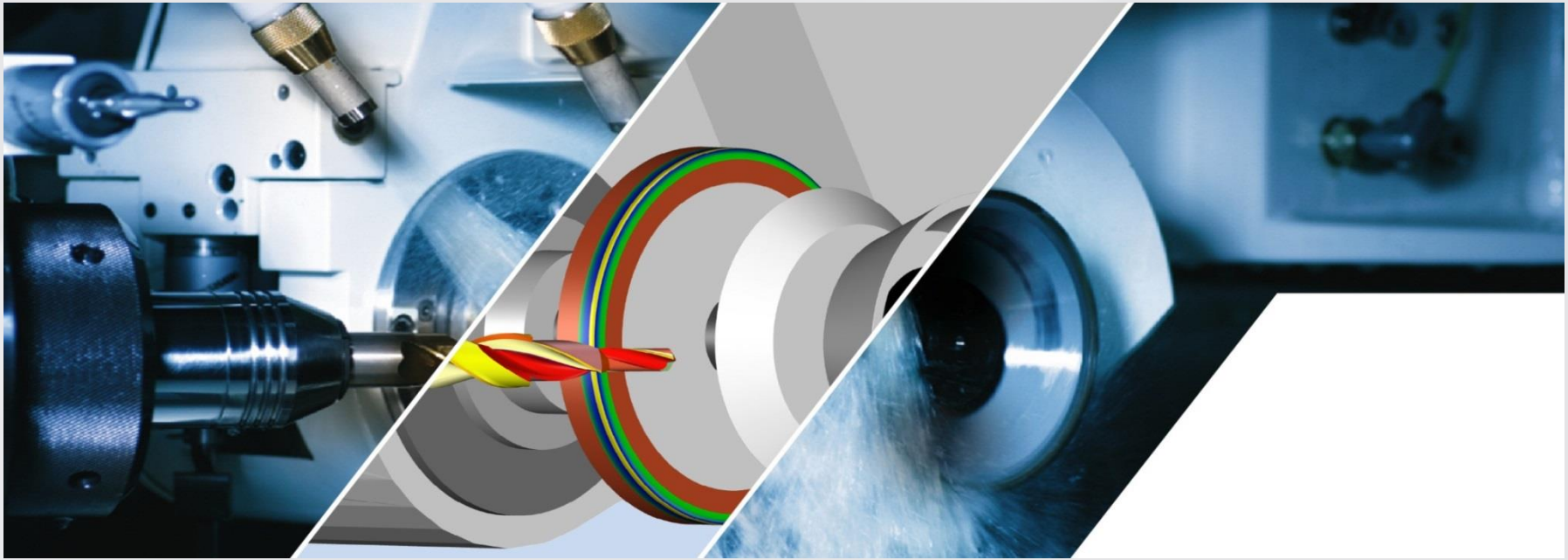
# CNC Power Engineering - Always on the move



numroto®

*Total solution for tool grinding*

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# New features in NUMROTO 4.2.0 and 4.2.1

(as some which were added to version 4.1.2b and following)

- End mills
- Drills / Step drills
- Form cutters
- 3D-Simulation
- NR Draw
- Probing
- NCI
- Other changes
- Additional small improvements

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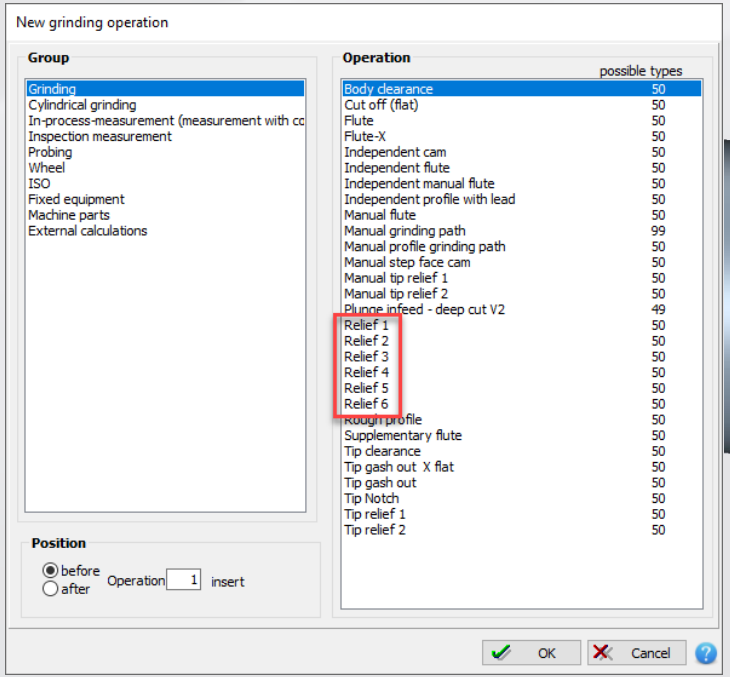
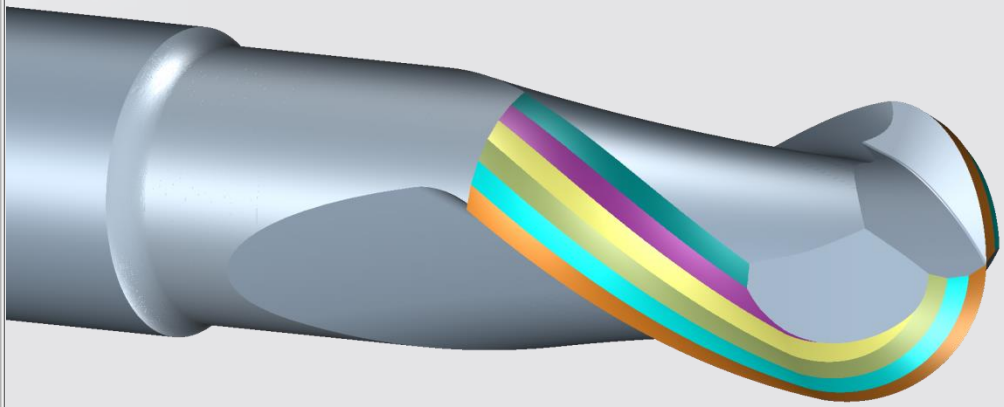
# Up to 6 reliefs

(complex end mills, since version 4.1.2)

- It is now possible to program up to 6 reliefs.

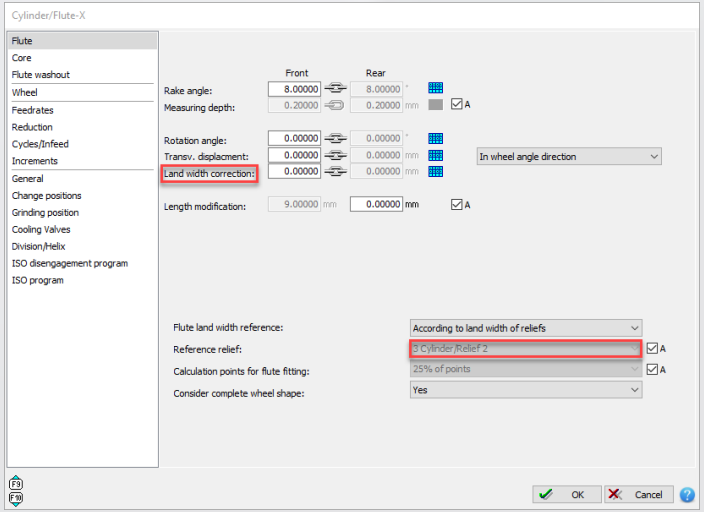


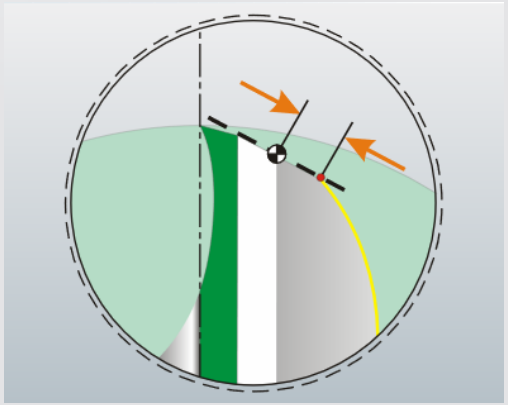



# Flute-X, Land width correction

(since version 4.2.0b)

- A new parameter for the land width correction has been added to the flute-X operation.
- The edge between the flute and the last relief can, due to grinding pressure or mechanical inaccuracies not be parallel to the cutting edge. With the help of the land with correction this can be compensated.

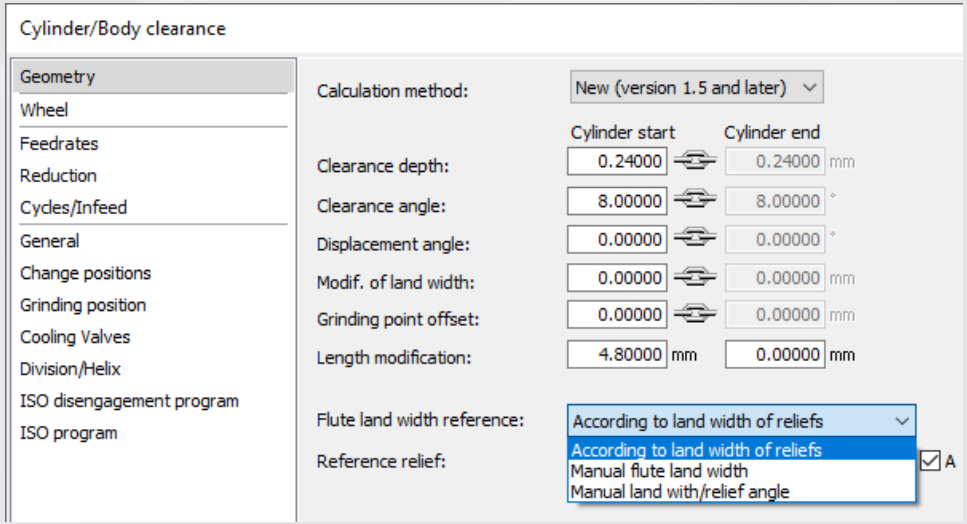


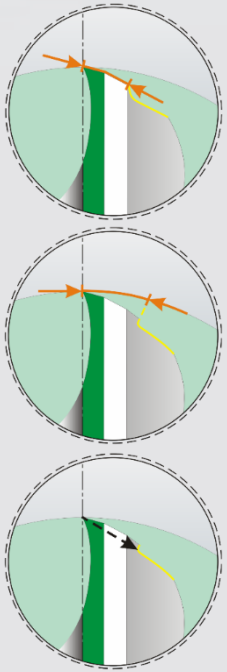



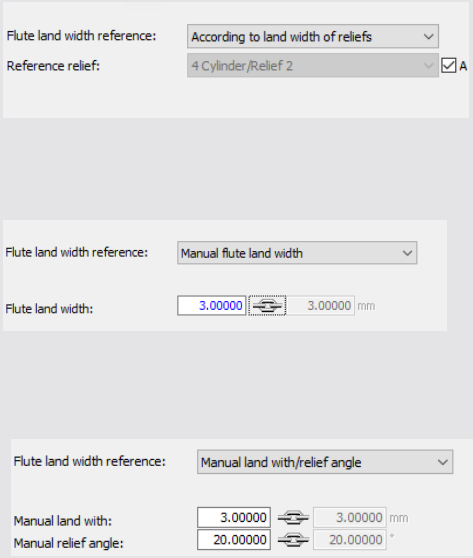
# Body clearance / Flute land width reference

(since version 4.2.0b)

- At the operation ‚Body clearance' it is now possible to define, which reference will be used to position the body clearance.



