

Passion | Vision | Commitment | Power | Performance | Value

*The most powerful CAM software ever.*



The Right Choice

**ESPRITMOLD**

DP Technology is a leading developer and supplier of computer-aided manufacturing (CAM) software. DP Technology's Commitment to provide CNC programmers with the most powerful CAM software ever is driven by a founding Vision of technology's potential, and an enduring Passion for excellence. These core values are embodied in DP Technology's flagship product, ESPRIT—the world's leading CAM system.

# *Discover the Advantages*

DP Technology reinforces its commitment to technical excellence by dedicating nearly 20% of its annual revenues to ongoing research and product development. This long-term focus has produced powerful technology innovations, putting ESPRIT in an industry-leading position since its market launch in 1985.

DP Technology maintains its worldwide headquarters in Camarillo, California and product development teams in California and Florence, Italy. Sales and support operations are located in Europe, Asia, and North and South America. For additional information about DP Technology and ESPRIT, call +1-805-388-6000, send an email to [esprit@dpotechnology.com](mailto:esprit@dpotechnology.com), or visit the company website at [www.dpotechnology.com](http://www.dpotechnology.com).



ESPRIT Mold™ is an automated, easy-to-use, robust and powerful 3-axis and 5-axis CAM system. Utilizing knowledge of in-process stock, remaining material, and integrated simulation and verification ESPRIT Mold delivers fast, safe and reliable programming for a wide variety of 3D machining applications.

# *Experience the Freedom*

ESPRIT Mold™ is a member of the ESPRIT family of CAM software which also includes ESPRIT SolidMill™, ESPRIT SolidTurn™, ESPRIT SolidMillTurn™ and ESPRIT SolidWire™.

The high-performance ESPRIT family of CAM software offers powerful programming for any CNC machine tool. ESPRIT's full-spectrum functionality includes programming for 2–5 axis milling, 2–22 axis turning, 2–5 axis wire EDM, multitasking mill-turn machining, and B-axis machine tools. Streamline your operations with the powerful and flexible ESPRIT system, valued by CNC programmers for its ease-of-use, extensive suite of machining cycles, comprehensive tool control, and capacity to fully support an entire shop.

### **ESPRIT Mold 3-axis Machining**

ESPRIT Mold automatically manages the in-process stock model, allowing the user to combine milling strategies from 2 ½-axis to 5-axis for optimized tool paths. With 20 different milling strategies, ESPRIT Mold is one of the most complete and powerful CAM systems in the market.

### **Z Plane Concentric Roughing**

ESPRIT Mold has powerful and easy-to-use roughing functionality which includes an extensive set of high-speed cutting features such as: rounding of sharp angles and fluent step over with cordial feed to avoid straight paths, allowing climb milling in all situations. Most importantly the toolpath is optimized based on the results of the previous machining cycle(s), (the dynamic

of the model resulting in a constant volume (stock) of remaining material. During the rest machining a uniform volume of material is removed producing a constant cutter load which optimizes your ability to perform high-speed cutting. The optimized re-machining of ESPRIT Mold is achieved by always monitoring the in-process stock model to know where the remaining material is at all times, even when machining undercut areas or utilizing inclined (4 & 5 axes) cutting.

### **Z-Level Finishing**

High-speed Z-Level finishing cycles available in ESPRIT Mold generate passes of variable height in support of a constant scallop height producing a high-quality finish on your work piece. This machining strategy is optimized

# *ESPRIT Mold 3-axis Machining*

*An easy-to-use, fast and reliable tool used by thousands of companies throughout the world in the production of models, prototypes, injection molds, die casting molds and sheet metal molds.*

in-process stock model), eliminating any “air cutting” and minimizing retract movements.

You can choose to calculate toolpath from outside to inside (collapse) or vice versa (expand). A wide range of approach/retract positions complete this module, which is one of the most outstanding features of ESPRIT Mold.

### **Roughing Re-Machining**

The rest roughing capabilities of ESPRIT Mold enable the re-machining of previously cut areas

by levels and by zones with smooth circular approach movement and fluent stepovers. The Z-Level zigzag strategy offers faster cycle time and the best quality along vertical walls. This finishing cycle optimizes the tool path by rounding internal sharp edges for high-speed cutting (HSC) and providing G-Code output utilizing G2/G3 circular interpolation whenever possible.

