

SLOVENSKI STANDARD
oSIST prEN ISO 14253-1:2016
01-julij-2016

Specifikacija geometrijskih veličin izdelka (GPS) - Preverjanje z merjenjem obdelovancev in merilne opreme - 1. del: Pravila odločanja za potrjevanje skladnosti ali neskladnosti s specifikacijo (ISO/DIS 14253-1:2016)

Geometrical product specifications (GPS) - Inspection by measurement of workpieces and measuring equipment - Part 1: Decision rules for proving conformity or nonconformity with specifications (ISO/DIS 14253-1:2016)

Geometrische Produktspezifikationen (GPS) - Prüfung von Werkstücken und Meßgeräten durch Messen - Teil 1: Entscheidungsregeln für den Nachweis von Konformität oder Nichtkonformität mit Spezifikationen (ISO/DIS 14253-1:2016)

Spécification géométrique des produits (GPS) - Vérification par la mesure des pièces et des équipements de mesure - Partie 1: Règles de décision pour prouver la conformité ou la non-conformité à la spécification (ISO/DIS 14253-1:2016)

Ta slovenski standard je istoveten z: prEN ISO 14253-1 rev

ICS:

17.040.30	Merila	Measuring instruments
17.040.40	Specifikacija geometrijskih veličin izdelka (GPS)	Geometrical Product Specification (GPS)

oSIST prEN ISO 14253-1:2016 **en**

DRAFT INTERNATIONAL STANDARD

ISO/DIS 14253-1

ISO/TC 213

Secretariat: DS

Voting begins on:
2016-06-06Voting terminates on:
2016-08-28

Geometrical product specifications (GPS) — Inspection by measurement of workpieces and measuring equipment —

Part 1:

Decision rules for verifying conformity or nonconformity with specifications

Spécification géométrique des produits (GPS) — Vérification par la mesure des pièces et des équipements de mesure —

Partie 1: Règles de décision pour contrôler la conformité ou la non-conformité à la spécification

ICS: 17.040.01

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ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.



Reference number
ISO/DIS 14253-1:2016(E)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 213, Dimensional and geometrical product specifications and verification.

This third edition cancels the second edition (ISO 14253-1:2013). The content applies ISO/IEC Guide 98-4:2012 and gives recommendation for simplification by using intervals representing the underlying probability approaches. As a consequence the default coverage factor $k = 2$ has been replaced with a default conformance probability of 95%. Some terminology has been updated.

ISO 14253 consists of the following parts, under the general title *Geometrical product specifications (GPS) — Inspection by measurement of workpieces and measuring equipment*:

- *Part 1: Decision rules for verifying conformity or nonconformity with specifications*
- *Part 2: Guidance for the estimation of uncertainty in GPS measurement, in calibration of measuring equipment and in product verification*
- *Part 3: Guidelines for achieving agreements on measurement uncertainty statements*
- *Part 4: Background on functional limits and specification limits in decision rules [TS]*
- *Part 5: Uncertainty in verification testing of indicating measuring instruments*
- *Part 6: Generalized decision rules for the acceptance and rejection of instruments and workpieces [TR]*

Introduction

This part of ISO 14253 is a geometrical product specifications (GPS) standard and is to be regarded as a global GPS standard (see ISO 14638). It influences the chain link D of all chains of general GPS standards.

The ISO/GPS Matrix model given in ISO 14638 gives an overview of the ISO/GPS system of which this document is a part. The fundamental rules of ISO/GPS given in ISO 8015 apply to this document and the default decision rules given in this document apply in ISO/GPS, unless otherwise indicated.

For more detailed information on the relation of this part of ISO 14253 to other standards and the GPS matrix model, see [Annex C](#).

The estimated measurement uncertainty is to be taken into account when verifying conformity or nonconformity with specification.

The problem arises when a measurement result falls close to the upper or lower specification limit. In this case verification of conformity or nonconformity with specifications is not possible: the measurement uncertainty induces a probability that a true value of the measurand is out of specification even if the measured result falls inside the specification zone, or is in specification even if the measured value falls outside.

Therefore, suppliers and customers should agree in advance a method to resolve any issues that may arise. This part of ISO 14253 explains how to define default acceptance- and rejection zones (i.e. decision rules) for verifying conformity or nonconformity with specifications.

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Geometrical product specifications (GPS) — Inspection by measurement of workpieces and measuring equipment —

Part 1:

Decision rules for verifying conformity or nonconformity with specifications

1 Scope

This part of ISO 14253 establishes the rules for verifying the conformity or nonconformity with a given tolerance for a characteristic of a workpiece (or a population of workpieces) or with given maximum permissible errors for a metrological characteristic of a measuring equipment, including when the measurement result falls close to the specification limits, taking measurement uncertainty into account.

