

# SolidCAM

The Solid Platform for Manufacturing

## *Building the Future of Manufacturing together!*

The Future of CAM in Your Shop Today!

The complete CAM Solution for your Manufacturing, with revolutionary iMachining, best MillTurn and Swiss CNCs support, seamlessly integrated and fully associative into SOLIDWORKS, Solid Edge and Inventor.

Leaders in Hybrid manufacturing, combining Metal 3D Printing and CNC Machining.



The unique, revolutionary Milling Technology  
**i**machining®  
patent by SolidCAM

**SolidCAM**®  
*MillTurn & Swiss*

**SolidCAM**®  
*Additive Manufacturing*

## Table of Contents

Introduction .....	3
Technical Support – Worldwide .....	5
About SolidCAM .....	6
Technology Partners .....	7
CAD Integration .....	8
iMachining 2D .....	10
iMachining 2D with Feature Recognition .....	12
iMachining 3D .....	14
2.5D Milling .....	16
Automatic Feature Recognition & Machining .....	18
HSS High-Speed Surface Machining .....	20
Indexial 4/5-Axis Milling .....	22
HSR & HSM   3D High Speed Machining .....	24
Turbo HSR & Turbo HSM   Auto 3+2 HSR .....	26
Geodesic Machining .....	27
Simultaneous 5-Axis Milling .....	28
Drag & Drop Automation .....	31
Solid Probe .....	32
Turning .....	34
Mill-Turn   Swiss-Type .....	36
SolidCAM Simulator .....	43
SolidCAM Toolkit .....	44
3 <sup>rd</sup> Party Interfaces .....	46
Technology Centers .....	48
Additive Manufacturing .....	50
Stay in Touch – Social Media .....	54
SolidCAM Worldwide Offices .....	55



# SolidCAM



Dr. Emil Somekh with SolidCAM Team at Customer BAK Kohler

Dear CNC Machine Shop and Manufacturing Managers,

Modern manufacturing relies on powerful and versatile CNC machines. All of your CNCs make up the backbone of your production and your profits – but how are you going to leverage them in the best possible way? How will you program all your CNC-machines – current and new, standard to complex, no matter what controller – with one single CAM-solution?

We are confident that you want your CNCs to machine with maximum performance, cutting the maximum number of parts, in the shortest possible time, with lowest cutting tool cost, and with minimal wear on your CNCs.

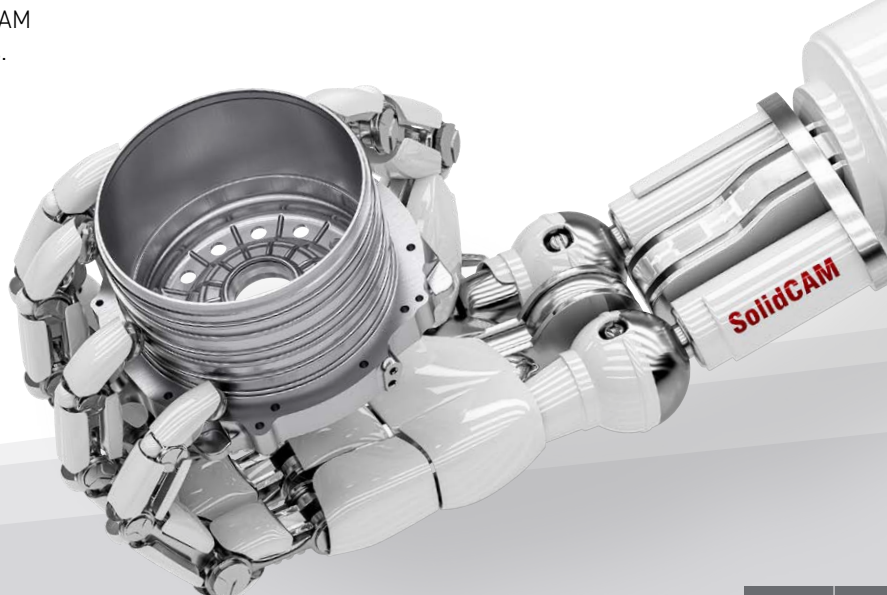
SolidCAM's amazing and patented iMachining provides optimal toolpaths, most efficient feeds and speeds generated automatically by our unique Technology Wizard, will enable you to achieve amazing savings in cycle time and tool life!

To increase your productivity, you are introducing today to your manufacturing those complex Multi-channel MillTurn and Swiss CNCs. SolidCAM provides you with the absolute best CAM Solution for easy programming of these complex CNCs.

Interested? Read on and we will tell you how!

Dr. Emil Somekh  
Founder and CEO of SolidCAM

- + Program smarter – machine faster
- + The most intuitive user interface in CAM
- + Seamlessly integrated and fully associative to SOLIDWORKS, Solid Edge and Inventor
- + Unique and revolutionary iMachining 2D/3D technology
- + Complete milling solution from 2,5D Milling, to 3D Milling and up to Sim5X
- + Mill-Turn up to highly complex multi-channel machines, including Swiss-Type
- + Certified postprocessors for all CNC machines and brands in the market





## Overcome all the Manufacturing Challenges for Modern Machine Shops



Best-in-class, complete CAM-Solution seamlessly integrated in SOLIDWORKS, Solid Edge and Inventor.



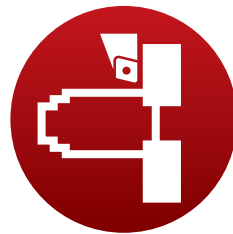
Easy to learn and to use.  
Fast programming for Maximum Productivity.



Supports all CNC machine types and brands on the market - up to complex multi-channel MillTurn CNCs including Swiss-Type.



Automatic Feature Recognition and Machining, using pre-defined templates for fast programming.



Advanced collision control and machine preview shows the complete machine kinematics during programming.



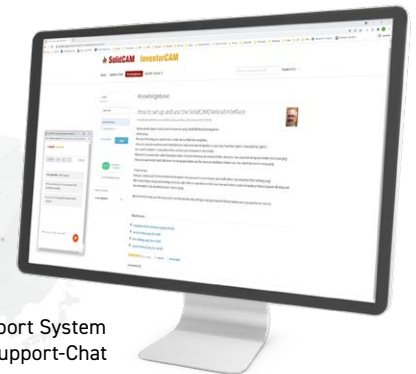
Certified post-processors which reliably generate the G-code - specially tailored to customer requirements.



## AMAZING TECHNICAL SUPPORT – WORLDWIDE

SolidCAM employs a large team of very experienced technical staff, supporting customers and resellers in programming parts and customizing Post-Processors – all over the world.

In our technology centers all our Milling, Turning, Mill-Turn and Additive technologies are thoroughly checked and can be demonstrated live on our latest CNC machines. Customers, resellers, technology partners and participants of our trainings all benefit from this practical experience.



Online-Support System  
with Live-Support-Chat



The SolidCAM crew is the best in the business. Of all the CAM software I have owned, this is far and above all others. The support is top notch. They constantly tell you to "Just call us" if you are stuck, or have a question. Others make you submit a ticket, and they will get back to you. SolidCAM answers the phone!

Randy Knight | Knight Design LLC



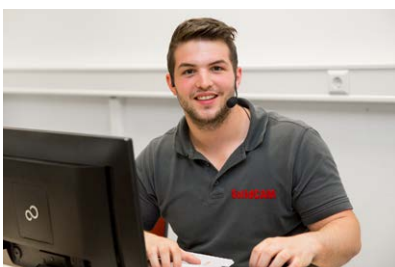
SolidCAM's seamless integration into Solidworks makes it a very intuitive CAD/CAM system. Coupled with SolidCAM's excellent, and responsive, customer service, this software package is both easy to use and very powerful. The iMachining system in SolidCAM is outstanding and delivers everything that is promised.

Brian Mugavero | National Manufacturing



SolidCAM so far has been not only the easiest learning curve, but one of the most powerful pieces of CAM software I've used. Could I do all of the same things in other software? Yes, but not as easy and the fact that in under six months I can do more in SolidCAM than anything else, that's saying a lot since I come from some big CAM players like ...

Duncan Lewis | Halcyon MFG Inc.



All SolidCAM support and application engineers have a strong technical background as well as CNC and manufacturing experience.



Modern technology and training centers enable us to test, demonstrate and train latest CNC, CAM and Additive technologies.

## Faster from the CAD model to the finished workpiece.

We live this motto in technical support and in our technology centers – day after day!

# ABOUT SOLIDCAM



## ABOUT SOLIDCAM

With close to 40 years of experience in the development and support of SolidCAM, we have created the most powerful CAM solution that takes your CNC machines to maximum productivity.

Founded in 1984, SolidCAM's strategy of integrating with the most popular CAD systems has created tremendous growth and established SolidCAM as the ultimate solution for integrated CAM systems.

SolidCAM's Add-ins for SOLIDWORKS, Solid Edge and Inventor provide seamless, single-window integration and full associativity to their design models.

## OUR MISSION

In today's world of manufacturing, productivity counts, and every CNC-machine must be utilized to the maximum. SolidCAM provides the ability to drive CNC machines in the most efficient and productive way.

In 2011, we launched the revolutionary iMachining, taking the machining industry to a new level. Still today, the patented iMachining technology offers tens of thousands of users unique, amazing benefits, including more than 70% faster machining times and dramatically increased tool life. In addition, iMachining's patented Technology Wizard guides machinists all over the world to perfect machining results on every single part.

SolidCAM is the perfect solution for multi-tasking machining needs, with the ultimate in programming flexibility and configurability. With full channel synchronization, you can optimally program multi-turret

and multi-spindle operations, then watch SolidCAM's simulation of your part being machined in multiple stages. SolidCAM best supports Swiss-Type and MillTurn machines, including multi-channel synchronization.

SolidCAM's large customer base spans across all industries including aerospace, automotive, electronics, medical, optics, energy, mold making, prototyping, and more. SolidCAM customers include Job Shops, medium size Engineering and Manufacturing companies, large Aerospace and Automotive companies as well as technical colleges and vocational institutions.

We believe that the perfect CAM solution involves both, the best software and the best support. SolidCAM's technical and postprocessor support, appreciated by tens of thousands of our customers, is a core philosophy of our company and is routinely enhanced to provide maximum service to our customers.

## THE SOLIDCAM ADVANTAGE

- + Easiest-to-use CAM system with short learning curve
- + Seamlessly integrated in SOLIDWORKS, Solid Edge and Inventor, with extensive import of all common CAD data formats
- + Patented iMachining – amazing and unique technology
- + The leading integrated CAD/CAM solution that can control the most complex Mill-Turn & Swiss-Type CNC-machines
- + SolidCAM supports Hybrid Manufacturing – combining 3D Metal printing with CNC Manufacturing



## SOLIDCAM TECHNOLOGY PARTNERS

Our worldwide cooperation with a large number of leading suppliers of CNC machine tools, CNC controllers, cutting tools, tool holders, fixtures and clamping, as well as toolpath verification and tool data integrators, has great benefits for SolidCAM's large customer base.

**GROB**

**brother®**

**stair**

**CITIZEN**

**TSUGAMI**

**NOMURA  
SWISS**

**KENAMETAL®**

**SIEMENS**

**TORNOS**

**DMG MORI**

**CGTECH  
VERICUT®**

**FANUC**

**NEXTURN  
SWISS TURN LEADER**

**HEDELIUS**

**Hoffmann Group**

**HEIDENHAIN**

**LOKUMA  
OPEN POSSIBILITIES**

**HERMLE  
besser fräsen**

**ALBRECHT  
Präzisions Spannfutter**

**ALZMETALL  
we drive productivity**

**röders  
TEC**

**Member IMC Group  
lenz**

**FAHRION®  
PRÄZISION**

**ZOLLER  
expect great measures**

**EMUGE  
FRANKEN**

**SECO**

**MHT  
INTELLIGENZ FÜR WERKZEUGMASCHINEN**

**CERATIZIT  
GROUP**

**WIDIA**

**MAPAL**

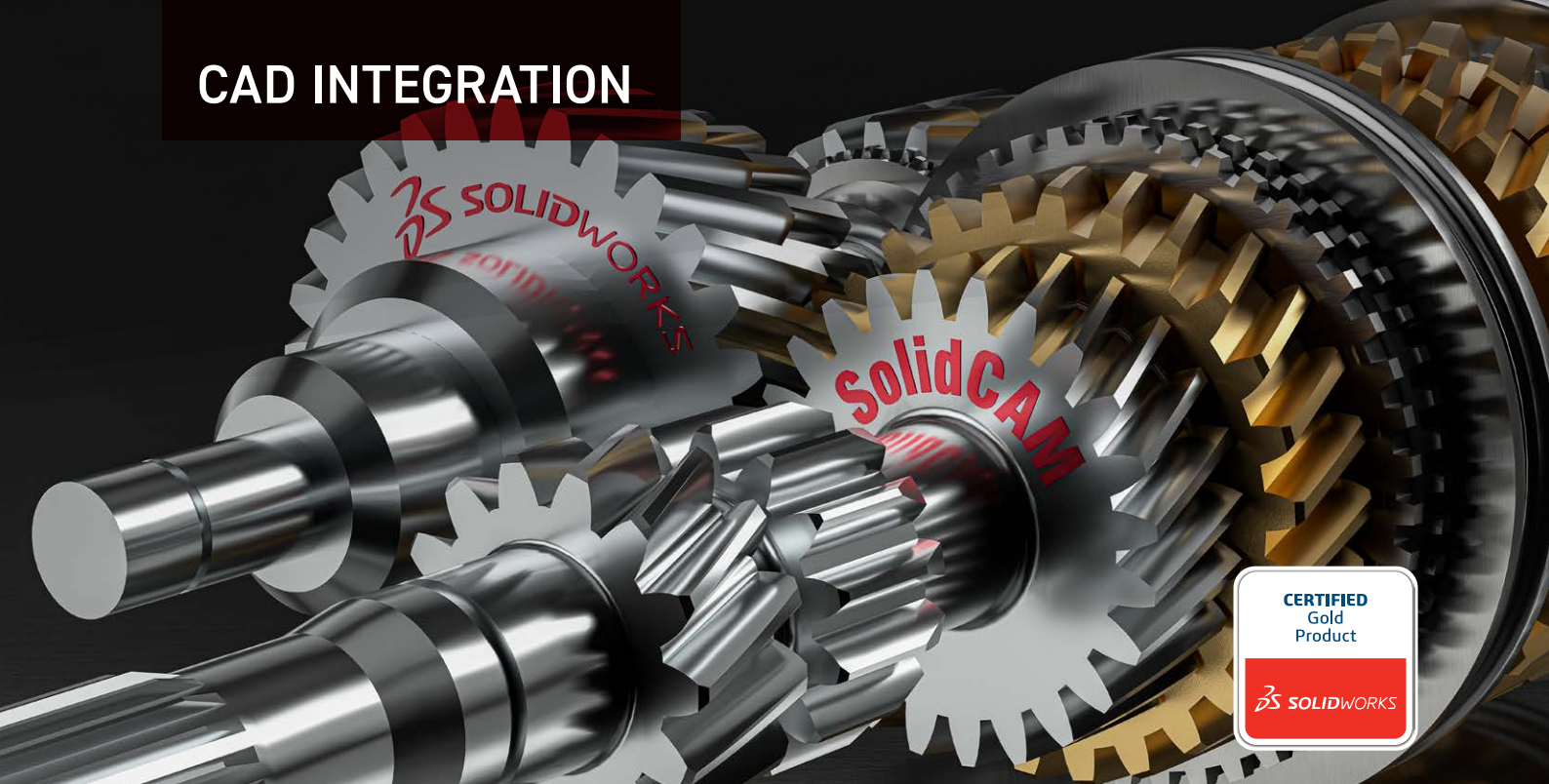
**SPREITZER**

**SCHUNK**

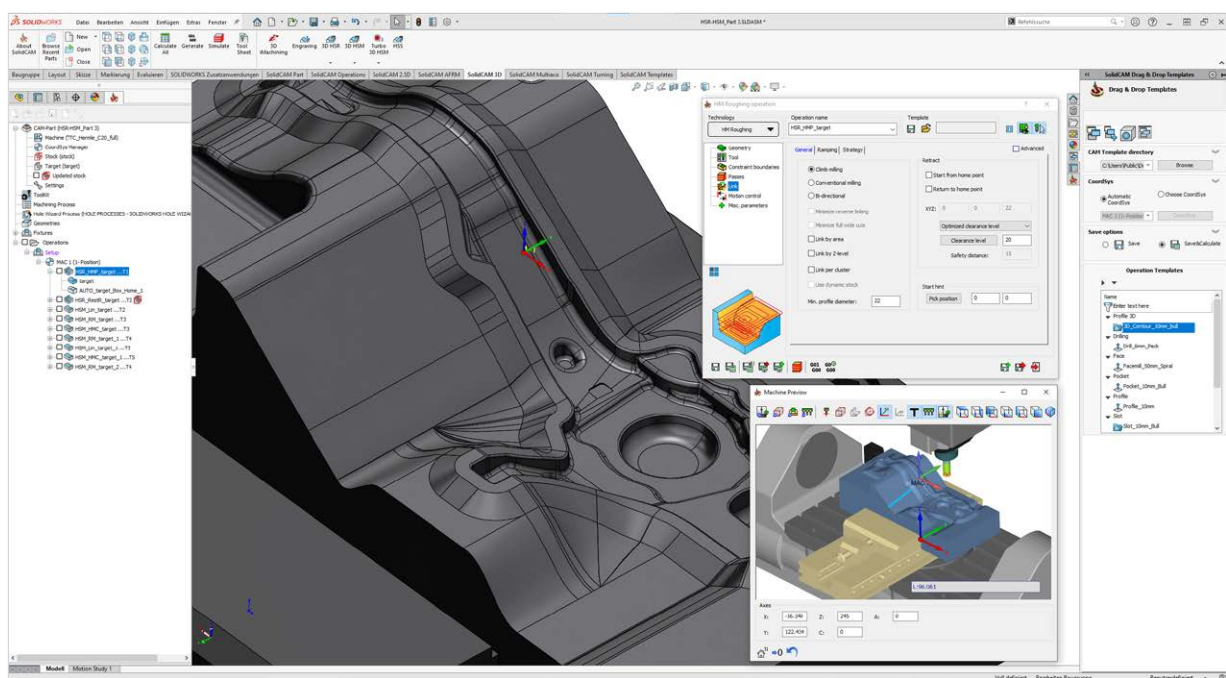
**BLUM  
focus on productivity**

**GÜHRING**

# CAD INTEGRATION



## The complete, 'Best-in-Class' CAM Suite for Profitable CNC-Programming in SOLIDWORKS



### Major Benefits of SolidCAM seamlessly integrated in SOLIDWORKS:

- SOLIDWORKS look and feel through seamless single window integration – with full support for modern 4K displays
- Full associativity: toolpaths automatically update when the SOLIDWORKS model changes
- SolidCAM works in the SOLIDWORKS assembly mode to define fixtures, tooling and vices

With the single-window integration, all machining operations can be defined, calculated and verified without leaving the SOLIDWORKS assembly environment.

All 2D and 3D geometries used for machining are fully associative to the SOLIDWORKS design model. If you make any changes to your SOLIDWORKS model, all of your CAM operations will be automatically updated.

SolidCAM + SOLIDWORKS is scalable for all CNC machine types and applications. The integrated CAD/CAM Solution, is available from SolidCAM, as a bundle-package.

Solution  
Partner

PLM

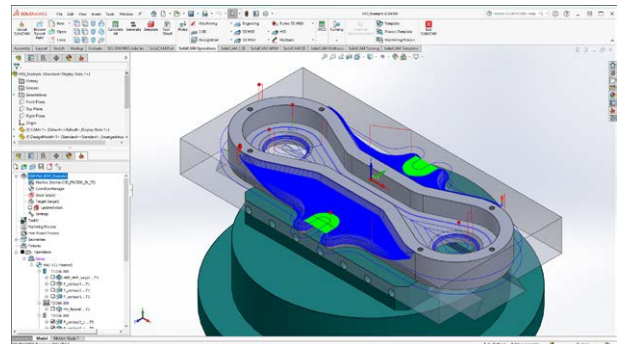
SIEMENS



## Customers rave about SolidCAM's integration in SOLIDWORKS

- ” This approach shortens the learning curve for programmers, offers greater geometry editing and manipulation power to manufacturing and provides a common tool for supporting interaction between designers and machinists.”
- ” If changes are made on the manufacturing side, we capture them on both the design side and the manufacturing side because SOLIDWORKS and SolidCAM are fully associative.”
- ” The integrated approach facilitates discussion and resolution of manufacturing issues because everyone is working with the same model and modeler. We communicate issues and features a lot better working with an integrated system.”
- ” The integrated approach has a lot of advantages, including saving time, accessing a single geometry file, and using the intelligence of our design data in a more efficient, systematic way.”
- ” SolidCAM is the Swiss pocket knife for machining. With the modules for the 2.5D, 3D, simultaneous 5-axis machining and rotary milling, all daily machining tasks can be done quickly – from the complex drilling pattern to the most demanding 5-axis impeller. Program the part, simulate and off you go on the machine. The software delivers, what it has promised!”

## You Never Have to Leave the SOLIDWORKS Window!



- ” Since loading the SolidCAM trial version integrated in SOLIDWORKS, I've been able to program complex parts and run them without concern. The machine seems to run smoother than before, cutters last longer and confidence levels are high. I am able to train others here to use SolidCAM with ease. The software is pretty self-explanatory and the tutorials are easy to follow.”
- ” The tight integration with SOLIDWORKS makes my design-to-production life cycle easy and fast. The SolidCAM support team is rock solid. I do some pretty complex 4-axis production projects and SolidCAM handles them very nicely.”

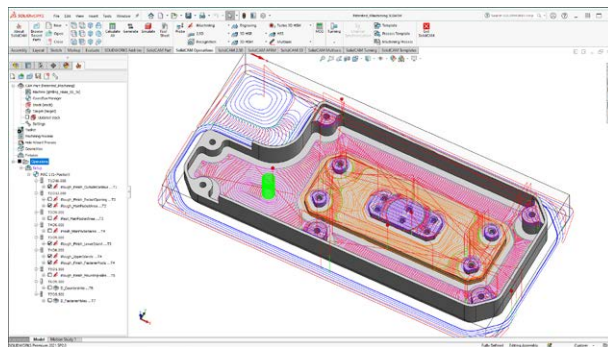
# iMachining 2D

**THE ORIGINAL**  
iMachining – exclusively from SolidCAM

*Imagine putting the Knowledge and Experience of Hundreds of CAM and CNC Masters in the Palm of Your Hand – Experience iMachining's Exclusive Wizard & Toolpath!*

## Patented iMachining: "Truly Amazing"

This is what customers, machine tool manufacturers and tooling companies alike say about iMachining. The revolutionary iMachining CAM module, fully integrated in SOLIDWORKS, will make you and your CNC machines more profitable and more competitive than ever before.



## The Revolution in CNC Machining

- + Increased productivity due to shorter cycles times - 70% savings and more!
- + Dramatically increased tool life – 5 times and more
- + Unmatched hard material machining
- + Outstanding small tool performance
- + 4-axis and Mill-Turn iMachining
- + Automatic, optimal feeds and speeds
- + High programming productivity
- + Shortest learning curve in the CAM industry

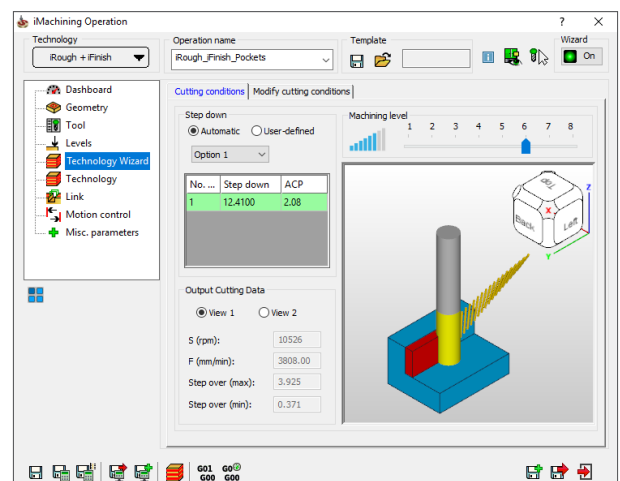
## Unique Technology Wizard

SolidCAM's iMachining has the exclusive patented iMachining Technology Wizard, the industry's first and only Wizard that automatically calculates optimal cutting conditions for every segment of the iMachining toolpath.

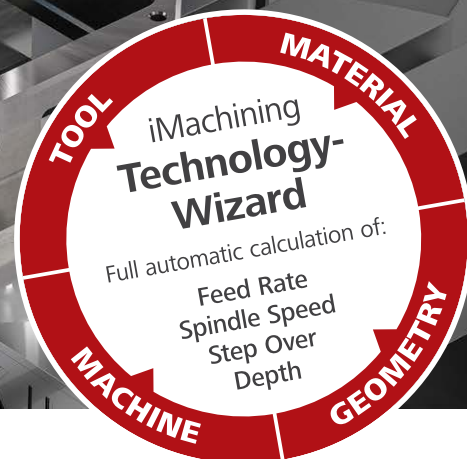
The Wizard provides synchronized values of feed rate, spindle speed, axial depth of cut, cutting angles and chip thickness based on the mechanical properties of the workpiece and tool, while also taking into account the technical limits of the CNC machine.

The "iMachining level slider" lets the user choose from 8 selectable levels, to automatically adjust for "real-world" fixture, tool holding and machine conditions. The slider makes it easy to overcome standard problems with spindle rigidity, fixture rigidity and cutting tool stability.

All SolidCAM customers worldwide, who use iMachining, are enjoying immense savings and have gained a real competitive advantage.

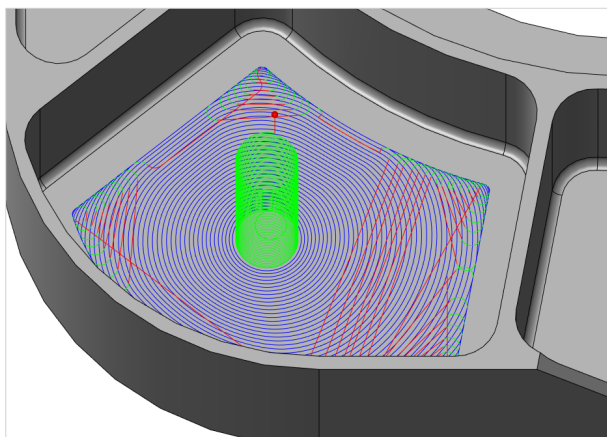


TIME SAVINGS  
**70%**  
... AND MORE!



## iRough, iRest, iFinish and Multi-tool Technologies

- + Combined roughing, finishing and rest material functionality in one single job.
- + Multi-tool: Easily define and edit related jobs that use multiple tools, all from within a single interface. Geometry and Levels are synchronized and rest material is tracked automatically.
- + iRough + iFinish: Optimized roughing and finishing in the same job with the same tool. Ideal for prototyping and the machining of soft materials.
- + iFinish: Suitable for hard materials and precise machining with separate tool for finishing floors and walls.
- + Optimized rest roughing and bottom finishing of 2.5D features with various strategies.
- + Automatic recognition and removal of rest material remaining through the drill tip.



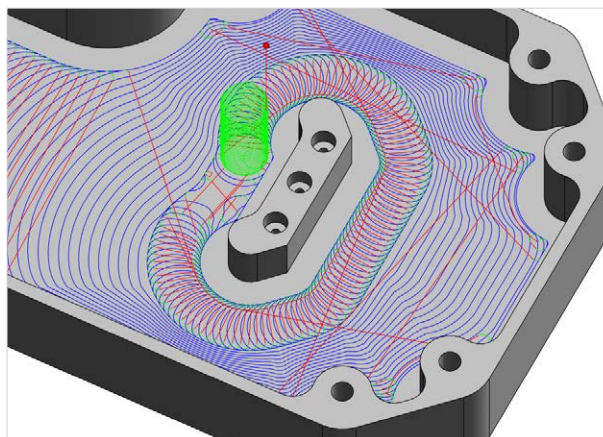
Most efficient iMachining Morphing Spirals toolpath

## Distinctive & Proprietary iMachining Toolpaths!

**Morphing Spirals** – iMachining uses an advanced, patented morphing spiral that gradually conforms to the geometry of the feature being machined rather than a conventional offset toolpath. This maximizes tool to stock contact or "tool in the cut" time.

**Channels and Moats: Divide & Conquer** – In order to most efficiently attack large areas of material removal as well as stand-alone islands, they are separated or subdivided into smaller sections using iMachining's patented Moating technology. This maximizes the continuous morphed spiral cutting.

**Eliminate Wasted Time & Motion** – iMachining toolpaths only cut the stock that needs to be removed, eliminating "air cuts". From the initial approach, right to the last cut, rest material tracking ensures every toolpath is always efficiently cutting material.



Moating: Intelligent Division of Areas to maximize Morphed Spirals

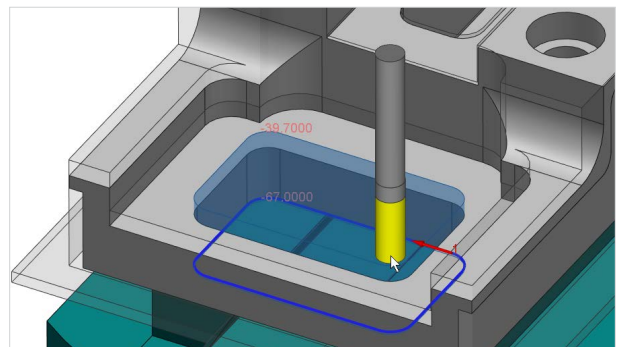
# iMachining 2D WITH FEATURE RECOGNITION

*Technology that simplifies the  
Geometry definition process by  
a remarkable extent*

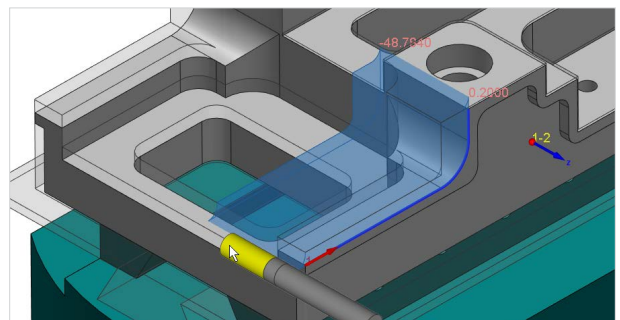
iMachining 2D's Feature Recognition technology detects and defines the part machinable features by utilizing the solid model data, with minimal input from the user.

