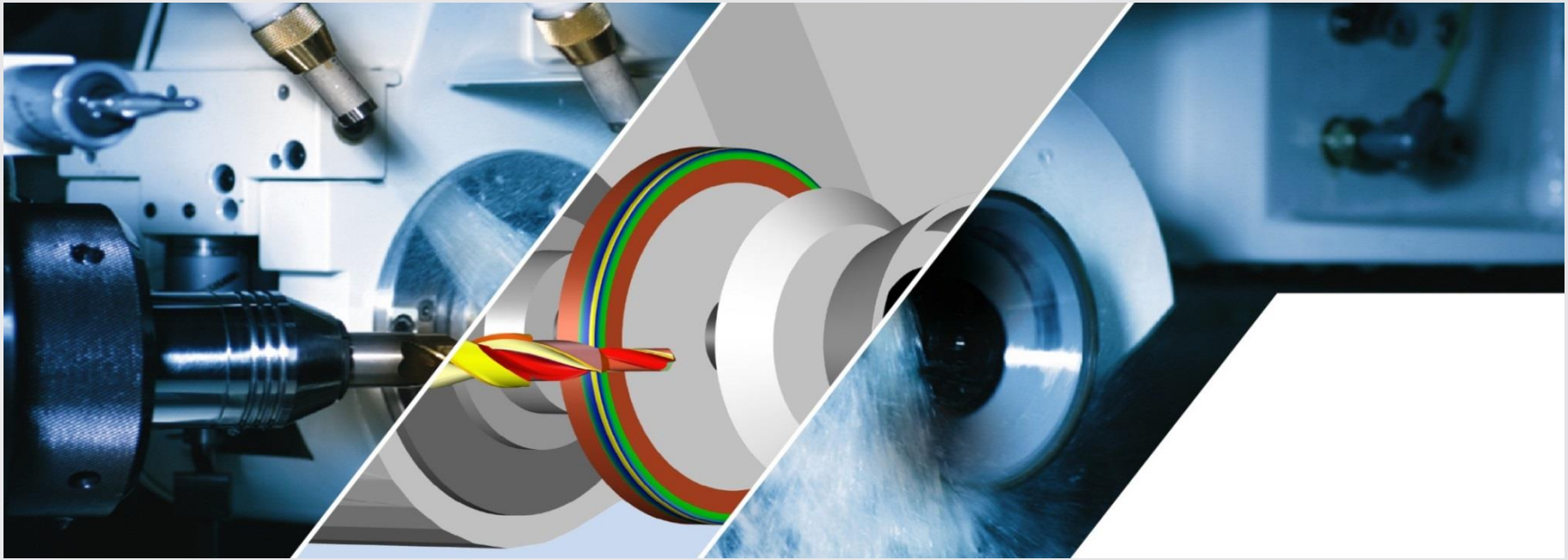
CNC Power Engineering - Always on the move



numroto®

Total solution for tool grinding

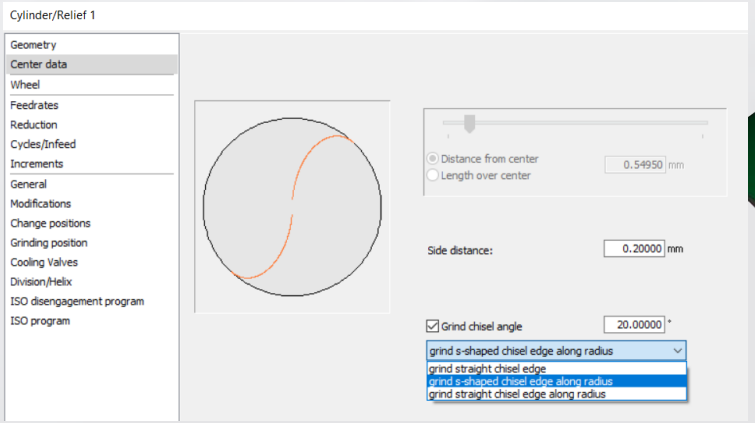
New features in NUMROTO 4.3.0, 5.0.0 and 5.0.1

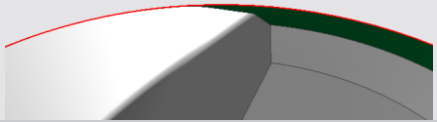
- End mills
- Drills / Step drills
- Form cutters
- 3D-Simulation
- NR Draw
- Other topics
- Planned innovations version > 5.0.1

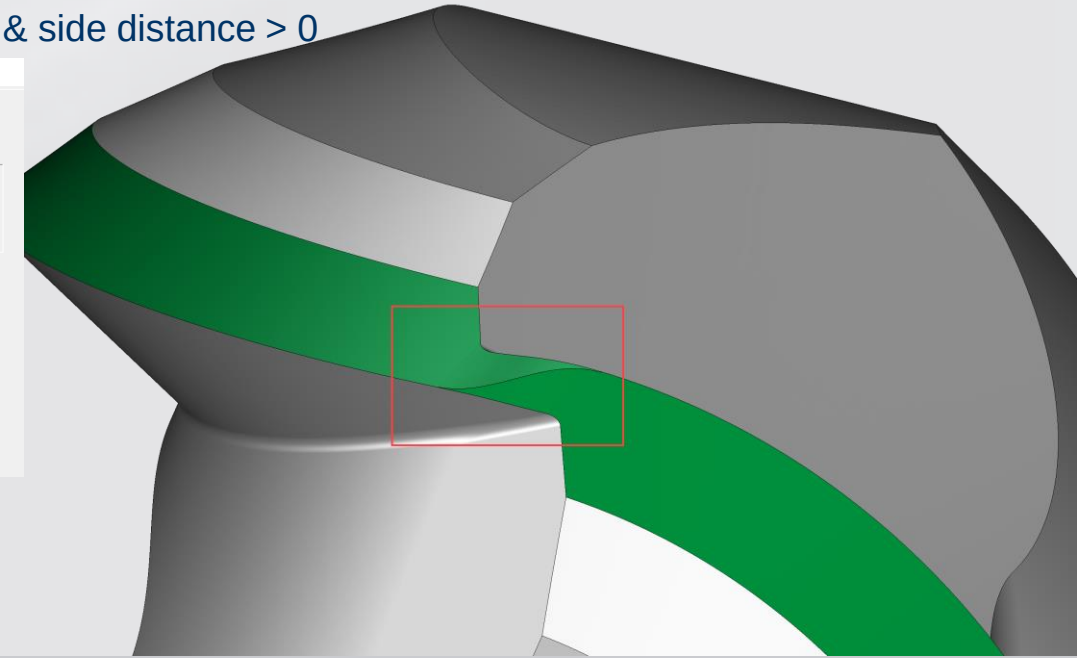
Cutting edge and chisel edge exactly on radius

(Special grinding functions, 4.3.0)

- S-shaped or straight chisel edge which follows the ball nose radius precisely
- Gashout-X and relief are precisely on the ball nose radius cutting edge
- Only for tools with 2 cutting edges to center & side distance > 0



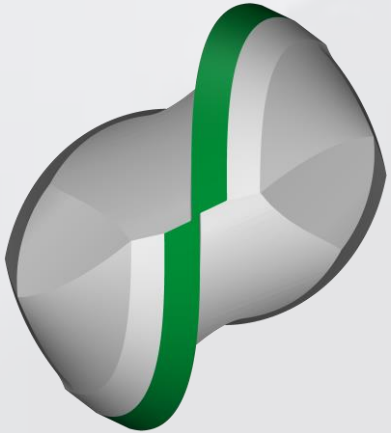




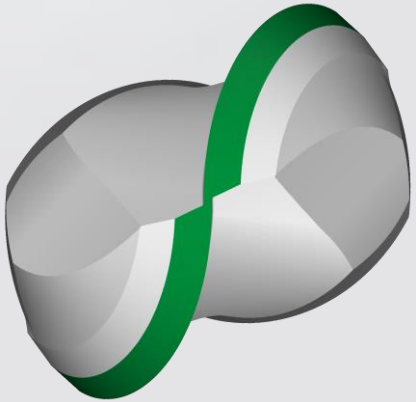
Reduce helix at ball center

(Special grinding functions, 5.0.1)

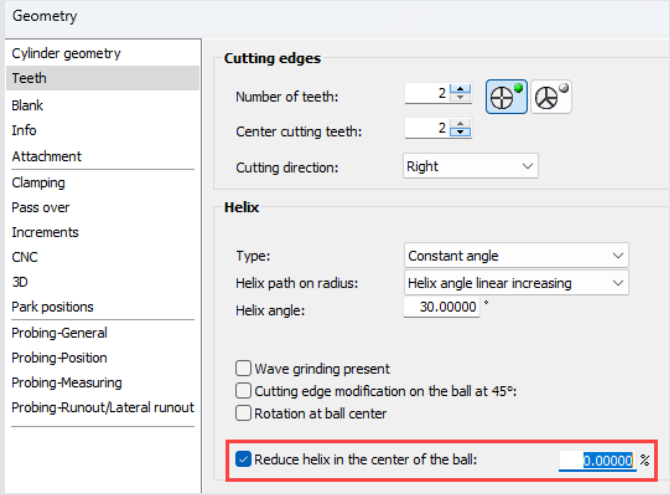
- For end mill with ball nose, the helix course on radius 'helix angle linear increasing' has proven itself technologically very well. With a new reduction factor, the helix course in the center of the ball can be made more straight. At 0%, everything remains as before. At 100%, the helix angle at the center of the ball is more straight. Intermediate values are also possible. In all cases, the cutting edge is always continuous.



Reduction factor 100%



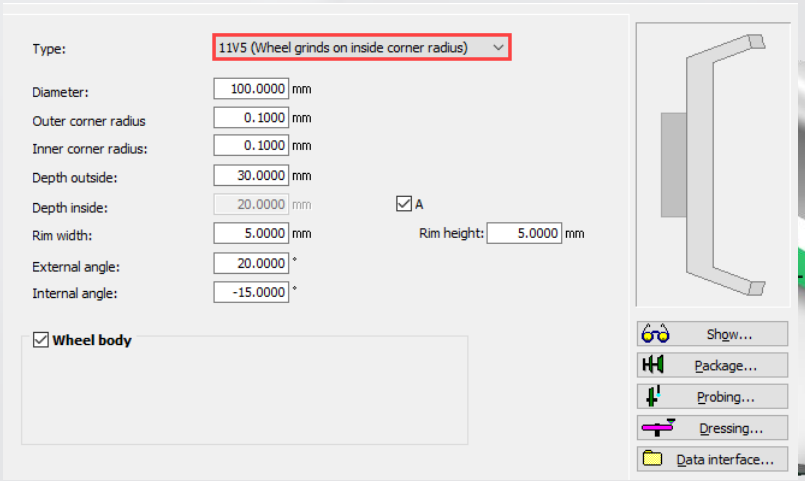
Reduction factor 0% (same as before)

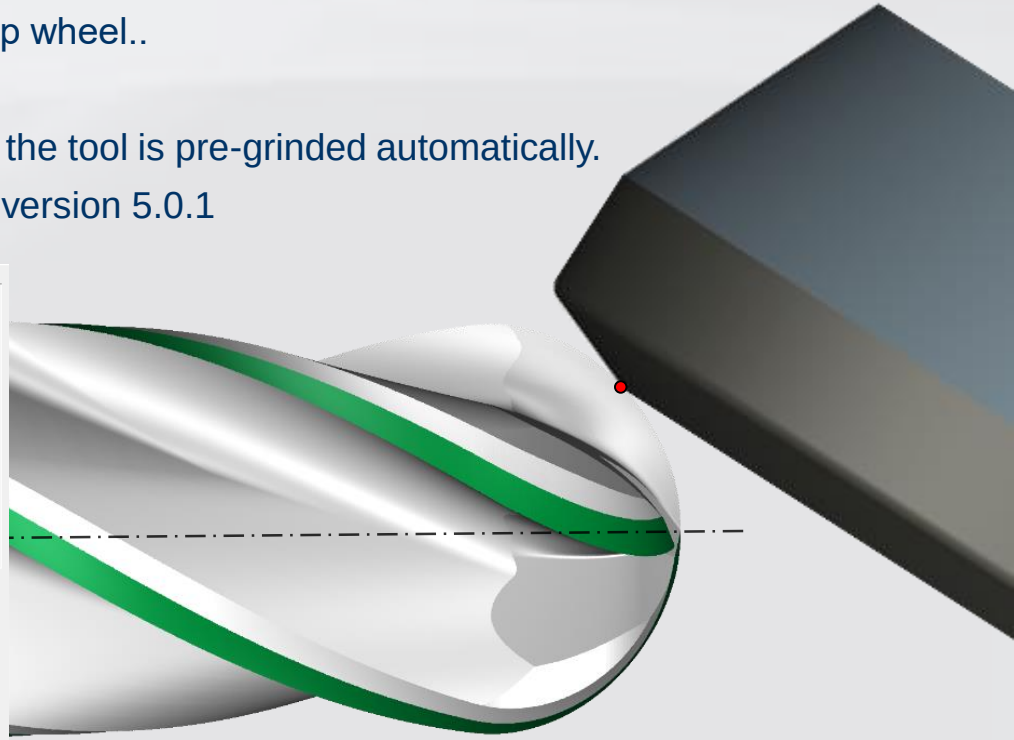


Cup wheel Typ '11V5'

(special grinding functions, 4.3.0)

- The type ‘11V5’ can now be used to define a cup wheel..
- The point of grinding is on the inner wheel rim.
- By using the wheel rim on the face of the wheel the tool is pre-grinded automatically.
- End mills since version 4.3.0 form cutters since version 5.0.1

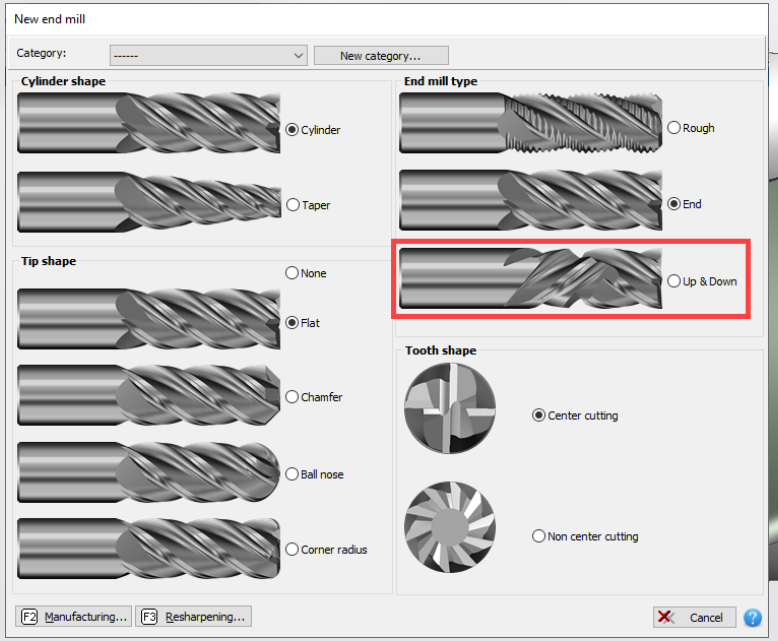


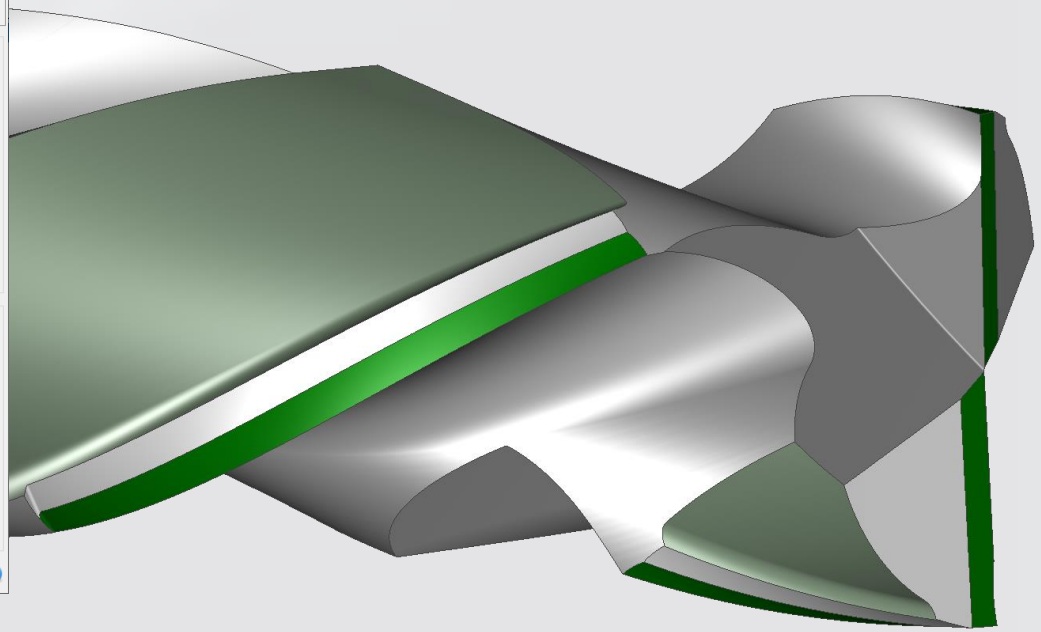


Up & Down Cutters

(new option, 5.0.0)

- New Cutter type ‘Up & Down’

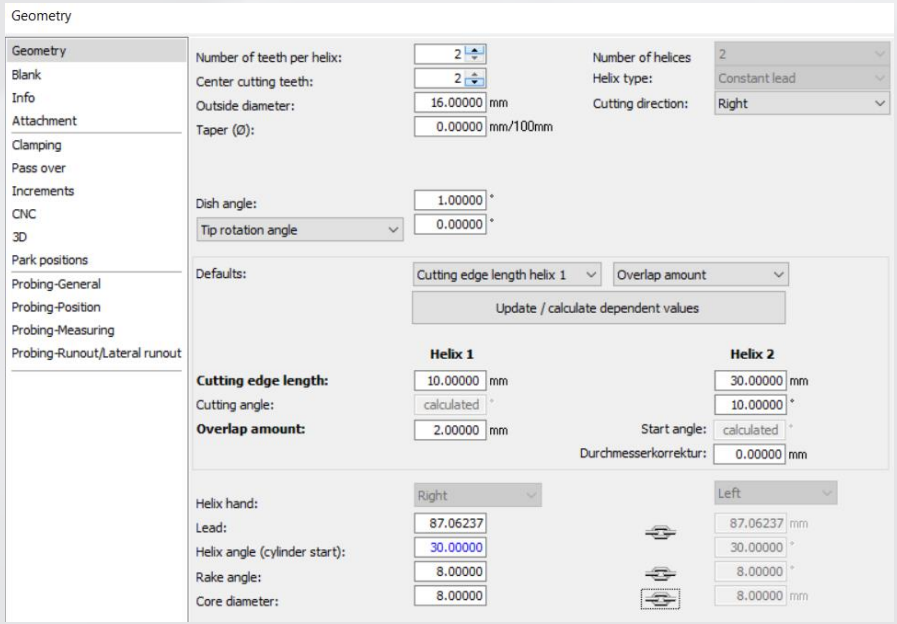


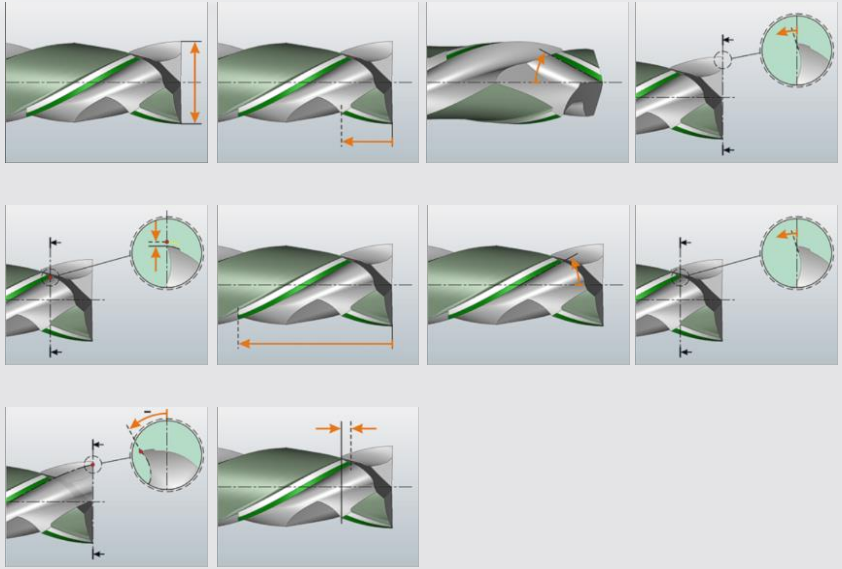


Up & Down Cutter

(new option, 5.0.0)

