

General Specifications

Each ESPRIT system is built upon a set of core functionality, as summarized in the Product Overview brochure. Beyond this you will add one or more components depending on your particular machining needs. Choose from among several milling, turning and Wire EDM components.

No matter how you put it together, ESPRIT is "The Right Choice!"

The following KnowledgeBase™ components are available for use with ESPRIT SolidMill—Traditional and Production; SolidTurn—Traditional and Production; and SolidMillTurn—Traditional, Production, and Advanced. ESPRIT for Milling, **SolidMill**, Turning, **SolidTurn**, Wire EDM, **SolidWire**, and Mill-Turn, **SolidMillTurn**, are covered in detail in separate brochures.

KnowledgeBase™

The ESPRIT KnowledgeBase™ is a "core" component of the ESPRIT CAM system. The KnowledgeBase™ utilizes Microsoft® SQL Server™ technology. While Windows is the operating system for the desktop, SQL Server is the "operating" system of choice for databases. The KnowledgeBase™ includes the following components:

- Designed for Microsoft® SQL Server™
- Includes Microsoft® SQL Server™ 2000 Desktop Engine (MSDE 2000)
- Scalable from single-user to multi-user across a workgroup or domain**
- Project Manager Feature Tab - organizing your work piece
- Project Manager Tool Tab - managing your cutting tools
- Project Manager Operation Tab - managing your machining cycles
- Process Manager - machine one or more part features with one or more machining cycle(s) in one simple step.
- Property Browser - providing extensive control over all cutting conditions
- Speed & Feed KB
- Cutting Tool Materials
- Part Materials
- Speed & Feed Calculator
- Adaptive Processes
- CUTDATA™* - the foremost machining database that contains over 100,000 feed and speed recommendations.

KnowledgeBase™ Advanced*

- Default KB – groups of user definable default settings providing user control over each machining parameter for each machining cycle.
- Default values
- Hidden versus Visible
- Locked versus Editable
- Captions
- Cutting Tool KB – a library of cutting tools
- Part/Feature KB – used to provide categorization of what is being cut
- Feature Types
- Keys & Values
- Variable Tables
- Process KB – stores machining parameters
- Rule/Expression Builder - control the adaptation of individual Processes to differing geometry

Notes: *Optional component **Multi-user: Microsoft SQL Server licensing must be purchased separately

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The most powerful CAM software ever.



The ESPRIT KnowledgeBase™ automates CNC programming of a work piece using a "Black Box" approach based on ESPRIT's "knowledge" of a shop's best practices, preferred methods and proven techniques. The result is a high degree of automation, quality, and consistency within the part programming process. ESPRIT's KnowledgeBase™ elevates the CNC programmer from programming individual parts to focusing on the larger picture of Process Planning, which is deciding what the best practices are. This transition has demonstrated productivity gains from ten to over one hundred fold.

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The ESPRIT KnowledgeBase™

Imagine a system that captures your shop's best practices as proven processes (your machining preferences for given types of parts). Now imagine a system with the ability to take these proven processes and adapt them to any individual geometry, part, or work piece. That is the ESPRIT KnowledgeBase™.

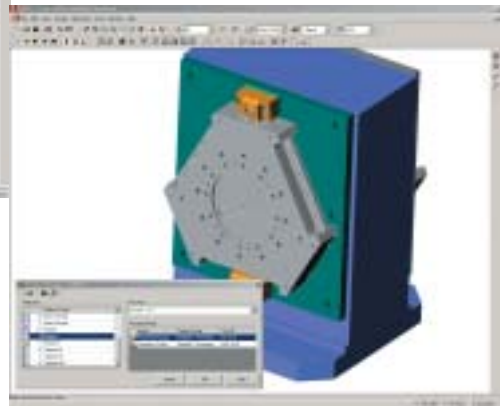
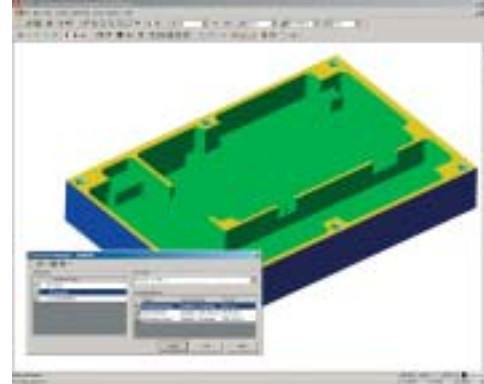
The results are significant improvements in both productivity and quality, along with an important shift in focus from tactical programming of individual parts to strategic planning to improve a shop's bottom line.

