CMM Inspection Programming

An end-to-end solution for creating machine independent programs and analyzing quality measurement information in a native CAD environment

Benefits
- Reduces time-to-market for new product introductions by enabling you to create offline programs for your CMM and NC tools before a designed part is actually available
- Reduces the impact of engineering change by leveraging CAD associativity to automatically reflect updates to inspection features, tolerances and probe paths
- Improves dimensional quality across the manufacturing process by enabling shop floor operators and design engineers to share unambiguous inspection data
- Reduces errors and time to create inspection programs by using CAD-embedded tolerance information, including PMI, GD&T or FTA (Catia) data
- Improves inter-domain productivity by using master model CAD geometry without requiring the use of a data translator

Summary
Tecnomatix® CMM Inspection Programming software is an end-to-end dimensional quality solution that unites the world of the manufacturing shop floor with manufacturing planning/design. The solution enables you to quickly and accurately generate complete and verifiable inspection programs for a shop floor's coordinate measure machines (CMM) and NC machine tools. You can use the solution to generate inspection programs offline, execute these programs, retrieve their inspection data and feed this data back to the machining design group's CAD environment – where you can efficiently compare it against the master model and perform root cause analysis.

Tecnomatix CMM Inspection Programming enables manufacturers to establish an end-to-end dimensional quality solution that establishes a closed-loop process for tying their shop floor operations with their manufacturing planning and design groups. This process relies on real-time bidirectional communications and automatic CAD associativity to eliminate the need for data translation and to reduce the impact of engineering change between these manufacturing domains.

The CMM Inspection Programming solution provides three key capabilities, including:
- *Offline inspection programming* capabilities that enable you to plan quality inspection processes for CMM and NC tools for machine specific parts, including determining which features to inspect, when to inspect them during the machining cycle and which resource to use during the inspection process
- *Graphical analysis* tools that interpret and analyze measured inspected data against industry standards in order to identify the root causes of inspection results
- *Fully embedded CAD solution* for Siemens PLM Software's NX™ suite, as well as Catia, which associates your inspection program features, tolerances and probe paths with their related CAD geometry

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Features
- Tools for generating complex inspection programs, including touch scanning probe paths
- Analysis tools for evaluating data from inspection runs against CAD geometry without requiring use of a data translator
- Real-time 3D graphics for quick analysis review and modification
- Full metrology standard compliant analysis (ISO, ANSI, ASME)
- Ability to leverage inspection data in CAD-native environments using a familiar and easy-to-learn user interface
- Ability to utilize model-based tolerances, component and assembly PMI
- Ability to generate industry-standard DMIS programs

Offline inspection programming
The solution's inspection programming capabilities virtually eliminate trial and error inefficiencies as you program your inspection machines. The solution provides many features to streamline program generation, including:
- User-specified path defaults
- Automatic approach/retract along the CAD surface normal
- A selected machine axis or specified vector
- Automatic safe points for entering/exiting holes and safe planes

Graphical analysis tools
The solution enables you to perform quick and accurate analysis by comparing inspected data measured by your inspection programs with specified design tolerances that support ANSI, ASME and ISO standards. The solution's analysis engine interprets and analyzes the measured data against these industry standards regardless which inspection device collected this information.
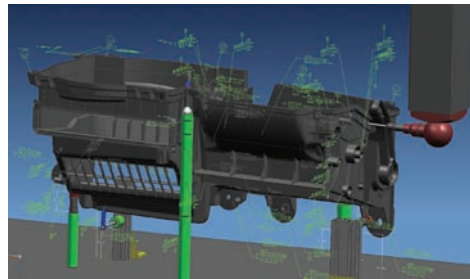
Two approaches enable you to evaluate how much rework will be needed to improve quality of the produced parts – optional analysis modes and the ability to "float" measure data when fitting it to the nominal CAD model.

Fully embedded CAD environment
CMM Inspection Programming runs within the NX and Catia environments like most other CAD functions, enabling users to work in a familiar environment while allowing companies to leverage their existing CAD infrastructure and training investments.

DMIS interface with CMM Inspection Execution
The solution generates a dimensional measurement interface specification (DMIS) source that you can use to execute

an inspection job and display operator work instructions and inspection results at the CMM or NC machine. You can use this industry-standard DMIS program with any compliant software, including the Tecnomatix CMM Inspection Execution solution, to store, retrieve and execute inspection job information.

Open, secure and scalable platform for quality management
For companies that employ dozens, if not hundreds, of quality engineers, integration and data management can be challenging and potentially expensive. Siemens Teamcenter® software's open and scalable PLM platform addresses this issue with a framework that you can use to easily manage all of your CMM inspection programs along with your existing product and manufacturing process information.