Issue 1/13

world of tools

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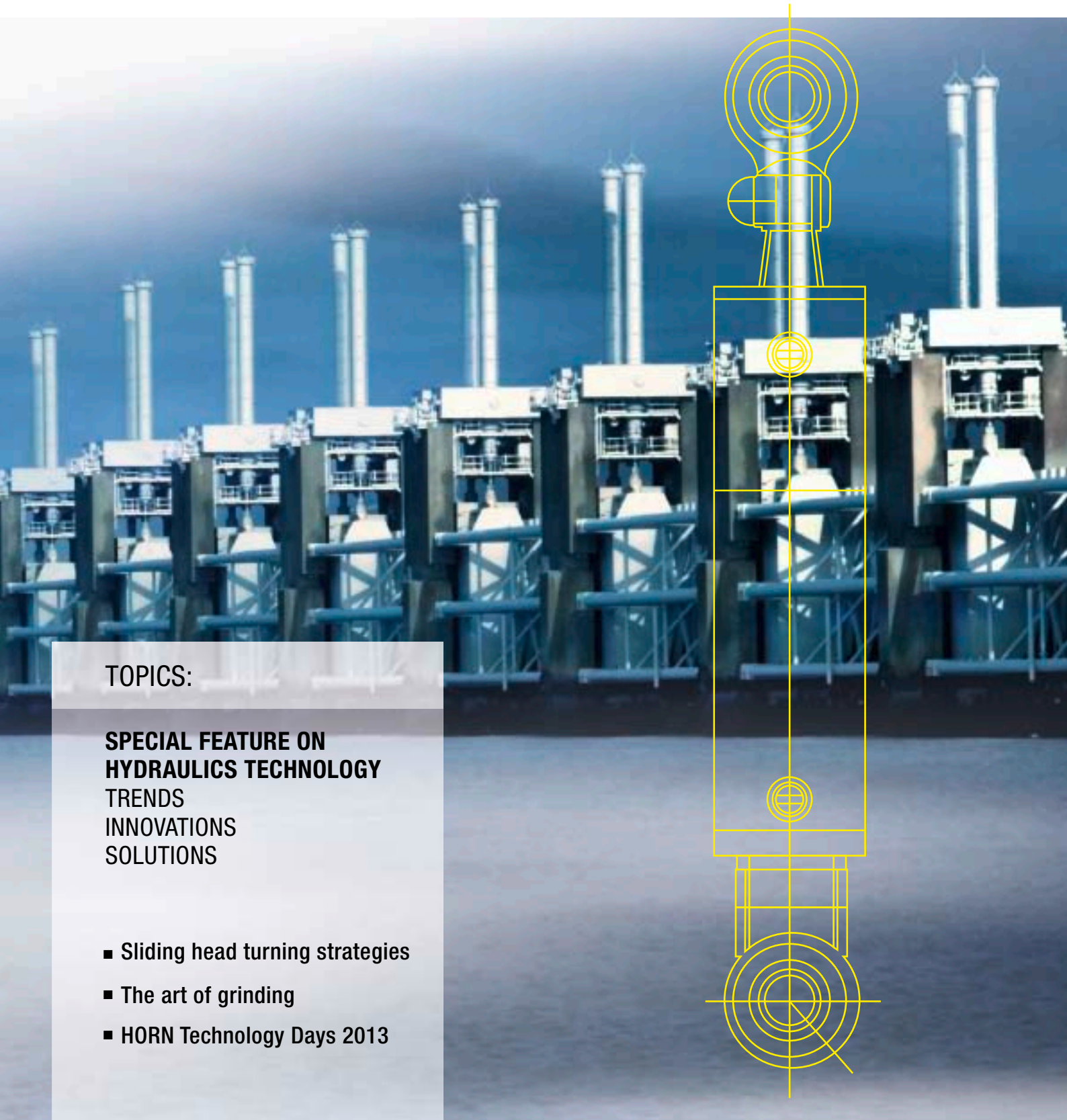
THE CUSTOMER MAGAZINE FROM HORN



TOPICS:

SPECIAL FEATURE ON HYDRAULICS TECHNOLOGY
TRENDS
INNOVATIONS
SOLUTIONS

- Sliding head turning strategies
- The art of grinding
- HORN Technology Days 2013

EDITORIAL

Dear Readers,

Hydraulics, the main topic in this edition of world of tools, have their own special charm. The areas of application are numerous, yet the products are often not immediately apparent. They work in the background, possess maximum quality and functionality and never fail to fascinate. They are mainly used where loads are moved. The title page features an impressive example: the Eastern Scheldt storm-surge barrier in the Netherlands, where 124 hydraulic cylinders protect the country and its inhabitants from the floods of the North Sea. However, hydraulics can also be found in action much closer to home. Hydraulic drives can be found in agricultural and construction machinery, as well as in your car or bicycle, for example. These are mostly fitted with hydraulic brakes and shock absorbers. Our tools are mainly used for reaming, grooving, circular milling, thread cutting, drilling, line boring and for boring out. Qualified employees play a significant role here.

For a year now, the HORN Academy has dedicated itself to internal training and further development as well as imparting practical knowledge and background information in customer seminars. Pooling know-how and thinking together. This is how we develop solutions and take new approaches by maintaining a dialogue.

I hope that you find the new edition of the HORN customer magazine both interesting and informative.

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

world of tools

THE CUSTOMER MAGAZINE FROM HORN

Special feature on hydraulics

Products/news

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HORN Academy

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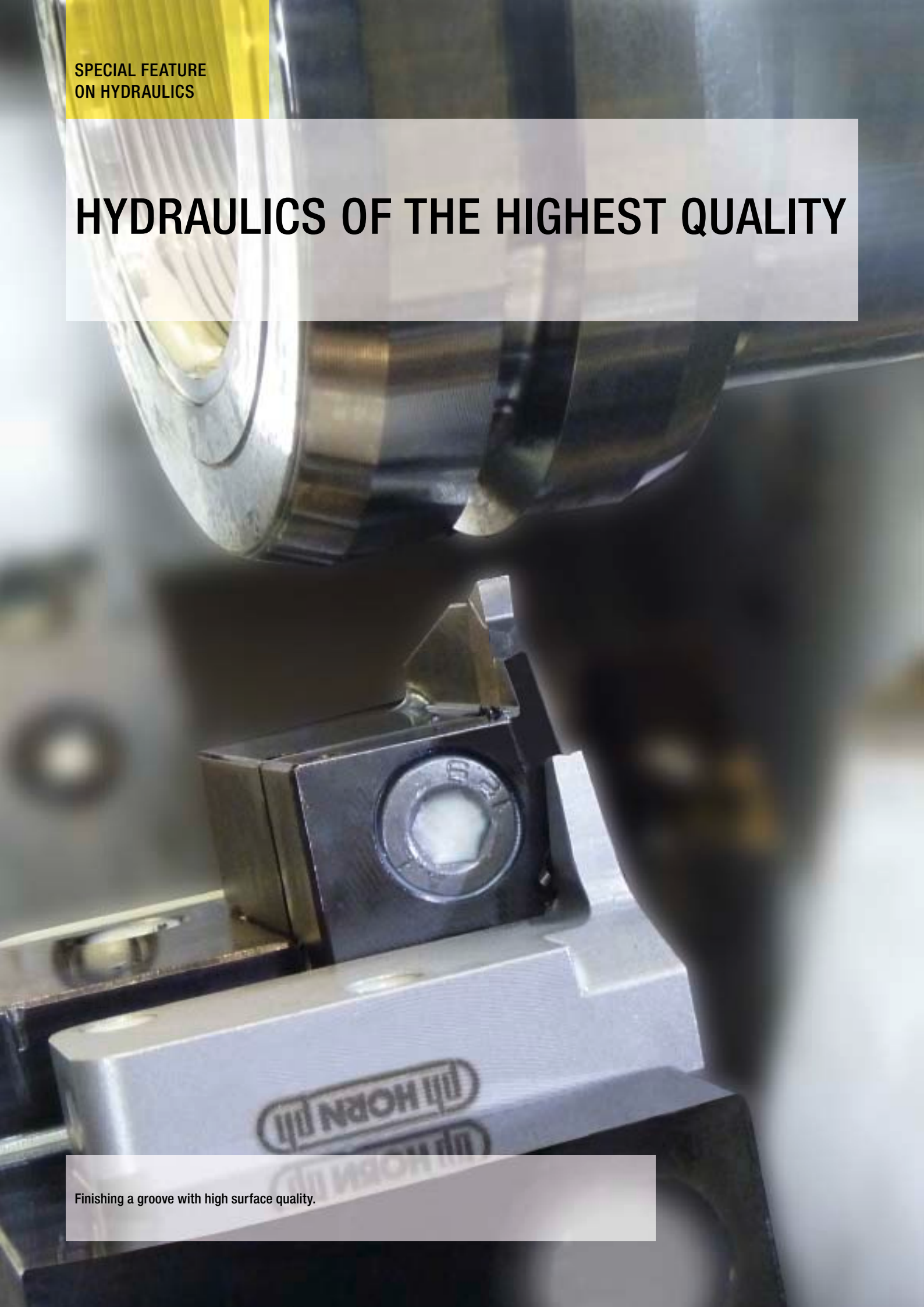
SPECIAL FEATURE
ON HYDRAULICS

HYDRAULICS OF THE HIGHEST QUALITY



Finishing a groove with high surface quality.

