

InventorCAM 2013

InventorCAM 2013 What's New

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N18 D88 N8000
N13 GO X87.851 Z170 Y47.399 S1000 M13
N14 G53 C3+1
N18 G141
N18 D88 N8002 *****
N17 G40
N18 G50 C3+1
N18 G49
N80 G74 Z1 L1
N81 G74 X700 Y590 L1
N82 G7 L1+1
N83 G93 C3+1
N84 M30
*****
N5 GO E101+O (O) E102+O (O) E103+O (A) E111+O (B) E112+O (C) E113+O (R10)
N6 E180+O E181+O E182+O
*****
N5002 O
N5 *****
N6 GO X87.851 Y47.399 Z130 CO B18.387
N7 Z181.585
N8 X85.825 Y44.417 Z103.945
N9 G1 X85.8 Y44.085 Z101.89 F33
N10 X85.887 Y43.987 Z108.009
N11 X85.53 Y43.759 Z109.048
N12 X85.424 Y43.548 Z108.089
N13 X85.304 Y43.346 Z108.197
N14 X85.148 Y43.171 Z108.18
N15 X84.858 Y43.085 Z108.189
N16 X84.741 Y42.815 Z108.218
N17 X84.514 Y42.839 Z108.289
N18 X84.279 Y42.809 Z108.334
N19 X84.038 Y42.804 Z108.344
N80 Y43.184
N81 X80.284 Y42.884 Z104.261 C89.108 B11.024
N82 X81.25 Y42.898 Z109.38 C86.848 S17.218
N83 X80.887 Y43.083 Z108.889 C84.739 S11.18
N84 X79.885 Y43.884 Z108.889 C81.875 S11.178
N85 X77.388 Y43.385 Z108.389 C88.951 S8.188
N86 X76.413 Y43.434 Z108.316 C89.508 S8.188
N87 X75.884 Y43.513 Z108.318 C87.833 S8.181
N88 X75.788 Y43.505 Z108.383 C86.888 S8.189
N89 X75.644 Y43.714 Z108.388 C86.177 S8.189
N90 X74.214 Y43.999 Z108.387 C84.64 S8.179
N91 X73.711 Y44.148 Z108.345 C83.787 S8.189
N92 X72.814 Y44.387 Z108.348 C82.959 S8.189
N93 X71.718 Y44.519 Z108.349 C82.28 S8.173
N94 X70.885 Y44.787 Z108.383 C81.804 S8.188
N95 X71.748 Y44.947 Z108.387 C80.649 S8.181
N96 X71.571 Y45.184 Z108.38 C80.877 S8.188
N97 X70.801 Y45.437 Z108.383 C80.888 S8.148
N98 X70.114 Y45.787 Z108.387 C80.178 S8.188
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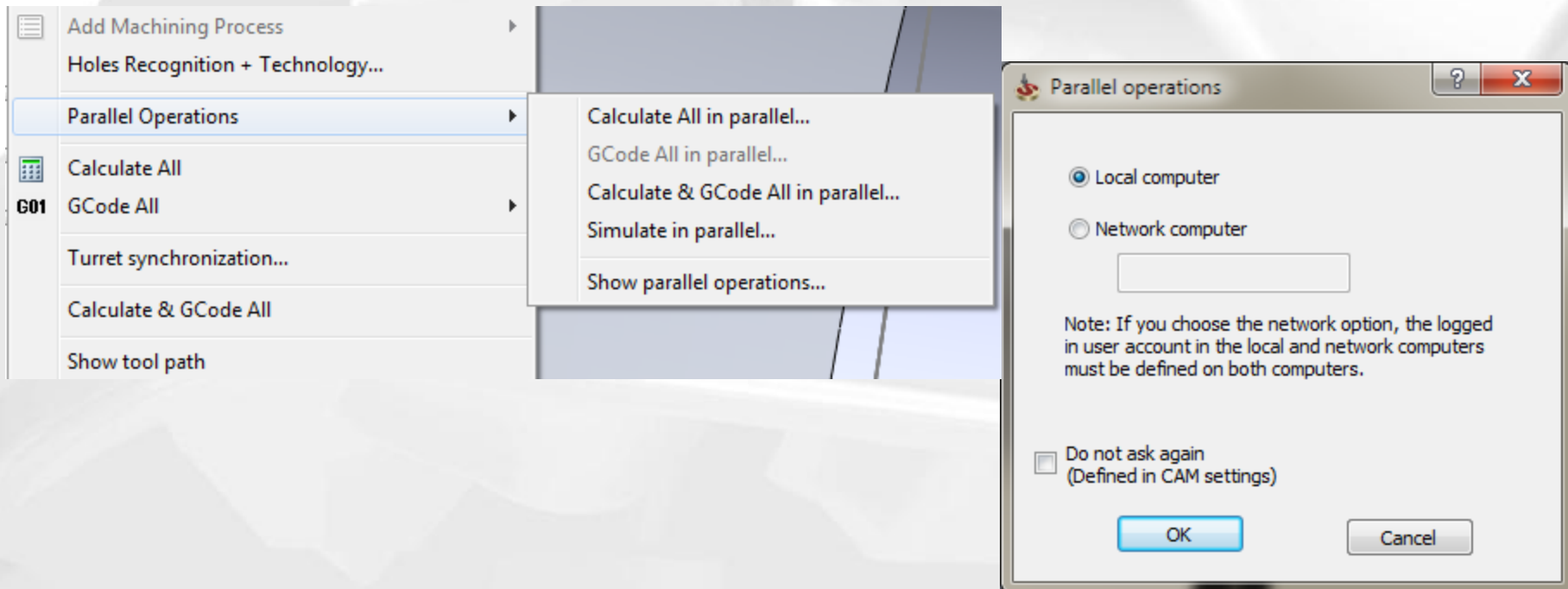
Parallel Computing

A major new capability in InventorCAM 2013: Parallel Computing

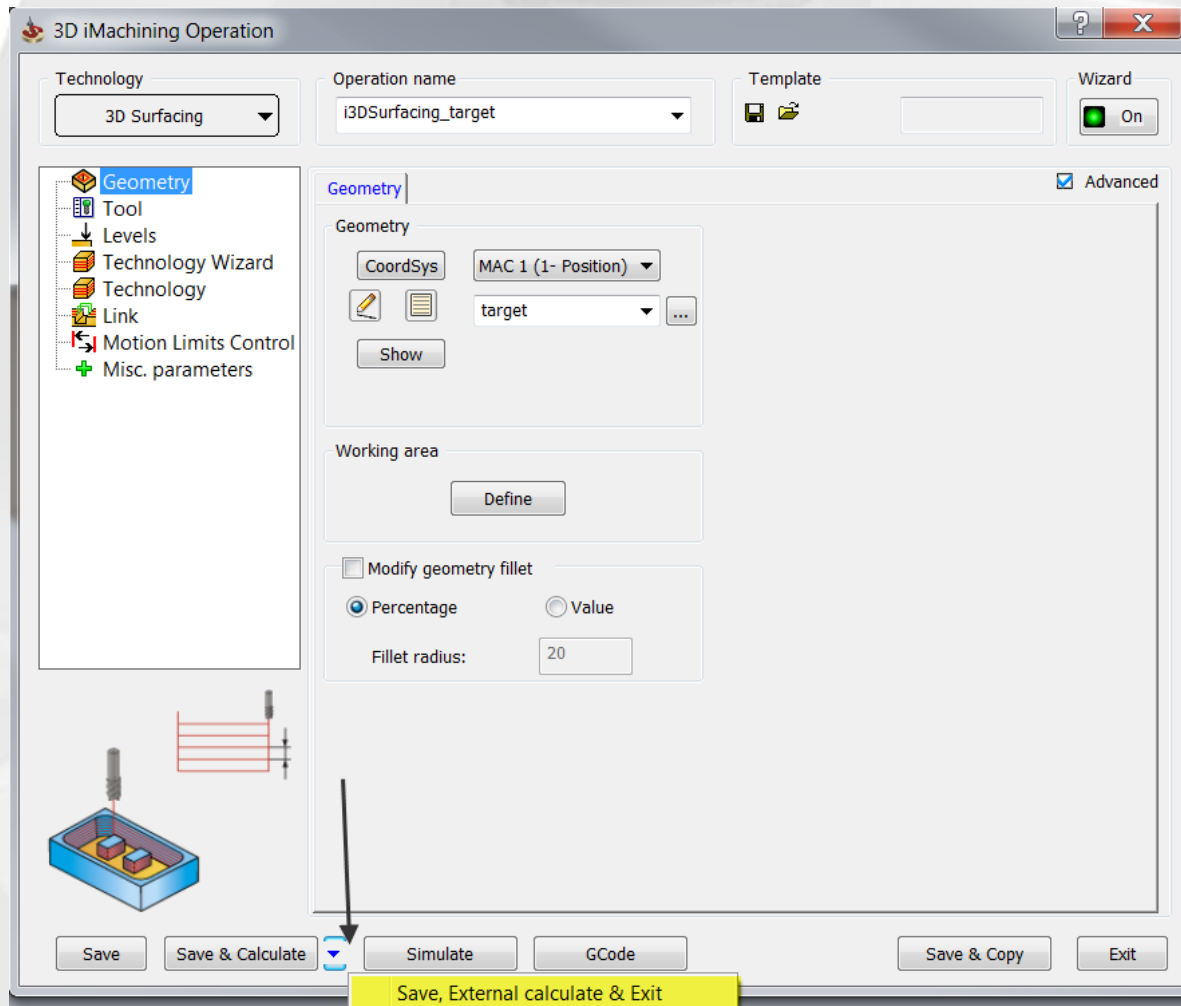
- User can start calculation of an operation or several operations and, while it is calculating, he can in parallel continue to define and calculate additional operations
- User can start parallel simulation and, while it is simulating in the background, he can in parallel continue to work defining additional operations
- User can start G-Code generation and, while it is generating G-code, he can in parallel continue to work defining additional operations

Parallel Computing – LOCAL or REMOTE

- LOCAL: Parallel computing on User Computer, using the power of multi-threading on multi-core CPUs
- REMOTE: Parallel computing on External computer on the Network



Parallel Computing – LOCAL or REMOTE



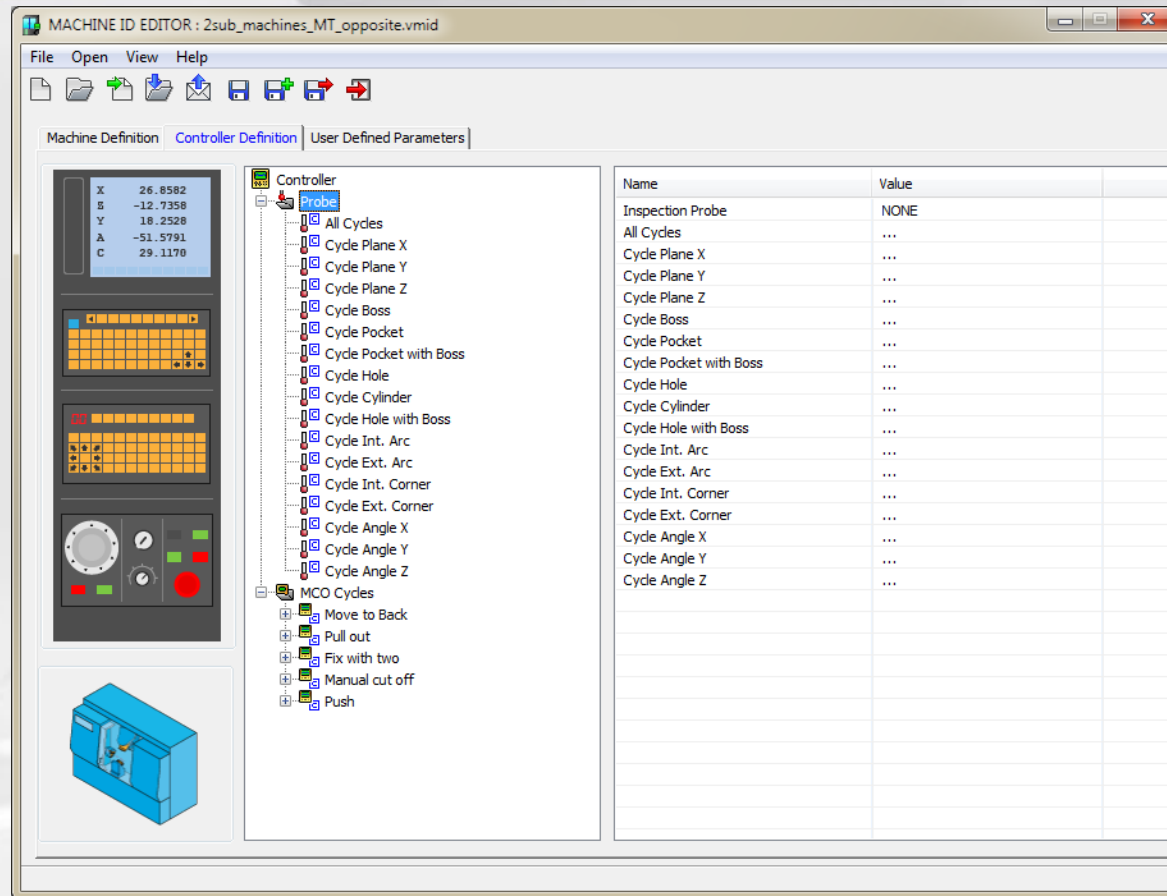
Software Licensing

InventorCAM 2013 provides software licensing, in addition to the standard hardware dongle licensing.

Advantages:

- For companies demanding a network software license instead of network hardware dongle
- Used instead of hardware dongle for customers who want a 30-day evaluation of the software

Controller ID



- First stage on the way to make machine definition in one file - *.VMID
- Probe cycles and MCO cycles are moved to *.VMID already in SC2012SP2

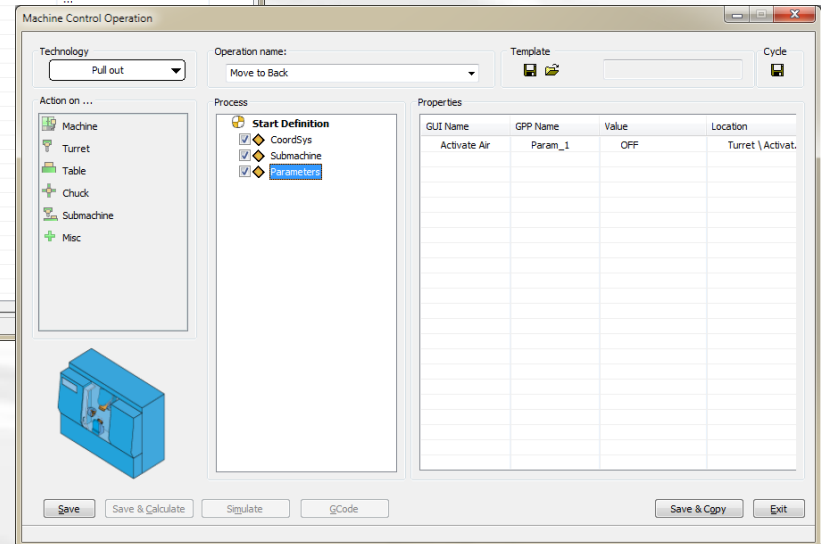
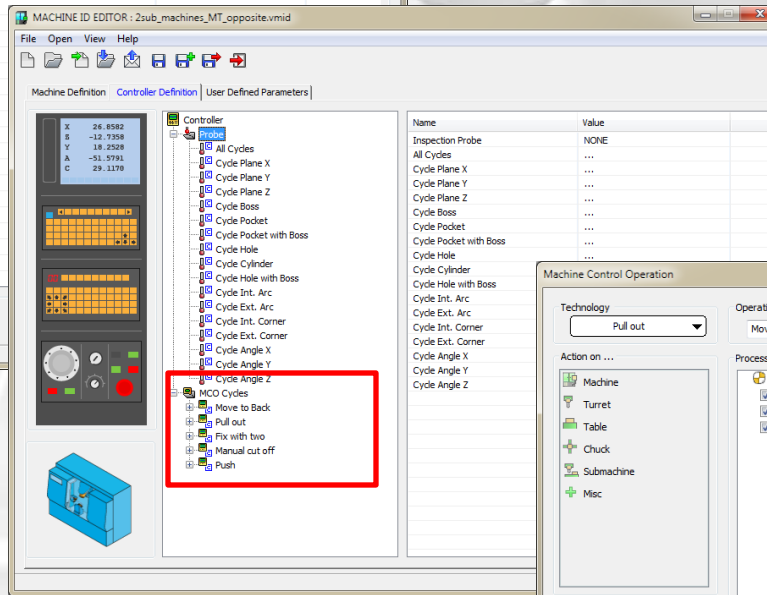
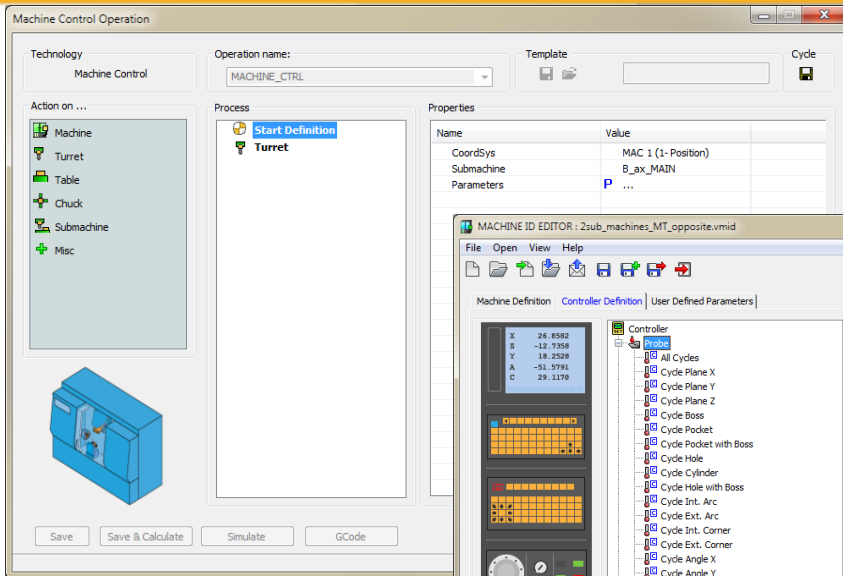
MCO cycles

- Predefined machine cycles
- User sees only needed parameters

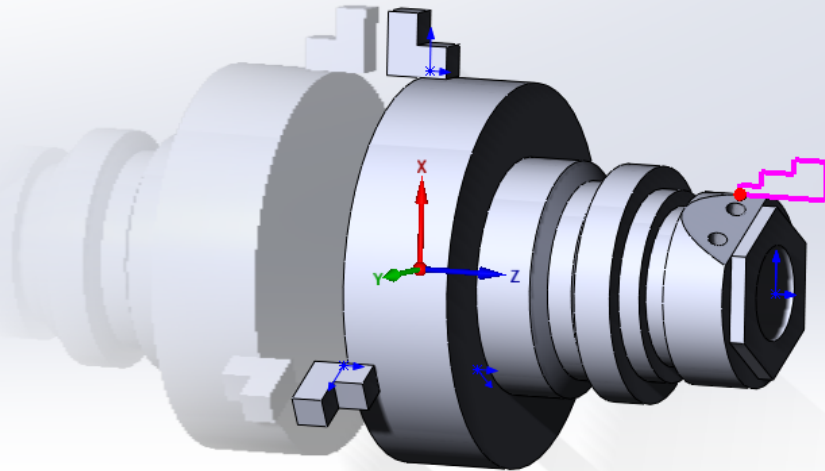
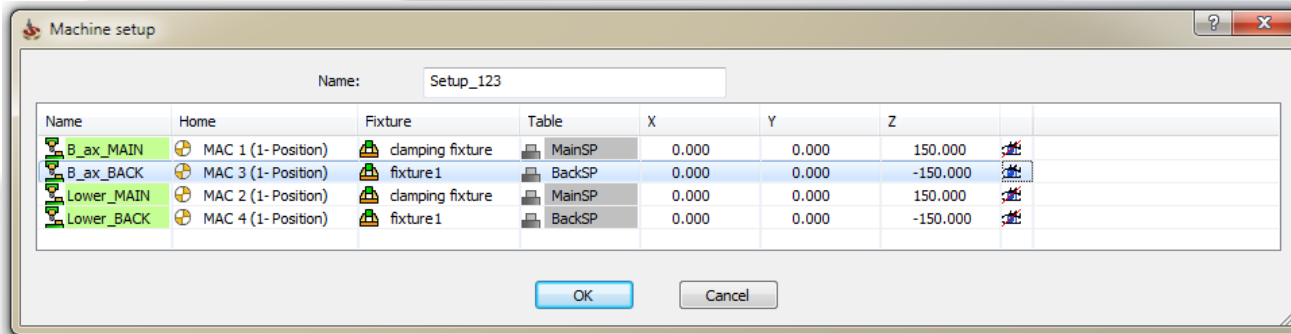
Create cycle

Save cycle

Use it in any CAM-part easily

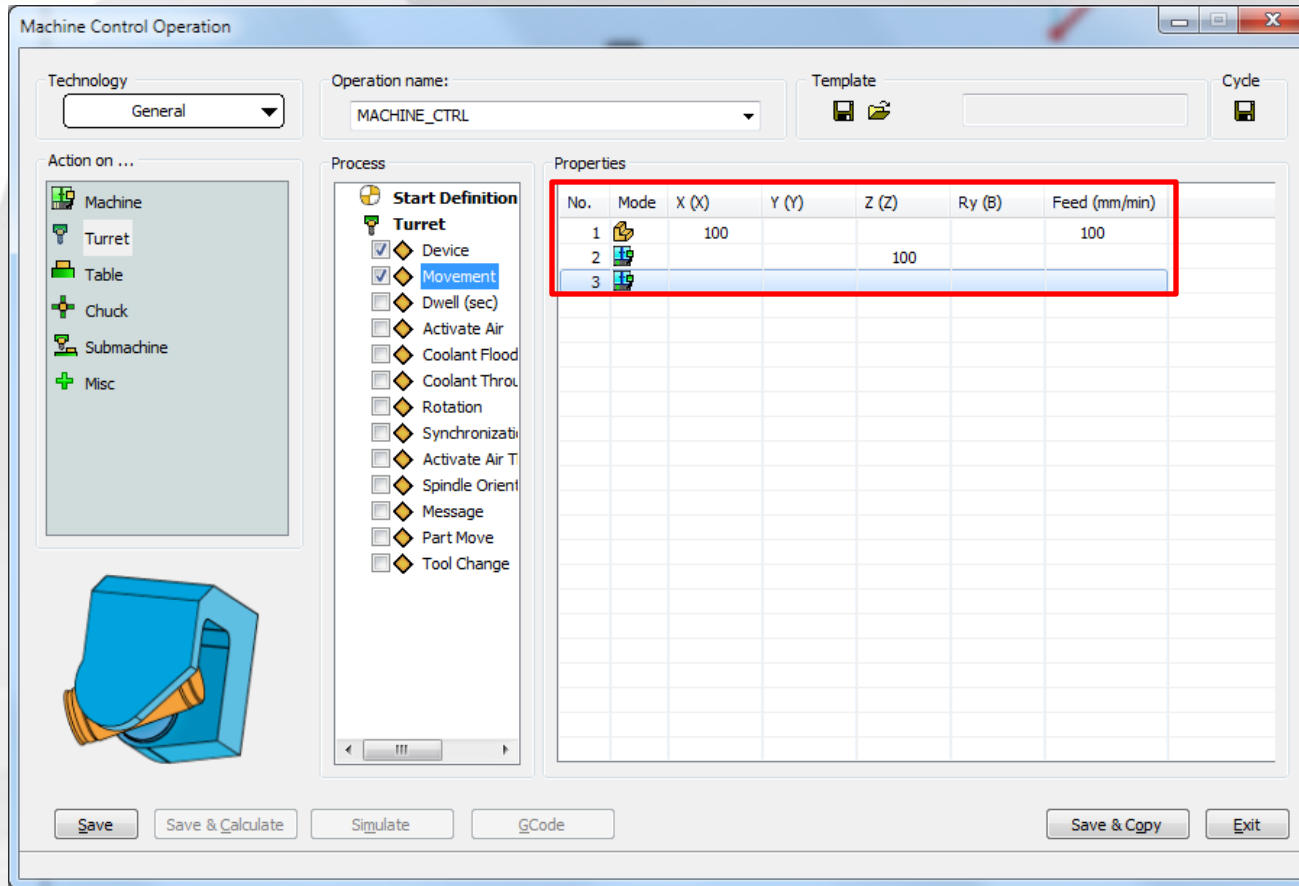


Machine Setup



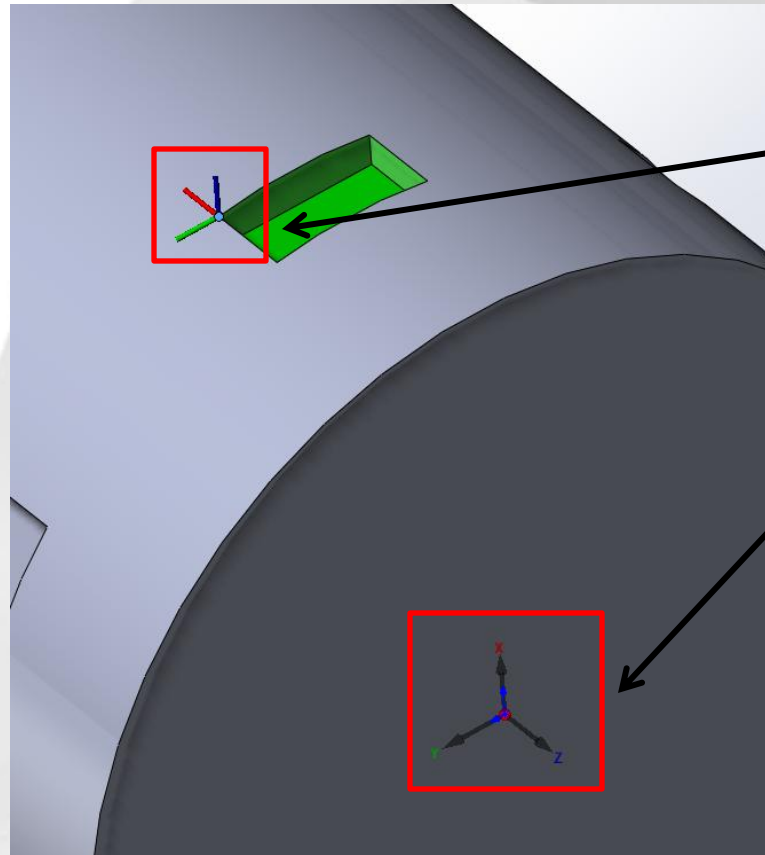
- Definition of fixture, MACs shiftings in one place
- Connection between fixture, MAC and Sub-Machine

MCO: Movement definition styles



- Definition of device movements in Part CoordSys
- Definition of device movement by axis value (according to Device CoordSys)

CoordSys: Easier CoordSys Edit

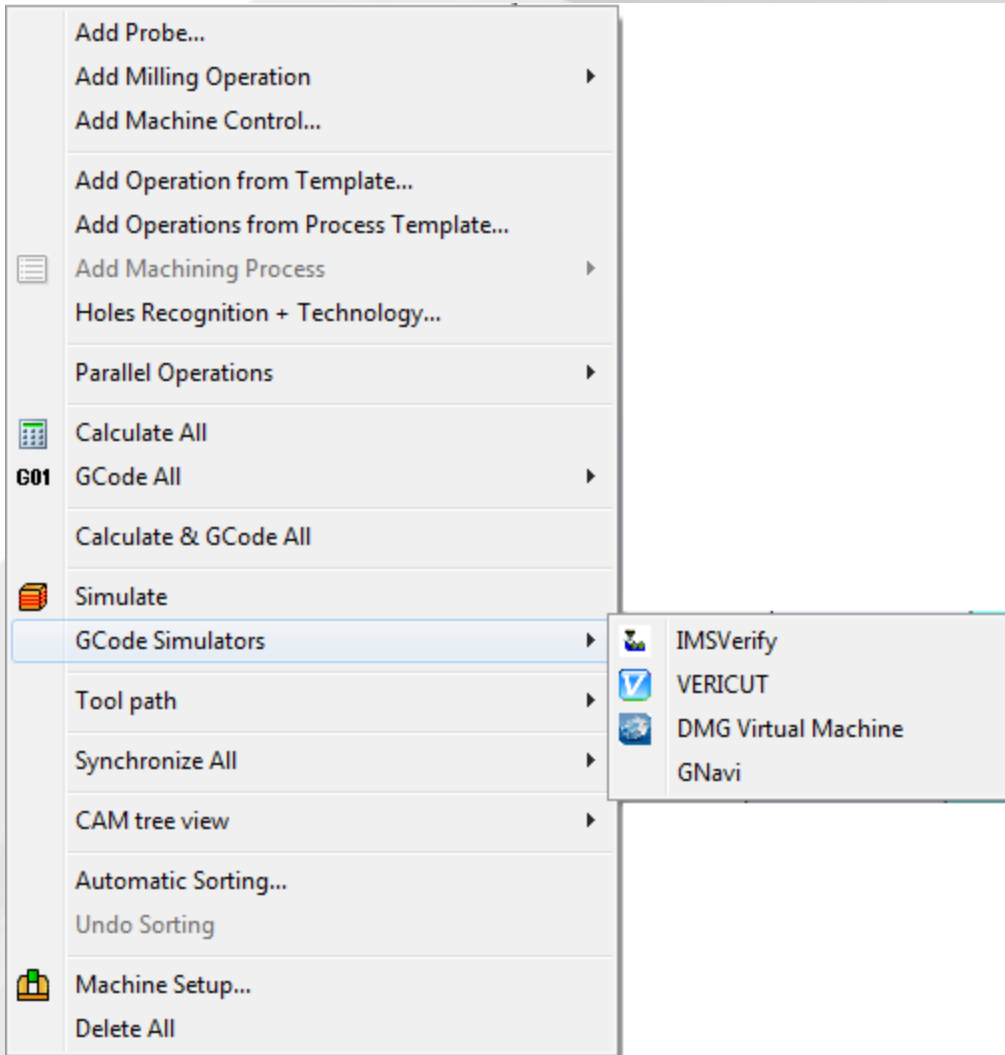


New CoordSys

**Existing CoordSys
(highlighted by gray color)**

- **Partly highlighted Existing Coordinate System**

Integration with G-code simulators

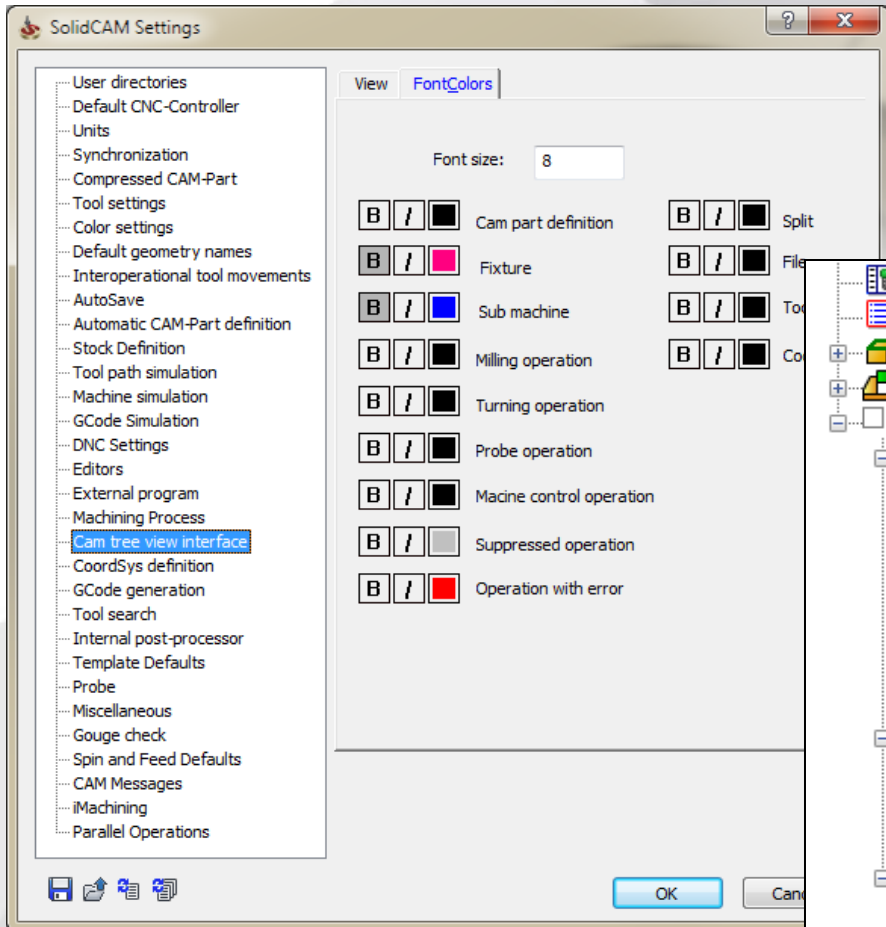


Possibility to use for Gcode simulation the following simulators:

