



**SLOVENSKI STANDARD**  
**oSIST prEN 9115-002:2022**  
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**Aeronavtika - Zahteve za letalske, vesoljske in obrambne organizacije -  
Nedobavljiva programska oprema**

Aerospace series - Requirements for Aviation, Space, and Defence Organizations - Non-Deliverable Software

Qualitätsmanagementsysteme - Anforderungen an Organisationen der Luftfahrt, Raumfahrt und Verteidigung - Nicht Mitgelieferte Software

Systèmes de management de la Qualité - Exigences pour les Organisations de l'Aéronautique, l'Espace et la Défense - Logiciel non livrable

**Ta slovenski standard je istoveten z: prEN 9115-002**

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**ICS:**

35.080	Programska oprema	Software
49.020	Letala in vesoljska vozila na splošno	Aircraft and space vehicles in general

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**prEN 9115-002**

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ICS

English Version

## Aerospace series - Requirements for Aviation, Space, and Defence Organizations - Non-Deliverable Software

Systèmes de management de la Qualité - Exigences  
pour les Organisations de l'Aéronautique, l'Espace et la  
Défense - Logiciel non livrable

Qualitätsmanagementsysteme - Anforderungen an  
Organisationen der Luftfahrt, Raumfahrt und  
Verteidigung - Nicht Mitgelieferte Software

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.

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

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

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## European foreword

This document (prEN 9115-002:2022) 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, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

prEN 9115-002 supersedes and modernizes the Aerospace Recommended Practice (ARP) 9005, “Aerospace Guidance for Non-Deliverable Software”, published in June 2005. ARP9005 guidance was published as an “Americas Only” sector-specific document.

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## Introduction

This document standardizes, to the greatest extent possible, the non-deliverable software requirements for the aviation, space, and defence industry. The establishment of common requirements for use at all levels of the supply-chain by organizations around the world is intended to result in improved quality, schedule, and cost performance by the reduction or elimination of organization unique requirements and wider application of good practices.

Applicability of this standard should be based on the context of organization, business, operations, product development, and other standards that may be required for higher quality assurance levels. The organization should identify applicable software based on the impact to the deliverable products and services.

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# 1 Scope

## 1.1 General

This document defines the requirements for the effective control of non-deliverable software. This document can be used during the development, test, production, release, use, maintenance, and retirement of non-deliverable software. This can include non-deliverable software procured from outside manufacturers and incorporated in the production, evaluation, test, acceptance, or calibration of a deliverable product. When an organization outsources one or more of the processes involved in the creation of non-deliverable software, this document applies.

This document focuses solely on the unique requirements of the operational processes that pertain to non-deliverable software as defined by section 1.2. Operational processes not covered in this document are addressed by the organization's Quality Management System (QMS), based on EN 9100 and/or ISO 9001.

## 1.2 Application

This document applies to non-deliverable software (including firmware) that directly affects the quality of a deliverable product or service. Following are several applications and supporting examples of non-deliverable software that is within scope of this document:

- Design and Development: modelling, simulation, virtual reality, virtual machine, data science, Computer-Aided Design (CAD), Three-Dimensional (3D) modelling, analysis tools, software compiler, and code generators.
- Manufacture: additive manufacturing data files, Computer Numerical Controlled (CNC) programs, robotics, factory automation, tools that load deliverable software, special process (e.g., heat treat, shot peen, sonic wall inspection), and automated manufacturing software (i.e., pick and place).
- Verification and Validation: Coordinate Measuring Machine (CMM) programs, hardware or software qualification, code coverage, test scripts, analysis tools, acceptance test, production acceptance, calibration (inspection, test or calibration), simulator, and emulator.

Non-deliverable software is not delivered to the customer under a contract or agreement.

The following types of software are not within scope of this standard:

- deliverable software (refer to EN 9115);
- embedded manufacturing and test equipment software (e.g., operating system);
- business systems or office software; and
- information systems software for business applications.

## 2 Normative references

There are no normative references in this document.

### 3 Terms and definitions

Definitions for general terms can be found in the IAQG Dictionary<sup>1)</sup>. An acronym log for this document is presented in Annex A.

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/>

For the purpose of this document, the following definitions apply:

#### 3.1

##### **Free Open-Source Software (FOSS)**

software that is both free software and open-source software; where anyone is able to use, copy, study, and change the software

Note 1 to entry: The source code is openly shared to encourage improvement of the software design.

