A Few Simple Clicks

Powerful Part Modeling

Mastercam’s streamlined CAD engine makes design work easier than ever before. Each piece of geometry you create is “live,” letting you quickly make modifications until it’s exactly what you want. Some of Mastercam’s modeling tools include:

- Easy 2D and 3D geometry creation with complete wireframe and surface modeling.
- Remove trim boundaries and fill trimmed holes.
- Automatic parting line calculation for mold making.
- Fitting tool to help place parts between clamps and fixtures.
- Associative dimensions update as you change your model.
- Advanced analysis tools to help modeling and programming.
- Solid modeling is available as an optional add-in.

- Built-in translators for IGES, Parasolid®, SAT (ACIS solids), AutoCAD® (DXF, DWG, and Inventor® files), SolidWorks®, Pro/Engineer, Solid Edge®, STEP, IGES, STL, and more.
- Direct translators for Siemens NX, CATIA®, Pro/E, and more are also available.
- Special free Mastercam Direct add-ins put a Mastercam launch button in your SolidWorks, Solid Edge, or AutoCAD Inventor toolbar.

Intelligent Machining

As the world’s most widely-used CAD/CAM system, Mastercam is dedicated to making your entire process easier from start to finish. Here are just a few of the things Mastercam offers to help you make the most of your time.

Capture Your Machining Knowledge

Mastercam’s full associativity gives you the power to capture your work and build on your experience. Once you program a part—no matter how complex—you can modify any element of the job, and immediately get updated toolpaths without starting over. You can also build a library of your favorite machining strategies. Choose any of your saved operations, apply them to a part, and Mastercam helps adapt them to the new model. It’s fast, easy, and productive—the way programming should be.

Mastercam’s File Tracking and Change Recognition give you an easy way to identify CAD edits and revise your toolpaths. Create a checklist of CAD files and Mastercam alerts you when a new version is available while identifying the changed areas for easy toolpath updating.

Dependable Toolpath Verification and Machine Simulation

Revealing your results before committing tool to material is crucial. Mastercam gives you several ways to ensure that your part will come off the machine exactly as you intended. These include full Machine Simulation, solid-model verification with tool and holder checking, and toolpath backplotting. These tools deliver vital information about every aspect of the tool motion so you know for sure that what you see is what you get.

Machining Stock Model

A precise machining stock model delivers a variety of benefits—viewing and verifying work as it progresses, performing stock-model comparisons, and easily choosing existing stock for rest machining. Mastercam gives you the power to create accurate, fully-associative stock models at any point in your machining process. You can reference the model within that project or save it as geometry for other use. You can even quickly bring in outside CAD models to use as starting stock models for added flexibility.

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Full Machine Simulation delivers a practical view of how your toolpaths interact with your equipment.
2D Toolpaths

Contouring, Drilling, and Pocketing

2D machining ranges from the very simple to the very complex. Mastercam delivers all the tools you need for these operations. Highlights include:

- **Dynamic Milling** creates an active toolpath that delivers more consistent cutting conditions and allows use of the entire tool flute length, while reducing machining time.

- **Feature Based Machining (FBM)** automatically programs a solid model's pockets, contours, and drilling routines, including new slug cutting and hole mapping.

- **Standards** such as zigzag, one way, true spiral, constant overlap spiral, "morph" pocketing, and open pocketing.

- Suite of entry methods including plunge, helical, ramp, profile, medial, or custom including trochoidal entries.

- **Contour and pocket remachining** use smaller tools to automatically clean out material left from previous operations.

- **Specialized support for ISCAR® High Efficiency Machining (HEM)** tool set.

- **Region Chaining** delivers a fast and easy way to adjust your 2D high speed machining areas.

- Ability to click and drag a machining start point to anywhere on your model.

- **Automatic tool circle and offset milling**.

- **Controlled path** by using a short tool length.

- **Automatic identification** and pre-drilling of multiple operations at their plunge points.

- **Automatic drilling and countersink depth calculation**.

For full details visit [www.MastercamMill.com](http://www.MastercamMill.com)

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3D Toolpaths

Roughing, Finishing, & Cleanup Machining

Operations that quickly deliver a clean and precise finished part are essential to efficient NC programming. Here are just a few of Mastercam's popular 3D machining techniques:

- **Roughing, Finishing, & Cleanup Machining**

  - **Conventional Finishing**

  - **Refined Finishing**

- **3D Toolpath Refinement** delivers a dramatically superior finish.

- **OptiRough** removes bulk material faster and with more consistent tool wear.

- **OptiRest** uses Mastercam's new stock model to identify and efficiently machine areas that need to be roughed with a smaller tool.

- **3D "projected" machining** creates a consistent, smooth finish with following the natural curves of the geometry.

- **High Speed OptiRest** uses Mastercam's new stock model to identify and efficiently machine areas that need to be cleaned out with a smaller tool.

- **3D Toolpath Refinement** provides unsurpassed control on surface cuts, delivering superior finishes and optimized cycle times.

- **High Speed OptiRest** uses Mastercam's new stock model to identify and efficiently machine areas that need to be cleaned out with a smaller tool.

- **3D Toolpath Refinement** provides unsurpassed control on surface cuts, delivering superior finishes and optimized cycle times.

- **Constant Z rest milling** removes bulk material faster and with more consistent tool wear.

- **Full check surface support**.

- **Smart hybrid finishing** and hybrid leftover machining each create a single toolpath that changes cut methods as the slope of the model changes.

