CAM to CAM Data Exchange

ISO 10303-238

STEP-NC Technical Data Package

Computer Aided Design

Computer Aided Manufacturing

Tool & Fixture Database

Machine System Database

Intelligent Control
Contracting for manufacturing assemblies

• How to reduce costs by cooperating?
  1. If OEM owns the process (by owning the resources) then the solution is more expensive (traditional solution)
  2. If supplier owns the process then the solution is more time consuming (recent aerospace solution)
  3. If OEM and supplier share the process then solution is less expensive and less time consuming (CAM Data Exchange solution)
Unnecessary costs

- Visits to suppliers to explain models
- Maintenance of additional machines
- Repetitive, error prone data entry
- Misunderstandings over drawing symbols
- Incomplete simulations

Weak automation
No interoperability

OEM assembly constraints
Repeat for every Supplier
One shop solution

One machine
One setup
One tooling

Weak automation
No interoperability
Desired solution – Science not Art

Geometry with associative tolerances from assembly

Adjustable tools and fixtures

Model Driven Manufacturing for Assembly

Adjustable manufacturing processes

Manufacturing accuracy solution
What is ISO 10303-238 STEP-NC?

- New information to make machining faster and more accurate
  - Supply chain interoperability
  - On machine feed-speed/tool-wear optimization
  - On machine simulation and collision detection
  - Closed loop machining and measurement
  - Feature based
  - Platform independent
  - Full fidelity simulation
  - Plug and play with CAD and CAM systems

- STEP-NC describes “what” not “how”
  - Make this geometry from this stock
  - By removing these features
  - In this order
  - With these tolerances
  - And tools that meets these requirements

- The old standard described “how”
  - Move tool to this location
  - Move tool to this location
  - And so on for millions of commands
## How do we know - 10 years of testing

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<th>Phase</th>
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<td>CAM to CNC data exchange without post processors</td>
<td>Interoperability</td>
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<td>May 2005 - June 2006, July 2007</td>
<td>Integration of machining and measurement</td>
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Projected Benefits*

- 35% reduction in preparation costs for routine machining
- 50% reduction in costs for engineering changes
- 50% reduction in inspection costs
- 90% reduction in drawings

- 20% increase in value of CAM solutions
  - New shop floor applications (e.g. adaptive fixturing)
  - Increased usage of advanced functionality (e.g. feed/speed automation)
  - Access to a much larger database
  - Support for a long term archive data format

*by Organization for Machine Automation and Control (OMAC)
Path to Deployment – Starting Jan 2013

Boxy STEP-NC file (www.steptools.com)

1st 6 months
CAM to CAM data exchange for a 3 axis part

ISO 10303-238
STEP-NC

2nd 6 months
CAM

Operation Reader

Boxy part in aluminum or steel

CAM

Operation Writer

STEP-NC Explorer

View & Verify

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Summary

• STEP-NC defines a technical data package for manufacturing
  – Portability and Interoperability for manufacturing
  – Enable many new automation applications
  – Faster communication, fewer errors, more accurate simulations
  – Decade of testing, ready for deployment

• Industry projects large process savings and significant increased value for CAM systems

• Join us!
  – Make a Boxy
  – Translate to STEP-NC
  – Participate in testing forum