numroto®
Total solution for tool grinding

25 years of high

| JAHR	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
NUMROTO-DOS	1.0	1.2	2.2	4.0	5.0	5.2	5.3	5.4	5.6	5.8	5.9	6.0	6.1
NUMROTOplus									1.1.0	1.1.5	1.2.1	1.3.1	1.5.0
DOS	3.3		4.0		5.0		6.0		7.0				
Windows					3.0		3.1		95				98
PC Processor	80386 20 MHz		80486 25 MHz		80486 50 MHz		Pentium 60 MHz		Pentium 120 MHz		Pentium II 300 MHz		Pentium 600 MHz
NUM CNC	750/760				1060				1050				Axium
NR-OEMs	Strausak (1987)		Saacke (1990)		Ewag (1991)				UWS (1995)		Hawema (1998)		StarCutter
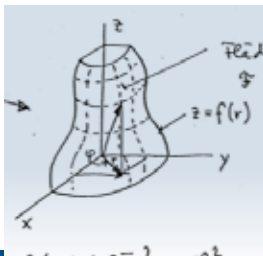
1987
First hand-written documentation
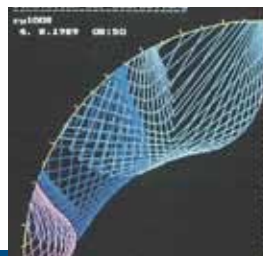
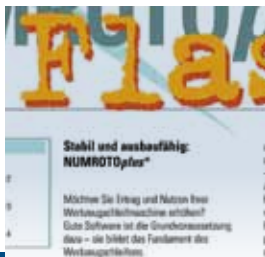**1987**
First 2D simulation from NUMROTO-DOS
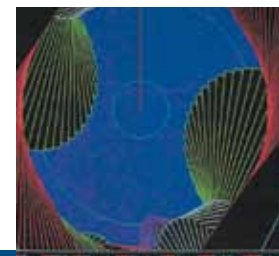
1989
Second version of the 2D simulation from NUMROTO-DOS

1989
First NUM

1999
First NUMROTOflash

First Multiuser-Version of NUMROTO*plus*
1999
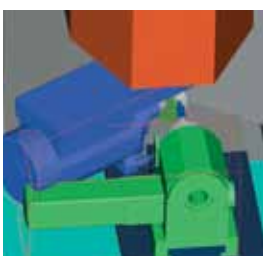Use of a central data base with all NUMROTO data for all machines of a company.

2000
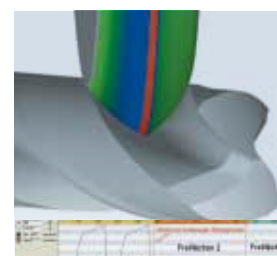Photo of the first Grindtec stand 2000

2000
Data inte
measurin

2006
First NUMROTO 3D simulation

2006
Measuring in process

2007
QW' analysis in NUMROTO 3D simulation

2012
Presenta

technology in toolgrinding

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
	1.6.0	2.1.1	2.5.0	2.5.4	2.6.0	2.7.1	2.8.0	2.9.0	3.0.0	3.5.0	3.5.1	3.6.0	4.0.0
		2000/XP						Vista		7			
III		Pentium 4 1.7 GHz		Pentium 4 3.2 GHz		Pentium Dual Core		Core 2 Duo		Core i5		Core i7	
												Flexium	
r (1999)		Deckel (2001) Zaro (2001)	Farman (2003)		TTB (2004) Kennametal Widia (2004)							Paragon (2012)	

