Aeronavtika - LOTAR - Dolgotrajno arhiviranje in iskanje digitalne tehnične dokumentacije o izdelkih, kot so podatki o 3D, CAD in PDM - 002. del: Zahteve

Aerospace series - LOTAR -LOng Term Archiving and Retrieval of digital technical product documentation such as 3D, CAD and PDM data - Part 002: Requirements

Luft- und Raumfahrt - LOTAR - Langzeit-Archivierung und -Bereitstellung digitaler technischer Produktdokumentationen, wie zum Beispiel von 3D-, CAD- und PDM-Daten - Teil 002: Anforderungen

Série aérospatiale - LOTAR - Archivage Long Terme et récupération des données techniques produits numériques, telles que CAD 3D et PDM - Partie 002 : Exigences

Ta slovenski standard je istoveten z: EN 9300-002:2018

ICS:

01.110	Tehnična dokumentacija za izdelke	Technical product documentation
35.240.10	Računalniško podprto snovanje (načrtovanje, oblikovanje) (CAD)	Computer-aided design (CAD)
35.240.30	Uporabniške rešitve IT v informatiki, dokumentiranju in založništvu	IT applications in information, documentation and publishing
49.020	Letala in vesoljska vozila na splošno	Aircraft and space vehicles in general

SIST EN 9300-002:2018   **en,fr,de**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 9300-002

June 2018

ICS 35.240.60; 49.020; 01.110; 35.240.30

English Version

Aerospace series - LOTAR -LOng Term Archiving and Retrieval of digital technical product documentation such as 3D, CAD and PDM data - Part 002: Requirements

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This European Standard was approved by CEN on 5 June 2017.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 9300-002:2018 E

EN 9300-002:2018 (E)

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European foreword

This document (EN 9300-002:2018) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2018, and conflicting national standards shall be withdrawn at the latest by December 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 9300-002:2018 (E)

Foreword

This standard was prepared jointly by AIA, ASD-STAN, PDES Inc and the PROSTEP iViP Association.

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.

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.

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

The Standards will be published under two different standards organizations using different prefixes. ASD-Stan will publish the standard under the number EN 9300–xxx. AIA will publish the standard under the number NAS 9300–xxx. The content in the EN 9300 and NAS 9300 documents will be the same. The differences will be noted in the reference documentation (i.e. for EN 9300 Geometric Dimensioning & Tolerancing will be referenced in ISO 1101 and ISO 16792, and for NAS 9300 the same information will be referenced in ASME Y14.5M and Y14.41). The document formatting etc. will follow that of the respective editorial rules of ASD-Stan and AIA.

Executive summary

Many companies are migrating their design processes from traditional hard-copy drawings and documents to using digital data. New processes are also needed to archive digital data and preserve access to it, in compliance with business and regulatory requirements appropriate to this new media. Some industries are required to archive data for the life of a product, which can be in excess of 50 years. Over these time periods, changes in technology impact the ability to retrieve and use product data. Organizations, which use digital product data, will need strategies and processes that maintain the usability of the data over multiple generations of technology.

Initially, this document sums up the main business requirements for long term archiving of digital product data.

Then, this document describes requirements for standardized processes (and associated technologies) that ensure product data are retrievable and usable for as long as needed. The archiving process is developed from the Open Archival Information System (OAIS) Reference Model (ISO 14721), which provides a conceptual framework for archive systems.

The archiving process is structured into sub processes for introducing new material into the archive (ingest), managing the data and metadata (data management), managing the physical systems (archive storage), retrieving information and providing it to users (access) and planning the evolution of the repositories (preservation planning). Specific requirements for the archiving of product data are put into this framework.

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EN 9300-002:2018 (E)

1 Scope

This document is a part of the EN 9300 Series. This document addresses requirements for the long term archiving of digital product information, applicable to the international aerospace industry.

Data shall be available to meet regulatory, legal, contractual and business requirements.

Initially, this document sums up the main business requirements for long term archiving of digital product data. Although these requirements are not in themselves normative, when making data available over an extended period, it is a fundamental principle that the contextual data needed to interpret the data is also available.

This document uses the OAIS reference model to provide comparability with other approaches to keeping information available. However, OAIS is a standard reference model for comparison, not a standard for implementation. Consequently, this document defines requirements for processes (and associated technologies) intended to make data available for the life of a product, and does so in terms of the OAIS model.

In dealing with traditional media, the differences between substantial change and unimportant "surface" change are generally self-evident. For example, the yellowing of paper over time, or the encrustation of a gravestone with lichen do not lose the information contained, whereas the loss of pages of a document, or the erosion of the stone do so, and archiving focusses on the preservation of the medium. For digital product data, the medium is unimportant, but the content can be corrupted. The subject of the (many) remaining parts of this standard is the identification of the information that shall be uncorrupted if digital product data is to be usable in the future, and the consequent refinement of processes and procedures to insure this.

