easyGRIND

Software changes

VERSION 6.14 & 6.15

Machining 2
- Form tool 2
- Other tools 3
- Probing 4

Broaches 4
- General use 4
- Flat Broach 4
- Round Broach 7
- Broach Fixes 8

Miscellaneous 9
- 3D Simulation 9
- General use 9
- Machine 10

Fixes 10
- v.6.15.0 10
- Patch v.6.15.1 11

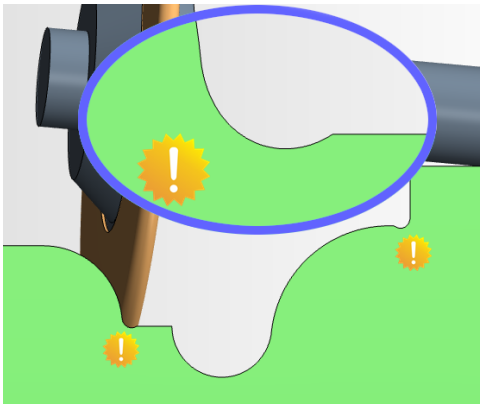
Machining

Form tool

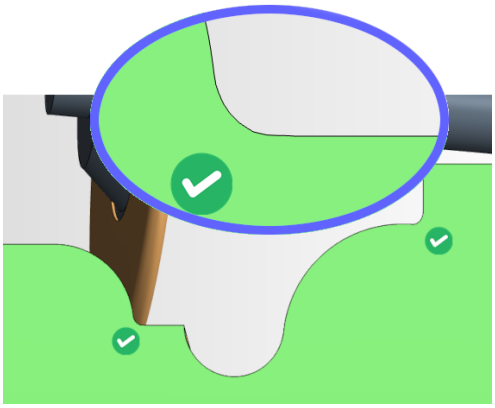
Better handling of "spikes" in concave corners

If the profile has a lot of relief (35°), and the profile has discontinuous concave angular points (typical of profiles for wood), there were "spikes" in the concave corners. To remove this phenomenon, it is possible to **automatically add fillets to the profile**. The value of the added radii is automatically based on the wheel's tip radius (wheel tip radius + an extra 10%). The operator does not need to manually modify the profile.

Activation: numaffut.ini [Formes] Ajouter_Conges = 1



Without fillets



With fillets

Better handling of "red" messages

The display of blocking red messages in form reliefs has been improved. It is now possible to display the message beyond a threshold on the A axis's maximum movement. The larger the value, the longer the program will let the part rotate before blocking.

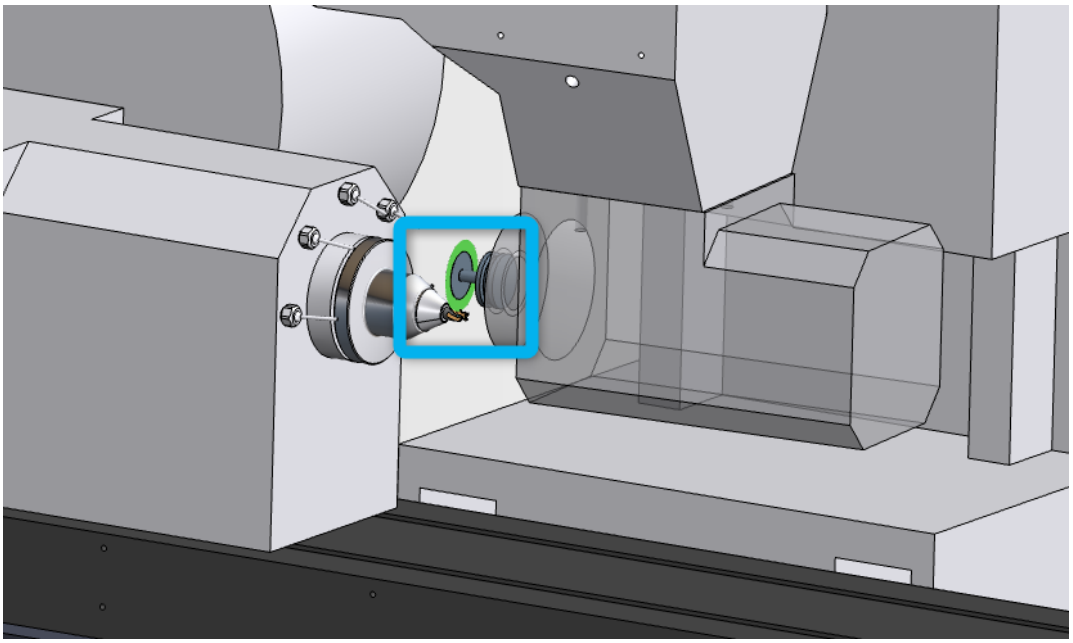
Activation: Numaffut.ini, [Formes] Angle_Limite_Messages = 45

