



MAKINO TECHNOLOGY EXPO 2019

SEE the **FUTURE** ••• **NOW**

September 10-12, 2019 • Auburn Hills, Michigan



[Register for the Technology Expo](#)

Tuesday, September 10, 2019 - The Predictable Process

- 8:00 Registration and Continental Breakfast
- 9:00 Makino Experience Center: See Makino Machines Anytime from Anywhere
- 9:30 Setting the Stage: Machine Set-ups for Predictable, Repeatable Wire EDM and Die Mold Milling Processes
- 10:45 Tomorrow's Tooling Solutions with NS Tool and MST
- 11:30 Predictive Solutions for Elimination of Downtime: MHmax
- 12:00 Lunch
- 1:00 Keynote: A First Look at The New Future in Industry 4.0 Technology
- 2:00 Reducing Per Piece Production Costs Through Strategic Application of 5-Axis Machining
- 3:00 Creating a Predictable Automation Process
- 4:00 Engineering Tool Geometries for Lower Cycle Time and Better Finish with Mastercam
- 4:30 Open House/Machining Demonstrations
- 5:00 Dinner in the Makino Showroom

Wednesday, September 11, 2019 - Makino Medical Solutions

- 8:00 Registration and Continental Breakfast
- 9:00 Breaking the Wire EDM Speed Limit: Double Your Cutting Speed, Not Your Wire Consumption
- 9:30 Voice-Control for Modern Machine Tools: Enhancing Productivity for New and Experienced Operators
- 10:15 Choosing the right EDM Consumables to optimize Quality and Productivity in your Wire and Sinker Applications
- 11:00 Keynote: John Phillips, Phillips Precision Medcraft
- 12:00 Lunch
- 1:00 Competitive Medical Manufacturing: Innovative, Cost Effective Solutions for Complex Part Geometry and Challenging Materials
- 3:00 Wire Innovation for Next-Level EDM Cutting with Bedra
- 3:30 A New Approach for Better Results using High Feed Cutting and Cam Tool strategies with Mitsubishi Tool/CAM Tool
- 4:00 Open House/ Machining Demonstrations
- 6:00 Dinner at Stahl's Car Museum

Thursday, September 12, 2019 - Optimize Your Die/Mold Application

- 8:00 Registration and Continental Breakfast
- 9:00 Advances in Mold Finishing: Using 5-Axis Continuous Milling and New Tooling Technology to Minimize Finishing and Polishing Times
- 10:00 5-Axis Machines: Toolholding and Workholding with BIG KAISER
- 10:45 Consolidate Your Grinding and Milling Operations with Closed Loop Tolerance Control
- 11:30 Breaking the Wire EDM Speed Limit: Double Your Cutting Speed, Not Your Wire Consumption
- 12:00 Lunch
- 1:00 Keynote: Laurie Harbour, Harbour Results
- 2:00 Future Technologies: A Die & Mold Machining Process for Fuel Cell Tooling
- 3:00 Boosting Efficiency with Industry 4.0 and Tool Management with Zoller
- 4:00 Open House/ Machining Demonstrations
- 5:00 Dinner in the Makino Showroom

