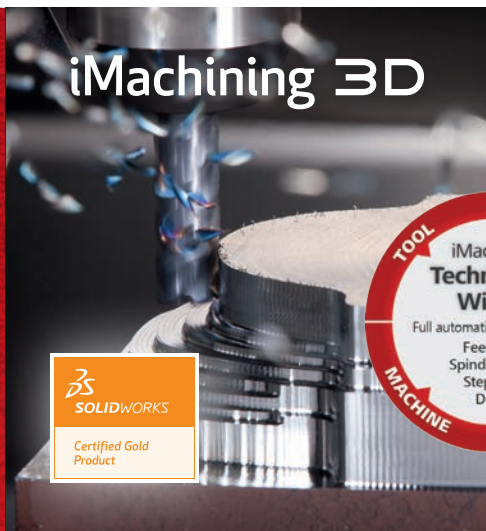


SolidCAM + iMachining Info-Booklet

The new, revolutionary Milling technology
iMachining[®]
by SolidCAM



The Revolution in
CNC Manufacturing

UP TO
70%
TIME SAVINGS

Foreword

Dear Customer,

SolidCAM provides you with a seamless integration with SolidWorks, supports the entire production chain and is well known throughout the industry for exceptional ease of use combined with powerful functionality.

As a special highlight we present the latest in-house development of SolidCAM, the patent-pending and revolutionary milling strategy – iMachining. With this breakthrough technology, you can save up to 70% of machining time and increased tool life dramatically, providing you with enormous profit gain.

With this booklet, you'll gain an overview of the functionality of SolidCAM. Afterward, I recommend that you contact one of our offices in your area. Refer to www.solidcam.com for these contact details.

SolidCAM with iMachining can help you gain a major competitive edge, while you take advantage of over 28 years of SolidCAM experience in the development of manufacturing strategies. We look forward to hearing from you!



A handwritten signature in black ink, appearing to read 'E. Somekh'.

Dr. Emil Somekh
Managing Director | SolidCAM Ltd.



The new, revolutionary Milling technology

imachining®
by SolidCAM

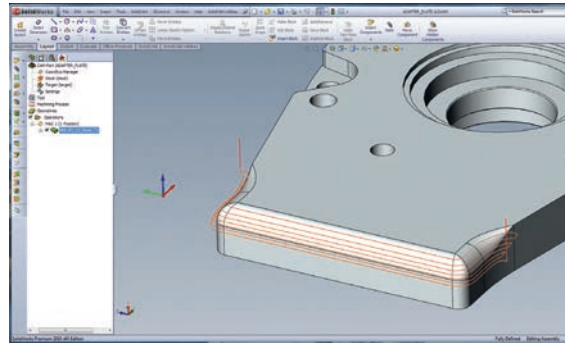
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SolidCAM – The Complete, Integrated CNC Solution for SolidWorks

For over 10 years, The CAD / CAM professionals of SolidCAM have been providing the best integrated CAM system for SolidWorks.



A seamless window integration and full associativity to the SolidWorks CAD model, as well as support for all major CNC technologies, distinguishes SolidCAM from other CAM solutions.



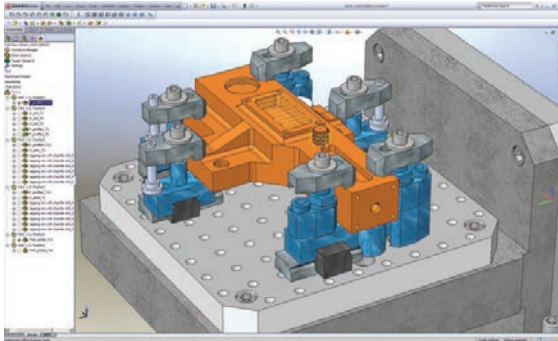
Support and Technical Services

- Individual postprocessor customisation
- Installation support and system integration
- On-site training at our training centers
- Hotline and user support from experienced technicians with many years of Manufacturing practice
- “SolidCAM Professor” video tutorials help you with all SolidCAM functions and applications

SolidCAM Xpress

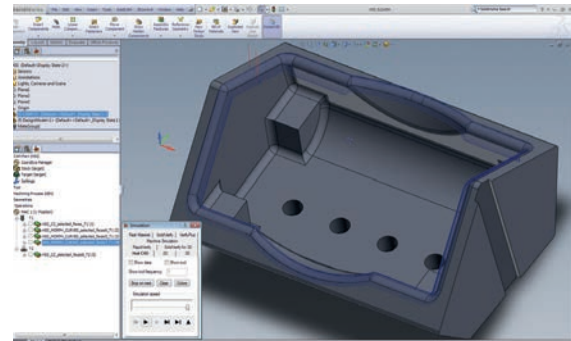
- SolidCAM Xpress provides an entry level SolidCAM, fully integrated in SolidWorks at a surprisingly affordable price.
- Includes the 2.5D Milling and 3 axis surface machining functions you need most.
- With an unlimited upgrade path, you can use your investment of time and money towards additional, more advanced modules in milling, turning and mill-turn.

