

# MULTIAXIS

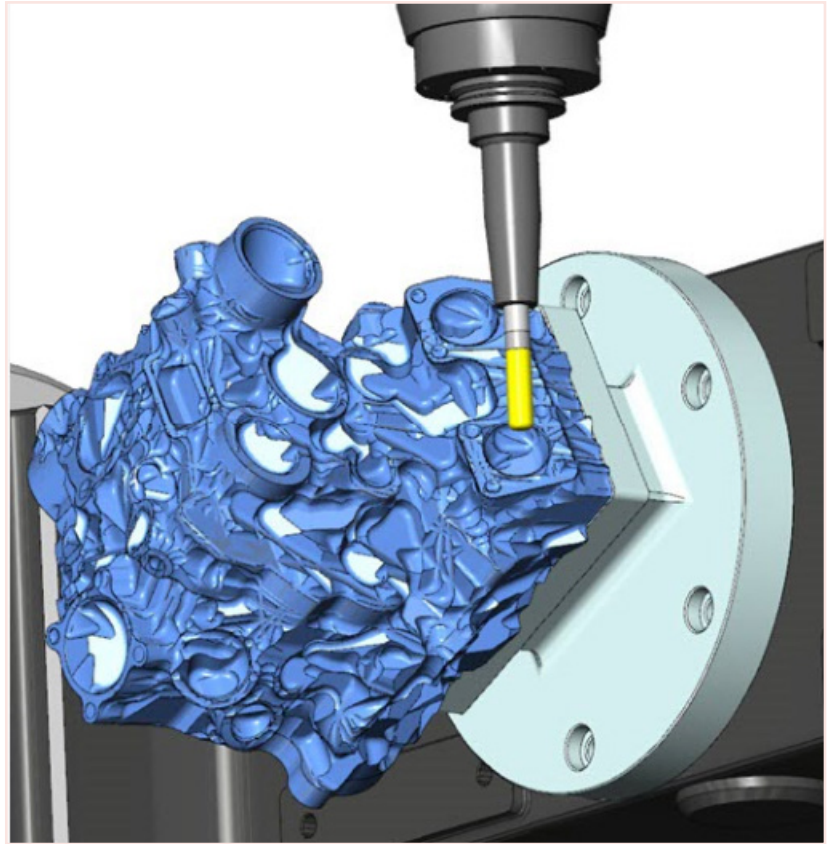
Enhance your productivity with Mastercam  
Multiaxis for intuitive programming of  
complex parts.



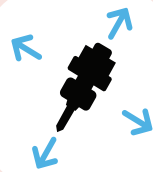
# SIMPLIFIED ACCESS TO COMPLEX MACHINING

## A practical solution to enhance productivity.

Mastercam's Multiaxis is a powerful 4- and 5-axis solution that can work in conjunction with Mastercam Mill 3D, Mastercam Router 3D, and Mastercam Mill-Turn. This product maintains stock model awareness, a 5-axis safe zone around the machined part, and tilt axis limits on the tool angle to avoid violating machine limits for the safest machining possible. It also comes with extensive dynamic-style roughing capabilities for going beyond 3+2 roughing and into full simultaneous motion material removal. The abilities of Multiaxis, which range from standard to advanced, give users complete control over cut pattern, tool axis, and collision avoidance.



**Cut Patterns**, ranging from simple 2D wireframes to complex multisurface grids, guide the cutting along predetermined paths. These varied toolpaths optimize cutting while ensuring safety.



**Tool Axis Control** gives users the ability to specify tool axis, lead/lag, entry/exit, and tilt. This technology orients the tool's center axis as it follows the cut pattern, and it uses advanced gouge checking and a 5-axis safe zone during machining to protect the part.

