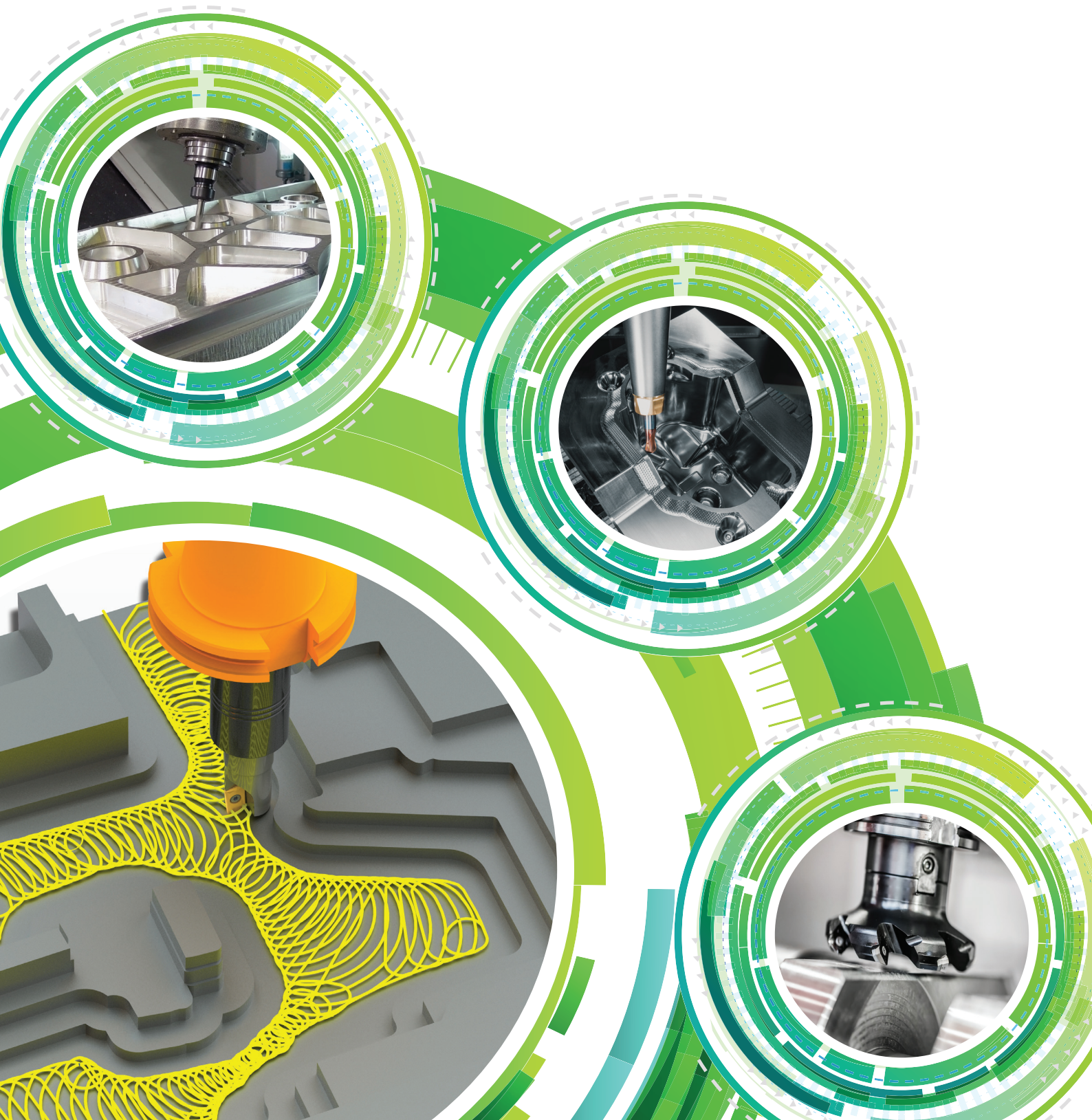# worknc

Advanced CAM Solution
from 2 to 5 Axis Machining

vero
Software

worknc

Finishing and Re-Machining

A raft of finishing and remachining strategies in WorkNC gives users the ability to easily tailor machining operations to suit their individual requirements. Rest-material remachining strategies automatically detect the remaining material, limiting unnecessary tool movements while reducing overwall machining time.