NUMROTO *plus*

1995

MROTO brochure

Start NRplus Development

1996

2D-Simulation NRplus
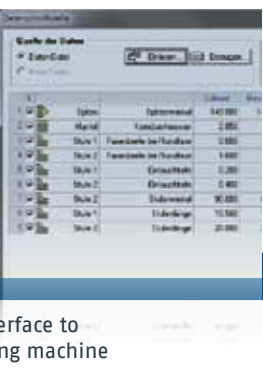
2001

erface to ng machine

3D-Simulation Vericut

1'000th NUMROTO delivery

2004
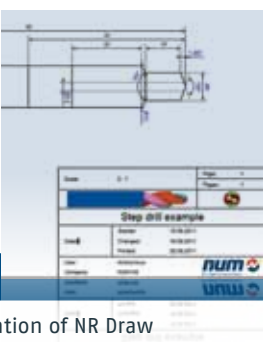
25 years of NUMROTO!

ation of NR Draw

2012

3000 NUMROTO-Installations, on more than 40 different machine models, at more than 1000 customers in 50 countries.

numroto flash¹⁵

We are there!

**NUM at GrandTec
Hall 7, Booth 7065**

GrindTec 2012

NUMROTO
at GrindTec 2012

NUM, together with NUMROTO, will be exhibiting at GrindTec exhibition in Augsburg in March 2012. We will be showing you the latest NUMROTO innovations and will be available for constructive conversations. Visit us from the 14th to the 17th of March 2012 in Augsburg: our team is looking forward to greeting you. You will find NUMROTO in **Hall 7, Booth 7065**.

And of course, there will also be many grinding machine manufacturers showing machines that use NUM CNC systems and NUMROTO. These are:

Exhibitor:	Hall:	Booth:
UWS	3	3026
Saacke	1	1002
Ewag	7	7041
Michael Deckel	7	7060
TTB	1	1002
Hawema	7	7037
Farman	3	3095

NUMROTO: 25 years in service of our customers

Do you remember what your PC looked like around 1990, how fast its processor was, how much memory it had and which operating system it used? Can you still remember 5 1/4" floppy disks?

In this Flash you will find a timeline of NUMROTO's key dates from 1987 to 2012. Some of the events made us chuckle, and some caused "aha" reactions. It will surely bring back a few memories for you as well.

When we think about the last 25 years, three aspects in particular seem to bear mentioning: 1st even machines of the earliest design were able to be updated again and again with the newest software. 2nd the customers we had at the very beginning are still among our most loyal users today. 3rd thanks to the close cooperation with our customers, we have a system to-day that allows the enormously challenging machining processes of tool grinding to be safely controlled.

NUMROTO is not just a software program, but has developed into a complete system for tool grinding over the years. The system today has remarkable functions, some of which have become standard for tool grinding. At GrindTec 2012 in Augsburg, we are presenting an interesting system overview with a number of new functions.

NUM looks forward to welcoming you at Stand 7065 in Hall 7 at GrindTec from 14 to 17 March 2012 in Augsburg.

Peter von Rüti, CEO NUM Group

NUMROTO Draw: Automatic product documentation for the ground NUMROTO tool

Today's certification procedure ideally demands that every product be delivered to the customer with product documentation. As a result, such documentation is demanded more and more from tool manufacturers and resharpeners. In turning and milling, programming systems have been on the market for a while. On the one hand, they calculate the CNC program for the tool production, on the other hand they create and dimension the accompanying drawing. A comparable solution has long been demanded in 5-axis tool grinding.

Initial solutions have already appeared on the market. Usually, these drawing generators limit themselves to one tool type and present these in tool dimension functions which have to be programmed (parameterised drawing). These systems are adequate for documenting tool outer geometry. However, they come up against their limitations when details or cuts of the ground geometry have to be presented. In contrast, NUMROTO Draw is not a drawing generator, much rather a task interface which uses the complete infrastructure of NUMROTO. It builds up on the NUMROTO data, so to speak. In order to be able to create an elevation drawing, the sizes defining the spatial course of the cutting edge must be at least defined. NUMROTO Draw then derives the drawing from this data and dimensions it. If the tool is fully programmed with all the grinding wheel data, NUMROTO Draw can also take on 3D details and integrate them into the drawing.

