

# NC Polaris



*The NC Polaris Expert NURBS Cutter Extension is designed for high-end 3D machining applications for the Mold and Die industry. 3D toolpath can be generated directly from 3D Solids or NURBS Surfaces created in Autodesk Mechanical Desktop<sup>®</sup>, or imported from other CAD systems. All 3D toolpath calculations support Ball, Bull, and Flat End Mill Tools.*

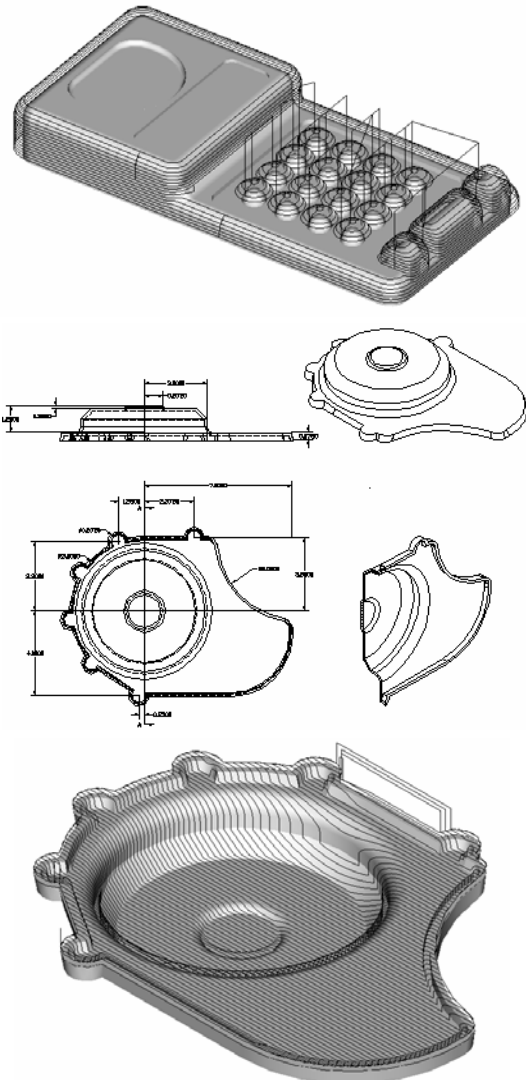
## World Class CAD/CAM

The NC Polaris Expert NURBS Cutter Extension is totally integrated inside Autodesk Mechanical Desktop (AMD) providing you with true CAD-CAM. Solid modeling and NURBS surface technology found in AMD has made 3D modeling of complex parts easy and affordable. The NC Polaris Expert NURBS Cutter Extension adds high-end 3D machining to the solution. The ultimate programming system configuration for 3D machining includes the combined power of both CAD and CAM.

The Autodesk Mechanical Applications Initiative (MAI) program has brought together the “best of breed” developers to address MCAD industry needs. NC Microproducts is proud to be a member of this distinguished group of suppliers. Other MAI members offer additional MCAD related solutions such as FEA, Mold Flow Analysis, Motion

Analysis, Design Aids, and more. These additional MCAD packages all operate seamlessly with each other. No single supplier CAD or CAM system can compare with the world class capabilities found by combining MAI partner solutions with AMD.

After a design is complete, the model is generally scheduled for CNC machining. The resultant physical model to be machined might be a finished part, or a Mold that will be used to create multiple parts. In either case the 3D machining solution must be capable of producing toolpath from the 3D solid, or the underlying NURBS surfaces. The ability to vary stock allowances by individual surfaces in the model greatly simplifies the part programmer’s task. This powerful feature is unique to the NC Polaris Expert NURBS Cutter Extension.



# Manufacturing Reality

## 3D Machining Requirements

The CNC part program must reflect the exact CAD representation. Various materials or cutting strategies require 3D machining support using Ball, Bull or Flat End Mill Tools. The CNC programming software must be able to automatically calculate gouge free toolpath directly from the 3D Solid model, or from NURBS surfaces, using any one of the three tool types. A multitude of toolpath strategies for roughing and finishing are required to enable fast efficient machining. The ability to recognize and act on individual surfaces to accommodate variable stock allowances on different surfaces as well as provide surface containment of toolpath is critical in 3D machining for mold applications.

## Integrated Solution

The part programmer requires maximum flexibility while preparing a CNC program. An integrated CAD and CAM solution provides the benefits of both CAD and CAM in one system. Total integration also removes the potential of lost data caused by translators. The learning or start up time is dramatically reduced because both CAD and CAM use a common interface.