## Feature Recognition Modes

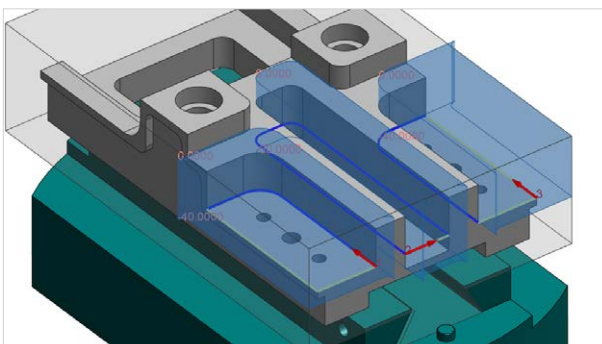
- **Faces:** Smart Face technology builds chains by just the simple selection of faces. Entire pocket features and their levels, which can consist of varying depths, are recognized automatically.
- **Chains:** Machinable areas are recognized by chains in combination with the solid model data. Perfect for features not having a floor face to select, such as when milling through pockets and side profiles.
- **Outside Feature Recognition:** Machinable stock surrounding the target is recognized and its levels are detected automatically.
- **Chains without Feature Recognition:** Option to use SolidCAM's standard chaining method, without iMachining's Recognition and Protection functionality.



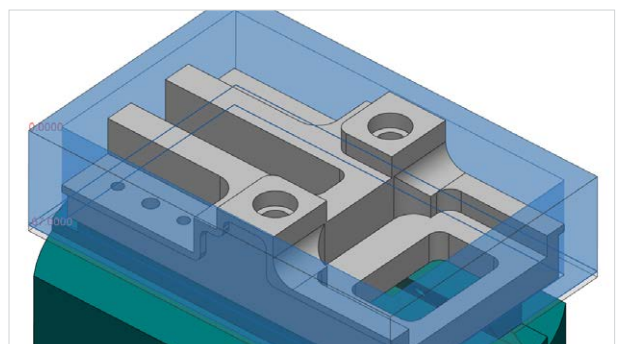
Chains Recognition for Through Pockets



Chains Recognition for Side Profiles



Faces Recognition



Outside Feature Recognition



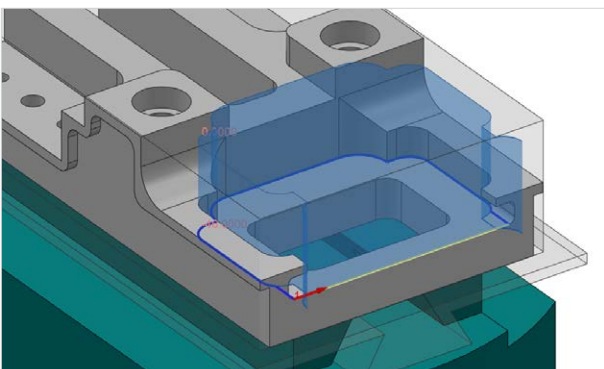
## Recognition + Protection

Taking into account the Stock/Updated Stock and Target models, iMachining 2D automatically:

- ⊕ Detects and avoids part features that create undercut areas
- ⊕ Detects and extends stock material in open pocket areas
- ⊕ Detects rest material at every stage of the machining process
- ⊕ Protects the solid geometries against cutting tool collisions

## Dynamic Display of Depths and iMachining Region

iMachining generates and displays a preview of the machinable regions and their levels. The machining geometry can have varying depths and its preview is dynamically updated on job editing, all of which can be visualized in the SOLIDWORKS Graphics Area.



iMachining's Faces Recognition: Features that make undercut areas are handled with ease



” We have found all the claims for iMachining to hold true for our applications in Dixons Surgical – incredible tool life, faster cycles, lighter cutting loads reducing vibration in poor work holding situations (mill-turn), and protection of small diameter cutters. The user interface is very clear and simple, and programming iMachining is faster than traditional strategies.”

**Jay Dixon, Dixons Surgical Instruments**

” We discovered that SolidCAM reduced our NC programming time by half. On our previous CAD/CAM system, we had to substantially edit G-codes to make the program operate. Now, with SolidCAM, the post processor produces perfect NC-code, making it far simpler and quicker to produce a new CAM program.”

**Bob Luck, Alcon Components Ltd**

*Utilizing Proven iMachining 2D & Technology Wizard Algorithms for Roughing and Semi-finishing of Molds, Complex 3D Parts and 3D Prismatic Parts*

iMachining 3D provides amazing 3D machining results, regularly saving 70% in machining time, reaching up to 90% in many cases.

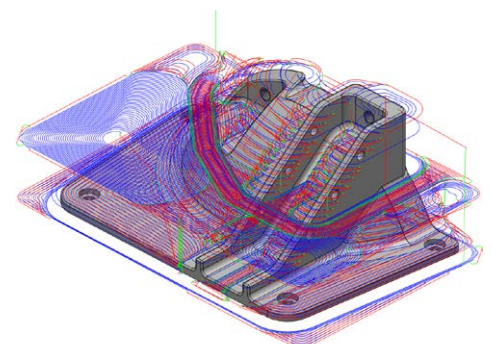
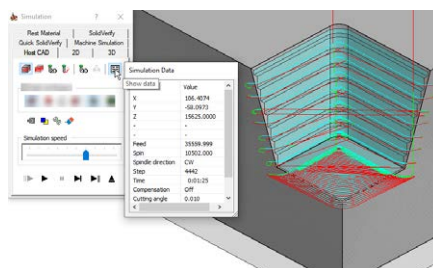
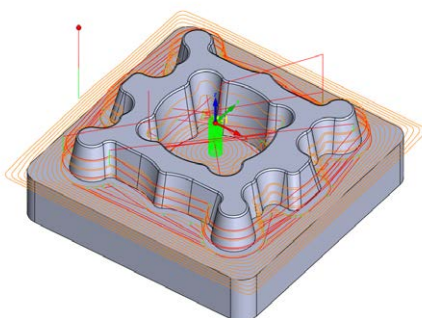
iMachining 3D automatically produces a complete, ready to run CNC program, with optimal cutting conditions, achieved by the expert knowledge-based Technology Wizard, to rough and rest rough an entire 3D part in a single operation.

iMachining 3D uses sophisticated analysis algorithms to determine the optimal order of its rough and rest rough toolpaths. Combined with its unique local machining feature, full-depth Step down, intelligent Step-up and smart positioning, iMachining 3D achieves the shortest possible cycle time for roughing and semi-finishing of molds, complex 3D parts and 3D prismatic parts.

iMachining 3D provides a complete machining solution when combined with other SolidCAM technologies, such as 3D HSM for finishing molds and complex 3D parts or iMachining 2D for finishing 3D prismatic parts.

## iMachining 3D is a Must-Have!

- + Quick solid geometry selection and automatic target model protection
- + Optimized machining of each Z-Step, using proven iMachining 2D technology
- + Deep roughing with the whole flute length, resulting in shorter cycle times and increased tool life
- + Rest material machining in small upward steps, optimized for constant scallop height, further shortens cycle time
- + Intelligent localized machining and optimal ordering eliminates retracts and long position moves, producing the shortest times in the industry
- + A dynamically Updated Stock model and "Cut only the Rest material" mode eliminates all air cutting
- + Toolpath automatically adjusts to avoid collisions between the tool holder and Updated Stock model, at every stage of the machining process



**THE ORIGINAL**

iMachining - exclusively from SolidCAM

TIME SAVINGS

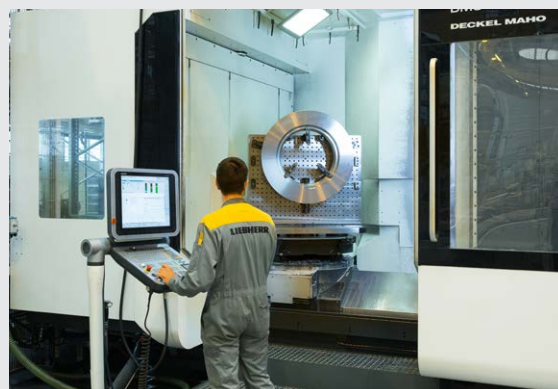
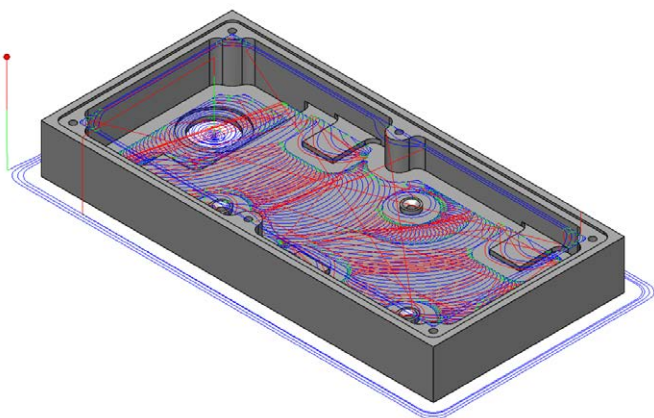
**70%**

... AND MORE!



## iMachining 3D for Prismatic Parts

Programming times for prismatic parts are drastically reduced with iMachining 3D. In a single operation, rough and rest rough an entire 3D prismatic part that includes any number of pockets and islands, without chaining or sketching a single contour. With just the solid geometry and cutting tool as input, iMachining 3D calculates the rest - automatically and optimally.



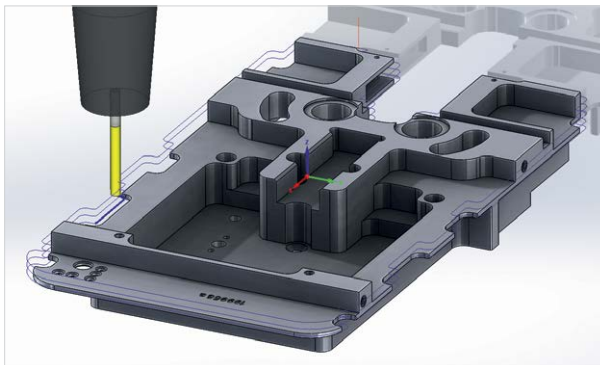
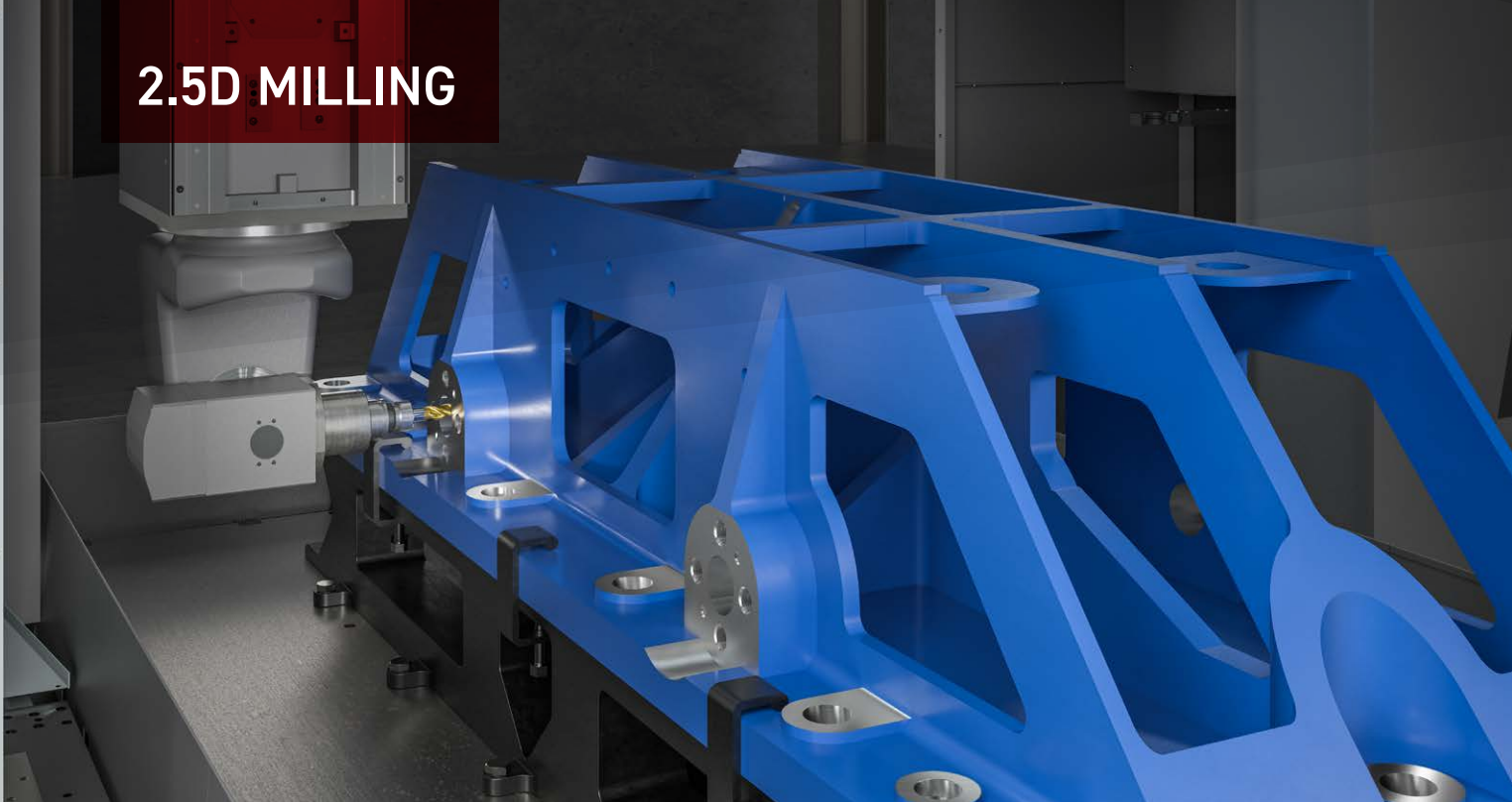
” Growth at the company is continuing at a very healthy rate with an emphasis on lean manufacturing. The introduction of SolidCAM has contributed to this expansion, enabling the company to manufacture more complex parts in a shorter lead time, raising throughput, and maximizing the productivity of our machines.”

**Dan Patrick, Big Bear Plastics**

” SolidCAM has enabled us to get the time down on downtime! It's allowed much more synergy going from one complex product to the next, more so if you have a complete new set-up on tooling. We need to make sure that from one set-up to the next that the downtime is as minimal as possible.”

**Shaun Palmer, Director, Oracle Precision Ltd**

# 2.5D MILLING



The most straightforward, easy-to-use interface, seamlessly integrated in SOLIDWORKS, combined with the latest toolpath technology, provides the fastest, most powerful and easiest to create 2.5D CNC Milling toolpaths.

Easily work on parts, assemblies, and sketch geometry to define your CNC machining operations. Quickly place fixtures and components for full visualization.

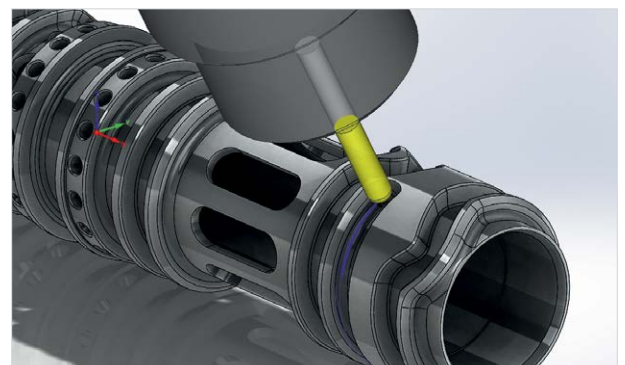
## Best of Both Worlds: Complete Interactive Control + Feature Recognition

SolidCAM provides both interactive and automated 2.5D milling operations on SOLIDWORKS models. Designed for both the novice and advanced user, SolidCAM offers the best of both worlds, with your choice of fully controlled selection of geometry, parameters and CNC programming strategies or Automated Pocket and Drill Recognition and machining with Feature Recognition.

## Interactive 2.5D Mill Operations

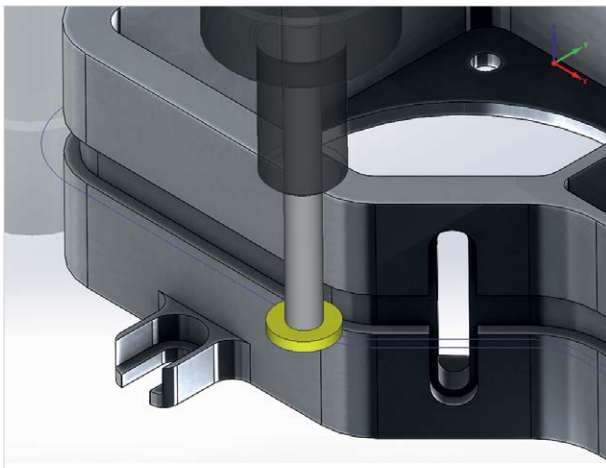
Besides the standard 2.5D milling profiling, pocketing and drilling operations, SolidCAM offers:

- + Chain modification options (offsetting, trimming, extending etc.), enabling changes to geometry without changing the CAD model
- + Automatic rest material machining to cut the material remaining after using larger tools
- + Chamfer machining using the same geometry defined in Profile and Pocket operations
- + Thread Milling operation for machining of standard internal and external threads
- + Variable levels of pockets and profiles in a single job
- + Engraving of text on flat and wrapped faces and middle line engraving of a multi-line text
- + Contour 3D operation drives the tool along a 3D curve, cutting the model at different depths
- + Machining of geometry wrapped around rotation axes, by transforming movement from linear to rotary
- + Special operation for machining of the side slots with undercut by a T-slot tool

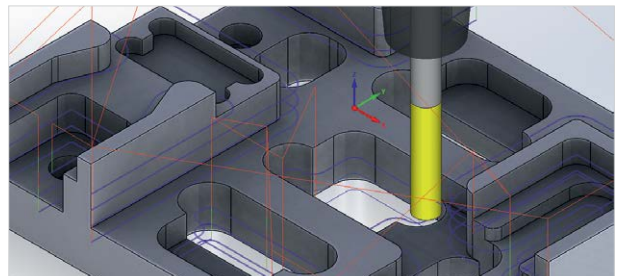




## Pocket Recognition

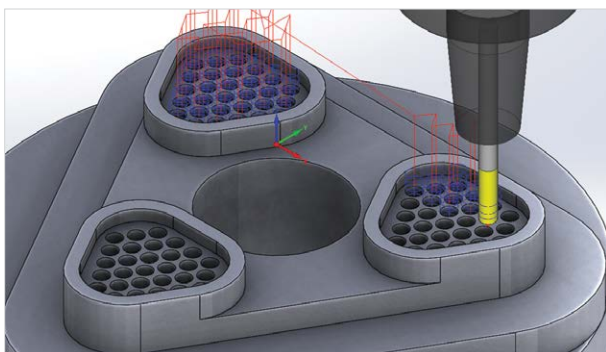


Takes SolidCAM's powerful pocketing operation to the next level, by automatically identifying all pockets on the CAD model. All strategies and options of the standard Pocket operation are available, combined with variable levels and depths recognized from the model faces.



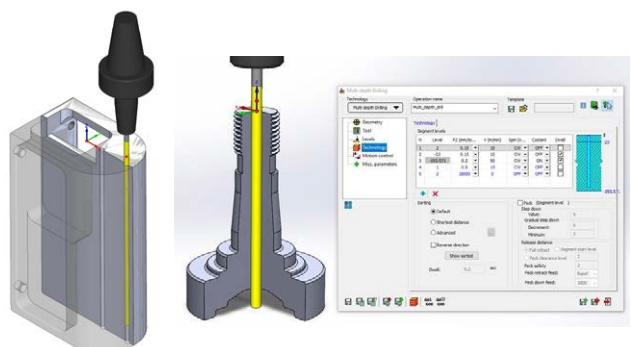
## Drill Recognition

Automatic recognition and grouping of holes from the solid model with option to modify resulting geometry. A single Drill Recognition operation can machine groups of holes on varying levels and depths.

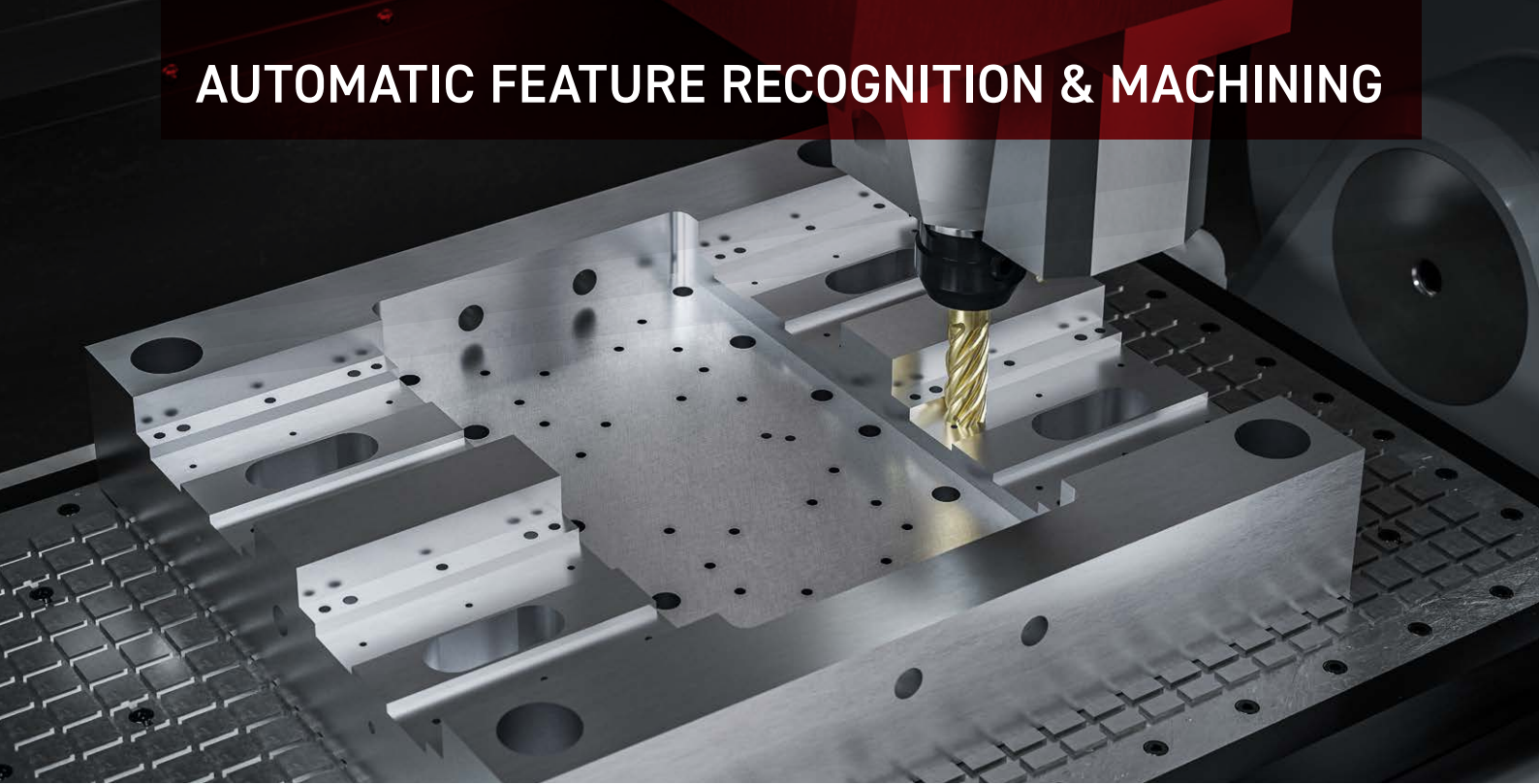


## Multi-Depth-Drilling

This powerful Drilling operation gives you full control allowing you to customize your drilling operation at every step and every depth. This is the perfect Drilling operation for Deep drilling and Cross hole drilling.



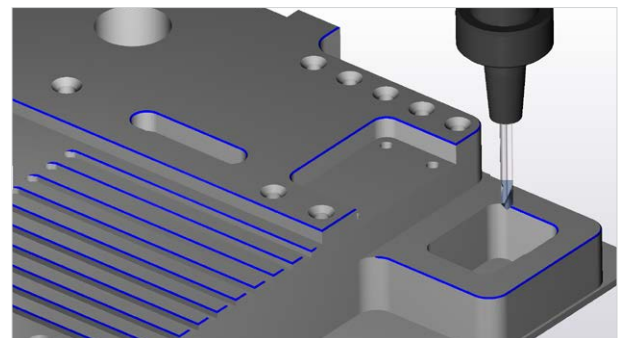
# AUTOMATIC FEATURE RECOGNITION & MACHINING



## Advanced Pocket Recognition

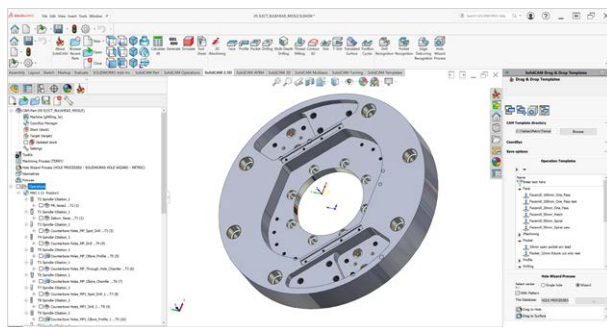
SolidCAM AFRM sets the new standards. Instead of machining each individual pocket in a separate operation, all pockets, no matter whether they are open, closed, blind or through pockets, are being identified with their corresponding depth and Z-level and machined in one operation. Full fixture protection in pocket, pocket recognition and 2D drilling allows you to machine your parts while protecting your fixtures.

- + All strategies and options of the standard pocket operation are available, combined with variable upper levels and depths recognized from the model faces. User controls the choice of the Tool, Technology and Cutting Strategy.
- + Automatic recognition and machining of fillets on the pocket floor
- + Automatic rest material recognition on each pocket
- + The perfect tool for multi pocketed parts

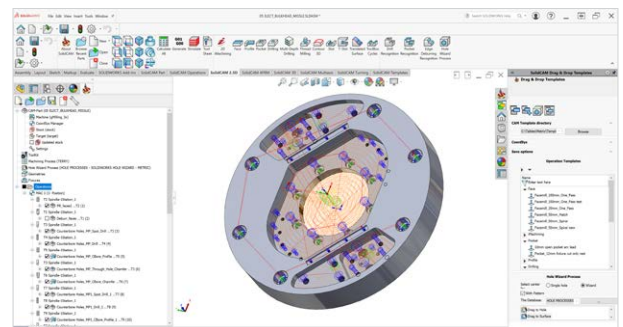


## Chamfering and Deburring

SolidCAM automatically recognizes all sharp edges where a chamfer can be applied. The user only sets the depth of the chamfer, the cutting diameter of the tool and a safety offset. SolidCAM's chamfer recognition automatically avoids vertical walls and machines as much as possible, while protecting the part from collisions with the shank. The option Dynamic Tool Diameter results in less wear and tear of the tool, which is particularly helpful with hard materials.



Drag & Drop Hole Wizard Process applied to a single hole feature



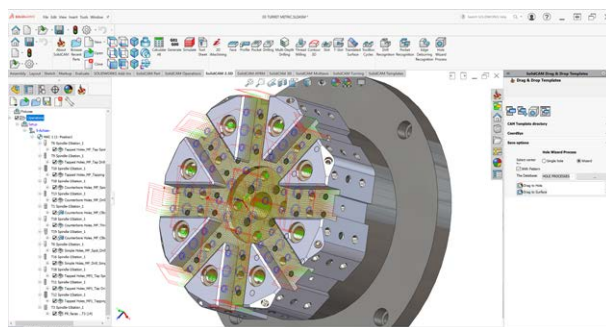
Drag & Drop Hole Wizard Processes applied to the entire part



## Advanced Drill Recognition

SolidCAM automatically identifies all drills on the solid model and generates the necessary CNC operations.

- + To select the drills to be machined, powerful filter tools such as diameter, Z-level or drill depth are available.
- + Spot drills can be generated on all drill positions, where the depth relates to the diameter of the drill tool being used.

