SLOVENSKI STANDARD
oSIST prEN 9300-001:2022

01-april-2022

Aeronavtika - LOTAR - Dolgoročno arhiviranje in iskanje digitalne tehnične dokumentacije o izdelkih, kot so podatki o 3D, CAD in PDM - 001. del: Struktura

Aerospace series - LOTAR - Long Term Archiving and Retrieval of digital technical product documentation such as 3D, CAD and PDM data - Part 001: Structure

Luft- und Raumfahrt - LOTAR Langzeitarchivierung und Bereitstellung digitaler technischer Produktdokumentationen, beispielsweise 3D CAD und PDM Daten - Teil 001: Struktur

Série aérospatiale - LOTAR Archivage Long Terme et récupération des données techniques produits numériques, telles que CAD 3D et PDM - Partie 001 : Structure

Ta slovenski standard je istoveten z: **prEN 9300-001**

ICS:

01.110	Tehnična dokumentacija za izdelke	Technical product documentation
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

oSIST prEN 9300-001:2022 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 9300-001

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ICS 01.110; 35.240.30; 35.240.60; 49.020

English Version

Aerospace series - LOTAR - Long Term Archiving and Retrieval of digital technical product documentation such as 3D, CAD and PDM data - Part 001: Structure

Série aérospatiale - LOTAR Archivage Long Terme et récupération des données techniques produits numériques, telles que CAD 3D et PDM - Partie 001 : Structure

Luft- und Raumfahrt - LOTAR Langzeitarchivierung und Bereitstellung digitaler technischer Produktdokumentationen, beispielsweise 3D CAD und PDM Daten - Teil 001: Struktur

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. prEN 9300-001:2022 E

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European foreword

This document (prEN 9300-001:2022) 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 document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

Introduction

This standard was prepared jointly by AIA, ASD-STAN, PDES, Inc., AFNeT and the prostep ivip Association.

The AFNeT non-profit association has operated for more than 30 years a multi-sectoral “Think Tank” articulated with a “Do Tank”, with digital transformation projects or standardization projects in many industries. These activities have led to the emergence of a network of recognized and highly skilled actors from the manufacturing industry, IT businesses, and research companies. Its members represent leading industrial companies, SMEs, French governmental agencies, software vendors, universities, and research organizations. AFNeT has conducted voluntary and innovative actions in order to develop competitiveness and innovation in industry by setting up collaboration projects or programs in the industrial sectors (Aerospace and Defence, Automotive, Rail, Shipbuilding, Nuclear, Energy, etc.) to enable the digital thread for the extended enterprise processes such as Product Lifecycle Management, Supply-Chain Management, Manufacturing, Maintenance and Operations, Integrated Logistics Support, and Identification. AFNet promotes the development, testing and usage of a set of coherent international standards for supporting these activities, especially in the PLM and the SCM domains.

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 re- source 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 NAS9300–xxx. The content in the EN 9300 and NAS9300 documents will be the same. The differences will be noted in the reference documentation (i.e. for EN 9300 Geometric Dimensioning and Tolerancing will be referenced in ISO 1101 and ISO 16792, and for NAS9300 the same information will be referenced in ASME Y14.5 and Y14.41). The document formatting, etc., will follow that of the respective editorial rules of ASD-STAN and AIA.

1 Scope

This document defines the structure and content for the long-term preservation of digital product and technical data. EN 9300 is broken into a series of separate standard parts to make the standard applicable for different business requirements and extensible for further long-term archiving formats.

The following outlines the total scope of this document:

For the purpose of this document, structure, and content of EN 9300 standard parts are detailed.

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 9300-007, *Aerospace series — LOTAR — Long Term Archiving and Retrieval of digital technical product documentation such as 3D, CAD and PDM data — Part 007: Terms and References*

3 Terms and definitions

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

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

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at https://www.electropedia.org/

4 Applicability

4.1 General

EN 9300 is a standard for long term archiving and retrieval of digital technical product documentation.

Since technical product documentation, such as design documents, are generated, exchanged, and used digitally, architecture, technology, processes, data formats, rules and regulations need to be adapted to enable digital retention and long-term archiving. EN 9300 closes this gap as the European standard for digital long-term archiving.

Long-Term is specifically concerned with impacts from changing technologies, including support for new media and data formats, or with a changing user community. The terms retention and long-term archiving are explained in EN 9300-003.

Different legal, certification, business and process requirements influence retention and archiving. The main requirements are explained in EN 9300-002.

EN 9300 considers two main requirements aspects:

- Legal and certification aspects;
- Technical aspects.