- With customized, simple geometry dialogue

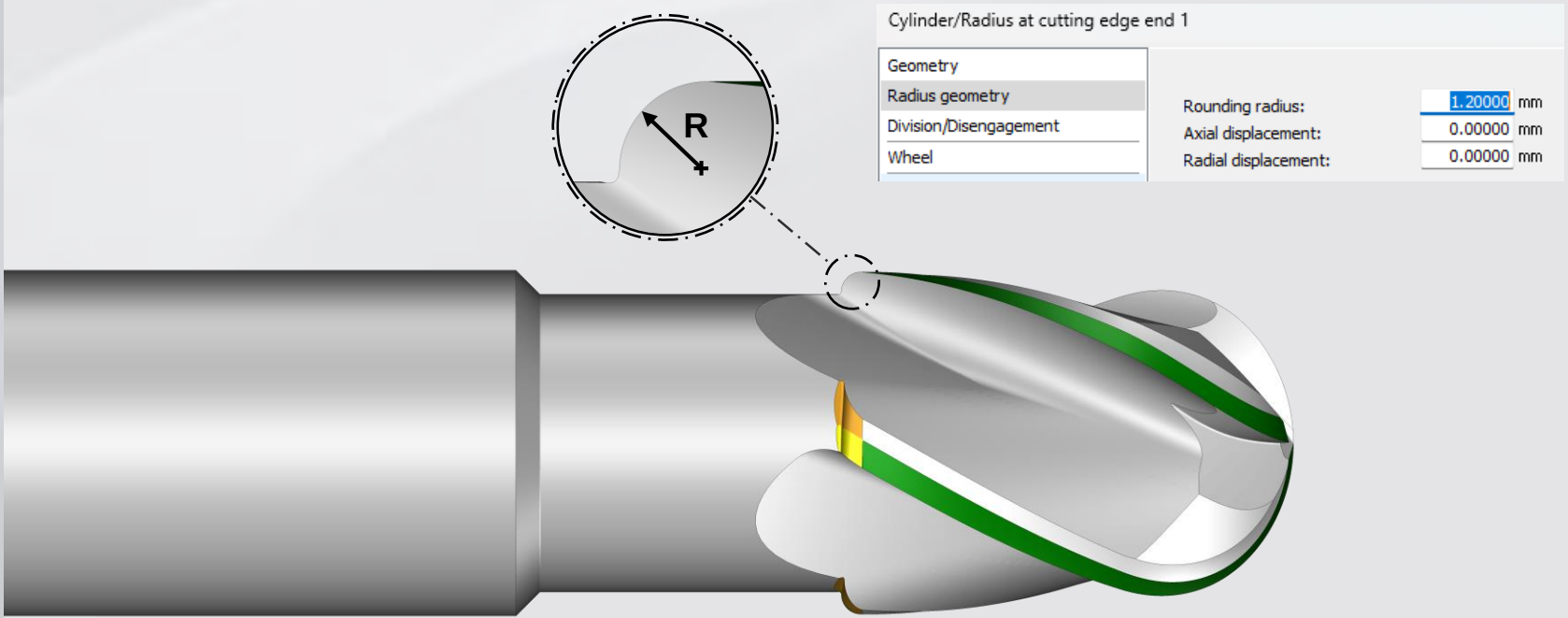




New operation 'Radius at cutting edge end' for end mill

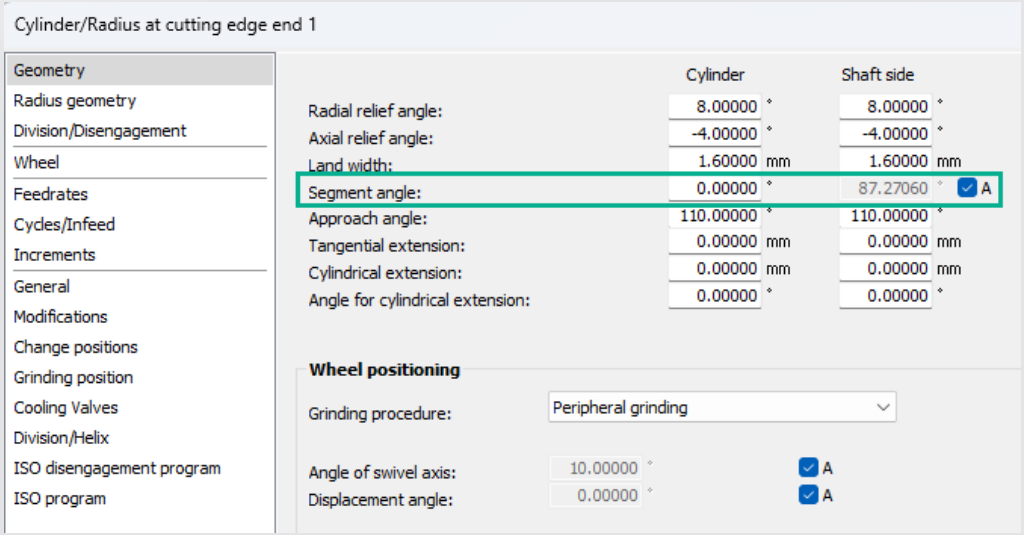
(Complex end mills, 5.0.0)

- At the end of the cutting edge, a radius can be ground.



New operation 'Radius at cutting edge end' for end mill (Complex end mills, 5.0.0)

- For Radius at cutting edge end, the segment angle ‘shaft side’ can now be defined with an automatic checkbox. In this case the operation gets shortened automatically, so that the wheel corner radius does not grind into the shaft.



Other innovations end mill

- High precision on ball nose and corner radius geometry: Gash out X and reliefs following the cutting edge to the micrometer (4.3.0)
- Separate feedrate on engage / disengage slant (5.0.0)
- Flute-X: Show calculated cutting angle
- New default values for chisel edge on a ball nose
- Calculating cutting edge length on taper end mills (5.0.1)
- Multi-helix end mill - Multiple helix probing

New features in NUMROTO 4.3.0, 5.0.0 und 5.0.1

- End mills
- Drills / Step drills
- Form cutters
- 3D-Simulation
- NR Draw
- Other topics
- Planned innovations version > 5.0.1

News Drills

- Clearance relief with disengage chamfer (5.0.0) 
- Chamfer relief - grinding wheel position inside – outside (5.0.0) 
- Faster calculation of the manual flute for drills (long tools) (5.0.1)

New features in NUMROTO 4.3.0, 5.0.0 und 5.0.1

- End mills
- Drills / Step drills
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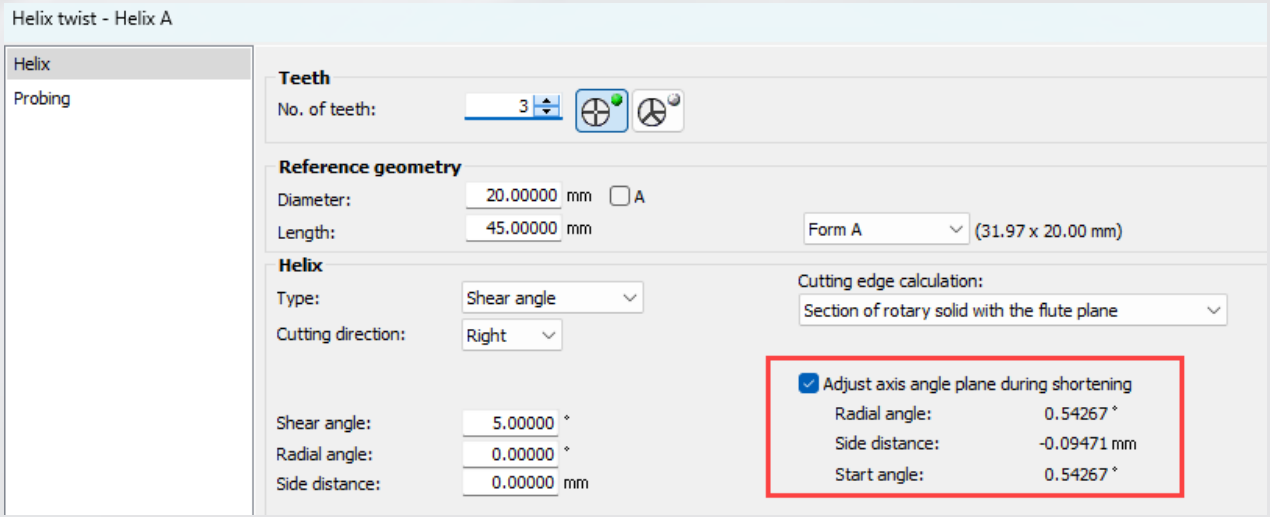
- Other topics
- Planned innovations version > 5.0.1

Shorting form cutter with shear angle

(5.0.0)

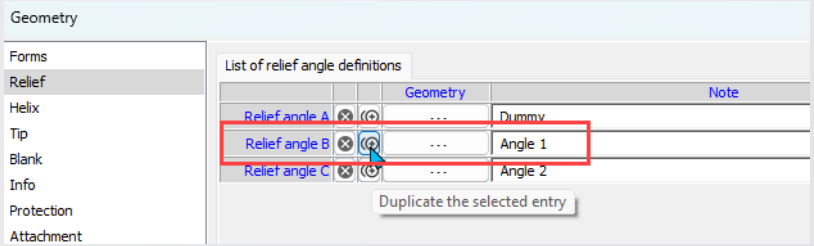
- If a form cutter with pre machined flutes and shear angle is shortened, the position an side distance will be changed. In order for the software to track this, the checkbox below must be activated.

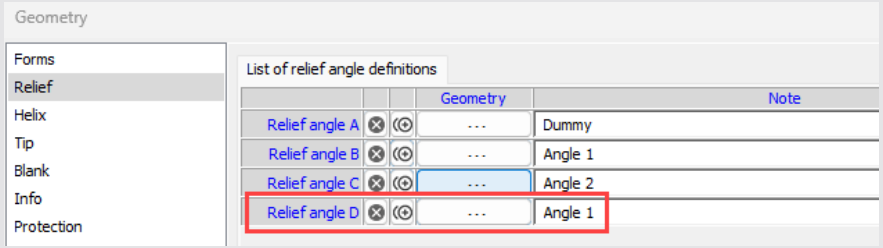


Duplicate selected form and relief angle

(5.0.1)

- Any form / relief angle / helix etc. can now be duplicated and deleted within the list.
- This also works for clamping system transformation and wheel dressing.





Other innovations form cutter

- Form Compensation - Automate Alignment Measuring Profile (5.0.0)
- Show relief profiles (4.3.0)
- Form relief - grinding in helix direction, the grinding point offset direction is now selectable (5.0.0)
- Measure in process for form relief and multi-axis oscillation (5.0.0)
- Form cutter – determine tooth center position (4.3.0)

New features in NUMROTO 4.3.0, 5.0.0 und 5.0.1

- End mills
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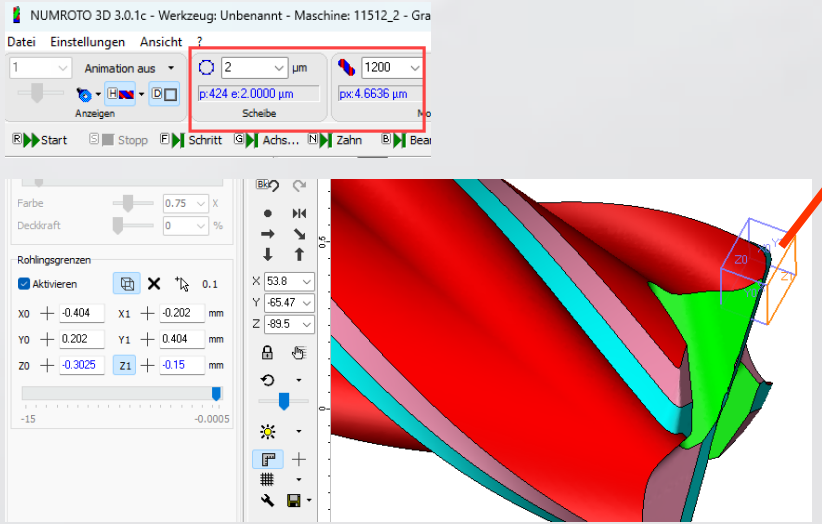
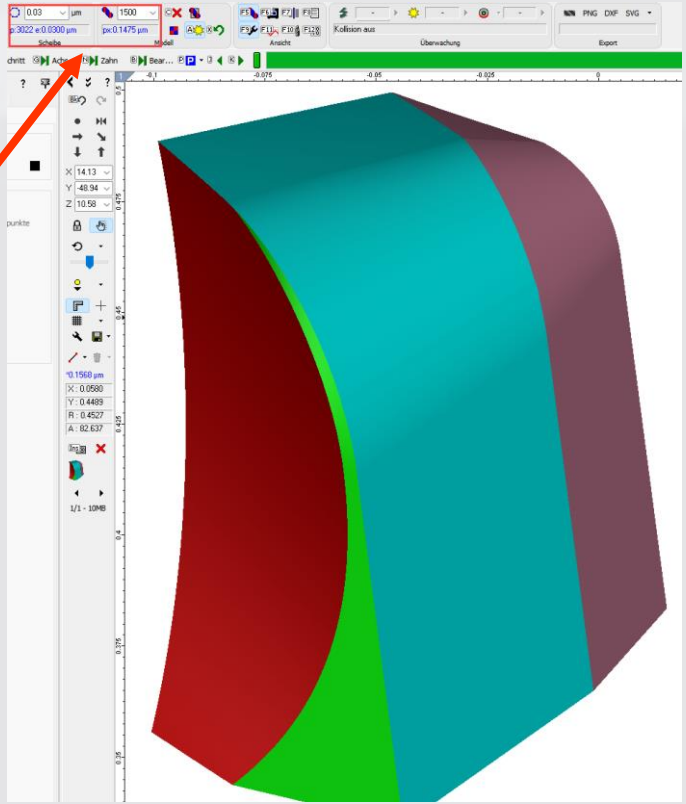
- Planned innovations version > 5.0.1

Reduce the blank to a cuboid

(4.3.0)

- Possibility to reduce the blank to a defined cuboid to get a highly accurate simulation of small details.

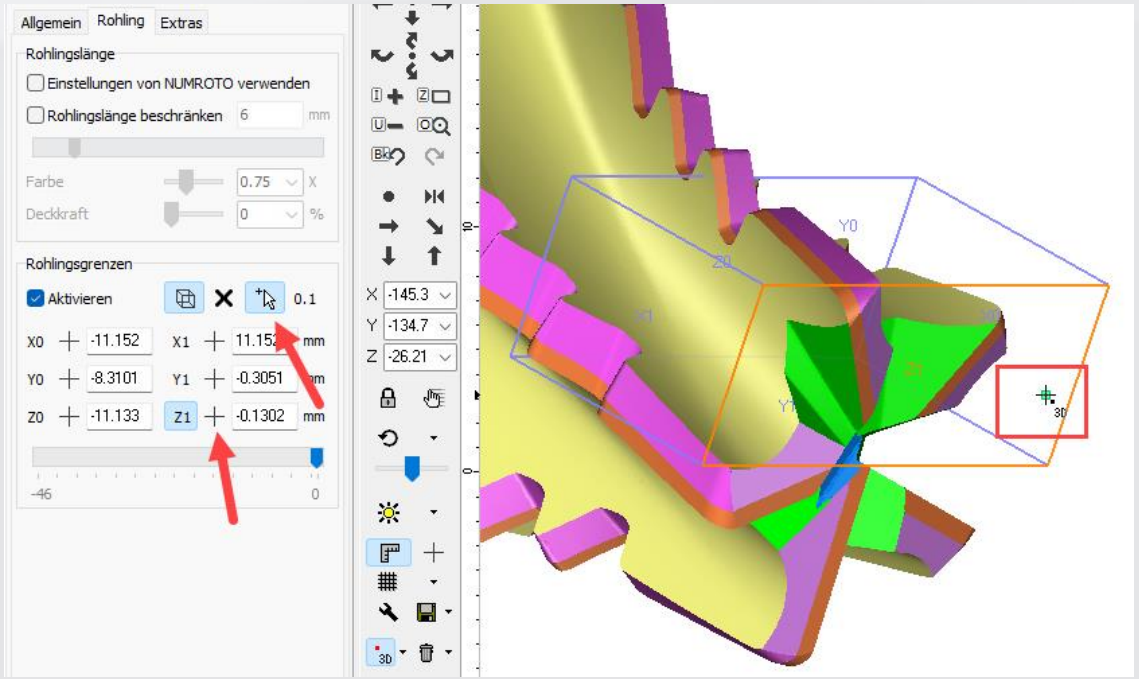




Reduce the blank to a cuboid

(5.0.1)

- Possibility to reduce the blank to a defined cuboid with mouse fast and directly.



Other innovations 3D simulation

- Cooling hole correction angle (5.0.1) 
- Up to 15% faster simulation when using a CPU with 6 or more cores (4.3.0)
- The removal rate for small tools is calculated more exactly (5.0.1)
- Display and monitor wheel body (4.2.1 / 4.3.0) 

New features in NUMROTO 4.3.0, 5.0.0 und 5.0.1

- End mills
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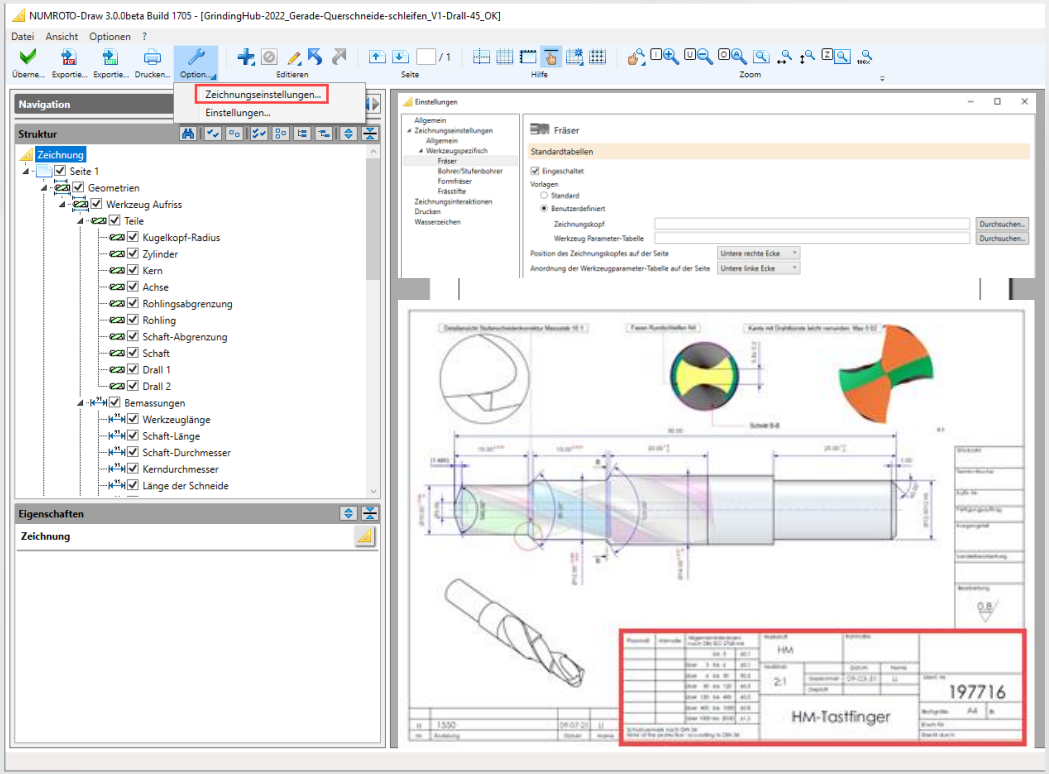
- Other topics
- Planned innovations version > 5.0.1

User defined drawing headers

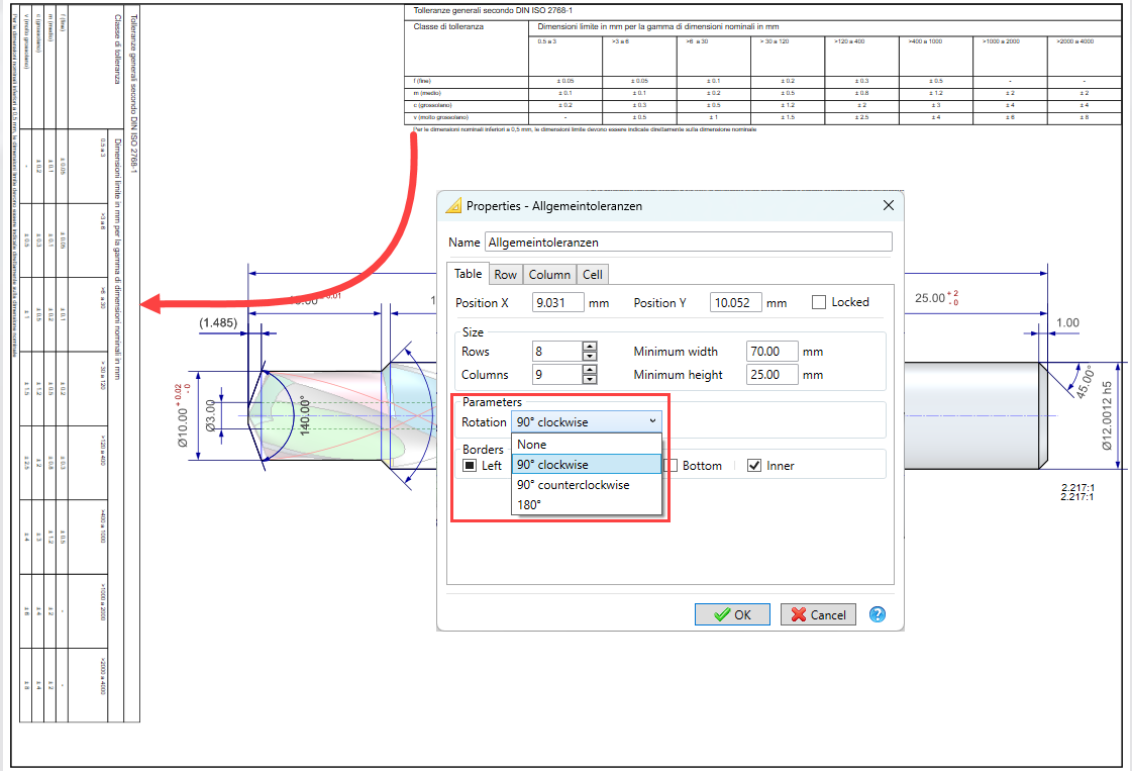
(4.2.1)



Tabels can now be rotated

(5.0.1)

- Tables can now be rotated.
- It is possible to rotate them clockwise , counterclockwise or 180 degrees.



