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Geometriska produktspecifikationer (GPS) – Rakhet – Del 2: Specifikationsoperatorer (ISO 12780-2:2011)

Geometrical product specifications (GPS) – Straightness – Part 2: Specification operators (ISO 12780-2:2011)

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Europastandarden EN ISO 12780-2:2011 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 12780-2:2011.

Denna standard ersätter SIS-ISO/TS 12780-2:2005, utgåva 1.

The European Standard EN ISO 12780-2:2011 has the status of a Swedish Standard. This document contains the official version of EN ISO 12780-2:2011.

This standard supersedes the Swedish Standard SIS-ISO/TS 12780-2:2005, edition 1.

Förhållandet till övriga delar under samma huvudtitel - Utdrag ur Förord i ISO 12780-2:2011/ Relations to other parts under the same general title - Extract from the Foreword of ISO 12780-2:2011

ISO 12780 consists of the following parts, under the general title *Geometrical product specifications (GPS) – Straightness:*

- Part 1: Vocabulary and parameters of straightness

- Part 2: Specification operators

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Toleranser, SIS/TK 507/AG 5.

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EUROPEAN STANDARD

NORME EUROPÉENNE

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EN ISO 12780-2

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English Version

Geometrical product specifications (GPS) - Straightness - Part 2: Specification operators (ISO 12780-2:2011)

Spécification géométrique des produits (GPS) - Rectitude - Partie 2: Opérateurs de spécification (ISO 12780-2:2011)

Geometrische Produktspezifikation (GPS) - Geradheit - Teil 2: Spezifikationsoperatoren (ISO 12780-2:2011)

This European Standard was approved by CEN on 17 March 2011.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Foreword

This document (EN ISO 12780-2:2011) 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 12780-2:2011 has been approved by CEN as a EN ISO 12780-2:2011 without any modification.

Introduction

This part of ISO 12780 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 line independent of datum.

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

For more detailed information on the relationship of this part of ISO 12780 to other standards and the GPS matrix model, see Annex B.

This part of ISO 12780 specifies the specification operators according to ISO 17450-2 for straightness of integral features.

This part of ISO 12780 does not specify defaults for filter cut-off, probe tip radius and method of association (reference line). This means that it is necessary for a straightness 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 straightness 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 12780 is not intended to disallow any means of measuring straightness.

Geometrical product specifications (GPS) — Straightness —

Part 2:
Specification operators

1 Scope

This part of ISO 12780 specifies the complete specification operator for straightness of integral features only and covers complete straightness profiles only, i.e. geometrical characteristics of features of type line.

NOTE Straightness of an extracted median line of a cylinder is defined in ISO 12180-1.

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

ISO 12780-1:2011, *Geometrical product specifications (GPS) — Straightness — Part 1: Vocabulary and parameters of straightness*

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 tenets, specifications, operators and uncertainties*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12780-1 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 straightness profile, together with an appropriate stylus tip geometry.

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