Developing solutions together

As one of the leading global manufacturers of high-quality injection moulding machines for plastics processing, ARBURG, based in Loßburg, Germany, almost exclusively uses tools from the tool specialist HORN in Tübingen, Germany, for generating the numerous grooves in their hydraulics systems: "When it comes to finishing, there are no better tools than HORN for us and our exacting requirements", says Joachim Bronner, Production Scheduler at ARBURG.

The family company, which was founded in 1923 in Loßburg in the Black Forest, currently has around 2,200 employees around the world. Over 1,700 work at the central production plant in Loßburg, which covers an area of 146,000 m². ARBURG is represented in 32 locations in 24 countries by its own organisations and in more than 50 countries via trade partners. The proportion of exports is approximately 60 percent. For 2012, the consolidated turnover is expected to be 488 million euros. ARBURG is one of the first companies to achieve triple certification as of 2012: ISO 9001 (quality management), ISO 14001 (environment) and ISO 50001 (energy). True to their guiding principle "ARBURG for efficient injection moulding" , the company focuses on "production efficiency" in all its activities and takes it into account throughout the entire value added chain – at product level as well as in their in-house production.

The advantages of using HORN tools in the rotation production area can be seen on a hydraulic component, which is representative of many other parts with similarly high requirements. The machining task here is to reliably and economically produce grooves for guide and sealing rings with the required level of quality. In addition, the external and internal diameter of the workpiece must be completely free of chips following the grooving process. The component material to be machined is a long-chipping tempered steel with a strength of approximately 1,000 N/mm².

Chips – toxic to high-quality surfaces

Up until summer 2012, the components were machined on a WFL M35 G without automatic part feeding. ARBURG then procured a new, fully automatic WFL M35 G with a gantry loader system to which these workpieces were moved. The reason for the purchase, as stated by Bronner, was to improve production efficiency. The focus was on flexible, just-in-time manufacturing of complex shafts and chucked parts of up to 50 kg.

The high level of automation opened up the possibility of unmanned operation for several hours. However, the requirements on the production process and the process environment have changed on a fundamental level. The presence of chips on the finished workpiece was not a problem with the previous manual part removal. However, with the automatic part removal, the parts gripper of the gantry would press any adhering chips into the high-quality surface and thereby damage it.

3 mm (0,118") cutting edge with little cutting pressure

During the first machining operation, four internal grooves are machined with flying clamping and a long throat depth of 250 mm (9,834"). An insert with low cutting pressure and op-

The L geometry ensures reliable chip break during internal grooving.

Four internal grooves for guide and sealing rings.

Automatic gripper on the gantry. Adhering chips must not be pressed into the high-quality surface during gripping.

Karl Schonhardt (l.) from HORN and Joachim Bronner from ARBURG: "When it comes to finishing, we only use grooving tools from HORN."

timised chip breaking is required. During pre-grooving, the type S224 insert proved to be ideal. With its chip breaking L geometry, it has huge advantages during partial cuts and only produces a minimum cutting pressure with its cutting edge width of just 3 mm (0,118"). This means there are no vibrations which has a positive effect on the tool life as well as the process reliability and thereby the costs.

Four grooves are created in the bore which has a diameter of 50 mm (1,969"). The monoblock holder with cassette has an HSK63-T interface. The internal cooling drives the short roughing chips out of the bore. The internal grooves are finished with an optimised NC geometry on a type S224 insert. The required surface quality for the groove base and flanks is reliably achieved despite both the rough machining and finishing operations being performed with very high parameters. Once finishing is complete, the bore is 100 percent chip free as required.

Double nozzle for optimum chip control

During the second clamping, the groove for a sealing ring is produced on the counter spindle in the piston area. Pre-grooving is performed with a type S229 standard insert integrated in the toolholder. Cooling is provided from outside. The remaining residual chips are cleared away during finishing. The high surface quality is reliably achieved for base and flanks. Finishing inserts of type 229 with an NC geometry optimised for the application are used or alternatively a type 224 carbide insert with TF coating. A special tool holder with dual internal cooling, one nozzle in the clamping finger directly above the cutting edge, another above the clamping finger, is aimed at the cutting edge and ensures that chips are deflected. This means that no chips stick to the high quality surface when the finished workpiece is automatically gripped and therefore cannot be pressed into it.

ARBURG has been using a wide range of HORN tools for grooving and milling for several years. In this regard, Joachim Bronner stresses the outstanding collaboration with field-based employee Karl Schonhardt and Application Engineer Rainer Saile from HORN. A team approach meant some problems were solved before they occurred and many production solutions have been optimised with new tool technologies and developments. "Many processes that are now automated would have been hard to realise without this teamwork", says Bronner. For finishing, ARBURG only uses HORN due to the high requirements in terms of surface quality and process reliability.

The knurls on the motor shafts are broached with a HORN type S117 special tool and are used to mount the rotor winding.

SHARP SOLUTIONS

The hydraulics specialist HAWE, based in Munich, is a leading manufacturer of hydraulic components. Their commitment to providing cutting-edge hydraulic solutions is reflected in the use of modern and high-performance production technology. Machine tools and machining technology meet the highest standards. HORN has been their key partner for demanding tool solutions for several years.

Hydraulic components and systems such as pumps, valves, cylinders and the many lower-level system components all share a common requirement: they must be robust, safe and long-lasting, and reliably able to cope with high and maximum pressures. The technology calls for ever more functions in increasingly compact dimensions. The 2,100 employees (2012) of HAWE which was founded in 1949 and has plants in Munich, Kirchheim, Dorfen, Sachsenkam, Berlin, Salem, Freising and a new site in Kaufbeuren achieved a turnover of 320 million euros in 2012. Numerous subsidiaries and partners around the world are testament to this flexible medium sized business's claim to be a global technology leader.

HAWE is a sought-after partner in all business fields with its technically sophisticated and economical hydraulic components. HAWE systems can be found in energy technology, in the field of infrastructure, in food and health, in resource extraction and in efficient production machines. They reliably control systems for wind and solar energy, they can be found in construction machinery, cranes, municipal equipment and rail engineering, agricultural machines, in the food industry and medical technology, oil and gas production, mining, machine tools, hydraulic tools and much more.

The Freising plant with 400 employees mainly specialises in hydraulic units for machine tools, construction machines and renewable energy as well as recycling. Production takes place according to a smoothly controlled flow principle from machine to machine, operation to operation, without cost-intensive interim storage. The tools are clearly visible in the production process. One example is the machining of rotor/motor shafts for compact

Three knurl teeth with a tooth height of 0.4 mm (0,016") are broached with the S117 broaching insert – three times as fast as before.

hydraulic units for use predominantly in machine tools. HORN tools are used in five challenging operations here: For knurling, for boring out the internal diameter for internal toothing, for broaching an internal slot for a parallel key, for the manufacture of the internal toothing as well as for trimming the burr of the rotor winding pressed against the shaft. The materials to be machined are ETF100, 42CrMo4 or CK45 depending on the application of the shaft.