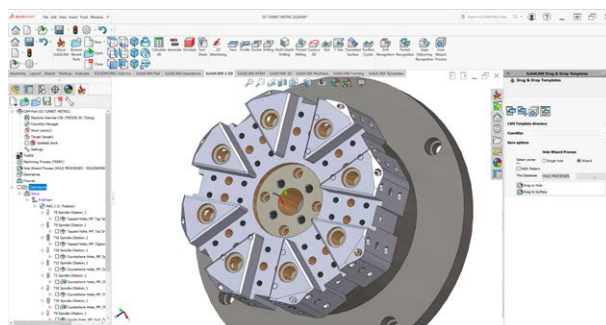
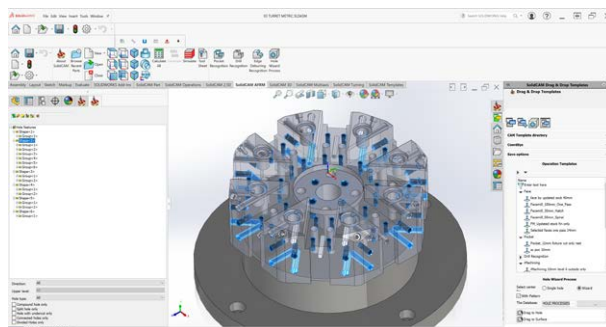


Drill features detection & Automatic Toolpath generation

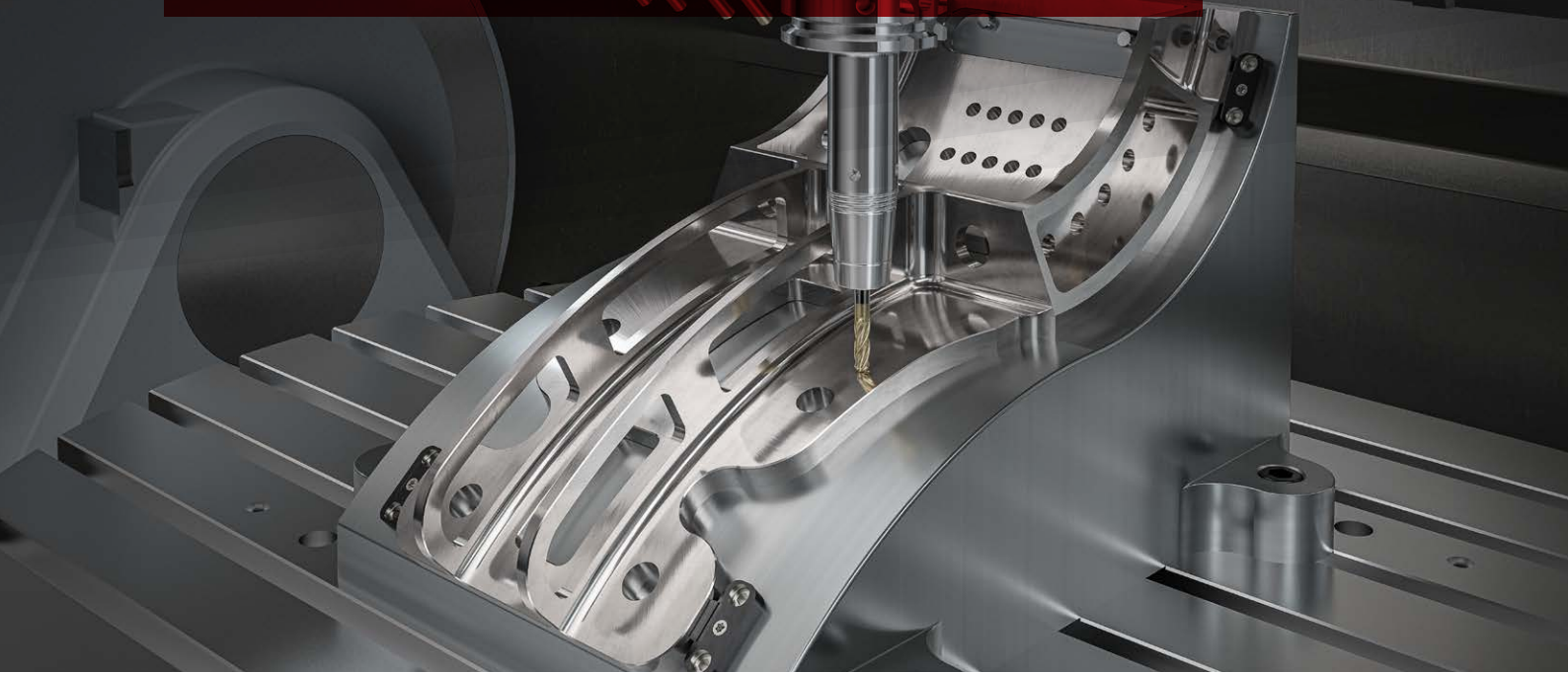
## SolidCAM's Hole Wizard, with Drag & Drop Machine Processes

SolidCAM's Hole Wizard, with Drag & Drop Machine Processes optimizes the task of programming multiple operation for complex holes.

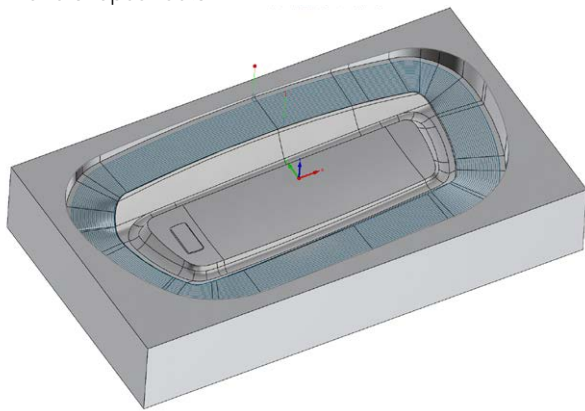
- + All holes in the CAD feature, including subordinate patterns are recognized.
- + All Geometry and Dimensional parameters of the CAD Feature are available for use in the machining process, including Hole Wizard tolerances.
- + Complex logic including conditional equations provides greater flexibility.
- + Simple, Counter Sunk, Counter Bored & Tapped hole sets are programmed with a single mouse click.



# HSS HIGH-SPEED SURFACE MACHINING



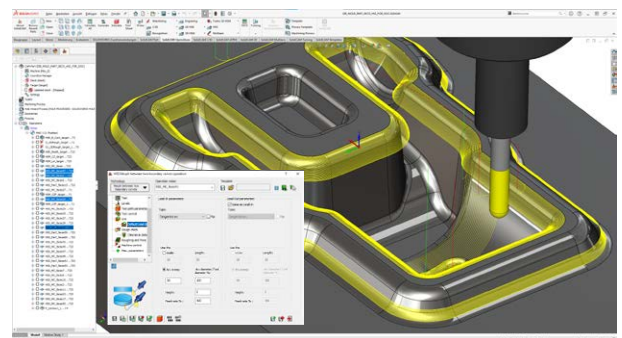
SolidCAM's HSS is a high speed surface machining module for smooth and powerful machining of localized surface areas in the part, including undercuts. It provides easy selection of the surfaces to be machined, eliminating the need to define boundaries. It supports both standard and shaped tools.



## Powerful Surface Machining Strategies for Smooth, Gouge-Free & Optimal Toolpaths

SolidCAM's HSS Module provides numerous surface machining strategies, that produce an efficient, smooth, gouge-free and optimal toolpaths to finish the selected surfaces.

HSS provides special toolpath linking options, generating smooth and tangential lead-ins and lead-outs. The linking moves between the toolpaths can be controlled by the user to avoid holes and slots, without the need to modify the model's surface. Retracts can be performed to any major plane.

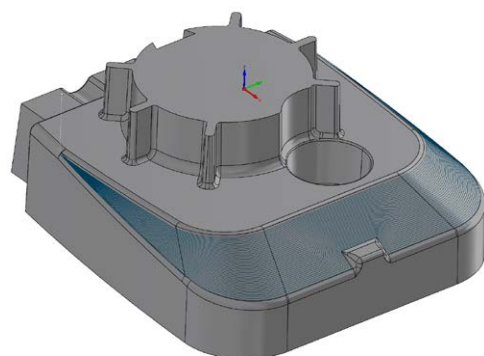


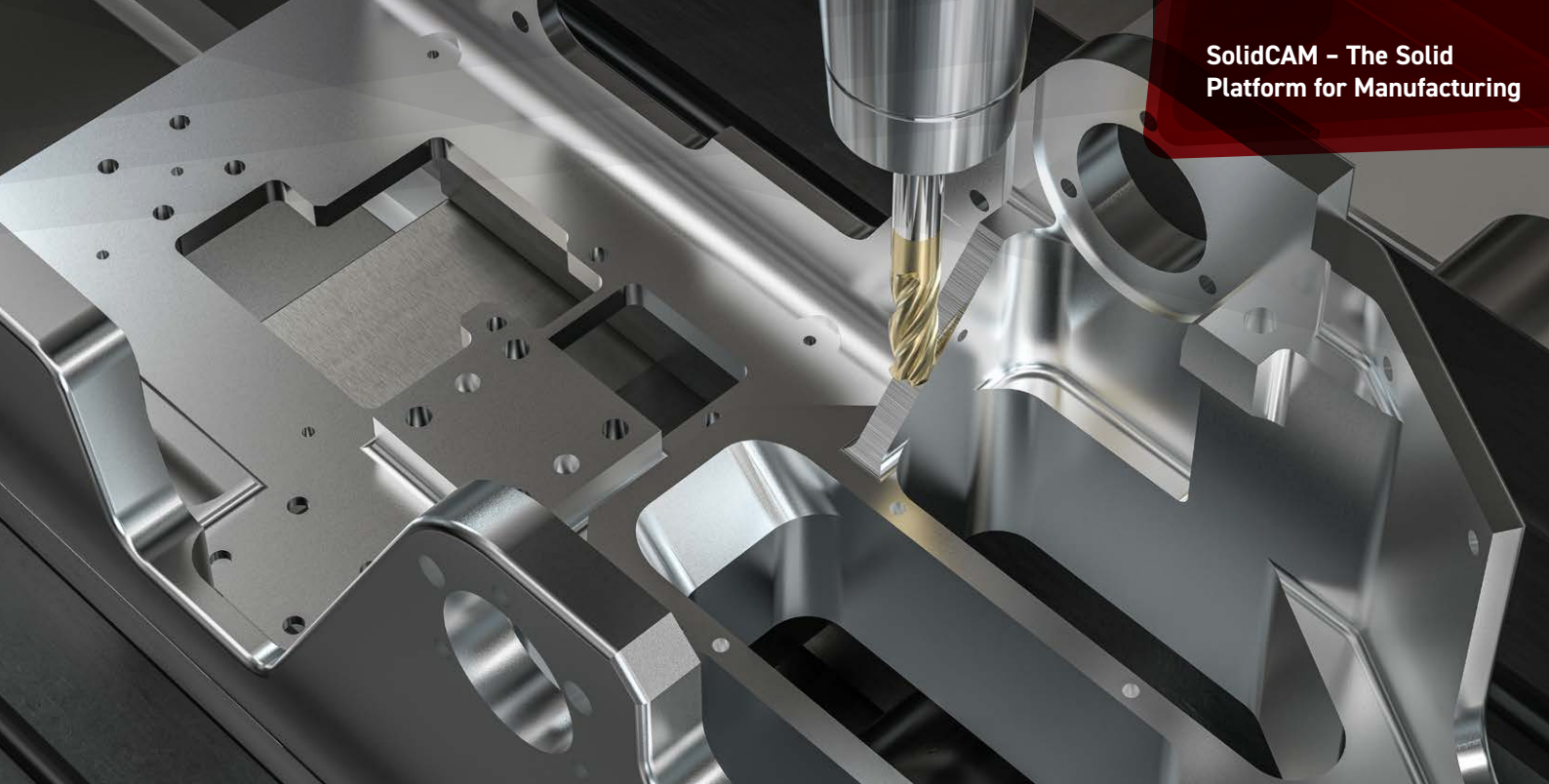
## Total Tool Control to Machine Only the Areas You Choose

HSS is the CAM module that takes your 2.5D machining far beyond profiles, pockets and faces, providing a 3D machining capability by driving along specific surfaces on prismatic and 3D parts.

The HSS toolpath is focused on single or multiple surfaces and excels in creating a flowing toolpath on a group of surfaces that form a complex 3D shape, e.g. fillets.

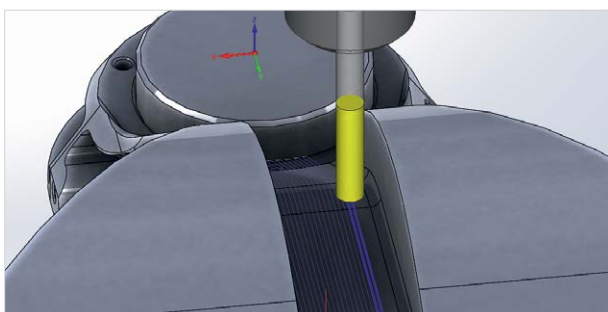
Experience total tool control to machine only areas you choose, without the need for constraint boundaries or construction geometry.





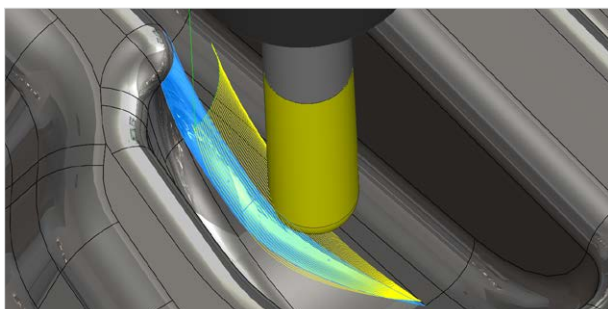
## Advanced Gouge Control for Holder, Arbor and Tool

Complete collision control is available for Holder, Arbor and Tool. Adjoining Check surfaces that are to be avoided can be selected. Several retract strategies are available under full user control.



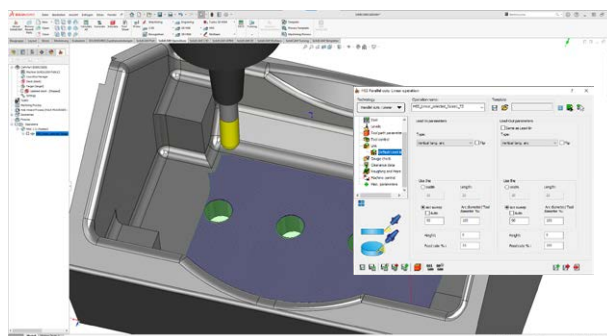
## Advanced Linking

Total freedom to control tool entry and tool exit motion, no surface modifications needed. Toolpaths can be extended or trimmed, gaps and holes can be jumped and you can choose from multiple lead-in/lead-out options.



## Important Module for Every Machine Shop

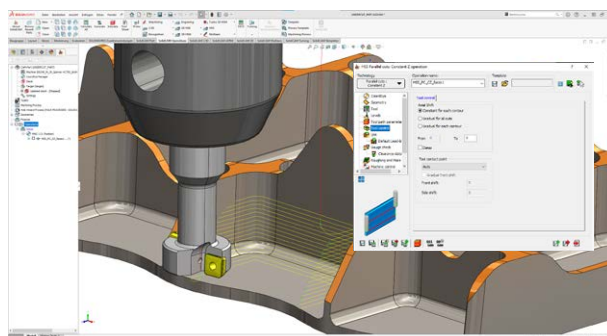
The advantages of SolidCAM's HSS module translate into significantly increased surface quality. The HSS module is an important and valuable add-on for every machine shop for the machining of all types of parts.



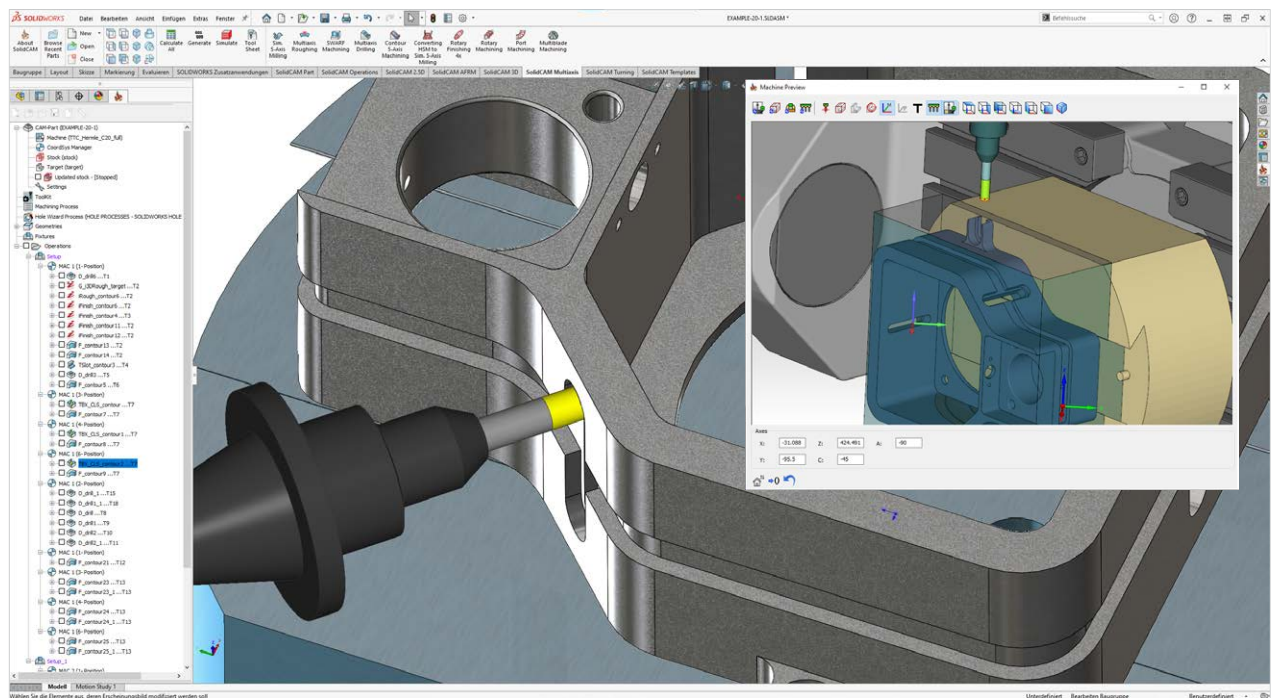
Linear High Speed Finishing toolpath on selected surface

## Handling Undercut in HSS

Use Tapered, Lollipop, or T-Slot tools for undercuts or geometry that is difficult to cut.



# INDEXIAL 4/5-AXIS MILLING



A common scene in any machine shop today is that 4- and 5-axis CNC machines are increasing production, providing faster cycle times.

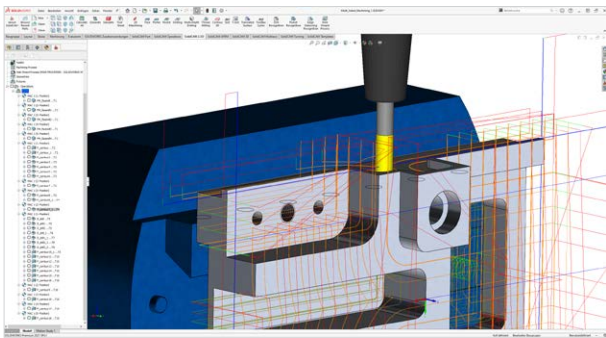
SolidCAM provides an effective and easy way to program on multiple sides of a part. Moreover, SolidCAM excels in indexial 4/5-axis machining.

## Easiest Definition of Coordinate Systems for Indexial 5-Axes!

Tired of dealing with construction views, copying models, and rotating them in space for new alignments? Do you still copy and transform geometry to separate layers for indexial programming?

Experience single machine home position, with One-click orientations for indexed setups – SolidCAM speeds up multi-sided machining by eliminating multiple coordinate system constructions. Define a Coordinate System on the fly by simply picking a face, and continue programming your part.

- SolidCAM's "select a face and machine" feature offers the fastest approach to indexial programming.
- Our coordinate system manager keeps track of all necessary data for each tool orientation.
- SolidVerify simulation displays tool holders and fixtures, alongside material removal for all machining operations.



## Efficient, Edit-Free G-Code for Multi-Axis Machines

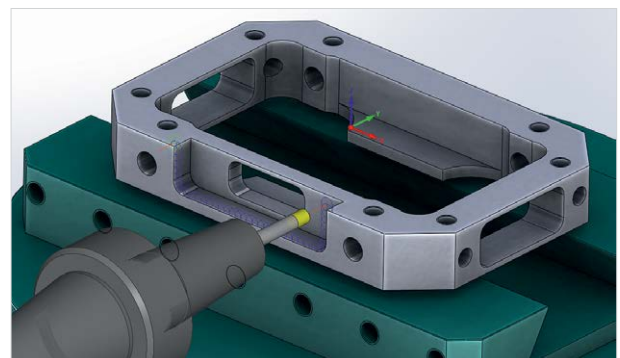
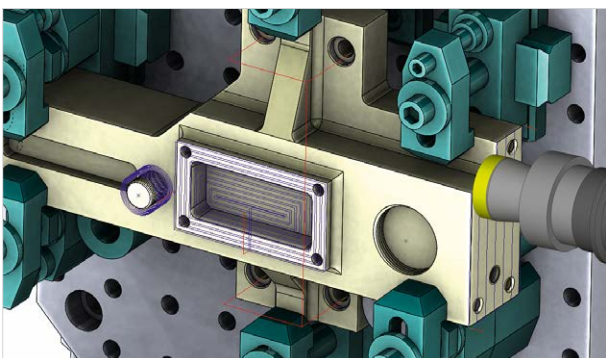
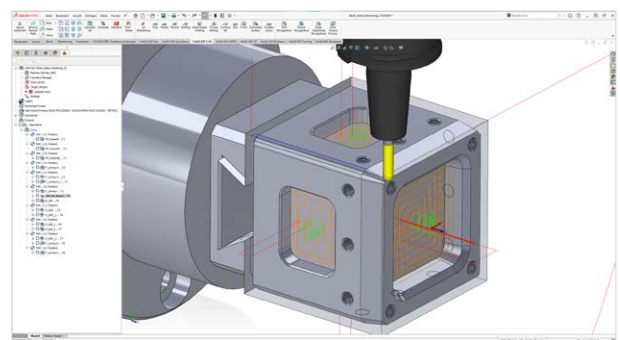
SolidCAM offers multiple options to get efficient G-code for multi-axis machines.

SolidCAM's post processor can be configured to handle all rotations and work offset shifts, eliminating the need for setting up multiple work offsets at the machine. Whether your controller can calculate part rotations internally or it needs the post processor to handle rotations, SolidCAM has you covered. For controllers with advanced plane rotation or coordinate rotation

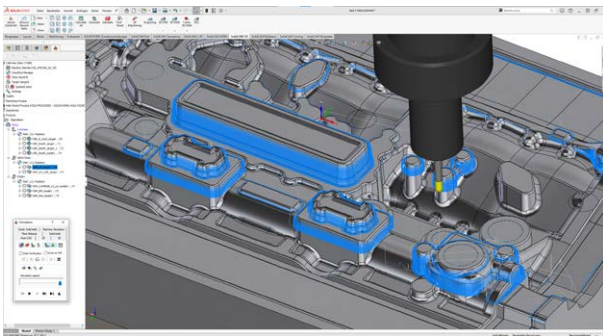
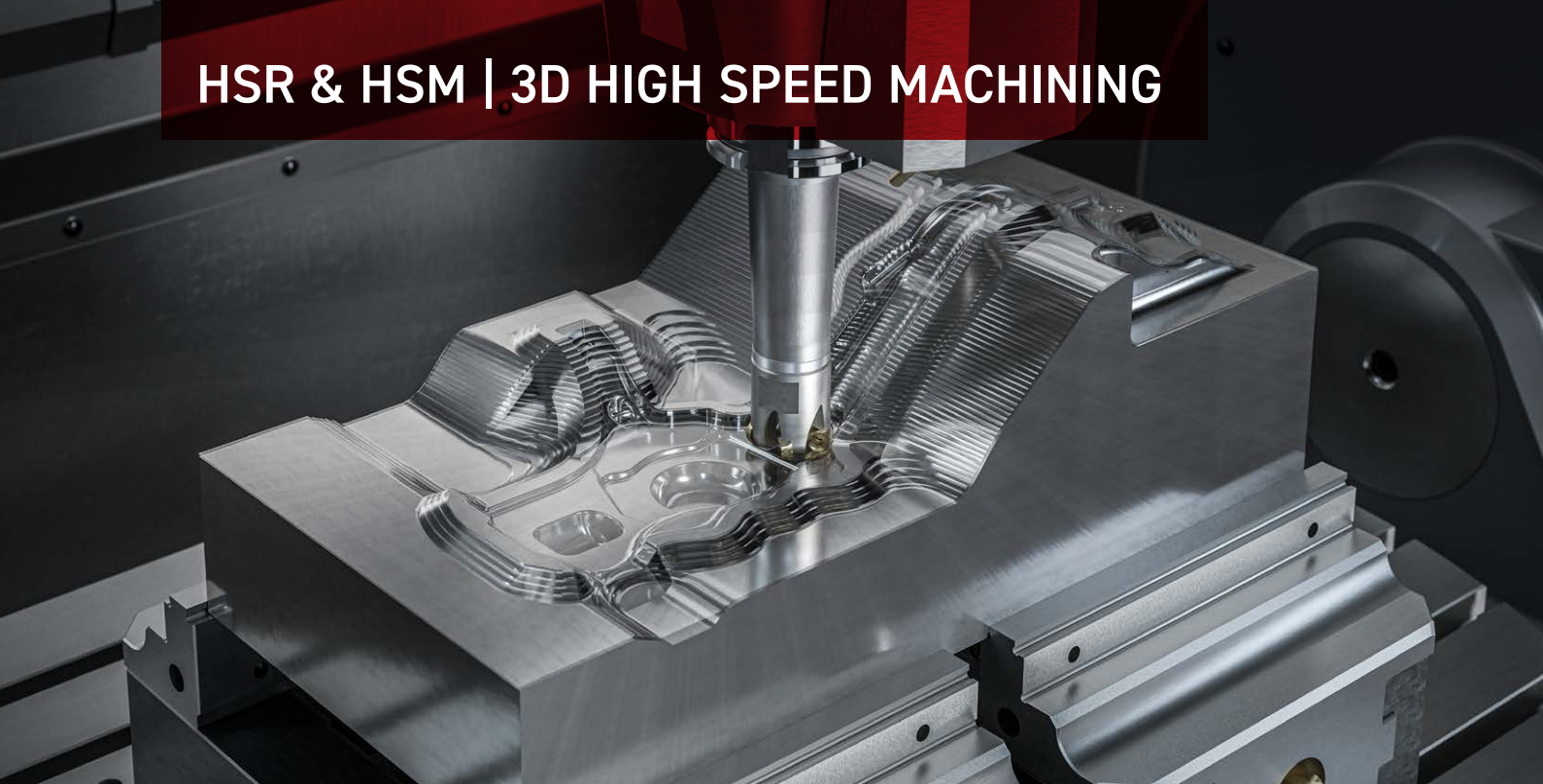
functions, SolidCAM's post processors are built to utilize these internal CNC functions. If your machine lacks such functions, you can input the part location within SolidCAM and the G-code will automatically handle all of the transformations for each rotation.

Our approach to indexial milling is straightforward: from software to G-code we make the process for indexial milling as seamless as single-sided milling.

No specialized functions or software tricks are required to machine multi-sided parts – it just works!



# HSR & HSM | 3D HIGH SPEED MACHINING



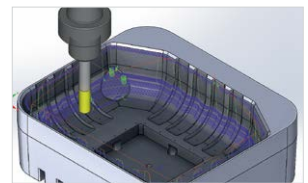
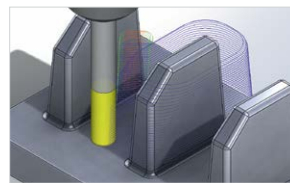
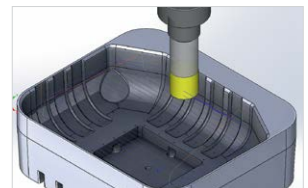
SolidCAM's High-Speed Machining (HSM) offers unique machining and linking strategies for 3D high-speed toolpaths. It smoothens the paths of both cutting moves and retracts, wherever possible, to maintain a continuous machine tool motion – an essential requirement for maintaining higher feed rates and eliminating dwelling.

- + 3D machining taken to an entirely new level of smoothness, efficiency and smart machining.
- + The finest toolpaths available anywhere for complex 3D parts, aerospace parts, molds, tools and dies.



## HSR – High Speed Roughing

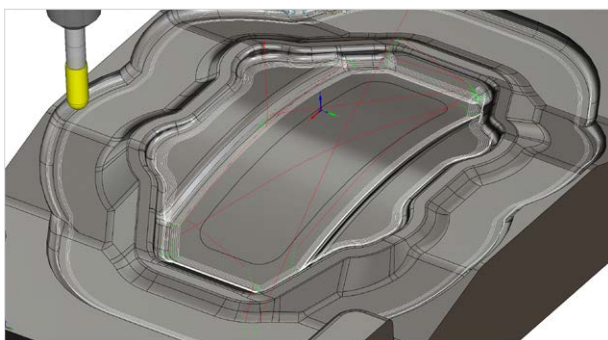
SolidCAM HSR provides powerful high-speed roughing strategies including: HM roughing, contour, hatch, hybrid rib-roughing, and rest roughing.



## High Speed Finishing

With SolidCAM's HSM module, retracts to high Z levels are kept to a minimum. Angles are smoothed with arcs wherever possible, ensuring that retractions never exceed what is necessary. This minimizes air cutting and machining time.

- + Efficient and smooth toolpath that translates to increased surface quality, reduced wear on your tools and a longer life for your machine tools.
- + High Speed Machining is a must in today's machine shops to meet demands for ever-shorter lead and production times, lower costs and improved quality.



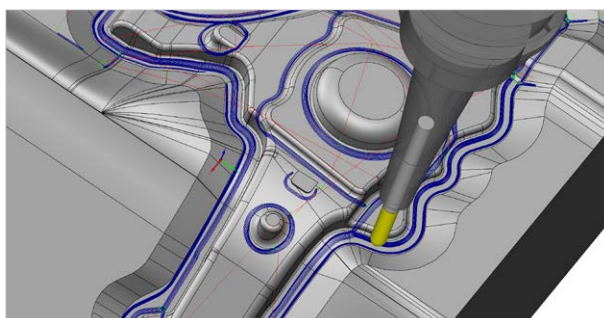
## 3D Machining to the Highest Level

SolidCAM's HSM module is a powerful solution for all users who demand advanced High-Speed Machining capabilities. It can also be used to improve the productivity of older CNCs with reduced air cutting and smoothing arcs thus maintaining continuous tool motion.