The SolidCAM Modules



2.5D Milling

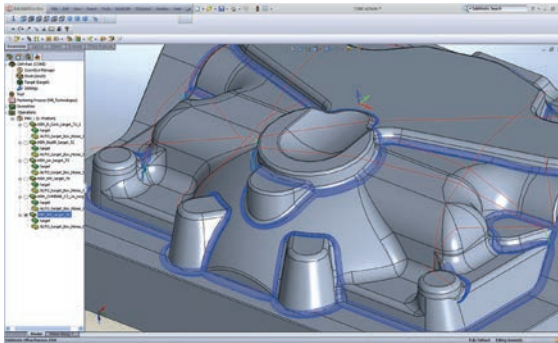
- The most straightforward, SolidWorks-style interface, combined with the latest technology for the fastest, most powerful and easiest to create 2.5D toolpaths.
- Designed for the advanced user and the novice. Full “Pilot Controls” provide unmatched power, “Auto-Pilot” feature recognition automates programming and gets you off the ground as quickly as possible.



High-Speed Surface Machining (HSS)

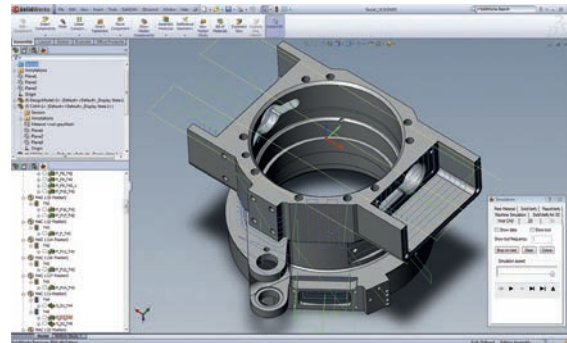
- The distinctive CAM module that takes your 2.5D machining way beyond profiles, pockets and faces.
- Enhance your 3D machining capability by driving along specific surfaces on prismatic and 3D parts.
- Total tool control to attack specific areas without the need for constraint boundaries or the timeconsuming design of construction geometries.

The SolidCAM Modules



3D High-Speed Machining (HSM)

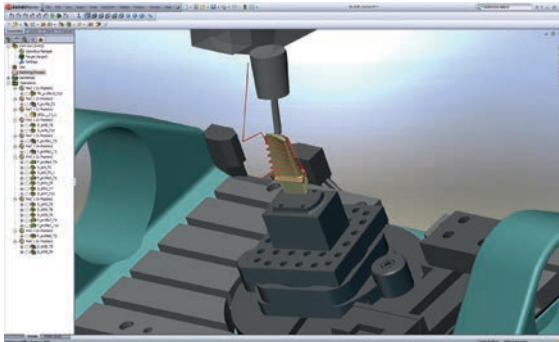
- Experience 3D machining taken to an entirely new level of smoothness, efficiency and smart machining.
- Speeds up slower machine tools and unleashes the speed of faster machines by eliminating inefficient, unnecessary moves and air cutting.
- The fastest and easiest way to generate the most advanced and best quality 3D toolpaths.



Indexed Multi-Sided Machining

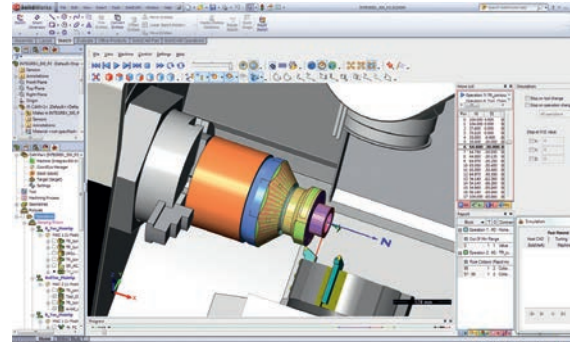
- Experience single machine home position with One-click orientations for indexed setups.
- Speed up multi-sided machining by eliminating multiple coordinate system constructions.
- Eliminate manual G-code editing or setting up multiple work offsets at the machine.

The SolidCAM Modules



Simultaneous 5-Axis Machining

- Trust in the most tested and proven 5-axis toolpaths in the industry with the most advanced control over all aspects of toolpath and collision checking.
- Pre-programmed, 5-axis strategies get you up and cutting instantly.
- Instant feedback with real time, life-like simulations complete with Cutter & Tool holder gouge checking.



