Communicating Cutting Tool Data Using ISO13399

Bengt Olsson
Project Manager
Competence Center PLM
Sandvik Tooling
bengt.olsson@sandvik.com

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The Driving Force

Contribute to Customer Success in Manufacturing

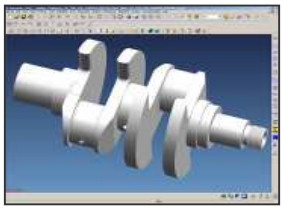
- Successful customers make smart decisions at multiple areas of their manufacturing.
- Smart decisions are made in presence of relevant and accurate information.

Sandvik Coromant offers in addition to high performing cutting tools:

➢Relevant and accurate information in order to enable smart decisions.

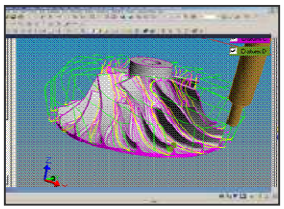
Smart Decisions

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

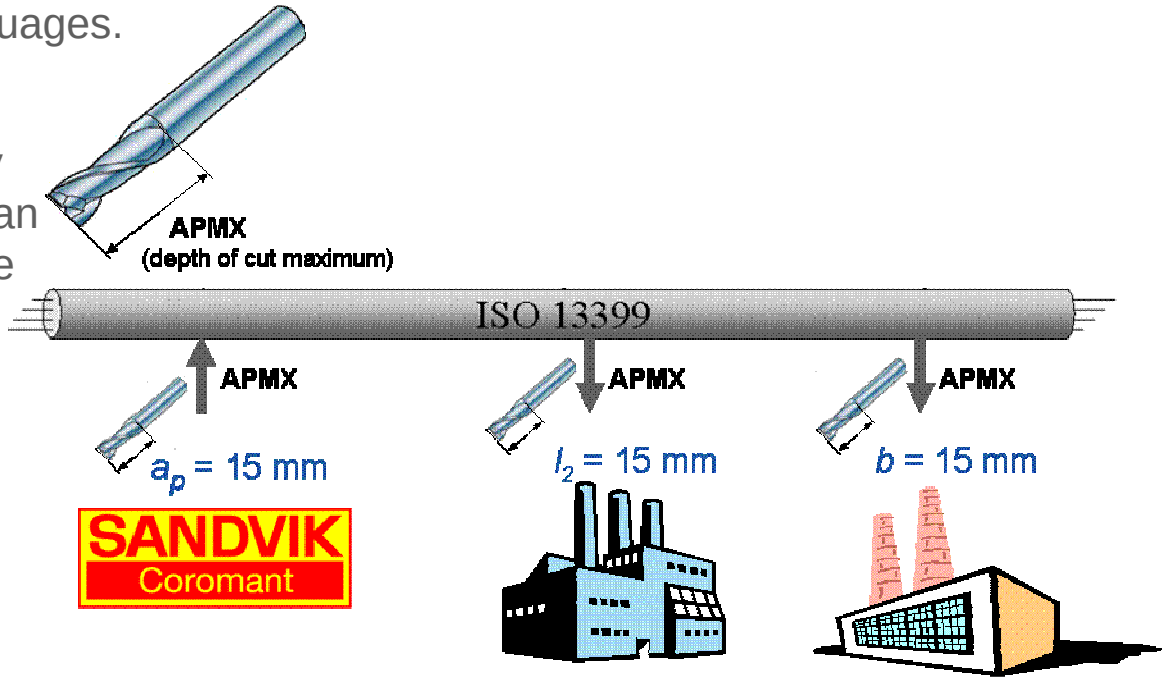
Cutting Tool Information Standard

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.