A Strategic Asset

A shop's strategic and competitive assets are the best practices and proven processes it employs to manufacture parts. Take advantage of these assets, while also protecting them by using the ESPRIT KnowledgeBase™. Improve your competitiveness by shifting the focus of your skilled CNC programmers from the repetitive job of programming discrete parts to the job of process planning, developing and improving your best practices.

Advanced Patent Pending Technology

The ESPRIT KnowledgeBase™ contains advanced Patent Pending technology. It is a non-intrusive learning system, designed to empower the CNC programmer by providing high levels of automation with minimal investments in time. For the first time a shop can achieve high levels of automation without the usual large, upfront investments.



Process Planning

Using ESPRIT, a CNC programmer decides how a given part/feature is machined by specifying the machining cycles, cutting tools, and machining parameters needed to create the tool path to machine the part. The KnowledgeBase™ provides a mechanism to manage these Processes by providing answers to questions like: What is the best known method to machine a given part? How were similar parts machined previously and what could be done to improve those processes? Each time a process in the KnowledgeBase™ is used to program a part it is refined in a continuous circular method, by retrieving what works and improving upon it.

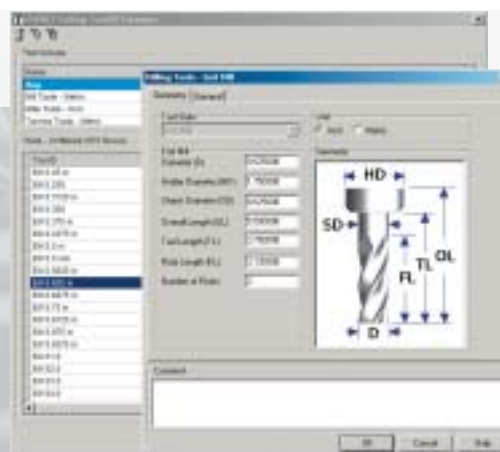
Adaptive CAM Software

When a KnowledgeBase™ machining Process is applied to an individual part it will adapt to the given geometry, selecting the specific process steps (machining cycles), cutting tools, and machining parameters to be used. The programmer does not need to rely on his memory to recall what worked last time; this information is known by the KnowledgeBase™. A shop's best practices are always readily available for any CNC programmer to use.

While associative systems are capable of updating tool path based on revisions to geometry within a given part, ESPRIT's Adaptive system extends this concept across part families and even to similar features of completely unrelated parts. More importantly, an adaptive system stores the processes independently of the part geometry and will update cutting tools, machining cycles, and machining parameters as necessary to accommodate any given geometry.

Adaptive Processes

As an example let's specify a couple of rules for machining slots: the cutting tool must be 75% of the slot width, and the depth of cut must not exceed 100% of the tool diameter. In this case a change to the part geometry, width of the slot, will result in the process adapting by selecting a different cutting tool, and changing cutting depths and possibly other machining parameters. Adding a chamfer to an existing hole, or changing the corner radius in a pocket will require similar changes in the selection of the process itself, machining cycles, cutting tools, and machining parameters. The adaptive capabilities of the ESPRIT KnowledgeBase™ system will handle these real-world, industrial challenges.