### **Rest Material Machining**

ESPRIT Mold’s ‘on air’ technology for approaches and links of the toolpath is applied to optimize the cycle times for rest material machining. Vertical edges are machined by

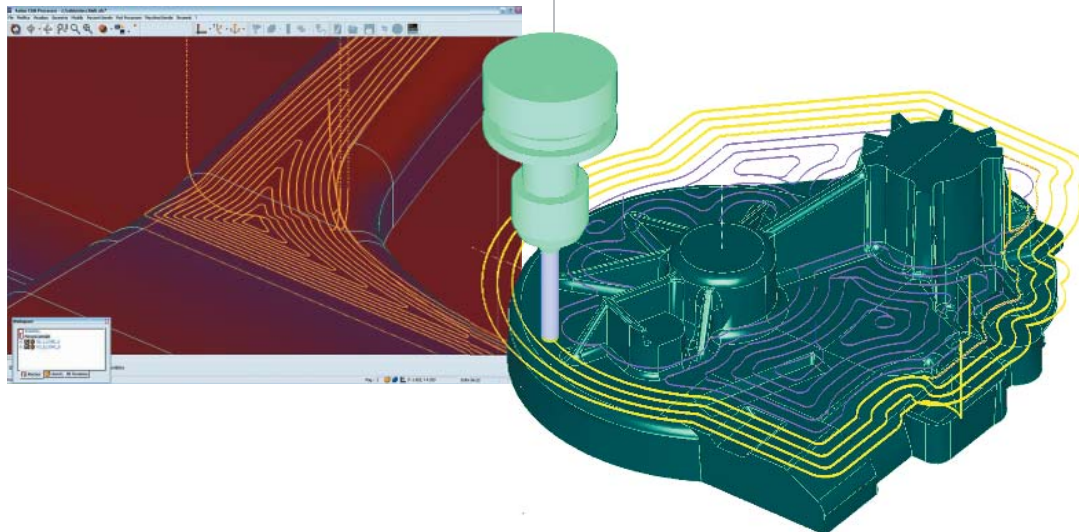
Z-plane tool motion and the planar edges by constant 3D step concentric paths. The calculation of bi-tangency limit curves is optimized to produce fluent and continuous toolpath. On horizontal edges, the Clean strategy generates progressive and constant removal of the rest material.

### Planar Zone Re-Machining

Combined with the Z-plane contouring, the planar zone re-machining produces excellent results even on the most complex parts. Zigzag or concentric toolpaths are available and the clearance distance from walls is independently controlled and may be different than clearance used with respect to the stock.

### Concentric Milling with a Constant Stepper

In this finishing strategy ESPRIT Mold produces toolpath inside a closed curve, avoiding any number of islands. With this cycle's constant 3D stepover ESPRIT Mold produces uniform milling of multiple complex surfaces with a single machining operation. Sharp angles within the toolpath are rounded, and the steppers are fluid to allow high-speed cutting.



### Combined Strategies

Combine several ESPRIT Mold machining strategies to optimize the machining techniques applied to the work piece, reduce cycle time, improve part quality and minimize tool wear. For example, radial or spiral finishing strategies combined with constant 3D step concentric milling provides higher machining speed, superior surface quality, longer tool life and optimization of cutting parameters.

### Milling between Two Curves

Use ESPRIT Mold's Two Curve machining strategy to clean mold areas with fluid toolpath motion, even for concave or convex edges. Simply select two curves on the mold and the material between those two curves is removed while respecting any stock allowance and the work piece surface(s). The initial stepover is calculated from the maximum distance between these two selected curves. Should the curves have a very different shape, a simple interactive graphic tool is provided to allow nodes on the curves to be synchronized.

## ESPRIT Mold 3-axis Specifications

CAM for simultaneous 3-axis milling with

- Fast calculation and repeatability
- Management of machining limits
- Constant scallop heights
- Rounding of internal edges for high-speed cutting
- Rounding of sharp angles and fluid stepovers
- G-code output with circular interpolation G2/G3
- Z-plane roughing
- Roughing rest material re-machining
- Parallel plane milling
- Contour finishing
- Radial milling
- Spiral milling
- Planar area re-machining
- Bi-tangency pencil tracing
- Bi-tangency rest material re-machining
- Surface contouring and engraving
- Surface drilling
- Concentric milling
- Two-curve milling

### Complete Security

All rapid movements between machining zones, even with different index angles, are automatically generated collision free with respect to the in-process stock.

### State of Art in 3+2 and 5-axis Machining

A few years ago 5-axis machining was considered a mysterious and unexplored process used primarily in the aerospace industry. Today, moldmakers understand using multi-axis machines will improve part quality, decrease costs, and eliminate time consuming setups that traditionally require highly skilled operators.

