



**International  
Standard**

**ISO 14405-1**

**Geometrical product specifications  
(GPS) — Dimensional tolerancing —**

**Part 1:  
Linear sizes**

*Spécification géométrique des produits (GPS) — Tolérancement  
dimensionnel —*

*Partie 1: Tailles linéaires*

**Third edition  
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CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

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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 document 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](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

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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](http://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).

This third edition cancels and replaces the second edition (ISO 14405-1:2016), which has been technically revised.

The main changes are as follows:

- the use of linear size specifications for cones, torus and two opposite circles is now reduced to the cases described in [Annexes D, E and F](#);
- the syntax is changed, and is now defined with several indication areas, and a sequence of specification elements in each area;
- linear size specifications can be stacked upon each other and the rules for stacked specifications are defined;
- the indication  $k\times/n\times$  is now possible, in order to facilitate stacking with geometrical specifications;
- the graphical rules are modified;
- the specification element “/0” to mean “any restricted portion whose length is equal to zero” has been removed to use the modifier “ACS”;
- when different specification operators applied for the upper and the lower specification limits of size characteristic, the new rule is to indicate two different size specifications;
- the indication of several linear size specifications on the same dimension line or reference line with brackets is removed;
- it is now required to use the “between” symbol to indicate that a linear size specification applies to a fixed restricted portion of a feature of linear size;

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- it is now required to indicate “SCS” with the identifier of the section for a specific cross-section;
- the rank-order size specification is now called statistical size specification.

A list of all parts in the ISO 14405 series can be found on the ISO website.

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](http://www.iso.org/members.html).

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## 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 to C of the chain of standards on size.

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 the specifications made in accordance with this document, unless otherwise indicated.

For more detailed information on the relationship of this document to other standards and the ISO GPS matrix model, see [Annex I](#).

This document deals with linear size specifications on the following features of linear size:

- cylinders;
- spheres;
- two parallel opposite planes.

It also deals with the following cases:

- circles as sections of a cone;
- circles as sections of a torus;
- parallel opposite lines as longitudinal sections of cylindrical tubes.

Different specification elements allow specifying local linear sizes or global linear sizes of different types, and, for example, specifications on several features of linear size, specifications in sections and specifications on portions. The many specification elements allow for specifying a variety of functional needs.

[Annex D](#) provides the definition of a size for a circle as section of a cone. [Annex E](#) provides the definition of sizes for circles as sections of a torus. [Annex F](#) provides the definition of sizes for parallel opposite lines as longitudinal sections of cylindrical tubes in half planes containing a specified axis. [Annex H](#) gives an overview of the sequence of specification elements for linear size specifications.

ISO 14405-2 gives the difference between linear size, angular size and dimensions other than linear or angular sizes. ISO 14405-2 relies on this document for the rules about indication.