This part of ISO 14253 applies to specifications defined in general GPS standards (see ISO 14638), i.e. standards prepared by ISO/TC 213, including:

- workpiece/population of workpieces specifications (usually given as an upper specification limit or a lower specification limit or both), and;
- measuring equipment specifications (usually given as maximum permissible errors).

This part of ISO 14253 only applies for characteristics and maximum permissible errors expressed as quantity values.

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.

ISO 3534-1:2006, *Statistics — Vocabulary and symbols — Part 1: General statistical terms and terms used in probability*

ISO 3534-2:2006, *Statistics — Vocabulary and symbols — Part 2: Applied statistics*

ISO 9000:2005, *Quality management systems — Fundamentals and vocabulary*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

ISO/IEC Guide 98-4:2012, *Uncertainty of measurement — Part 4: Role of measurement uncertainty in conformity assessment*

ISO/IEC Guide 99, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3534-2, ISO 9000, ISO/IEC Guide 98-3, ISO/IEC Guide 98-4 and ISO/IEC Guide 99 and the following apply.

Note 1 to entry “Specification limit”, “upper specification limit (USL)”, “lower specification limit (LSL)”, “specified tolerance” and “population” are defined in ISO 3534-2:2006.

Note 2 to entry “Maximum permissible measurement error”, “measurement uncertainty”, “standard measurement uncertainty”, “combined standard measurement uncertainty”, “coverage interval” and “coverage probability” are defined in ISO/IEC Guide 99:2007.

Note 3 to entry “Acceptance limit”, “acceptance interval”, “rejection interval”, “conformance probability” and “guard band” are defined in ISO/IEC Guide 98-4:2012.

Note 4 to entry “Conformity” and “nonconformity” are defined in ISO 9000:2005.

3.1 specification zone

variate values of the specified workpiece characteristic or population characteristic or the specified maximum permissible error (MPE) of a metrological characteristic of a measuring equipment fulfilling the specification

Note 1 to entry: A specification refers to or includes drawings, patterns or other relevant documents.

3.2 conformance probability limit

agreed minimum value of conformance probability when verifying conformity

Note 1 to entry: The conformance probability limit effectively sets the criterion for acceptance when verifying conformity.

Note 2 to entry: A conformance probability limit of p corresponds to a risk of false acceptance not exceeding $(1 - p)$.

3.3 default conformance probability limit

conformance probability limit (3.2) set by this international standard as default

3.4 nonconformance probability

probability that an item does not fulfil a specified requirement

Note 1 to entry: The *conformance probability* and *nonconformance probability* sum up to unity

3.5 nonconformance probability limit

agreed minimum value of *nonconformance probability* (3.4) when verifying nonconformity

Note 1 to entry: The nonconformance probability limit effectively sets the criterion for rejection when verifying nonconformity.

Note 2 to entry: A nonconformance probability limit of p corresponds to a risk of false rejection not exceeding $(1 - p)$.

3.6 default nonconformance probability limit

nonconformance probability limit (3.5) set by this international standard as default

3.7 acceptance zone

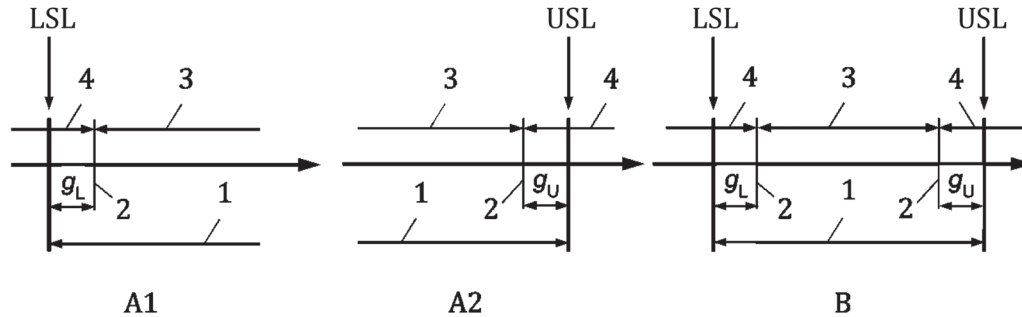
set of one or more acceptance intervals.

3.8

default acceptance zone

acceptance zone (3.7) based on the default conformance probability limit (3.3).

Note 1 to entry: See Figure 1.



