

HAM Präzision and NUM

Over 20 Years of Partnership and Cooperation



The Andreas Maier GmbH carbide tool factory, or HAM for short, was founded back in 1969 in Schwendi-Hörenhausen in Baden-Württemberg, Germany. It began quite literally as a classic garage startup, but today employs over 450 people worldwide, 270 of them at the parent company in Schwendi-Hörenhausen, about 30 km south of Ulm. HAM has its own branches and partner companies around the globe. HAM and NUM are already able to look back on more than 20 years of successful cooperation as partners. This is why HAM uses the proven NUMROTO programming system on many of its machines across the group companies.

HAM offers its customers highly reliable deliveries with the aim of being able to deliver tools plus coatings in just a short time at their usual optimal level of quality. To achieve this, HAM has invested heavily in recent years in expanding its production facilities and infrastructure. A major restructuring followed in 2013, thanks to which the warehousing, production, and delivery processes could be significantly improved, allowing the stated objective to be achieved. HAM also offers its customers an express service in emergencies, of course. In-house coating systems plus comprehensive services (including tool management) complete the all-in-one portfolio.

The corporate cornerstones of HAM are defined as four areas: HAM Präzision, providing drilling and milling tools using solid carbide (SC) and polycrystalline dia-

mond (PCD) for the automotive, aerospace, engineering, and component supply industries; HAM Elektronik, providing tools for the printed circuit board industry; HAM Medizintechnik, providing rotating tools for dental and medical applications; and HAM Kristall-Technologie, providing components for solid-state lasers.

To ensure the highest quality, HAM intends to keep its production site located in Germany. Mr. Andreas Marcus Maier, Managing Director of Production for HAM and the son of the company's founder, sees the specialization in special tools for the high-end market as a major competitive advantage. "The key foundations as we move towards the future are research, development, and innovative products," says Mr. Maier. NUMROTO adds a lot of technical know-how to this specialization in special solutions, for instance offering flexible solutions for even the most complex shapes. Mr. Jaruga, Solid Carbide Tools Production Manager at HAM, adds, "Our most complex tool shapes – the most difficult ones – can only be realized with NUMROTO." Furthermore, the high level of user-friendliness and the precise 3D simulations are seen as advantages. Mr. Maier notes, "What you see in the 3D simulation is implemented directly in the tool." The multi-user system that lets the NUMROTO workstations (a machine or programming station) work with the same sets of data is also being used successfully at HAM. Data for tools, wheels, machines, and settings are stored centrally on the database server.

Another unique selling point is the special polishing procedure that provides tools with mirror-smooth surfaces, which HAM distributes in Europe as the exclusive distribution partner of MMP Technology® (Micro Machining Process from BinC Industries SA). Selective machining of micro-roughness allows the cutting edges and surfaces of solid carbide tools to be precisely and reproducibly produced and finished. Cutting tools treated with this procedure have defined edge rounding in the micron range, giving a significantly better

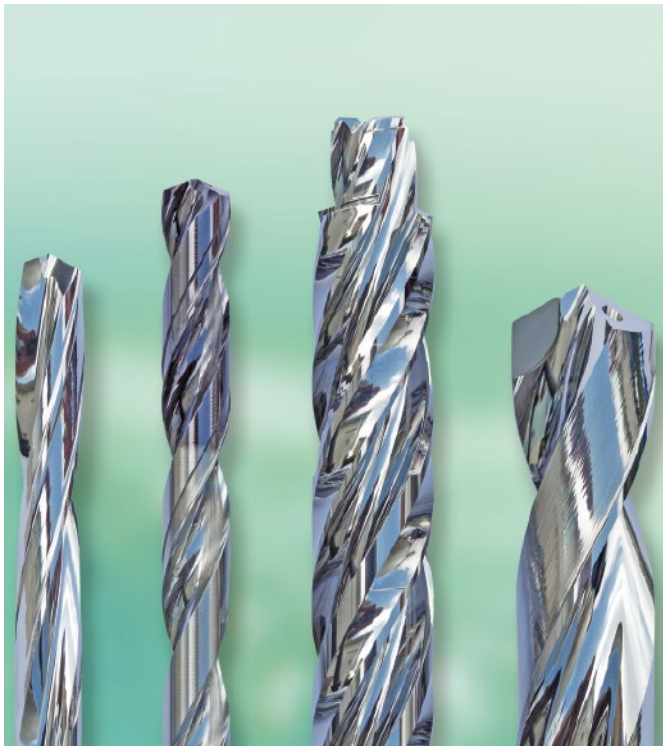


A special tool manufactured, polished and coated by HAM (step drill with several form steps) according to customer order.



surface quality than conventionally polished tools, which leads to a longer service life and allows higher cutting and feed speeds.

