



**SLOVENSKI STANDARD**  
**SIST ISO 5436-2:2002**  
**01-december-2002**

---

GdYVWZ\_UVYU[ Yca Yf]g\_l`j Y] ]b`nXY\_U!`HY\_gli fUdcj fy]bY.`dfcZ]bUa YrcXU!  
GHubXUfX]nUa Yf^Yb^Y!`&^XY.`GHubXUfX]nUa Yf]bc`dfc[ fUa g\_c`cdfYa c

Geometrical Product Specifications (GPS) -- Surface texture: Profile method;  
Measurement standards -- Part 2: Software measurement standards

**iTeh STANDARD PREVIEW**

Spécification géométrique des produits (GPS) -- État de surface: Méthode du profil;  
Étalons -- Partie 2: Étalons logiciels

[SIST ISO 5436-2:2002](https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-c5d124c05224/sist-iso-5436-2-2002)

Ta slovenski standard je istoveten z: **ISO 5436-2:2001**

---

**ICS:**

17.040.30      Merila      Measuring instruments

**SIST ISO 5436-2:2002**      en

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ISO 5436-2:2002](#)

<https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002>

# INTERNATIONAL STANDARD

**ISO**  
**5436-2**

First edition  
2001-12-15

---

---

## **Geometrical Product Specifications (GPS) — Surface texture: Profile method; Measurement standards —**

### **Part 2: Software measurement standards**

iTeh **STANDARD PREVIEW**

*Spécification géométrique des produits (GPS) — État de surface: Méthode  
du profil: Étalons —*

*Partie 2: Étalons logiciels*

[SIST ISO 5436-2:2002](https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002)

[https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-  
e3d124e05224/sist-iso-5436-2-2002](https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002)



Reference number  
ISO 5436-2:2001(E)

© ISO 2001

**ISO 5436-2:2001(E)****PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ISO 5436-2:2002](https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002)

<https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002>

© ISO 2001

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.ch](mailto:copyright@iso.ch)  
Web [www.iso.ch](http://www.iso.ch)

Printed in Switzerland

**Contents**

Page

Foreword.....	iv
Introduction.....	v
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	2
4 Type F software measurement standards.....	3
5 File format for type F1 reference data .....	3
6 Software measurement standard certificate.....	9
Annex A (informative) Example of file format .....	11
Annex B (informative) Relation to the GPS matrix model.....	14
Bibliography.....	15

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ISO 5436-2:2002](https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002)

<https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002>

## ISO 5436-2:2001(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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 5436 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 5436-2 was prepared by Technical Committee ISO/TC 213, *Dimensional and geometrical product specifications and verification*.

This first edition, together with ISO 5436-1, replaces ISO 5436:1985, which has been technically revised.

ISO 5436 consists of the following parts, under the general title *Geometrical Product Specifications (GPS) — Surface texture: Profile method; Measurement standards*:

- *Part 1: Material measures*
- *Part 2: Software measurement standards*

Annexes A and B of this part of ISO 5436 are for information only.

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

SIST ISO 5436-2:2002

<https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002>

## Introduction

This part of ISO 5436 is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO/TR 14638). It influences link 6 of the chain of standards on roughness, waviness and primary profile.

For more detailed information on the relationship of this part of ISO 5436 to other standards and the GPS matrix model, see annex B.

This part of ISO 5436, together with ISO 5436-1, introduces two new measurement standards: Type E, for calibrating the profile co-ordinate system, and Type F, for calibrating software. This part of ISO 5436 is concerned with software measurement standards.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ISO 5436-2:2002](https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002)

<https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ISO 5436-2:2002](#)

<https://standards.iteh.ai/catalog/standards/sist/65ce4ee6-cd2c-4d18-ab6f-e3d124e05224/sist-iso-5436-2-2002>



# Geometrical Product Specifications (GPS) — Surface texture: Profile method; Measurement standards —

## Part 2: Software measurement standards

### 1 Scope

This part of ISO 5436 defines Type F1 and Type F2 software measurement standards (etalons) for verifying the software of measuring instruments. It also defines the file format of Type F1 software measurement standards for the calibration of instruments for the measurement of surface texture by the profile method as defined in ISO 3274.

NOTE 1 Throughout this part of ISO 5436, the term “softgauge” is used as a substitute for “software measurement standard Type F1”.

