

What's New in SolidCAM 2021



SolidCAM



2021
The MILLTURN / SWISS-Type Edge

The unique, revolutionary Milling technology
iMachining
patented by SolidCAM

TIME SAVINGS
70%
... AND MORE!

iMachining Technology Wizard
for Automatic Feeds and Speeds

TOOL MATERIAL
MACHINE GEOMETRY

ADVANCED **MILL-TURN** & SWISS-TYPE SOLUTIONS

iMachining 2D & 3D | 2.5D Mill | AFRM | HSS | 3D HSR/HSM | Indexial Multi-Sided | Sim. 5X | Turning | Advanced **MILLTURN** | Solid Probe

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What's New in SolidCAM 2021











- **SolidCAM 2021 is our BEST version ever!**
- It has a **Powerful New Tool Table – ToolKit** (important especially for Mill-Turn & Swiss-Type customers).
- It has an amazing **new SolidCAM Simulator**.
- It provides additional functionality in **Advanced Mill-Turn and Swiss-Type**.
- It also provides additional **advanced functionality in all other modules** – 2.5D Milling, HSR, THSR, HSM, THSM & Sim. 5x.

What's New in SolidCAM 2021

New Tool Table

Getting Started with SolidCAM's New Tool Table

- Click the **PLAY** buttons to see the “Getting Started with ToolKit” Recordings on YouTube

-  Basics of creating and defining tools
 -  Adding tool adaptor and holder
 -  Handling various cutting conditions
 -  Customizing tool list details
 -  Adding and using multiple cutting points
 -  Importing CAM and TAB tools
 -  ToolKit Settings overview
-  Adjusting tool assembly connections
 -  Visualizing tools and assemblies
 -  Tool properties used in iMachining

New Tool Table

TOOLKIT: 2_5D_Milling_1

File Edit View Help

<Quick Filter>

Machine Name: Hermle_SAE

| Tool Number | T... | Diameter | Tool Type | Desc... | Tool ID |
|-------------|------|----------|-----------|---------|---------|
| 1 | | 40.000 | FACE ... | | |
| 2 | | 16.000 | END ... | | 0 |
| 3 | | 10.000 | END ... | | 0_1 |
| 4 | | 3.000 | END ... | | 0_2 |
| 5 | | 8.000 | CHA... | | 0_3 |
| 6 | | 36.000 | SLOT ... | | |
| 7 | | 8.000 | SPOT ... | | 0_4 |
| 8 | | 3.650 | DRILL | | 0_5 |
| 9 | | 4.300 | DRILL | | 0_6 |
| 10 | | 5.350 | DRILL | | 0_7 |
| 11 | | 2.300 | DRILL | | 0_8 |

Tool [1] (FACE MILL D40 R0)
HSK A 63 ER 32x100
FACE MILL
Cutting Point

Catalog number:

Shape type: Parameter Data

Swap Units Data: mm <-> inch ...

FACE MILL

Tool parameters

Diameter (D): 40 mm

Tip diameter (TD): 40 mm

Corner radius (R): 0 mm

Taper angle (A): 90°

Shoulder diameter (SD): 32 mm

Arbor diameter (AD): 32 mm

Cutting (CL): 20 mm

Cutting shoulder length (CSL): 30 mm

Start shoulder length (SSL): 30 mm

Shoulder length (SL): 35 mm

Shoulder angle (SA): 0°

Total length (TL): 60 mm

Outside holder (OHL): 40 mm

Helical angle: 45 (Medium)

Rough Number of flutes: 4

New ...

Tool Components Library

Tool Assemblies Library

Machine Tool Setup Library

OK Cancel

TOOLKIT: ToolsComponents.tlv

File Edit View Help

Feed & Spin [X] | Feed & Spin

Metric

Feed units: F (mm/min) FZ (mm/tooth)

Feed X1: 1000

Finish feed X1: 800

Feed Z: 300

Feed Z for penetration only

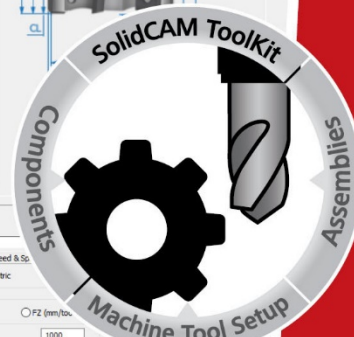
Feed Link, %: 200

Feed Lead 0%, %: 100

Spin finish: 3500

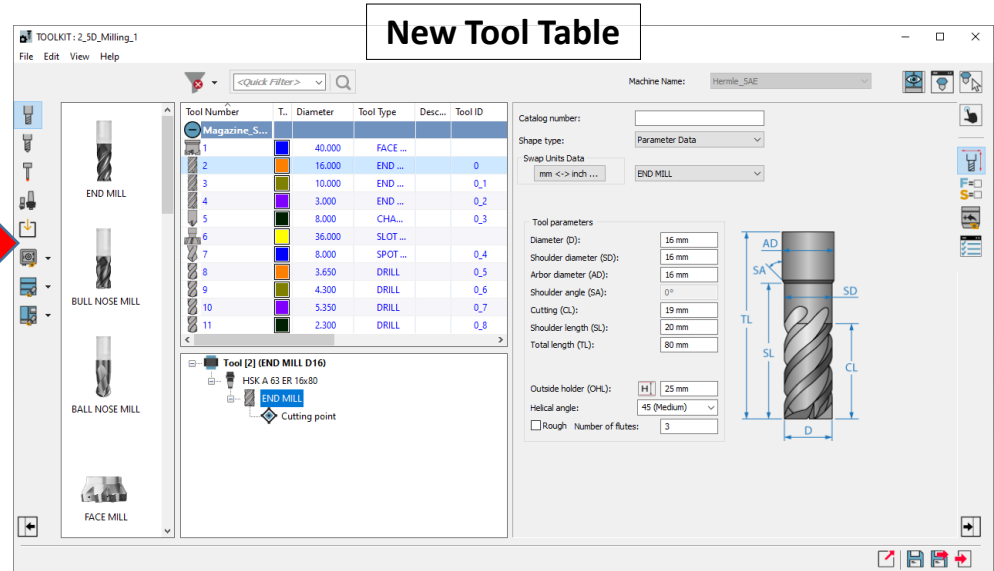
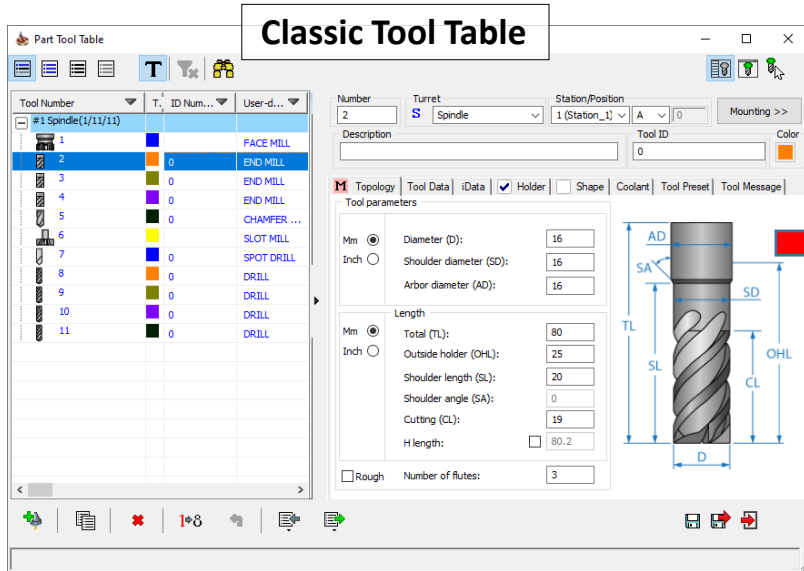
Spin direction: CW CCW

Machining level: 5



SolidCAM ToolKit

- Classic Tool Table is replaced by SolidCAM's powerful New Tool Table feature, ToolKit
 - Unified Tool Library system that facilitates better tool management
 - Provides major enhancements in Tool definition functionality



ToolKit's Part Tool Library

- Manage Tool Items available for use in a specific CAM-Part and in accordance with the CNC-Machine chosen for the CAM-Part Definition
 - Same level of functionality as Machine Tool Setup Library

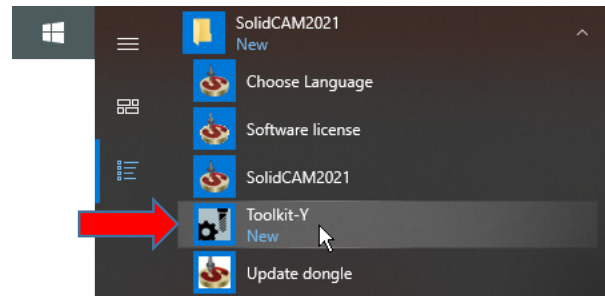
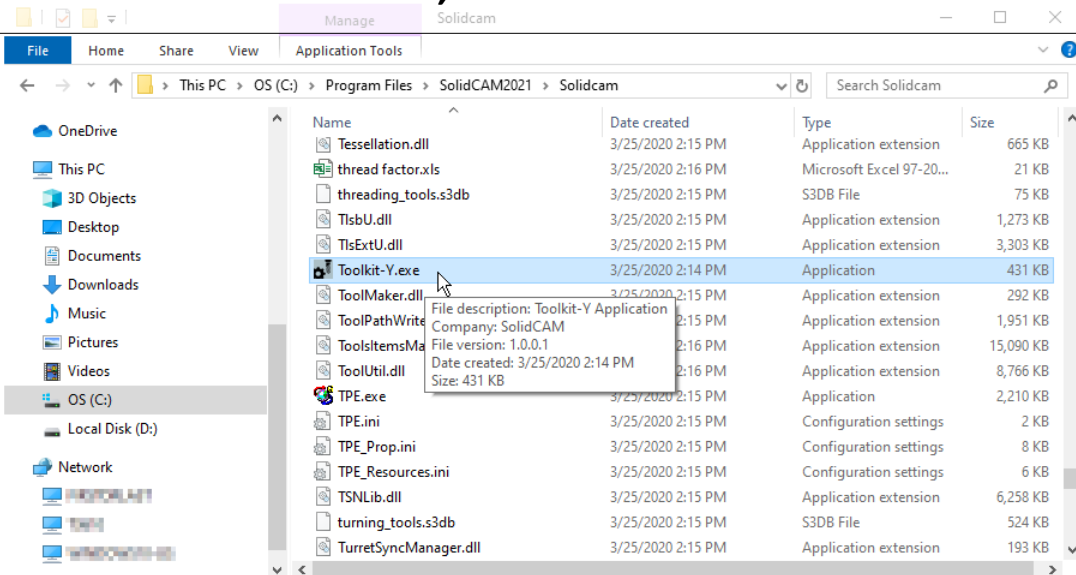
The screenshot displays the 'TOOLKIT: Mill_Turn_Swiss-Type' window. On the left, a vertical toolbar shows icons for various tool types, including 'END MILL' and 'BULL NOSE'. A central 'Part Tool Table' lists tool items with columns for Tool Number, Diameter, Tool Type, Desc..., and Tool ID. Red arrows point from the tool icons in the toolbar to the corresponding rows in the table. On the right, the 'Machine Name' is set to 'Star SR-38 type B'. Below this, there are fields for 'Catalog number', 'Shape type' (Parameter Data), and 'Swap Units Data' (mm <-> inch ...). The 'Tool parameters' section includes fields for Diameter (D), Shoulder diameter (SD), Arbor diameter (AD), Shoulder angle (SA), Cutting (CL), Shoulder length (SL), and Total length (TL). A 3D diagram of an end mill is shown with dimension lines for AD, SA, SD, TL, SL, and CL. The 'Outside holder (OHL)' is set to 25 mm, and the 'Helical angle' is 45 (Medium). The 'Number of flutes' is 3.

| Tool Number | T. | Diameter | Tool Type | Desc... | Tool ID |
|----------------|----|----------|-----------|---------|---------|
| Magazine_T... | | | | | |
| Turning [T1... | | | | | |
| 1 | | | Groove | | |
| 2 | | | Thread | | |
| 3 | | | Profile | | |
| 4 | | | Groove | | |
| Milling [T6... | | | | | |
| 6 | | 3.000 | DRILL | | |
| 7 | | 6.000 | END ... | | |
| Milling [T3... | | | | | |
| 31 | | 3.000 | TAP | | |
| B1->MS [T1... | | | | | |
| 17 | | 3.000 | DRILL | | |
| 18 | | 6.000 | END ... | | |

Machine tool holding devices and Tool Items mounting positions reflected in Part Tool Table

ToolKit Integrated AND Standalone

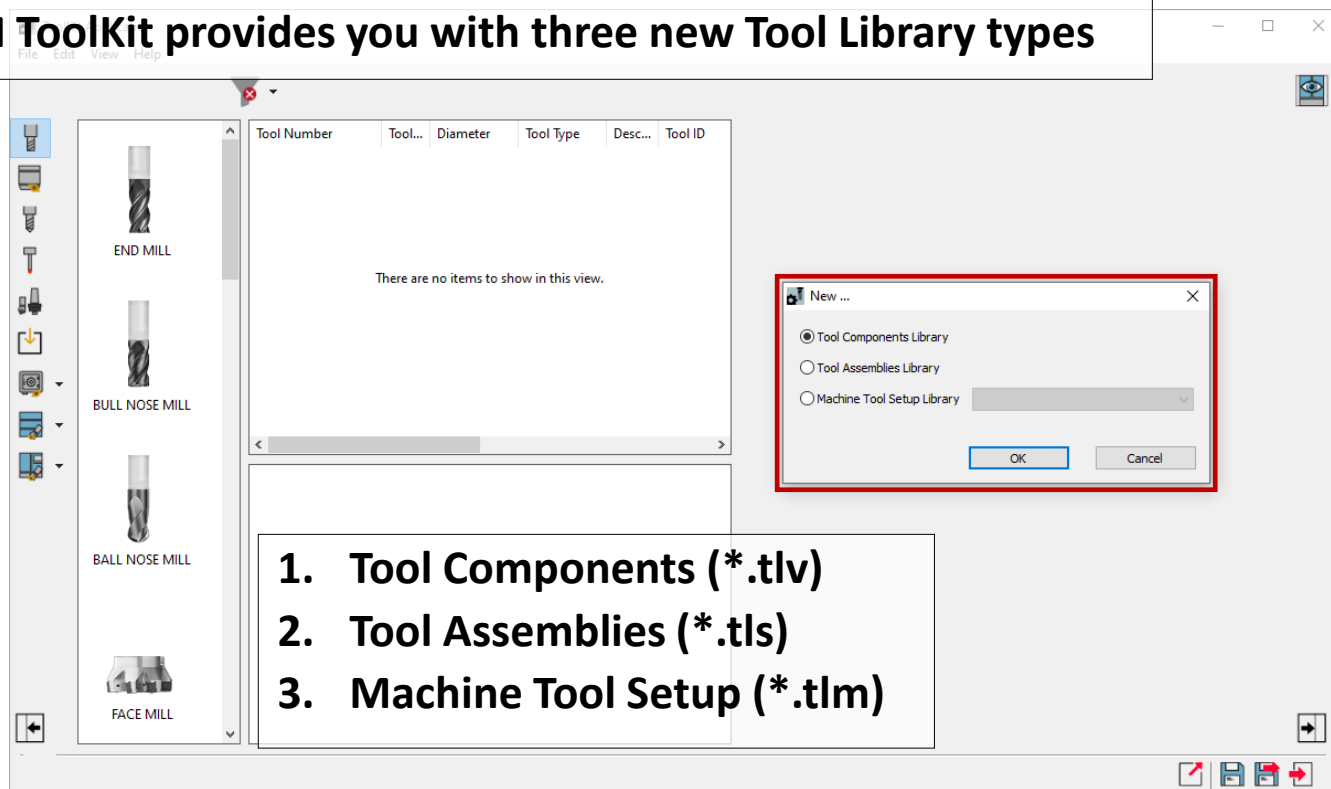
- Make new and edit existing ToolKit Tool Libraries from inside SOLIDWORKS/SolidCAM or totally independent of your CAD/CAM software using ToolKit standalone
- For new Tool Libraries, launch ToolKit standalone from your Start Menu



Full path to standalone application is C:\Program Files\SolidCAM2021\Solidcam\Toolkit-Y.exe

ToolKit – New Tool Libraries

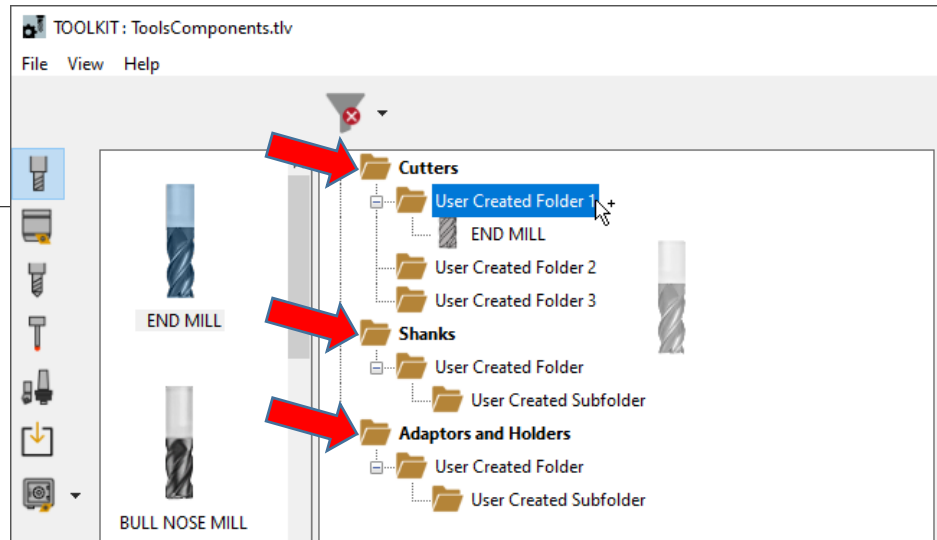
- **SolidCAM ToolKit** provides you with three new Tool Library types



1. **Tool Components (*.tlv)**
2. **Tool Assemblies (*.tls)**
3. **Machine Tool Setup (*.tlm)**

Tool Components Library

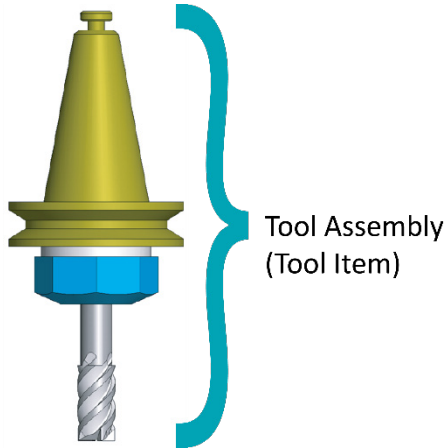
- Manage all your individual tool components, such as those typically stocked in your machine shop warehouse
- Customizable folders to keep your component files organized in main library structure:
 - Cutters
 - Shanks
 - Adaptors and Holders



Tool Assemblies Library

- Manage tool assemblies (Tool Items) existing in Tool Storage and prepared for use on any given CNC-Machine

- Each Tool Item comprises a combination of tool components, such as the cutter and the tool holding system



TOOLKIT : ToolsAssemblies.tls

File View Help

SolidCAMComponentsLib

- Cutters
 - Metric
 - Imperial
- Shanks
- Adaptors and Holders
 - Adaptors
 - HSK A 63
 - BT40
 - BT50
 - SPECIAL
 - Holdings for 1/8" Endmill
 - Holdings for 1/4" Endmill
 - Holdings for 5/16" Endmill
 - Holdings for 3/8" Endmill

| Tool Number | T. | Diameter | Tool Type | Description |
|---------------|--------|----------|-----------|-------------|
| < Storage ... | | | | |
| 1 | Blue | 120.000 | FACE ... | |
| 2 | Orange | 10.000 | END ... | |
| 3 | Green | 12.000 | TAPER... | |
| 4 | Blue | 6.000 | BALL ... | |
| 5 | Black | 10.000 | SPOT ... | |

Tool [1] (FACE MILL D120 R0)

- HSK63
 - Fly_Holder
 - FACE MILL
 - Cutting Point

Machine Tool Setup Library

- Manage Tool Items in Machine environment, according to VMID of specific CNC-Machine
- The Tool Item definitions include their mounting positions on the CNC-Machine (i.e., in the Magazine Pockets and Tool Stations of the Turret(s))

MACHINE ID EDITOR : Hermle_5AE.vmid

TOOLKIT : Hermle_5AE.TLM

Advanced View shown for illustrative purposes

| Magazine No. | Color | Quantity | Tool Name | Tool ID |
|--------------|------------|----------|-----------|----------------------|
| 1 | Blue | 120.000 | FACE ... | FACE MILL D120 R0 |
| 2 | Orange | 10.000 | END ... | END MILL D10 |
| 3 | Green | 12.000 | TAPER... | TAPER MILL D12 R0 |
| 4 | Blue | 6.000 | BALL ... | BALL NOSE MILL D6 R3 |
| 5 | Dark Green | 10.000 | SPOT ... | SPOT DRILL D10 |

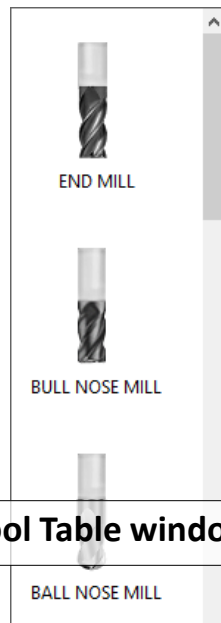
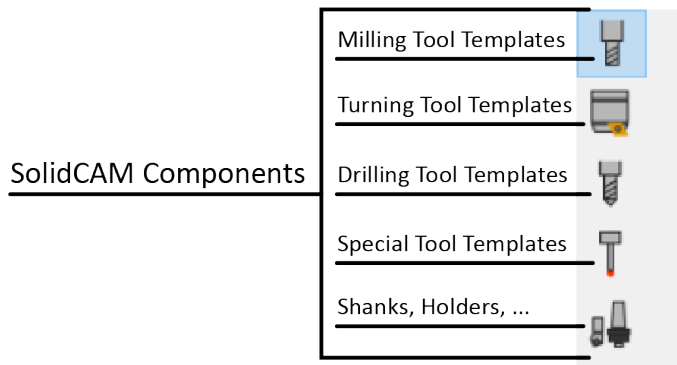
VMID tool holding device properties reflected in corresponding Machine Tool Table

Adding Components

- Easily add components to your Tool Library using the extensive SolidCAM Components

On Library Toolbar, choose the templates you want displayed in the Selection Pane

Drag & drop to your Tool Library



Tool Assemblies Library

| Tool Number | T.. | Diameter | Tool Type | Description | Tool ID |
|---------------|-----|----------|-----------|-------------|---------|
| < Storage ... | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

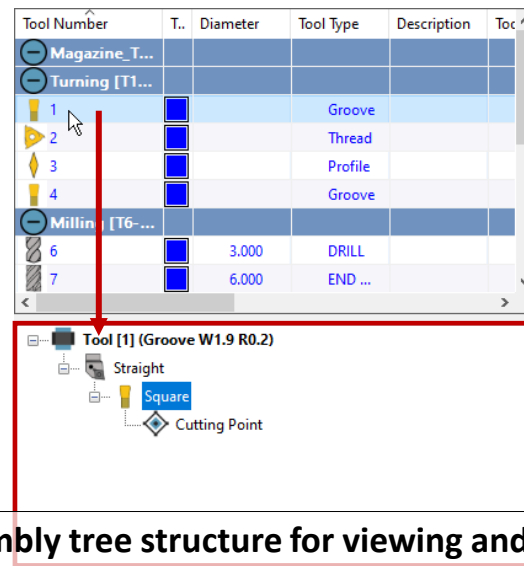
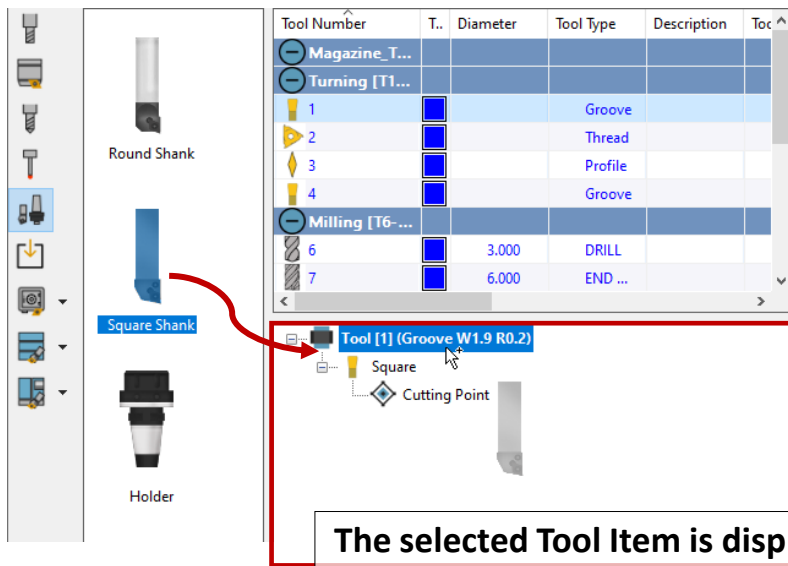
Machine Tool Setup / Part Tool Library

| Tool Number | T.. | Diameter | Tool Type | Description | Tool ID |
|-----------------|-----|----------|-----------|-------------|---------|
| Magazine_T... | | | | | |
| Turning [T1... | | | | | |
| Milling [T6... | | | | | |
| Milling [T31... | | | | | |
| B1->MS [T1... | | | | | |
| B1->BS [T17... | | | | | |
| Turning [T5... | | | | | |

Note: Tool build starts by adding Cutter component to Tool Table window

Creating Tool Assemblies

- The Tool Item Manager (in Tool Assemblies, Machine Tool Setup and Part Tool Libraries) enables you to easily create tool assemblies, aka Tool Items
- Build upon the Cutter with additional components such as Shanks, Adaptors & Holders



The selected Tool Item is displayed in assembly tree structure for viewing and editing

Tool Assemblies from SolidCAM Components

- Easily build tool assemblies using SolidCAM's default Tool Components Library
- SolidCAMComponentsLib.tlv is included with the installation of SolidCAM

TOOLKIT: Multi_Sided_Machining_2

Machine Name: Hermle_5AE

| Tool Number | T. | Diameter | Tool Type | Desc |
|---------------|----|----------|-----------|------|
| Magazine_S... | | | | |
| 1 | | 120.000 | FACE ... | |
| 2 | | 10.000 | END ... | |
| 3 (3A) | | 24.000 | SLOT ... | |
| 3 (3B) | | 24.000 | SLOT ... | |

Number of Items: 506
Total Price: 0,000

SolidCAMComponentsLib is automatically loaded in the Selection Pane when Adaptors and Holders are added to the tool assembly

Tool [2] (END MILL D10)
HSK63
HOLDER
END MILL
Cutting point

Tool Assemblies from STL Models

- Easily build tool assemblies using 3D models downloaded from your preferred online resource, such as MachiningCloud and Iscar, Kennametal or any other website...

Details - Iscar - 4504061

Inch Metric Create a new Tool Assembly Add To Check Availability **Download Model**

Send Copy To

| | |
|----------------|-------------------|
| Catalog Number | 4504061 |
| Designation | BT40 SRKIN 10X 90 |
| SS | 40 |
| DCONWS | 10 |
| BD | 32 |
| BTED | 24 |
| LPR | 90 |
| LBX | 63 |
| LB | 50.5 |

Thermal shrink chucks with BT MAS 403 form AD taper shanks for carbide HSS and steel tools.
Use only inductive heating device for SRKIN holders @ For solid carbide, HSS and steel tools @ For shank dimensions and shrink units information, click on 'More Info' @ ISCAR cannot guarantee an unbalance value less than 1 gr x mm

Technical drawing labels: CRKS, SS, Me, LSCWS, ADURGA, 4°30', DCONWS, BTED, BD, LB, LBX, ITHID.

3D Viewer labels: LPR = 90.00 mm, CAN = 19.50 mm, Report a problem

To speed up productivity, you can:

1. Use SOLIDWORKS Task Scheduler to quickly and easily convert multiple models to STL format
2. Import entire folders of STL models to a Tool Components Library using the Import Structure option
3. Build tool assemblies with STL models from the Tool Components Library

Complex Tool Assemblies

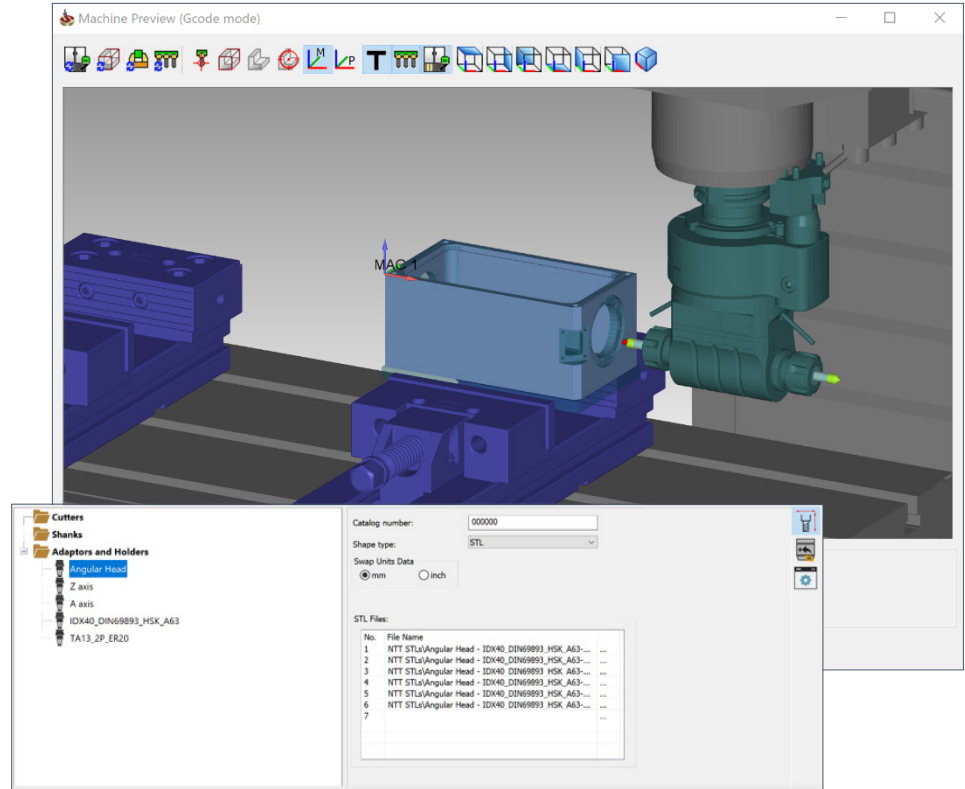
- ToolKit enables you to easily create multi-body holders and multi-tool assemblies

The screenshot displays the SolidCAM software interface for configuring a complex tool assembly. The main window is divided into several panels:

- Tool List:** A table listing tool parameters for two tools.
- Tree View:** A hierarchical tree structure showing the assembly of Tool [4], including components like RB65MID2525MMHIDS, ST 25X 50 ER25 F, ER25 SPR AA, and ECA050B14-2C06, along with cutting points.
- Connect to Joint:** A dropdown menu set to 'Station'.
- Mounting:** Input fields for X, Y, Z, Rx, Ry, and Rz coordinates, all currently set to 0.
- Joints Table:** A table listing joint configurations for Tool 1 M, Tool 1 B, Tool 2 M, Tool 2 B, Tool 3 M, and Tool 3 B.
- Tool 1 M CoordSys:** Input fields for X, Y, Rx, and Ry coordinates, all set to 0.
- Pattern:** A button for applying patterns.
- Drive Unit Type:** A dropdown menu set to 'DIRECT'.
- Tool Viewer:** A 3D perspective view of the tool assembly, showing a black holder with six tool holders. The tools are labeled: Tool 1 M, Tool 2 M, Tool 3 M, Tool 1 B, Tool 2 B, and Tool 3 B. The holder is labeled '4 (Station_4)'. Red, green, and blue arrows indicate the orientation of each tool.

