



SLOVENSKI STANDARD
oSIST prEN ISO 12179:2020
01-april-2020

Specifikacija geometrijskih veličin izdelka - Tekstura površine: profilna metoda - Umerjanje kontaktnih (s tipalom) instrumentov (ISO/DIS 12179:2020)

Geometrical product specifications (GPS) - Surface texture: Profile method - Calibration of contact (stylus) instruments (ISO/DIS 12179:2020)

Geometrische Produktspezifikation (GPS) - Oberflächenbeschaffenheit: Tastschnittverfahren - Kalibrierung von Tastschnittgeräten (ISO/DIS 12179:2020)

Spécification géométrique des produits (GPS) - Etats de surface : Méthode du profil - Etalonnage des instruments à contact (palpeur) (ISO/DIS 12179:2020)

<https://standards.iteh.ai/catalog/standards/sist/5c43e7b8-829d-4953-8979-ef1278f84ec/osist-pr-en-iso-12179-2020>

Ta slovenski standard je istoveten z: prEN ISO 12179

ICS:

17.040.30	Merila	Measuring instruments
17.040.40	Specifikacija geometrijskih veličin izdelka (GPS)	Geometrical Product Specification (GPS)

oSIST prEN ISO 12179:2020

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN ISO 12179:2020](#)

<https://standards.iteh.ai/catalog/standards/sist/5c43e7b8-829d-4953-8979-ef1278f84ec/osist-pren-iso-12179-2020>

DRAFT INTERNATIONAL STANDARD

ISO/DIS 12179

ISO/TC 213

Secretariat: BSI

Voting begins on:
2020-02-03Voting terminates on:
2020-04-27

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

Spécification géométrique des produits (GPS) — État de surface: Méthode du profil — Étalonnage des instruments à contact (palpeur)

ICS: 17.040.30

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN ISO 12179:2020](https://standards.iteh.ai/catalog/standards/sist/5c43e7b8-829d-4953-8979-ef1278f84ec/osist-pren-iso-12179-2020)<https://standards.iteh.ai/catalog/standards/sist/5c43e7b8-829d-4953-8979-ef1278f84ec/osist-pren-iso-12179-2020>

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING



Reference number
ISO/DIS 12179:2020(E)

© ISO 2020

iTeh STANDARD PREVIEW (standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/5c43e7b8-829d-4953-8979-ef1278f84ec/osist-pren-iso-12179-2020>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

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	iv
Introduction	v
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	2
4 Conditions of use.....	3
4.1 Components and configurations of the contact (stylus) instrument.....	3
4.2 Calibration of a configuration.....	3
4.3 Place of calibration.....	3
4.4 Defects.....	3
5 Measurement standards.....	3
6 Contact (stylus) instrument metrological characteristics.....	4
6.1 Residual profile calibration.....	4
6.2 Vertical profile component calibration.....	5
6.3 Horizontal profile component calibration.....	6
6.4 Profile co-ordinate system calibration.....	6
6.5 Calibration of the total contact (stylus) instrument.....	6
7 Calibration.....	6
7.1 Preparation for calibration.....	6
7.2 Evaluation of the residual profile.....	7
7.3 Calibration of the vertical profile component profile.....	7
7.3.1 Overall objective.....	7
7.3.2 Procedure.....	7
7.4 Calibration of the horizontal profile component.....	8
7.4.1 Overall objective.....	8
7.4.2 Procedure.....	8
7.5 Calibration of the profile co-ordinate system.....	8
7.5.1 Overall objective.....	8
7.5.2 Procedure.....	8
7.6 Calibration of the total contact (stylus) instrument.....	8
7.6.1 Overall objective.....	8
7.6.2 Procedure.....	8
8 Measurement uncertainty.....	9
8.1 Information from the calibration certificate for a measurement standard.....	9
8.2 The uncertainty of the values measured during calibration of a measuring instrument using a measurement standard.....	9
9 Contact (stylus) instrument calibration certificate.....	9
Annex A (normative) Calibration of instruments measuring parameters of the motifs method.....	11
Annex B (normative) Calibration of simplified operator instruments for the measurements of surface texture.....	13
Annex C (informative) Example: roughness measurement standard parameter <i>Ra</i>	14
Annex D (informative) Relation to the GPS matrix model.....	17
Bibliography	18

ISO/DIS 12179:2020(E)

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. (standards.iteh.ai)

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

<https://standards.iteh.ai/catalog/standards/sist/5c43e7b8-829d-4953-8979-8f1b7844e714/iso-12179-2020>

This second edition cancels and replaces the first edition (ISO 12179:2000), which has been technically revised.

