Edition 1/05

world of tools

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HORN'S CUSTOMER MAGAZINE

This month's subject:

MOTORS FOR THE MARS ROVER

Superminis get the Mars Rover into shape

- HORN improves tool life
- Micro milling in the mould industry
- From a blank to an individual customer solution
- HORN France thinks ahead

Ladies and Gentlemen

world of tools is intended to extend our communication with you beyond our well-established publication of product and user related technical information. The magazine will keep you informed about a wider range of developments in our business. It will be published twice a year and we hope it will give you a broader insight into the way that our company operates.

Paul Horn GmbH is known as a manufacturer of high-precision carbide-tipped tools, for whom it is a routine aim to impress its customers not just with its products, but also with the service it provides. In connection with both of these aims, our aspirations go well beyond what is usual. We hope that, in the service we provide, we have provided proof of this and that we can further reinforce this impression via this new customer magazine.
Reports based on user applications and the customer benefit achieved as a result emphasise the practical benefits of HORN tooling technology. Presentation of new products, plus further developments, will keep you abreast of both technical development and our innovative zeal. In addition, whenever and wherever we are exhibiting at trade fairs, or planning and carrying out in-house exhibitions or seminars, mention will be made in a dedicated section.
Furthermore in a look behind the scenes, we will be introducing you to our employees and informing you about the ongoing development of our internal and external organization.

However, as with technological development, the concept of a customer magazine is not static; rather it has to be geared towards market conditions and therefore the requirements of our customers. For this reason, we will be pleased to receive your suggestions and would like to invite you to take an active part in our development through the medium of the world of tools and thus get to know Hartmetall-Werkzeugfabrik Paul Horn GmbH even better.
I hope you have an enjoyable and informativeread.
Yours Sincerely,

Lothar Horn
General Manager,
Hartmetall-Werkzeugfabrik Paul Horn GmbH,
Tübingen

world of tools
HORN'S CUSTOMER MAGAZINE

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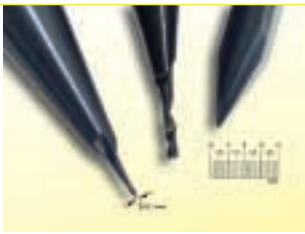

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Masthead: world of tools, HORN's customer magazine twice a year and is sent to customers and interested parties.

Publisher: Hartmetall-Werkzeugfabrik Paul Horn GmbH • Postfach 17 20 • D-72007 Tübingen
Tel.: +49-7071 70 04-0 • Fax: +49-7071 7 28 93 • Email: info@phorn.de • Internet: www.phorn.de

Print run: 20,000 in German and 10,000 in English

Overall production: Werbeagentur Beck GmbH & Co. KG • Alte Steige 17 • 73732 Esslingen • in co-operation with Schenk Marketing

Karl Fackler, Production Foreman (left) and Jürgen Hauber, from the stator production line are satisfied with the cutting rates and the service life of our Superminis

MOTORS FOR THE MARS ROVER

Superminis get the Mars motors into shape

Early in 2004, the Mars exploration vehicles 'Spirit' and 'Opportunity', developed by NASA, landed on the most Earth-like planet in our Solar System.

Their task was to examine the geological conditions there, and in particular the planet's surface, for signs of the earlier presence of water. During these 'expeditions', the vehicles covered about 40 metres per Mars day, a distance for which the previous model 'Sojoumer' required for the whole of its 90-day mission. An important contribution to this increase in mobility was provided by 39 DC motors from maxon motor AG, located in Sachseln in the Swiss Canton of Obwalden. Manufacture of these motors involved the use of HORN Supermini 105 series tooling.

The picture shows a selection of components for geared motors manufactured at maxon motor and the Supermini carbide special tools employed

Stock lines specially adapted for Mars

NASA's decision in favour of electric motors from the Swiss drive mechanism specialists was based on their positive experience with the drives for the 'Pathfinder' on the first Mars mission, and on their very high degree of efficiency. At 80 to 90 percent, they markedly exceed that of alternative manufacturers examined by NASA. In selecting the motors it was possible to base the components on standard RE Series products adapted for the harsh conditions on Mars. For example, they had to withstand temperature ranges of from -80 °C to +70 °C, as well as varying degrees of vibration. The motors were employed to drive the robotic arms, the rock drill and the control mechanism, and for operating the camera, plus the six drive wheels for moving the vehicle – which weighed some 180 kg – across the red planet's surface.

Directional systems from Baden

RE Series DC motors are based on an extremely high quality design using a neodymium magnet. Their 'heart' is their world-wide patented rotor with its non-ferric winding. For use on Mars an only slightly modified listed product came into use, in the shape of the RE 25 model, whilst the RE 20 model was specially constructed for this application. The fact that ex-catalogue products were already suitable for use on Mars, is remarkable and gives some insight into the high level of both product and quality of the world-wide, and now Mars-wide, leading manufacturer for mini motors and gear-boxes. The components for

the 1.5 million mini motors manufactured annually are produced by the 280 employees of their German subsidiary, maxon motor GmbH of Sexau near Freiburg.