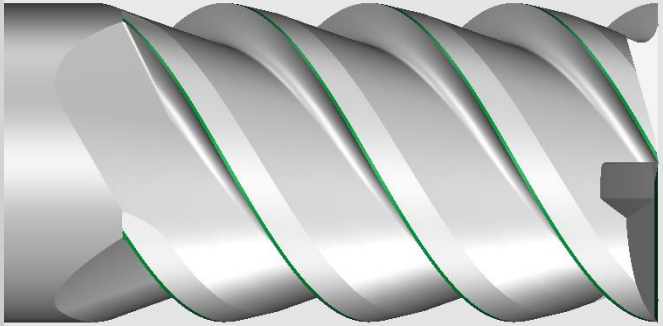



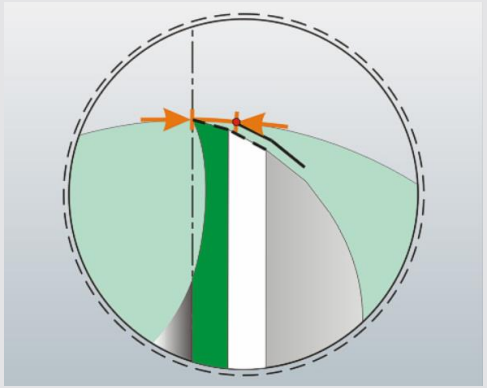


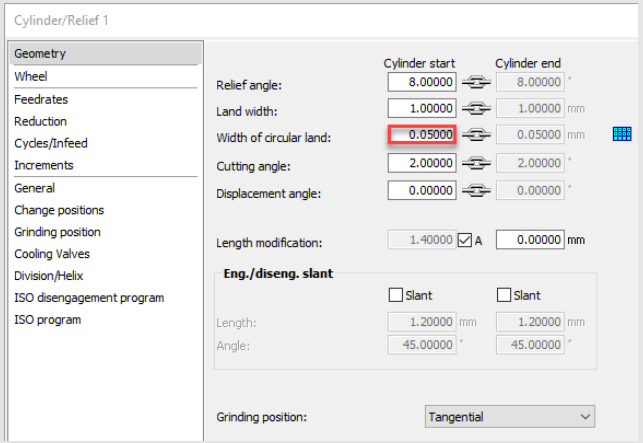
# Width of circular land

(since version 4.1.2f)

- At relief 1 and at the radial relief it is now possible to define a circular land (on the cylindrical part of the tool). The reliefs will afterwards be rotated according to the width of the circular land.
- The circular land is usually quite small. Due to grinding pressure or mechanical limits it might be that the circular land is not 100% parallel after grinding. Such an error can be compensated by programming the width different at the front and back. If the error is not linear, it is also possible to use a data table. Using a data table also allows to modify the width of the circular land at the transition area at the tip (ball/corner radius) to the cylindrical part.



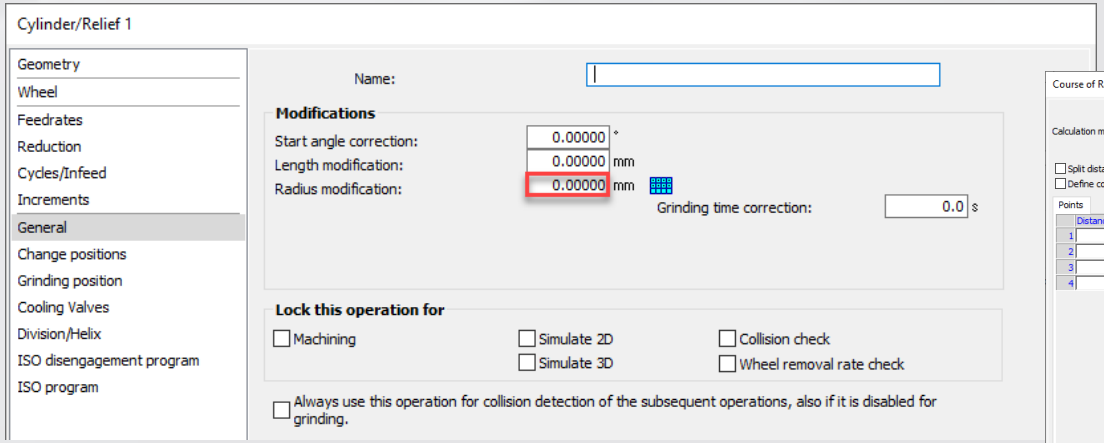


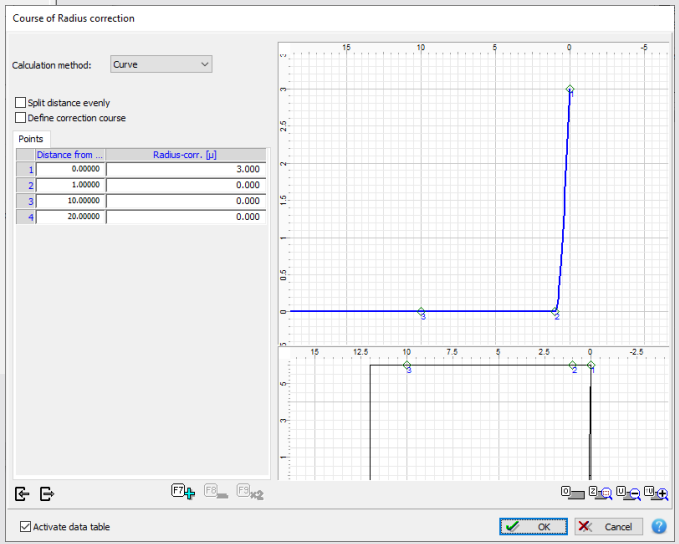


# Radius modification (data table)

(since version 4.1.2f)

- The radius modification (diameter correction) for reliefs can now also be programmed as a data table. This allows to add a variable diameter modification. The radius modification from relief 2 can now be linked to the radius modification from relief 1.

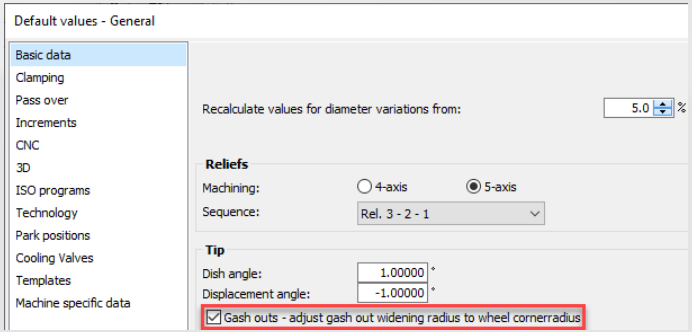


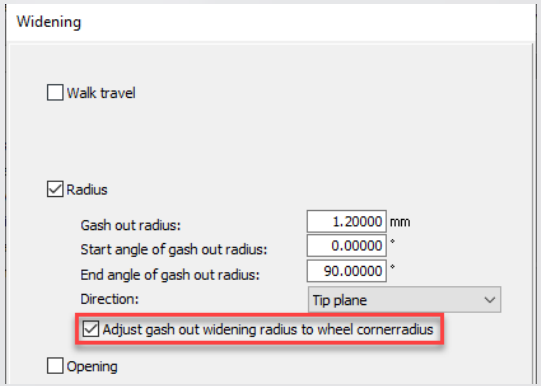
# Gash-out radius independent from wheel corner radius

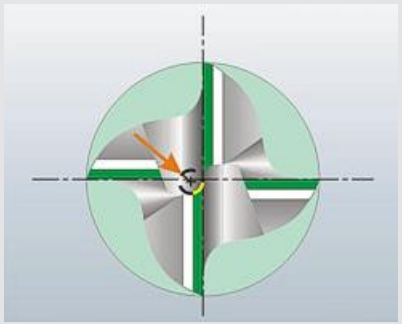
(since 4.2.0b)

- At the tip gash-out (for end-mills, drills or form cutters) the wheel corner radius can now be compensated so that the gash-out radius is no longer changed when a wheel with a different corner radius is used.




- Example: Gash-out X flat:



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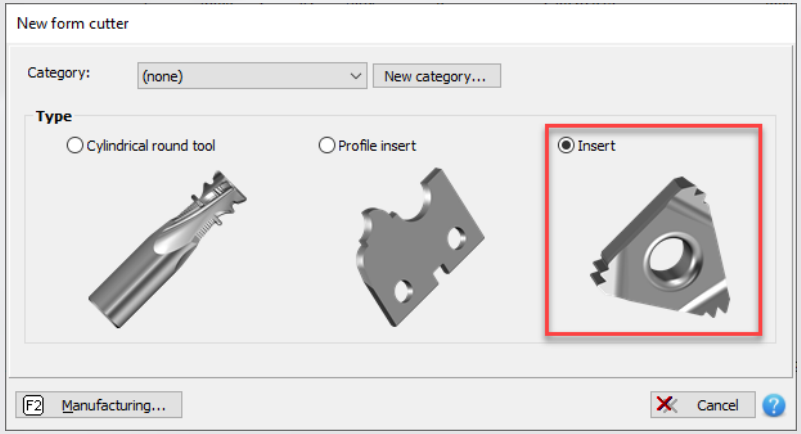
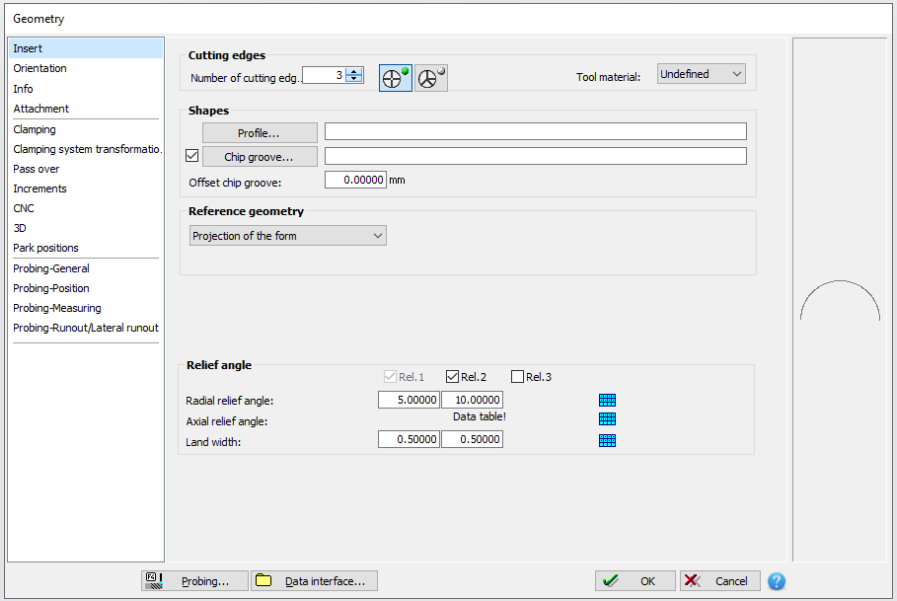
# New module for inserts

(new option, since version 4.1.2)

- With customized and simple dialogs for insert grinding.