Feature Based Machining

ESPRIT's KnowledgeBase™ Automated Feature recognition subdivides a given part into Features like pockets, slots, shoulders, and holes. Each feature will have a set of known physical characteristics such as: height, thickness, draft, volume and area. The KnowledgeBase™ will automatically categorize these Features into Feature Cases based on a shop's standards, terminology, and each feature's characteristics. Typical Feature Cases might be described as: Large Open Pocket, M10 x 1.5 Tapped Hole, Thin Wall Part Face, O-Ring Groove. This categorization allows the system to "know" what you are about to machine.

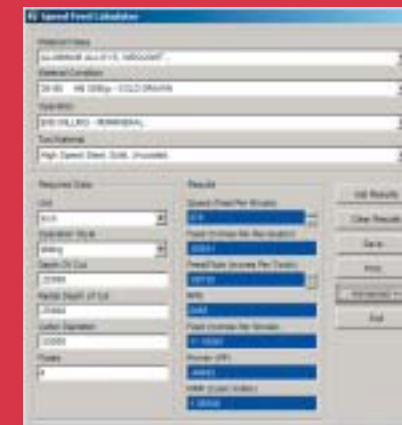
Process Manager

The KnowledgeBase™ provides an invaluable combination of detailed tool control and extensive automation via the Process Manager. The Process Manager will automatically choose the most suitable Process to machine a given feature (Feature Case). The selected Process will include one or more Process Steps, which are sets of machining cycles, cutting tools, speeds & feeds, and all the associated machining parameters. When a Process is applied to a Feature, the Steps are automatically adapted to accommodate the exact geometry and other characteristics of the Feature.

The Process Manager also allows the CNC programmer to create new processes and easily update any details of existing processes. All parameters are presented to the programmer in a color coded fashion in an interface called the Technology Page. It provides visual feedback of the source and condition of each parameter in a clear and understandable format.

Cutting Tools

The Cutting Tool KB (KnowledgeBase) is the ESPRIT database for managing a library of cutting tools. This multi-user database works hand in hand with the Process KB to provide automated tool selection. Alternately, the user can manually access the library and quickly and easily locate tooling from a common managed database. Consistent and accurate tool selection is made routine.



Speeds & Feeds

The ESPRIT KnowledgeBase™ automatically selects cutting speeds and feeds for any given Process Step based upon the part material (class and condition), cutting tool (style and material), and machining operation (style, axial and radial depths). The programmer may use the Speed and Feed calculator built into the KB to add/update cutting speeds for any

given situation. CUTDATA™ - the foremost machining database that contains over 100,000 feed and speed recommendations - is optionally included inside the ESPRIT Speeds and Feeds KB. This set of tools automatically provides the programmer with the best cutting speeds for each machining situation while also providing complete control.

Rules and Expressions

Choices made during the programming process are recorded as rules and expressions. Rules govern how and when a process is selected; they represent the logic of how a choice is made. Expressions provide control over how an individual Process adapts to differing part geometry. As an example: a rule might choose when to use a separate cutting tool for finishing versus roughing, while an expression may define the cutting tool diameter to be 75% of the width of the slot. The Rule/Expression Wizard provides a simple method to define rules and expressions.

An Open System

The KnowledgeBase™ system contains an extensive collection of pre-defined standards and processes for machining commonly found part features. The entire ESPRIT KnowledgeBase™ can be tailored to the unique requirements of any machine, department, shop and/or company.

The ESPRIT KnowledgeBase™ is built upon a scalable multi-user architecture utilizing Microsoft® SQL Server™ technology as the database "operating system". The KnowledgeBase™ is equally effective for an individual on his/her computer as it is on a server for a shop or the entire enterprise.

Closing the Loop

The multi-user database built into ESPRIT's KnowledgeBase™ closes the loop between CNC programming and the shop floor by providing a central repository to accumulate your experiences. What works (your best practices) will be refined using real world input from the shop floor. By using the KnowledgeBase™ your parts will be produced in a more consistent fashion, regardless of who programs the job or which CNC machine tool they are run on. As ideas for improvements arise, the Processes are updated for the benefit of the current and all future jobs. You will have a new level of uniformity between CNC programmers, operators and machines. Similar parts are programmed and machined with undeviating consistency providing more predictable, accurate results and greater profits.