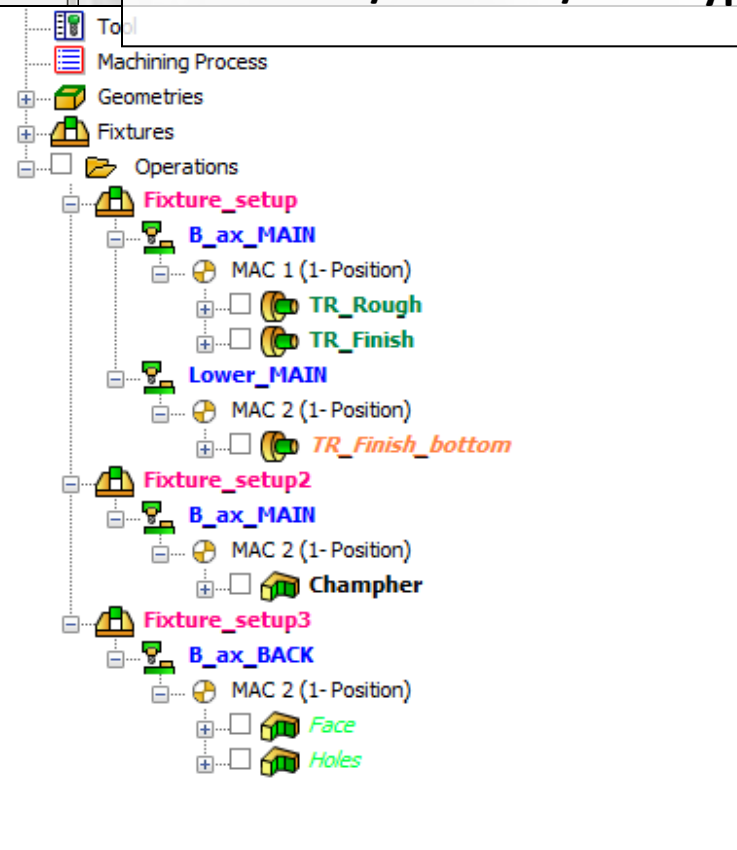
- **VERICUT**
- **IMSVerify**
- **DMG Virtual Machine**
- **G-Navi**

Send all needed data by one mouse click

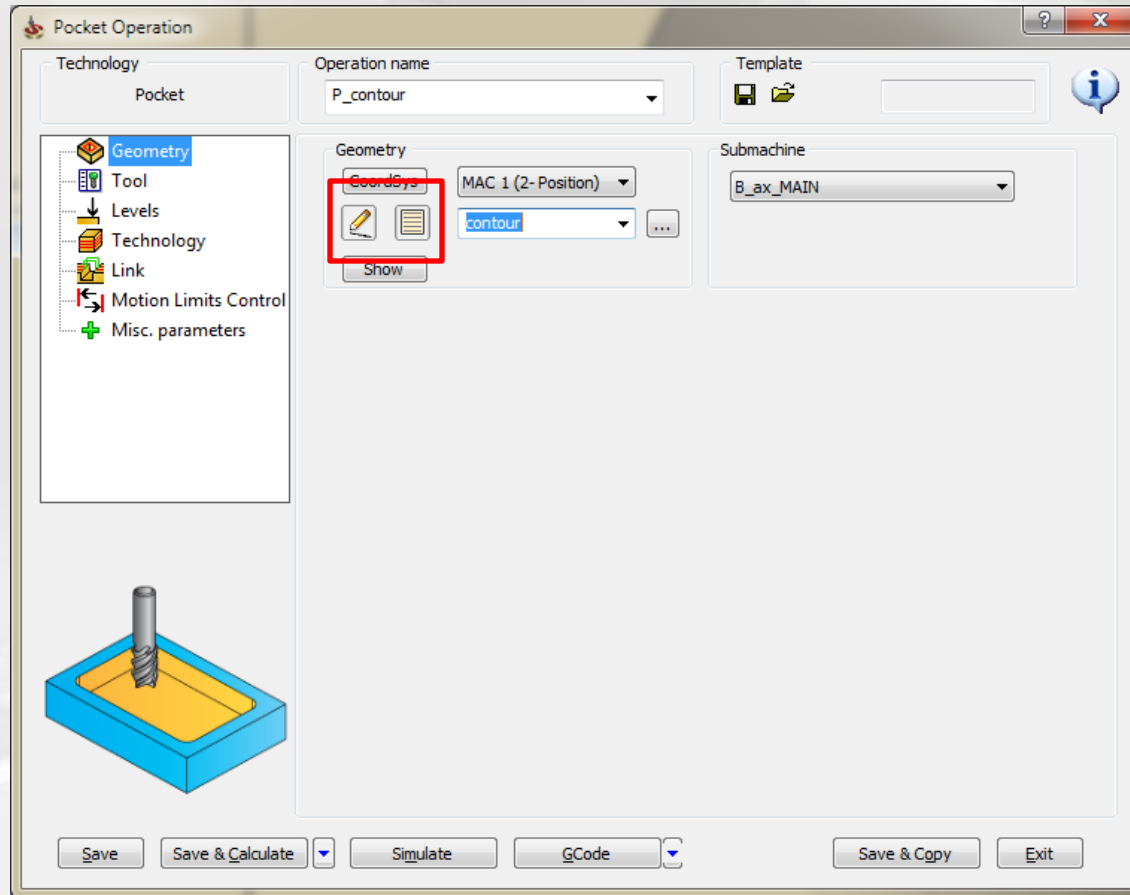
Color the CAM-tree



- Assign color for each operation group
- Color the operation by tool color
- Change font size
- Normal/Cursive/Bold types of fonts

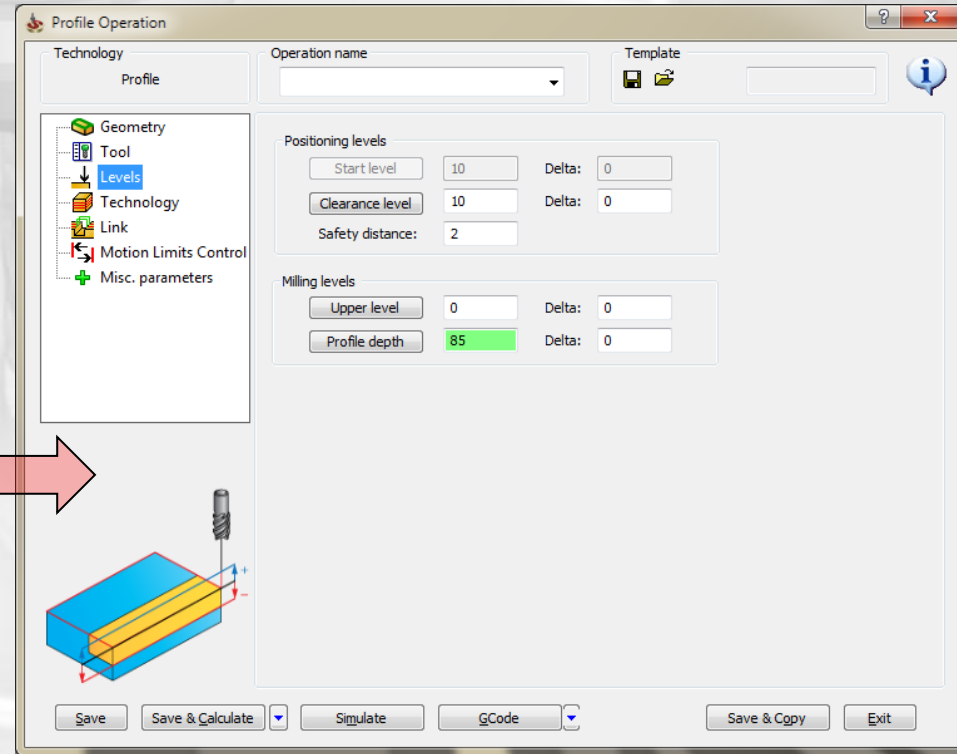
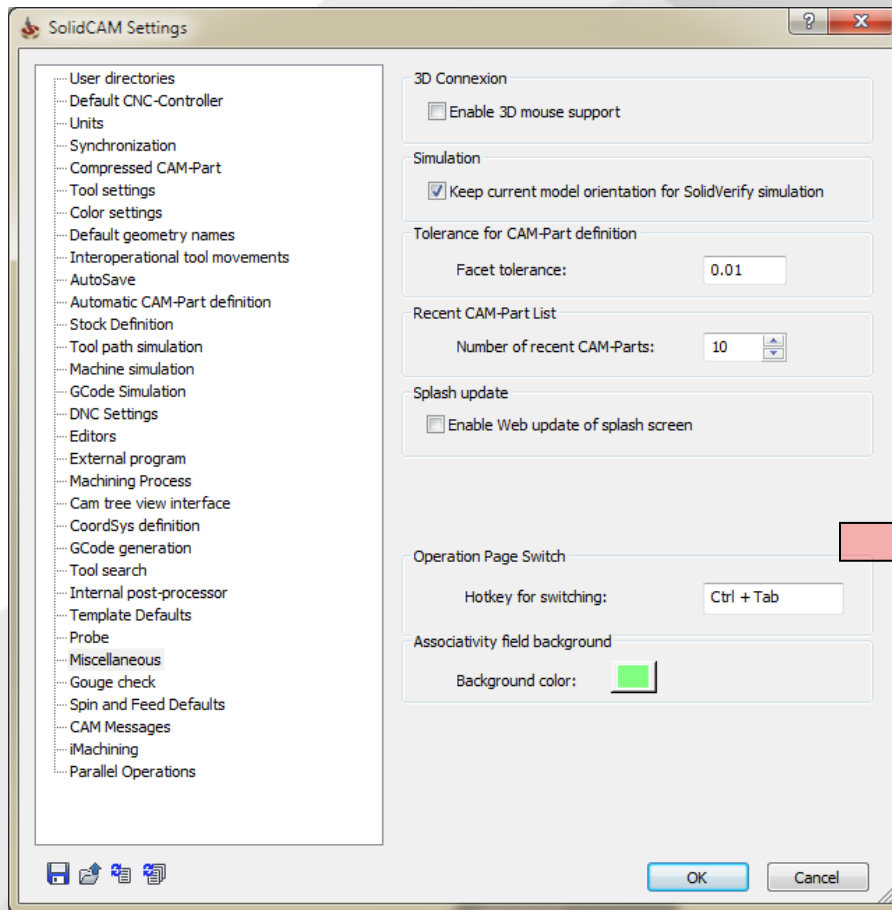


General: New and Edit geometry



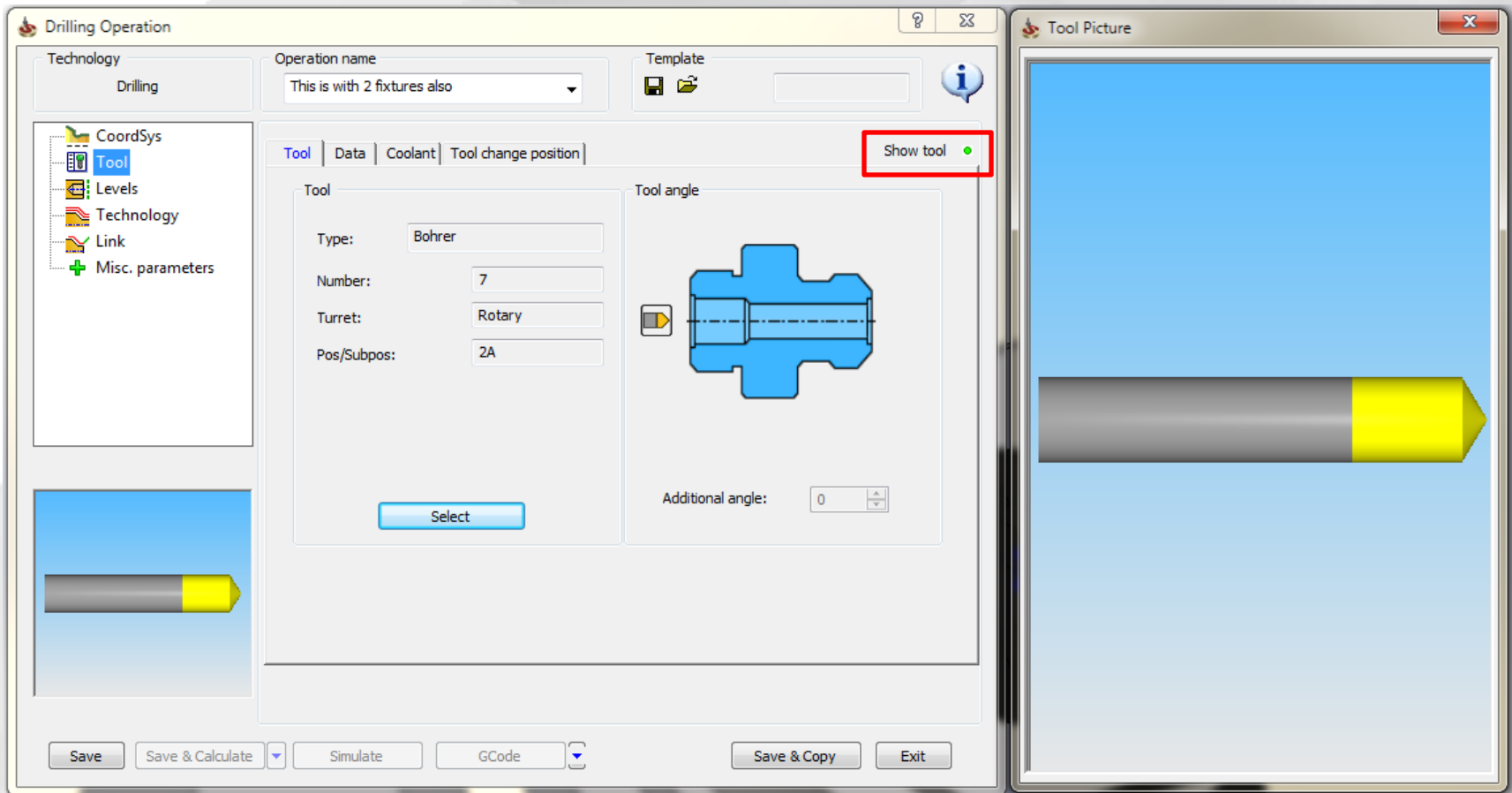
- No need to delete previous geometry from interface to define new one

General: Associative cell color



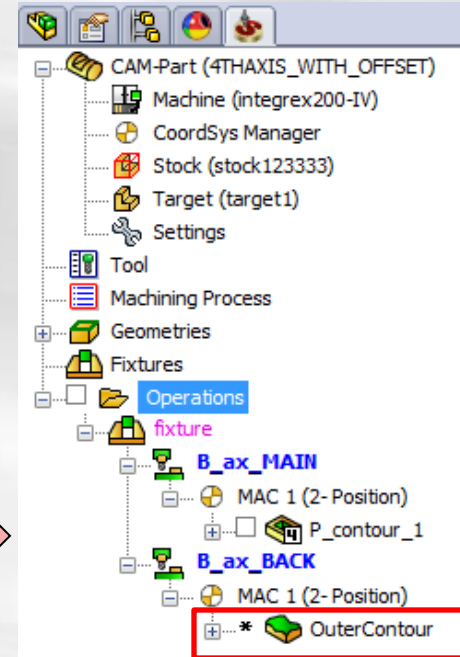
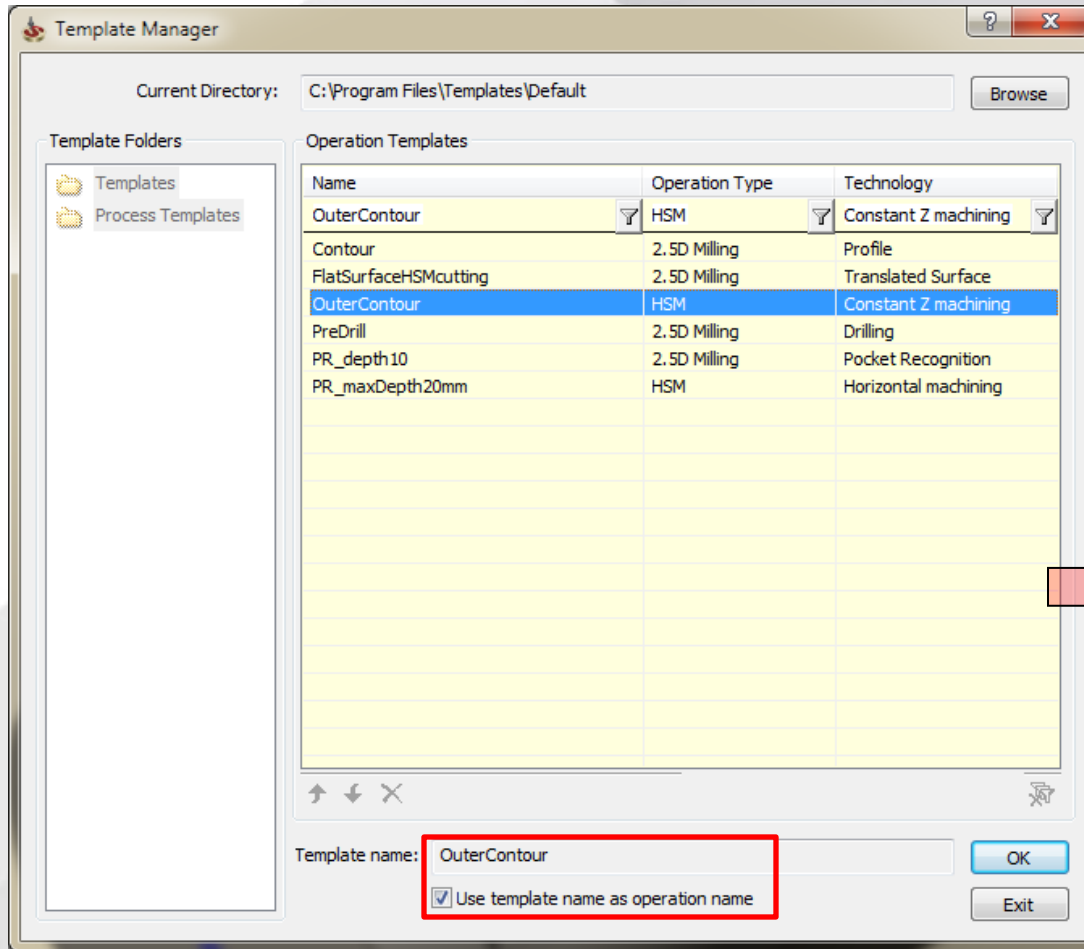
- Customize the color of Associative field in interface (red was confusing)

General: Show tool from all operations



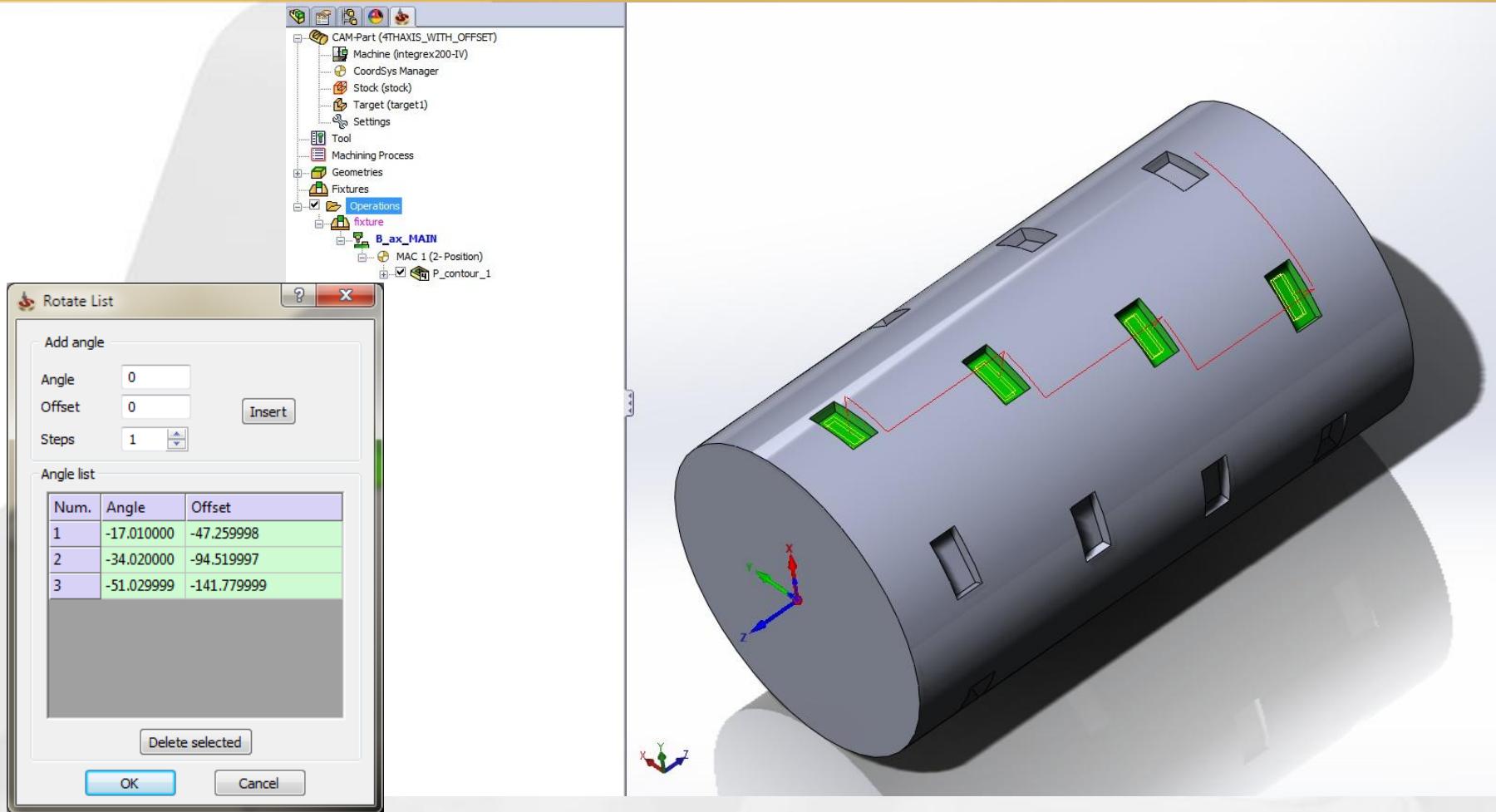
- Show 3D tool in separate window

Template: Keep template name



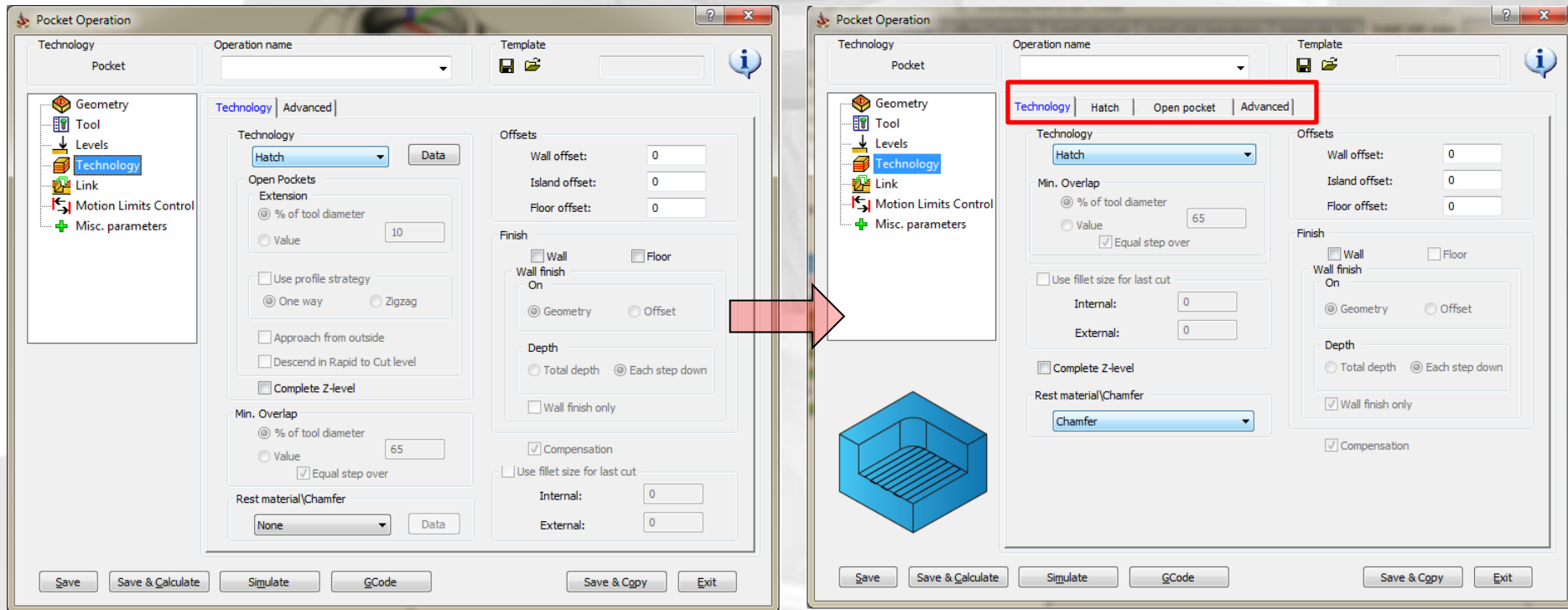
- Use template name as name of operation created from this template

Transform: 4x transform with offset



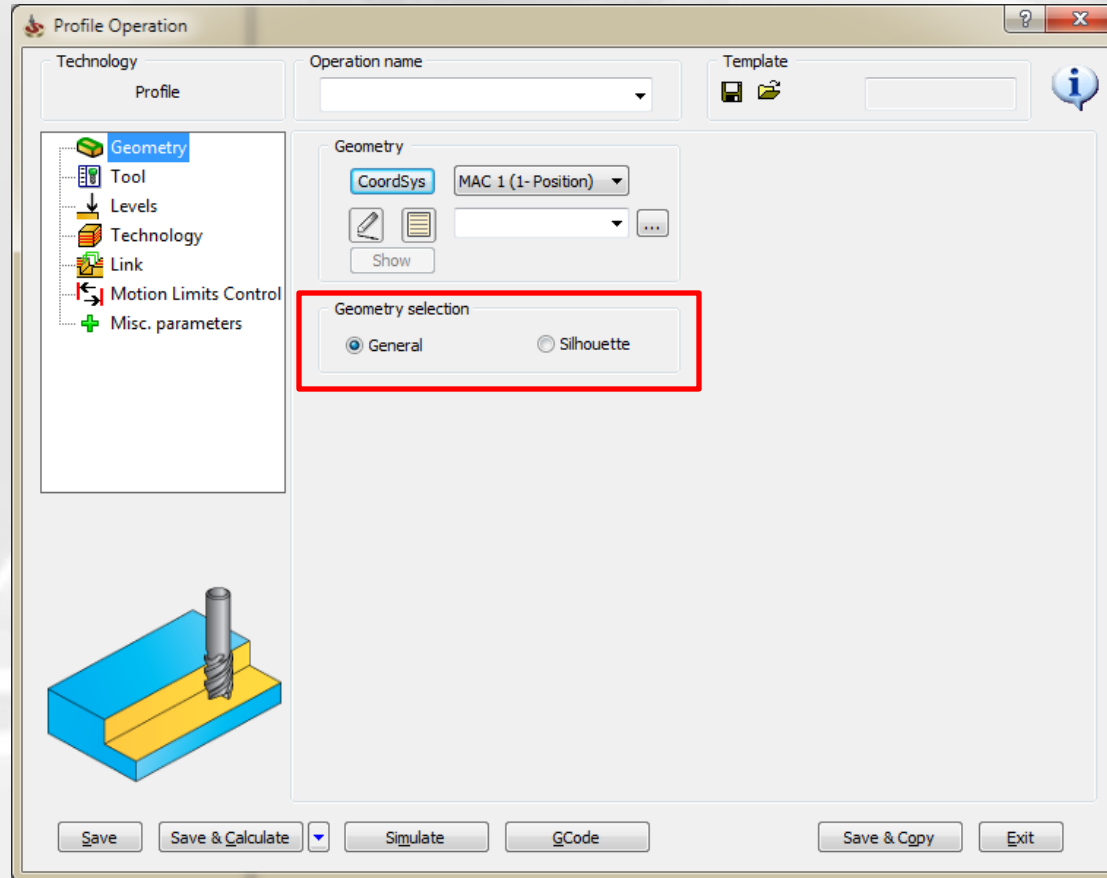
- Possibility to add offset along 4th axis during transformation

2.5D operations: technology on TABs



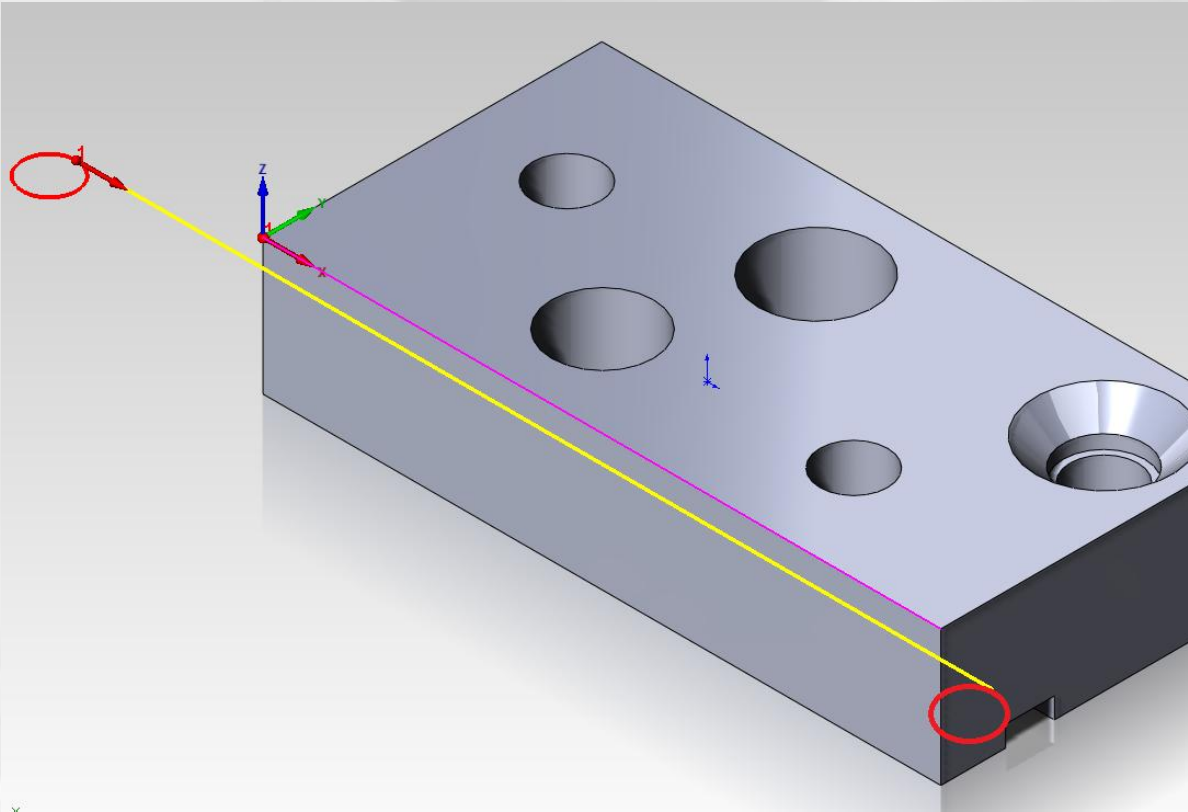
- Split technology page of 2.5D milling operations to TABs
- More structured parameters placing