This document addresses, archiving of digital product data required for product definition, such as in three-dimensional representations a tolerances, material properties, manufacturing data, etc. specification call-outs, product structure and configuration control data, etc. Other parts of the EN 9300 standards will cover more specifically the long term archiving of, for example, composites, electrical systems, product analyses and product simulation information.

This document also addresses managing the evolution of technologies required to ensure the availability and usability of the data for the required archiving period.

This document is not intended to incorporate company specific requirements and does not dictate specific organizational structures within a company. This document does not specify a design or an implementation of an archive system. Actual implementations may distribute responsibilities or break out functionality differently.

This document assumes that all requirements for configuration management of the product data are in place and therefore are not specifically described in this document.

If an organization chooses to implement requirements beyond those outlined in this requirements document, those additional requirements shall not conflict or negatively impact the requirements contained in this document.

Purpose:

This document establishes legal and other business requirements for processes intended to preserve digital data. Data needs to be stored and maintained so that data is retrievable and usable for the required archiving period. In addition, for some business requirements, data needs to be authentically preserved and accessed.

This standard is intended to allow for different implementations based on a company's specific business environment.

2   Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 9300 (all parts), *Aerospace series — LOTAR — LOng Term Archiving and Retrieval of digital technical product documentation such as 3D, CAD and PDM data*

3   Terms, definitions and abbreviations

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/

- ISO Online browsing platform: available at http://www.iso.org/obp

4   Applicability

Refer to EN 9300-001, Clause 4, for applicability.

5   Introduction

iTeh STANDARD PREVIEW

Many companies are migrating their design processes from using traditional hard-copy drawings and documents to using digital data. New processes are also needed to archive digital data and preserve access to it, in compliance with business and regulatory requirements appropriate to this new media. Some industries are required to archive data for the life of a product, which can be in excess of 50 years. Over these time periods, changes in technology impact the ability to retrieve and use product data. Organizations which use digital product data will need strategies and processes that maintain the usability of the data over multiple generations of technology.

The cost of a particular technology varies over time. As a particular technology ages, the cost of implementation, use and maintenance of that technology can provide a large economic pressure to move to a more current technology. Typically, a newer technology also provides additional business benefits, which is not reflected only in the figures of a cost and benefits comparison. At some point, regardless of cost, it may become impractical or even impossible to use older technology due to lack of materials, equipment, tools and support for the technology.

Business requirements dictate the archiving of product data for long periods of time. It is generally not feasible to maintain a single generation of technology over a period of 50 years. Over these time periods, changes in technology impact the ability to retrieve, reproduce and use product data. Organizations which use digital product data will need strategies and processes that maintain the reproducability and usability of the data over multiple generations of technology.

Development of new aerospace projects implies increasingly the use of digital product information by the supply chain, for inservice support reasons and by the customers. The business requirements described within this standard are planned to be applicable for the full aerospace product life cycle.

This standard sums up the main business requirements for long term archiving of digital product data. In some cases, the authentic preservation of design type information is requested; EN 9300 describes related requirements applicable for this constraint. (see also EN 9300-003 "Fundamentals and Concepts").

Then, this document describes requirements for standardized processes (and associated technologies) that ensure product data are retrievable, reproducible and usable for the required retention period. The

long term archiving and retrieval process is described in terms of the Open Archival Information System (OAIS) Reference Model (ISO 14721.2003) that provides a conceptual framework for archive systems.

The long term archiving and retrieval process is structured into sub-processes for:

— Ingest: introducing new material into the archive;

— Data management: managing the data and metadata;

— Archive storage: managing the physical systems;

— Access: retrieving information and providing it to users and

— Preservation planning: planning the evolution of the repositories.

Specific requirements for the archiving of product data are put into this framework.

6   Key requirements

Within the aerospace industry, a lot of requirements are known for a risk mitigation with respect to certification and legal demands. The following list of requirements are categorized into:

— Acceptance (see 6.1)

— Legal demand (see 6.2)

— Security (see 6.3)

— Certification (see 6.4).