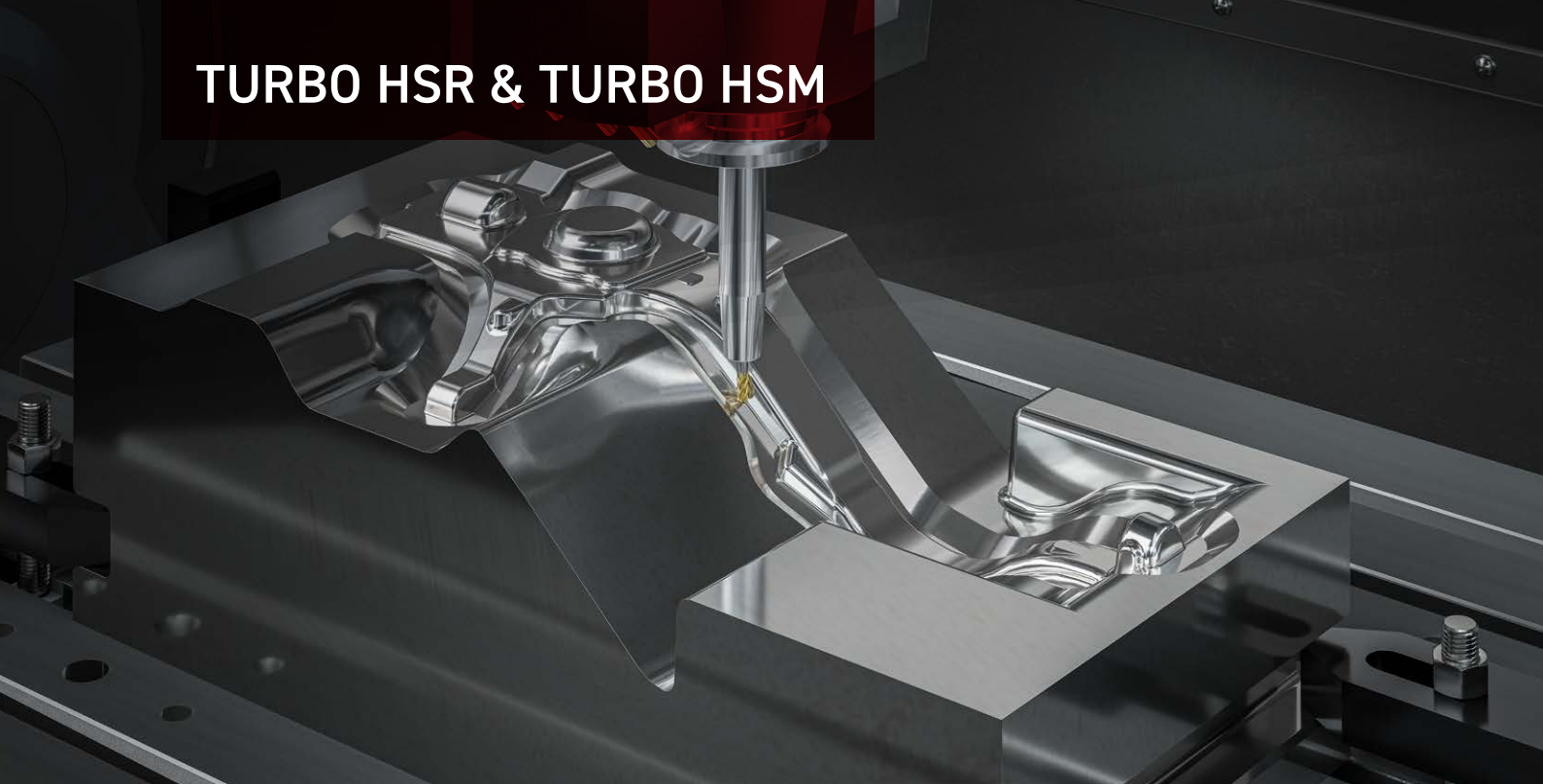
Let us show you how HSM takes 3D Machining performance to the highest level – all with your current machines.

SolidCAM's HSM module features several enhancements to CAM technology that make high speed operations possible, e.g. avoiding sharp angles in the toolpath and generating smooth and tangential lead-ins and lead-outs.

- + Tool stays in contact with the material as much as possible, reducing non-machining moves.
- + Working area can be precisely controlled using a comprehensive set of options, including silhouette boundaries, cutter contact area boundaries, shallow area boundaries, rest area boundaries.
- + HSR/HSM toolpaths can be edited after toolpath creation using working areas, Z-level limits or a combination of both to control cutting moves or to exclude specific areas from machining.

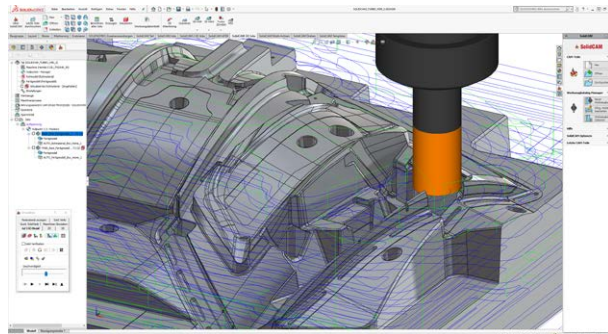


# TURBO HSR & TURBO HSM



## SolidCAM's THSR and THSM

SolidCAM's Turbo 3D HSR (THSR) and Turbo 3D HSM (THSM) are powerful High Speed Roughing (HSR) and High Speed Machining (HSM) modules for much faster calculations than the regular HSR / HSM modules.



THSR and THSM offer unique machining and linking strategies for generating high-speed toolpaths. The 3-Axis calculation engine recalculates the toolpath at lightning speeds. Its 64-bit architecture completely utilizes all the cores for toolpath calculations.

The current THSR strategies (Hatch, Contour, and Rest) remove large volume of excess material rapidly and leave a small amount of stock for semi-finishing and finishing strategies. The biggest advantage of these strategies is that the toolpath contours are always collision free while machining.

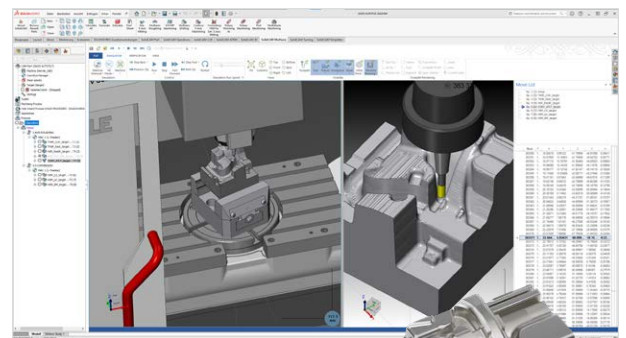
- + Extremely fast calculation and generation of toolpaths.
- + Fewer options – quicker definition of High-Speed Machining jobs.
- + Advanced gouge checking strategies.
- + Most efficient, collision free toolpath.

## Auto 3+2 High Speed Roughing

### Hybrid High Speed Roughing with 5X-transitions between THSR Jobs

SolidCAM's Auto 3+2 THSR Hatch and Contour technologies detect and process undercut areas in the specified range of processing angles. The functionalities of these technologies remain mainly the same as Turbo 3D HSR with an added advantage of Auto 3+2 Axis support.

The Auto 3+2 module is useful to efficiently machine undercut areas and gaining increased access from a single direction. It minimizes the number of operations with different machining directions.

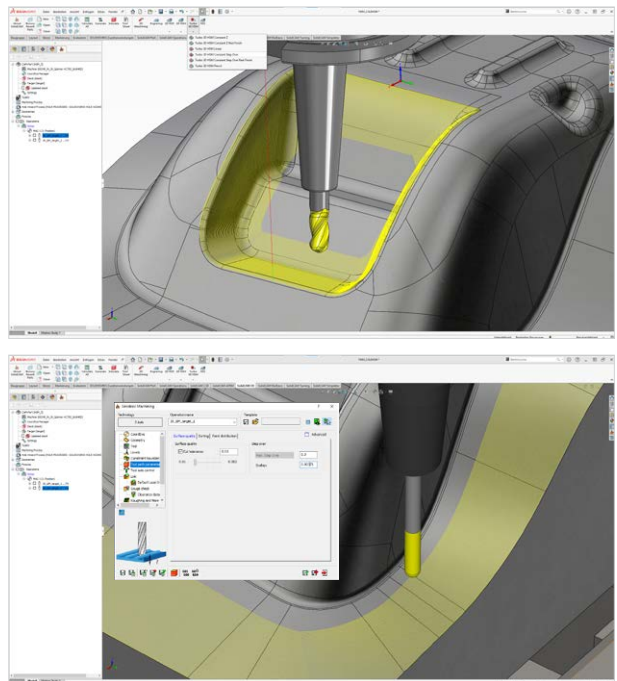




## Geodesic Machining

SolidCAM's Geodesic Machining enables machining of complex 3D Shapes (Solid Model & Surface Groups) with a toolpath that has constant stepover and undercut areas. This module generates a pattern of toolpath with measurable constant step over. The stepover remains constant even on steep and shallow walls as it machines different surfaces or an entire model. SolidCAM uses a global distance field without a fixed direction. Typically, a stepover is calculated with reference to a vector direction, but in Geodesic Machining global distance and a stepover are used without a fixed direction.

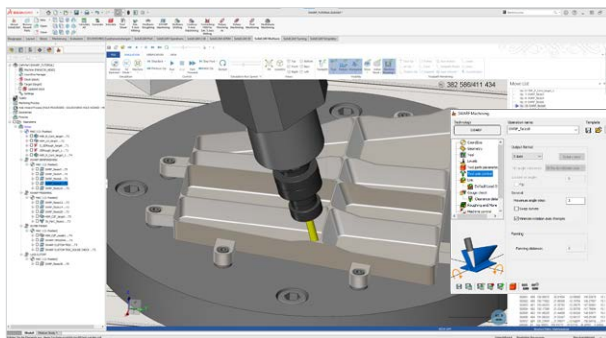
- + Various toolpath patterns available.
- + Constant 3D distance between consecutive cuts.
- + Works effectively even in undercut situations.
- + Utilizes single entry and exit move



Excellent surface finish of  $0.4 \mu\text{m}$  with SolidCAM HSM strategies

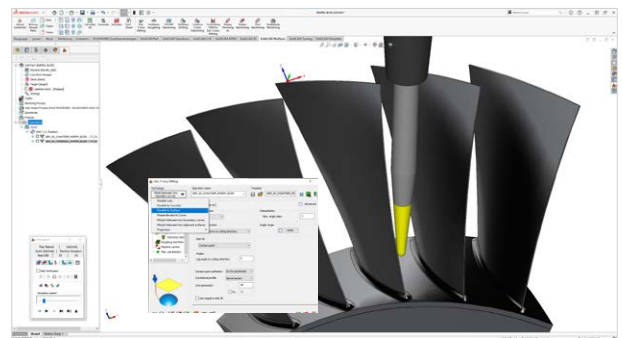
# SIMULTANEOUS 5-AXIS MILLING

Impeller Manufacturing



Benefit from the most tested and proven 5-Axis machining toolpaths in the industry, with a user-friendly interface, collision checking and the most advanced control over all aspects of the toolpath:

- + Wide variety of Simultaneous 5X cutting strategies.
- + Flow line cutting that produces a toolpath following the natural shape of the component.
- + Multi-surface finish machining keeps the tool normal to the surface (or with specified lead and lag) to achieve a smooth surface finish.
- + Advanced tool tilting control including direct control over side tilting and lead/lag angles.
- + Automatic collision avoidance strategies that assess each part of both the tool and holder.
- + Multi-axis rest roughing efficiently removes the remaining material of the larger cutter diameter used previously.
- + Realistic full 3D machine simulation offering comprehensive collision and axis limits checking.



Circular-segment cutters with barrel-, oval- and tapered geometry are being supported in SolidCAM

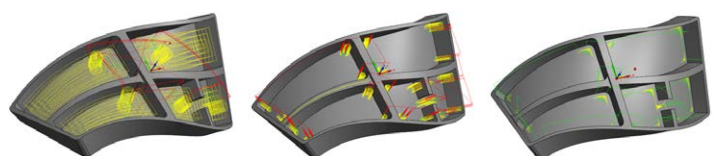
## Flexibility and Control

Each 5-Axis machining strategy provides sophisticated options for approach/link control and tool axis control.

Link and approach moves are fully gouge protected and different strategies may be used depending on the distance of the link move. SolidCAM also provides options for control over lead/lag and side tilt angles to give complete control over the final toolpath.

## Collision Avoidance for Tool and Holder

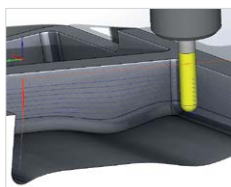
Collision avoidance is supported for both the tool and holder, and a range of strategies is offered for avoiding collisions. The Machine Simulation provides complete visualization of the gouge checking.





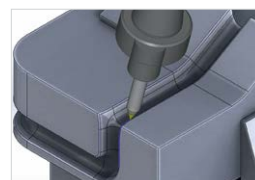
## SWARF Machining

With SWARF machining, the tool is tilted over to cut with its lateral surface. SWARF cutting utilizes the entire cutting length of the tool, resulting in better surface quality and shorter machining time.



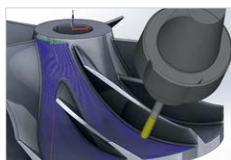
## Contour 5-Axis Machining

The Contour 5-Axis machining strategy tilts the tool along a chained 3D profile drive curve, while aligning the tool axis according to defined tilt lines, making it ideal for generating 5-axis toolpath for deburring and trimming.



## Multiblade Machining

The Multiblade machining operation easily handles impellers and bladed disks, with multiple strategies to efficiently rough and finish each part of these complex shapes, which are being used in many industries.

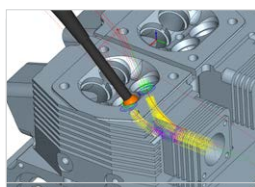


## Multi-Axis Drilling

The Multi-Axis Drilling operation uses SolidCAM's automatic hole recognition and then performs drilling, tapping or boring cycles, at any hole direction, easily and quickly. All the advanced linking, tilting and collision avoidance strategies are available in this operation.

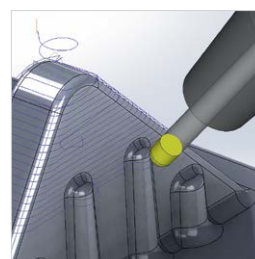
## Port Machining

With this 5X operation you can machine intake and exhaust ducts as well as inlets or outlets of pumps, in castings or steel blocks with tapered lollipop tools. Roughing and finishing operations can be quickly and easily defined and reliably simulated with complete collision control for the entire tool and holder.



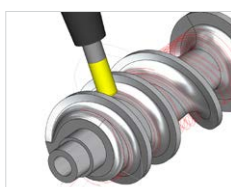
## Convert HSM to Sim. 5-Axis

The Convert HSM to Sim. 5-Axis milling operation converts HSM 3D toolpaths to full 5-Axis collision-protected toolpaths. This maintains optimum contact point between the tool and the part, enabling the use of shorter tools for more stability and rigidity.



## Screw Machining

This operation generates 4-Axis rotary roughing and finishing toolpath for screws using bull nose, ball nose or flat end mills.

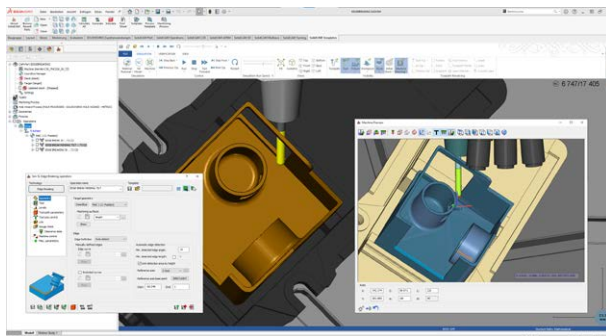


# SIMULTANEOUS 5-AXIS MILLING



## Simultaneous 5X Edge Breaking

After machining a CAM part, a burr can sometimes be found that have straight edges or non-tangent outer surface topologies. This occurs when the tool chips the metal off the edge, potentially compromising the functionality of the part, endangering the user due to its razor-sharp nature. Removing it is the best option.

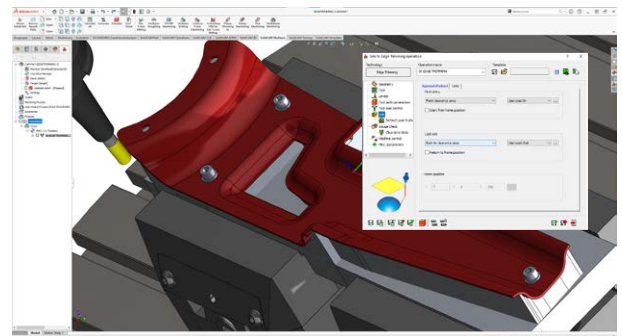


SolidCAM's Edge Breaking operation creates a deburring toolpath on the outer edges of a part geometry. The position of the tool relative to the edge is always the bi-vector between the two surfaces of that edge.

- + Enables creation of a fully automatic toolpath by just selecting the part geometry.
- + Additional features include Automatic Feature Detection, Linking, Lead-In and Collision avoidance.
- + Ball mill cutters and quality geometry input (mesh) are required for the detection feature to work properly.

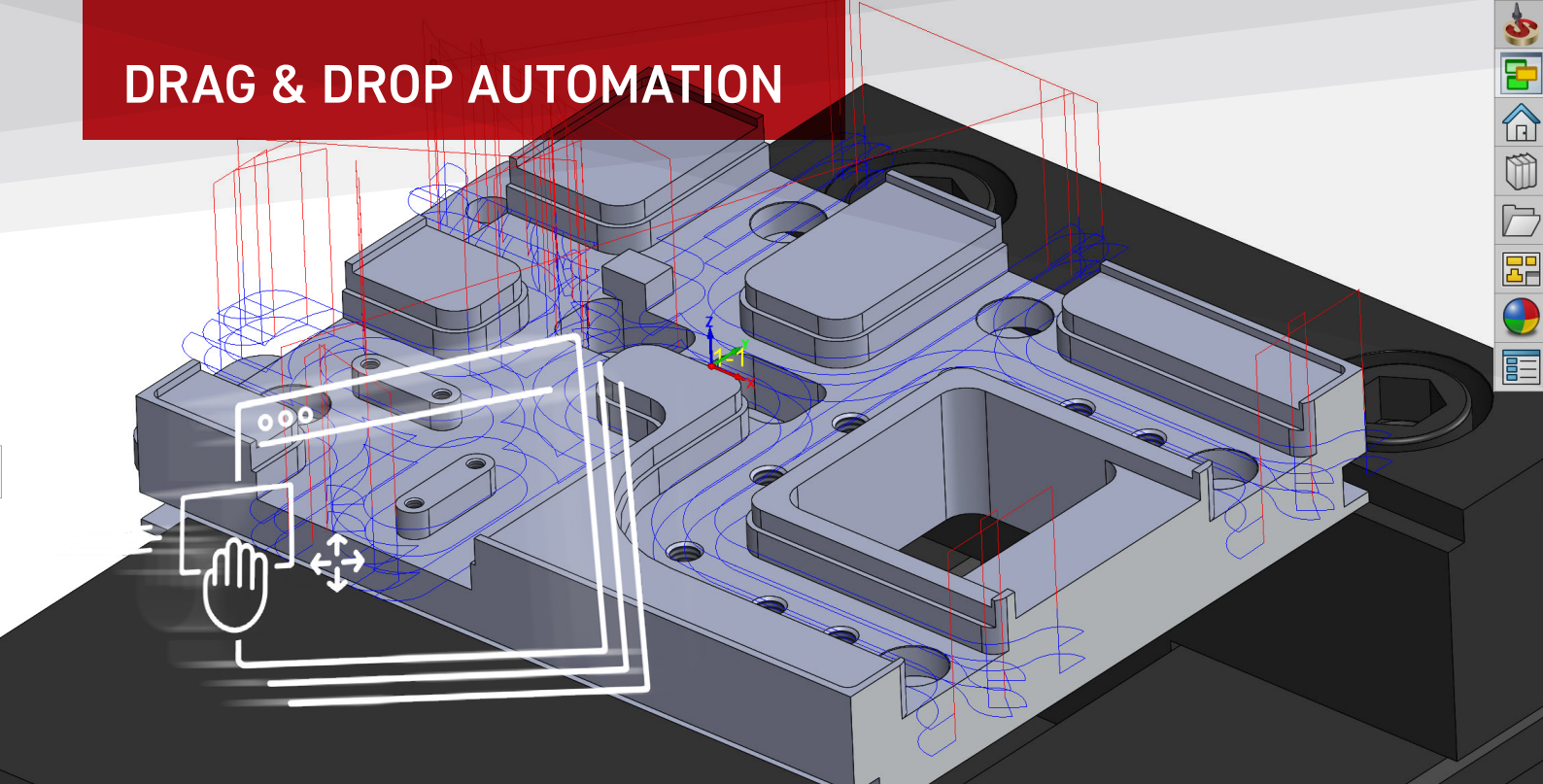
## Simultaneous 5X Edge Trimming

SolidCAM's Edge Trimming operation efficiently machines parts that require edge trimming to get their final shape. This operation uses a highly automated algorithm to create a toolpath to trim the edge thin materials.



- + Designed for the edge trimming of thin materials.
- + 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.
- + Axial shift enables the tool to be engaged with a certain value into the material.
- + Edge trimming can be automated or user defined, and offers a variety of corner handling functions to create a seamless toolpath.

# DRAG & DROP AUTOMATION

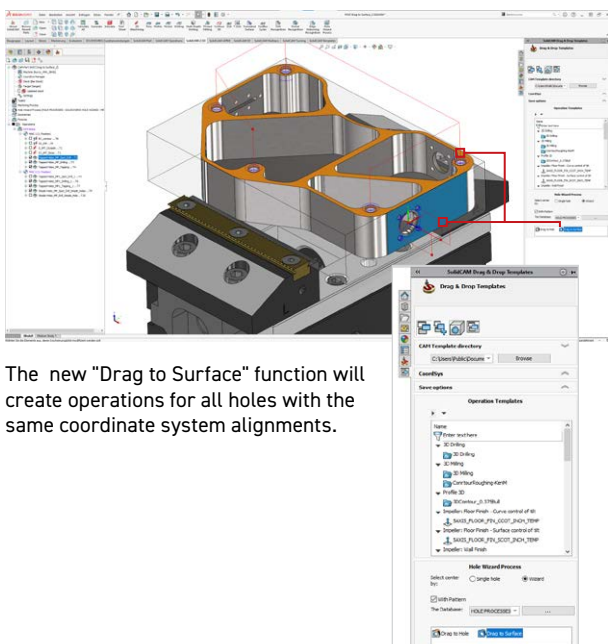


## Drag & Drop Templates

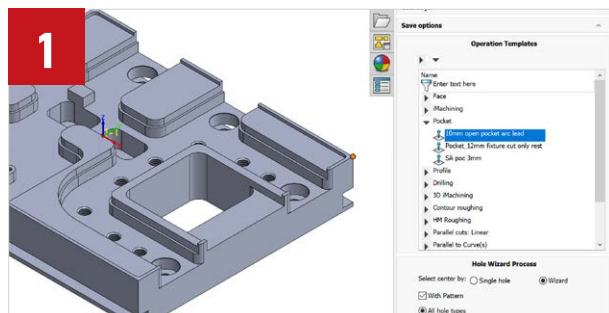
One of the most intuitive and fastest ways of programming a part is to use SolidCAM's Drag & Drop templates. These are ready-made templates that you can drag directly onto surfaces and holes.

The templates can be created by the user directly from existing jobs and can be flexibly adapted at any time in a clearly structured database.

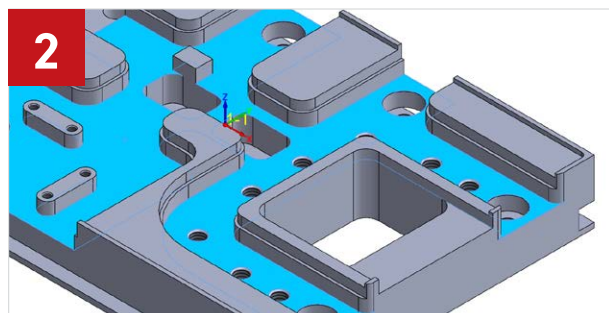
Drag & Drop is available in a wide span of SolidCAM's operations including 2,5D, iMachining, HSS, HSM etc.



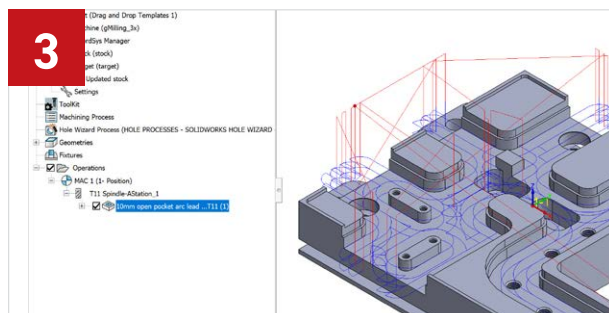
The new "Drag to Surface" function will create operations for all holes with the same coordinate system alignments.



Grab operation template from template directory

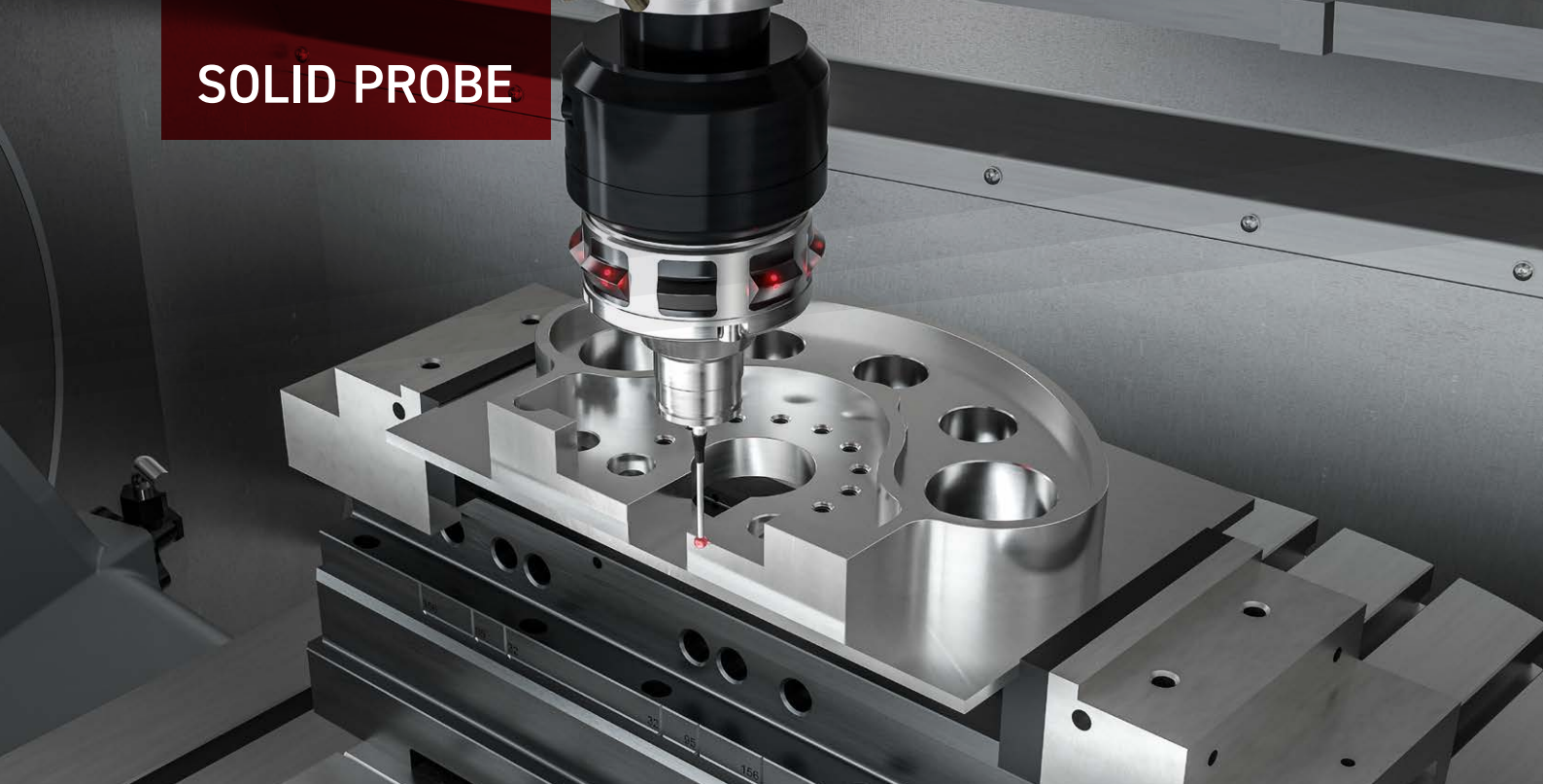


Drag the template to the face to be machined



A new Operation is added to the CAM Manager operation tree and the toolpath will be calculated

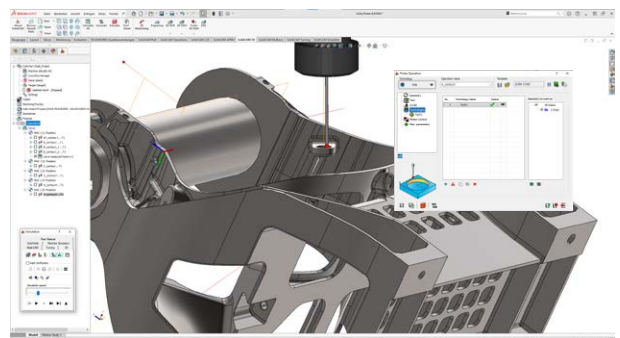
# SOLID PROBE



## Probing & Measuring Made Easy

Solid Probe is the SolidCAM module that provides capabilities for Home definition and On-Machine Verification, using probes on the CNC machine, to do setup and control the quality of machined parts.

Full visualization of all the probe movements, provided by SolidCAM Machine Simulation, enables you to avoid any potential damage to the Probe tool.

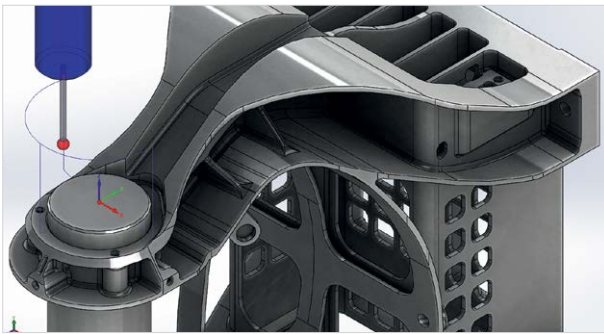


## Solid Probe is a Must for Every Machinist using Probes:

- + Easy Home definition
- + On-Machine Verification
- + Tool Presetter support
- + Easy geometry selection on solid model
- + Supports a wide range of probe cycles
- + Visualization of all the Probe tool movements
- + Support of different Probe controllers

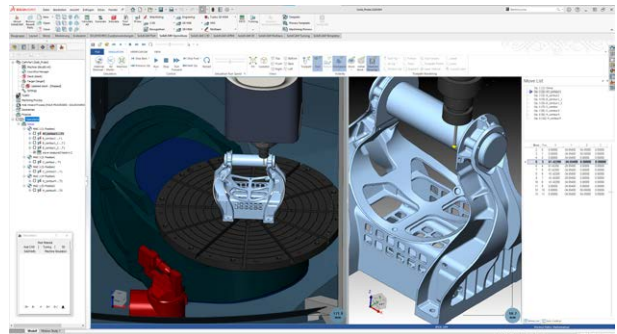
## Combined Probe and Machining Operations

Machining operations and Probe operations are inter-mixed in the SolidCAM CAM manager and can use the same geometries on the solid CAD model. When the solid model is changed, both the machining and probe operations can be automatically synchronized to the change.



