







# DRAFT International Standard

## Geometrical product specifications (GPS) — Surface texture: Profile — Calibration of contact (stylus) instruments

*Spécification géométrique des produits (GPS) — État de surface:  
Profil — Étalonnage des instruments à contact (palpeur)*

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

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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 12179:2021), which has been technically revised.

The main changes to the previous edition are as follows: [12179:2025](#)

— [Annex C](#) has been amended and [8.2](#) has been modified accordingly.

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).

## ISO/DIS 12179:2025(en)

### 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 link G of the chain of standards on profile surface texture.

The ISO GPS matrix model is given in ISO 14638, For more detailed information on the relationship of this document to the GPS matrix model, see [Annex F](#). An overview of standards on profiles and areal surface texture is given in [Annex E](#).

This document introduces calibration of contact (stylus) instruments as defined in ISO 25178-601. The calibration is carried out with the aid of measurement standards.

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# Geometrical product specifications (GPS) — Surface texture: Profile — Calibration of contact (stylus) instruments

## 1 Scope

This document specifies the calibration and adjustment of the metrological characteristics of contact (stylus) instruments for the measurement of surface texture by the profile method as defined in ISO 25178-601. The calibration and adjustment is intended to be carried out with the aid of measurement standards.

[Annex B](#) specifies the calibration and adjustment of metrological characteristics of simplified operator contact (stylus) instruments which do not conform with ISO 25178-601.

## 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 10012, *Measurement management systems — Requirements for measurement processes and measuring equipment*

ISO 14253-2, *Geometrical product specifications (GPS) — Inspection by measurement of workpieces and measuring equipment — Part 2: Guidance for the estimation of uncertainty in GPS measurement, in calibration of measuring equipment and in product verification*

ISO 25178-73:2019, *Geometrical product specifications (GPS) — Surface texture: Areal — Part 73: Terms and definitions for surface defects on material measures*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 25178-601, ISO 14253-1, ISO 21920-2, ISO/IEC Guide 98-3 and ISO/IEC Guide 99 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1 calibration

operation that, under specified conditions:

- a) in a first step, establishes a relation between the quantity values with measurement uncertainties provided by measurement standards and corresponding indications with associated measurement uncertainties; and
- b) in a second step, uses this information to establish a relation for obtaining a measurement result from an indication

[SOURCE: ISO/IEC Guide 99:2007, 2.39, modified — Notes to entry removed.]

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### 3.2

#### **task-related calibration**

set of operations which establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument and the corresponding known values of a limited family of precisely defined measurands which constitute a subset of the measuring capabilities of the measuring instrument

### 3.3

#### **adjustment**

adjustment of a measuring system

set of operations carried out on a measuring system so that it provides prescribed indications corresponding to given values of a quantity to be measured

[SOURCE: ISO/IEC Guide 99:2007, 3.11, modified — Notes to entry removed.]

### 3.4

#### **measurement standard**

etalon

realization of the definition of a given quantity, with stated quantity value and associated measurement uncertainty, used as a reference

Note 1 to entry: Measurement standards are also referred to as “calibration specimens”.

[SOURCE: ISO/IEC Guide 99:2007, 5.1, modified — Examples and Notes to entry removed.]

### 3.5

#### **measurement uncertainty**

uncertainty of measurement

uncertainty

non-negative parameter characterizing the dispersion of the quantity values being attributed to a measurand, based on the information used

[SOURCE: ISO/IEC Guide 99:2007, 2.26, modified — Notes to entry removed.]

### 3.6

#### **metrological traceability**

property of a measurement result whereby the result can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty

[SOURCE: ISO/IEC Guide 99:2007, 2.41, modified — Notes to entry removed.]

### 3.7

#### **defect**

<material measures> part of the measurement standard’s geometrical feature (non-ideal surface) on which the geometrical shape and geometrical dimensions deviate from those on the nominal feature (ideal surface) either by an amount greater than some agreed or stated maximum value, or, in the absence of any such agreed or stated maximum value, by an amount greater than what is typical or characteristic for the processes used in manufacturing the measurement standard

[SOURCE: ISO 25178-73:2019, 3.1.2, modified — Notes to entry removed.]

### 3.8

#### **residual profile**

primary profile obtained by tracing an ideally smooth and flat surface (optical flat)

Note 1 to entry: The residual profile is composed of the deviations of the guide, external and internal disturbances, as well as deviations in profile transmission. The determination of the causes of the deviations is not normally possible without special equipment and a suitable environment.