Angular Head Adaptors

- **ToolKit** enables you to easily create angular head adaptors from multiple components
- **Assembly structure** and **Joints** makes defining multiple tools easy
- **VMID – Tilt Plane** definition and angular head adaptors
 - Machine Plane by Tilt Plane
 - Arcs in ZX and YZ planes
 - Compensation in ZX and YZ planes
 - Machine Preview and Tilt Plane



Tool Components/Assemblies Linking

- Possibility to work with and import from multiple Tool Components Libraries
- Imported components/assemblies are linked between your ToolKit Tool Libraries, making it easy to update linked components if modified in parent library

Import from

- Tool Components Library
- Tool Assemblies Library
- Machine Tool Setup Library

Library Toolbar

The screenshot shows the SolidCAM software interface. On the left, a 'Library Toolbar' contains three icons for 'Tool Components Library', 'Tool Assemblies Library', and 'Machine Tool Setup Library'. The main window displays a list of tool components, with 'BT40 SRKIN 10x90' selected. A context menu is open over this tool, showing options like 'Collapse', 'Swap Views', 'Rename', and 'Restore Link'. A red arrow points from the 'Restore Link' option to a status bar message: '*Component not updated from 'SolidCAMComponentsLib.TLV''. Another red arrow points from this message to the 'Restore Link' option in the context menu.

| 7 | 8.000 | TAP | 7A |
|---|--------|--------|----|
| 8 | 12.000 | CHA... | 8A |

Tool [2] (END MILL D10)

- HSK63
- BT40 SRKIN 10x90
- END MILL
- Cutting

*Component not updated from 'SolidCAMComponentsLib.TLV'

- Restore Link
- Update Component
- Reload Component

Defining the Tool Assembly Data

- Manage complete information about the Tool Item and its assembled components using the Data Toolbar and corresponding Data Pane
- Tool Item tree selection determines data displayed and parameters/options availability

The screenshot displays the SolidCAM software interface for defining tool assembly data. On the left, a table lists tool items:

| Tool Number | T. | Diameter | Tool Type | Description |
|-----------------|----|----------|-----------|-------------|
| Turning [T1... | | | | |
| 1 | | | Groove | |
| 2 | | | Thread | |
| 3 | | | Profile | |
| 4 | | | Groove | |
| Milling [I6... | | | | |
| 6 | | 3.000 | DRILL | |
| 7 | | 6.000 | END ... | |
| Milling [T31... | | | | |

Below the table is a tool tree showing the hierarchy: Tool [7] (END MILL D6) -> HOLDER -> END_MILL -> Cutting Point. A red arrow points from the END_MILL item to the data pane.

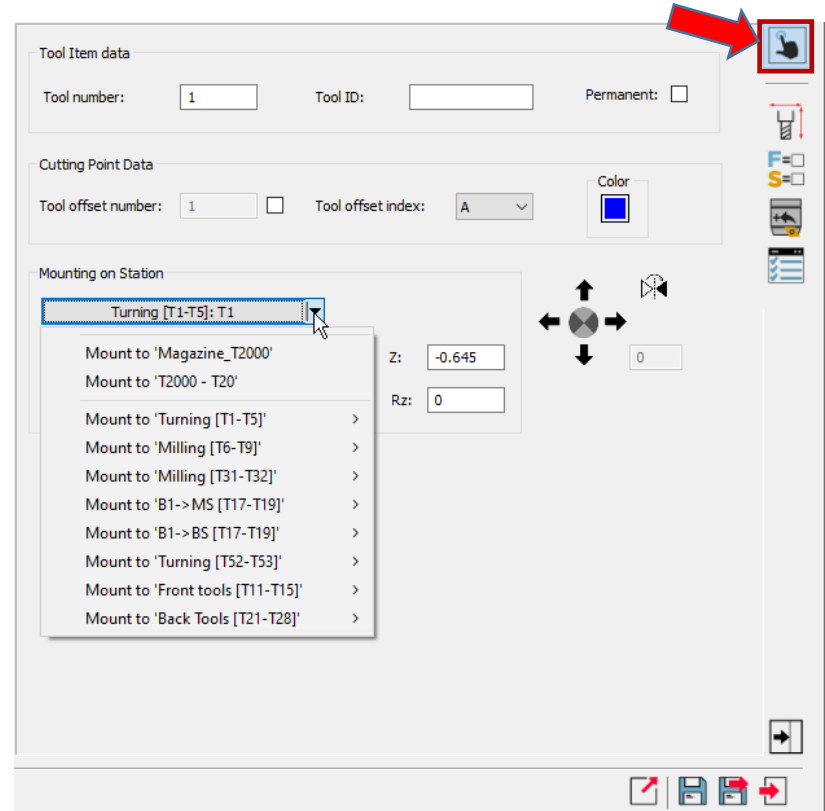
The data pane, titled "Data Toolbar" and "Data Pane", contains the following parameters for the selected tool:

- Catalog number: []
- Shape type: Parameter Data
- Swap Units Data: mm <-> inch ...
- END MILL
- Tool parameters:
 - Diameter (D): 6 mm
 - Shoulder diameter (SD): 6 mm
 - Arbor diameter (AD): 6 mm
 - Shoulder angle (SA): 0°
 - Cutting (CL): 15 mm
 - Shoulder length (SL): 20 mm
 - Total length (TL): 80 mm
- Outside holder (OHL): H | 25 mm
- Helical angle: 45 (Medium)
- Rough Number of flutes: 3

A 3D model of the tool is shown with dimensions labeled: AD (Arbor diameter), SA (Shoulder angle), SD (Shoulder diameter), TL (Total length), SL (Shoulder length), CL (Cutting length), and D (Diameter).

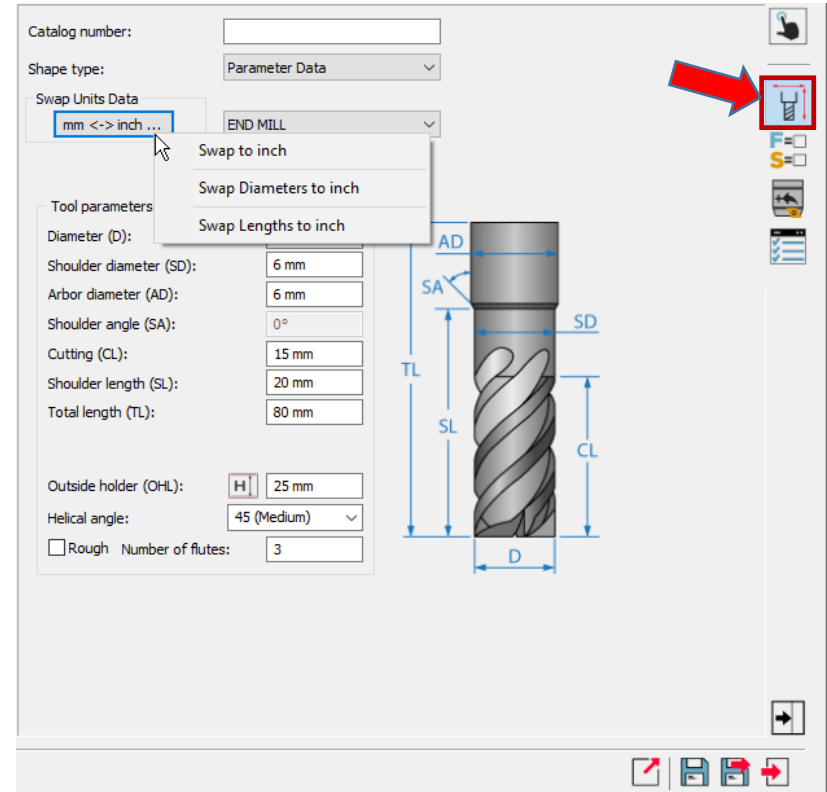
Quick Access Data

- Quickly and easily manage important aspects of your Tool Items, such as:
 - Tool Item identifiers (Tool Number, Tool ID, Tool offset parameters, etc.)
 - Setting Tool Item as Permanent
 - Mounting position on CNC-Machine



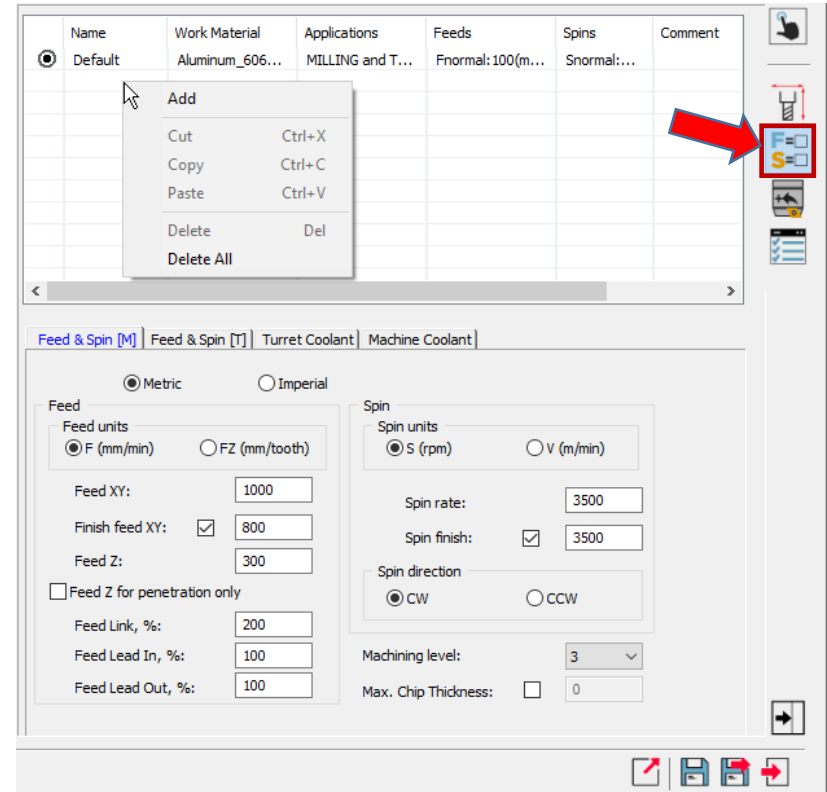
Topology Data

- **Easy management of Tool Item geometries**
- **Different components (e.g., Cutter vs. Holder) can be defined by different Shape types:**
 - **Parameter Data specifies dimensions as pictured in the image**
 - **2D Sketch specifies dimensions using a variety of segment shapes**
 - **3D Model defines component by one or more STL/STEP files**
- **Possibility to quickly swap the units (mm to inch and vice versa)**



Cutting Condition Data

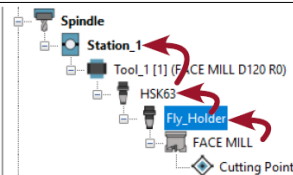
- Easily manage, for Cutter components, any number of default Cutting Condition sets
 - Specific to different Work Materials
 - Specific to different Applications (Milling [M] and/or Turning [T])
- Define, in same place, the Feed & Spin data for Milling and Turning operations



Connection Data

- Easily manage the geometric relationships between Tool Item components
 - Mounting position of each component is connected to Joint CoordSys position of higher component
 - Mounting position of topmost component is connected to Station CoordSys position of Station to which it is mounted
- Possibility to shift and rotate each position

Mounting hierarchy reflected in Tool Item tree



Advanced View shown for illustrative purposes

Connect to Joint: Joint_1

Mounting

X: 0 Y: 0 Z: 0

Rx: 0 Ry: 0 Rz: 0

| Name | Position | Rotation | Axis | Drive Unit |
|---------|-------------------------|-----------------------|------|------------|
| Joint_1 | (0.000, 0.000, -35.000) | (0.000, 0.000, 0.000) | | DIRECT |

Joint_1

CoordSys

X: 0.000 Y: 0.000 Z: -35.000

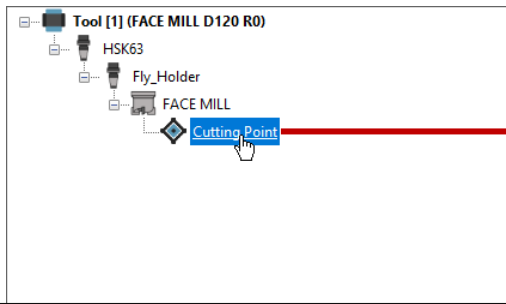
Rx: 0.000 Ry: 0.000 Rz: 0.000

Pattern For Part Mounting

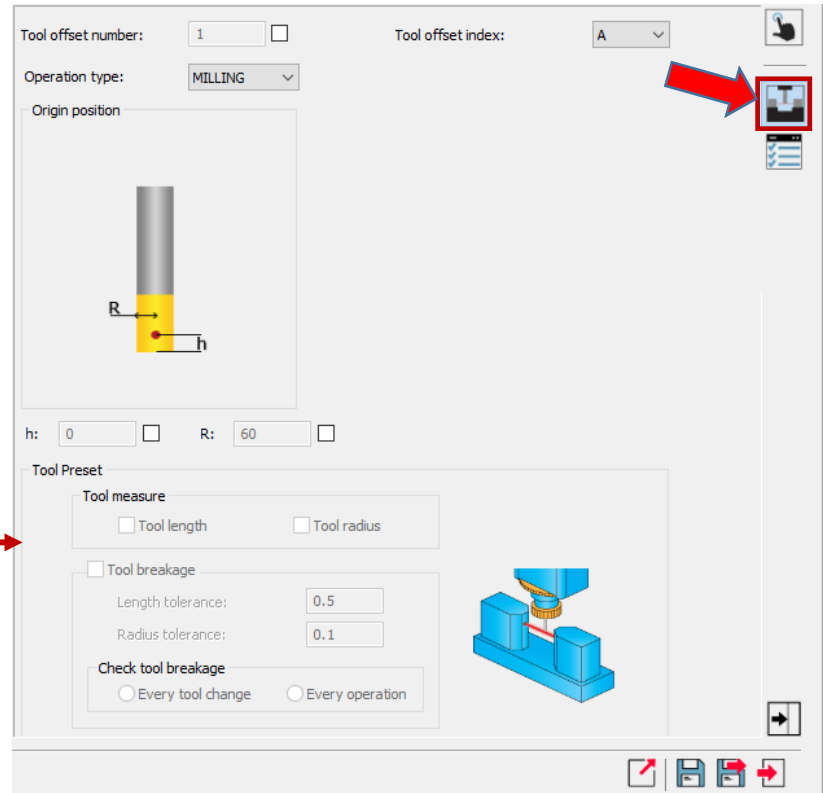
Drive Unit Type: DIRECT

Offset Data

- Easily manage the Tool Item's Offset Data:
 - Cutting Point definitions and relative Tool offset parameters
 - Tool Preset options (activated if supported by CNC-Machine and set in corresponding *.vmid file)



Cutting Point must be selected in Tool Item tree



Properties Data

- Easily manage additional information relevant to the Tool Item and its components, such as:
 - Price and Mass (for each and sum of all)
 - Cutter Material
 - Descriptions
 - Quantities
 - Hyperlinks (for referencing)
 - Tool Item Messages (for Gcode)
 - And many others...

Permanent :

Tool number: 1

Tool ID:

Catalog number:

Description:

Total price: 0

Total mass: 0

Turret name: Spindle

Station name: Station_1

Pull Stud type: NONE

Adaptor type: HSK63

Message 1:

Message 2:

Message 3:

Message 4:

Message 5:

Multiple Cutting Points – Milling Tools

- SolidCAM ToolKit supports multiple cutting points on a single Cutter component
- E.g., top and bottom cutting faces of same SLOT MILL can be used by quickly and easily adding another Cutting Point in the Tool Item Manager

Swap Views shown for illustrative purposes

| Tool Number | T. | Diameter | Tool Type | Description | Tool ID | Tool Offset | X | Y | Z | R |
|-------------|----|----------|-----------|-------------|---------|-------------|-------|-------|---------|-------|
| 1 (1A) | ■ | 24.000 | SLOT... | | 1A | 0.000 | 0.000 | 0.000 | -19.500 | 0.000 |
| 1 (1B) | ■ | 24.000 | SLOT... | | 1B | 0.000 | 0.000 | 0.000 | -7.500 | 0.000 |

Replicated Tool Item [with different h offset] is added to Tool Table list and automatically assigned the next available Tool offset index. Shared properties are maintained when Tool Item is modified.

Nose Point Management – Turning Tools

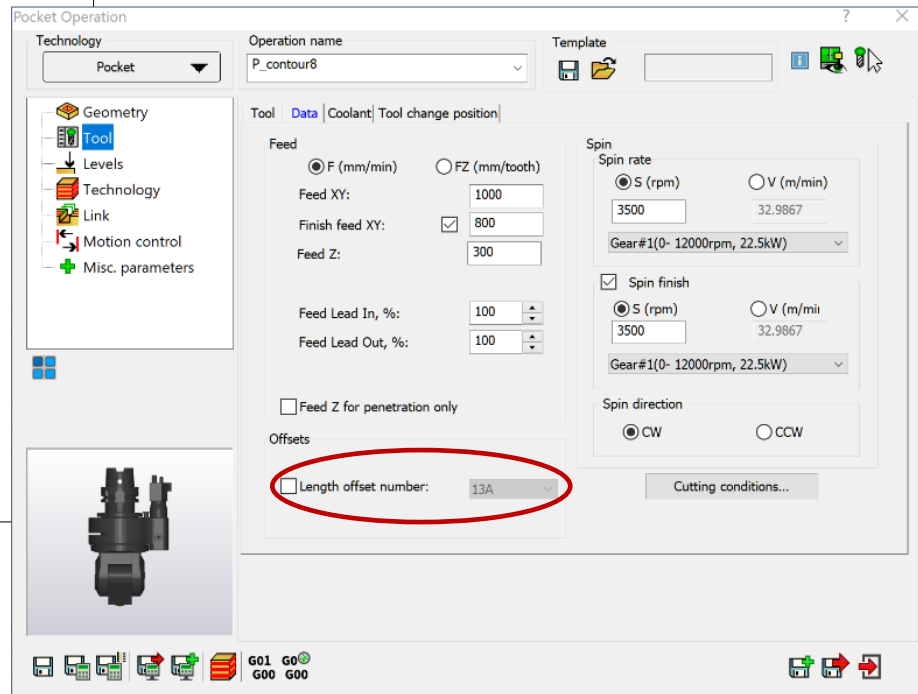
- Easily manage Nose Points

- Ability to select any Nose Point
- Measure the tool in any position
- Automatic radius detection

The screenshot displays the SolidCAM software interface for nose point management on a turning tool. The main window is titled "Machine Preview" and shows a 3D model of a turning tool with a "Station 1" label. Below the preview is a coordinate system with X, Y, and Z axes. The "Axes" section contains input fields for Z1, X1, Z2, TRAx1, Y1, B, X2, and C. The "Machine Name" is "Integrex IV-200-ST". The "Tool offset number" is 2, and the "Tool offset index" is A. The "Rotation type" is TURNING. The "Origin position" is set to "For Radius: R-1". The "Measure Orientation" checkbox is checked, and the "Flip" checkbox is unchecked. The "Axis 'B' value" is 80, and the "Spindle orientation" is 0. The "Tool Viewer" window shows a top-down view of the tool with a yellow highlighted area and a red dot labeled "N.P." (Nose Point). The "Tool measure" section includes checkboxes for "Tool length" and "Tool breakage", with "Check tool breakage" set to "Every tool change".

Cutting Points in SolidCAM

- Easily manage Cutting Points with ToolKit and use them in SolidCAM
 - Control tool wear separately for each operation – length and diameter
 - T-slot having multiple cutting points
 - Chamfering with compensation
- Machine Preview functionality
 - Change tool (Mounting on Station)
 - Exchange tools between Stations



Drive Units in Holder

- SolidCAM ToolKit supports definition of Drive Unit Type in Holder components

The screenshot displays the SolidCAM software interface. On the left, a tool list table is visible:

| Tool Number | T. | Diameter | Tool Type | Description | Tool ID |
|---------------|----------|----------|-----------|-------------|---------|
| Magazine_S... | | | | | |
| 1 | [Blue] | 120.000 | FACE ... | | |
| 2 | [Orange] | 10.000 | END ... | | |
| 3 | [Green] | 12.000 | TAPER... | | |
| 4 | [Blue] | 6.000 | BALL ... | | |
| 5 | [Black] | 10.000 | SPOT ... | | |
| 6 | [Yellow] | 6.800 | DRILL | | |
| 7 | [Blue] | 8.000 | TAP | | |
| 8 | [Orange] | 12.000 | CHA... | | |

Below the table, a tree view shows the tool structure for 'Tool [2] (END MILL D10)'. A red arrow points from the 'C5 SRKIN 16X80' tool in this tree to the 'Drive Unit Type' dropdown menu in the configuration panel on the right.

The configuration panel on the right includes the following sections:

- Connect to Joint:** Station
- Mounting:** X: 0, Y: 0, Z: 0, Rx: 0, Ry: 0, Rz: 0
- Joints Table:**

| Name | Position | Rotation | Axis | Drive Unit |
|---------|---------------------|---------------------|------|------------|
| Joint_1 | (0.000, 0.000, ...) | (0.000, 0.000, ...) | | DIRECT |

- Joint_1 CoordSys:** X: 0, Y: 0, Z: -80, Rx: 0, Ry: 0, Rz: 0
- For Part Mounting:**
- Drive Unit Type:** A dropdown menu with options: DIRECT, DIRECT, NOT DRIVEN, SELF DRIVE, GEAR. The first 'DIRECT' option is selected.

Rotary Turret Interpolation Support

- Ability to index the rotary turret to specific angle by the turret axis to use special tool holders

Haas DS-30Y 2020

- Options
- Machine Orientation
- C
- Main
- Z
- Y
- X
- Rotary
 - Options
 - CoordSys
 - Drive Unit
 - Stations
- B
- C1
- Sub
- Tools Magazines
- Submachines
- MainWork

| Name | Value | Units |
|-----------------------------|-------------------------------|-------|
| Name | Rotary | |
| Turret Number | 1 | |
| Catalog No. | 000002 | |
| Options | ... | |
| CoordSys | ... | |
| Turret Type | ROTARY | |
| Tool Check Position | (0.000, 0.000, 0.000, 0.00... | |
| Tool Change Time | 2.000 | (sec) |
| Tool Change Direction | CURDPT | |
| Rotary Turret Axis Name | TRAx1 | |
| Rotary Turret Axis | (0.000, 0.000, 1.000) | |
| Rotary Turret Interpolation | YES | |
| Geometries | ... | |

Turning Operation

Technology: Turning

Operation name: TR_contour_1

Tool: Data | Feed Points | Org

Tool Type: Profile

Number:

Tool offset:

Tool orientation:

Turret:

Safety angle:

Safety envelope:

Station:

Machine Preview

Axis:

C: 0 Y: 0.036 TRAx1 -15 C: 0

Z: -729.08 X: -172.493 B: -1.60

Tool offset number: 2 Tool offset index: A

Operation type: TURNING

Origin position

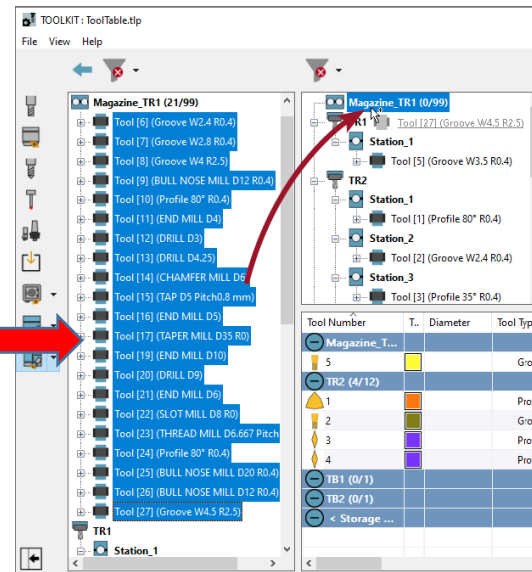
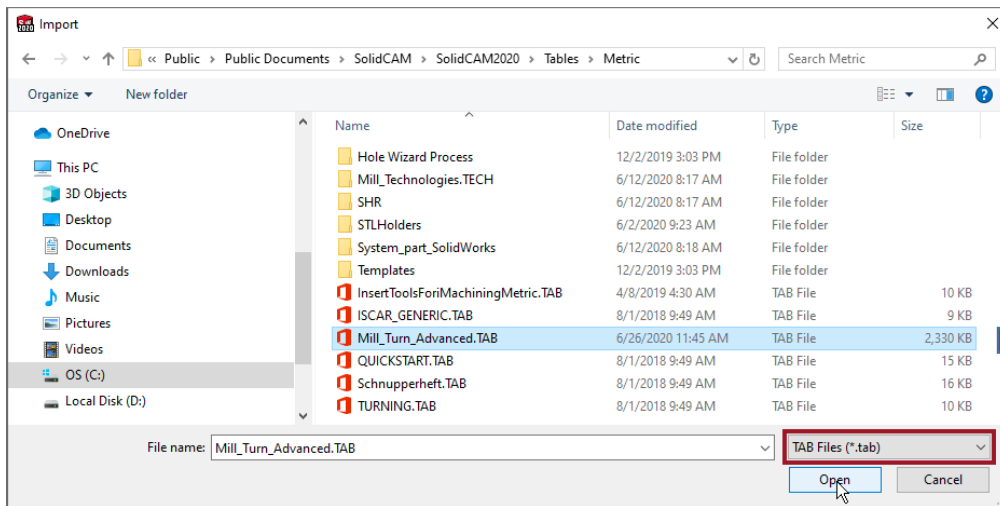
For Radius: R-1

Measure Orientation

Delta Axis 'TRAx1' value: -15

SolidCAM TAB Tool Libraries

- SolidCAM ToolKit supports importing TAB tools from *.TAB Libraries of previous versions
- TAB tools are automatically converted to ToolKit Tool Items that can be easily imported to Tool Assemblies, Machine Tool Setup and Part Tool Libraries



ToolKit Filtering

- Extensive range of simple and advanced filters for facilitating tool components searches

The screenshot displays the SolidCAM ToolKit interface with the following components:

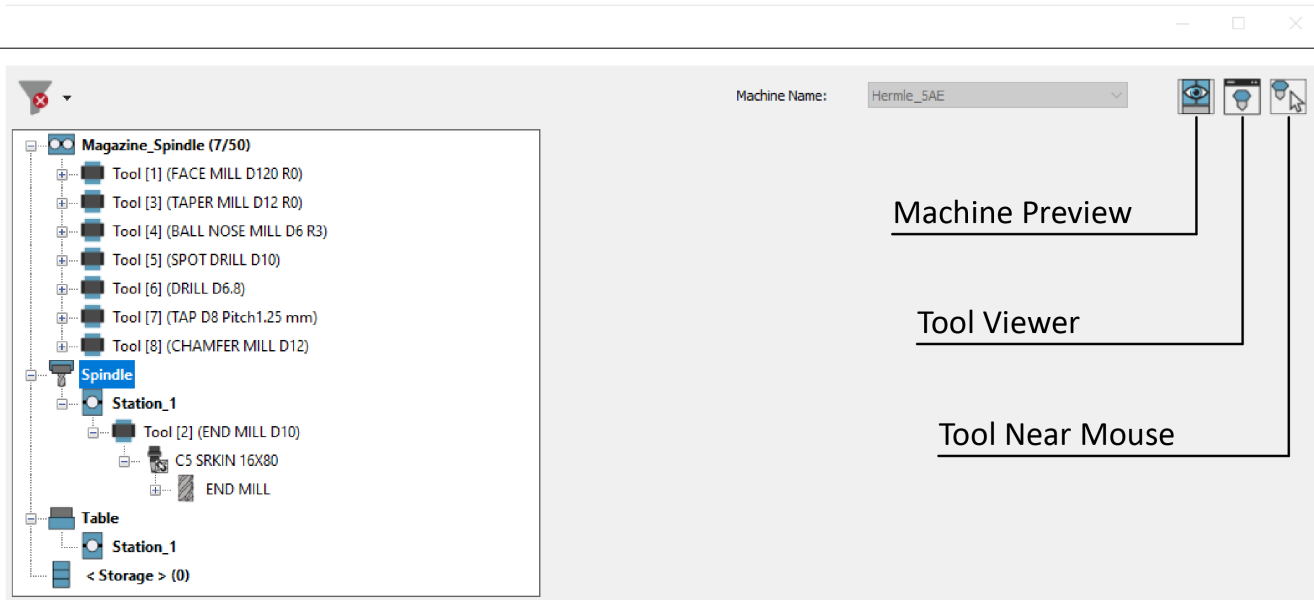
- ToolsComponents Tree:** A hierarchical tree on the left showing categories like Cutters, Shanks, and Adaptors and Holders.
- Filtering Icons:** A vertical toolbar with icons for filtering, including a funnel icon and a magnifying glass icon, both highlighted with red boxes.
- Tool List:** A list of tools with columns for Tool Number, T., and Diameter. A table below shows the first 8 tools:

| Tool Number | T. | Diameter |
|-------------|----------|----------|
| 1 | [Blue] | |
| 2 | [Orange] | |
| 3 | [Green] | |
| 4 | [Purple] | |
| 5 | [Black] | |
| 6 | [Yellow] | |
| 7 | [Blue] | |
| 8 | [Orange] | |

- Advanced Filter Dialog:** A modal window titled "Advanced Filter" with the following fields:
 - Cutter name: [Text input]
 - Price: [Dropdown] [Text input]
 - Mass: [Dropdown] [Text input]
 - Coolant Hole: [Dropdown]
 - Cutter Material: [Dropdown] [Text input] %
 - Description: [Text area]
 - Hyperlink: [Text input]
 - Labels: [Text area]
 - Quantity: [Text input] Assume max quantity Min quantity: [Text input]

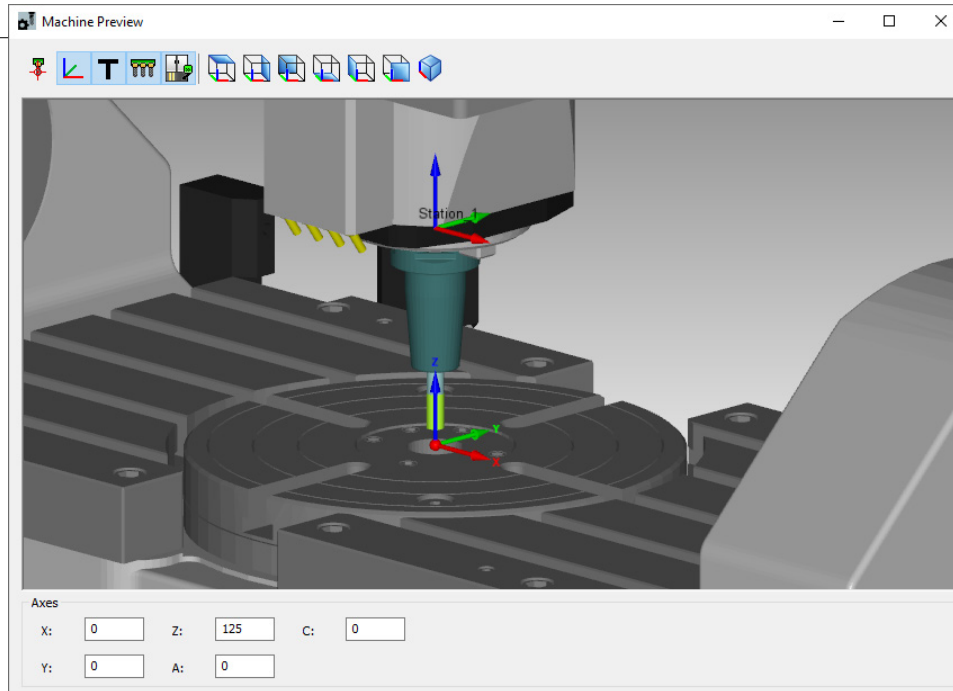
ToolKit Visualization Tools

- Robust visualization tools for previewing and checking your Tool Item definitions
- Tool Item changes are updated instantaneously and can be viewed on the fly
- Supports preview of [Revolved STL Tool Items](#) (Cutters, Shanks & Holders)



Visualization – Machine Preview

- Visualize the Tool Item and its schematic position relative to Machine Coordinate System and in connection with the machine devices



Visualization – Tool Viewer

- Visualize a 3D model representation of your Tool Item in different orientations, etc.
- Dynamically displays Cutting Points, Mounting and Joint CoordSys positions, etc.