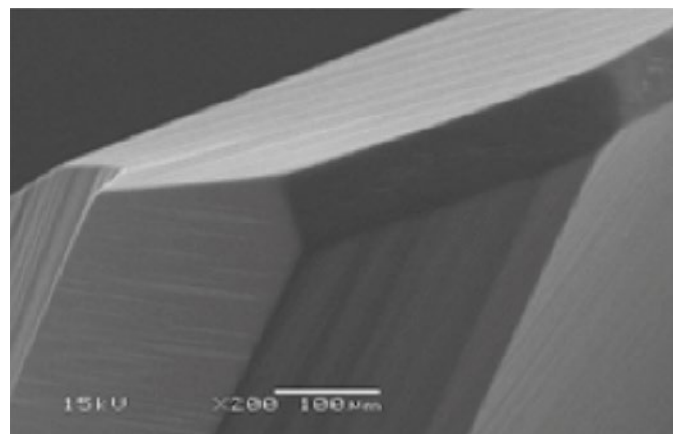
“One Step Ahead” – the motto of HAM Precision and NUM Service reflect the promise of being close to the customer, forward-looking advice, and research and development.



Special tools treated with MMP Technology® and manufactured using NUMROTO software. The micro-treatment uses a special process comprising mechanical, physical, and catalytic aspects.



From right to left: Mr. Andreas Marcus Maier, Managing Director of Production at HAM Präzision, Mr. Dawid Jaruga, Solid Carbide Tools Production Manager at HAM Präzision, Mr. Jörg Federer, Application Technology Manager at NUMROTO.



Cutting edge of a special tool after polishing using MMP Technology®, 200x enlarged. Only minimal edge rounding, which guarantees excellent cutting.



www.num.com
www.numroto.com



numroto® flash

Issue 21, March 2018

NUMROTO Version 4.0

The eagerly awaited major release 4.0 of the NUMROTO software has just come out. In the „Release Notes“ section of this publication, you can find various new key features, such as helix step on ball nose/corner radius end mills or adaptive grinding via monitoring of the grinding spindle performance. If specific conditions are met, adaptive grinding can significantly increase productivity without additional measurement hardware having to be installed. NUMROTO Draw, the drawing and documentation tool, has also been subjected to interesting and comprehensive innovations. From NUMROTO Version 4.0 and higher, for instance, NUMROTO Draw can be upgraded with automatic drawing of the geometry of a grinding wheel, which is needed for the production of a tool. This function saves on time and costs, as a grinding wheel assembly drawing can be provided with no additional effort. Details of these and other items about NUMROTO Draw can be found in this newsflash.

of its machines throughout the group. Another interesting aspect worth a special mention is the special polishing procedure that provides tools with mirror-smooth surfaces, which HAM distributes in Europe as the exclusive distribution partner of MMP Technology®.

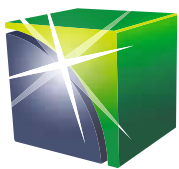
To mark the occasion of GrindTec, we are this year once again supporting the industry competition „Tool Grinder of the Year“. There are two parts to the competition, looking at theoretical knowledge in the first part, and practical work on a machine live during the trade fair in the second. We wish all participants every success!

Take the opportunity to visit us at GrindTec 2018, which is being held from 14 to 17 March in Augsburg, at our booth 7038 in hall 7. Our team is looking forward to demonstrating the new aspects of NUMROTO live to the visitors.

If you do not have an opportunity to visit us at GrindTec, there is a list of other trade fairs we are taking part in on our website www.num.com.

