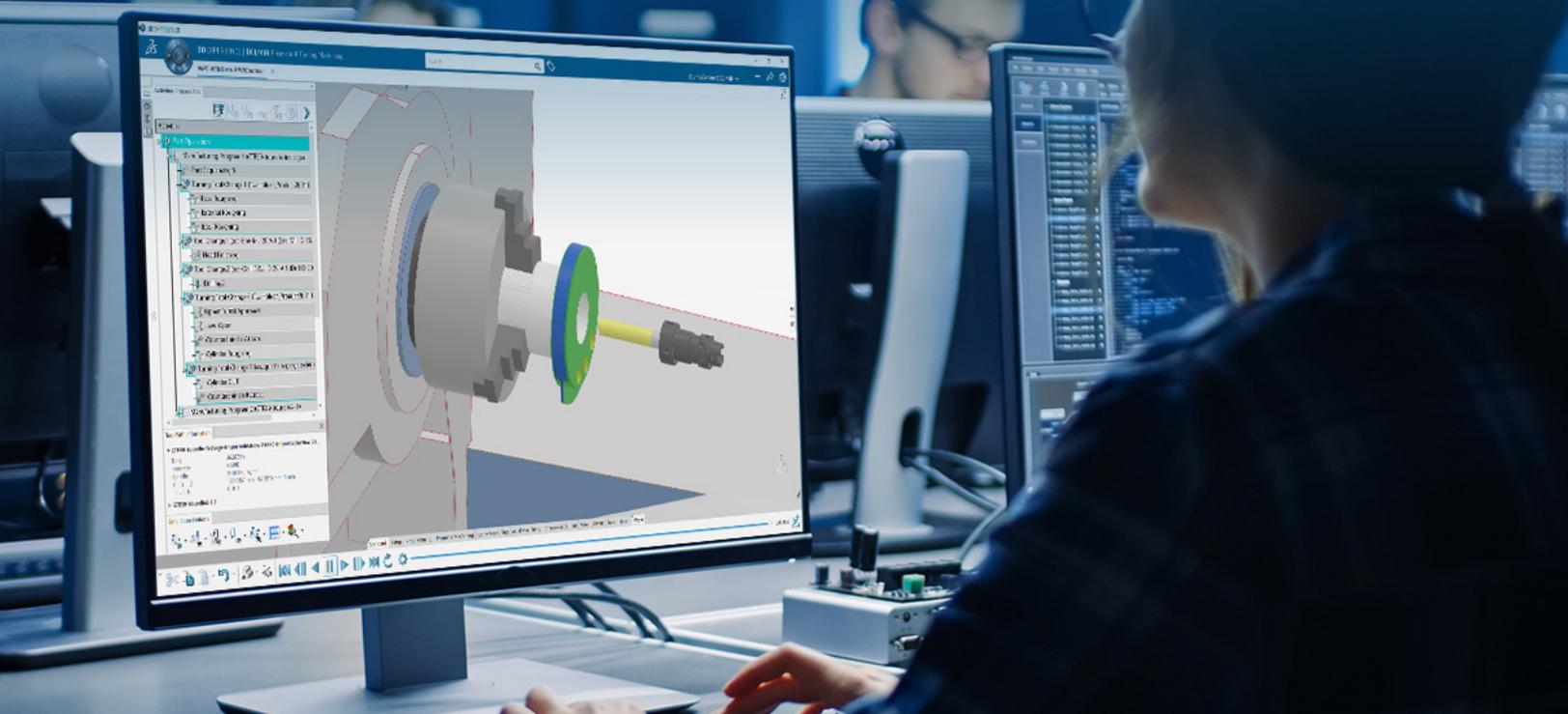# 3S DELMIA

3DEXPERIENCE®

NC PRISMATIC & MILL-TURN MACHINE PROGRAMMER
3DEXPERIENCE MANUFACTURING & PRODUCTION ROLE

PRODUCE 3D PARTS THAT REQUIRE ADVANCED 2.5-AXIS MILLING AND TURNING OPERATIONS

With *NC Prismatic & Mill-Turn Machine Programmer,* users can program milling and turning machines to produce 3D parts that require advanced 2.5-axis milling and turning operations. They can program complex multi-tasking mill-turn machines with synchronization and part-transfer capabilities.

The 3D environment immerses NC programmers in a realistic virtual workplace as they create, optimize and validate NC programs for 2.5-axis milling and turning processes. *Prismatic & Mill-Turn Machine Programmer* provides a full set of features for workpiece setup, cutter tool assembly and toolpath simulation that include material removal, machine-tool simulation and NC code generation. NC programmers can capture and leverage Enterprise IP and collaborate with other stakeholders as they develop, validate and optimize NC programs. *Prismatic & Mill-Turn Machine Programmer* makes it easy to access current information about machining resources, programs and machine tool setups.