Profile geometry: Silhouette



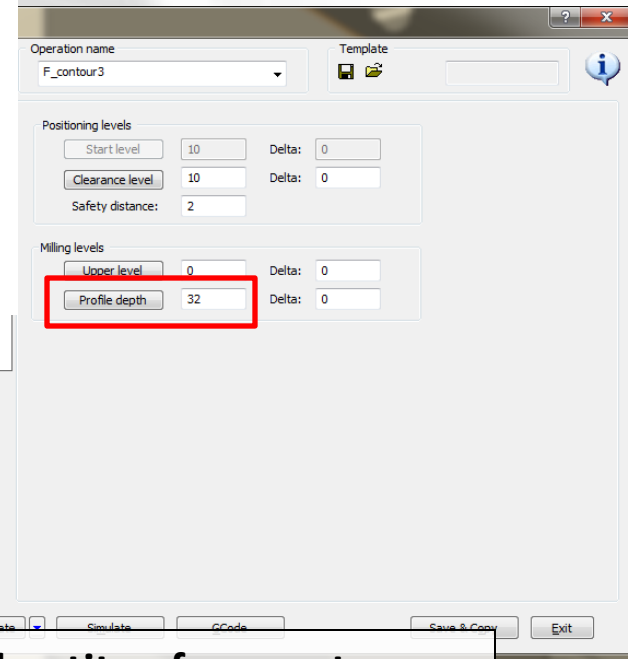
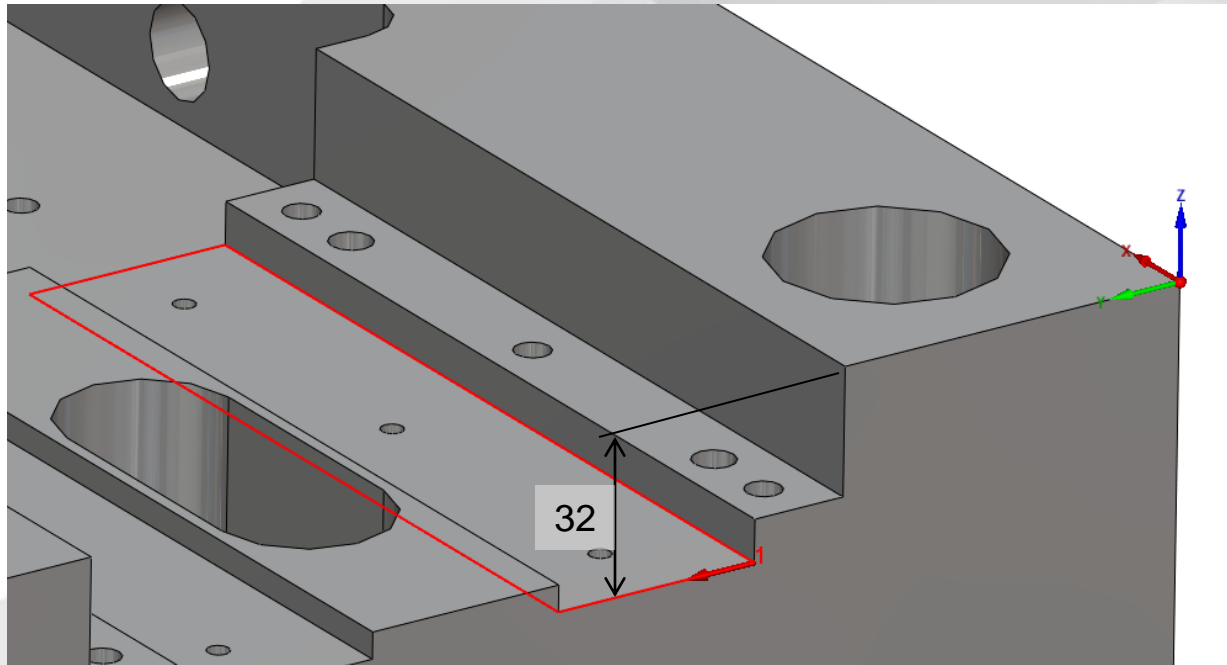
- **Automatic creation of silhouette around defined model**

Profile geometry: Show tool at the end also



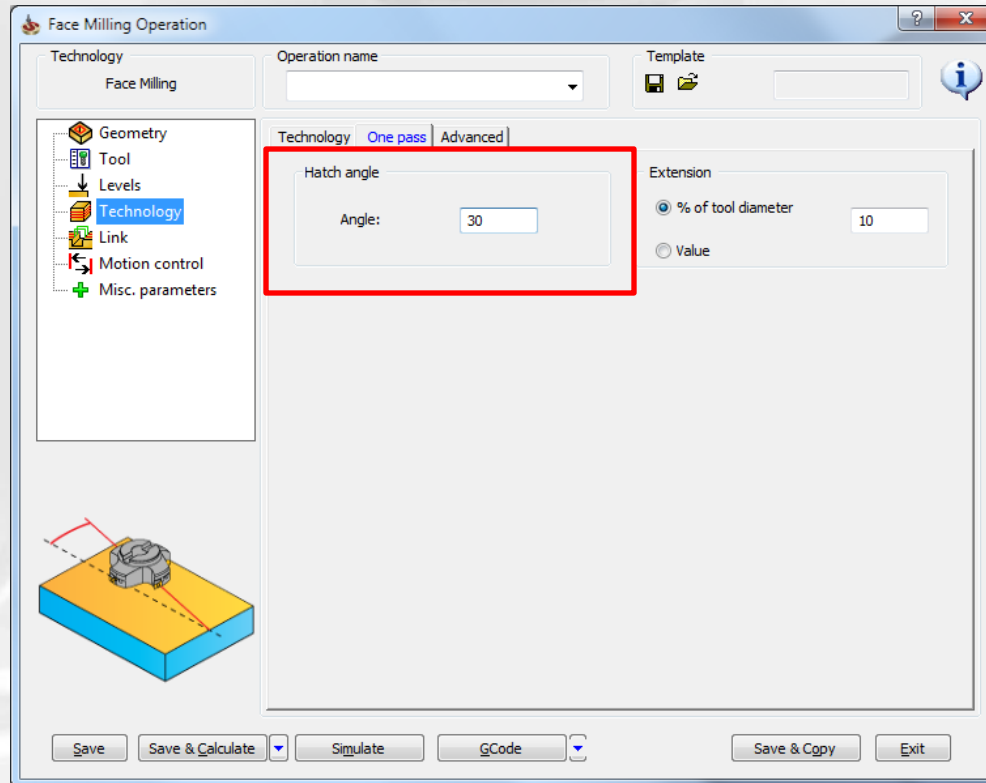
- Under Modify geometry we can see tool radius at the end and at the beginning of geometry
- Useful for complex geometries

Profile geometry: Take depth from 1st selected item of geometry



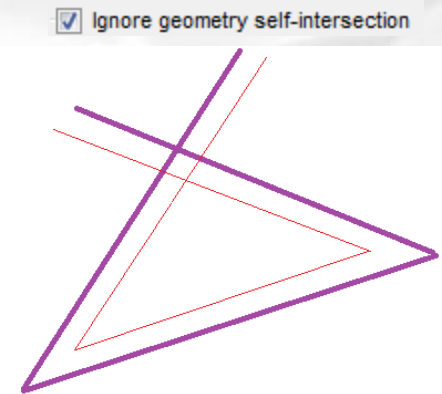
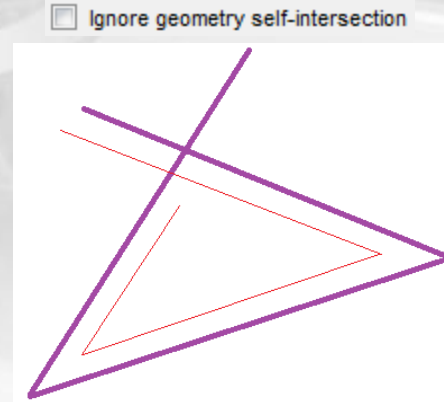
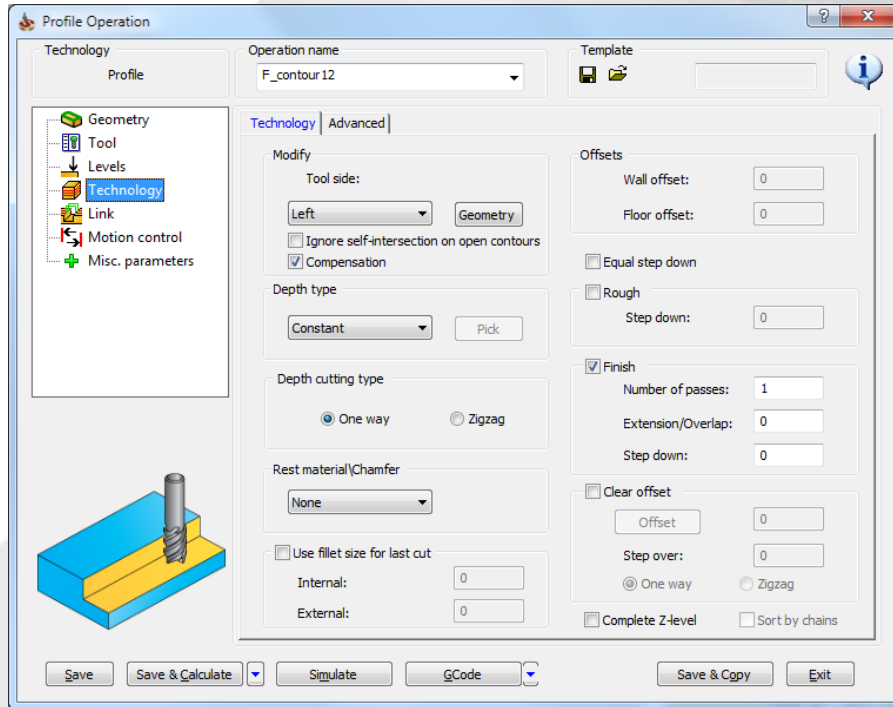
- If select new geometry – get depth from 1st selected entity of geometry

Face milling: Angle of cutting in “One pass”



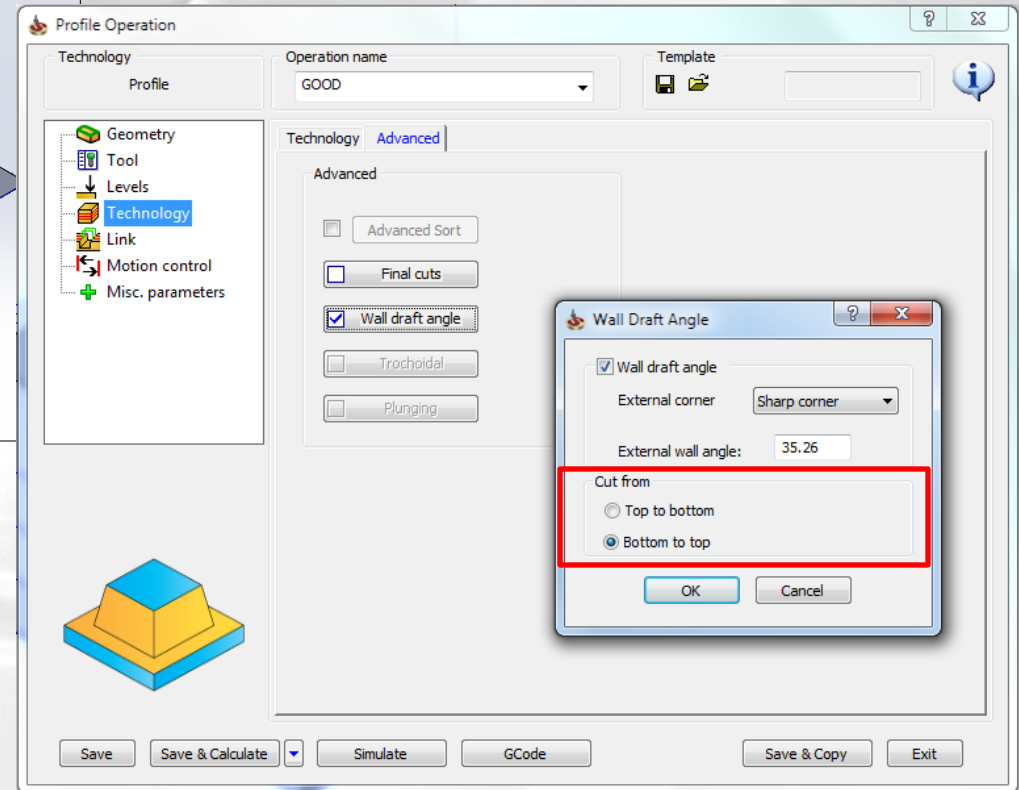
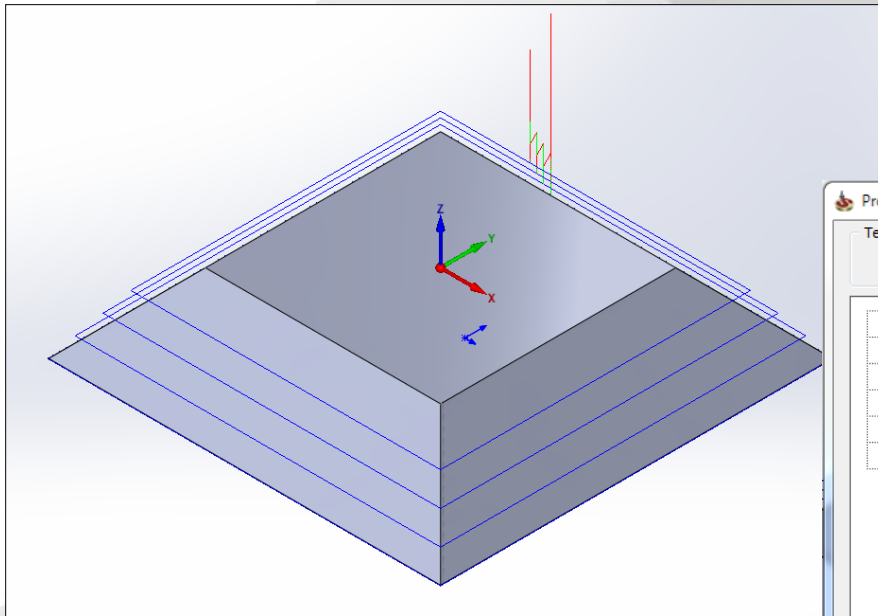
- **Angle is added to One pass in Face milling**

Profile: Ignore geometry self-intersection



- Possible to use open self-intersecting geometry with compensation without reducing toolpath

Draft wall angle: Bottom to top

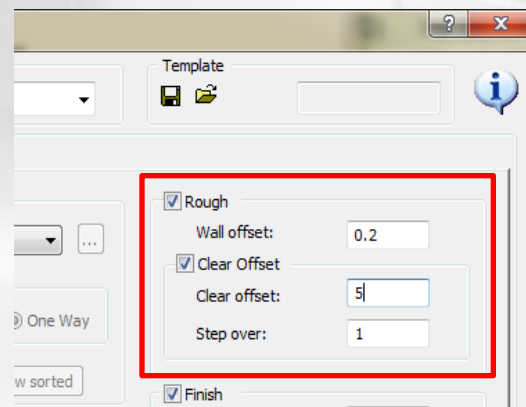
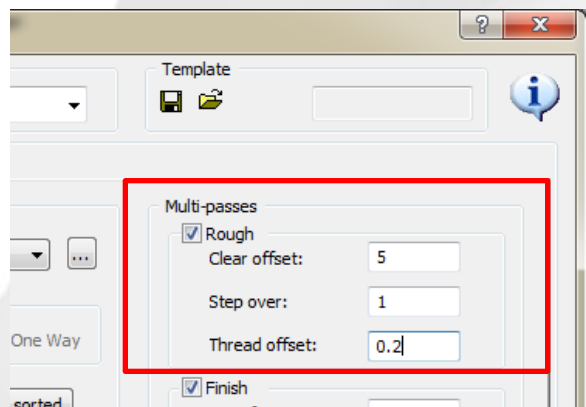


- **New option – bottom to top in Draft angle in Profile**

2.5D Threading: Roughing definition improvement

InventorCAM 2012

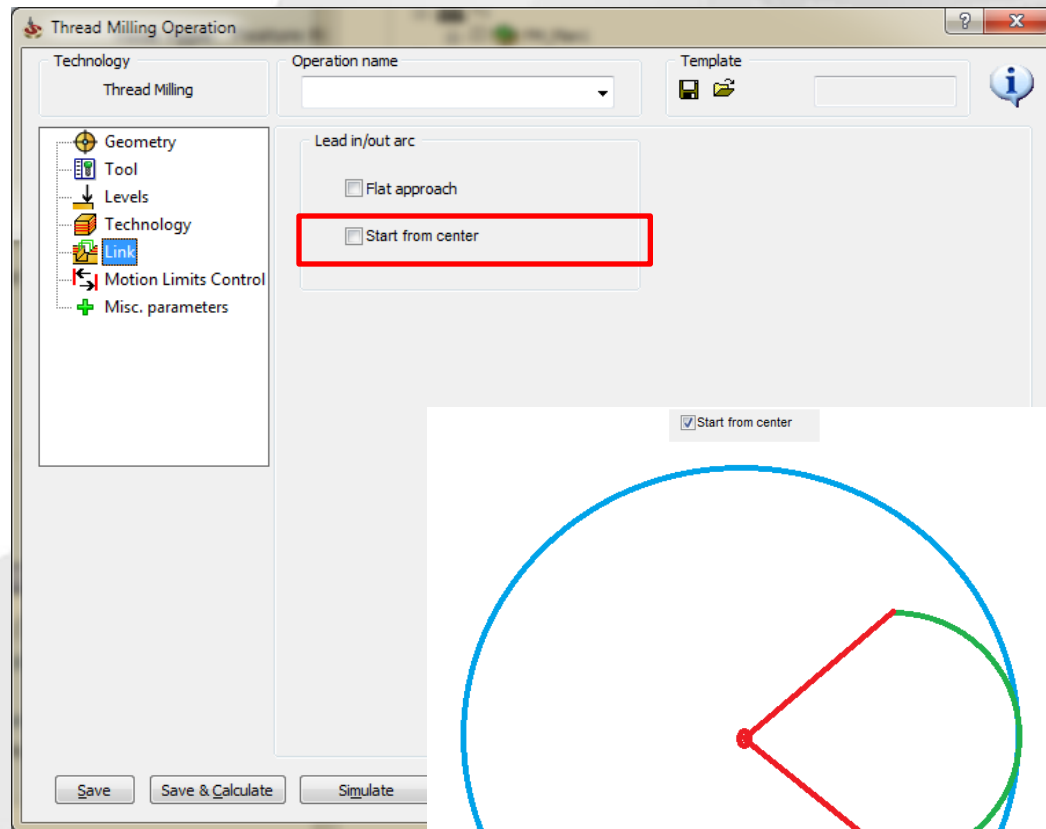
InventorCAM 2013



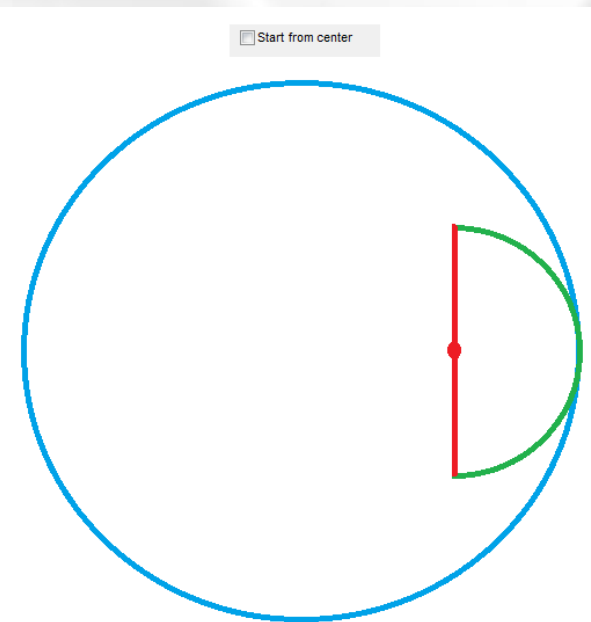
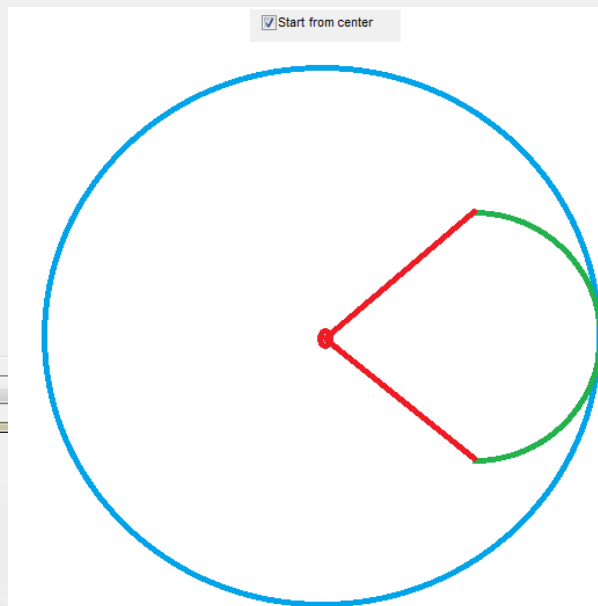
- Only multi-step Roughing is available

- Enable one step Roughing, in addition to multi-step Roughing (clear offset option)

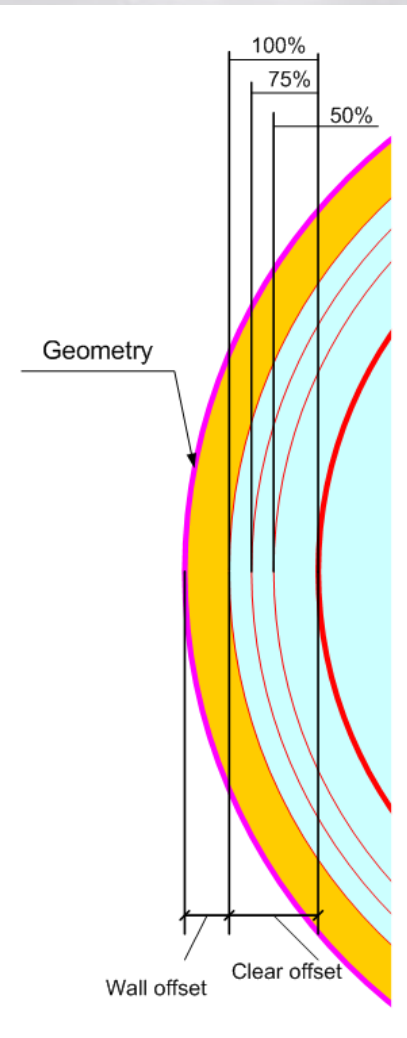
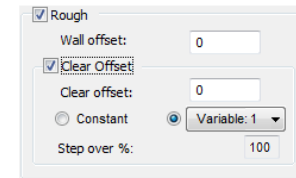
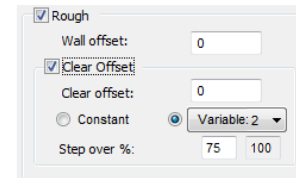
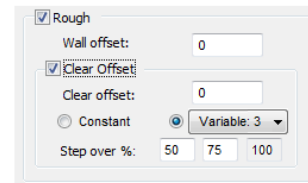
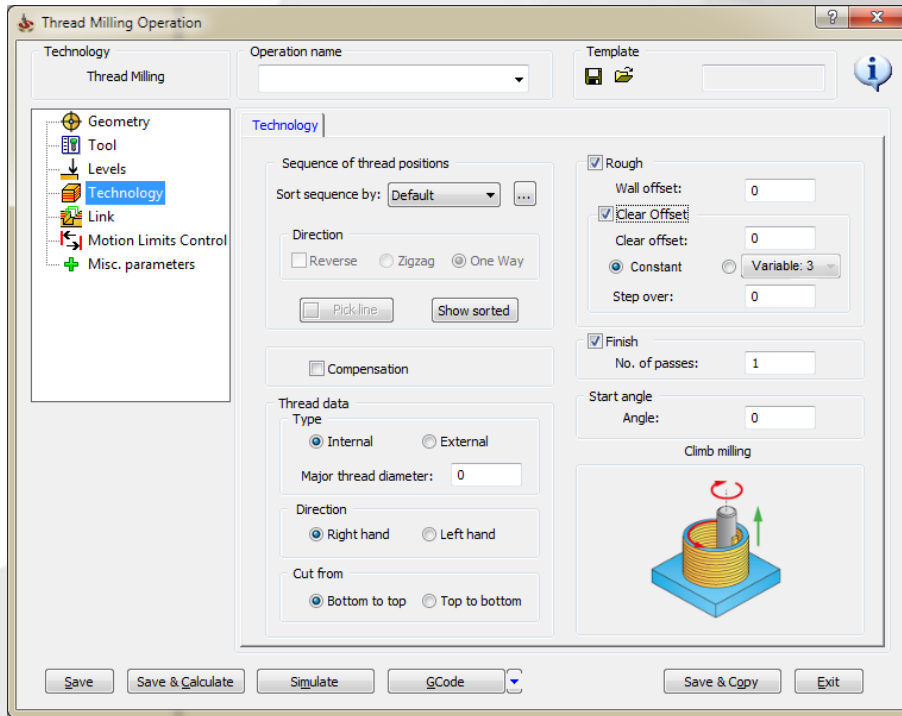
2.5D Threading: Minimize air cutting



- For large internal threadings – now there is an option not to start from the cylinder center

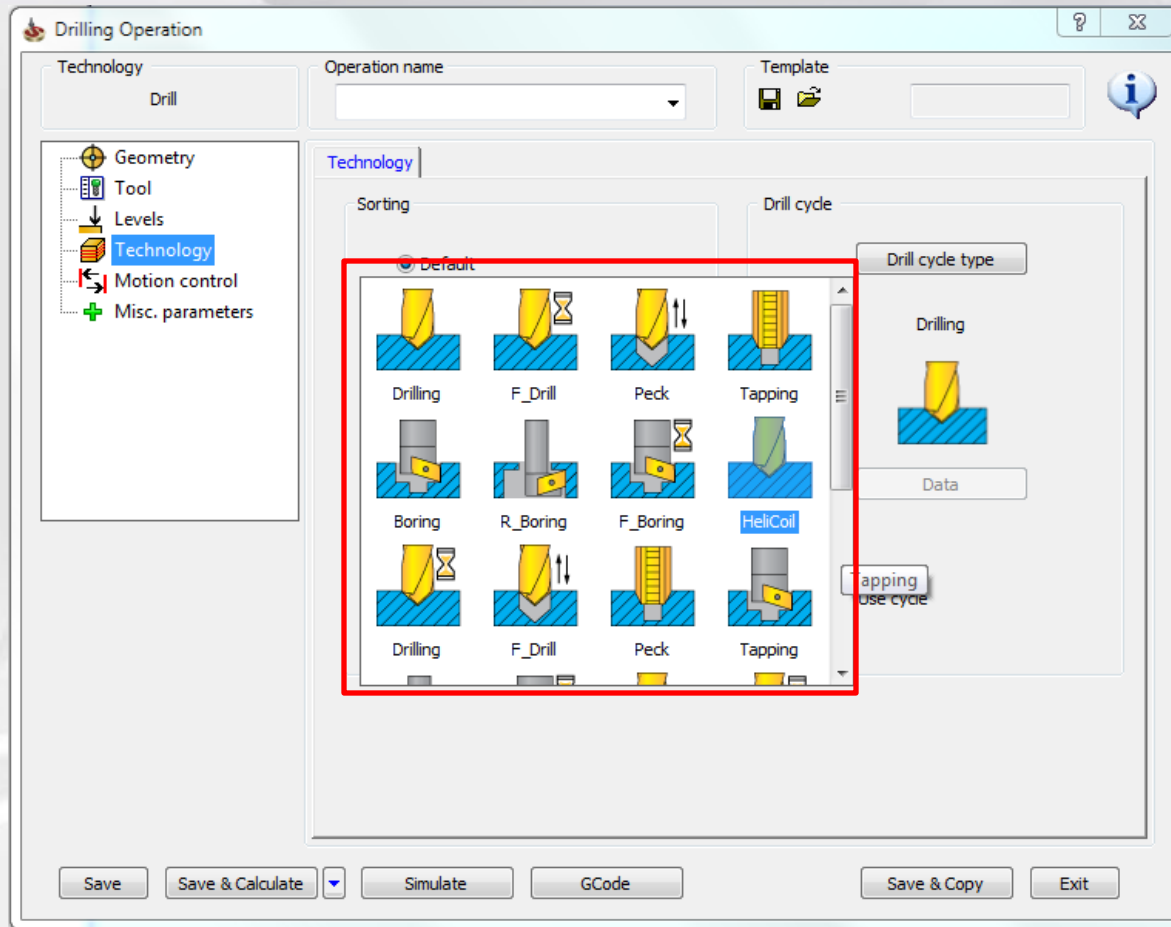


Threading: Variable step over (%)



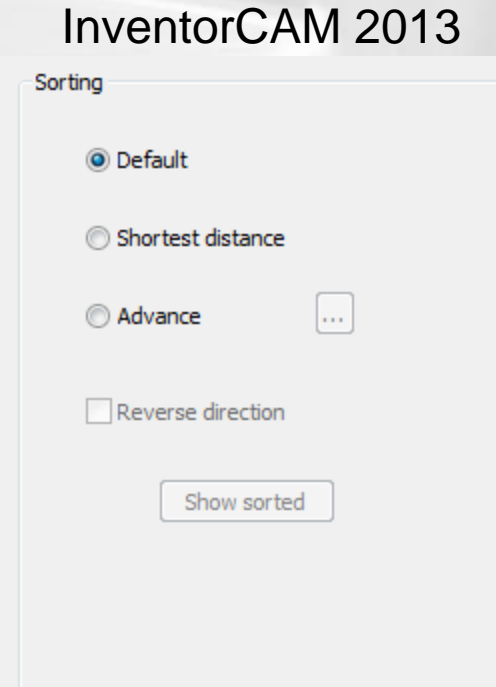
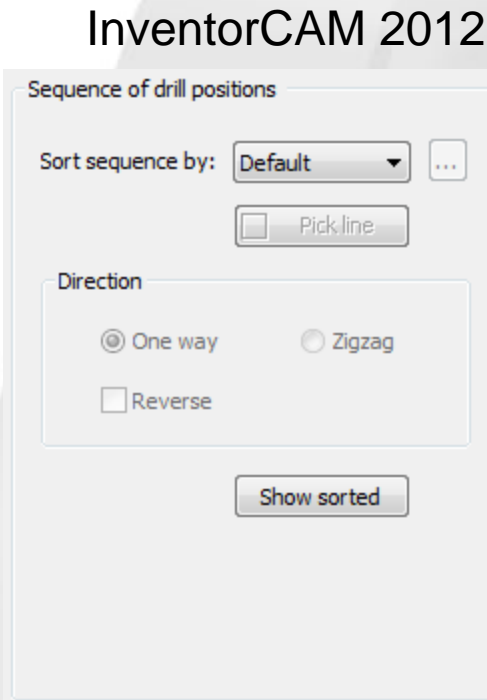
- Up to 3 different depth on different rough cutting steps

Drilling: up to 24 cycles available



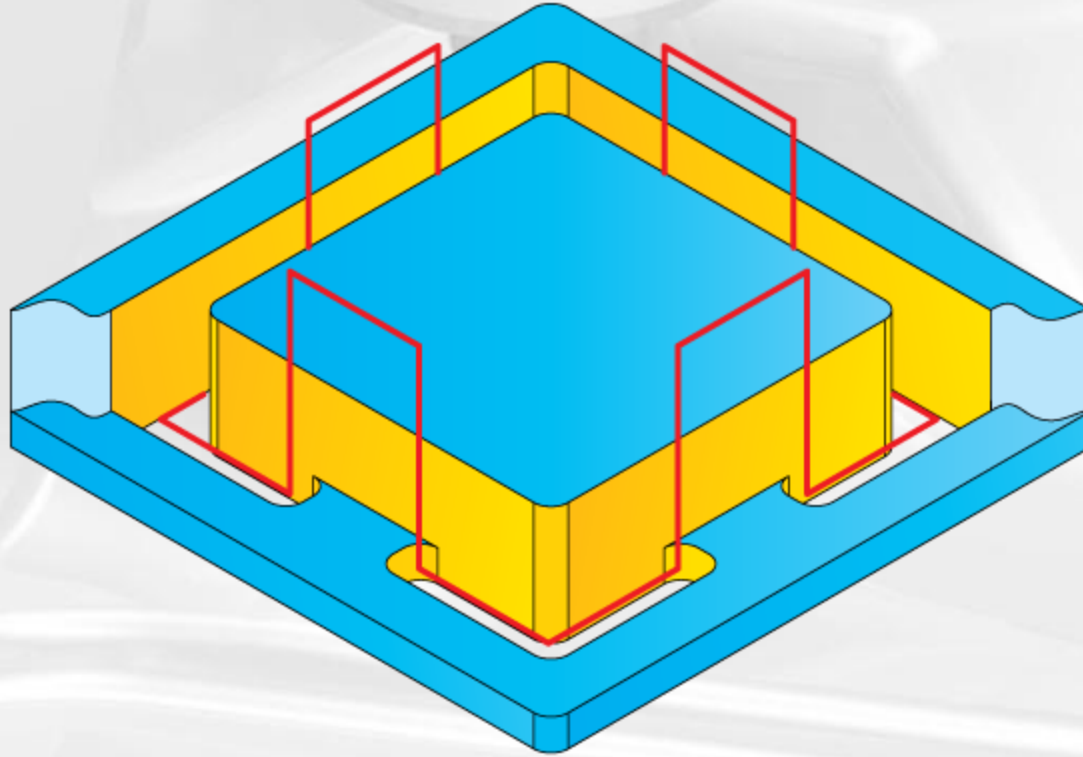
- Amount of Drill cycles was increased up to 24

Drilling: Sorting options interface improvement



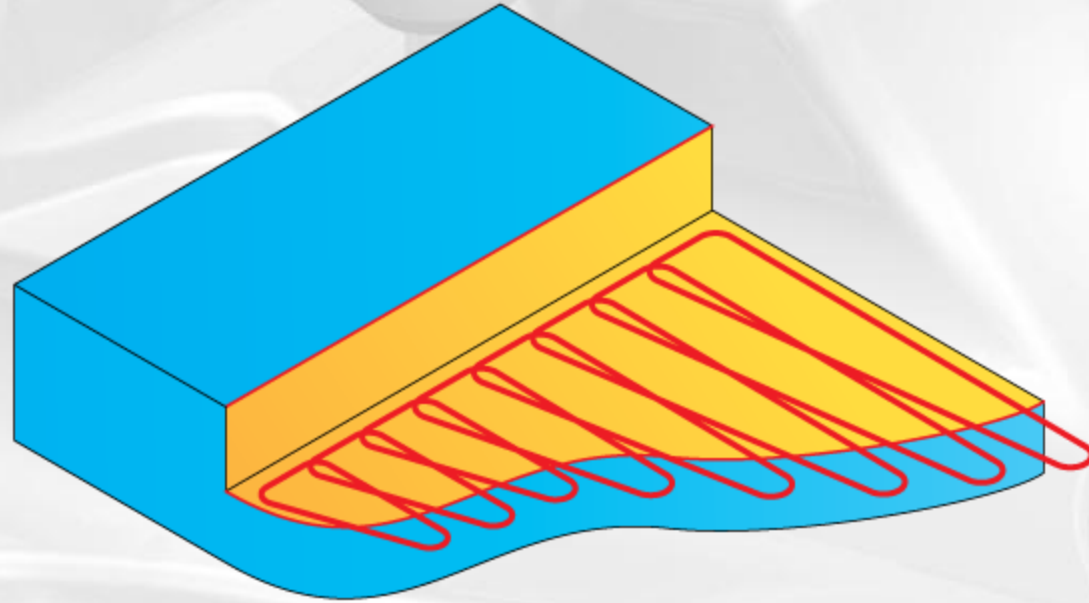
- Now all sorting options are on the screen
- Only useful options left (“Line” option is converted to Default, and deleted from options)
- Changes appear in 2.5D drill, Threading, 3D Drill, Multi-axes drill, Drill recognition

Toolbox: 4 nubs cycle



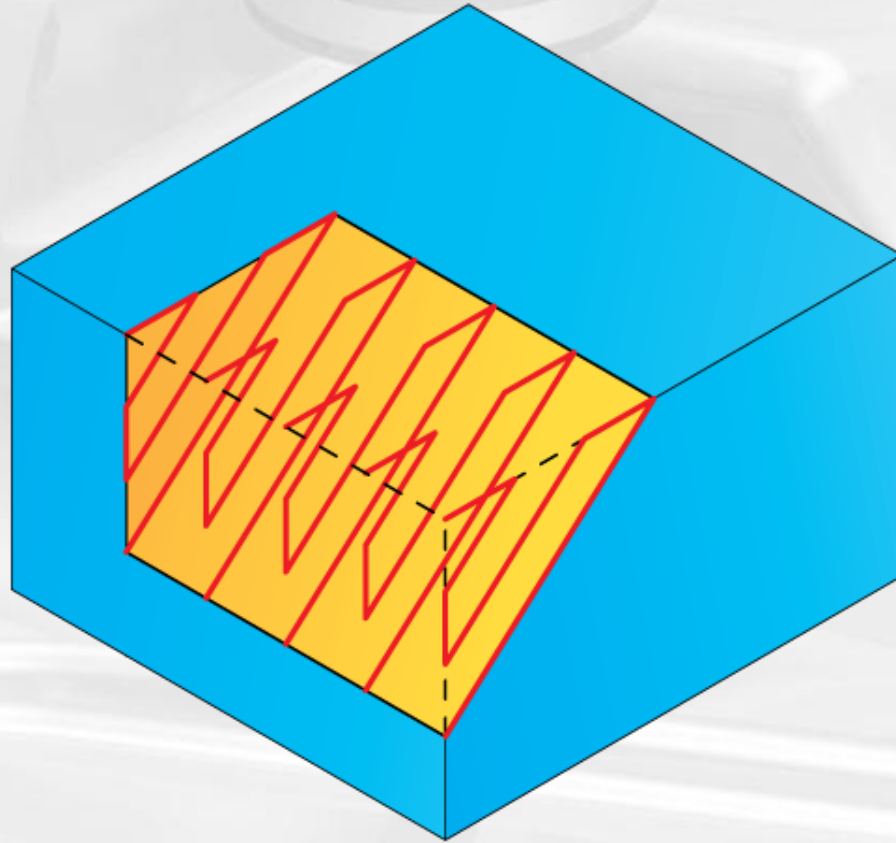
- In case of big through holes - If user wants to break out the material, instead of machining it with simple pocket.