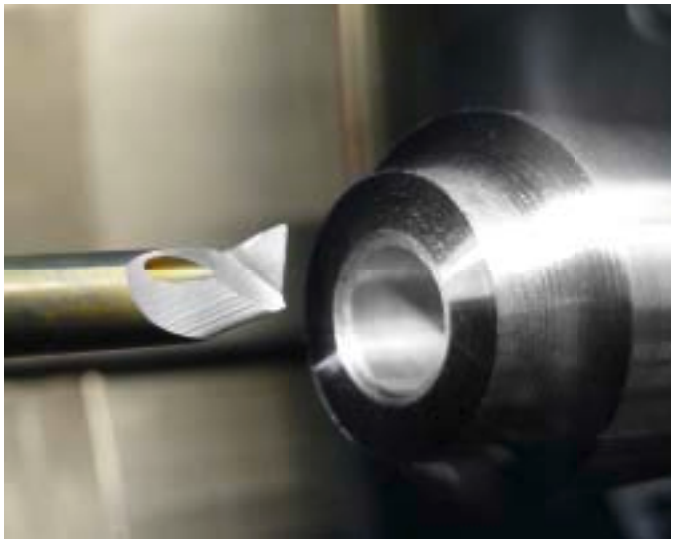
Broaching knurls instead of knurling

Previously, the 50 to 80 mm (1,169" to 3,150") long knurl for securing the rotor winding was created with a cut knurling tool. This resulted in some imprecise knurl areas and pressed-in chips. To achieve a better quality result, they switched to broaching the knurl teeth with a type S117 single-edged carbide plate from HORN. This indexed one tooth at a time. To speed up the process, a three-tooth insert with a specially profiled shaft radius was developed in conjunction with HORN. Now three knurl teeth with a tooth height of 0.4 mm (0,016") are broached with a high level of quality and accuracy in full profile. In addition to the three-fold increase in speed, the tool life of the broaching insert has increased by a factor of five. The broaching insert with its larger size and improved guidance is also more resistant to the transverse and longitudinal microvibrations created during broaching. Over the year around 3,000 shafts are produced in batches of 200 pieces. The operation time for broaching has been reduced from 2.5 to 1.5 minutes. For 200 shafts, this results in a machine hourly rate saving of around 3.5 hours, for 3,000 shafts this is a saving of over 50 hours a year. The type S117 special insert is optimally protected against wear with the highly capable TA45 grade coating. In addition to the reduction in non-productive time, there was another benefit: Tripling the indexing process and the broaching strokes also reduced the load on the Gildemeister Twin 65 by a third.

Only HORN will do

The internal diameter on the shaft is drilled to a depth of 17 mm (0,669") in preparation for the internal toothing and bored out with a Supermini® insert with internal cooling to an internal diameter of 10.8 mm (0,425"). At the same time, an undercut with a depth of 14 mm (0,551") is created at the bottom of the hole for the subsequent broaching of the internal toothing. The internal toothing is a multi-tooth profile according to DIN 5480 for mounting a toothed wheel pump. The 18 teeth with a tooth depth of 0.6 mm (0,024") are broached by three cuts per tooth, the cutting depths are 2 x 0.25 mm (0,010") and then 0.1 mm (0,004"). In this case, the type 105 special insert features the new AS45 coating. The new coating increases the tool life by almost 50 percent in comparison to the initial trials. In this case there is no comparison to the previous machining processes, as only the HORN solution was considered due to the positive long-term collaboration with HORN and the relevant field-based employee Michael Götze. HAWE has been successfully using the broaching tools for several years now.

Even the keyway on the opposite side of the shaft is broached using a HORN type S117 broaching tool. The profile of the cutting edge covers the entire width of the slot. The cross-section is efficiently created in 80 rapid strokes. A cross-hole in the bottom serves as a chip outlet. This prevents the workspace



The bore on the front face of the motor shaft is bored out with a type 105 Supermini® with internal cooling and equipped with an undercut for the subsequent internal toothing.

The teeth of the internal toothing are broached to a tooth profile depth of 0.6 mm (0,024") with a type 105 special plate in three infeeds.

For Production Engineer Michael Etschbaum and Segment Manager Franz Prummer (both employees of HAWE), the tool specialist HORN is by far the most important supplier "for solutions that definitely enable us to grow".

from becoming clogged as well as preventing the chips from being run over in reverse.

Cutting edge for a narrow gap

An additional type 315 special insert deburrs the aluminium end profile of the pressed on rotor winding. Between the rotor winding and the shaft there is a narrow gap on both sides of the winding. The surface turning of the winding faces inevitably results in a burr here, which must be removed. Franz Prummer, the responsible segment manager at the HAWE plant in Freising came up with an idea which he discussed with Michael Götze and which was then implemented in the usual rapid manner. "Although the manual deburring could be performed simultaneously, we use machine deburring. Manually deburring rotors over five kilos doesn't fit my idea of ergonomics and reproducible quality. I showed HORN a sketch of my idea and the solution was implemented in the machine in next to no time."

A type 315 insert with a dual wedge-shaped cutting edge, one with a 80 degree cutting angle, "so that it doesn't drive against the face, but completely catches the burr", and one with 45 degrees for the chamfer, is now used. Due to the narrow gap between the shaft and the winding, the cutting edge is tapered in the 80 degree area to a width of up to 1 mm (0,039").

Having worked at HAWE for 26 years, Franz Prummer always has his finger on the pulse when it comes to technology and he is using his experience to develop an exemplary production area. HAWE have enjoyed a highly successful collaboration with HORN and Michael Götze for several years. Numerous solutions have been developed together – and are always being optimised. "Helmut Hoffmann, Applications Engineer at HORN, has also supported us with optimisation in a very professional manner. HORN is by far our most important partner in terms of technology and solutions that definitely enable us to grow." The range of HORN tools at HAWE consists of well over 250 items, which are used at all production facilities. Together with Götze and the designers in Tübingen, they mainly develop and optimise special geometries across all product groups such as circular milling, broaching, boring out, and grooving. Prummer and Götze estimate the number of machining operations that this covers to be over 500. "Our estimation might be a little out, but it's certainly not any lower", says Götze with a smile.

From left: Armin Jaud from HORN with Markus Quapil and Horst Bromm from Weber-Hydraulik: "It is the people who define a partnership. Partnership is more than a good customer-supplier relationship."

"... AN EXCELLENT PARTNERSHIP."

Over 70 years of experience make Weber-Hydraulik, based in Swabian Güglingen, Germany, a competent specialist in hydraulic applications. HORN has been a key partner for many years with its cutting tools – an extremely positive collaboration for both companies. For slot diameters below 25 mm (0,984") and circular milling, they only use HORN tools – and with good reason.

With 1,900 employees and a turnover of 330 million euros in 2012, Weber-Hydraulik is a leading and innovative international player that implements sophisticated, customer-specific solutions for hydraulic drive and control engineering. The product range extends from components to systems for mobile and stationary applications. Weber is also known for its high-quality rescue equipment, such as spreaders and shears which are used by the fire services and emergency management bodies.

High level of vertical integration at Weber-Hydraulik

One of numerous different parts is a guide piece for a suspension cylinder which ensures driving comfort in the cab of modern tractors. A precision component with several connections and functions. The material is forged S355 JZG3 (St 52) with a strength of 520 N/mm^2. And, as Horst Bromm, CNC programming employee who is also responsible for tool management at Weber, knows: "Tough, difficult to machine due to the material variations, long-chipping, with inclusions and hard spots". Despite this, St 52 is a typical hydraulic material.

Technology proven over many years

The two sealing surfaces for Ermeto couplings with diameters 17.8 mm (0,701") for the accumulator connection and 13.8 mm (0,543") for the oil supply are milled by circular interpolation with the same type 306 three-cutting edge tool with special geometry. The sealing surface is conical at 15 degrees with a rounded transition to the face and a 45 degree entry chamfer to the thread and in the milling cutter contour. The profile miller plunges with a quarter circle, completes a full circle and exits with a quarter circle. The entire process takes up to five seconds depending on the diameter. The external cutting edge of this circular miller is 11.7 mm (0,461"). 40 different components and diameters can be machined with a total of three different insert types, one type 306 and two type 311.

The component batches contain between 50 and 1,000 pieces. They are all fully machined on a DMG Twin 102 turning and milling centre. In the case of the part mentioned with a batch size of 1,000 pieces, the tool life of the high-precision profiled type 306 three-cutting edge tool is sufficient to reliably cover the entire order.
It is coated with the TA45 TiAlN coating. Even after the thousandth sealing surface, it achieves the required high level of dimensional accuracy and surface quality of Ra10. As this works so well, only HORN tools have been used for this operation for ten years – continuously optimised and as 100 percent reliable as ever.