... AGENDA

Presentations are in Conference Room 1



Tuesday, September 10, 2019 - The Predictable Process

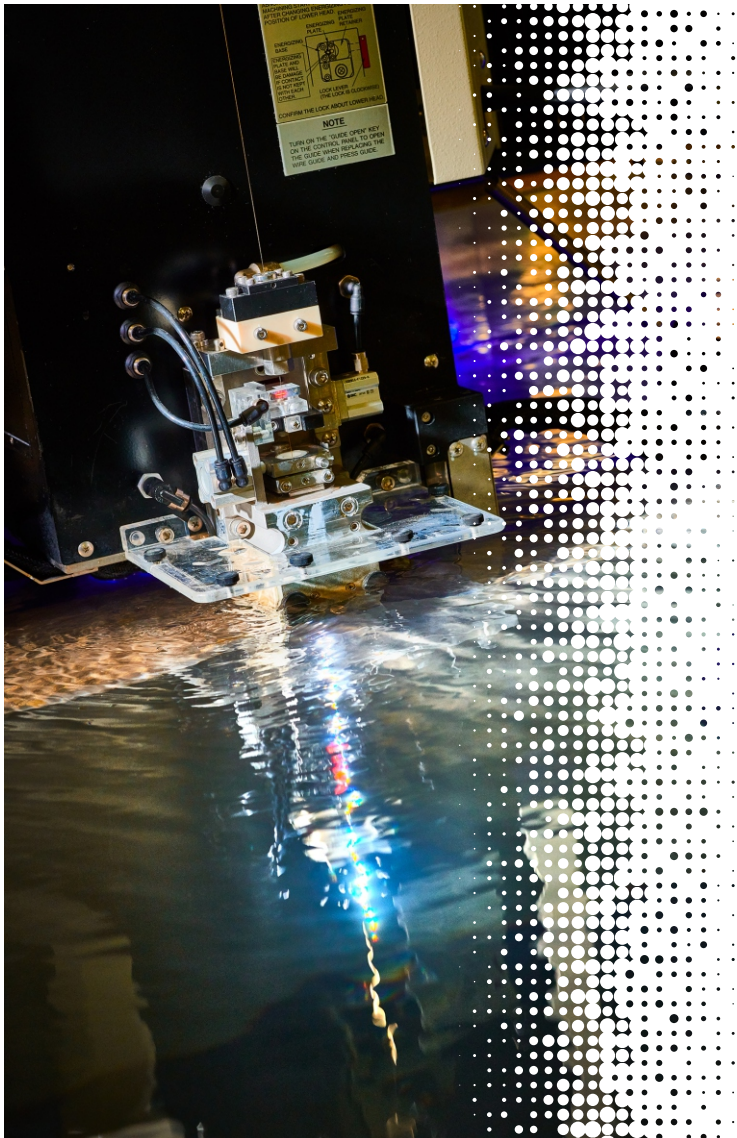
- 9:30 EDM New Product Overview
- 10:30 Vertical New Product Overview
- 2:00 Aero Engine Milling and EDM Machining

Wednesday, September 11, 2019 - Makino Medical Solutions

- 11:30 Vertical New Product Overview

Thursday, September 12, 2019 - Optimize Your Die/Mold Application

- 11:00 EDM New Product Overview
- 2:00 Vertical New Product Overview



Setting the Stage: Machine Set-ups for Predictable, Repeatable Wire EDM and Die/Mold Milling Processes

How to Do it Right the First Time — It's not just that faster setup makes you money with better equipment utilization, though that's plenty good reason to seek improvement. The choices you make in fixturing and tooling can have a huge impact on process quality, repeatability, part loading/unloading efficiency and the elimination of scrap and rework. With better setup preparation most shops can increase machine output by 30% or more. Makino engineers will explain how.

Reducing Per Piece Production Costs Through Strategic Application of 5-Axis Machining

How to Get the Most out of Your 5-Axis Investment — Five-axis machines can cut complicate parts extremely efficiently, but most shops can get even more out of their equipment by choosing the right setup and workholding strategies. You'll learn how to minimize setups and fixturings for even the most complex parts to reduce part handling and labor. Makino engineers will also explain how to use functions in the Pro6 control to achieve further cycle time reductions on a-series machines.

Creating a Predictable Automation Process

How and Where to Automate for the Best ROI — Automation doesn't have to be an all or nothing proposition. Particularly for those just getting started there are plenty of low-risk and affordable options that still can prove to be game changers in improving a shop's competitiveness and profits. Makino is partnering with EROWA to explain how to identify automation opportunities and how to plan and manage sensible automation programs that fit almost any shop.

Breaking the Wire EDM Speed Limit: Double Your Cutting Speed, Not Your Wire Consumption

Double Your Burn Speed with Better Wire — Makino's burning 0.016" wire enables an astonishing improvement to EDM productivity. Using revolutionary Heat Extreme Technology, Makino will show you how to double your burn speed, but not your wire consumption. Come see for yourself how to achieve the savings created with this all new EDM technology.