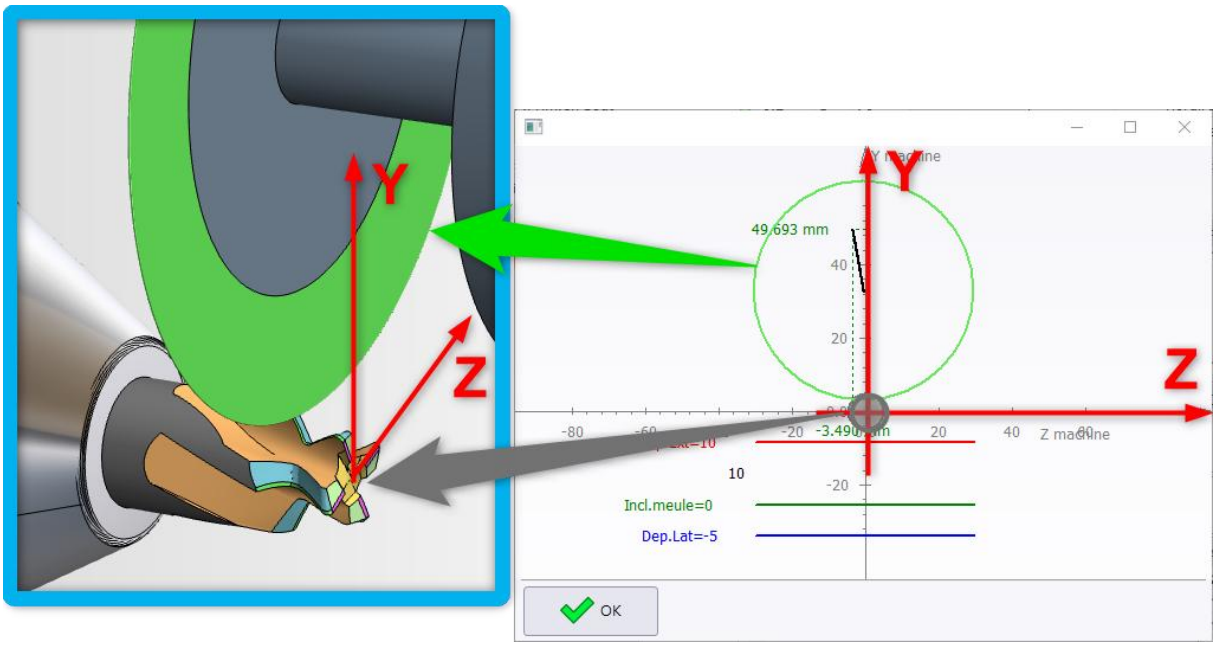
[Formes] Supprimer_Messages = 0 to let the new feature operate
= 1 if you NEVER want to see a message.

Adjusting the machining position in the machine

The Y & Z machining positions are displayed in a 2D view (with immediate display).

Access: [>] button of the "Prioritize Y or Z" parameter





Other tools

Inserts, form RELIEF

Once the wheel is in position, it is possible to lock the A axis rotation: the axis does not turn during machining of the profile.

Access: Check the job parameter "Lock A axis"

Fellow, T cycle and tooth count / pass count reversal

- Machining by T cycle (depth of cut on the forward and return passes)
- stacking roughing / finishing
- stacking between passes

Zero-helix hob

Improved precision during machining: When machining a flute on a hob with a very small helix, it is treated as machining a zero helix to improve precision (the A axis will not move)

Probing

Measuring machine drift

Using a reference cube, or the machine's master, a reference can be probed.