Technology and economic viability united

The motors' dimensions, the materials used and the high demands placed on functionality and quality present numerous challenges to Erich Rieker, General Manager of maxon motor GmbH, located in Sexau, and his employees. Since not everything that is technically possible is also justifiable in economic terms, it is a matter of finding the right compromise on an almost daily basis, in order to manufacture mini series and special designs cost-effectively.
In performing this tightrope walk, expertise, innovation and creativity are required, both from the company's own workforce, and from its suppliers, including Paul Horn GmbH. Here we were able to bring our strengths into play when strategy and tool selection for turning the magnet systems came into question.
Along with initial provision of HORN Supermini series tooling, HORN was able to assist with development of the CNC programming, and support this with expertise for successful adaptation to the various applications. HORN's flat organizational structure and its short channels of communication enabled rapid, effective reaction to the concepts of Erich Rieker and his team.

Supermini gives Mars motor the right idea

For machining the various elements of the motor and in particular the turning of the bearing carriers, there were standard guidelines: For the material combinations of aluminium/steel, brass/steel and brass/aluminium, the same lathe tool was to be designated for each, the concentricity tolerance was not allowed to exceed 0.02 mm and the tolerance zone for the bearing carriers had to exhibit in the system a hole basis fit of H7/n6. Unfortunately, we cannot go into greater detail concerning further specifications, since various manufacturing stages are subject to secrecy. For all these tasks, no DIN tools could be employed; only HORN Supermini met maxon motor's turning technology requirements.
For turning bearings, the main requirement was for the precision and tool life standards achievable using HORN products. First the outer contour of the magnet system made from aluminium, brass or stainless steel is turned lengthwise and flat on, using System S 223, and then relieved. After this, both bearing carriers are machined with the inner diameter being turned, including undercuts and further contours. These complex tasks are accomplished using Supermini 105, using a right and a left handed insert in turn, the polished section, clearance and coating of which have been selected for the material.

DC motors from maxon motor AG keep the Mars Rover 'on the move' and drive various control and slave units

High benefit to users: Task-oriented tools

Supermini is capable of using a single holder for right and left cutting inserts allowing various turning operations to be carried out on diameters of from 0.3 to 7 mm. This unique advantage of multiple machining using only one basic holder allows the user to economise on holders, simplifies the time and cost involved in producing the bearing carriers and makes for an easier overview.
HORN Supermini guarantees high working and replacement accuracy through the finely machined holder seating and the insert's ground contact surface. In this application, our philosophy of easing the customer's way towards economical complete machining by means of a strategy is once more confirmed.
A key part of this is that for each machining task we select the right geometry, coating and cutting metal and adjust the cutting data to the components and materials. In this, HORN's technology database provides significant decision aids. Using the experience gathered there, our specialists from development, production and sales were soon in a position to inform maxon motor on the method, time budget and projected cost for the Mars project, in order then for the project to be processed.

HORN IMPROVES TOOL LIFE…

Pallet clamping System to machine the root form of the Turbine blades

…and set-up consistency for compressor blade manufacture.

Devon-based gas turbine component manufacturer Centrax Ltd has achieved a ten-fold improvement in tool life, improved as-machined surface finish and improved set-up consistency on tool change, using tooling supplied by HORN UK.

Specially ground HORN groove milling cutters are used to generate root forms on compressor blades manufactured from extruded 17-4 ph stainless steel, and have achieved tool life of 500-off compared with 50-off for the previous tooling.
Centrax, whose factory is in Newton Abbot, is a leading manufacturer of packaged turbo-generator systems, whilst its Turbine Components Division supplies finish machined blade sets to the aerospace industry. The contract for which HORN supplies tooling is concerned with manufacture of compressor blade sets for a number of different stages in a gas turbine engine.

Difficult to machine turbine blades

The company is committed to a policy of continuous quality and methods improvement for the benefit of its own productivity and its customers' costs. This includes ongoing investment in modern manufacturing equipment and optimising production strategies through revision/upgrading of fixturing and tooling. Generation of the root form is completed as part of a full blade machining process. The as-extruded root form is initially prepared as a precisely milled block, following which a form cutter is used to finish machine the main form. Other machining processes follow according to the specification of the stage for which the blades are being produced.
Prior to adoption of HORN tooling Centrax had utilised an inserted three bladed cutter with inserts manufactured in its own toolroom. These inserts were produced to a very high standard so form accuracy was not a problem.

However volume and time constraints made it impractical to have the inserts coated and tool life was restricted to 50 root forms. In addition the location repeatability of the inserts in the tool holder meant initial set-up could be time consuming and the need for set-up adjustment frequently resulted in the first-off component being scrapped. Albeit the added value at this point was not high, it was an undesirable hiccup in what should be a smoothly flowing process.