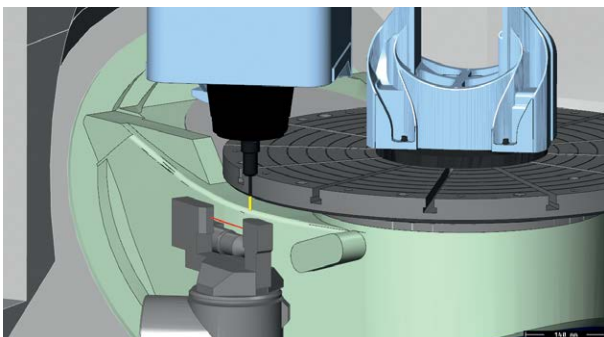
## Home Definition

Solid Probe provides an easy solution for home setting, using 16 different cycles, to easily define home positions, replacing manual setup procedures.



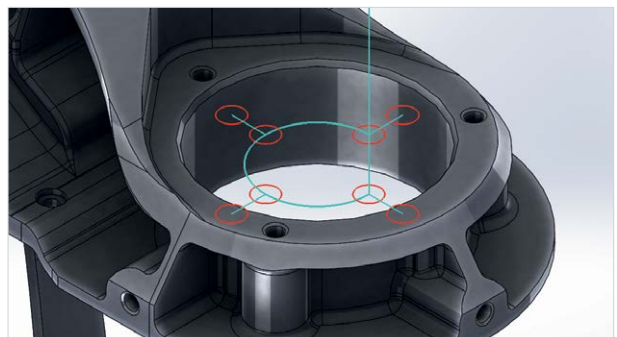
## On-Machine Verification

Solid Probe cycles are used for measuring machined surfaces, without transferring the part to a CMM machine – the part can be inspected on the CNC machine itself.



## Tool Presetter Support

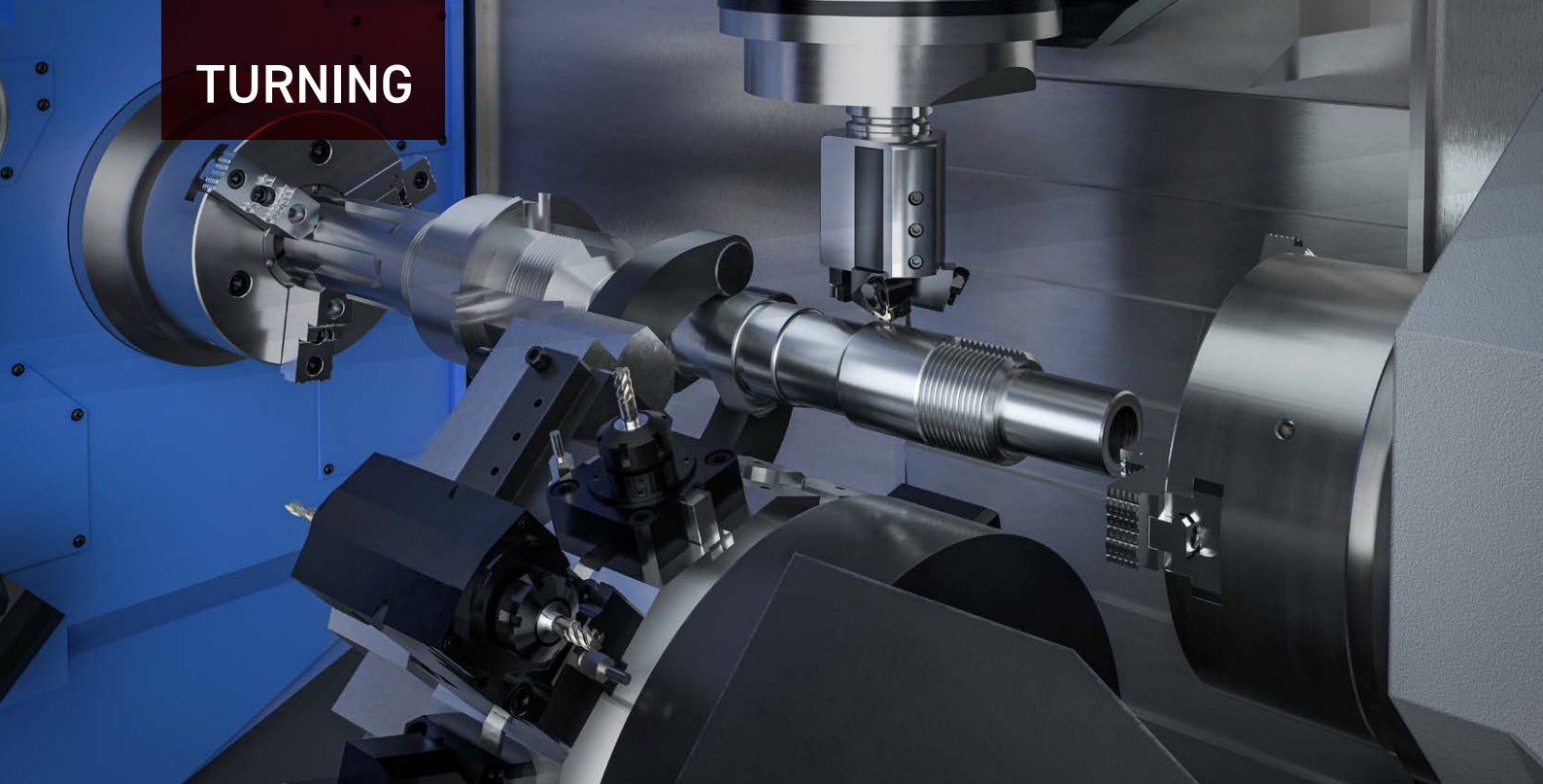
Solid Probe includes Tool Presetter support to check your milling and turning tools, between Machining operations and tool change events. It also provides tool breakage detection for continuous and safe machining.



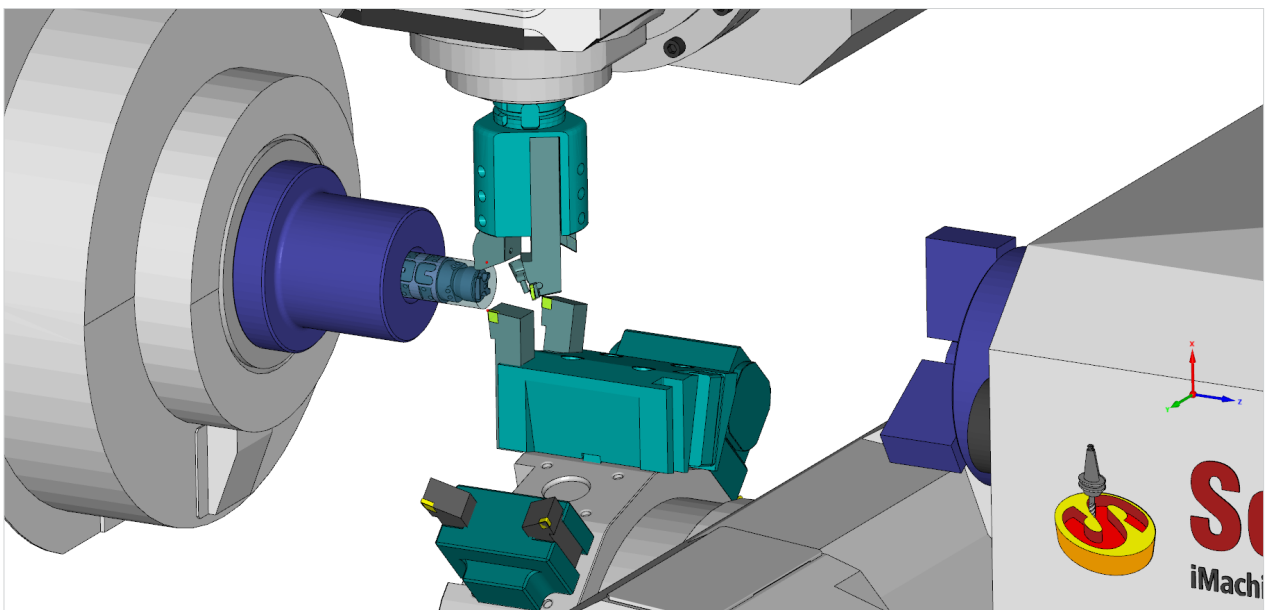
## Preview of Cycle Movements

Solid Probe uses the same geometry as the 2.5D milling operations. Full control over tolerances, different sorting options and preview of cycle movements are provided.

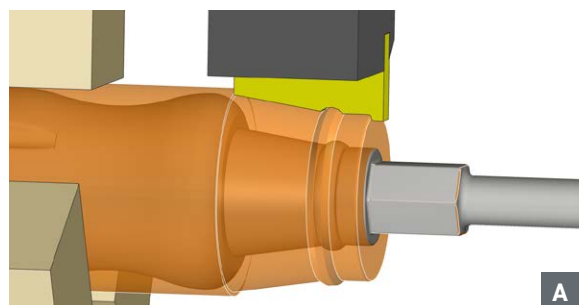
# TURNING



## SolidCAM Module for Fast and Efficient Turning

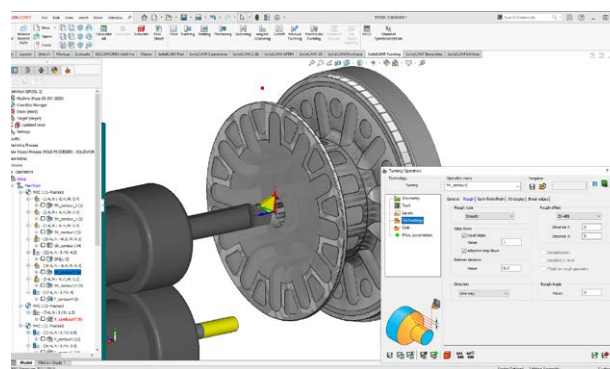
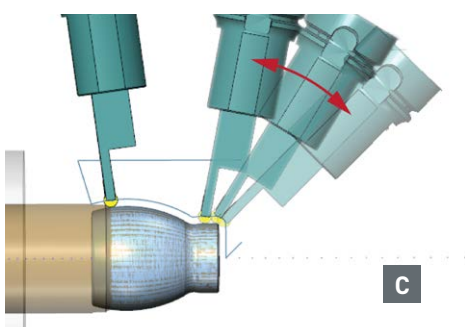
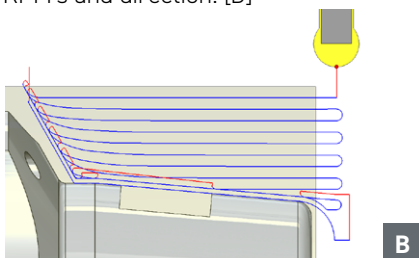


- + SolidCAM provides a comprehensive turning package with powerful toolpaths and techniques for fast and efficient turning with fixture and holder protection.
- + SolidCAM produces advanced rough and finish profile turning, together with support for facing, grooving, threading and drilling cycles.
- + Turning geometries and profile can be generated very quickly, easily adopted or modified for production.
- + The Machine Preview allows you to interactively, in machine environment, check and verify your setup and machine position, at every stage of the toolpath, minimizing programming and setup errors.
- + SolidCAM turning supports the widest range of machine tools, including 2-Axis lathes, multi-turret configurations with or without sub-spindles.
- + Custom turning inserts, shape inserts with multiple cutting edges can be used. [A]



## Advanced Turning Capabilities

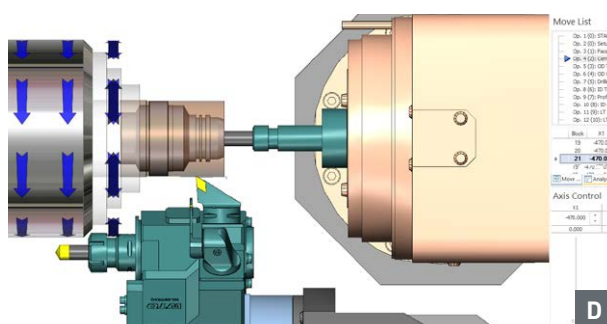
- + **Balanced Roughing:** two turning tools working simultaneously, or in trailing mode, to perform roughing turning of long and large parts.
- + **Angled Grooving:** performs internal or external inclined grooves, at any defined angle.
- + **Manual Turning:** performs turning according to user-defined geometry, regardless of stock and target
- + **A new Trochoidal toolpath of round grooving tools for increased efficiency [B]**
- + **4th Axis Simultaneous Turning:** performs machining of curved profile using the B-axis tilting capabilities of the tool, in order to machine undercut areas in a single machining step. [C]
- + **Drive Unit Sharing:** two tools working simultaneously while single Drive Unit (spindle) rotates with the same RPM's and direction. [D]



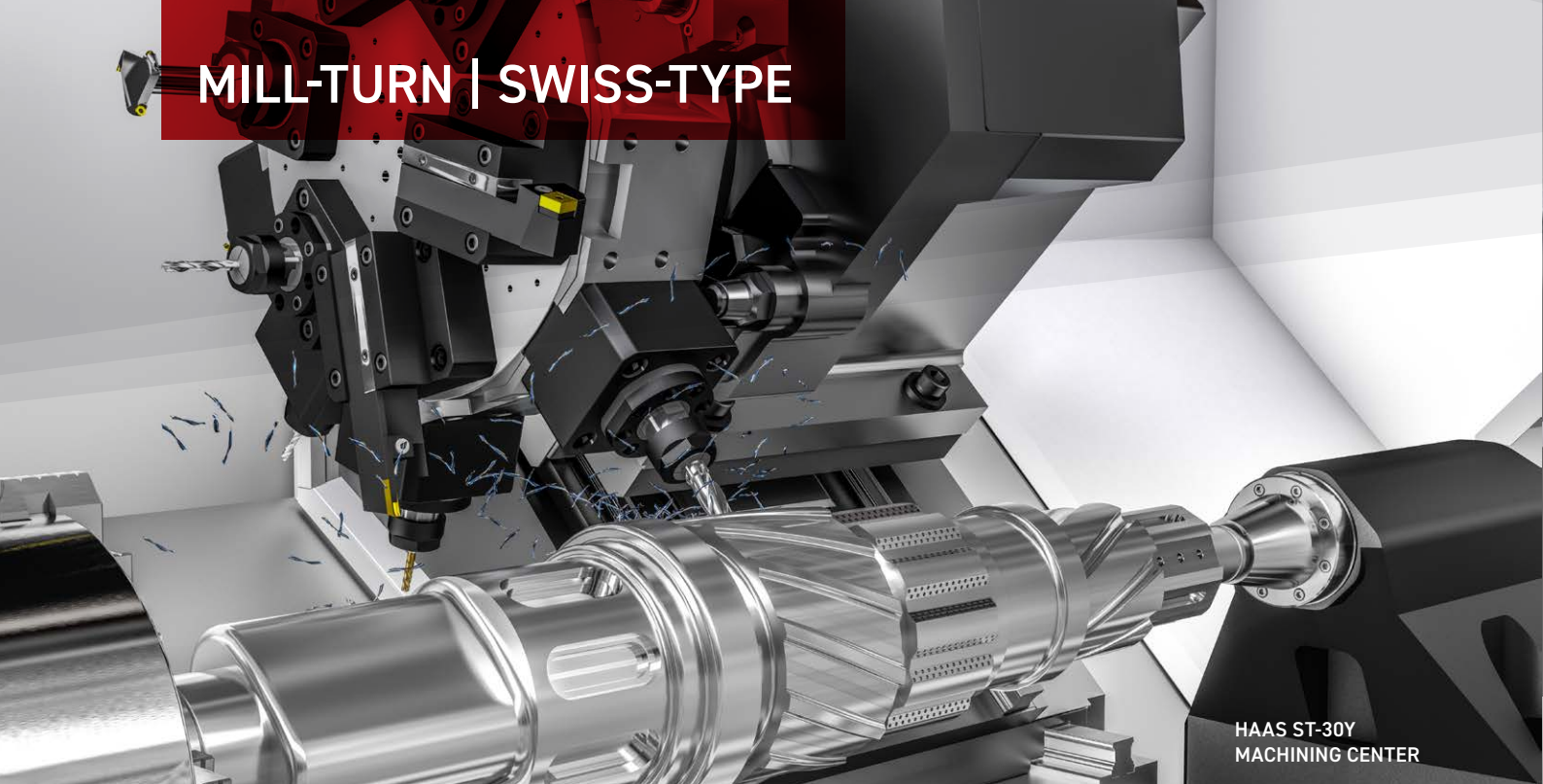
## Updated Stock

SolidCAM has the ability to keep the stock updated live within the operations tree. Updated stock is supported from the most basic 2-Axis Turning Center, right through to a CYB Multi-turret, Sub-spindle Mill-Turn CNC-Machine.

On a Sub-spindle Turning Center, when a component is transferred from the main to the sub-spindle, the Updated stock model is transferred with it. Any subsequent machining on the sub-spindle will detect the stock in the state that it left the main spindle, ultimately providing the most efficient machining sequence possible.



# MILL-TURN | SWISS-TYPE



HAAS ST-30Y  
MACHINING CENTER

## Complete Solution for Advanced Multi-Turret/Spindle Mill-Turn and Swiss-Type Machines

Modern Multi-Axis machining centers are designed to combine as many milling and turning operations as possible to manufacture work-pieces at maximum productivity.

Manual CNC programming of sophisticated parts on complex machines, directly at the machine controller is – if at all humanly possible – unproductive, error-prone and expensive.



### TURNING OPERATIONS



Manual



Face



Turning



Grooving



Drilling



Balanced  
Roughing



Threading



Angled Grooving



Trochoidal  
Turning

### MILLING OPERATIONS



2D iMachining



Face



Profile



Pocket



Drill



Multi-Depth Drilling



Threading



Contour 3D



Slot / T-Slot



Translated  
Surface



3D iMachining



Engraving



HSR / HSM /  
HSS



Sim. 5X



Blade Machining



Screw  
Machining



Rotary  
Machining

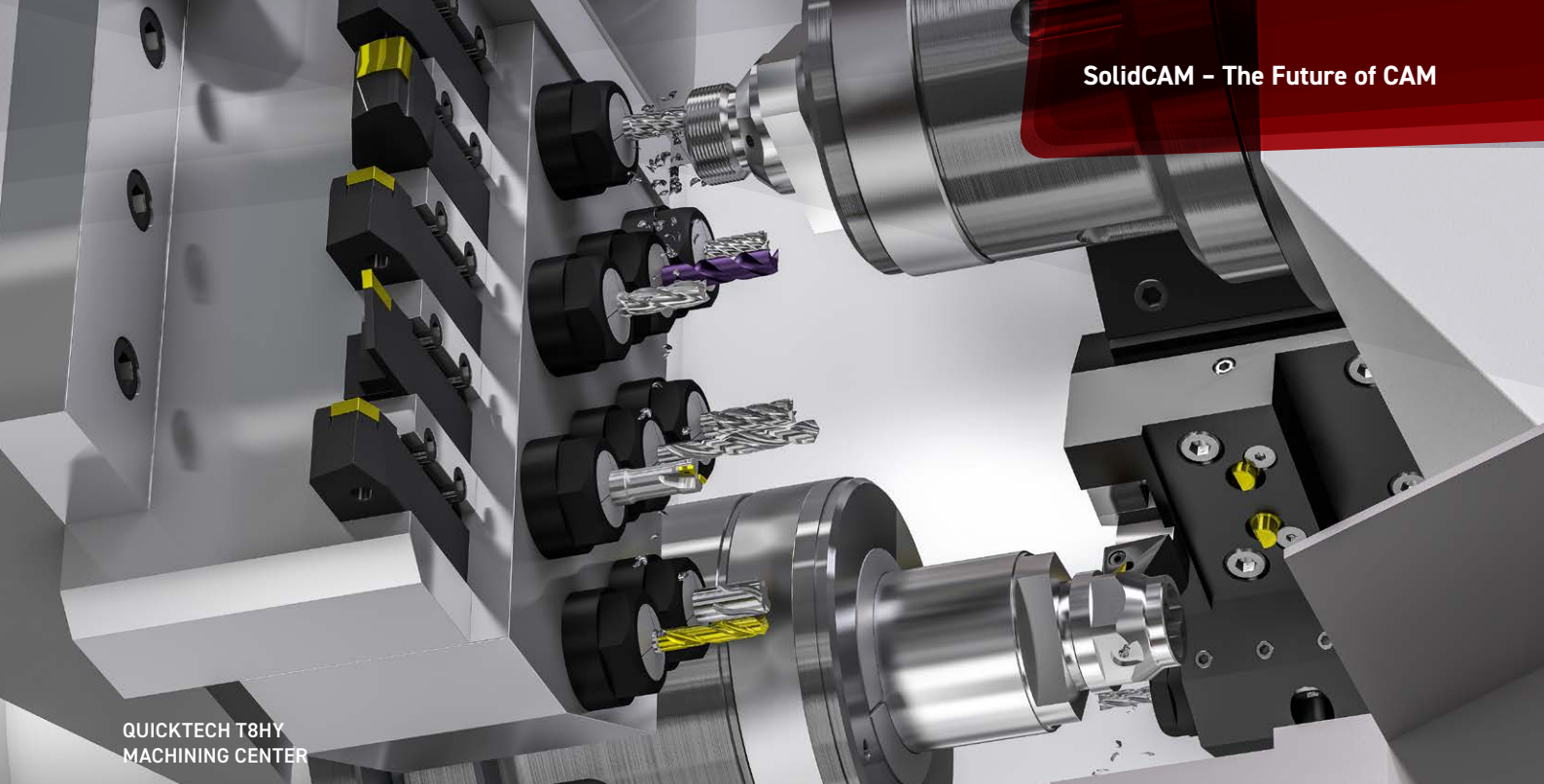


Multiaxis Drilling

... and many  
more!

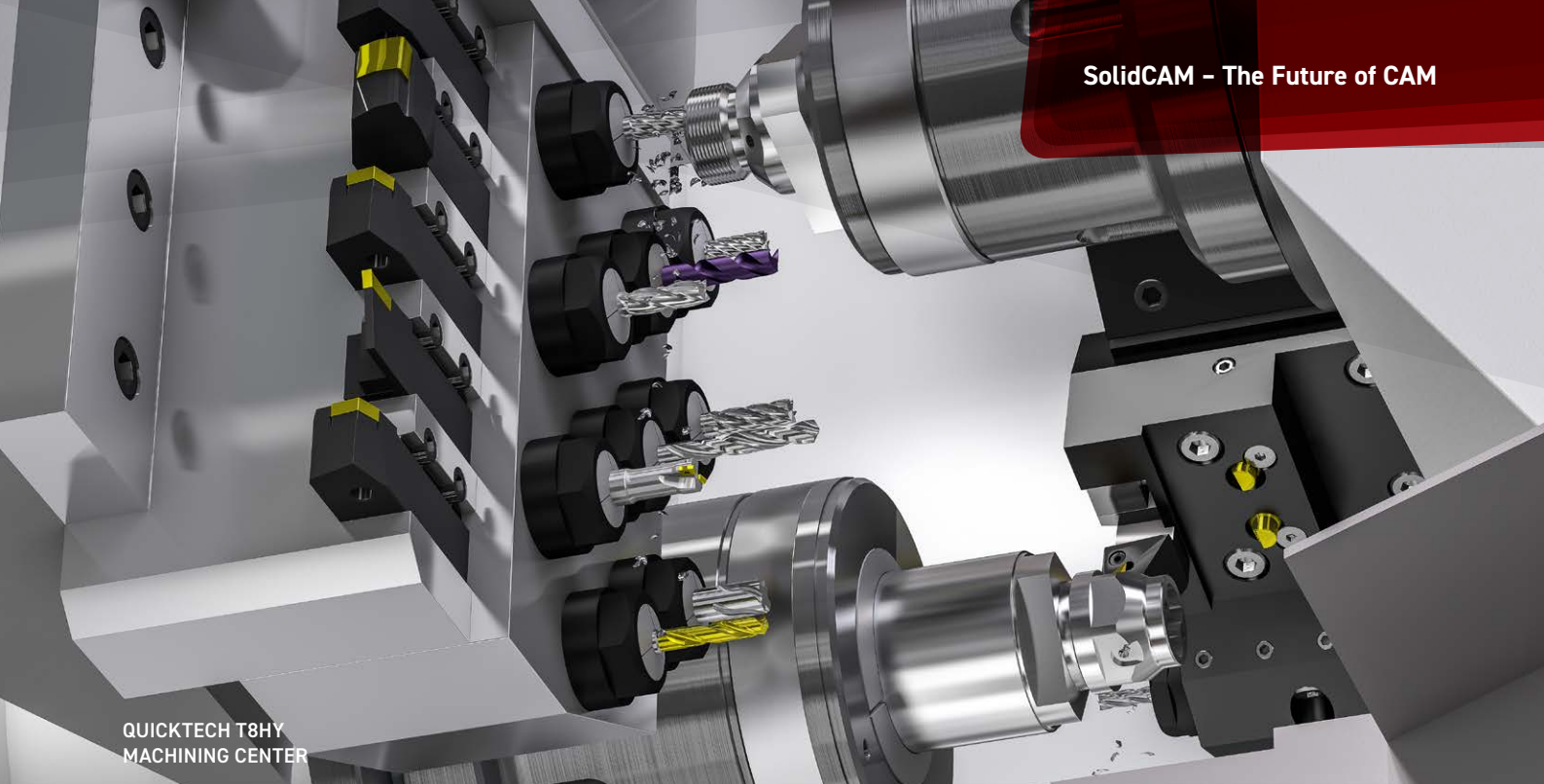
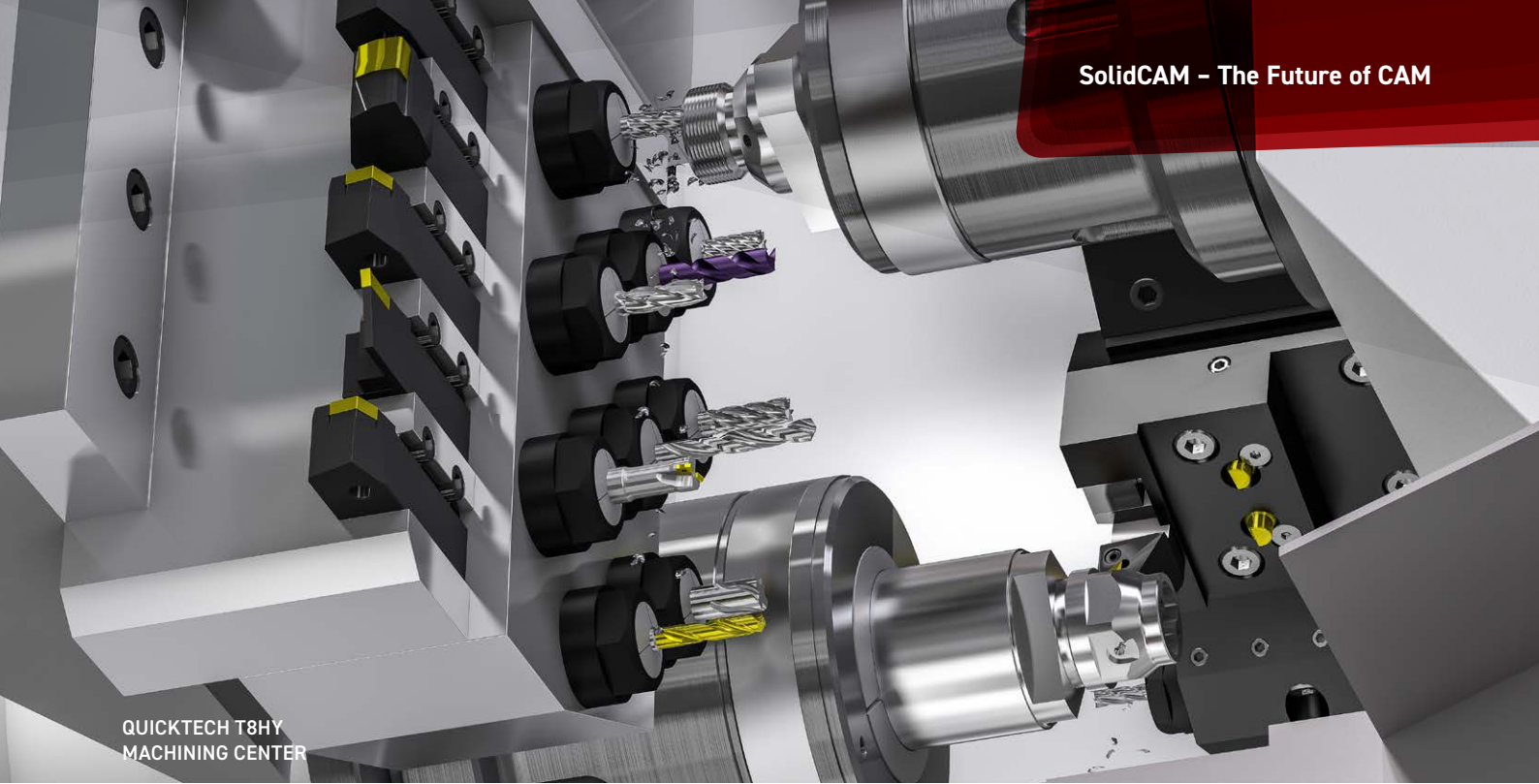
**SolidCAM - The Future of CAM**

