

Round15J Review Meeting
March 15 – 17, Asheville, NC



CAX - IF

Round15J Results and Round16J Scope



CAX
Implementor Forum

CAX Implementor Forum

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CAX-IF

Round 15J Schedule

Date	Action
December 8, 2004 (Wed)	Test Suite available / 1 st CAX Implementor Forum conference call
ASAP	Production Models released
January 7, 2005 (Fri)	Initial STEP files and native stats due
January 28 (Fri)	STEP files and native stats frozen
February 14 (Mon)	Target stats due / 2 nd conference call
February 28 (Mon)	Target stats frozen
March 8 (Tue)	Pre-release of final stats / 3 rd conference call
March 15 (Tue)	Review meeting for test round
March 16 – 17 (Wed – Thu)	CAX Implementor Forum meeting, Asheville, NC

CAX-IF and Review meeting in conjunction with PDES, Inc. Spring offsite

CAX-IF Who did what in Round 15J

Vendor Test case	AL	CT	ID	IN	OC	OD	PE	SY	Tx	UG
8.Benchmark Model	I	Y	Y	Y	Y	I	Y	Y	Y	Y
Production Models	Y	Y	Y	Y	Y	I	Y	Y	Y	Y
GVP (AP203e2)	N	Y	Y	N	Y	N	?	?	Y	N
ExtRef (AP203e2)	I	Y	N	N	Y	N	Y	Y	Y	Y
AP209 / AP210 / Ancient files	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
Density & Material name	N	N	Y	N	Y	N	?	?	N	N
GD & T	N	N	E	N	I	N	Y	Y	Y	N

Vendors:

Did less than signed up for

Did more than signed up for

AL:Alias, CT:CATIA, ID:I-deas, IN:Inventor, OC:OpenCascade, OD:CoCreate, PE:ProE, SY:T-Systems, Tx:Theorem, UG:UGS

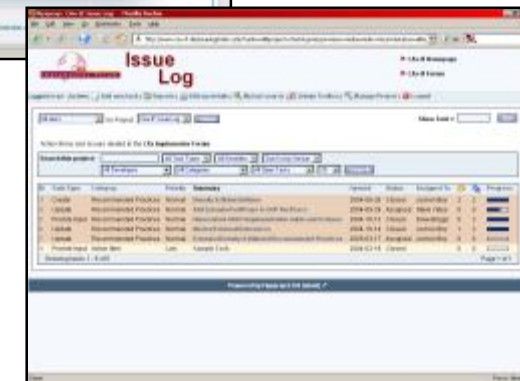


N

Critical issue: vendor is not testing GD&T

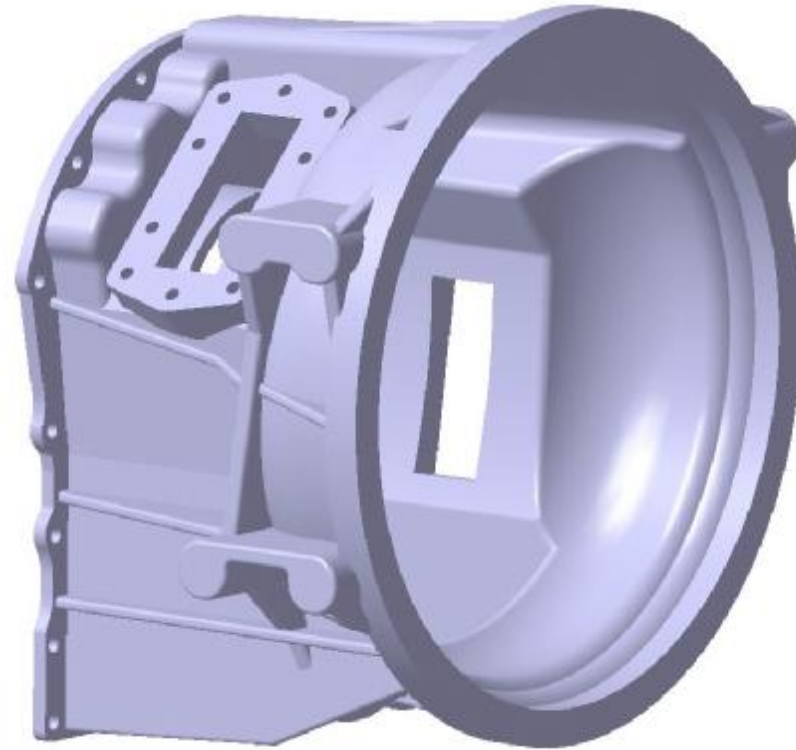
Accomplishments since Round14J Meeting

- Released new or updated Recommended Practices:
 - Density & Material Name (to be extended further)*
 - Nested External References*
- Set up online discussion forum to support technical discussions
 - <http://www.cax-if.de/forum/>
 - STEP experts always welcome J*
- Set up online issue log for the CAX-IF
 - <http://www.cax-if.de/issuelog/>
 - Improved tracking of action items*