Auto5 module

WorkNC Auto5 is a truly unique and revolutionary innovation in the field of 5 axis machining. Users can now automatically generate 5 axis toolpaths based on existing 3 axis toolpaths while taking into account the specific kinematics of the 5 axis milling center selected.

WorkNC is the closest system to "One Button CAM" with automated, efficient toolpaths bringing dramatic productivity gains through shorter machining times, longer tool life, improved surface finish and accuracy, better machine utilization, and fast and easy CNC programming.

Highly Efficient Roughing Strategies

Roughing and Re-roughing toolpaths are one of the many strengths of WorkNC. The new Waveform Roughing strategy significantly improves the standard roughing technology with its consistent material removal while increasing the tool and machine service life.

vero
Software
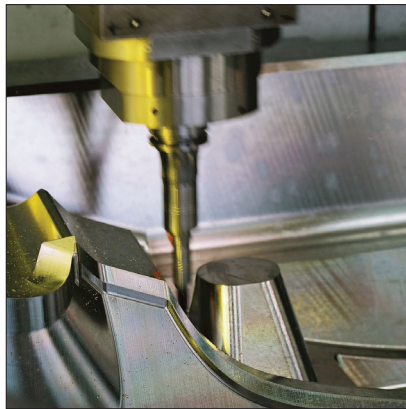
WorkNC automated CAD/CAM software for 2 to 5 axis machining has been continuously developed since 1988 and is currently used by thousands of companies around the globe from a range of industries.

WorkNC is the closest system to "One Button CAM" with automated, efficient toolpaths bringing dramatic productivity gains through shorter machining times, longer tool life, improved surface finish and accuracy, better machine utilization, and fast and easy CNC programming.

WorkNC's multi-threaded processing takes advantage of multi-core computers giving blisteringly fast calculation and processing times. Preparation times are also reduced thanks to predefined machining sequences and batch mode toolpath calculations.

WorkNC's dynamic stock management updates as machining progresses and supports any shape of cutter. The result is highly accurate remachining, constant tool loads and exceptionally reliable toolpaths.
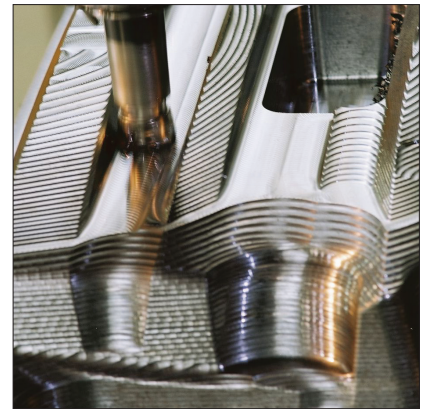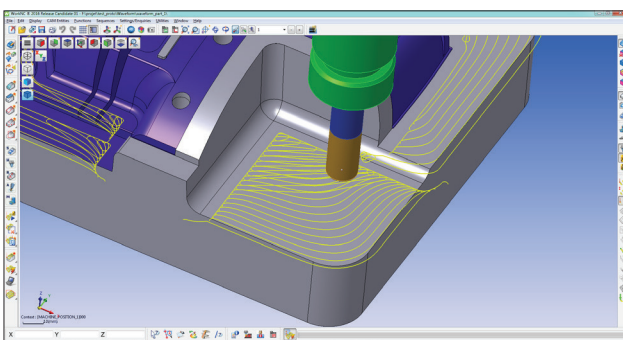
Roughing
Roughing and re-roughing toolpaths in WorkNC enable large volumes of stock to be removed in a single pass with large depths of cut, while dynamic stock management gives it the sensitivity to work with small diameter tools too.
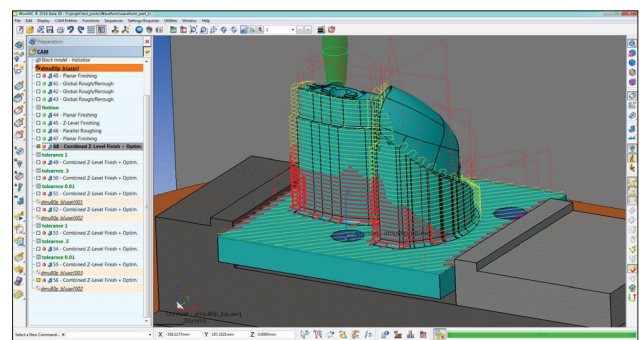
Toolpath Optimization
Toolpaths optimized for high speed machining make it easy to rapidly and safely cut the hardest materials, reducing the need for EDM.