Peter von Rüti
CEO NUM Group

“One Step Ahead” – the claims made by the Andreas Maier GmbH carbide tool factory (HAM Präzision) and NUM coincide perfectly. They reflect more than 20 years of successful cooperation as partners. Further cornerstones that make both companies stand out are the specialization in high-end sectors plus the development of innovative products. This is why HAM Präzision has successfully used NUMROTO on many



Exhibitions 2018

NUMROTO is there

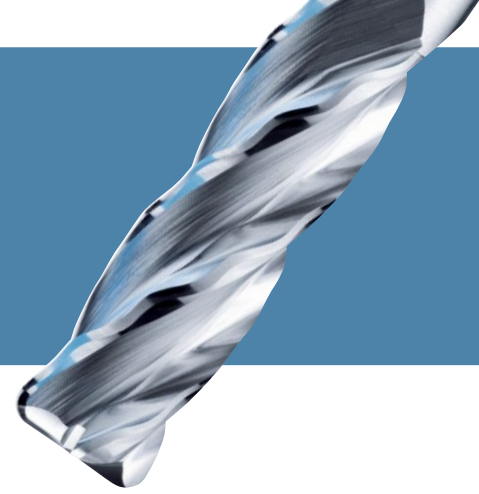
With NUMROTO, NUM will once again take part in various trade fairs around the world this year. We will present the latest NUMROTO innovations and are ready for constructive discussions. Visit us at the above-mentioned trade fairs. Our team is looking forward to meeting you.

Go to our website www.num.com to find our respective stand numbers before the start of the trade fairs.

And of course, there will also be many machine manufacturers on site with machines that are equipped with NUM CNC systems and NUMROTO.



NUMROTO Draw



NUMROTO Draw

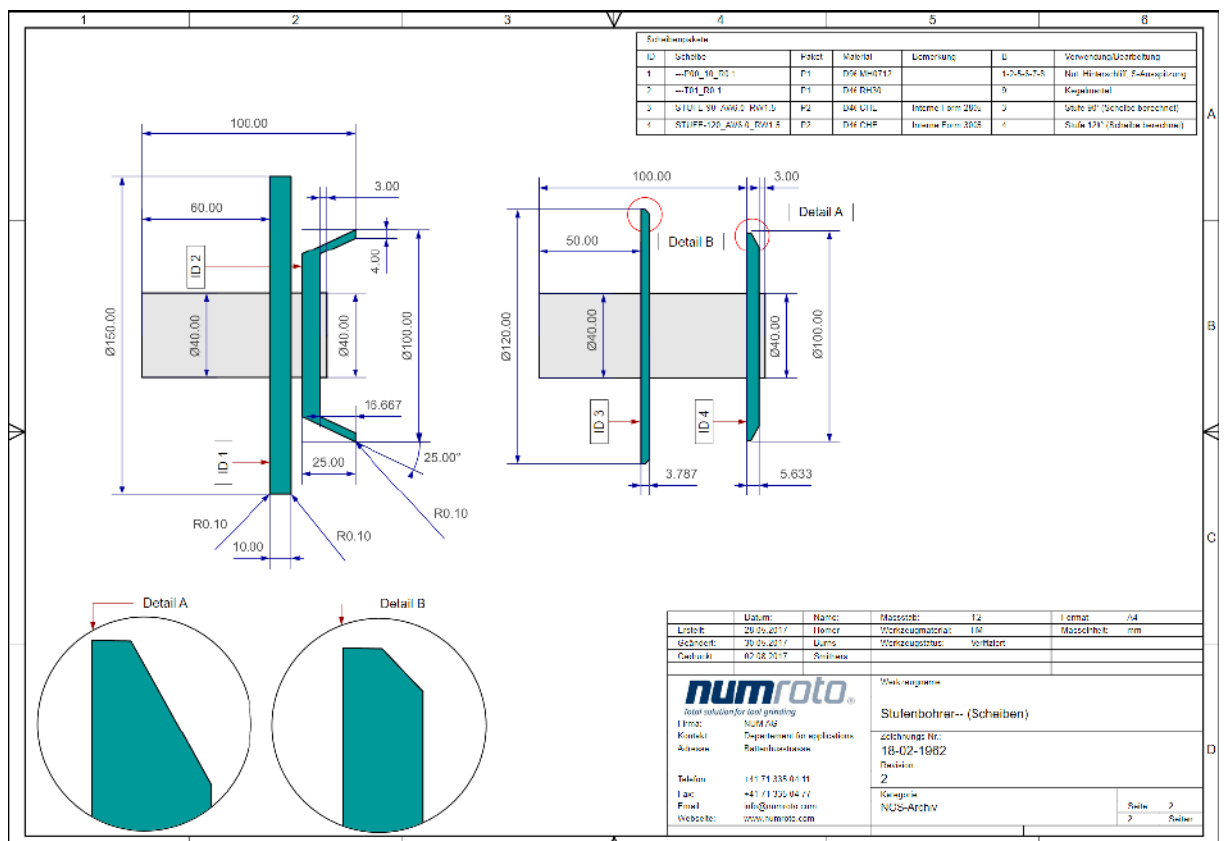
Wheel package drawings and other new features