4.2 Legal and certification aspects

4.2.1 General

Laws, their applicability and their interpretation vary from country to country, and are most likely to change over the period of time when this standard is in use. EN 9300 considers requirements coming

from legal and certification rules and regulations on long term archiving of technical documentation. The standard defines architecture, processes, and data formats to fulfil these requirements. It does not provide means for the proof of digital technical documentation in cases of action on law or for certification.

Different legal and certification rules exist worldwide and they have been not completely harmonized in the US and Europe. There are still different rules of various airworthiness authorities. Some examples for rules and regulations are given on example by the US **Federal Rules of Civil Procedure (FRCP)** as well as **European law.**

4.2.2 Product Liability Law

Under US product liability law, manufacturers, distributors, suppliers, retailers, and others who make products available to the public can be held responsible for the injuries caused by those products. If a consumer, user, or bystander gets injured by a product that is defective or unreasonably dangerous, the manufacturer or anyone else in the supply chain can be held responsible for that injury. Product liability lawsuits brought by individual consumers or groups of consumers can become costly and lengthy.

According to the German product liability law from 1990, last updated in 2017, the manufacturer of defective products is bounded to pay compensation in the case that somebody was killed, suffered or something was damaged by use of this product. This case is represented through an absolute liability. The ability to claim compensation expires 10 years after the product rollout.

According to German "§§823 BGB": Everybody who injures somebody's health, body, freedom, possession is bounded to pay compensation. This case involves the placing on the market of defective products by a manufacturer. The manufacturer has to prove the absence of defects and the correctness of the product. The claim for compensation expires 30 years after the damaging event.

- Types of Liability:

  - The consumer's cause of action may be based on (i) negligence, (ii) breach of warranty, or (iii) strict liability.

  - Negligence means that the manufacturer or someone else within the chain of manufacture did not act with reasonable care to ensure the safety of the design and manufacture of product. What constitutes "reasonable care" depends upon the nature and risk of the harm that can be caused by the product. The higher the risk of bodily harm is, the stricter are the requirements in the manufacturing process. The consumer must prove a breach of duty on the part of the manufacturer and the causation of certain damage.

  - A warranty is an express or implied contract between a manufacturer or vendor and its customer concerning the fitness of the product. Express warranties can be created, for instance, by a salesperson's statements, or the literature distributed with the product or included in advertising materials. If the manufacturer doesn't fulfil the terms of the promise, claim or representation concerning the quality or type of product he breached the warranty. Implied warranties exist even if no such statements are made. Unless expressly excluded, a seller implicitly warrants that a product is merchantable and fit for the purpose for which the seller knows the buyer will use the product.

  - Strict liability makes a manufacturer or vendor responsible for all injuries that might be caused by a defective product that is unreasonably dangerous to the user, consumer or to his or her property. Unlike for warranty claims, it does not matter whether there is a connection between the user or consumer and the manufacturer. And unlike for negligence claims, it is not necessary to show that the manufacturer did not act with reasonable care. The consumer must only prove that the product was defective, that the defect existed when product left defendant's hands, and that the defect caused injury to the consumer, who must be a reasonably foreseeable user.

- Types of Defects:
  - Manufacturing defect: The consumer has to show that a construction or manufacturing defect existed, which made the product unsafe for its intended use.
  - Design defect: A design defect refers to a whole class of products that are inadequately planned and therefore unreasonably hazardous for consumers.
  - Failure to warn: Often the manufacturer has the duty to warn the consumer against a hazardous use or instruct him how to use the product properly. Typically, such warnings are included in the labelling or the instructional material. Additionally, the manufacturer always has a duty to warn consumers against a defect discovered after the product was sold. U.S. law generally imposes much stricter product warning requirements than German law. While German courts would often not require a warning because the inherent danger of the product is viewed as self-evident, U.S. courts often take a more consumer friendly approach.

4.2.3 Patent law

To avoid unwarranted demands based on royalties a manufacturer has to provide evidence that he has not infringed a patent. A demand for violating of copyrights can be notified retrospective for 30 years. United States Code Title 35 – Patents.

4.2.4 Regulation (EU) No 910/2014

European regulation on electronic identification and trust services for electronic transactions, repealing Directive 1999/93/EC: Throughout the directive a common and comparable pan-European standard for offering and using signature proceedings shall be established. For details see EN 9300-005.

4.2.5 Airworthiness regulation

Additional to the general legal demands, there are aerospace industry established standards, company specific rules and recommendations regarding documentation and archiving of digital documents.