Other innovations NR-Draw

(5.0.0)

- Additional tables per tool range
- Simplified alignment of drawing elements
- New dimensioning type for relief on outside diameter
- Optimized dialog for printing
- New element 'Circles' available
- Move elements with keyboard arrow keys

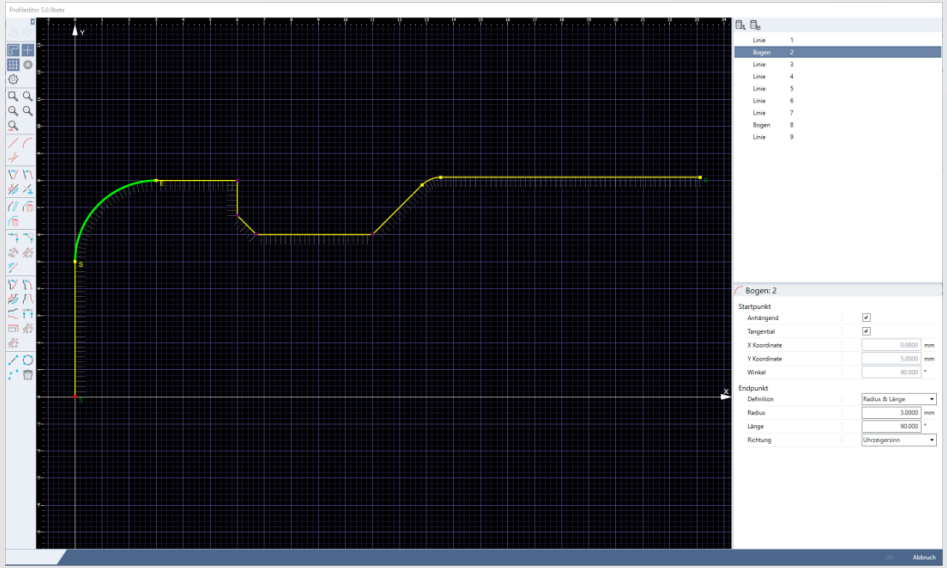
New features in NUMROTO 4.3.0, 5.0.0 und 5.0.1

- End mills
- Drills / Step drills
- Form cutters
- 3D-Simulation
- NR Draw
- Other topics
- Planned innovations version > 5.0.1

Profileditor-X

(5.0.0)

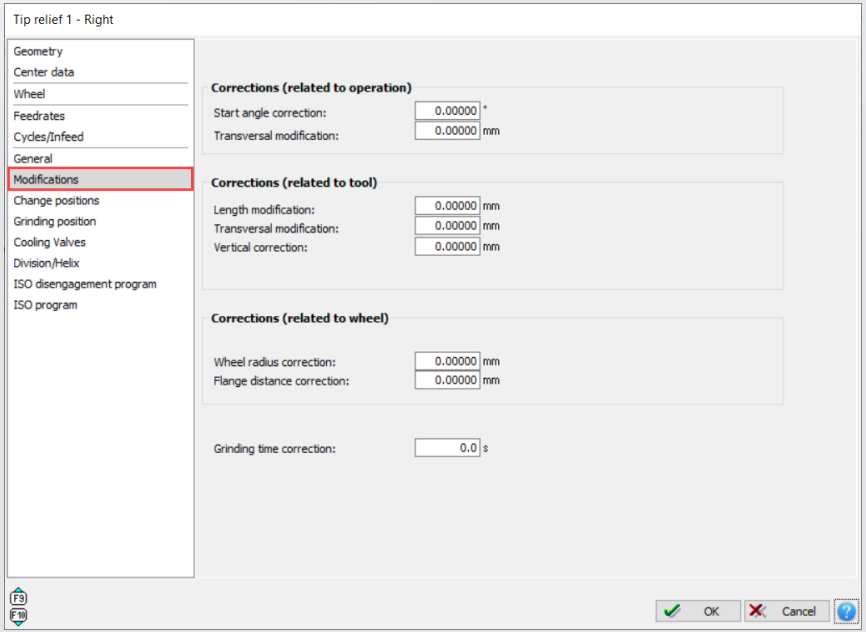
- Quick editing of the profile with mouse
- Easy-to-read table with all elements
- Multiple Layers
- Conversion Spline → Polyline
- Consistent application of attachment and tangency



Dialogue with corrections

(4.3.0, 5.0.0)

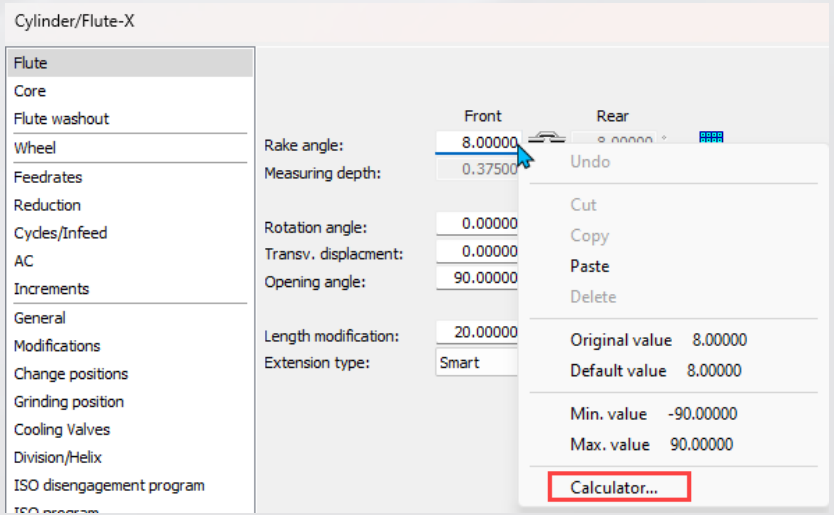
- The same corrections can now be used for practically every operation. The list of possible corrections has been greatly expanded. (Related to operation, work piece or wheel).
- Important: These corrections should only be used with small values. With larger values, geometry deviations may occur and collisions cannot be ruled out.

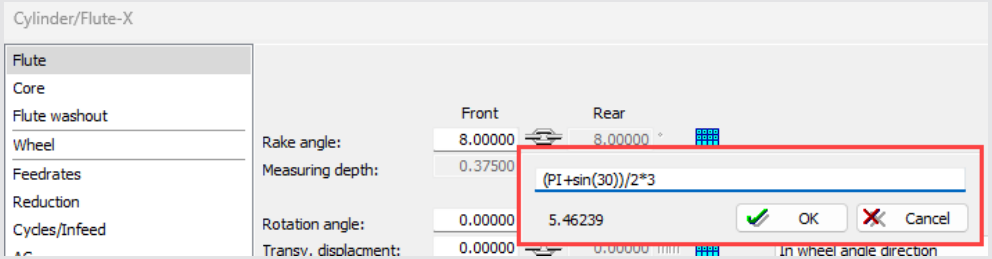


Parameter input with simple calculator

(5.0.1)

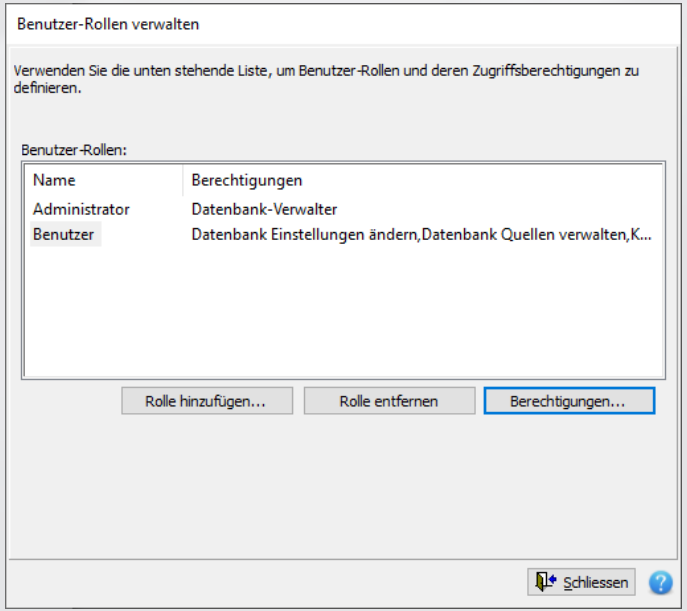
- Calculator opens with right click on the parameter.
- Simple calculations but also trigonometry (triangle calculation) possible.

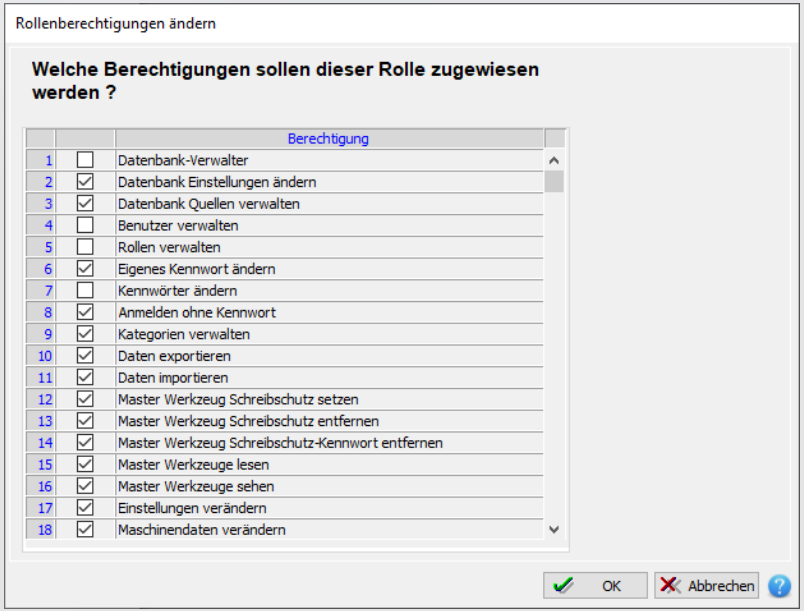




Multiuser-Server: Sybase 17 and new user management (5.0.0)

- More rights can be defined in the user administration.
- As of Windows Server 2019, Sybase 17 is required.





Other general innovations (1)

(5.0.0)

- Thermal growth compensation
- Copy wheel packages
- Grinding wheel - show list of tools
- Separate parking position for program end within NR-Control
- Automatically use last used machine
- Numbering teeth
- Inch / mm value converted in context menu
- K-land probing with coolant hole needle
- Tab page ‘Blank‘ available on F10-Resharpening

Other general innovations (2)

(5.0.1)

- Filter according to operation (Search filter) 
- NCI show more last cycle times 
- Set wheel CNC-compensation to zero after wheel probing 
- Assign collets to multiple machines 
- Insert tool into job list (F10 – resharpening) 
- Save and restore calibration data 

New features in NUMROTO 4.3.0, 5.0.0 und 5.0.1

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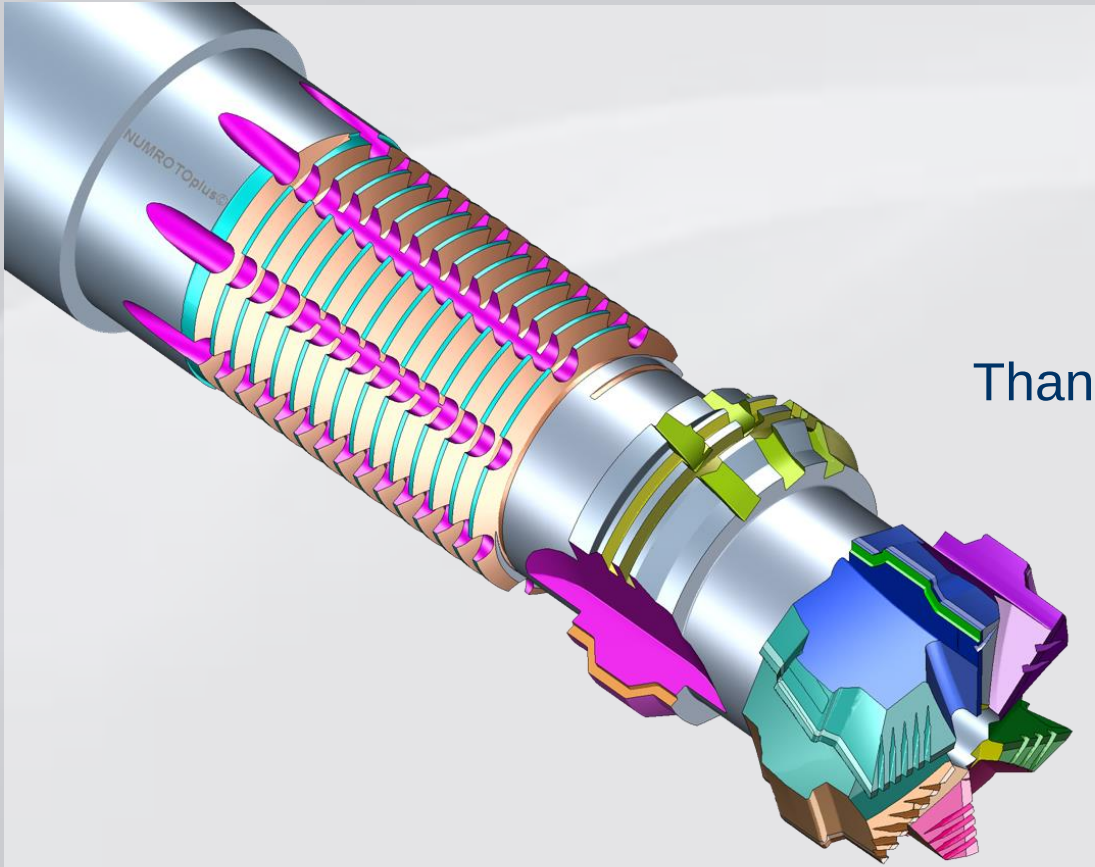
- Other topics
- Planned innovations version > 5.0.1

Planned innovations version > 5.0.1

- Definition of tables generally in respecto to start-/endpoints of profile elements (similar to range in form reliefs)
- Wheel type 11V5 also suitable for radial reliefs (end mill and form cutters)
- Flute - X also for drills
- Consider form wheel profile for flute X
- Grinding on ball nose or corner radius with the wheel rim. (same as radial relief)
- In-process-measurement core diameter for drill flutes, on different positions, with automatic compensation (long drills)
- Replace wheels (for example master wheels) based on a fix rule (in respect of the wheel name)
- Probing run out as an operation

Further information:

Release Notes in the NUMROTO customer area:
www.numroto.com

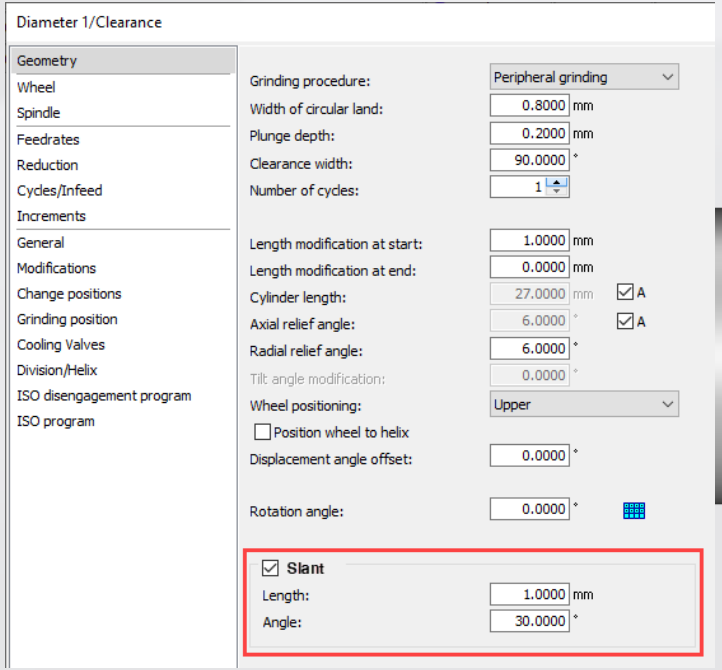


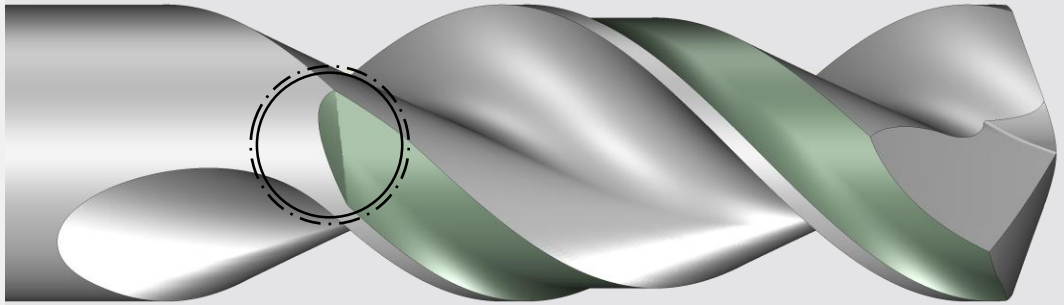
Thank you for your interest!

Clearance relief with disengage chamfer

(5.0.0)

- At the end of the clearance relief operation, it is now possible to program a disengage chamfer.

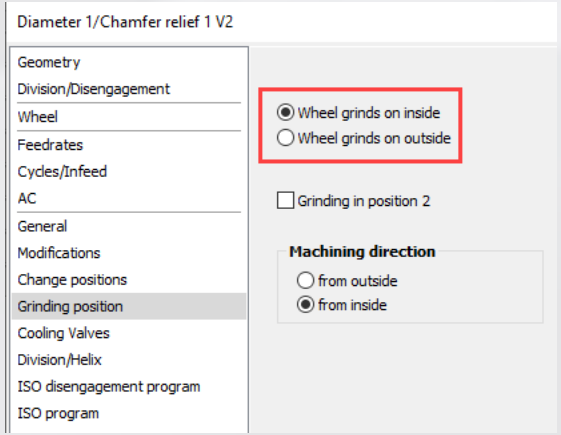




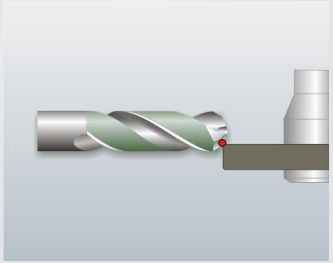
Chamfer relief - grinding wheel position inside - outside

(5.0.0)

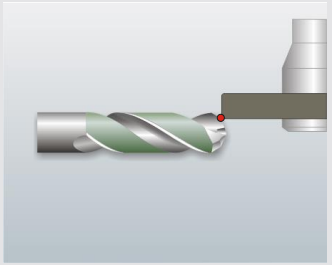
- When using a peripheral wheel, the inside - outside grinding wheel position can now be selected.



