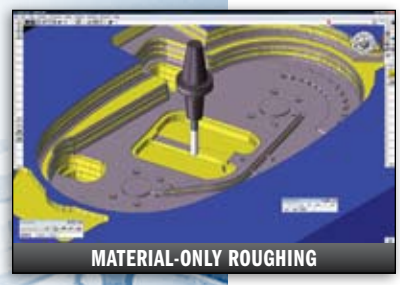
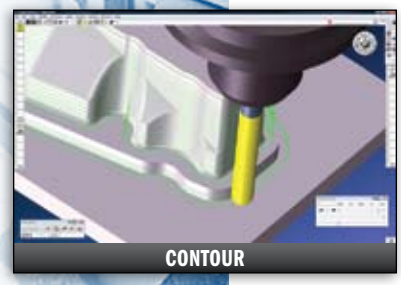

POCKETING


POCKETING WITH CORE DETECTION


MATERIAL-ONLY ROUGHING


CONTOUR


FLATS CUT


LACE CUT – RASTER

GibbsCAM® SolidSurfacer®

Including Advanced 3D with High-Speed Machining (HSM)

GibbsCAM SolidSurfacer provides powerful capabilities for machining complex 3D solids, surfaces, and STL files with toolpaths tailored for high speed machining and hard-metal cutting. Smooth corners, smooth stepovers and arc fitting minimize sudden direction changes, improving surface finishes. Minimizing tool retracts and maintaining a constant tool load helps machine tools to run faster and reduce tool wear and breakage. Automatic gouge protection, tool holder collision checking, and rest material options make it easy to use short rigid tools and large efficient tools in combination to cut parts faster.

HSM Rough Machining Capabilities

Pocketing

Pocketing clears large volumes of material efficiently. A series of offset or zig-zag passes are generated at constant Z-depths calculated to remove the maximum amount of material without leaving uncut areas. The depth of cut is adaptive, adding more cuts in shallow areas to improve consistency of scallop height. Helix or profile ramping entries are combined with smooth corner arcs and smooth transitions between passes, allowing for faster cycle times.

Pocketing with Core Detection

Automatic core detection allows the Pocketing process to machine cores from the outside-in, starting from the outside of the material, and working in to the shape of the core. Processes that include both core and cavity areas automatically switch between core roughing and cavity roughing styles in a single process, saving programming time.

Material-only Roughing

3D material-only cutting is achieved by following the operation of a big tool with one or more smaller tools in areas not cleared by the previous operation. Finish part plus stock amount for castings, user supplied solids or STL files, or automatic rest material calculated from a prior process can all be used to avoid air-cutting and increase machine tool productivity. Flexible retract styles and options add to toolpath efficiency.

HSM Finish Machining Capabilities

Contour

For components with steep walls, the constant-Z slices provided by Contour leaves a good surface finish. Boundary geometry can be used to control the machining region and angle limits can be used to eliminate passes in shallow areas. A helical option allows one continuous path to be created eliminating witness lines on the part and improving surface finish.

Flats Cut

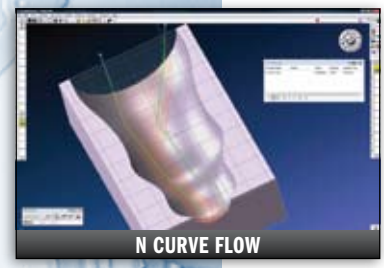
The Flats Cut process automatically detects all the flat areas of the part clearing them with an offsetting path at the Z-level of each area. Using a flat bottom tool, helix and profile ramping entries, and smooth positioning motions between areas, machining time is reduced and surface finish improved. Any number of Z-axial offset passes can be added.

Lace Cut – Raster

For many parts, parallel plane cuts generated by the Lace Cut process are most effective. Unidirectional or zigzag passes can be set at any angle. Normal vector angles define steep and shallow areas eliminating the need for complex geometry boundaries. Optimized cross-machining can automatically create additional perpendicular passes, machining only the areas necessary to produce a constant surface finish. Z-steps can be used to rough and finish the part in one operation. Smooth stepovers and tangential path extensions produce a better surface finish and smoother running machine tool.

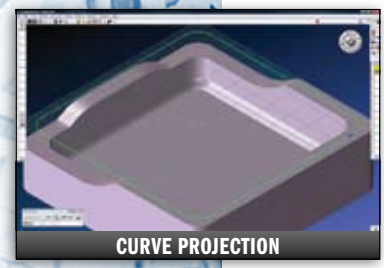

LACE CUT - RADIAL


LACE CUT - SPIRAL


N CURVE FLOW


CONSTANT STEPOVER CUT


STEEP SHALLOW CUT


CURVE PROJECTION


INTERSECTION AND INTERSECTION REST

MLG155/RM/1108

Lace Cut - Radial

Radial Lace Cut is an ideal finishing strategy for circular components as the toolpath is based on an inner and outer circular limit. Machining converges to a central point with the ability to stop short of the center where the passes become dense. Radial Lace Cut allows upwards only, downwards only or zigzag machining options, providing complete control.

Lace Cut - Spiral

The Spiral Lace Cut toolpath has only one start and one finish point and the tool remains on the part eliminating any redundant moves or sharp direction changes. The focal point of the cut is located automatically or can be determined by the user. The spiral toolpath will enable the machine tool to run at very high feedrates as it eliminates the acceleration and deceleration caused by sudden changes in direction.

N Curve Flow

N Curve Flow machining controls the toolpath using flow boundaries and trim curves. Passes flow across the surface in a near-parallel formation morphing continuously between the flow boundaries. User controls for machining along or across, upward or downward, and unidirectional or back and forth provide excellent control of the toolpath.

Constant Stepover Cut

Constant Stepover toolpaths provide a consistent surface finish independent of the shape or slope of the part. 3D passes are created equidistant from each other across the surface of the part. One toolpath will finish the entire area, keeping the tool on the surface, minimizing retract movements and eliminating duplicate passes. Since the stepover is smoothly adapted to the shape of the part, loading of the tool will be consistent, enabling the machine tool to run at an optimal feedrate.

Steep Shallow Cut

A combination of machining methods is excellent for finishing steep and shallow areas in one process. This strategy allows steep area Machining using constant-Z passes and shallow area machining with 3D constant stepover passes. This strategy operates as a one-stop finishing toolpath.

Curve Projection

A finish toolpath is created by projecting the cutter onto the part and following a single curve or set of curves to produce a precise toolpath. This is perfect for engraving text or chamfering along a profile or a mold tool runner detail. Negative machining thickness can be used to machine at a constant depth below the surface being machined.

Intersection and Intersection Rest

The Intersection process creates a single pass along internal corners and fillets. This “pencil milling” technique is used to finish cusp marks left from prior operations. The Intersection Rest process generates multiple passes on either side of the intersection, machining from the outside in, creating an exceptional surface finish.

Addressing Your 3D Machining Requirements

With demands for shorter lead times, reduced production costs, and improved product quality, high speed machining is becoming more widely adopted in machine shops throughout the world. GibbsCAM SolidSurfacer including Advanced 3D with High Speed Machining provides the power and flexibility to meet these demands with optimized CNC programs even when cutting hard materials. At the same time, many of these strategies can improve the productivity of older CNC machines by reducing air cutting, and creating smooth toolpaths maintaining continuous machine tool motion. However challenging your 3D machining needs may be, the GibbsCAM SolidSurfacer option will help you to succeed.

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