ESPRIT Mold meets the challenge of making 5-axis technology accessible to everyone by focusing on the automatic generation of optimized 5-axis toolpaths. As a result of the

ESPRIT. The 3+2 product provides an innovative simple approach to managing the travel limits of the machining and an easy-to-use method to control the tool inclination and indexing angles. The automatic definition of the approach and retract movements between the machining zones with different indexing angles is complete with comprehensive collision avoidance.

### Trim APL

The Trim APL function of ESPRIT Mold optimizes any 3-axis toolpath, minimizing the required tool length by indexing the part (inclining the cutting tool). By reducing the tool length, the rigidity of the tool assembly is greatly increased. The use of the Trim APL function results in the ability to run the machine at greater speeds (high-speed machining) and produces significant improvements in the resulting part quality.

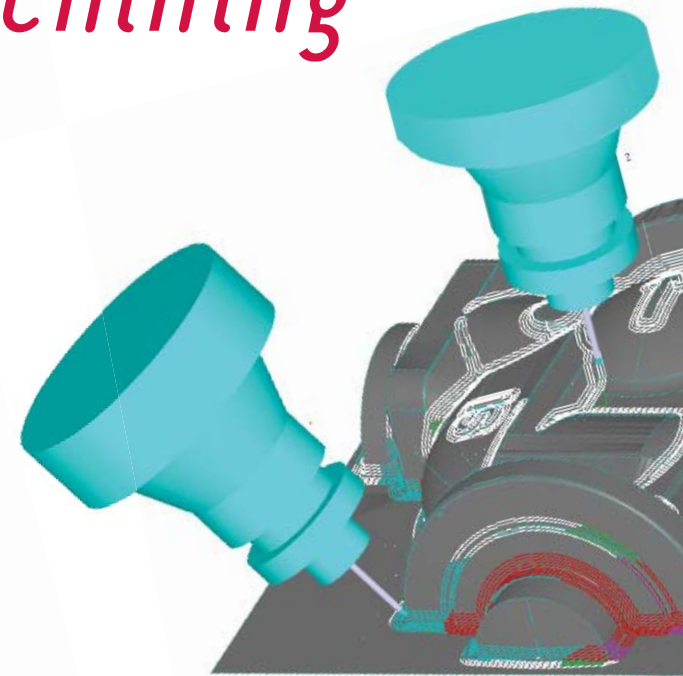
# ESPRIT Mold 3 + 2 Machining

*Optimized machining for improved surface finish utilizing A and B axes to incline the cutting tools. The use of shorter, more rigid cutting tools and direct machining of undercut areas is therefore possible.*

close coordination of ESPRIT with today's machine tools, the product is easy-to-use, even for the novice programmer or machinist. Users have confidence in the resulting G-code programs due to the consistent and reliable results the software produces, along with the built-in 5-axis solid simulation and verification system.

### ESPRIT Mold 3+2 features

The ESPRIT Mold 3+2 adds 5-axis positioning capability (inclined cutting tools) to all of the 3-axis machining strategies available within