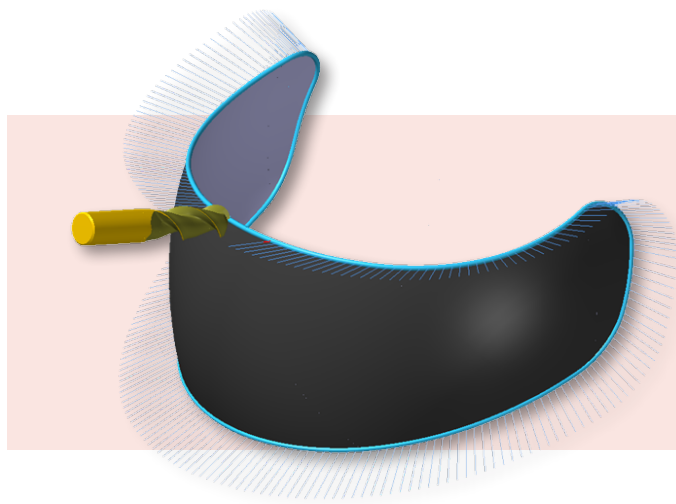
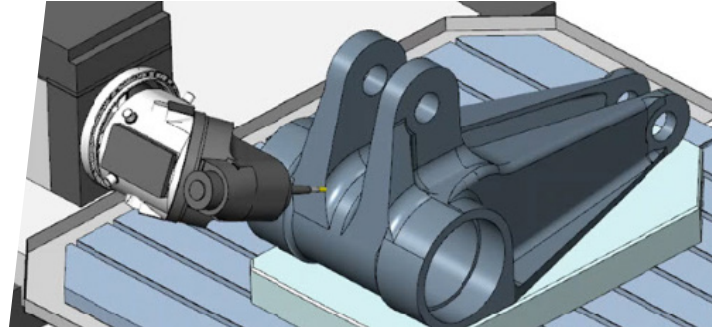


**Collision Control** provides a "near miss tolerance" field so that users can choose exactly how close they want to allow the tool to approach any workholding or machining component.

## Popular Multiaxis Toolpaths

**Unified 5-axis:** New to Mastercam 2022 and the result of customer feedback, with the Unified toolpath, users need to only select their Machining and Avoidance geometries once before being able to experiment with Cut Patterns. Not needing to reselect geometries every time will save mouse miles and time.

**Deburr 5-axis:** Sharp edges are common occurrences on completed parts. Deburring those edges is a challenging manual task, and keeping up consistency is nearly impossible, but Deburr 5-axis automates this process.



**Curve 5-axis:** This toolpath is one of Mastercam's oldest and most popular. The cut pattern follows a curve (a line, a spline, a circle, or a surface edge) that can be wireframe, solid, or surface.

**Swarf 5-axis:** Sometimes called "Flank-milling", Swarf 5-axis uses the side of a tool to cut a wall. It is very popular in aerospace milling.



**Tilt to Avoid:** Available in Mastercam's 3D HST Finishing paths, Tilt to Avoid is the fastest way to add Multiaxis motion to a 3-axis toolpath. With just one click, the tool assembly is checked against the machining and avoidance geometries and introduces tilt where necessary to machine the path.

