

Pro|ENGINEER[®]

COMPLETE NC MACHINING

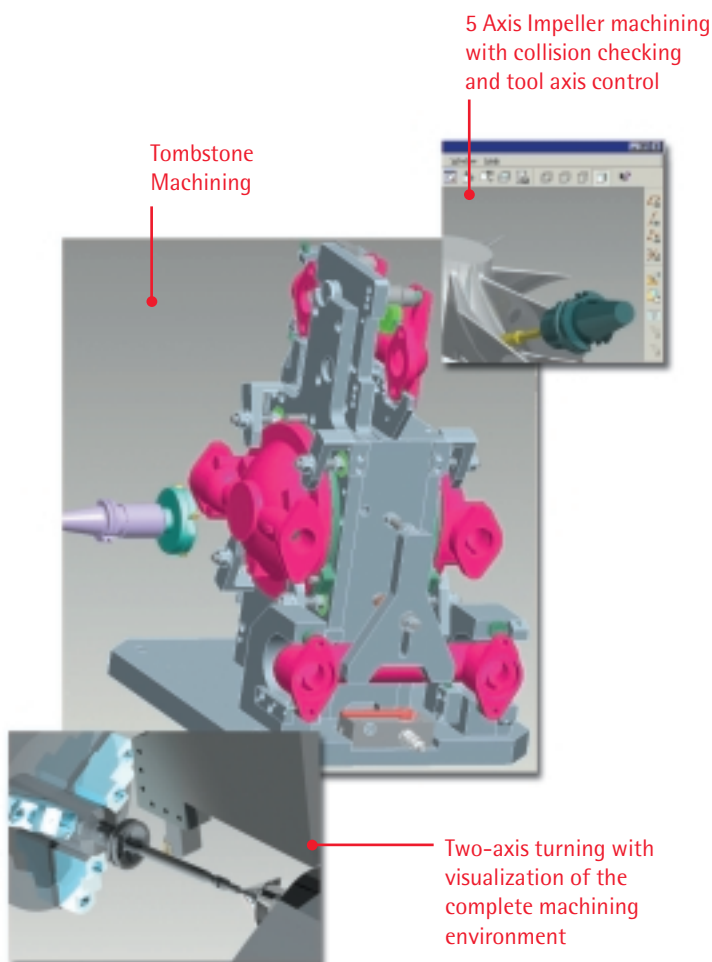
Pro/ENGINEER Complete NC Machining provides manufacturing engineers and job shops with the most powerful and comprehensive package of NC programming capabilities and tool libraries available, enabling users to easily create an unlimited variety of programs for CNC machines.

With Pro/ENGINEER Complete NC Machining, manufacturing engineers can work concurrently with designers to automatically incorporate design changes. This collaboration dramatically increases product quality, reduces scrap, and shaves production time and costs.

Now you can have all the capabilities of PTC's industry standard NC Machining solutions—Pro/ENGINEER Production Machining and Pro/ENGINEER Expert Machinist—plus support for multi-axis milling machines and multi-axis lathes, in a single, comprehensive NC solution.

Key Features

- Supports three to five-axis milling, two and four-axis turning, two and four-axis wire EDM, and multi-axis mill/turns
- Includes the 2¹/₂-axis, feature-based machining capability of Pro/ENGINEER Expert Machinist
- Extends the full associativity of Pro/ENGINEER Foundation into manufacturing
- Eliminates the inaccuracies and inconvenience of exporting Pro/ENGINEER geometry to third-party machining software
- Features a best-of-breed programming system for families of parts having many variations of the same basic design
- Reduces or even eliminates physical part program prove-outs by simulating the process of material removal on NC machines
- Enables users to efficiently develop and refine the most demanding geometry and free-form surfaces
- Includes Pro/NC-GPOST, enabling users to create and update post-processors for any type of CNC machine



Complete NC Machining

Key Capabilities

- Graphic toolpath generation
- Data Import that supports IGES, STEP, VDA, DXF
- Works with imported data as well as Pro/ENGINEER solid data
- Tooling library with feed, speed, and cutting conditions based on material
- Tool gauge checking with all tool shapes: end mill, ball mill, bull nose, tapered
- Ramping, plunging or helical tool entry and exit
- Automatic shop floor documentation: tool setup, part setup, and process documentation
- Drag-and-drop re-ordering of toolpaths
- Design modifications automatically propagate to machining
- Family parts machining: program once and propagate to all instances
- Toolpath editing and manipulation
- Support for subroutines
- Cutter radius compensation
- Tool length compensation
- Multiple fixture offset control

Two-Axis Milling

- Feature-based milling: face, slab, pocket, through pocket, step, profile, channel, slot, through slot, boss top, flange, O-ring, rib top, chamfer, round, undercut, entry hole, hole pattern
- Freehand machining
- Four-axis and five-axis indexing and tool positioning
- Tombstone machining
- Capture machining processes and strategy
- Thread milling
- Automated hole-making

Three-Axis Milling

- Roughing: Z level, plunge milling
- Re-roughing: by previous tool, corner picking, flat surfaces
- Finishing: Z level, parallel planes, isolines, cutlines, projected
- Rest milling
- Pencil tracing
- Engraving

Wire EDM

- Two-axis contouring with advanced conics
- Non-planar four-axis YXUV and XYQR with manual and auto-synchronization
- No-core cut pocketing
- Support for multiple rough and skim cuts
- Support for glue stop and technology changes in cut

Turning

- ID, OD, and face area turning
- ID, OD, and face grooving
- Hole-making cycles
- Automatic update of in-process workpiece
- Dual turret four-axis synchronization
- Standard and custom threading
- Support for solid tools
- Multiple spindle machines
- Live tooling, mill/turn "C" and "Y" axis support

Integrated NC Simulation

- Solid toolpath simulation
- Multi-window display
- Automatic error detection
- Ability to "slice" model to view inside part

Multi-Axis Milling

- Multi-surface, five-axis machining: conventional, isolines, and cutlines
- Five-axis helical cutline machining for high-speed cutting
- Five-axis swarf milling
- Five-axis hole-making
- Support for lead and tilt angles
- Advanced tool axis control
- Tool axis containment with pivot curve and pivot axis

High-Speed Machining

- Specialized roughing and re-roughing strategies: constant load, optimized retract pocket, etc.
- Slope-based finishing
- Helical spline approaches and exits
- High-speed, friendly connections
- Superb surface quality

NC Post-Processing

- Integrated in Pro/ENGINEER Complete NC Machining
- Graphic NC post-processor generator
- Tangential arc-fitting
- NURBS-based CNC machine tools
- Interactive, online, context-sensitive help
- Extensive library of machine tools and CNC controls