Turning & Mill-Turn

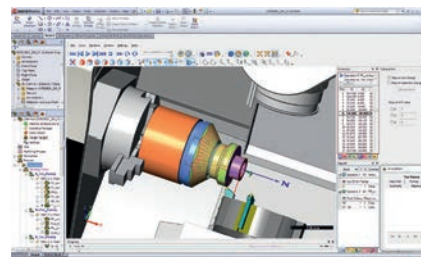
- Supports all the latest multi-function CNC machines for combined milling and turning.
- Complete multi-turret and multi-spindle programming with full simulation, seamlessly integrated into one extremely powerful package.
- Intelligent management of rest material between Milling and Turning operations limits air cuts for the most efficient toolpaths and reduced cycle times.



iMachining is a Module of SolidCAM - The Complete Integrated CAM Solution for SolidWorks

- Benefit from the seamlessly integrated user interface and the full tool path associativity to the SolidWorks model.
- SolidCAM's familiar look & feel as well as its ease of use, shortens required training and familiarization periods, and provides quick access to all functionality.
- Take advantage of the strengths and realize the full potential of SolidCAM, with unlimited expansion options for additional modules for Milling, Turning, Mill-Turn and Wire EDM.
- Full associativity: avoid delays due to design changes by extending the parametric modeling through to the production phase. Tool paths are automatically updated to match design changes if desired.
- Gain the competitive advantage by breaking through the barrier between design and manufacturing - the fastest way from design to prototype to production.

- iMachining
- 2.5D Milling
- High-Speed Surface Machining
- 3D High-Speed Machining
- Multi-Sided Indexial Milling
- Simultaneous 5-Axis Milling
- Turning & Advanced Mill-Turn
- Wire EDM



iMachining: "Simply Amazing"

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

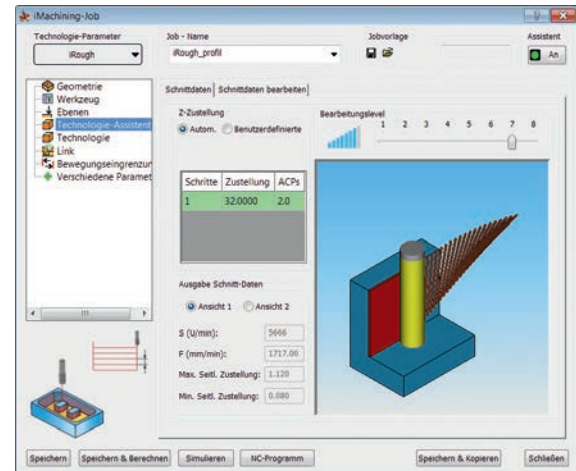
SolidCAM's iMachining differs from other High-Speed Machining CAM systems both by the method of programming which includes the patent-pending Technology Wizard as well as by the mathematical algorithms for calculating the toolpaths.

The patent-pending iMachining from SolidCAM features ...

- ✓ Increased Productivity due to shorter cycles - up to 70% savings
- ✓ Increased tool life - up to 2-3 times longer
- ✓ Unmatched hard material machining
- ✓ Outstanding small tool performance
- ✓ 4-axis and Mill-Turn iMachining
- ✓ High programming productivity
- ✓ Shortest learning curve in the Industry

The iMachining Technology Wizard

The unique iMachining Technology Wizard takes tool, geometry and material data as well as machine information into account and automatically calculates the optimum machining parameters for highly effective, yet safe milling.





"I just had to try iMachining, and when I saw how well it worked, I decided to work only with iMachining and it has been great"

Rolf Dettinger
ProKASRO Mechatronik GmbH

A problem for every Machinist: General recommendations for feeds and speeds

High-Speed Machining has disappointed many people in the industry by failing to live up to the expectations raised by early publications and marketing hype.

This led to the development of iMachining...

In 2006, SolidCAM software developers had the goal to calculate the most efficient high-speed machining pocketing toolpath. They agreed on an adaptive spiral (morphing spiral), because it generates the most efficient, tangent and continuous cutting path. In addition, they decided that the only way to make high-speed machining software practical was to have the cutting conditions automatically determined by the software.

Once a basic algorithm was calculated, initial cutting of SS304, aluminum and titanium were highly successful. It soon became clear, however, that the proper feeds and speeds had to match iMachining to different tools, material properties and depth of cuts. The information from text books and manufacturers' catalogs was insufficient because they only covered the recommended cutting speed for the material. The user still needed

to decide on depth, chip thickness and feeds. Additionally, to get the fastest possible machining, the user would need to specify many different feeds for different parts of the tool path.



In iMachining, chip thickness was found to be the ideal control variable. After many tests, a technology wizard software module was developed which generated not one set of speeds and feeds for a given toolpath, but eight sets. This allows the wizard to match the cutting conditions to the state of the machine and the rigidity of work and tool holding.