The duration of retention differs for the different types of documents. For CAD and PDM data there are differences for Design and Type Design Data. Regarding FAA-Recommendations (FAR 21.35) the type design data have to be retained for the life of the type certificate product fleet. Regarding EASA-Regulation (Part 21) the type design data have to be retained three years after the “product type certificate has been completely withdrawn or as agreed with the relevant authority”. Despite the different regulation wording, in the aerospace industry this can lead to archiving durations more than 70 years.

In general, it can be said, that keeping of documents for the future have to take place in such a way that they are usable mainly for the proof of:

- Legal and certification constraints;
- Contractual constraints;
- Re-use of data belonging information;
- Manufacturing processes;
- Modifications on products and documents.

EN 9300-01x, and domain specific parts (e.g. EN 9300-1xx, −2xx, −3xx, etc.) define in more detail auditable processes, data definitions and formats for long term archiving for supporting legal and certification requirements.

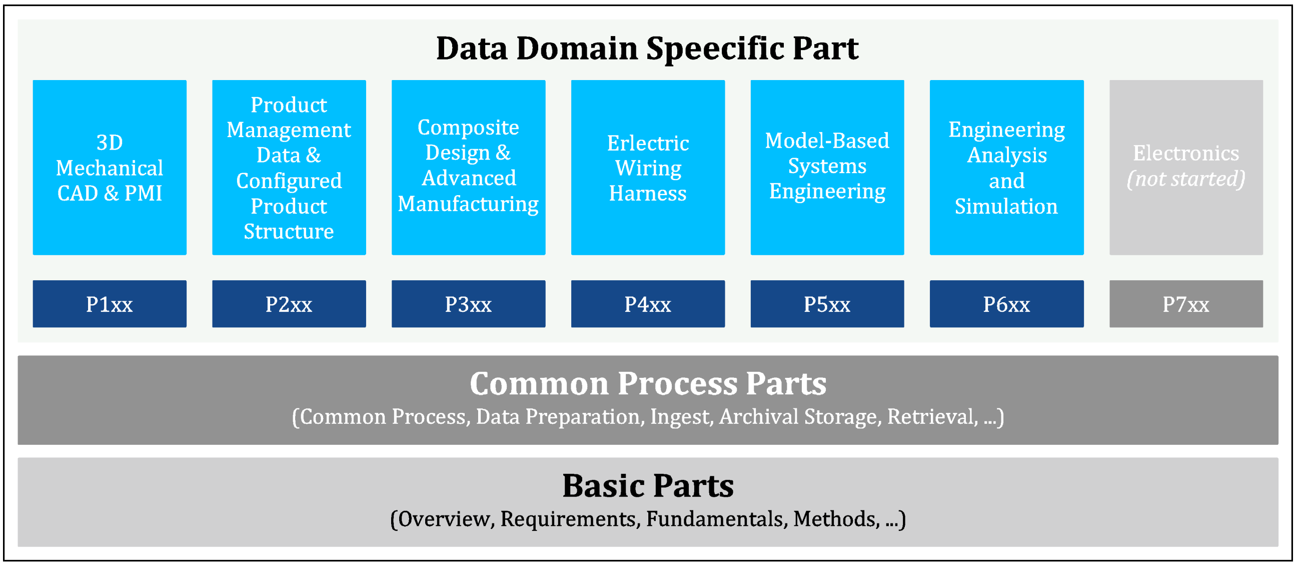

Figure 1 — EN 9300 structure overview

4.3 Technical Aspects

Long term archiving of MBD data has meant so far archiving of 2D drawings or documents as paper drawings, digital images (e.g. as TIFF), or aperture card documents. Because of the continuous development of technical product documentation EN 9300 has to consider the constant changes of methods and tools, which are used for design, manufacturing, customer support and archiving. The history of changes for each method is categorized and listed within four main categories:

- Before 1980: Mainly manual paper drawings and a minor number of 2D CAD drawings;

- Between 1980 and 1995: Mainly 2D CAD drawings, a minor number of manual paper drawings and additionally 3D surface CAD design;

- The usage of 3D solid and assembly CAD design, generated 2D drawings from 3D master models, started in 1995 and will be probably used until 2006;

- Afterwards the usage of 3D solid and assemblies with extended GD&T design information might be implemented;

- Today we see a transition towards more sophisticated model-based product information including engineering analysis and simulation (EAS), model-based system engineering (MBSE) and other disciplines to support seamless end to end digital processes throughout the full product lifecycle.

With regards to the physical product definition for example, the changes of technical product documentation are closely correlated with the development and releases of new generations of CAD systems. New releases of CAD systems offering new functionalities are regularly introduced within the development processes. The following figure gives an example of the possible development of CAD systems and their functionalities.