**QUICKTECH T8HY  
MACHINING CENTER**



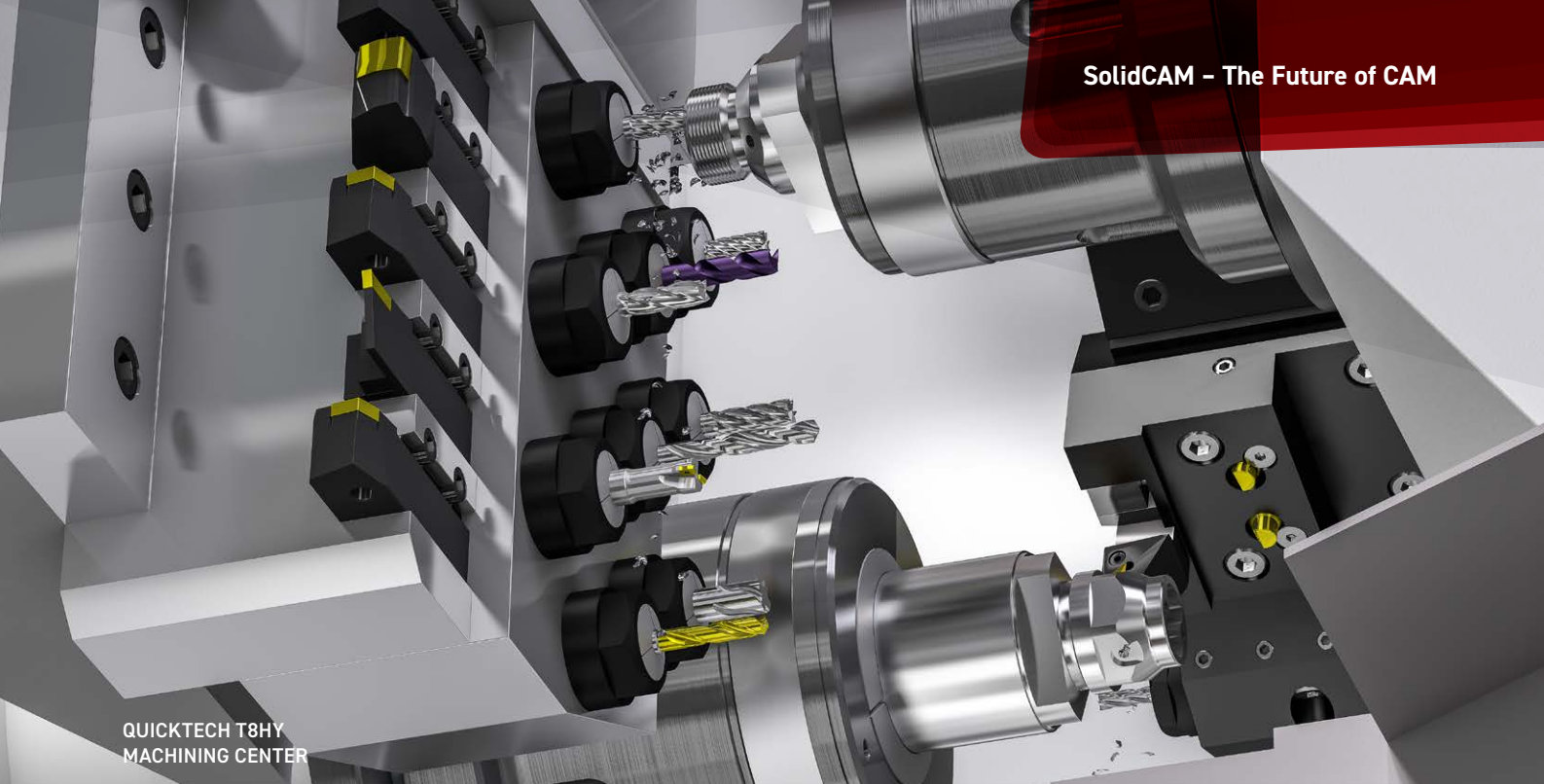
SolidCAM - The Future of CAM

QUICKTECH T8HY  
MACHINING CENTER



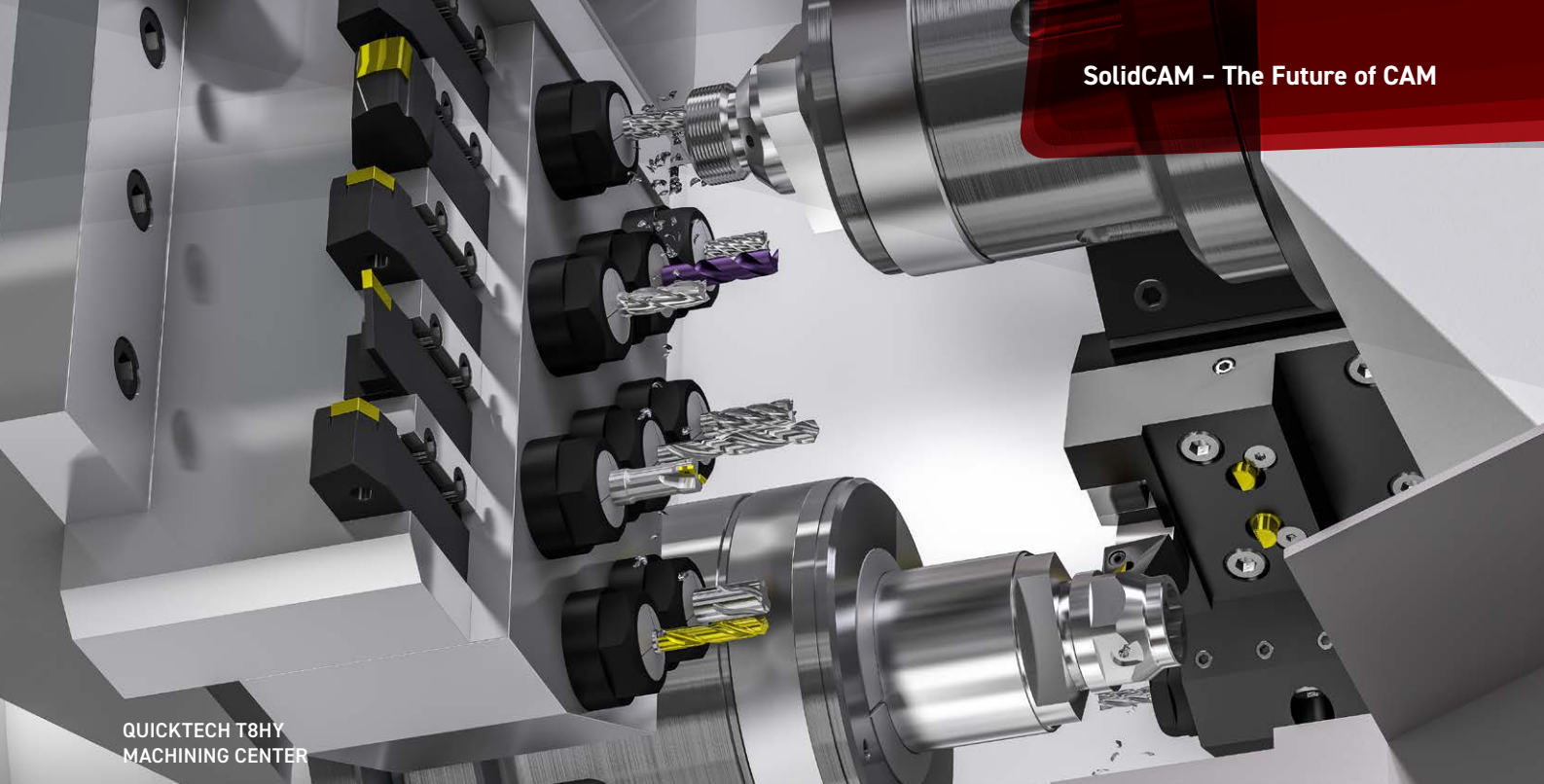
SolidCAM - The Future of CAM

QUICKTECH T8HY  
MACHINING CENTER



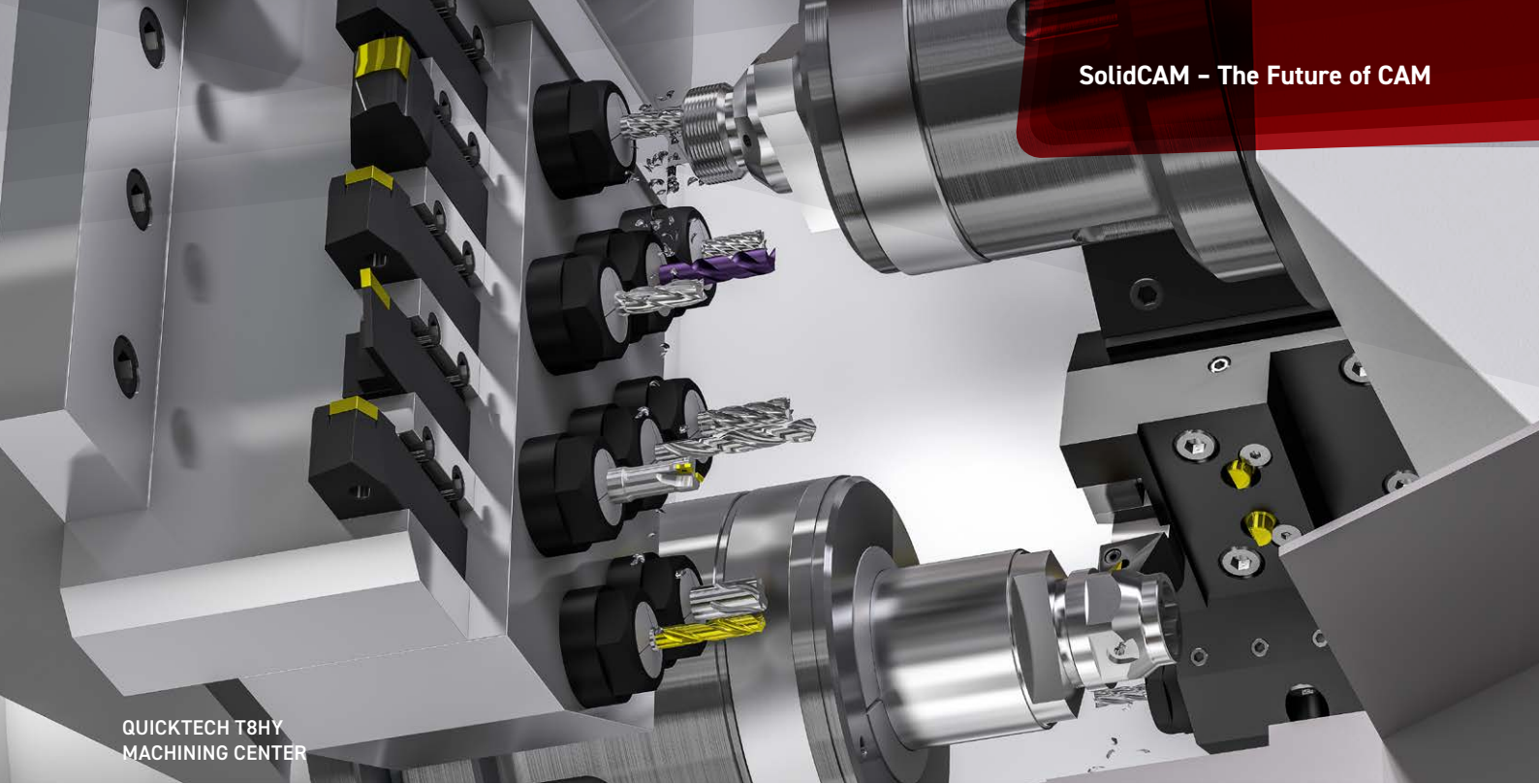
SolidCAM - The Future of CAM

QUICKTECH T8HY  
MACHINING CENTER



SolidCAM - The Future of CAM

QUICKTECH T8HY  
MACHINING CENTER



SolidCAM - The Future of CAM

QUICKTECH T8HY  
MACHINING CENTER

SolidCAM - The Future of CAM

QUICKTECH T8HY  
MACHINING CENTER

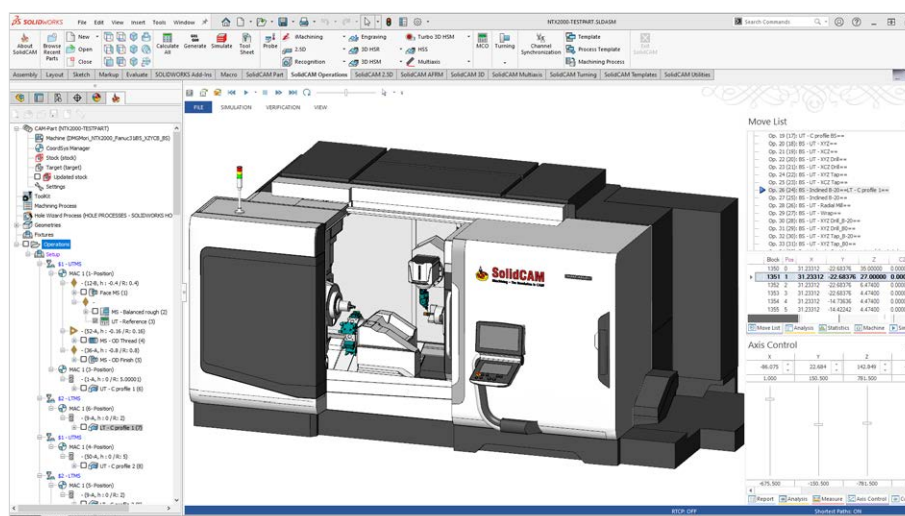
SolidCAM - The Future of CAM

QUICKTECH T8HY  
MACHINING CENTER

# MILL-TURN | SWISS-TYPE

STAR SR38-TYPE B  
SWISS-TYPE MACHINE

## Speed Up Your Complex CNC-Machines



DMG Mori Seiki NTX2000 in Machine Simulation

SolidCAM supports the most complex CNCs with unlimited number of axes and channels. We are constantly adding Mill-Turn and Swiss-Type machines with various configurations to our machine tool database.

SolidCAM's Advanced Machine Simulation shows the complete kinematics and all machine elements, providing full tool-path simulation and verification for all your machining operations.



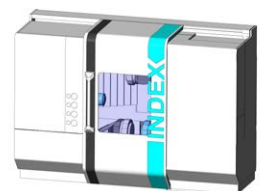
Chiron FZ08MT



Mazak Integrex i-400S



Doosan SMX2600SX



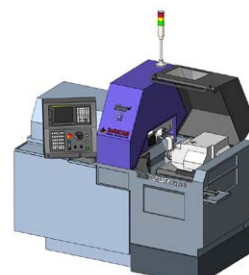
INDEX G200



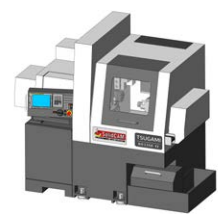
Citizen D25



Swiss ST 28



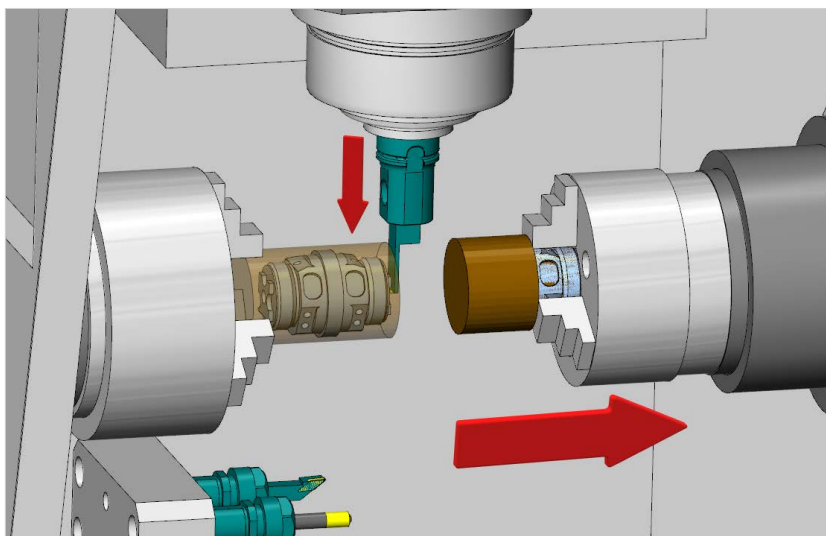
STAR SB20-R type G



Tsugami B0326E-II

CITIZEN L20E-M12  
SWISS-TYPE MACHINE

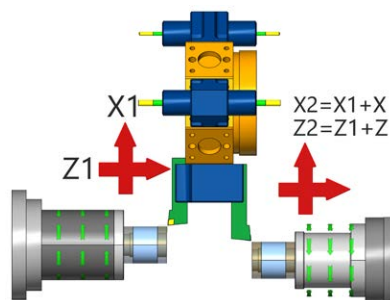
## Advanced Rest Material Handling



SolidCAM always keeps the stock updated live, within the operations tree, to optimize the tool-path, avoid air-cutting and to achieve minimal cycle time.

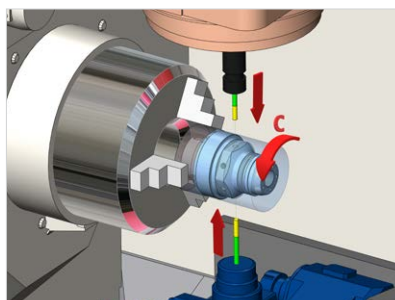
When the workpiece is transferred from the main to the sub-spindle, the updated stock model is also transferred to the new position.

Any subsequent machining on the sub-spindle will detect the stock in the state that it left the main spindle, ultimately providing the most efficient machining.



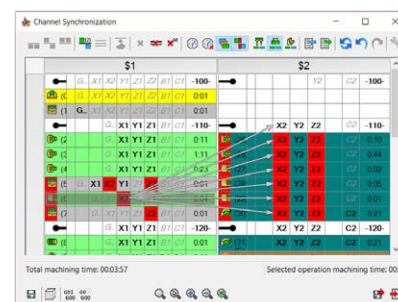
SolidCAM supports three different superimposition modes. A pair of axes can be superimposed one to another, where the slave one follows the master one.

For applicable Mill-Turn machines, SolidCAM will automatically detect this mode.



Reduce machining time by sharing axes and drive units.

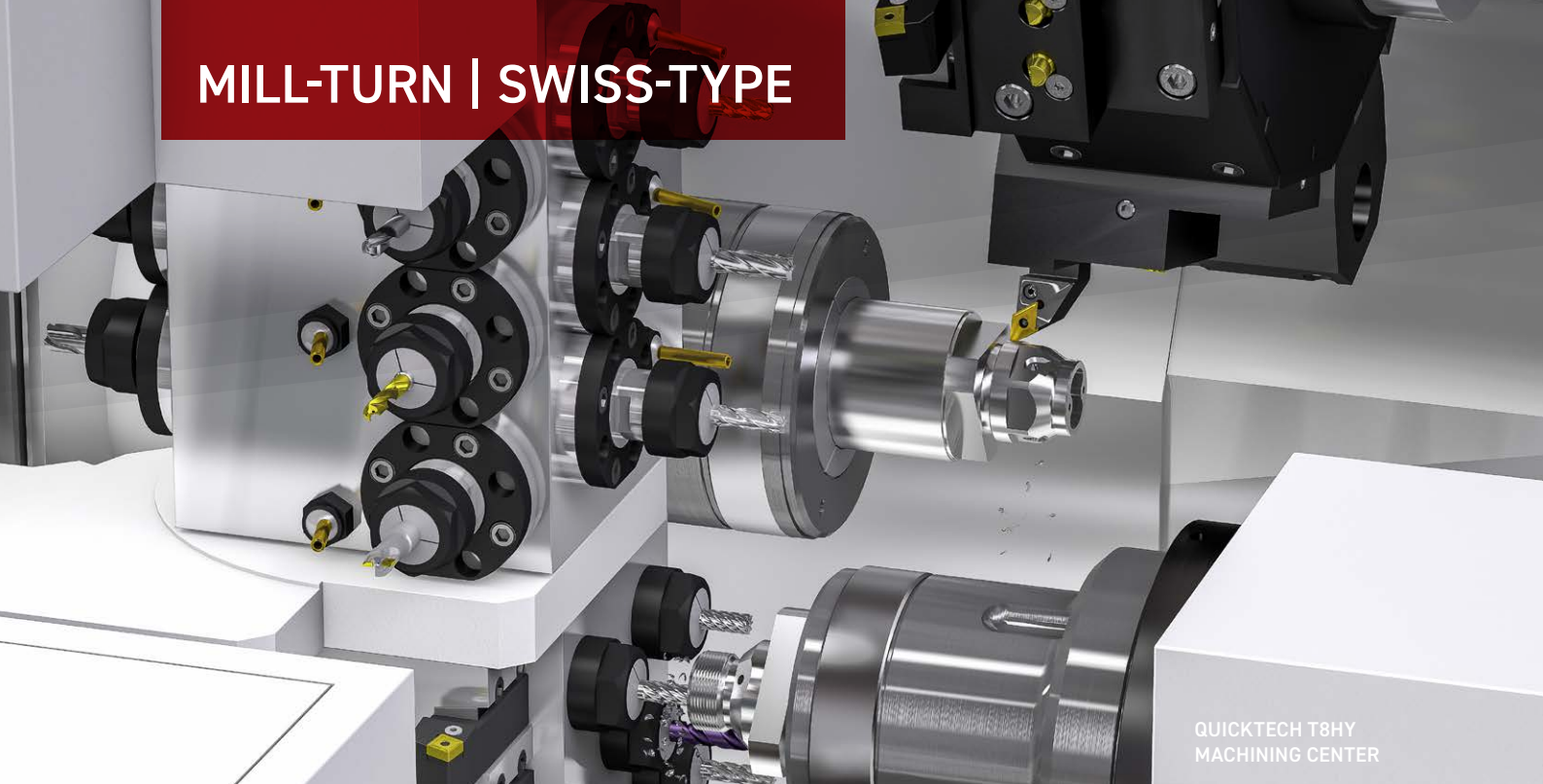
Synchronize your milling/turning operations, on different turrets, on the same table device, under specific conditions.



The Channel Synchronization's clash engine displays any issue with logical comments.

The intelligent system holds the logic and checks the possibilities of the synchronization taking into account the complete machine kinematics.

# MILL-TURN | SWISS-TYPE

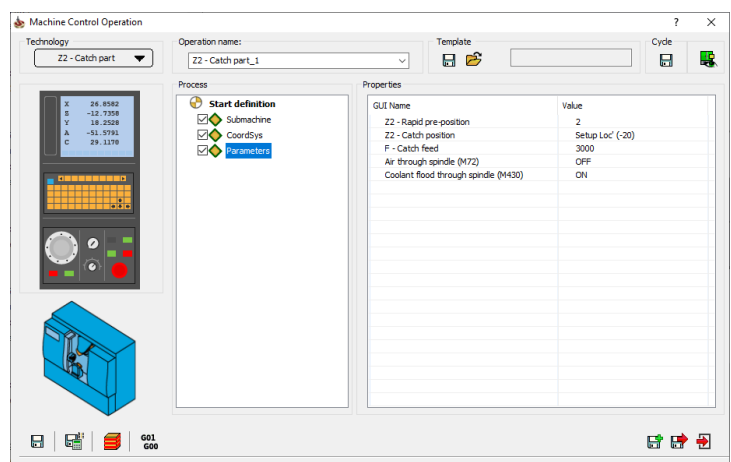


## Machine Control Operations: MCO

With MCOs you can define various CNC machine actions, in addition to machining operations programmed in SolidCAM.

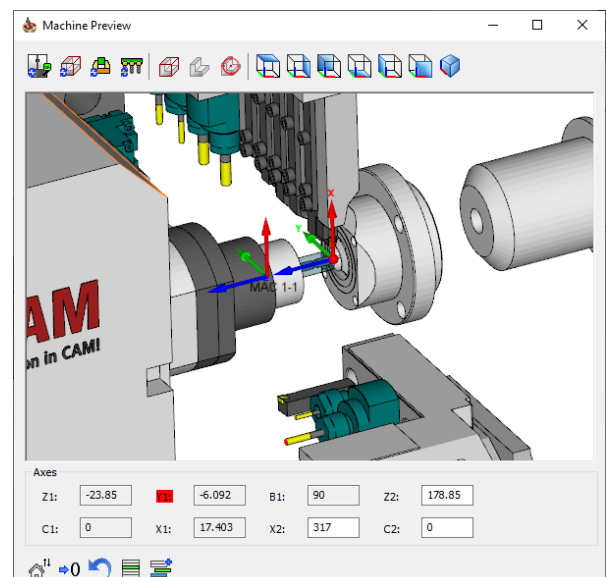
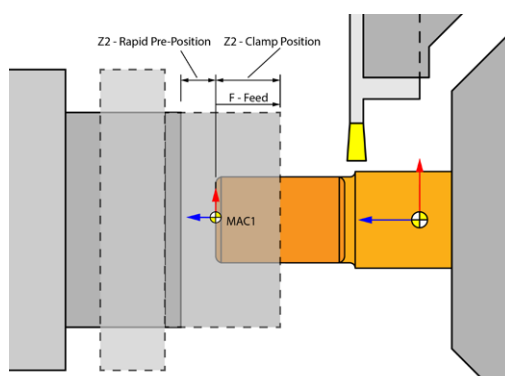
Such actions include:

- + Change tool
- + Move machine components
- + Transfer stock
- + Clamp/unclamp fixture
- + Program bar feeder
- + Control coolants
- + Machine mode
- + Axes and phase synchronization
- + Output any G/M command



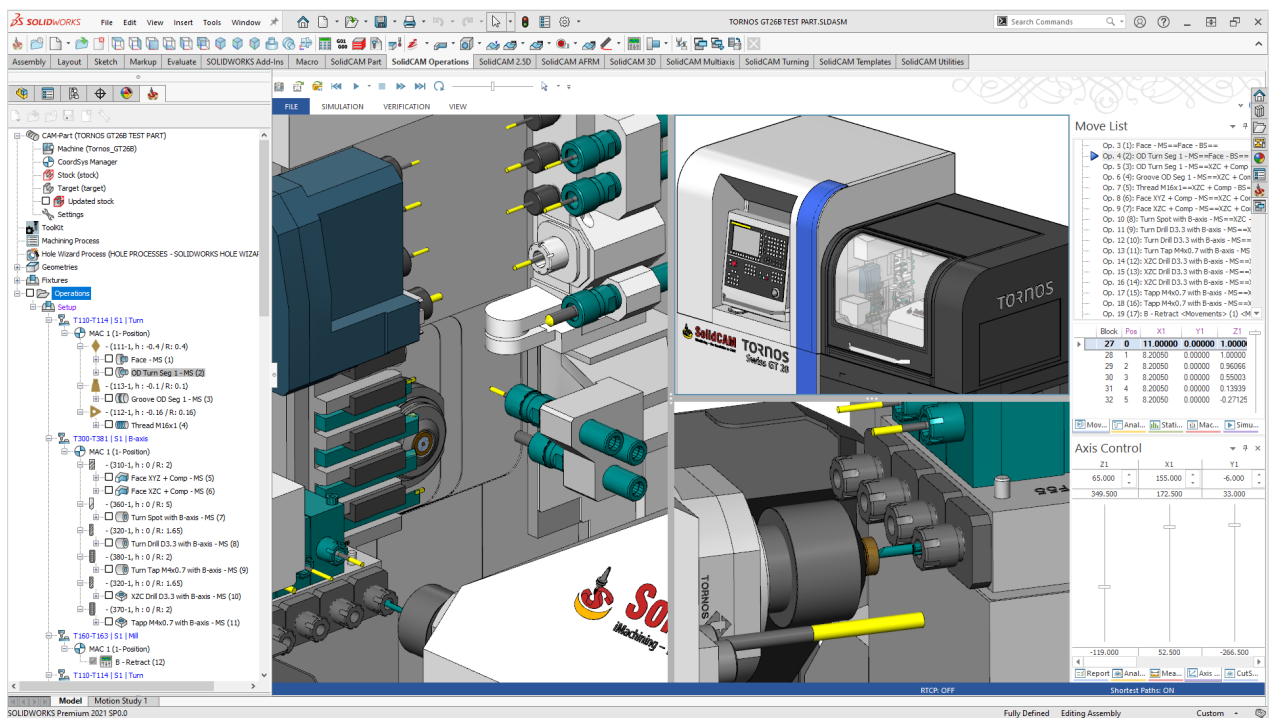
## Part transfer between spindles

Control the transfer of parts between the main and sub-spindle, using Machine Control Operations. Ready made MCOs provide the best solution for this process.

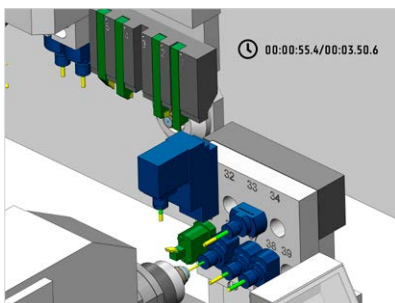


CITIZEN L20E  
SWISS-TYPE MACHINE

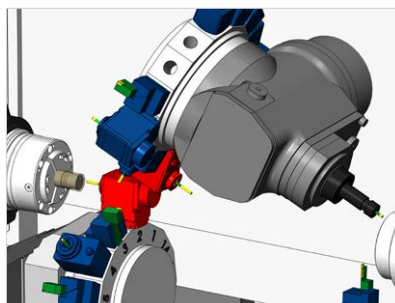
## Advanced Machine Simulation



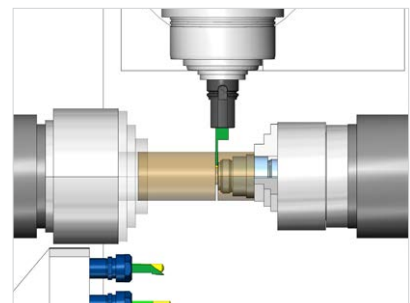
Making visual prove-out and verifying programmed tool-path in Machine Simulation on Tornos GT26B.



The calculated cycle time is displayed in the simulation module.