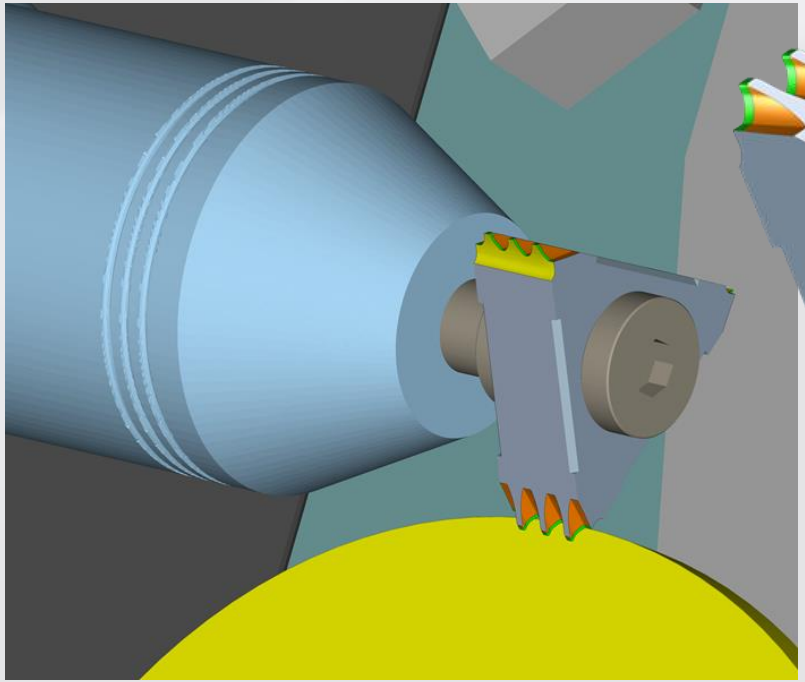


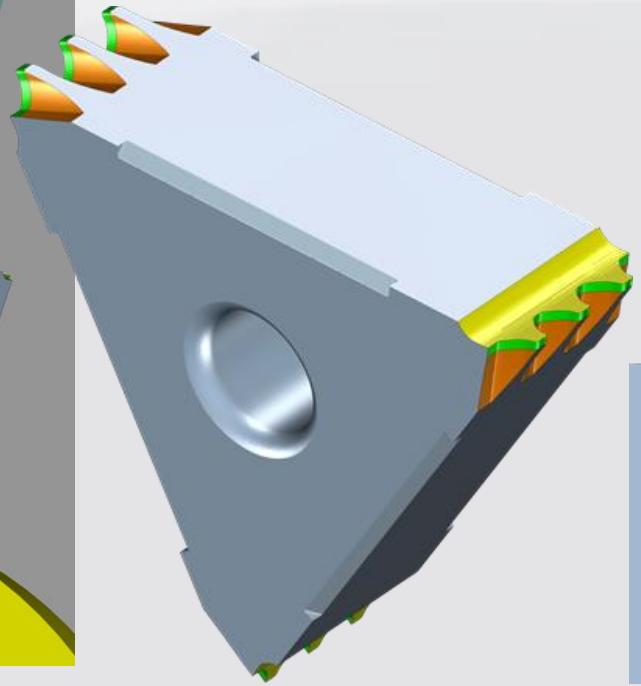



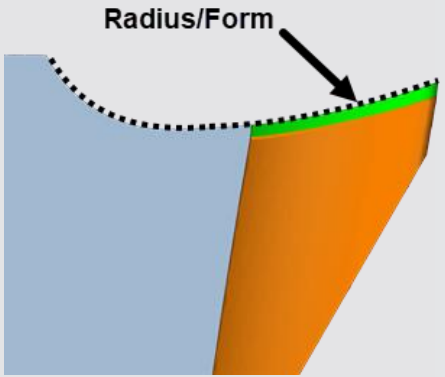
# New module for inserts

(new option, since version 4.1.2)

- Distortion-free relief grinding even with a round chip surface.



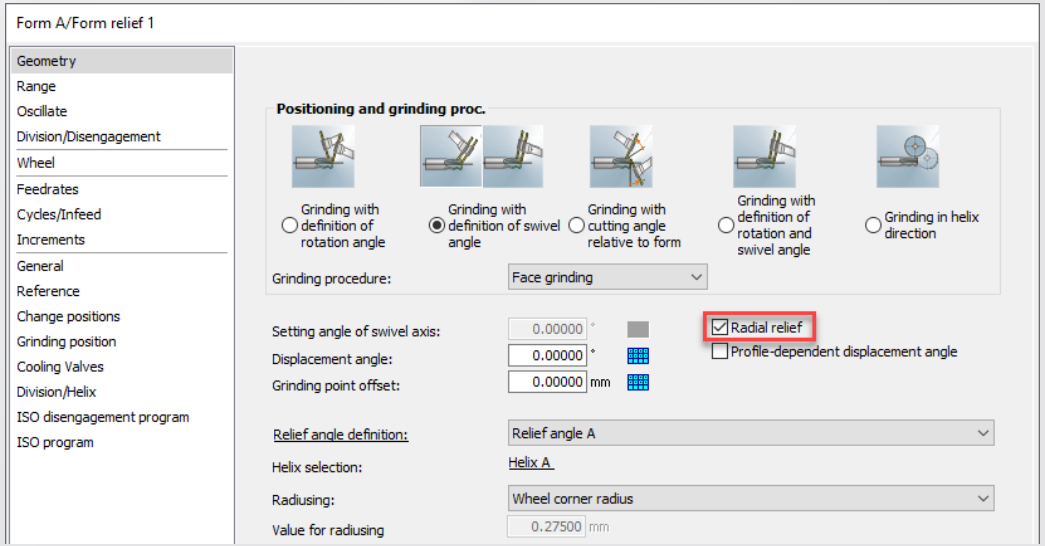


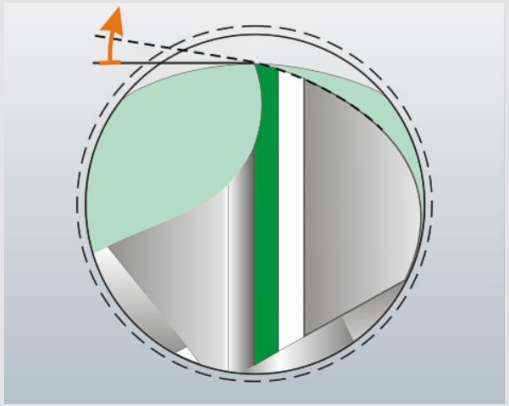


# Form reliefs: Radial relief

(since version 4.1.1)

- Automatic calculation of angle for the swivel axis thus on cylindrical parts of a profile a radial relief will be generated.
- Can be used for form reliefs 1 to 3.

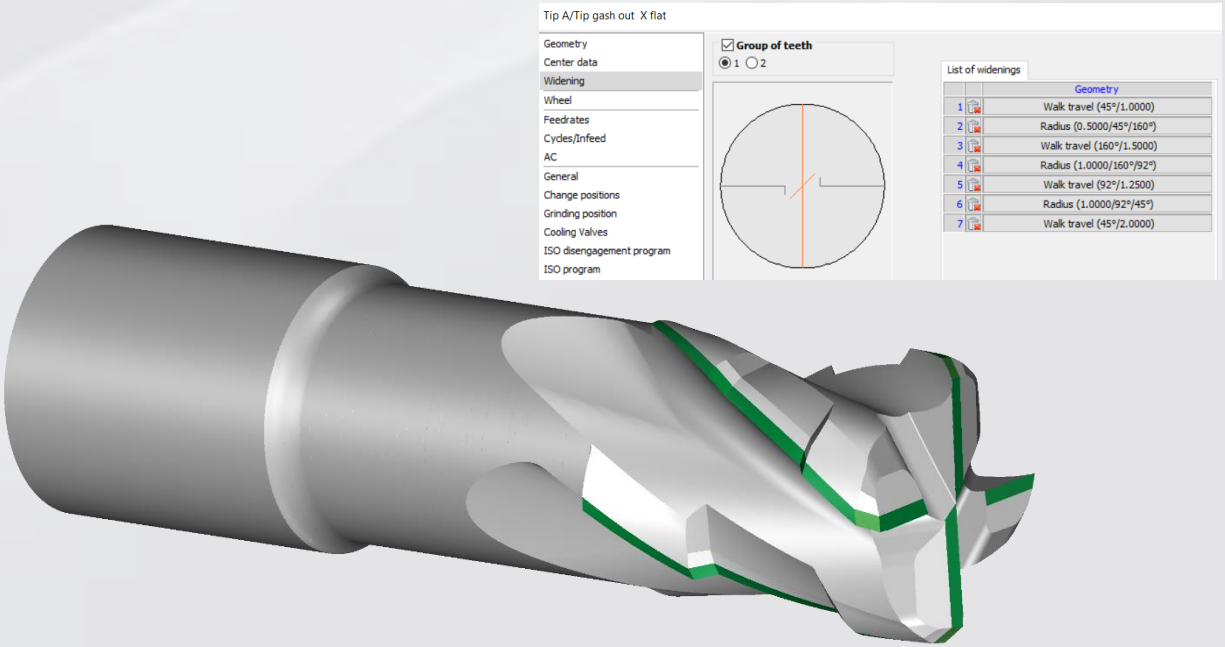


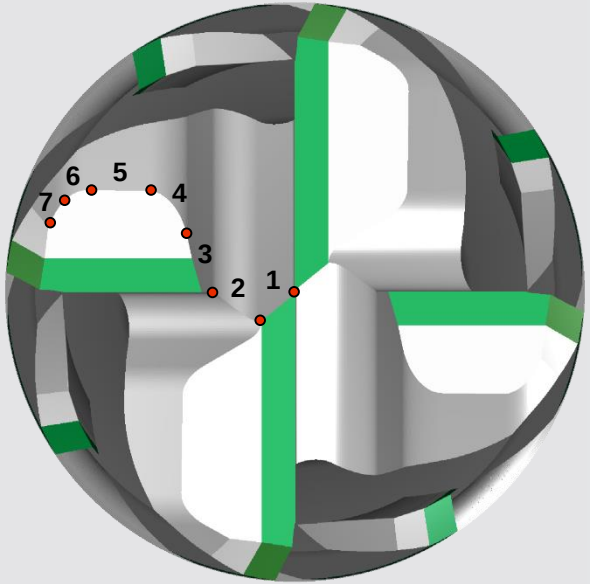



# Gash-out X flat

(since version 4.2.0a)

- The operation ‘Gash-out X flat’ for a flat tip can now also be used in form cutters. For individual widening of the tip chip space.