The screenshot displays the SolidCAM software interface. On the left, a table lists tool items:

| Tool Number | T.. | Diameter | Tool Type | Description |
|---------------|----------|----------|-----------|-------------|
| Magazine_S... | | | | |
| 1 | [Blue] | 120.000 | FACE ... | |
| 2 | [Orange] | 10.000 | END ... | |

Below the table, a tree view shows the tool structure for 'Tool [2] (END MILL D10)'. It includes 'C5 SRKIN 16X80' and 'END MILL'. A red box highlights the 'Cutting point' icon in the tree view. A red arrow points from this box to the 3D model in the 'Tool Viewer' window.

The 'Tool Viewer' window shows a 3D model of a tool mounted on a spindle. The spindle is labeled 'Spindle 1 (Station_1)'. A coordinate system is shown with X, Y, and Z axes. A red box highlights the 'Mounting' parameters in the top right:

Connect to Joint: Joint_1

Mounting

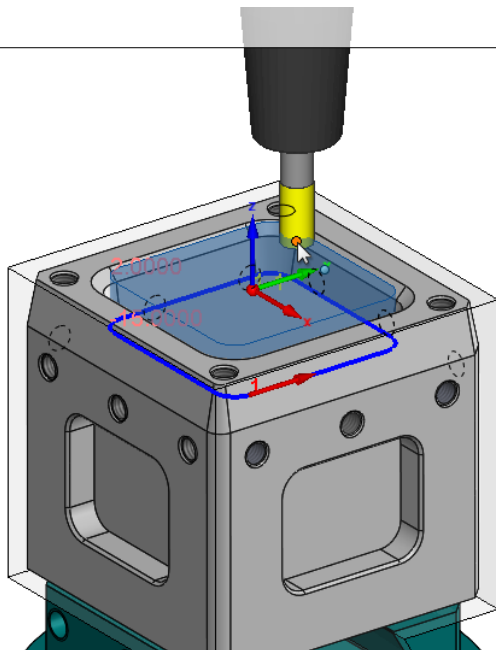
X: 0 Y: 0 Z: 45

Rx: 0 Ry: 0 Rz: 0

A context menu is open over the 3D model, showing options: Measurement, Fit, Fit by box, Focus, Rotate (checked), Move, Zoom In/Out, Standard Views, Shaded (checked), Transparent, Wireframe, and Wireframe (hidden lines).

Visualization – Tool Near Mouse

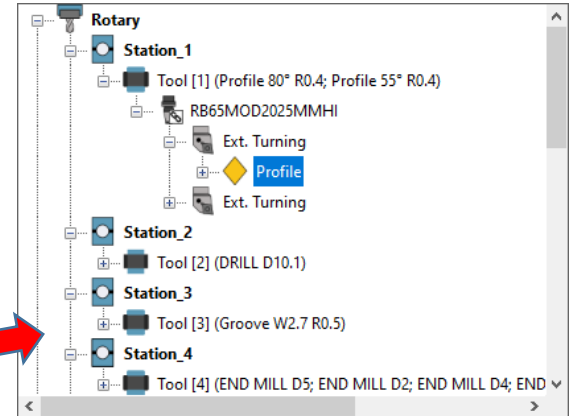
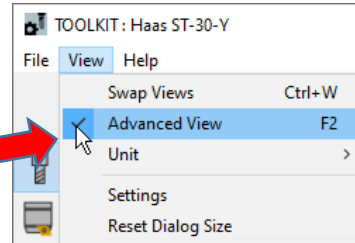
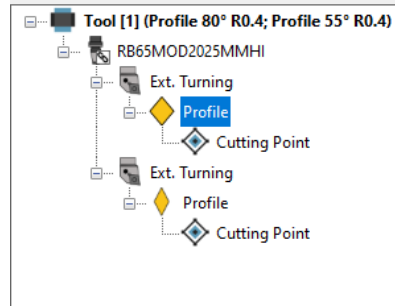
- Toggle on/off 3D graphic representation of Tool Item in the SOLIDWORKS Graphics Area for performing visual tool checks



Advanced View for Experienced Users

- Simple View (default) shows Tool Items individually in Tool Item Manager
 - Tool build starts with Cutter component

| Tool Number | T. | Diameter | Tool Type | Desc... | Tool ID |
|-------------|----|----------|-----------|---------|---------|
| 1 | | | Profile | | |
| 1 | | | Profile | | |
| 2 | | 10.100 | DRILL | | |
| 3 | | | Groove | | |



| Tool Number | T. | Diameter | Tool Type | Desc... | Tool ID |
|----------------|----|----------|-----------|---------|---------|
| Rotary (12/12) | | | | | |
| 1 | | | Profile | | |
| 1 | | | Profile | | |
| 2 | | 10.100 | DRILL | | |
| 4 | | 5.000 | END ... | | |
| 4 | | 5.000 | END ... | | |
| 4 | | 5.000 | END ... | | |
| 4 | | 5.000 | END ... | | |

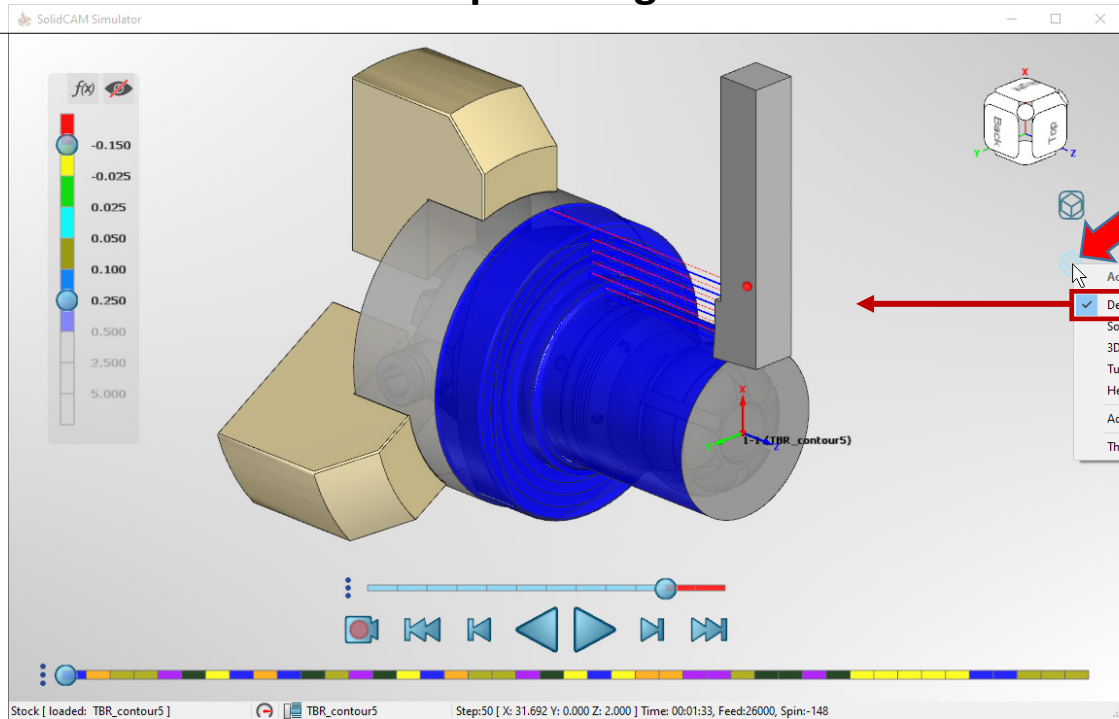
- Advanced View shows all Tool Items and device mounting
 - Tool build can start at the top of hierarchy (Station -> Adaptor -> Holder -> Shank -> Cutter)
 - Possibility to quickly change mounting by drag & drop

What's New in SolidCAM 2021

New SolidCAM Simulator

SolidCAM Simulator Themes

- Visualization features of SolidCAM's classic Simulation modes are now available in SolidCAM Simulator as preconfigured themes



Easily select your preferred mode or toggle between available ones

Default theme now has improved graphics and optimized performance

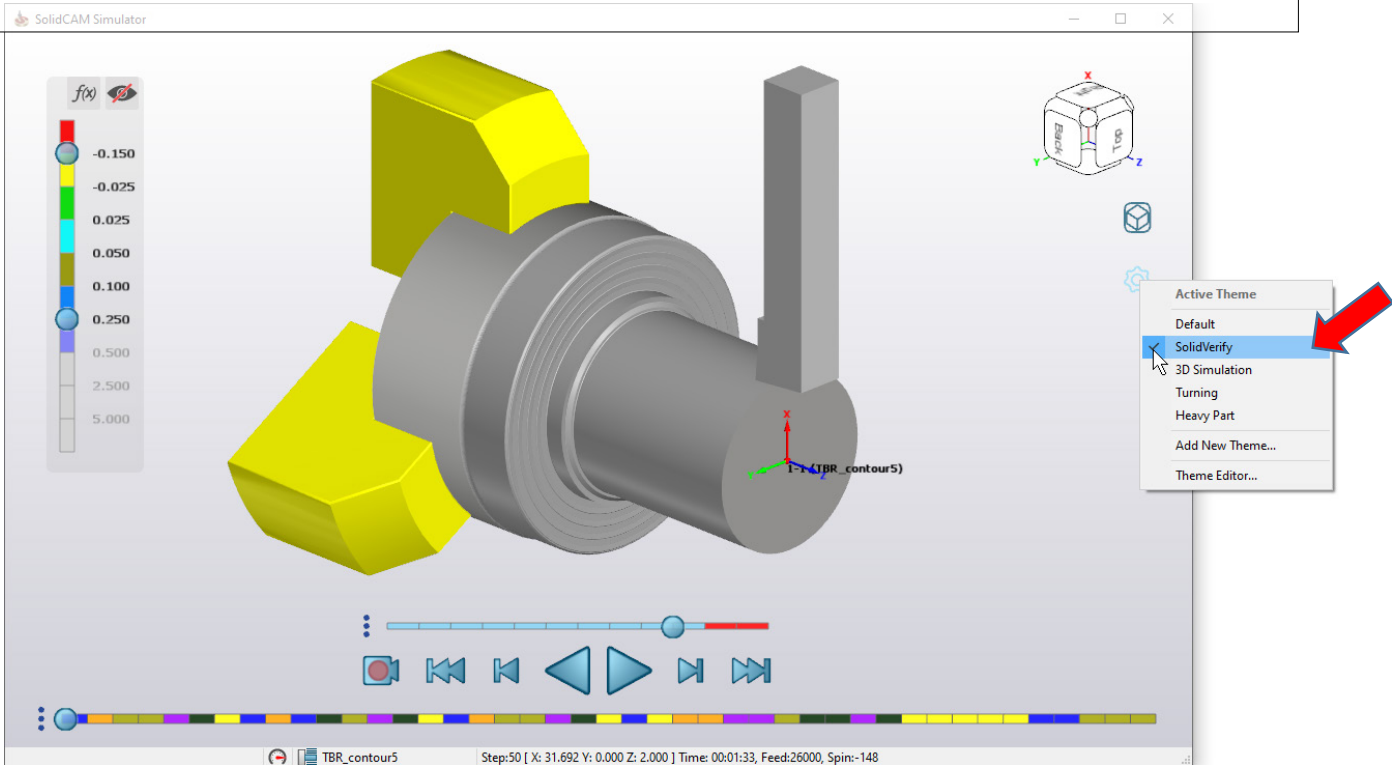
See Demo



on YouTube

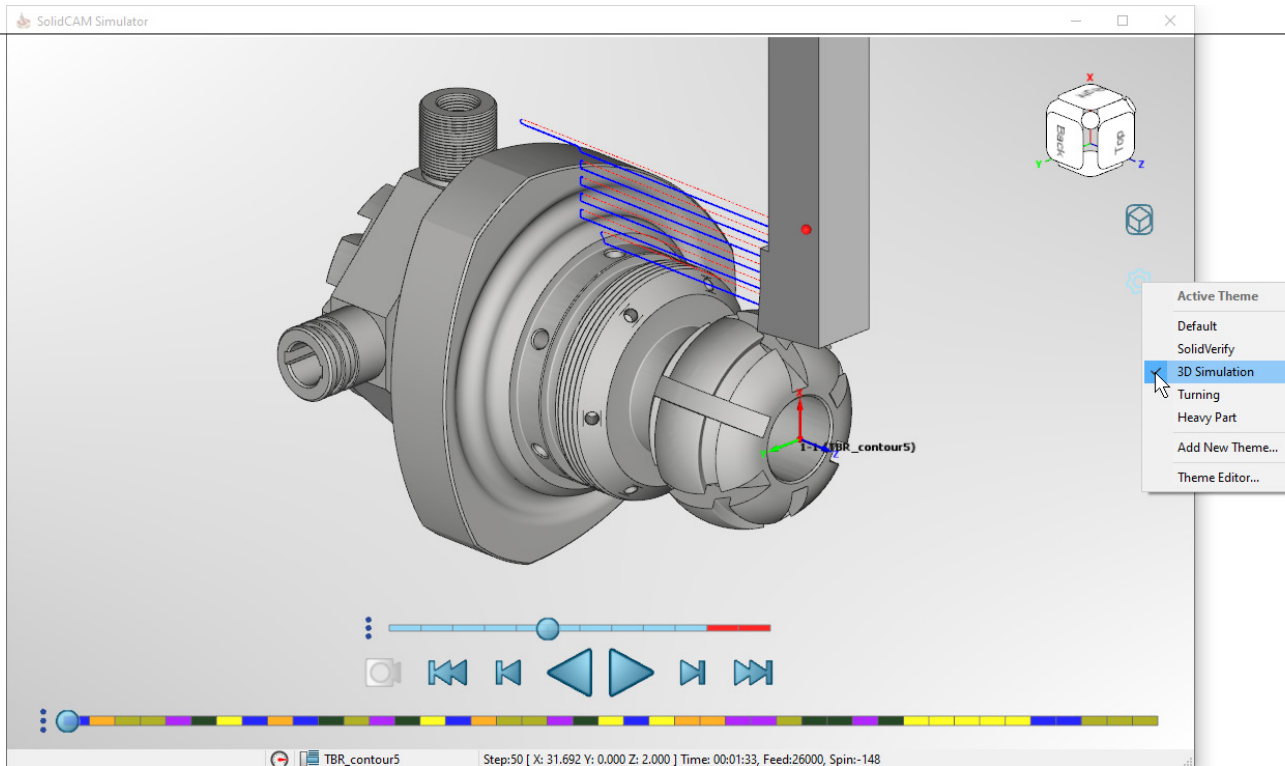
Simulator's SolidVerify Theme

- Emulate the familiar SolidVerify Simulation inside SolidCAM Simulator



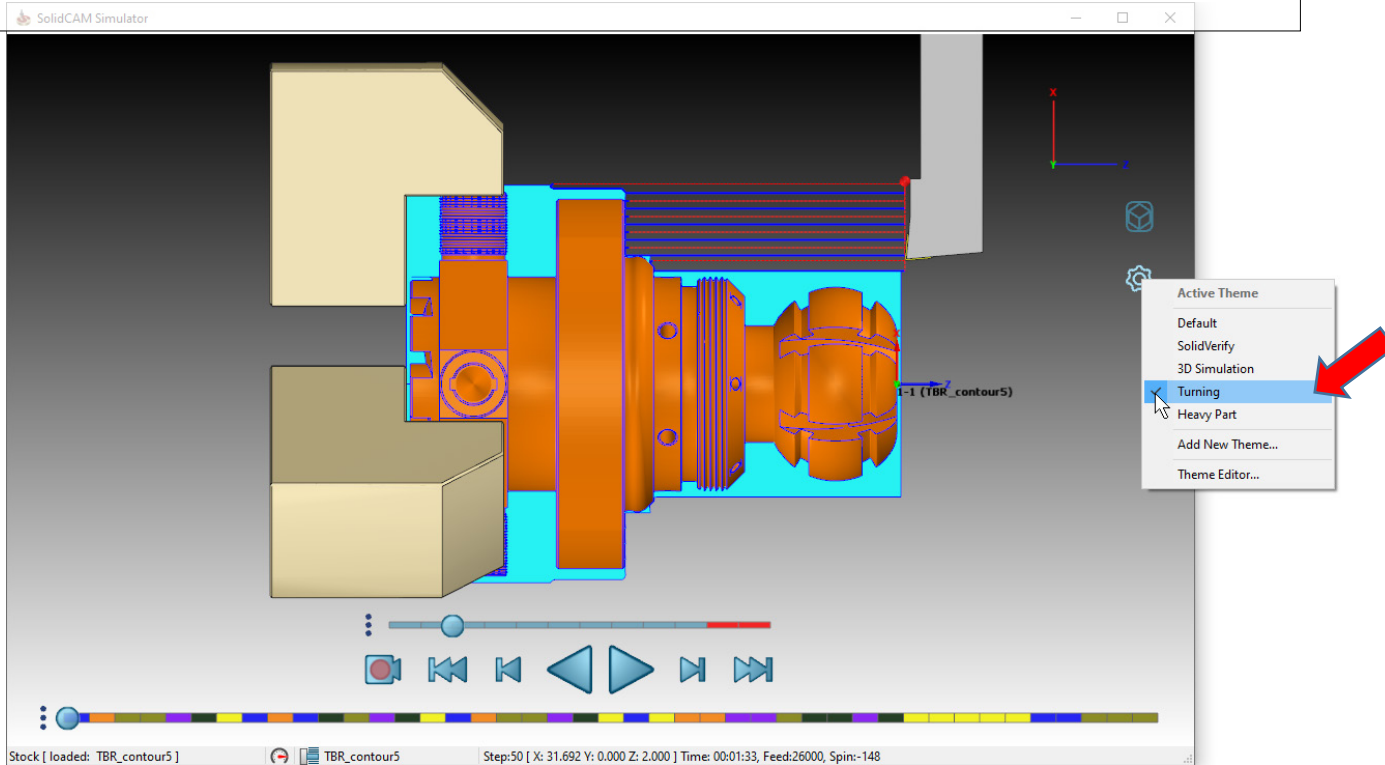
Simulator's 3D Simulation Theme

- Emulate the familiar 3D Simulation inside SolidCAM Simulator



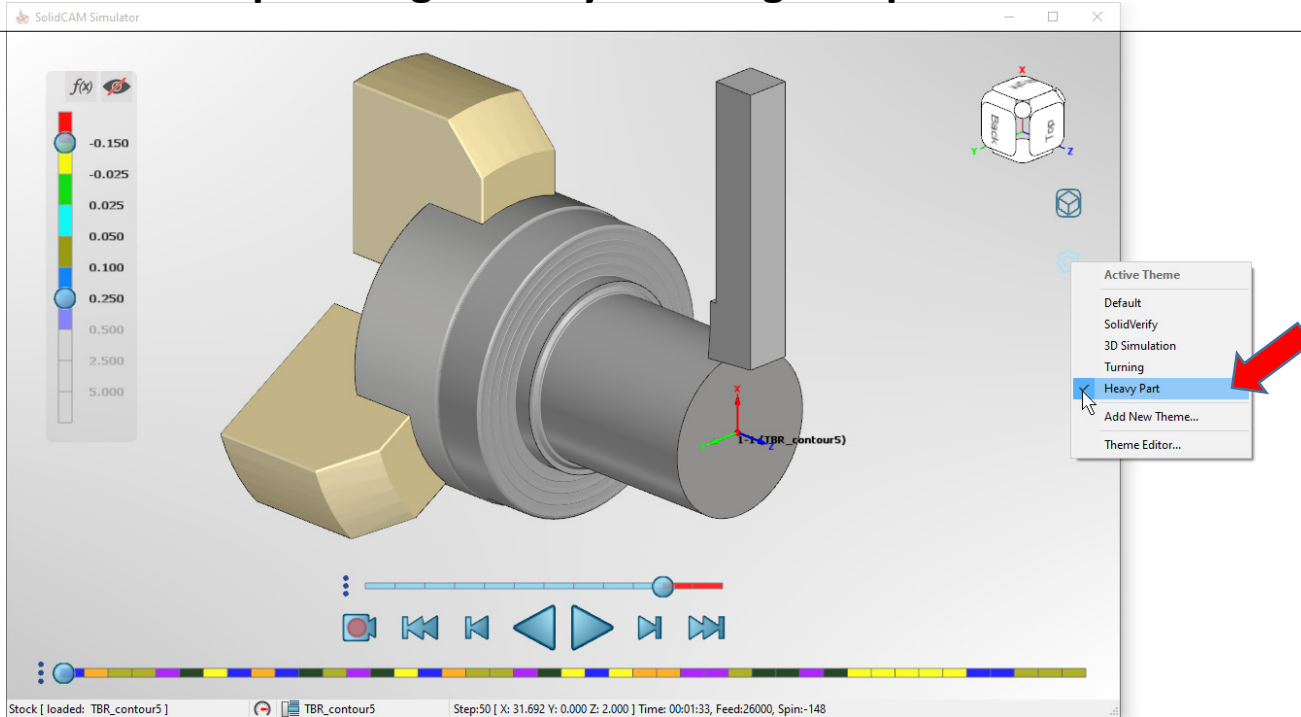
Simulator's Turning Theme

- Emulate the familiar Turning Simulation inside SolidCAM Simulator



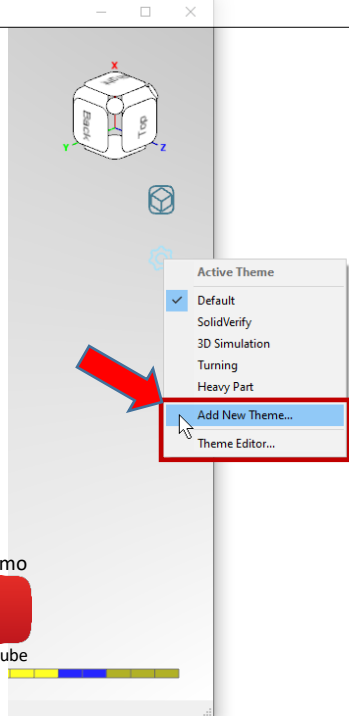
Simulator's Heavy Part Theme

- **SolidCAM Simulator also offers a theme specifically optimized for faster processing of heavy parts with complex 3D geometry and long tool paths**

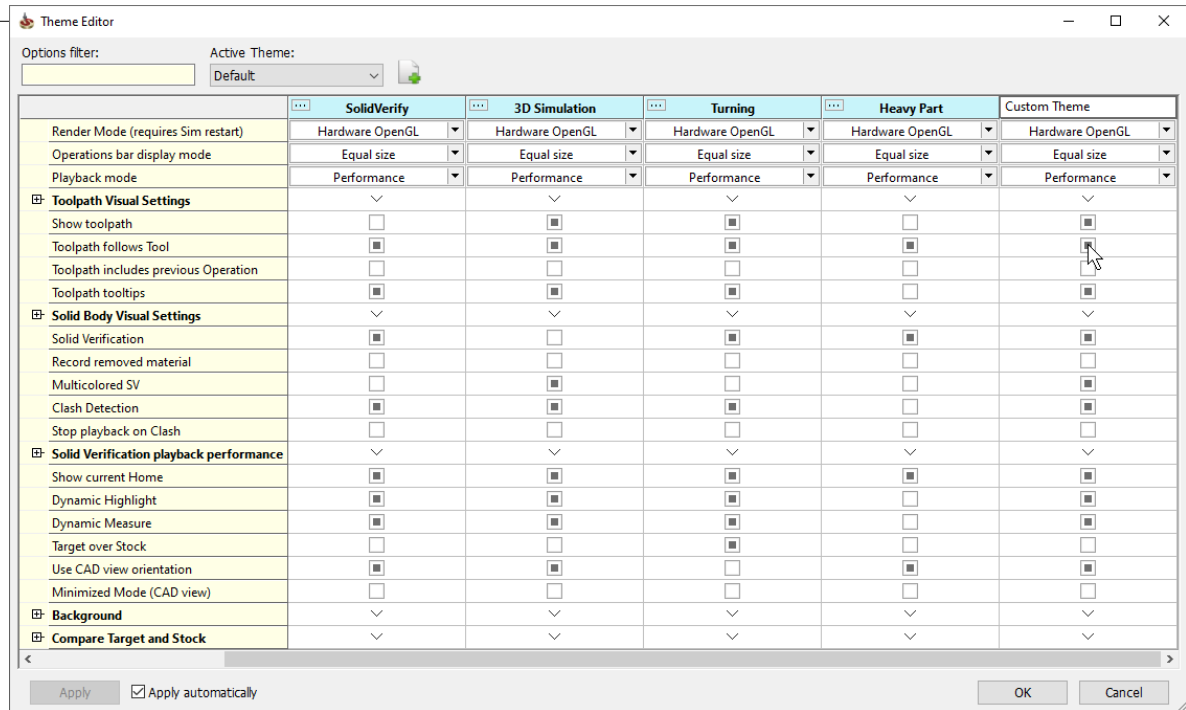


Custom Themes & Theme Editor

- Simulator's Theme Editor enables you to manage the preconfigured themes and create any number of custom themes based on a variety of settings

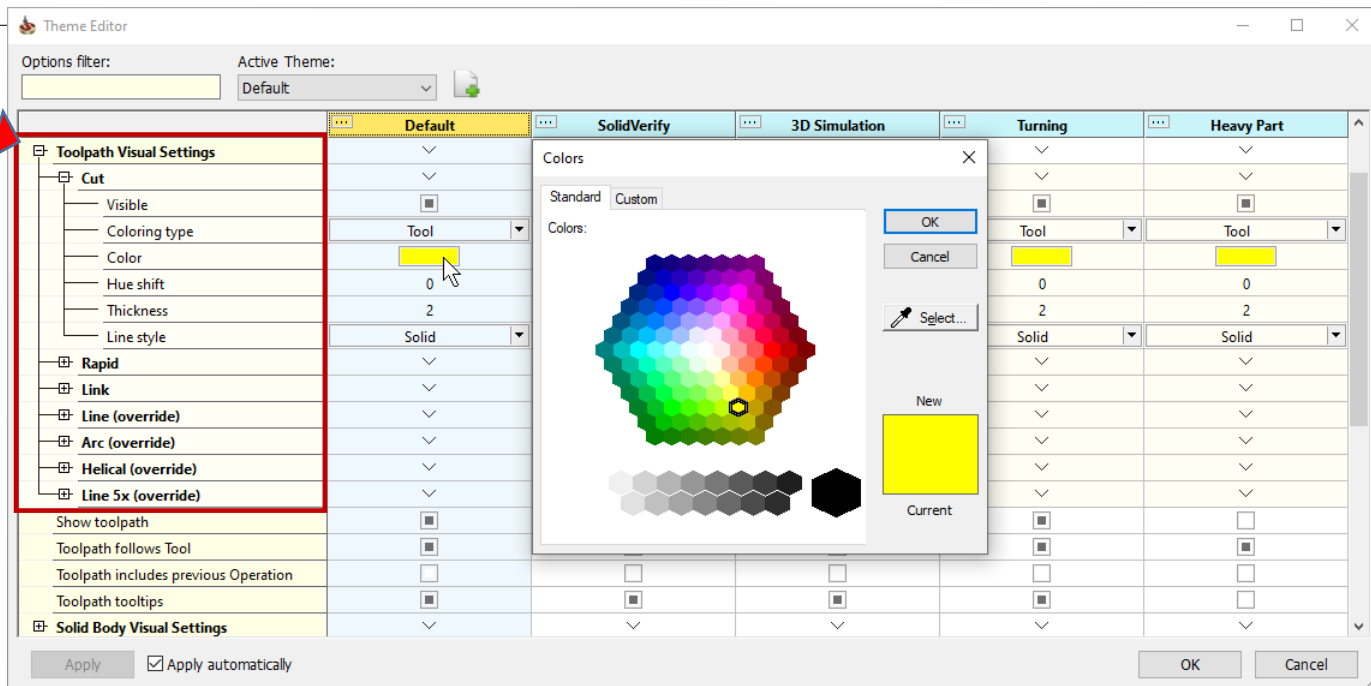


See Demo
on YouTube



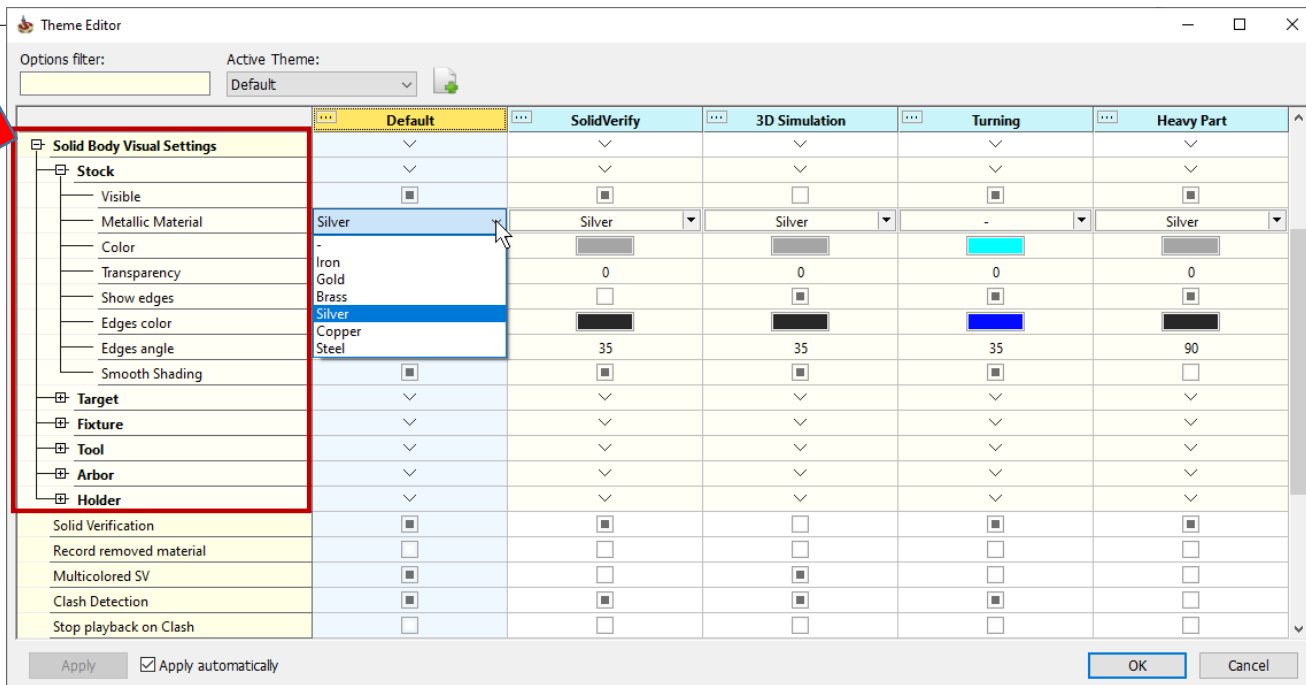
Visual Properties for Tool Path

- Theme Editor > Toolpath Visual Settings enables you to modify the appearance of the simulated tool path



Visual Properties for Solid Bodies

- Theme Editor > Solid Body Visual Settings enables you to modify the appearance of all solid bodies participating in the simulation



Fixture Support

- Toggle on/off visualization of your fixture during simulation playback

The screenshot displays the SolidCAM Simulator (Beta) interface. On the left, a vertical color scale legend indicates stock levels from -1.500 to 50.000. The main 3D view shows a yellow clamping fixture holding a grey workpiece. A black tool is positioned over a pocket being milled. A red arrow points to the 'Fixture [clamping fixture.FST]' option in the simulation settings menu on the right. The menu also includes options like 'Flyout Window', 'Toolpath', 'Solid Verification', and 'Stock [FM_facemill]'. The status bar at the bottom shows 'Stock [loaded: FM_facemill]', 'iRough_FrontPocket', 'Step:11301 [X: 231.850 Y: -193.030 Z: -16.700]', 'Time: 00:03:17, Feed:3693, Spin:10502'.

