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NAS9300-115

Long Term Archiving and Retrieval
of digital technical product documentation
such as 3D, CAD and PDM data

PART 115: Explicit CAD assembly structure

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PROCUREMENT SPECIFICATION NONE	TITLE LONG TERM ARCHIVING AND RETRIEVAL OF DIGITAL TECHNICAL PRODUCT DOCUMENTATION SUCH AS 3D, CAD AND PDM DATA PART 115: EXPLICIT CAD ASSEMBLY STRUCTURE	CLASSIFICATION STANDARD PRACTICE NAS9300-115 SHEET 1 OF 15

FOREWORD

1. This standard was prepared jointly by AIA, ASD-STAN, PDES Inc and the PROSTEP iViP Association.
2. The PROSTEP iViP Association is an international non-profit association in Europe. For establishing leadership in IT-based engineering it offers a moderated platform to its nearly 200 members from leading industries, system vendors and research institutions. Its product and process data standardization activities at European and worldwide levels are well known and accepted. The PROSTEP iViP Association sees this standard and the related parts as a milestone of product data technology.
3. PDES Inc is an international non-profit association in USA. The mission of PDES Inc is to accelerate the development and implementation of ISO 10303, enabling enterprise integration and PLM interoperability for member companies. PDES Inc gathers members from leading manufacturers, national government agencies, PLM vendors and research organizations. PDES Inc. supports this standard as an industry resource to sustain the interoperability of digital product information, ensuring and maintaining authentic longevity throughout their product lifecycle.
4. Readers of this standard should note that all standards undergo periodic revisions and that any reference made herein to any other standard implies its latest edition, unless otherwise stated.
5. The Standards will be published under two different standards organizations using different prefixes. ASD-STAN will publish the standard under the number EN9300-xxx. AIA will publish the standard under the number NAS9300-xxx. The content in the EN9300 and NAS9300 documents will be the same. The differences will be noted in the reference documentation (i.e. for EN9300 Geometric Dimensioning & Tolerancing will be referenced in ISO 1101 and ISO 16792, and for NAS9300 the same information will be referenced in ASME Y14.5M and Y 14.41). The document formatting etc. will follow that of the respective editorial rules of ASD-STAN and AIA.

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1 Scope

NAS9300-115 describes the requirements, and particularly the information required, for the long term archiving and retrieval of a mechanical CAD explicit assembly structure. This will allow the retrieval of the assembly structure including the placement information.

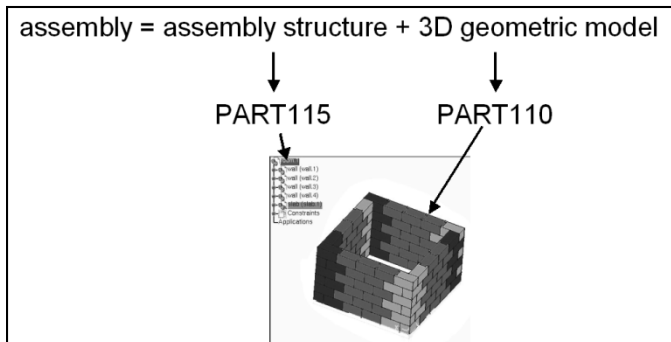


Figure 1 – Assembly structure and geometric model

The CAD assembly structure defines the collection of CAD parts into assemblies, and assemblies into higher level assemblies. An assembly can contain several occurrences of the same part or subassembly.

The assembly structure is a tree, in which the leaf nodes are individual parts, and the non-leaf nodes are assemblies. The parent/child relationship between two nodes records not only that the child is part of a higher assembly, but also the relative position of that child in that assembly.

This standard covers the archiving of the tree structure and the associated positioning information. The geometry of the individual component parts is out of scope.

The assembly structure can be recorded in the same file as the geometry, or can cite the geometry as an external reference.

The assembly structure can be supplied as a single file, or as a set of files, with cross references between files.

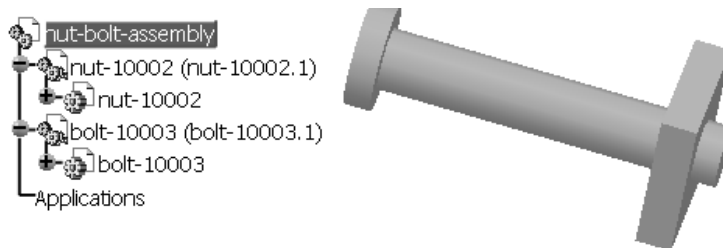


Figure 2 – Example of the scope of the Part 115

Note: An assembly node may contain geometry that is defined directly in the coordinate system of the assembly rather than through a child node with a corresponding transformation matrix to move the part into the assembly co-ordinate system. Some modeling systems call this a hybrid assembly. This kind of assembly is within the general scope of this part; however no specific verification and validation rules for this geometry are defined.

Out of scope:

- The archiving of the geometric model of the components;
- The management of different occurrences of the same part that have different geometry.
- The management of different occurrences of the same part that have different attributes.
- The archiving of assembly-by-constraint (where, for example, the position of a part is given as "perpendicular to part X", rather than given as a positioning matrix);
- The archiving of the Geometrical Dimensioning and Tolerance (GD&T);
- The archiving of assembly Form Features.

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Note: Product assembly structure may be defined based on the data base management system approach. This case uses other fundamental concepts not covered in this part. Ref. family NAS 9300 2xx.

2 Normative references

This Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication applies.

NAS9300 Aerospace series – LOTAR – Long Term Archiving and Retrieval of digital technical and product documentation such as 3D CAD and PDM data. Other parts are applicable as required.

3 Terms, definitions and abbreviations

For the purposes of this standard, the terms, definitions and abbreviations given in NAS 9300 – 007 shall apply.

4 Applicability

Refer to applicability of NAS 9300-001, paragraph 4.

5 Business specifications for the long term archiving and retrieval of the explicit CAD assembly structure

5.1 Use cases

The following sections record the potential use cases for the archiving of an explicit CAD assembly structure. ANNEX A – Recommended archiving scenarios,” identifies the main archiving scenarios corresponding to these two use cases..

5.1.1 UC1: Full archiving

The term "full archiving" is used where the complete assembly structure is archived as a single unit, and all the assembly structure data are contained in the same Submission Information Package (SIP). The assembly may be contained in one file or in a set of files (see Figure 3 – Archiving overview of the submission information package).

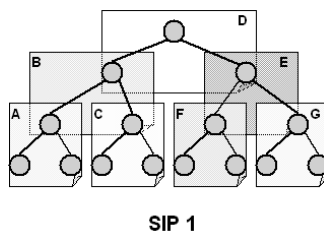


Figure 3 – Archiving overview of the submission information package

5.1.2 UC2: Bottom up and incremental archiving

The assembly structure is archived subset by subset. The assembly structure files are submitted in different submission information packages. For example, in bottom-up archiving, the assembly structure files are submitted from the lower level up to the top level (see figure 4).

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