for metal working
Hall: 4.1
Stand: 139

AMB 2006 19.-23.9.

Euromold 2006, 29.11.-2.12.2006 in Frankfurt a.M.

World Exhibition for the Mold and Die Industry, Design and Product Development
Hall: 9.0
Stand: C67/C79

EUROMOLD

Retrospective

Tooltech 2006, New-Delhi, India

From February 01st to 05th, 2006 the exhibition for production technology with focus on „Cutting Tools" took place in the capital city of India. Several German companies like us showed their products in co-operation with their Indian sales and distribution partners. A total of 114 companies were present at the Show.

Caught en route to the exhibition: truck with notice „HORN PLEASE" (request to blow the horn)

Due to the fact that the market in India grows continuously there exists a high demand for German machine tools. „Made in Germany" is a highly valued trade mark in India, representing the latest manufacturing technologies and a guarantee of quality. For German enterprises and in particular for our company it was important to participate in this trade show.

MACH 2006 in Birmingham, England

From May 15th to 19th, 2006 the most important Trade Show for the Metal Working Industry in Great Britain took place in Birmingham. More than 500 Exhibitors from the areas Machines & Machine Tools, Laser Technology, Sheet Metal Working, Automation, Warehousing, Tool Manufacturing and Measuring Equipment were present.

General and export management at wok at the exhibition

HORN UK showed all new products and product developments of this year on a 120 m² stand, and demonstrated our DS Solid Carbide end mills on a Hurco 3 axis machining centre. In the first 4 days of the show we welcomed more visitors to our stand than at the whole exhibition two years ago. Andreas Vollmer, Export Sales Director, was able to take a very positive summary of the Show. However he concluded that the exhibition has a lower profile compared with Mach Shows during the 1990s. Especially small exhibitors and also a growing number of visitors are now concentrating on local and regional trade shows in the UK.

A TV screen allowed visitors to view our products in use as an aid to discussion of machining applications

Introducing:

Gisbert Voß, Technical Sales Representative

Gisbert Voß,
technical sales representative for the areas Tuttlingen, Upper Swabia and Lake Constance

Our man in the area of Tuttlingen, Upper Swabia and Lake Constance, the centre for rotating part, precision engineering and medical equipment manufacturers is Gisbert Voß. The skilled foreman in turning is well accepted as a competent partner to discuss applications not only from a technical standpoint but also because of his expertise in cost reduction and production efficiency.

The professional career of the 44 year old began at a manufacturer of mechanical equipments in Friedrichshafen. After working at another machine and trading company and a distributor of cutting tools he joined HORN in 2002. Because he was already familiar with our products from his previous positions he was able to start immediately as a Technical Sales Representative.
His technical knowledge is based both on his professional career and on experience from his hobby activities. For 25 years he has been a passionate supporter of and participant in Autocross. In the early years an active driver in cars of the type „DIY" (Do-It-Yourself) he has more recently moved off the track as a spectator and supporter. Autocross is a cross race on short distances which is staged on an oval track providing very good visibility for the spectators. The cars are mainly open, 4WD Buggy Style single seaters.
The cars are built entirely by the Gisbert Voß - only the Porsche engine is a purchased item. Frame, gear box, transmission for example are manufactured in his own well equipped workshop also using HORN tools. Currently he is in the process of developing a new „Racer". The finish date of the car remains open due to his lack of spare time. Until then he tries to watch the most important domestic and international races, joined by his wife and children who are also fascinated by the racing atmosphere.

Stefan Schneck, Export Office

Stefan Schneck,
our sales support technician for Austria, Czech Republic, Slovakia and Poland

Our export office with its elements technical support, quotations and sales is sub-divided into eight country specific areas. One of these areas with the countries Austria, Czech Republic, Slovakia and Poland is the responsibility of Stefan Schneck. As a skilled precision mechanic with the additional education of a mechanical technician he can support and advise his customers on difficult and complicated machining applications.

His practical experience was gained during his 5 year placement at a manufacturer of machining centres. With this knowledge he was able to cover our customers and sales partners after a very short training period when he joined the company in 2003.
Our sales partners usually prepare the quotations for the customers in the individual countries provided that they are standard catalogue items.
When there is a request for special tools it is the time for Stefan Schneck to apply his know-how. If possible he tries to find a solution for the application by himself but he can also call upon advice and support from the technical office, R&D and production. His quotation is then modified to suit the market and customer specific necessities in the particular market.
Together with the sales partner he also visits end users in the countries. For this specific kind of customer support and to discuss actual applications and test results Stefan Schneck spends a minimum of one week in each country. In addition to this he also participates with his support on the most important regional or national exhibitions.
The 31 year old bachelor has a strong spare-time interest in technology. One interest lies in the railway history while another passion is travelling around the world. Aside from an interest in foreign cultures he is also fascinated by skyscrapers. He has already visited ten of the worlds tallest, including the 508 metre high TAIPEI101 in Taiwan.

HORN USA – „METRINCH“, THE KEY TO LONG TERM SUCCESS

The American market is dominated by the Inch dimension system. Initial moves to change to the metric system began in the middle of the 1960‘s, but visible progress has been „Inch by Inch“. Right from the beginning it was important for HORN USA to offer tooling solutions to the US customers in both dimension systems (METRINCH= Metric + Inch).

First experiences in the US

With the beginning of direct sales activities on the North American market through HORN USA based in Franklin, Tennessee, it was clear that long term success would be achievable only by offering inserts and toolholders in metric and Inch dimensions.
It was possible to fulfil this requirement within a short period. In the first instance the existing range of inch products was expanded and production initiated by the parent company in Tübingen, Germany.
A small range of Inch products already existed, as our first export sales activities through our former sales partner had started in 1989. However by the middle of the 1990‘s it became obvious that the existing sales structure, the small range of inch products and the general interest of our former partner limited our future development prospects on the North American market.

The sales office at HORN USA

The structure of the American market

The product range is not the only important element for a long term success. It is also important to consider and respect the conditions within the American market. Because of the size of the country (appr. 9,6 million km², compared with Germany 0,35 million km²) a direct sales and support network like we have with the Paul Horn GmbH in Germany is almost impossible. In addition over the decades the market has developed a structure based on a large number of regional and local distributors including manufacturer representatives who act as a independent consultant on the shop floor level.

The US represents with a volume of approximately $ 2 Bn one third of the world wide precision cutting tool market. With a volume of $ 511 m. the US was according to statistics from the VDMA the most important overseas market for German high precision cutting tools.

Tools „Made in USA“

As mentioned above, Inch products were initially manufactured in Tübingen. After establishing HORN USA we recognised the need to develop a production capability. Three years after establishing HORN USA the project was started. From an initial area of 750m² (7.500 ft²) the company developed to a size of 2.200m² (22.000 ft²) with office, warehouse and manufacturing space. Since 2001 HORN USA has produced (indexable) standard inserts of the types MINI, Supermini®, Mini Milling and gradually 229 / 312 / 314 / 315 in Inch dimensions including special inserts of all types.

Aside from shorter lead times, the quality sign „Made in USA“ is an important asset underpinning the future expansion of the market and the local image of HORN USA. The company has more than 30 employees and is today an (almost) American company. Its young management along with the whole team has embraced the long term objective, to establish HORN - LEADERS IN GROOVING TECHNOLOGY in the USA.

The senior management of HORN USA (from left):- Duane Drape, national sales manager and Dave Fabry, operations manager

Production of indexable inserts at Franklin

Warehouse

PLUNGE CUTTING · CUTTING OFF · GROOVING · BROACHING · COPY MILLING

HORN is at home in over 70 countries across the world

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