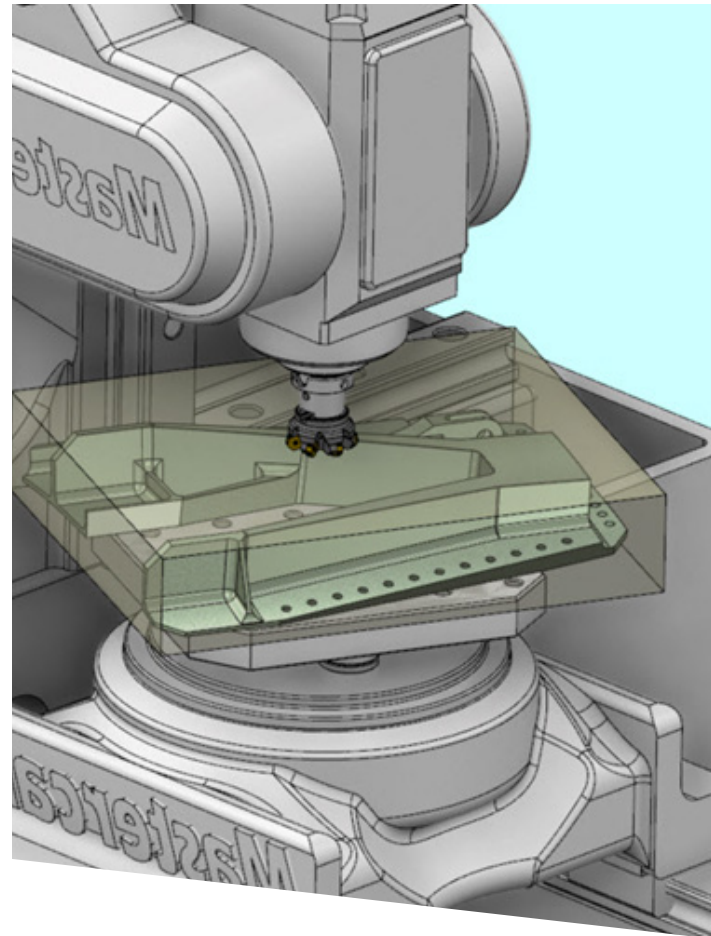




## Make it Multiaxis

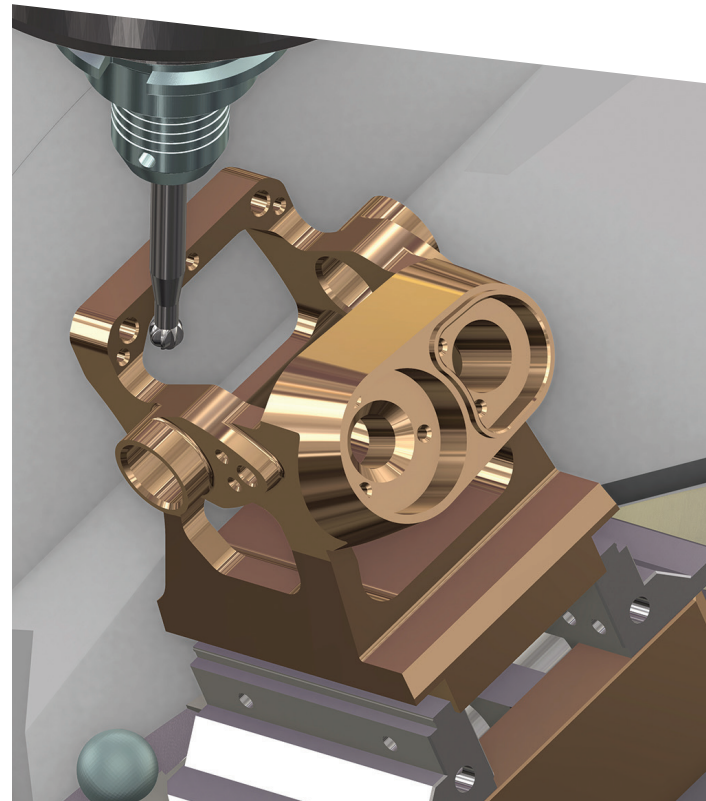
Multiaxis machining expands on the traditional 3-axis machine's motion abilities. Instead of moving along three simple linear axes, Multiaxis machines can move in four or more directions by adding rotary axes and parallel linear axes. Some modern Multiaxis centers can use nine axes, but most use only four or five simultaneously.

Launching into the Multiaxis world can be — understandably — daunting. In the past, access to training resources could be limited, and often, the only publicly available material came from forums or user YouTube videos. While these are still valuable resources, Mastercam has taken steps in recent years to make learning easier. Mastercam University is an online learning center full of self-directed courses that walk users through simple and advanced machining topics. It has a full, end-to-end Multiaxis course on all our toolpaths and on standard Multiaxis machining concepts as well.



*Make it quicker. Make it easier. Make it yours. **Make it Multiaxis.***

Mastercam and its Resellers have also produced and released extensive official YouTube tutorials on everything from individual toolpath use to fully-fledged examples with real parts. Many Resellers also offer training at their locations or will even visit your shop, and all of them will have their own Multiaxis resources and experts to give you a leg up. If you want in-person training, reach out to your local Reseller as a first step.



To learn more about Mastercam's Multiaxis solutions, visit [mastercam.com/multiaxis](https://mastercam.com/multiaxis).



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