Toolbox: 1 side open slot



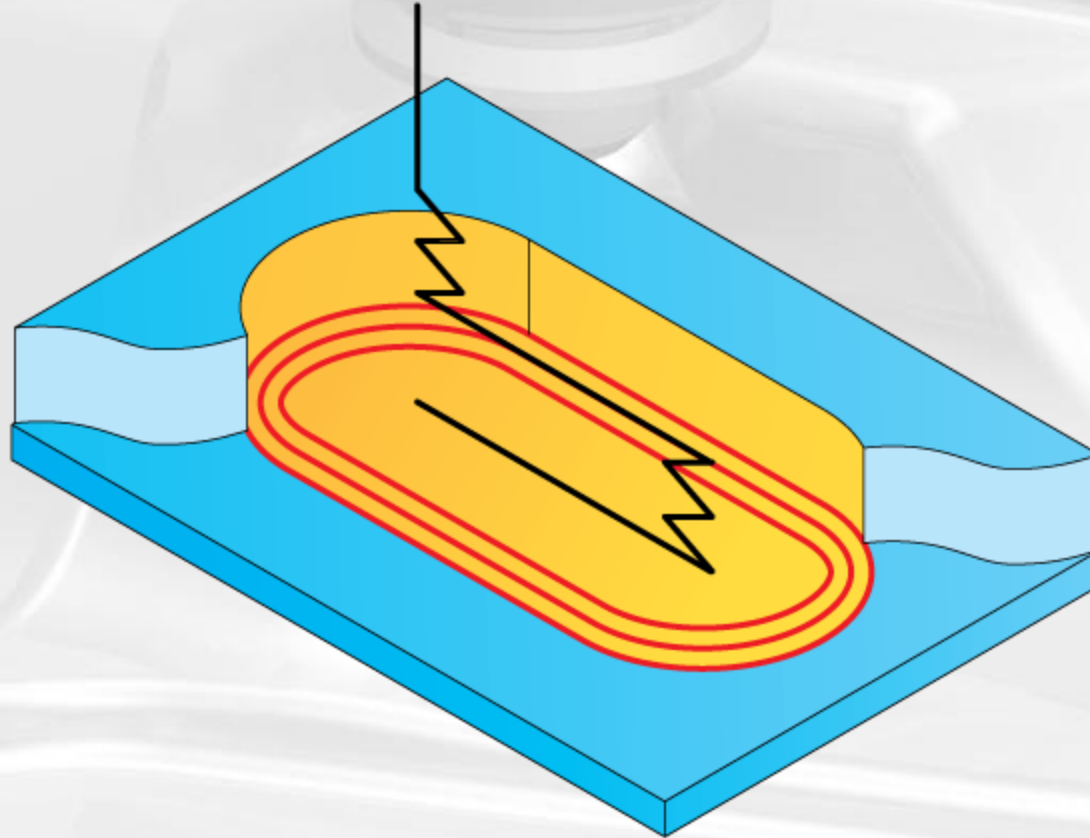
- For cutting one-side open slots with spiral cuts

Toolbox: Flatten surface on corner



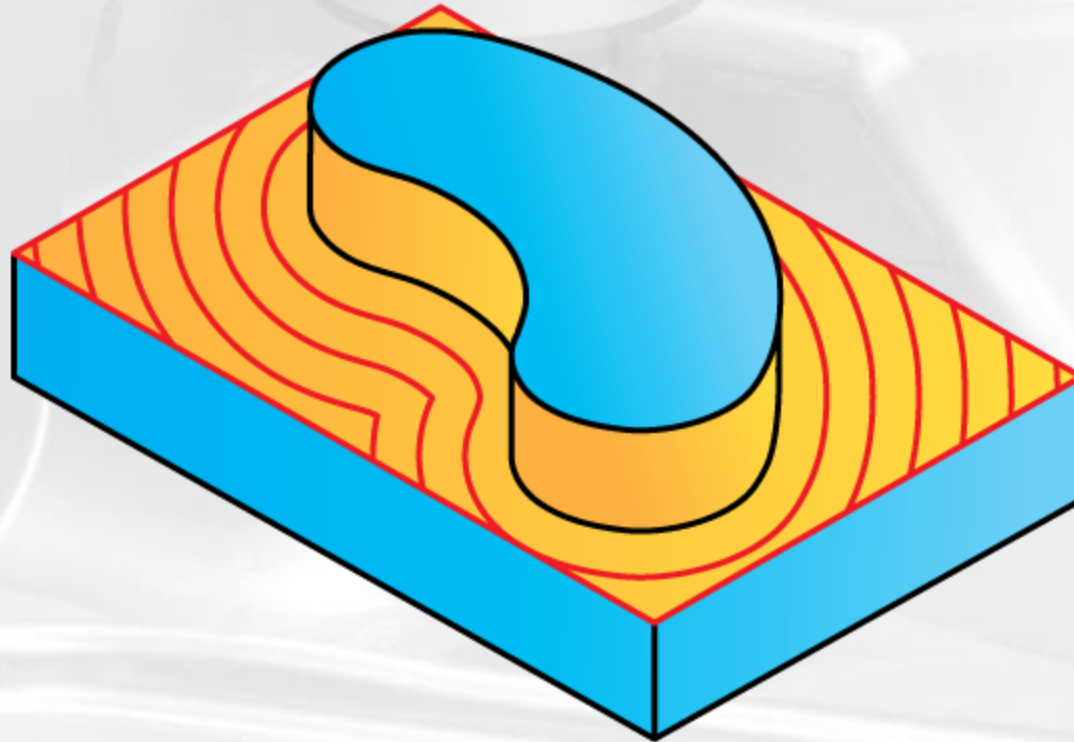
- For big chamfers and corner faces machining

Toolbox: Zig-zag slot operation



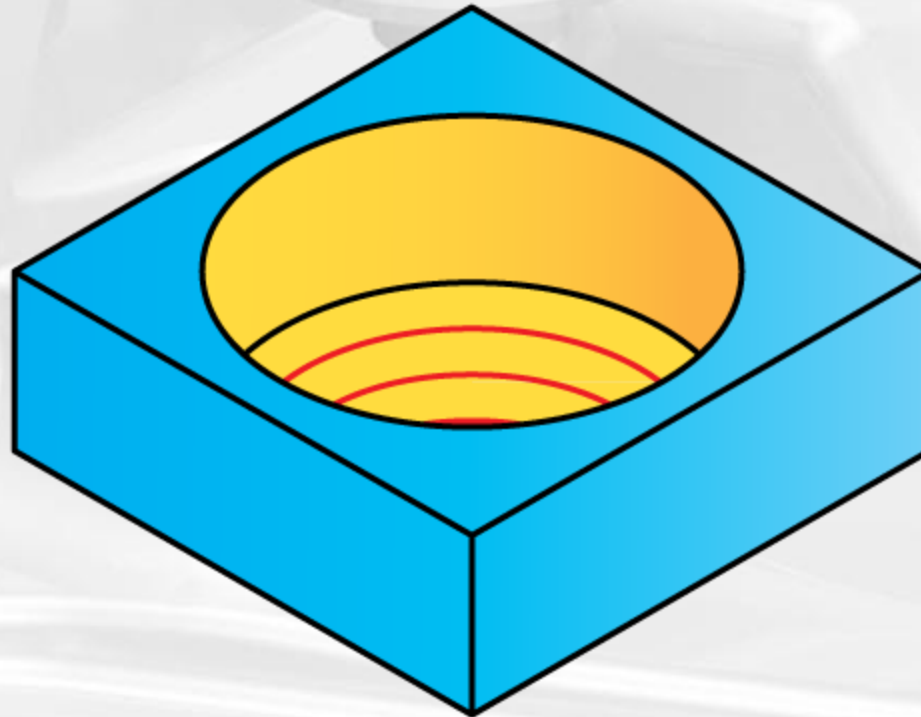
- Slot machining with zig-zag ramping

Toolbox: Simple boss



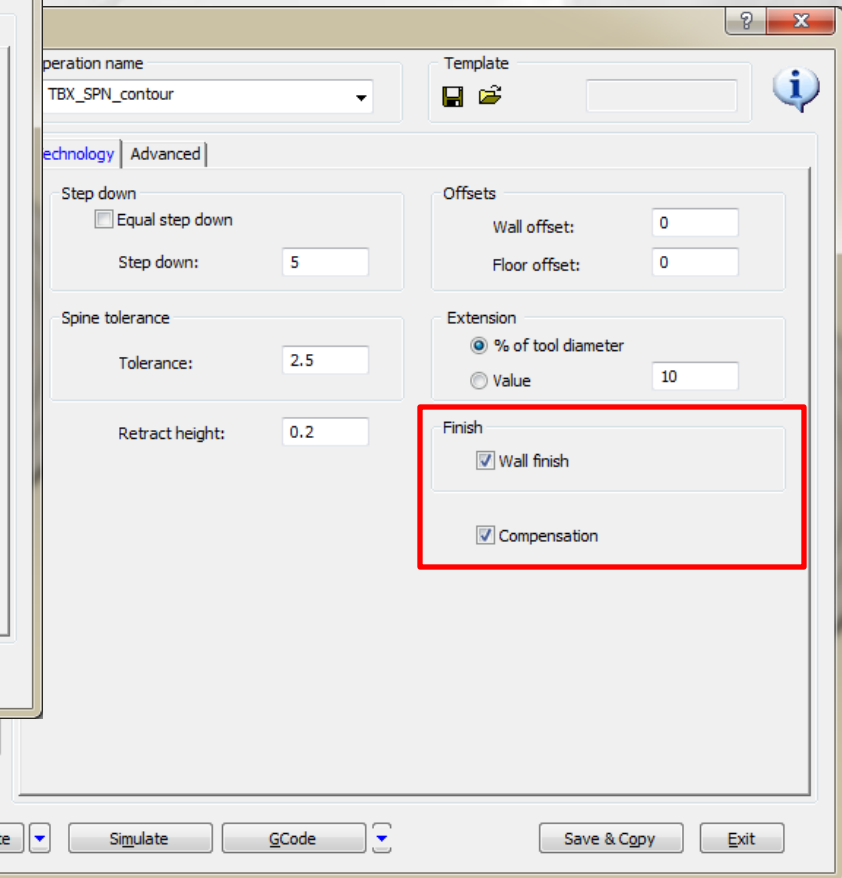
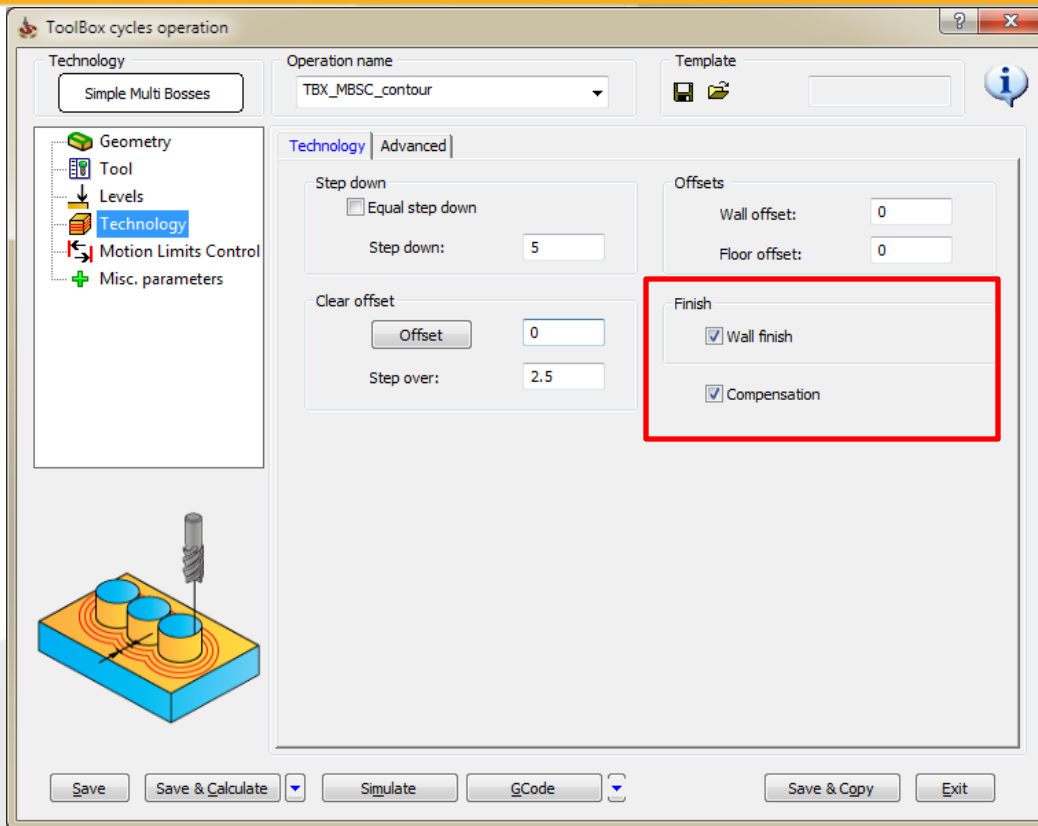
- Slot machining with zig-zag ramping

Toolbox: Spiral pocket



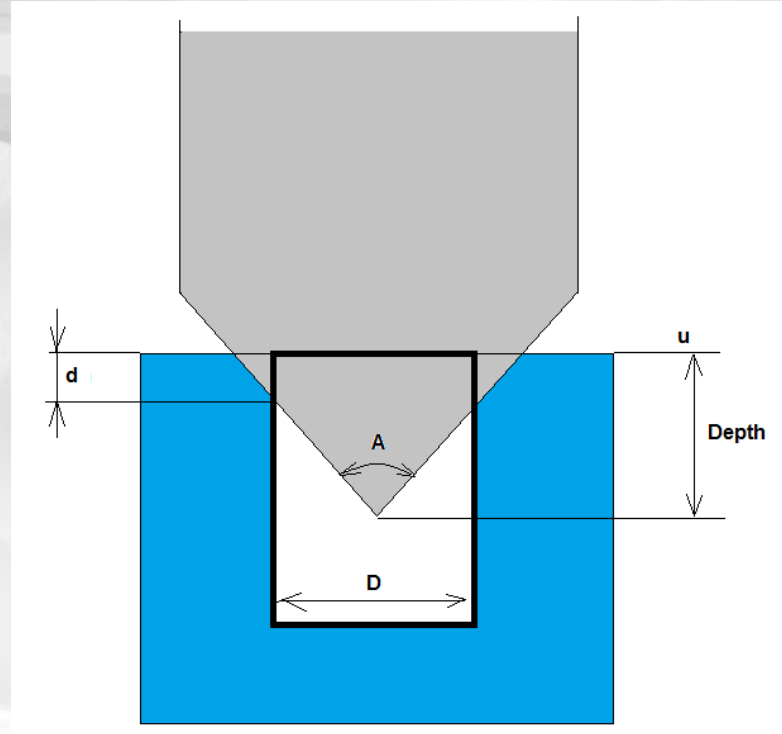
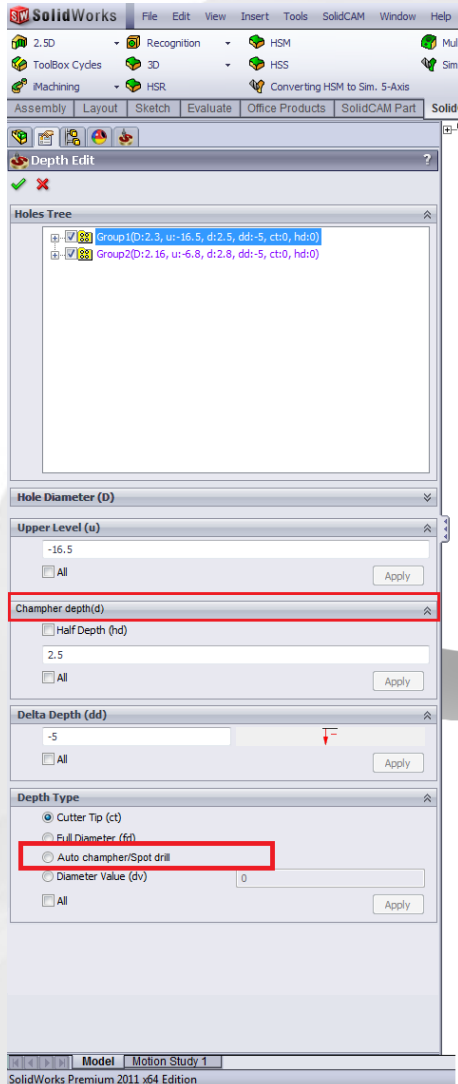
- Slot machining with zig-zag ramping

Toolbox: Compensation and Finish



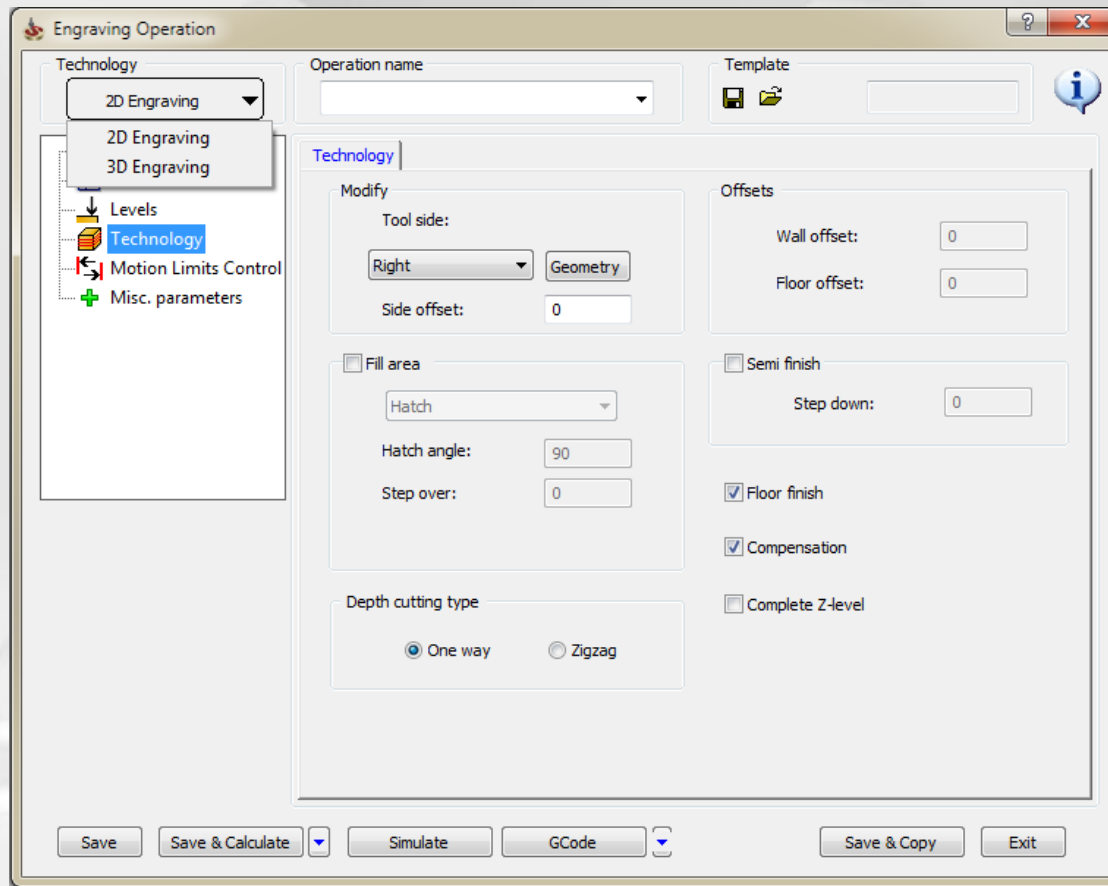
- Now Compensation and Finish options are almost in all Toolbox operations

Drill Recognition: Chamfer/Spot



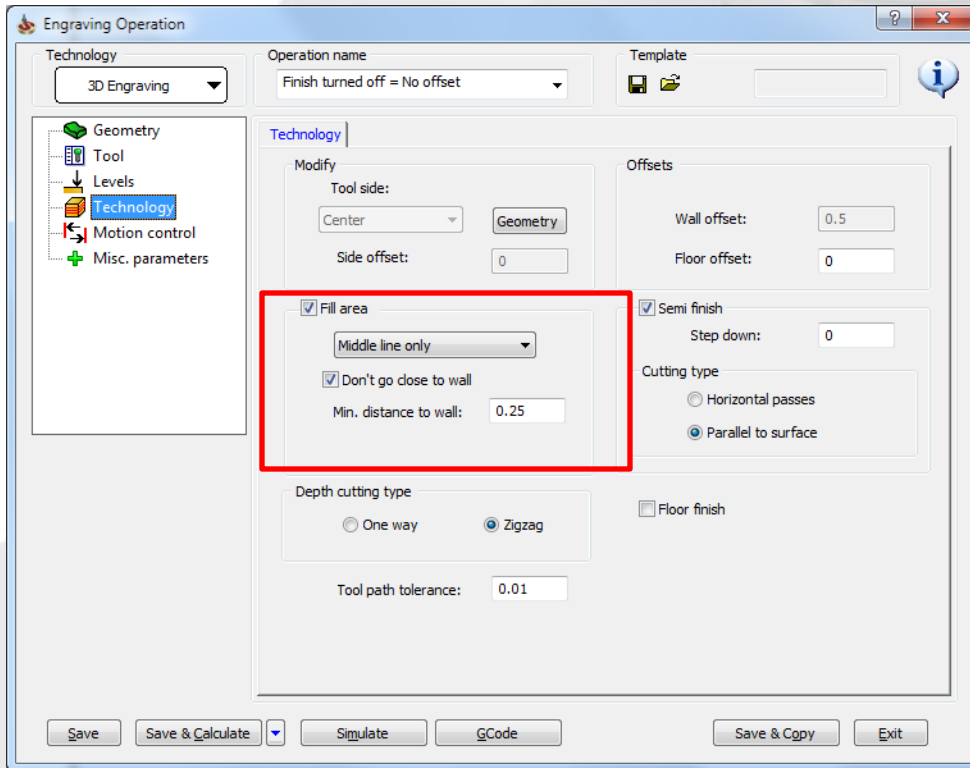
- Define chamfer/Spot drill depth = Drilling depth will be calculated automatically

2D/3D Engraving operation



- Separation to 2D and 3D Engraving
- Improvement in interface – easier to understand the, meaning on parameters

2D/3D Engraving: Middle line toopath



Geometry

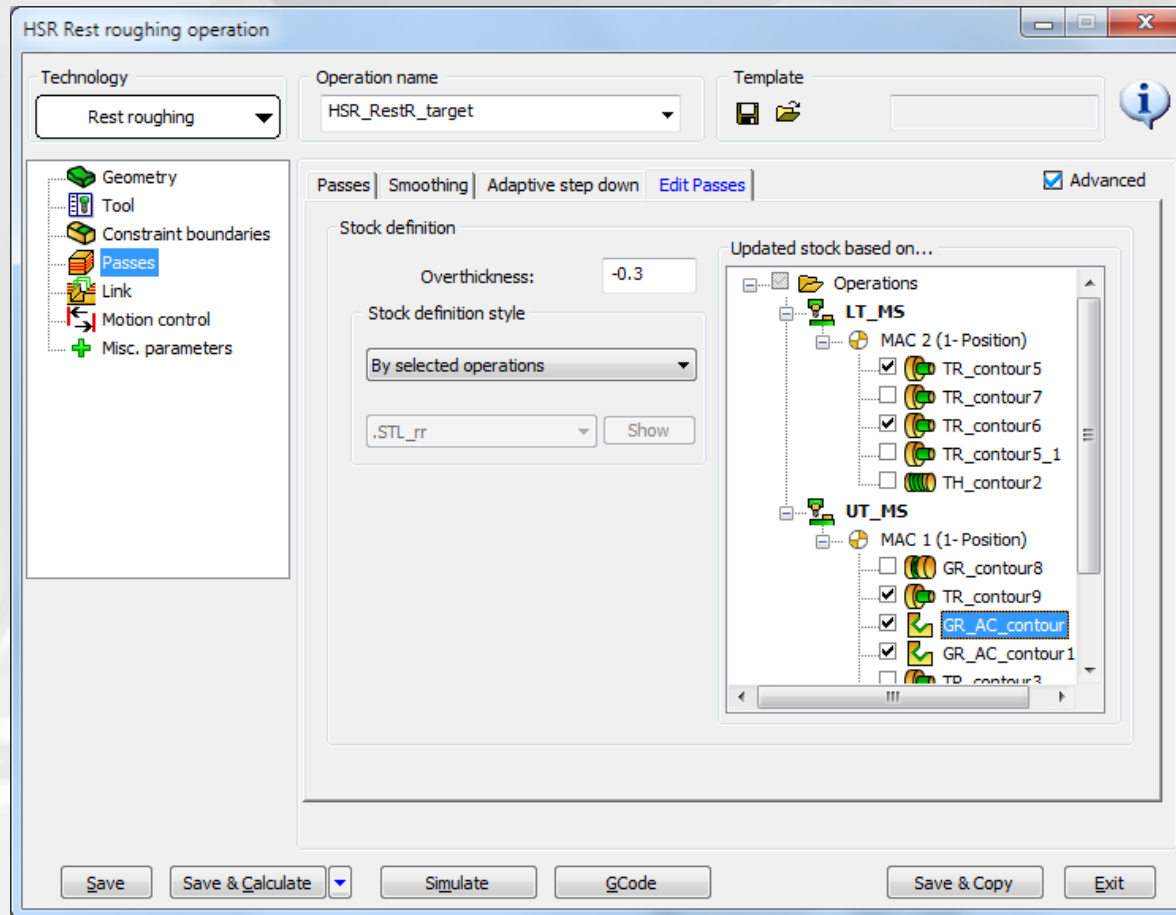
CAM-part

Machining



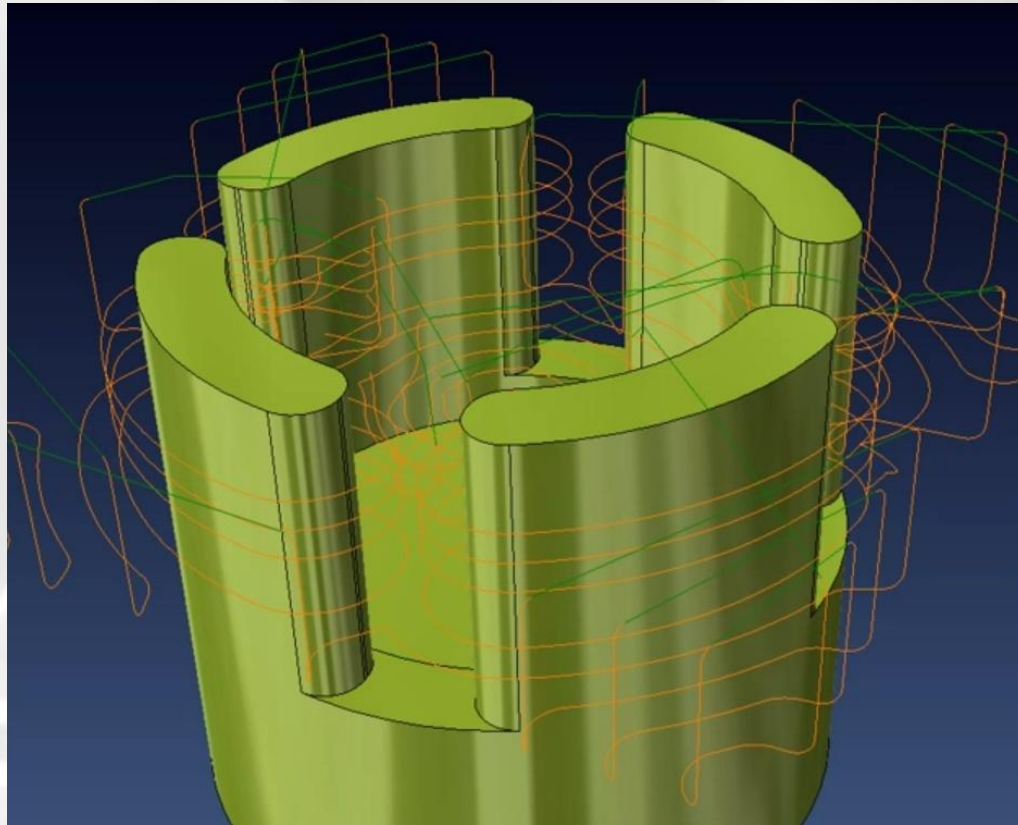
- Engraving only center line of multi-line text geometry

HSR: Edit passes by selected operations



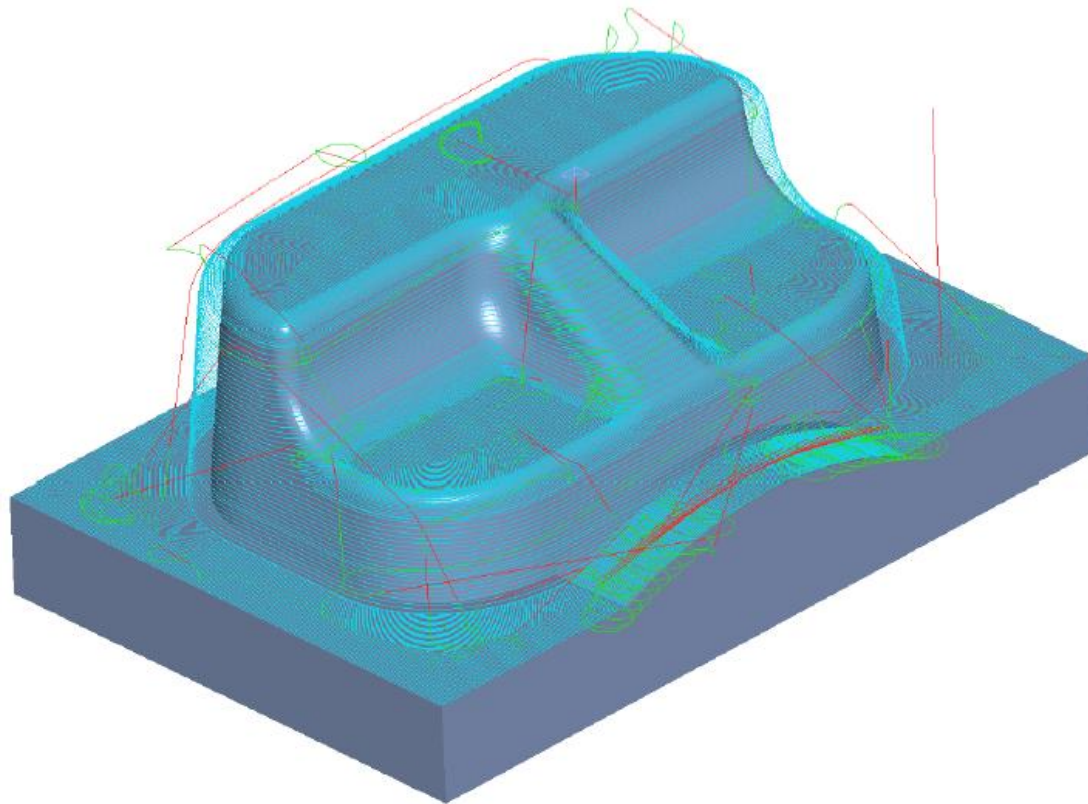
- 3 new options of Updated stock: Automatic, by *.FCT file, by Selected operations

HSR: New operation - Rib machining



- For very thin walls made from exotic materials
- Rough+ semi-finish are combined in one operation, level by level.