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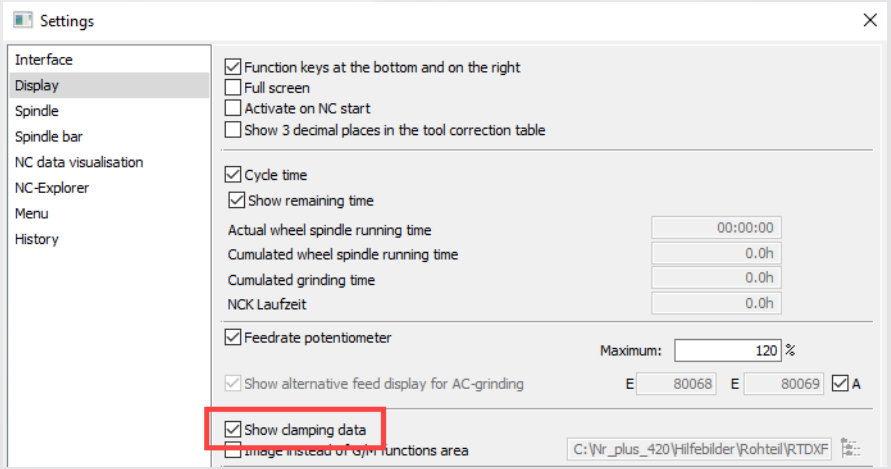
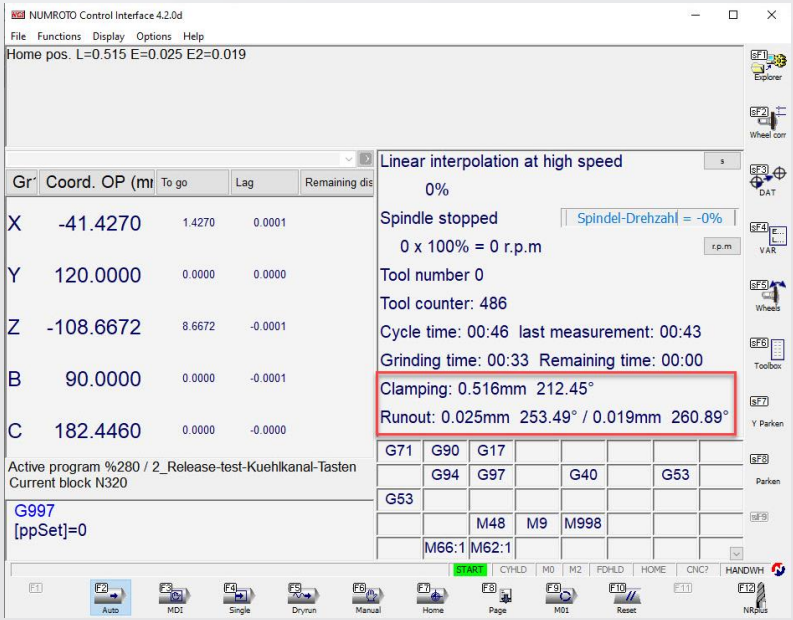
# NCI: Tool position and run-out probing results

(since version 4.2.0b)

- Now the following probing results can be displayed:
  - Difference to the probed clamping length
  - Results from the run-out probing



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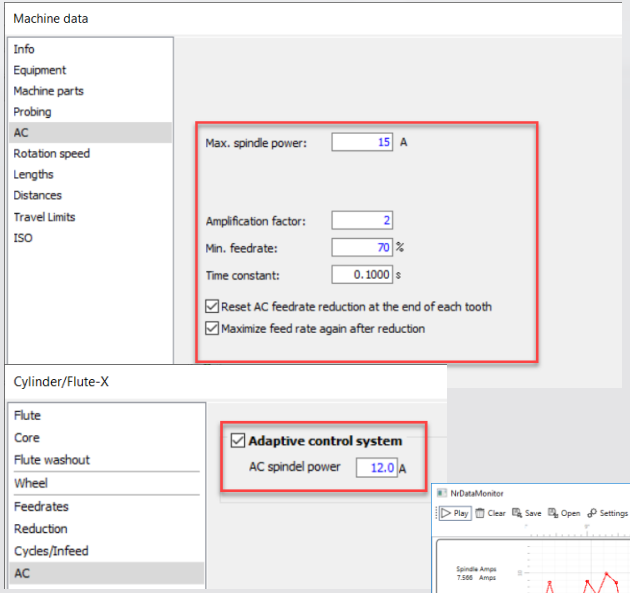
# AC-grinding (Adaptive control)

(new option, since 4.1.2)

- Automatic adjustment of feed rate when reaching a certain load on the grinding spindle.
- Avoid overloading the grinding wheel
- Optimization of grinding time and grinding quality.
- Primarily for machines whose grinding spindle is equipped with a NUM drive and for which the necessary adjustments have been made.
- Further information can be obtained from the machine manufacturers.



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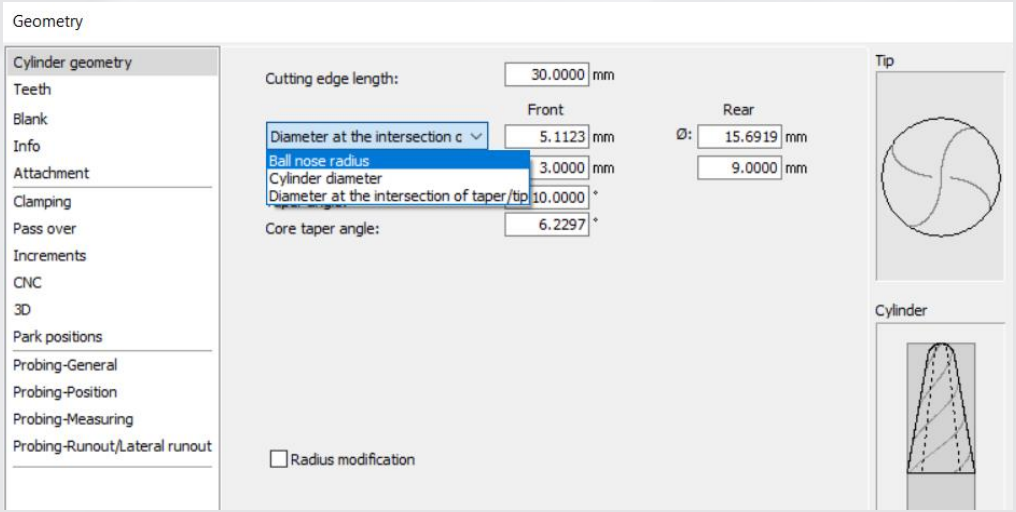
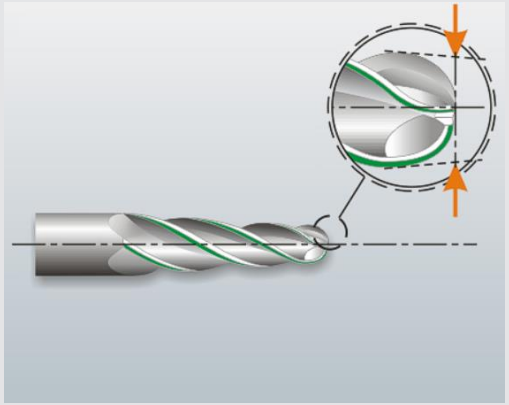
# Diameter definition at intersection taper / tip

(since version 4.2.0b)

- For conical milling cutters with ball or corner radius, the diameter can now be defined at the theoretical intersection point between the taper and the tip.

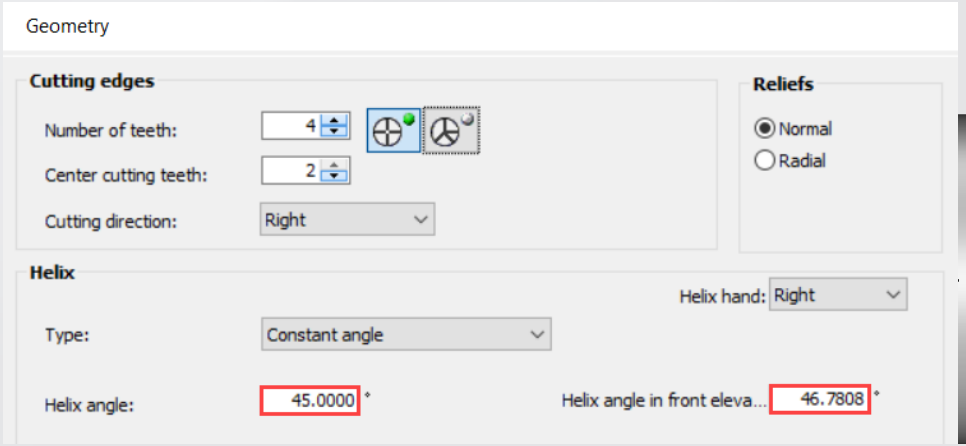


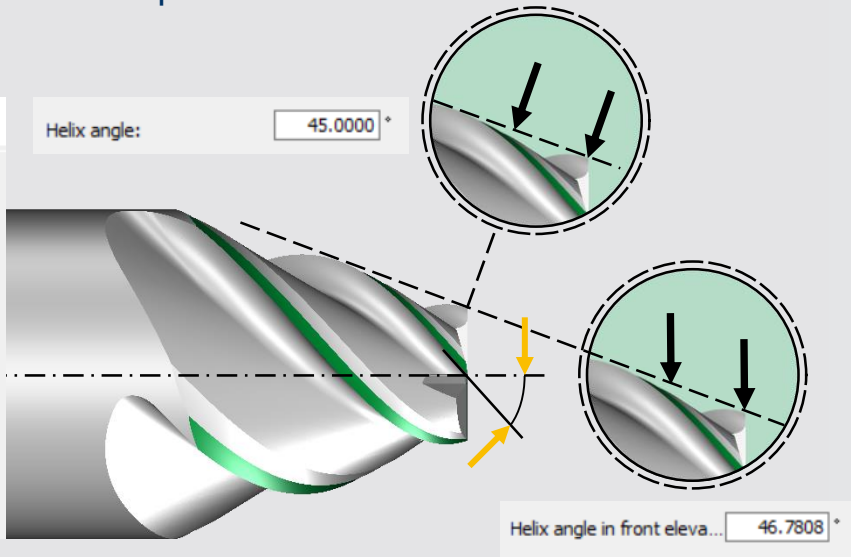



# Helix angle defined in elevation projection

(since version 4.2.0b)

- For conical milling cutters, it was previously assumed that the helix angle is defined perpendicular to the taper surface.
- The helix angle can now also be defined in the elevation and programmed via the corresponding input field. Internally a conversion to the previous helix angle definition is then performed.

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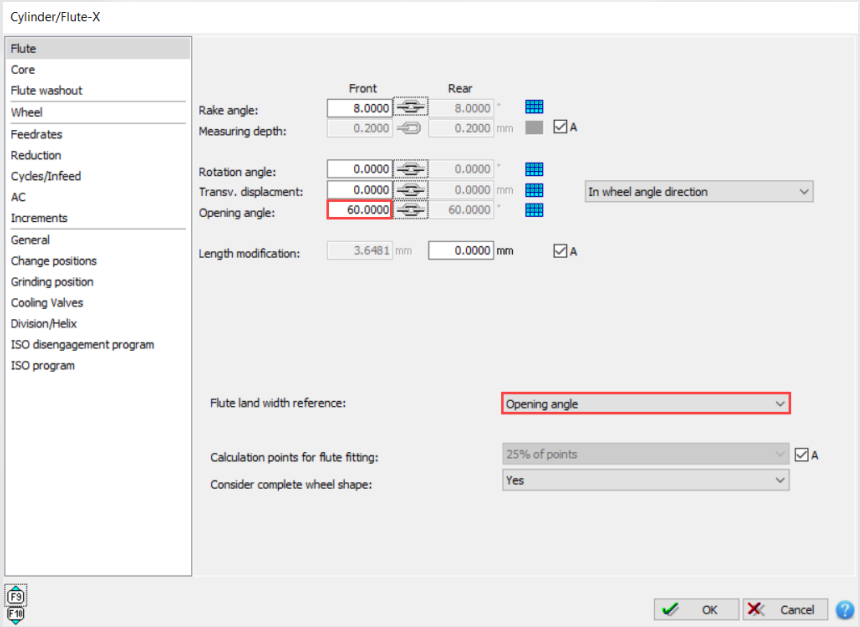
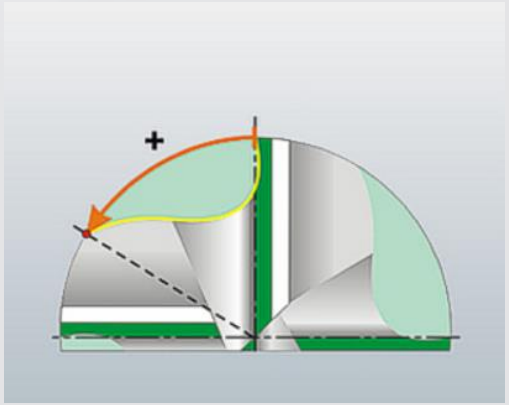
# Flute-X, opening angle (flute space)

(since version 4.2.0a)

- Now the flute opening angle can be used to define the width of the flute space. This width is then constant, even if the pitch is unequal.

