SLOVENSKI STANDARD
SIST EN ISO 5458:2018

01-september-2018

Nadomešča:

SIST EN ISO 5458:2000

Specifikacija geometrijskih veličin izdelka (GPS) - Geometrijsko toleriranje - Vzorec in kombinirane geometrijske specifikacije (ISO 5458:2018)

Geometrical product specifications (GPS) - Geometrical tolerancing - Pattern and combined geometrical specification (ISO 5458:2018)

Geometrische Produktspezifikation (GPS) - Form und Lagetolerierung - Positions- und Mustertolerierung (ISO 5458:2018)

Spécification géométrique des produits (GPS) - Tolérancement géométrique - Spécification géométrique de groupes d'éléments et spécification géométrique combinée (ISO 5458:2018)

Ta slovenski standard je istoveten z: **EN ISO 5458:2018**

ICS:

01.100.01	Tehnično risanje na splošno	Technical drawings in general
17.040.10	Tolerance in ujemi	Limits and fits
17.040.40	Specifikacija geometrijskih veličin izdelka (GPS)	Geometrical Product Specification (GPS)

SIST EN ISO 5458:2018 **en**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 5458

June 2018

ICS 17.040.10

Supersedes EN ISO 5458:1998

English Version

Geometrical product specifications (GPS) - Geometrical tolerancing - Pattern and combined geometrical specification (ISO 5458:2018)

Spécification géométrique des produits (GPS) - Tolérancement géométrique - Spécification géométrique de groupes d'éléments et spécification géométrique combinée (ISO 5458:2018)

Geometrische Produktspezifikation (GPS) - Form und Lagetolerierung - Positions- und Mustertolerierung (ISO 5458:2018)

This European Standard was approved by CEN on 25 February 2018.

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.

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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.

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

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Ref. No. EN ISO 5458:2018 E

EN ISO 5458:2018 (E)

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European foreword

This document (EN ISO 5458:2018) has been prepared by Technical Committee ISO/TC 213 "Dimensional and geometrical product specifications and verification" in collaboration with Technical Committee CEN/TC 290 "Dimensional and geometrical product specification and verification" the secretariat of which is held by AFNOR.

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.

This document supersedes EN ISO 5458:1998.

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.

Endorsement notice

The text of ISO 5458:2018 has been approved by CEN as EN ISO 5458:2018 without any modification.

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INTERNATIONAL STANDARD

ISO
5458

Third edition
2018-05

Geometrical product specifications (GPS) — Geometrical tolerancing — Pattern and combined geometrical specification

Spécification géométrique des produits (GPS) — Tolérancement géométrique — Spécification géométrique de groupes d'éléments et spécification géométrique combinée

Reference number
ISO 5458:2018(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 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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 voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 213, *Dimensional and geometrical product specifications and verification*.

This third edition cancels and replaces the second edition (ISO 5458:1998), which has been technically revised.

The main changes to the previous edition are as follows:

— exception from the independency principle removed according to ISO 8015;

— rules harmonized to align with ISO 1101;

— unstated rules in ISO 5458:1998 removed;

— concept of "pattern" to control all types of geometrical features introduced more generically, rather than applying it only with position symbol.

Introduction

This document is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO 14638). It influences chain links A, B and C for form, orientation and location.

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 ISO 14253-1 apply to specifications made in accordance with this document, unless otherwise indicated.

For more detailed information of the relation of this document to the GPS matrix model, see Annex F.

ISO 1101 and other relevant documents, such as those dealing with the least and maximum material requirement (ISO 2692) and the datum system (ISO 5459), should be taken into consideration when using this document.

This document provides rules for the tolerancing of a tolerance zone pattern, i.e. a collection of tolerance zones constrained to each other with or without reference to a datum system which does not lock all degrees of freedom.

For the presentation of lettering (proportions and dimensions), see ISO 3098-2.

All figures in this document for the 2D drawing indications have been drawn in first-angle projection with dimensions and tolerances in millimeters. It should be understood that third-angle projection and other units of measurement could have been used equally well without prejudice to the principles established.

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Annexes A and B provide more information on the changes in practice and differences between this document and ISO 1101 on one hand and ISO 5458:1998 on the other hand.

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INTERNATIONAL STANDARD   **ISO 5458:2018(E)**

Geometrical product specifications (GPS) — Geometrical tolerancing — Pattern and combined geometrical specification

IMPORTANT — The illustrations included in this document are intended to illustrate the text and/or to provide examples of the related technical drawing specification; these illustrations are not fully dimensioned and toleranced, showing only the relevant general principles. In particular, many illustrations do not contain filter specifications. As a consequence, the illustrations are not a representation of a complete workpiece, and are not of a quality that is required for use in industry (in terms of full conformity with the standards prepared by ISO/ TC 10 and ISO/TC 213), and as such are not suitable for projection for teaching purposes.

1   Scope

This document establishes complementary rules to ISO 1101 to be applied to pattern specifications and defines rules to combine individual specifications, for geometrical specifications e.g. using the symbols POSITION, SYMMETRY, LINE PROFILE and SURFACE PROFILE, as well as STRAIGHTNESS (in the case where the toleranced features are nominally coaxial) and FLATNESS (in the case where the toleranced features are nominally coplanar) as listed in Annex C.