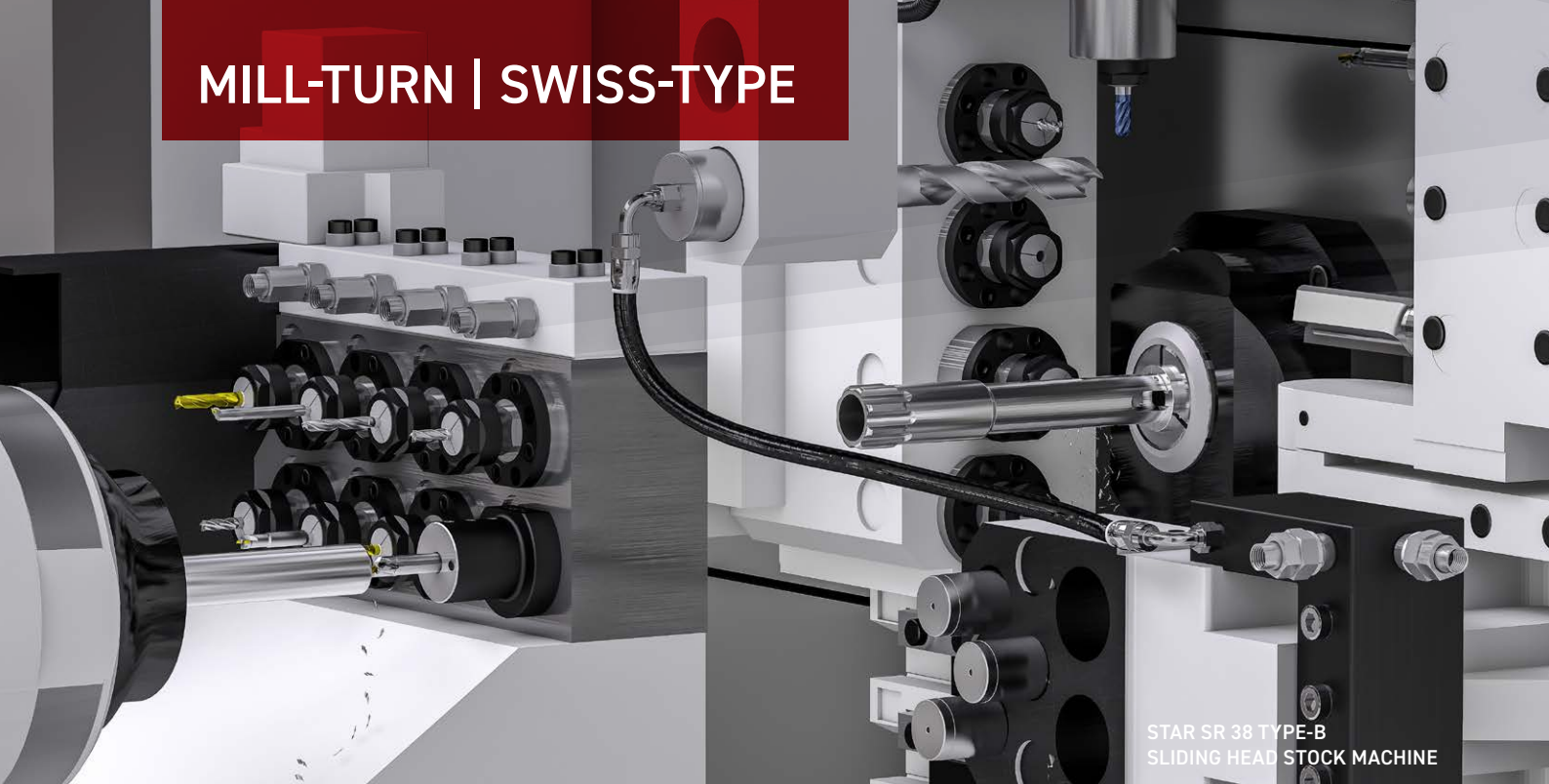


Collision detection



Part transfer: simulating the cut-off process

# MILL-TURN | SWISS-TYPE



STAR SR 38 TYPE-B  
SLIDING HEAD STOCK MACHINE

## Post-Processors: Well structured. Verified. Trustful.

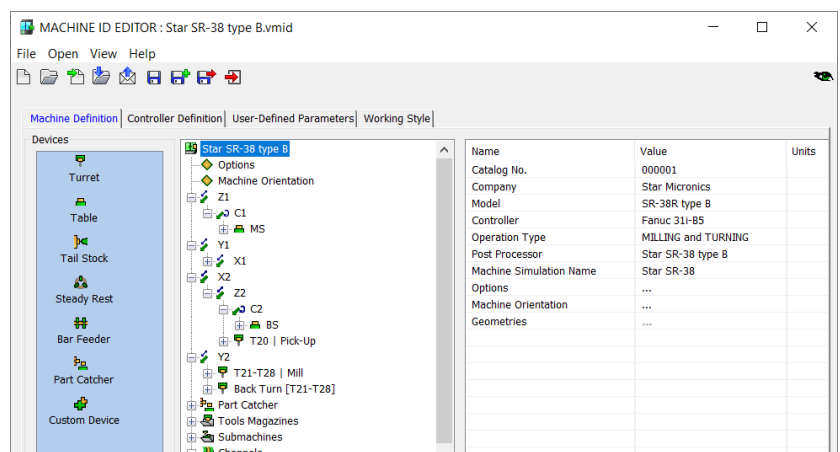
SolidCAM open-source post-processors are written in SolidCAM's GPPL (an internal language of SolidCAM for writing post-processors) and support defining output for any G-code format or structure for specific NC control unit. With no manual editing needed, generated G-code can be sent straight to the CNC machine.

### Dedicated Post-Processor Team

Post-processors are defined by a dedicated development team of post writers, all with a strong background in programming and practical machining. The Post-Processor Team takes care of customizing the G-Code output to the needs and requirements of your specific controller and CNC machine.



Worldwide Post-Processor Team



```
%_N_TR_PROFIL3_Kanal1_MPF
; $PATH=_N_WKS_DIR/_N_SOLIDCAM2018_
; RADNABE_NTX1_WPD
; N1 CHANDATA(1)
; -----
; : KANAL: 1
; :
; : SOLIDCAM : 99748 PP:Rev.3.6
; : ERSTELLT : 9-MAY-2019 - 19:56:41
; : MASCHINE : NTX 1000
; : WERKSTUECK: SOLIDCAM2018_RADNABE_NTX1000
; -----
; N2 WAITM(1,1,2)
; R10=0 R11=0 R12=298.565 ;G54 X Y Z
; R20=0 R21=0 R22=603.919 ;G55 X Y Z
; R29=0 ;G55
;
; $P_UIFR[1]=CTrans(X,R10,Y,R11,Z,R12,C4,0,C3,0)
; ;G54
; $P_UIFR[2]=CTrans(X,R20,Y,R21,Z,R22-
; R29,C4,0,C3,0) ;G55
;
; N3 WORKPIECE(,"CYLINDER",192,2.5,-150,-230,110)
; ;GOTOF ABDA
;
; GROUP_BEGIN(0,"1: Programmkopf",0,0)
; N4 WAITM(2,1,2)
; N5 TRANS
; N6 ROT
; N7 DIAMOF
; N8 GETD(Z3)
; N9 GETD(B3)
; N10 G00 SUPA X330. D0
; N11 G00 SUPA Z400. Y0. B1=90.
; N12 WAITM(3,1,2)
; N13 NP_B3_VAR(0,870)
; GROUP_END(0,0)
; N14 WAITM(4,1,2)
; N1 WAITM(5,1,2)
; N1 WAITM(6,1,2)
```

DMG Output

```
00001 ( MAZAK_I400S )
( INTEGREX-i - 400 S )
(part : MAZAK_I400S )
(created : 9-MAY-2019 )

#800=-458.7 (Work-Offset G54 - Z1)
#801=0. (Work-Offset G54 - C1)
(-----)

G21
M901
G92 S2000 R1
G92 S2000 R2
G90 G0 G53 G0 X0. Y0.
G90 G0 G53 G0 Z0.
M108
G90 G53 G0 B0.
M107

G10 L2 P1 X-490. Z#800 C#801
G10 L2 P2 X-490. Z#802 U#803

M902
M312
M302

M1
N1
T001.01 M6
M901
M200
M108
G90 G53 G0 B90.
M107
```

Mazak ISO Output

```
00010(L32-1M12)
$1
(PROGRAMM-NR.: DCL32-L32-1M12)
(DATE: 9-MAY-2019)

G50 Z[#141-#142]
M52
M6
M9
M346
G0 X[#814+#815] Z-0.05
M51

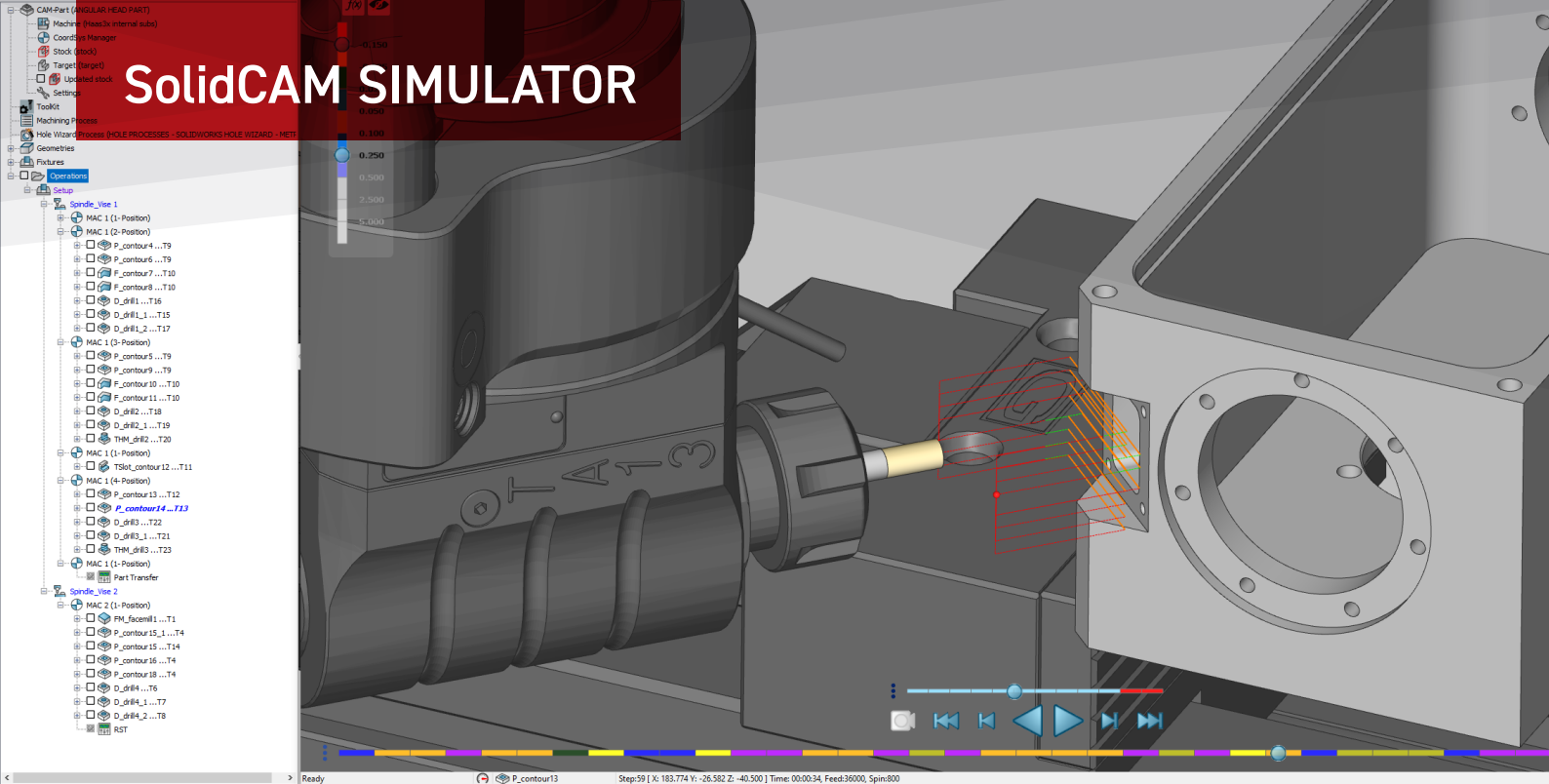
G600

I2L110

(JOB-NR.2)
(MS-FACE)
T0202 Z-0.0867 (OD TURNING)
G18
G50 S1500
G96 M3 S300
M97
G0 G99 X1.436 Z-0.0867
Z0
G1 X-0.0315 F0.003
Z-0.08
G0 X1.4359
G97 M96

(JOB-NR.3)
(MS-OD)
G50 S4000
```

Mitsubishi / Fanuc  
G-Code Output



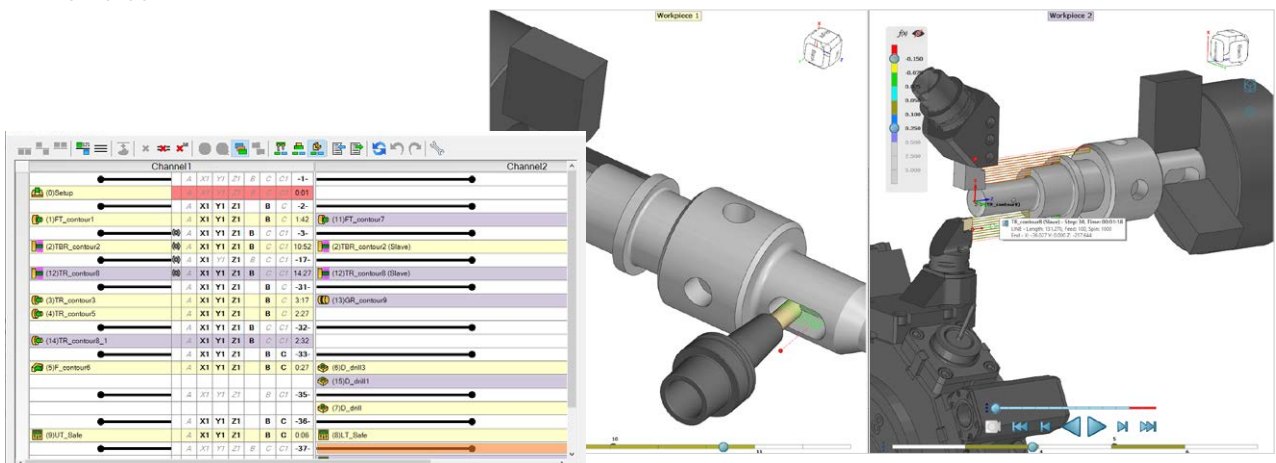
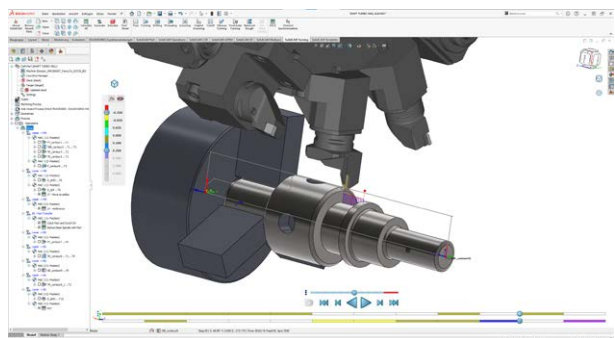
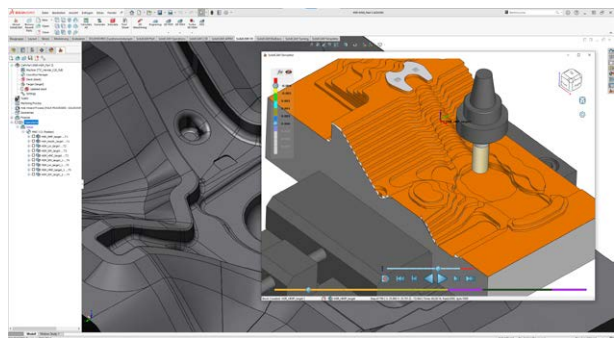
## SolidCAM Simulator

The SolidCAM Simulator merges all previous internal Simulation Modes into a single environment, and takes advantage of today's 64-bit Multi-core CPU architecture and Multi-Monitor environment.

From parallel loading of Simulation data, to parallel solid verification calculation, the SolidCAM Simulator will utilize today's CPUs to maximum extent and is also "fully self-contained", allowing you to keep it open and working during your entire CAM session.

### Channel Synchronization Mode

- + Simulates order of operations from Channel Sync
- + Wait marks are simulated with paused channels
- + Fast loading aids testing of different Channel Sync order
- + Keeps previous Channel Sync order, while editing new order





## SolidCAM ToolKit: New. Advanced. Complete.

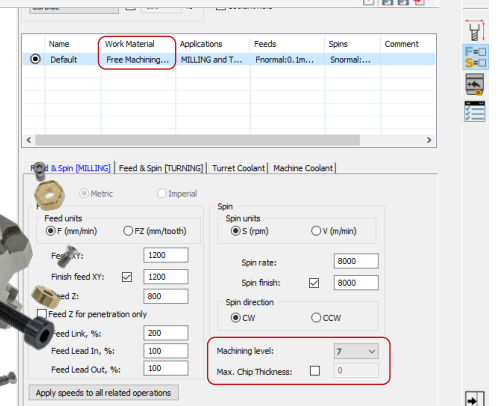
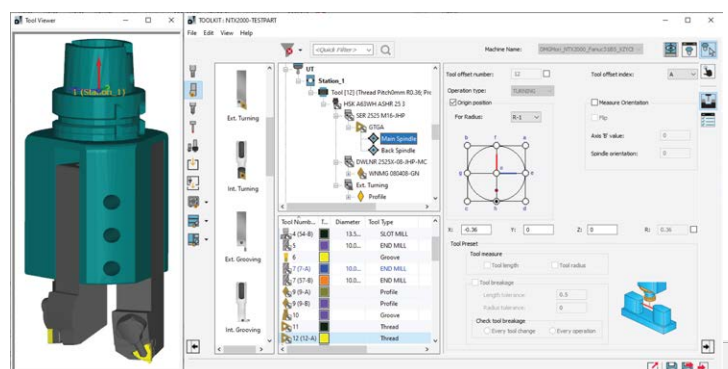
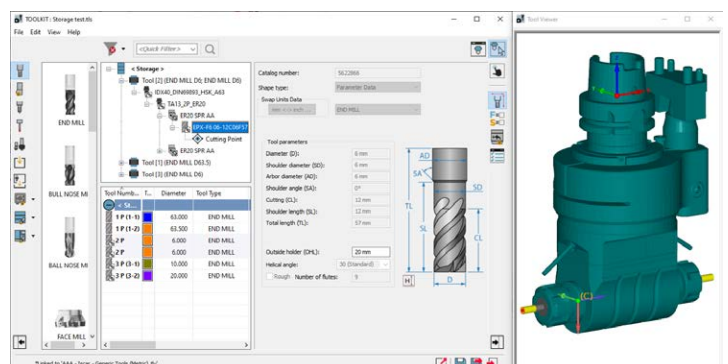
SolidCAM's New Tool Table feature, named ToolKit, is a powerful new system that facilitates better tool management and provides major enhancements in Tool definition functionality. SolidCAM ToolKit offers three Tool Library types, each having a graduated level of tool managing capabilities:

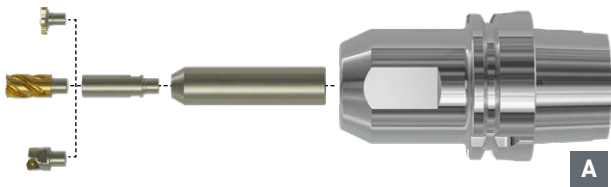
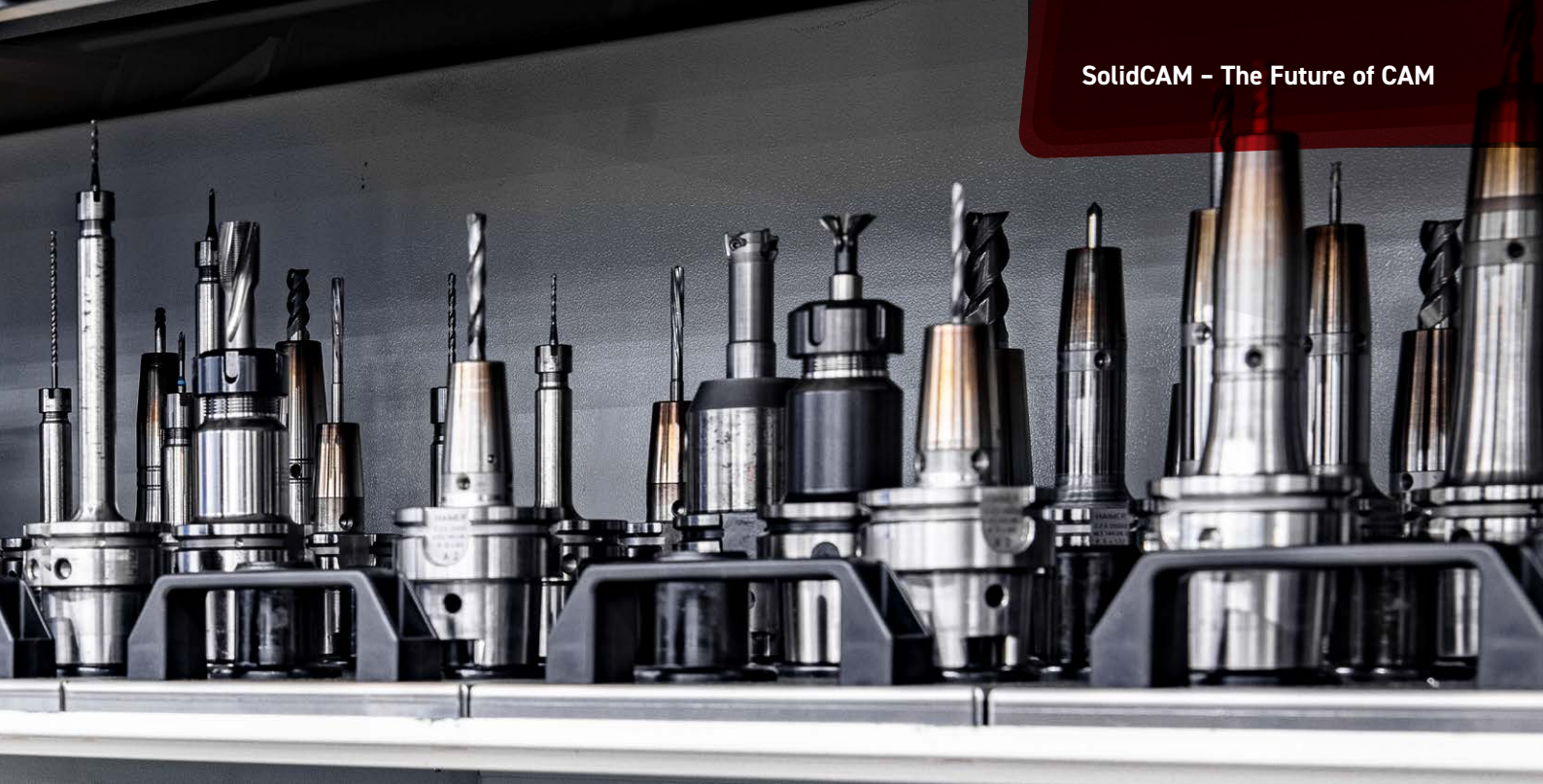
- Tool Components Library
- Tool Assemblies Library
- Machine Tool Setup Library



### ToolKit Highlights

- Import any 3D model Milling/Turning/Fixture component
- Angular holders supported
- Cutting conditions according to workpiece material: the cutter material, work material, and machining level selection affects the maximum cutting speed adjustments generated by the iMachining Technology Wizard
- Swapping between metric and inch parameter units was never easier.
- Multiple cutting points: pre-define any number of cutting points (tool offsets) on a single cutter component.



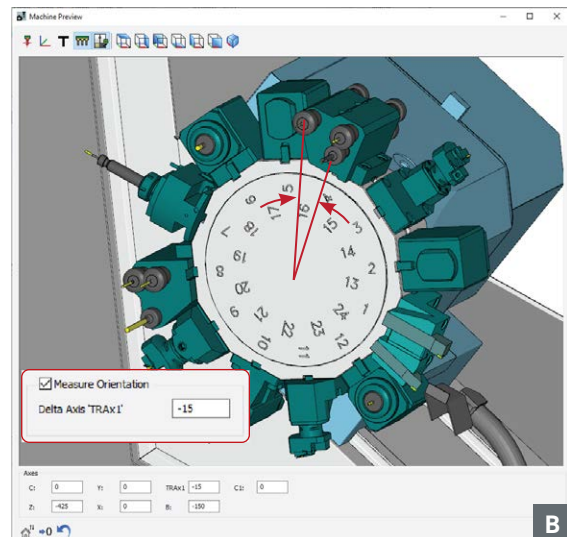


- ⊕ All Tool components are linked: any change may update the tool for all projects where it was used. [A]

## Measure Tool Orientation & Preview

Depending on the turret type, you can measure the tool on a specific spindle orientation, tilting angle, or indexed position and get the Tool offset output and simulation accordingly. [B]

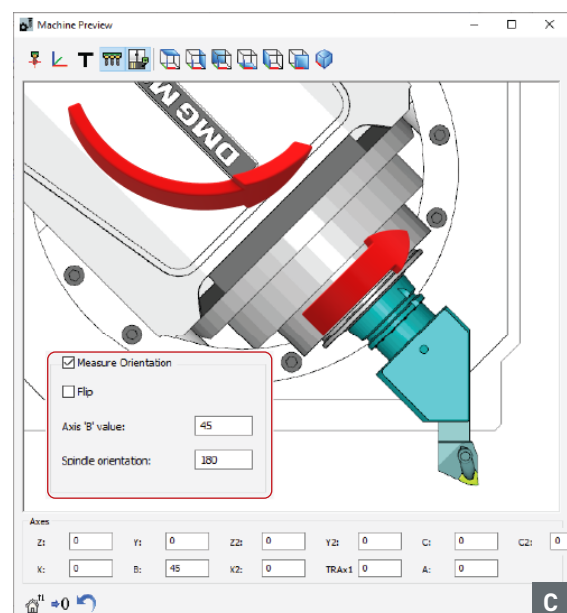
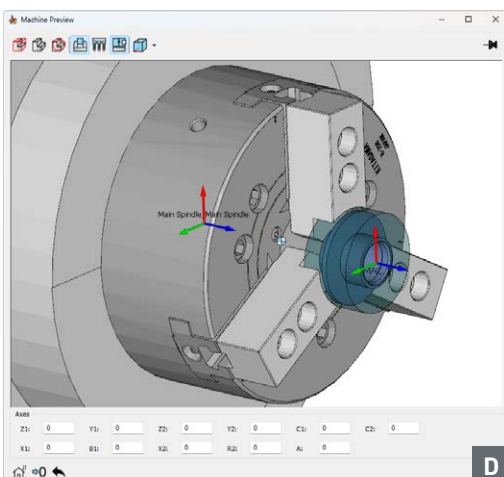
Machine Preview helps you to define and visually check all tools in the machine environment of your CNC machine. [C]



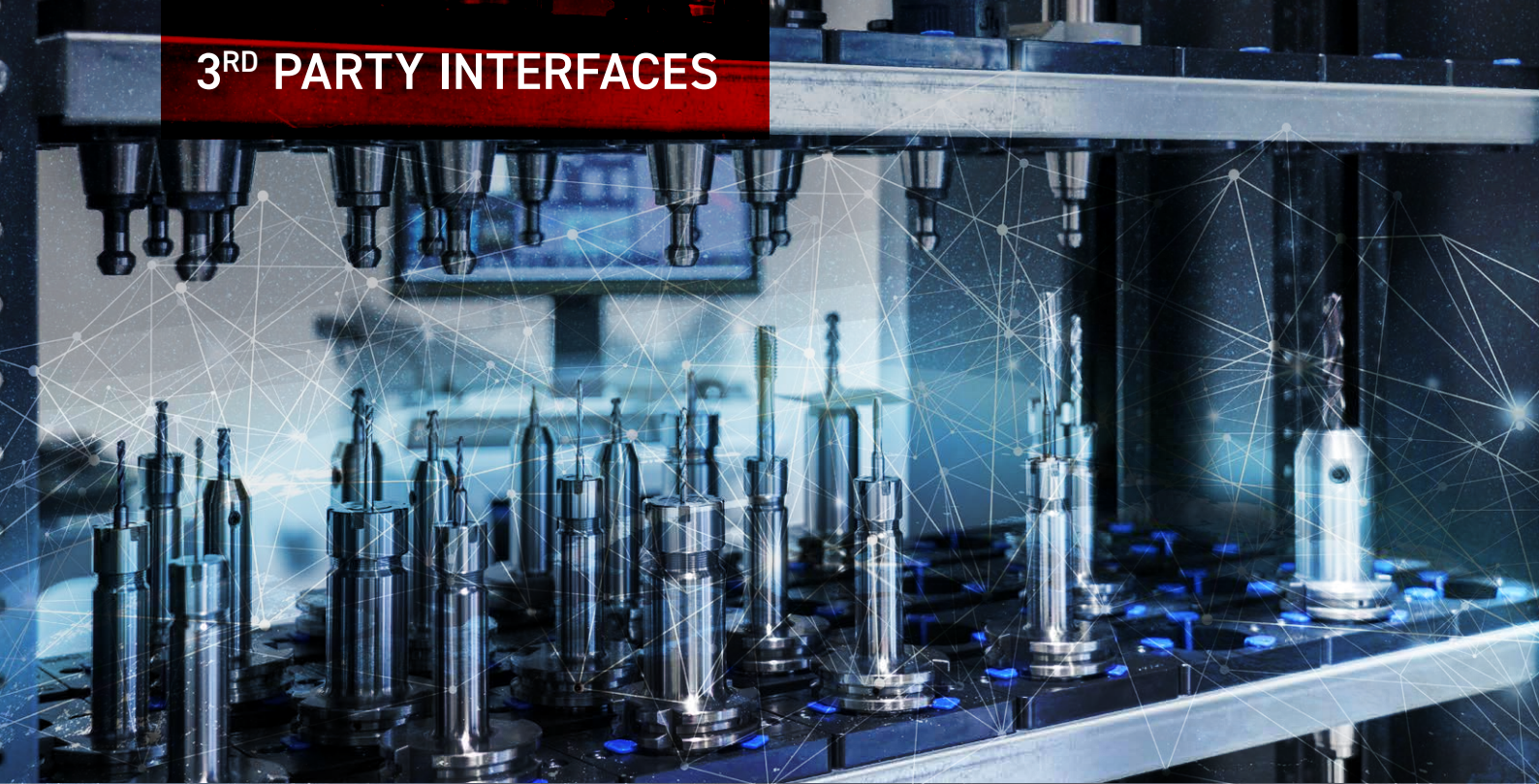
Measured tool orientation on indexed capable revolver

## ToolKit – Fixture components

The ToolKit is also a platform for Fixtures, allowing the definition of any Fixture components and assemblies in libraries and their use in applications [D].



