numroto®

Total solution for tool grinding

mauth
Werkzeug-Schleiftechnik GmbH

Form cutters and removable inserts systems for one-, two and three-blade tools.

numroto® flash 16

High precision and flexibility thanks to NUMROTO

Whether in mechanical engineering, the automotive industry, electrical and medical technology or wood and plastics processing, the range of different tools used in an increasingly differentiated production environment seems endless. Mauth Werkzeug-Schleiftechnik GmbH is a long-standing NUM partner – it has been using NUMROTO for its highly specialist production for around 15 years.

From left to right: Tilo Leicht, Production Manager at Mauth Werkzeug-Schleiftechnik GmbH, Michael Mauth, Managing Director of Mauth Werkzeug-Schleiftechnik GmbH, and Jörg Federer, NUMROTO Application Manager at NUM AG.

Mauth develops and produces perfect-fit tools in series, which meet exacting customer demands. Complex shapes are designed to specific measurements in the CAD system and loaded onto the CNC machines using NUMROTOplus. Whether it is a drill, an end-mill, a form cutter or a step drill, NUMROTO gets everything in shape and ensures a perfect finish. Mauth opted for NUMROTO around 15 years ago, following a market analysis which revealed that a NUM control-ler combined with NUMROTO software was difficult to beat in terms of flexibility and quality. It is this quality and, more importantly, the flexibility which is so important to Mauth Werkzeug-Schleiftechnik GmbH. As all 16 tool grinding machines in the company are running on the NUMROTO multiuser system and are networked to a central system database, any employee trained in NUMROTO can operate all the machines. This guarantees continuity in the event of employee absence, and helps maximize productivity as employees do not need to wait for a particular machine to be available – they can simply move to a free machine and continue production.

Mauth Werkzeug-Schleiftechnik GmbH, which has a production area covering over 1000 square metres in Oberndorf am Neckar, is constantly increasing its fleet of machinery. In 2013, Mauth is adding another two machines to the fleet. "These new machines will also be equipped with NUMROTO," explains Michael Mauth, Managing Director of Mauth Werkzeug-Schleiftechnik GmbH. This keeps the company at the cutting edge of technology. Measurement machines fitted with infrared and swivel cameras, as well as constant reconciliation of actual and target values, ensure consistently high process quality. The connection between the measurement machine and the grinding centre adds more production accuracy, as does measurement of the rotary tools while they are turning – all controlled and monitored by NUMROTO. Most of Mauth's customers are in Germany and its neighbouring countries, though it also has some in the USA and Asia. A sophisticated logistics system makes it possible, in exceptional cases, to produce tools and deliver them to the customer within 24 hours, even if the customer is based in Asia.

Mauth's most precious asset is the expertise of its engineers and employees, based on 35 years of experience in metal processing. Its philosophy is the same as NUM's, to offer 'maximum quality and perfection', and this ensures low error rates at both companies and great customer satisfaction. Continuous professional development is very close to the hearts of those at Mauth. NUM works together with innovative customers such as Mauth on targeted developments to achieve a competitive advantage. This is the only way that it is possible to produce standard and specialist tools with optimum precision, run-out accuracy and machining performance. Mauth works in the same way as NUM, in close proximity with its customers, thus providing the aforementioned flexibility and quality as well as problem-solving at the machine. This means that the customer's workflow can be examined on site if required. Its know-how allows Mauth to optimise specific customer processes, which can mean cutting several seconds off the entire working process – and everyone knows what a few seconds can mean in modern series production.

Removable inserts – the complete solution
With the help of its insert systems, Mauth can provide tools for internal and external processing – shaped removable inserts with one, two or three blades. Excellent replacement accuracy of under 0.01 millimetres and consistent repeat accuracy ensure uncompromising quality and optimum service.

num®
CNC HighEnd Applications

2013 trade shows with NUMROTO

TIMTOS
5th – 10th March 2013, Taipei, Taiwan

CIMT
22nd – 27th April 2013, Beijing, China

EMO
16th – 21rst September 2013, Hanover, Germany

NUM will be showcasing NUMROTO at various trade fairs around the world this year. We will be presenting the latest NUMROTO innovations and will be available for constructive discussions. Come and visit us at the trade fairs listed above. Our team is looking forward to meeting you. Our hall and stand numbers will be listed on our website (www.num.com) before the beginning of every trade fair.

There will, of course, also be a number of tool grinding machine manufacturers at the trade fairs whose products are equipped with NUM CNC systems and NUMROTO.