CAX-IF

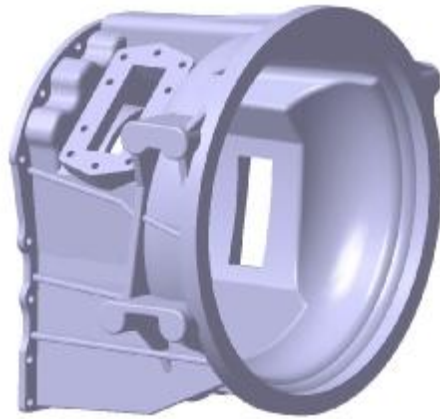
Round15J



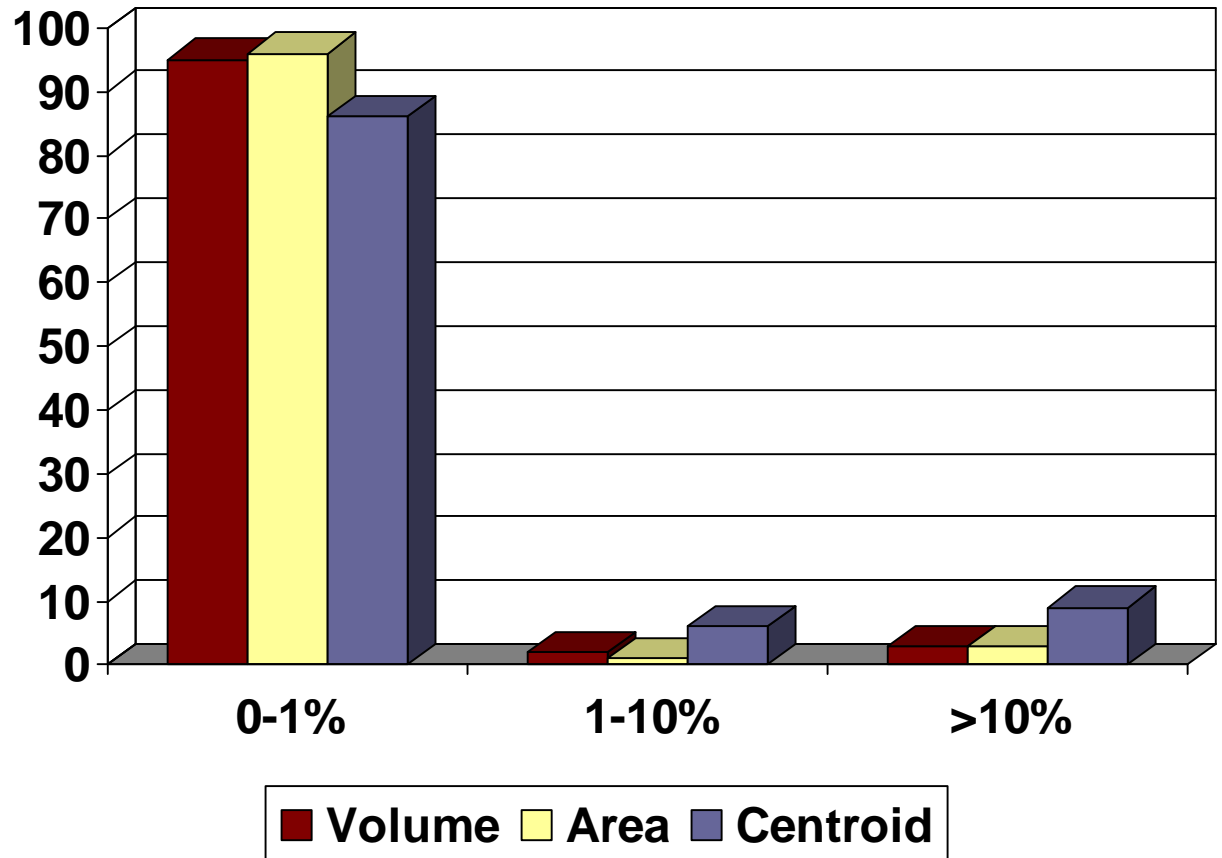
B3

Benchmark Model

Round15J – Benchmark Model

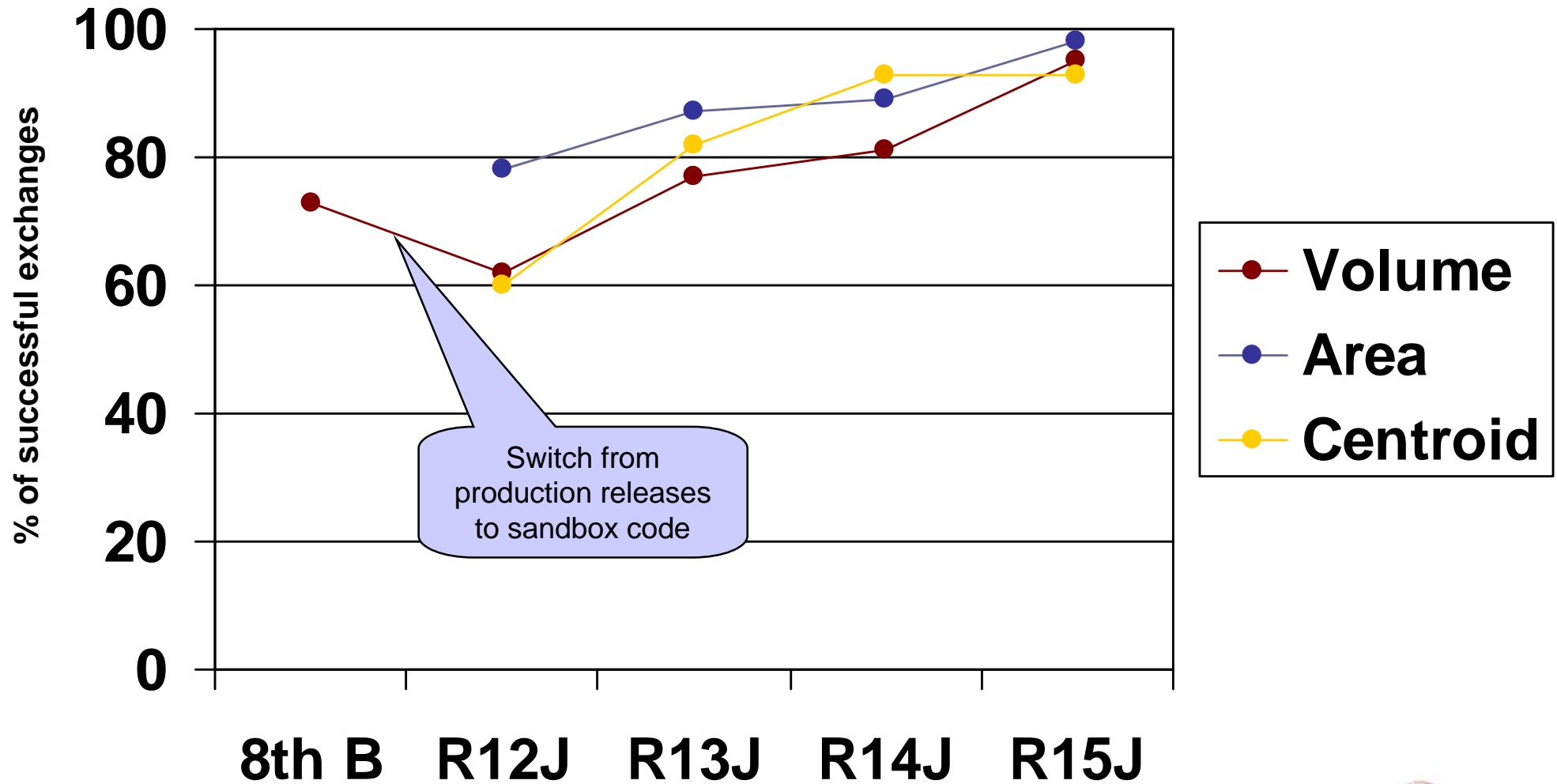


Torque Converter Housing
Single Part

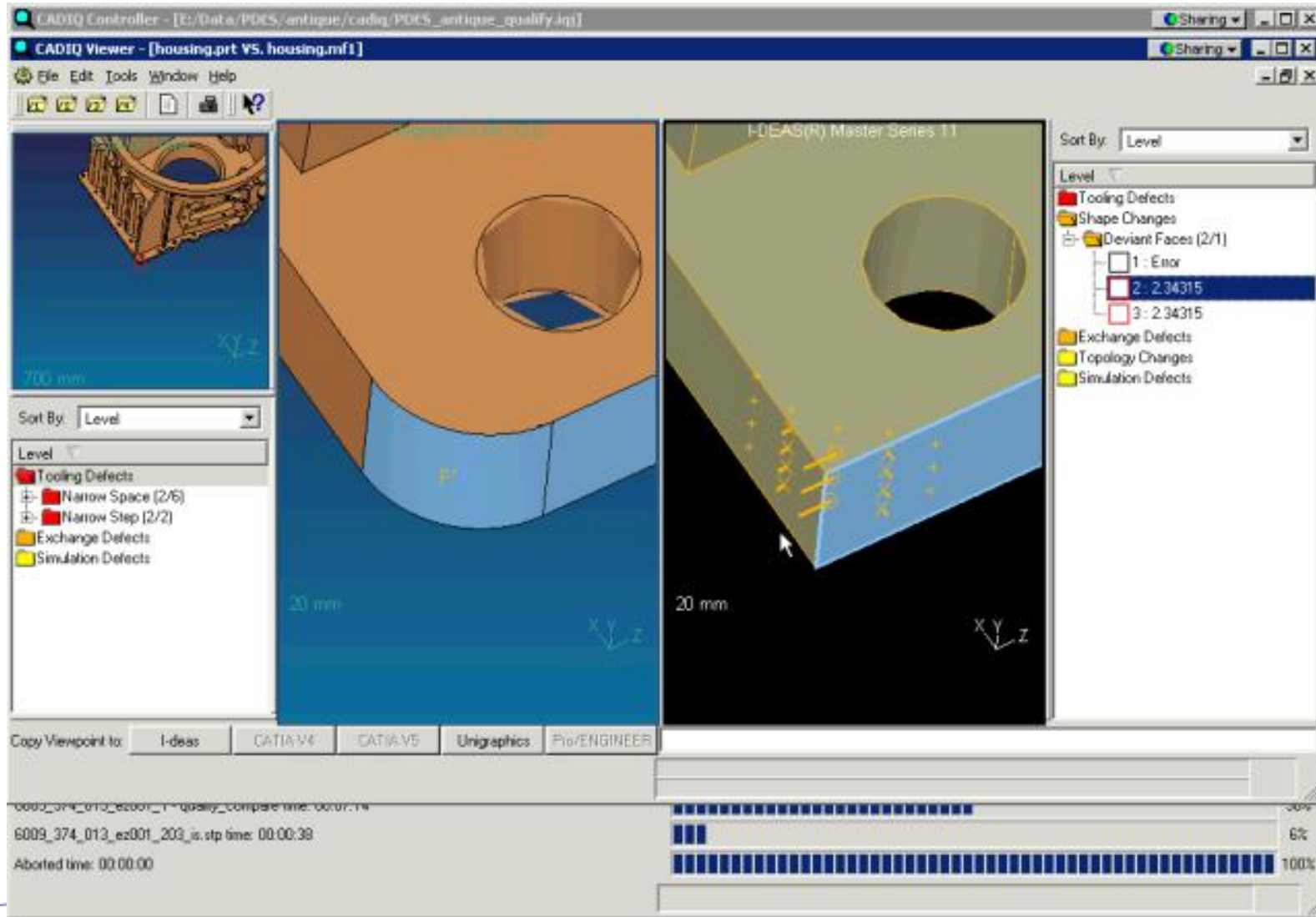


70 exchanges

Benchmark Model Results History



Benchmark Model Quality Analysis

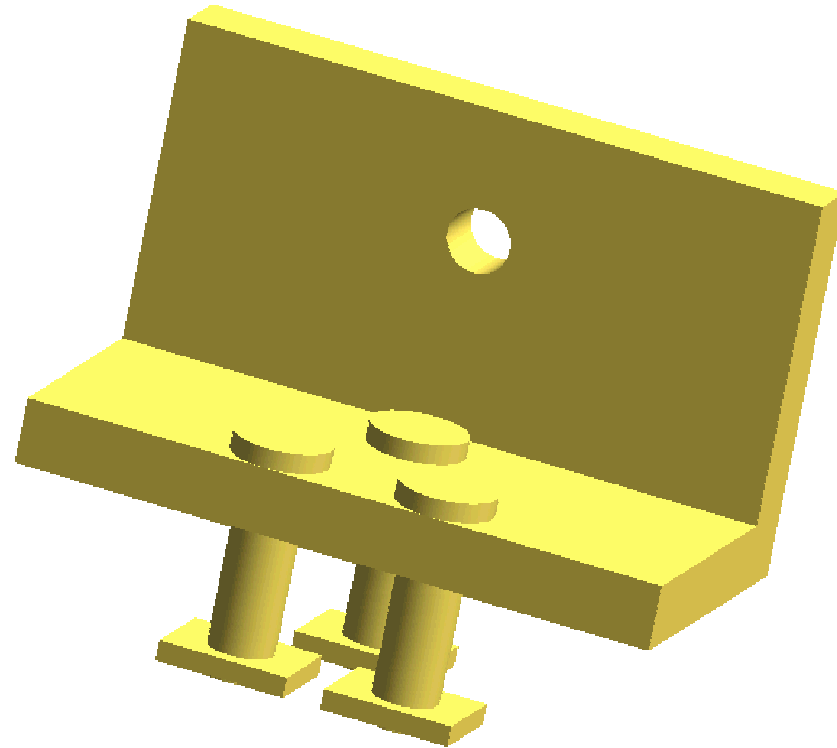


Benchmark Model Conclusions

- The model has been tested four times in the CAX-IF since the 8th ProSTEP Benchmark. The issues identified there have almost all been resolved.
- In Round15J, for the first time quality investigations were done using CAD/IQ
- For Round16J, a deeper look into model quality through the whole exchange chain (source system native model à STEP file à target system native model) will be performed