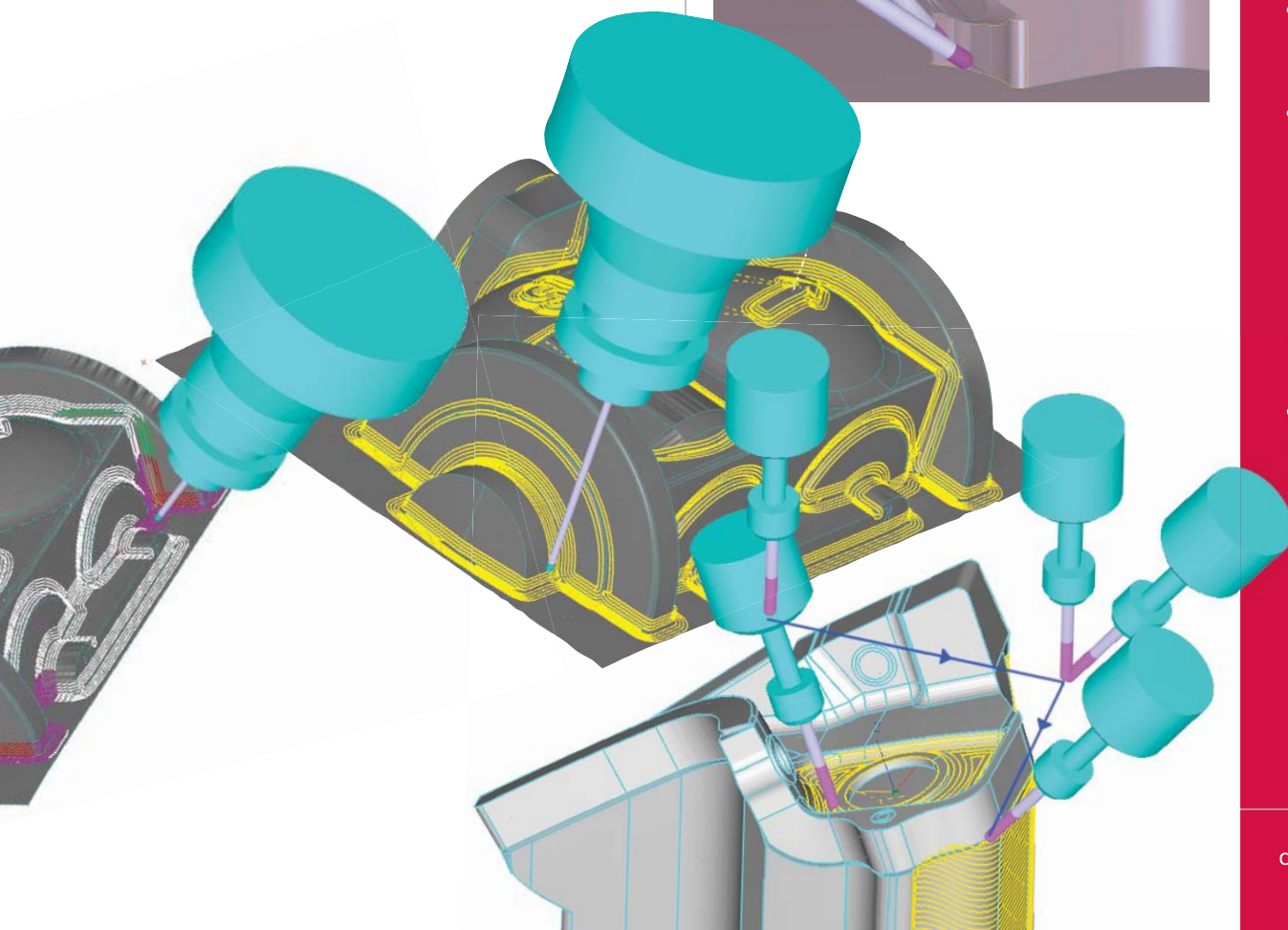
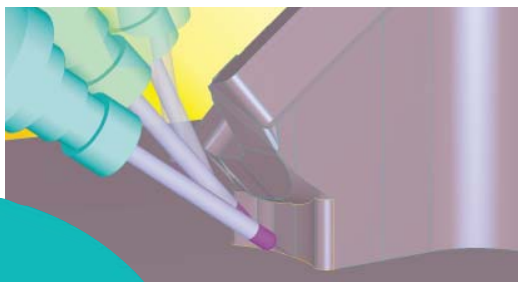
With ESPRIT Mold a previously calculated 3-axis tool path is automatically converted into an optimized 5-axis tool path. Trim APL automatically produces a set of possible tool axes (index positions) and then automatically subdivides the original tool path into several different tool paths, each machined with a different optimum 4<sup>th</sup> and 5<sup>th</sup> axis index position.

After a pre-calculation, the original tool path is redrawn with various colors, each associated to a different tool inclination. This display provides a clear understanding of which portions of the tool path will be machined with the different index angles, and if any zone is unreachable. From this preview, the user can accept the

proposed solution or introduce additional tool axis inclinations or varied tool lengths.

#### Removal of Residual Material in Undercut Areas

Roughing operations are now simplified thanks to the execution of any 3-axis operation with tilted tool axis on a continuous 5-axis machine. This allows for the removal of residual material in traditional undercut areas with automatic rest material roughing provided by ESPRIT Mold.



### ESPRIT Mold 3+2 Specifications

CAM for simultaneous 3-axis milling with 4<sup>th</sup> and 5<sup>th</sup> axes indexing

- All ESPRIT Mold 3-axis machining cycles with 4<sup>th</sup> and 5<sup>th</sup> axes indexing
- 3+2 machining with in-process stock for automatic collision avoidance
- Trim APL automatic conversion of 3-axis tool path into 5-axis for optimal tool lengths
- Automatic definition of approach and retract movements in 5-axis
- Simplicity in the definition of the index angles:
  - by direct angle specification
  - by the actual view angle
  - along a hole axis
  - normal to a face belonging to the part
- Easy-to-use management of the travel limits of the machining and indexing angles.