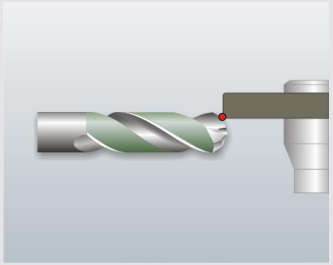
Wheel position inside (Pos-1)



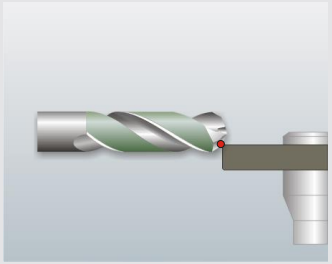
Wheel position outside (Pos-1)



Wheel position inside (Pos-2)

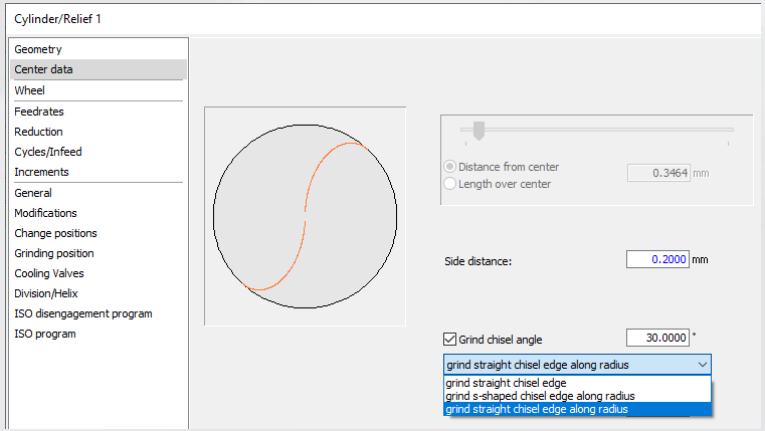


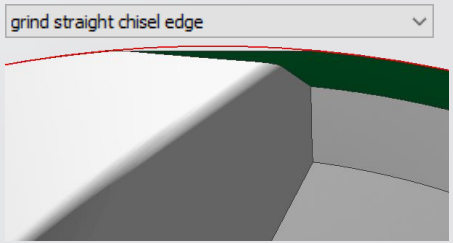
Wheel position outside (Pos-2)

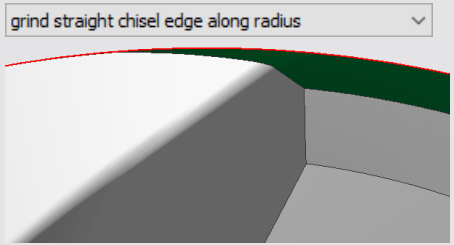


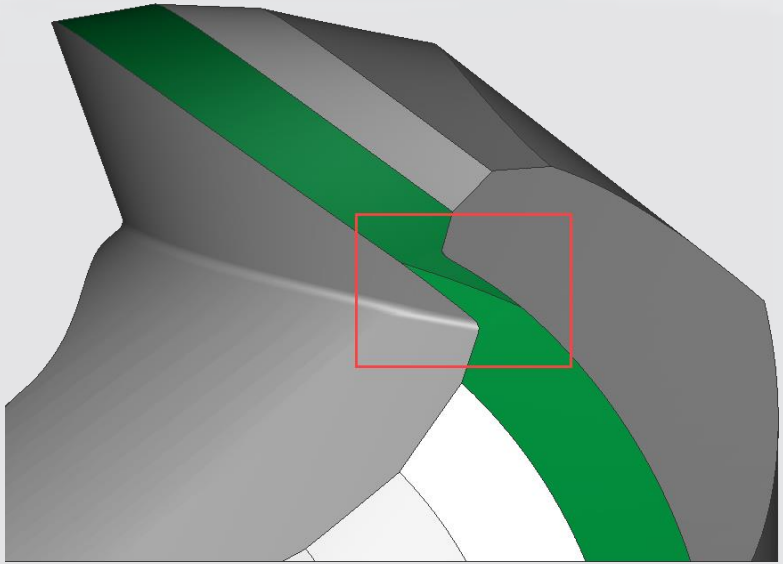
Straight chisel edge (on radius) grinding

(Special grinding functions,4.3.0)





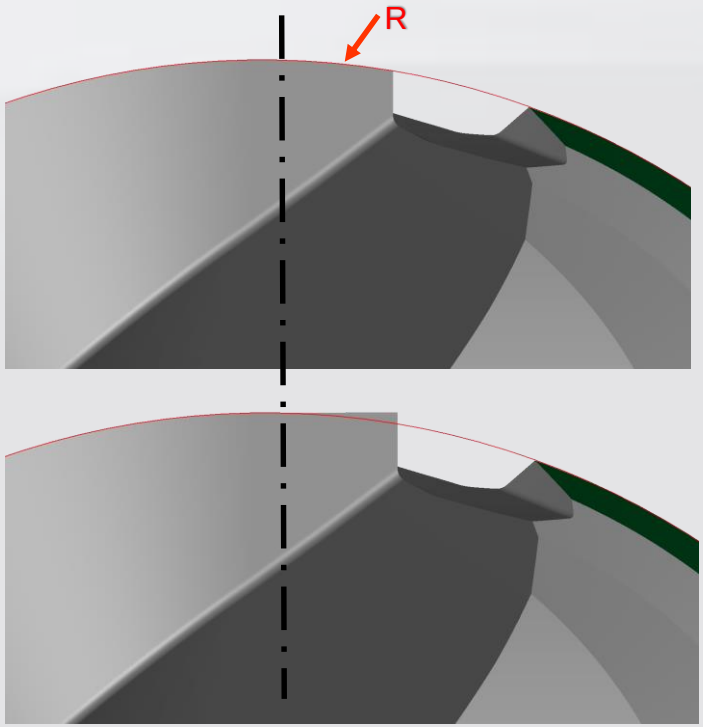




Grind cutting edge along radius past center

(Special grinding functions, 4.3.0)

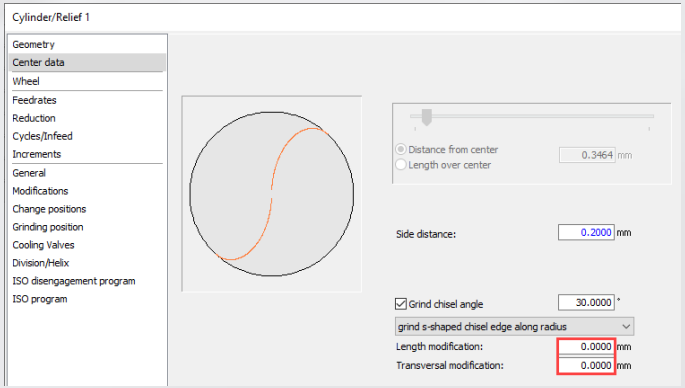
- Cutting edge always precisely on radius

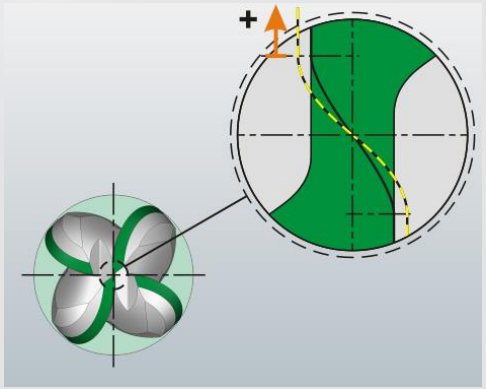


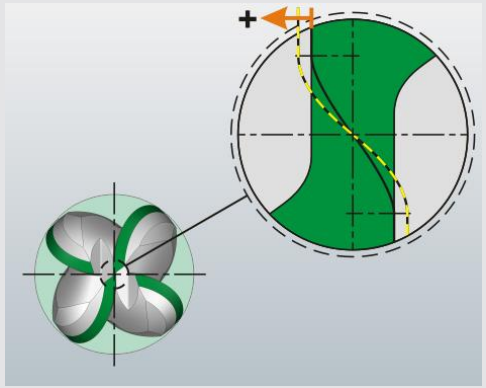
Extension chisel edge

(Special grinding functions, 5.0.0)

- Chisel edge extension - transverse correction.
- For S-shaped and straight chisel edge.







Increment ball relief chisel edge

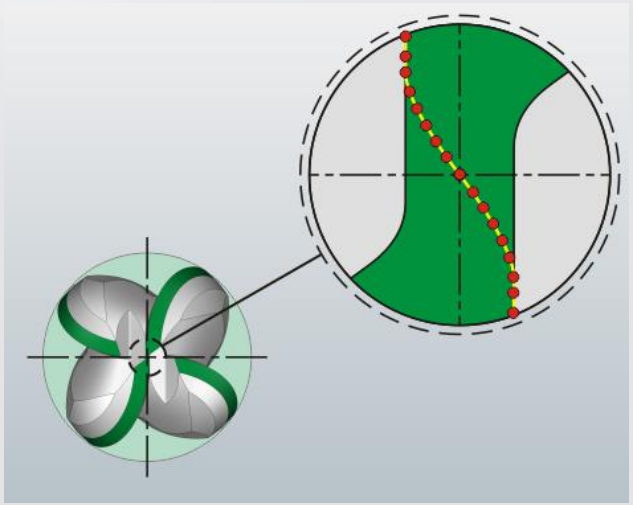
(5.0.0)

- Separate increments for bal relief chisel edge.

Geometry

- Cylinder geometry
- Teeth
- Blank
- Info
- Attachment
- Clamping
- Pass over
- Increments
- CNC
- 3D
- Park positions
- Probing-General
- Probing-Position
- Probing-Measuring
- Probing-Runout/Lateral runout

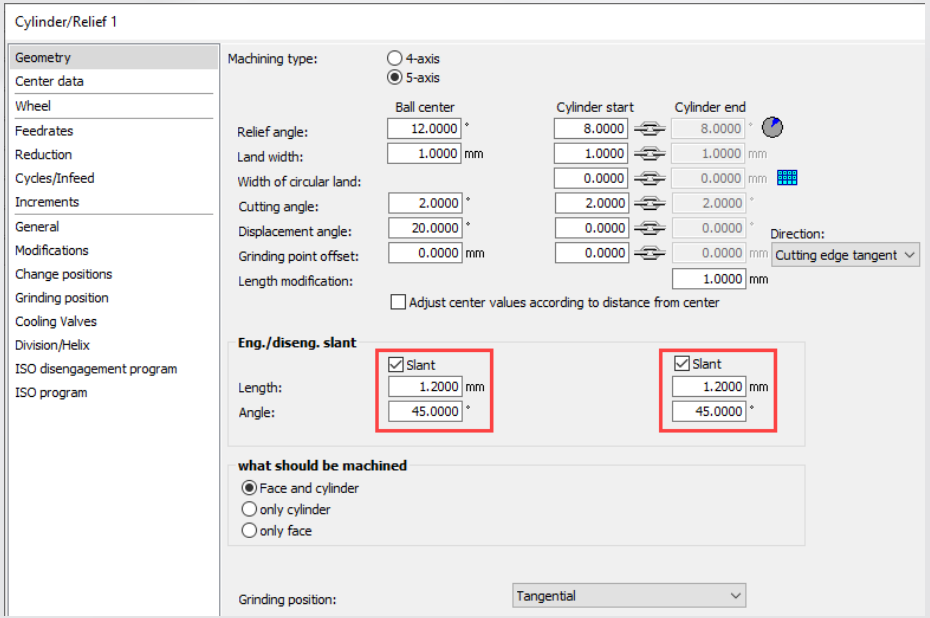
	2D-Sim	CNC/3D		
Cylinder flute:	0.1200	1.2000	mm	A
Flute washout intermediate points:	5	5	Pts	A
Cylinder relief:	0.8400	1.2000	mm	A
Radial body relief:	0.0480	0.6000	mm	A
Tip gashout:	0.0720	0.6000	mm	A
Tip relief:	0.3000	0.1200	mm	A
Ball/Corner radius gash out:	1.0000	0.4167	°	A
Ball relief:	1.0000	0.4564	°	A
Ball relief chisel edge:		20	Pts	A
Tip clearance:	50	50	Pts	A
Gashout widening:	50	25	Pts	A
Rough profile:	1.0000	2.0000	°	A
Cylindrical grinding:	30	2	Pts	A
Manual grinding path:	50	2	Intermed. poi...	A
Manual step face cam:	1.0000	5.0000	°	A
Round clearance grinding:	2.4000	6.0000	mm	A
Copy form / Independent profile:	100	50	Pts/...	A
Other (linear):		1.0000	mm	A
Other (degree):		5.0000	°	A
Other (points):		20	Pts	A

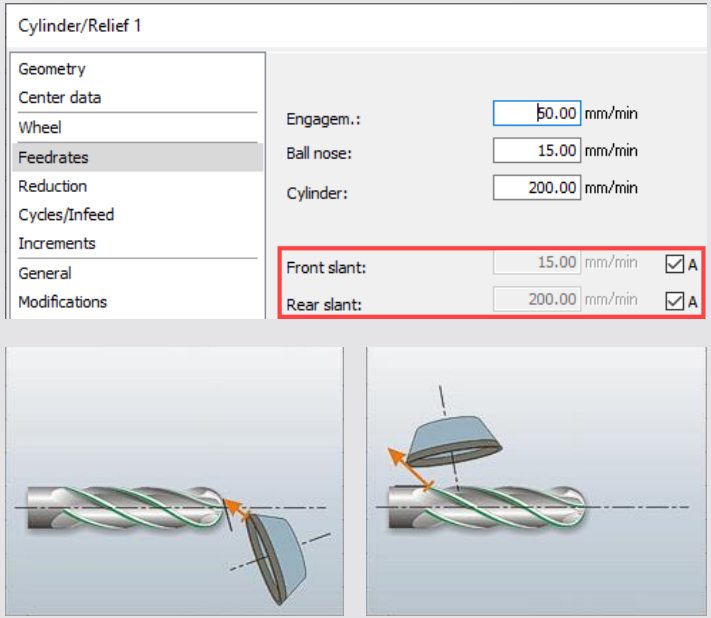


Separate feedrate for engage and disengagement slant

(5.0.0)

- A separate feed rate can now be programmed for the engage and disengagement slant.

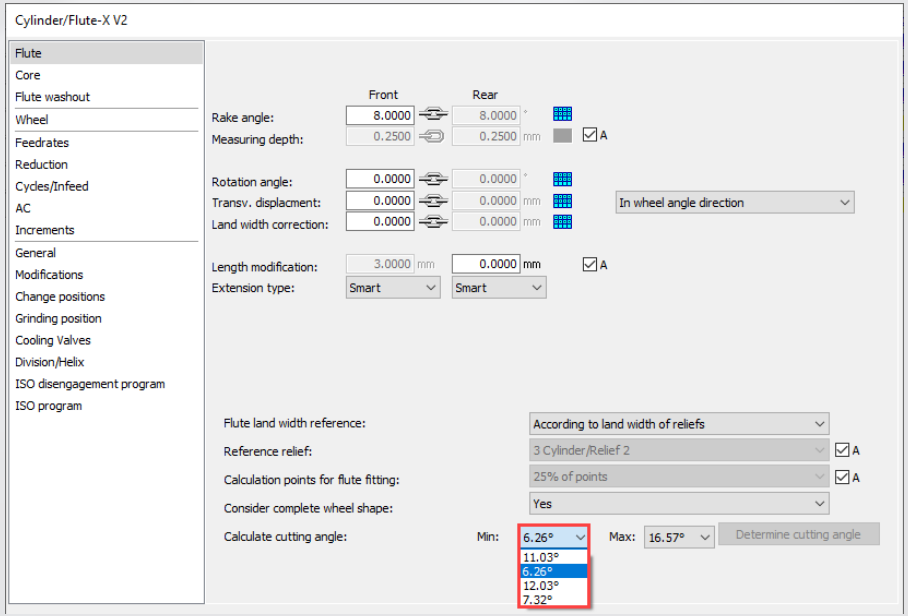




Flute-X: Show calculated cutting angle

(5.0.0)

- The smallest (Min) and largest (Max) calculated cutting angle of all flutes is always displayed as the top value. If you open the drop-down box, the values according to helix 1 up to helix n are displayed.

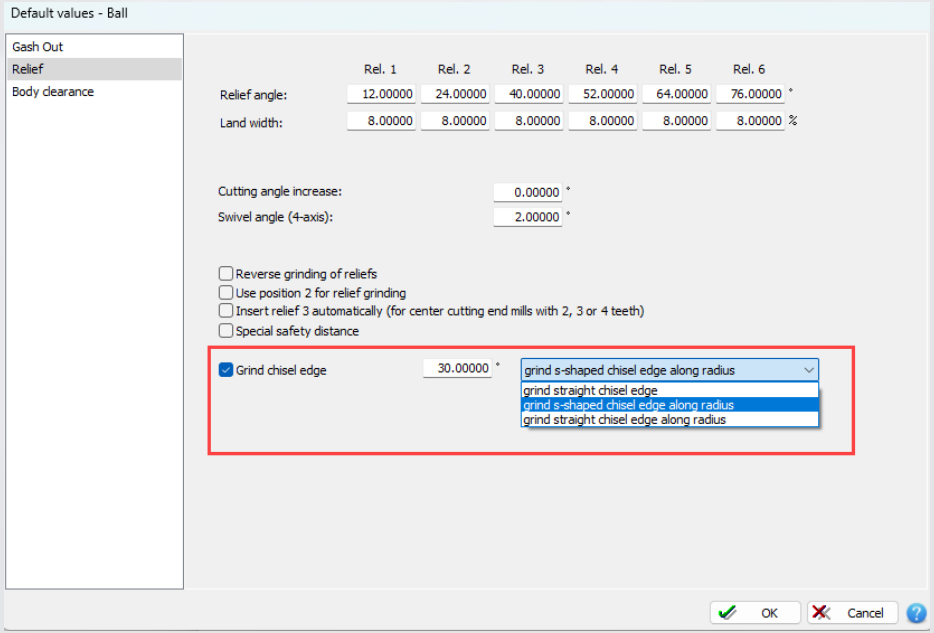


New default values for chisel edge on ball nose

(5.0.1)

- It is possible to define default values for chisel edge.

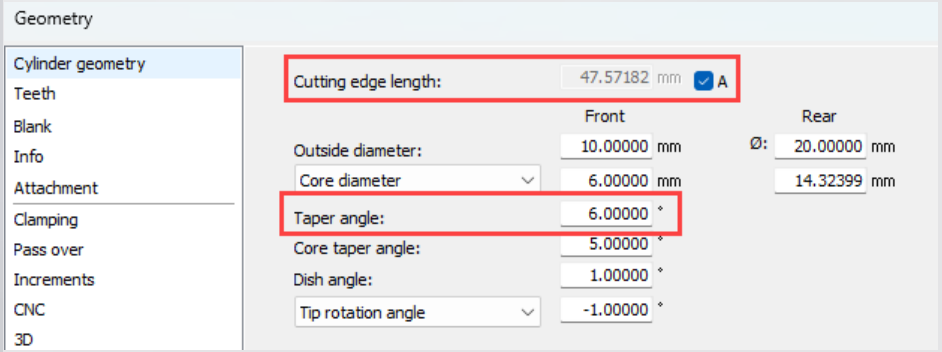
  These values are only used for a relief , if a side distance is active.

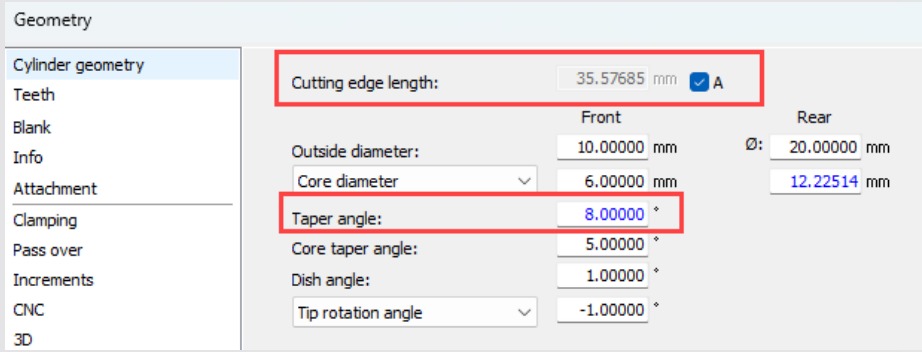


Calculating cutting edge length on taper end mills

(5.0.1)

- For taper end mills (flat / corner radius) the cutting edge length can be calculated automatically.
- Therefore it is important , that the taper angle is defined first.



