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Geometrisk produktspecifikation (GPS) – Planhet – Del 2: Specifikationsoperatorer (ISO 12781-2:2011)

Geometrical product specifications (GPS) – Flatness – Part 2: Specification operators (ISO 12781-2:2011)

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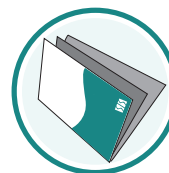
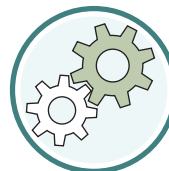
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Denna standard ersätter SIS-ISO/TS 12781-2:2005, utgåva 1.

The European Standard EN ISO 12781-2:2011 has the status of a Swedish Standard. This document contains the official version of EN ISO 12781-2:2011.

This standard supersedes the Swedish Standard SIS-ISO/TS 12781-2:2005, edition 1.

**Förhållandet till övriga delar under samma huvudtitel - Utdrag ur Förord i ISO 12781-2:2011/
Relations to other parts under the same general title - Extract from the Foreword of
ISO 12781-2:2011**

ISO 12781 consists of the following parts, under the general title *Geometrical product specifications (GPS) – Flatness*:

- *Part 1: Vocabulary and parameters of flatness*

- *Part 2: Specification operators*

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EUROPEAN STANDARD

EN ISO 12781-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2011

ICS 17.040.20

Supersedes CEN ISO/TS 12781-2:2007

English Version

**Geometrical product specifications (GPS) - Flatness - Part 2:
Specification operators (ISO 12781-2:2011)**

Spécification géométrique des produits (GPS) - Planéité -
Partie 2: Opérateurs de spécification (ISO 12781-2:2011)

Geometrische Produktspezifikation (GPS) - Ebenheit - Teil
2: Spezifikationsoperatoren (ISO 12781-2:2011)

This European Standard was approved by CEN on 26 February 2011.

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Foreword

This document (EN ISO 12781-2:2011) has been prepared by Technical Committee ISO/TC 213 "Dimensional and geometrical product specifications and verification" in collaboration with Technical Committee CEN/TC 290 "Dimensional and geometrical product specification and verification" the secretariat of which is held by AFNOR.

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 October 2011, and conflicting national standards shall be withdrawn at the latest by October 2011.

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Endorsement notice

The text of ISO 12781-2:2011 has been approved by CEN as a EN ISO 12781-2:2011 without any modification.

Introduction

This part of ISO 12781 is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO/TR 14638). It influences chain link 3 of the chain of standards on form of a surface (independent of a datum).

The ISO/GPS Masterplan given in ISO/TR 14638 gives an overview of the ISO/GPS system of which this part of ISO 12781 is a part. The fundamental rules of ISO/GPS given in ISO 8015 apply to this part of ISO 12781 and the default decision rules given in ISO 14253-1 apply to specifications made in accordance with this part of ISO 12781, unless otherwise indicated.

For more detailed information on the relationship of this part of ISO 12781 to other standards and the GPS matrix model, see Annex C.

This part of ISO 12781 specifies the specification operators according to ISO 17450-2 for flatness of integral features.

ISO 12780-2 does not specify defaults for filter cut-off, probe tip radius and method of association (reference plane). This means that it is necessary for a flatness specification to explicitly state which values are to be used for these specification operations in order for it to be unique.

Consequently, if a specification does not explicitly state which values are to be used for one or more of these operators, the specification is ambiguous (see ISO 17450-2) and a supplier can use any value for the operator(s) not specified when proving conformance.

Extracting data always involves applying a certain filtering process. An additional filtering of the extracted data might or might not be applied. This additional filter can be a mean line filter (Gaussian, spline, wavelet, etc.) or a non-linear filter (e.g. morphological filter). The type of filtering influences the definition of flatness and the specification operators and, therefore, needs to be stated unambiguously.

NOTE 1 Stylus filtering is not sufficient on its own to smooth a profile. In certain circumstances, it can create spurious high-frequency content, thus giving incorrect values. To correct this, a longwave-pass filter can be employed. A Gaussian filter is used, since this is the state-of-the-art. This filter has some shortcomings, e.g. it can distort, rather than eliminate some roughness features and it can distort, rather than transmit correctly some waviness features. It is envisioned that new filters under development within ISO provide better solutions for several of these issues.

NOTE 2 If a smaller tip radius than the one specified is used for a given cut-off length, the resulting measured value is generally higher. This effect is usually insignificant. If a larger tip radius is used, the resulting measured value is generally lower. The amount of change is heavily dependent on the surface measured.

NOTE 3 The measuring force of 0 N is chosen to eliminate effects of elastic deformation of the workpiece from the specification operator. On metal surfaces with adequate thickness, the effect of normally occurring measuring forces is negligible.

NOTE 4 Aliasing and other problems during extraction (see Annex A) due to the higher harmonic content of the skin model, in the straightness directions, can cause specification uncertainty.

This part of ISO 12781 is not intended to disallow any means of measuring flatness.

Geometrical product specifications (GPS) — Flatness —

Part 2: Specification operators

1 Scope

This part of ISO 12781 specifies the complete specification operator for flatness of complete integral features only, i.e. geometrical characteristics of individual features of type plane.

2 Normative references

The following referenced documents are indispensable for the application 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 12781-1:2011, *Geometrical product specifications (GPS) — Flatness — Part 1: Vocabulary and parameters of flatness*

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 specifications*

ISO 17450-2:—¹⁾, *Geometrical product specifications (GPS) — General concepts — Part 2: Basic temets, specifications, operators and uncertainties*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12781-1 and ISO 17450-2 apply.

4 Complete specification operator

4.1 General

The complete specification operator (see ISO 17450-2) is a full ordered set of unambiguous specification operations in a well-defined order. The complete specification operator defines the transmission band for the flatness surface, together with an appropriate stylus tip geometry.

NOTE In practice, it is unrealistic to achieve comprehensive coverage of the flatness feature given by the theoretical minimum density of points (see Annex B) within an acceptable time span using current technology. Therefore, more limited extraction strategies are employed that give specific rather than general information concerning the deviations from flat form.

1) To be published. (Revision of ISO/TS 17450-2:2002)