Clash Detection

- Option to check for possible collisions between all the components that participate in the machining (incl., Tool, Tool Holder, Machined Stock and the Fixture)

Warning: Collision(s) detected!

| | | |
|-------------------------------------|--------------------------------------|--------------|
| <input checked="" type="checkbox"/> | Flyout Window | Ctrl+Shift+F |
| <input type="checkbox"/> | Minimized mode | Shift+M |
| <input type="checkbox"/> | Stationary Tool | |
| <input checked="" type="checkbox"/> | Toolpath | Ctrl+T |
| <input checked="" type="checkbox"/> | Follow the Tool | |
| <input type="checkbox"/> | Include previous Operations | |
| <input checked="" type="checkbox"/> | Solid Verification | |
| <input type="checkbox"/> | Record removed material (Reverse SV) | |
| <input checked="" type="checkbox"/> | Multi-color Stock | |
| <input type="checkbox"/> | Reset | Ctrl+Shift+R |
| <input checked="" type="checkbox"/> | Clash Detection | Shift+C |
| <input type="checkbox"/> | Stop playback on Clash | |
| <input checked="" type="checkbox"/> | Stock [FM_facemill] | Shift+S |
| <input type="checkbox"/> | Reload | |
| <input checked="" type="checkbox"/> | Target [target.FST] | Shift+T |
| <input checked="" type="checkbox"/> | Compare Target and Machined Stock... | |
| <input checked="" type="checkbox"/> | Tool | Ctrl+Shift+T |
| <input checked="" type="checkbox"/> | Holder | Ctrl+Shift+H |
| <input checked="" type="checkbox"/> | Fixture [clamping fixture.FST] | Shift+F |
| <input type="checkbox"/> | Operations bar | > |
| <input type="checkbox"/> | Advanced Options | > |
| <input type="checkbox"/> | Exit | Ctrl+Shift+X |

Stock [loaded: FM_facemill] iRough_iFinish_faces Step:15738 [X: 211.000 Y: -146.000 Z: -35.700] Time: 00:09:37, Feed:1635, Spin:8346

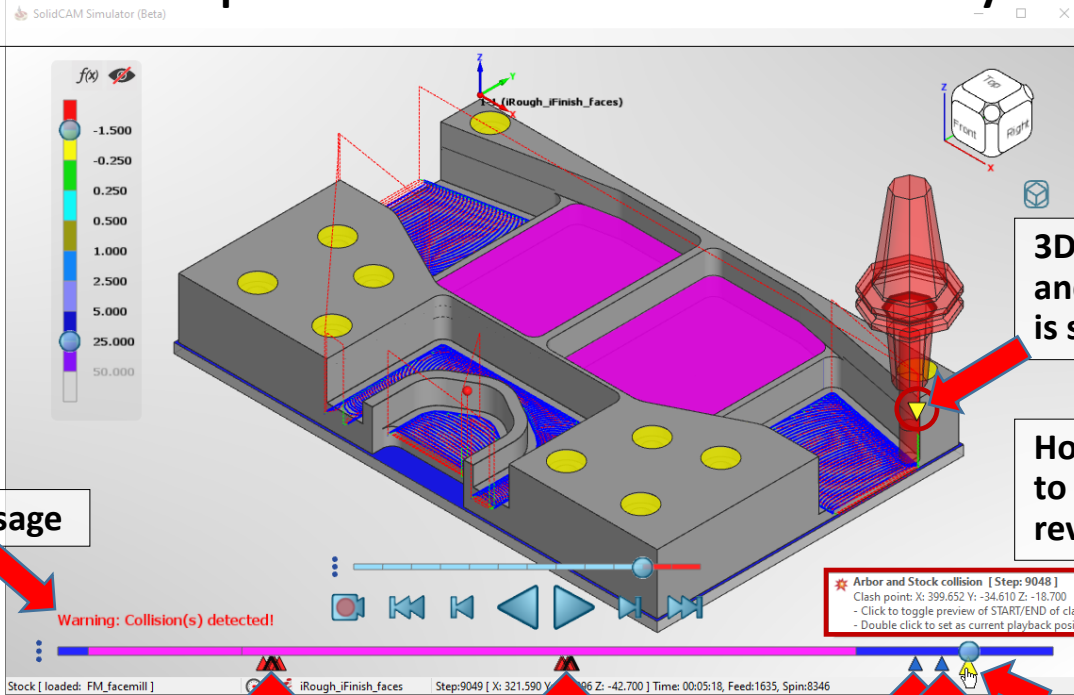
See Demo



on YouTube

Clash Detection Feedback

- Detailed feedback is provided for detected collisions so they can be thoroughly reviewed



Warning Message

3D tool and holder changes color and corresponding collision point is shown in the graphics area

Hover mouse over collision point to show detailed information and review options

Collision detections and their exact locations are displayed on the Operations bar

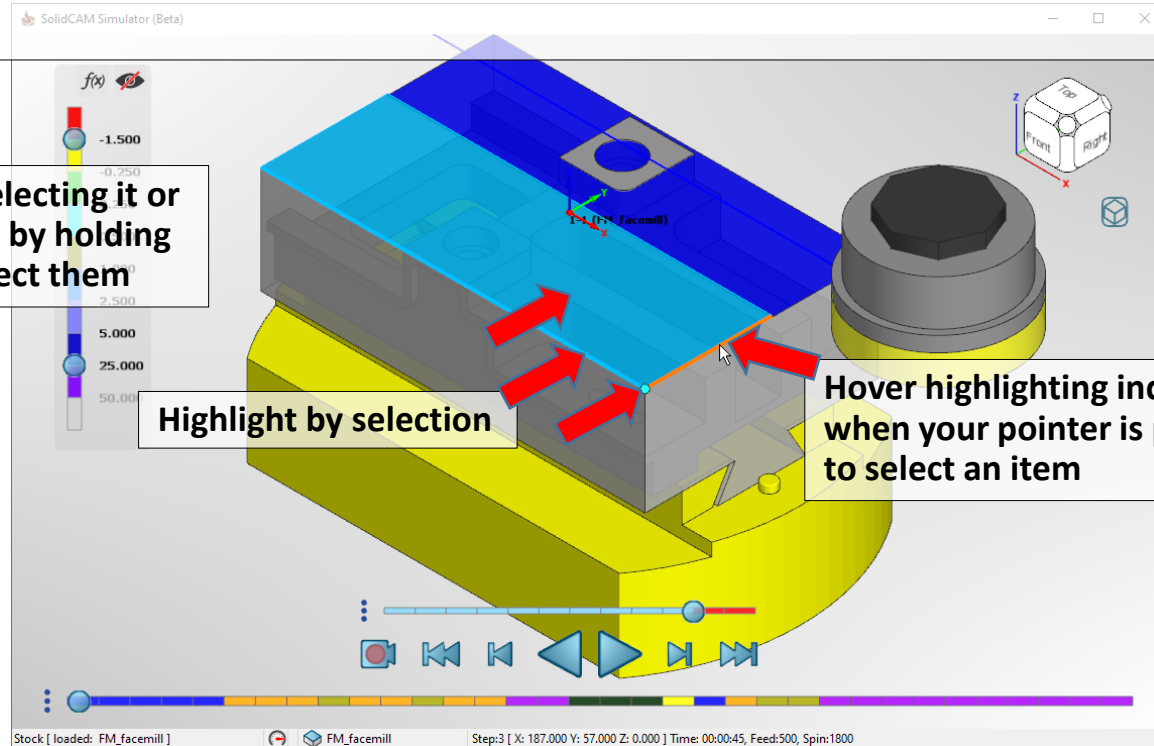
Dynamic Highlighting

- Dynamically highlight faces, edges and vertices on the Machined Stock at any stage of the simulation

Highlight one item by selecting it or multiple items at a time by holding the Ctrl key to multi-select them

Highlight by selection

Hover highlighting indicates when your pointer is poised to select an item



Dynamic Measuring

- Dynamically measure one item or a combination of multiple items (up to six) at any stage of the simulation

Simply highlight the item(s) you want to measure

Measurements data appears here

Data options and indicators are shown when you hover your mouse

D:100.713 Dx:90.100 Dy:0.000 Dz:45.000

- i** Measurements data (click to Select and Copy)
- 'V': Vector
 - 'D': Distance
 - 'L': Length
 - 'P': Point
 - 'A': Angle
 - 'Dt': Distance to Target

D:100.713 Dx:90.100 Dy:0.000 Dz:45.000

See Demo

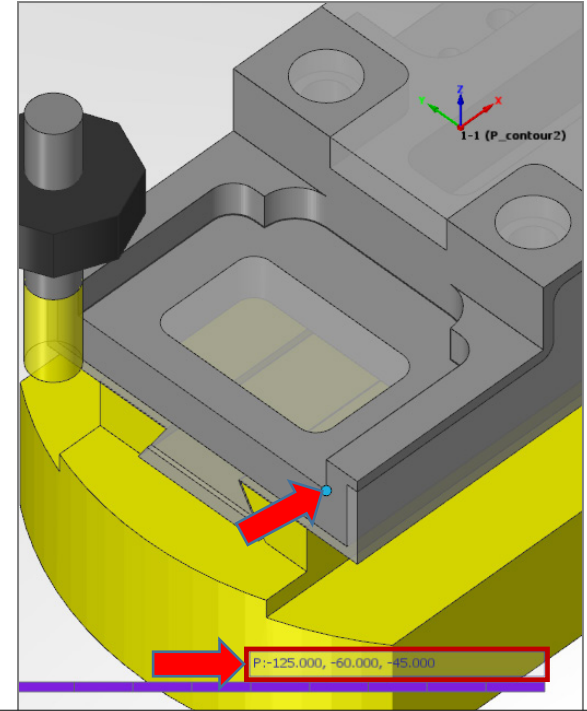
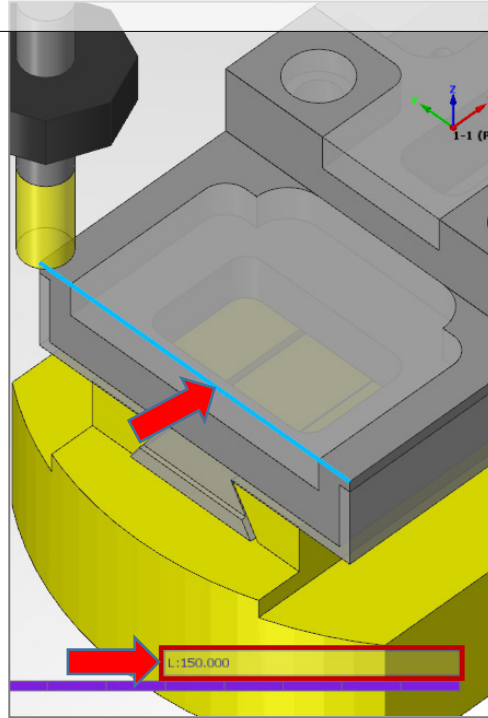
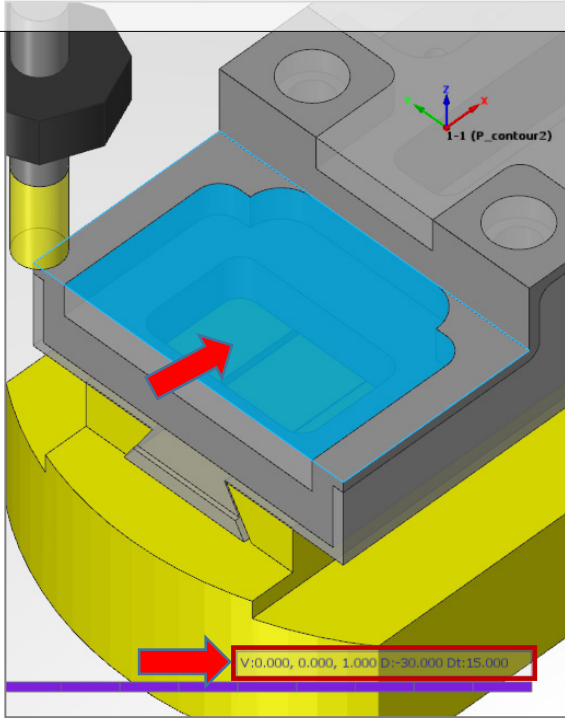


on YouTube

Take Machined Stock measurements in simulation, such as between jobs, and verify on the machine for accuracy

Dynamic Measuring – One Item

- Easily and accurately measure a face, an edge or a vertex

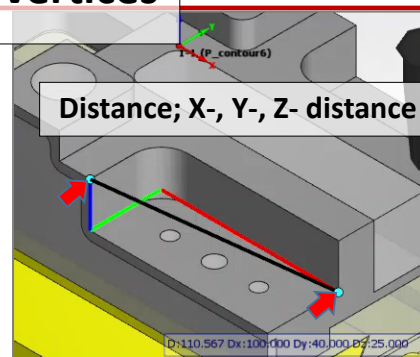
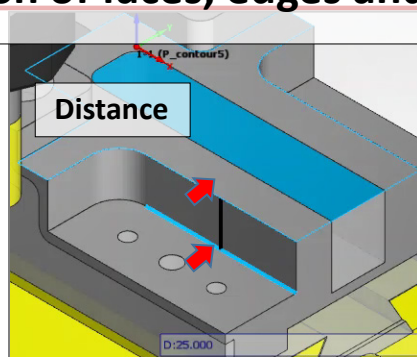
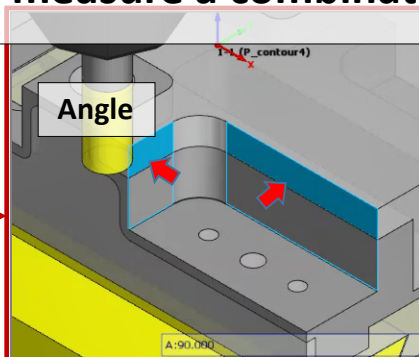


Point X-, Y-, Z- coordinates relative to CoordSys Position

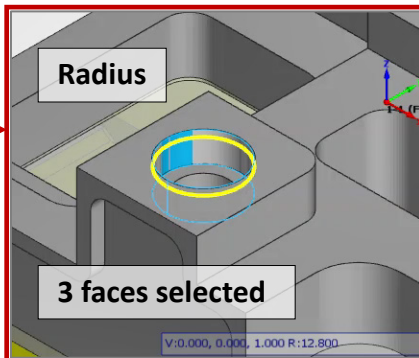
Dynamic Measuring – Multiple Items

- Easily and accurately measure a combination of faces, edges and vertices

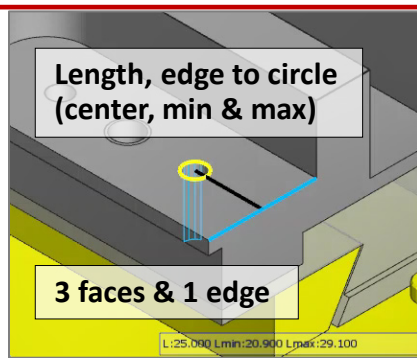
Examples:
Two items selected



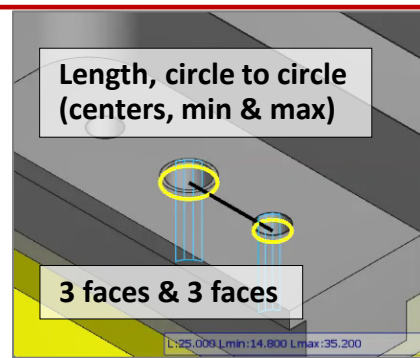
Examples: More than
two items (up to six)



3 faces selected



3 faces & 1 edge



3 faces & 3 faces

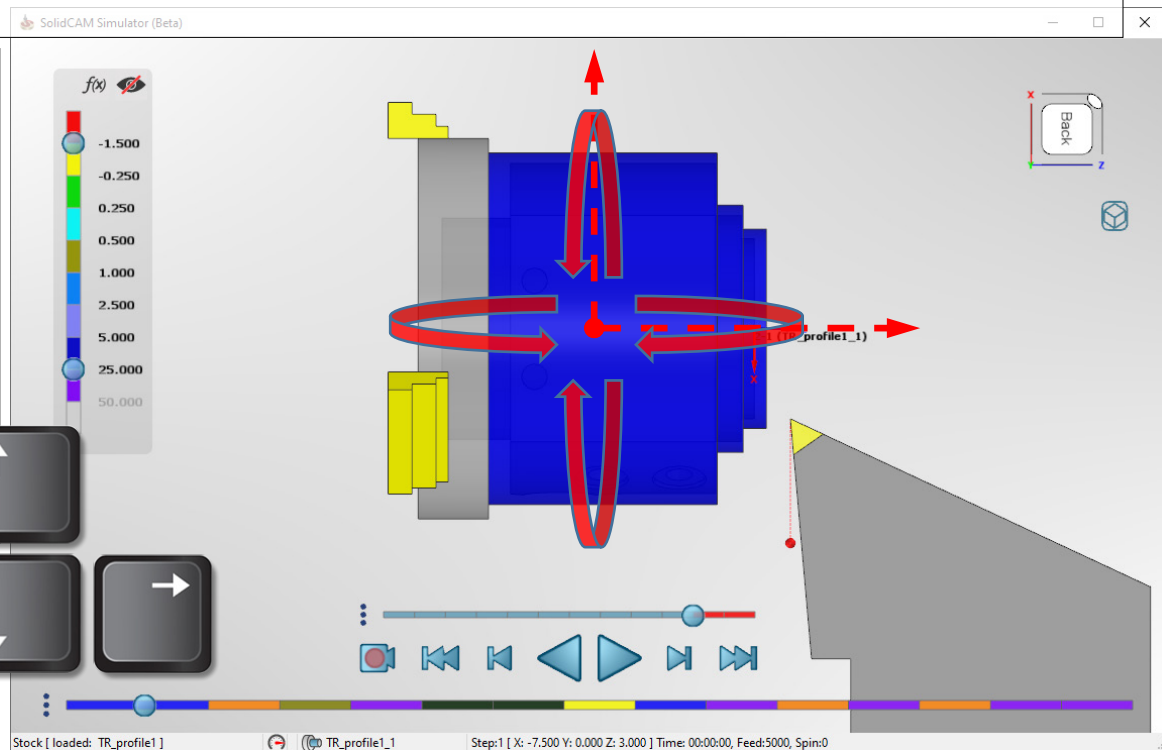
Examples shown do not cover every possible item combination

View Manipulations – Axis Rotation

- Change the view orientation using your keyboard controls (same as SOLIDWORKS)

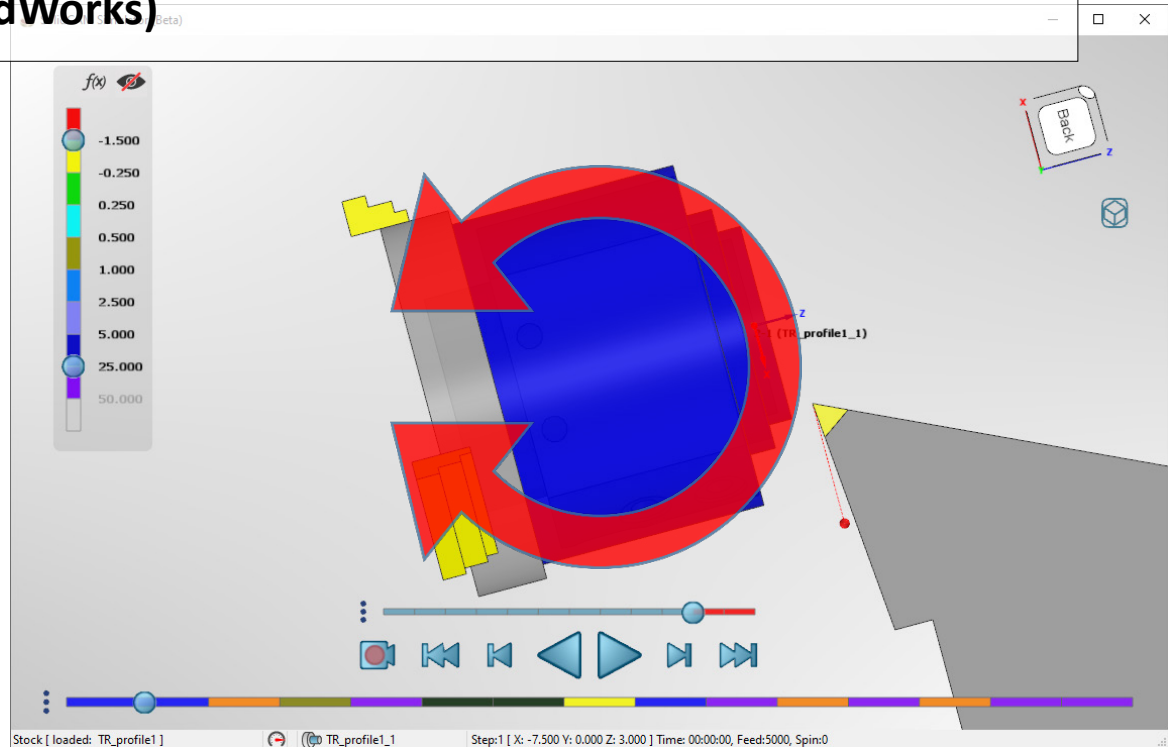
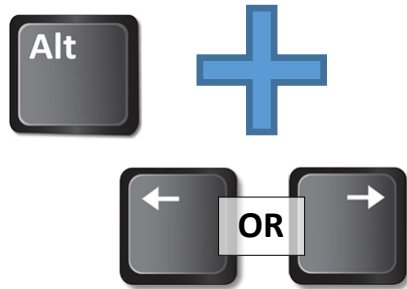
- Left/right arrow keys – Vertical axis rotation
- Up/down arrow keys – Horizontal axis rotation
- Shift + left/right or up/down arrows – 90° rotation around vertical/horizontal axis

See Demo
on YouTube



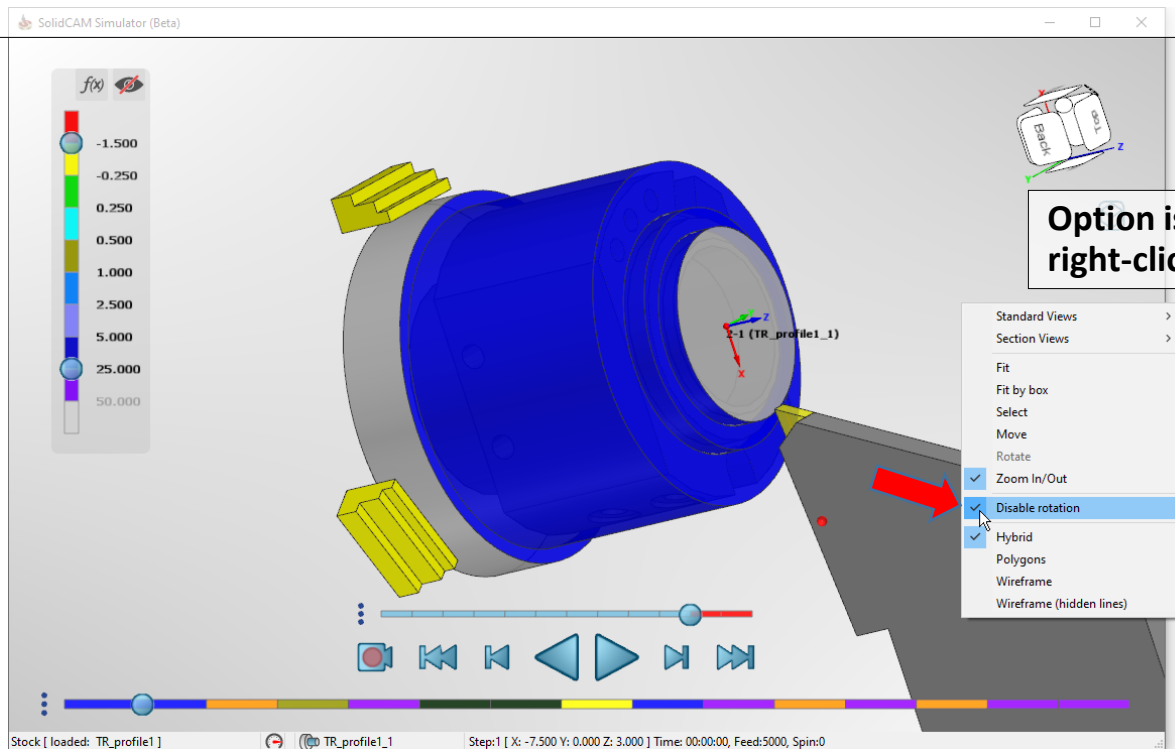
View Manipulations – Plane Rotation

- **Alt + left/right arrow keys – Rotates model normal to the current viewing plane (similar to Roll View in SolidWorks)**



View Manipulations – Disable Rotation

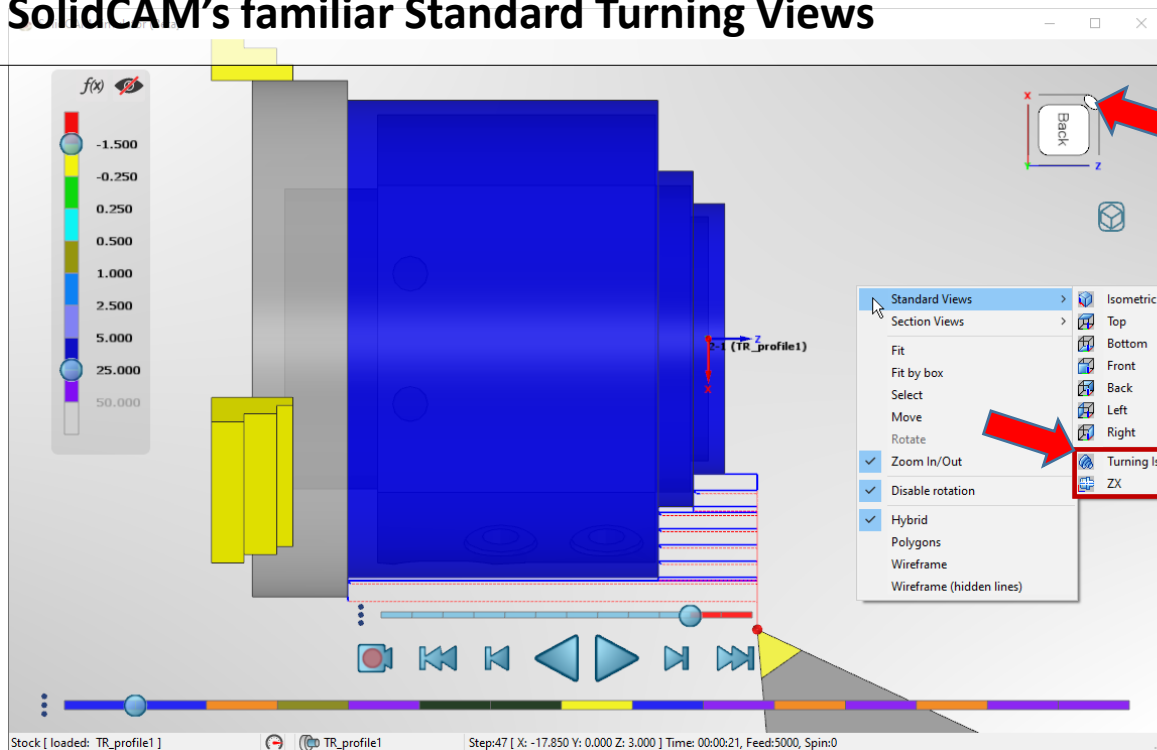
- **Disable rotation option – model will not rotate when middle mouse wheel is pressed**



Option is in View menu, displayed by right-clicking in graphics area

Standard Turning Views

- Quickly and easily change the view orientation of your Turning and Mill-Turn parts using SolidCAM's familiar Standard Turning Views

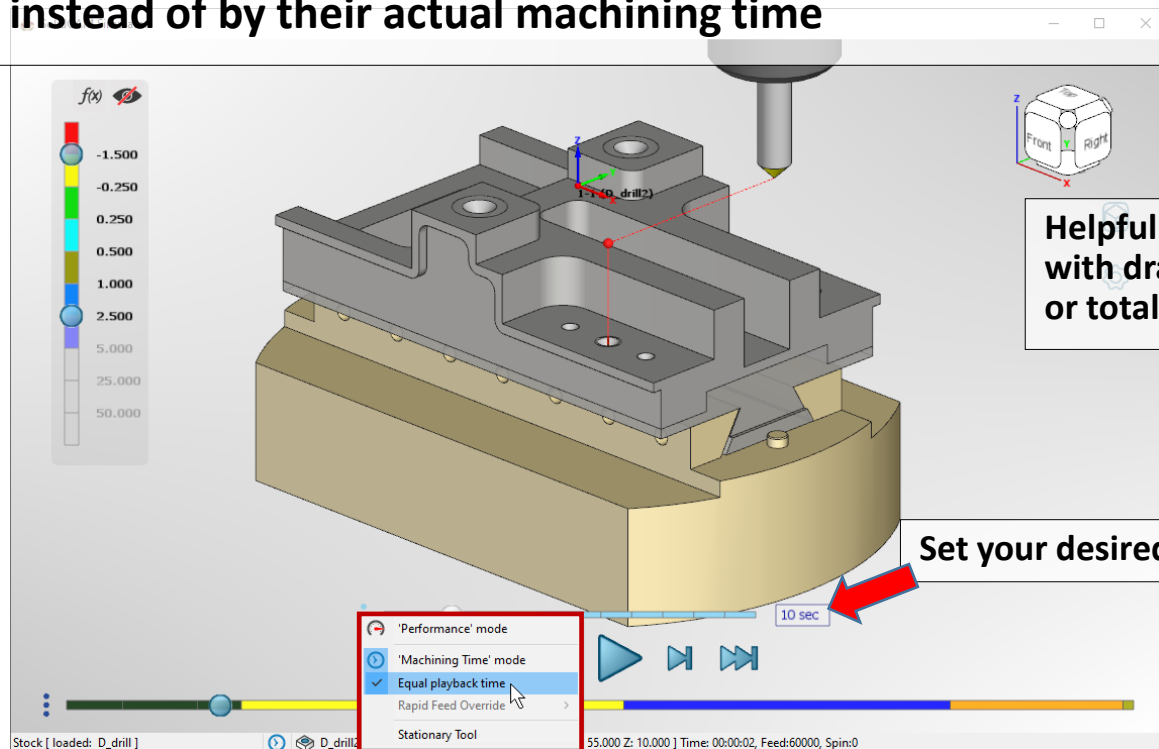


CAM Iso Z Up and Turning Isometric are also available on the View Cube

- Standard Views >
- Section Views >
- Fit
- Fit by box
- Select
- Move
- Rotate
- Zoom In/Out
- Disable rotation
- Hybrid
- Polygons
- Wireframe
- Wireframe (hidden lines)
- Isometric
- Top
- Bottom
- Front
- Back
- Left
- Right
- Turning Isometric
- ZK

