

Geometrical Product Specifications (GPS) — Surface texture: Profile method — Calibration of contact (stylus) instruments

ICS 17.040.20

National foreword

This British Standard is the UK implementation of EN ISO 12179:2000. It is identical with ISO 12179:2000, incorporating corrigendum December 2003.

The UK participation in its preparation was entrusted by Technical Committee TDW/4, Engineering drawing, metrology, precision measurement and related documentation, to Subcommittee TDW/4/-/3, The properties and metrology of surfaces.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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30 June 2009	Implementation of ISO corrigendum December 2003, in Annex C the calculations the sum-of-squares S_1 , S_2 , S_3 and S_4 have been modified

English version

Geometrical Product Specifications (GPS) - Surface texture:
Profile method - Calibration of contact (stylus) instruments (ISO
12179:2000)

Spécification géométrique des produits (GPS) - Etat de
surface: Méthode du profil - Etalonnage des instruments à
contact (palpeur) (ISO 12179:2000)

Geometrische Produktspezifikation (GPS) -
Oberflächenbeschaffenheit: Tastschnittverfahren -
Kalibrierung von Tastschnittgeräten (ISO 12179:2000)

This European Standard was approved by CEN on 15 March 2000.

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Foreword

The text of the International Standard from Technical Committee ISO/TC 213 "Dimensional and geometrical product specifications and verification" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 290 "Dimensional and geometrical product specification and verification", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 12179:2000 has been approved by CEN as a European Standard without any modification.

NOTE: Normative references to International Standards are listed in annex ZA (normative).

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Introduction

This International Standard is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO/TR 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 International Standard introduces calibration of contact (stylus) instruments as defined in ISO 3274. The calibration is to be carried out with the aid of measurement standards.

Geometrical Product Specifications (GPS) — Surface texture: Profile method — Calibration of contact (stylus) instruments

1 Scope

This International Standard 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 normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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 10012-1:1992, *Quality assurance requirements for measuring equipment — Part 1: Metrological confirmation system for measuring equipment*.

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

ISO 14253-1:1998, *Geometrical Product Specifications (GPS) — Inspection by measurement of workpieces and measuring equipment — Part 1: Decision rules for proving conformance or non-conformance with specification*.

ISO/TS 14253-2:1999, *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*.

Guide to the expression of uncertainty in measurement (GUM). BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML, 1st edition, 1995.

International vocabulary of basic and general terms used in metrology (VIM). BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML, 2nd edition, 1993.

3 Terms and definitions

For the purposes of this International Standard, 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, apply.

3.1

calibration

set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realized by standards

[VIM 6.11]

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 instrument)

operation of bringing a measuring instrument into a state of performance suitable for its use

[VIM 4.30]

3.4

(measurement) standard

etalon

material measure, measuring instrument, reference material or measuring system intended to define, realize, conserve or reproduce a unit or one or more values of a quantity to serve as a reference

[VIM 6.1]

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

3.5

uncertainty of measurement

parameter, associated with the result of a measurement, that characterizes the dispersion of the values that could reasonably be attributed to the measurand

[VIM 3.9]

3.6

traceability

property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties

[VIM 6.10]

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).