The standard dimensioning is created automatically. If this does not correspond to the customer's wishes, the
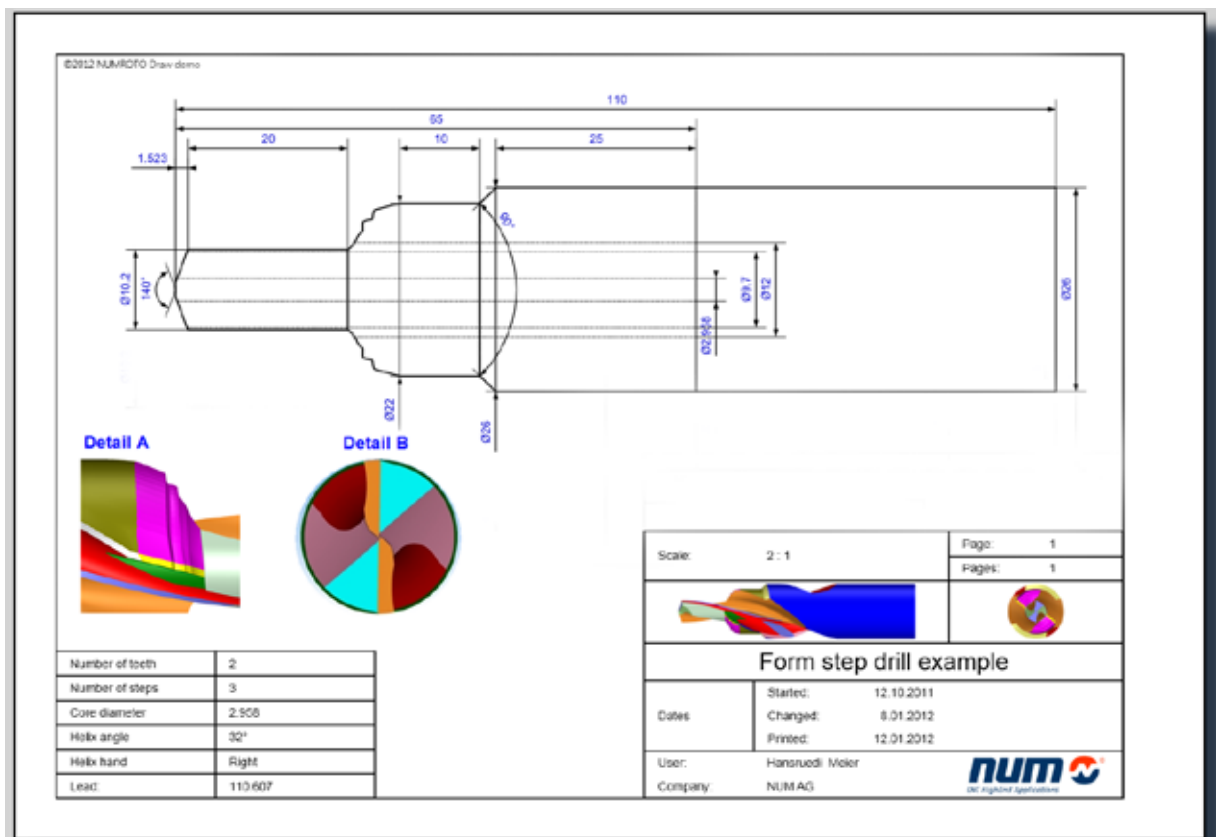