#### 3.2

##### **non-deliverable software**

software that is not delivered to the end-user of a deliverable product under a contract or agreement

Note 1 to entry: Software may be used in the design, manufacture, inspection, test, acceptance, or calibration processes.

#### 3.3

##### **obsolete software**

software that is no longer required for product development or verification

#### 3.4

##### **porting**

migrating

modifying software to run on a different computer and/or operating system than those on which it has been verified and validated

#### 3.5

##### **purchased software**

software purchased or supplied by an external provider that is not modified or customized

Note 1 to entry: This includes COTS software used for product development. Software that is modified for use in production or not used in its original off-the-shelf state, exclusive of selection of options and features, is not considered COTS.

### 4 Design and development of non-deliverable software

#### 4.1 Design and development planning

The organization shall develop and maintain a non-deliverable software design and development plan, defining the required tasks and activities associated to these efforts.

The design and development plan shall include the following items, as applicable:

- a. development lifecycle methodology (e.g., waterfall, agile);

<sup>1)</sup> Located on the IAQG website: <https://iaqg.org/tools/dictionary/>.



- b. identification of applicable standards, conventions, tools, and techniques;
- c. identification of Free Open-Source Software (FOSS) intended for use;
- d. configuration management requirements (e.g., identification, control, problem reporting, retention, storage);
- e. tools, templates, and work aids;
- f. interfaces between different groups involved in design and development to ensure effective communication and clear assignment of responsibility;
- g. software quality requirements (e.g., compliance verification, non-compliance handling, software quality independence);
- h. risk management;
- i. verification and validation;
- j. the purpose, primary function, and description of the software;
- k. contribution of software to operational risk;
- l. identification of inputs and outputs;
- m. identification of software;
- n. traceability of software requirements throughout the lifecycle;
- o. computer hardware requirements, limitations, and constraints;
- p. information assurance, cybersecurity, and security requirements for the software and data, including digital data transfers;
- q. the level of testing coverage (e.g., unit, integration, qualification);
- r. release review and approval; and
- s. documented information.

#### 4.2 Design and development inputs

Inputs are a comprehensive set of requirements used to define and develop software products. Software requirements shall be verifiable, traceable to, and consistent with parent requirements. It is understood that not all requirements can be traced back to a parent requirement (e.g., derived requirement).

All requirements (inputs) shall be documented. The software requirements shall be reviewed to ensure they are complete and correct. Requirements (inputs) shall include the following items, as applicable:

- a. functional and performance requirements;
- b. key characteristics and critical items needed to develop the non-deliverable software;
- c. information derived from planning documentation;
- d. environmental requirements, including operating systems and platforms;
- e. system and interface requirements, if the software does not function as stand-alone;
- f. operational requirements;
- g. information derived from previous similar designs;
- h. maintenance requirements; and
- i. security requirements.

**prEN 9115-002:2022 (E)****4.3 Verification**

Verification shall be performed, as planned. Acceptance testing shall be completed, reviewed, and results documented. This shall be undertaken prior to initial use and reconfirmed as necessary.

When software outputs cannot be verified by monitoring or measurement, alternative verification processes shall be established and approved. Applicable methods, procedures, and criteria shall be defined, as applicable.

The documented information shall contain evidence that the software meets requirements and records of verification shall be documented and maintained.

The organization should establish a method to ensure the accuracy and repeatability of software-controlled measurement equipment during data collection.

**4.4 Validation**

Validation shall be performed, as planned. Reviews shall be completed and results documented.

New hardware environments can necessitate software modification and re-validation, including software modification due to new or modified requirements. Re-validation shall occur when porting or migrating software into a new hardware or software environment.

**4.5 Release, review and approval**

The purpose of the release, review and approval is to provide objective evidence of the following:

- a. the requirements are accounted for, validated and verified (as appropriate), and recorded;
- b. the non-deliverable software is acceptable for its intended use; and
- c. the approved non-deliverable software is maintained under configuration management.

**4.6 Design and development outputs**

Outputs are the expected results (documented information) of the non-deliverable software development process. Outputs shall include:

- a. non-deliverable software executable object and source code, including requirements, configuration data, user guidance, and release documentation;
- b. validation and verification data;
- c. change requests (e.g., process improvements, planning improvements, problem reports);
- d. limitations of use; and
- e. target hardware and software environment.

**4.7 Configuration management****4.7.1 Identification and traceability**

The organization shall establish and maintain a configuration control process for non-deliverable software that includes the capability to:

- a. uniquely identify each version of software;
- b. identify each item that makes up the software;