- The complete torque converter assembly including the housing will be tested

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Round15J



DM1

**Density and
Material name**

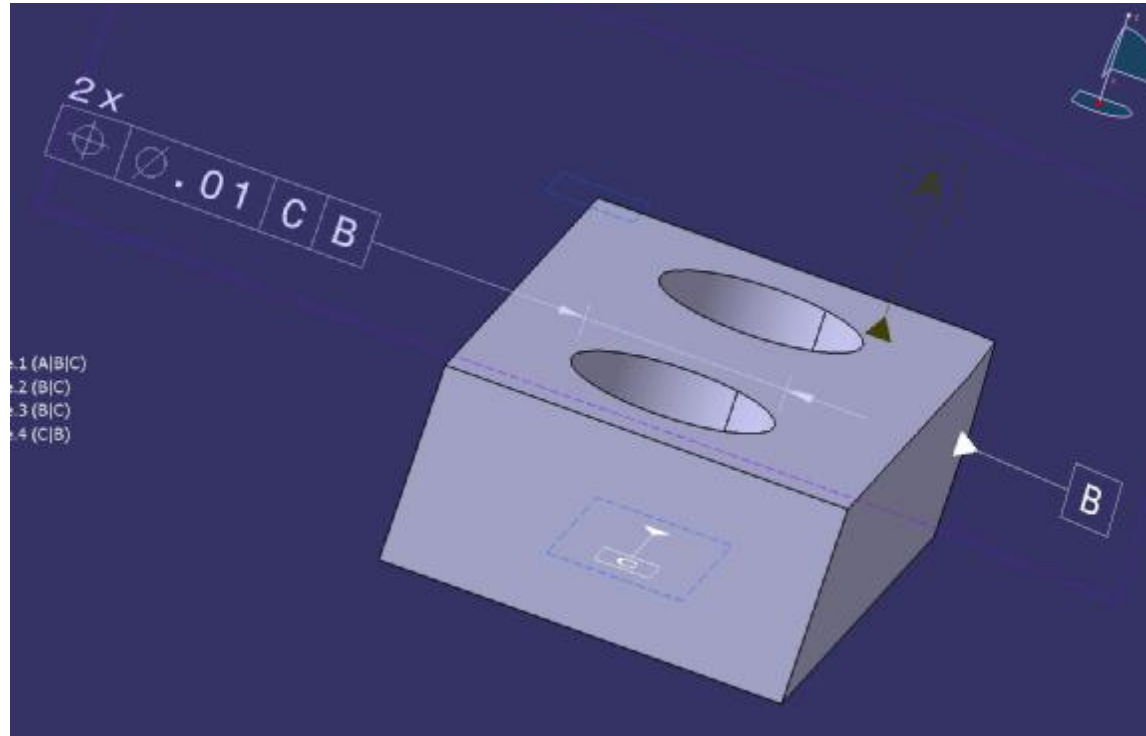


Round15J – Density and Material Name

- Two native files and two sets of target stats
- One vendor imported everything successfully
- One vendor implemented the more complex “material as product” approach, as compared to the simple “material as property” approach agreed on in the CAX-IF
- Additional import support for “material as product” announced for Round16J
- The Recommended Practices will be extended to cover a wider scope with regard to assigning material properties to subshapes
- There was a joint session with CAX-IF and the EA Team. A scenario for detailed interoperability testing was agreed on for Round16J