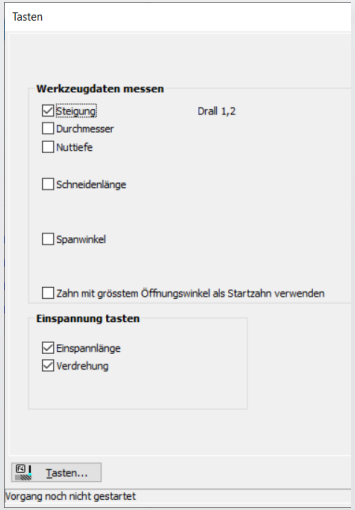


Probing page: Multiple helix probing

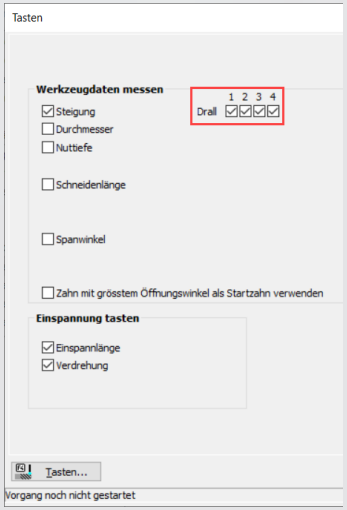
(5.0.0)

- Now it is possible to select in the probing dialog which helix must be probed (multi-helix end mill)

4.3.0



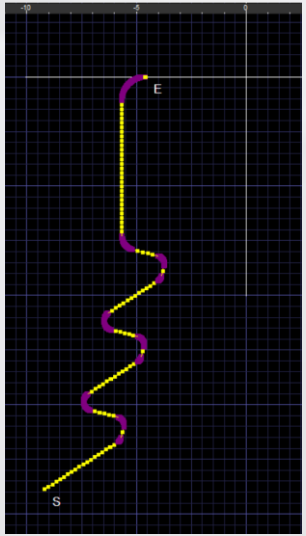
5.0.0

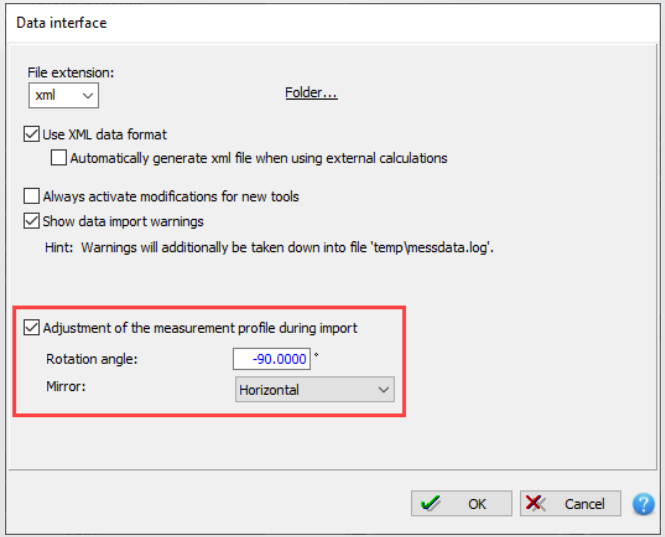


Automated Alignment for Measurement Profile

(5.0.0)

- When importing a DXF measurement profile, the start - end point can be swapped and the profile automatically aligned based on the settings.

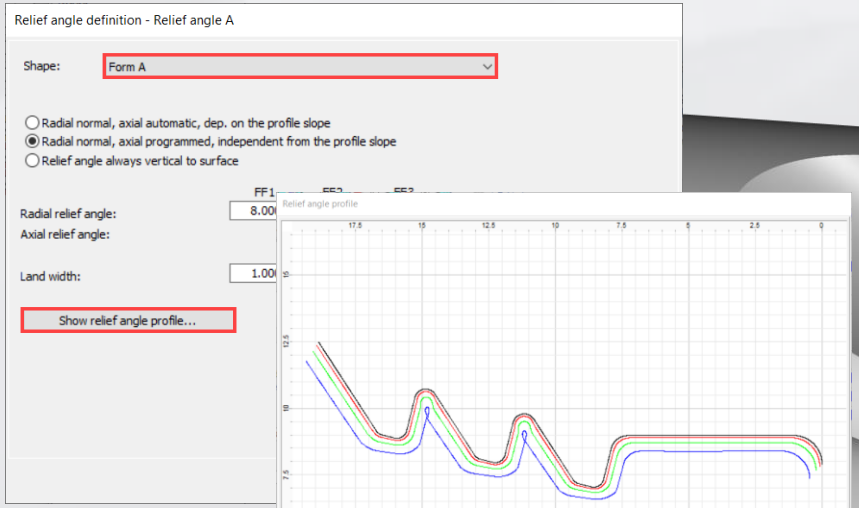


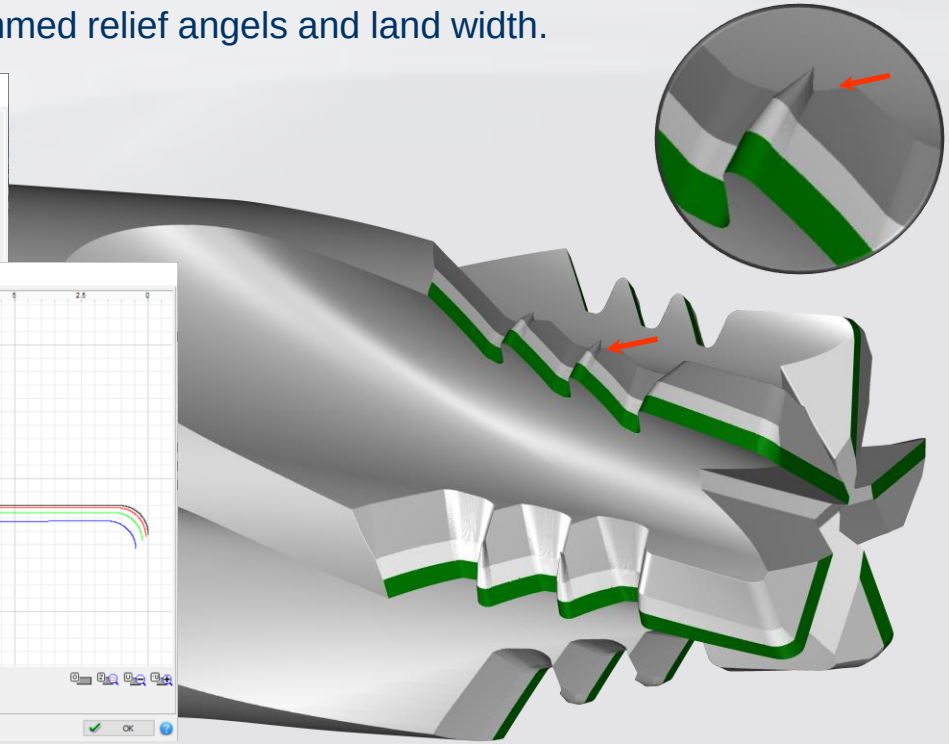


Show relief profiles

(4.3.0)

- Show relief profile based on the programmed relief angels and land width.

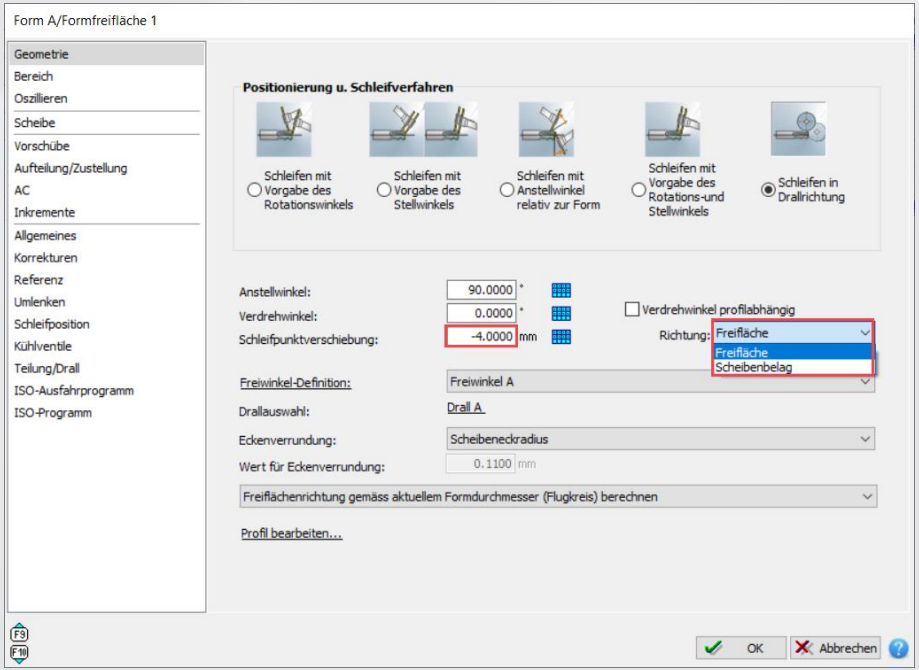


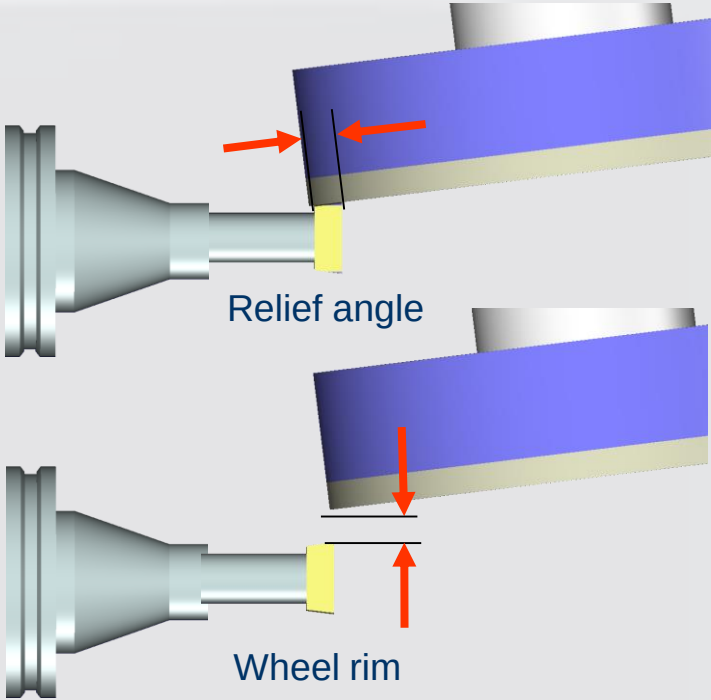


Form relief - grinding in helix direction

(5.0.0)

- The grinding point off-set can be new selected in the direction of the relief angle or wheel rim.

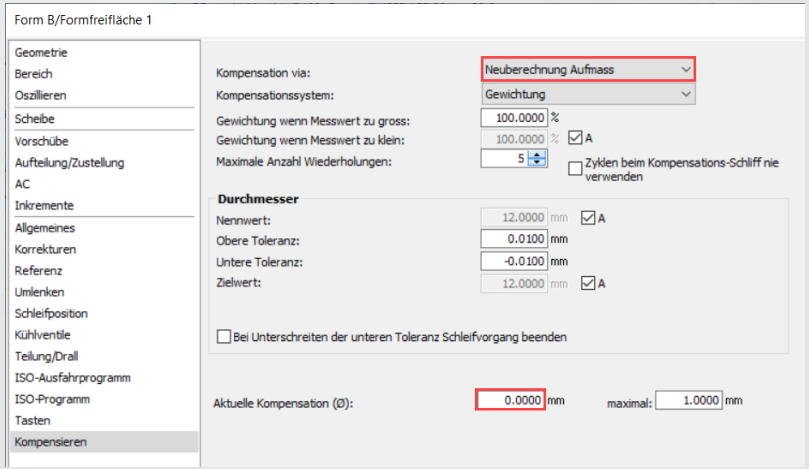


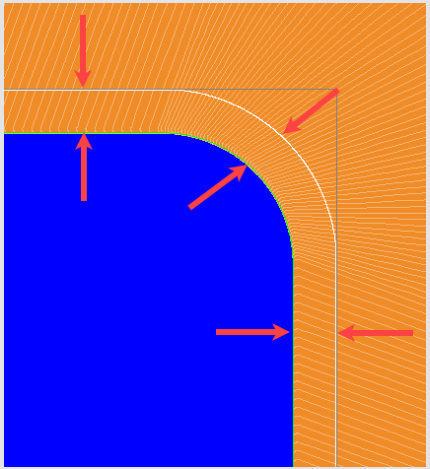


Measure in process for form relief

(5.0.0)

- For the form relief operation, the measurement in process can be used with the probe task 'Diameter'. The probed diameter difference can now be compensated not only in the diameter direction ('new culation'), but also as an stock amount (recalculation using 'stock amount'). The result is so far the same as with the compensation 'wheel compensation'. The advantage is that multi-axis oscillation can also be applied at the same time.
- Interesting also for CBN material.

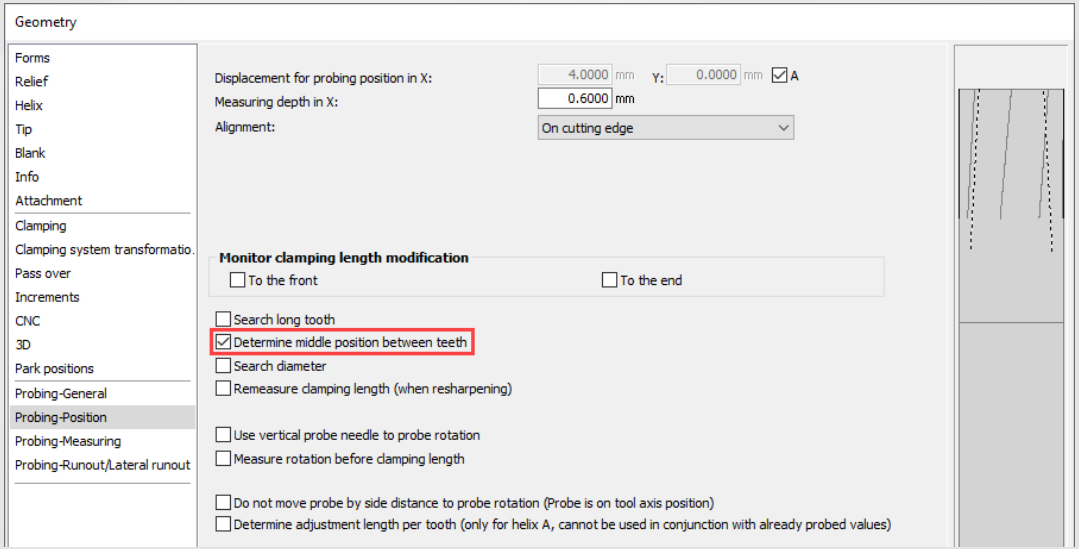


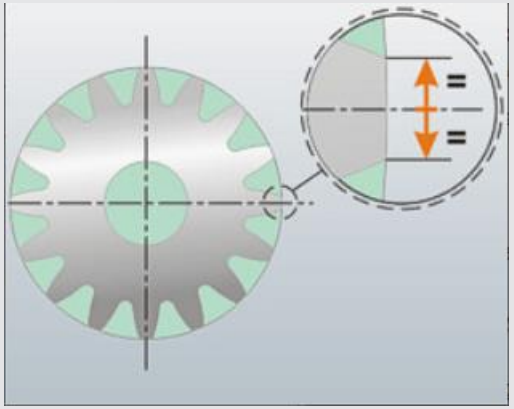


Form cutter – determine tooth center position

(4.3.0)

- As in the drill program, it is now also possible in the form cutter program to determine the tooth center position with the measuring probe.

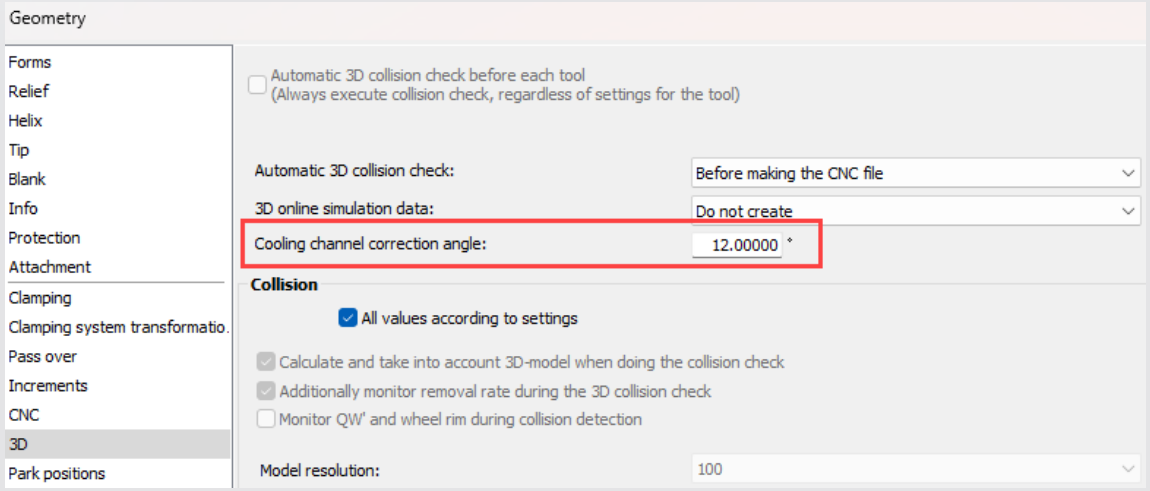




Coolant hole correction angle for 3D simulation

(5.0.1)

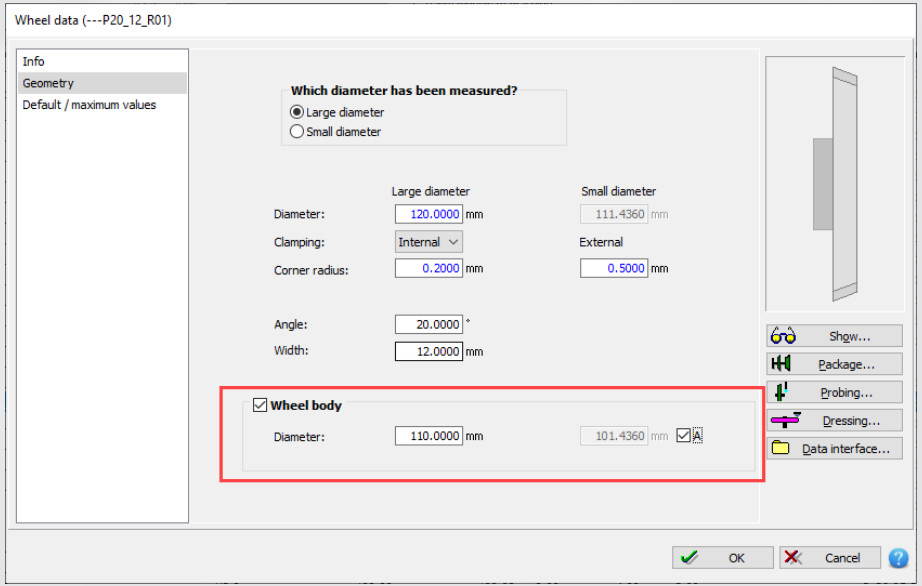
- Since version 5.0.1 its possible to program a coolant hole correction angle for 3D simulation.
- This can be used to compensate a possible difference between the actual tool and the simulated 3D model.
- Only has an effect in 3D-simulation.

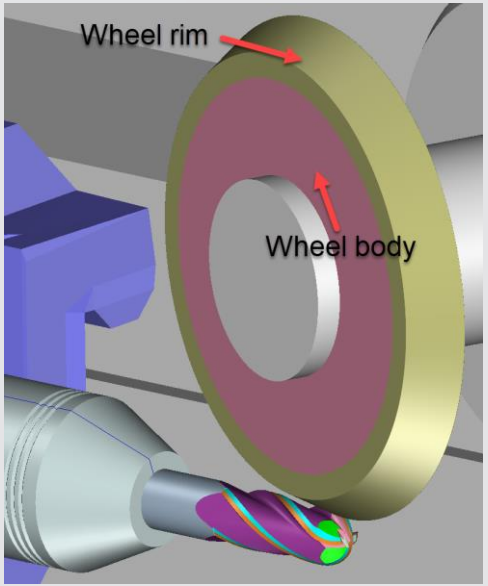


Display wheel body

(4.2.1)

- The size of the wheel body can now be defined. This will also be considered by the 3D collision check and it will be animated in the 3D simulation.