3S DASSAULT SYSTEMES

BENEFITS

Accelerate NC programming

Quickly author and edit NC programs. Intuitive graphic dialog boxes, traffic light indicators for undefined machining parameters and help icons for each parameter make the process highly efficient. Tool changes and machine rotations are automatically generated and can be visualized in the machining operation definition panel. Copy-and-paste functions help organize programs in the specification tree.

Maximize machine tool utilization

Prismatic & Mill-Turn Machine Programmer offers a wide range of operations and strategies that help programmers create toolpath programs that minimize non-value-added motion. Optimized NC programs, including high-speed machining features, reduce overall machining cycle time. *Prismatic & Mill-Turn Machine Programmer* considers in-process parts when generating collision-free toolpaths.

Mitigate risk to production

A 3D environment enables programmers to create optimized NC programs in the manufacturing context: NC machine, cutter, tool assemblies, NC accessories and other elements. This provides a better understanding of the machining cell and ensures that the toolpath and machining strategy consider the tool's physical environment. It reduces the risk of unexpected issues and production delays.

Leverage intellectual property

Improve automation and standardization of NC toolpath programs. Users can define and store machining processes as dedicated templates, then store them in catalogs for reuse. Company intellectual property is capitalized and re-used to make programming more efficient. The gains in productivity and machining work standardization are significant.

A single design-to-machining solution to understand engineering changes

Based on the **3D**EXPERIENCE® platform, *Prismatic & Mill-Turn Machine Programmer* provides an unrivaled level of associativity between product engineering, manufacturing processes and resources. Companies can better manage concurrent engineering and manufacturing flows and shorten the design-to-manufacturing cycle. *Prismatic & Mill-Turn Machine Programmer* offers the best available support of design changes or design variants and the rapid creation of programs for families of parts. Native implementation links connect machining programs to engineering and manufacturing data. These links can be used to see which machining programs are impacted by engineering or manufacturing changes like a new cutter, for example, and to see whether machining data is up to date with respect to engineering changes.
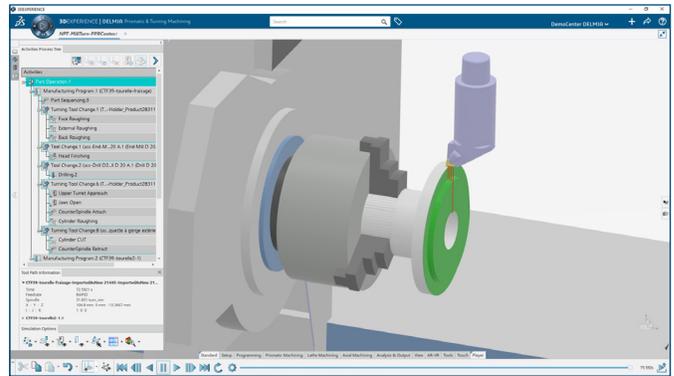
Create, enhance and validate advanced multi-axis milling programs
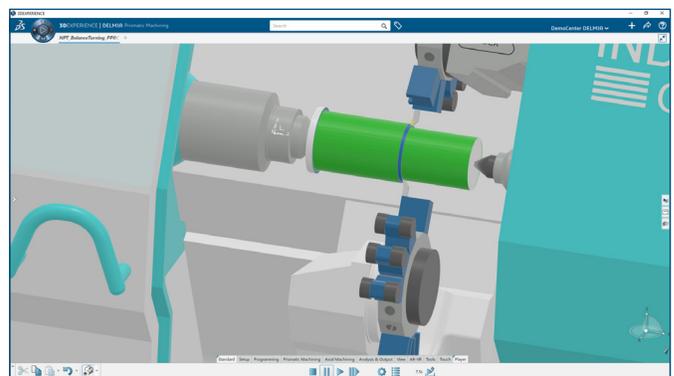
Create multi-axis toolpaths quickly and efficiently

HIGHLIGHTS

Manage and program machining resources with powerful multi-tasking mill-turn capabilities

Manage Computer Numerical Control (CNC) machines, accessories, tools and tool assemblies in 3D. These resources can be retrieved through standard search capabilities using relevant machining attributes and instantiated in a machining cell. Users can clearly see the impact of changes on the definition of objects such as parts or cutting tools across all NC processes and programs. *Prismatic & Mill-Turn Machine Programmer* supports default or customized representations of the cutter and tool assemblies that are used for verification, simulation with material removal and collision checking. Programmers can author NC programs for complex mill-turn machines with multiple spindles and turrets using synchronization features, balance turning and part-transfer capabilities. Through an immersive, intuitive interface, users can synchronize operations and passes within an operation and define part-transfer activities.