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Round15J



GD2

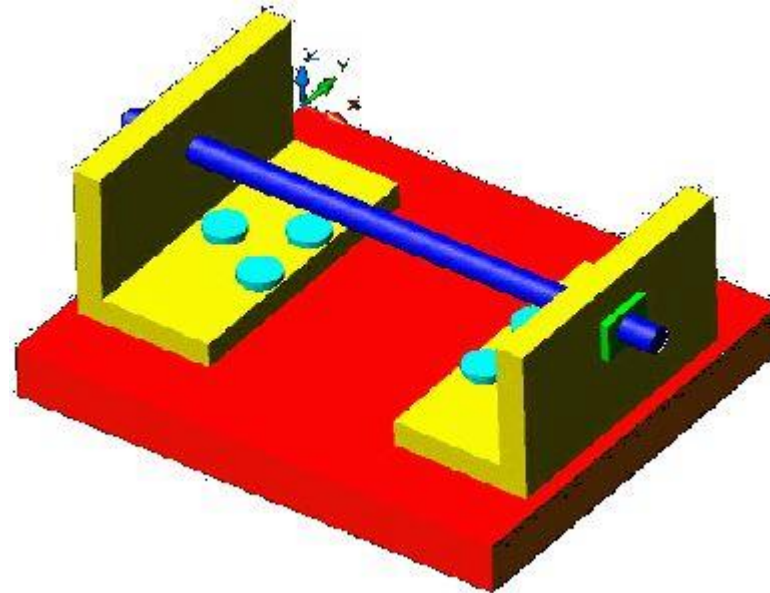
Geometric & Dimensional Tolerances

Round15J – Geometric & Dimensional Tolerances

- Only one exchange was made
- An issue with the datum definition in the test part has been identified and needs to be looked at
- More implementations supporting GD&T on their way
- Discussed future GD&T scope with Dave Briggs and Simon Frechette
- CAX vendors are looking forward to receiving a suite of test models that cover as many tolerance types as possible. The models should be defined by users actually using GD&T functionality