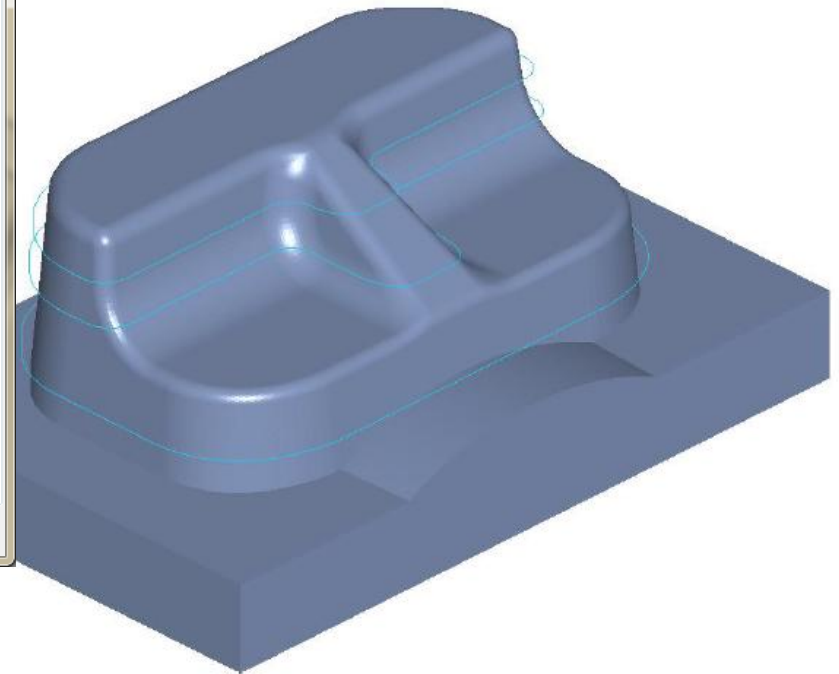
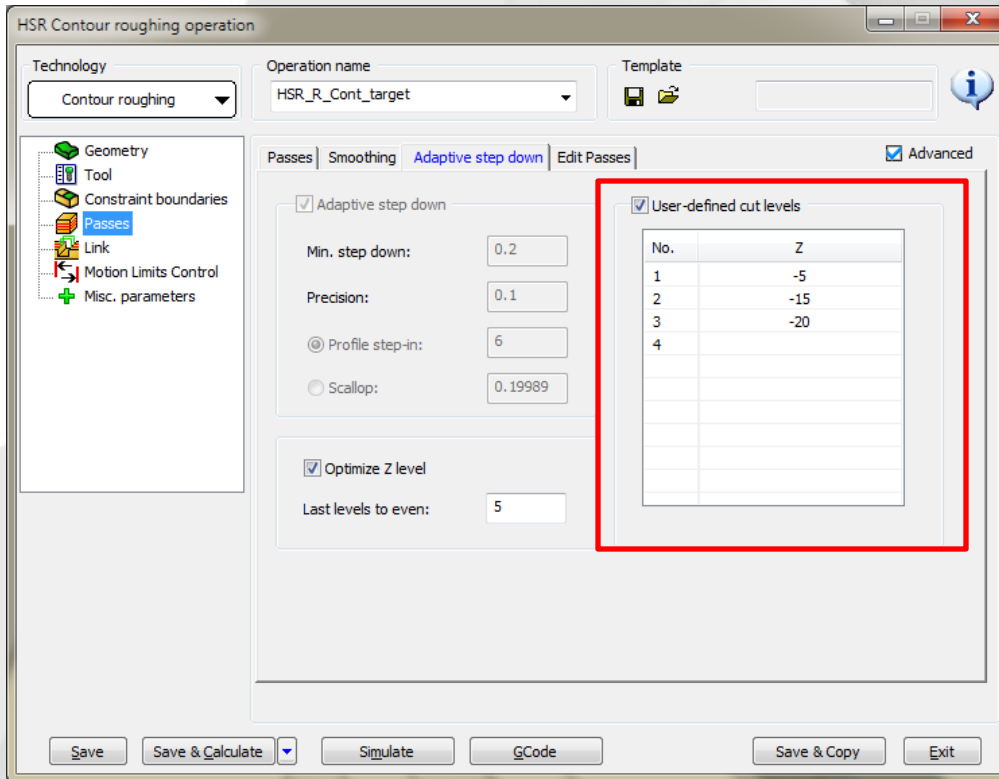
HSM: New Operation – Hybrid Constant Z



- New Finishing strategy combining Constant Z operation and 3D pocketing with 3D constant stepover, where needed

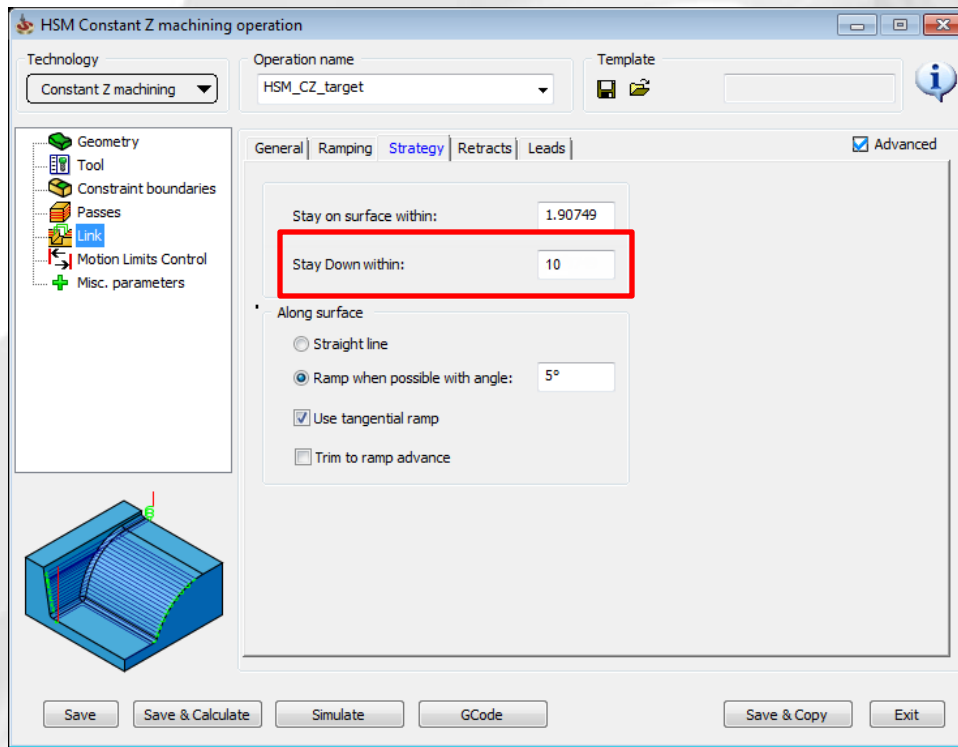
HSM/HSR: User-defined cut levels

- Cut ONLY on specified Z levels, instead of cut on every step down

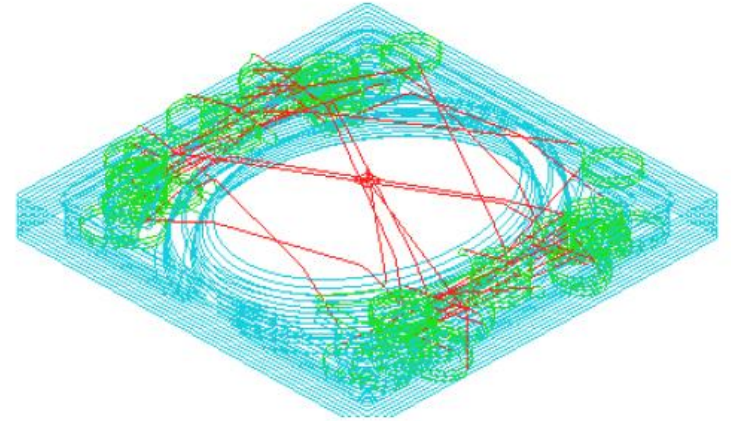


HSM/HSR: Stay down within

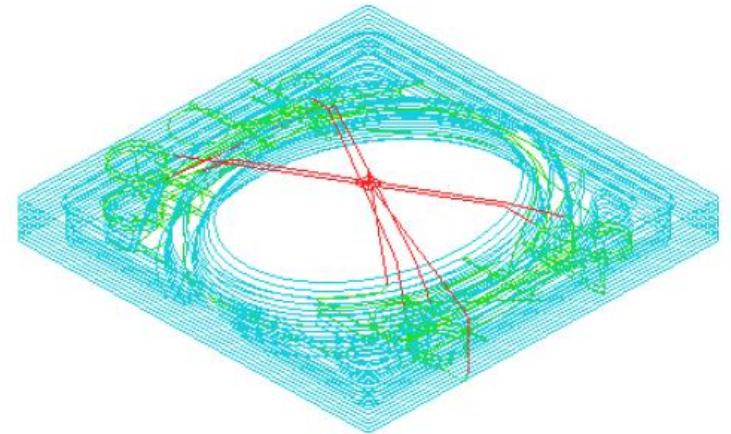
- Minimize amount of vertical tool moves
- The smaller this value – the more retract moves



Stay down within: 1

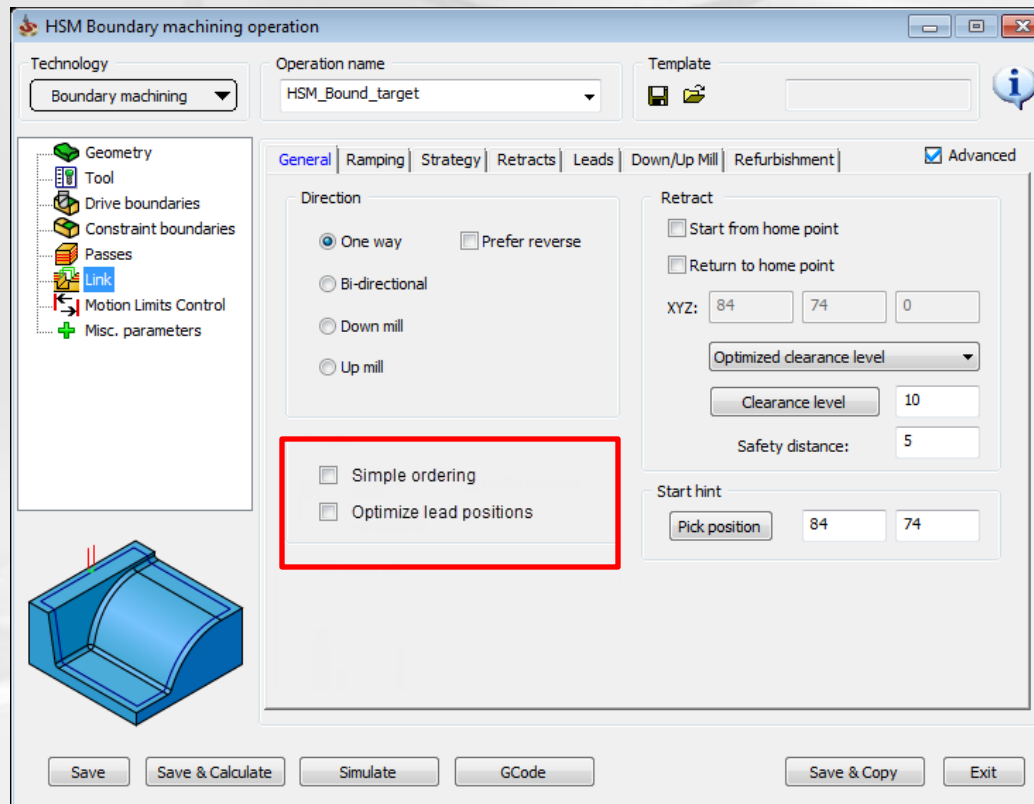


Stay down within: 10



HSM/HSR: Simple ordering and optimize lead position

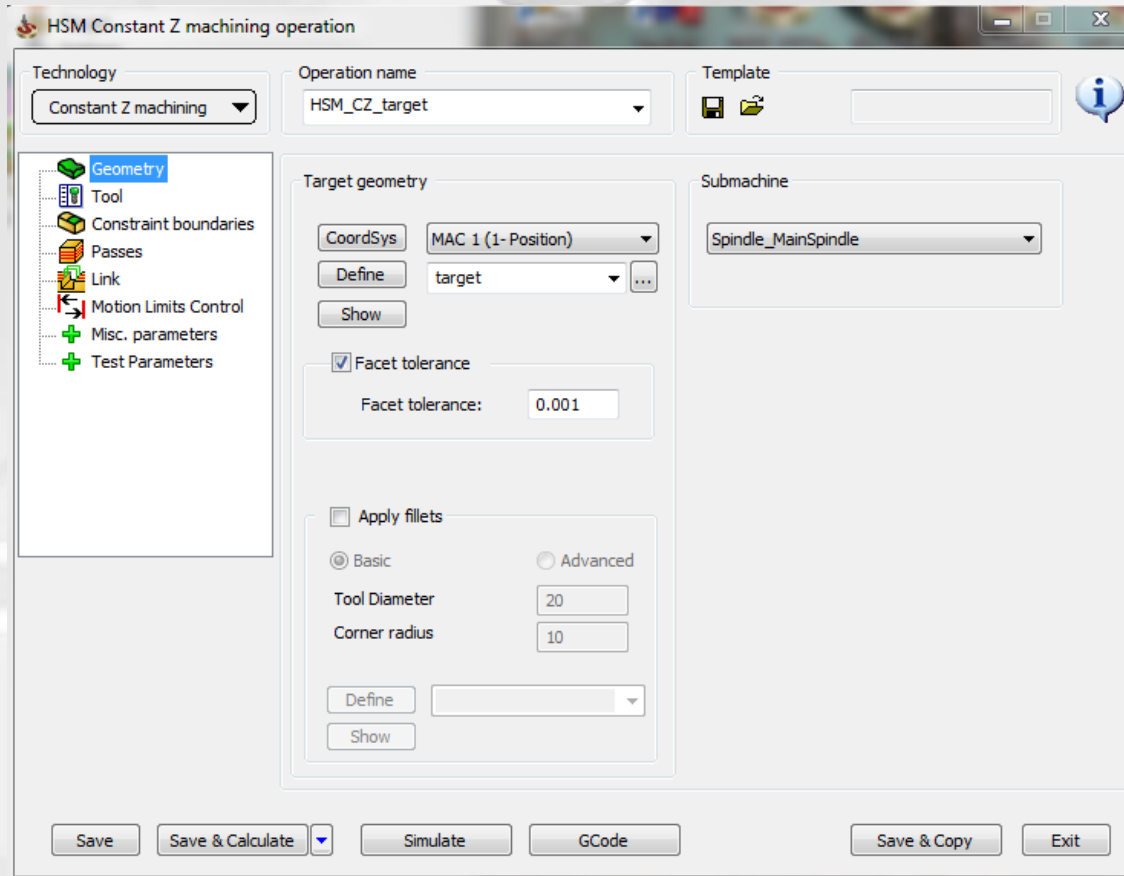
- Simple ordering between cutting passes – minimize length of connections between passes



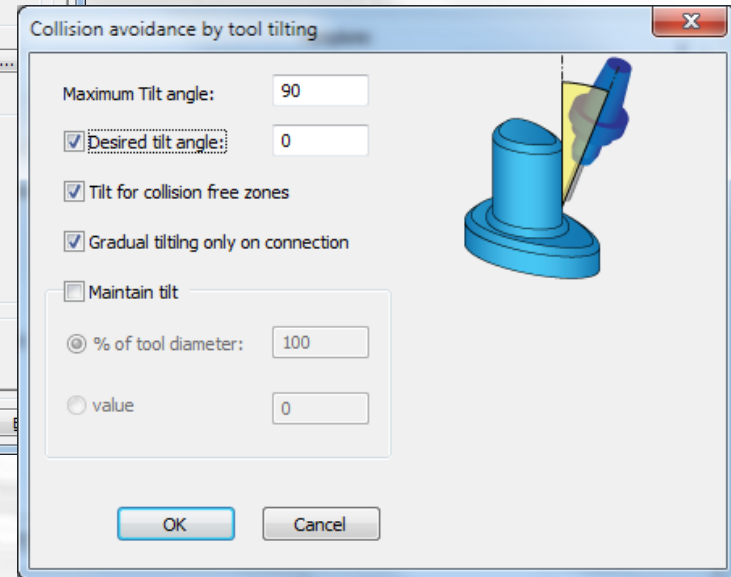
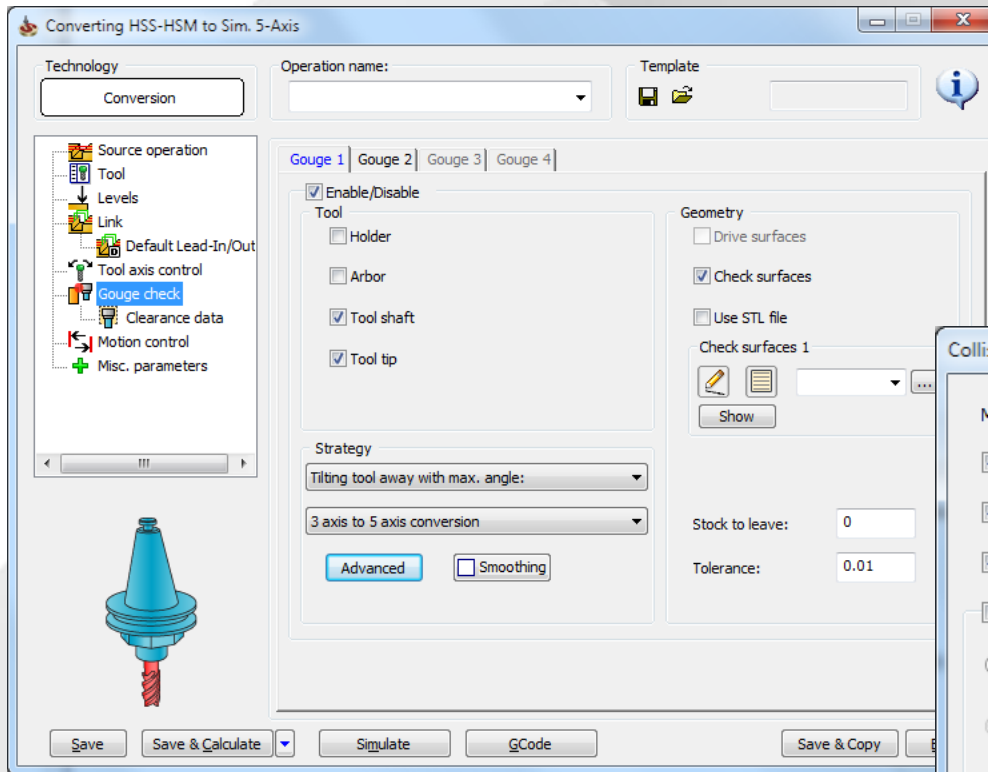
- Optimize Lead position– find the point to minimize length of Lead-In movement

HSM/HSR: User-defined Facet tolerance

- Enable the user to define the facet tolerance in any HSM operation – in previous versions this was automatically according to Passes tolerance



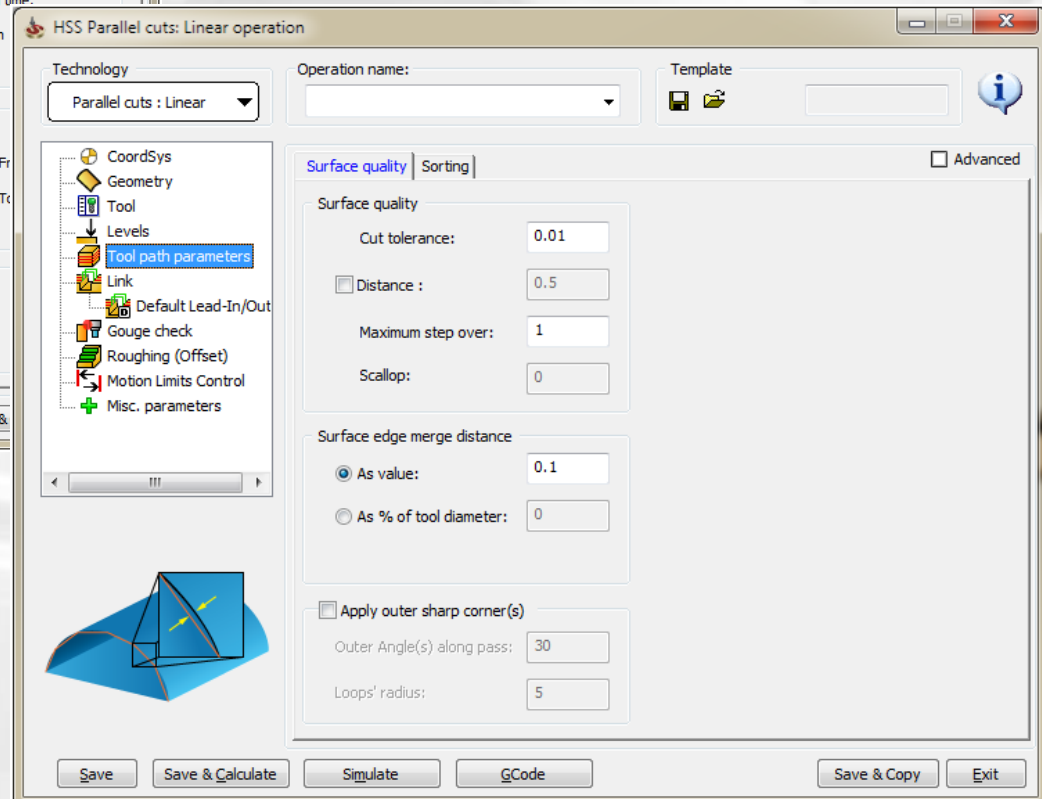
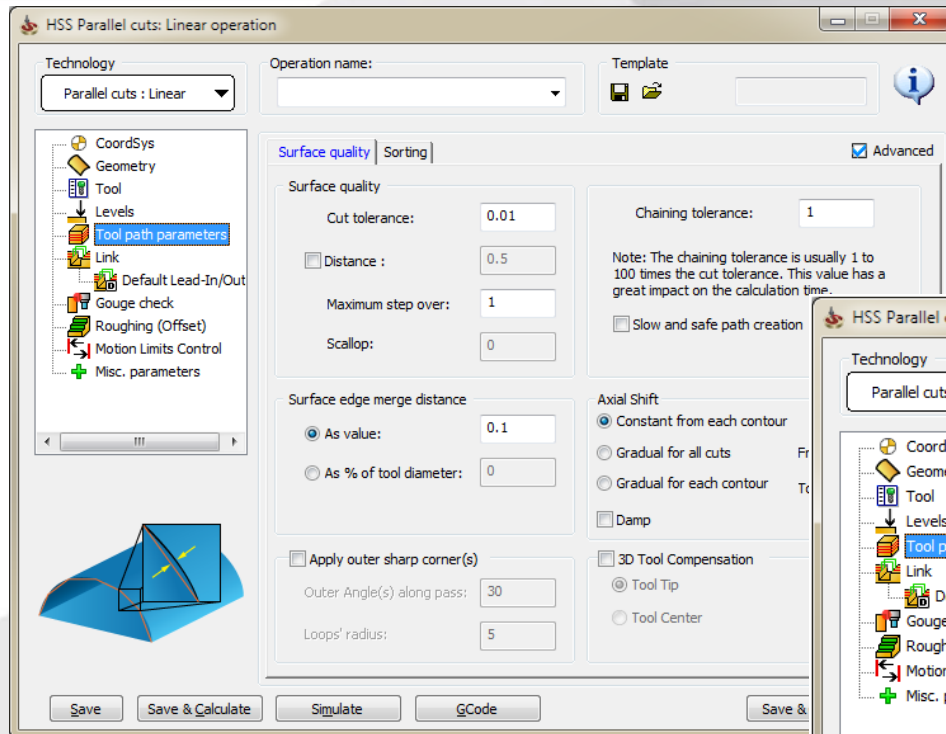
Convert From HSS/HSM: New tilting options



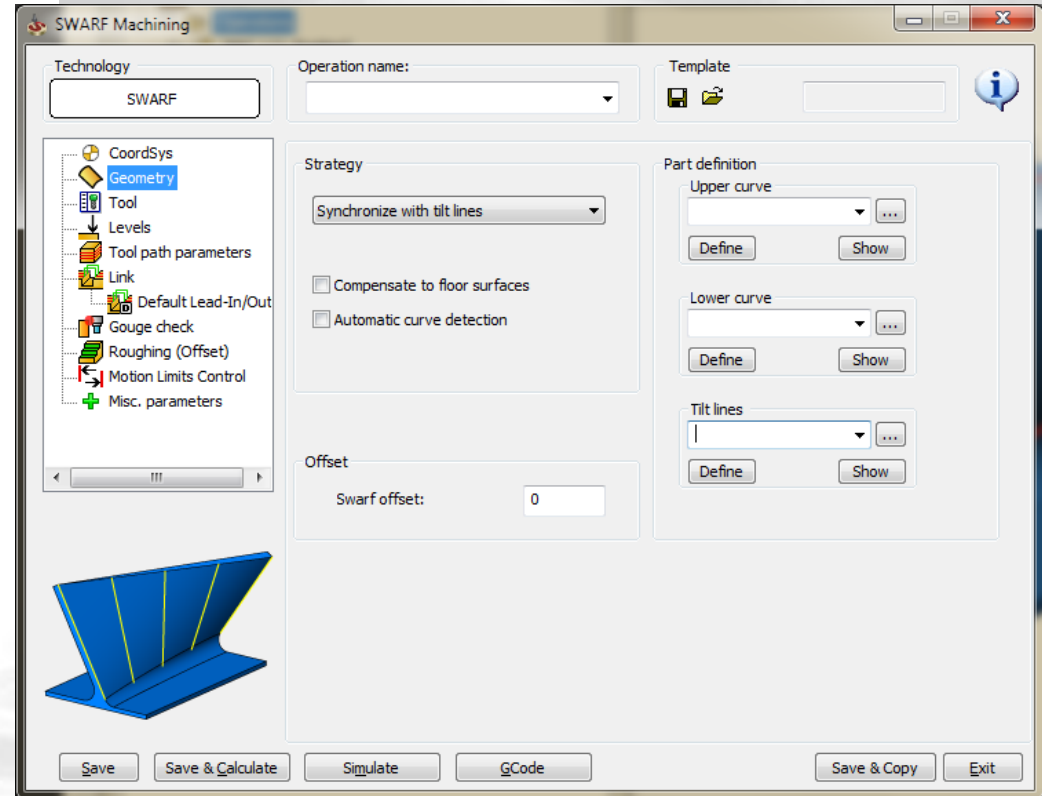
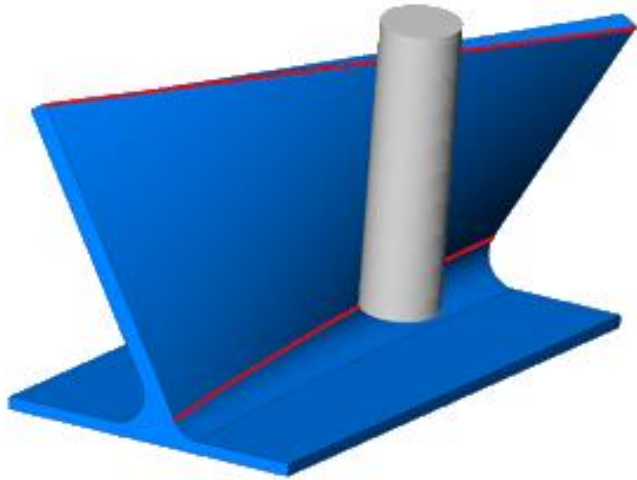
- **Advanced options of Tilting tool away with max. angle : 3 axis to 5 axis conversion**

Advanced button in HSS and 5x sim. operations

- Hide/Show advanced parameters, needed in rare cases



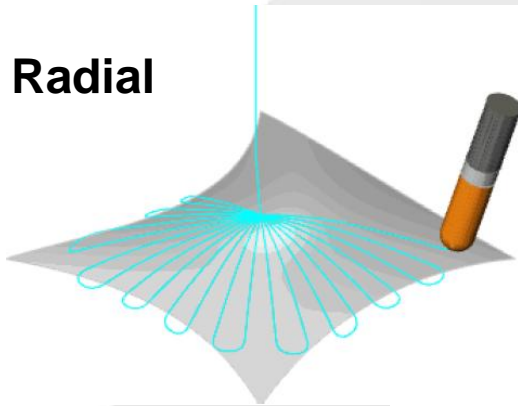
Swarf Machining – new sim 5x operation



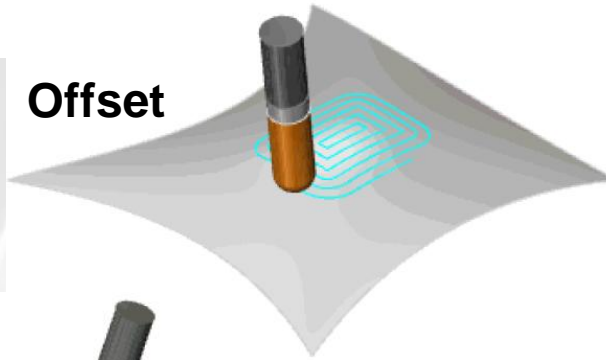
- Easy definition of geometry
- Automatic definition of tool axis control

