Communicating Cutting Tool Data Using ISO13399

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The Driving Force
Contribute to Customer Success in Manufacturing

- Successful customers make smart decisions at multiple areas of their manufacturing.
- Smart decisions are made in presence of relevant and accurate information.

Sandvik Coromant offers in addition to high performing cutting tools:
➢ Relevant and accurate information in order to enable smart decisions.
Smart Decisions
Influenced by Cutting Tool Information

- **CAD/CAM**
  - choice of operations, machines, cutting tools
  - creation of efficient tool paths

- **Resource Management**
  - tool planning, efficient inventory and service of items in tool crib
  - selection and creation of tool assemblies

- **Simulation**
  - verification of tool paths
  - selection of cutting data

- **CNC Machining**
  - optimization of process
Cutting Tool Information Standard
ISO13399 – For Digital Communication

• Need for a communication language
  – Increasing demand for cutting tool information supplied digitally

• High demand on information quality
  – One language for communication (=one mapping) is more reliable than multiple languages.

➤ International Standard
  – Demands on information quality prevents us from using more than one language. Hence the choice of an international standard.
Cutting Tool Information Standard
ISO13399 – What Can Be Communicated?

- Tool item information
  - Classification
  - Property values

- Tool assembly
  - Assembly instructions for tool room
  - Tool information used by CAM/CNC

- References to external documents
  - 3D model of single tool or complete tool assembly

- Multi-function
  - "Multiple tools" on one body

- Nominal and physical tool
  - Nominal tool information to CAM and tool room
  - Physical tool information between tool room and CNC
Immediate Benefits of ISO13399
Case: Tool Management – The Tool Room

1. Receives tool item information
   – from cutting tool supplier

2. Receives assembly instructions
   – from process planning

3. Builds the physical tool
   – Tool ready for transfer to CNC
   – Information ready for transfer to CNC
Immediate Benefits of ISO13399

Case: Tool Management – At The CNC

4. Receives new cutting tool
   – Physical tool
   – Information about physical tool

5. Returns used cutting tool
   – Physical tool
   – Updated information
ISO13399 Ready For Use
Available components for ease of use

• API
  – reads ISO13399 file (file format: ISO10303-21)
  – creates ISO13399 file
  – mapping to/from existing systems now possible
  – API available for free upon request

• Browser
  – browsing the definition of classes and properties of ISO13399
  – Browser available for free upon request
Product Data Example
– Turning Holder

- Product Identification, Classification and Property Values
- Cutting Tool Assembly (adapter/holder/insert)
- Referenced information (CAD model of above)
Current Coromant Activities

• Assurance of information quality
  – Preparation of data structures in PLM systems
  – Product data model and concept definitions

• Delivery of product information in ISO13399 format
  – All products ready by end of 2010

• Virtual Machining
  – Creating a platform for full support of virtual machining (STEP-NC)
Summary
Benefits of Using ISO13399

Enabling smart decision making
- CAD/CAM
  - operations, machines, cutting tools, tool paths
- Resource Management
  - inventory control, service, tool assemblies
- Simulation
  - verification of tool paths, selection of cutting data
- CNC Machining
  - optimization of process

Information which could be communicated
- Catalog data
  - Classification
  - Geometrical data
- 3D models
  - detailed view (for visual communication)
  - profile view (for simulation)
- Tool assembly information
  - tool room instructions
  - tool room results
  - instructions for automated 3D assembly
- Usage data (in combination with other standards)
  - cutting data range
  - cutting method
  - tool life