Collision Detection
Advanced collision detection and avoidance checks the tool, its holder, the machine tool itself, and the machine limits, to produce completely reliable toolpaths. It automatically splits the collision free and collided sections of the toolpath. WorkNC is so reliable that many users maximize productivity through unattended, "lights out" machining.

Waveform Machining

Collision Detection

From 2 to 5 Axis Machining

Application Specific CAD for CAM

What did they say?

WorkNC's graphic toolpath editor is lightning fast.

Ceyhun ÇINAR,
Serdar Plastik

Four modellers in the Styling Studio use WorkNC in the workshop. Its ease of use makes their tasks much simpler and they have absolute confidence in the results it produces.

Kevin Baker,
Bentley Motors

The analysis function color codes radii so we can select the right tools from the tool library, and the dynamic cross section and semi-transparent part views make it easy for us to examine complex components.
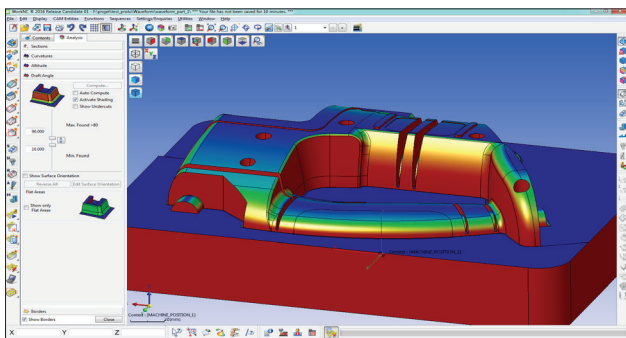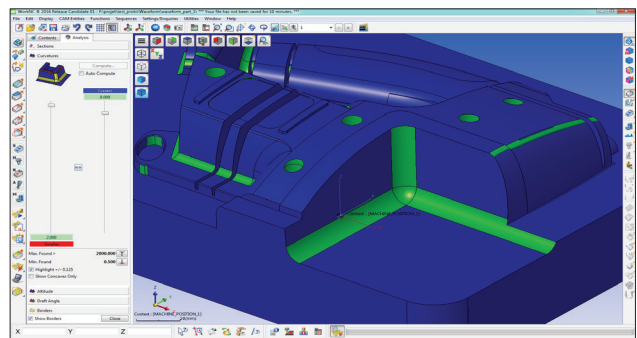
Haruki Matsui,
TOMCO Co Ltd

User Interface
WorkNC's intuitive GUI enables users to become productive in the shortest possible time.

Analysis Tools
Analysis tools simplify the interrogation of CAD data to check features such as draft angles and the smallest radius. The intuitive operation and automated machining strategies make WorkNC ideal for use on the shop floor.

Toolpath Editing
WorkNC's powerful graphical toolpath editor enables users to quickly and intuitively modify the toolpath to suit their individual requirements from a single command.

Job Preparation
There is more to programming than just creating toolpaths. WorkNC contains specialized CAM-oriented CAD functions that can be used prior to programming. Automation tools, such as sequences, can be created to streamline programming. The less time you spend preparing your model for machining, the faster it can be machined.