NUMROTO Draw, the drawing and documentation tool, is now being used by many of NUMROTO's 5,000-plus customers. It automatically uses the geometry data that is used for programming the grinding of a tool to generate a basic drawing. This is created very quickly and can therefore be printed out while grinding a small run or during sharpening and then delivered with the finished, ground tool. Manually produced drawings can as a result largely be dispensed with. NUMROTO customers who have extensive files of existing tool data records can also document those tools quickly and easily after the event. NUMROTO Draw is also ideal for customers who need to document their drawings in great detail because of strict certification standard requirements. In such cases, the basic drawing can be completed by adding your own dimensioning, tolerances, comments, tables, symbols and images. DXF profiles and images can be exported from NUMROTO 3D simulations and added to perspective views and sections, using selectable scale. These detail views can even be rotated and cut to size later, for example using rectangular or circular templates. The application also makes it possible

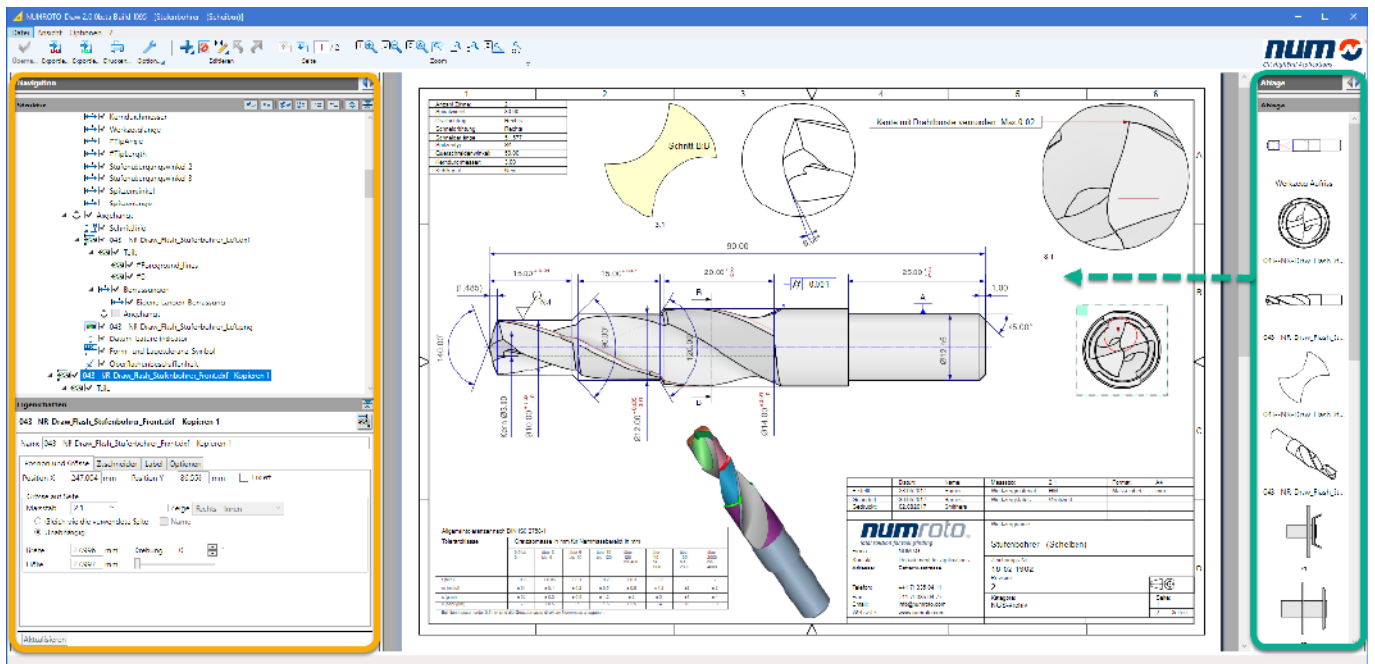
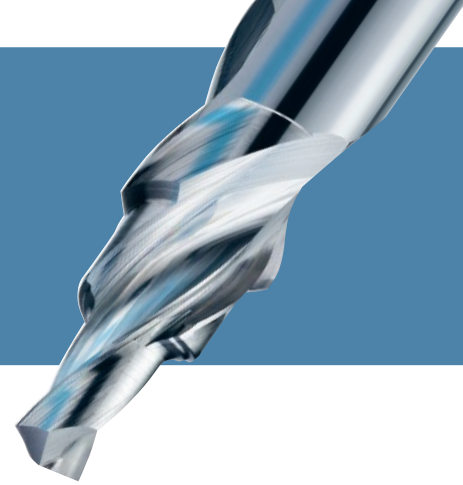
to integrate graphics from your own sources without any problems. The drawing can be split across several pages if necessary.