Guide piece for a suspension cylinder, a component with several precise internal contours.

Rough milling is performed with a type 308 circular milling cutter with long throat depth.

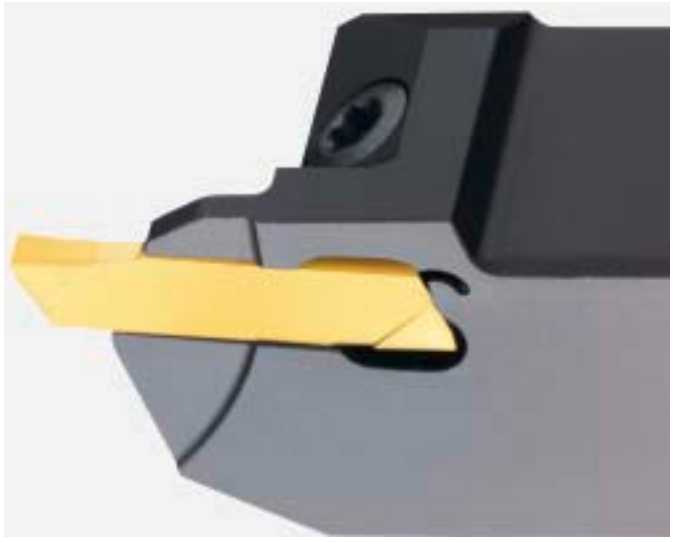
Comma chips instead of snarl chips

The four grooves in the inside contour have different functions. The outer groove accommodates the dirt scraper, the next the guide belt for the piston rod, then the piston rod seal as well as an undercut for the oil supply to the cylinder with four transverse oil bores.

All four grooves are prepared with a long throat depth type 308 circular milling cutter with a diameter of 15.7 mm (0,618") and a cutting edge width of 2.5 mm (0,098"). The internal diameter is widened from 18 mm to 25 mm (0,709" to 0,984") in the groove. The parameters here are: t = 3.5 mm (0,138"), n = 3,000 rpm, feed rate of the C-axis 3,200 degrees/min, which corresponds to around nine spindle revolutions per minute. Previously, when the component was rough and finish machined as a turned part with turning tools, the unpredictable long-chipping material created uncontrolled snarl chips in the bore. Today, with internal circular milling via the C-axis, only short comma chips are produced. The result is a fully reliable process that is suitable for gantry load/unload.

Basic principle: if the going gets tough, turn to HORN

All four grooves are finished using the same type LS114 tool with sintered chip geometry for additional chip control. The two front grooves are finished on the main spindle and the two inside grooves on the counter spindle. The grooves are created with two contour definitions per contour, in one cut. In the case of the inner groove, the flank of the groove must be deburred once more after the four transverse bores have been drilled. The parameters for finishing: Diameter from 18 mm to 25.3 mm (0,709" to 0,996"), n = 2,100 rpm and feed rate f = 0.05-0.07 mm/rev (0,002"-0003"/rev).
It never ceases to amaze Horst Bromm that one tool can be used in such a universal manner – "when it's from HORN". "We have a basic principle: for small components, small diameters, deep slots, high reliability, difficult materials, automated processes and a high level of surface quality, we only ever use HORN tools and this principle has never let us down. We have decades of experience with HORN, have never been disappointed, our understanding is based on appreciation – an excellent partnership."



System 264 for grooving and parting off.

Tools for tight spaces on long lathes.

SOLUTIONS FOR SMALL PARTS IN BIG VOLUMES

Sliding head turning strategies

Tool solutions for volume production of small parts on long and short lathes

Workpieces with short or medium diameters are machined on automatic lathes with bar magazines. It is mostly narrow and long workpieces that bend due to their low stiffness and the forces acting during machining. This can result in dimensional and profile errors which are outside the specified tolerances. This can be prevented by using sliding head or sliding bush lathes. This means that the radial and axial machining forces, determined by the kinematics, directly affect the chuck. This results in only small deformations at the cutting point. Typical workpieces are precision parts for precision engineering, particularly for the watch making industry, tool building and medical technology.

Sliding head/bush automatic lathes differ in two basic different structural principles. In the case of the "Swiss principle", a fixed guide sleeve fixes the workpiece in a radial direction and it is pushed through the guide sleeve by the workpiece headstock which moves in the axial direction. The tools can be arranged directly in front of the fixed guide sleeve and only need to be adjusted in the x-direction, as in the case of a Traub TNL 16, for example. The structure with fixed sliding bushing enables different operations to be performed on the main and counter spindle: simultaneous use of two turning tools on the main spindle, simultaneous turning on the front and rear side, simultaneous transverse milling with positioning via the C-axis, use of the counter spindle as milling spindle, threading with single or dual clamping of the workpiece, thread whirling or milling on the counter spindle.

The second structural principle of long lathes is the "Offenbacher principle", as in the case of a Traub TNL 32, for example. It involves a fixed workpiece headstock and the guide sleeve is moved in the axial direction towards the workpiece headstock. In order to engage the tool directly in front of the guide sleeve, the tools must be moved in the axial direction. Possible operations are: simultaneous use of two turning tools, simultaneous turning on the front and rear side, simultaneous tuning with dual clamping of the workpiece, radial and axial machining on the main and counter spindle, milling on the counter spindle, including with dual clamping of the workpiece. For axial or angular machining operations such as drilling and milling, the upper turret can be continuously adjusted within a range of 0 to 90 degrees. The radial position is determined by the C-axis.

High precision and tight tolerances

Cutting directly in front of the guide sleeve creates very robust working conditions, which enable the machining of tough and high-strength materials with large cut depths and high feed rates even on long workpieces with a high degree of accuracy and tight tolerances. For support, the workpiece can also be supported or held via the counter spindle.
Long turning also enables efficient and economical series production of typical short turned parts. The process uses the high chip capacity, the rapid pick up times of the counter spindle and the extremely short change times of the tools, which are mostly attached to a stable linear slide. A further advantage of long turning is the low vibration and oscillation tendency due to machining close to the guide sleeve. This results in increased accuracy, improved surfaces and longer tool lives of the tool cutting edges.

Special conditions taken into account

When constructing the tools for long and short turning, HORN took into account the special conditions of both processes:
– The accessibility of the clamping bolts in the machine.
– The height and head size of the tools were minimised for use in linear units.
– Where necessary, tools are equipped with an internal coolant supply directly on the cutting edge.

HORN offers tool solutions for internal, external and back end machining and for multi-edged milling or thread whirling. For this purpose they offer round and square shanks, system fixtures, direct fixtures and quick-change systems as well as special solutions.

External machining

System 264
Grooving and parting off with groove depths of up to 16 mm (0,630") for rods with a diameter up to 32 mm (1,260"), longitudinal turning, threads with cutting widths from 1.5 to 3 mm (1,5 to 0,118"), grooving and longitudinal turning with a_p up to 1.5 x w

System 274
Grooving and parting off, longitudinal turning, thread cutting, back end machining with Graf system, can be screwed from both sides

System 361/386/396 with type 312 indexable inserts
Grooving and parting off, longitudinal turning, thread cutting, back end machining with Graf system

System 224 and 217
Grooving and parting off, longitudinal turning and thread cutting

Multi-edged milling
Tool solutions for multi-edged milling equipment for all standard machine types. Also specially tailored to the machine conditions, for example the Traub TNA12/7 with M275 multi-edge milling cutter on the counter spindle.

Back end machining

HORN offers a wealth of special tool solutions for back end machining:
– Direct fixtures for Tornos, Star, Traub, Citizen, etc.
– Height-adjustable tool holder
– KMmicro and W&F quick-change systems
– Direct fixtures with VDI cylinder shafts according to DIN 69880
– Internal machining with the extensive Supermini® 105 system from 0.2 mm (0,008") diameter
– Offset square shanks from shank diameter of 8 x 8 mm (0,318" x 0,318") type HC105
– Round shanks in imperial sizes with double-sided insert seats for Citizen, for example
– Tools with internal cooling
– Type 105 tool holder with minimal head sizes with union nut

DCX tool system expanded for larger slot depths

DCX solid carbide circular milling system for deep and narrow slots.