A picture is worth a thousand words

No doubt you will agree that a picture can really help explain something, especially when it comes to very complex issues. Often, a specific subject can be explained more easily with a picture, and misunderstandings are less likely to arise, as all those involved are working from the same starting point. Misunderstandings can be very expensive if they only come to light at the end of a process, and nobody would dispute that tool grinding is a highly complex environment in which we are constantly faced with picturing how a tool, a cutting edge, a point, etc. should look. Spatial representations of tools displayed on the basis of data entered into the programming system are very helpful in this respect. But what if you don't have the programming system to hand? We have come up with a solution.

We have added the NUMROTO Draw function to the already extensive NUMROTO functionality to support the visualisation of tools. Our aim was to combine the 3-D images with scaled 2-D drawings and then be able to print them out. This provides us with an instrument which, on the one hand, helps to check whether the actual tool to be produced matches the ideas of all those involved and, on the other hand, can also be used as documentation.

I am pleased to report that initial feedback from users of this new function is very positive. We were surprised at how sought after the function is, which once again confirms the adage that "a picture is worth a thousand words."

We hope you enjoy reading our NUMROTO Flash.

Peter von Rüti, CEO NUM Group

NUMROTO users document their ground tools with NUMROTO Draw

NUMROTO Draw was first presented at GrindTec 2012. This add-on to the widely used NUMROTO software went down really well with the trade fair's visitors. The increasing demand in the market for professional product documentation has a decisive influence on the choice of programming system. The lower the outlay on documentation for ground tools, the more competitive and successful the sharpening business can be.

In NUMROTO Draw, the outline of the tool and the drawing header are generated automatically. As a result, it makes sense to produce drawings even for small runs and resharpening. The functionality has now been substantially extended, enabling the software to be used for very complex tools with multiple cut views. This product documentation is perfect, even for end customers with high standards in terms of certification.

NUMROTO Draw produces this product information from the same data that is used for grinding the tool. NUMROTO Draw uses the entire infrastructure of NUMROTO and can therefore use any of the detailed views from the 3-D simulation. All the formatting information is stored in the NUMROTO database under the relevant tool data set ,and saved as part of the NUMROTO backup strategy.

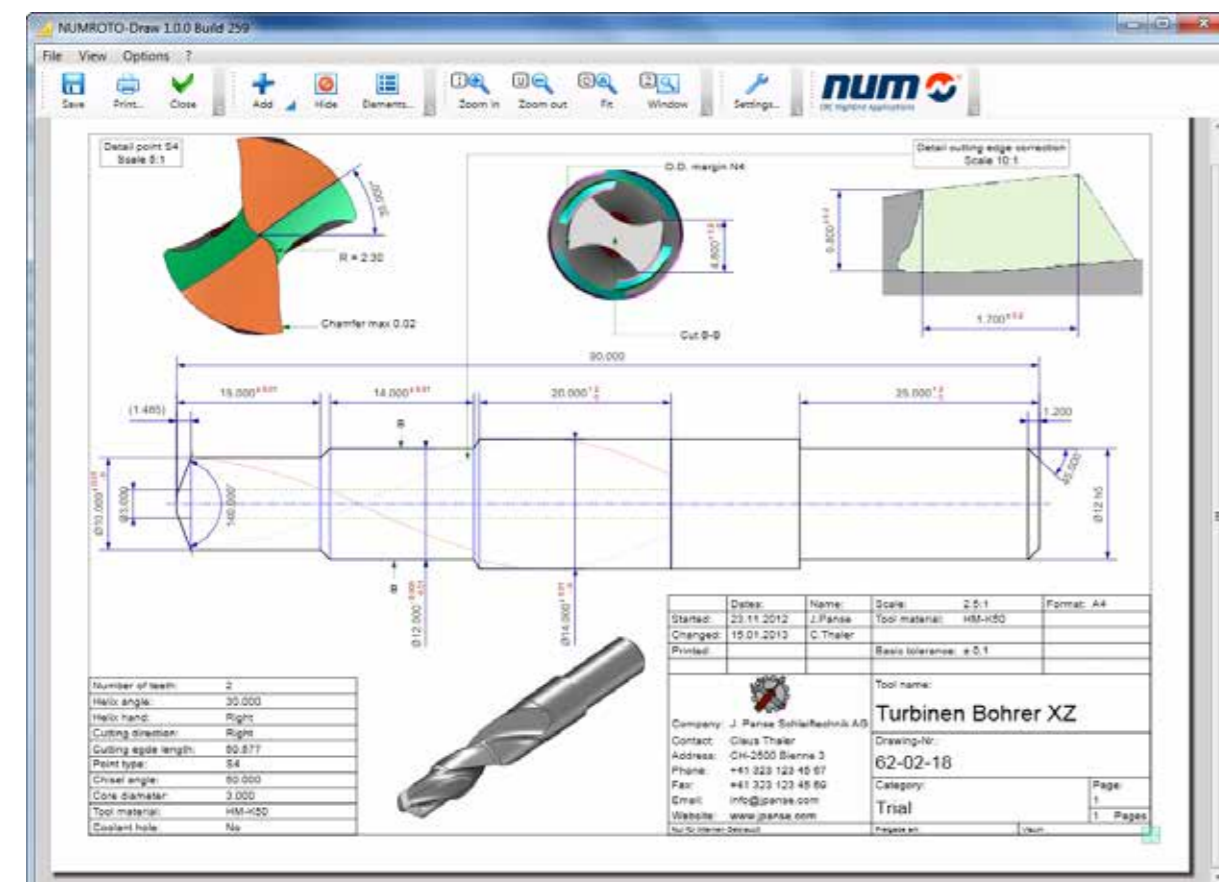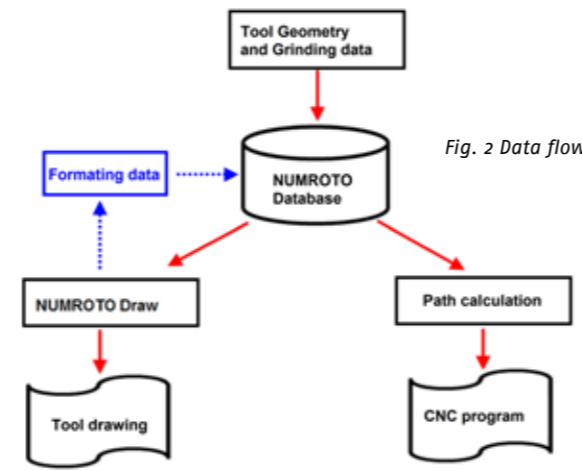Thanks to this strategy, any users who have used NUMROTO in the past can apply NUMROTO Draw to their existing tools without additional outlay.