CAD Data
WorkNC can import model data from all the leading CAD packages and can easily manipulate the largest files. WorkNC includes popular neutral file formats such as IGES, STEP, STL, Parasolid and Soliworks. For specific, native CAD files, WorkNC's direct translators can be used to open those files. WorkNC's direct translators have been continuously developed to provide an optimum level of performance and reliability when opening native CAD files. WorkNC direct translators are constantly updated to stay current on changes to the native file formats.

WorkNC Viewer
WorkNC Toolpath Viewer is an ideal tool when not programming directly on the shop floor. This low cost yet high value product allows you to open WorkNC CAM files for viewing, analyzing, simulating, verifying and then post processing without the need for tying up a full WorkNC programming license. Machine operators can load a WorkNC workzone and check the part or toolpath anywhere, without interrupting a programmer or stopping what they are currently doing.

Draft Angle Analysis

Minimum Curvature Analysis

Highly Efficient Roughing Strategies

WorkNC's automated Roughing and Re-Roughing toolpaths enable engineers across the world to reliably and safely achieve unprecedented metal removal rates. Using its dynamic stock model management, the software's algorithms know exactly where material needs to be removed at any instant, keeping tool loads constant while checking for potential collisions and minimizing retract and wasted movements.

## Parallel Processing Technology

Multi-threaded processing operates across WorkNC's toolpaths and Workzones, running on multiple cores simultaneously and producing speed improvements of up to ten times, allowing several toolpaths to be calculated at the same time to greatly reduce programming and calculation times.

Roughing and Re-Roughing Strategies Include :

- Constant tool engagement rates through the Waveform algorithm.

- Localized retracts and corner smoothing for HSM.

- The ability to cut at large Z depths in a single pass to maximize metal removal and make the best use of the tooling.

- Flat surface machining across the complete part, automatically creating the correct 3+2 machining orientation for each of the multiple toolpaths.

- Spiral core roughing for a highly fluid and high speed tool trajectory.

- High volume roughing with a plunging action.

- Batch processing of long toolpaths with integrated collision detection.
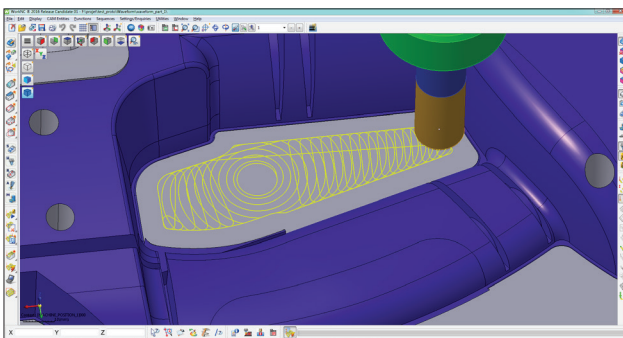
Waveform Strategy
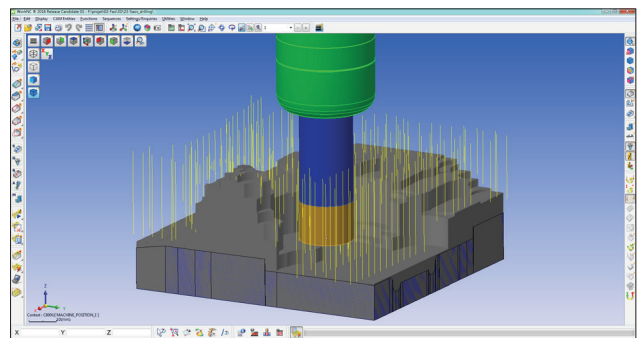
High Volume Roughing