Key

- A1, A2 specification with a single specification limit
- B specification with lower and upper specification limits
- 1 specification zone
- 2 acceptance limits
- 3 acceptance zone
- 4 rejection zone
- g_U, g_L upper and lower guard band

Figure 1 — Acceptance zone and rejection zone when verifying conformity

3.9

rejection zone

set of one or more rejection intervals

Note 1 to entry: The rejection zone is the complement to the acceptance zone (3.7)

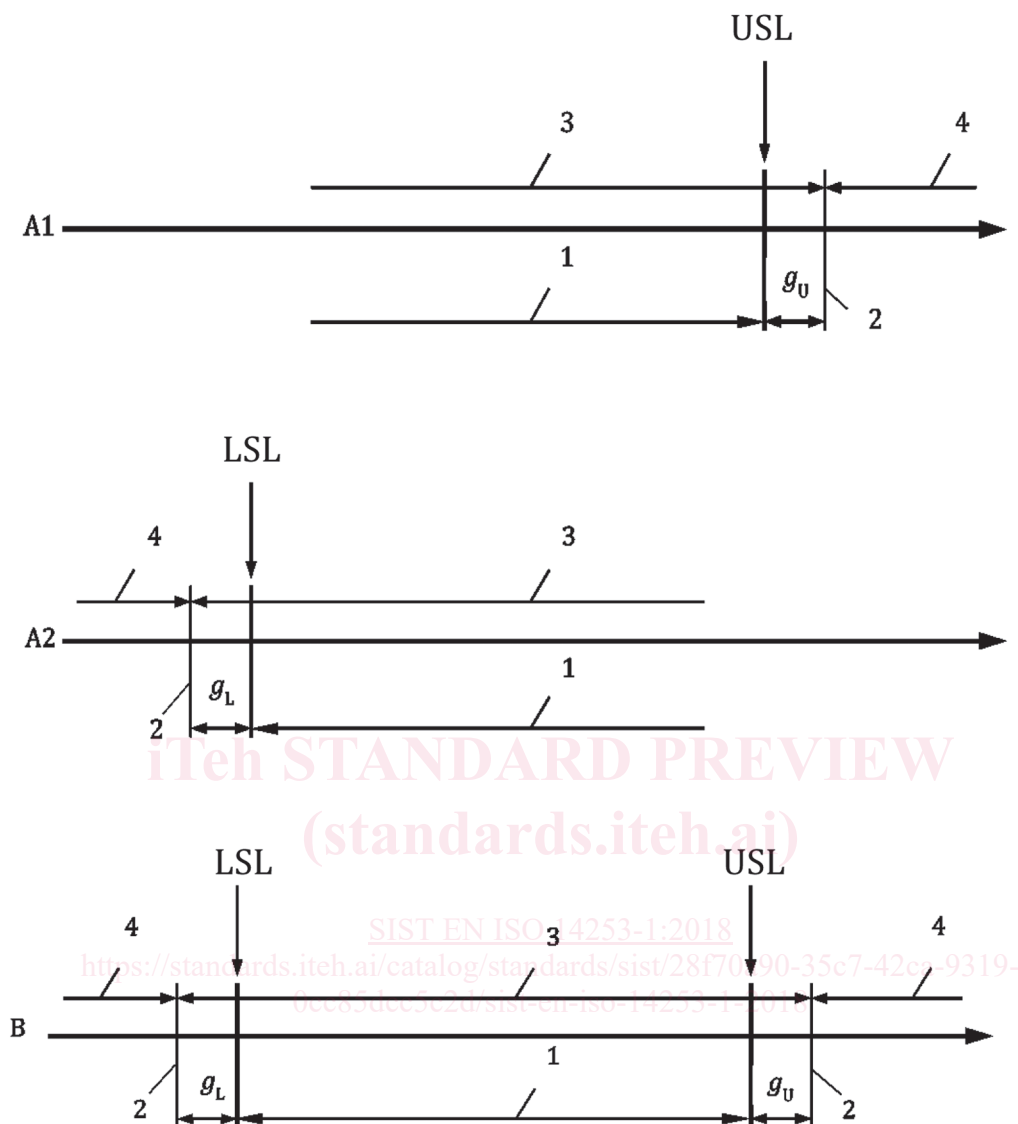
3.10

default rejection zone

rejection zone (3.9) based on the default nonconformance probability limit (3.5)

Note 1 to entry: See Figure 2

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**Key**

- A1, A2 specification with a single specification limit
 B specification with lower and upper specification limits
 1 specification zone
 2 acceptance limits
 3 acceptance zone
 4 rejection zone
 g_U, g_L upper and lower guard band

Figure 2 — Rejection zone and acceptance zone when verifying nonconformity