### 5-axis Contouring

The tool follows a curve keeping its axis perpendicular to the model surface. A lateral slope with respect to the feeding direction can also be specified.

### 5-Axis Ruled Swarf Cutting

ESPRIT Mold's 5-axis swarf cutting strategy utilizes the side of the cutting tool to machine tilted walls. This classic 5-axis strategy has been enhanced by ESPRIT Mold making it more suitable to a wider variety of part geometries by allowing the toolpath to contain several steps along the walls. In each case, the tool's 4<sup>th</sup> and 5<sup>th</sup> axis positions are automatically determined from the selected walls as the tool moves around the work piece.

resulting tool path utilizes rigid tooling to produce superior work pieces in shorter cycle times.

### 5 Axis Trimming

A specific module for automatic cutting of excess material in thermoplastic products.

### Regional

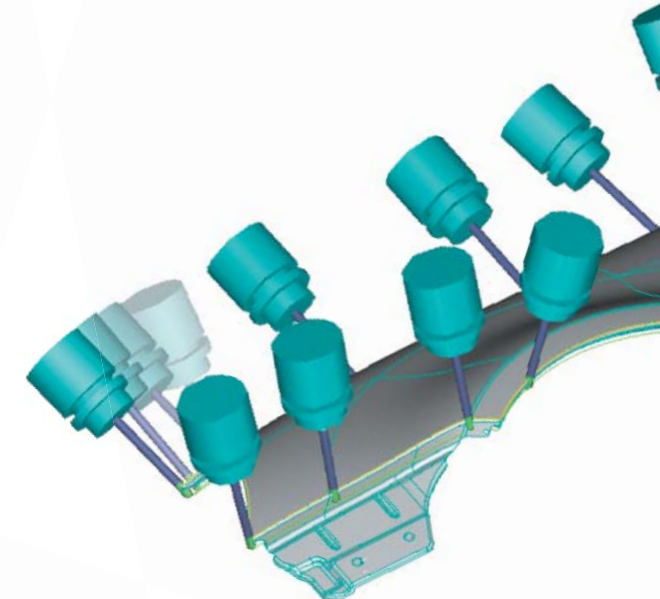
The ESPRIT Mold Regional strategy is an extremely flexible way to machine a part utilizing a drive surface to control the tool orientation. The selected drive surface determines the 5-axis orientation of the cutting tool, the feed directions and cutting patterns while the cutting tool actually cuts on the surface of the part. The drive surface can be imported from an external CAD file, defined inside ESPRIT Mold, or be one of the surfaces of the part model. By using

# ESPRIT Mold 5-axis Machining

*A rich set of functions helps you take profit from the latest 4- and 5-axis machine tools, while continuing the legacy of easy of use.*

### Automatic Continuous 5-Axis

ESPRIT Mold offers the benefit of automatic, continuous 5-axis machining to maximize part quality and cutting speeds while reducing cycle times. This feature works in a similar fashion to 3+2 and Trim APL but produces continuous 5-axis output. ESPRIT Mold's automatic 5-axis takes any 3-axis tool path (Z level contour finishing, roughing or re-machining, etc.) and automatically converts it into a continuous 5-axis operation. The resulting toolpath has a continuous 5-axis motion, automatically tilting the tool as needed to avoid head, toolholder and tool collisions with the in-process stock. All this is accomplished while machining parts of any complexity with limited tool lengths. The



