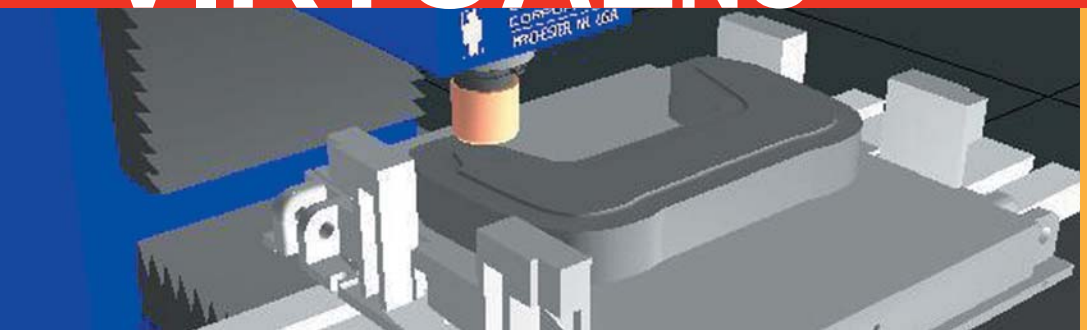
Resource Modeling & Simulation

DELMIA

VIRTUAL NC



Rapid Emulating, Validating and Optimizing NC Machine Processes

DELMIA

DELMIA

VIRTUAL NC

Rapid Emulating, Validating and Optimizing NC Machine Processes

DELMIA Virtual NC is the complete digital manufacturing solution for rapidly emulating, validating and optimizing NC machine processes. Virtual NC's powerful simulation environment enables manufacturers to quickly and efficiently validate the post processed NC program off-line, in a digital environment, thereby keeping the actual machine tool in production.

Make It Right the First Time, Every Time

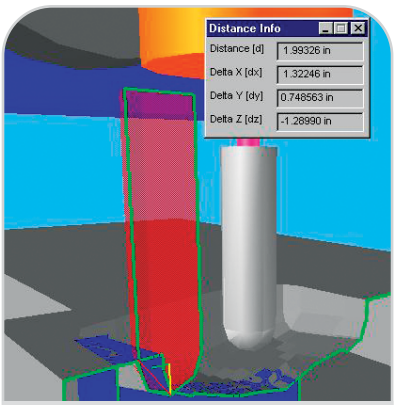
Using Virtual NC early in the machining process, manufacturers have improved part quality and saved thousands of dollars in man-hours, increased machine utilization, reduced engineering change orders and expensive machine tool crashes by implementing Virtual NC early in the machining process.

Operators can collect, modify, and validate NC data for:

- ***Cycle Times***
- ***Feed Rates***
- ***Access Speed***
- ***Acceleration***
- ***Volumetric Rate***
- ***Tool Utilization***
- ***Depth of Cut***

The Complete Part and Process Verification Solution

DELMIA Virtual NC's robust environment first assists manufacturers in planning the machining process through early simulation of the tool path operations. This early tool path verification can be accomplished using pre-post processed APT or CL data or post- processed NC code and a "floating tool" simulation model. Once the tool path is verified and optimized, the programmer can validate the entire NC process using a model of the machining center including tool changer and material handling devices using the post-processed NC code. Virtual NC can be used to validate new, or modified post processors. The analysis data collected during the machining cycle is used to optimize the program cycle time, tool life and surface finish. Through the use of Virtual NC, manufacturers have eliminated expensive machine tool collisions, optimized and validated the NC process without having to take their machine tools out of production for dry runs. Optimizing the parts and processes in a digital environment reduces man-hours, increases machine utilization, and improves product and process quality. From concept to customer, Virtual NC offers the only complete solution for improving quality, reducing costs and speeding time to market.