The DCX solid carbide circular milling system is particularly suitable for deep and narrow slots. It can be supplied with cutting edge diameters of 20, 25, 30, 35 and 40 mm (0,787", 0,984", 1,181", 1,378" and 1,575") for slot widths of 1.5 to 3.0 mm (0,059" to 0,118") in part as well as with shanks with a diameter of 10 and 12 mm (0,039" and 0,472"). Depending on the cutting edge diameter, the circular milling cutters have between 6 and 8 teeth. The milling depths have been increased to expand the areas of application. The carbide grade AS45 circular milling cutters provide an alternative to milling using saw blades.

Some of their applications include medical technology for machining surgical instruments, for cutting with narrow kerf and for applications which require a larger slot depth than standard circular milling systems can support. All sizes are available ex stock.

DG tool system with new cutting inserts

The modular DG milling systems has been expanded with a slot miller for deep and narrow slots with a slot width of 1.0 to 3.0 mm (0,039" to 0,118") for the DG10 size. The cutting edge diameter up to 30 mm (1,181") can be supplied with any number of teeth and any tooth shape. The carbide grade and coating can be adjusted to suit each machining task and material.

An additional milling cutter with DG interface for standard shanks, specially designed for use with CFRP materials in conjunction with diamond coating, is another addition to the universal DG system. The two-piece design of a steel shank and carbide exchangeable head displays the highest level of rigidity and concentricity.

DG milling system expanded with slot miller.

M100 – slotting cutter for pipes and solid material

M100 slotting cutter with exchangeable carbide cutters.

The slotting cutter with exchangeable 5 mm (0,197") wide carbide cutters is equipped with 30 teeth on its 630 mm (24,803") cutting edge. It is ideally suited for cutting pipes and solid material up to a diameter of 7". It successfully replaces the carbide tipped circular saw blades on inclined bed machines and vertical saws. It cuts an N80 oil field pipe with a diameter of 7", for example, with v_c = 180 m/min (7.086,614"/min) at f_Z = 0.12 mm (0,005").

M100 offers numerous advantages over carbide tipped saw blades: The coating of the cutting edges and the chip shape geometry can be optimised for each material to be machined and each area of application. The self-clamping cutting edges can be exchanged and drastically reduce the stock required for carbide tipped saw blades for finish grinding.
The cutter can be supplied with cutting edge diameters of 200 to 730 mm (7,874" to 28,740") and for cutting widths of 1.6 to 8 mm (0,063" to 0,315").

Modular grooving system for deep grooving and parting off

A standardised cassette interface for groove blades with groove depths of up to 100 mm (3,937") and widths from 6 to 10 mm (0,079" to 0,630") has been developed for the S100 grooving insert system. An integrated coolant supply directs the coolant to the cutting edge via the cassette. The modular system has been designed for the most common tool interfaces, such as HSK-T in axial and radial grooving versions.

The single-edged S100 groove system is ideally suited for deep grooving and parting off with groove widths of 2 to 16 mm (0,079" to 0,394"). Different grooving geometries and different coatings ensure optimised use. The cooling can be supplied via the clamping finger, laterally or through the insert. With its extensive, partly machine-specific range of holders, the S100 is a universal grooving system.

S100 grooving insert system with standardised cassette interface.

DAH37 tool system with new SC6A carbide grade

The new SC6A grade supplements the successful SA4B grade for high feed milling. The new carbide grade is ideally suited for rough machining with steel. The tough substrate is CVD-coated and suitable for high loads and thermal stress. The smooth surface of the cutting edges also prevents the formation of built-up edges.

The DAH37 milling system can be supplied with cutting edge diameters of 20, 25, 32 and 40 mm (0,787", 0,984", 1,260" and 1,575") as cutter head and screw-on milling cutter. Arbor milling cutters are available for 40, 50, 63 and 80 mm (1,575", 1,969", 2,480" and 3,150") cutting edge diameters. The very large radius on the main cutting edge of the triple-edged indexable inserts ensures a soft cut with excellent cutting division. Depending on the workpiece material to be cut, cut depths of up to 1.2 mm (0,040") and feed rates of up to 3 mm (0,118") per tooth are possible.

The DAH37 high feed miller is now available with the new SC6A carbide grade.

S100 cutting inserts with internal cooling

S100 cutting insert with internal cooling.

These cutting inserts with 3 mm (0,118") groove width and internal coolant supply for effective cooling of the cutting zone expand the previous areas of application of the S100 grooving system. The coolant jet acts directly on the cutting zone, thus ensuring the best cutting conditions. The nozzle shape ensures a targeted coolant jet, which aids chip forming and thus reduces the chance of chip accumulation. This also considerably reduces the formation of a built-up edge and reduces the wear on the cutting edge. In contrast to conventional cooling, this enables higher cutting parameters along with longer tool lives.

In particular, with hard-to-cut materials, the AS45 carbide grade and the EN geometry shape with chip former also permits good chip flow with long tool lives and reliability, even with long engagement times and at high temperatures. The square holder with left or right internal cooling can be supplied with the dimensions 12 x 12, 16 x 16, 20 x 20 and 25 x 25 mm (0,472" x 0,472", 0,630" x 0,630", 0,787" x 0,787" and 0,984" x 0,984") Depending on the version, the screw clamp or self-clamping permits a groove depth of up to 40.5 mm (1,594").

Lothar Horn, Chairman of the VDMA Association of Precision Tools.

LOTHAR HORN CONFIRMED AS CHAIRMAN

The VDMA Association of Precision Tools re-elected its previous Chairman Lothar Horn at its general meeting on November 22nd 2012. Hans-Joachim Molka was also confirmed as his deputy.

Lothar Horn has been re-elected for a second term as Chairman of the Association of Precision Tools. The Managing Director of Paul Horn GmbH in Tübingen will publicly represent the German manufacturers of precision tools for a further three years. His deputy Hans-Joachim Molka, managing director of Römheld GmbH in Laubach was also confirmed in office. In his speech at the general meeting in Hamburg, Mr Horn thanked members for their support and announced his intent to focus on training and advanced training during his second term.

There is already an array of example projects for recruiting, training and supporting engineers and skilled employees for the members of the Association of Precision Tools: namely the additional qualification of industrial specialist for cutting tools, the endowed chair in metal-cutting manufacturing at the University of Aalen or the new Bachelor's degree in cutting tool technology. However, in light of the increasing competition with other sectors for qualified employees, HR is becoming ever more important. As a result, Mr Horn called upon his fellow companies to get involved in training and advanced training and "head together towards a successful future with highly-qualified employees for precision tools".

VDMA

Präzisionswerkzeuge

RELIABLY CONTROLLING THE PROCESS

Giuseppe Di Gianni discusses the art of grinding at HORN.

Mr Di Gianni, the majority of HORN inserts undergo the grinding process. Why is this?

The market and customer requirements for machining demand an ever increasing level of precision. This high degree of dimensional accuracy and tight tolerances means that grinding is currently essential for the manufacture of high-precision inserts.

So, this would not be possible without grinding?

Grinding is used in the majority of cases. It enables a high level of accuracy. This is the only way to guarantee the shape or geometry of the cutting edges. There are also precision-sintered inserts. However, these cover a different tolerance range. The ground inserts can be made with tighter tolerances and finished in a more controlled manner than the sintered variants. In terms of production technology, we are therefore in a position to cover all requirements from small to large orders. Ultimately, the version used depends on the customer's application.

What level of accuracy are we talking about?

Some of our products are manufactured with tolerances of ± 0.001 mm (0,00003937") and this can also measure µ. It is not uncommon for us to finish normal series orders with a tolerance range of 0.005 mm (0,0001968"). In contrast, the tolerance of the precision-sintered insert is currently ± 0.05 mm (0,0001968").

What factors influence the grinding process?

It is essential to reliably control the process. Man, machine and methods must be coordinated down to the last detail across the internal added-value chain. There are many influencing factors, such as, the grinding wheel supplier. They must supply a consistent level of quality in order to achieve the stated results during the grinding process. This includes a constant room temperature and competent employees who are able to implement the high requirements. This is just a small part of what is required to ensure that the grinding process is optimally performed.

Let's talk about the infrastructure. How is your area structured in terms of machines and organisation?

In the grinding departments, there is predominately one machine type "developed in-house". Here, a basic machine combined with an automation system which is optionally tuned to the products and provides maximum flexibility is used. The processing lines each consist of ten grinding machines, which are operated by three people per shift. Despite the high level of automation and modern IT system, each employee has a high level of personal responsibility. Experience has shown us that this leads to very good results and optimum throughput. It is also worth mentioning that this has a noticeable effect on employee motivation.