Very early on it was clear that iMachining is far more than just another pocketing toolpath, it's a complete solution to milling a 2.5D part. Gradually, iMachining technology has been expanded to include associative iRest roughing and iFinishing, 3D iMachining, so that today a complete milling task can be achieved.



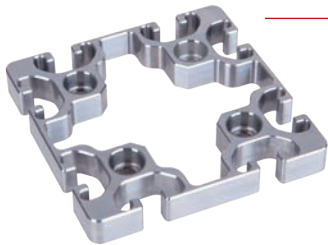
"I'm really excited about iMachining. At first, my staff and I were skeptical. However, since my employees started using it, people that came into the office said, 'Wow! It's great, good to see that you bought it!' There is no better confirmation of iMachining."

Enrico Galander
Galander Medical GmbH

Patent Pending: iMachining "Controlled Step Over" Technology

iMachining generates an adaptive tool path with continuous spiral movements, customized feeds and speeds and a large Z-axis depth. This machining strategy maintains continuous cutting contact with the stock material, with a small controlled force on the tool, enabling surprisingly deep and fast cuts, totally avoiding "Air Cutting" and minimizing retract repositioning moves. The continuous smooth toolpath provides an extremely high material removal rate even with very hard materials, and the process itself allows for very safe use of small tools while minimizing tool and machine wear.

- The cutting angle always slowly varies between a minimum and a maximum value and the feed is dynamically adjusted to ensure constant mechanical and thermal load on the tool
- Automatically determines the most suitable cutting conditions, taking account of the material, tool, geometry and machine properties.
- Depending on the geometric layout of the cutting area, automatically creates morphed spiral or D-shaped tool paths
- Consistently higher metal removal rates
- Optimal rest material recognition eliminates air cuts



CONNECTOR PLATE

Stock: 150 x 100 mm, Height: 30 mm

Material: 16MnCr5 (1.7131) Steel

Min. Radius: 1.5 mm

Chamfer on all edges

Regular cutting time: **25 min**

iMachining time: 9:30 min

Time Savings: 62%

COOLING TURBINE

Stock: Ø 90 mm x 22 mm

Material: AlMgSi0.5

Min. Radius: 2 mm

Tool: VHM, Ø4 mm

Regular cutting time: **22 min**

iMachining time: 7:30 min

Time Savings: 66%





"We have all been delighted with iMachining. In the past it was unthinkable that you could cut so much material in such a short time."

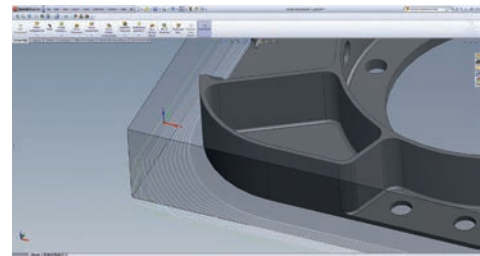
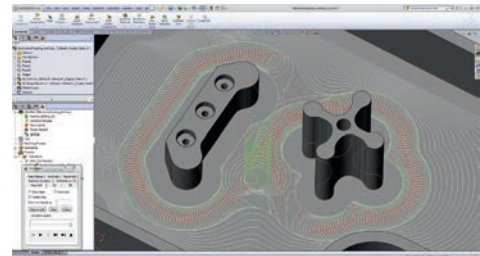
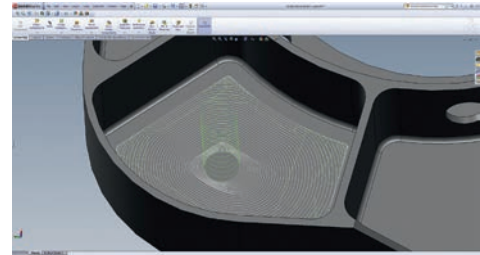
Thomas Gödeke
Dreiling Maschinenbau GmbH

Why users say "WOW!" - Unique iMachining toolpath features:

Morphing Spirals – Unlike a simple spiral toolpath, iMachining employs an advanced morphing spiral that gradually conforms to the geometry of the feature being machined, maximizing "tool in the cut".

Moating – Islands are separated and large areas are subdivided, using iMachining's patent pending moating technology, to maximize morphing spiral cutting and to minimize the D-shaped tool path cutting.

No wasted motion – All iMachining toolpaths cut stock to be removed, and never cut "air". From the initial approach, right to the last cut, a dynamically updated stock representation makes sure every toolpath actually cuts material. "Smart repositioning" is applied, at cut depth, to move the tool from one cut to another, only retracting when absolutely necessary.