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Round15J



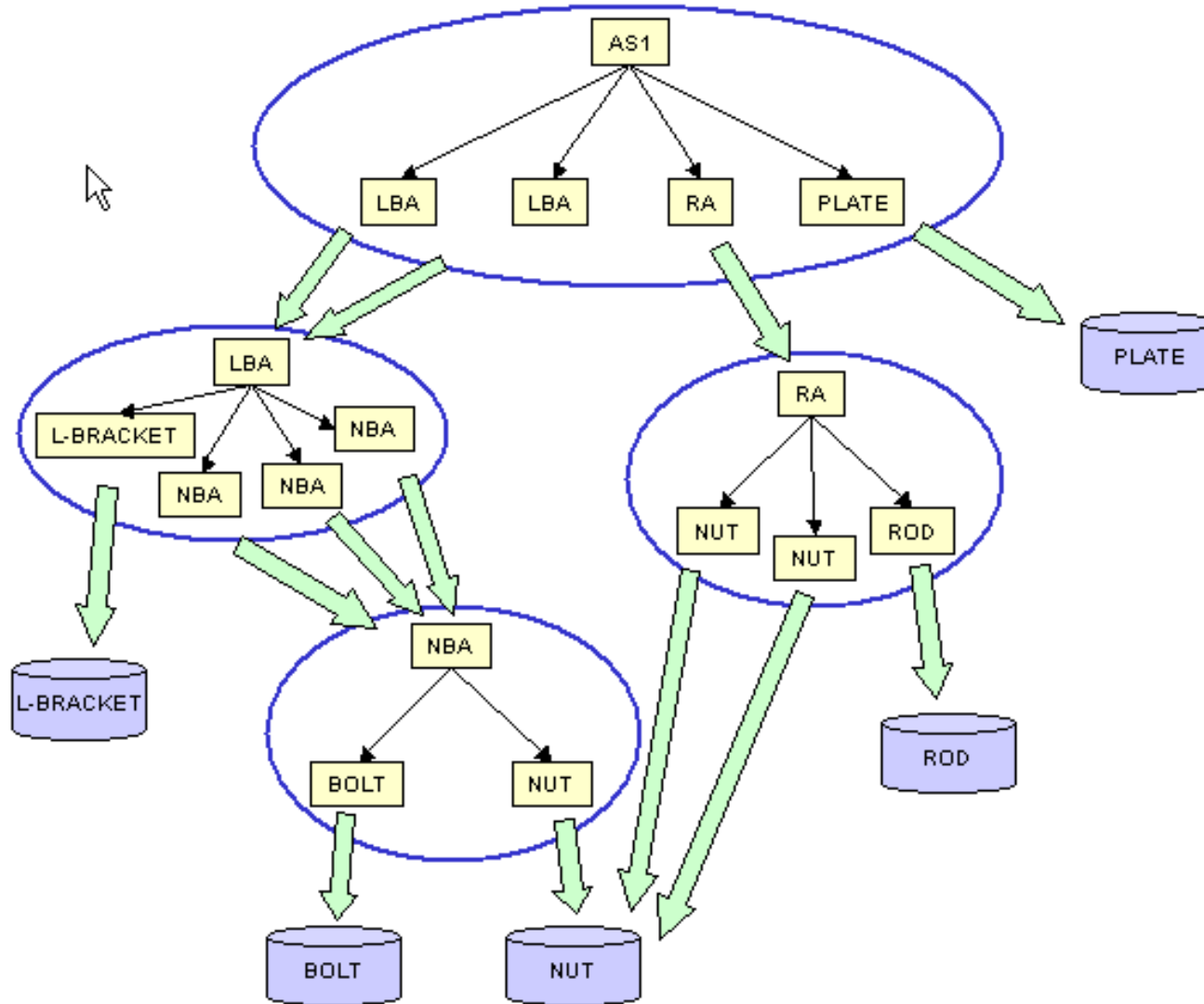
AS1

AP203e2 Migration

including (Nested) External References

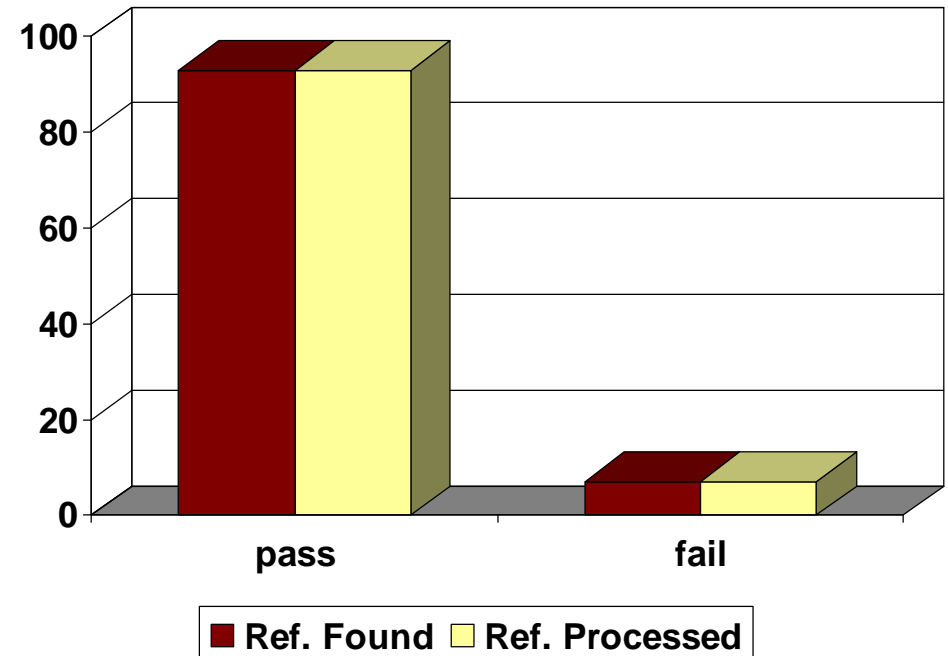


AS1 Recommended File Structure

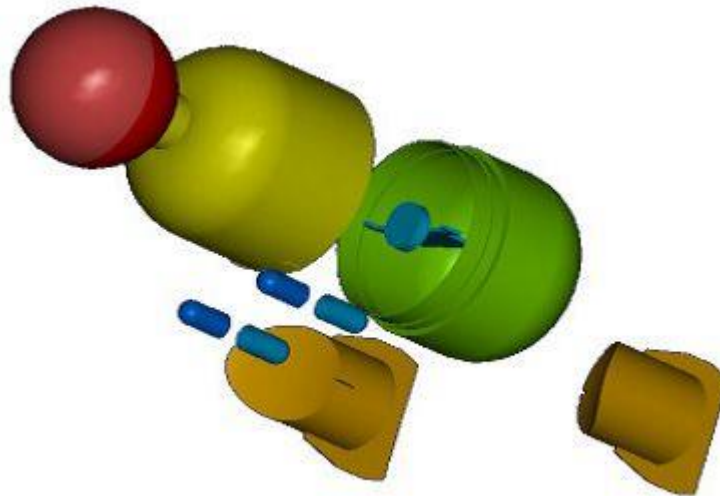


AS1 Nested External References

- First tests with the “nested” external references approach, that is not (yet) supported by all vendors
- 3 vendors exporting (one of them as nested assemblies), 5 importing
- As far as the external references could be resolved, geometry results were perfect
- Issues with the file structure identified in the previous round have been resolved successfully



CAX-IF Round15J



S1

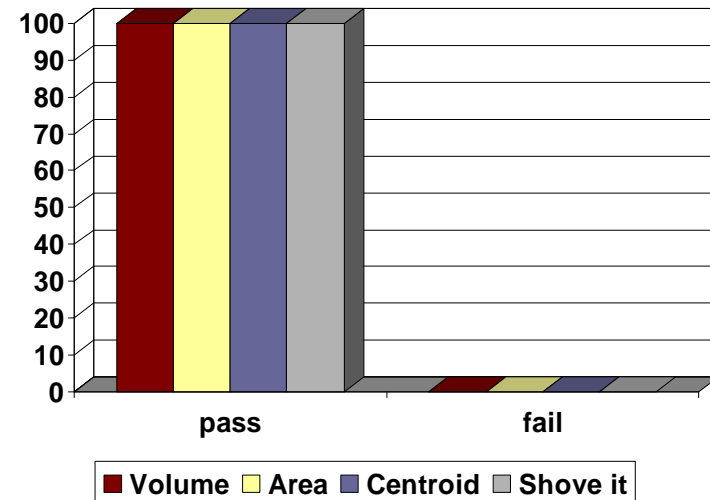
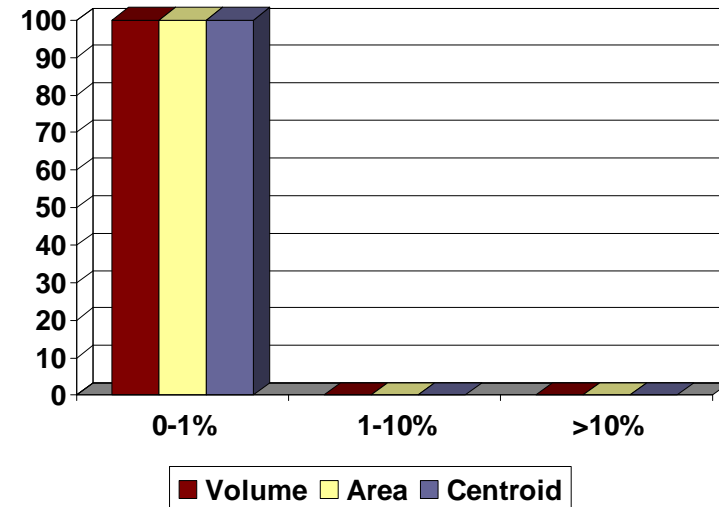
AP203e2 Migration

including (Extended) Geometric Validation Properties

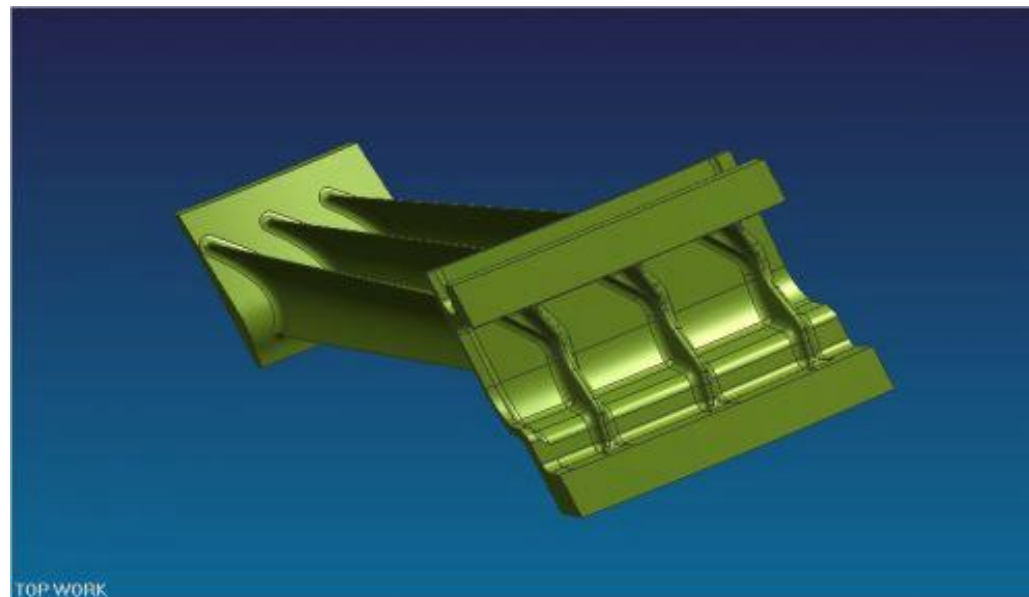
CAX-IF

S1 Overall Results

- Presentation, Validation Properties and “Extended” Val Props were tested using AP203e2
- 3 vendors exporting, 6 importing
- All information was transferred successfully as far as supported by vendors
- AP203e2 testing to be continued to confirm functionality coverage by vendors supporting AP203e2