- **Pencil tracing** walks a tool along the intersection of surfaces to clean out hard-to-reach areas. You can perform single or multiple passes for precision cleanup.

- Go to [www.MastercamMill.com](http://www.MastercamMill.com) for more.

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"Mastercam’s Dynamic Milling is a game changer for us. We specialize in high-precision molds, and Dynamic Milling has reduced our programming and machining time while boosting tooling and machine life—while keeping our quality at the high standards we demand."

Carmen Goudey
CNC Operations Manager
Prosin Molds, Ontario, Canada

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[Image: Dynamic Milling creates an active toolpath that delivers more consistent cutting conditions and allows use of the entire tool flute length.]

[Image: Feature Based Machining makes it significantly easier to machine prismatic parts while automating the programming process.]

[Image: Hybrid finishing intelligently blends one efficient cutting technique in one toolpath.]

[Image: Conventional Finishing]

[Image: Refined Finishing]

[Image: 3D Toolpath Refinement delivers a dramatically superior finish.]
A Wide Range of Strategies

Multiaxis Machining

Multiaxis machining can dramatically increase a shop’s competitiveness. Mastercam offers a wide range of multiaxis machining strategies. With Mastercam, you have complete control over the three crucial elements of multiaxis machining: cut pattern, tool axis control, and collision avoidance. Some highlights of Mastercam’s multiaxis machining:

- **Multisurface 5-axis roughing and finishing (including depth cuts), plunge roughing, and high-speed milling.**
- **Machine 5-axis curves with independent definitions of tool side angle and lead/lag angle.**
- **Create 5-axis contour toolpaths for applications such as trimming vacuum-formed parts.**
- **Easy 4-axis rotary, roll die, and 5-axis drill programming.**
- **Minimum tilt control helps prevent tool motion that would cause toolholder collisions.**
- **Create full 5-axis motion from a 3-axis toolpath.**
- **Advanced gouge checking and a 5-axis “safe zone” around the part.**
- **Complete control over the tool axis, lead/lag, entry/exit, and tilt.**
- **Mastercam Blade Expert delivers specialized tools for efficiently cutting multi-bladed parts and hubs.**
- **Mastercam Port Expert offers dramatically faster head port programming and smoother toolpath motion.**

“Here at OCC we need to stay on the cutting edge of technology to keep our designs new and fresh. We are always trying to one-up what we’ve done in the past, and for us that means multi-axis machining. The features in X6 continue to make our multiaxis jobs easier to program and more efficient to use.”

Jim Quinn (JQ)
Engineer / CNC Specialist
Orange County Choppers
Newburgh, NY

Faster Turnaround and Superior Finish

High Speed Machining/Feed Rate Optimization

High Speed Machining (HSM) is a powerful cutting method that combines high feed rates with high spindle speeds, specific tool motions aimed at producing ultrasmooth movement and cutting action. HSM can deliver faster turnaround and a superior finish. Mastercam includes HSM toolpaths designed to help you make the most of this powerful technique, even if you don’t have a high speed machine.

Mastercam also delivers another powerful way to get the most out of your machines. As every shop owner knows, running an entire job at a single feed rate reduces efficiency. Running the same job at varying optimal feed rates can save time and money, and reduces tool wear. Our **Feed Rate Optimization** feature enhances any 2-axis or 3-axis toolpath based on the volume of material being removed and machine tool limitations; more material and the cutter moves slower, less material and the cutter moves faster. Feed Rate Optimization will also automatically ease the tool in and out of corners. The result is efficient, varied feed rates tailored to each job.

**High Speed Machining/Feed Rate Optimization**

- **Automatically remove features using new time-saving maximum isotropic and smoothness tools, and tool motion.**
- **High speed toolpaths smooth tool motion even when the cutter moves faster.**
- **Smart core roughing cuts from the outside-in.**
- **High speed area clearance removes bulk material from the inside-out with smooth motion.**
- **High speed rest roughing smoothly removes material left from a previous rough pass.**
- **Mastercam also delivers another powerful way to get the most out of your machines.**

Feed Rate Optimization can save up to 35% in machining time over non-optimized toolpaths.
Specialized Options
Very often, that one additional CAD or CAM tool makes a specific job easier, faster, and more profitable. Mastercam offers a set of specialized add-in options for these occasions, including:

- Focused 5-axis programming tools tailored to cutting multi-bladed parts and cylinder head ports.
- Complete programming for complex machining robots.
- Automatic separation of surface model into core and cavity, including draft angle analysis and identification of problem surfaces.
- Use of point data to create surfaces or STL data for reverse engineering and manufacturing.
- Sophisticated tools for traditional blueprint and CAD-based inspection.
- Automated EDM electrode creation, including a library of definable stock sizes and materials.
- See a full list at www.Mastercam.com/Products/Addins.

System Requirements

- **Processor:** 2.5 GHz (minimum) 32-bit or 64-bit Intel®-compatible processor; Mastercam will automatically identify the processor and install either the 32-bit or 64-bit version.
- **Operating System:** Windows® XP, Windows Vista® (Business or Ultimate), or Windows 7 (Ultimate or Professional) including the latest service packs and recommended updates.
- **Memory:** 2 GB (minimum), 3 GB available hard disk space (minimum).
- **Graphics:** 256 MB OpenGL-compatible graphics card, 1280x1024 pixel screen resolution (minimum).
- **Mouse:** Windows-compatible 2- or 3-button mouse (or with mouse wheel).