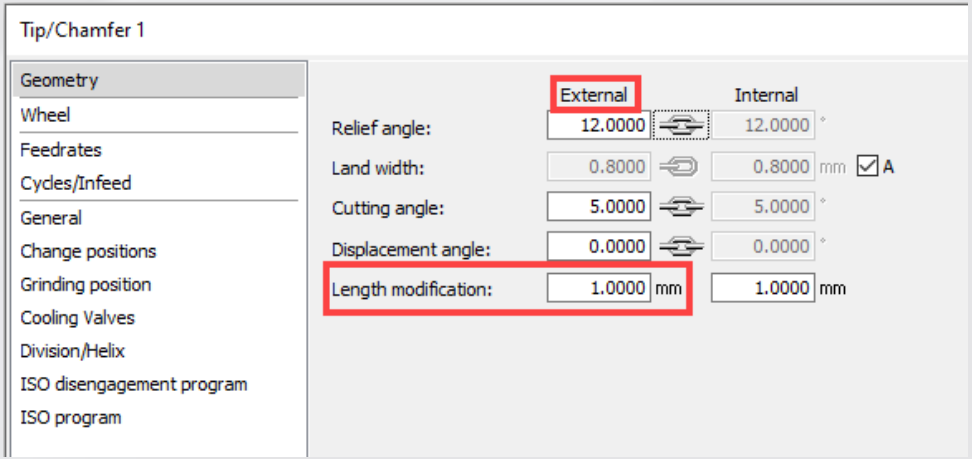


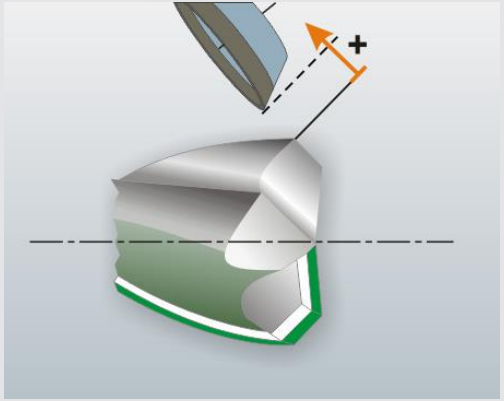



# Chamfer extension

(since version 4.2.0b)

- For milling cutters with a chamfer, an extension can now also be defined 'Outside'. The grinding wheel follows the programmed helix along this path.

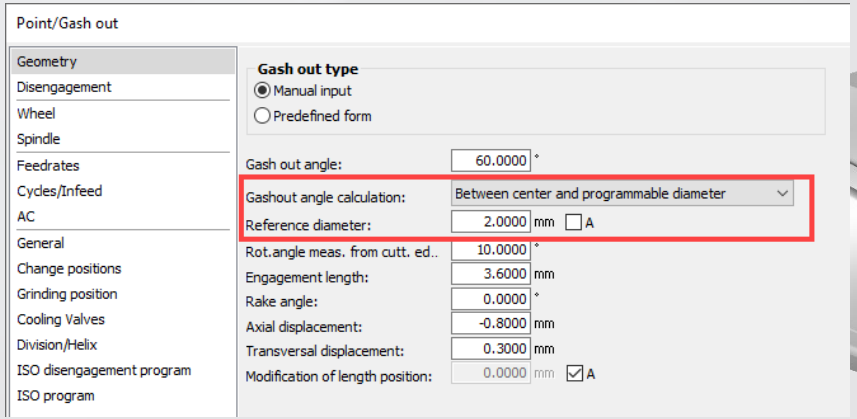


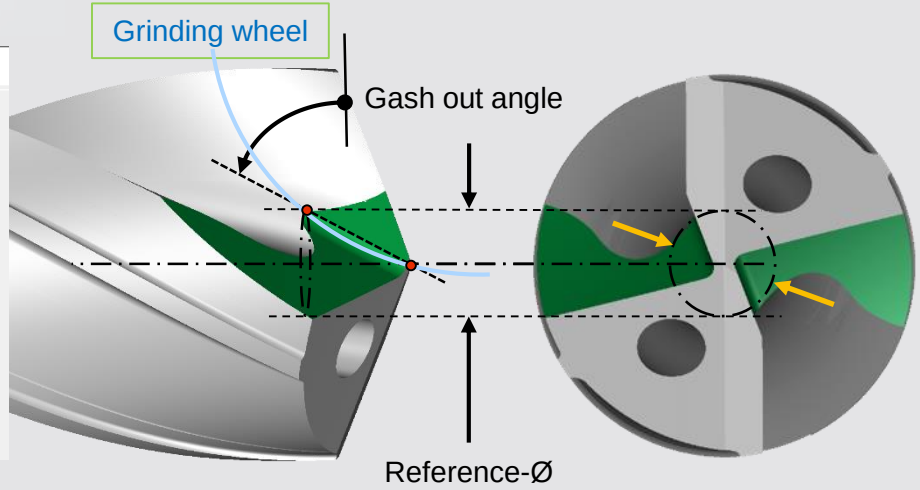



# Gashout angle calculation

(since version 4.2.0a)

- The gashout angle of the drill was previously measured tangentially at the center of the point.
- Now it can be measured between two points: Point 1 at the point and point 2 at a selectable reference diameter. This makes the gashout angle less dependent on the grinding wheel diameter.

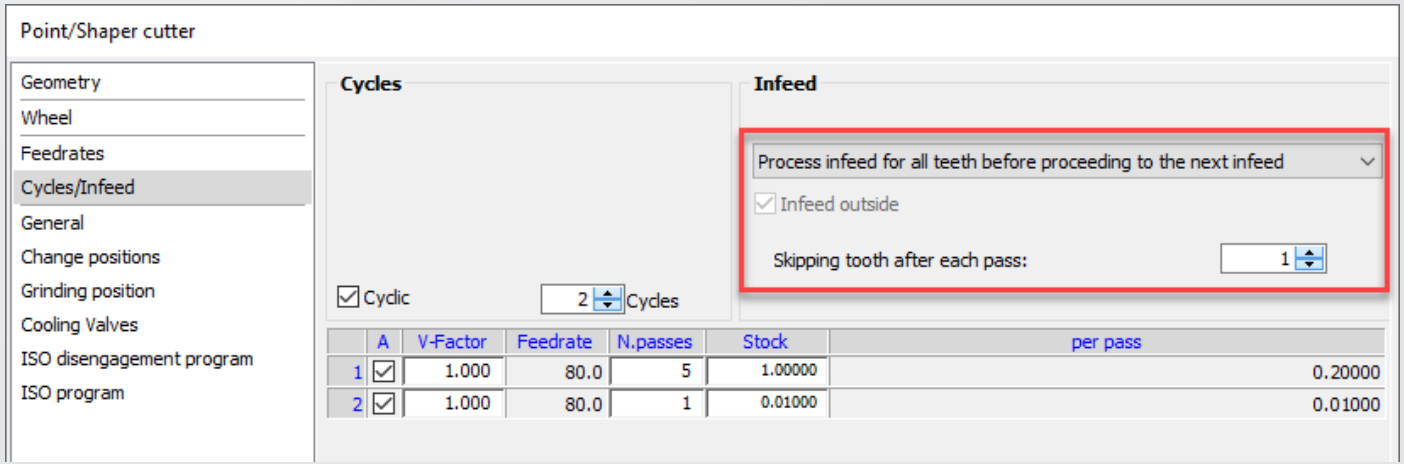


# Shaper cutter

(since version 4.2.0)

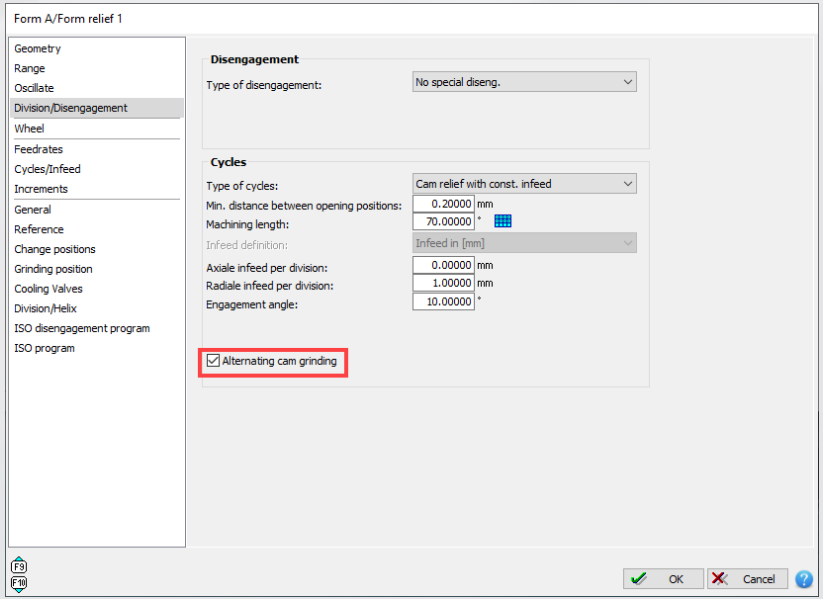
- If several cycles are defined, the cyclic infeed can now be performed in such a way that all teeth are first ground with the first infeed. The next infeed is then performed, which in turn grinds all teeth and so on.
- In addition, a skipping tooth function can be performed after each complete revolution.

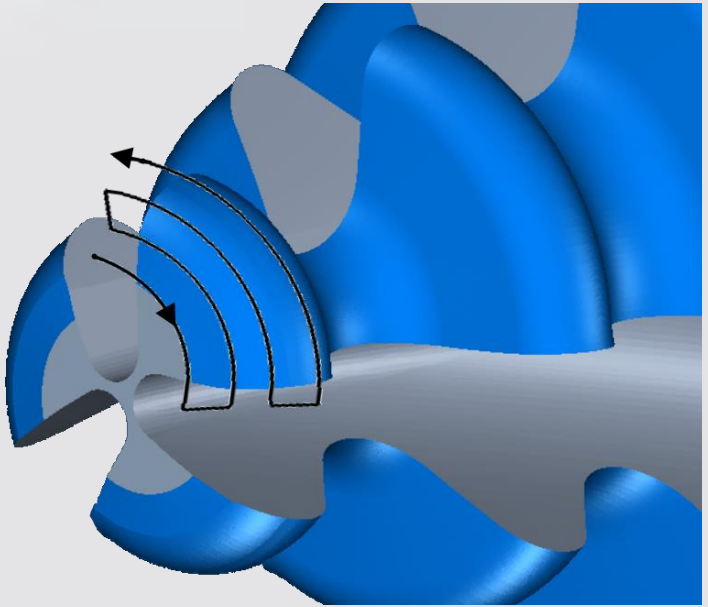


# Form reliefs: Cam grinding with alternating infeed

(since version 4.1.2)

- Newly the infeed for cam grinding can be made at the cutting edge and at the back. This reduces the grinding time while maintaining the same surface quality.