What philosophy do you follow?

Our field sales force often report that our customers need the products as soon as possible. This requirement led to the development of the "GreenLine" production philosophy, whereby "Green" stands for the green light principle - i.e. a particularly fast throughput. This enables us to supply special tools within five days, with a consistently high level of quality. As the structures had grown it was necessary to carry out a personnel and organisational restructuring process.

What challenges did you face during the restructuring process and how long did it take?

Some departments had up to 80 people. This was particularly evident in terms of communication. Today each department has a maximum of 25 people, divided into three shifts. This meant that we required additional department managers, who we were able to recruit internally. It was important to retain the soft factors, such as team spirit, family atmosphere and the shared aim of providing the best result, despite the changes. We were able to complete the restructuring process in less than a year. Today, it is clear that our flexibility has significantly improved as well as communication.

HORN has a high level of vertical integration, added value is created in Germany, from powder through to the ground and coated final product. What enables you to manufacture competitively here?

The basic requirements are qualified and motivated employees with the classic virtue of "Made in Germany" as well as a high level of automation. In addition, we take a different approach to many others. We draw on expertise within the company. We can only have a direct influence on what we do in-house. Then there is the infrastructure that we have talked about, which has been optimised over many years.

Your employees must be highly technically qualified. Have you ever worked on a grinding machine yourself?

Of course. After my training as an industrial mechanic, I worked in the insert grinding area for seven years. So terms such as peripheral grinding, form/profile grinding or the application of protection chamfers are in my blood. In the past I have also worked in the work preparation and the special tools areas, also at a precision tool manufacturer. These experiences serve me well in my day to day work and when talking to people.

Giuseppe Di Gianni, 38, certified technician in mechanical engineering, has worked for HORN since 2011. In 2012, he was appointed head of the grinding production line.

A country which forms a hub between Europe, Asia and Africa.

TURKEY – A MARKET WITH A FUTURE

The Turkish economy is more dynamic than ever – even in the case of machining

Turkey covers an area of 814,578 km² and represents an attractive geographical link to Europe, Asia and Africa for commercial activities. In addition to being a hub, the country is also appealing as a market with almost 80 million inhabitants. Since 2011, Turkey has been one of the fastest growing economies in Europe. Mechanical engineering has since become one of the most important industries in the country.

Growth and change

The VDMA's export statistics on development in the area of precision tools point in one direction since the crisis year of 2009: upwards. The infrastructure of both the country and the individual sectors continues to adjust due to this recovery and is clearly tending towards a European level. This is also related to Turkeys plans to join the EU. In this regard, politics and industry have and continue to work towards complying with the requirements of the union. Nonetheless, the Turkish market is a challenge. Politics and industry still have their own rules, aside from official documents, which can provide advantages once one is aware of them and knows how to utilise them. Therefore, a partner who has experience of both German and Turkish business is normally required. For this and other reasons, HORN partners with Sumisertmetal in the Turkish market.

The formation of Sumisertmetal

Sumisertmetal was formed by the Turkish-based companies Milmak and Sumitomo Electric. Both partners founded the new company on 1st May 2012. Three months later they began to work with HORN. Although HORN had already been active in the Turkish market for several years, they decided to work with this new sales partner. Sumisertmetal sells HORN, Sumitomo and Wedco products all under one roof in Turkey. They are based in the municipality of Ümraniye, in the district of same name within the Turkish province of Istanbul. The Managing Director of the Turkish representative, Edip Bayizitlioglu, is also Managing Director of the HORN representative Wedco, which sells HORN products in Austria and Slovenia. This background provided an excellent basis for activities on the Turkish cutting tools market.

Positioning as complete provider

With approx. 25 employees and premises of 600 m², the company is positioned as a complete provider for precision tools. This collaboration is supported by Milmak, which continues to operate as a service centre and special tools manufacturer at the same premises as Sumisertmetal. As a complete provider,

Exterior of the Sumitomo premises in Turkey.

Sumisertmetal is able to offer all types of cutting tools from a single source, including application-dependent coatings.

Active across the nation

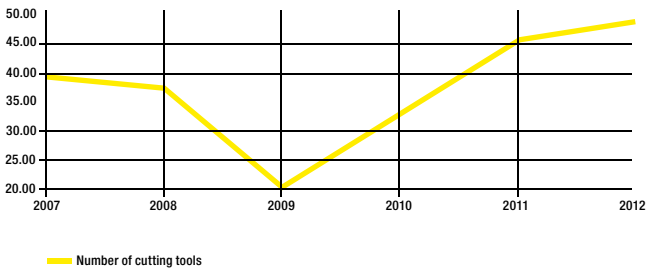
Sumisertmetal is represented by dealers in the larger, industrial urban centres such as Istanbul, Izmir, Bursa and Ankara. It also has its own field sales employees, who work on site. This shows that many high-tech applications can also be found in Turkey, whereby the best result is normally achieved through collaboration with the precision tool suppliers.

A look at the future

Turkey's entry into the EU remains one of the biggest questions. However, this decision is made at a political level rather than a commercial one. Nonetheless, the Turkish market continues to develop. Experts continue to forecast strong growth for the coming years – even in machining. The outlook is positive, the potential is there. Now we just need to utilise it. For HORN the path is: Sumisertmetal.

A look at the coating centre.

High-tech machines in the service centre.



Germany – export to Turkey: Selected goods.
Cutting tools in millions of euros.

Edip Bayizitlioglu, CEO of Sumisertmetal in Istanbul and Managing Director of Wedco (HORN representative in Austria).

> Turkey is one of the most rapidly growing national economies in the world ...

AN INTERVIEW WITH EDIP BAYIZITLIOGLU

Wot interviewed this experienced engineer about his collaboration with HORN

Mr Bayizitlioglu, Sumisertmetal has been the official representative of HORN in Turkey since 1st August 2012. What customer industries are there locally?

There is a wide range of customer industries in Turkey. The main ones are the auto, electronics and machine and systems industries. In addition, we are also well represented in the fields of textile machines, motor vehicles, supplier industries, wheel rim production, tool and mould making.

What technological challenges are you facing at the moment?

The emerging Turkish market currently has the same requirements as the rest of Europe in terms of technology. The in-house manufacturing options are somewhat limited but the quality standards are very high in many companies that specialise in exports. At large companies the specialists are trained to a high level. In smaller or medium-sized companies, there is still some catching up to do, but they are also headed in the right direction.

In your opinion what are the trends and key issues for Turkey in the future?

The energy sector is a key topic for Turkey in regard to the future. Large investments are planned in this area. The automotive industry is also very promising. When you think that Turkey doesn't even produce a million cars per year and it has 80 million inhabitants, then there is still a lot of untapped potential here.

"Quick", "custom" and "solution-oriented" are important HORN attributes. Are these also reflected in your customer's requirements?

These characteristics could have been designed for the Turkish market itself. Customers respond extremely well to HORN. Turkey has a very distinct market structure which is not readily transparent and is very different to that of other countries. Our competitors, who sell their products via promotions or sales offers, flood the market with cheap, and often less than optimum, tools. Unfortunately, this means that small companies quite often use the wrong tools. In this market situation, many customers are attracted to the approach taken by HORN and Sumisertmetal.

In Germany, they are anticipating a year as good as 2012. In other European countries the mood is somewhat more subdued. What expectations do you have for the Turkish market?

If the mood in Europe is subdued, then it is not euphoric in Turkey either. But it is definitely more optimistic. Turkey is one of the most rapidly growing national economies in the world, therefore we are assuming that it will exhibit clear growth in comparison to the Central European countries in 2013.

The production stages of a Supermini® tool. Our in-house production enables a high level of flexibility in terms of tool shapes and quantities.

TAKING CONTROL RIGHT FROM THE POWDER STAGE

Forward-looking "carbide tools" process chain

"With new machines and processes, we are also setting technological trends in tool manufacture here at Horn Hartstoffe GmbH. They enable shaping processes which would not otherwise be possible." (Lothar Horn, Managing Director).

Key facts about the new plant

- Floor area: 5,000 m²
- Investment:
- 14 million euros for the building
- 16 million euros in process technology and expanded resources
- Key investments:
- Toolmaking, preparation and mixing of carbide alloys,
- Shaping processes, sintering, quality assurance
- Employees: 62

Important work stations at a glance

Toolmaking
New production options for our injection moulding and pressing tools through capacity expansion for milling, eroding and grinding.