3, 3+2 Axis Roughing and Re-Roughing
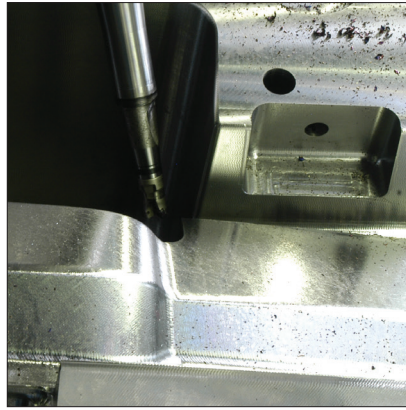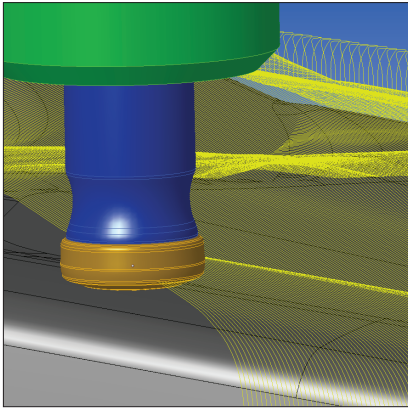
Precise High Speed Finishing, and Re-Machining

Finishing & Re-Machining

A raft of finishing and remachining strategies in WorkNC gives users the ability to easily tailor machining operations to suit their individual requirements. Coupled with the powerful graphical toolpath editor and the ability to create sets of knowledge based automatic cutting strategies, WorkNC will deliver extremely short programming times and greatly improved quality and productivity.

Rest Material Technology

Rest material technology detects the remaining material, limiting unnecessary tool movement and enabling engineers to work successfully with the smallest and most fragile cutters while reducing overall machining times. Optimization for high speed machining includes helical approach paths, elimination of unnecessary retract moves, corner smoothing, and global finishing strategies which keep the tool in contact with the part.

For even greater ease of use, 3D surfaces can be selected by simply rolling the mouse across them, ready for machining.

Finishing Toolpaths Include:

- Global finishing for a continuous spiral toolpath across a contoured surface.

- Planar finishing for shallow surfaces

- Flat surface finishing

- Z-level machining and optimized Z-Level machining for steep surfaces

- Undercut remachining

- Z level remachining

- Contour remachining
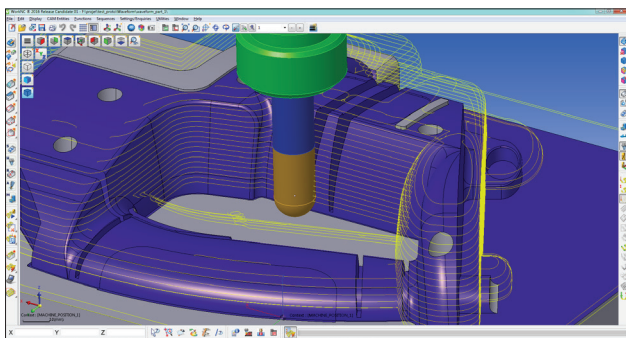
- 3D drive curve machining

- Thin wall machining

3 Axis Finishing Strategies

Continuous Finishing
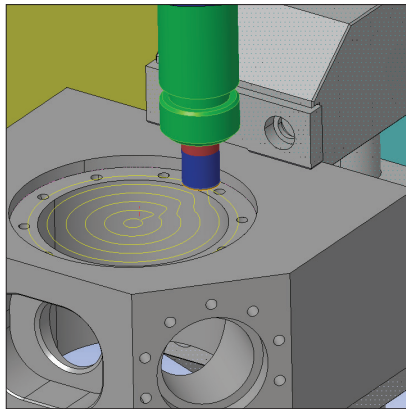
Standard 2 Axis Machining

WorkNC automatically programs 3D models. For 2D geometry, powerful 2D curve machining options simplify and speed up the programming even where the geometry is damaged or intersecting. The advanced toolpaths which WorkNC produces are highly reliable, and result in short machining times and long tool life.

Feature Recognition

For parts with many holes, WorkNC's Feature Recognition automates drilling and boring operations and eliminates the possibility of human error. WorkNC identifies specific hole types formatted in the CAD model and automatically applies predefined and customized drilling, boring and tapping strategies. The resulting toolpaths produce consistent machining performance across the whole part and ensure positional accuracy, even for cross drilled holes.