Image 1 Tool drawing of a step drill
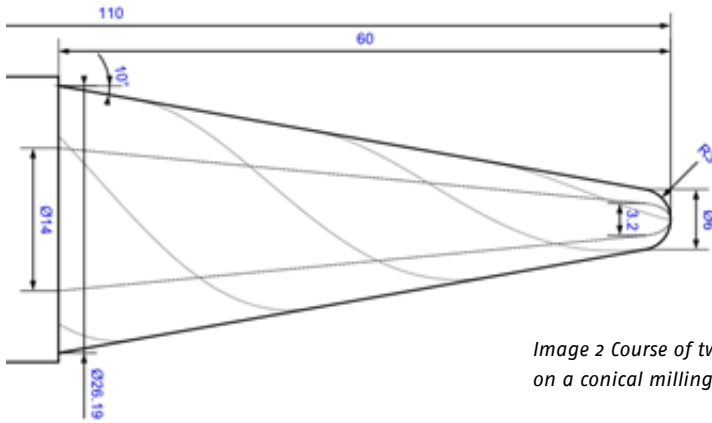
25 years of high technology in toolgrinding

Image 2 Course of twist and core on a conical milling cutter

measurements can be transferred to the appropriate position and the customer's own dimensions added.

For detail views, 3D objects are provided which are taken directly from the 3D simulation and can be placed on selectable positions on the page. The 3D simulation represents every detail realistically; this ensures that the customer sees even very complicated details or cuts as they will be ground by the tool grinding machine. These details can be presented in colour (Image 1 detail A) or as a wire frame model (Image 1 detail B). The document head can be structured by the user to the customer's specifica-

tions. All fields can be edited and the tool designation can be directly taken from the NUMROTO data bank. Additionally, a separate table with the parameters of the illustrated tool can be designed. The format of this table can be created according to the customer's specifications. The texts can be edited and the values taken from the NUMROTO databank. For similar tool types, table templates are provided. In this way, the amount of input needed for a new drawing is reduced to a minimum.

The documentation can be structured over several pages, for example by presenting on a following page the shape and dimensions of the grinding wheel pack graphically or using a table. The format of the output can range from A4 to a larger format, depending on the type of printer connected to the PC.

NUMROTO Draw can also be very efficiently used even during the sampling stage. It often occurs that a tool grinding company must grind a new tool geometry for a customer who itself can only describe this

with words and sketches by hand. In this phase, it is important that this customer is quickly shown an exact drawing of the grindable geometry of the desired tool. If required, this can be combined with a 3D model that the customer observes from various sides with a viewer. Changes can be implemented without delay, and misunderstandings are reduced to a minimum. If the customer then gives its "ok" to the grinding of a sample or to a sample series, the corresponding tool can be ground directly on the tool grinding machine without any further programming. NUMROTO ensures that the ground tool geometry is the same as that on the drawing. This greatly shortens the sampling process.

Summary

With over 3,000 systems on the market, NUMROTO is very widely distributed. Many millions of tool data sets are stored in these systems. NUMROTO Draw enables standardised and realistic product documentation both for existing and new tools. These are automatically created for the most part, leading to savings of time and costs.

Allow us to show you NUMROTO Draw at GrindTec 2012 in Augsburg, Germany!