The combination of the NC Polaris Mill and Expert NURBS Cutter Extensions is a complete CNC programming solution that satisfies the most demanding Mold and Die shops. This unique combination provides comprehensive machining strategies for 3D Solids and/or surfaces. 3D machining, drilling, profiling, pocketing, and direct cutting of ACIS Extruded Models is provided. The entire tooling process is performed inside AMD, directly on the model.

## Expert NURBS Cutter Features

The Expert NURBS Cutter is rich in 3D machining features using a Ball, Bull or Flat End Mill Tools. All toolpath created by the Expert NURBS Cutter is gouge free on the most complex models, without operator intervention. Toolpath can be created directly using the Solid model or on NURBS surfaces.

The Expert NURBS Cutter incorporates a multi threaded Windows Open GL application called *NCSurfer* to calculate and display toolpath while simultaneously creating NC code. *NCSurfer* can be run in real time or in batch mode for overnight operation.

## Roughing

Roughing is accomplished using any one of six (6) methods provided with the Expert NURBS Cutter: three vertical (XZ-YZ) roughing algorithms and three horizontal (Z Level) roughing

algorithms. Horizontal (Z-Level) roughing approach macros accommodate ramping or selective plunge points.

## Finishing

Finishing can be accomplished using horizontal (XY), vertical (any angle), flow-line, or spiral toolpath motions. All finishing toolpath motions can be controlled using fixed stepover or constant scallop height control. Constant scallop height finishing toolpath practically eliminates the need for hand polishing.

## Surface Containment

Surface containment control of toolpath can be applied to any toolpath strategy. Containment surfaces are fully protected against gouging. Containment surface(s) machining provides flexibility for mold makers not found in systems that employ polyhedral mesh surface representation.

## String Containment

2D polylines, or 3D surface edge extracts can be used to contain toolpath. Multiple strings are allowed.

## Re-machining

Re-machining strategies include, intersect or pencil milling, vertical and horizontal rest cutting (automatic finding and removing material left by larger tool or machining strategy), and cross cutting (to remove scallops on steep surface areas). 90 degree intersect cutting makes perpendicular toolpath of any length at all surface intersections.

## Flow Cutting

Flow line cutting can be accomplished parallel or perpendicular to open flow lines. Closed flow line parallel cutting can be zig-zag, unidirectional, or spiral toolpath. Perpendicular closed flow line cutting can include control lines to maintain perpendicularity on filleted corners.

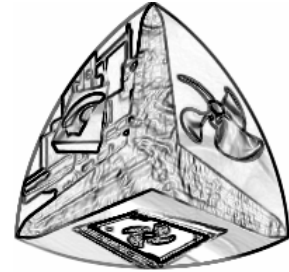
## Project Cutting

2D polylines can be projected onto the surface of the model for 3D groove cutting or engraving. Constant tool depth measured normal to the model surfaces or straight down in the Z axis are controlled by the user.

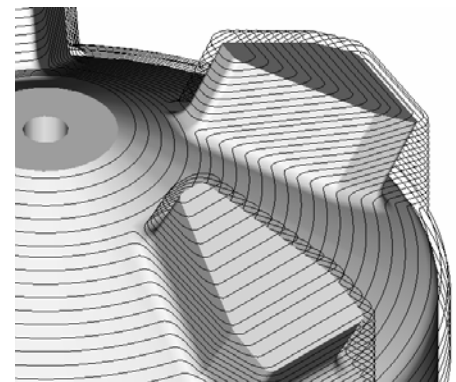
## More-More-More

The Expert NURBS Cutter Extension contains features beyond those mentioned here. Contact your local NC Polaris dealer for a demonstration.

## Expert NURBS Cutter

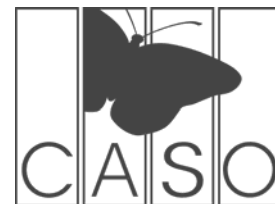


## Extension



*Look-down protects back cut areas for all machining strategies. XY constant scallop finishing*

For More Information:



**CASO GmbH**

WORLDWIDE SALES AND SUPPORT

Montgelasstr.13  
D-83109 Grosskarolinenfeld  
Germany  
TEL: +49(0)8031-356380  
FAX: +49(0)8031-382558  
EMAIL: info@ncpolaris.de  
<http://www.ncpolaris.de>

**autodesk**  
authorized reseller