Following this, a periodic check is offered, with recording of the deviations found.

This makes it possible to monitor whether the machine is drifting. If so, new P16s can be performed.

Access: eHomePositions

Arbitrary probing

It is now possible to probe spline flanks in A.

Access: Quick Probing | %114: Arbitrary Measurement A- 2 sides

Fellow Tool probing

The probing speed for the setup between the two teeth is now set based on the setup probing speed in the modules.

Rotational diameter probing

Creation of the new probing method 'R-Rotary': the probe approaches the tool while the A axis rotates quickly. This probing allows any type of tool to be measured.

Broaches

General use

ISO program editing mode (ISO_SYMBOLIQUE)

Added a column that allows the edit type to be chosen for each job:

A-Automatic (let the program decide)
0-Simple ISO
1-Symbolic ISO

Pitch & progression table

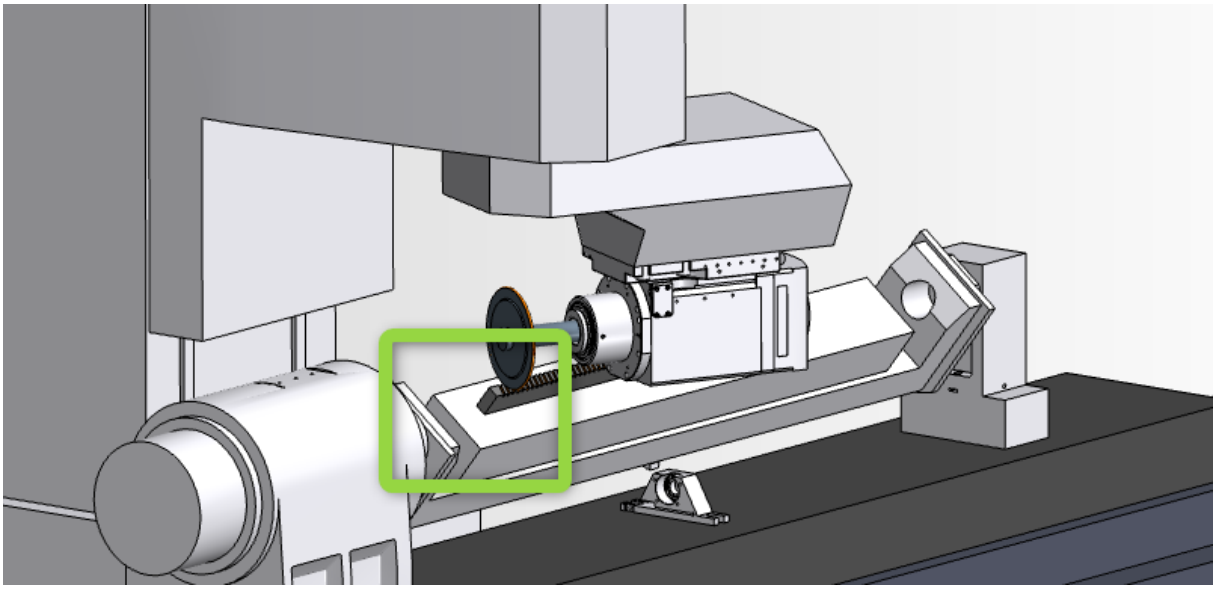
Clicking the chart at the bottom positions the cursor in the grid on the correct tooth.