Feature Include:

- Automatic recognition of cylindrical forms.
- Automatic feature creation to suit detected axes or angled planes.
- Predefined drilling sequence selection.
- Automatically generated drilling operations.
- Deep hole and intersecting hole drilling management.

Interactive Drilling

WorkNC's interactive drilling functions allow users to select hole locations and sizes directly from the model topology. Complete drilling cycles are quickly built up from the intuitive interface, allowing users to easily generate reliable and effective drilling operations even for angled holes.and long tool life.

2D Machining Strategies Include:

- Tangent to curve.
- Curve re-machining.
- On curve (engraving).
- Pocketing.
- Rib machining.
- Facing.
- Drilling, tapping & point drilling.
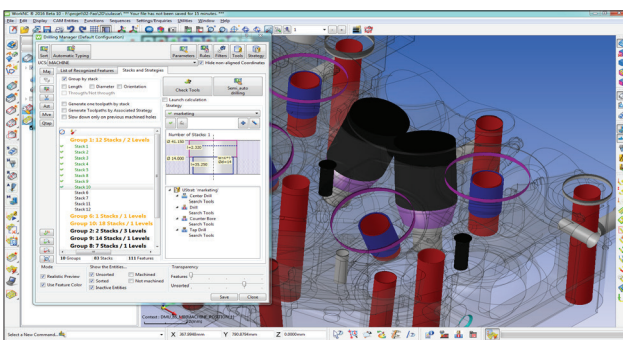
Interactive Drilling
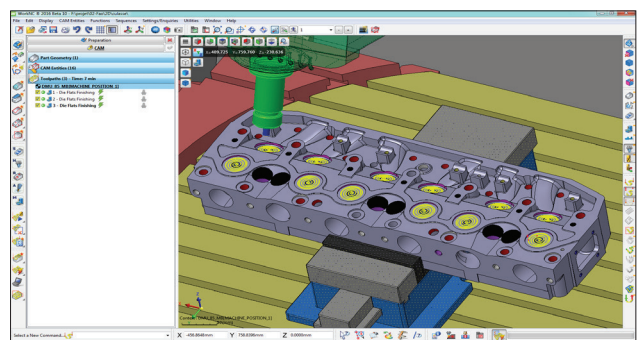
Automatic Multi-Face Surfacing
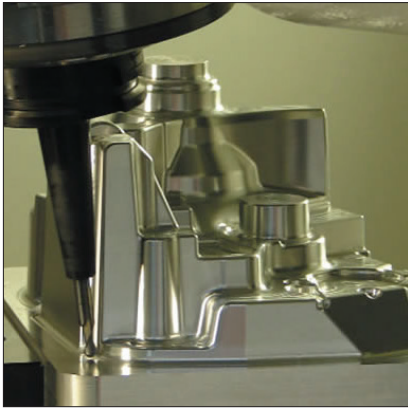
Automatic 2 Axis Machining

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5 Axis Machining

The ease of programming brings 5 axis machining well within the reach of every company by eliminating programming complexity and making it practical to carry out 5 axis programming on the shop floor.

The intelligent toolpaths are automatically and dynamically controlled to avoid collisions and to manage the rotation limits of each specific machine tool.

Simultaneous 5 Axis Strategies

WorkNC also offers specialized 5 axis strategies for individual applications such as trimming, pocketing, blade and tube machining and impellers.

▮ Rolling.

▮ Planar finishing.

▮ Pocketing.

▮ Blade machining.

▮ Tube machining.

Auto5

From just six ergonomic dialogue boxes, engineers can automatically turn 3 and 3+2 axis machining toolpaths into full 5 axis simultaneous toolpaths using WorkNC Auto5.

This unique WorkNC Module offers companies the benefit of smooth, fluid 5 axis toolpaths enabling the use of shorter, more rigid cutters, and allow more of the job to be finished in one setting.