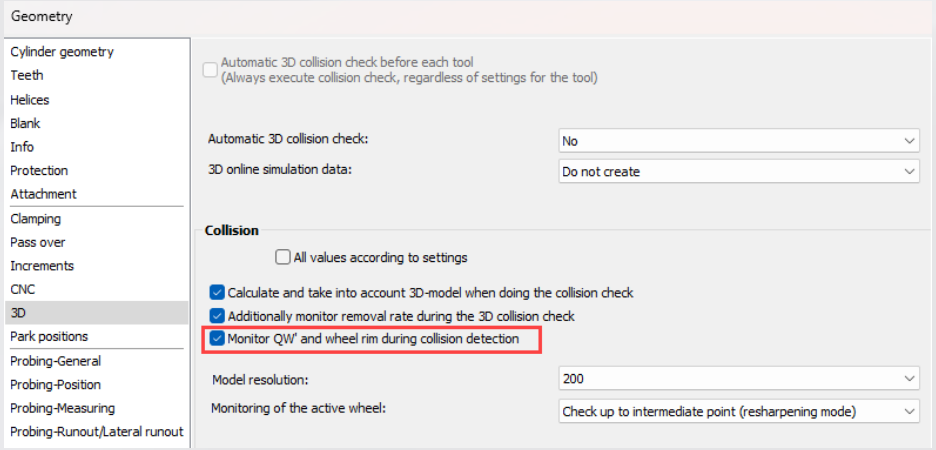


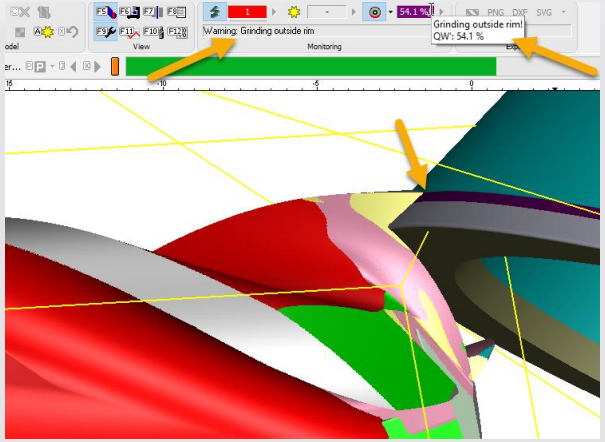


Monitor wheel body

(NUMROTO-3D special functions, 4.2.1)

- In the 3D simulation the wheel body will be monitored for collision (only if QW'-calculation is active)





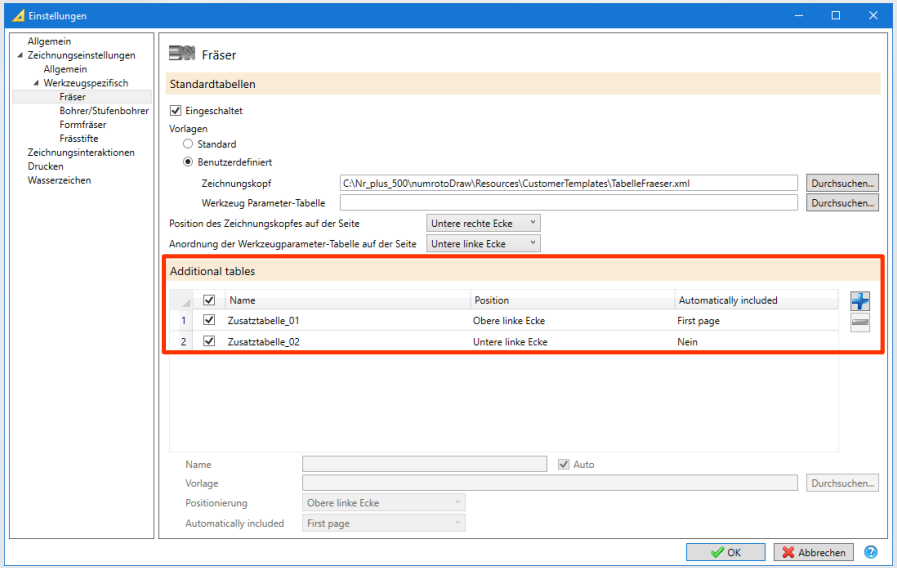
		O	3D	Color	Operation	Wheel	Rotation speed	ID	Feedrate	Collision state	Removal rate	QW'
1	Cylinder	☑	☑		Flute-X	---P00_15 (3)	6684 / 35.00	3	80.0		882.77	4.34
2	Tip	☑	☑		Tip clearance	---P00_15	6684 / 35.00	3	30.0		1[illegible]33	0.64
3	Tip	☑	☑		Tip gash out X	---P45_08	6685 / 35.00	1	50.0		[illegible].94	1.52
4	Tip	☑	☑		Tip gashout	---P45_08 (2)	6684 / 35.00	1	25.0		8.00	1.02
5	Tip	☑	☑		Tip Notch	---P45_08 (2)	6684 / 35.00	1	30.0		37.52	1.26
6	Cylinder	☑	☑		Relief 2	---T01 (2)	6684 / 35.00	4	5.0		47.70	4.09
7	Cylinder	☑	☑		Relief 1	---T01	6684 / 35.00	4	15.0		[illegible].31	

Grinding outside rim

Additional tables per tool range

(5.0.0)

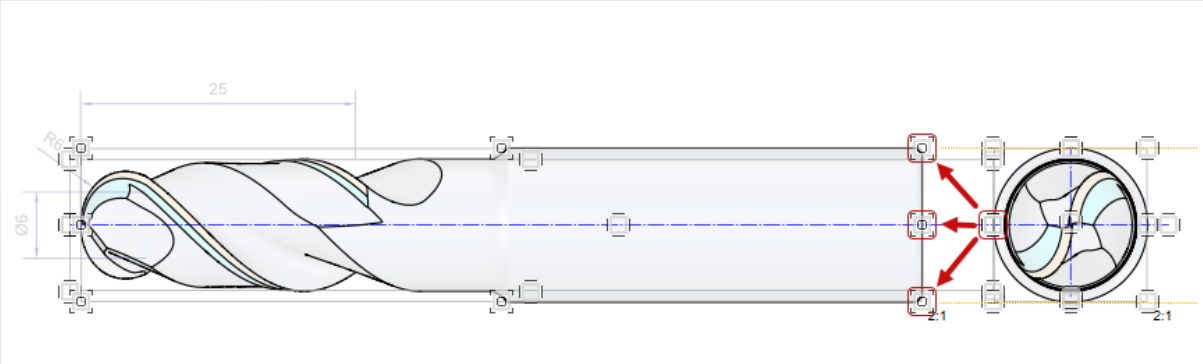
- Any number of tables can be added as defaults for each tool range (end mills, drills, form cutters and burrs).



Simplified alignment of drawing elements

(5.0.0)

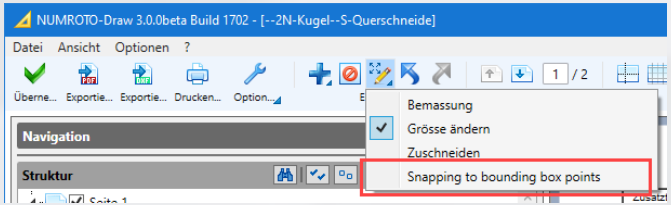
- Drawing elements can now be easily aligned with other drawing elements.
- When approaching, the snap function boxes of the individual drawing elements, snap into each other.
- After snapping in place, the element can be moved in horizontal or vertical direction using the arrow keyboard keys.



Simplified alignment of drawing elements

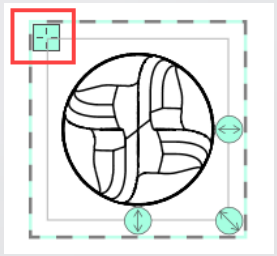
(5.0.0)

- The snap function is activated either via the 'Edit mode' key.

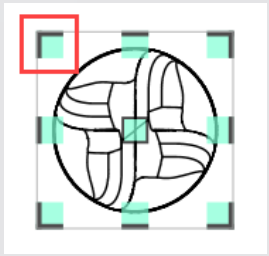


Or by 2x clicking the move and crop border box.

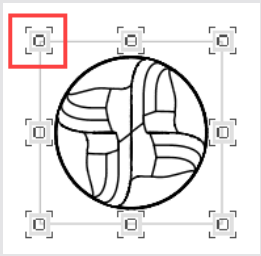
Displacement box



Crop Box



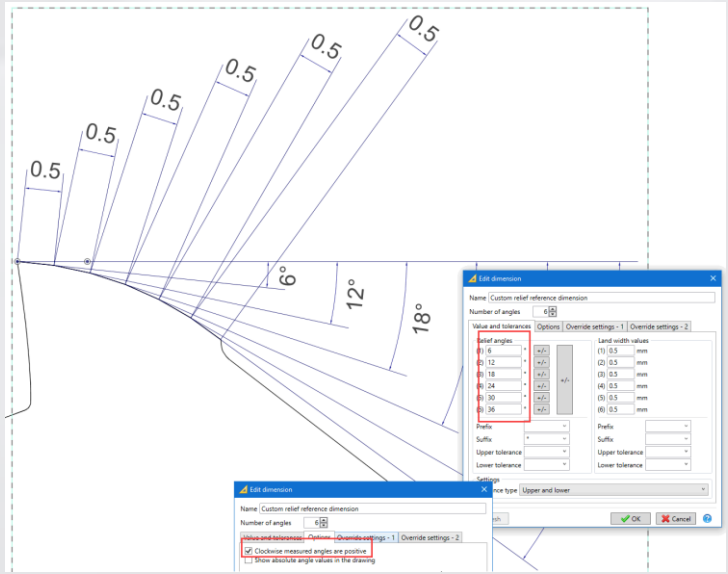
Snap function box

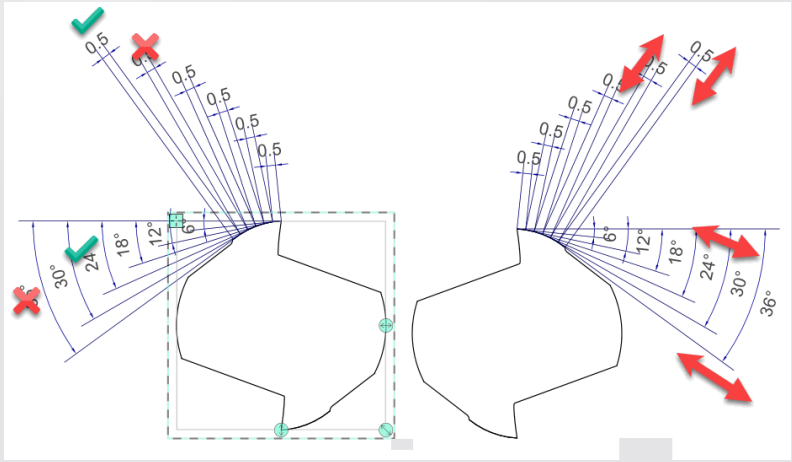


New dimensioning type for relief on outside diameter

(5.0.0)

- Relief on outside diameter can now be easily dimensioned.
- The dimensions can be displayed or moved individually.

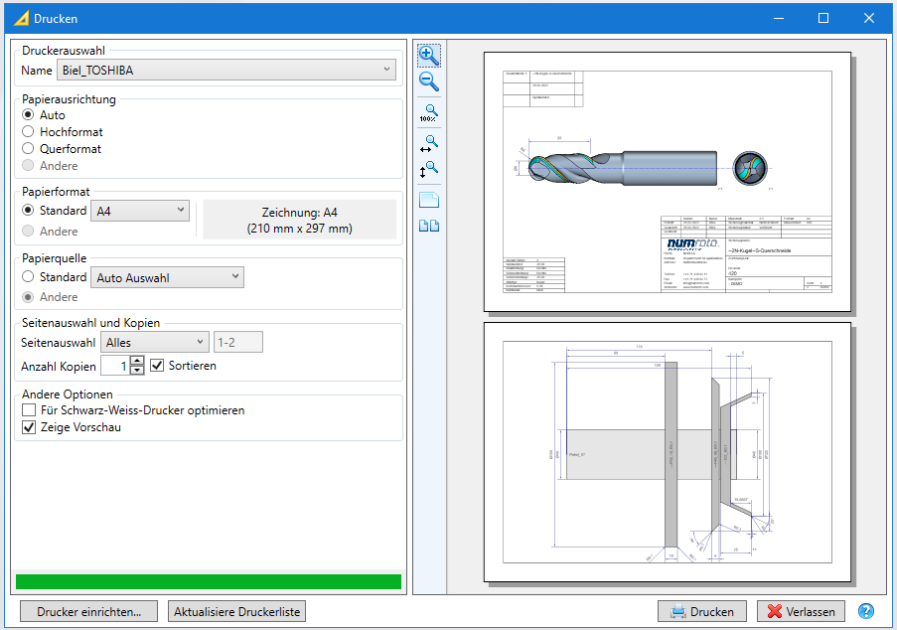




Optimized dialog for printing

(5.0.0)

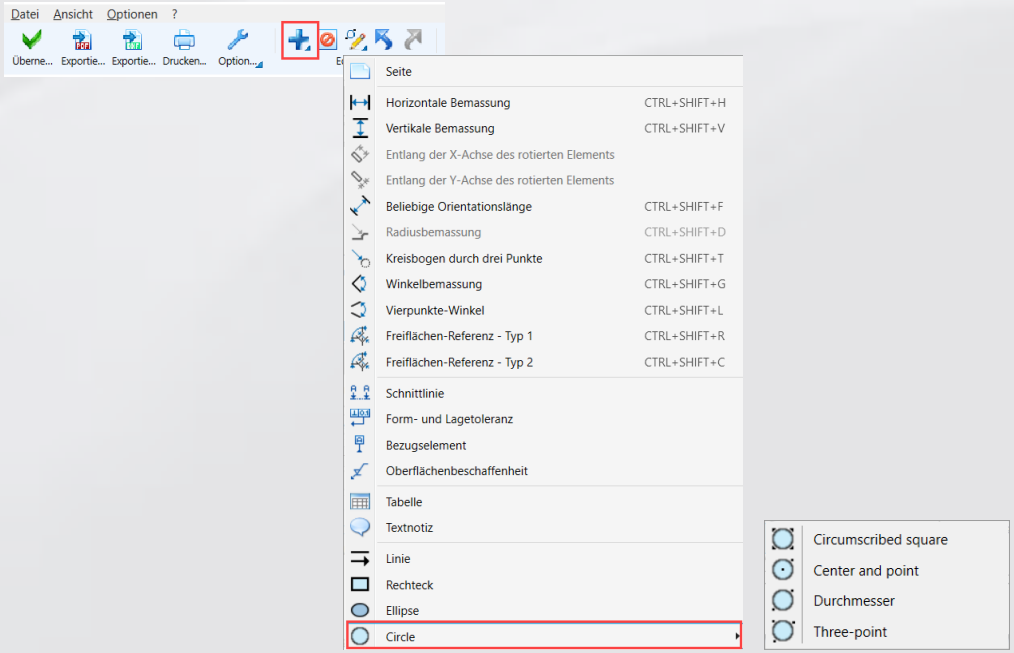
- Print quickly and easily with the new buttons and selections.

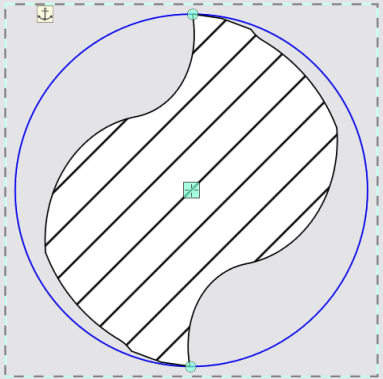


New element 'Circles' available

(5.0.0)

- Simplified way to draw a circle.

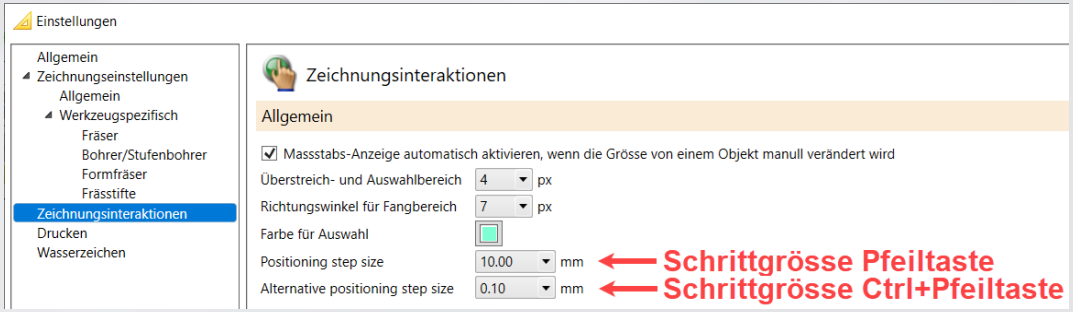


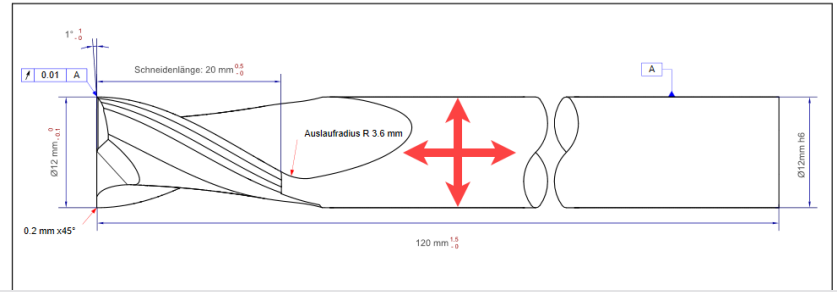


Move elements

(5.0.0)

- Move elements with keyboard arrow keys.
- Step size adjustable in the settings.

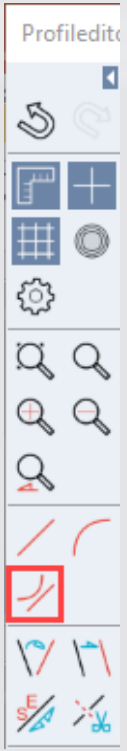




Profile Editor-X : Quick editing of the profile with mouse

(5.0.0)

- This function can be used to draw a contour of lines and radii.
- By positioning the mouse (crosshairs) on the drawing, the left mouse button is used to select the starting point of the first line or radius.
- Clicking the left mouse button once activates the function for creating a line. By holding the left mouse button longer, a radius is created.
- Then, by moving the mouse horizontally, vertically or diagonally, the direction and length of the line or the direction and size of the radius is determined. By clicking the left mouse button again once, the end point is selected and a line automatically follows as a further element. If you hold the left mouse button longer, the end point is selected and a radius automatically follows as the next element.
- The upper steps can be repeated as often as required until the final contour is achieved.
- Finally, the exact size must be determined manually for each element.



Profile editor-X: easy-to-read table with all elements

(5.0.0)

- In the upper right corner the tables of individual elements and type are displayed.
- When you click on an element, the size of the element is displayed in the lower right corner.