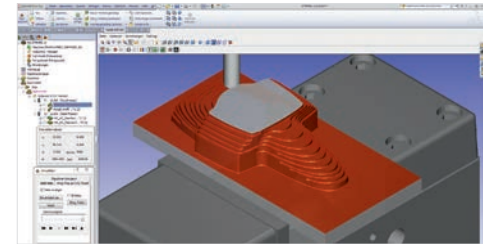
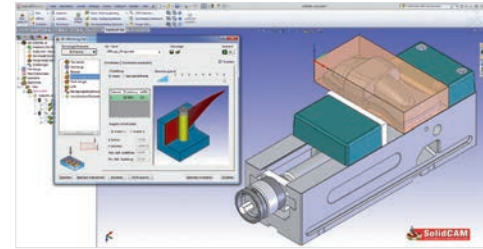
“Thanks to iMachining, we get many more projects completed on each machine, which of course saves us money. With iMachining, we have won customers because they can spend less money for excellent quality, which naturally benefits our customers as well as our company.”

Steffen Grafe
Trentzsch & Hillig GbR

iMachining 3D

The new 3D iMachining offers all the advantages of iMachining 2.5D. The main difference is the separation of the 3D components into levels. To achieve as much material removal rate as possible, 3D iMachining layers toolpaths for roughing in big steps going down and in smaller steps for rest-roughing going up. An additional advantage is that when going up in smaller steps, it only cuts where there is excess material instead of going all around the part.

3D iMachining provides tool and mold makers previously unknown material removal rates combined with extended tool life and excellent handling qualities, even with very hard materials.



3D FORM PLATE

Stock: 200 x 100 mm, Height: 35 mm

Material: Toolox 44, 1.500 N/mm² | 45 HRC

Tool Diameter: 12 mm

Processing Time: 7:10 min



"iMachining saves us time, money and resources, while allowing us to manufacture parts that we could never have completed previously. It's absolutely sensational."

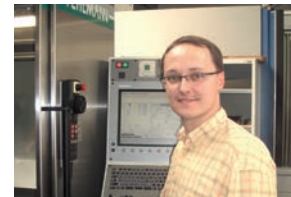
Jörg Meißner
Formenbau Meißner

iMachining PRODUCTIVE | Meissner Molds

Meissner Molds manufactures, among other things, quality titanium parts for the Theegarten-Pactec company. Jörg Meissner, son of the business' owner and an avid iMachining tester, saves thanks to iMachining up to 40 percent of production time, with increased tool life as well as reduced machine wear and tear.

Especially when machining titanium parts, efficient and productive machining, without having a lot of rejects, is absolutely crucial. iMachining helps Meissner Molds comply with very tight manufacturing tolerances, even with hard materials and very long parts.

	without iMachining	with iMachining
Technical Details		
Material	Titanium	Titanium
Machine and Controller	Fehlmann Picomax / iTNC 530	Fehlmann Picomax / iTNC 530
Tool Type / Manufacturer	Ø 12 VHM, Hoffmann Group	Ø 12 VHM, Hoffmann Group
Cutting Speed		147.8
Maximum Feed		2519
Depth of Cut		26 mm
Maximum Stepper		0.6 mm
Cooling	Coolant	Coolant
ROI		
Processing Time	25 min	17 min
Results	30-40% Savings	



iMachining PRODUCTIVE | Dengler CNC-Technik

Dengler CNC equipment manufactures large machined parts from stainless steel. Using iMachining, the processing time is reduced by more than 60 percent. For example the machining time for a specific part is reduced from 140 minutes to 52 minutes! According to Mr. Dengler, an additional important advantage is the great reduction in programming time. In the past

the programming took much longer time because of the “trial and error” process. With iMachining there can always achieve first part success. In this way there are no delays in delivering parts. Mr. Dengler also mentioned the extension of tool life and the reduction of machine maintenance cost.

	without iMachining	with iMachining
Technical Details		
Material	VA 1,4301	VA 1,4301
Machine and Controller	Doosan DNM500 / iTNC 530i	Doosan DNM500 / iTNC 530i
Tool Type / Manufacturer	Holex HSS NR Rough Ø20mm	SARA HPC Ø 16 mm und Ø 12 mm
Cutting Speed m/min	23VC	Ø 16: 238VC / Ø 12: 183VC
Maximum Feed mm/min	110F	Ø 16: 3564F / Ø 12: 2662F
Depth of Cut	15 mm	Ø 16: 27 mm / Ø 12: 15 mm
Maximum Stepper	60% of Cutter diameter	Ø 16: 1,56 mm / Ø 12: 1,76 mm
ROI		
Processing Time	Complete 1 Side ca. 140 min	Complete 1 Side 52 min
Tool Life	Approx. 65 minutes for 1 part	60 minutes, Ø 12: 6 parts
Results	Time Savings: 63%, 6-times tool life	



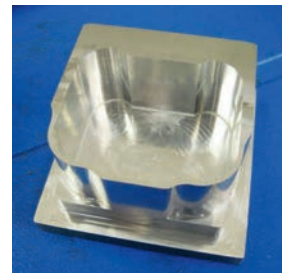
iMachining PRODUCTIVE | Adaptronic Prüftechnik GmbH

The German company Adaptronic Prüftechnik produces high quality checking Systems for cables. With iMachining they were able to reduce the processing time of their milled parts from 18:58 minutes to 4:55 min. – that's a time savings of 74 percent!