NOTE 2 Formerly, “measurement standards” were referred to as “calibration specimens”.

NOTE 3 ISO 3274 only refers to instruments with independent reference datums.

### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 5436. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 5436 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 5436-1:2000, *Geometrical Product Specifications (GPS) — Surface texture: Profile method; Measurement standards — Part 1: Material measures*

ISO 11562:1996, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Metrological characteristics of phase correct filters*

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

ISO/TS 17450-2:—<sup>1)</sup>, *Geometrical Product Specifications (GPS) — General concepts — Part 2: Basic tenets, specifications, operators and uncertainties*

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

1) To be published.

**ISO 5436-2:2001(E)**

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

**3 Terms and definitions**

For the purposes of this part of ISO 5436, the terms and definitions given in ISO 3274, ISO 5436-1, ISO 11562, ISO 12085, VIM, and the following apply.

**3.1****software measurement standard**

reference data or reference software intended to reproduce the value of a measurand with known uncertainty in order to verify the software used to calculate the measurand in a measuring instrument

**3.2****ASCII string**

array of ASCII characters terminating in <ASCII 0>

**3.3****integer**

2-byte representation of whole number

NOTE 1 Integers have a minimum value of  $-32\,768$  and a maximum value of  $+32\,767$ .

NOTE 2 The less significant bytes are stored in memory addresses lower than those in which are stored the more significant bytes.

**3.4****unsigned integer**

2-byte representation of a positive whole number

NOTE 1 Unsigned integers have a minimum value of 0 and a maximum value of 65 535.

NOTE 2 The less significant bytes are stored in memory addresses lower than those in which are stored the more significant bytes.

**3.5****long integer**

4-byte representation of a whole number

NOTE 1 Long integers have a minimum value of  $-2\,147\,483\,648$  and a maximum value of  $+2\,147\,483\,647$ .

NOTE 2 The less significant bytes are stored in memory addresses lower than those in which are stored the more significant bytes.

**3.6****single precision float**

4-byte representation consisting of a sign bit, an 8-bit excess  $-127$  binary exponent and a 23-bit mantissa representing numbers between 1,0 and 2,0

NOTE 1 Since the high-order bit of the mantissa is always 1, it is not stored in the number.

NOTE 2 Single precision float have an approximate range of  $\pm 1,17^{-38}$  to  $\pm 3,4e^{+38}$ .

NOTE 3 The less significant bytes are stored in memory addresses lower than those in which are stored the more significant bytes.

**3.7****double precision float**

8-byte representation consisting of a sign bit, an 11-bit excess – 1023 binary exponent, and a 52-bit mantissa, plus the implied high-order 1 bit

NOTE 1 Double precision float have an approximate range of  $\pm 2,22e^{-308}$  to  $\pm 2,22e^{+308}$ .

NOTE 2 The less significant bytes are stored in memory addresses lower than those in which are stored the more significant bytes.

**4 Type F software measurement standards****4.1 General**

These measurement standards are designed to verify the measuring instrument's software (i.e. filter algorithms, parameter calculations etc.)

The measurement standards can contain a form component which it shall be possible to remove.

**4.2 Type F1 — Reference data**

These measurement standards are computer data files that depict a digital representation of a total surface or profile in a suitable recording medium.

Type F1 measurement standards are used to test software by inputting them as data into the software under test/calibration and comparing the results from the software under test with the certified results from the calibration certificate of the softgauge.

NOTE The certified results for mathematically designed synthetic data can often be calculated directly without the need for certification by Type F2 measurement standards.

**4.3 Type F2 — Reference software**

These measurement standards are reference software. Reference software consists of traceable computer software against which software in a measuring instrument can be compared.

Type F2 measurement standards are used to test software by inputting a common data set into both the software under test/calibration and the reference software and comparing the results from the software under test with the certified results from the reference software.

NOTE Type F2 measurement standards can also be used to certify type F1 measurement standards.

Reference software values shall be traceable.

**5 File format for type F1 reference data****5.1 General**

The file extension of this file protocol is `.smd`. The file protocol for the softgauge is divided into four separate sections or records. Each record is composed of lines of information and within each line there are various "fields" in which the information is coded. The file format is in 7-bit ASCII character code. Each line is terminated by a carriage return, (`<cr>`), and line feed, (`<lf>`).