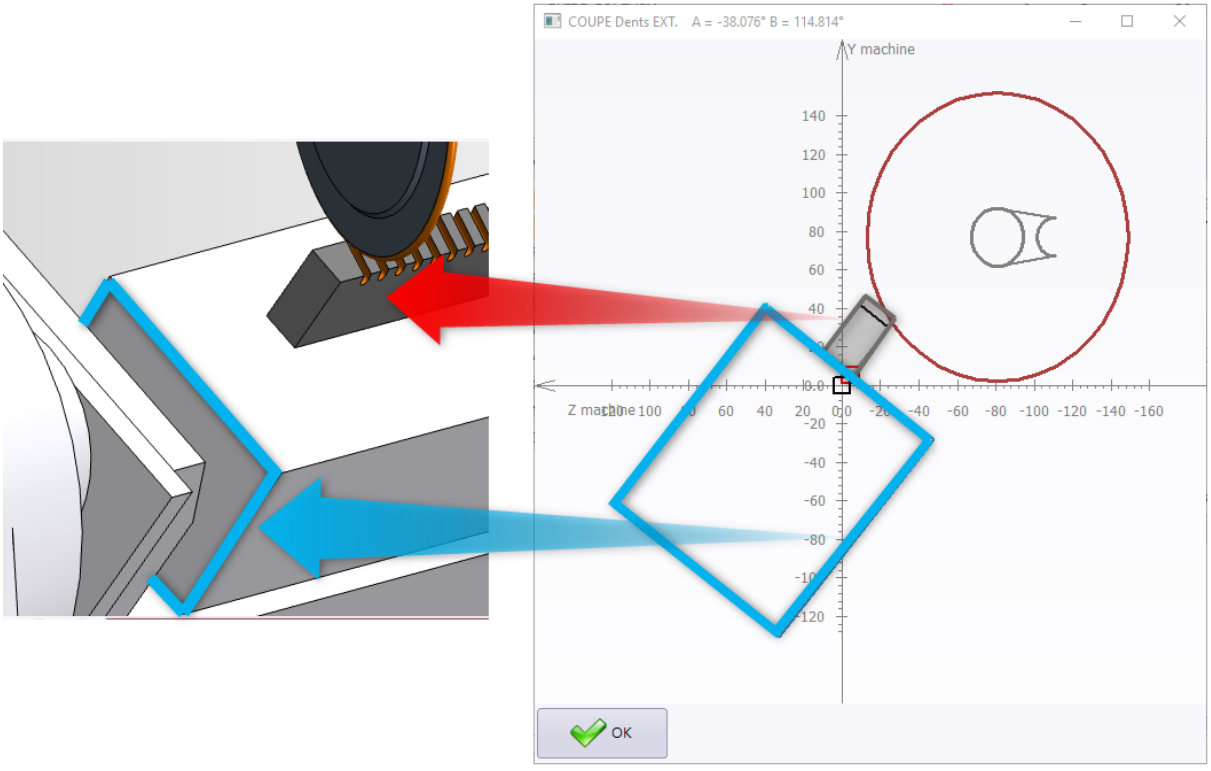
Flat Broach

2D view of the machining position

It is now possible to see the broach and the wheel in their machining positions in a 2D view (with immediate display).

Activation: Numaffut.ini, [BROCHES] 2D_Tilting_Display = 1



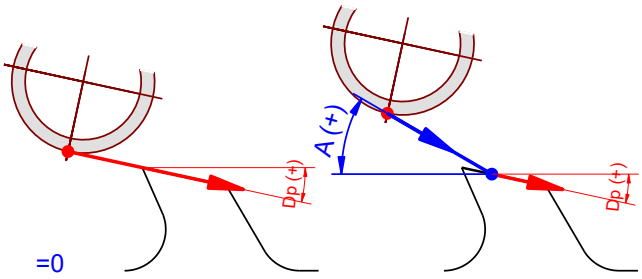


Relief correction on full-form broach

New "form of line" relief correction option, with the creation of a new step in the tool declaration "Simple Relief / Relief with correction".

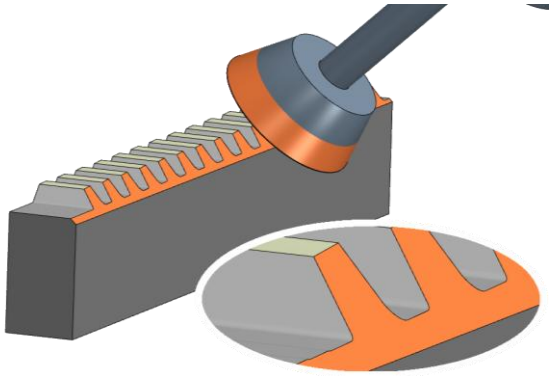
The "Angle" and "Distance" parameters allow the wheel toolpath to be corrected to compensate for a relief defect measured on the part.

