



# SLOVENSKI STANDARD

## SIST EN 9102:2016

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Nadomešča:  
SIST EN 9102:2009

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**Aeronavtika - Sistem vodenja kakovosti - Zahteve za prvi pregled vzorcev**

Aerospace series - Quality systems - First article inspection requirements

Luft- und Raumfahrt - Qualitätsmanagement - Erstmusterprüfung Anforderungen

Série aérospatiale - Systèmes qualité - Exigences pour la revue premier article  
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**Ta slovenski standard je istoveten z: ~~SIST EN 9102:2015~~ EN 9102:2015**

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**ICS:**

03.120.10	Vodenje in zagotavljanje kakovosti	Quality management and quality assurance
49.020	Letala in vesoljska vozila na splošno	Aircraft and space vehicles in general

**SIST EN 9102:2016**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 9102**

December 2015

ICS 03.120.10; 49.020

Supersedes EN 9102:2006

English Version

**Aerospace series - Quality systems - First article inspection  
requirements**

Série aérospatiale - Systèmes qualité - Exigences pour  
la revue premier article

Luft- und Raumfahrt - Qualitätsmanagement -  
Erstmusterprüfung Anforderungen

This European Standard was approved by CEN on 27 September 2015.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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.

CEN members are the national standards bodies of 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## European foreword

This document (EN 9102:2015) 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 European 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 June 2016, and conflicting national standards shall be withdrawn at the latest by June 2016.

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

This document supersedes EN 9102:2006.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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## ***RATIONALE***

This European Standard was revised to emphasize the value of the First Article Inspection (FAI) process to an organization, separate and enhance the planning and evaluation activities, and define Digital Product Definition (DPD) and its relationship to the FAI process. Additional changes to the standard requirements, definitions, and associated notes were incorporated in response to stakeholder needs.

To assure customer satisfaction, aviation, space, and defence organizations must produce and continually improve safe, reliable products that meet or exceed customer and applicable statutory and regulatory requirements. The globalization of the industry and the resulting diversity of regional and national requirements and expectations have complicated this objective. Organizations face the challenge of purchasing products from suppliers throughout the world and at all levels of the supply chain. Industry suppliers and processors face the challenge of delivering products to multiple customers having varying quality requirements and expectations.

The aviation, space, and defence industry established the International Aerospace Quality Group (IAQG) for the purpose of achieving significant improvements in quality and safety, and reductions in cost throughout the value stream. This organization includes representation from companies in the Americas, Asia/Pacific, and Europe. This international standard has been prepared by the IAQG.

This document standardizes FAI process requirements to the greatest extent possible and can be used at all levels of the supply chain by organizations around the world to provide a consistent process and documentation requirements for verification of aviation, space, and defence product. Its use should result in improved quality, schedule, and cost performance by the reduction or elimination of organization-unique requirements and wider application of good practices. While primarily developed for the aviation, space, and defence industry, this European Standard can also be used in other industry sectors where a standardized FAI process is needed.

## 1 Scope

### 1.1 General

This European Standard establishes the baseline requirements for performing and documenting FAI. Should there be a conflict between the requirements of this European Standard and applicable statutory or regulatory requirements, the applicable statutory or regulatory requirements shall take precedence.

### 1.2 Purpose

The primary purpose of FAI is to validate that product realization processes are capable of producing parts and assemblies that meet engineering and design requirements. A well-planned and executed FAI will provide objective evidence the manufacturer's processes can produce compliant product and that they have understood and incorporated associated requirements. FAI will:

- Provide confidence that the product realization processes are capable of producing conforming product.
- Demonstrate that the manufacturers and processors of the product have an understanding of the associated requirements.
- Provide objective evidence of process capability.
- Reduce potential risks associated with production start-up and/or process changes.
- Provide assurance of product conformance at the start of production and after changes outlined in this European Standard.

An FAI is intended to <https://standards.iteh.ai/catalog/standards/sist/3ad9d2ac-c7c3-4a76-970f-31f9b8e8ad44/sist-en-9102-2016>

- Reduce future escapes, risks, and total costs.
- Help ensure safety of flight.
- Improve quality, delivery, and customer satisfaction.
- Reduce costs and production delays associated with product nonconformances.
- Identify product realization processes that are not capable of producing conforming product, and initiate and/or validate corrective actions.

### 1.3 Application

This European Standard applies to organizations that are responsible for producing the design characteristics of the product (i.e., product realization). The organization shall flow down the requirements of this European Standard to suppliers or processors who produce design characteristics.

This European Standard applies to assemblies, sub-assemblies, and detail parts including castings, forgings, and modifications to standard catalogue or Commercial-Off-the-Shelf (COTS) items.

Unless contractually required, this European Standard does not apply to:

- Development and prototype parts that are not considered as part of the first production run.

**EN 9102:2015 (E)**

- Unique single run production orders, not intended for ongoing production (e.g., out-of-production spares).
- Procured standard catalogue items, COTS, or deliverable software.

**2 Normative references**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 9100, *Quality management systems — Requirements for aviation, space and defence organisations*

EN 9103, *Quality management systems — Variation management of key characteristics*

ISO 9000, *Quality management systems — Fundamentals and vocabulary*

NOTE Equivalent versions (e.g., AS, EN, JISQ, SJAC, NBR) of the IAQG standards listed above are published internationally in each IAQG sector.