Special tools jointly developed

Andy Bould, Centrax production and tooling engineer, explains. “Blade manufacture is a more-or-less continuous process with the rate of manufacture subject to fluctuations in demand from our customers. During peak periods our toolroom used to struggle to keep up with demand so it became desirable to develop an out-sourced solution that addressed those issues that we had.”

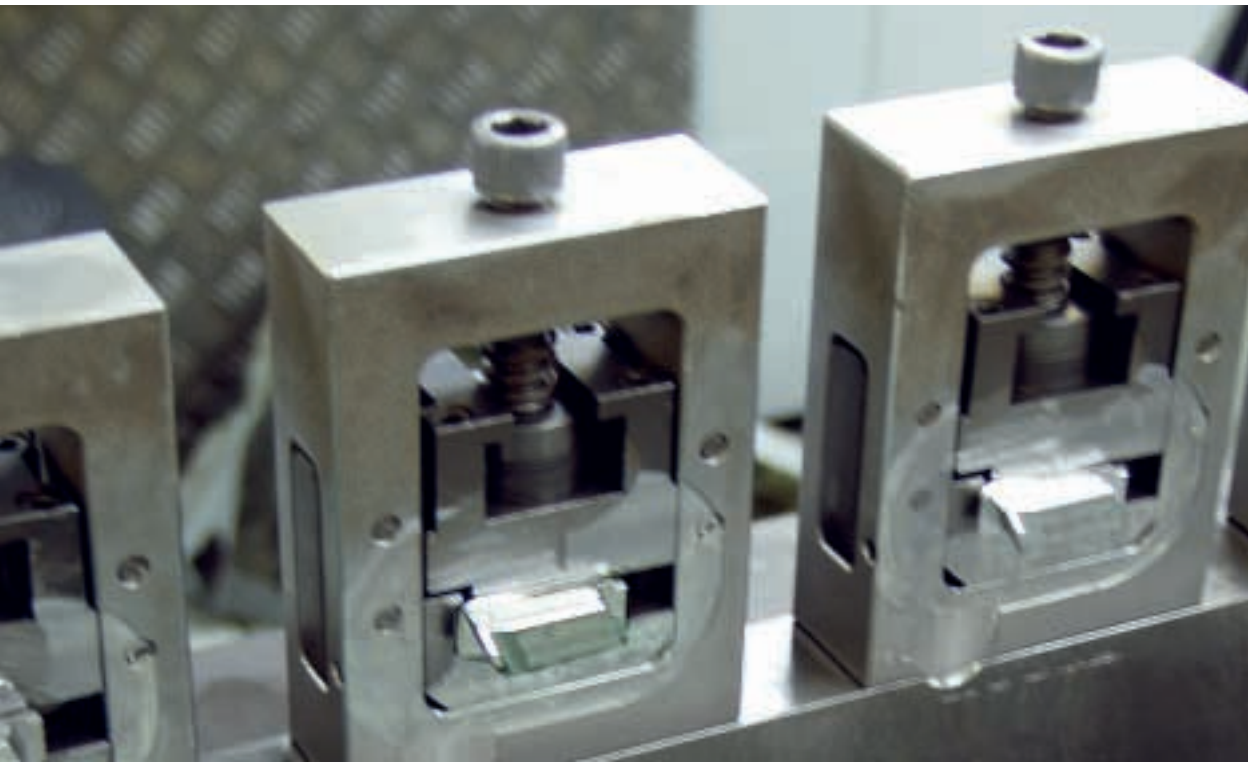
The solution was a joint development between Centrax, HORN UK and West Country Tool Company Ltd., which manages tooling supply under contract to Centrax. The tooling is based on cutters from the HORN Type 300 series of groove milling cutters with different blank specifications selected according to the dimensions of the root. These are ground by HORN to the specific form and then coated to optimise cutting performance.

HORN 300-series are three-blade solid cutters which attach to a tungsten carbide shank using a central screw fixing. Castellations on the back of the insert mate with a corresponding form on the end of the shank/holder to provide positive, high accuracy location and excellent torque transmission. In addition the tungsten carbide shank has a brazed-on steel nose which is fully replaceable in the event of collision damage.

10 times higher serviceable life

“The initial trials with the HORN tooling demonstrated an instant improvement in performance.” Mr Bould commented. “As well as a ten-fold improvement in tool life the combination of the coated HORN cutter with higher spindle speeds and feed rates, necessitated by its smaller diameter, gave us better finish. In addition the consistency of tool length between insert changes eliminated the need for set-up adjustment so scrap components have been all but eliminated and machine operator confidence has benefited.”

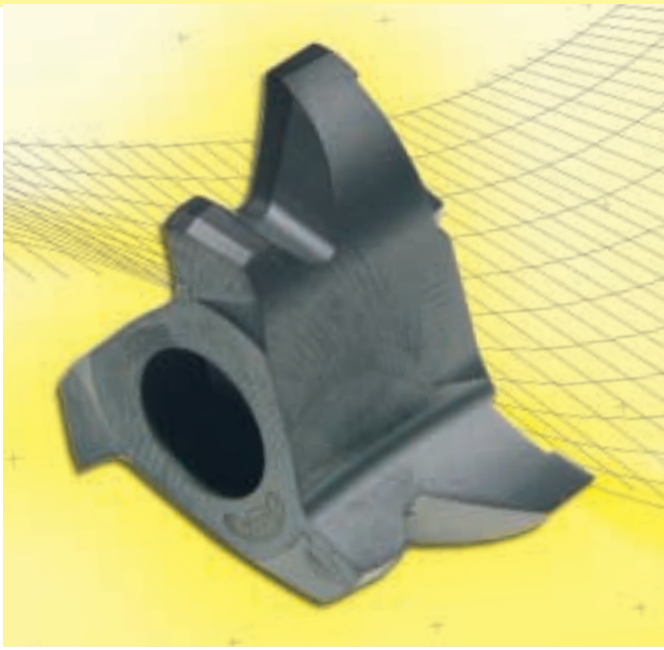
Following the success of the initial trials, HORN tooling was developed for a variety of different root forms. Tooling based on HORN insert types 313, 328 and 335 is now in service at Centrax, and has proved to be consistently capable.



Detailed view of the clamping system showing the root form of the blade

Convinced by advice and service

Apart from machining performance a key aspect of the application's success has been the consistency of quality and continuity of supply provided by HORN UK. Tooling is supplied via West Country Tool Company's WCT Integration offshoot which operates a vending machine based consignment stock system installed on the Centrax shop floor.
"We've been very impressed with the service that we've had from HORN." Mr Bould concluded. "Their investment in manufacturing facilities in the UK has served to reinforce our confidence in them while the success of the root form process has given us cause to assess how a similar approach to tooling might be helpful elsewhere."



Profile ground Special milling insert to machine the root form of the blades

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HORN System 335 –

High Performance Groove Milling Tools with patented locking system between Insert and Milling Shank.

Introduction of groove milling inserts of type 335 completes the range of 3- and 6-fluted HORN groove milling inserts. These have thus far been available with cutting edge diameters starting from 11.7 mm up to 27.7 mm.

Addition of insert type 335 provides maximum cutting edge diameter of 34.7 mm. Its availability fills a gap in the range of the available milling tools to the multi-insert milling cutters of type 380 which are available starting from cutting edge diameter of 44 mm.

Insert type 335 with asymetric location profile

The rear location profile on insert type 335 (3 notches) is a new design developed to ensure that there is no torsion of the insert and guarantee maximum rigidity once it is clamped with the central locking screw on the milling shank. In practice the system has already proved its high performance and reliability having been used by HORN for some time on special tools designed for ball track milling applications.
Its asymmetric profile helps to reduce forces which can cause loosening of the central locking screw during the cutting process by a minimum of 25%. With this profile there is therefore an enhanced level of security and rigidity in the clamping system. This is of particular value for largere diameters and wider profile widths. Depending on the insert form, profile widths of up to 15 mm can be supplied on type 335.
Because of these positive qualities the new location profile has also been applied to inserts of type 322 and 332.
It is important to mount inserts of this new generation on the compatible milling shanks of type M322, M332 and M335.

Retrospective

Turning Days, 23.–25.6.2005 in Villingen-Schwenningen

This fair, held for the first time in the 'Golden triangle of lathe operators' between Heuberg, the Black Forest and Switzerland, was a complete success. Over 3,500 visitors attended this regional trade fair, which is dedicated to the needs of turned parts manufacturers. HORN exhibited on a stand shared with Deckel Maho Gildemeister and was able to demonstrate our tooling in 'live' applications.

MACHTECH 2005 19.–22.4.2005 in Budapest

During the MACHTECH and CHEMEXPO Fair this year approximately 560 exhibitors from 23 countries showed their products and equipment in an exhibition area of more than 18,000 m².
The exhibition is organized every 2 years and has opened its gates for the 7th time this year. MACHTECH has developed into one of the most important trade shows in Eastern Europe, and provides a well organised forum for visitors and exhibitors alike.

The HORN Magyarország Kft. Stand at MACHTECH 2005 in Budapest

WESTEC 2005 4.–7.4.2005 in Los Angeles

More than 45,000 visitors were able to examine the latest tooling and machine tool industry developments at this years WESTEC.
This annual exhibition has established itself as the most important on the American West Coast. Once again the aircraft and aerospace Industry provided more than 45 % of the overall attendance whilst the automotive and defence sectors each accounted for a 26 % of visitor numbers.

HORN USA Inc. Stand at WESTEC 2005 in Los Angeles

Outlook

EMO, 14.–21.9.2005 in Hanover

EMO Hannover 14-21·9·2005

HORN will be attending the world's major production engineering exhibition, occupying Stand A 52 in Hall 5. Visitors to the stand can expect to see many new developments including DM milling cutters in 8 and 10 mm diameter, DS milling cutters from 0.2 mm diameter for machining graphite, different types of holders, boring tools, the latest Supermini innovations, new coatings, and advanced tools for machining grooves.

Turntec/EuroMold, 30.11.–3.12.2005 in Frankfurt

turntec

EUROMOLD

This International Trade Fair for turned parts, turning and milling technology will be held in parallel with EuroMold, the world fair for tool and mould construction and design and product development.
At Turntec HORN will be displaying new lathe tools and holders in Hall 4.0, Stand C 53 – B 52.
At EuroMold we will be exhibiting in Hall 9.0, Stand C 79 and displaying new lines for the DM and DS milling systems.

Solid Carbide endmill
of the DS System

MICRO MILLING IN THE MOULD INDUSTRY

HORN milling tools in higher Dimensions

Several sectors of modern industrial technology make use of micro-machined assemblies and components. Applications are found in the Automotive, Aerospace, Communications, Medical, Environmental and Energy Industry as well as the Machine tool Industry.

Regardless of whether the products are produced as prototypes or in small or high volumes the availability of micro machining capability using cutting tools is becoming more desirable as manufacturers seek an economical, low environmental impact alternative to galvanic and EDM processes.
HORN began to research the basic requirements for micro milling applications and development of relevant cutting tools several years ago. The aim has been to develop solutions that enable small and medium size manufacturers to apply this technology to their manufacturing operations.

Classification of Micro machining

'Micro machining' processes generally apply to working sections from 2 mm down to ≤ 1 µm. The cutting edge diameter for the tools with defined cutting geometries ranges from 0.1 mm up to 2 mm. HORN currently produces Turning and Milling tools for these applications with a cutting diameter starting from 0.2 mm. These are capable of covering a wide variety of micro machining applications and utilise the carbide grades, geometries and coating technologies most appropriate to the task.

Ultra fine grain carbide

Carbide is a powder metallurgy material with its main hard material contents like Wolframcarbide and Cobalt as well as binders. For the production of micro machining tools and their very fine detailed geometries, only ultra fine grain carbide can be used with grain sizes between 0.2 µm and 0.5 µm.

Grinding limits the profiling

After the sintering process of the carbide a high precision grinding process transforms the sintered cutting edge into a geometrically defined cutting edge with all the necessary top rake, front reliefs and lip angles. In practice, the carbide grain size and run out tolerances of the grinding wheels define the smallest possible concave radius profile – down to 40 µm – that may be manufactured. At these very small dimensions it is also necessary to consider the influence of chatter marks that can be introduced by the grinding process, and its negative impact on the straightness of the cutting edge.

“Dropless” Coatings

It is almost always desirable to reduce the friction between the cutting edge and the workpiece/chippings as this minimises abrasive wear and improves temperature resistance at the cutting edge. This can be achieved by protecting the cutting edge with a coating, the thickness of which ranges between 1 to 3 µm.

PVD coating using ARC Technology allows small droplets remain on the surface of the coating. The droplet size ranges from 0.5 µm up to 20 µm. The droplet itself has an undefined form and is capable of compromising the performance of the coating during the Micro maching application.
HORN therefore uses Sputter Technology to guarantee a much better coating surface quality. This process excludes the production of droplets and creates a topographically even surface along the cutting edge, an important requirement for the Micro maching process.

Top view of the inner radius of the chip space of a Micro endmill with Ds = 0.2 mm

Cutting Data: Theory and Reality

Today it is possible to machine on the latest 5 Axis HSC Milling Centers almost all complex 3 dimensional forms and profiles in materials such as Copper, Graphite, Plastics and Steel up to 70 HRC. However, for micro machining applications with very small diameter tools it is often not possible to run at sufficiently high spindle RPM to achieve optimum cutting speeds.
Depending on the effective cutting edge diameter of the milling cutter (Ds_{eff}) and for instance at a cutting speed of v_c = 160 m/min, the Spindle RPM required ranges between 50,000 min^{-1} (Ds_{eff} = 1mm) and 250,000 min^{-1}.
For example, using a ball nose endmill with Ds = 0.5 mm and a ap value of 0.05 mm and inclination angle of the milling cutter β = 0° the effective cutting edge diameter has a value of Ds_{eff} = 0.31 mm. This means that it is necessary to run at 169,000 min^{-1} to achieve the optimum cutting speed of v_c = 160 m/min.

During profile milling of complex contours it is possible to work without or with a positive/negative inclination angle of the milling cutter. This results in a large variation of the effective cutting speeds achieved along the cutting edge profile of the milling

Geometry male dies machined with micro milling process for inserts type S224 and S229

cutter. Most of the currently available machines offer spindle RPM's which are between 18,000 and 42,000 min^{-1}. With these values the cutting edge speed range is far below 80 m/min.

Clamping of the Tool and run out tolerance

Surface quality and the precision of the contour are heavily influenced by the clamping concentricity of the tool in the spindle.
This example is based on machining a male die from material 1.2842. Using an RPM of n = 30,000 min^{-1}, effective cutting width ae = 0.01 mm, a cutting depth of ap = 0.05 mm and a feed rate vf = 200 mm/min results in a feed rate per tooth of fz = 0.003 mm. If the run out tolerance of the tool set up is 3 µm, the logical consequence is that a double edged milling cutter turns into a milling cutter with effectively 1 cutting edge. To avoid this situation use of a shrink fit tool set up is recommended.

Security aspects in the process chain of Micro milling

The perfect combination of each individual parameters is absolutely important to achieve a positive result during the micro milling process.
By focusing on the individual parameters and investigating the relationships between them and the required sizes, it becomes apparent where difficulties exist in the area of high end and high precision machining in the miniature die and mould industry.
At HORN we are continuously expanding our R&D activities to improve our know-how in Micro machining. As well as the tooling this the environment of the machine, the machine tool side and specifically the coating technology.
As a result of that, our customers can expect highly reliable tooling and process solutions with the well known HORN Quality.

Milling tool examples of the HORN DM + DS system

FROM A BLANK TO AN INDIVIDUAL CUSTOMER SOLUTION

Our production facility, the source of our technological leadership

Over 100 CNC grinding machines work insert blanks into their final form

Paul Horn GmbH's world leading reputation for turning and grooving tooling, and circular, thread and contour milling technology stems from the fact that the entire genesis of a product from a blank to a finished customer solution is completed within our own manufacturing facilities. Only heat and surface treatment are outsourced.

This high degree of vertical integration combined with a broad product range demand a high degree of flexibility, excellent organisation and employment of the most modern means of production available today. Production is structured according to product groups in six divisions that are directly or indirectly involved with a product 's genesis. These are, insert grinding, holder manufacture, planning, training, maintenance and coating. Each division is sub-divided into departments that bear full responsibility for their field of activity.

Grinding using a high degree of automation

With 250 employees, the insert grinding shop at Tübingen is the biggest division by far. Operating a three-shift pattern, every year around 5 million cutting inserts in average lots of a 100 are worked into their final form. These quantities can only be produced using a high degree of automation applied to 4 and 5-axis CNC grinding machines. In practice this involves mechanised handling of the blank throughout the process of conversion to a finished insert, automated dressing of the grinding wheel(s) and centralised coolant supply including filtration and cooling to guarantee consistent, optimum conditions for the insert grinding process.

Over 100 CNC grinding machines have been converted and automated according to these criteria by HORN's in-house toolmaking and maintenance department.

In order to cope better with peaks in ordering, HORN always installs machines in pairs. Having identical machines provides a certain amount of 'overlap' and enables switch over between grinding of different types of cutting inserts to be achieved quickly without interrupting the flow of production. This also pro vides scope to fulfil unusual customer requirements within a short time without compromising normal production standards; something that other companies cannot do.

Tool holders machined to completion

Our 'tool holder' division,works two shifts per day to process some 10,000 production orders per year. Throughout the manufacturing process priority is given to throughput times of the shortest possible duration, consistent with maintenance of quality standards.
Components are manufactured in lot sizes of from 1 to 30. To minimise set-up time and fixturing costs

Walter Wiedenhöfer, Production Manager

five and seven-axis machining centres, are used to machine parts to completion by drilling and milling from bar stock held in a chucking device. For other components CNC turning and grinding systems are also applied whilst CNC universal machining centres are used for insert pocket machining,
Almost all fixtures and clamping devices required for production are created in the toolroom. However, although assigned to the tool holder division the toolroom also produces prototypes and special tool holders.
In machine terms, it is ideally equipped with 5 axis universal milling machines, cylindrical and surface grinding machines, spark erosion machines and CNC lathes. These facilities allows it to work to HORN production quality standards in the shortest possible time.

One of our core skills: In-house coating

In-house coating facilities are a basic requirement for the efficient manufacture of high performance tools. HORN began to acquire knowledge and experience of this area over ten years ago and has recently invested in PVD sputtered coating plants, a move aimed at offering customers the best possible solution. The facilities are designed for all current coatings, such as TiAIN and TiN,as well for the new generations of coating like supernitrides.
The key advantage of the sputtering process for HORN's customers is that this method creates a substantially smoother coating on the surface. This translates into lower friction during machining as the exit of the chip from the cutting zone is uninterrupted by random microscopic bumps. During turning, the tool is impressive as a result of its lesser inclination to build up edges and its lower friction, which markedly reduces the cutting load.

A barcode identifies each product

So that the company can maintain control over the great number of products in process at any given time, each order and all its process operations is encoded by means of a barcode. By scanning in his employee number and relating this to the job number a member of staff will identify the stage in the production process reached by the job.
This data will be processed using SAP system, so the applicable stage of manufacture for a part or a series can be immediately retrieved. However, a production planning system is only as good as the data as supplied by the various departments. So that we can largely match the actual situation to that projected, a daily fine-tuning session is carried out by the departments using priority indices. Along with continuous progress chasing, bottlenecks are identified early on. This allows the production planning department to reassign production priorities as required to meet delivery targets.

On the spot quality inspection

HORN production staff are not just responsible for manufacturing products on time, but also for their quality.
There is no centralized inspection at HORN. Each part is inspected at each stage of its manufacture, and, in the case of volume parts, according to statistical criteria. Inspection procedures are stipulated

in quality control plans and the result is likewise documented there.
The cost benefit for measuring and testing devices – each workplace and each department has the required instruments at its disposal – is reflected in the company's rejection and complaint index. At less than one percent, it is well below the average for the sector.

Commitment

By involving employees from the setting up and programming of the machine, right through to the release of finished parts, HORN aims to foster their commitment, giving specialists the opportunity to prove their competence and thus coming ever closer to the objective of maximising productivity by reducing downtime and setting-up time.
HORN's production facilities, workforce, organisation and mechanical equipment are aligned to provide the optimum service to its customers with high quality standard tools or customised products according to their individual requirements, all in the shortest possible time.

For Walter Wiedenhöfer, production manager at Tübingen, the primary goal is to be prepared for all eventualities and be able to react quickly to changing customer demands. In the course of this, he depends above all on having key processes available in-house, and on maximising their flexibility. In this he is supported by the company's strong commitment to ongoing investment in high capability manufacturing equipment, and in the training of a high quality workforce with the expertise to gain full advantage from modern technology.

These grinding machines were converted by our 'jig construction' department according to our concepts

These grinding machines were developed by the tool making department according to HORN concepts

HORN FRANCE – LÀ, OÙ LES AUTRES S´ÂRRETENT (STARTS WHERE OTHERS END)

HORN France came into being as an emergency solution. At its formation France was already the most important export market for Paul Horn GmbH – a position it maintains today. Our first subsidiary has built upon that foundation and currently remains our strongest external sales organization.

Pascal Ortega (Operations Manager), Pascale Le Gouill (Secretary), Didier Ortega (National Sales Manager)

From compromise to Sales success

The foundation of HORN France in 1993 followed a substantial reduction in sales of our products via the existing distributor for the French market. As France was already the largest export market for HORN it was essential not to have that sales volume reduced.

Initially the problem was addressed in co-operation with our distributor. Sales activities were supported via the appointment of two new application engineers Mr Pascal Ortega and Didier Ortega. However, this development enjoyed limited success and, as a result the management of HORN elected to re-organize sales activities under the HORN trademark, in preference to working through an independent distributor.

At the outset this venture was not wholly successful, largely due to the way in which it was organised. In common with many companies expanding outside their national boundaries, HORN initially underestimated the importance of establishing a local office with independent technical resources, and had no real idea of the size of the market. As a result an attempt was made to operate with a purely representative sales operation operating from Mr Ortega's spare bedroom, with technical support provided directly from Paul Horn GmbH in Tübingen. The perceived lack of investment in the local market undermined the confidence of French customers in our products, making it difficult to expand the customer base.

Growth with a own Team

In 1995 it was decided to establish a fully supported HORN sales organisation in France in Brie Comte Robert (along the Peripherique of Paris). The number of Sales and Administration personnel was increased and a warehouse was established to offer deliveries directly from the French office to end users.

This was the turning point for HORN France. Continuous sales growth well in excess of 15 % annually, increases in the number of employees and pressure on office soon space made it necessary to move the Sales Office to a larger location.
This new location was found in Moissy Cramayel also adjacent to the Peripherique of Paris. Parallel to the development of the main office it became important to cover also the high potential market in the south eastern part of France, in the Haute Savoie region. In this region there are more than 800 potential customers supplying the automotive and micro-technical industries. A second office was therefore established in Scionzier to guarantee further development of HORN France.
Because of the very successful activities of our colleagues in France, the customer base came to include a number of high profile companies. These now include Groupe PSA, Airbus, Renault, SNECMA, Ford, Renault Formula 1, Mechachrome and many more. Overall the customer portfolio contains more than 2,000 customers.

Office Scionzier

On the way to become market leader

Today HORN France employs in total more than 40 people and sales for 2004 were more than € 10 million. In April 2005 a new of fice complex with approximately 1,800 m² was built to specification. This investment was justified by the need to continuously improve customer service, technical support and training activites as well as support commercial expansion. Since 2002 HORN France has also been a member of the “Syndicale des Carburiers”, an association of the most important carbide manufacturers and suppliers in France.

HORN France – Là, où les autres s'ârretent (starts where others end) has developed to a highly successful organization. It is poised to emulate the HORN parent organisation in Germany by achieving market leadership in France for grooving, parting off and groove milling within the next couple of years. In terms of applicable tooling technology, HORN France already occupies the pole position in the French market.

Office Moissy Cramayel – Seminar Room

Office Moissy Cramayel – Entrance

Introducing:

Our Logistics Department

A well-honed team of employees ensures a smooth process

High availability

Over 27,000 different HORN tool components, including inserts and tool holders from our standard and specialised programmes are stocked in the computer controlled carousel storage system at Tübingen. The logistics department is managed by Norbert Menke, assisted by an ingenious logistics system and his well trained team of 25 personnel. Together they ensure that from the total of 600,000 stock lines up to 900 consignments per day are ready for dispatch all over the world. From Monday to Friday orders arriving up to 18.00 hrs from home and abroad are ready to leave the premises that same day. In an emergency, orders can be picked and packaged on Saturdays or on German Public Holidays for shipment to customers of HORN France or HORN UK by next working day delivery.

Best possible delivery

The logistics department is a vital facility within the company and is very much a service oriented organisation. As well as finished tools and components it manages the unmachined parts and materials store for in-house manufacturing, the customised tooling operation, the ticketing and finalization section, the despatch section, the goods received and despatch bays, plus commercial handling and customs liaison. Its location adjacent to the production facilities assists its integration within the supply chain for smooth operation, and saves time when implementing customer requirements. A 'trade counter' facility means that, if a local customer telephones his order, he can come and collect stocked parts 15 minutes later, labelled, ticketed and environmentally packaged.

Rising to the challenge

People in the department regard special requests from customers as more of a sporting challenge than a tiresome interruption of their routine. A recent example is that of a customer from Cristian in Romania. The manager of the factory called to say that his machines were idle and he needed replacement tools as a matter of urgency. Norbert Menke immediately got on the phone to find a courier service that promised to deliver the goods to Siebenbürgen the following day, rather than the three days offered by other parcel services he had contacted.
(Almost) nothing is impossible: A customer from the USA sent a 'cry for help' on a Friday afternoon, to the effect that he had to have some new cutter shafts immediately. An unsuspecting sales representative from a courier company turned up in Mr Menke's office on that very afternoon. The latter handed over the package and on Saturday the customer in Chicago received the goods, which had already been cleared by Customs.

Some 27,000 different tools are constantly available

Introducing:

Ralf Rosmus, sales representative

Ralf Rosmus impresses customers with his convincing advisory skills

Since April 2004, Ralf Rosmus has been the point of contact for HORN customers in Thuringia and parts of Saxony-Anhalt.

Ralf is ideally equipped for his role in technical advice and sales, having progressed from apprentice through to foreman and production management in manufacturing industry.
Born in the GDR, as it was then, in 1960, he initially trained as a specialist lathe operator. He then attended the engineering school in Schmalkalden to improve his knowledge and qualifications and was eventually promoted from vertical lathe operator to foreman in the mechanical fabrication of the same company. The technical and business management knowledge he acquired during his studies were then applied as a technologist in the process planning office.

After the reunification in 1990, Ralf Rosmus made the move into sales with a distributor for machine tools and other tools. The experience gained during this time and his many years working in industry gave him the confidence and competence to provide advice that his customers were happy to rely on. Ralf is based in Zeulenroda. The town which lies between the motorways A9 (Nuernberg – Berlin), A4 (Dresden – Erfurt) and A72 (Hof – Dresden), giving him good access to customers in the important cities of Suhl, Chemnitz and Wernigerode.
He is married with 2 children, and in his spare time he indulges in angling and running marathons as often as possible. For both hobbies his homeland, the Thuringian Vogtland, offers outstanding facilities.

Sven Joos, Sales 1

Sven Joos is outstanding on account of his sound PC and CAD knowledge

Sales 1 provides support for car manufacturers located in Germany. The department works with the design and production departments at HORN to provide a range of technical services.

These range from initial quotation through tooling and methods development to delivery of the finished tools. This process progresses in co-operation with the technical representative responsible for the particular OEM. So that these individuals can respond faster and more substantially to customer requirements, we have reinforced our sales office in the shape of Mr Sven Joos, who joined the company in November 2004.
Sven's remit is one of project supervisor. Starting with the customer's drawing for the part, he will co-ordinate development of special tooling from its conception through to its initial production trials. This includes agreeing the 3D model of the tool with the user and planning manufacturing timescales in co-operation with HORN's production facility. Having someone employed in this specific role ensures that special tooling orders are completed as efficiently as possible.
In fulfilling this role, Sven Joos benefits from both his technical and his commercial training. Born in 1976, he started his career as an apprentice in the field of precision engineering. He then gained working experience as a craftsman, before receiving further training to become a state-certified technician specialising in product engineering. Further advancement followed a course of study leading to graduation in business administration.
His broad training, supplemented by sound PC and CAD knowledge enables quick and effective communication both with work colleagues with customers. This gives Sales 1 a worthwhile advantage in terms of the service it can provide to its clients within the German automotive industry sector.

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

HORN is at home in over 70 countries across the world

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