INTERNATIONAL STANDARD

ISO 1

Third edition
2016-09-01

Geometrical product specifications (GPS) — Standard reference temperature for the specification of geometrical and dimensional properties

Spécification géométrique des produits (GPS) — Température normale de référence pour la spécification des propriétés géométriques et dimensionnelles

Reference number
ISO 1:2016(E)

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Foreword

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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 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 .

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

This third edition cancels and replaces the second edition (ISO 1:2002), which has been technically revised. Specifically, the following points have changed:

— the standard reference temperature definition has been included; consequently, the title, introduction and scope, have been changed;

— the general definition of reference temperature has been included.

Introduction

This International Standard is a geometrical product specification (GPS) standard and is to be regarded as a fundamental GPS Standard (see ISO 14638:2015[1]). For more detailed information on the relationship of this International Standard to other standards and the GPS matrix model, see Annex B.

The definitions of the units, including those of length and temperature, are adopted by the General Conference of Weights and Measures (CGPM) under the authority of the Convention of the Metre. These definitions are maintained in the SI brochure.[5]

The unit of length, the metre, is independent of temperature. The current definition of the metre[6] is based on the distance light travels in vacuum during a unit of time. However, a physical object is subject to thermal expansion and consequently, its geometrical and dimensional properties are dependent on its temperature. Specifying a reference temperature allows the geometrical and dimensional properties of a physical object to be unambiguously stated.

Geometrical product specifications (GPS) — Standard reference temperature for the specification of geometrical and dimensional properties

1 Scope

This International Standard defines the concepts of a reference temperature and of the standard reference temperature, and specifies the standard reference temperature value for the specification of geometrical and dimensional properties of an object. Some examples of geometrical and dimensional properties include size, location, orientation (including angle), form and surface texture of a workpiece.

This International Standard is also applicable to the definition of the measurand used in verification or calibration.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
reference temperature
temperature of an object, having a uniform temperature, specified as part of the definition of a geometrical or dimensional property

Note 1 to entry: The specification of a geometrical or dimensional property is typically given in technical product documentation, e.g., on an engineering drawing or in a CAD file, or in the specification of the measurand (the quantity intended to be measured).

2.2
standard reference temperature
internationally agreed-upon reference temperature

Note 1 to entry: In prior editions of this International Standard, the term “standard reference temperature” was defined as its assigned numerical value, i.e. 20 °C. In this edition, the definition of the *reference temperature* (2.1) and the assignment of a standardized value to this temperature are separately addressed (Clause 3).

3 Standard reference temperature value for the specification of geometrical and dimensional properties

The standard reference temperature value for the specification of geometrical and dimensional properties shall be fixed at 20 °C. Unless otherwise explicitly specified, the reference temperature for geometrical and dimensional properties of workpieces shall be the standard reference temperature. See Annex A for information on the use of the reference temperature specification.

NOTE 1 There is only one standard reference temperature value and it is fixed at 20 °C. However, this does not prevent a different (non-standard) reference temperature from being specified for all geometrical and dimensional properties of a workpiece or for a specific geometrical or dimensional property on a workpiece, provided it is explicitly stated as part of the specification.

NOTE 2 The specification of a non-standard reference temperature may increase the measurement uncertainty during verification because most dimensional measuring equipment and gauges are calibrated with their measurand defined at the standard reference temperature.