**3 Terms and definitions**

An acronym log for this European Standard is presented in Annex A. For the purposes of this European Standard, the terms and definitions stated in ISO 9000 and the following apply:

**3.1 attribute data**  
 a result from a characteristic or property that is appraised only as to whether it does or does not conform to a given requirement (e.g., go/no-go, accept/reject, pass/fail)

**3.2 baseline part number**  
 this refers to the previous FAI part number or approved configuration, including revision level, to which a partial FAI is performed. An example of an approved configuration could be a part produced, prior to the requirements of this European Standard.

**3.3 capability**  
 ability of an organization, system, or process to produce a product that will fulfill the associated design characteristics defined for that product

**3.4 Commercial-Off-the-Shelf (COTS) items**  
 commercially available items intended by design to be procured and utilized without modification (e.g., common electronic components)

**3.5 deliverable software**  
 embedded or loadable airborne, space borne, or ground support software or firmware components which are part of an aircraft type design, weapon system, missile, or spacecraft

**3.6 design characteristics**  
 those dimensional, visual, functional, mechanical, and material features or properties, which describe and constitute the design of the article, as specified by drawing or DPD requirements. These characteristics can be measured, inspected, tested, or verified to determine conformance to the design requirements. Dimensional features include in-process locating features (e.g., target-machined or forged/cast dimensions on forgings and castings, weld/braze joint preparation necessary for



acceptance of finished joint). Material features or properties may include processing variables and sequences, which are specified by the drawing or DPD (e.g., heat treat temperature, fluorescent penetrant class, ultrasonic scans, sequence of welding and heat treat). These provide assurance of intended characteristics that could not be otherwise defined.

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**EN 9102:2015 (E)****3.7****designed tooling**

product specific tooling [e.g., check fixtures, Coordinate Measurement Machine (CMM) program] specifically made to validate the design characteristics of a product

**3.8****Digital Product Definition (DPD) requirements**

requirements of any digital data files that disclose, directly or by reference, the physical or functional requirements, including data files that disclose the design or acceptance criteria of a product

Examples of DPD include the following:

- The digital definition and fully dimensioned two-dimensional (2D) drawing sheets.
- Three-dimensional (3D) data model and simplified or reduced content 2D drawing sheets.
- The 3D model with design characteristics displayed as text.
- Any other data files that define a product in its entirety.

**3.9****drawing requirements**

requirements of the drawing and associated parts lists, specification, or purchasing document to which the product is to be produced from, including any notes, specifications, and lower-level drawings invoked

**3.10****First Article Inspection (FAI) – also referred to as production process verification**

a planned, complete, independent, and documented inspection and verification process to ensure that prescribed production processes have produced an item conforming to engineering drawings, DPD, planning, purchase order, engineering specifications, and/or other applicable design document

**3.11****First Article Inspection Report (FAIR)**

the forms and package of documentation for a part number, sub-assembly, or assembly, including associated FAI results, as defined by this European Standard

**3.12****first production run**

the initial group of one or more parts that are the result of a planned process designed to be used for future production of these same parts

**3.13****multiple characteristics**

Identical characteristics that occur at more than one location (e.g., “4 places”), but are established by a single set of drawing or DPD requirements (e.g., rivet hole size, dovetail slots, corner radii, chemical milling pocket thickness)

**3.14****product**

any intended output resulting from the product realization process, which in the context of this European Standard includes finished detailed parts, sub-assemblies, assemblies, forgings, and castings

**3.15****qualified tooling**

universal (not part specific) calibrated monitoring and measuring equipment (e.g., go/no go gauges, thread gauges, radius gauges) used to validate product design characteristics, that are uniquely identified and traceable to their calibration records

**3.16****reference characteristics**

the characteristics that are used for “information only” or to show relationship; these are dimensions without tolerances and refer to other dimensions on the drawing or in the DPD

**3.17****special processes**

any processes for production and service provision where the resulting output cannot be verified by subsequent monitoring or measurement and, as a consequence, deficiencies become apparent only after the product is in use or the service has been delivered

**3.18****standard catalogue items**

a part or material that conforms to an established industry or national authority published specification, having all characteristics identified by text description or industry/national/military standard drawing

**3.19****variable data**

quantitative measurements taken on a continuous scale (e.g., the diameter of a cylinder, the gap between mating parts)

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**4 Requirements**

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**4.1 Part requirements**

- a) The organization shall perform FAI on new product representative of the first production run. The first production delivery parts require an FAI.
- b) The organization shall use a representative item from the first production run of a new product to verify that the production processes, production documentation, and tooling have the capability to produce products that meet established requirements.
- c) For assemblies, the assembly level FAI shall be performed on those characteristics specified on the assembly drawing or DPD.
- d) This process shall be repeated, when changes occur that invalidate the original results (e.g., engineering changes, manufacturing process changes, tooling changes).

**4.2 First article inspection planning**

- a) The organization shall have a process to plan for completion of FAI or shall plan FAI activities prior to the first production run.
- b) FAI planning shall address the activities to be performed throughout the FAI process and identify the responsible organizations for those activities.
- c) The organization should consider the following activities during FAI planning and coordinate planning with the customer, if required: