SLOVENSKI STANDARD
SIST EN ISO 21204:2020

01-junij-2020

Specifikacije geometrijskih veličin izdelka (GPS) - Specifikacija prehoda (ISO 21204:2020)

Geometrical product specifications (GPS) - Transition specification (ISO 21204:2020)

Geometrische Produktspezifikation (GPS) - Spezifikation von definierten Übergängen zwischen Geometrieelementen (ISO 21204:2020)

Spécifications géométriques des produits (GPS) - Spécification de transition (ISO 21204:2020)

Ta slovenski standard je istoveten z: EN ISO 21204:2020

ICS:

17.040.40	Specifikacija geometrijskih veličin izdelka (GPS)	Geometrical Product Specification (GPS)

SIST EN ISO 21204:2020 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 21204

March 2020

ICS 17.040.01

English Version

Geometrical product specifications (GPS) - Transition specification (ISO 21204:2020)

Spécifications géométriques des produits (GPS) - Spécification de transition (ISO 21204:2020)

Geometrische Produktspezifikation (GPS) - Spezifikation von definierten Übergängen zwischen Geometrieelementen (ISO 21204:2020)

This European Standard was approved by CEN on 16 February 2020.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

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

Contents

Page

European foreword

This document (EN ISO 21204:2020) 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 September 2020, and conflicting national standards shall be withdrawn at the latest by September 2020.

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.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 21204:2020 has been approved by CEN as EN ISO 21204:2020 without any modification.

INTERNATIONAL STANDARD

ISO 21204

First edition
2020-02

Geometrical product specifications (GPS) — Transition specification

Spécifications géométriques des produits (GPS) — Spécification de transition

Reference number
ISO 21204:2020(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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 of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 213, *Dimensional and geometrical product specifications and verification*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 290, *Dimensional and geometrical product specification and verification*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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 of the chains of standards on form, orientation and location, see Annex D.

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 stated.

In technical drawings, the ideal geometric shape of the workpiece is represented without any deviations and, in general, without consideration of the states of the transitions between adjacent integral features. Nevertheless, for many purposes (the functioning of a part, or out of safety considerations, for example) particular states of transition features need to be indicated. ISO 13715 provides the tools for indicating requirements to edges of undefined shape. These tools are insufficient when the shape of the transition feature is important for functional reasons. Therefore, this document provides a set of tools for indicating transition specifications.

IMPORTANT — Most specification illustrations in this document show edges drawn as sharp corners. They could equally have been drawn showing the nominal geometry of the transition feature, without changing the meaning of the indications. In a computer aided design (CAD) system, the transition feature geometry can be modelled or not without changing the meaning of the indications.

All the specification illustrations in this document show a 90° angle between the two adjacent features. Specifications according to this document have the same meaning, taking the nominal angle into account, regardless of the angle between the two adjacent features.

All figures in this document have been drawn with dimensions and tolerances in millimetres. It should be understood that other units of measurement could have been used equally well without prejudice to the principles established.

Geometrical product specifications (GPS) — Transition specification

1 Scope

This document defines a number of specification operators for the specification of extended edge transition features between features. An edge transition feature is an integral feature connecting two adjacent integral features. The extended edge transition feature includes portions of the adjacent features. All these specifications apply to any line in a defined direction in the extended edge transition feature. This document also defines the specification modifiers and the drawing indications for such transition specifications.

The proportions and dimensions of the graphical symbols to be used are also specified.

The specifications defined in this document are suitable for relatively simple edge transition functions, for example ensuring assembly without interference. For more complex functions, geometrical tolerancing offers more precise tools.

This document is by intention limited to only edge transition features between two planes and between a cylinder and a plane nominally perpendicular to it.

Annex A gives the first approach for an algorithm to identify toleranced features and adjacent reference sections. This algorithm is subject to change as more experience is gathered.

This document provides a set of tools to express several transition specifications. It does not present any information on the relationship between a function or a use and a transition specification.

NOTE 1 Corners (the transition between three or more features) are not edge transition features and are consequently not covered by this document.

NOTE 2 An edge transition feature exists between two single features. A defined edge transition feature has a defined nominal shape and is not sharp ($r = 0$).

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 1101:2017, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 http://www.electropedia.org/

3.1
transition feature
single integral feature connecting two or more adjacent integral surfaces

Note 1 to entry: A single integral feature connecting three or more adjacent integral surfaces (corner) is not covered in this document.

3.2
edge transition feature
single integral feature connecting two adjacent integral surfaces

3.3
extended transition feature
collected integral surface including a transition feature and specified contiguous portions of the adjacent features

3.3.1
extended edge transition feature
collected integral surface including an edge transition feature and specified contiguous portions of the adjacent features

3.3.1.1
extended edge transition section
line resulting from the intersection of an extended edge transition feature with a specified plane

3.4
transition specification
GPS requirement applied to an extended transition feature

3.5
reference portion
line segment in an adjacent feature beyond the extended edge transition section

3.6
adjacent reference section
straight line associated to a reference portion

Note 1 to entry: An adjacent reference section is used as a datum in a transition specification.

3.7
separation point
point separating the search areas for finding the ends of the adjacent features

3.8
specification origin
intersection point between two straight lines established from the adjacent surfaces in an intersection plane defined in a specified direction

Note 1 to entry: See Figure A.4.

3.9
specification direction
direction in which one of the distances defining the toleranced feature and the reference portion applies

4 Basic concepts

An edge transition feature is an areal feature.

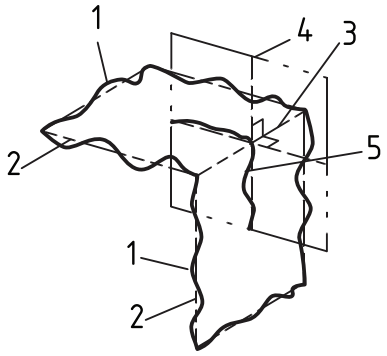
Specifications for edge transition features according to this document specify either extended edge transition sections defined in a specified set of intersection planes, where the specification for each

section is independent of the other sections, or collections of such sections, for example a requirement that the radius shall be consistent along the edge transition feature.

By default, transition specifications apply to all extended edge transition sections along the extended edge transition feature.

Figure 1 shows the case where the two adjacent features are planes. The intersection planes that defines the toleranced features are in theoretically exact relationships to the situation feature (straight line) of the collection of associated features adjacent to the edge transition feature. The associations are performed individually to each adjacent feature with the total least squares (Gaussian) criterion. The intersection planes are perpendicular to the intersection straight line between the two associated planes.

The length of the toleranced extended edge transition feature is limited as proposed in A.3.



Key

1 nominally flat real features adjacent to the edge transition feature
2 total least squares (Gaussian) planes associated to 1 independently
3 intersection straight line between 2
4 one of the infinite set of intersection planes perpendicular to 3
5 one of the infinite set of line profiles containing a toleranced extended edge transition section

Figure 1 — Intersection planes defining the toleranced features for an edge transition feature between two planar features

Figure 2 shows the case where one adjacent feature is a plane and the other is a cylinder. In this case the associations are performed simultaneously to the two adjacent features with the constraint that the associated features are perpendicular to each other, like a common datum, but with the total least squares (Gaussian) criterion. The intersection plane contains the axis of the associated cylinder and is also by definition perpendicular to the associated plane.