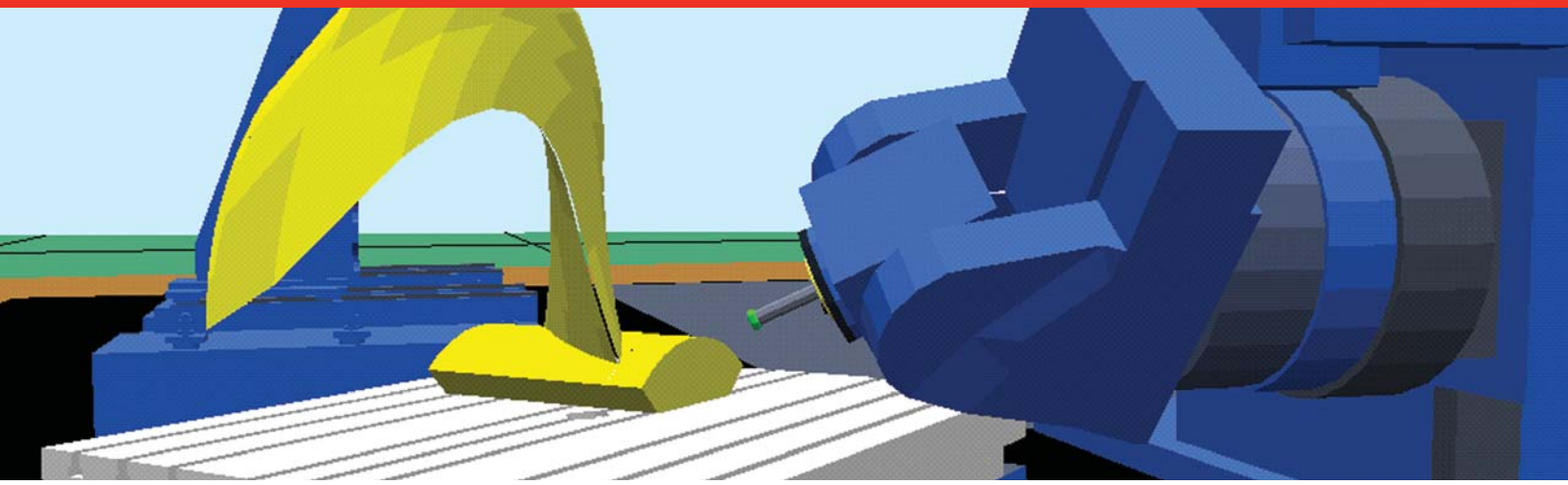
Virtual NC's Gouge Detection *feature allows users to compare the pre-defined part design with the machined part and record the results.*

Simulating the Controller

Virtual NC's built-in configurable controller emulator, "Mimic," allows even the most complex CNC programs to be emulated and verified in the digital environment. Mimic provides continuous monitoring and feedback of the machining cycle and automatically creates user-defined reports. Mimic also provides an open environment in which user-defined process algorithms can be evaluated, refined and implemented. A unique Mimic configuration file can be easily created for each machine tool.

Advanced Material Removal Technologies

Virtual NC's advanced Boolean material removal technology dramatically increases simulation speeds. Virtual NC offers the fastest and most accurate material removal technology available in today's market.



Eliminate Collisions

Virtual NC automatically detects near misses and collisions, and will stop the cycle or log the event noting the NC program block in which the collision occurred plus the machine components and the parts damaged. Near miss tolerances can be specified to maintain safe distances between any two components. Users can enforce machine parameters by setting limits for axis over travel, maximum axis speed and maximum acceleration.

Rapidly Model Workcells

Quickly and effortlessly import your existing CAD data using DELMIA's advanced CAD importing technology, import an STL file, or create the CAD geometry in DELMIA's CAD system. From simple 2-axis to complex multi-axis mill-turn machines, Virtual NC's powerful modeling environment, based on core DELMIA technologies, offers the best-in-class model building technologies.

Easily Import CAD Data

Most mechanical CAD databases are supported by Virtual NC. Natively use CATIA® or Unigraphics data within Virtual NC with a simple button click. Other optional direct CAD interfaces are available for IDEAS, Pro/ENGINEER and CADDS5. Neutral CAD data translators that are available as options include IGES, DXF, DWG, VDA, DES, STL, and STEP.