More iMachining application reports on www.solidcam.com



	without iMachining	with iMachining
Technical Details		
Material	3.1645	3.1645
Machine and Controller	DMU50 S840D	DMU50 S840D
Tool Type / Manufacturer: Face Mill	Face Mill 32+SF 16	SF16
Cutting Speed	VC=225	VC=366
Maximum Feed	500-1500	3400-3800
Depth of Cut	4 mm	31-34 mm
Maximum Stepover	10.4 mm	3.2 mm
Cooling	Water	Water
ROI		
Processing Time	18 min 58 sec	4 min 55 sec
Results	74% Savings	





"Since we run our machine with iMachining, it gives out much less noise and vibration, thereby extending the life of our tools and machines. We are really impressed with iMachining."

Udo Trimborn
Trimborn Maschinenbau GmbH

The Advantages of iMachining

Fastest Cycle Times

- Patent Pending “Controlled Step Over” for constant tool load
- Uses more Spiral cuts to increase the Material Removal Rate
- Machines deeper at the fastest fully optimized Feeds and Speeds
- Eliminates air cutting and unnecessary tool retracts

Longer Tool Life

- “Controlled Step Over” and continually adjusted feed rates reduces tool and machine wear!
- No “overloading” or “shocks”, ends premature wear or chipped flutes
- Increased depth of cut spreads the cutting to more of the flute, increasing tool life
- Managed “Chip Thickness” extends tool life by eliminating “tool rubbing” situations

Faster Programming

- “Chain and Calculate” – produces toolpaths with perfect Feeds and Speeds
- Associative Rest Machining and Finishing decreases programming time
- Automatic Lead-Ins and Lead-Outs

iRest Roughing & iFinish

- Combined with iRest and iFinish, iMachining provides a complete machining solution
- iRest reduces cycle time dramatically by updated stock driven rest-roughing with smaller and smaller tools
- iFinish pre-machines all necessary areas, ensuring the final finish pass can be taken at full cut depth, without chatter in corners

iMachining for 4-Axis & Mill-Turn

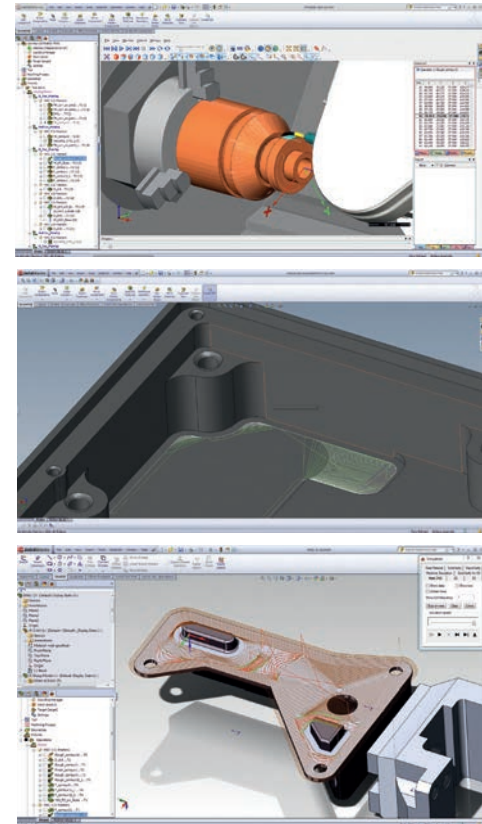
- Program 4-axis cuts with iMachining technology!
- Decreases cycle time, extends tool life and provides superior finishes for 4-axis and Mill-Turn
- iMachining advantages overcome standard problems of rigidity and imperfect tooling in 4-axis simultaneous machining

Easily cuts the Hardest Materials with the Smallest Tools

- With automatic control of the entire machining process, you can cut the hardest material at incredible speed!
- Technology Wizard sets correct Feed and Speed for your tool and material
- No more shallow and slow cuts to compensate for small cutter fragility

Seamless Integration in SolidWorks

- iMachining in SolidCAM is seamlessly integrated into the SolidWorks CAD system.
- The CAM machining geometry is fully associative to the CAD model.





SolidCAM in Numbers

As of June 2012

1984	Founded by Dr. Emil Somekh	120	Resellers in 50 countries
28	Years of experience in the development of manufacturing software	17,000	Licenses installed worldwide
140	Employees worldwide	10	Years of Gold-Integration in SolidWorks
50	Employees in Germany	31	Percent increase in sales in 2011
20	Employees in USA	5	Times fastest-growing CAM vendor worldwide in the last 7 years

The Technology Center in Schramberg, Germany has 900 square meters of combined expertise

Experience the latest CAD / CAM manufacturing software and technology first hand in our technology center. Here, we can use our leading technologies, such as the revolutionary iMachining and advanced Mill-Turn, in practical settings.