NUMROTO Draw can also be used by 'non-grinders'. Because the grinding process is kept strictly separate, the manual input entered into NUMROTO Draw has no effect on the grinding program and thus does not affect the grinding results.

The 3-D simulation shows every detail in a realistic manner, ensuring that the end customer sees even very complex features or sections in the same way that they will be ground on the tool grinding machine. These details can be shown in colour or as a wire-frame model, and can also be scaled to ensure the size matches the drawing exactly. This means, for example, that a side view can be added to the automatically generated view.
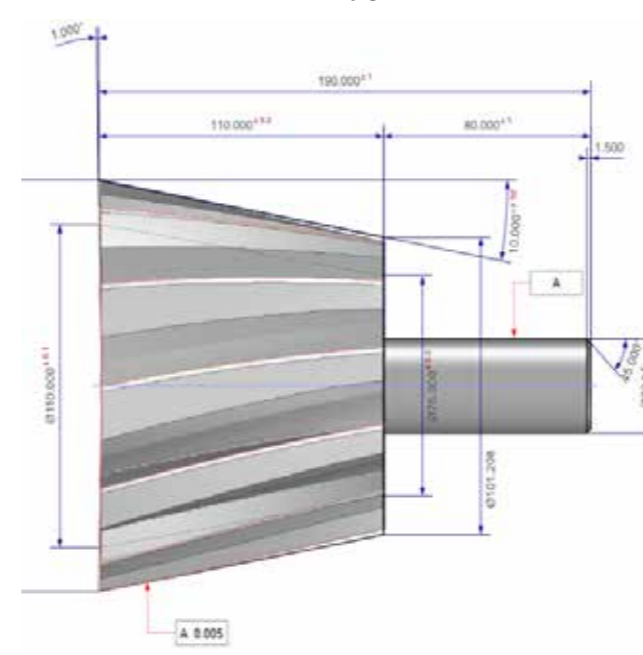

Fig. 1 Tool drawing for a step drill produced in NUMROTO Draw

Fig. 2 Data flow

As well as the actual cutting geometry, the shaft of the tool is drawn and dimensioned.

Standard dimensions are generated automatically. If desired, users can adjust the dimensions according to their requirements. Additional information such as units and tolerances, plus colour and font attributes, can be assigned to each dimension. Headings and additional dimensions can be selected freely.