Launch Virtual NC from CATIA® Manufacturing Programs

With the click of a button, users can launch, simulate and validate preprocessed APT programs from within CATIA's manufacturing programs. DELMIA and CATIA's bidirectional functionality also allows users to write CATIA geometry files from within all DELMIA products.

Multi-axis Gouge Detection System

Virtual NC provides the best mechanism for in-process gouge check and analysis, that exceed a user-defined tolerance. This mechanism compares the machined part with the pre-defined design part and records the gouges onto a table. Selecting a gouge from the table will make it's COI (center of interest) zoom-in automatically, which allows the user to toggle ON a cross-sectional slice along the tools Z-axis, enabling the user to measure and analyze the gouge depth.

It also allows the user to dynamically rotate, translate and snap the slicing plane for better visualization of the gouge.

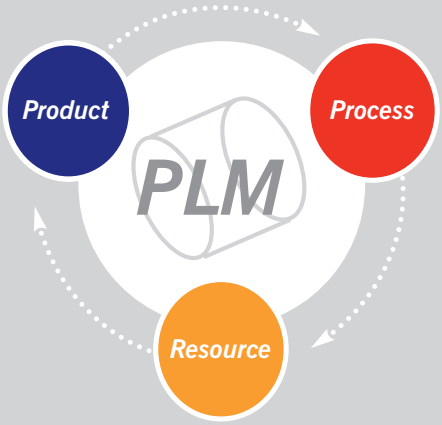
Maintenance and Training

Using a virtual machine, machine operators experiment with new techniques, setups, processes or program modifications in a safe environment.

DELMIA

VIRTUAL NC

Rapid Emulating, Validating and Optimizing NC Machine Processes



Virtual NC & the Manufacturing Hub

DELMIA's entire solution portfolio work on top a unique data model called the Manufacturing Hub, which allow manufacturers to store, manage and reuse all product, process, and resource information required throughout the product lifecycle.

The Manufacturing Hub is part of a collaborative, PPR data system that supports Dassault Systemes' Product Lifecycle Management solution. This PPR data system ensures the seamless integration between CATIA, ENOVIA, SMARTEAM and DELMIA. CATIA provides the product design solution; DELMIA provides the manufacturing engineering solution; and ENOVIA & SMARTEAM provide the lifecycle applications and decision support tools.

With DELMIA digital manufacturing solutions, companies have the power to capture, manage and share their best practices and ensure everyone has access to the right information, at the right time.

The DELMIA Digital Manufacturing Solution

DELMIA's portfolio of digital manufacturing solutions are categorized in three distinct domain suites, based on how the impact the flow of the manufacturing process. Each domain employs a set of tools that steps through the entire manufacturing process from concept to implementation.

Process Planning

Provides a comprehensive process and resource planning support environment. The resulting process diagrams can provide a clear overview of the sequences and links between processes and resources early in product design conception.

- *Layout Planning*
- *Time Measurement*
- *Process & Resource Planning*
- *Product Evaluation*
- *Cost Analysis*
- *Line Balancing*

Process Detailing & Validation

Employs the structure and diagrams of the Process Planning solutions into the application specific disciplines of manufacturing. Verify process methodologies with actual product geometry and define processes to a greater level of detail within a 3D environment.

- *Manufacturing and Maintenance*
- *Assembly Sequences*
- *Factory/Cell Layouts*
- *Machining Operations*
- *Workforce Performance and Interactivity*
- *Shop Floor Instructions*

Resource Modeling & Simulation

Provides a comprehensive process and resource planning support environment. The resulting process diagrams can provide a clear overview of the sequences and links between processes and resources early in product design conception.

- *Factory Flow Simulations*
- *Robotic Workcell Setup and OLP*
- *NC Machining*
- *Virtual Reality Scenarios*
- *Ergonomic Analysis*
- *Inspection*

DELMIA

DELMIA CORP
900 N. SQUIRREL RD., SUITE 100
AUBURN HILLS, MI 48326
TEL: 248 267 9696 FAX: 248 267 8585

www.delmia.com