5x sim: Projection strategies

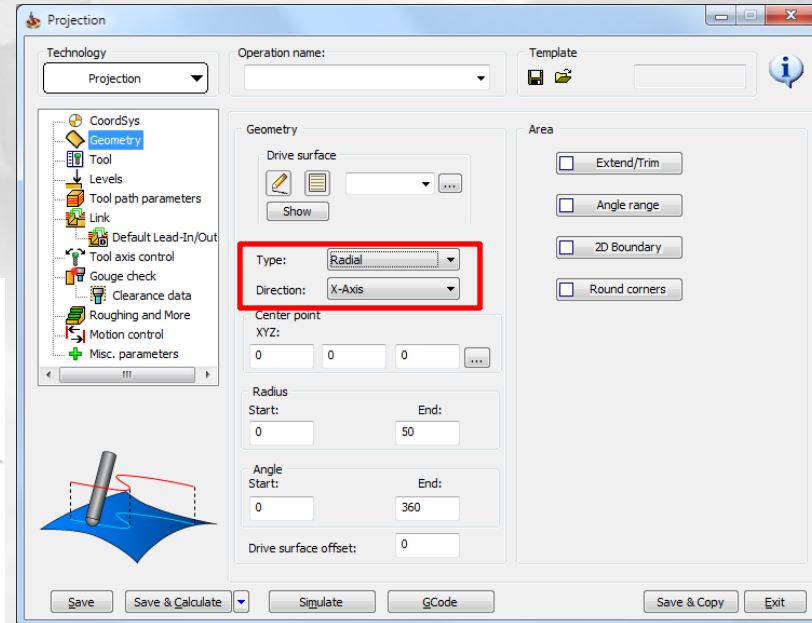
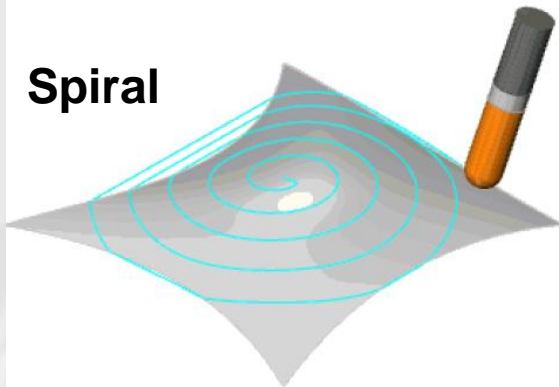
Radial



Offset



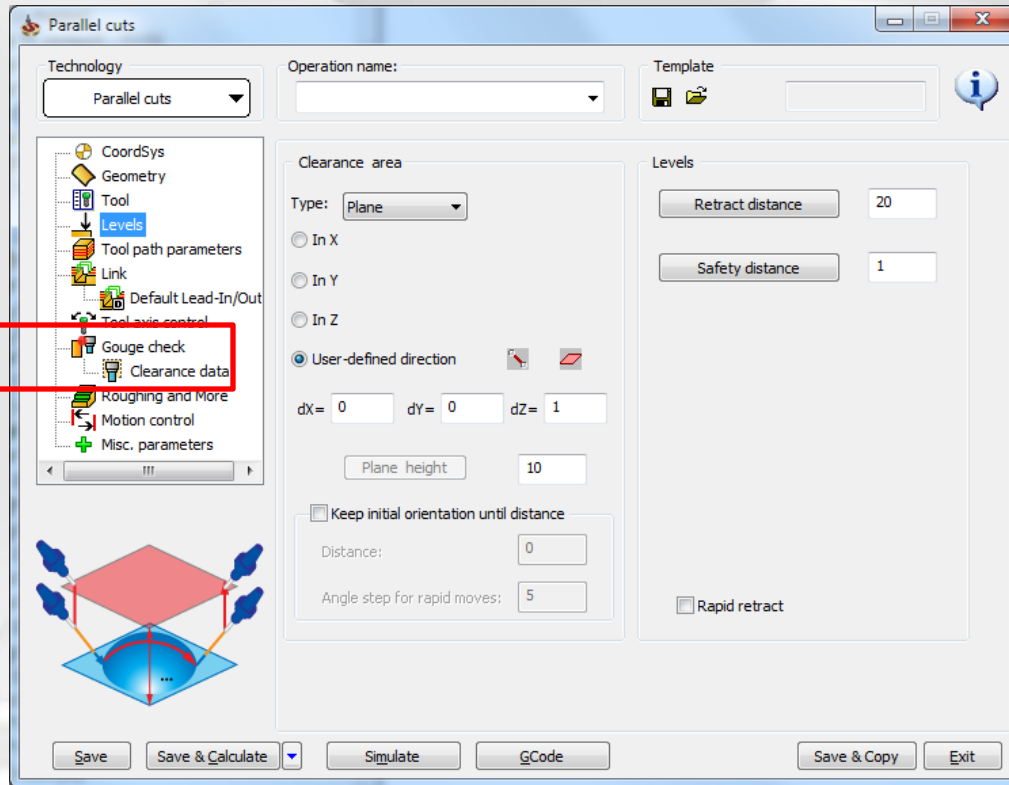
Spiral



- 3 new strategies of Projection technology

- Possibility to define direction of passes by X/Y/Z axis or user-sefined direction

5x. Sim: Retract plane definition

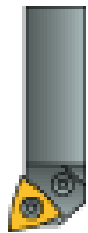


Plane definition by:

- Normal vector (by 2 points)
- Plane

Tooltable: composite tools

Composite Tools



Turning



Boring



Ext. Groove



Int. Groove



Ext. Thread



Int. Thread

- Composite turning, boring, grooving and threading tools

Tooltable: Grooving composite tools

M Topology Tool Data Holder Coolant Tool Preset Tool Message

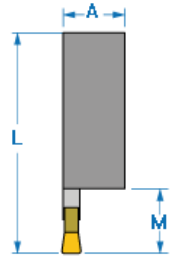
Insert Shank

Unit
 mm Inch

Shank type: Straight

Cutting Direction: L

Name	Value
A	10
L	40
M	10
Thickness	5

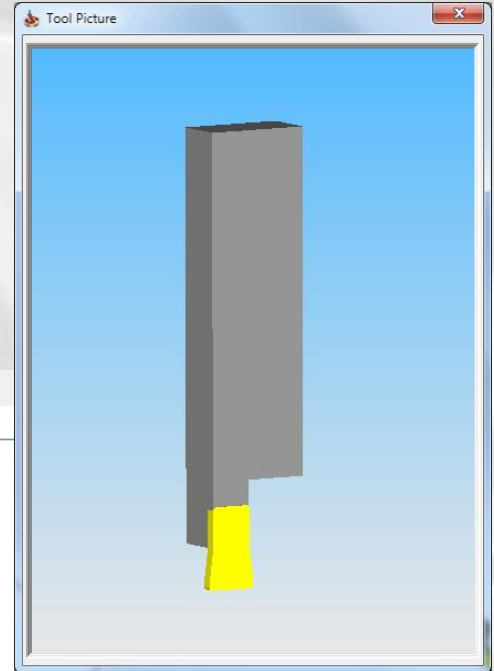
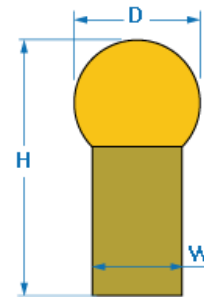
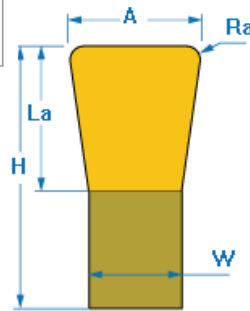


l Message

Tool Message

Name	Value
Thickness	1
H	8
W	4
A	5
La	4
Ra	0.4

Insert only



- Internal and External grooving tools
- Square and Round inserts

Tooltable: Threading composite tools

M Topology Tool Data Holder Coolant Tool Preset Tool Message

Insert Shank

Unit: mm Inch

Shank type:

Cutting Direction:

Name	Value
A	20
L	80
M	10
Thickness	5
N	25

Threading type: Metric (ISO)

Thread standard
 Thread fine

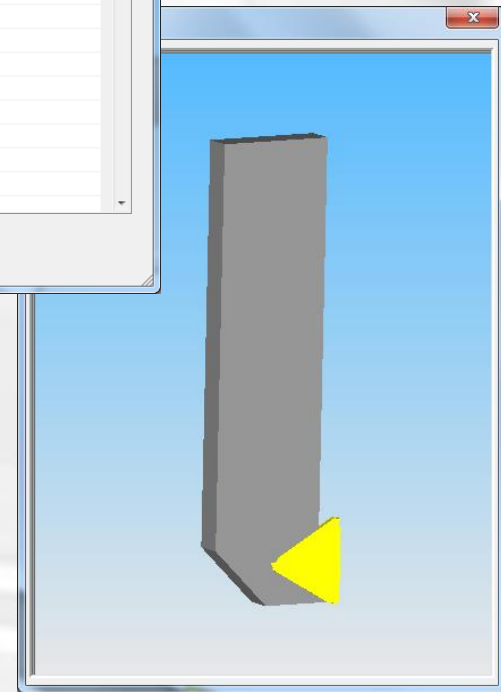
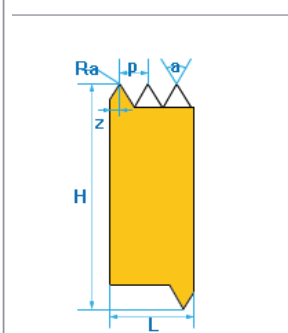
Standard	Drill preparation	Cylinder preparation
M1 x 0.25	0.75	1
M1.1 x 0.25	0.85	1.1
M1.2 x 0.25	0.95	1.2
M1.4 x 0.3	1.1	1.4
M1.6 x 0.35	1.25	1.6
M1.8 x 0.35	1.45	1.8
M2 x 0.4	1.6	2
M2.2 x 0.45	1.75	2.2
M2.5 x 0.45	2.05	2.5
M3 x 0.5	2.5	3
M3.5 x 0.6	2.9	3.5
M4 x 0.7	3.3	4
M4.5 x 0.75	3.8	4.5
M5 x 0.8	4.2	5

Insert Shape:

Thread type:

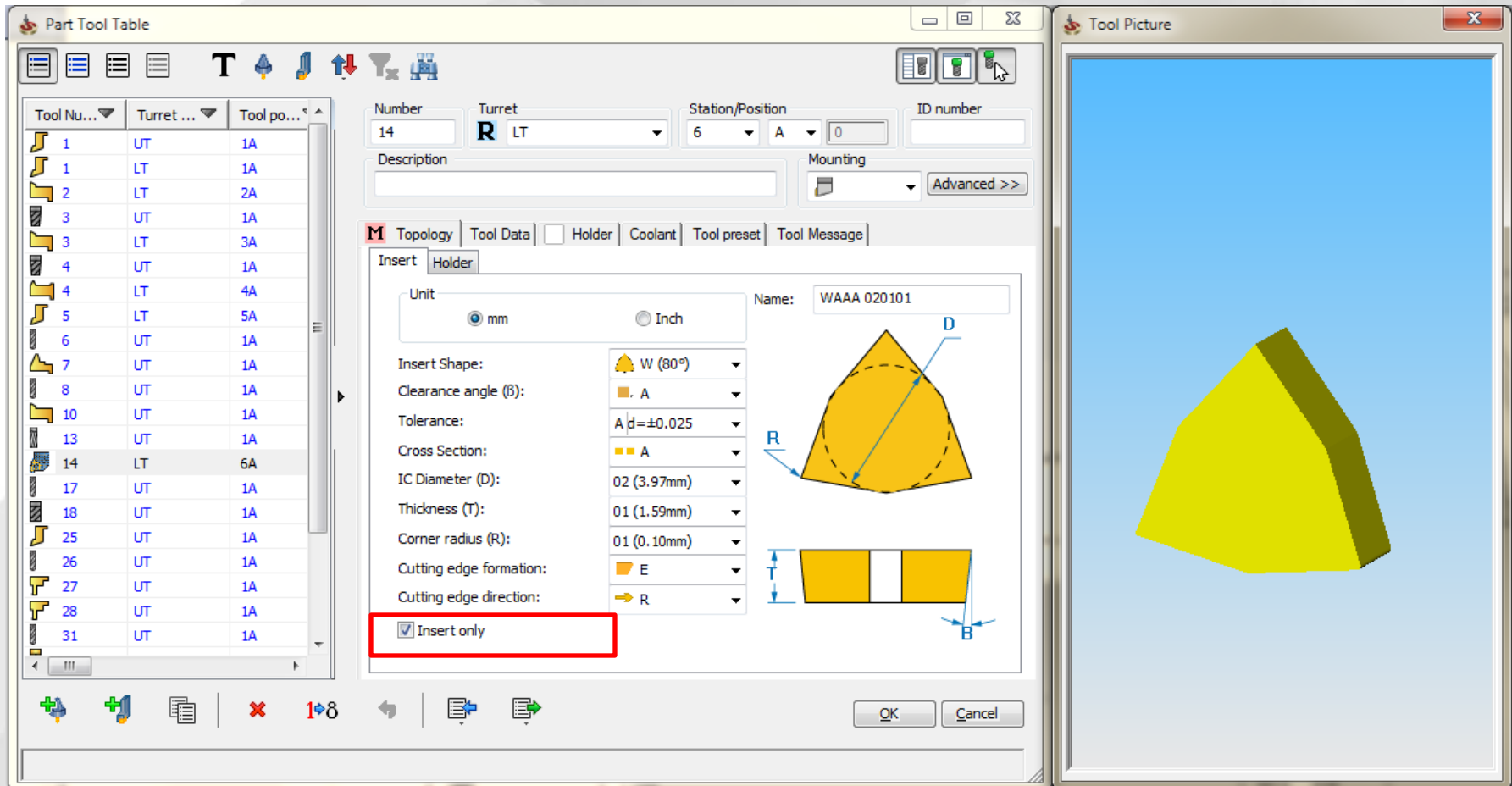
Name	Value
Ra	0.4
p	0
a	60
z	0
H	16.5
Thickness	1

Insert only



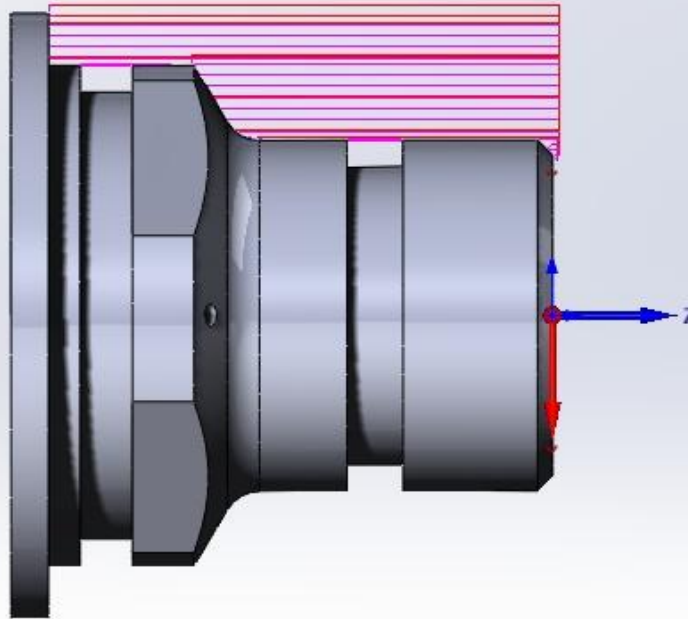
- Internal and External threading tools
- Option to use standard thread type tables
- Triangle and rectangle inserts

Tooltable: Use only insert



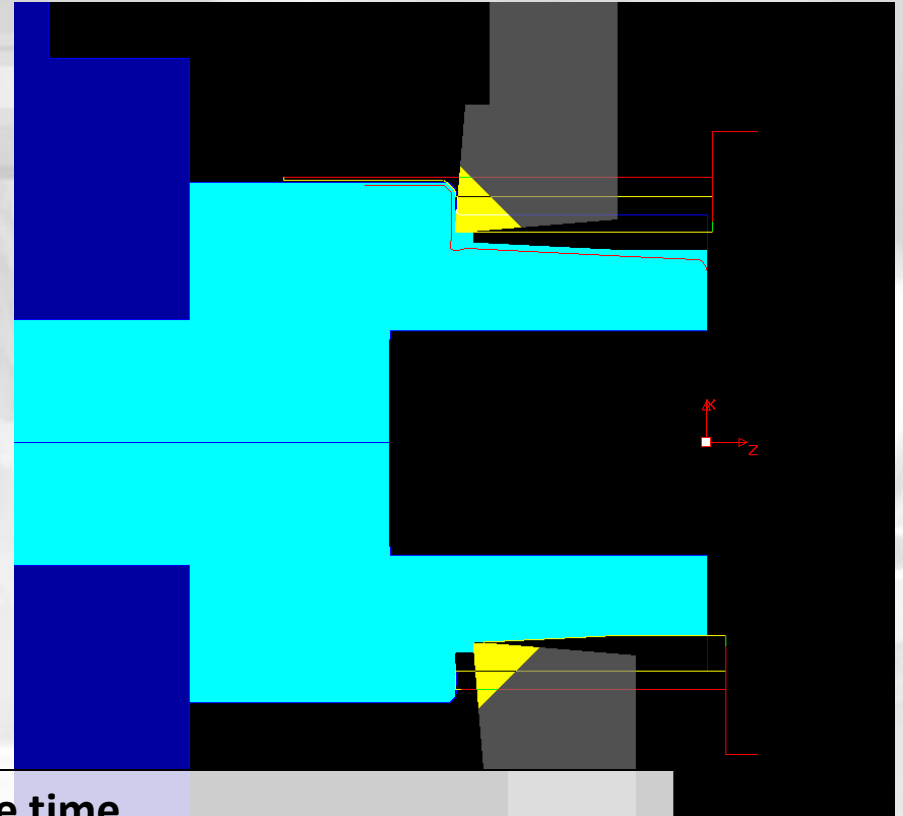
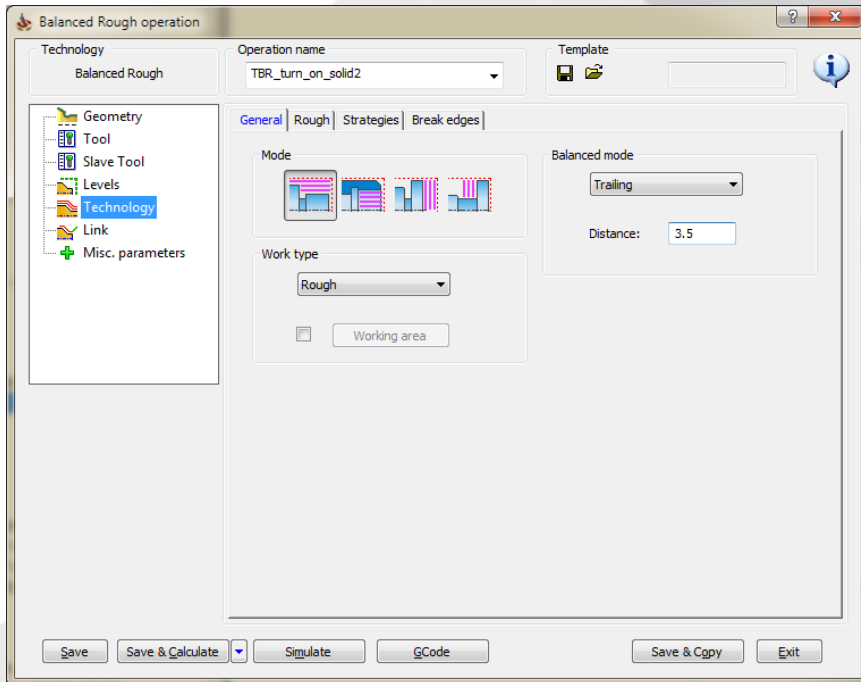
- Define only cutting part of the tool - tool body can be defined as STL holder

Turning: Work without fixture



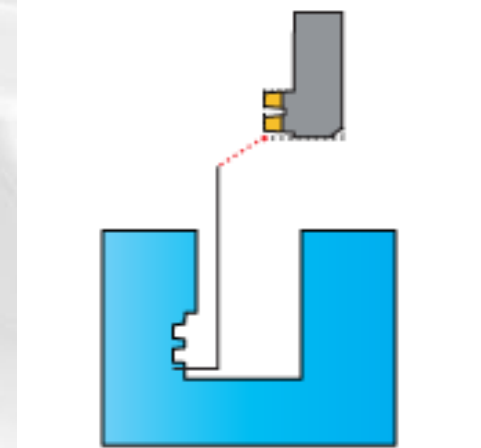
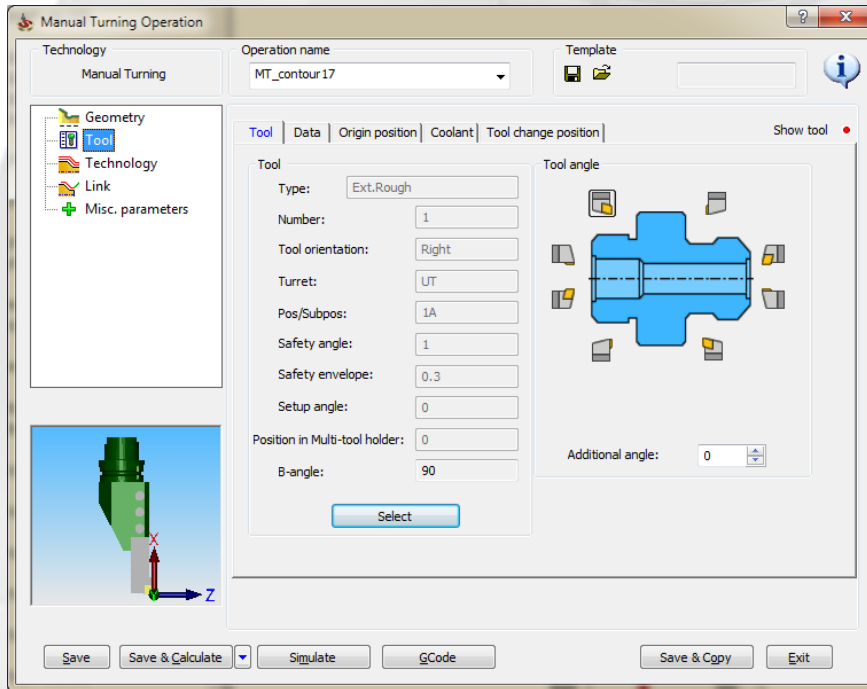
- **If there is target defined – fixture is not needed anymore for turning**
- **If there is NO target – fixture is needed**
- **Machine without fixture and without target - impossible**

Turning: Balanced roughing



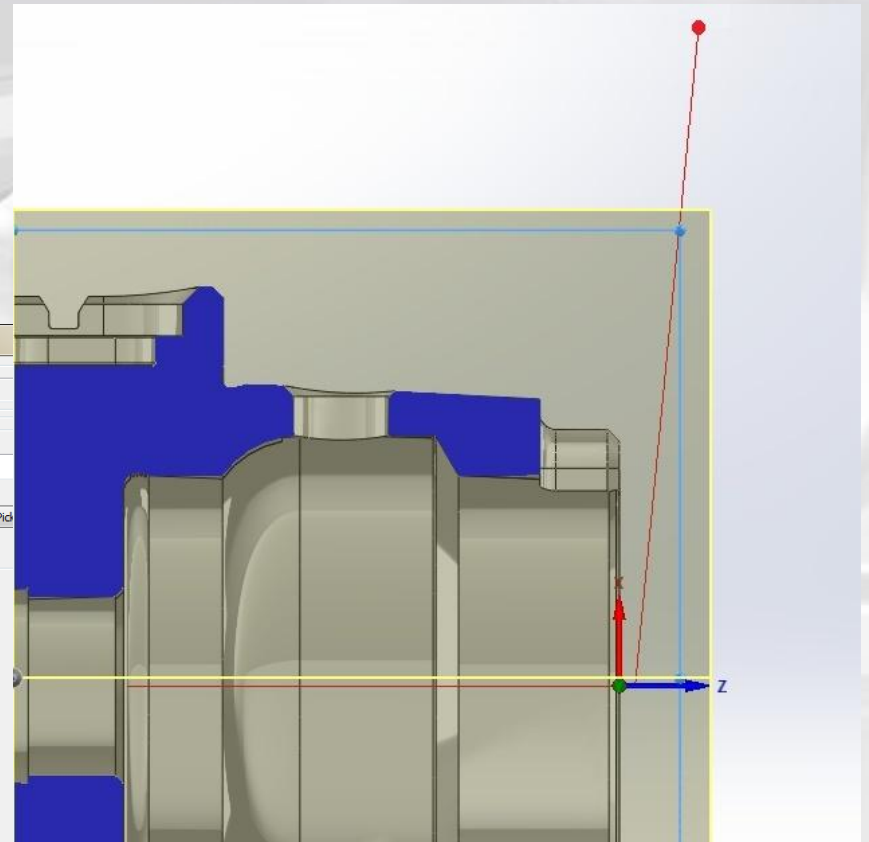
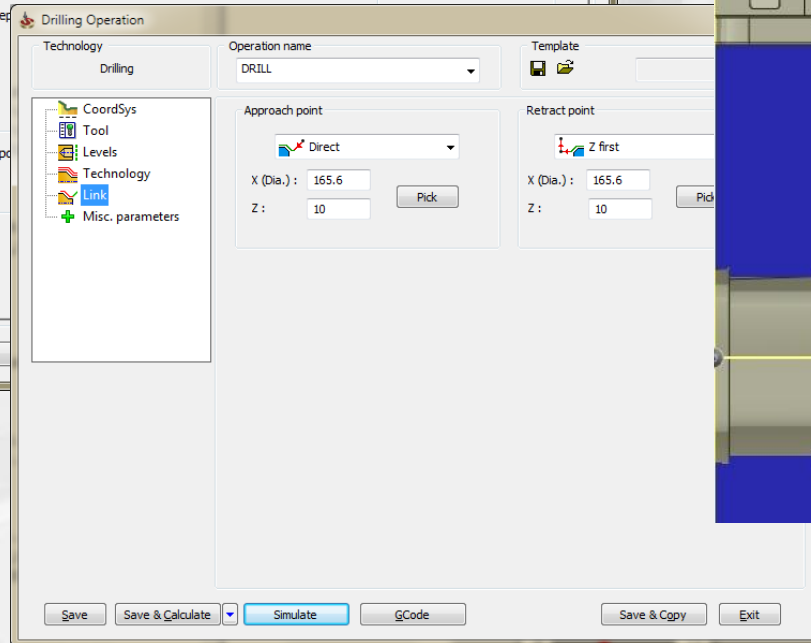
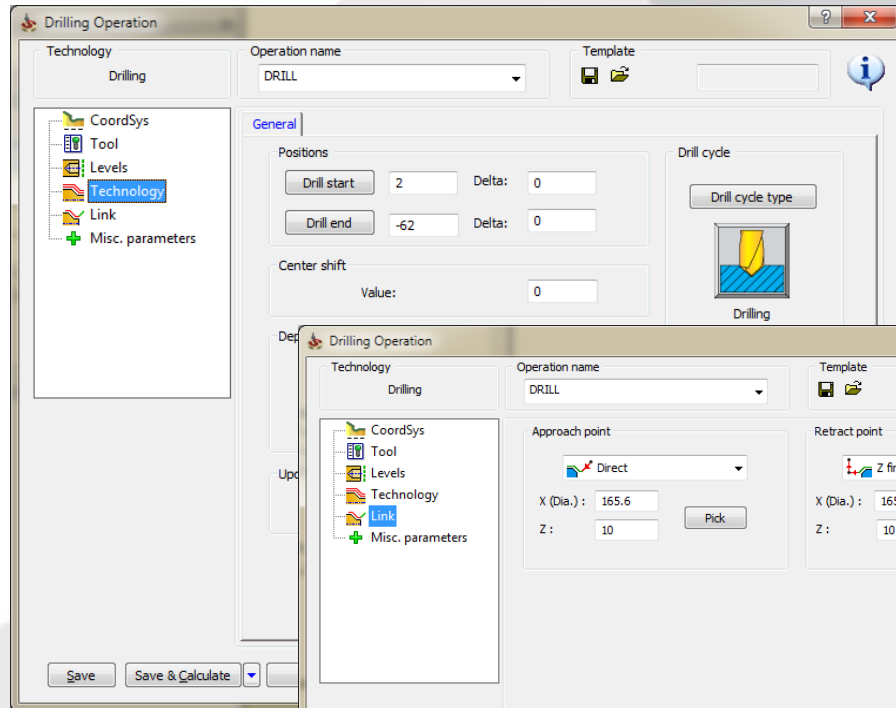
- **Possibility to cut with 2 tools at the same time**
- **Simultaneous balanced turning**
- **Option to define trailing distance**
- **Twice faster machining on machines with 2 turrets**

Turning: Manual turning



- **Define toolpath by sketch**
- **Full control on tool movements**

Turning: Approach/Retract in drilling

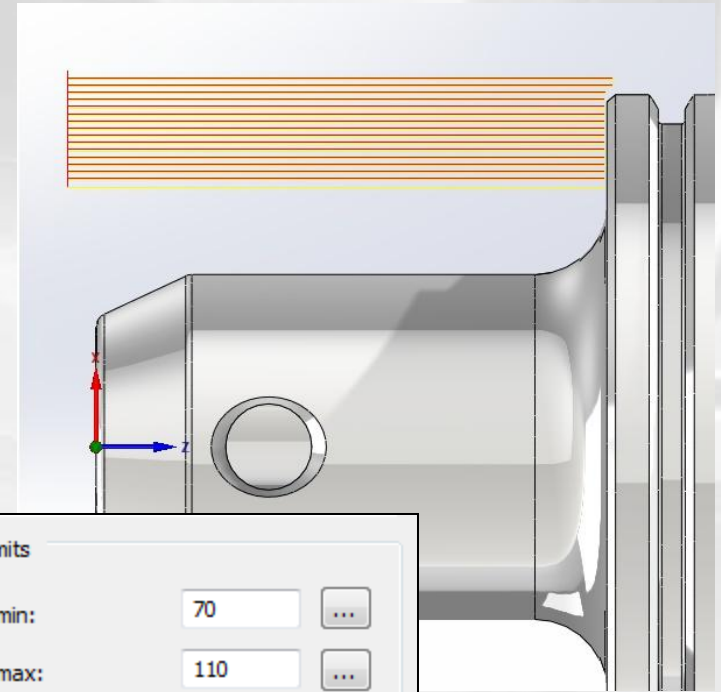
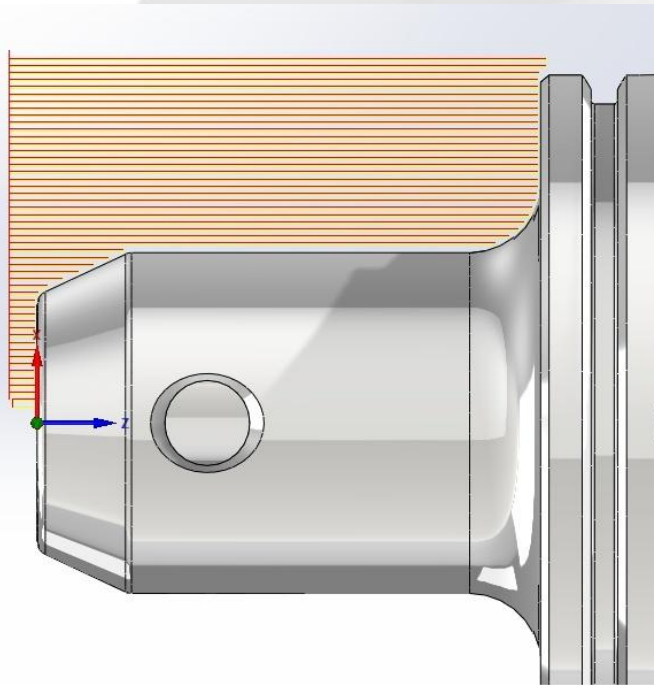


- **Control approach and retract motions in turning drilling operations**

Turning: Reduce toolpath on X axis

Full toolpath

Limited toolpath



Limits

X min: ...

X max: ...