Due to the continuous availability of the latest CNC machines, our latest technologies are always deeply checked. Customers, as well as participants of our CAD / CAM training and education, benefit from this practical experience. Faster from the CAD model to the finished workpiece - this is the motto we live by in the Technology Center.

Be sure to check us out, whether online, during one of our webinars, or by personally attending one of our Live-Cutting Events. You won't be disappointed.

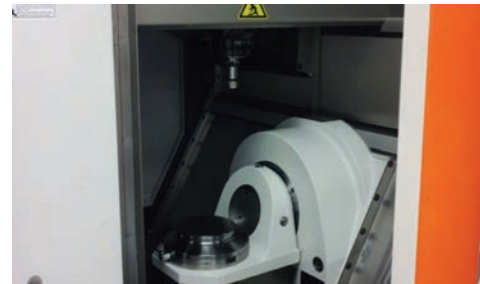
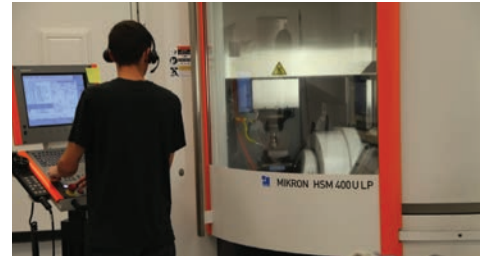


This is our new 465 square meter Technology Center in Newtown, PA USA

Our new Technology Center, located in Newtown Pennsylvania, enables us to use SolidCAM software and modules, such as the revolutionary iMachining, in a shop floor style environment. Additionally, plenty of seating for the classroom setting - right next to the machine - enables us to show customers all of the benefits of iMachining, 5-Axis milling, HSS, HSM, and more.

Our latest technologies are tested and proven out in-house at our world-wide technology centers. Customers benefit from practical CNC training along with software training, all at the same time.

Join us for one of our online webinars, or personally attend a Live-Cutting event to experience everything SolidCAM has to offer. Trust us, you'll be amazed.



Seeing is believing!

Immerse yourself in the world of iMachining, and learn more about the Revolutionary new manufacturing technology.