Activation: option on request



"Longitudinal CHAMFER" job

Added the "Rotation A+180°" & "Reverse B +180°" parameters, which allow working with the back of the wheel in a different position in the machine. Caution, a wheel incline must be set to avoid a collision between the hub and the part.



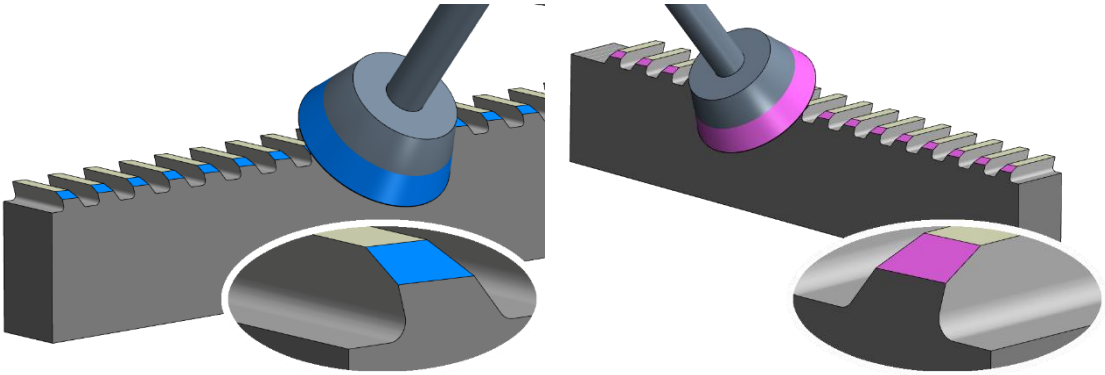
"CHAMFER - Right" & "CHAMFER - Left" jobs

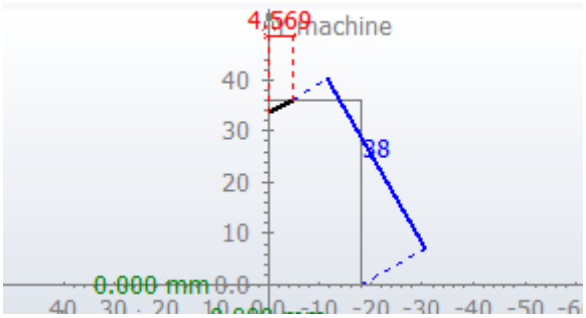
Added left and right chamfer jobs on flat broaches. It is no longer necessary to declare a "Double Broach" to machine a chamfer.

Added the "Rotation A+180°" & "Reverse B +180°" parameters, which allow working with the back of the wheel in a different position in the machine. Caution, a wheel incline must be set to avoid a collision between the hub and the part.

The chamfer is drawn in the job's 2D view.

A utility (in the Calculator) converts a slope dimension into a chamfer width and vice versa.





"Ext. Right Relief" job

the relief parameter can be customized in the job parameters (this allows the relief job to be selected several times and machined with different relief values. Note: does not work if the broach is declared as "variable relief"

Safety for the "Triple pass" option

When the requested pass conditions do not allow the part to be machined, the calculation blocks editing, and indicates the teeth concerned (approach & bottom machining)

Round Broach

ROUND BROACH & [ISO_Symbolique], "CUT" job:

Reminder of the cutting job cycle:

the depth of cut requested by the operator is applied along X. The wheel always travels a distance in X equal to 1.5 x the requested depth of cut in order to start outside the tooth, but this does not change the final sharpening dimension.

The 1.5 coefficient is now configurable. This allows customers who do not want to machine an extended travel to customize their cycle.