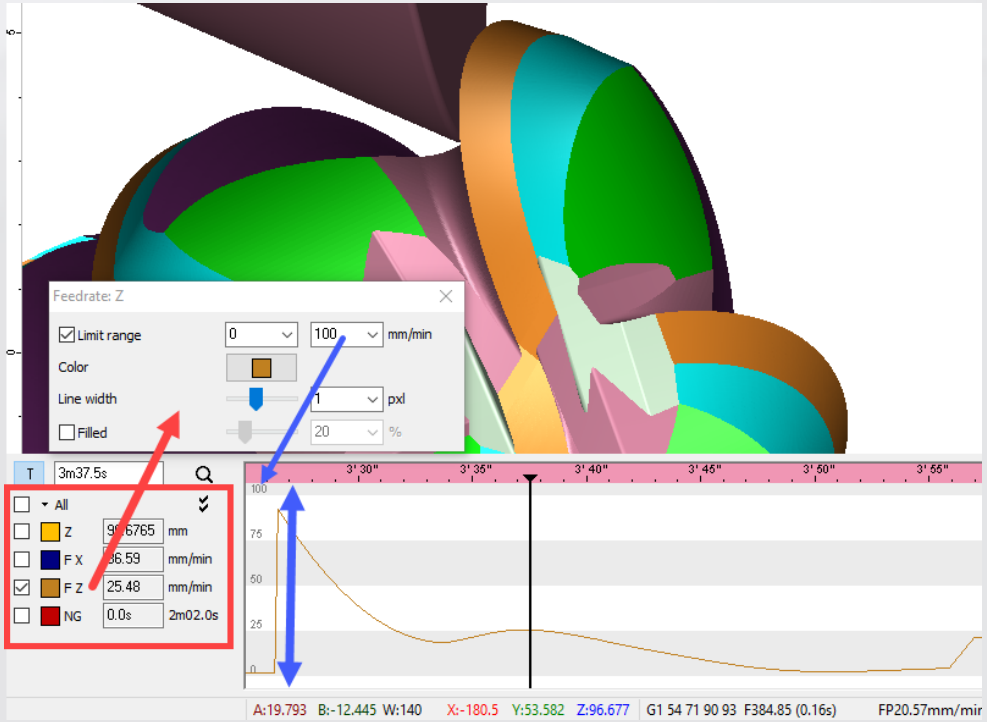


# NUMROTO-3D: New possibilities of graphical representation

(since version 4.1.2)

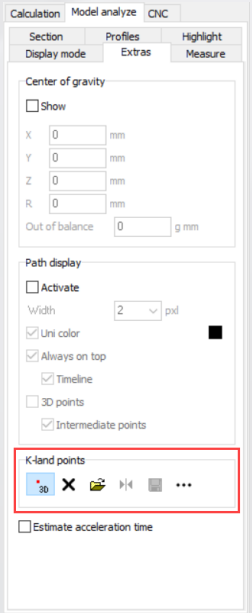
- In the graphic analysis, each active graphic curve can now be switched on/off individually.
- Each graphic curve can be freely scaled with a minimum and maximum value.
- You can also specify the line width, color and fill for each curve.

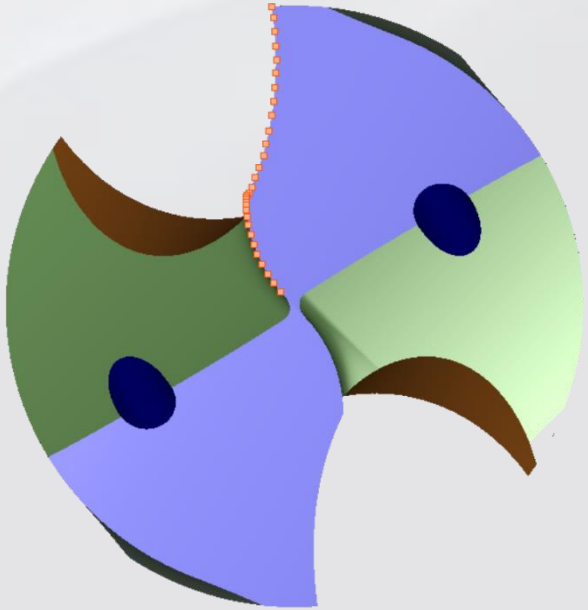


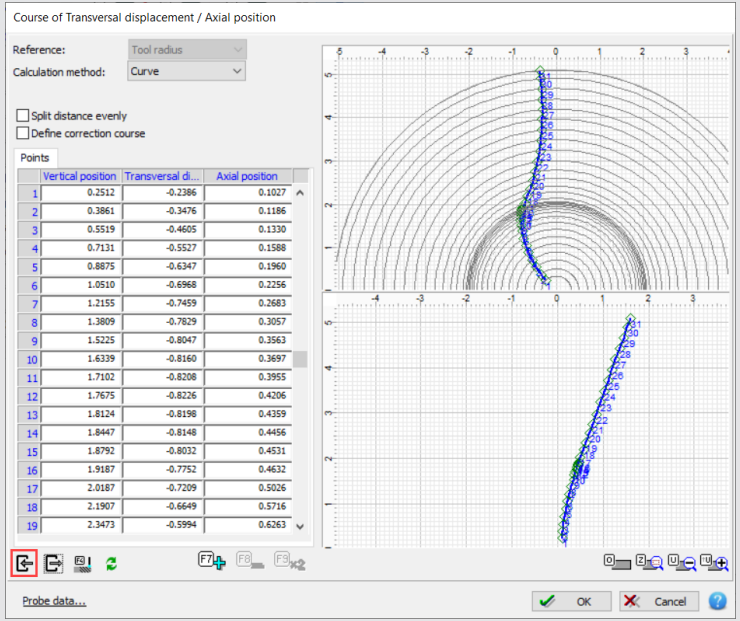
# NUMROTO-3D: Teach-In of K-land shape

(3D special functions, since version 4.2.0b)

- The points along the drill's main cutting edge required for grinding a K-land can now be selected in the 3D simulation and then exported for NUMROTO.



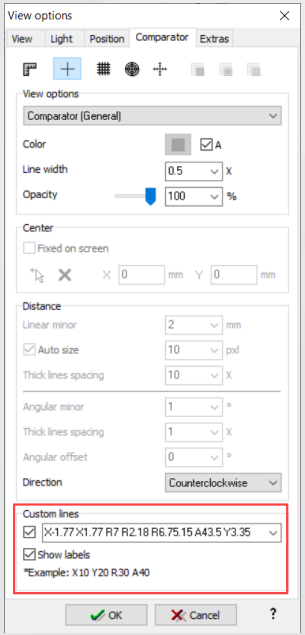



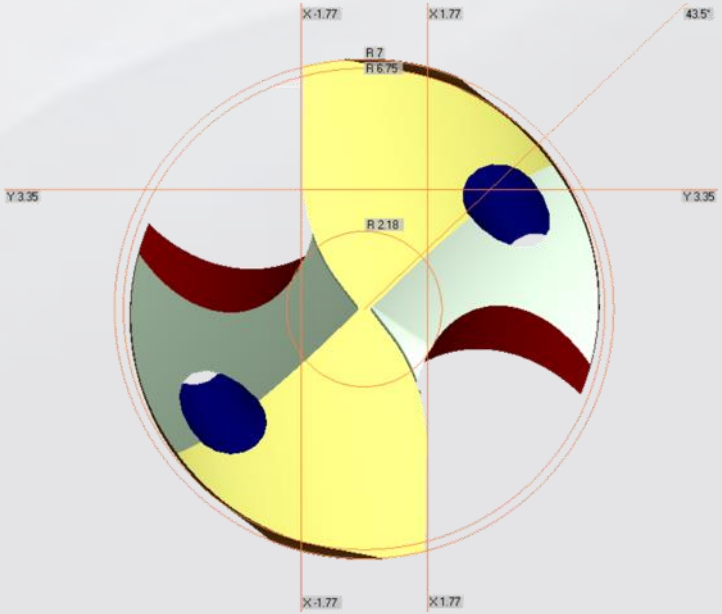


# NUMROTO-3D: User defined lines

(since version 4.2.0b)

- New user-defined guiding lines can be inserted. In addition, these lines can now be automatically provided with dimensions (label).

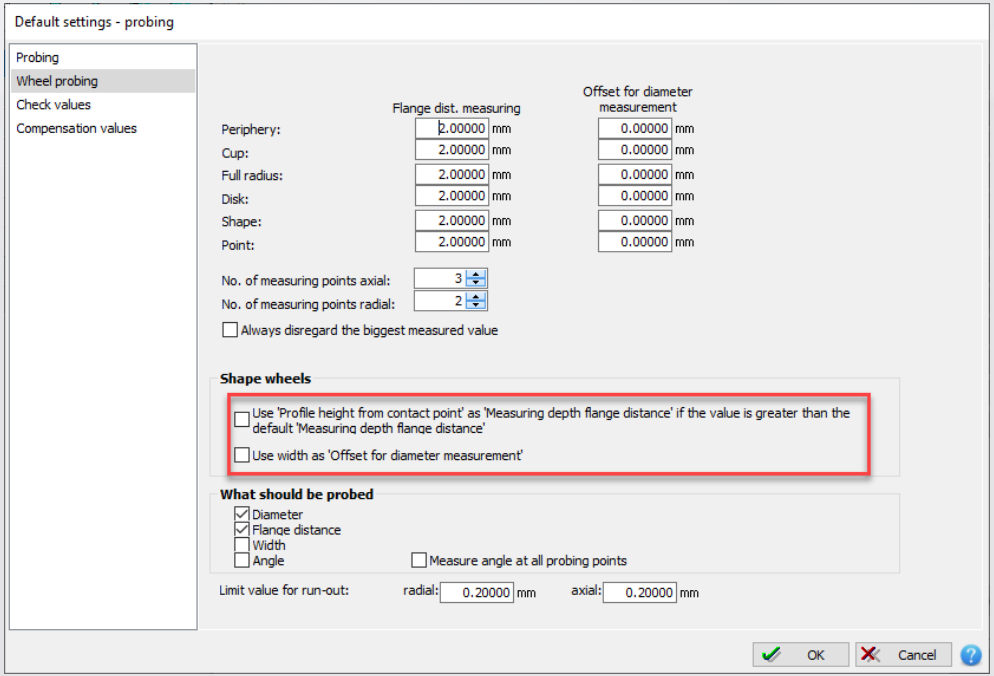


# Wheel probing: Form wheels

(since version 4.2.0)

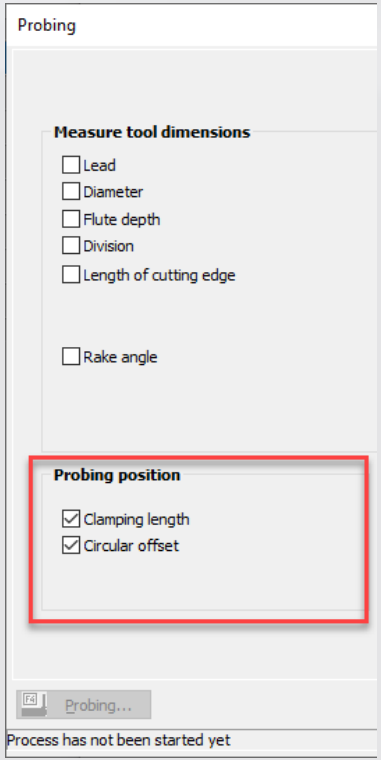
- Automatic adjustment of the measuring depth for probing the flange dimension and use of the width for the offset of the diameter measurement.