Competitive Medical Manufacturing: Innovative, Cost Effective Solutions for Complex Part Geometry

See Best-in-Class Solutions for Medical Machining — Today's medical industry demands machining solutions that deliver both high quality parts and cost-effective processes. Here you'll learn about state-of-the-art developments in machining and EDM technology, even automation, specifically targeted to deliver the highest value to medical manufacturers of all types. You'll learn how these technologies are being applied to generate the most efficient processes with reduced labor requirements.

Advances in Mold Finishing: Using 5-Axis Continuous Milling and New Tooling Technology

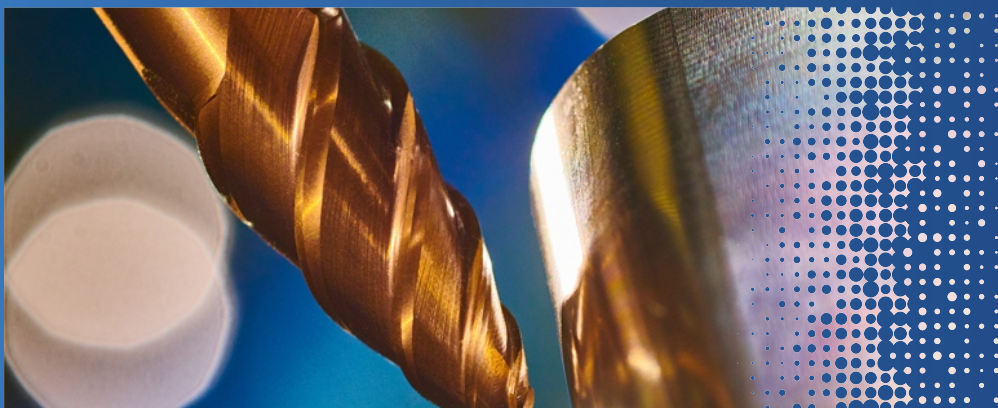
See the Remarkable Capabilities of Makino's Newest 5-Axis Technology — Makino's latest generation 5XC machining centers combine the versatility of 5-axis machining centers with the efficiency of volume production machines. Here you'll learn how all the process elements come together to enable higher production rates including machine rigidity and dynamic stiffness, high-speed tool path processing, state-of-the-art cutting tools, and CAM software. It all results in high quality surface finishes with optimized tool center point control while maintaining high volumetric accuracy yet at reduced cycle times.

Consolidate Your Grinding and Milling Operations with Closed Loop Tolerance Control

Learn How to Mill and Grind Without Stacking Up Tolerances — Being able to grind and mill on a single machine is extremely efficient, but they are still often executed in separate processes which can create accuracy concerns. By integrating both grinding and milling into a single process you can increase productivity by 20% and eliminate a common problem of stack-up tolerances. Makino engineers will explain how closed-loop machining enables this single process to reduce variability and achieve repeatability you can count on.

Future Technologies: A Die and Mold Machining Process for Fuel Cell Tooling

Learn What's in Store for Toolmakers with Hydrogen Powered Vehicles — Hydrogen powered vehicles aren't as far away as many people think, and that's going to present a new opportunity for die and mold makers. Makino engineers will discuss tooling process requirements for hydrogen fuel cells and micro precision technology. We will help you understand the current and likely future challenges of fuel cell tooling.



F5 Pro6 (Vertical Machining Center)

The F5 Pro6 Machine will have 3 short live demos showing a Radial Roughing Technique for better Metal Removal Rates, MultiFlute and Hybrid Tool Finishing promoting shorter cycle times, and a Deep Rib Machining Demo addressing the efficiency improvement in mold making by deploying the latest tooling and programming techniques.

DA300 with Erowa ERC 80

The versatile DA300 5x VMC will showcase pallet automation with the Erowa ERC 80 with 5 axis Die/Mold parts varying from highspeed hardmilling injection molds/lifters/details to aluminum prototype and blow molds.