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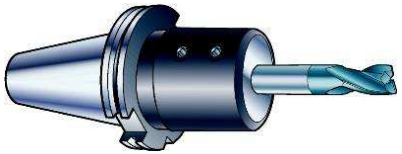
Cutting Tool Information Standard

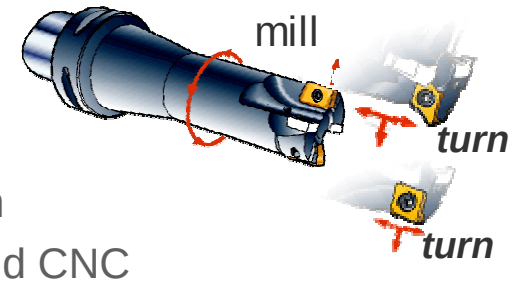
ISO13399 – What Can Be Communicated?

- 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

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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

ISO13399

- T10 -Indexable Mill Assembly COROMILL790 44mm
  - General Classifications
    - end mill
      - functional length=132
      - cutting diameter maximum=44
      - corner radius=4
  - T10-1 Current data about physical tool
    - Properties
      - functional length=132.266
      - cutting diameter maximum=44.072
      - corner radius=4

ISO13399

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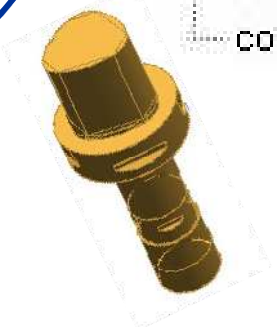
Immediate Benefits of ISO13399

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



T10-1 Current data about physical tool
- Properties
  - functional length=132.266
  - cutting diameter maximum=44.072
  - corner radius=4