# Probing: Clamping length / Rotation

(since version 4.2.0b)

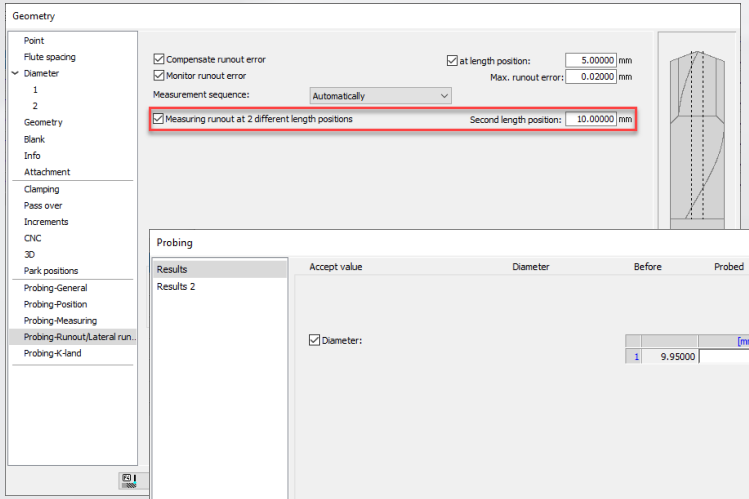
- The previous checkbox 'blank' is no longer available. Instead, it is now possible to select directly from the 'Geometry' and 'Resharpening' pages whether or not the rotation should also be determined before measurement. If the tooth position (rotation) is not probed, we assume a blank will be used and only the diameter and run-out of the tool can be measured.

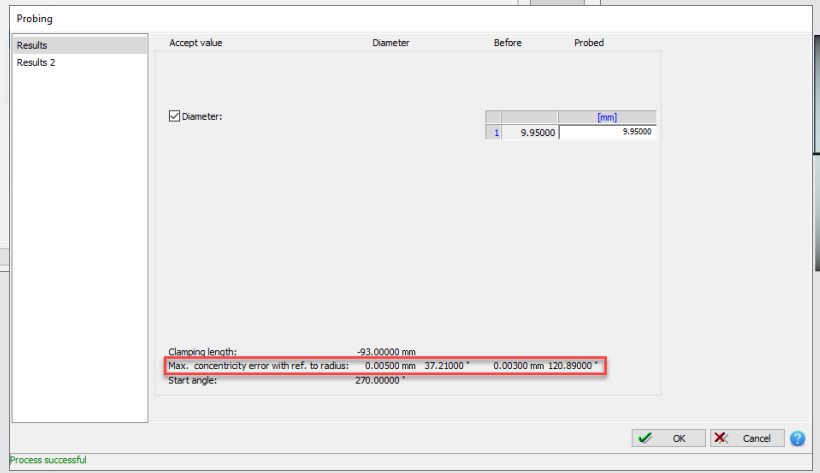


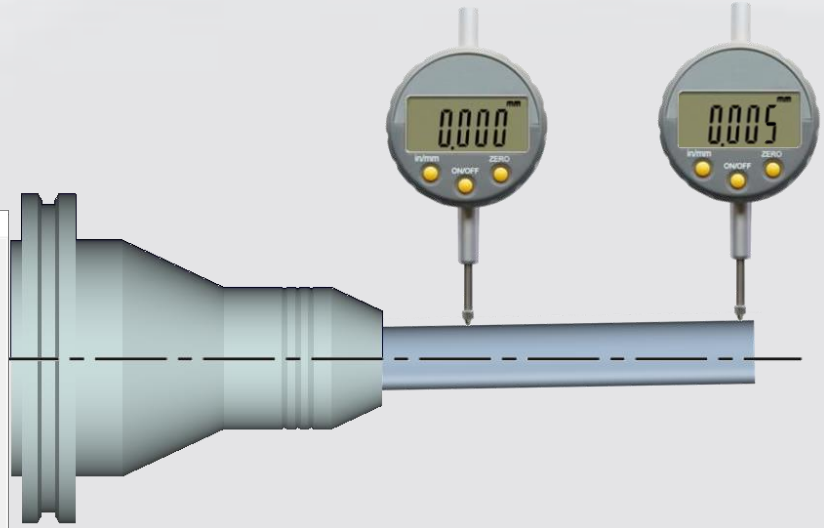
# Measurement of runout error at two positions

(since version 4.1.2)

- The runout error can now be measured at two longitudinal positions.



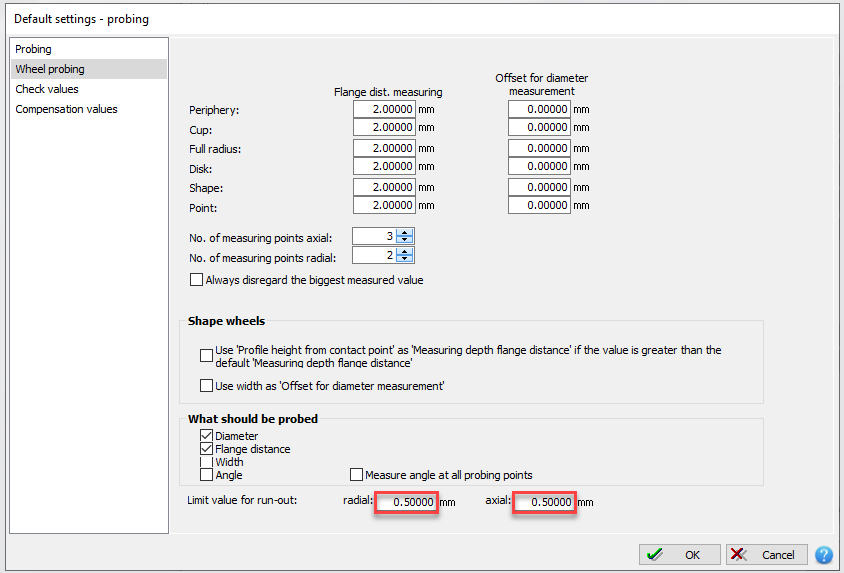



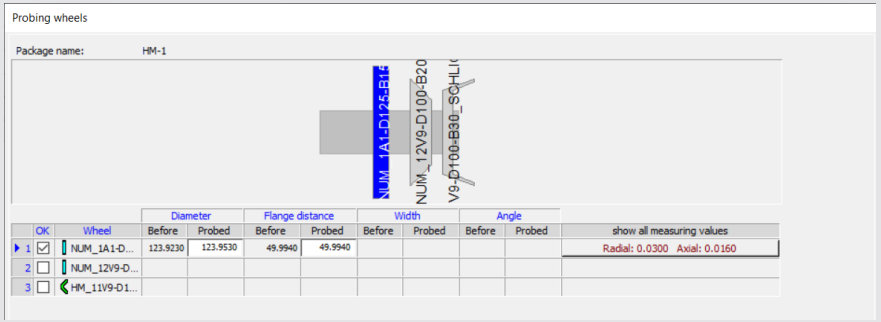



# Wheel probing

(since version 4.2.0b)

- In the settings, the limit value for the maximum runout for wheel probing can now be specified. If one of the two limit values is exceeded, the wheel probing results are highlighted in color.

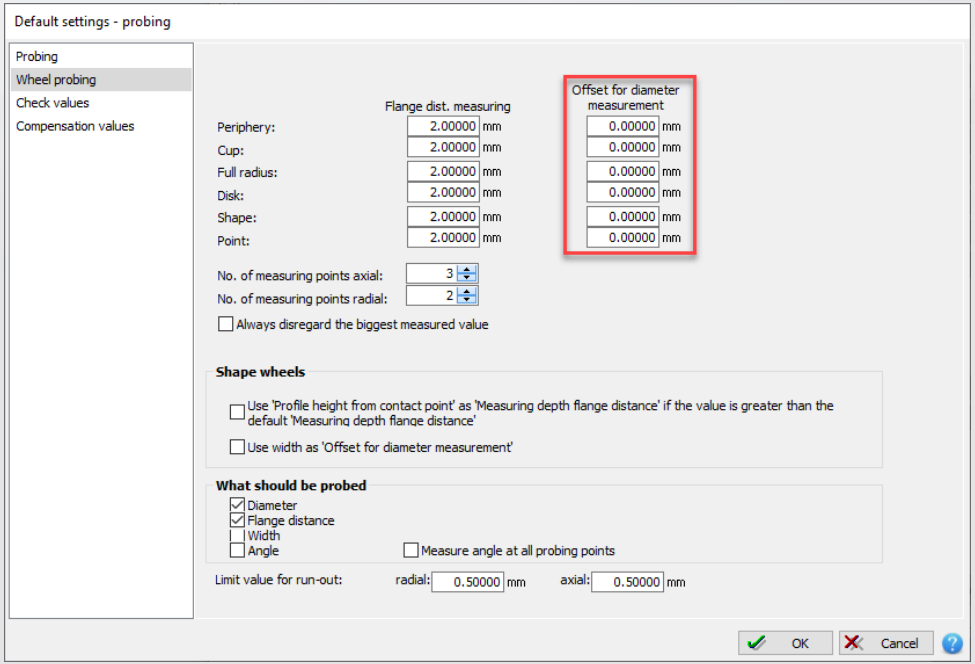


# Wheel probing: Offset for diameter measurement

(since version 4.2.0b)

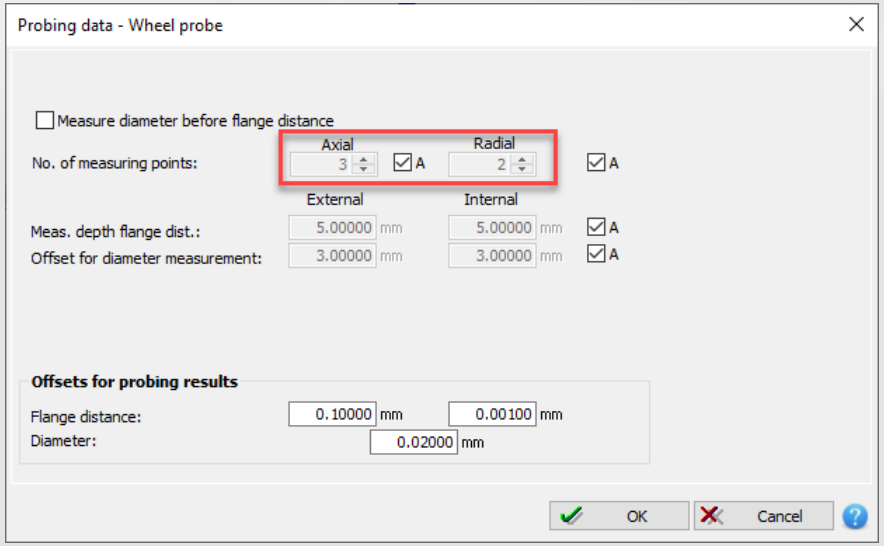
- Depending on the type of grinding wheel, different offsets can now be programmed, so that not all grinding wheels touch the wheel probe at exactly the same place when measuring the diameter.



# Wheel probing: No. of measuring points axial / radial

(since version 4.2.0b)

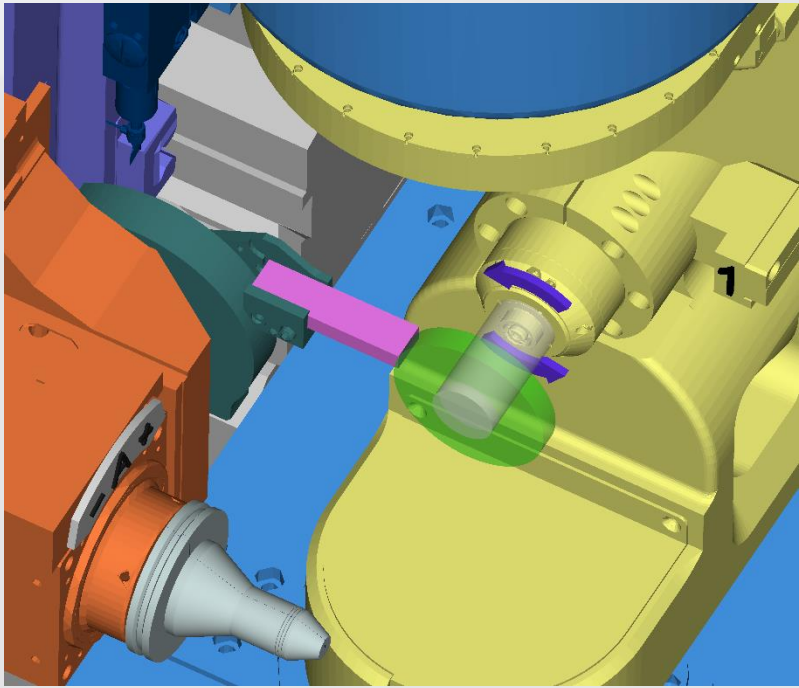
- The number of measuring points for probing the flange dimension and the diameter can now be specified separately. More measuring points are recommended for the flange dimension probing as for the diameter probing.
- Thus the measuring process can be optimized in terms of time.