Automatic association of prismatic machining features with part design

Prismatic & Mill-Turn Machine Programmer automatically recognizes the prismatic machining features of the product design, significantly reducing toolpath programming time. A manufacturing view of the design part is generated, with all the drilling and milling features that are to be machined. Through this embedded feature-recognition technology, *Prismatic & Mill-Turn Machine Programmer* enables toolpath programming for geometrical-machined, feature-creation design parts—even those with no design feature specifications.

Best-in-class machining strategies for efficient programming of turning and mill-turn machines

Prismatic & Mill-Turn Machine Programmer offers a full set of high-end turning operations such as roughing, finishing, groove turning, groove finishing and thread turning for accurate toolpath definition. NC programmers can also author turning operations to address B- and C-axis interpolations of mill-turn machines.

Creation and optimization of 2.5-Axis milling, drilling and probing operations

Prismatic & Mill-Turn Machine Programmer offers a broad range of machining operations for toolpath definition, including pocketing, facing and contouring. These operations can be defined as multi-level and multi-pass. At the user's request, the toolpath can be optimized for high-speed machining. Point-to-point machining is available, as well as a full set of axial operations from standard drilling to complex boring and chamfering. Several dedicated strategies for hard material are included such as trochoidal milling, concentric milling and spiral morphing. This concentric strategy controls the radial engagement to maximize the efficiency on the machine while protecting the cutter. *Prismatic & Mill-Turn Machine Programmer* offers unique functionalities for creating and verifying milling, drilling and probing operations. Probing operations are very flexible and can be customized with associated user parameters. *Prismatic & Mill-Turn Machine Programmer* extends the 2.5-axis capabilities by offering best-in-class 4-axis pocketing that includes a variety of strategies, island management and user-defined lead angle on the tool axis for better cutting conditions. This operation also supports non-cylindrical and non-conical surfaces and revolution surfaces going beyond the 180 degrees.

Quick toolpath verification and editing

Toolpath replay allows the generation and verification of individual operations or of the complete program. Users can visualize the in-process part and analyze remaining material. Alternative machining strategies can be tested to obtain collision-free trajectories. The toolpath can be replicated, mirrored, translated and locally edited. The Compare Part and Remaining Stock commands display only the differences. *Prismatic & Mill-Turn Machine Programmer* improves toolpath verification by pinpointing a lack of material or material in excess.

Advanced simulation capability

Prismatic & Mill-Turn Machine Programmer has powerful simulation capabilities for toolpath validation. This simulation functionality brings one of the most advanced machine simulation modules to the market to identify potential issues earlier in the process. *Prismatic & Mill-Turn Machine Programmer* has the capability to compute the volume of gouges in the workpiece, making it easier for users to prioritize and process gouges in machining programs. Near misses (at user-defined safety distance) are identified, and multiple tool change locations are supported for a more accurate simulation of the machine motions. The simulation context, saved in the **3D**EXPERIENCE® platform, allows the user to organize the review in the most convenient way. This ensures traceability of the validation task. It allows users to program, optimize and validate machining in the most efficient way. It lets NC programmers identify toolpath errors earlier in the process and shortens programming time.

High levels of automation and standardization

Machining processes can be defined as dedicated templates and stored in a catalog for re-use. The stored template can be retrieved and applied to the design features of the part geometry. The company's intellectual property is capitalized and re-used to make programming more efficient. NC objects and attributes are handled as Knowledgeware objects in order to increase the level of automation and standardization in NC program creation.

Seamless NC data generation

Prismatic & Mill-Turn Machine Programmer offers seamless generation of Advanced Package Tool (APT) source and NC Code ISO format through the integrated post-processor execution engine, the library of standard post-processor syntax mapping tables and post-processor samples. The output formats can easily be customized. Additional files generated by the post-processor are also automatically saved in the same container in the **3D**EXPERIENCE® platform, thus ensuring that all relevant outputs for a given part are available at the same location and are up to date. The manufacturing program's key information can be exported as documentation for reference on the shop floor.

Wire Electrical Discharge Machining (EDM) machining

Prismatic & Mill-Turn Machine Programmer allows users to simulate, validate and program wire Electrical Discharge Machining (EDM) processes. Users have the ability to compute the wire Electrical Discharge Machining (EDM) path and program the synchronization of each end of the wire to the part contours. Users can implement 2- and 4-axes programming capabilities with dedicated wire Electrical Discharge Machining (EDM) strategies, visualize and validate the program strategy, then produce the machine code for use in the real machine. As with all DELMIA Machining applications, users can save and re-use best practices by creating the wire Electrical Discharge Machining (EDM) paths, storing these in a template and then re-using the same strategy on other parts to be machined.

Our **3D**EXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3D**EXPERIENCE Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating 'virtual experience twins' of the real world with our **3D**EXPERIENCE platform and applications, our customers push the boundaries of innovation, learning and production.

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3DEXPERIENCE®

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