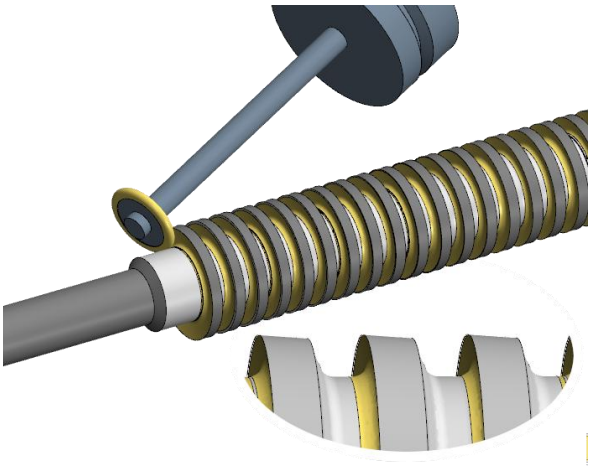
Activation: [BROCHE] Coupe_Rond_Coeff_Passe = 1.5 (default). Set = 1 to cancel the option.

Feed rate:

When the feed rate (in mm/min) is left at 0, it is recalculated automatically. In this case, the unit depth of cut corresponds to the depth of cut performed for 1 revolution.

"Cut" and "Chip Chamber" jobs:

When the wheel diameter is too large, the software can no longer calculate the toolpath, and proposes an inconsistent B axis position. I created the "S" method (manual position + dressing), which allows the operator to manually set the B axis position. This makes it possible to machine the cut with a wheel much larger than the expected diameter. However, the cutting angle will no longer be respected, but this allows roughing cycles to be performed.



UTILITY FOR TANGENTING THE RAKE FACE:

-Fixed: since v.6.12, the approach blocks of the "CUT" job were improved (particularly to allow setting the B axis outside the part). Unfortunately, this approach movement was also performed on every pass in the utility for tangenting the rake face. I have therefore added the "Approach mode" parameter, which must be set to "_ Default", except for CA7U where only "A-Automatic" mode is allowed.

Broach Fixes

- when increasing the number of teeth, the pitch of the last tooth was updated incorrectly

- "The number of teeth disappears, along with the increments table": Symptom: when opening a tool, and directly clicking the yellow arrow of the "number of teeth" parameter, the box displaying the value turns gray, and the value disappears. When clicking elsewhere, the number of teeth has become zero.

- grid bug: when confirming "N-No" in the "Rake face on tailstock side" combo box, this changed the choice of the "Mounting position" parameter to "N-Lying" (randomly). A parameter was inserted between the two to neutralize the bug.

- "CUT" job, the Y approach was done in the wrong direction (when enabling the "Reverse Toolpath" option)

- ROUND BROACH: With the new ISO, the approach for a job with partial machining could be very dangerous (approaching very close to tooth #1, then moving in X onto the first machined tooth).

- Job stacking (Roughing / Finishing) no longer worked with the new ISO (symbolic ISO) (Bug appeared in v.6.12.3)

- ROUND BROACH | "Spline Tooth Root" job: since v.6.12 inclusive, depths of cut were no longer being applied

- Dressing guard: with Flexium, the number of return dressing passes was incorrect (always one pass too many). It was the same ISO as Axium, but different behavior on the "TRUNC" function.

- DRESSING: after dressing, the toolpath's X position was very much offset

Miscellaneous

3D Simulation

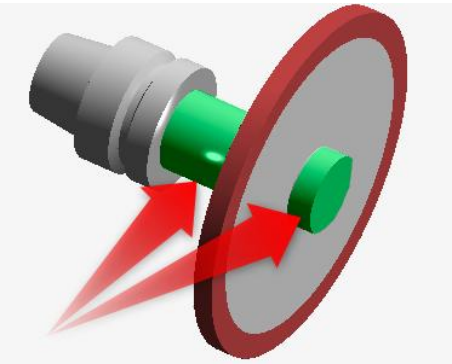
Simulating wheel hubs

It is now possible to simulate wheel hubs, and to customize them if necessary.

"Hub length" parameter: if left at 0, everything is automatic. The entered value is used for simulation and for checking the magazine.

"Hub rear diameter" parameter: it could not be smaller than 32 mm; this restriction has been removed.