As of NUMROTO version 4.0.0, NUMROTO Draw can also automatically display the geometry of the grinding wheels and grinding wheel packages needed to make the tool in its drawing. For the machine operator, a grinding wheel assembly drawing can be printed out with no additional effort. Many companies can therefore save the effort of having to make such drawings separately in the design department.

It is only worth keeping tool-specific grinding wheel packages in stock for large production lots. For smaller tool runs, it is more economical to reassemble the grinding wheel packages each time. It is then important that the grinding wheel packages in each series are geometrically as similar as possible to the ones assembled for the first series. This is the only way to guarantee short set-up times and reliable production procedures. NUMROTO Draw can therefore retain the geometry of



Automatically drawn and dimensioned wheel package.



Yellow Tree structure, green Repository.

the grinding wheel packages (as originally defined for the first series) in the drawing. If the package assembly is optimized in a subsequent series or if grinding wheels with other dimensions are used, you can update the drawing dimensions in NUMROTO Draw. Views of details such as for the tool geometry can be set using the 'Crop' function and displayed separately using a different scale. The grinding wheel shape can for instance be displayed as a template for dressing on a defined scale on a separate page.

A further innovation is that drawings can be supplemented with tables to document general data or to unify dimensions and measurements. For example, a drawing such as this can be used for various dimensions by denoting the diameter with a letter instead of the effective measurement. The corresponding value can then be found in the table. In addition, 'company-specific' tables can be drawn up

and saved in XML format. These tables can then also be used in other drawings. NUMROTO Draw also offers ready-made tables, e.g. for general tolerances as per DIN ISO 2768-1, which can be placed at any point of the drawing at a selectable scale.

Taking DXF views or vector graphics across from the 3D simulation has been made more user-friendly. The available objects are arranged on the right in a drawing file. This can be extended without any great effort. A simple drag-and-drop approach lets you insert or remove individual elements from the drawing. The clear tree structure also helps you group individual elements together, superimpose them, and make them visible or invisible.

The toolbox has been adapted to the extended requirements and made clearer. A few simple clicks let you insert new pages or access them directly. In addition, zooming has been made more convenient.

As the NUMROTO Draw option is an integral component of NUMROTO, software maintenance and upgrades are provided in accordance with the normal NUMROTO policy. Treat yourself to a NUMROTO Draw demo at GrindTec 2018.

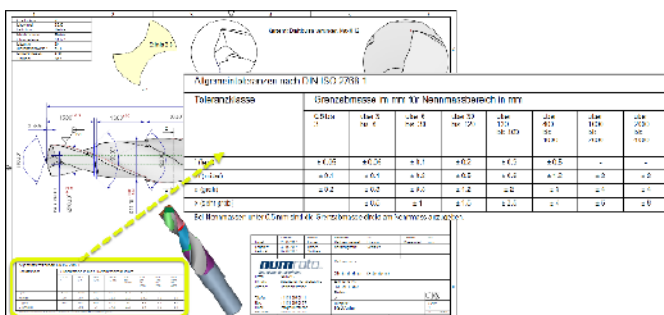


Table with general tolerances.