Measured tool orientation on spindle with tilt axis



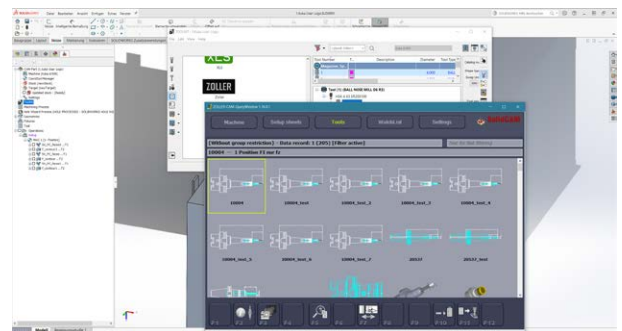
## Stay Connected with the Machining Digital World

Tool data management has been a challenge for mid-size and large enterprises for decades. The digitalization of our machining world is progressing rapidly and SolidCAM is moving fast to ensure our customers benefit the most from the advancing digitalization.

With the new Tool Catalogue, SolidCAM provides advanced interfaces to 3rd Party Tool Management Softwares.

Any interface to specific Tool Management Systems can be accessed directly from within SolidCAM's Tool Table, enabling the import and immediate use of complete tools for machining.

The Tool data may include parametric and 3D / 2D data for holder and tools, recommended feeds, spins and machining parameters for milling and turning tools.



**SolidCAM provides interfaces to the following external Tool Management Systems:**

**tdmsystems**

TDM from tdm systems  
[www.tdmsystems.com](http://www.tdmsystems.com)

**WINTOOL**

Wintool from Wintool AG  
[www.wintool.com](http://www.wintool.com)

**ZOLLER**

TMS Tool Management Solutions from  
E. ZOLLER GmbH & Co. KG  
[www.zoller.info](http://www.zoller.info)

**The following 3rd Party products have already developed their Interface to SolidCAM:**

**InovaTools**  
GERMAN TOOLS GROUP

Inovatools Eckerle & Ertel GmbH –  
Tool manufacturer: [www.inovatools.eu](http://www.inovatools.eu)

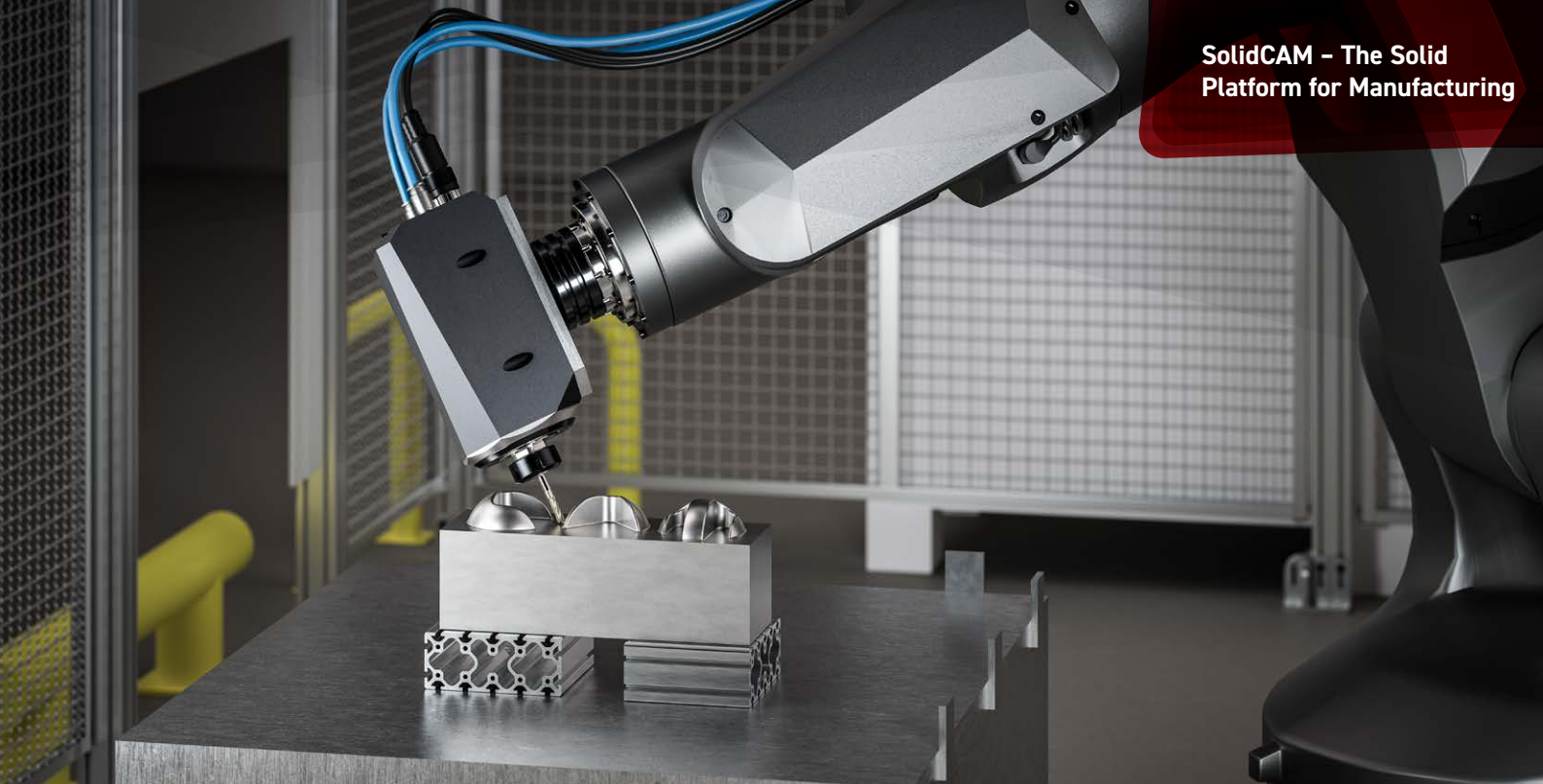
**EMUGE  
FRANKEN**

[www.emuge-franken-group.com](http://www.emuge-franken-group.com)

**KENNAMETAL**

[www.kennametal.com](http://www.kennametal.com)

**Coming soon!**



## Interfaces to 3rd Party G-Code Verification and Robotics

### NC-Code Verification

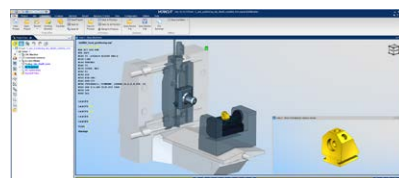
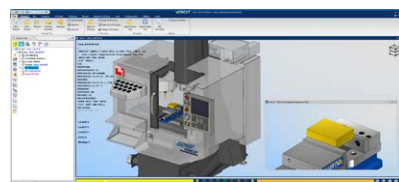
Third party G-Code verification provides an extra level of validation for SolidCAM's NC-code output. It can detect collisions and takes into account tolerances between all machine components such as axis slides, heads, rotary tables, spindles, tool changers, devices, workpieces, tools as well as other defined objects to validate the NC-code generated by SolidCAM.

It reduces the probability of errors and the need for single-step testing on the CNC-machine. SolidCAM has interfaces to various 3rd party NC-program verifiers.

### Robotics

With its interface to 3rd party robotic solutions, the calculated toolpath by SolidCAM is transferred together with the CAD data to the robotic application that converts it to kinematic robot moves and simulates the robotic operations.

The CAD 3D data includes the design, stock, and fixtures models. All data is exported in the format of the specific robotic solution. The toolpath generated in SolidCAM is provided in a neutral format – the robotic software uses this information to generate robot specific G-code to control the industrial robot.



Vericut from CGTech  
[www.cgtech.com](http://www.cgtech.com)



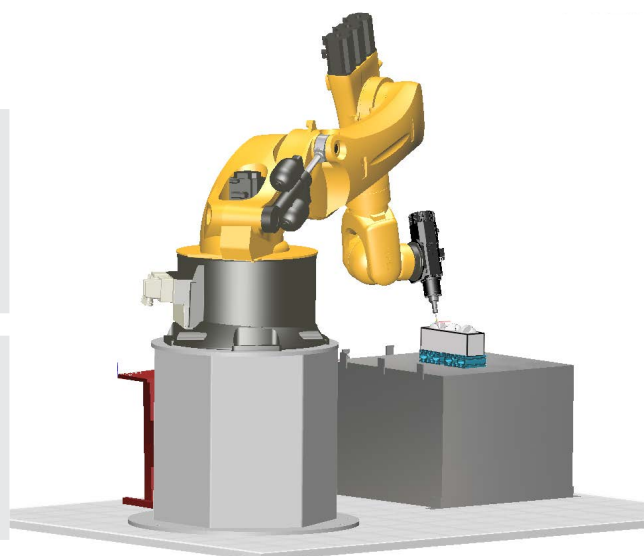
NCView from Cimple Technology Inc.  
[www.cimple.co.jp/e/ncview/](http://www.cimple.co.jp/e/ncview/)



CIMCO Edit Professional  
[www.cimco.com](http://www.cimco.com)



[www.ncsimul.com/ncsimul-machine](http://www.ncsimul.com/ncsimul-machine)





## The Perfect Place to Demonstrate the Power of SolidCAM Software, with Live CNC-Machining

### SolidCAM GmbH | Germany

Our major technology center is located at the SolidCAM GmbH office in Schramberg, Germany. In addition we maintain technology centers in Suhl and Rosenheim. All our Milling, Mill-Turn, Swiss-Type and Additive technologies are thoroughly checked and can be demonstrated live on our latest CNCs and Metal 3D-Printing systems:

- + Hermle C30 5-Axis CNC with Heidenhain controller
- + DMG NTX 1000 Mill-Turn Machine with Upper B-Axis, Lower Turret and Sub-Spindle, Siemens controller
- + Citizen L20 ATC sliding headstock Swiss CNC
- + Alzmetall GS 800/5-FDT, Siemens 840 controller, 5-X Milling and Mill-Turn Center
- + Quaser MF400 Milling 5X-Milling center, Heidenhain 530 Controller
- + Desktop Metal Shop System, Studio System, ETEC Envision One 3D printing systems

SolidCAM customers, resellers and participants of our trainings all benefit from this practical experience.





## SolidCAM UK Ltd. | United Kingdom

SolidCAM UK Ltd, based in South Yorkshire, is the UK and Ireland reseller of SolidCAM. SolidCAM is a Technical Member of the British Turned Parts Manufacturers Association (BTMA). As well as employing Sliding Head Swiss Technical experts, SolidCAM UK features a Star SR-38 Type B Swiss CNC as an integral asset in delivering unrivalled support to the Association's members. In addition, two 5-axis machining centers are being used to test and demonstrate the latest CAM technologies.



## SolidCAM Inc. | United States

The USA Technology Center is located at our SolidCAM Inc. offices in Newtown, Pennsylvania.

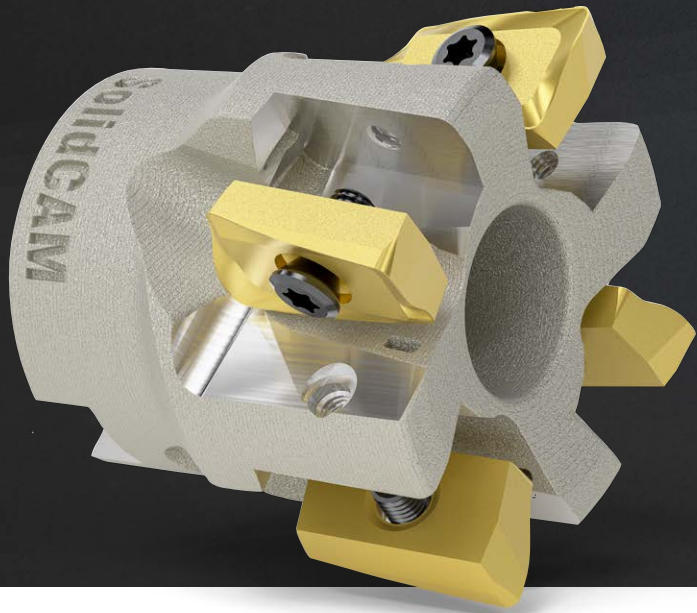
A Hermle C42 Sim5X Milling center and a Haas ST-20 lathe are used to develop and test new Milling and Turning toolpaths, to further advance SolidCAM's amazing Mill-Turn capabilities.



The USA Technology Center also includes Desktop Metal 3D printing systems, mainly the Shop System that provides mass production for metal parts, using the very fast binder jetting technology.

## Join Our LIVE Cutting Webinars from our Technology Centers

Attend our Live-Cutting webinar events to see live the power of iMachining 2D/3D, our advanced Mill-Turn and Swiss solutions. Visit [solidcam.com](http://solidcam.com) for more information.



## MANUFACTURING UNLIMITED

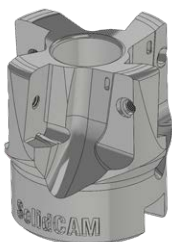
The complete Solution for cost effective combined Metal 3D printing & CNC machining, all from one Source – SolidCAM!

## Combining 3D Metal Printing with CNC Machining!



## SolidCAM Additive – Upgrade Your Manufacturing!

- + SolidCAM Additive adds 3D Metal Printing into your manufacturing process.
- + Our extensive machining knowledge will help guide the entire process from Design to 3Dprinting, and to CNC Machining.
- + 3Dprint near-net target stock, then CNC post-process to spec with SolidCAM
- + 3Dprint complex model geometry, at no additional cost, vs simpler geometry
- + 3Dprint impossible to machine geometry (Internal passages, infills, undercuts, etc.)



Design



3D Print



Sinter



CNC-Machine



## SolidCAM's Global Partnership with Desktop Metal



SolidCAM has established combined CNC and AM Technology Centers in the US, Germany and Israel. These centers feature Desktop Metal's Studio 2 Systems and Shop Systems solutions, in addition to CNC machines, to demonstrate how Desktop Metal's AM 2.0 solutions complement traditional subtractive CNC machining technologies and workflows.

Desktop Metal, Inc., based in Burlington, Massachusetts, is accelerating the transformation of manufacturing with an expansive portfolio of 3D printing solutions, from rapid

prototyping to mass production. Founded in 2015 by leaders in advanced manufacturing and metallurgy, the company is addressing the unmet challenges of speed, cost, and quality to make additive manufacturing an essential tool for engineers and manufacturers around the world.

Desktop Metal® Exists to Deliver on the Vision of 3D Printing: Mass Production

## The Promise of 3D Printing



Rapid prototyping



Part consolidation



Complex geometries



Design customization



Rapid tooling



On-demand manufacturing

## Shop System

Designed with the modern machine shop in mind, the Shop System™ is built to introduce high quality binder jetting seamlessly into your workflow. Produce parts with superior surface finish and resolution versus laser-based 3D printing systems at a fraction of the cost.

- + High resolution printhead for superior surface finish, bleed control and rich feature detail at high speed
- + Unparalleled productivity – up to 70 kg of metal parts/day
- + No tooling required
- + Simplified post-processing



### 3D printing on the manufacturing floor: volume production with no tooling!



## Envision One



Rapid production of strong, fully isotropic hard plastic end-use parts. The ETEC Envision One features patented CDLM (continuous digital light manufacturing) technology, which provides the ability for continuous printing. With little to no delay between layers, the Envision One delivers exceptional speed, print resolution, surface finish, and part properties.

The Envision One leverages long-chain polymer chemistry to produce strong, stable parts. The result is isotropic parts suitable for end-use applications and capable of standing up to the most demanding conditions.



Print technology  
Continuous Digital Light Manufacturing (CDLM)

Build envelope (L × W × H)  
180 × 101 × 330 mm (7.09 × 3.98 × 13 in)

XY resolution  
60 µm (with patented pixel tuning)

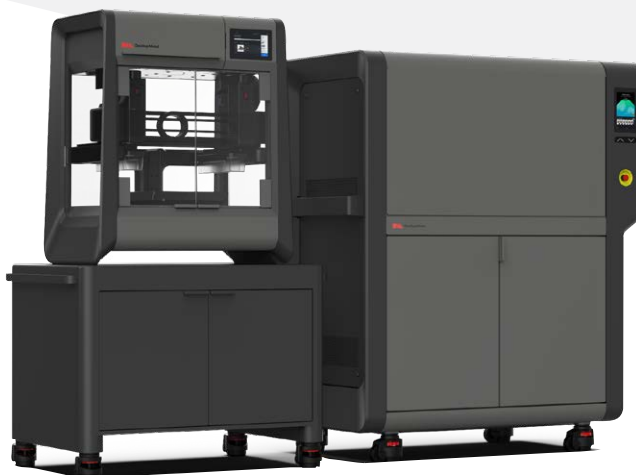
Z resolution  
50–150 µm (material dependent)

## Studio System 2

Desktop Metal's Studio System 2 was designed from the ground-up to fit into your team's workflow. With no solvents, no loose metal powders or lasers and very little operator intervention required, the system makes it easy to start printing metal parts - no third-party equipment or special facilities required.

Using Bound Metal Deposition™ (BMD) process, making complex, high-performance metal parts has never been easier. Bound metal rods allow higher loading of metal powder to binder as they do not require the flexibility of a spooled filament.

- ⊕ Easy, two-step processing
- ⊕ User-friendly software-controlled workflow
- ⊕ Patented smart Separable Supports™ technology for quick post-processing
- ⊕ Qualified for eight materials
- ⊕ Designed for office-friendly printing
- ⊕ A trusted system used worldwide with success



Functional prototyping



Jigs & Fixtures



Low volume production



Manufacturing tools

## InnoventX



### Compact, easy-to-use system for high-quality small parts

The entry-level InnoventX reliably produces functional parts in a variety of materials, including metal, ceramics, and composites by selectively binding thin, cross-sectional layers of fine powder with Triple ACT advanced compaction technology. With an open control system and various printhead sizes (80, 30, or 10 picoliters), you're in full control of the output in an easy-to-manage build volume. The InnoventX is used to process stainless steels, tool steels, nickel alloys, aluminum and titanium alloys, and metal composites as well as technical ceramics such as silicon carbide and aluminum-infiltrated boron carbide (B4C).

- ⊕ Compact and affordable: it only takes only 8 kg standard MIM powder to get started. The small build volume keeps ongoing operating costs low
- ⊕ Using widely available and relatively low cost feedstock from powder injection molding processes makes the system affordable to operate for education, research, prototyping, rapid product development, and short-run production of small components
- ⊕ Patented Triple ACT advanced compaction technology dispenses, spreads and compacts ultra-fine MIM powders
- ⊕ Wide range of metal print materials: 316L, 17-4PH, 304L, Inconel 718, M2 and H13 Tool Steels, Copper and more



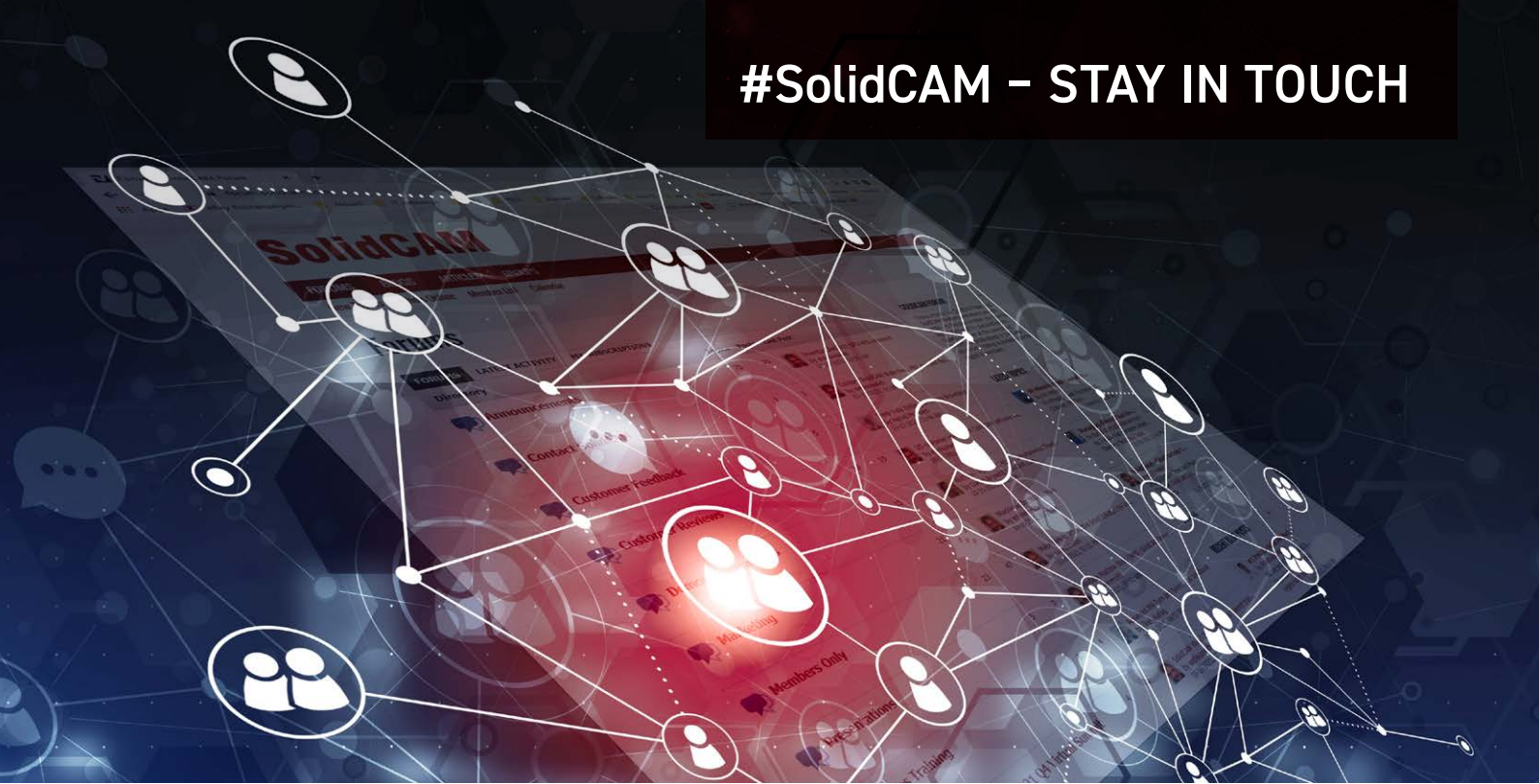
Print technology  
Triple ACT binder jetting

Build envelope (L × W × H)  
160 × 65 × 65 mm (6,3 × 2,5 × 2,5 in)

Proprietary  
54cc/hr at 65 µm layer thickness

Print resolution  
400 µm

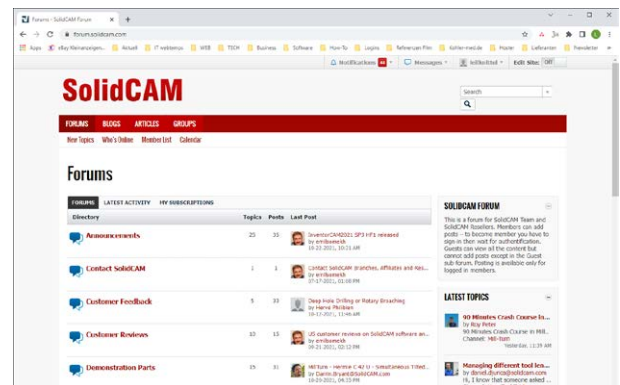
# #SolidCAM – STAY IN TOUCH



## Welcome to the SolidCAM Forum

We believe that up-to-date information for our customers and resellers is a priority, so we launched the SolidCAM forum, where everyone can get in depth information about SolidCAM products and future developments.

Check out [forum.solidcam.com](http://forum.solidcam.com) for more details or get the **SolidCAM Forum App** available for IOS and Android from the App-Store & Google Playstore.



## SolidCAM on Facebook

Join our Facebook page for daily posts in your News Feed about SolidCAM News, iMachining Success Stories, SolidCAM Professor Recordings, Upcoming Webinars, Events and Product releases.

[www.facebook.com/SolidCAM](http://www.facebook.com/SolidCAM)



## SolidCAM on YouTube

See recorded SolidCAM webinars and powerful cutting videos of SolidCAM & iMachining, on our SolidCAM YouTube channels:

[www.youtube.com/SolidCAMiMachining](http://www.youtube.com/SolidCAMiMachining)

[www.youtube.com/SolidCAMProfessor](http://www.youtube.com/SolidCAMProfessor)



## SolidCAM on Twitter

<https://twitter.com/solidcam>



## Follow us on Instagram

<https://www.instagram.com/imachining/>



## AMERICAS

### **SolidCAM Inc.**

E-Mail: [infousa@solidcam.com](mailto:infousa@solidcam.com)  
Phone: +1 866 975 1115

## ASIA-PACIFIC

### **SolidCAM ANZ**

E-Mail: [info@solidcam.com.au](mailto:info@solidcam.com.au)  
Phone: +61 7 3805 7518

### **SolidCAM India**

E-Mail: [info.india@solidcam.com](mailto:info.india@solidcam.com)  
Phone: +91 11 49425170

### **SolidCAM China**

E-Mail: [marketing.china@solidcam.com](mailto:marketing.china@solidcam.com)  
Phone: +86 10 8599 7302

### **SolidCAM Japan K.K.**

E-Mail: [info.japan@solidcam.com](mailto:info.japan@solidcam.com)  
Phone: +81 3 6300 6730

### **SolidCAM Korea**

E-Mail: [info\\_korea@solidcam.com](mailto:info_korea@solidcam.com)  
Phone: +82 506 5681225

## EUROPE

### **SolidCAM GmbH**

E-Mail: [info@solidcam.de](mailto:info@solidcam.de)  
Phone: +49 7422 2494-0

### **SolidCAM UK**

E-Mail: [info@solidcamuk.com](mailto:info@solidcamuk.com)  
Phone: +44 1226 241744

### **SolidCAM France**

E-Mail: [info@solidcam.fr](mailto:info@solidcam.fr)  
Phone: +33 4370623

### **SolidCAM Italia**

E-Mail: [info@solidcam.it](mailto:info@solidcam.it)  
Phone: +39 051 0952911

### **SolidCAM Spain**

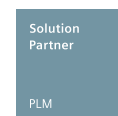
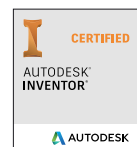
E-Mail: [info@solidcam.es](mailto:info@solidcam.es)  
Phone: +34 900 909 878

### **SolidCAM CZ**

E-Mail: [vojtech.havlicek@solidcam.cz](mailto:vojtech.havlicek@solidcam.cz)  
Phone: +420 734 156 443

### **SolidCAM Ltd.**

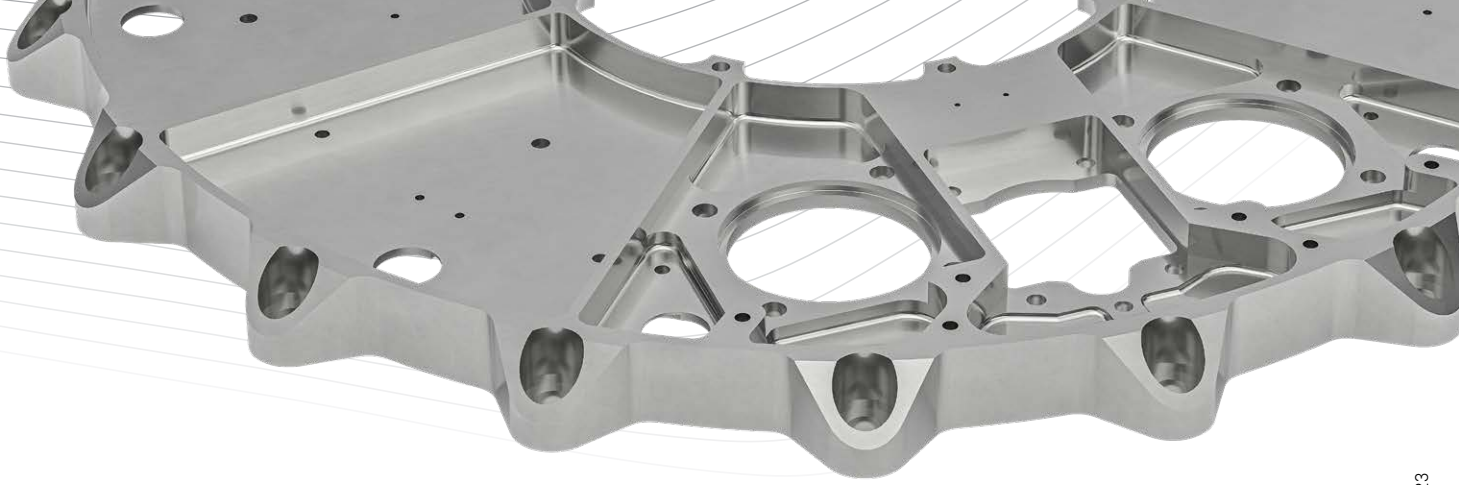
E-Mail: [info@solidcam.com](mailto:info@solidcam.com)  
Phone: +972 3 5333 150



### **SolidCAM in Your Country**

Contacting a SolidCAM office or reseller is easy. The complete list of our worldwide, dedicated distribution and support network is available on [solidcam.com](http://solidcam.com)





**SolidCAM**  
The Solid Platform for Manufacturing

The unique, revolutionary Milling technology  
**i**machining®  
patent by SolidCAM

**SolidCAM**®  
*MillTurn & Swiss*

” My personal goal was to be able to program all CNC machining operations consistently with a single CAM system. The biggest challenge here was to bring the Swiss-type lathes on board. Thanks to the extensive support provided by SolidCAM, that also worked out wonderfully!”

Steffen Rudischhauser | Managing Director  
Rudischhauser Surgical Instruments & Implants Manufacturing GmbH | rudischhauser.com



” What matters to us are the structure and quality of the generated CNC programs that go to the machine, as well as how quickly and easily they can be generated. The service at SolidCAM is unparalleled. The technicians have done a great job with the post-processors for our complex Bumotec machines. And if we ever have a problem, someone from the support team is immediately offering help. These days, that isn't a given; it's unique!”

Stjepan Matacun | Production Manager  
Stuckenbrock Medizintechnik GmbH

” After only two weeks with SolidCAM we had more success than with the previous CAM system after three years. We can now program the most complex workpieces much faster. Creating the tools is much easier and I can already program a part even if the final tool data is not yet completely available. This was not possible in the past.”

Franz Fuchs | CNC & CAM Programming  
Hefter Maschinenbau GmbH & Co. KG | hefter.de