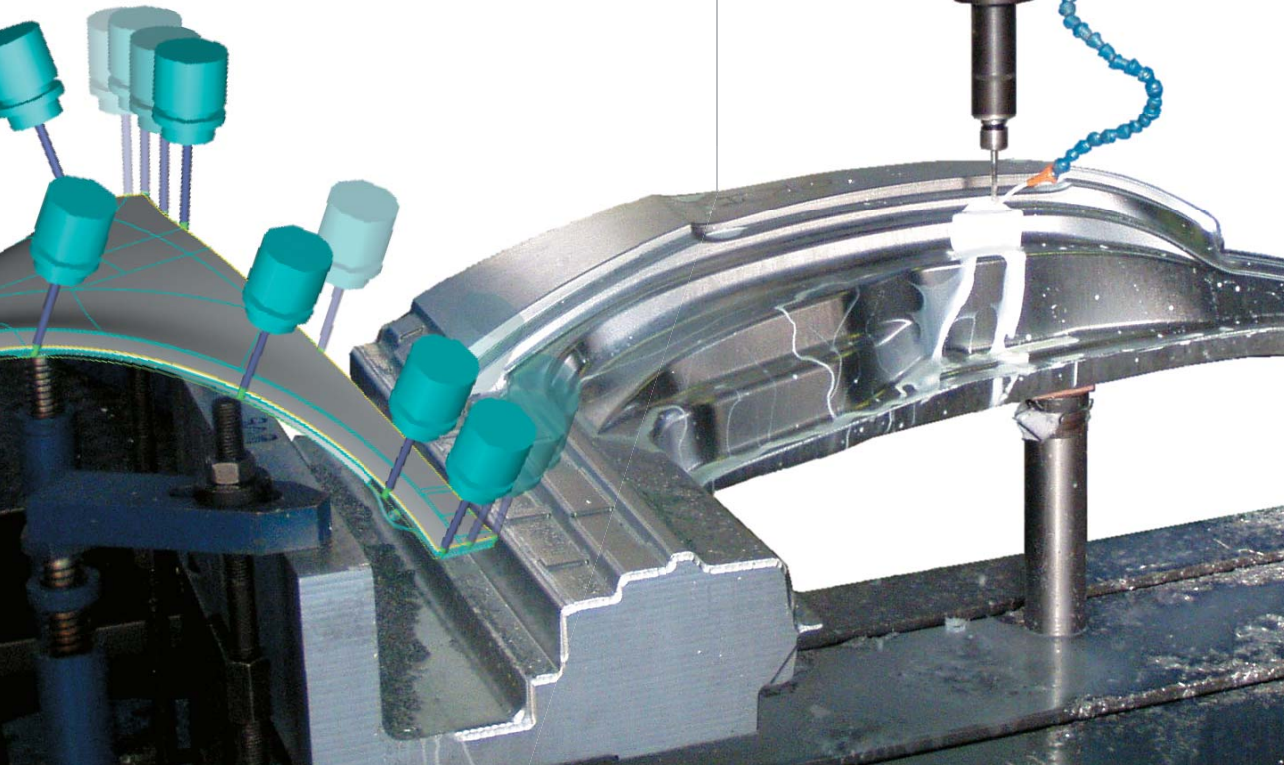
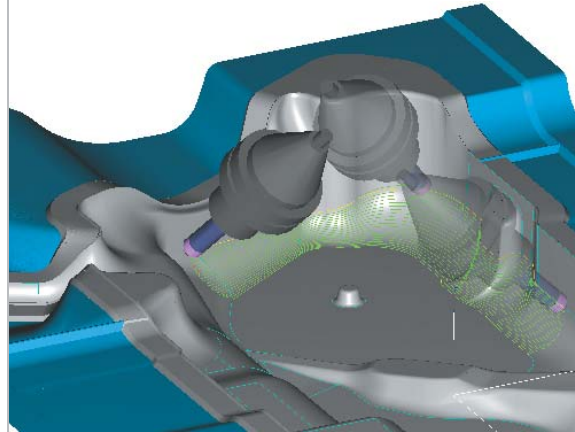
additional options, such as tool angle control, this machining strategy becomes very powerful, while remaining simple and intuitive to use.

#### Drill Cycle

ESPRIT Mold's strategies for 5-axis drilling (hole making) look at the set of holes and calculate the most optimum sequence. Most importantly, the program automatically calculates the approach and retract movements in a continuous 5 axis motion, complete with collision avoidance.

#### Thru Point

The Thru Point strategy is very powerful for machining deep cavities and other regions that may have undercuts, allowing milling on parts that would otherwise require secondary EDM operations utilizing electrodes. This is accomplished by allowing the tool and holder to pivot through a point in space while machining the work piece.



### ESPRIT Mold 5-axis Specifications

CAM for simultaneous 5-axis milling with

- Fast calculation and repeatability
- Management of machining limits
- Constant scallop heights
- Rounding of internal edges for HSC
- Rounding of sharp angles, and fluid stepovers
- G-code output with circular interpolation G2/G3
- Ruled Swarf Cutting
- 5-axis Contour milling
- Regional machining
- 5-axis drilling
- Automatic 5-axis milling

Dry runs are rendered in a dynamic solid simulation of the complete machining environment: machine tool, fixtures, stock, and workpiece with “as-machined” versus “as-designed” part inspection.