Machine Time Mode – Equal Playback Time

- New option to smoothly simulate your operations in a specified, equal amount of time instead of by their actual machining time



Helpful when reviewing many operations with drastically different tool path steps or total machining times

Set your desired playback time

See Demo



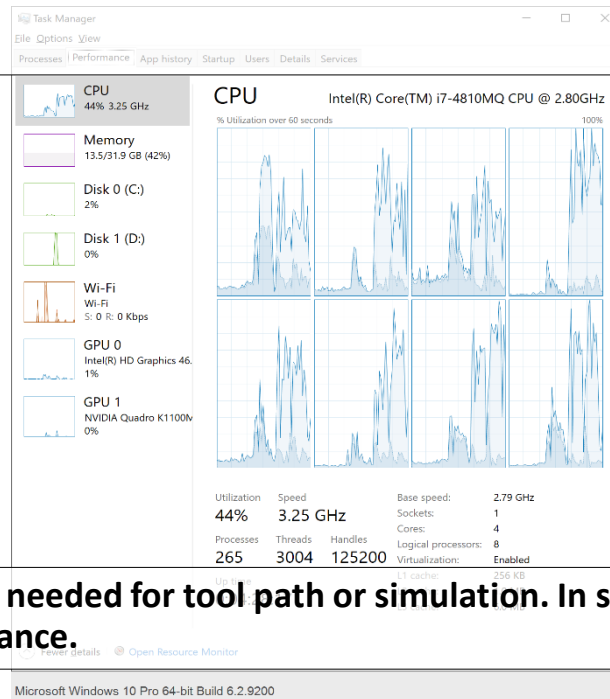
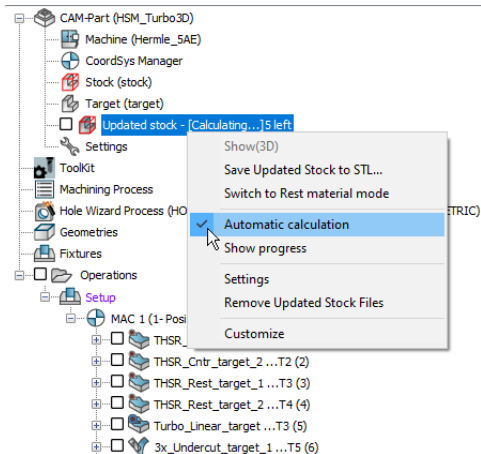
on YouTube

What's New in SolidCAM 2021

General

Automatic Updated Stock Uses Half Cores

- CPU is limited to 50% utilization of the cores when the Updated stock is calculating in the background (Automatic calculation enabled)
- Increases overall system responsiveness



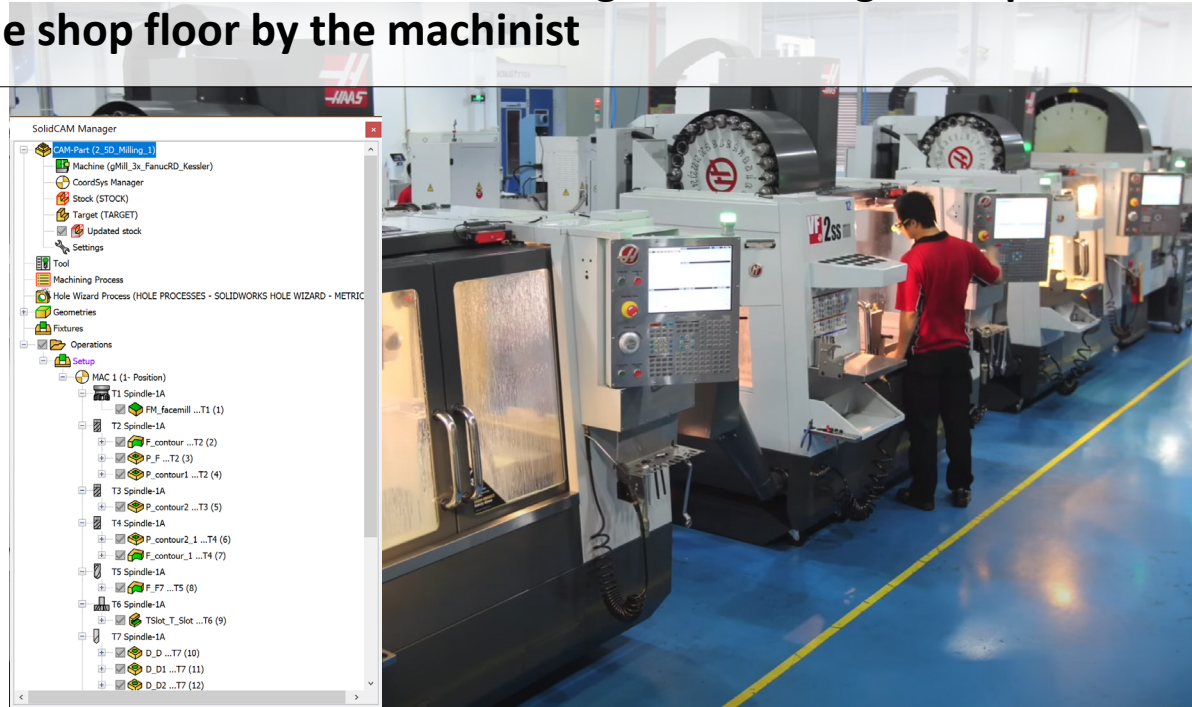
Note: This change does not affect Updated stock calculations needed for tool path or simulation. In such cases, SolidCAM uses 100% of the CPU cores for maximum performance.

SolidCAM ShopFloor Editor

- SolidCAM's ShopFloor Editor is an excellent tool for making minor changes in operations that can be done right on the shop floor by the machinist

- Perfect for:

- Adjusting spin and feed rates while you work
- Changing tools during a night shift when your programmers are not available

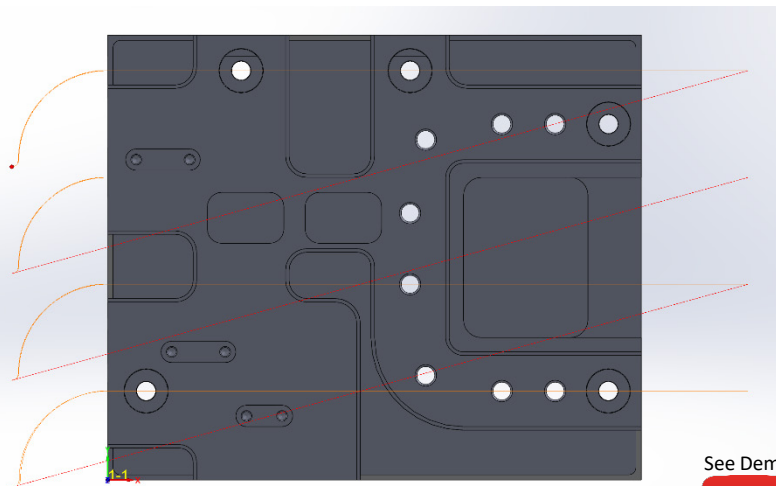
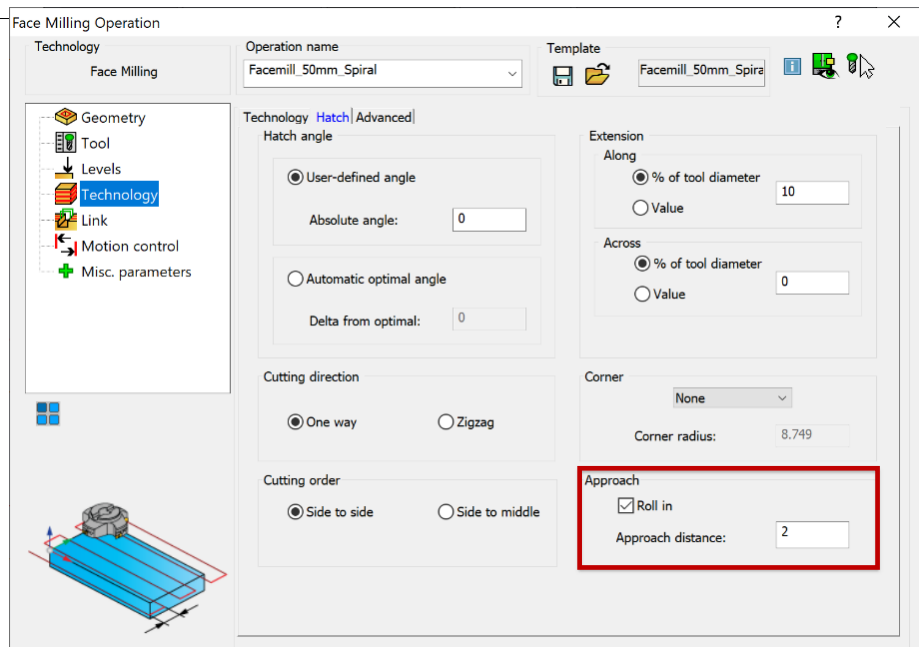


What's New in SolidCAM 2021

2.5D Milling

Face Milling – Roll in Approach for Hatch

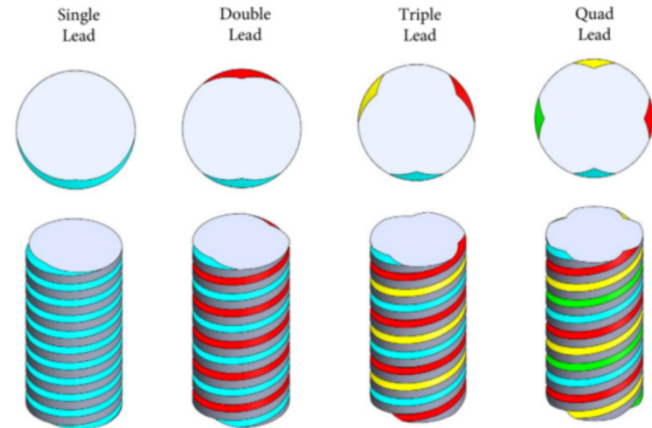
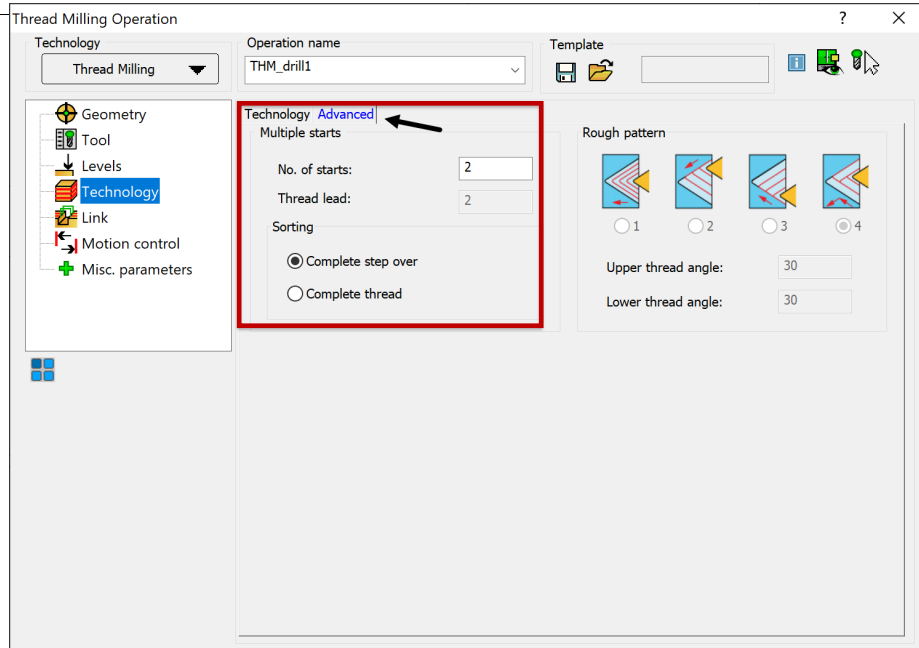
- The Roll in approach will turn into the Hatch tool path at the start point
- This method is recommended by tool manufactures when using Face Mill insert tools



See Demo
on YouTube

Thread Milling – Multi-start Threads Support

- Thread Milling now has the option to have several leads for a thread
- These thread types are usually used for quick closing and release of threaded parts

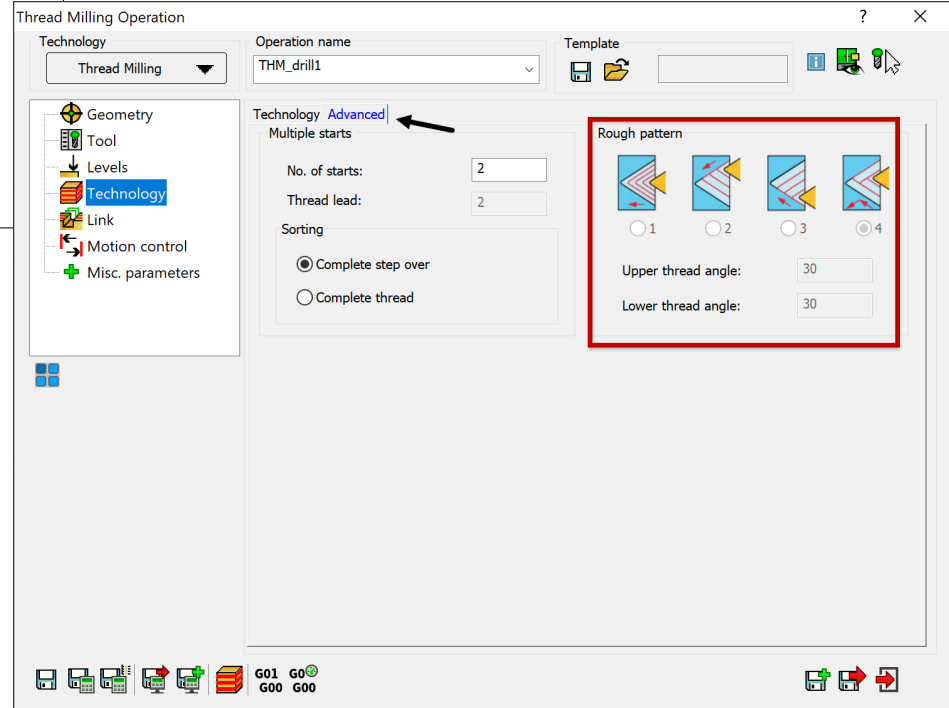


See Demo
on YouTube



Thread Milling – Infeed Patterns Support

- **Rough patterns is now available in Milling (Thread Milling) as in Turning**
- **This allows you to have complete control over the cutting edge used on the part**



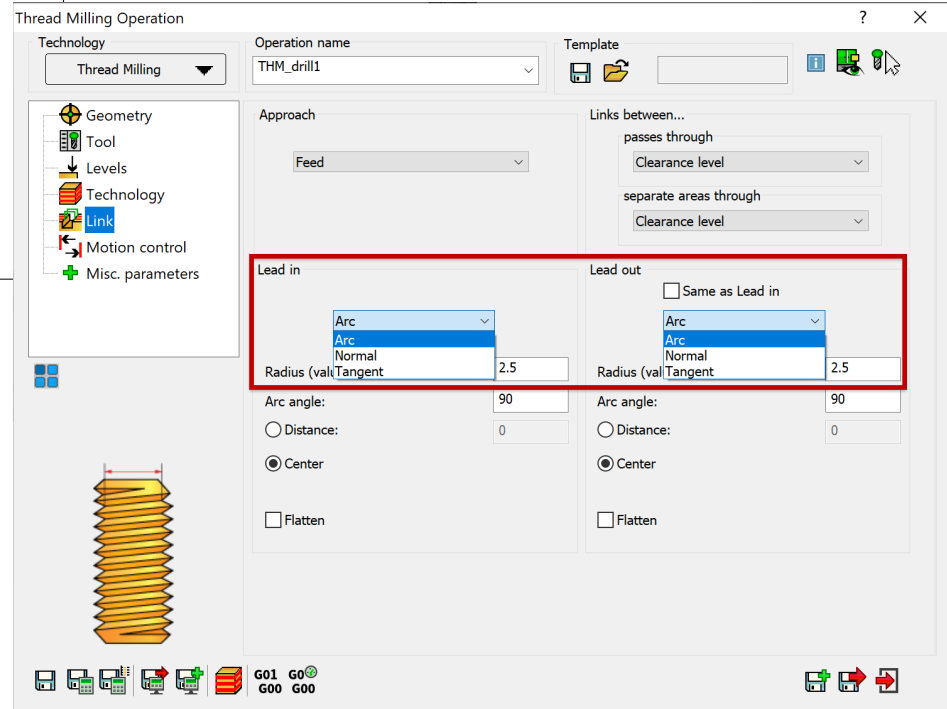
See Demo



on YouTube

Thread Milling – Lead in/out with Arc, Normal & Tangent

- You now have complete control as to the method you prefer using for Lead in/out in Thread Milling
- You can now use Arc, Normal and Tangent (External thread only) for the Lead in/out



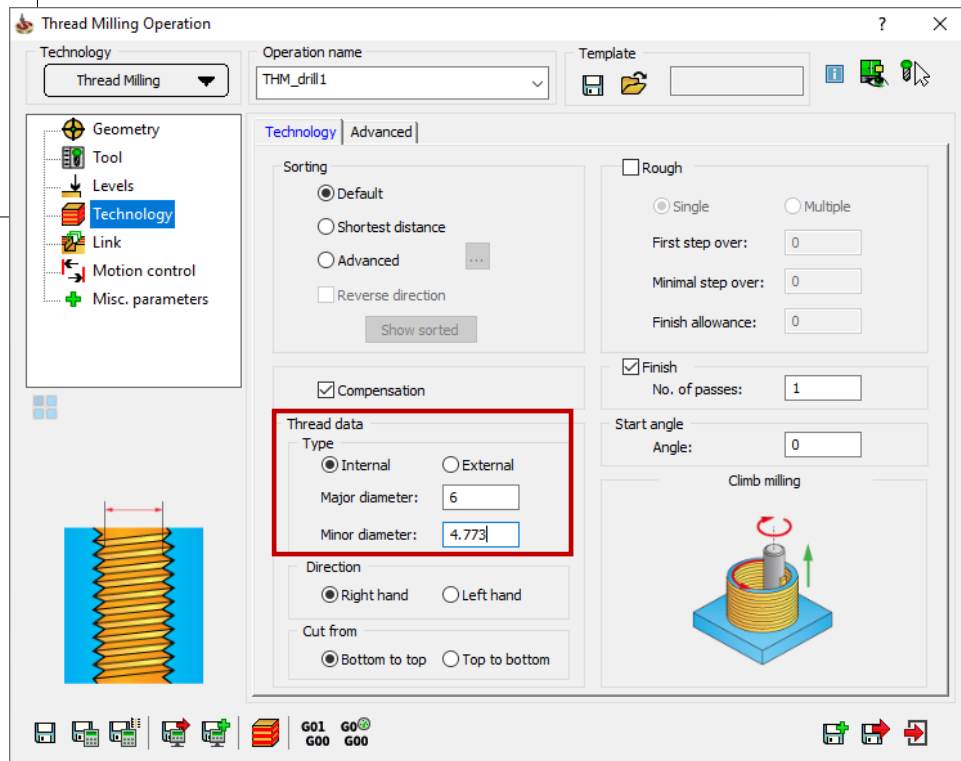
See Demo



on YouTube

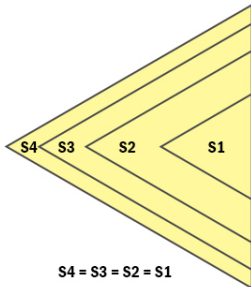
Thread Milling – Minor Diameter Definition

- Thread data can now be defined with a Minor diameter
- This reduces air cutting passes



Thread Milling – First Step Over Control in Rough

- **First step over removes the entered amount on the first Multiple step**
- **The following steps will decrease automatically to keep a constant load on the tool until it reaches the Minimal step over, and then stop when it reaches the Finish allowance**



Thread Milling Operation

Technology: Thread Milling

Operation name: THM_drill1

Template: []

Technology | Advanced |

Sorting: Default, Shortest distance, Advanced, Reverse direction

Compensation

Thread data: Type: Internal, External; Major diameter: 6; Minor diameter: 4.773

Direction: Right hand, Left hand

Cut from: Bottom to top, Top to bottom

Rough

Single, Multiple

First step over: 0.2

Minimal step over: 0.1

Finish allowance: 0.05

Finish, No. of passes: 1

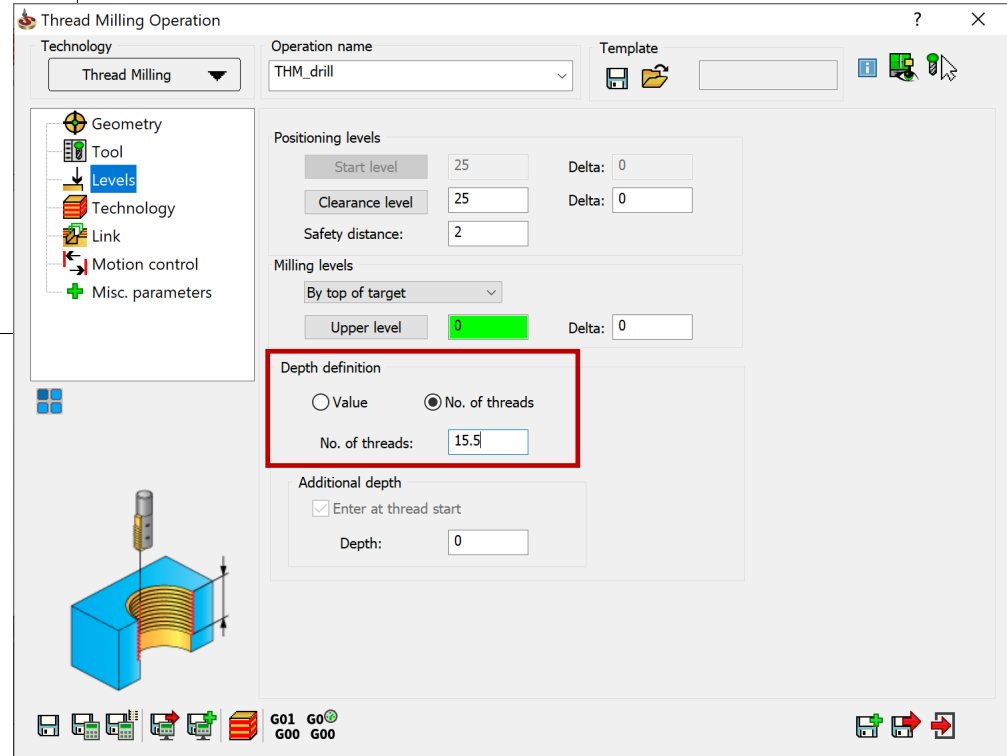
Start angle: Angle: 0

Climb milling

GO1, GO0, G00

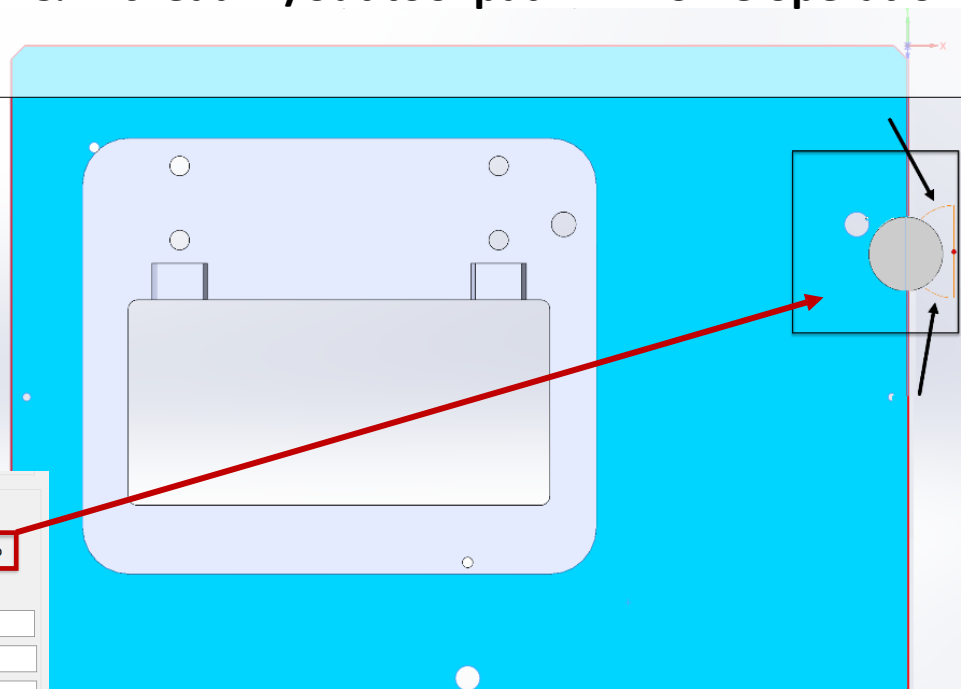
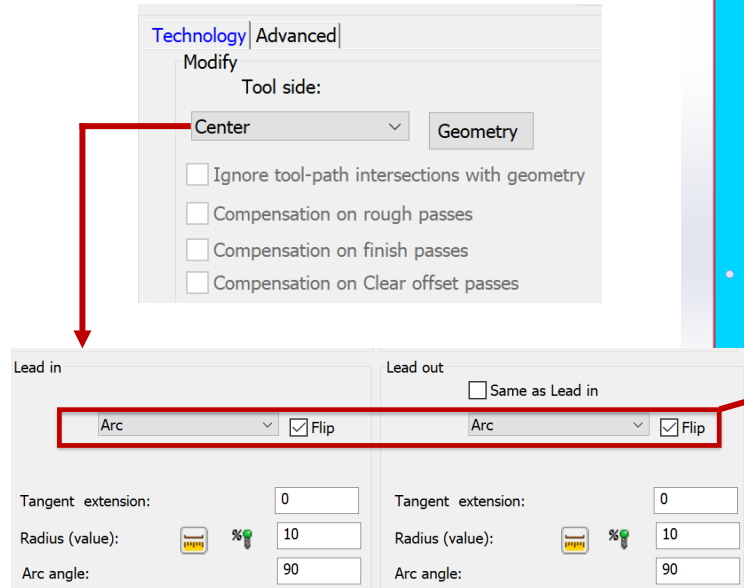
Thread Milling – Decimal Depth Support

- **Depth definition in Thread Milling now supports decimal values**
- **Support implemented for Number of threads**



Profile – Lead in/out Flip Option for Center Tool Path

- Option to flip orientation of Normal & Arc lead in/out tool path in Profile operations when Tool side is set to Center

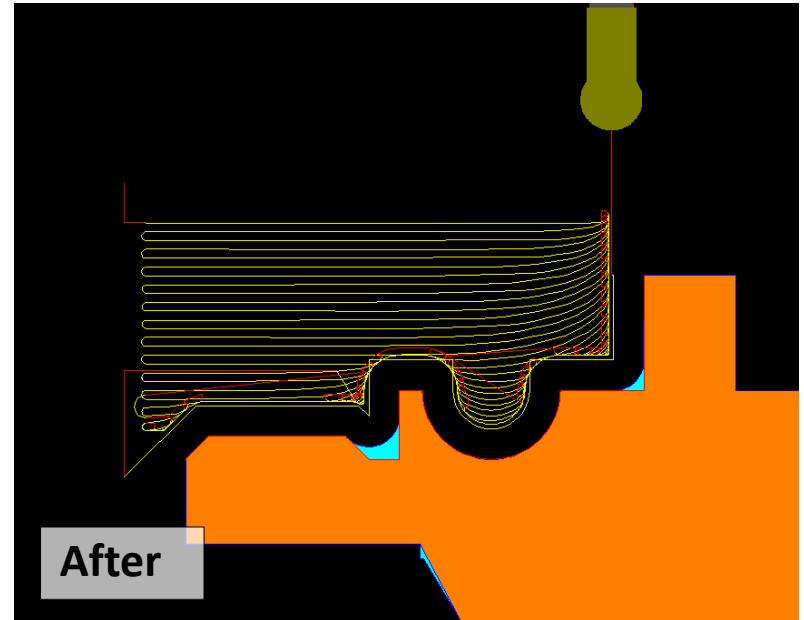
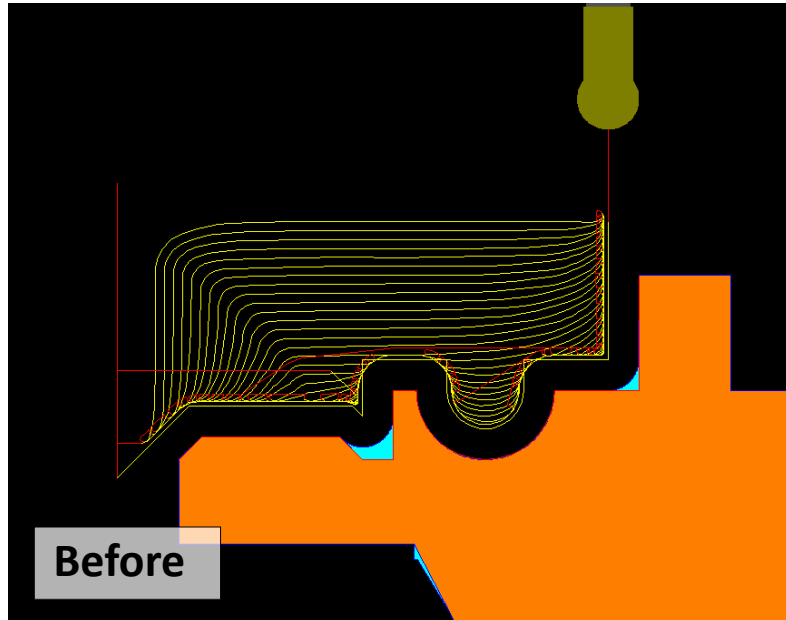


What's New in SolidCAM 2021

Turning

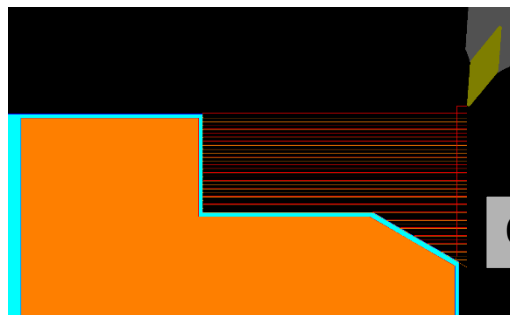
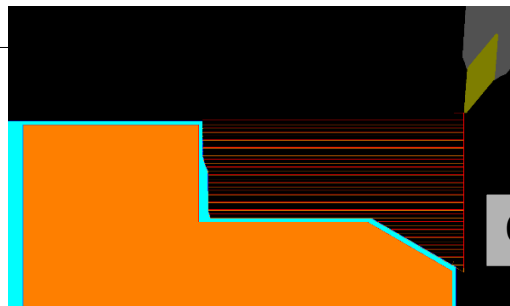
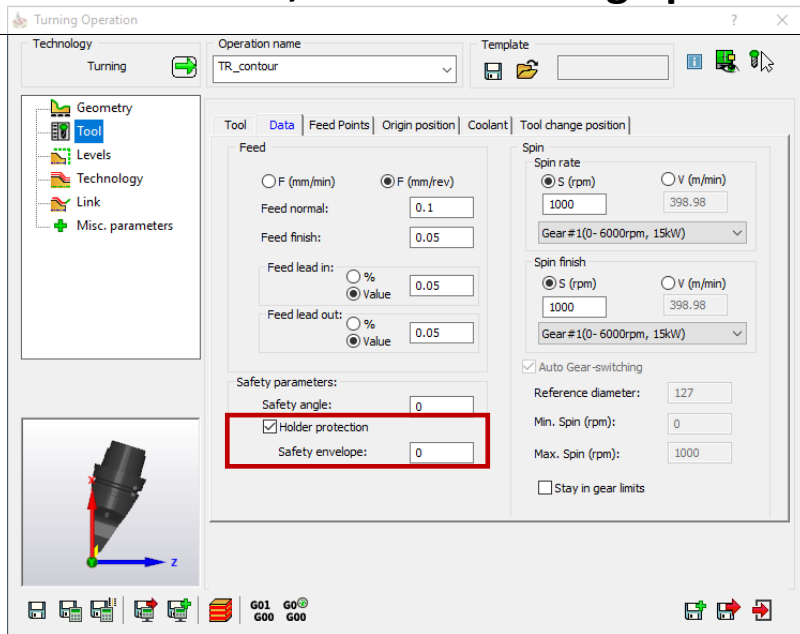
Trochoidal Turning – Improved Tool Path Algorithm

- Improved Trochoidal Turning algorithm optimizes the entire roughing procedure by producing a more suitable tool path at the end of the stock



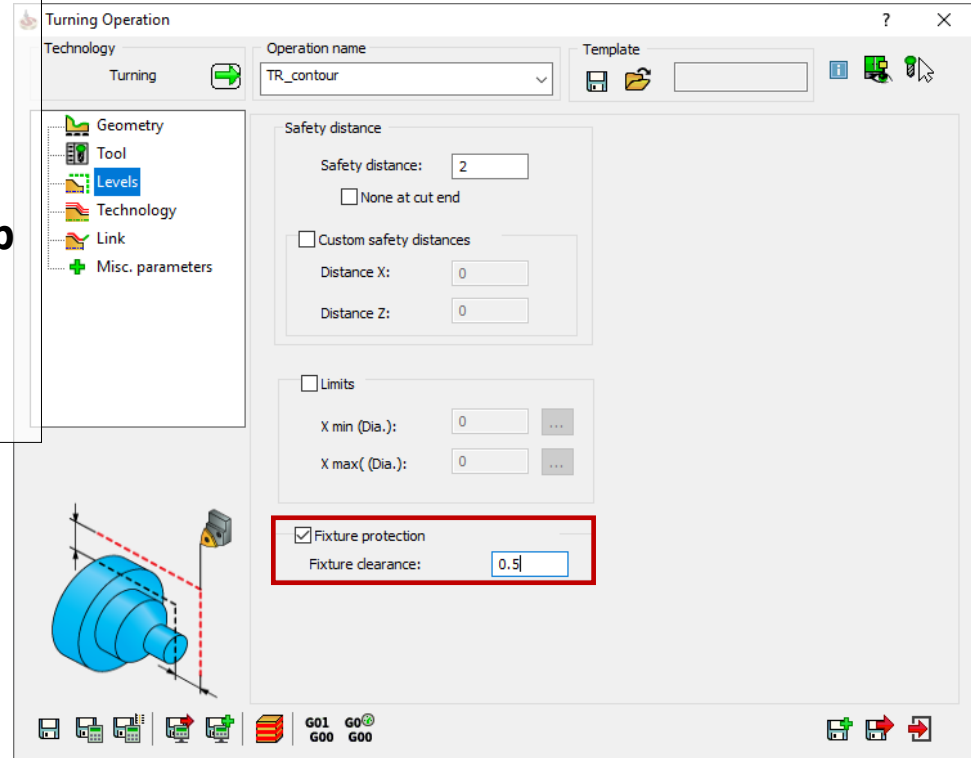
STL Holder Protection in Turning

- Holder protection detects and avoids collisions in Turning rough and finish procedures
- Check box allows you to cancel holder collision detection when it's not needed, such as for Face Groove, Internal Turning operations, etc.