V33i (Vertical Machining Center)

The V33i Vertical Machining Center will demonstrate its accuracy is at the same level as your CMM. You can verify your part quality on the V333i by On Machine Verification (OMV Autodesk)

a51nx (Horizontal Machining Center)

The a51nx Horizontal Machining Center machine will be showcasing its advantages for Die/Mold insert part production utilizing a 3 sided tombstone. Deploy this workhorse in your shop with maximizing spindle utilization through multi part set-up and parallel load/unload via automatic pallet changer

U3 (Wire EDM)

The U3 will be highlighting the HyperDrive wire drive system. The demonstration will be showing ultra-high corner accuracy and straightness on intricate form geometry.

U3i (Wire EDM)

The new U3i machine will be demonstrating jetless threading capability. Highlighting the HyperDrive Extreme wire drive system.

UP6 H.E.A.T. (Wire EDM)

The UP6 H.E.A.T. will be machining a precision die plate illustrating machine stability and repeatability. Learn how to achieve 1 micron pitch accuracy on large details.

EDNC6 (Sinker EDM)

The EDNC6 will be highlighting the new ES-200 generator. The demonstration will be showing high speed sinker EDM with low electrode wear in both tool steel and Moldmax.

EDAF3 Fine Hole (Sinker EDM)

The EDAF3 Fine Hole will be demonstrating automated high accuracy small hole EDM drilling.

V80s (5-Axis Vertical Machining Center)

The V80s will highlight 5-Axis Continuous Machining benefits for die/mold applications. The iSetup control feature allows for fast set-ups of large parts. The dynamic stiffness and control processing capability ensures continuous 5X cutting coupled with Hitachi multi-flute ball nose cutters up to 1000"/min reduces cycle times with superior blending of optimum surface finishes.

D200Z and EDAF3 H.E.A.T. with Erowa Robot

The D200Z graphite vertical increases efficiency to manufacture graphite electrodes utilizing benefits from 5-Axis Continuous machining. Witness cycle time reduction of graphite electrodes by 90% with INOVA burr bit tooling and D200z 2G acceleration. Manufacture graphite electrodes in no-time and dramatically improve your EDM burn speeds.

The EDAF2 H.E.A.T. will be demonstrating rib machining in an Erowa automation cell with a D200Z graphite mill. Highlighting the high speed HS-Rib Z axis reducing roughing time by up to 65%.

U6 H.E.A.T. Extreme (Wire EDM)

The U6HEAT Extreme will be demonstrating 0.016" Ø wire capability. Highlighting cutting speeds 2 to 3 times faster than standard wire EDM machining.

DA300 (5-Axis Vertical Machining Center)

The DA300 5-Axis Vertical Machining Center will demonstrate how multi part setups for multi axis machining will reduce cycle time. Using this application, a Machine with a burn rate of \$150 per hour can save up to \$90,000 per year per machine. Core Cooled Ball Screws, Thermally Controlled Direct Drive Motors and Ultra High Torque Motors create stability over extended machining hours while providing excellent surface finishes and blends.

D200Z (5-Axis Vertical Machining Center)

The D200Z 5-Axis Vertical Machining Center will demonstrate 5 Axis Continuous Machining, 55HRC cavity cutting with 5X motion control smoothing that will improve cycle time, blends and surface quality.

V33i Jig Bore

This V33i Vertical Machining Center will show a unique application of Closed Looped 5 sided jig grinding for the preparation of mold Inserts. Eliminate manual block preparation and automate your precision machining by measuring your parts and adjusting your toolpath for the tightest true positioning assembly tolerances.

iQ300 (High Precision Vertical Machining Center)

The iQ300 machine will showcase a unique applications for Fuel Cell Technology and Automotive Lighting Molds. Benefitting from the machine's high accuracy and Mirror Surface Technology come witness nanometer surface finish and sub-micron spindle thermo control.

Four Person Scramble

Friday, September 13, 2019

Arrival Time: 8:00am ... Shotgun Start: 9:00am



Prizes awarded for:

- ... Longest Drive
- ... Closest to the Pin
- ... Lowest Team Round

Please include handicap and requested golf partner(s) in the Comment Section of the Registration Page.

NOTE: You must attend the **Makino Technology Expo** in order to participate in the golf outing.

[Register for the Technology Expo](#)

[Register for the Golf Outing](#)

Special Thanks to the Following Sponsors of the Expo