#### **Machine any Part Geometry**

ESPRIT Mold’s seamless CAD to CAM interface directly imports any part model from virtually any source, fully intact, with no need for programmers to edit or rebuild geometry. By directly machining your original part geometry ESPRIT Mold provides fast, reliable and safe 3-axis and 5-axis programming.

#### **Cutting Tool Library**

Tool holders of any shape can be defined by using a simple, but powerful, graphic editor. Once the tool holder is defined it can be associated

#### **Automated Collision Avoidance**

ESPRIT Mold monitors your toolpath for collisions between the tool holder and part geometry zones. Guess work is eliminated since ESPRIT Mold automatically suggests a new length for the tool holder should a collision be detected. You can easily machine to very deep zones by positioning the tool at an inclined angle and using Collision Check feature.

#### **High-Speed Cutting**

High-quality part finishes and extended tool life are the result of ESPRIT Mold’s high-speed cutting technology. ESPRIT delivers smooth tool motion with fluid links between passes, constant cutting loads, and rounding of all sharp corners. ESPRIT also optimizes the point density along the toolpath taking the maximum advantage of the machine dynamics.

# *Easy-To-Use and Powerful*

*ESPRIT Mold is an automated, easy-to-use, robust and powerful 3-axis and 5-axis CAM system.*

*The ESPRIT family of CAM systems also includes ESPRIT SolidMill™, ESPRIT SolidTurn™, ESPRIT SolidMillTurn™, and ESPRIT SolidWire™.*

to the tools existing inside a tool library, where you can define the cutting parameters for the materials. Operating on this simple premise, save time by associating these tool libraries to machining centers or milling machines. You’ll have complete and flexible management of any type of tool, including those with special profiles suitable for high-speed cutting.

#### **Universal Post Processing**

ESPRIT’s universal post processor creates the high-quality G-code needed to fully exploit your machine tool investment. ESPRIT provides proven out-of-the-box operation with a library of pre-defined post processors. Additionally you can easily adjust any post processor to suit your personal preferences and shopfloor requirements. Spend more time cutting parts, maximize machine utilization and optimize part quality at the lowest possible cost with ESPRIT.

#### **In-Process Stock Models**

ESPRIT Mold significantly shortens cycle times and automatically generates optimized error free retract movements by always considering the in-process stock model (remaining/rest material).

This precise model is continuously updated for all movements of the tool as they are generated, even in undercut areas, regardless of the tool's orientation. The initial stock can be defined automatically from the original part geometry or imported from a separate data file.