Very fast learning curve with big productivity gains due to WorkNC's ease of use and numerous automatic features, the training time required is much shorter than for other CAD/CAM systems, even for 5 axis.

What did they say?

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WorkNC is the best software we have for 3 and simultaneous 5 axis machining. Our engineers prefer it by far. It has definitely enabled us to win more business.
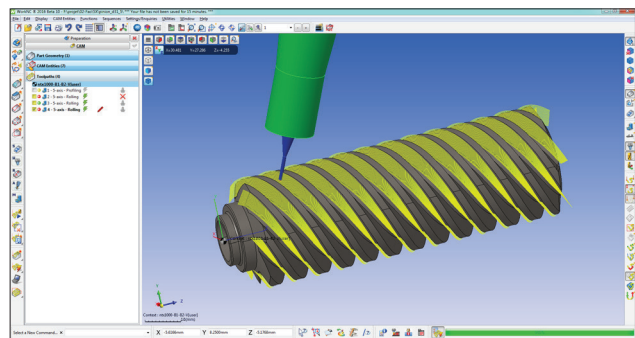
Haruki Matsui,
TOMCO Co Ltd

We use WorkNC's Auto5 module exclusively for our 5 axis programming and we found it so easy to use that we did not need any training. Now around 25% of our work requires 5 axis machining and our 10 machinists use it every day in the workshop.

Roy Thomas,
Patterson Mold & Tool

"
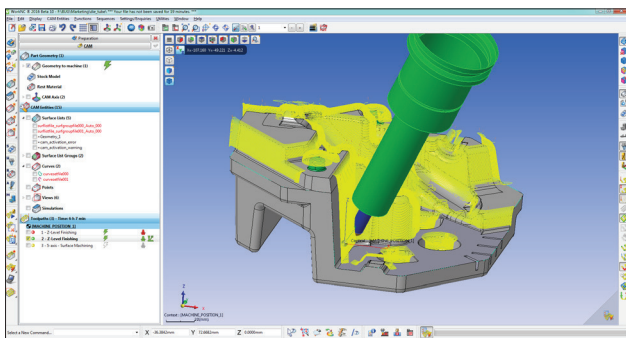
Auto5

5 Axis Machining Toolpaths

WORKNC
Continuous development and service

From its inception in 1988, WorkNC has been developed as an automated CAD/CAM system. Continuous development, and many years of experience and expertise in CNC machining have enabled Vero to offer its clients leading edge technology. WorkNC has the solution for your activity whether you serve one or a number of different industries: Automotive, Aerospace & Defence, Engineering, Consumer Electronics, General Mechanical, Medical & Dental, Mold, Die & Tooling, Models & Prototypes, Motor Sports, Special Machines, Sport & Leisure Goods. Vero prides itself in the quality of its after sales service, working in partnership with its customers to optimize the efficient use of their CNC machinery through its worldwide customer support network.

The Solution

Manufacturers around the world have put their trust in the quality, reliability and ease of use of WorkNC, one of the world's most widely used CAD/CAM systems. Vero Software constantly invests in quality, customer service, and research and development to provide its customers with cutting edge software technology.

VERO SOFTWARE
We speak your language

Vero Software is a world leader in CAD/CAM software with a proven track record of reliable product delivery. Vero develops and distributes software for aiding the design and manufacturing processes, providing solutions for the tooling, production engineering, sheet metal, metal fabrication, stone and woodworking industries. Despite the diversity of application, these solutions have one thing in common: they all address the rising challenges of achieving manufacturing efficiencies and bring huge value to the operations where they are deployed.

The company has direct offices in the UK, Germany, Italy, France, Japan, USA, Netherlands, China, Korea, Spain and India supplying products to more than 45 countries through its wholly owned subsidiaries and global reseller network.

Part of Hexagon

Vero Software is part of Hexagon, a leading global provider of design, measurement and visualisation technologies that enable customers to design, measure and position objects, and process and present data.

WWW.WORKNC.COM

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FRIUL SYSTEM

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