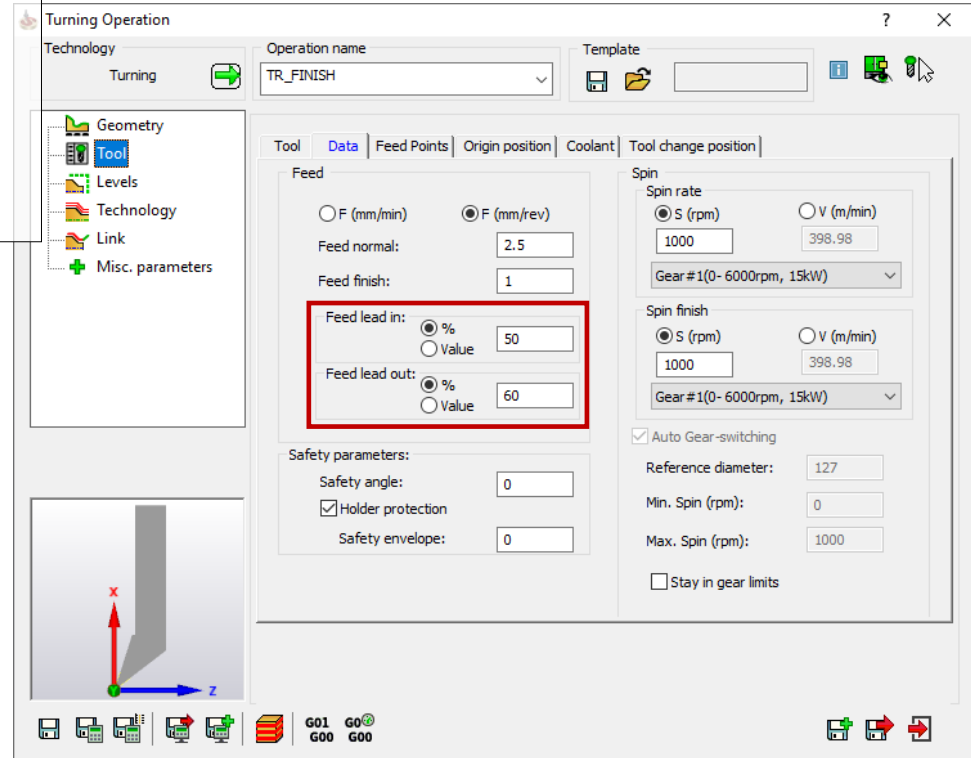
Fixture Protection in Turning

- **Fixture protection detects and avoids collisions between your defined Setup and the Cutter**
- **Fixture clearance specifies the distance by which the Cutter must avoid the Setup**
- **Turning tool path is adjusted automatically**



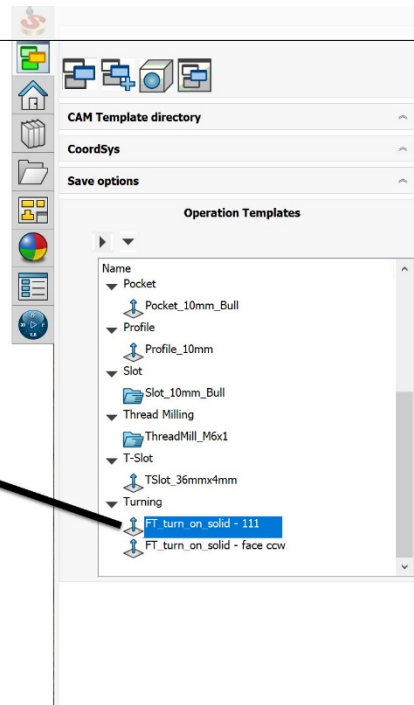
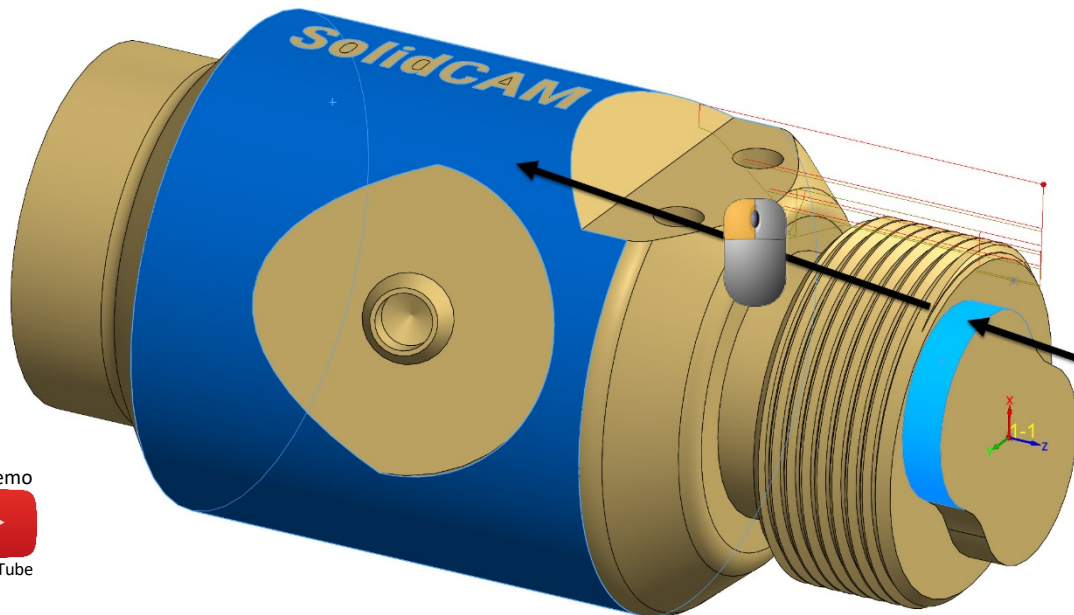
Feed Lead In/Out in Turning Tool Data

- You now have the option to modify the Feed rate for Lead in and Lead out by a user-defined value or by a percentage increase/decrease relative to Feed finish



Drag & Drop Templates in Turning

- You can now drag & drop a template with your mouse from the SolidCAM Task Pane to one or more surfaces of your model to create a Turning operation



See Demo



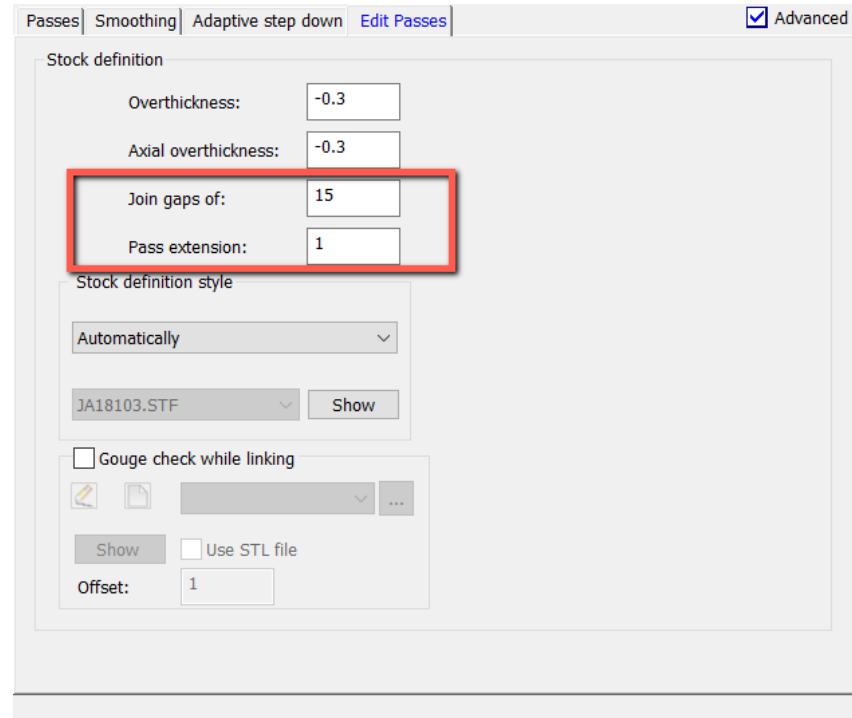
on YouTube

What's New in SolidCAM 2021

HSR/HSM

HSR – Join Gaps & Pass Extension

- **Join Gaps** allows HSR to join gaps between 2 groups of tool paths
- **Pass extension** allows the user to extend the tool path by the user defined value



See Demo



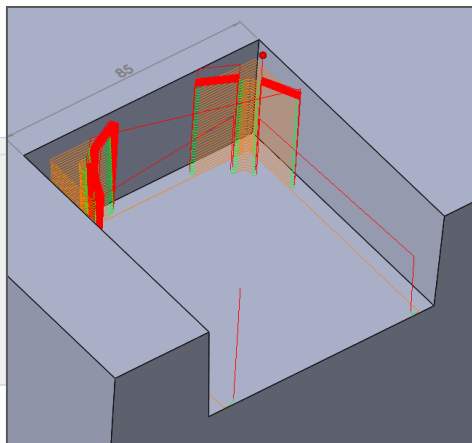
on YouTube

HSR – Join Gaps & Pass Extension Tool Path

Original tool path

Stock definition

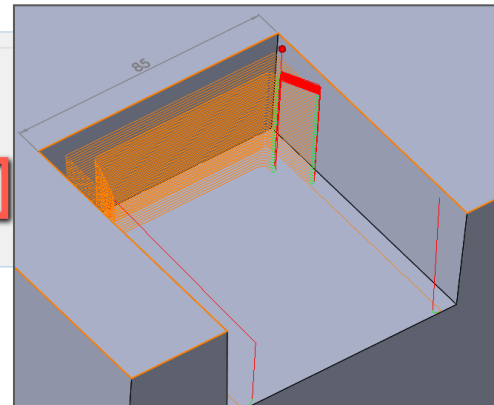
| | |
|----------------------|-----------------------------------|
| Overthickness: | <input type="text" value="-0.3"/> |
| Axial overthickness: | <input type="text" value="-0.3"/> |
| Join gaps of: | <input type="text" value="15"/> |
| Pass extension: | <input type="text" value="1"/> |



Stock definition

| | |
|----------------------|-----------------------------------|
| Overthickness: | <input type="text" value="-0.3"/> |
| Axial overthickness: | <input type="text" value="-0.3"/> |
| Join gaps of: | <input type="text" value="100"/> |
| Pass extension: | <input type="text" value="1"/> |

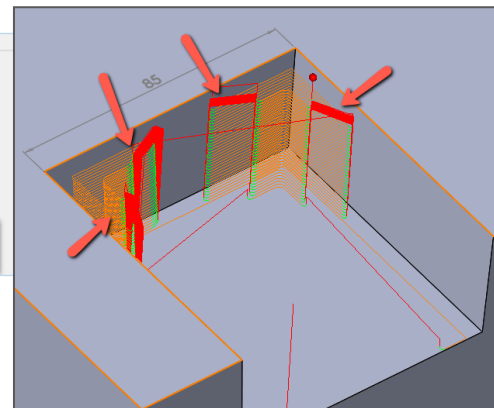
Join gaps



Stock definition

| | |
|----------------------|-----------------------------------|
| Overthickness: | <input type="text" value="-0.3"/> |
| Axial overthickness: | <input type="text" value="-0.3"/> |
| Join gaps of: | <input type="text" value="15"/> |
| Pass extension: | <input type="text" value="7"/> |

Pass extension



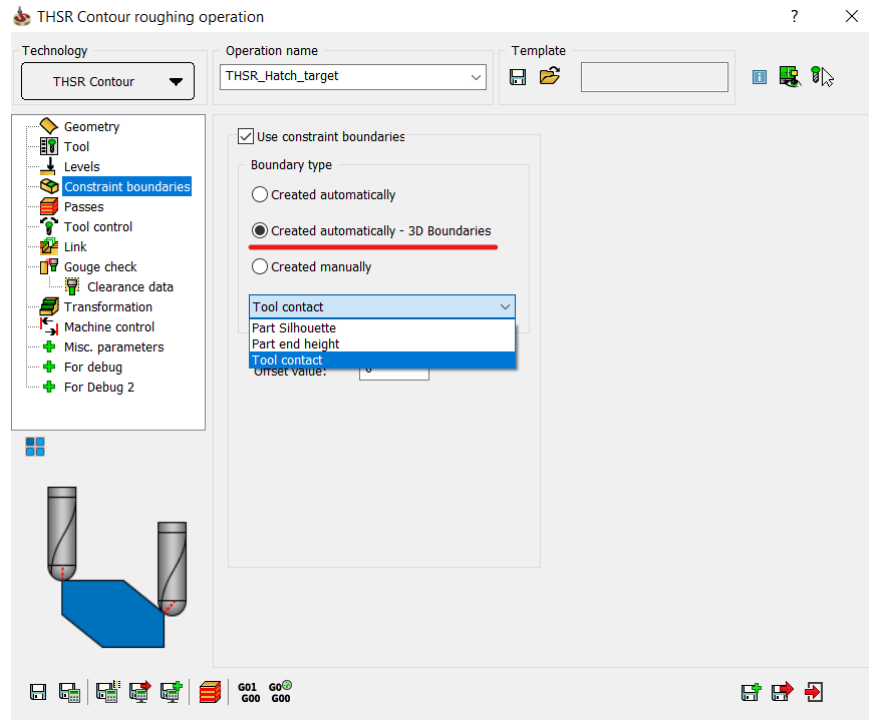
What's New in SolidCAM 2021

Turbo HSR

Turbo HSR – New 3D Boundaries

- Turbo HSR now offers **Automatic Boundary Definition** based on the following:

- Part Silhouette
- Part end height
- Tool contact



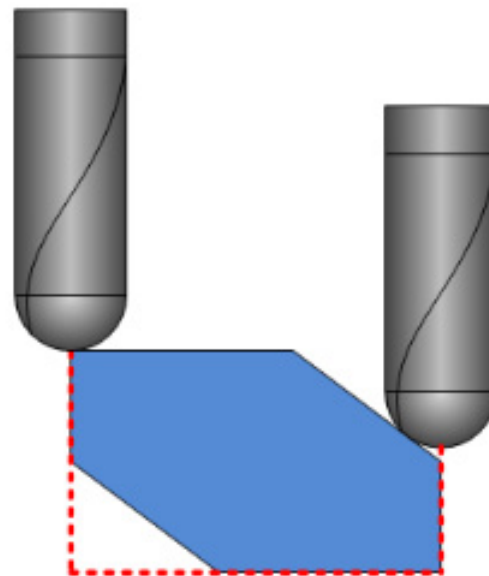
See Demo



on YouTube

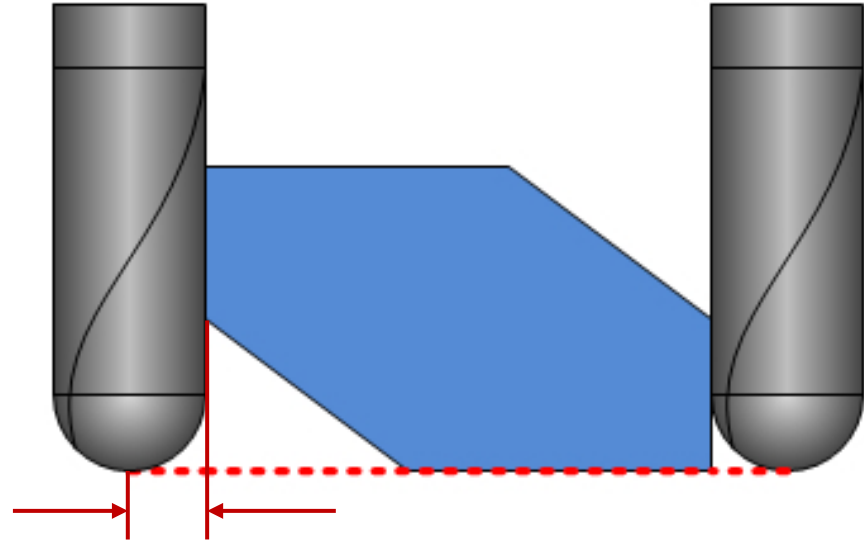
Turbo HSR – Part Silhouette Boundary

- **Part Silhouette is the default boundary**
- **The area machined is limited to the tool center line which follows exactly the actual part shadow**



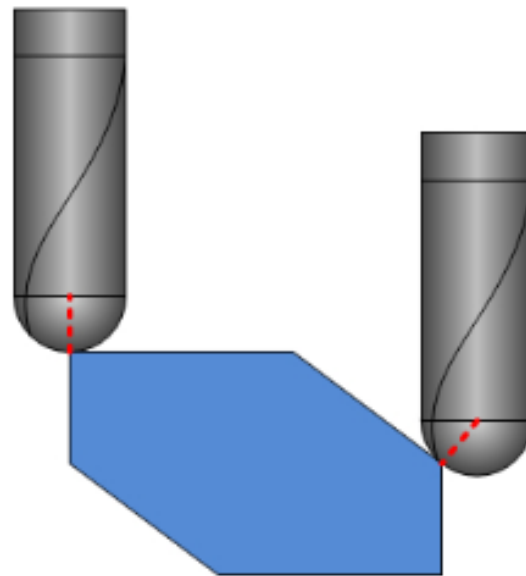
Turbo HSR – Part End Height Boundary

- In Part end height method, 2D contour is determined by the part shadow onto machining plane offset outwards by the tool radius



Turbo HSR – Tool Contact Boundary

- In Tool contact method, the silhouette is determined by the tool contact point
- In case of steep walls, the silhouette is the exact tool tip
- In shallow areas, the tool reaches a bit over the tool tip in order to machine the complete surface

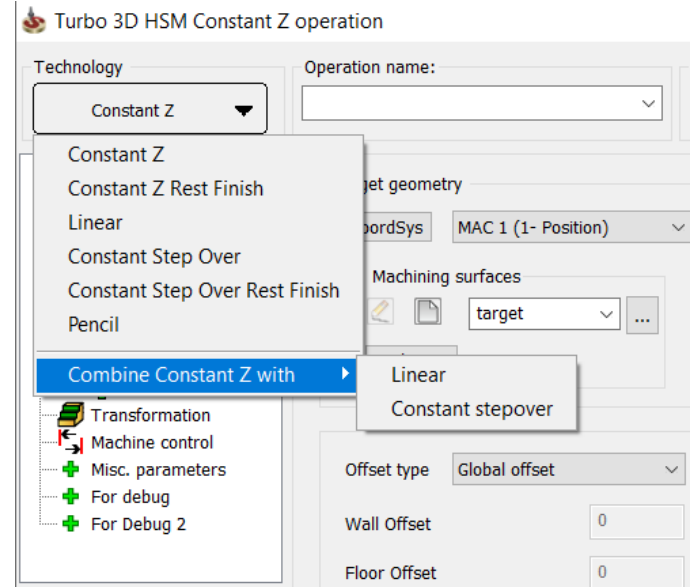


What's New in SolidCAM 2021

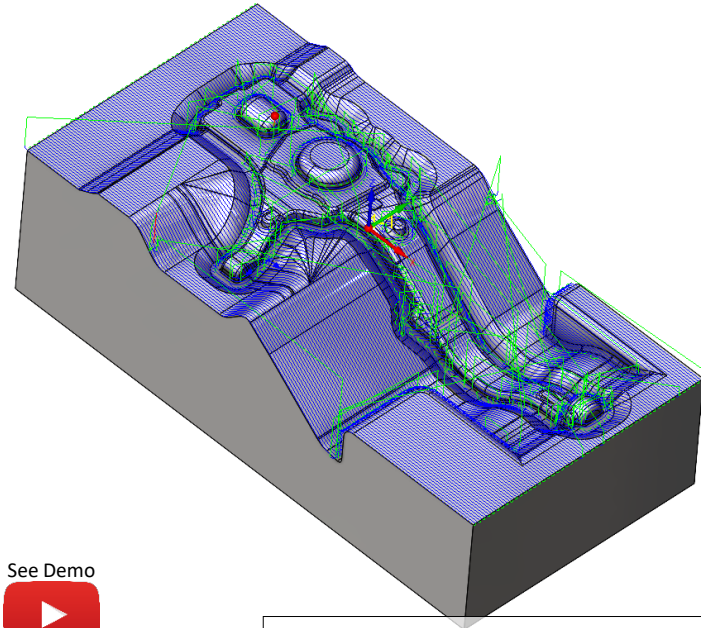
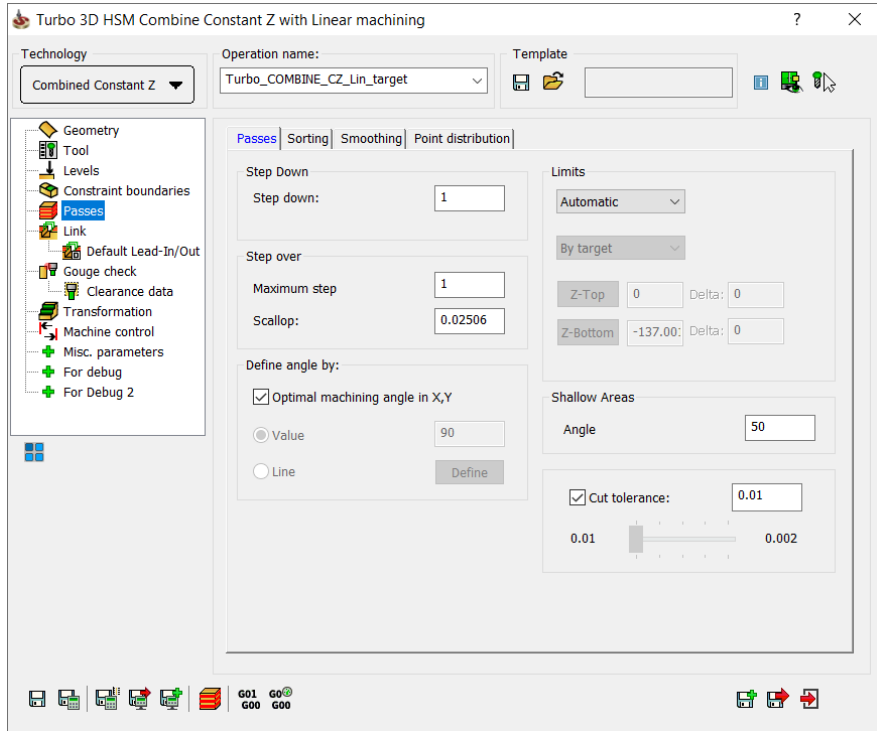
Turbo HSM

Turbo HSM – Combination Operation

- **Turbo HSM now offers combination operations, which combine 2 strategies together to provide a single tool path**
 - **Constant Z + Linear**
 - **Constant Z + Constant stepover**



Turbo HSM – Combine Constant Z + Linear Machining

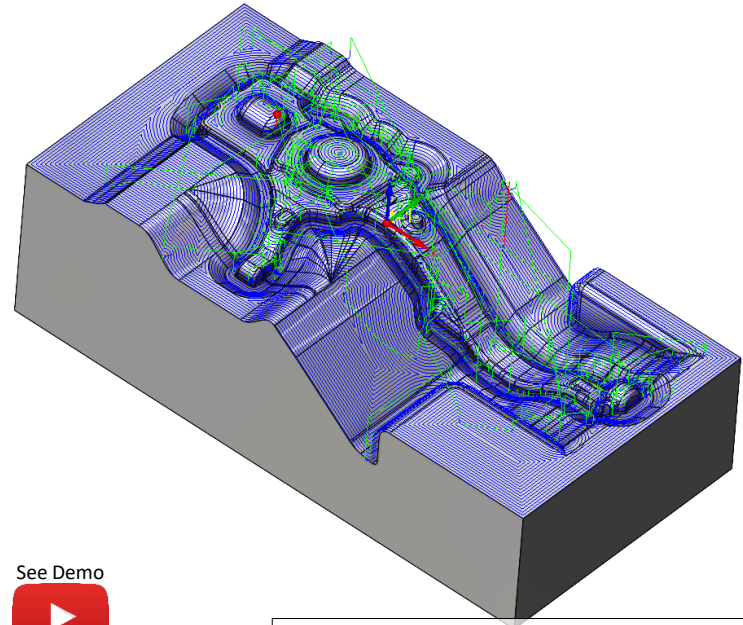
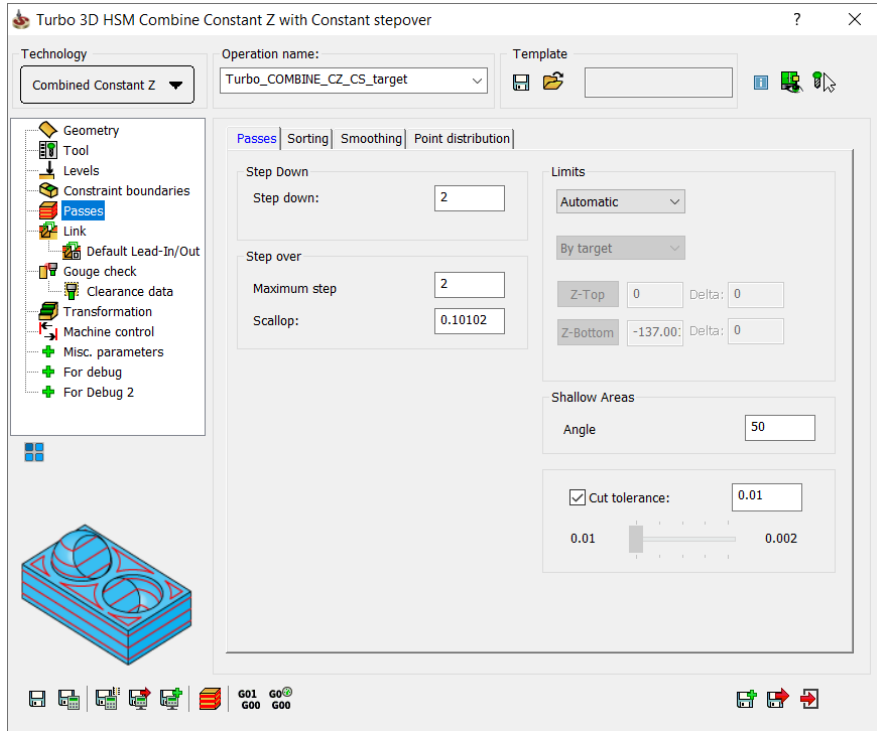