Mixing the source material
The manufacturing process starts with preparing carbide alloys in powder form (grain sizes 0.6 to 6 µm), pressing aids and additives into mixtures for pressing.

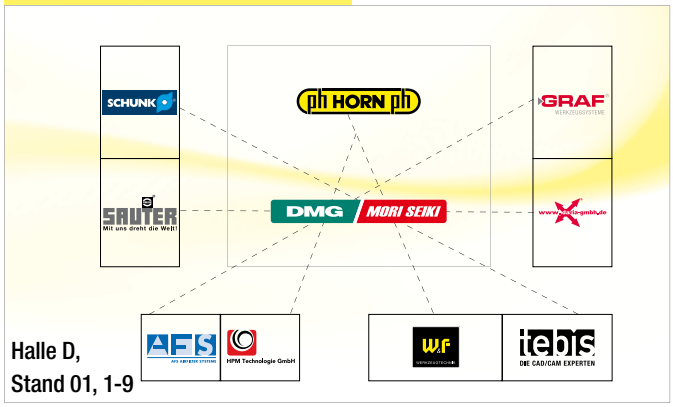
Direct and indirect shaping
Shaping the mixture into inserts or tool shanks. The green compacts created from the extrusion and isostatic presses (indirect shaping) are pre-sintered, then machined and final-sintered. In the case of axial pressing or injection moulding (direct shaping), pre-sintering and final-sintering are carried out.

Injection moulding of complex inserts
Creation of complex undercuts, free-form surfaces and geometries. We were the first tool manufacturer in the world to produce indexable inserts using injection moulding processes in 1992.

Pre-sintering removes pressing aids
After pressing or injection moulding, the green compacts are unstable. They are solidified during pre-sintering (820°C). They can then be cut with diamond tools.

Final sintering of carbide green compacts
The pre-sintering and chipping processes turn the green compact into a fully shaped brown part. Sintering (1,300-1,500°C) results in carbide inserts, whose volume has been reduced by around 20 percent.

Ongoing checks and in-process controls
Each manufacturing step is monitored and controlled. For example, through fully-automated measurement of the sintered insert, checks of the physical and metallurgical properties of the carbides, through batch-specific material analysis, tests and optimisation of the sintering process as well as microscopic porosity and structure examinations.



A LOOK BACK AT TURNING DAYS SÜD 2013

17th-20th April 2013 in Villingen-Schwenningen

TURNING DAYS SÜD
Villingen-Schwenningen

In 2011 Turning Days recorded an increase in visitor numbers from 4,800 to around 5,650. The trade fair benefits both from the renowned exhibitors as well as the increased exhibition space. The fair mainly focuses on the Baden-Württemberg region. Two years ago, HORN and DMG / MORI SEIKI launched "Team Future" together with their strong partners. This is an exhibition concept relating to the process chain. They also joined forces again in 2013. The benefit for the visitor: they were able to obtain information and news on all areas at one stand. Machines, clamping equipment, cooling, turret and tools – combined and coordinated know-how. In addition, the "Team Future" demonstrated live machining on a variety of machines, for example in the areas of turning and milling. The partners of the "Team Future" all enjoyed interesting conversations and many visitors to the stand during Turning Days Süd 2013.

The "Team Future"

Paul Horn GmbH
Whatever you want to turn: HORN has an innovative tool solution. Highly efficient. Economical. Precise. And individually tailored to your sophisticated machining process.

DMG / MORI SEIKI
DMG / MORI SEIKI is an industry leader, offering a wide range of metal cutting machine tools. The range includes innovative machine technologies, services and software solutions for the entire life cycle of the machine tools.

SCHUNK GmbH & Co. KG
Superior clamping and gripping. Our superior components unlock potential where no-one expects: in the machine.

Ernst Graf GmbH
The specialist for high-quality tool systems. Increase your efficiency with HORN inserts and GRAF tools.

HPM Technologie GmbH
The MMS complete provider. Individually configurable internal and external lubrication. Coolant for every MMS application purpose.

AFS Airfilter Systeme GmbH
Air purification equipment and systems for extracting and cleaning coolant mist from machining tools of all sizes.

Sauter Feinmechanik GmbH
Competence across the board – from turrets to tooling – "we make the world turn".

W+F-Werkzeugtechnik GmbH
The company W+F-Werkzeugtechnik GmbH offers modular tool systems for automatic lathes, multispindle lathes and turning/milling centres.

DARIA GmbH
Speed is key – loading magazines for short lathes up to 120 mm (4,724") and multispindle lathes as well as special solutions.

Tebis Technische Informationssysteme AG
Tebis Technische Informationssysteme AG offers CAD/CAM solutions for maximum machine productivity and optimum process chain support from the CAD model to the finished component.

14. Fachmesse für Fertigungstechnik, Werkzeugmaschinen- und Sondermaschinenbau

A look back at intec 2013

14th trade fair for production technology, machine tools and special machines in Leipzig, 26th February-1st March 2013

Intec, together with the supplier fair Z, in Leipzig continues to thrive: more exhibitors, more international interest and more information on offer. 21,400 visitors from 27 countries flocked to Leipzig to find out about the latest innovations in the industry. Key topics at this year's trade fair were the machining of innovative materials and material composites and resource-efficient production. For example, HORN exhibited the DAH37 high feed milling cutter which has proven to be particularly efficient at rough machining steel. "The discussions we had and questions posed by visitors were very positive this year too," summed up Lothar Horn and added: "Intec continues to grow in importance. In 2015, I expect an even greater response, both in terms of the number of visitors and the number of exhibitors."
Visitors were able to gain an insight into current topics in the industry in compact form at special areas in the trade halls as well as at the trade fair stands. There were also congresses and specialist events in the neighbouring Congress Center Leipzig (CCL) on topics such as resource efficiency and vehicle manufacturing.

intec young people prize 2013 for HORN

The intec prize was awarded during the opening of the intec and Z trade fairs on 25th February 2013. The young people prize of 1500 euros was won by the apprentice team at Paul Horn GmbH.

HORN had given the first and second year apprentices full project responsibility for developing and producing a pedal car, a type of modern soapbox. The aim was to participate in the British Pedal Car Grand Prix 2012 in Ringwood, England. It must be emphasised that the apprentices discussed, planned and carried out all the work independently alongside their training: from financial planning, conception, design and procurement of parts through to the actual production.
With the intec price, the Leipzig trade fair recognises the innovative power of the exhibitor and the special achievements of the apprentices. The young people prize is sponsored by VDMA Ost.

Presentation of the intec young people prize 2013. From left: Markus Geisenberger (Managing Director, Leipziger Messe GmbH and LMI Leipziger Messe International GmbH), Reinhard Pätz (Managing Director, VDMA Ost), Christian Thiele (Press Officer, HORN), Matthias Rauscher (apprentice, HORN), Max Kocher (apprentice, HORN).

HORN Technology Days – the company opens its doors again.

HORN TECHNOLOGY DAYS 2013

5th-7th June 2013 in Tübingen

The HORN Technology Days will take place for the fourth time between 5th-7th June 2013. At the headquarters in Tübingen, Paul Horn GmbH will open its doors, and for the first time, those of Horn Hartstoffe GmbH, where the blanks are produced from powder. The main highlights are the eight technical presentations. In-house specialists will present the following topics in German and English.

The presentations at a glance

Ultra-hard cutting materials
Key topics are diamond cutting material and precision machining of hardened steel. Participants will receive information ranging from properties and fields of application through to the entire system – tool, component and machine.

High feed machining
High machine hourly rates often bear no relationship to the tool costs. Therefore, the machining time plays the key role. One solution here is high feed machining for milling and also turning. With this method, production times can be partly reduced to a quarter.

Parting off with internal cooling
Numerous grooving systems with internal cooling will be presented, which enable targeted supply of the cooling lubricant up to the cutting edge. Based on this, different cooling and lubrication options will be considered for internally cooled tools and new technologies will be presented.

Broaching on CNC machines
Tools and processes for longitudinal grooving in the broaching process are creating new potential for complete machining on CNC lathes and milling machines and on machining centres.

Tool and mould making
Advances in milling thanks to adapted milling tools. From soft to hard milling, from copper to graphite machining.

Tools of today and tomorrow
Production technology and especially machining technology play a decisive role in the implementation of trends in marketable products. There are a variety of challenges in doing so. This presentation discusses current tool developments and takes a look at the tool systems of the future.