The most important changes between Version 3.9.0 and 4.0.0

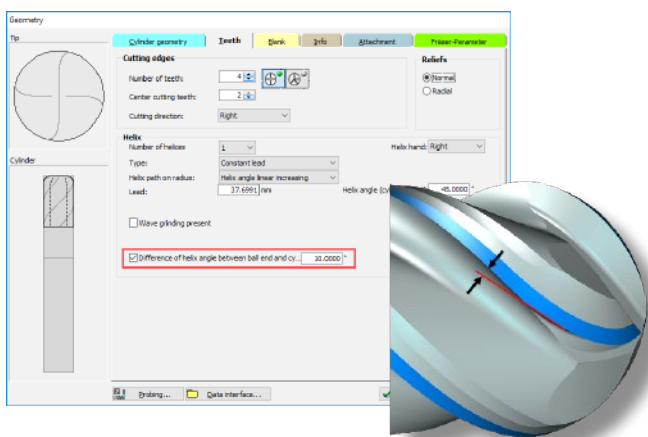
All significant extensions and improvements can be found at: www.numroto.com



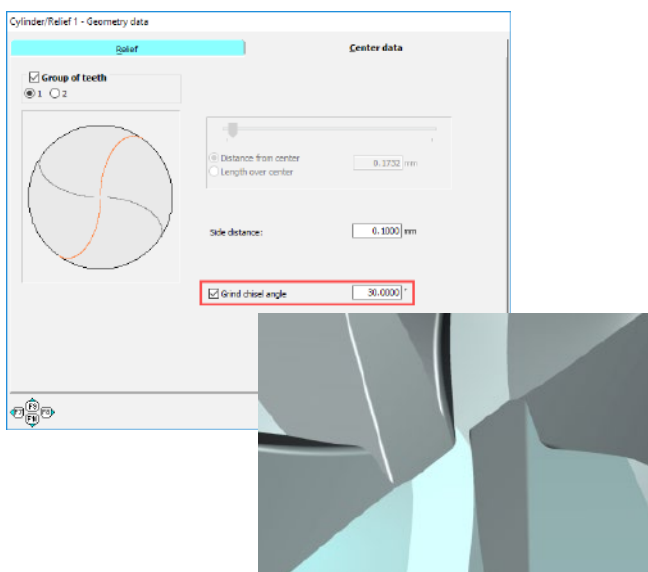
Release Notes

End mills

- New possibility for programming a helix step on ball nose and corner radius end mills. It is now possible to program different helix angles for the end of the radius and the beginning of the cylindrical part.



- At the Flute-X it is now possible to consider the complete wheel shape (width and second corner radius) to get the correct flute width according to the programmed land width of the reliefs.
- On end mills with 5 and 7 cutting edges there are now 5 tooth groups available for the gash-out operations.
- Automatic generation of a chisel edge in the ball nose center on end mills with a side distance for the center cutting teeth.



- New operation "Tip gash-out X flat" which can be added to most tip shapes.

- Automatic conversion of widening angle on a tool with a flat tip according to the tip relief angle or the gash-out angle.

General

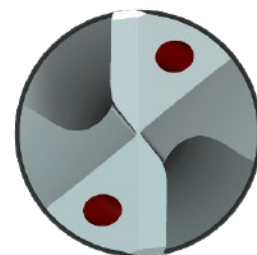
- Complete new re-worked datahandling for the collets. Among other new features it is now possible to export single collets or to export tools together with the used collet.
- In wheel dressing it is now possible that the cycles of all sections can be done one after the other.
- More advanced protocol and status function reporting for instance for machine state and production surveillance (industry 4.0).
- AC grinding for some machine types (new option) which allows automatic optimization of the feedrate, depending on the current grinding spindle power.
- Inch/metric and language selection directly in the status bar.
- Attachments can now also be added through the clipboard (for instance for screenshots).
- New possibilities for external calculations or when using an external path, which was generated by a CAD/CAM program.
- Possibility to hide columns in the tool and wheel list.

NUMROTO-Draw

- Wheel packages including dimensions are now automatically added to the drawings.
- Export and import of customer specific tables.
- For NUMROTO-Draw there is now a location based license available. This can be interesting for customers with many machines.

NUMROTO-3D

- Automatic display of coolant holes in the blank.
- New possibility to add DXF comparison profiles.
- New measurement mode similar to a comparator.
- The programmed feedrate can now be displayed during the 3D simulation.
- The out of balance value of the simulated tool can now be displayed in grams.



Probing

- Some new probing processes for in process measurements.
- Other optimizations of some probing features.

NR-Control

Several optimizations and some new features.

NCI

Different colors are now used for axis values which are relative or for axis which have not yet been referenced.