- Available for Rough and Finish

Turning: Adaptive step down

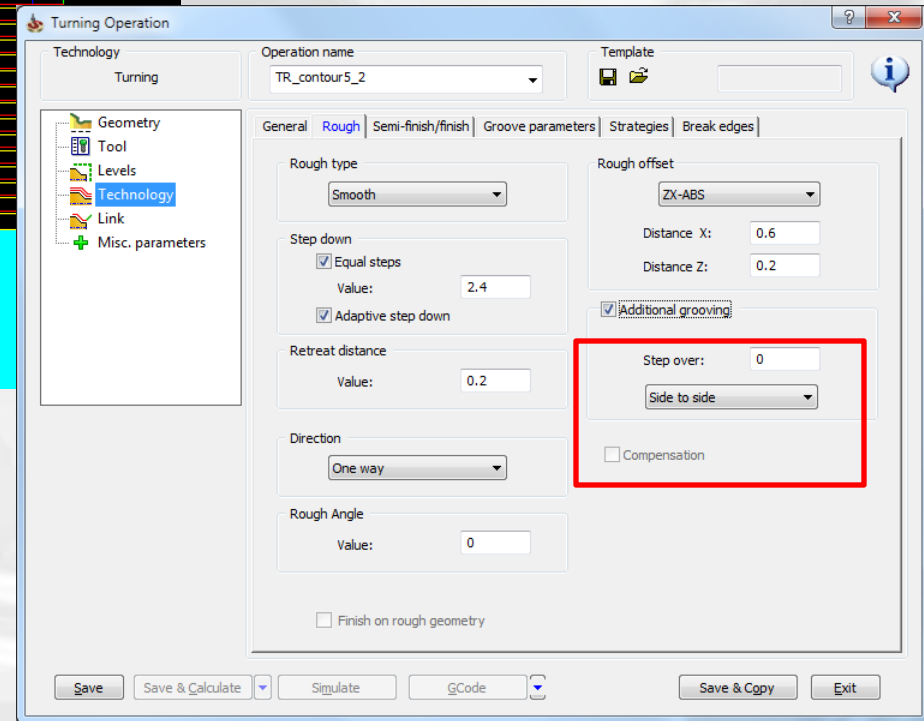
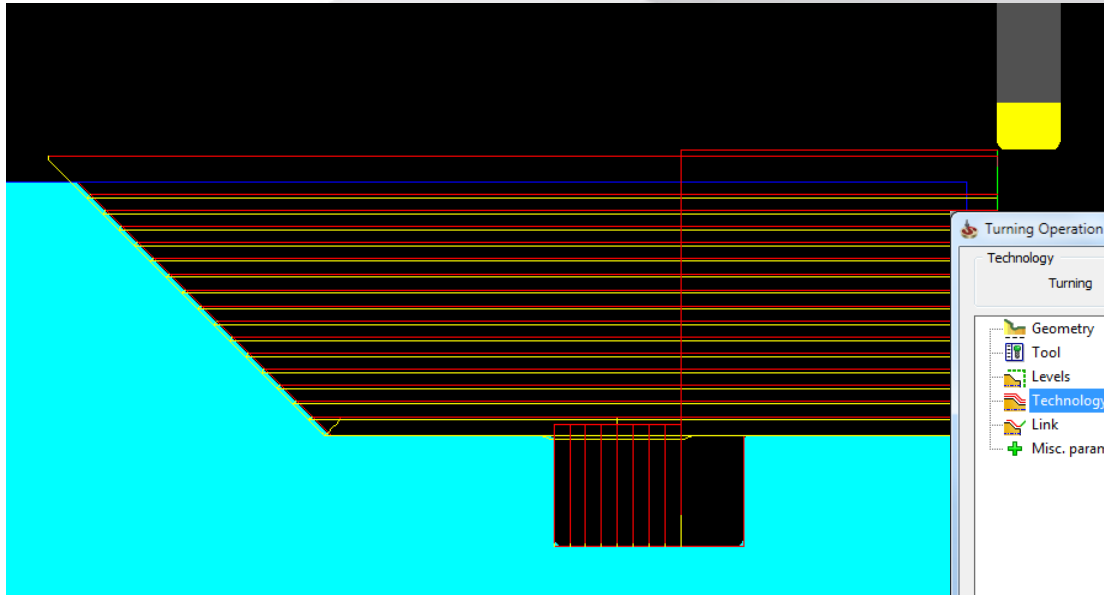
The image displays the 'Turning Operation' dialog box in a CAD software, showing various settings for a turning operation. The 'Step down' section is highlighted with a red box, indicating the 'Adaptive step down' option is selected. The 'Equal steps' option is also checked, with a value of 1.6. Other settings include 'Retreat distance' (0.2), 'Direction' (One way), and 'Rough Angle' (0). The 'Rough offset' is set to 'ZX-ABS' with 'Distance X' (0.6) and 'Distance Z' (0.2). The 'Finish on rough geometry' option is unchecked.

Below the dialog box, four diagrams illustrate different step down methods:

- Step down:** Shows a single step down with a flat top surface.
- Step down + Adaptive step down:** Shows a step down with multiple passes, including additional passes on the flat top surface to clean it.
- Equal step down:** Shows a step down with equal step sizes.
- Equal step down + Adaptive step down:** Shows a step down with equal step sizes and additional passes on the flat top surface.

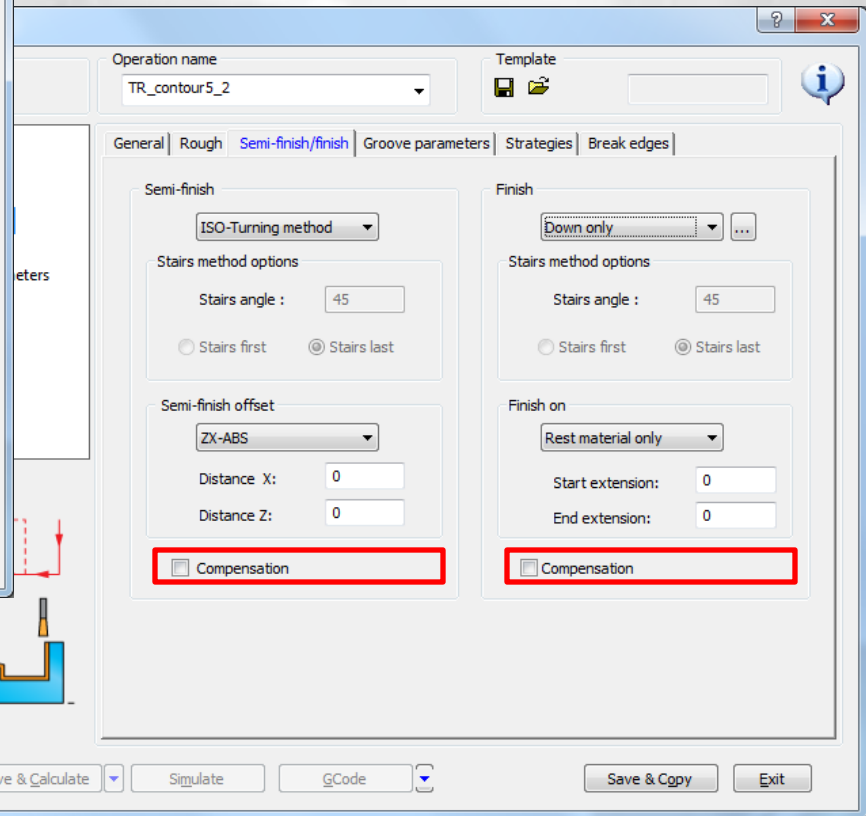
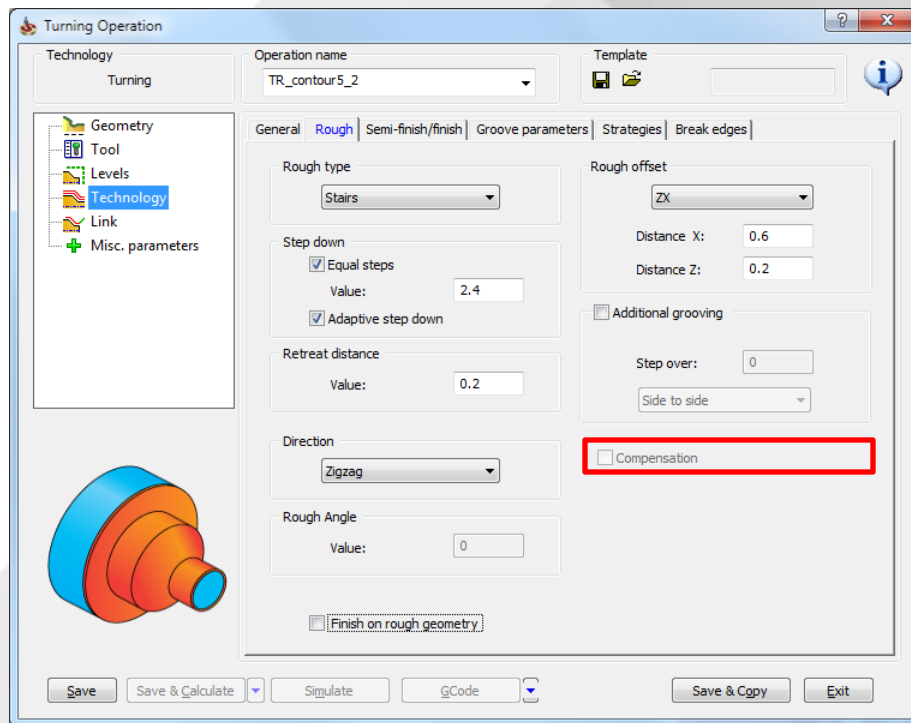
- Add additional passes to clean „flat“ areas

Turning: Additional grooving paths



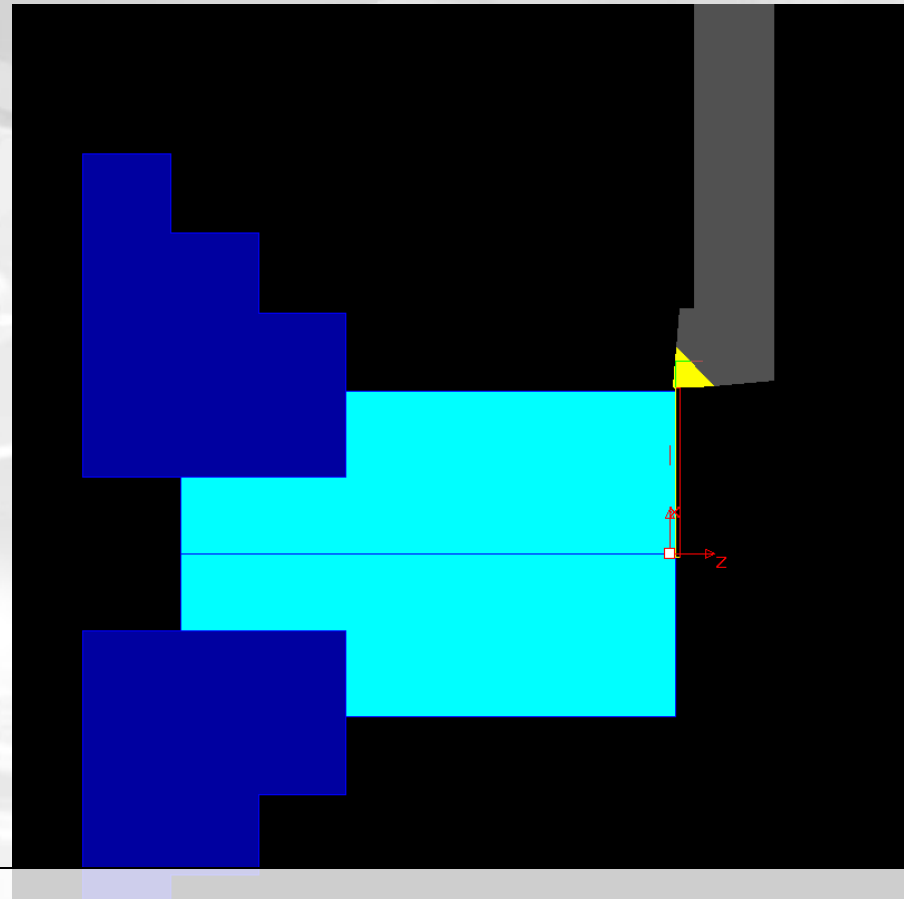
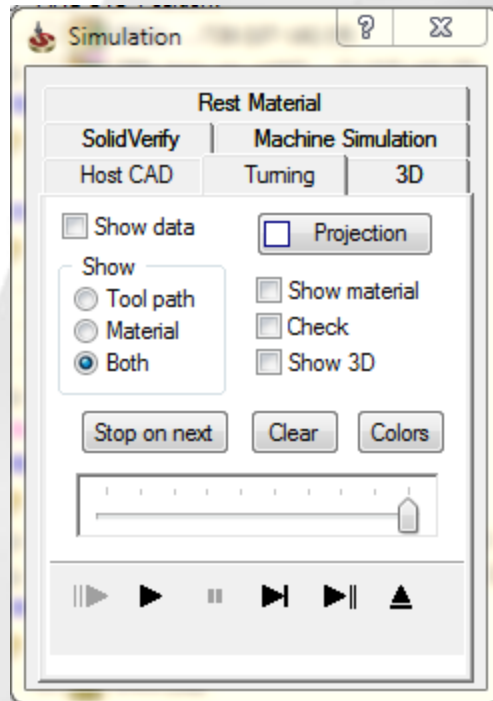
- **Grooving tool in turning operation = Additional grooving passes could be optionally added**

Turning: Separate Compensation for Rough and Finish



- **Separate compensation for Rough and Finish in turning**

Turning: Improvement of simulation



- **Scroll/Zoom/Pan by mouse**
- **Colored tools**
- **Better visualization during actions (Scroll/Zoom/Pan)**

Turret Synchronization

UT		LT	
(13)SIM_Turn_contour3 T8 (UT-1A)	0:01		
(14)mco2 0	0:01		
(15)F_contour4 T9 (UT-1A)	1:03		
(16)TR_contour11 T10 (UT-1A)	0:01		
(17)F_contour12 T11 (UT-1A)	0:10		
(18)D_drill T12 (UT-1A)	0:15		
(19)D_drill1 T13 (UT-1A)	0:34		
(20)D_drill1_1 T14 (UT-1A)	0:09		
(21)D_drill_1 T14 (UT-1A)	0:05		
(22)D_drill1_2 T15 (UT-1A)	0:03		
(23)5X_Proj_faces T16 (UT-1A)	1:43		
(24)5X_Proj_faces1 T17 (UT-1A)	2:24		
(25)mco3 0	0:26		
		(26)TR_contour15 T18 (LT-5A)	0:01
		(27)TR_contour16 T18 (LT-5A)	0:01
(28)FM_facemill T17 (UT-1A)	0:25		
(29)3DSurfacing_model T19 (UT-1A)	0:01		
(30)F_contour17 T19 (UT-1A)	5:35		
(31)mco4 0	0:01		
(32)F_contour19 T9 (UT-1A)	1:52		
(33)F_contour19_1 T9 (UT-1A)	2:29		
(34)F_contour20 T20 (UT-1A)	6:04		
(35)TR_contour21 T10 (UT-1A)	0:01		
(36)5X_Proj_faces2 T16 (UT-1A)	1:29		
(37)mco5 0	0:01		
(38)D_drill2 T21 (UT-1A)	0:36		
(39)F_contour22 T22 (UT-1A)	0:32		
(40)TSlot_contour23 T23 (UT-1A)	0:28		

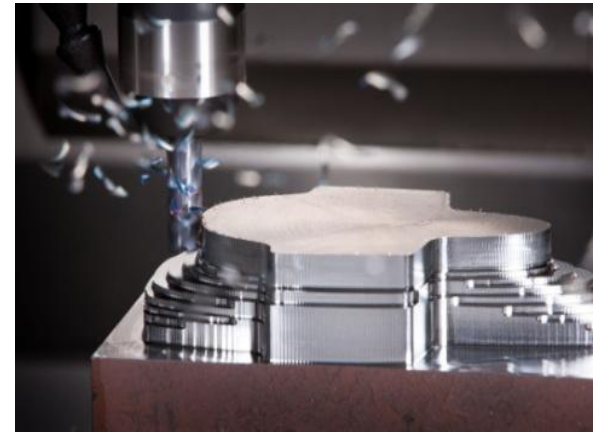
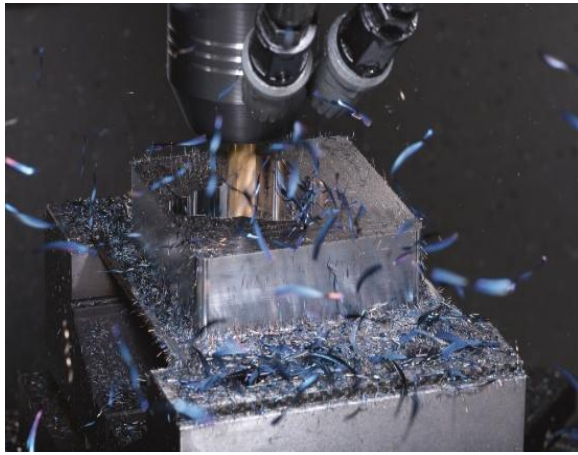
Total machining time: 00:53:29 Selected operation machining time: 00:00:10

OK Cancel

- Easy to use vertical interface
- Color differentiation between tables
- Customizable settings of GUI
- Documentation

Synchronization types:

- Start at the same time
- End at the same time
- Start after previous



The new, revolutionary Milling technology

imachining[®]
by SolidCAM

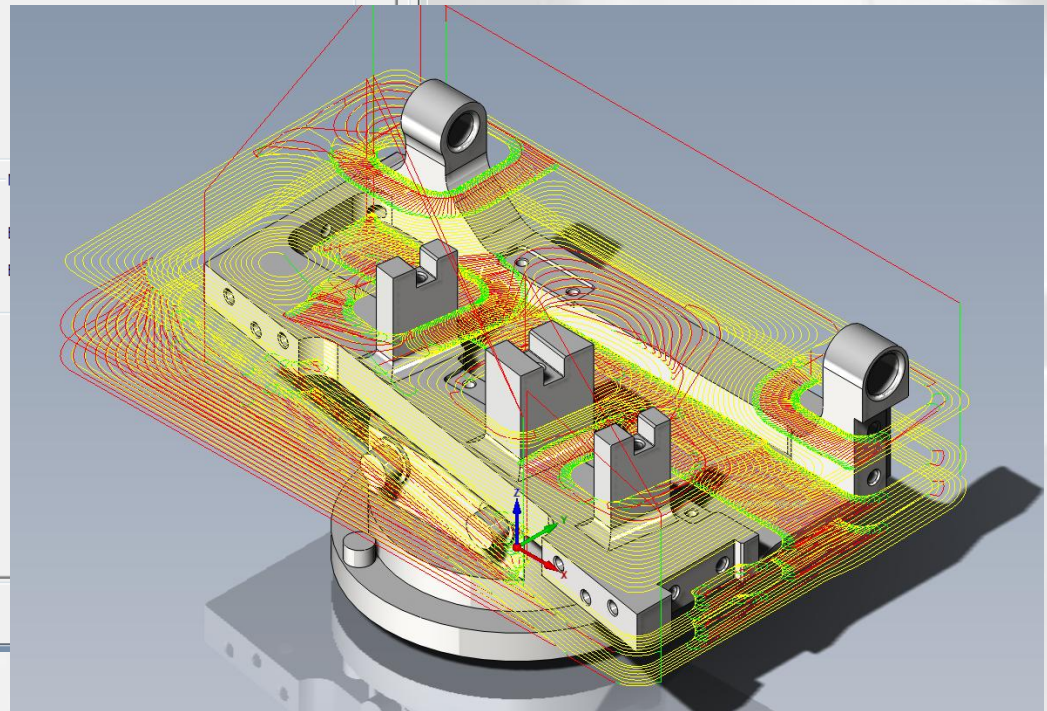
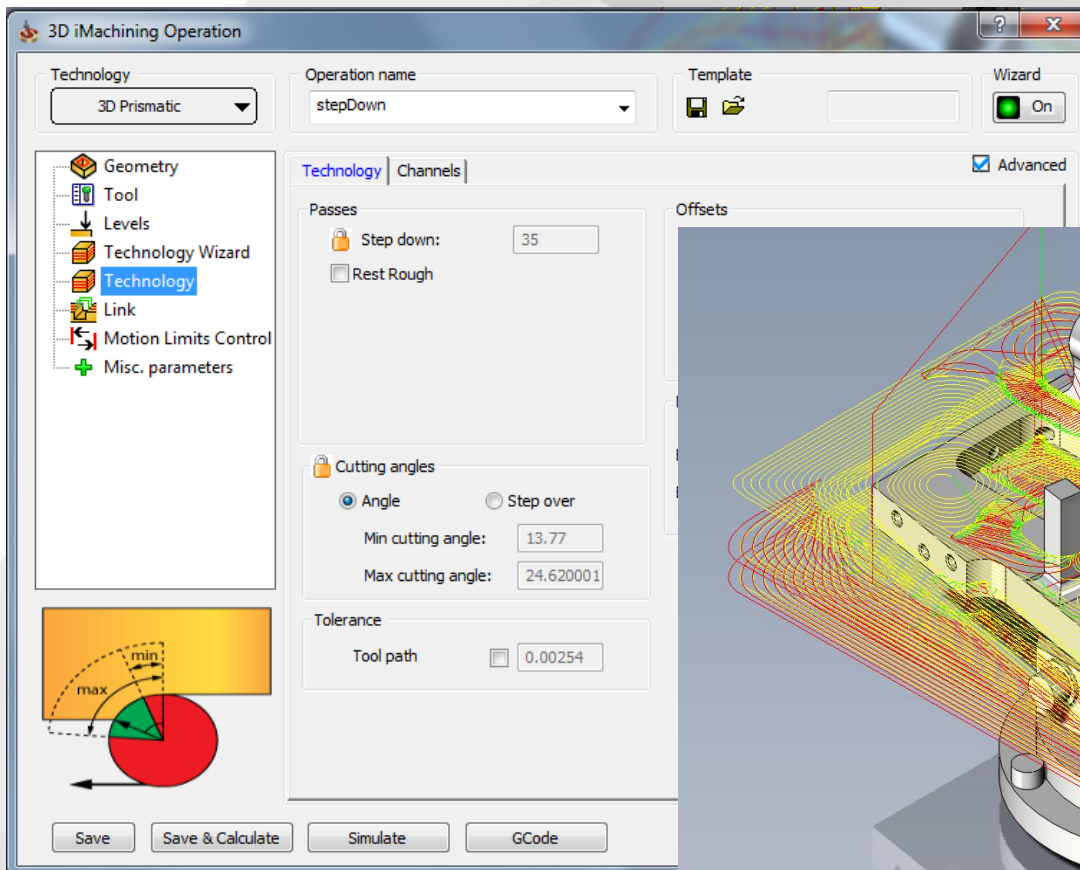
UP TO
70%
TIME SAVINGS

The revolution in CNC machining



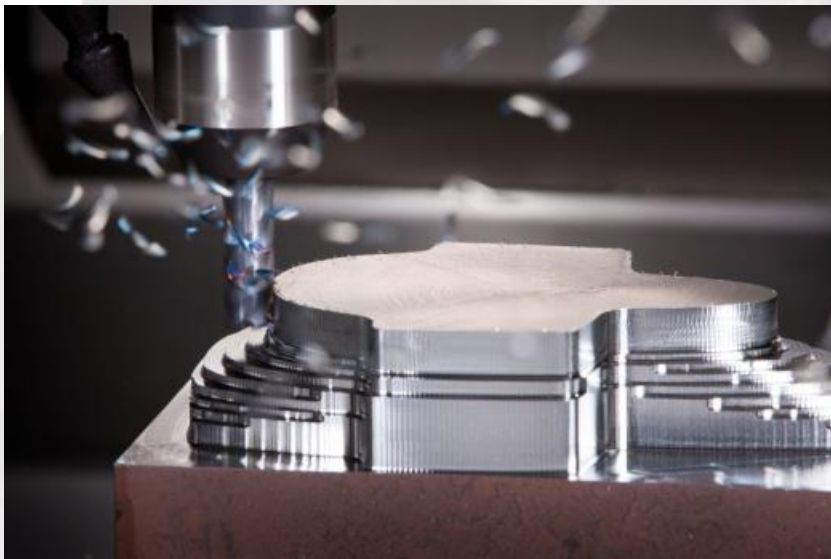
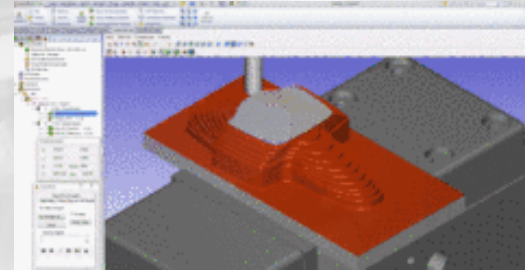
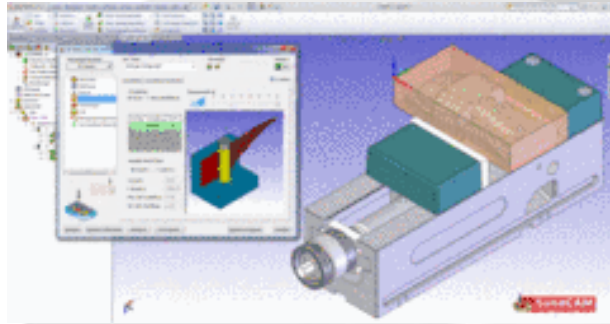
3D iMachining