6.1 Acceptance

The first requirement category covers users' acceptance of the manageability of archived documents and the minimizing of costs of archiving within the long term archiving system:

Table 1 — Requirements of category "Acceptance"

No.	Requirement
AC1	Each document within an archive has to be retrievable
AC2	Each document has to be found in a predefined time frame (e.g. 3 days required by JAR)
AC3	The life cycle costs for archiving and access shall be minimized
AC4	The data (a copy of the archived data) shall be available for further use or manipulation (preservation of the design intent), but possibly with limited functionality with respect to the original source. (For example, one use case may only be required to visualize the model and measure distances between the geometric entities, while another may require updates to the model, which in turn entails that the original parametric information would need to be preserved.)
AC5	A planned retention period shall be provided for archived documents/data, i.e., a point in time when a document or a set of data has reached its retention period it must be reviewed prior to removal. The Archive system provides a report that the document has been removed from the archive.

6.2 Legal Requirements

The second requirement category covers the compliance with legal demands. Because of the fact that legal demands (LD) are not fully described by laws, the following list of requirements covers the known and expected demands.

Table 2 — Requirements in category "Legal Requirements"

No.	Requirement
LD1	The ability to verify that a part or product conforms to its archived documentation (a form of configuration audit)
LD2	The users shall be enabled to meet the provisions of relevant laws regarding data security and protection of data privacy over the life cycle of the archives
LD3	The processes of archiving and retrieval shall be auditable

The goal of requirement LD1 is to ensure the conformity of a part or product with the associated documentation. Requirement LD2 ensures the ability of the long term archiving system to provide information about aspects of IT security. Throughout the IT security the long term archiving system ensures the integrity of archived data during archiving time and protects data against unauthorized changes. It requires auditable archiving and retrieval processes.

6.3 Security and integrity

The third requirement category covers the various aspects of integrity and accuracy. The first priority for accuracy and integrity is to retrieve the same content for a document as it was archived.

The second priority is that the content of a document is semantically understood in the same way as when it was created (i.e. preservation of the design intent of the user by the formal description of the key characteristics of the information to be preserved), meassures should be provided which enable ckecking of predefined properties (validation properties based on the essential information) of the digital product documentation against given quality parameters.

Table 3 — Requirements of category "Security"

No.	Requirement
S1	It shall be impossible to destroy a document during its scheduled lifetime.
S2	Each document shall be protected against unauthorized changes while archived.
S3	The document retrieved shall match search criteria. According to a predefined relevant method.
S4	All actions that change the organization and structure of data within the archives shall be recorded so that it will be possible to retrieve of the original contents over the complete retention period.
S5	Documentation and data structure (e.g. Product Structure, documents, physical documents, and product definition models) shall be retrievable and reproducible for the retention period required. This may exceed the period of 50 years.
S6	It is required to provide supporting evidence that product met the design rules from the period when the design was archived.
S7	Guarantee the integrity (ensure information is persistent and unaltered) of data for the period required which may exceed the period of 50 years.
S8	The risk, expenses and costs arising from change of the archiving system or its release shall be

No.	Requirement
	managed, (i.e. via a cost model etc.).
S9	Electronic archives shall be designed to allow migration to new platforms, media, software versions and components without loss of information.
S10	The information content of the document shall not be changed during the archiving, retrieval and migration processes
S11	Each document should be able to be displayed and represented consistent with the form as recorded. (This will assure the archived data is unchanged.)
S12	The processes by which the document is inserted into an archive, migrated or retrieved from the archive should not delete or remove any document from the archive, and should be certifiable to this effect Document removal will be dictated by a retention schedule and determined by an archive administrator.
S13	The archive shall provide fixity information against each archived document / set of data. Evidence of security of an archive may also be provided through a certified process.
S14	The archiving system shall provide adequate measures when technically feasible to check predefined properties within the documents which enable that information are understandable by the Designated Community without the assistance of the information producers. Furthermore this requirement should be supported where required by providing links to the documents describing the correct interpretation of the context and content of an archived document.

It is required to provide the contextual information (methods, procedures, guidelines, …) associated with the product information, in order to ensure its correct interpretation after retrieving |
S15	An audit trail for the archiving process is required. This provides assured information about the actions of relevant processes, and may provide evidence about what occurred.
S16	Collection management is required. I.e. archiving processes which include CAD or PDM data, documents, etc. Supporting information should be managed within the Archive Information Packages (AIP).
S17	The archive shall record the information about the management of access rights.

6.4 Certification

This category covers further requirements which shall be fulfilled for the archiving of type design documents relevant for certification of a product.

Based on an analysis of certification standards and guidelines the ASD-STAN LOTAR came to the conclusion, that the requirements resulting from certification demands are less restricted than of the other three categories above, therefore certification requirements are already covered by the requirements listed above.

6.5 Requirements Refinement

The business requirements identify the business functions that the archive shall support, however these give no detailed criteria for assessment of whether a particular implementation will meet those requirements.

The OAIS standard provides a reference to compare different archiving standards, but does not mandate any particular approach to the solution. It has been recognised that OAIS gives a thorough and