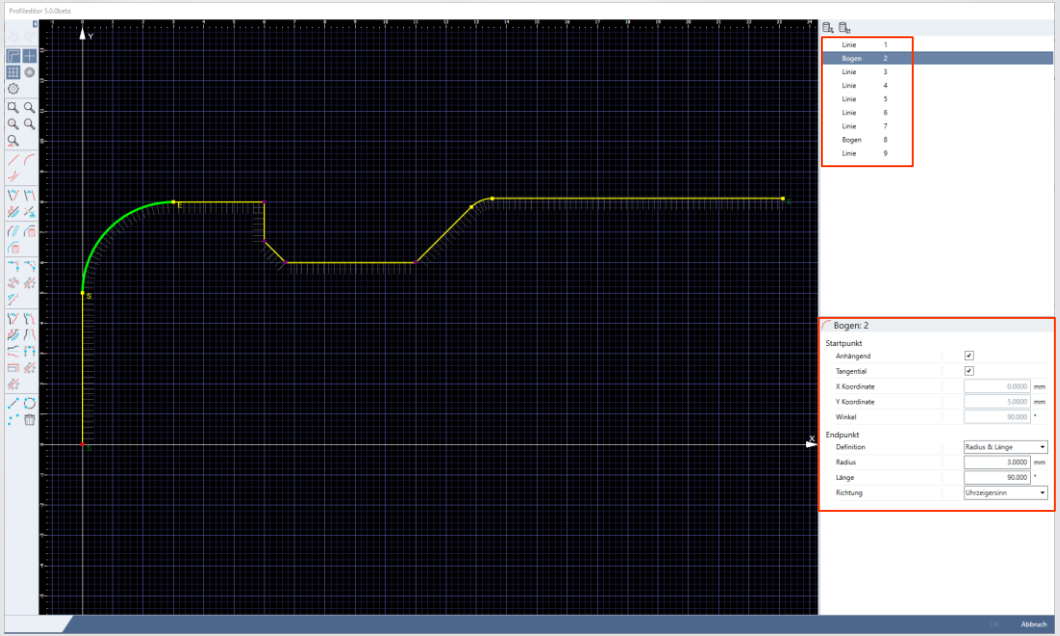


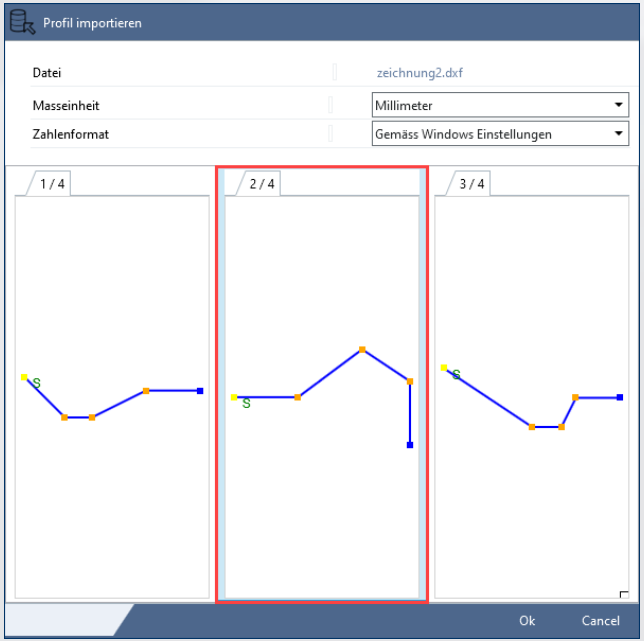
Table of all elements

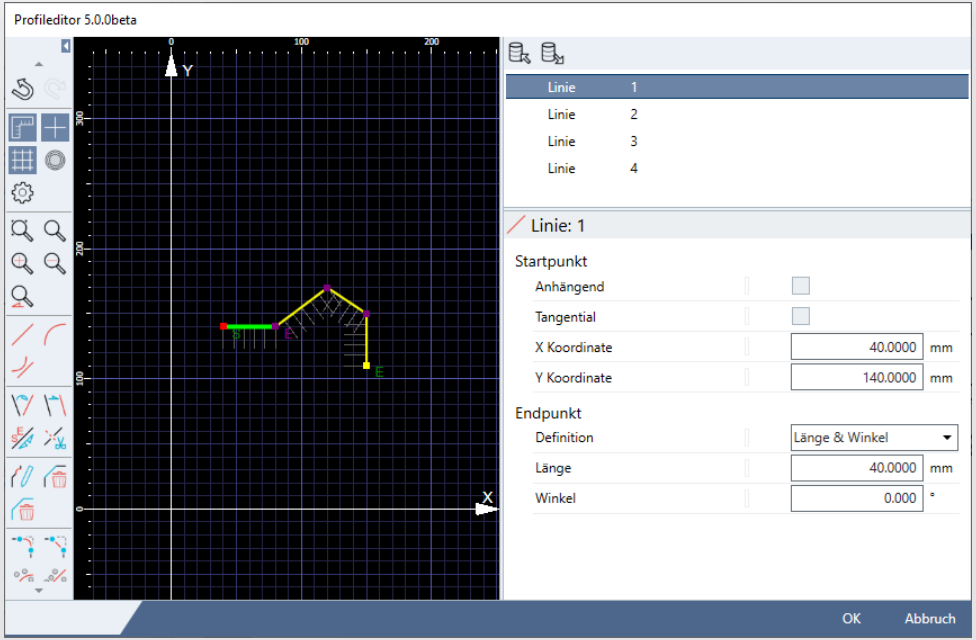
Size of the element

Profile Editor-X: Multiple Layers

(5.0.0)

- During DXF import, all existing layers are displayed in a preview.



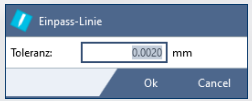


Profile Editor-X: Conversion Spline – Polyline

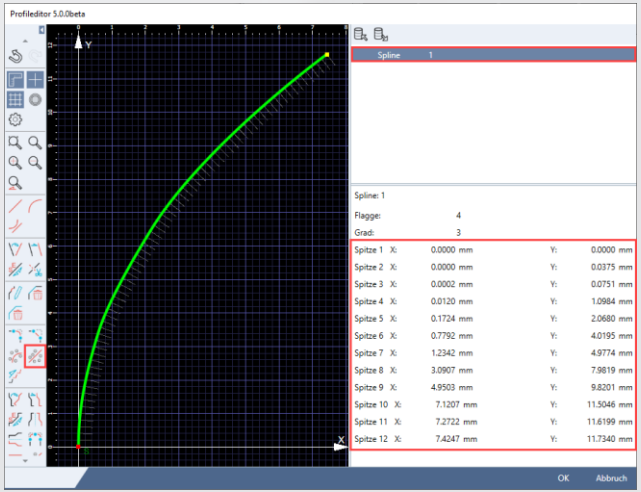
(5.0.0)

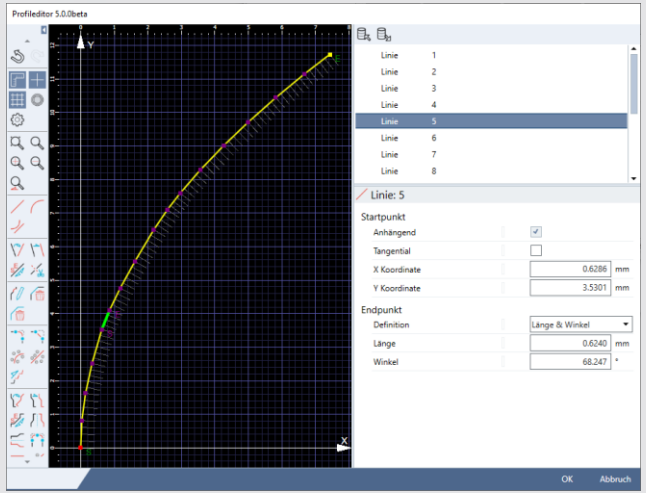
- Splines can now also be read in and segmented into lines with a maximum tolerance.

Spline

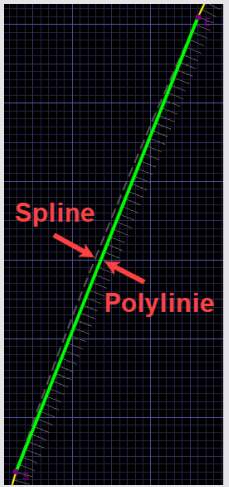


Polyline





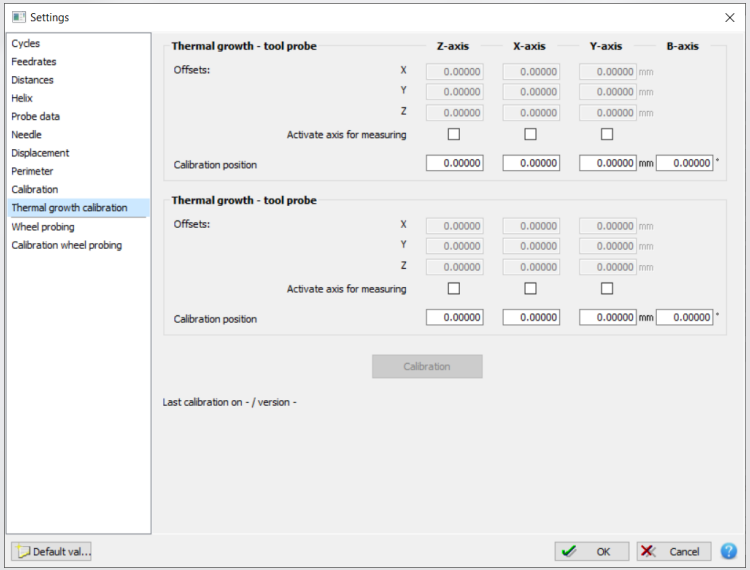
<1.002mm

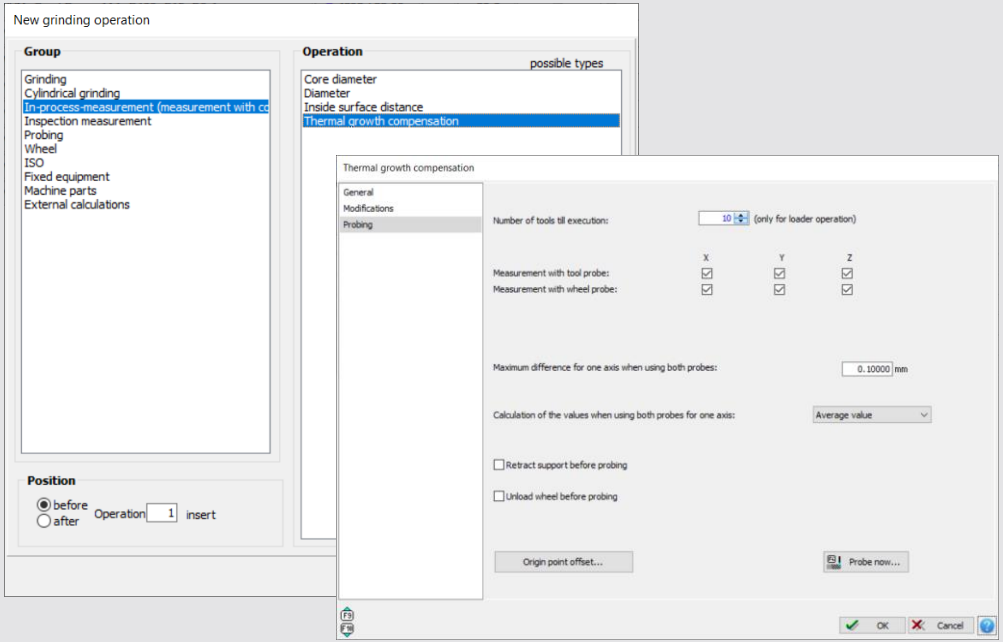


Thermal growth compensation, new option

(new option 4.3.0)

- Automatic thermal growth compensation using the work piece or wheel probe
- This function must be adapted once for each machine kinematic

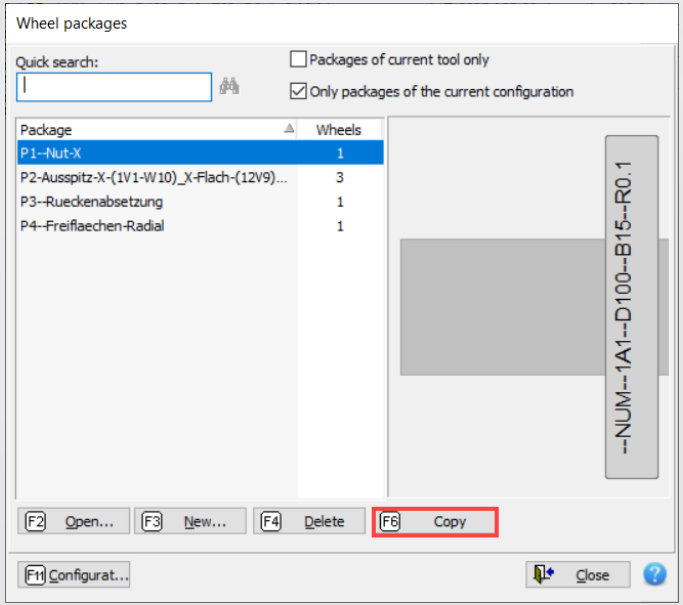


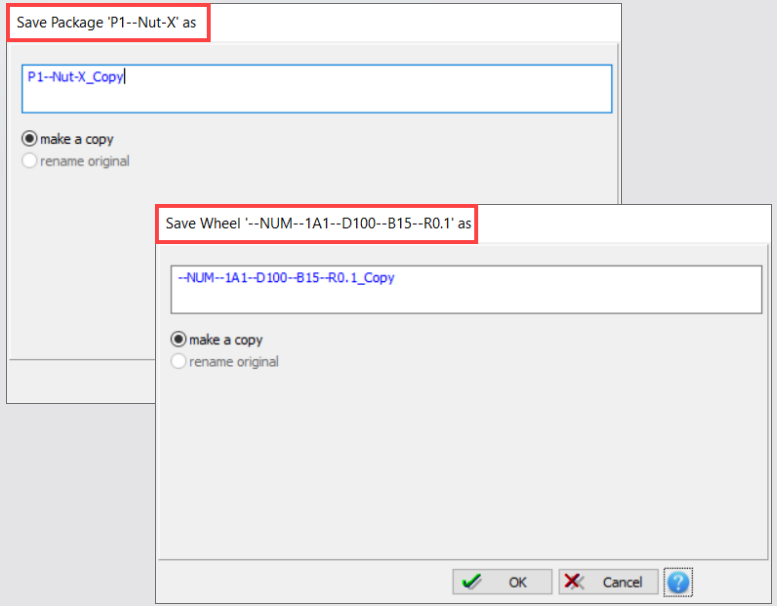


Copy wheel packages

(4.3.0)

- Existing wheel packages can now be copied. The package and the wheels are automatically duplicated during this process. The names for the new package and the copied wheels can be selected individually.

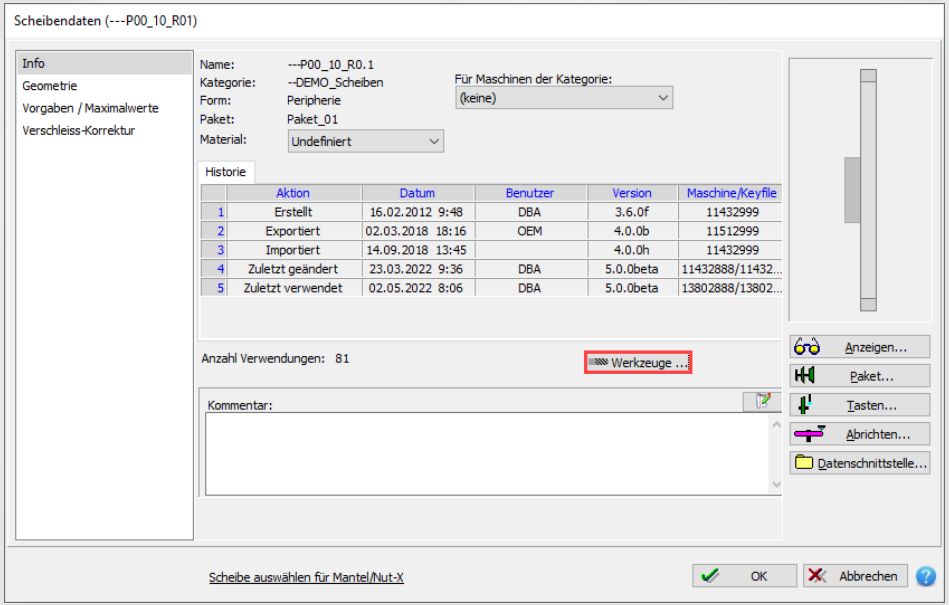


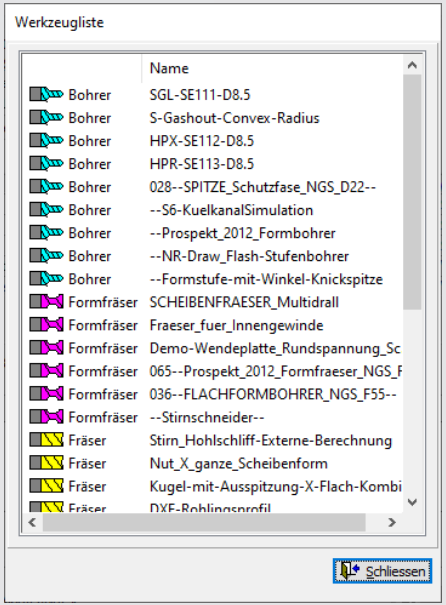


Grinding wheel - show list of tools

(5.0.0)

- On the info page of a grinding wheel, a list of all tools in which the corresponding wheel is used can be displayed.

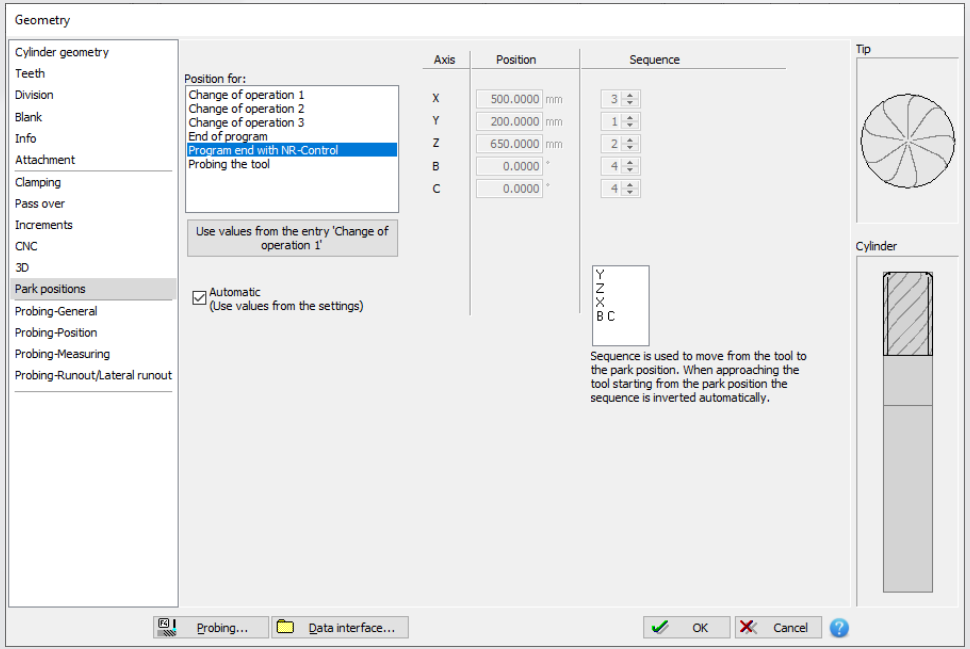




Separte parking position for NR-Control

(5.0.0)

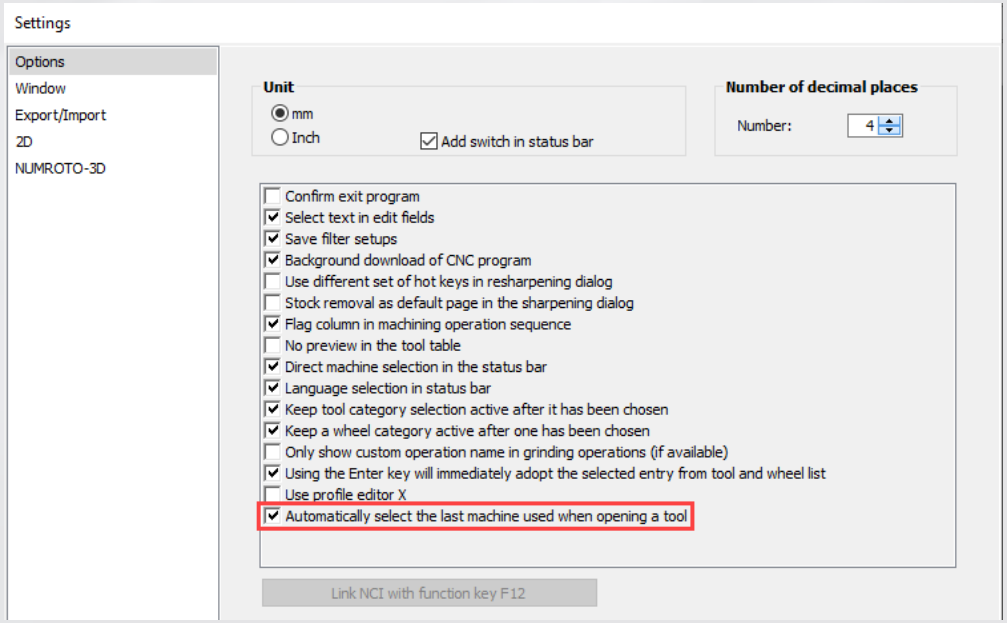
- For NR-Control at the end of the programm a separate parking position can be defined.



Automatically use last used machine

(5.0.0)

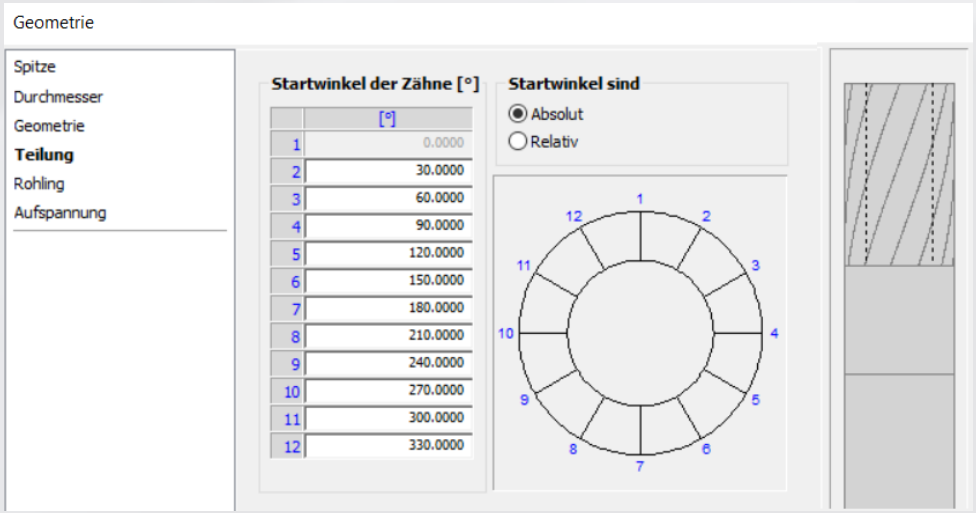
- It is now possible to automatically activate the last machine used, according to the workpiece info, when opening a tool.