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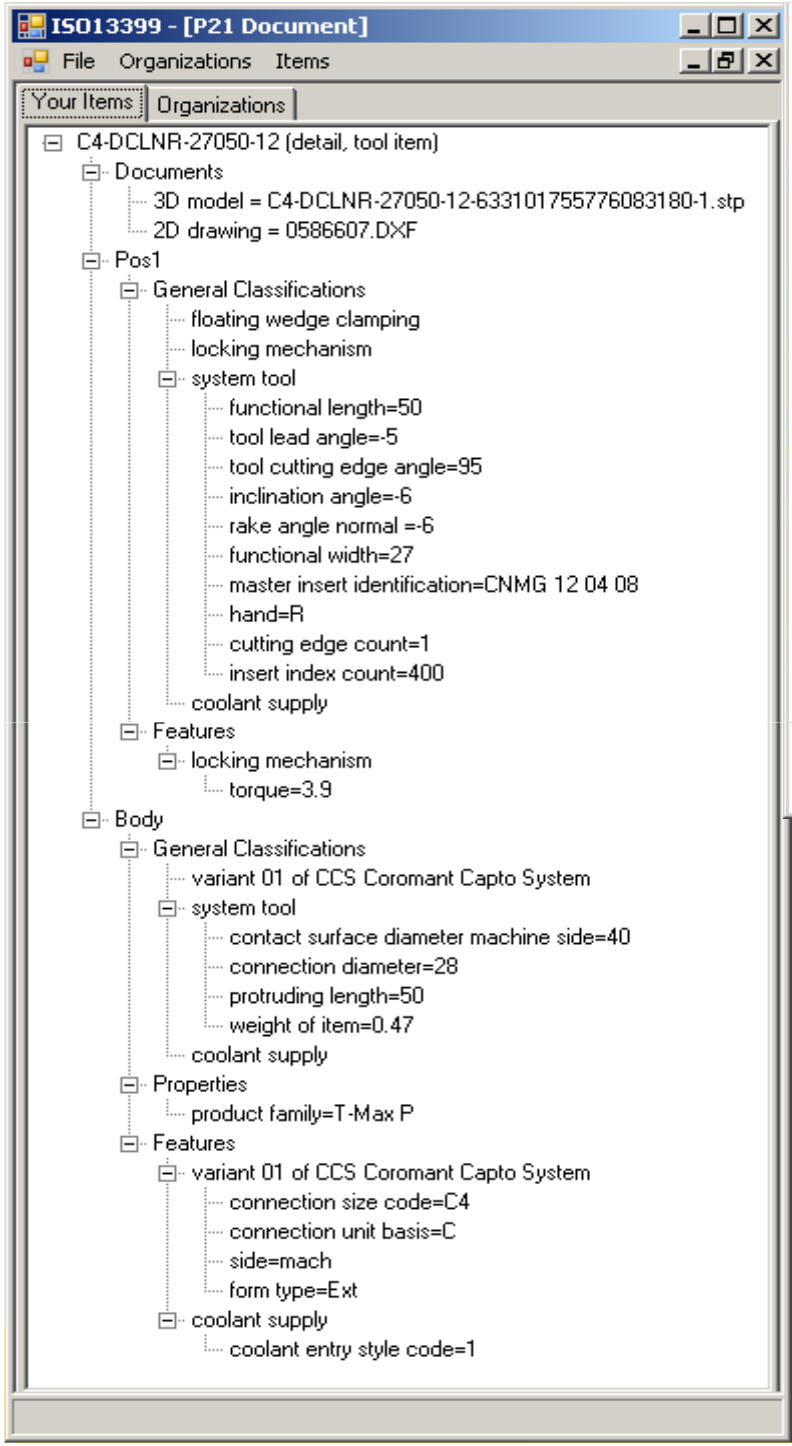
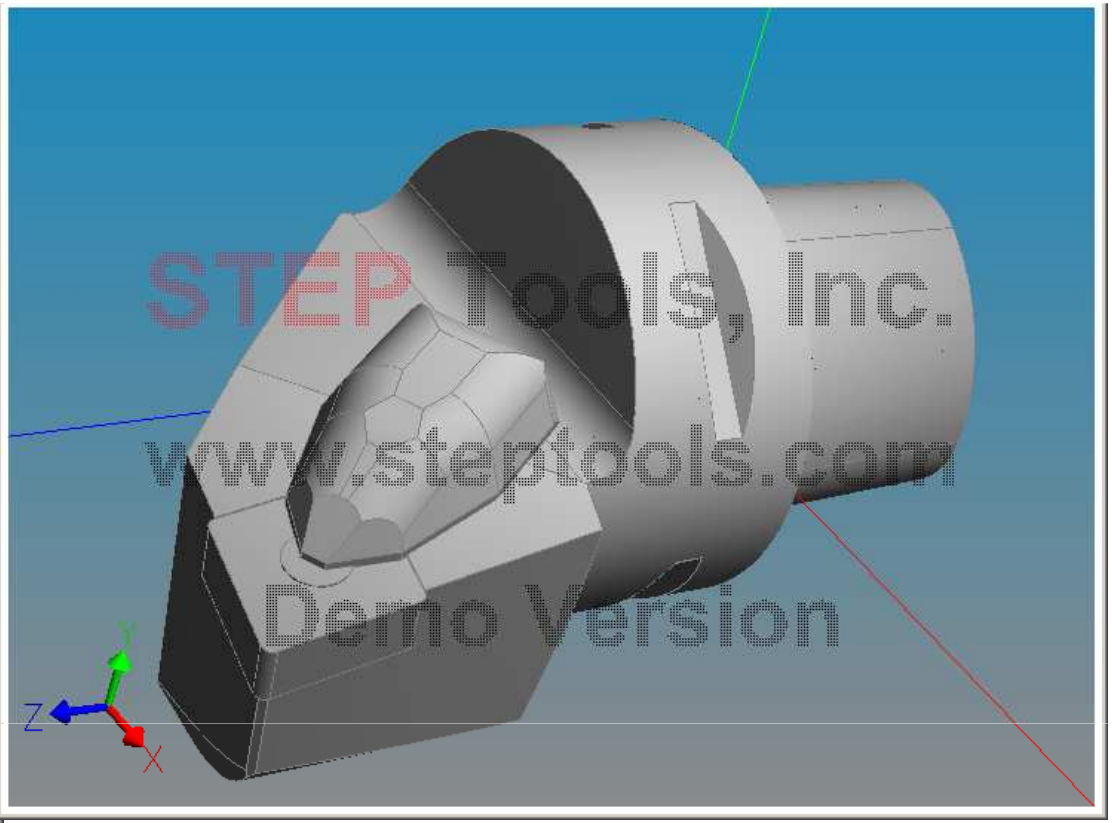
ISO13399 Ready For Use

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)

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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