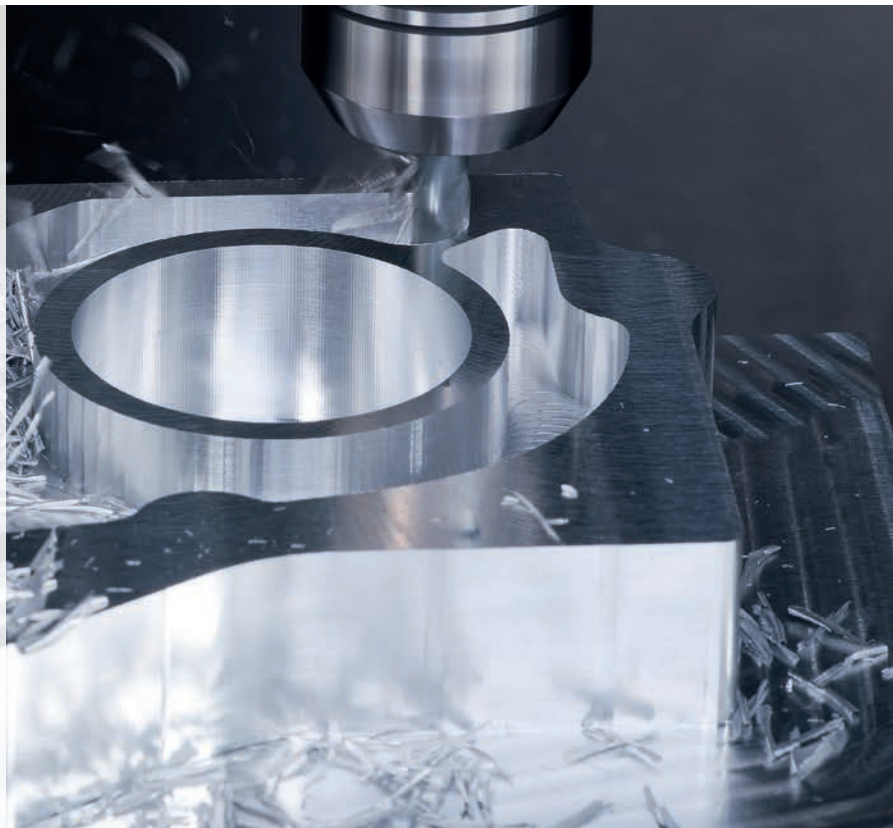
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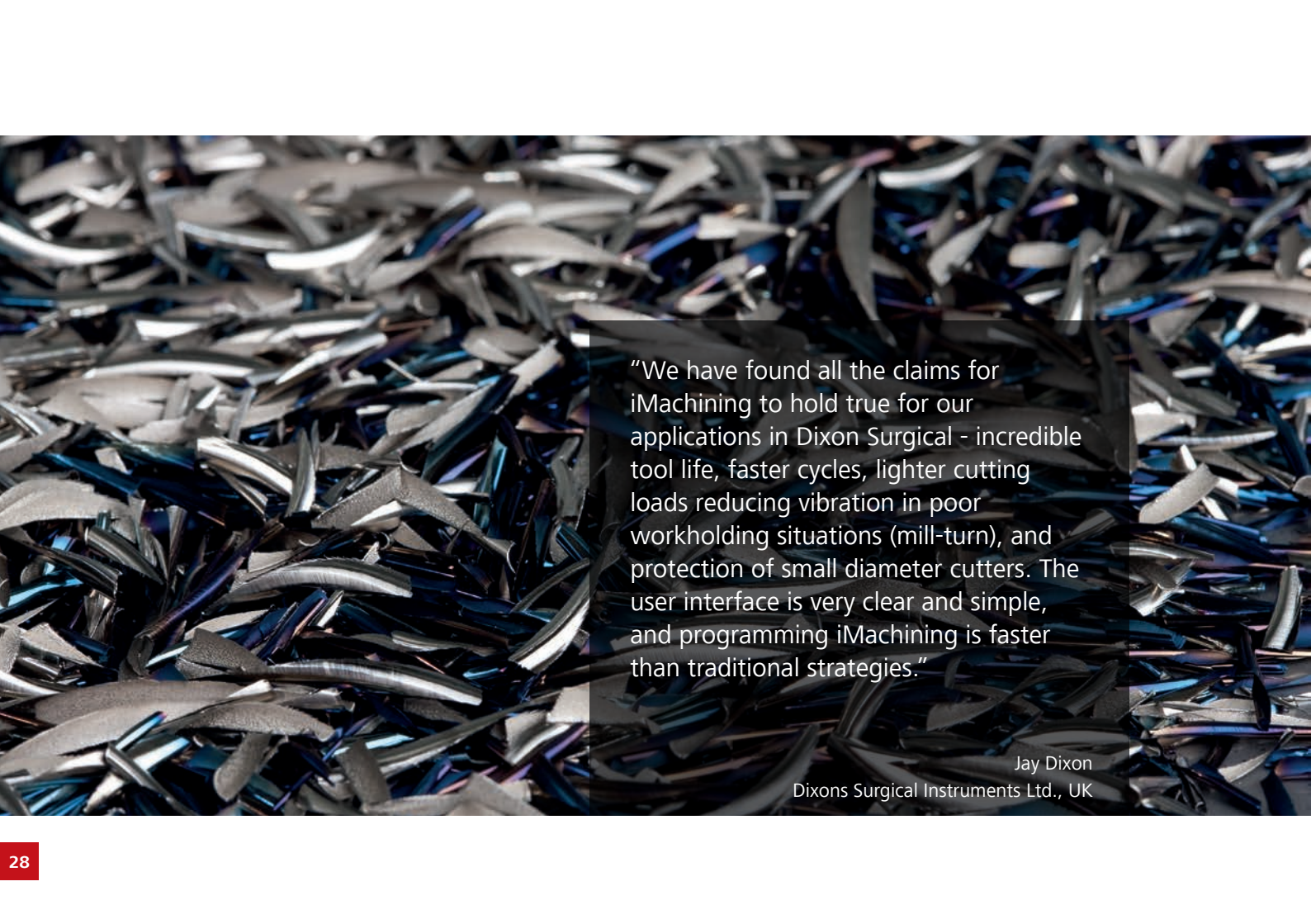
www.youtube.com/iMachining



www.facebook.com/iMachining

Visit one of our **LIVE** iMachining events. Upcoming events can be found online or contact us for more information.





"We have found all the claims for iMachining to hold true for our applications in Dixon Surgical - incredible tool life, faster cycles, lighter cutting loads reducing vibration in poor workholding 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 Ltd., UK



SolidCAM + SolidWorks
The Complete Integrated Manufacturing Solution



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Die CAD/CAM Experten in Ihrer Nähe:
Schramberg | Rosenheim | Worms | Hörstel | Zella-Mehlis

**Get the best CNC programs ever.
Get iMachining.**

- ✓ Fastest cycle times
- ✓ Longer tool life
- ✓ Automatic feeds and speeds
- ✓ Faster CNC programming
- ✓ Easy and simple operation

www.solidcam.com