These rules apply when a set of tolerance zones are grouped together with location or orientation constraints, through the use of the CZ, CZR or SIM modifiers.

This document does not cover the use of the pattern specifications when the least and maximum material requirement is applied (see ISO 2692).

This document does not cover the establishment of common datum (see ISO 5459) based on pattern features.

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.

ISO 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 8015, *Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules*

ISO 17450-1, *Geometrical product specifications (GPS) — General concepts — Part 1: Model for geometrical specification and verification*

ISO 17450-2, *Geometrical product specifications (GPS) — General concepts — Part 2: Basic tenets, specifications, operators, uncertainties and ambiguities*

ISO 22432, *Geometrical product specifications (GPS) — Features utilized in specification and verification*

3   Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8015, ISO 1101, ISO 17450-1, ISO 17450-2, ISO 22432 and the following apply.

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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 http://www.electropedia.org/

3.1
pattern specification
combined requirement indicated by a set of geometrical specifications, and controlled by a tolerance zone pattern

Note 1 to entry: The geometrical features controlled by a pattern specification can be a set of compound features, united features or single features, which can be features of size (linear or angular).

Note 2 to entry: Annex C provides examples of pattern specifications in Table C.1.

Note 3 to entry: The set of pattern features controlled by a pattern specification does not define a united feature. A united feature can be a pattern feature, i.e. one of the members of the toleranced features controlled by a pattern specification.

3.2
pattern feature
geometrical feature which is a member of the set of features controlled by a pattern specification

3.3
tolerance zone pattern
combination of more than one tolerance zone, having, without priority between them, constraints of orientation and location, or constraints of orientation

Note 1 to entry: A tolerance zone pattern is composed of several tolerance zones which can have different nominal geometries.

Note 2 to entry: A tolerance zone pattern can be established without external constraint or with orientation constraint and/or location constraint from a datum system.

3.4
pattern characteristic
geometrical characteristic controlled by a pattern specification

3.5
theoretical exact feature pattern
TEF pattern
combination of more than one TEF having, without priority between them, constraints of orientation and location, or constraints of orientation, used to establish the pattern characteristic

Note 1 to entry: A TEF pattern is composed of several TEFs which can have different nominal geometries and constrained between them, with respect to their relative location and/or orientation.

Note 2 to entry: A TEF pattern can be established without external constraint or with orientation constraint and/or location constraint from a datum system.

3.6
single indicator pattern specification
pattern specification, controlled by one tolerance indicator specification

3.7
multiple indicator pattern specification
pattern specification, controlled by more than one tolerance indicator specification

3.8
multi-level single indicator pattern specification
single indicator pattern specification applied to more than one group of toleranced features

3.9
internal constraint
location constraint and/or orientation constraint between the individual tolerance zones of the tolerance zone pattern

3.10
external constraint
location constraint and/or orientation constraint between a tolerance zone or tolerance zone pattern and a datum system

4 Symbols and specification modifiers

For the purposes of this document, the specification modifiers of Table 1 shall apply.

Rules for the presentation of graphical symbols shall be in accordance with Annex D.

Table 1 — Specification modifiers

Applied to	Symbol	Description	Internal constraint	Modifier defined in
Toleranced feature	UF	United feature	Not applicable	ISO 1101
Tolerance zones	SZ	Separate zones	None	5.1
	SIMia,b	Simultaneous require-ment No. i	Orientation and location constraints	5.4.4
	CZ	Combined zone	Orientation and location	5.4.3, 5.4.5 and ISO 1101
	CZR	Combined zone rota-tional only	Orientation constraint only	5.4.3 and 5.4.5
a An identification number i can be associated to the modifier SIM. In this case there is no space between SIM and i.				
b "SIM" in ISO 8785 is used for a family of "surface imperfection" parameters with indices (e.g. a, n, t, w, cd, ch, sh, n/A). The modifier simultaneous requirement (SIM) as indicated in this document shall not be confused with the indication of a surface imperfection parameter (e.g. SIM1 versus SIMt).				

5 Principles

5.1 General

According to the feature principle (see ISO 8015:2011, 5.4), by default a geometrical specification applies to one complete single feature as defined in ISO 22432. It is the designer's responsibility to select the features or portions of features to which a specification applies and either indicate that on a 2D drawing using appropriate symbology or define it in the CAD model.

According to the independency principle (see ISO 8015:2011, 5.5), by default a geometrical specification that applies to more than one single feature applies to those features independently. The tolerance zones defined by one tolerance indicator or by several tolerance indicators shall be considered independently by default; this corresponds to the meaning of the modifier SZ. When the same geometrical specification is applied to several toleranced features, for all geometrical specifications other than position specifications, the indication of SZ modifier is redundant (see rule A for position specification, 5.3).

If it is required that the geometrical specification applies to the features simultaneously with some constraint between the tolerance zones, it is the designer's responsibility to either indicate this on a 2D drawing or in the CAD model using appropriate pattern specifications.

In order to manage functional requirements for a set of features, they can be controlled simultaneously by means of a pattern specification, using tolerance zone pattern modifiers CZ, CZR or SIMn.

The use of the concept of "simultaneous requirement" transforms a set of more than one geometrical specification into a combined specification, i.e. a pattern specification.