See Demo

on YouTube

Constant Z + Linear machining

Turbo HSM – Combine Constant Z + Constant Stepover



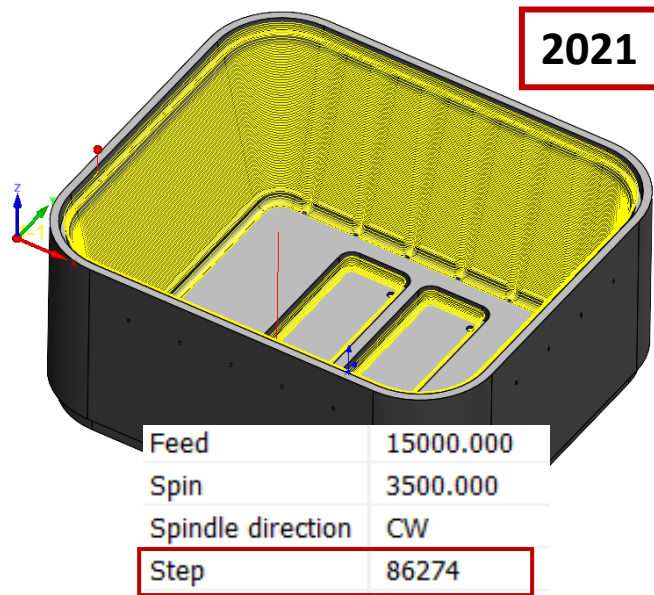
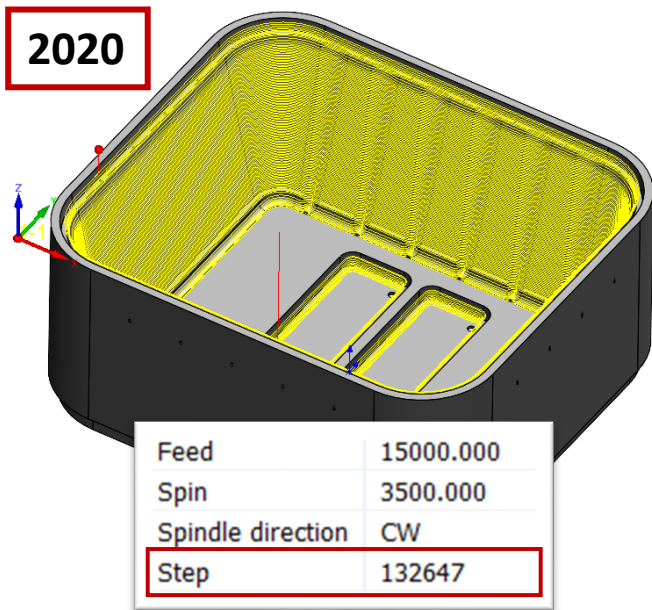
See Demo

on YouTube

Constant Z + Constant stepover

Turbo HSM – Tool Path Quality Improvement

- The generated Turbo HSM tool path now contains significantly less points while still maintaining the same tool path quality as before



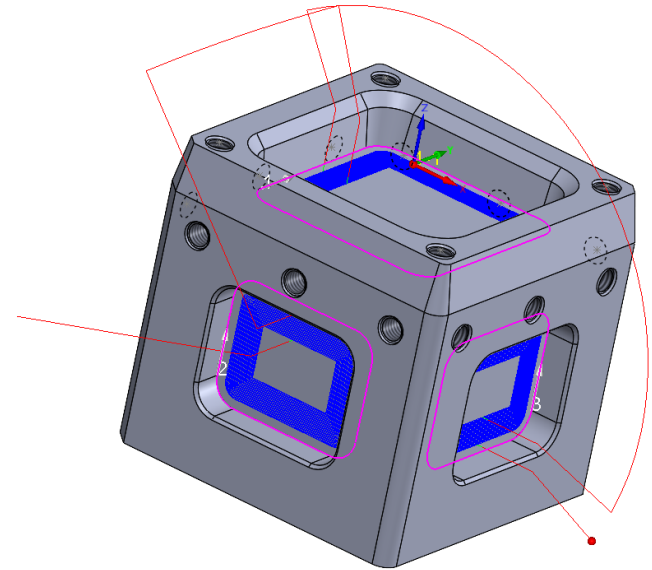
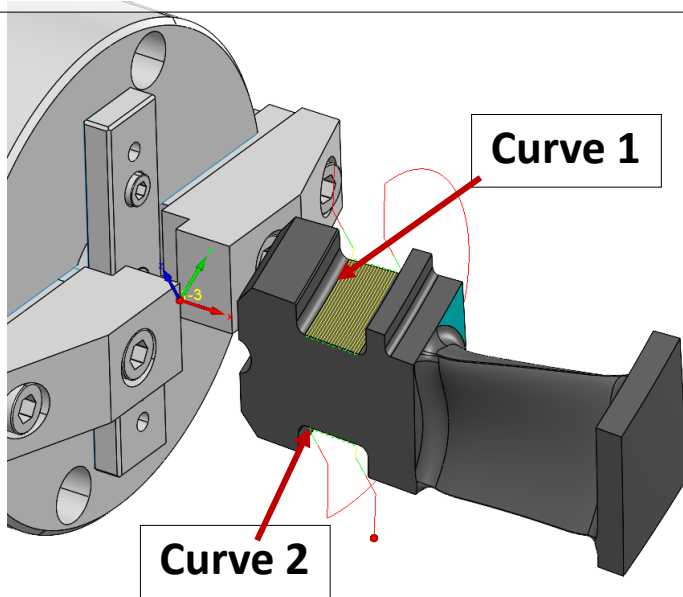
See Demo
on YouTube

What's New in SolidCAM 2021

HSS & Sim 5X Improvements

HSS/SIM 5X – Support of Multiple Guide Curves

- **SolidCAM now enables you to define multiple guide curves, which helps you to create a single tool path for more than one region**
 - **Applicable for “Parallel to Curves” only**



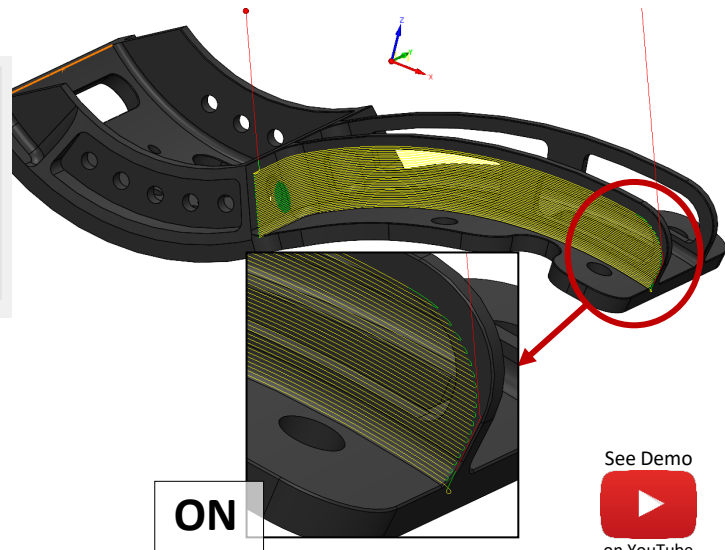
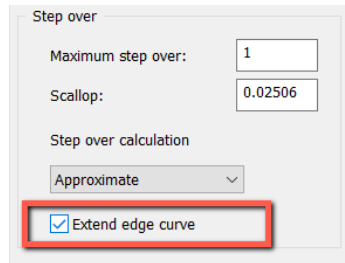
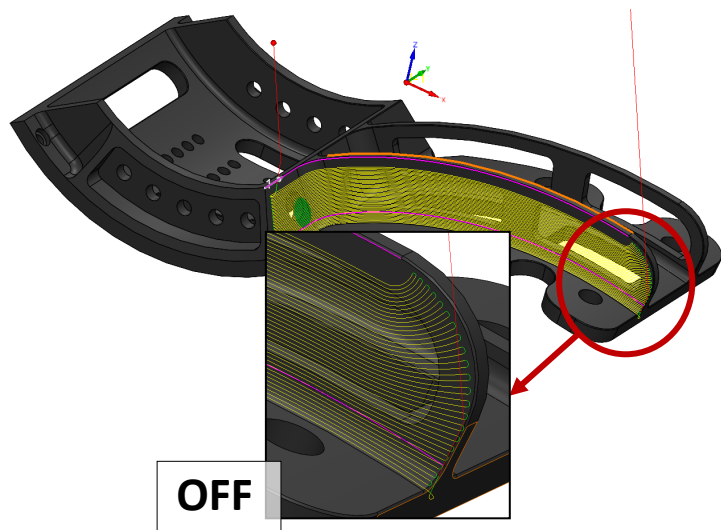
See Demo



on YouTube

HSS/SIM 5X – Extend Edge Curve

- **Extend edge curve option extends the shorter curve to match longer curve, forcing the tool path pattern to follow the extended curves**
 - **Applicable for “Morph between 2 curves” & “Parallel to Curves” only**



See Demo



on YouTube

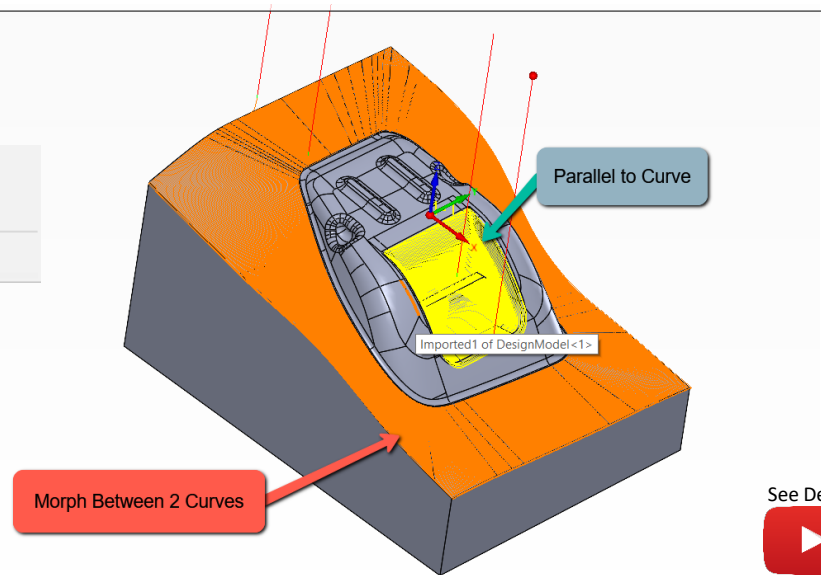
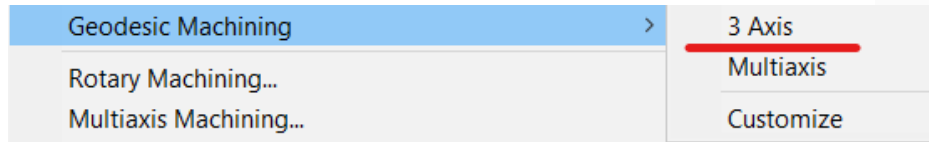
SIM 5X – Operation Name Changes

- There are several Operation names that have been changed to suit the process for which the feature / operation is built

| 2020 Operation Name | 2021 Operation Name |
|---------------------------------|-----------------------------|
| 3D Milling... | 3D Milling... |
| 3D HSR... | 3D HSR... (Ctrl+R) |
| Turbo 3D HSR... | Turbo 3D HSR... (Shift+R) |
| 3D HSM... | 3D HSM... (Ctrl+M) |
| Turbo 3D HSM... | Turbo 3D HSM... (Shift+M) |
| Undercut Milling | 3+2 Roughing... |
| Sim. 5-Axis Milling... | Undercut Milling |
| Rotary Machining 4 axis... | Sim. 5-Axis Milling... (S) |
| 3 to 5 axis Conversion | Rotary Finishing 4x... |
| Contour 5-Axis Machining... | 3 to 5 axis Conversion |
| Multiaxis Drilling... | Contour 5-Axis Machining... |
| SWARF Machining... | Multiaxis Drilling... |
| Multiaxis Constant Steptover... | SWARF Machining... |
| Screw Machining... | Geodesic Machining |
| Multiaxis Roughing... | Rotary Machining... |
| Multiblade Machining... | Multiaxis Machining... |
| Port Machining... | Multiblade Machining... |
| Customize | Port Machining... |
| | Edge Breaking... |
| | Edge Trimming... |
| | Customize |

Geodesic Machining – 3X Support

- **SolidCAM Geodesic Machining uses a global distance field without a fixed direction as a reference for the calculation, which enables full flexibility for calculating various pattern types while maintaining consistent distances (Constant Stepover) between cuts**



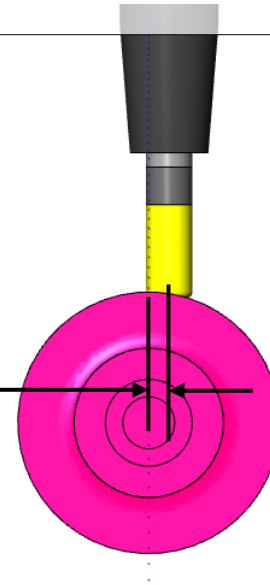
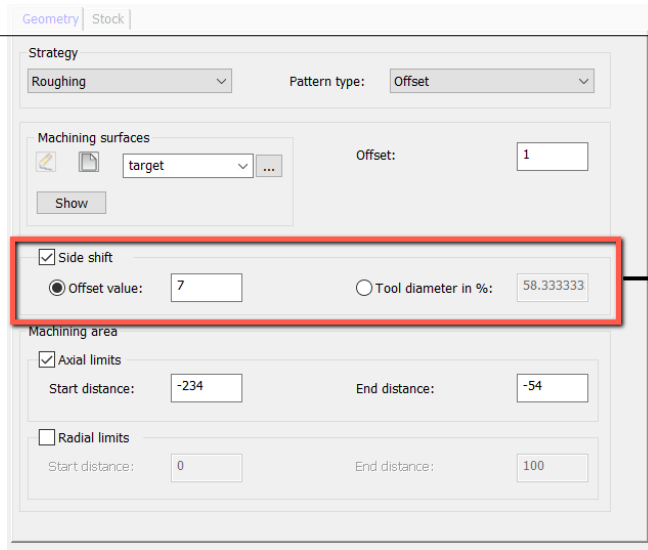
See Demo



on YouTube

Rotary Machining – Side Shift

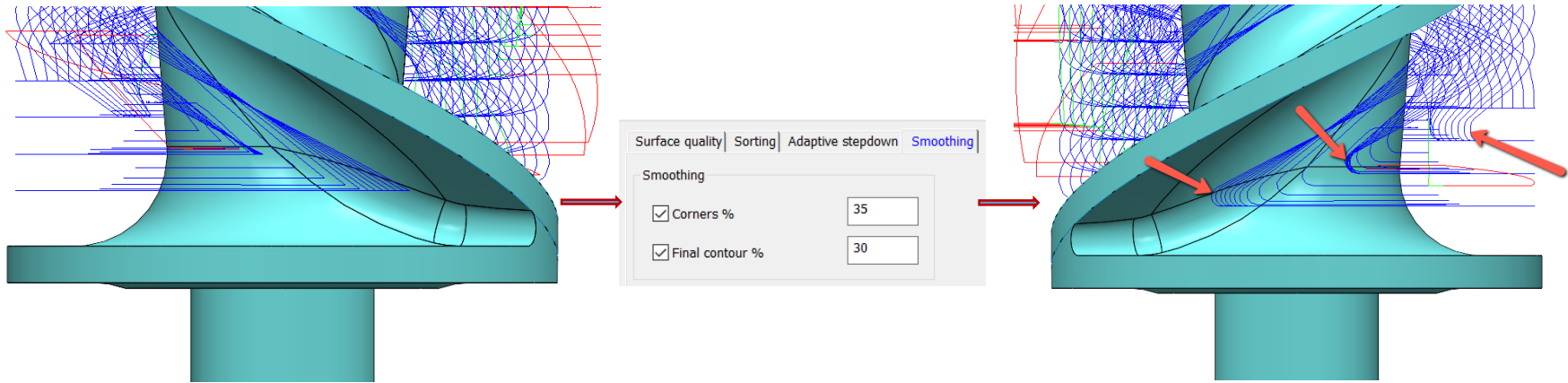
- Side shift, available only for roughing cycles, allows rotary machining with an axis offset
- This option enables the tool to cut properly with the cutting edges, not the tool center, thereby enabling more stable cutting speeds and close-to-diameter cutting with non-spherical tools



See Demo
on YouTube

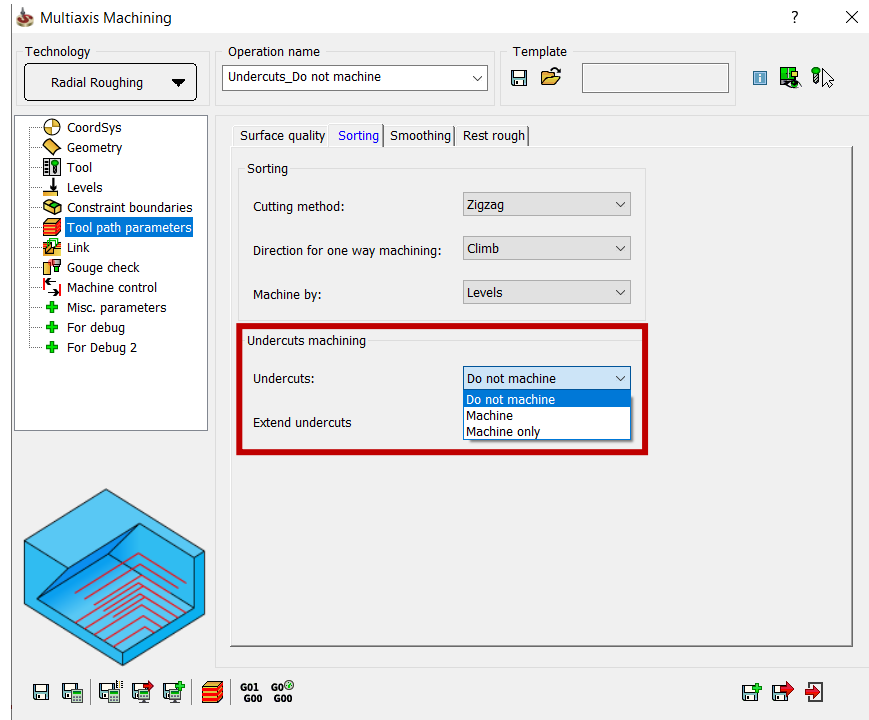
Rotary Machining – Corner Smoothing

- **Rotary machining enables you to apply corner rounding to the sharp motions on the final contour as well as intermittent contours**
- **This allows the machine to cut faster and maximizes the tool life**



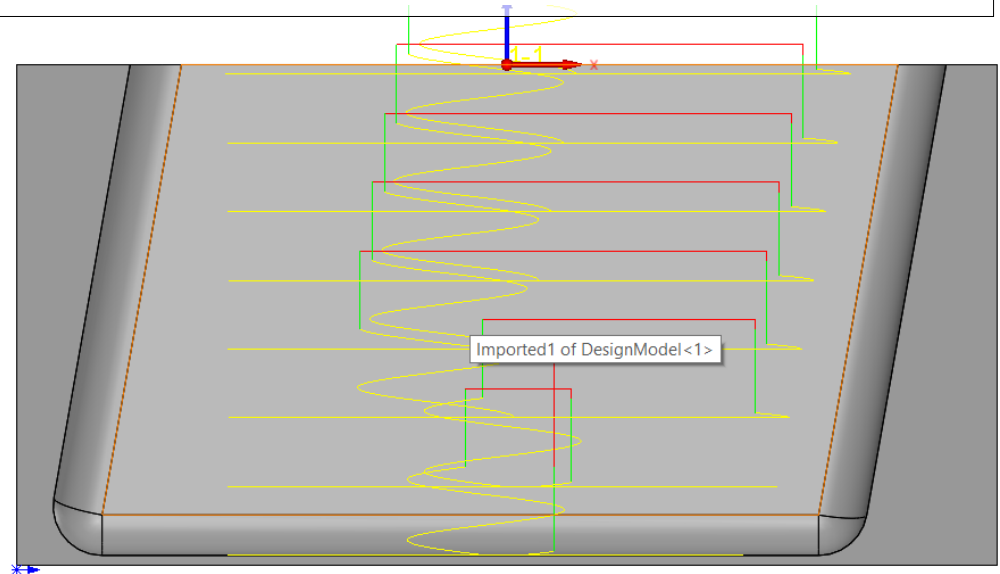
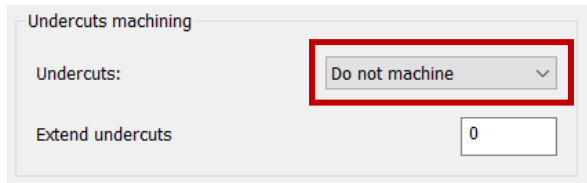
Multiaxis Machining – Undercuts machining

- You can now process undercut and non-undercut areas
- This enables you to gain more access from different machining directions, minimizing the number of operations needed to process the part



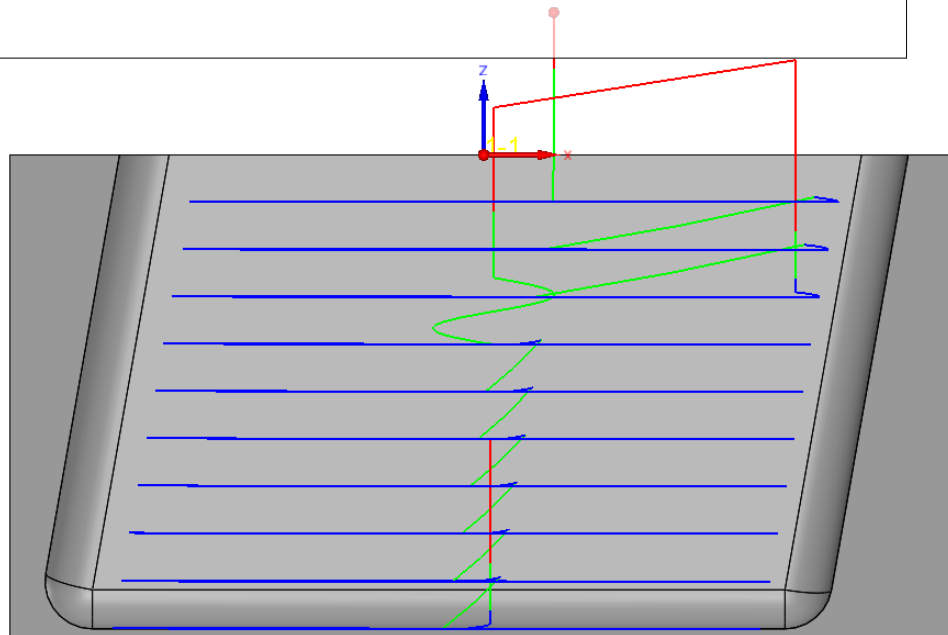
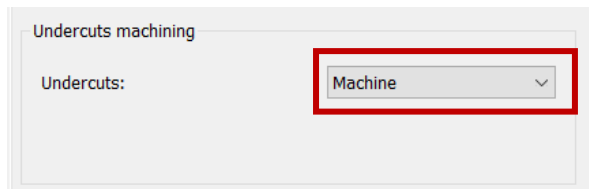
Undercuts machining – Do not machine

- This option excludes undercut areas for the most productive material removal rate using non-spherical tools
- Supports Flat, Bull and Ball Nose End Mills



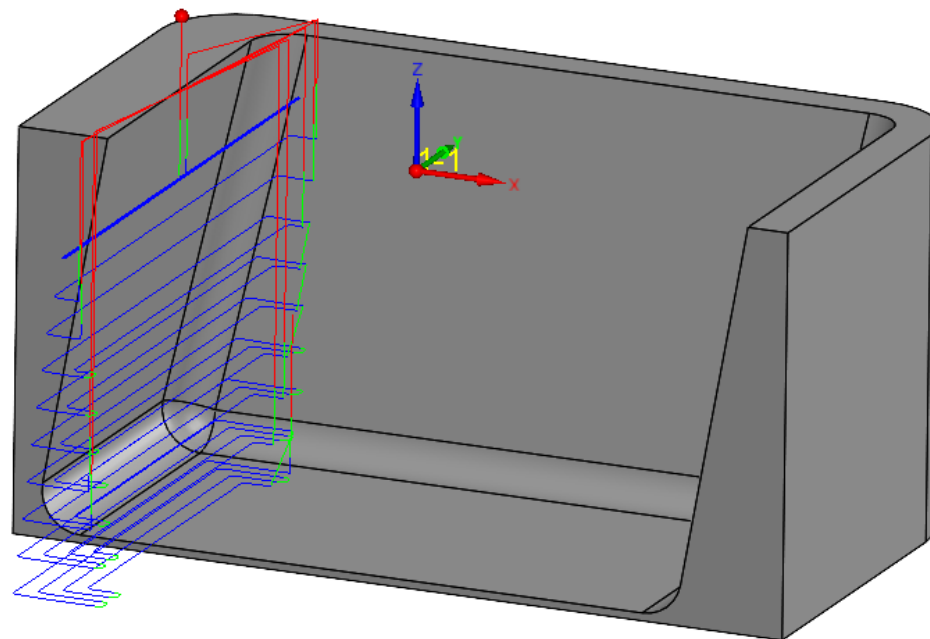
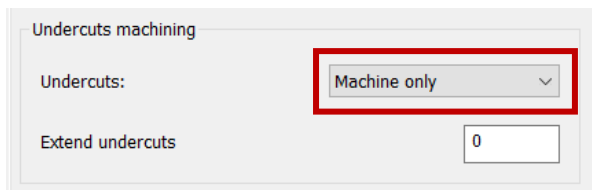
Undercuts machining – Machine

- **This option performs the machining of both undercut and non-undercut areas**
- **Supports Ball Nose Mills only**



Undercuts machining – Machine only

- This option automatically detects undercuts for the most efficient machining of specific areas
- Supports Ball Nose Mills only

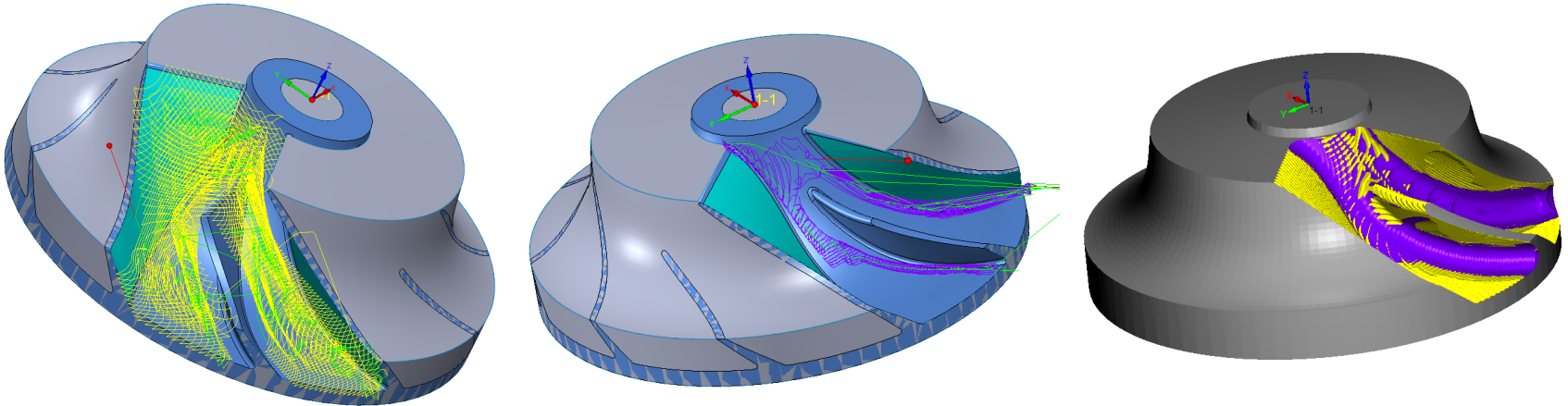


What's New in SolidCAM 2021

SolidCAM Auto 3+2 Roughing

SolidCAM Auto 3+2 Roughing

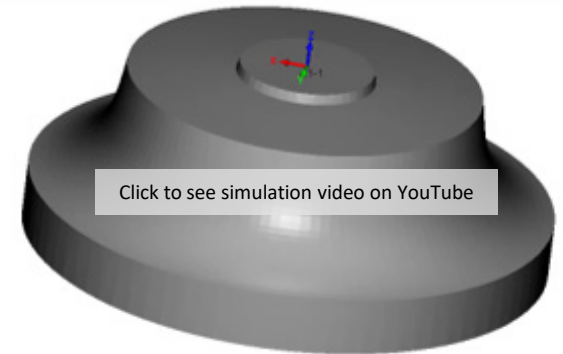
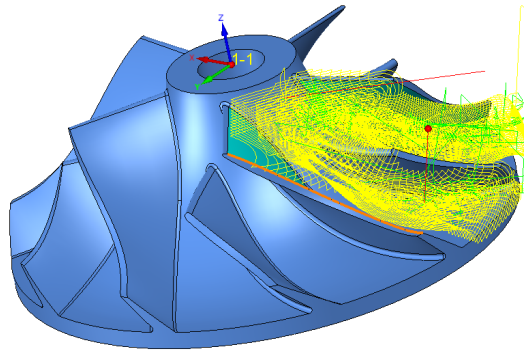
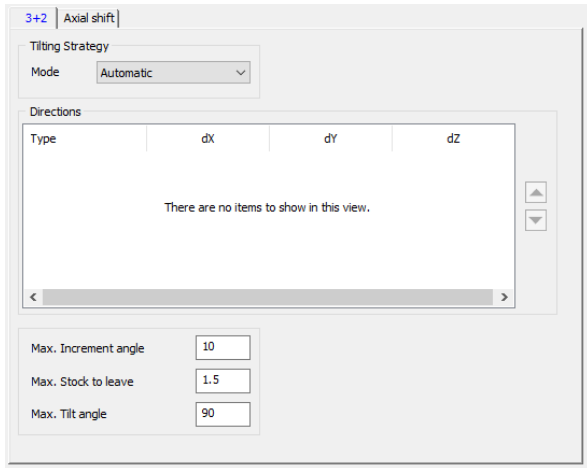
- **SolidCAM can create 3+2 Roughing tool paths using the following methods:**
 - **Automatic**
 - **Semi Automatic**
 - **Manual**



SolidCAM finds the optimal direction based on the maximum stock/material that can be machined

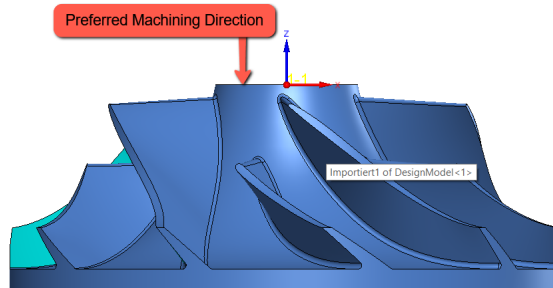
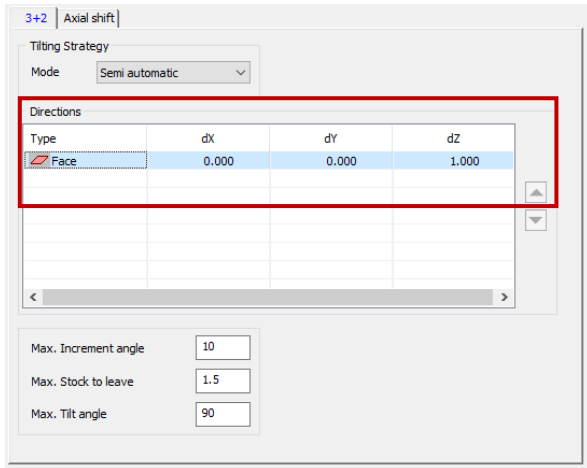
SolidCAM Auto 3+2 Roughing – Automatic Mode

- In Automatic mode, SolidCAM searches the unmachined areas and processes them according to *Max. Increment angle*, *Max. Stock to leave* and *Max. Tilt angle*
 - With these parameters, machining is performed from all possible indexed directions