The new, revolutionary Milling technology
imachining
by SolidCAM



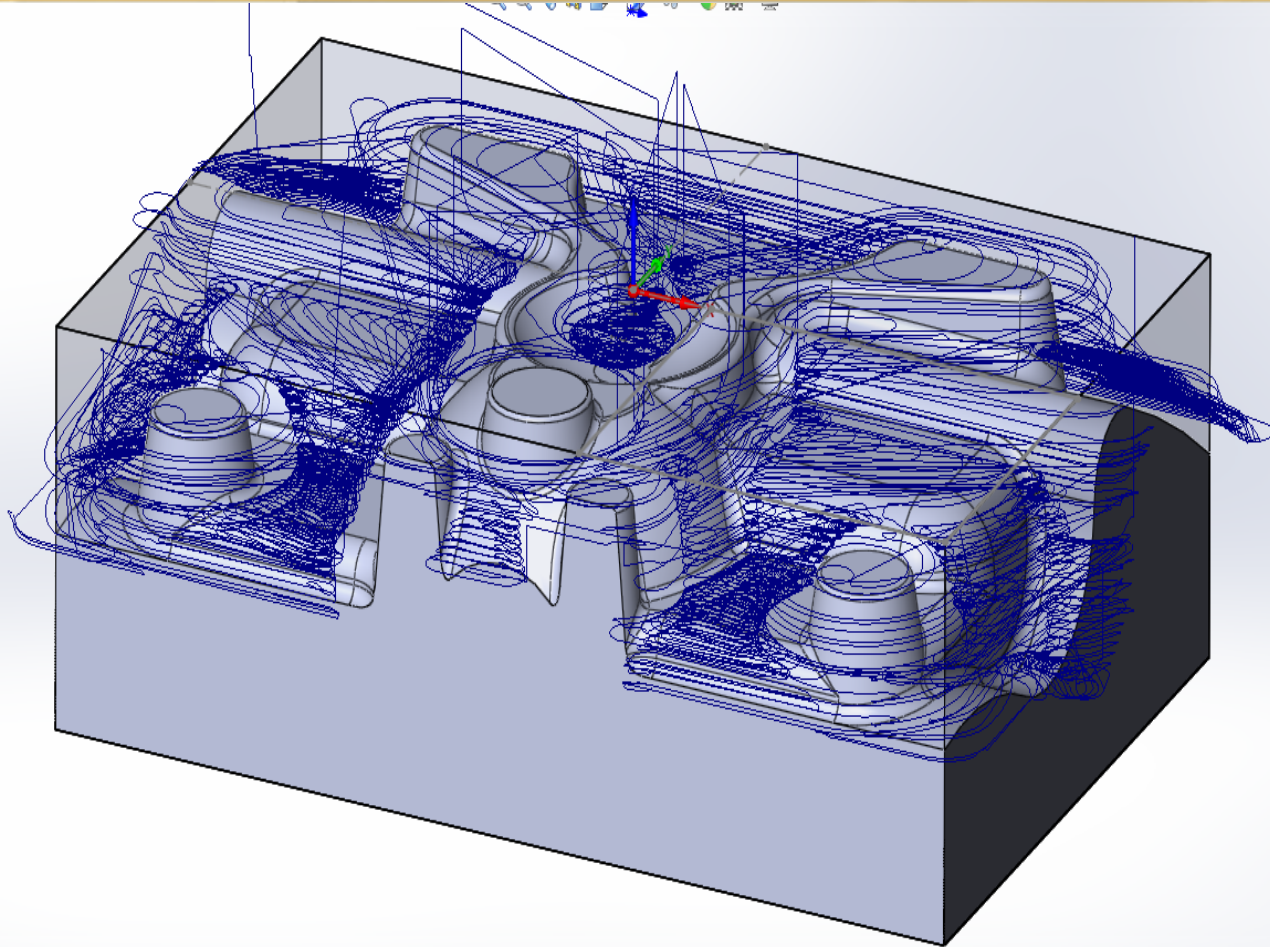
3D iMachining with intelligent step-up

3D iMachining



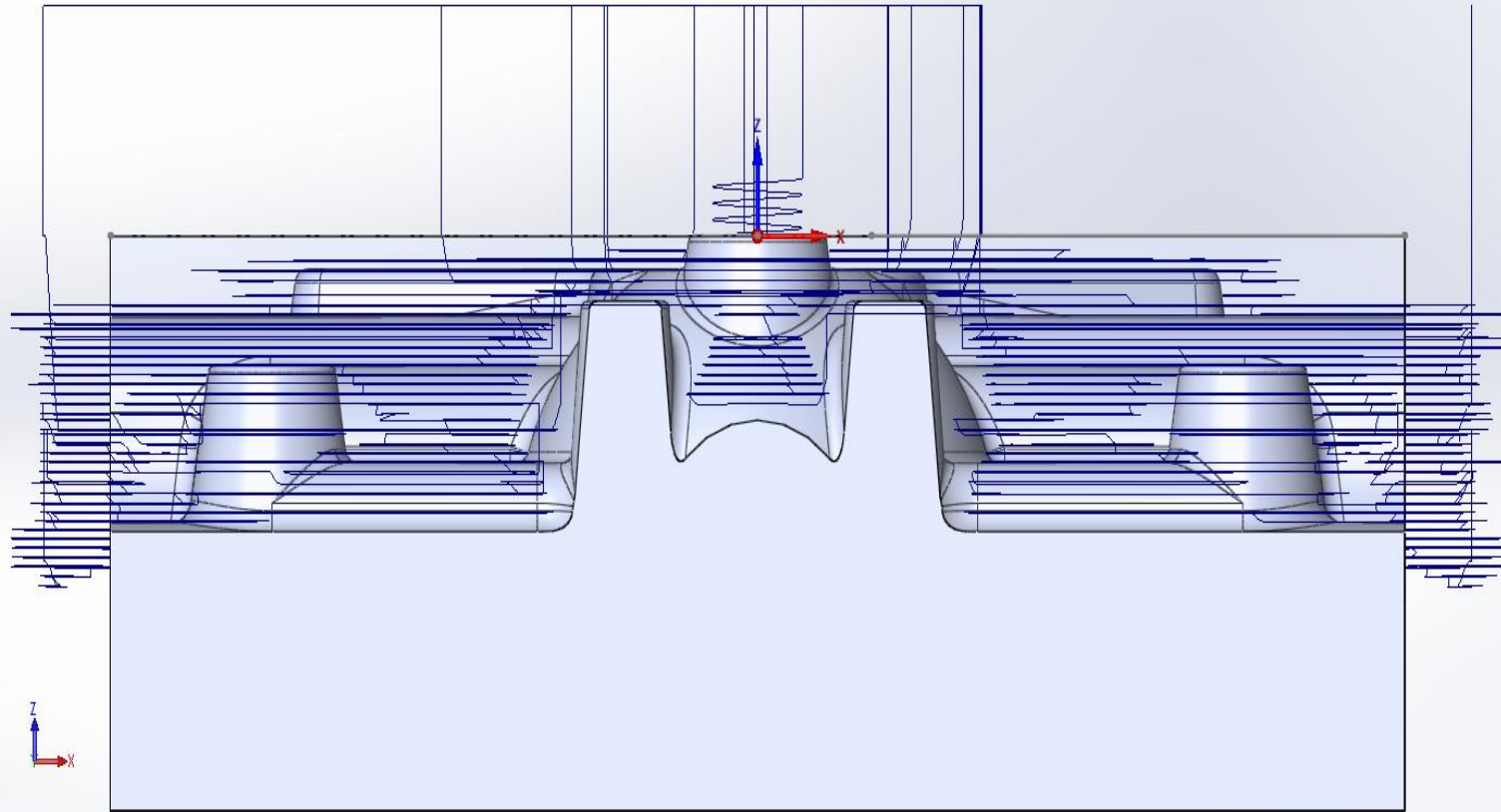
3D iMachining with intelligent step-up

3D iMachining



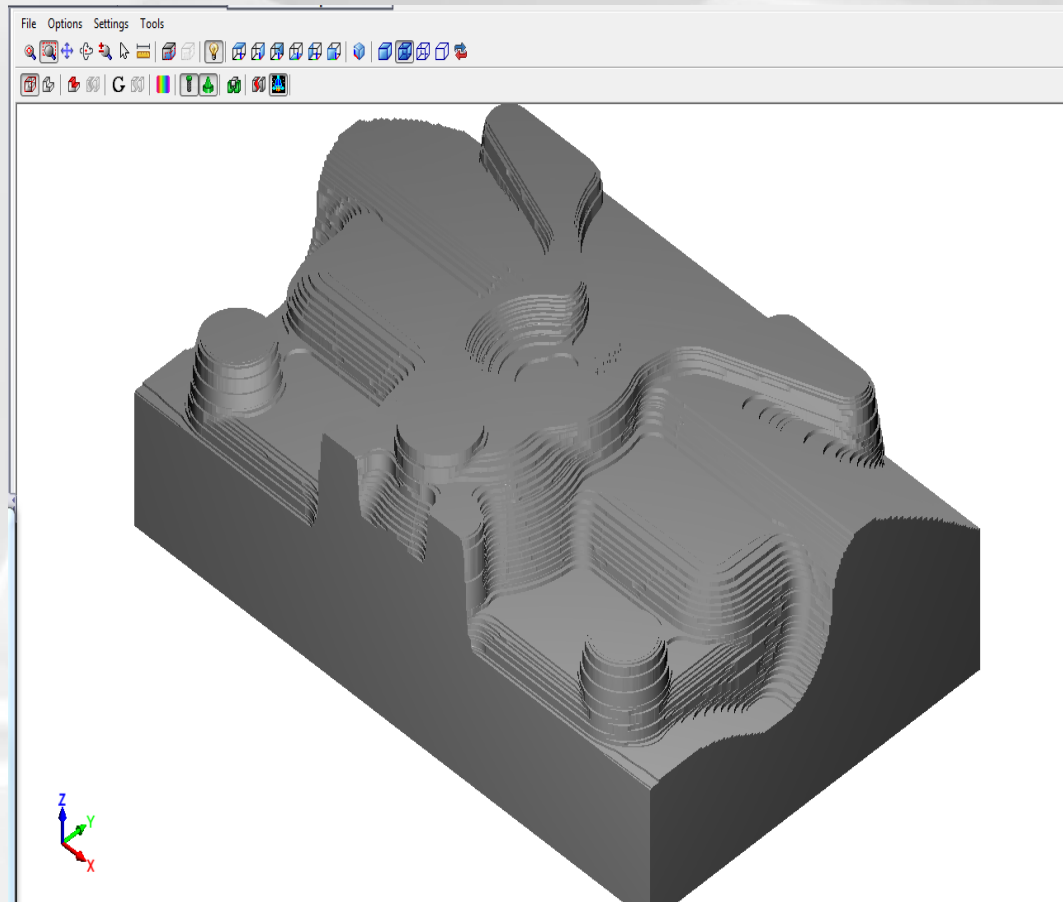
3D iMachining smart positioning

3D iMachining



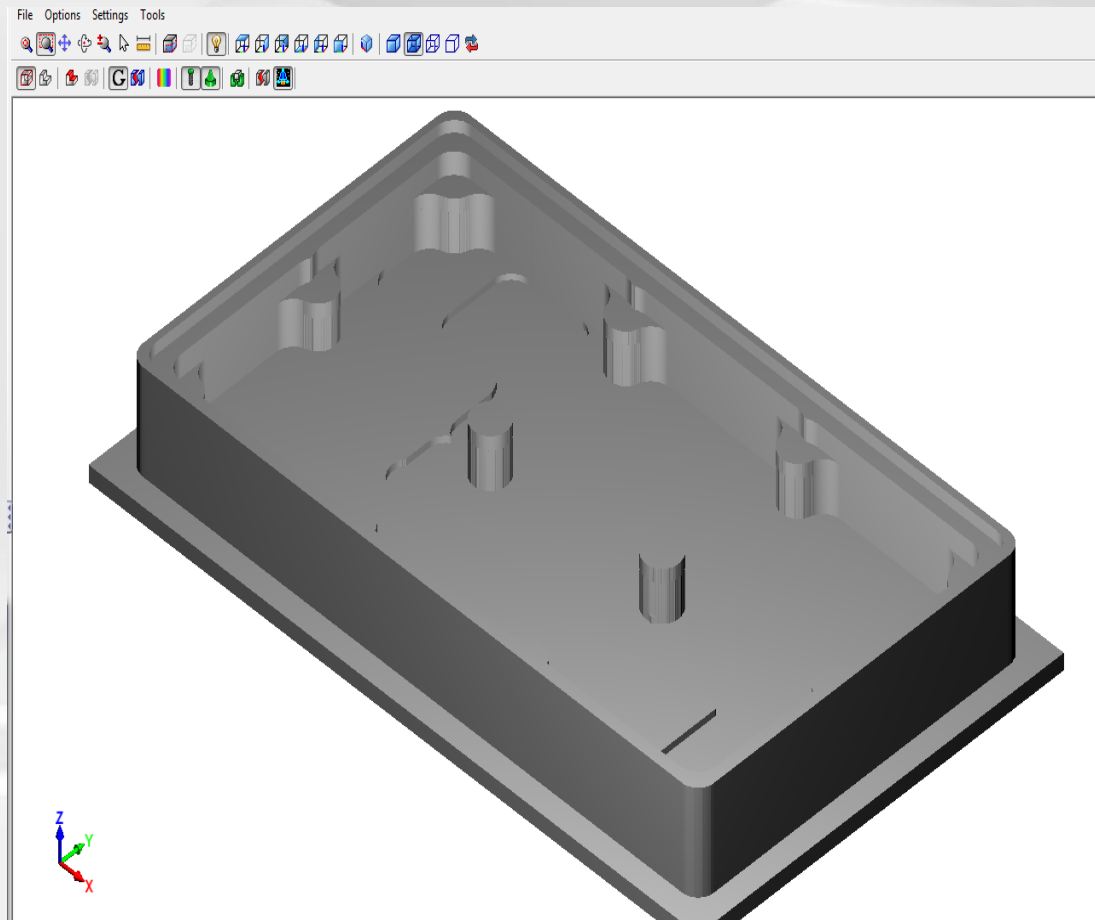
3D iMachining smart positioning

3D iMachining



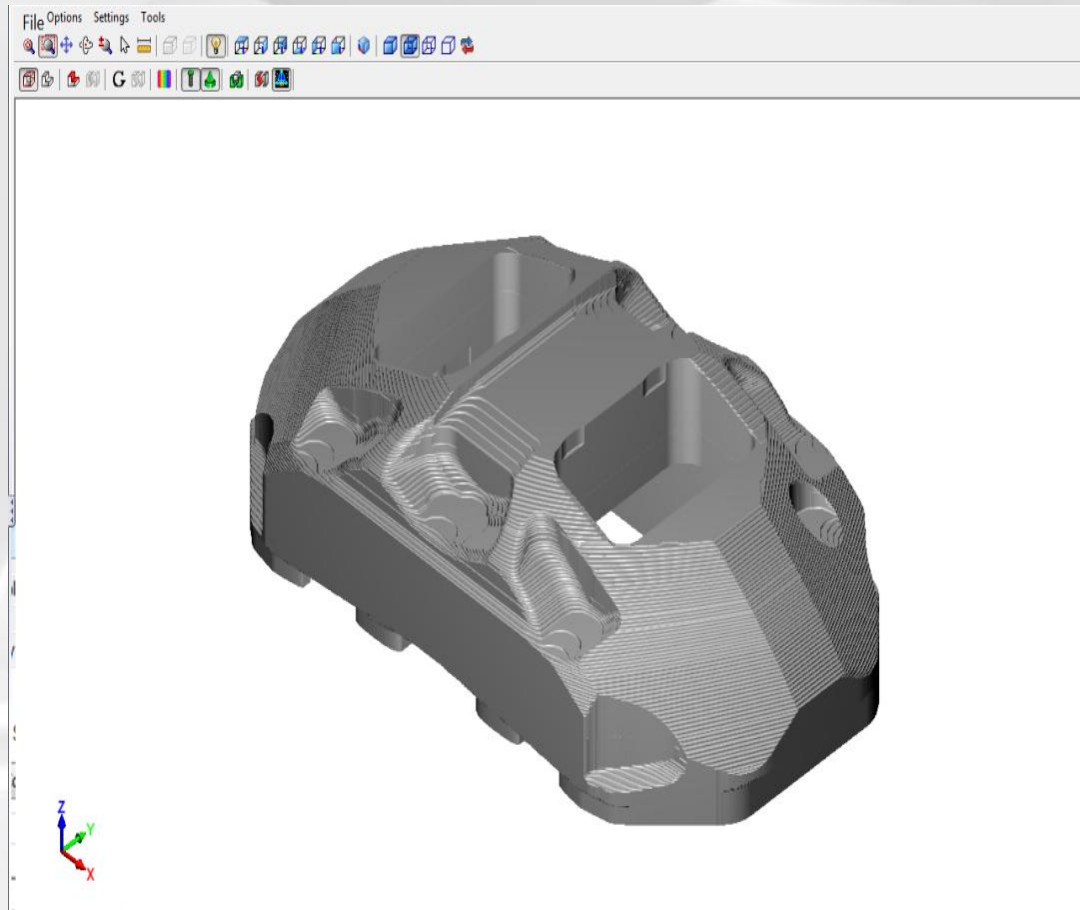
3D iMachining for molds

3D iMachining



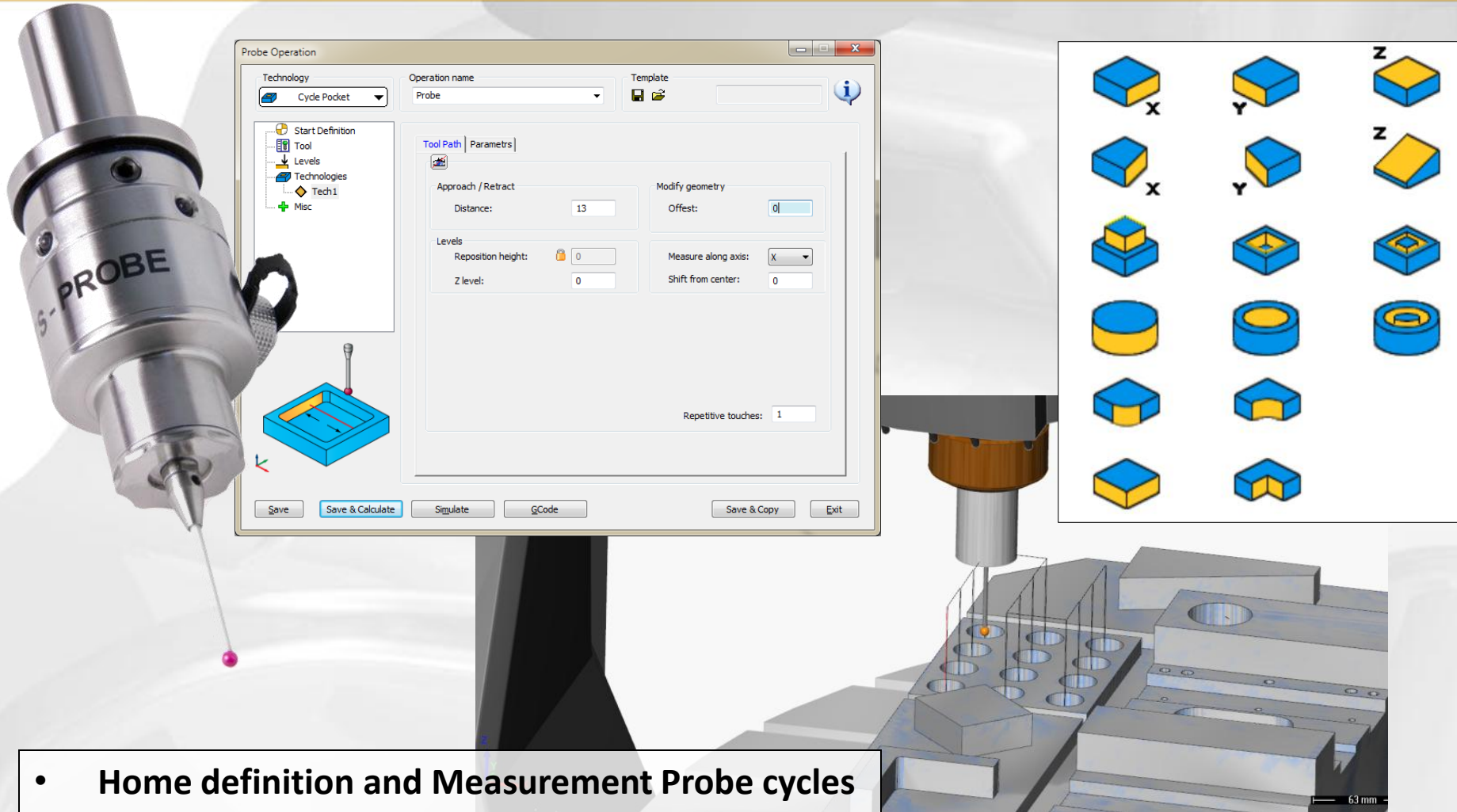
3D iMachining for Prismatic parts

3D iMachining



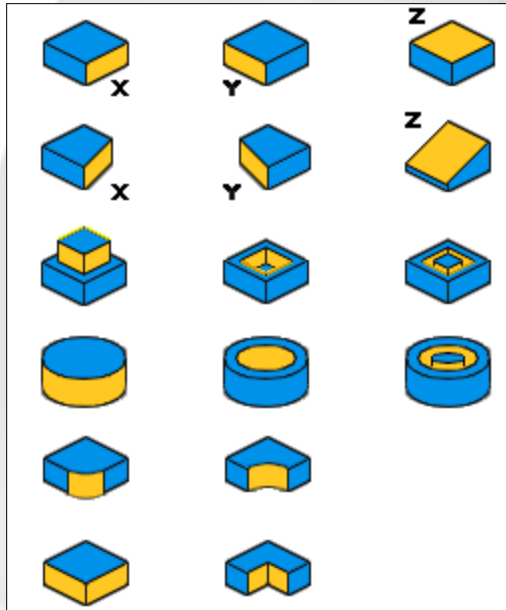
3D iMachining for complex 3D parts

New Product: SolidProbe



- Home definition and Measurement Probe cycles
- Tool presetter

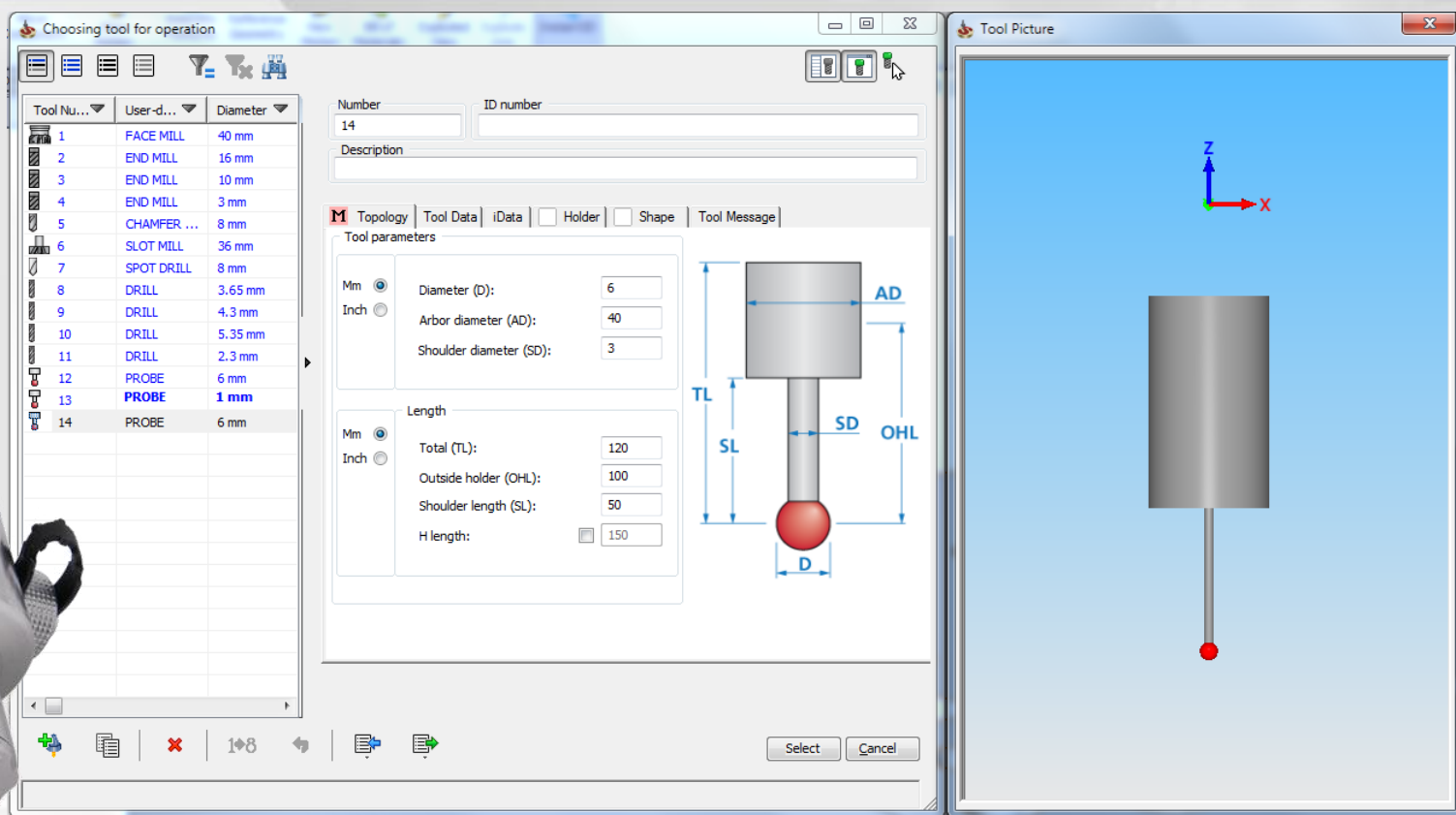
SolidProbe cycles



- Single point X
- Single point Y
- Single point Z
- Angle X
- Angle Y
- Angle Z
- Boss
- Pocket
- Pocket with boss
- Cylinder
- Hole
- Hole with boss
- External arc
- Internal arc
- External corner
- Internal corner

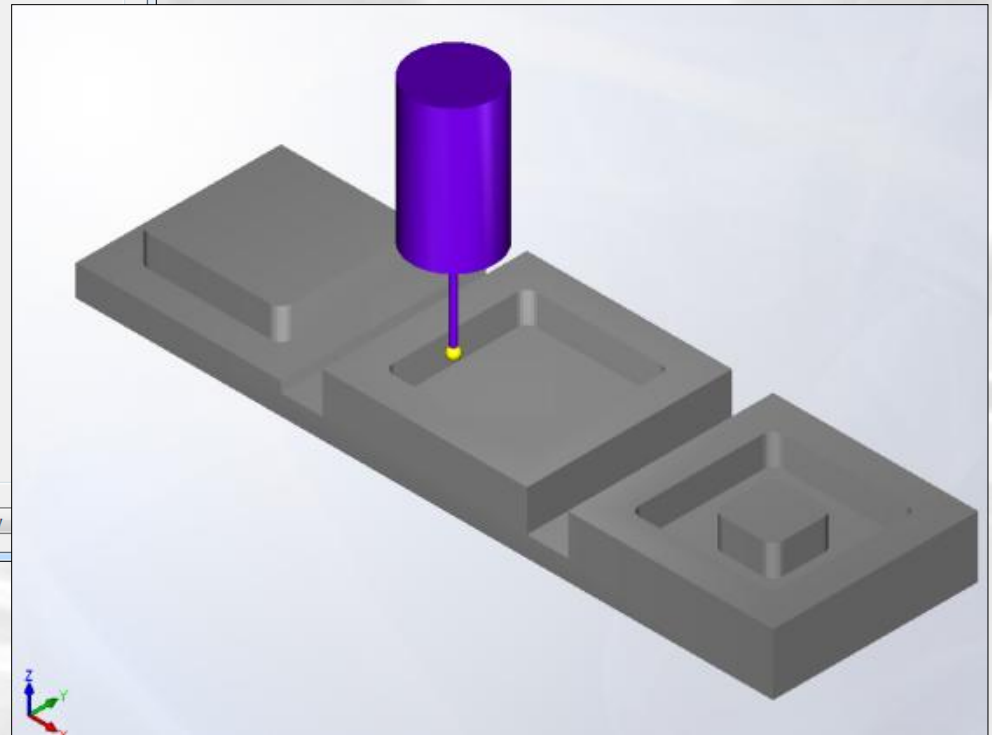
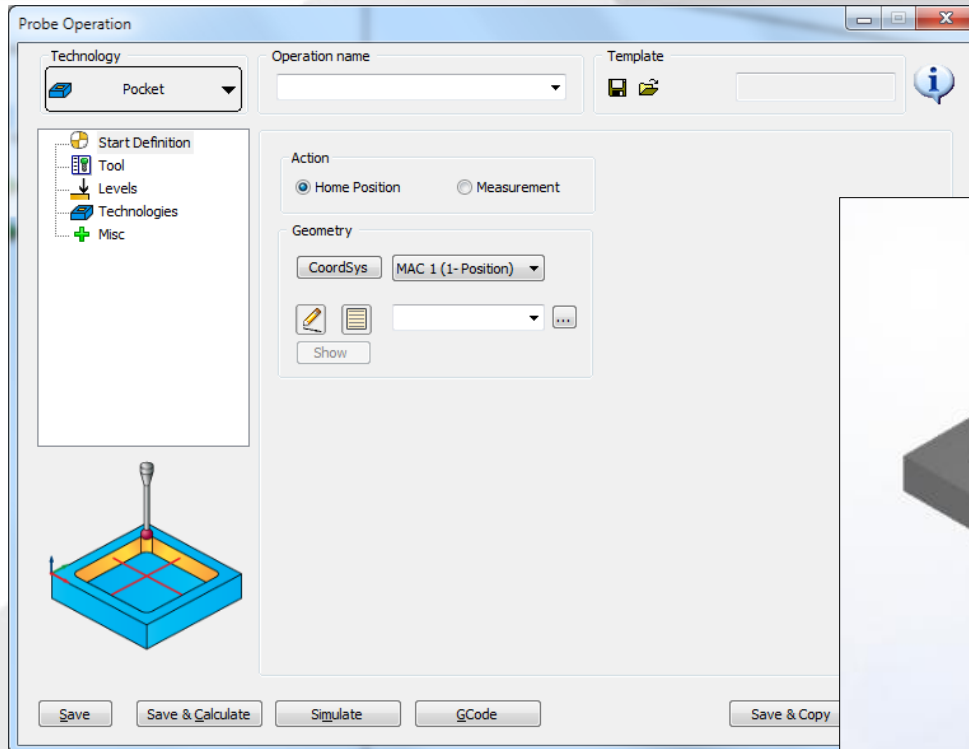
- Possibility to customize cycle usage in Measurement and Home Definition (inside *.VMID file)

Probe Tool



- New Probe tool in tooltable
- Support of Probe tool in all simulations

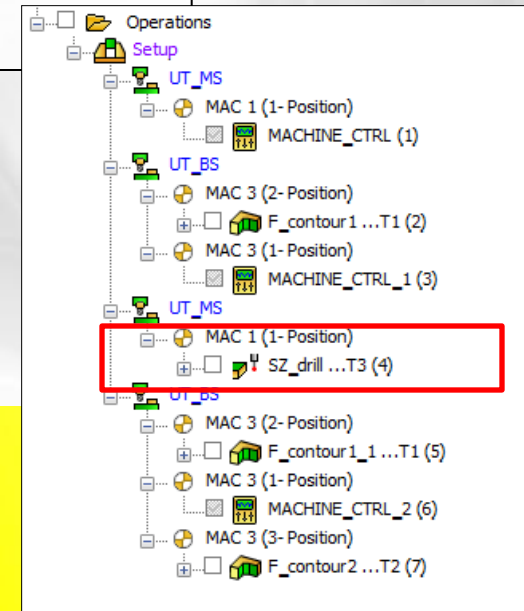
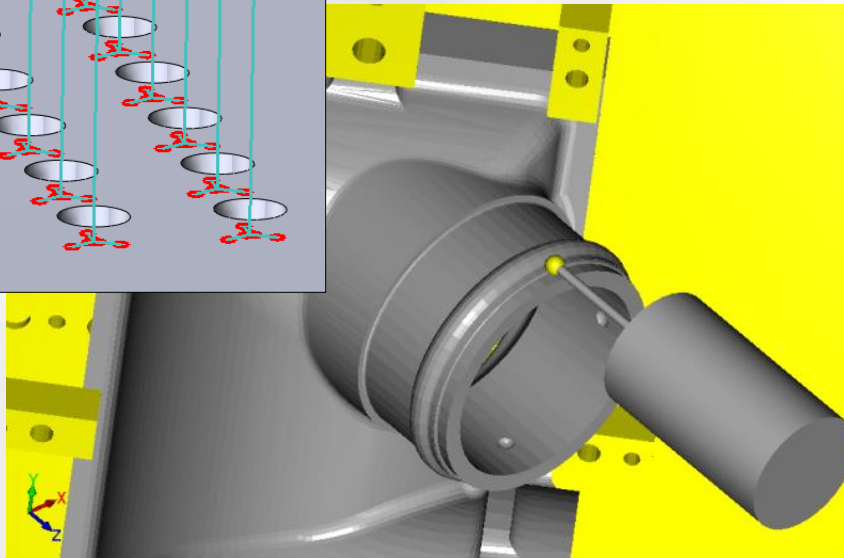
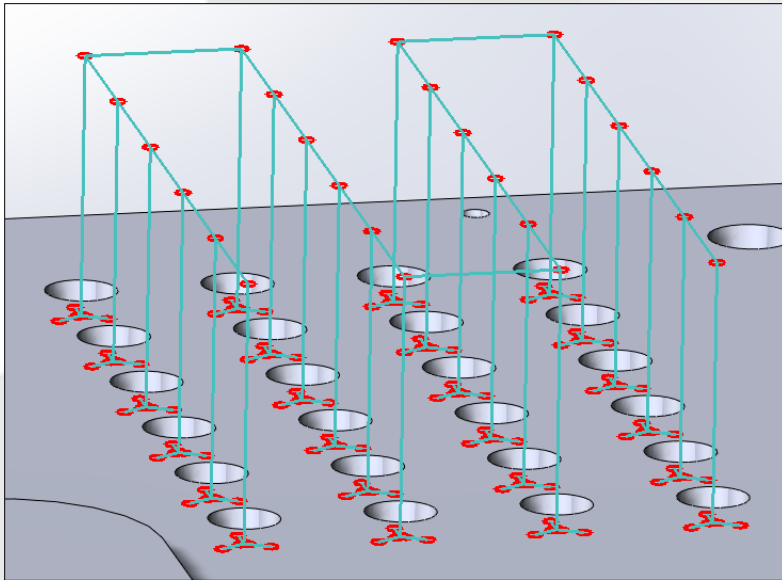
SolidProbe: Home definition



- **Probe cycles support home definition**

SolidProbe: Measurement

- Enables measuring the part, during machining
- Includes many cycles of measurement



User-defined parameters in MachineID

The screenshot displays the Machine ID Editor interface. The main window is titled "MACHINE ID EDITOR : table_table_exercise.vmid" and has a menu bar with "File", "Open", "View", and "Help". Below the menu bar are icons for file operations. The interface is divided into several panes:

- Machine Definition:** Shows a table of coordinates for X, Y, A, and C axes.
- Controller Definition:** A tree view showing a "Probe" cycle with sub-cycles for "All Cycles", "Cycle Plane X", "Cycle Plane Y", "Cycle Plane Z", "Cycle Boss", "Cycle Pocket", "Cycle Pocket with Boss", "Cycle Hole", "Cycle Cylinder", "Cycle Hole with Boss", "Cycle Int. Arc", "Cycle Ext. Arc", "Cycle Int. Corner", "Cycle Ext. Corner", "Cycle Angle X", "Cycle Angle Y", "Cycle Angle Z", and "MCO Cycles". A parameter "My parameter" is highlighted under "Cycle Plane X".
- User Defined Parameters:** A table listing parameters for the selected cycle.
- Probe Operation Dialog:** A separate window for configuring the probe operation.

The "User Defined Parameters" table in the Controller Definition pane is as follows:

Name	Value
GUI Name	My parameter
GPP Name	My_parameter
Type	NUMERIC
Default Value	13.000
Activation State	ON

The "Probe Operation" dialog shows the following configuration:

- Technology:** Single point X
- Operation name:** SX_D1
- Template:** (empty)
- Tool path:** Parameters
- Parameters Table:**

Name	Type	Value
<input type="checkbox"/> Overtravel	Numeric	10.000
<input checked="" type="checkbox"/> My parameter	Numeric	13.000

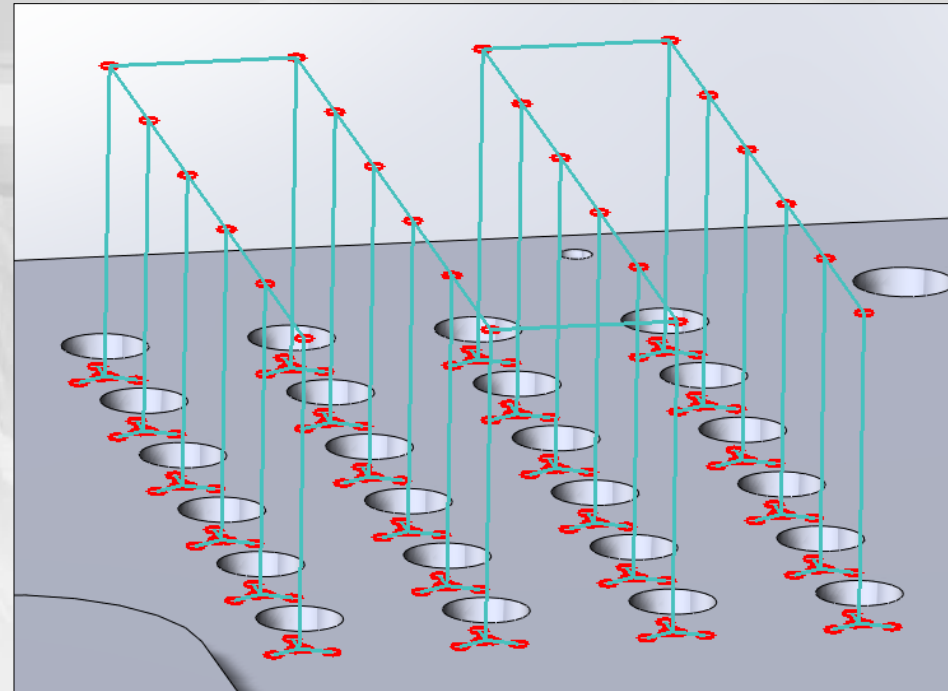
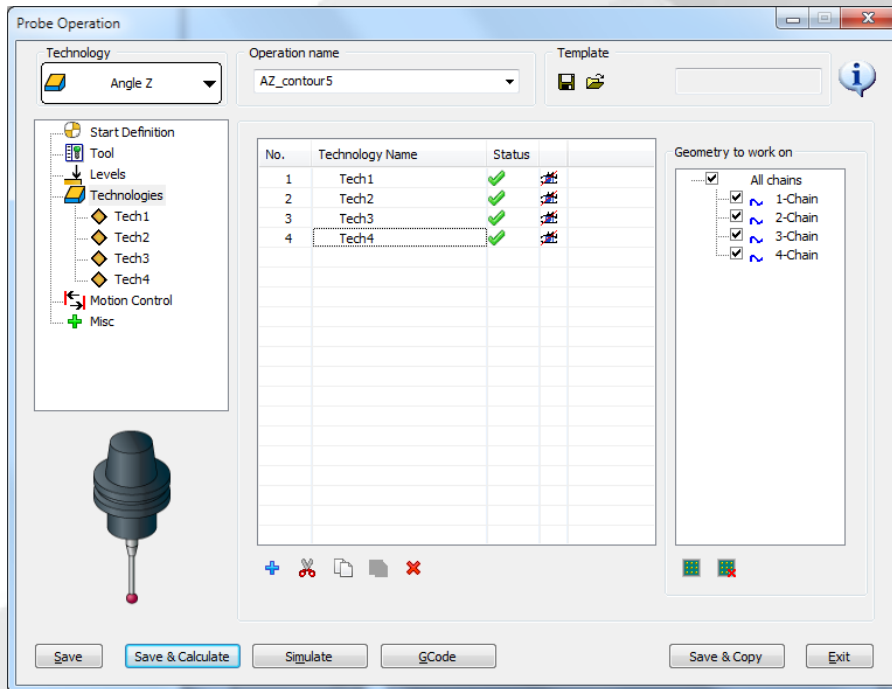
The dialog also includes a "Tolerance" table:

Tolerance	Min	Max
Point X	-0.010	0.010
Point Y	-0.010	0.010
Point Z	-0.010	0.010

At the bottom of the dialog are buttons for "Save", "Save & Calculate", "Simulate", "GCode", "Save & Copy", and "Exit".

- Parameters for each Probe cycle in *.VMID file – Controller Definition page
- Separate GUI and GPP name – for easier localization
- Possibility to activate/deactivate parameter by checkbox

SolidProbe: Technologies page



- **Support for multi-chains(points) geometries**
- **Several technologies (the same cycle type) in the same operation, if needed**
- **Sorting of chains(points)**
- **Preview of several technologies**
- **Preview of geometries by one click**
- **Status of geometry with technology compatibility** ✓ ⚠ !

Machining & Probe operations intermixed

- **Machining operations and Probe operations are intermixed in the CAM manger**
- **Machining operations and Probe operations can use the same geometries**
- **When the solid model is changed, both the machining and probe operations can be automatically synchronized to the change**