The main changes compared to the previous edition are as follows:

- [Annex C](#) has been amended.

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 the chain link 6 of the chain of standards on roughness, waviness and primary profile.

For more detailed information on the relationship of this standard to the GPS matrix model, see [annex D](#).

This document introduces calibration of contact (stylus) instruments as defined in ISO 3274. The calibration is to be carried out with the aid of measurement standards.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN ISO 12179:2020](#)

<https://standards.iteh.ai/catalog/standards/sist/5c43e7b8-829d-4953-8979-ef1278f84ec/osist-pren-iso-12179-2020>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN ISO 12179:2020](#)

<https://standards.iteh.ai/catalog/standards/sist/5c43e7b8-829d-4953-8979-ef1278f84ec/osist-pren-iso-12179-2020>

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

1 Scope

This document applies to the calibration of the metrological characteristics of contact (stylus) instruments for the measurement of surface texture by the profile method as defined in

ISO 3274. The calibration is to be carried out with the aid of measurement standards.

[Annex B](#) applies to the calibration of metrological characteristics of simplified operator contact (stylus) instruments which do not conform with ISO 3274.

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 3274:1996, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Nominal characteristics of contact (stylus) instruments*

ISO 4287:1997, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

ISO 5436-1:2000, *Geometrical Product Specifications (GPS) — Surface texture: Profile method; Measurement standards — Part 1: Material measures*

ISO 10012:2003, *Measurement management systems — Requirements for measurement processes and measuring equipment*

ISO 12085:1996, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Motif parameters*

ISO 14253-1:2017, *Geometrical product specifications (GPS) — Inspection by measurement of workpieces and measuring equipment — Part 1: Decision rules for verifying conformity or nonconformity with specifications*

ISO/TS 14253-2:2011, *Geometrical product specifications (GPS) - Inspection by measurement of workpieces and measuring equipment- Part 2: Guide to the estimation of uncertainty of measurement 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*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

ISO/IEC Guide 99:2007, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*

ISO/DIS 12179:2020(E)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3274, ISO 4287,

ISO 14253-1, VIM [some of which are reproduced below (without their notes) for convenience], GUM and term and definition 3.2 and the following apply.

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

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

3.1 calibration

operation that, under specified conditions, 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, 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 (VIM), 2.39]

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 of a measuring system adjustment

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 (VIM), 3.11]

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

[SOURCE: ISO/IEC Guide 99:2007 (VIM), 5.1]

Note 1 to entry: In ISO 5436:1985, "measurement standards" were referred to as "calibration specimens".

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 (VIM), 2.26]

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 (VIM), 2.4.1]

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]

4 Conditions of use**4.1 Components and configurations of the contact (stylus) instrument**

The contact (stylus) instrument is comprised of the basic equipment, a drive unit, a probe and a profile recorder (see ISO 3274). If the basic equipment is used with several drive units and probes, each of these instrumental combinations (configurations) shall be calibrated separately.

4.2 Calibration of a configuration

The contact (stylus) instrument shall be calibrated when a change is made to the basic elements of the system which intentionally or unintentionally modifies the measured profile/measuring result. Each configuration of the contact (stylus) instrument shall be calibrated separately.

EXAMPLE With a change of probe the contact (stylus) instrument shall be calibrated.

4.3 Place of calibration

The contact (stylus) instrument should be calibrated at the place of use with environmental conditions similar to those present when in use for measurement to take into account external influence factors.

EXAMPLE Noise, temperature, vibration, air movement, etc.

4.4 Defects

Geometrical defects that may be present on the surfaces of material measures and calibration specimens shall be taken into consideration according to ISO 25178-73.

5 Measurement standards

The following measuring standards are applicable to the calibrations given in [Clause 6](#):

optical flat;

depth measurement standard ([Figure 1](#)): type A according to ISO 5436-1; spacing measurement standard ([Figure 2](#)): type C according to ISO 5436-1; inclined optical flat ([Figure 3](#));

profile co-ordinate measurement standard (consisting of a sphere or prism): type E according to ISO 5436-1;

roughness measurement standard ([Figure 4](#)): type D according to ISO 5436-1.

NOTE It is recommended that a profile co-ordinate measurement standard be used on contact (stylus) instruments where the stylus rotates at least plus and minus one half of a degree when moving through its full range.