We are there!
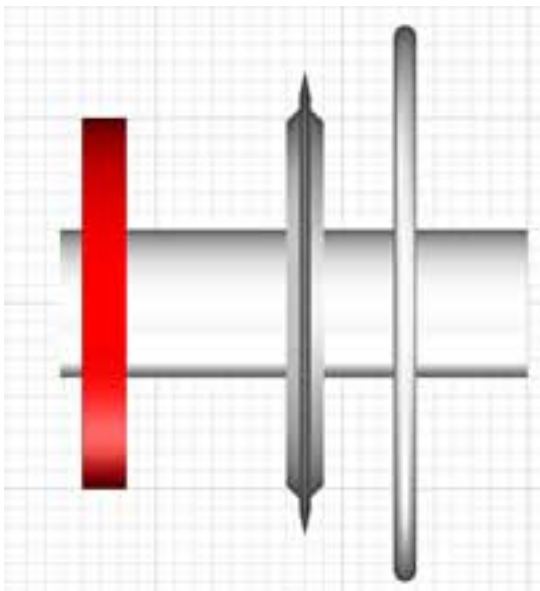**GrindTec 2012**

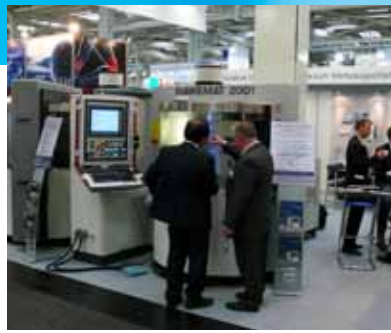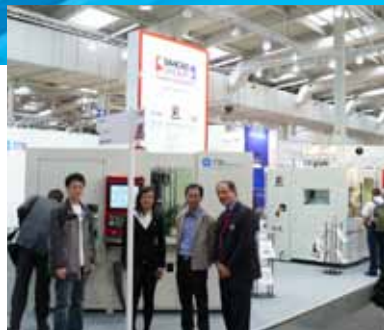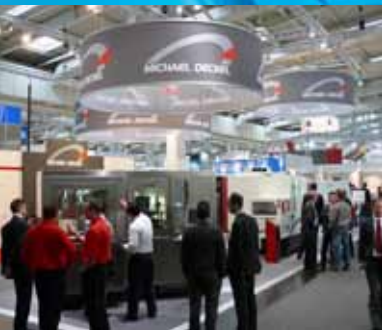**NUM at GrandTec
Hall 7, Booth 7065**

Image 3 Representation of wheel packs used

EMO 2011 – NUM takes off

The EMO 2011 exhibition was an all-round success for NUM. We were able to maintain relations with our existing customers, as well as gain a variety of new contacts. NUM presented CNC solutions and work processes to provide machine manufacturers with a competitive advantage.

Over the course of six days, 140,000 visitors from over 100 countries visited EMO. Here, 2,037 exhibitors from 41 countries presented the latest machines, solutions and services in all aspects of metalworking staged under the motto of "Machine tools and more". EMO is a ideal opportunity for NUM to personally present the entire range of the company to visitors and customers.

Release Notes

The most important innovations between 3.5.2 and 3.6.0

NUMROTO general

Show all tools
In the tool list it is now possible to show the tools of all modules (drills, end-mills, form cutters...) within one list.

Save shortening amount history
The last 10 shortening amounts, which have been used for manufacturing, are now saved with the data of each tool.

Search automatically for suitable collet when importing tools
When importing tools NUMROTO will now always search for a suitable collet based on the collet name.

Measurement in process – measure 'Inner surface distance'
When using the function measurement in process for the operation manual grinding path, the new measurement function "Inner surface distance" is now available.

Measure coolant hole at outside diameter
A coolant hole, which exits at the outside diameter, can now be probed with the vertical probe needle. Also it is now pos-sible to probe both sides of the coolant hole to achieve a higher accuracy.

Overwrite wheels and tools separately during import
When importing tools it is now possible to select separately whether tools and wheels should be replaced (overwritten) or not.

NUMROTO 3D

Selection of sections
The selection of sections has been im-proved.

Automatic wheel resolution
The wheel resolution can now auto-matically be adjusted in relation to the model resolution.

QW' during OD grinding
Improved calculation of QW' prime for OD grinding.

STL compare
There is a new NUMROTO-3D integrated function, for comparing two STL files.

Icon of gravity point
Improved representation of icon for gravity point.

Cutters

Modification of probing values
The probed data for flute depth, tool di-ameter and cutting length can now be automatically adjusted by programmable offsets. Like this small probe errors can be compensated for.

Drills and step drills

New features for operation 'Scalping cut'
Substantial new features have been added to the operation 'Scalping cut' for taps.

Second ground radius for S-gash-out
A second ground radius can be added to the S-gash-out.

Measure side distance with probe
On drills with a straight helix it is now possible to measure the side distance of the flute with the probe.