# Wheel dressing/sticking

(since version 4.2.0b)

- The active collet is now used for sticking and dressing in the 3D simulation.
- Wheel sticking available on various customer machines. (more information is available from the respective machine manufacturers).
- Further options for the installation and orientation of the sticking station in the machine
- Various extensions and optimizations of the sticking cycles, e.g. for form wheels.

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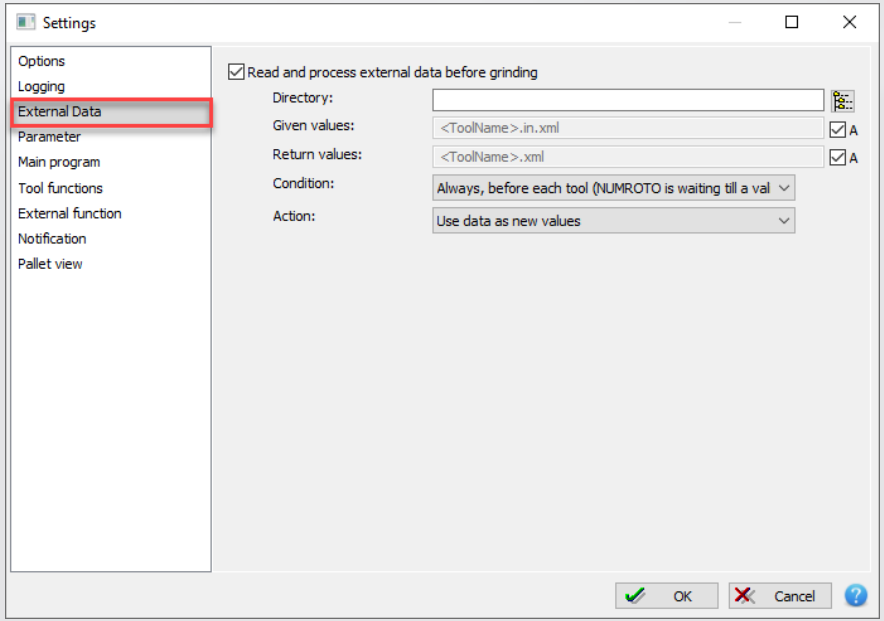
# NR-Control: Read external data

(Data interface option, since version 4.1.2)

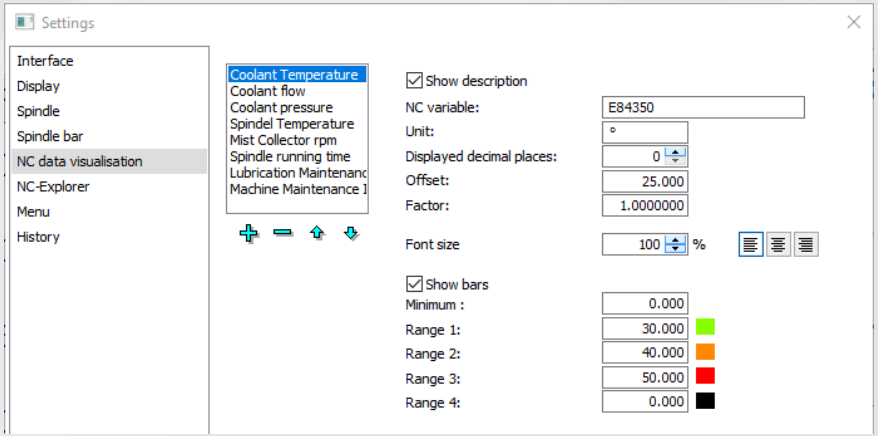
- When grinding several tools with NR-Control, external data (e.g. measured values) can now be read in automatically at some point in the process, allowing automatic compensation to be carried out.
- The use of this function requires special training.

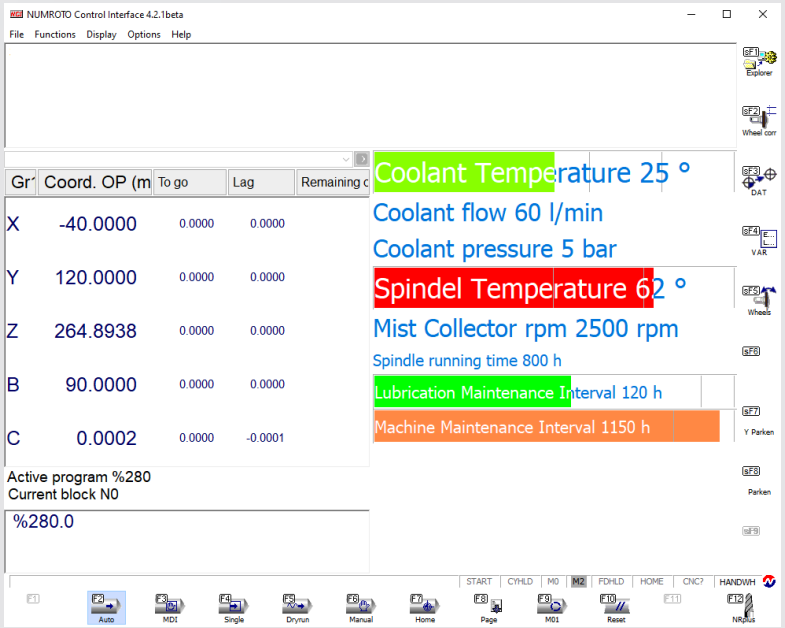


# NCI: CNC data visualization

(since version 4.1.2f)

- Individual CNC/PLC parameters can be displayed on an additional page in the NCI. For example coolant temperature, axis information, maintenance intervals etc.



# Further new features (Draw)

- It is now possible to insert user-defined images into user-defined tables.
- Using data elements and drawing properties as value sources for cells of user-defined tables.
- Easier operation when creating tables (insert, move and delete column and rows).
- The position of the drawing header for new drawings can now be specified in the settings for each tool type (end-mills, drills/step drills, form cutters and burrs).
- Dimensions can be hidden individually with Ctrl + double click.
- For the tolerances you can now choose between the display mode: "Upper and lower" or "Symmetrical".
- When printing, you can now select in more detail which pages are to be printed.
- If the minimum number of decimal places is set to 0, only decimal places are displayed if there are actually decimal places.
- Extension of the toolbar for grids, rulers and crosshairs.

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# Further new features (Draw)

- Color pixel images of tools in SVG format.
- Removing the support lines of a measurement for better clarity.
- Improved snap function for defining dimensions.
- Individually adjustable line width, color and dashing of foreground lines.
- Separate settings for font sizes, colors, prefixes and suffixes of dimension names.
- Separate settings for lines, colors and fillings used for wheels and wheel packages.
- Overwrite the label fonts for each dimension.
- Calling the specific help per window (dialog).
- Self-drawn rectangles and circles can now also be cropped.
- Optionally, an empty page can be inserted automatically from the beginning of a new drawing.

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# Further new features

- Now you can specify in the settings which diameter definition is to be used depending on the tip shape. You can also select whether the core diameter or the flute depth should be queried for manufacturing and resharpening.
- Form reliefs - division: now all form reliefs can be divided. So it is now possible to repeat the first form relief several times, even if there is a second form relief.
- NUMROTO-3D: For the quick export of bitmaps and STL models, various individual settings can now be specified. From 4.2.0b.
- When probing the side distance of a drill with S-gashout, the second measurement position can now be adjusted based on the point angle.
- When using the wheel probing function, the feed rates for measuring the flange dimension and the diameter can now be specified separately. For measuring the diameter a lower feed rate is recommended to minimize the wear of the wheel probe.

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Further information:

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

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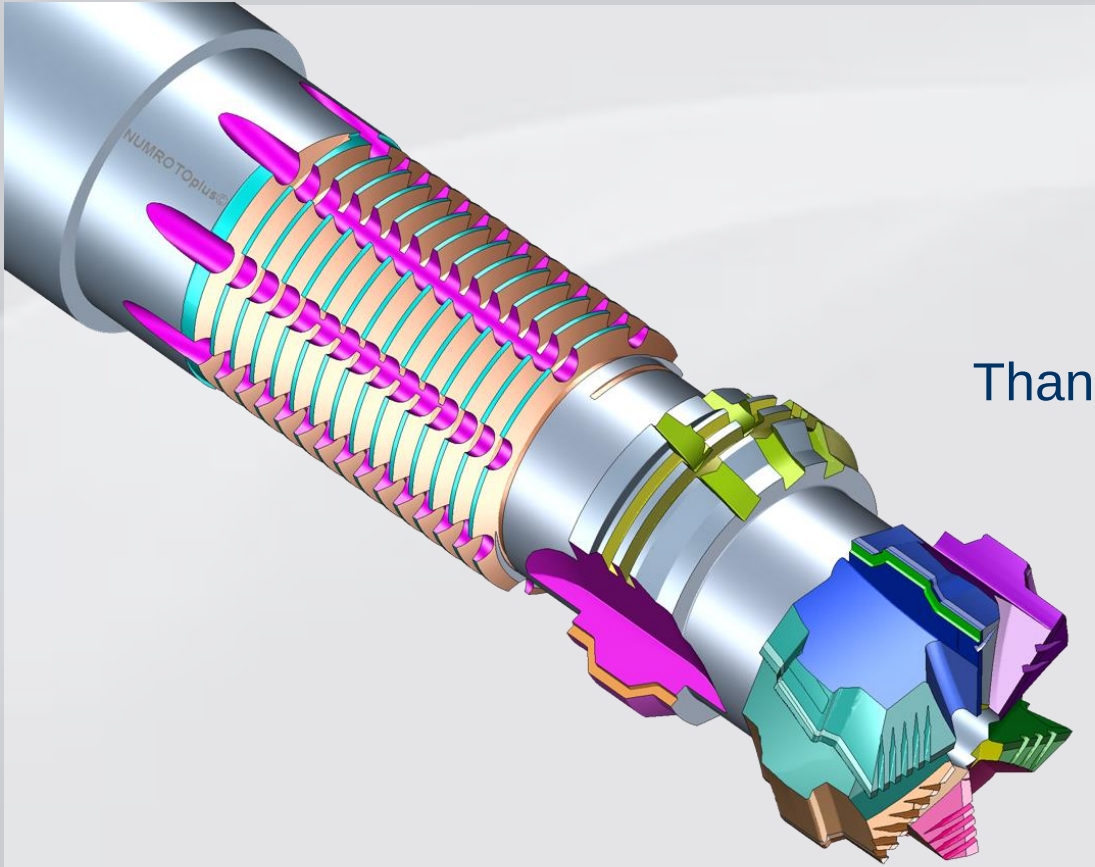


Thank you for your interest!