Users also have a great deal of freedom in laying out the drawing. They can design the document header, including a company logo, on a customer-specific basis. All fields can be edited at will and the tool designation can be copied directly from the NUMROTO database. In addition, a separate table with parameters of the illustrated tool can be placed on the drawing.
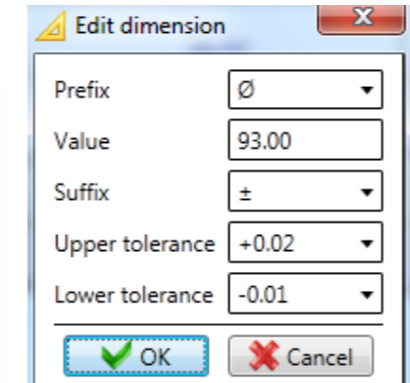

Fig. 4 Dimensions

The format of the output can be selected from A4 to oversize, depending on the types of printers connected to the PC. User-defined page sizes can also be configured.

Of course, NUMROTO Draw is also very efficient when used for quotations or in the prototyping phase. It often occurs that a tool grinding operation needs to grind a new tool geometry

Fig. 3 Dimensioning the shaft geometry of a conical cutter

for an end customer who can only describe this geometry in words or with sketches drawn by hand. In this phase it is important that the end customer can be presented with a precise drawing of the grindable geometry of the required tool as expediently as possible. If necessary, it could also be combined with a 3-D model, which allows viewing from a wide range of different perspectives. Change requests can be quickly implemented and misunderstandings are reduced to a minimum. When the end customer then grants his approval for the grinding of a model or model series, the corresponding tool can be ground directly on the tool grinding machine without further programming effort. NUMROTO ensures that the ground tool geometry is the same as that shown on the drawing. This greatly shortens the prototyping process.

NUMROTO Draw is largely intuitive to use. Even beginners can be 'let loose' on the software without problems. The system can easily be introduced within half a day, and it is recommended that the introduction is combined with an update training session covering all the other new features in version 3.7.0.

NUMROTO is widely used in the market, with over 3000 systems installed. Many millions of tool data sets are saved on these systems. For both existing and new tools, NUMROTO Draw creates product documentation that is realistic, unambiguous and of uniform quality. The documentation is generated on a largely automatic basis, saving time and money. This gives NUMROTO customers using NUMROTO Draw a considerable competitive advantage.

2012 trade show review

2012 was a very important trade-fair year for NUM. We had never previously showcased NUMROTO at so many trade fairs at virtually the same time. The most important events were GrindTec, IMTS, AMB and BIMU. NUM presented various CNC solutions and working processes, all designed to give mechanical engineering companies a competitive edge.

Each trade fair allowed us to show our latest control and application solutions for metal processing to an interested, international audience over several days. For NUM, such trade fairs are an ideal opportunity to present the company's entire portfolio of products and services to visitors and customers on an individual basis.

Release Notes

The most important innovations between 3.6.0t and 3.7.0a

> All relevant enhancements and improvements can be found at: www.numroto.com > Customer Area

General

Wheel profile calculation
After calculating the profile of a profile wheel the result will be shown directly in the profile editor. Also, the old profile will automatically be shown as a comparison profile.

XML data interface
Export and import of many more parameters through the XML data interface.

Profile editor – scale profile
In the profile editor, it is now possible to scale a profile with a factor.

Search coolant hole
The coolant hole can now be searched on different pitch circle diameters in case it is not found immediately.

Export tool list
The tool and wheel list can now be exported to an Excel file. The same export function can also be used for the calculated grinding times from a tool.

NR-Control notifications
NR-Control now generates a notification if the machine stops due to a CNC/PLC error or a drive error.

Drills

Multi angle point
New drill point with 3 point angles: Multi angle point.

Form cutters

Default values
It is now possible to define default values for form reliefs in the settings.

Inserts
New possibilities for grinding inserts and wood profile tools. For instance: block shaped blank, definition of special clamping system, automatic clamping system transformation.

Core diameter calculation on shear angle tools
The core diameter on tools with a shear angle is now calculated correctly.

Oscillation for form reliefs
An oscillation move in one axis can now be added to the form relief operation.

NUMROTO-3D

STL display without option
An STL model can now be displayed immediately in the 3D tool simulation, even if the '3D special functions' option is not available.

Simulation of cyclic grinding
It is now possible to use the real CNC file for the 3D simulation. This also allows the simulation of multiple passes (cyclic grinding).

Simulation of oscillation
It is now possible to simulate oscillation moves in the 3D simulation.

NUMROTO-Draw

Release of first version