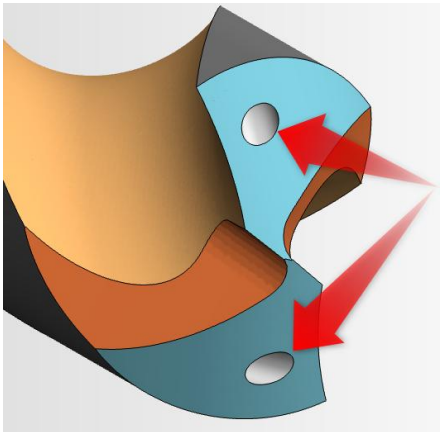
Access: Check the "Customize hub (eSim)" parameter



Simulating oil holes

It is now possible to add a "job" that is used only in simulation to simulate oil holes.

Access: Add the "Simulation: Oil hole" job



General use

CycleManager

The management of machining program editing has been modernized. The main improvements are as follows:

- Chained tools can be probed in manual mode
- The cycle progress display is unified (manual mode, robot mode), and is also more detailed

Access: in Numaffut.ini, [Cycle_Manager_Universel]
= 0 to change nothing
= 1 to use CycleManager in manual mode only
= 2 to use CycleManager at all times (manual, transfer, or robot mode)

Caution, when changing the value, restart EasyGrind.

Wheels Screen

- when hovering the mouse over the "Wheel angle" parameter of a cylindrical wheel, the tooltip that appears displays the angle measured relative to the outer diameter (90° gives 0° // 100° gives 10° FORWARD // 80° gives 10° BACKWARD)

- when hovering the mouse over the "Speed" parameter, the tooltip that appears displays both speeds (in m/sec and rpm)

Licenses

When the computer is connected to the internet, license updates will happen automatically when EasyGrind starts.

Added a button to automatically update the license in eLicensing

Updates and new versions

When the computer is connected to the internet, upon starting EasyGrind, the software checks for existing patches and available new versions. These updates can then be accepted, downloaded and installed.

Machine

Safety on VG300, CA5, VG400 transfer systems

The G10 codes written in %2001 and %2002 have been removed.

Machining time

the machining time is now systematically sent to the CNC (it must have been calculated by the simulation).

Access: c:\Numaffut\Config\varCN_Base.ini [VarCN]
KLadder_TEMPS_USINAGE=%MACHINE_VAR%.Numaffut_TempsDuCycle

Fixes

v.6.15.0

Dressing while tilting the B axis

The machined profile was not correct when the B axis was tilted.

3D Simulation

- in the tooling configuration, "OUTIL_" has been removed from the list

- flat and round broach blanks were poorly positioned in Oppo-Gen (Rake face on tailstock side = "O-Yes")

- the blank for double broaches and fir-tree-root broaches was poorly positioned (since v.6.12 inclusive).

- the Fast / Precise mode was "reversed" relative to the configuration (6.15 only)

Mills

- **Barrel Tapered MILL**: the land disappeared on the tool's periphery

- **Double Radius Mill**: the "Lip/axis dist." parameter did not work when it had a negative value

- **Double Radius Mill**: the tip approach parameter in Y & Z (in the job) did not work (used to remove the "spike" toward the center)

- **"Peripheral RELIEF" job** : the default value of the wheel incidence in the job parameters was incorrect (bug appeared in v6.12)
- 2-tooth mill, "peri relief" jobs: wheel incidence 30° instead of 3°
- 2-tooth mill, "continuous relief" jobs (full and tip zone): wheel incidence 45° instead of 1°

Also included ...

- Error **editing %113** if no blade probe declared

- Removal of the access violation when opening the "**Tool Description**" screen

- Code hardening to prevent crashes when opening the "**Wheel List**" screen

- Display **issue** with buttons on opening (black background)

- **Helix probing**: the "Tip distance" parameter was no longer taken into account

- **CNC Editing**: when the tool name is too long, it is truncated by replacing the start with '...'. This causes a CNC error. The '...' string has therefore been removed

- **Mill, Tooth back / relief job**: The approach speed coefficient when the approach is R-Radial no longer worked. The line had been added in 6.09 commit 1854 then removed in 6.10 commit 1862

- Helical tapered entry: since v.6.05 (at least), it was no longer possible to edit a tool declared with "one helix per tooth".

Patch v.6.15.1