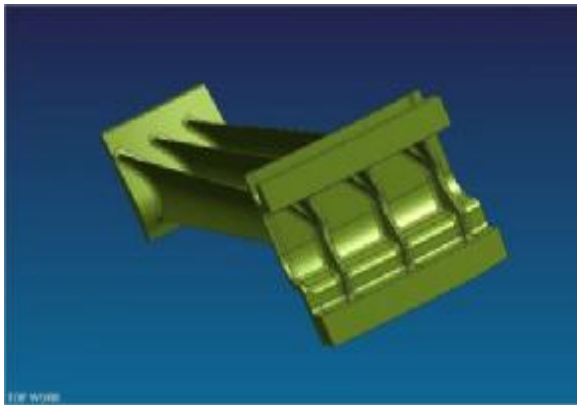


PM13
Production Model(s)



Vane Cluster
Theorem and UG – New Model

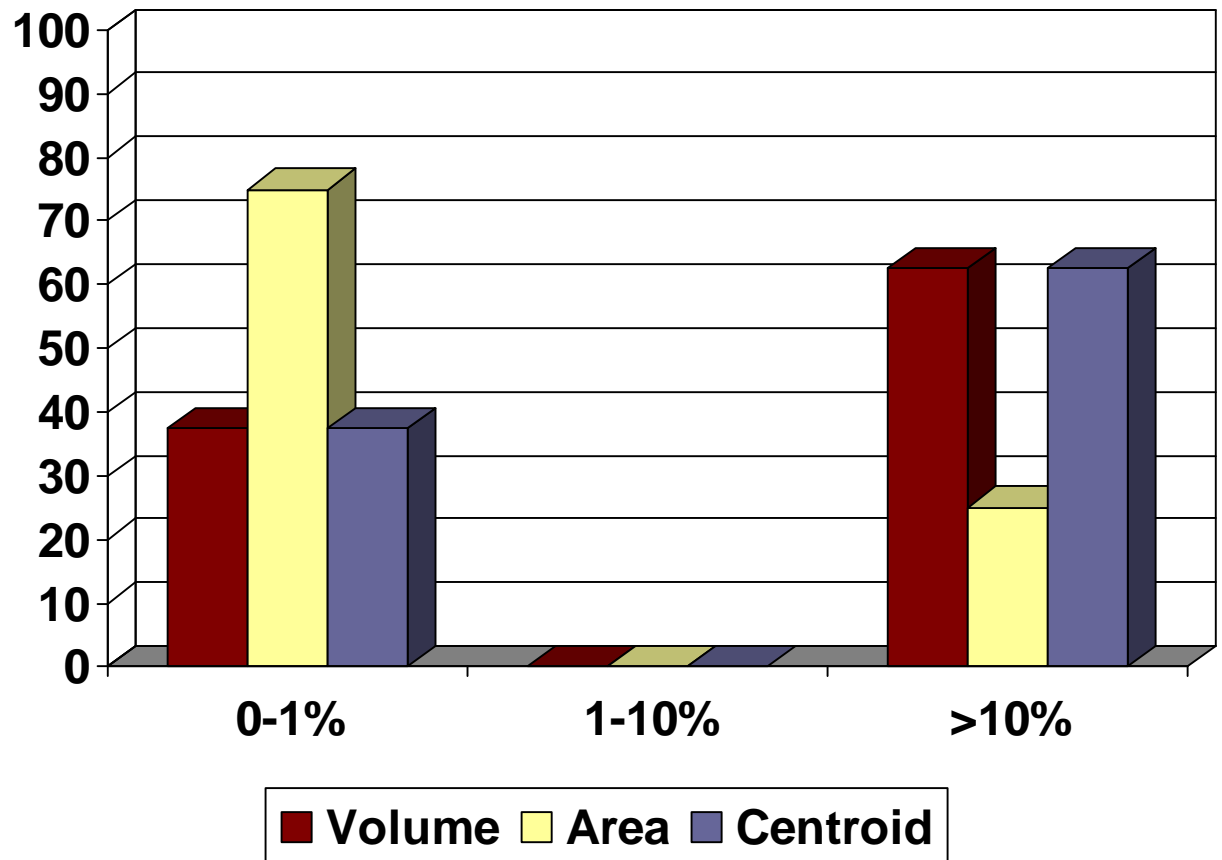
CAX-IF PM13-TU



Vain Cluster

Theorem Unigraphics

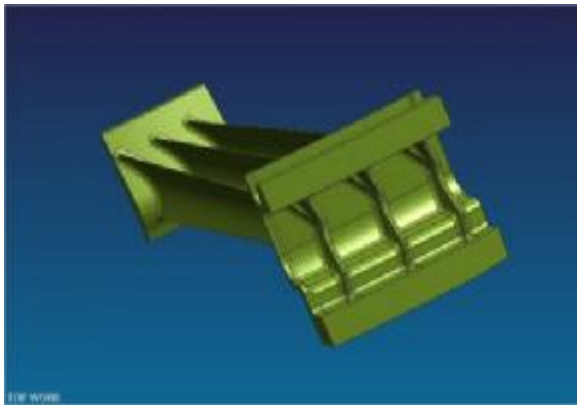
Single Part



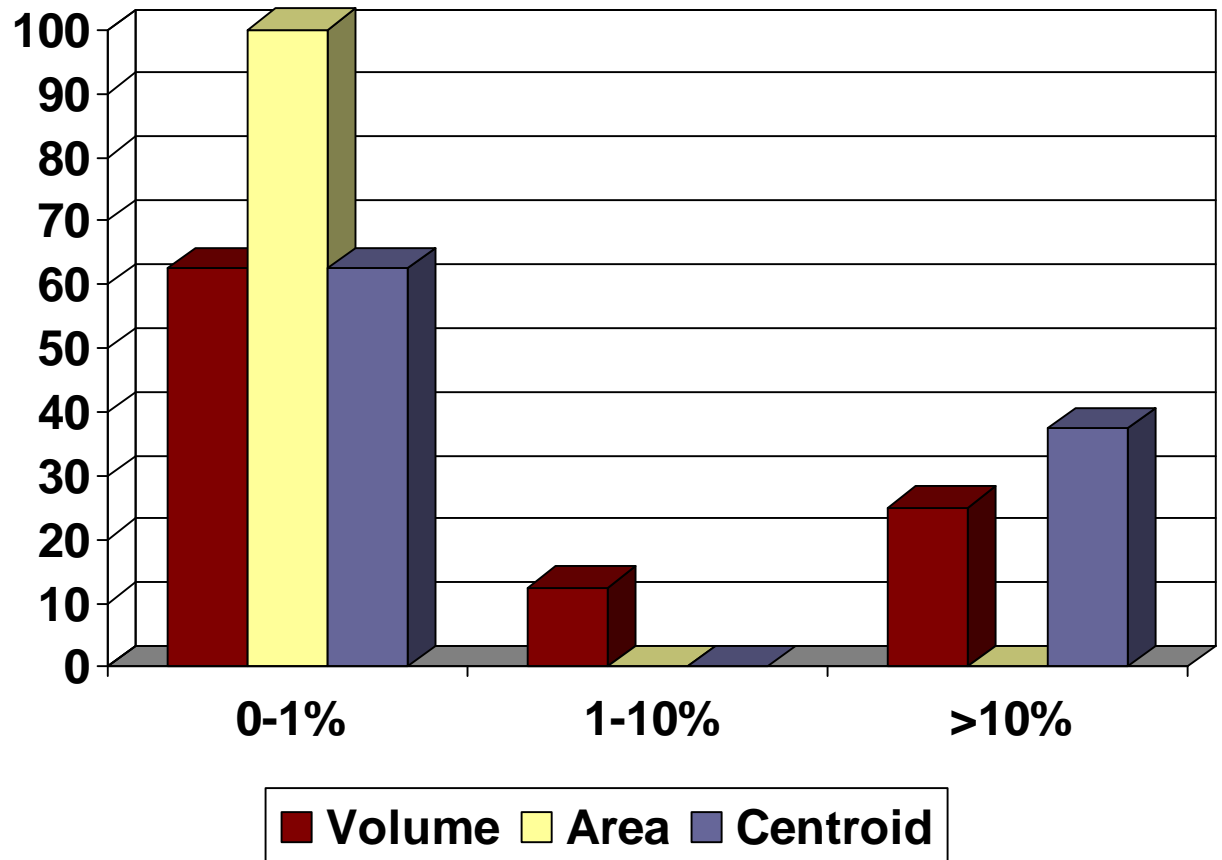
8 imports



CAX-IF PM13-UG



Vine Cluster
Unigraphics
Single Part

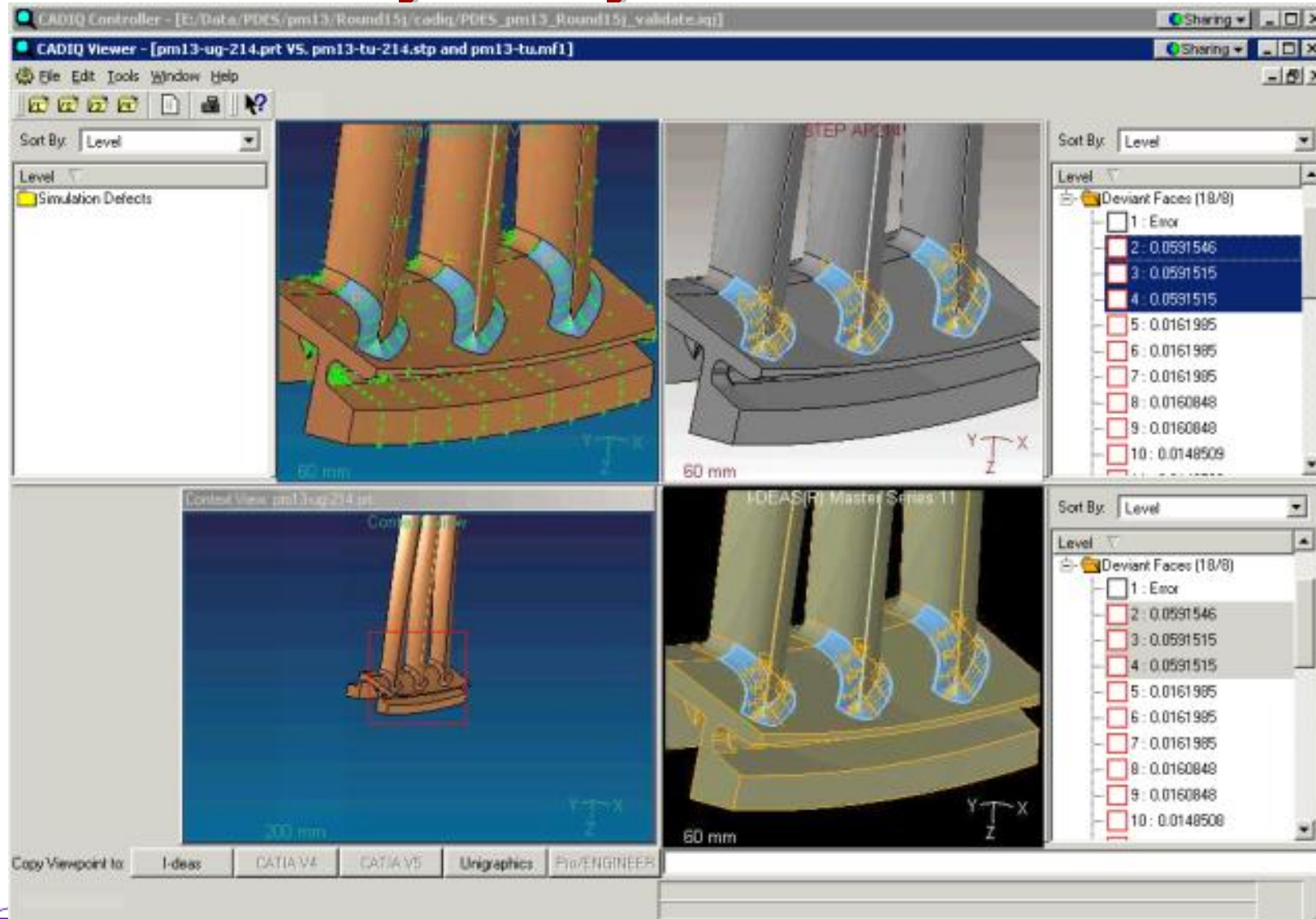


8 imports



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PM13 Quality Analysis

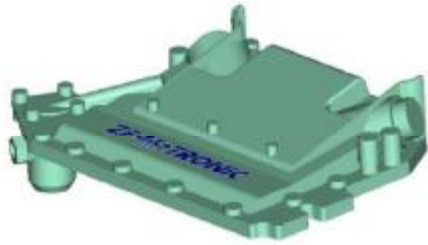


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PM13 Conclusions

- **Problematic native model**
- **Doug Cheney provided detailed input about end-to-end data quality evaluation that showed a number of issues with blend surfaces and unmanufacturable conditions**
- **The evaluation of the resulting model allowed us to trace problems back to the native model that are easy to be overlooked in the source system when not specifically looked for**
- **Continue CAD/IQ evaluation in Round16J**
- **Need for new Production Models**

CAX-IF Round15J



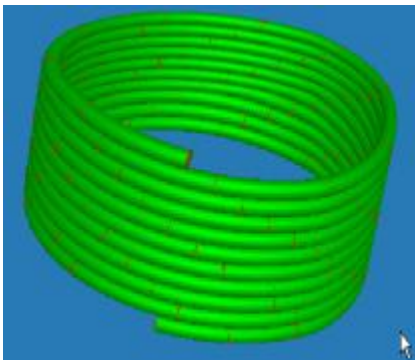
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Pro/E 2000i