Customer-specific tool solutions
When designing application-specific tools and in order to assess the efficiency of machining processes, various aspects must be considered. This presentation provides an overview, explains the connections and presents a calculation method.

From powder to indexable insert
Participants will learn more about the different shaping processes of carbide manufacturing. This presentation offers an insight into the processes of sintering, injection moulding, extrusion presses and metallurgy.

HORN Technology Days are supported by a selection of partners to provide a complete picture of the topic of tools.

Images from the HORN Technology Days 2011.

Technology partners at a glance

Chiron-Werke GmbH & Co. KG
Manufacturer of vertical machining centres and turnkey solutions.

DMG / MORI SEIKI
Metal cutting machine tools in the fields of turning, milling, Ultrasonic/Lasertec as well as services.

Carl Benzinger GmbH
Machine manufacturer for optics, precision engineering, medical engineering and the watch and jewellery industry.

TORNOS Bechler
Manufacturer of machine tools including numerically controlled single-spindle and multi-spindle machines for the production of complex precision parts.

Ernst Graf GmbH
Specialist in the development and production of external, internal and back-working cutting tools for CNC automatic lathes.

Renishaw GmbH
Renishaw is a multinational organisation specialising in the areas of metrology, motion control, spectroscopy and precision machining.

Tyrolit Schleifmittelwerke Swarovski K.G.
The TYROLIT Group is one of the world's leading providers of innovative solutions for grinding, cutting, drilling, honing, trimming and polishing.

H10 Diamant GmbH
H10 is one of the world's leading manufacturers of diamond tools, specialising in challenging applications in the field of brilliant finish machining.

Open Mind Technologies AG
Designing and developing technologically flawless CAM strategies, the company is blazing a trail in innovative 5-axis technologies.

HPM Technologie GmbH
Provider of high-quality fluids with outstanding lubrication properties and maximum evaporation for industry and trade.

LT Ultra-Precision Technology GmbH
Manufacturers of high performance metal optics, ultra precision machines and special machines.

HORN Akademie

HORN ACADEMY – CUSTOMER SEMINARS

HORN Academy has been responsible for training at HORN for a year.

More knowledge, more benefits

For several years, HORN has held practically-oriented customer seminars which deal with the aspects, theories and practical and economical advantages of modern machining options. In the technology seminars, the experienced specialists at HORN also explain complex issues about common topics in an easy to understand, practical and comprehensible manner, from the basics of machining technology to highly specialized applications. On one hand, these seminars offer HORN specialists the opportunity to inform their customers about new developments, products and technology from the company. First, the seminars show how well-known machining problems can be solved more efficiently and secondly, they present forward-looking solutions for the machining of modern materials. On the other hand, seminars are highly effective at promoting day to day work and collaboration.

Seminars kick off with 100 participants

Since autumn 2012, the HORN Academy represents a further milestone in presenting the machining skills of HORN and its employees even more efficiently. The first series of seminars by the academy began in November under the responsibility of Hans-Jürgen Bender. Around 100 participants got to grips with the range of topics presented in this event between 19th-30th November 2012.
The pilot project kicked off with a two-day technology seminar on grooving. The participants were given a comprehensive overview of all aspects of grooving. The aim was to present modern machining processes using powerful tools as well as give an insight into the world of coating and the topic of minimising wear through to the selection of the right cutting tool.

More than positive feedback

The seminars took place over two weeks and also covered other topics in equal depth such as slot and profile broaching, milling, bore machining, ultra-hard cutting materials and special applications. The practical workshops which complemented the theoretical components were the highlight of the seminars and were rated very positively and mentioned by all participants in their feedback.

The seminar series continued between 7th-19th March 2013 with the first seminar block of the year on the topic of "Hard machining of steel". Other topics included:
"Diamond as a cutting material", "Grooving", "Milling", "Bore machining", "Slot and profile broaching", "Special applications" as well as "Circular, combination and special tools".

The second seminar block is scheduled for November 2013 and will be announced in good time at www.horn-akademie.de. Although HORN academy does not use classic target group division, appropriate basic knowledge of machining is a prerequisite.

Practical and user-oriented

The seminars are designed to be practical and user-oriented so that they are as beneficial and informative as possible for participants. Seminars can also be held at another company's premises. Here, it is possible to adapt the contents to the requirements and application in question on an individual and company-specific basis. This on-site conditions will determine the level to which the practical component can be carried out.

All customer seminars are complemented by practical workshops.

Grinding is a key topic of the industrial specialist for cutting tools (IHK) training course.

HORN ACADEMY – QUALIFICATIONS

Practical knowledge from professionals

Germany and countries such as Switzerland and Austria are technology leaders in the development and production of cutting tools for metal processing and other modern materials,. To secure this position, including in terms of the industries of these countries, for the future challenges of international competition, there is no time to rest on our laurels. Well trained and highly specialised employees and managers are required to help Germany maintain its lead as an industrial nation. This leading technological position is mainly supported, in the case of cutting tools, by medium-sized companies who are regionally based but globally active. Some of these medium-sized companies, such as Paul Horn GmbH, have distinguished themselves as international technology and market leaders in their respective segments and recognised how to enhance their position with training opportunities for employees and customers.

Reach your goal faster

HORN has always placed high value on training, instruction and further education. In order to continue to maintain this claim and stay ahead of the game, HORN has long been actively enhancing the qualifications required by its well-trained employees and its customers in line with technological progress and the increased efficiency of its products with a systematic training offering. HORN has two aims: first, to increase the level of knowledge across the entire production chain, from carbide, production processes such as pressing, sintering, grinding and coating as well as customer-specific applications; secondly to enable well-trained young people to put their specialist knowledge relating to cutting tools to use at a high level more quickly following studies and training. In this regard, Lothar Horn, comments: "When a new colleague joins us following their studies, it generally takes years before the specifics of our company and cutting tools become second nature to them. We want to use the possibilities provided by the HORN Academy, firstly to impart this specialist knowledge regarding cutting tools during their studies, and secondly to considerably speed up this process using the academy training options. Both the employee and the company benefit as the qualified, highly-productive working life begins earlier and is thereby lengthened."

Academy with a wide range of options

The HORN Academy officially opened in May 2012. It offers a wide range of topics for customer seminars, training and advanced training of various employee groups, a degree course, retraining and employee qualifications. The study material is taught by experienced HORN specialists as well as instructors from colleges and specialist institutions. It is developed with qualified professionals and also incorporated into national educational paths and qualifications.

Employee qualifications

The employee qualification incorporates a wide range of the academy offerings. The core areas are further technical and commercial qualifications, languages and general knowledge. The options for training and advanced training include a training course in industrial mechanics, preparation for courses of study as well as the advanced course for the qualification of industrial mechanic. A new additional qualification permits advanced training to the level of industrial specialist for cutting tools with IHK qualification. The advanced training material such as safety technology and health and safety, lubrication and cooling, cutting tool technology and the manufacturing technique for grinding cutting tools is imparted over 240 hours with both theoretical and practical components. All 14 participants of the pilot course began their training in industrial mechanics in 2011 and started with the advanced training in early 2012. Following successful examination by the IHK Reutlingen in early 2013, they are the first HORN Academy qualified industrial specialists in cutting tools.

Dual studies

The mechanical engineering course in the field of production technology with a focus on cutting tool technology open up new professional horizons. The dual study in cooperation with the DHBW Horb (Baden-Württemberg Cooperative State University) begins in September 2013 and last approximately three years. It alternates 3-month theory phases at the DHBW Horb campus with practical phases at Paul Horn GmbH in Tübingen. The course results in the award of a Bachelor of Engineering (B. Eng.) qualification with 210 ECTS credits. The bachelor's degree fulfils the formal requirement for study at masters level.

To support the industrial specialist for cutting tools training course and for the mechanical engineering course in the field of production technology with a focus on cutting tool technology, the companies HORN, DMG, Castrol, Tyrolit, 3M Winterthur and the DHBW Stuttgart (Horb campus) founded the Cutting Tool Technology Competence Centre. The centre is located within the HORN business premises.

The graduates of the pilot course are now official industrial specialists for cutting tool technology (IHK).

HORN is at home in more than 70 countries in the world

GROOVING • PARTING OFF • GROOVE MILLING • BROACHING • PROFILE MILLING • DRILLING • REAMING

○ Subsidiaries or representatives

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