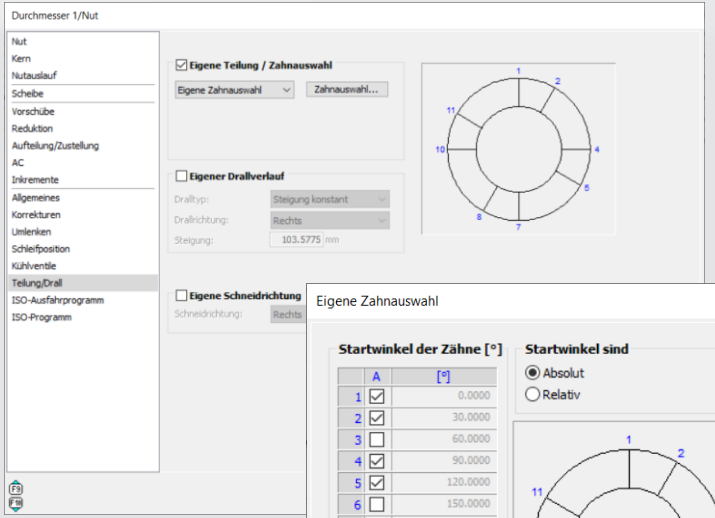


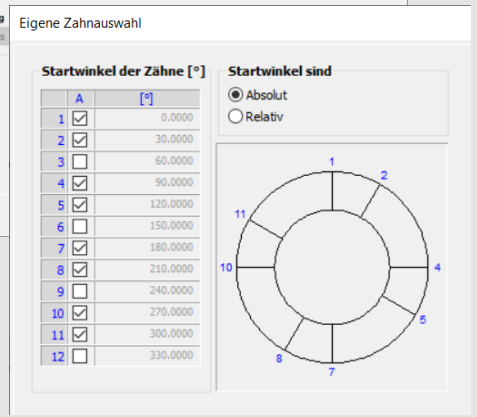
Pitch: Numbering of teeth

(5.0.0)

- Teeth are new numbered



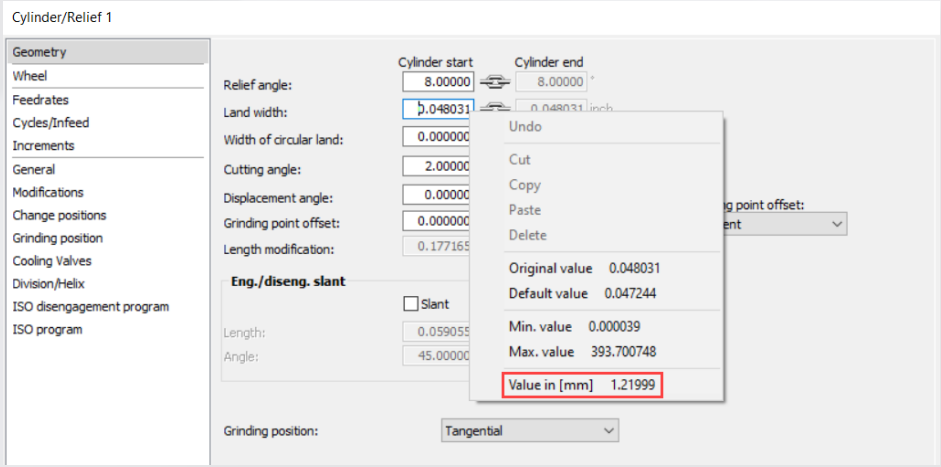




Inch / mm value converted in context menu

(4.3.0)

- The input value can be displayed in the context menu in the other measure system.

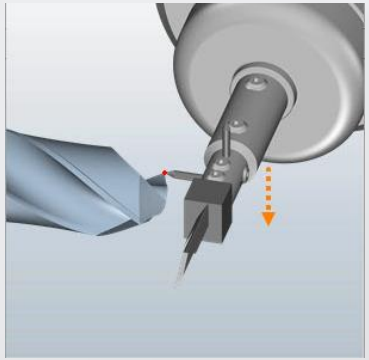


K-land probing

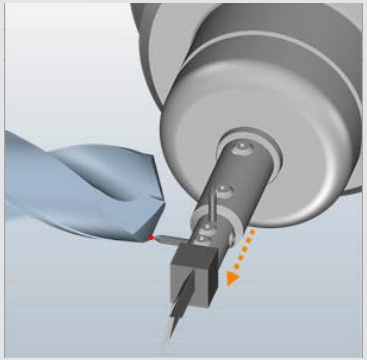
(4.3.0)

- K-land probing with coolant hole needle, additional probing method selectable

Coolant hole needle vertical (new)



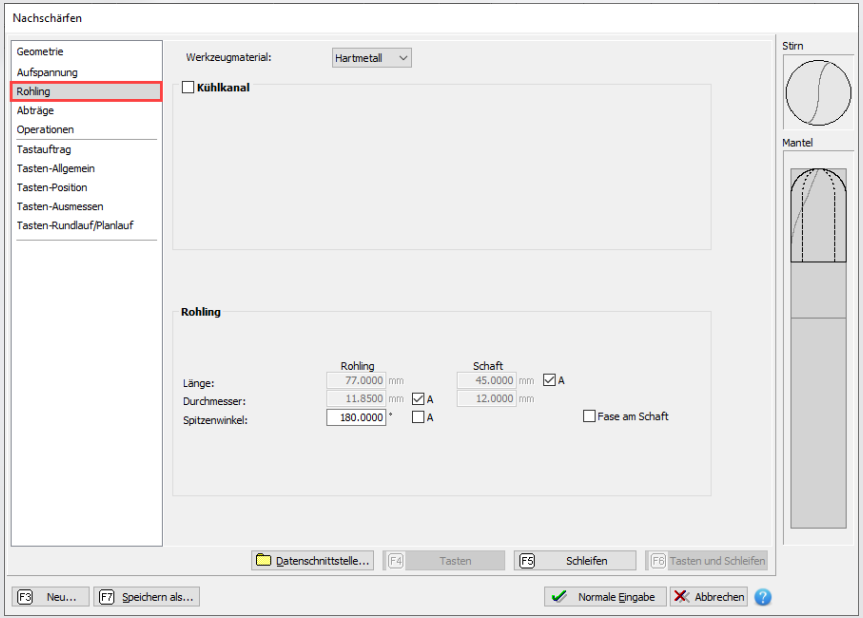
Coolant hole needle transverse



Tab page 'Blank'

(5.0.0)

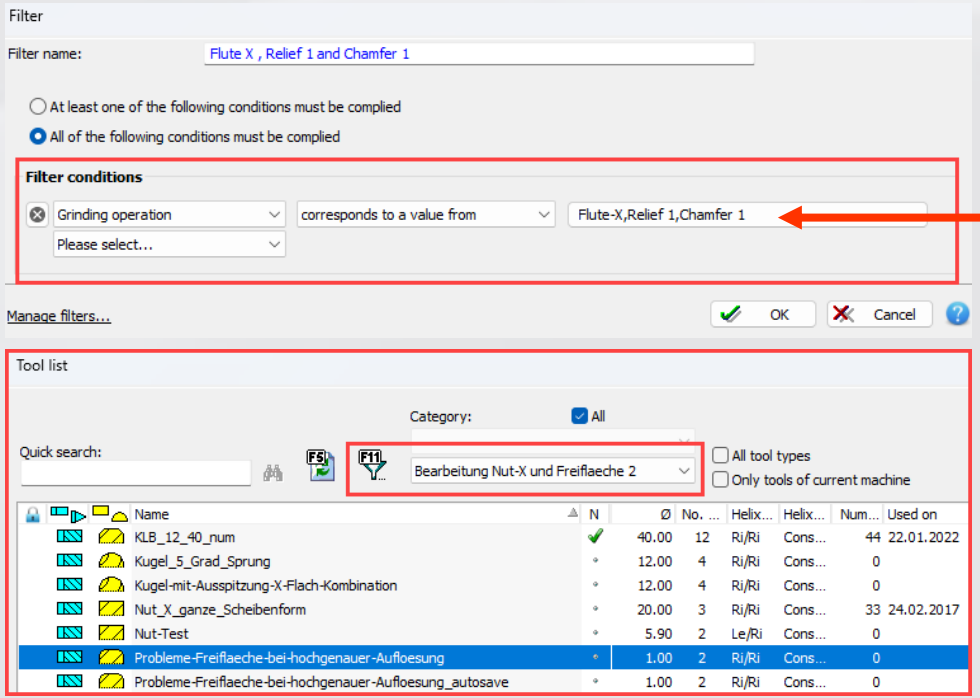
- The 'Blank' dialog is now available on the F10 Resharpening page. This makes it again possible to define the length of the blank directly within the resharpening page.

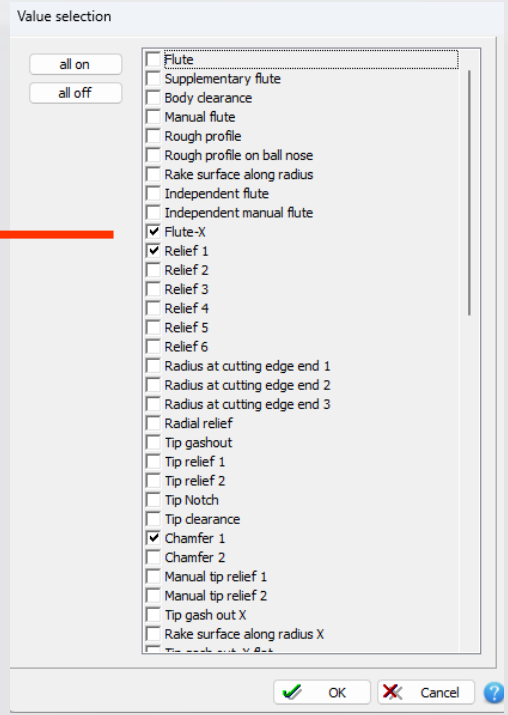


Filter according to grinding operation

(5.0.1)

- Tools can now be filtered according to grinding operations.

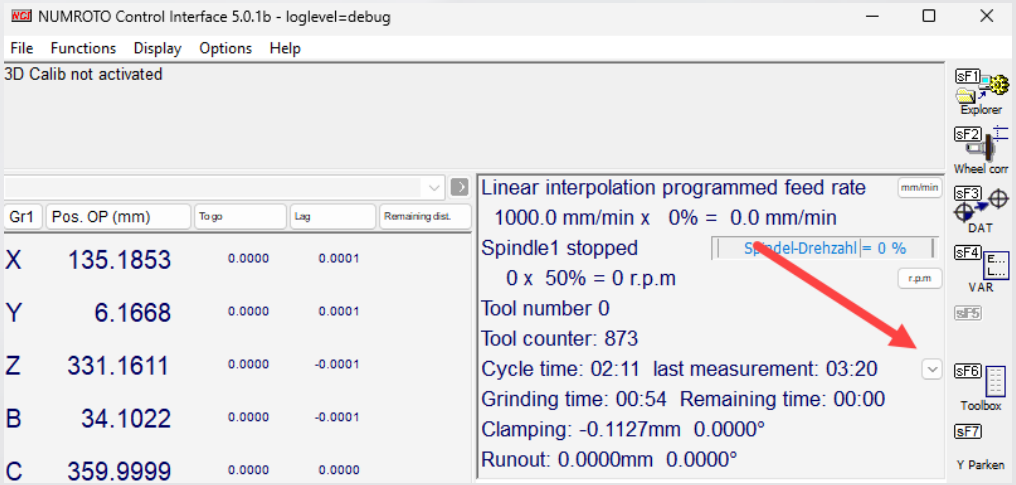


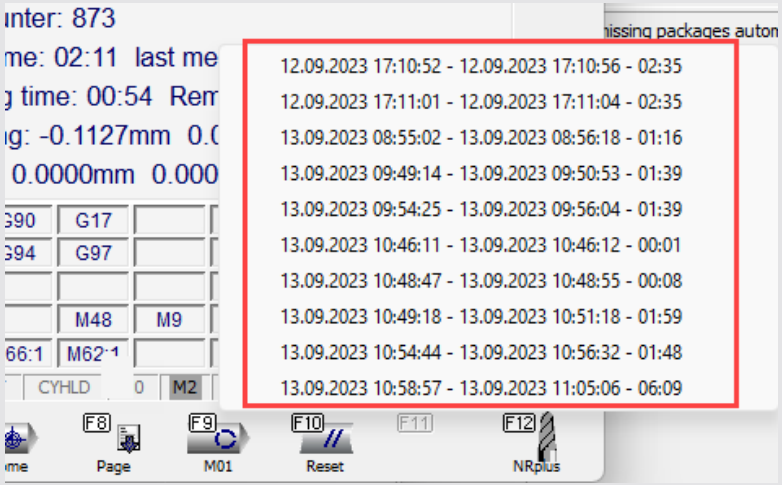


NCI – Show more cycle times

(5.0.1)

- Via drop-down menu it is possible to show the last 10 cycle times.
- It shoes the start- and endtime, but also the duration time of the last cycles.

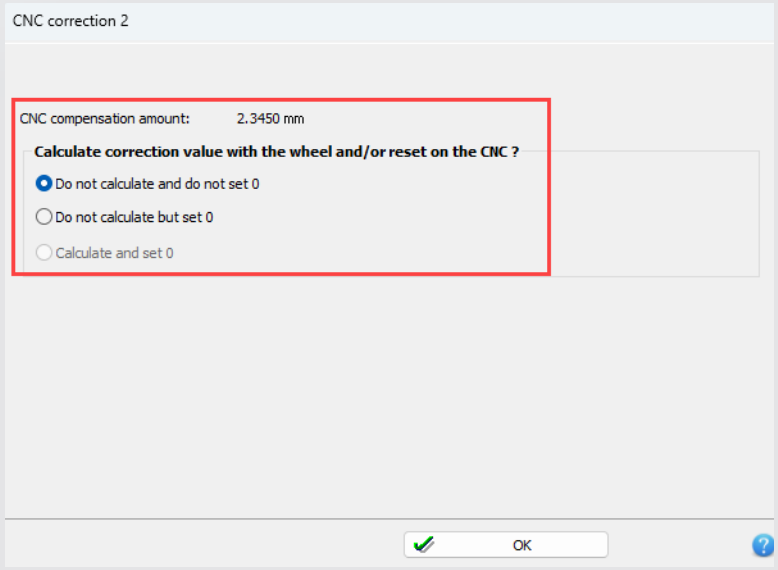




Set CNC wheel compensation to 0 after wheel probing

(5.0.1)

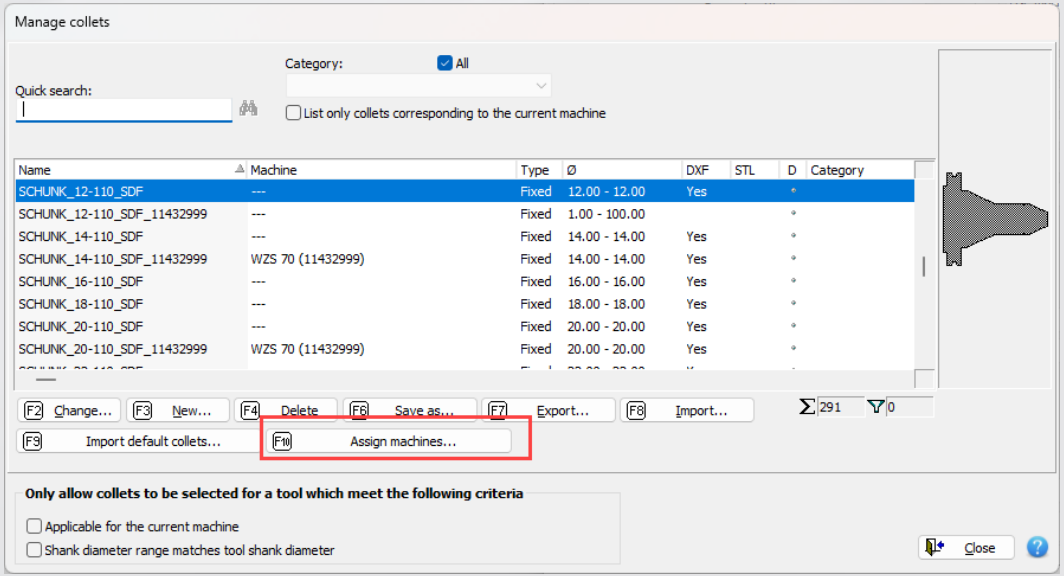
- After running a manual wheel probing, it is possible to delete the CNC – compensation amount.
- The dialogue where you can delete the CNC – compensation amount appears after the probing is finished.

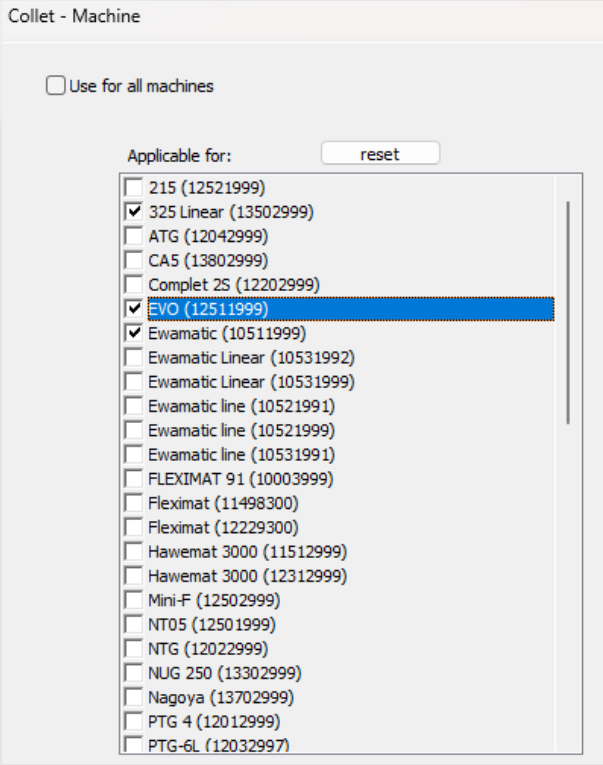


Assign collets to multiple machines

(5.0.1)

- In the settings it is possible to assign collets to multiple machines.

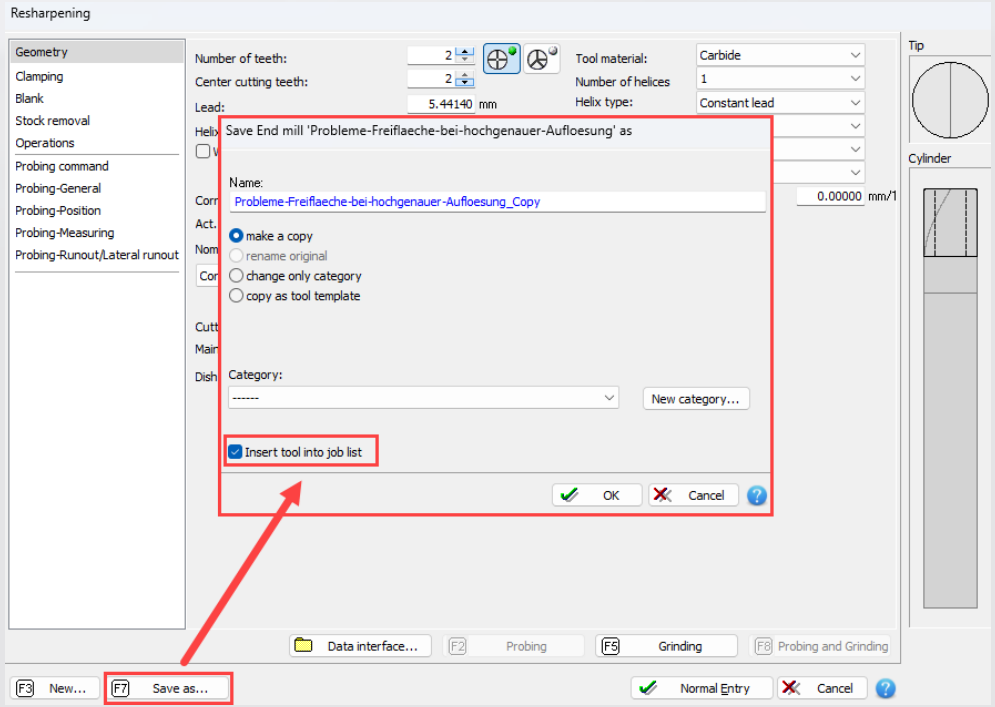




Insert tool into job list (F10 – Resharpening)

(5.0.1)

- In resharpening mode it is now possible to add the active tool in the job list using ‚save as' (F7).
- Important notice: it only works if a joblist is already existing.



Save and restore probe calibration data

(5.0.1)

- Calibration data can now be saved in a file and also restored if necessary.