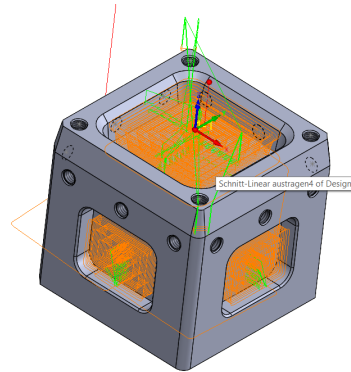
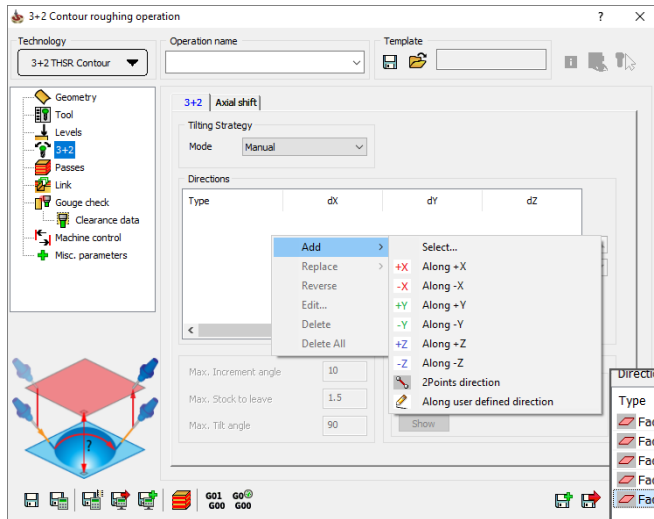
SolidCAM Auto 3+2 Roughing – Semi Automatic Mode

- **Semi automatic mode enables you to start the machining from a preferred direction, while allowing you to modify the *Max. Increment angle*, *Max. Stock to leave* and the *Max. Tilt angle* parameters**



SolidCAM Auto 3+2 Roughing – Manual Mode

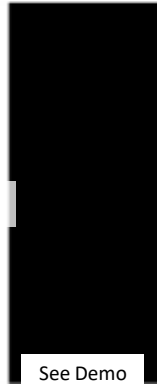
- In Manual mode, SolidCAM machines only from the directions added by the user or by the tool plane
 - Part is machined in the chosen directions according to the maximum reach of the tool



| Type | dx | dy | dz |
|------|--------|--------|-------|
| Face | 0.000 | 0.000 | 1.000 |
| Face | 1.000 | 0.000 | 0.000 |
| Face | 0.000 | -1.000 | 0.000 |
| Face | 0.000 | 1.000 | 0.000 |
| Face | -1.000 | 0.000 | 0.000 |



Click to see simulation video on YouTube



See Demo



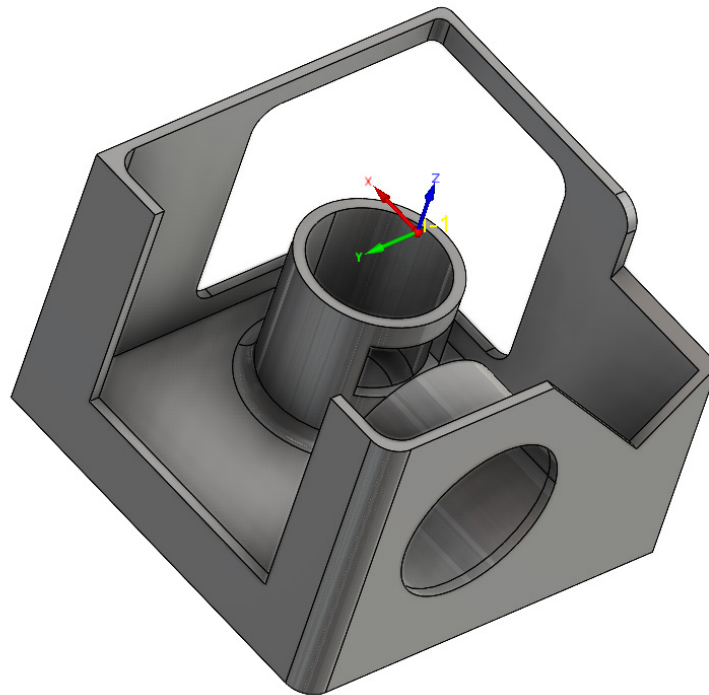
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What's New in SolidCAM 2021

SolidCAM Edge Breaking

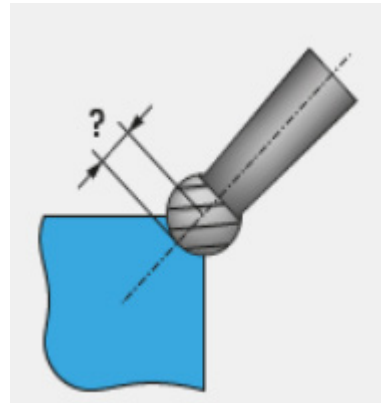
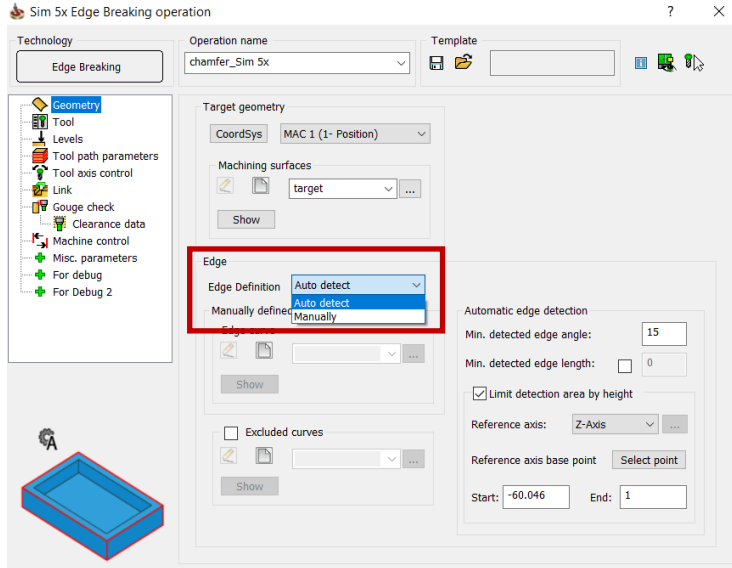
SolidCAM Edge Breaking – New Operation

- After machining, on all the parts that have straight edges or non-tangent outer surface topologies, you will find a burr caused by the tool which is chipping the metal off that edge
- SolidCAM Edge Breaking operation automatically detects these edges and creates a deburring tool path
- Currently this is a manual process and can approximately take the same time as that which is being spent to fully program a part programmed with a CAM system

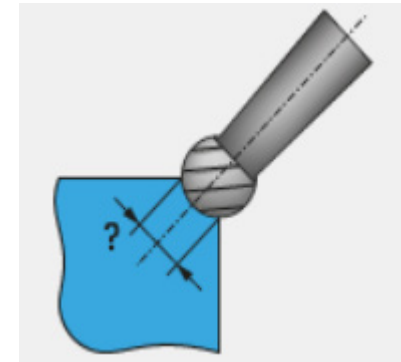


SolidCAM Edge Breaking – Edge Detection

- Edges to be deburred can be detected automatically or detected manually by the user
- Chamfer can be of Constant Depth or Constant Width
- Only Ball Nose tools & Lollipop tools are supported for Edge Breaking



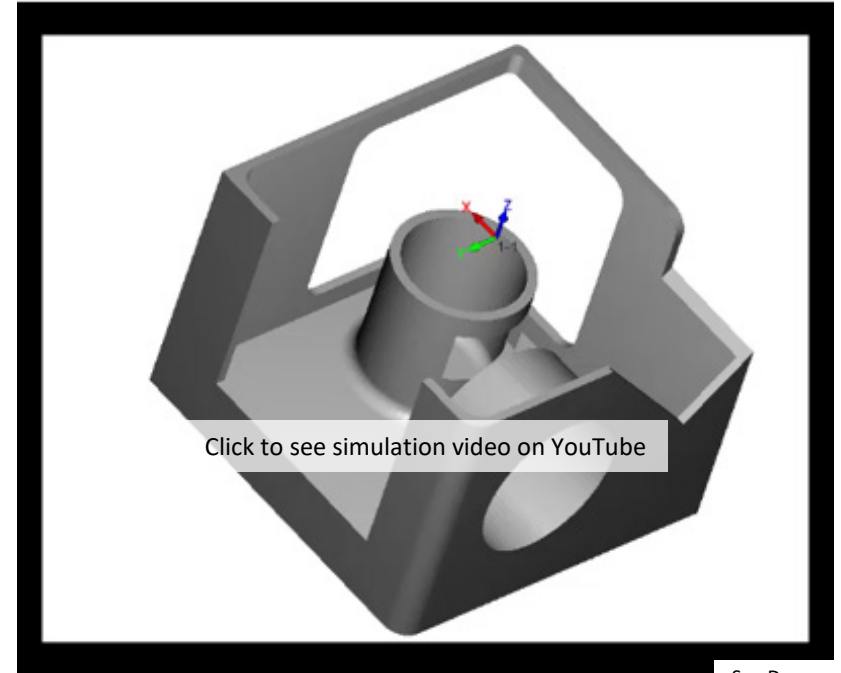
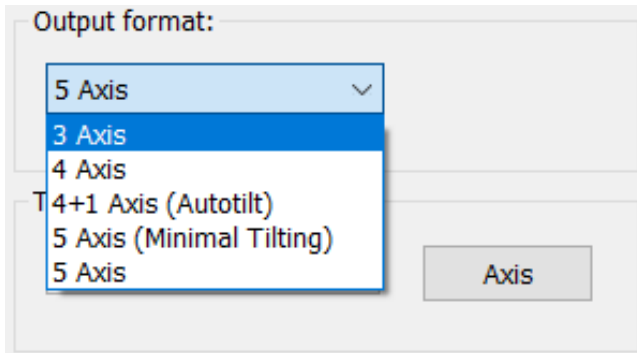
Constant Depth



Constant Width

SolidCAM Edge Breaking – Tool Axis Control

- **5 types of Tool Axis Control are provided:**
 - **3-Axis**
 - **4-Axis**
 - **4+1 Axis**
 - **5-Axis with Minimal Tilting**
 - **Full 5-Axis**



3-Axis Edge Breaking

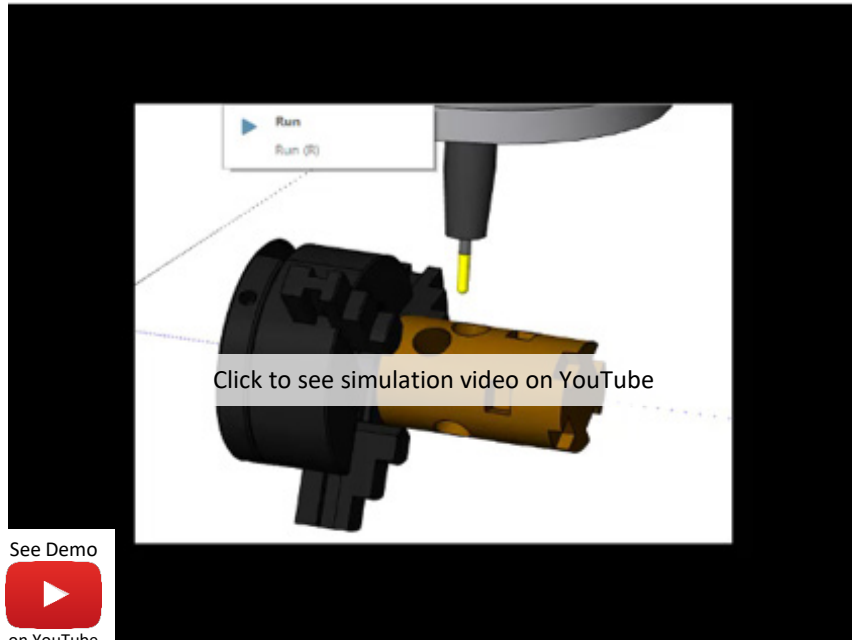
See Demo



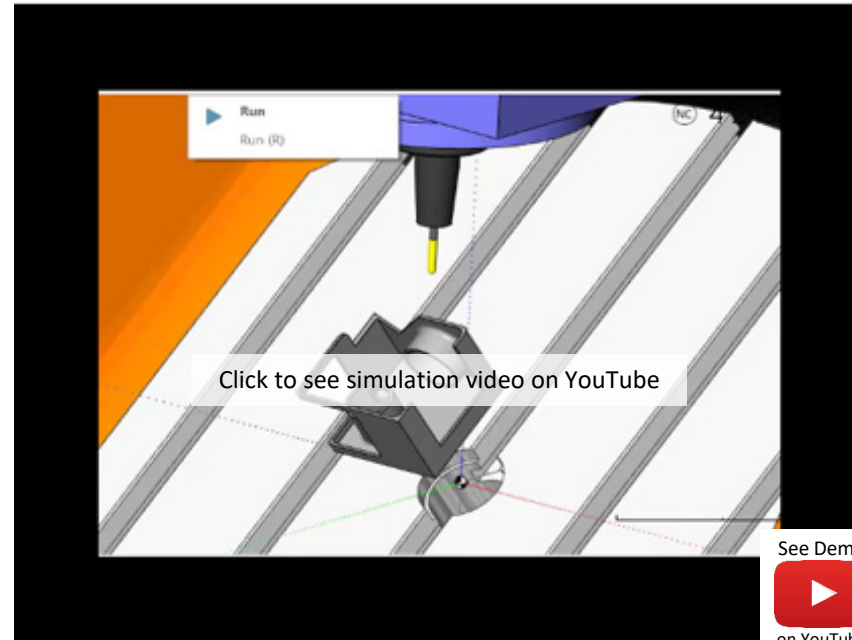
on YouTube

SolidCAM Edge Breaking – Tool Axis Control

4-Axis Edge Breaking

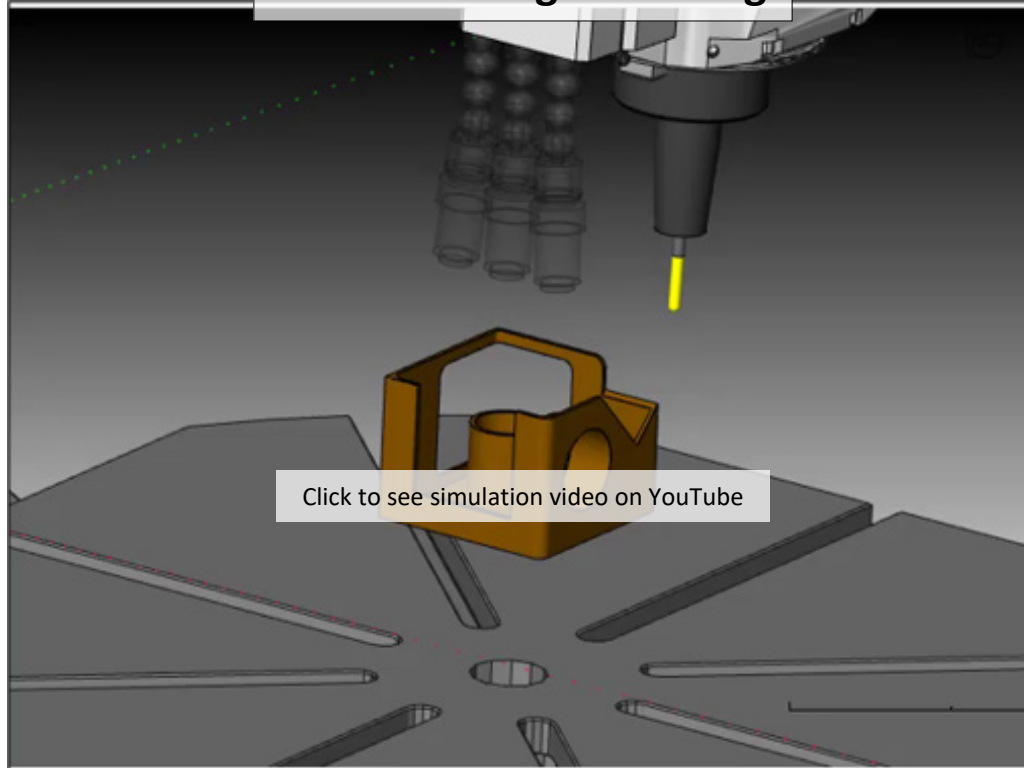


5-Axis Minimal Tilting



SolidCAM Edge Breaking – Tool Axis Control

Full 5-Axis Edge Breaking



Click to see simulation video on YouTube

See Demo



on YouTube

What's New in SolidCAM 2021

SolidCAM Edge Trimming

SolidCAM Edge Trimming – New Operation

- Energy efficient materials like composites are becoming more popular
- Generally cast, these parts require an edge trimming operation to get their final shape
- Vacuum Formed parts in automotive industry also require an edge trimming operation to get their final shape

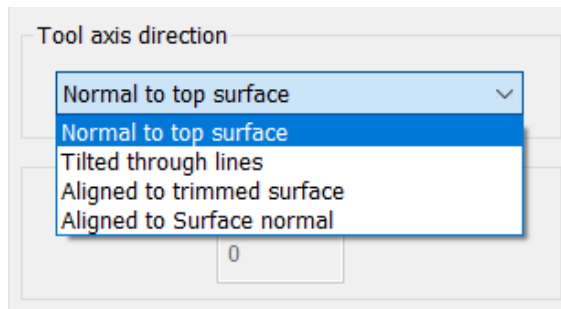
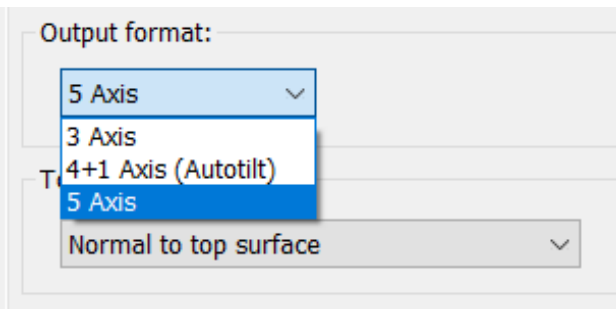
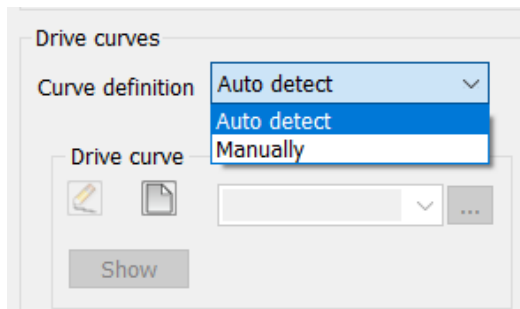


SolidCAM Edge Trimming – Sample Video

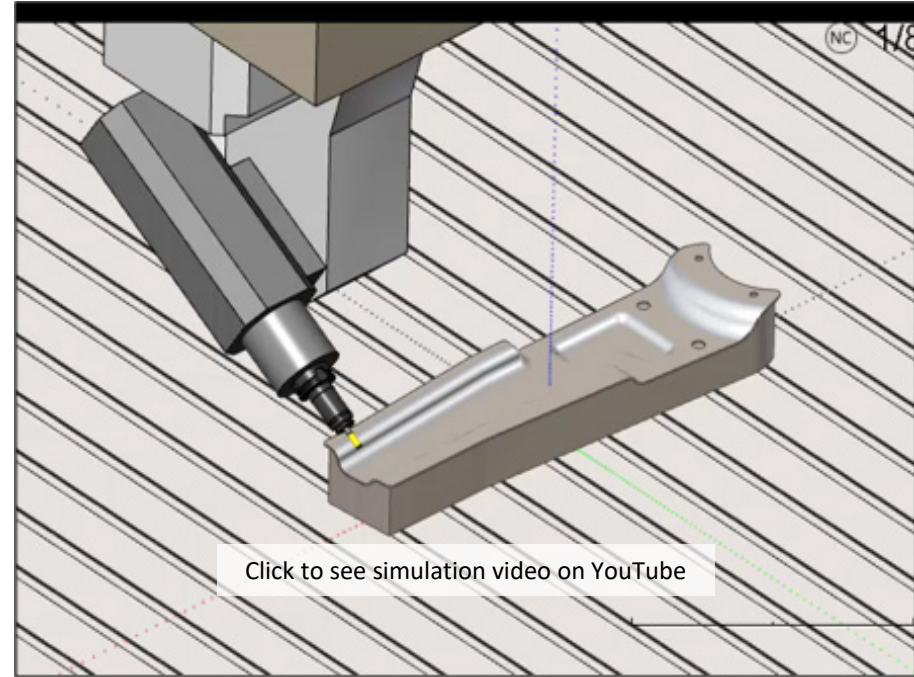
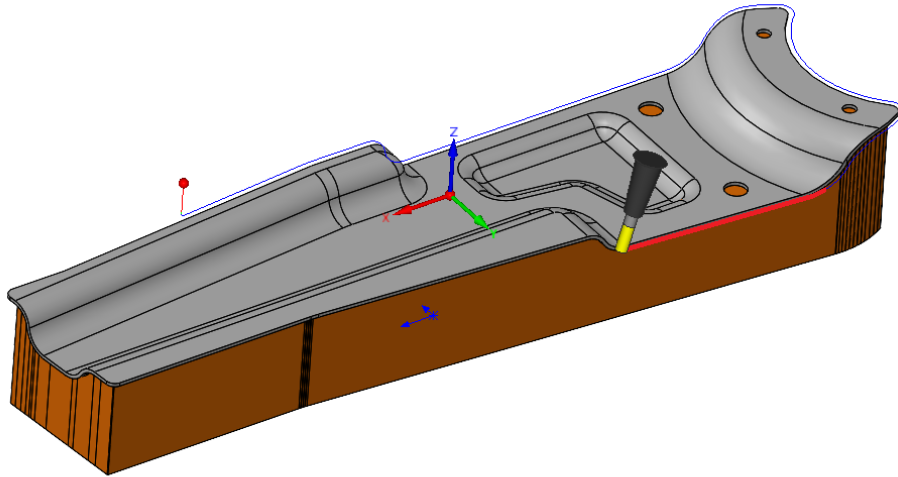


SolidCAM Edge Trimming

- Edge Trimming is a highly automated algorithm to create the edge trimming tool path
- The trimming edge can be defined automatically, or it can be user defined
- The position of the tool relative to the geometry can be defined by various options, from only a 3-Axis output to a more complex 5-Axis output with different tool axis orientation options



SolidCAM Edge Trimming



What's New in SolidCAM 2021

Simulations

Revolved STL Tool Items in Milling Simulations

- VMID & ToolKit together support revolved STL Tool Items for Milling Simulations
- Revolved bodies of Cutters, Shanks & Holders increase collision detection and material removal precision

Working Style

- General
- Trace Output
- Gcode Output
- Program Numbers
- Procedures
- Channel Synchronization
- iMachining
- Machine Simulation
- Sim 5x Options
- Timing

VMID Setting

| Name | Value |
|-----------------------------------|----------|
| G-Code Simulation Name | |
| Pos To Machine | YES |
| DPP File Name | |
| ToolKit Advanced View Mode | NO |
| Machine Tool Setup Library Na... | Test MTT |
| Revolve Holders For Milling | YES |
| Delta For Tool H | 0 |
| Home Data At Start | YES |
| At Start All Axes Set To Home ... | YES |
| At End All Axes Set To Home R... | YES |
| Safety Distance | 2.000 |
| Hole Wizard (Metric) | |
| Hole Wizard (Inch) | |
| General | ... |

Tool Item Assembly & Drive Unit definition in ToolKit

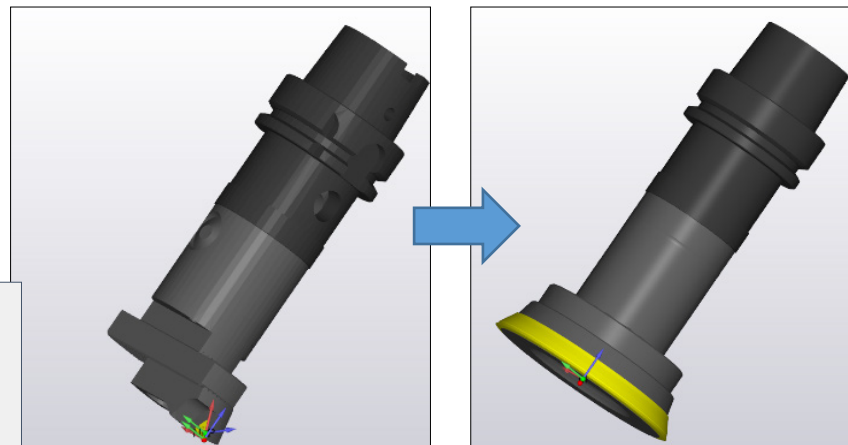
Pattern For Part Mounting

Drive Unit Type: SELF DRIVE
DIRECT
NOT DRIVEN
SELF DRIVE
GEAR

Drive Unit Name:

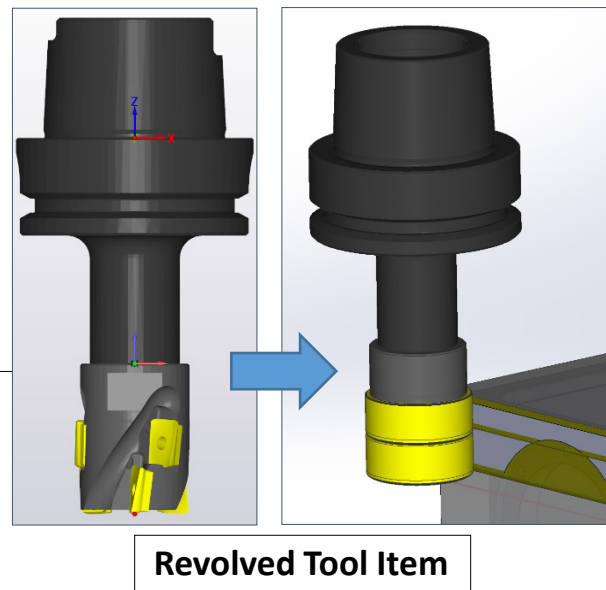
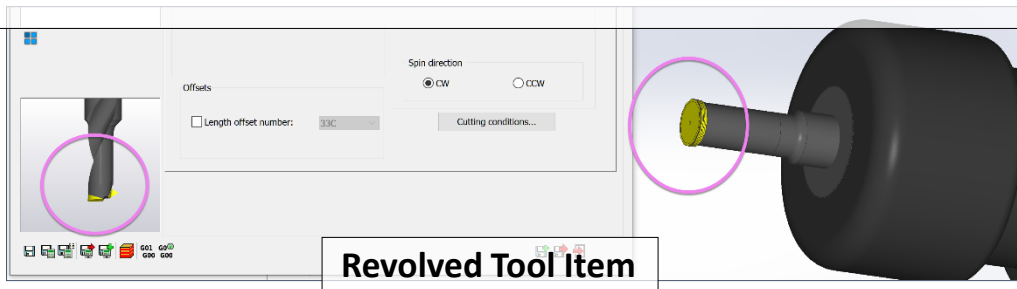
Min Spin: 0 Max Spin: 4000 [rpm]

Power: 15 [kw]



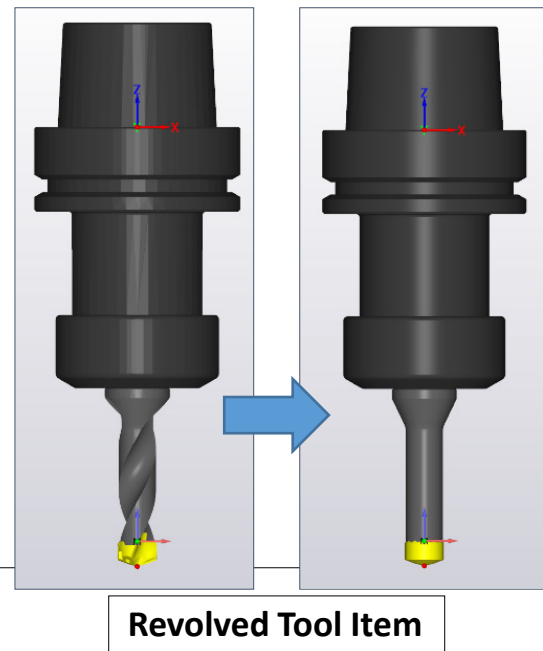
Simulation Enhancements via ToolKit

- **SolidVerify enhancements through ToolKit implementation**
 - Shows multi-body holders and 3D fixtures
 - Detects collisions between all components
 - Supports revolved Cutters & Holders
- **Host CAD enhancements through ToolKit implementation**
 - Shows multi-body holders and multi-tool assemblies
 - Shows tool path and detects all collisions
 - Supports revolved Cutters, Shanks & Holders



Simulation Enhancements via ToolKit

- **SolidCAM Simulator (Beta) enhancements through ToolKit implementation (all playback modes: forward, reverse, etc.)**
 - Shows multi-body holders and multi-tool assemblies
 - Shows tool path and detects all collisions
 - Supports revolved Cutters, Shanks & Holders
- **Machine Simulation enhancements through ToolKit implementation (kinematic simulation)**
 - Shows multi-body holders and multi-tool assemblies
 - Shows tool path and detects all collisions
 - Supports revolved Cutters, Shanks & Holders



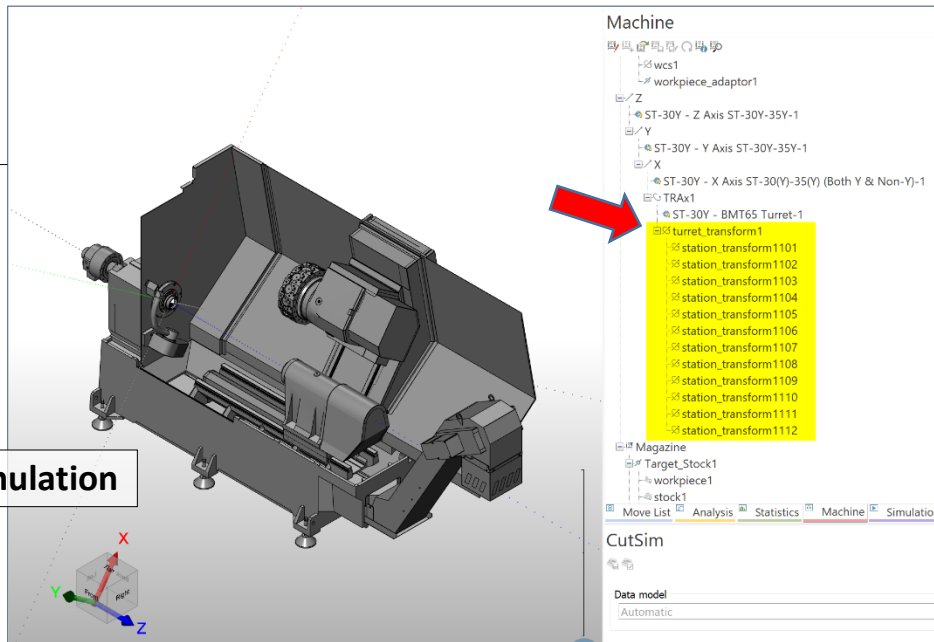
What's New in SolidCAM 2021

Machine Simulation

Simplified Structure and Complex Holder Support

- XML structure needs only the Station(s) defined, not entire Tool structure
- Fully supports multi-body holders and multi-tool assemblies from ToolKit
- Enables faster loading

Machine Simulation



What's New in SolidCAM 2021

Machine Preview

Visualizing Part Positions in Machine Setup

- Machine Preview now displays a transparent view of the Target model and its position on the selected machine table (in Machine setup dialog box)

- “Stock in” option no longer required to see another part position when more than one table is defined (e.g., Mill-Turn Machine with main and back spindles)