7691_001_141_ez001
Pro/E 2000i



7852_001_644_geh
Pro/E 2000i



spiral2
Unigraphics 15/16

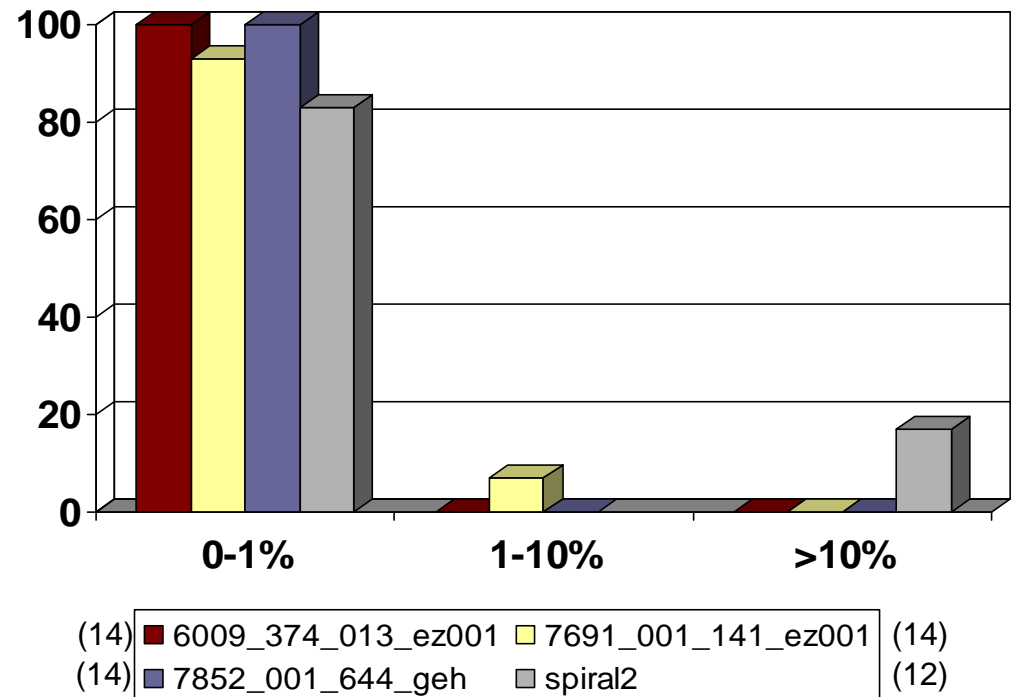
Antique Files

Round15J – Antique Files

- **Four models from Round3J (October 1999 – March 2000) were retrieved from the CAX-IF archives:**
 - *3 native Pro/E 2000i parts with three corresponding STEP files each (plain 203, 203 w/ valprops, 214)*
 - *1 native UG 15 part – since the original solid model STEP file was lost, two new ones (203, 214) were created using UG 16*
 - *Vendors were asked to import the old STEP files into their most recent processor, and, if supported, the native models*
- **Basic idea behind the test was to get a first feeling for long term data retention: how are files handled today, that have been created a number of system releases ago?**

Antique File General Results

- No “age-specific” issues were encountered when importing the STEP files
- The systems supporting the native file formats could import the native models successfully, at least when healing was applied
- Tests to be continued with other and also older test models (StepNet)



Round15J Summary & Conclusions

- Meeting participation disappointing
 - *Motivate vendors to show up*
 - *Actual testing participation was good*
- GD&T testing participation low
 - *Users need to increase pressure on implementors*
- CAD/IQ feedback very interesting
 - *Continue and extend scope*

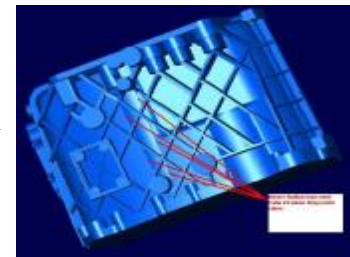
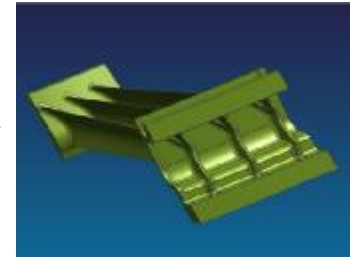
Round 16J Scope

Proposed Round16J Schedule

Date	Action
May 4, 2005 (Wed)	Test Suite available / 1 st CAX Implementor Forum conference call
ASAP	Production Models released
July 8 (Fri)	Initial STEP files and native stats due
July 29 (Fri)	STEP files and native stats frozen
September 1 (Thu)	Target stats due / 2 nd conference call
September 30 (Fri)	Target stats frozen
October 11 (Tue)	Pre-release of final stats / 3 rd conference call
October 18 (Tue)	Review meeting for test round
October 19 – 20 (Wed – Thu)	CAX Implementor Forum meeting, Munich, Germany

Proposed Round16J Scope (1)

- **B4 Model (= B3 full assembly) for supported CAD/IQ Systems**
 - *Source native*
 - *STEP*
 - *Target native*
- **Production Models**
 - *Vane Cluster (UG @ Pratt & Whitney)*
 - *Dashboard (CATIA V4 @ Volkswagen)*
 - *Transmission Housing (Pro/E @ ZF)*
 - *Further models always welcome J*
- **GD&T**
 - *Additional functionality as per Rec. Pracs.*
 - *High coverage GD&T parts (need from users)*
- **Density & Material Name**
 - *Interoperability testing with EA-Team*



Proposed Round16J Scope (2)

- AP203e2 Migration
 - *Production Models*
- LTDR
 - *Older models (StepNet) and assemblies*

Vendor AP 203 E2 Plans

- **OpenCascade – Capability is ready, just have to make the decision**
 - **PTC – Q4/06**
 - **UG – No definite plans, when enough other vendors are ready**
 - **CT – V5R15, Q2/05 “AP203 e2 does not mean GD&T of course ;-)”**
 - **Theorem – Q2/05**
 - **Ideas – Capability ready, probably Ideas V12**
-
- **In terms of detailed vendors support, a table showing which vendors supports which units of functionality with AP203e2 will be set up.**

AP 203 E2 Units of Functionality

- **Geometry**
- **Colors and Layers**
- **Annotation**
- **GD&T Representation**
- **GD&T Presentation**
- **Material and Density**
- **Validation Properties (classic and extended)**
- **External References (classic and nested)**
- **PDM**
- **Construction History and Parametrics***

Round16J – GD & T Possible Scope

- **GD&T Presentation**
- **Part Level Geometric Tolerances**
 - *Datum Features*
 - *Datum Targets*
 - *Angularity*
 - *Circular Runout*
 - *Concentricity*
 - *Cylindricity*
 - *Flatness*
 - *Parallelism*
 - *Perpendicularity*
 - *Position*
 - *Linear Profile*
 - *Surface Profile*
 - *Straightness*
 - *Symmetry*
 - *Total Runout*
- **Support for Modified Datum references and Modified Tolerances**
- **Composite Tolerances**
- **Pattern of Features**