



From: **ASD SSG Mechanical Interoperability working group**  
Ref. <http://www.asd-ssg.org/cad-3d-mechanical-interoperability>  
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To: **List of 3D viewer vendors** (Autodesk, CT CoreTechnologie, Datakit, Dassault Systèmes, ITI, Kubotek, LKSoft, PTC, SAP, Steptools, Siemens PLM solutions, Techsoft 3D, Theorem)

Date: **27 May 2013**

Object: **Visualization of STEP CAD 3D Product Manufacturing Information (PMI)**

Dear Sir or Madam,

**Aerospace and Defense industries use more and more full 3D definition without 2D drawings, and archive full 3D definition in STEP standards (as recommended by NAS/EN 9300 LOTAR<sup>1</sup>).**

Some companies want to decide on the compliance of the manufactured parts using the STEP CAD 3D PMI document which has been approved and released. The resulting business requirement is to visualize the same STEP file, both:

- To approve the CAD models for parts and assemblies,
- And to demonstrate the compliance of the manufactured parts with the specification.

**In consequence, the ASD SSG promotes the development and deployment of STEP 3D viewers<sup>2</sup>.**

Current 3D Viewers are not fully able to read STEP AP203/AP214 and emerging AP242<sup>3</sup> files.

The STEP viewers shall cover at least the following CAD 3D PMI essential information:

- 3D exact BREP representation,
- 3D tessellated BREP representation,
- PMI (polyline presentation)
- User Defined Attributes associated to geometric elements,
- Links between shape and PMI, for cross-highlight,
- Predefined views,
- Assembly structure.

The STEP viewers shall support the associated following functions:

- sectioning,
- measurement,
- cross highlight,
- and filtering.

In addition, to comply with NAS / EN 9300 2 edition 2, the STEP 3D viewers shall support the validation properties associated to this essential information<sup>4</sup>. The visualization tool shall provide access to the

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<sup>1</sup> The list of companies having implemented the LOTAR standards for Long Term Archiving of CAD 3D PMI is available at: <http://www.lotar-international.org/lotar-standard/industry-use.html>

<sup>2</sup> See [ASD SSG statement on 3D Viewers and STEP - 29 November 2012](#)

<sup>3</sup> ISO 10303 STEP AP 242 edition 1 is planned to become ISO DIS standard before end of 2013 and International Standard in Q1 2014.

<sup>4</sup> List of CAX IF recommended practices for validation properties:

- Recommended practices for geometry and assembly validation properties
- Recommended practices for the representation and presentation of Product Manufacturing Information.
- Recommended practices for the User Defined Attributes.
- Recommended practices for 3D tessellated geometry.



validation properties stored in the STEP file and report the result of the comparison with the corresponding validation properties computed by the viewer<sup>5</sup>.

**To prepare the deployment of such a solution in the industry, the ASD SSG invite you to participate to the following evaluation process:**

- End of June 2013: please provide a status of support of your 3D viewer in regards to the above requested functionalities; in case of limitations, please provide the planning of implementation of the missing functionalities. Don't hesitate to send questions requesting clarifications to the ASD SSG.
- Mid of September 2013, The SSG will organize a teleconference with you, in order to present the answers to the questions received before end of June. This will also include an overview of the ASD SSG test cases.
- End of September 2013: The SSG will provide the test cases to the vendors agreeing to participate to the evaluation.
- December 2013: The ASD SSG will organize a teleconference with each CAD 3D viewer vendor, allowing you to present your results of visualization of the ASD SSG test cases, with indicative performance measures.
- January 2014: The ASD SSG will publish (for example on the ASD SSG web site) a summary of the results, including the list of STEP viewers and associated functionalities / limitations. In case no results are provided, it will be reported in the publication.

**We hope your active participation to this process.**

The proposed evaluation process complements CAX IF<sup>6</sup> testing activities - and ASD SSG invites you to participate to CAX IF works.

Based on the results of the proposed evaluation process, and according to their needs, the European A&D companies (OEM and suppliers) will have to organize company specific assessments based on their own test cases, and to select their preferred STEP 3D PMI viewer.

With our best regards,

Signed: the ASD SSG Mechanical Interoperability working group, on behalf of ASD SSG (for the whole list of ASD SSG participants see [www.asd-ssg.org/members](http://www.asd-ssg.org/members))

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*PS: For all correspondence relating to this activity please use the **working group email address**:  
[mechanical\\_interoperability\\_wg@asd-ssg.org](mailto:mechanical_interoperability_wg@asd-ssg.org)*

<sup>5</sup> Extract of LOTAR NAS / EN 9300 part 2 edition 2: "7.3.7 Access 7. Validation properties: in case of translation of the archive representation into a native representation, or in case of processing by a viewer based on the archived open formats, the access process shall check the validation properties, and shall inform the Consumer of the result of the comparisons (refer to EN 9300-007 for detailed definition)."

<sup>6</sup> CAX Implementor Forum: <http://www.cax-if.org/>