### Toolpath Management

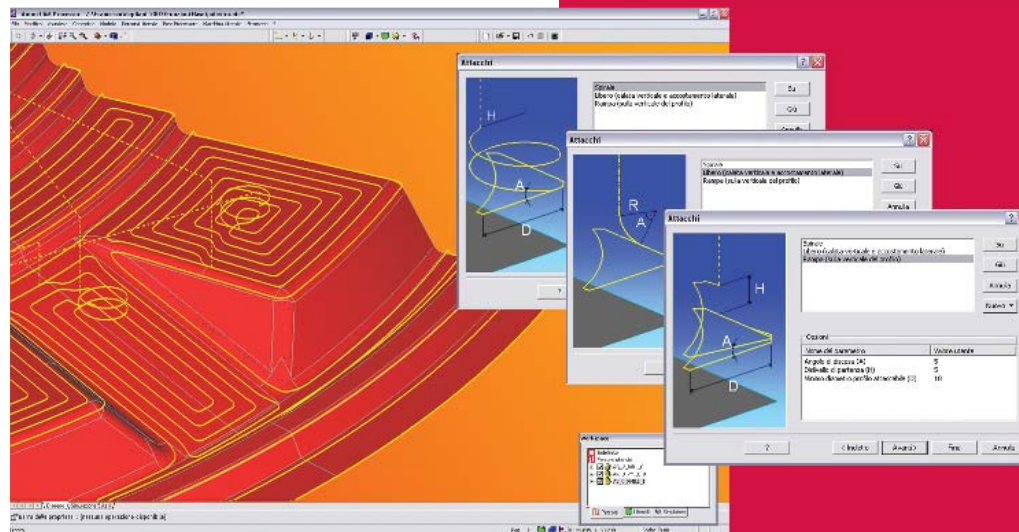
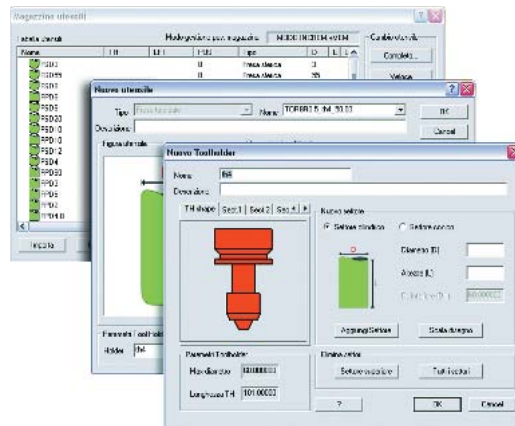
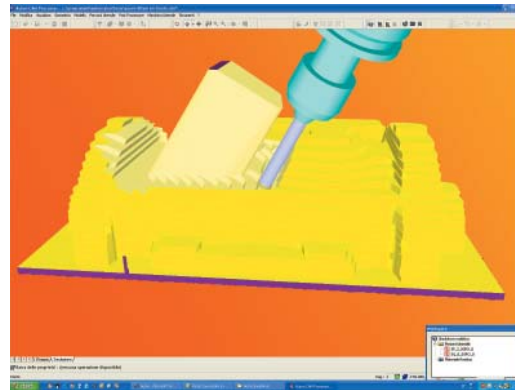
ESPRIT Mold displays each toolpath with its associated machining parameters in a clear, concise user interface called a tree, which allows quick viewing and editing. It's easy to view each individual toolpath as a "leaf", with related operations as "branches". Simply select the "related leaf" on the toolpath tree to manipulate or activate machining processes such as: cutting, copying, renaming, translating, and rotating the toolpath and g-code output.

### Simulation and Verification

The realistic simulation and visualization generated by ESPRIT Mold renders the complete cutting process with life-like realism, including all toolpaths, inclined or indexed, from 2 to 5-axis. The simulation is not limited to a simple graphical effect, but provides the advance detection of any unreachable axis position, or collision of the machine's moving parts, the tool and its holder, and the part being produced.

### Report Generator

Streamline your workflow processes with custom generated HTML reports from ESPRIT Mold. Viewable within a standard web browser, the reports are complete with the machining processes, description, setup positions, and graphic representation of your part. By using the power of the internet, these reports can be transferred and accessed within your internal business network, maximizing both internal and/or external communication.



**ESPRIT Mold is an automated, easy-to-use, robust and powerful 3-axis and 5-axis CAM system.**

- Machine any Part Geometry
- Automated Collision Avoidance
- High-Speed Cutting
- Cutting Tool Library
- Universal Post Processing
- In-Process Stock Models
- Toolpath Management

DP TECHNOLOGY CORP.

Corporate Offices  
1150 Avenida Acaso  
Camarillo, CA 93012  
USA

Tel: (805) 388-6000  
Fax: (805) 388-3085

[esprit@dptechnology.com](mailto:esprit@dptechnology.com)  
(800) 627-8479

European Headquarters  
"Le Thèbes"  
68 Allée de Mycènes  
34000 Montpellier  
France

Tel: +33 4 67 64 99 40  
Fax: +33 4 67 64 99 41

[dptechnology.fr](http://dptechnology.fr)

Midwest USA:  
1001 E. Touhy Ave  
Suite #300  
Des Plaines, IL 60018

Tel: (847) 297-8100  
Fax: (847) 297-8107

DP Germany  
Sommerleite 1  
D-96 148 Baunach  
Germany

Tel: +49 9 54 49 80 3 53  
Fax: +49 9 54 49 80 3 54

[dptechnology.de](http://dptechnology.de)

East USA:  
8535 Cliff Cameron Drive  
Suite #112  
Charlotte, NC 28269

Tel: (704) 594-9551  
Fax: (704) 594-9802

DP Italy  
Via Iacopo Nardi 2  
50132 Florence  
Italy

Tel: +39 055 2342286  
Fax +39 055 2347858

[dptechnology.it](http://dptechnology.it)

DP Asia  
Aoyamada Building 902  
Shibuya 2-9-10, Shibuya-ku  
Tokyo, Japan 150-0002

Tel: +81 3 5485 1884  
Fax: +81 3 5469 1885

[dptechnology.jp](http://dptechnology.jp)



The Right Choice

[dptechnology.com](http://dptechnology.com)