International Standard

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Geometrical product specifications (GPS) — Surface texture: Areal —

Part 606: Design and characteristics of non-contact (focus variation) instruments

Spécification géométrique des produits (GPS) — État de surface: Surfacique —

Partie 606: Conception et caractéristiques des instruments sans contact (à variation de focale)

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Foreword

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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 document 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).

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This document was prepared by Technical Committee ISO/TC 213, *Dimensional and geometrical product specifications and verification,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 290, *Dimensional and geometrical product specification and verification,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 25178:606:2015), which has been technically revised.

The main changes are as follows:

— removal of the terms and definitions now specified in ISO 25178-600;

— revision of all terms and definitions for clarity and consistency with other ISO standards documents;

— addition of Clause 4 for instrument requirements;

— addition of Clause 5 on metrological characteristics;

— addition of Clause 6 on design features, which clarifies the types of instruments relevant to this document;

— addition of an information flow concept diagram in Clause 4;

— revision of Annex A describing the principles of instruments addressed by this document;

— addition of Annex B on metrological characteristics and influence quantities, replacement of the normative table of influence quantities with an informative description of common error sources and how these relate to the metrological characteristics in ISO 25178-600.

A list of all parts in the ISO 25178 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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 F of the chain of standards on profile and areal surface texture.

The ISO GPS matrix model given in ISO 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 of the relation of this document to other standards and the GPS matrix model, see Annex C.

This document includes terms and definitions relevant to the focus variation instruments for the measurement of areal surface topography. Annex A briefly summarizes focus variation instruments and methods to clarify the definitions and to provide a foundation for Annex B, which describes common sources of uncertainty and their relation to the metrological characteristics of focus variation.

NOTE Portions of this document, particularly the informative sections, describe patented systems and methods. This information is provided only to assist users in understanding the operating principles of focus variation. This document is not intended to establish priority for any intellectual property, nor does it imply a license to proprietary technologies described herein.

Geometrical product specifications (GPS) — Surface texture: Areal —

Part 606: Design and characteristics of non-contact (focus variation) instruments

1 Scope

This document specifies the design and characteristics of focus variation instruments for areal measurement of surface topography. Because surface profiles can be extracted from areal surface topography data, the methods described in this document are also applicable to profiling measurements as well.

This document applies to focus variation without pattern illumination or with fixed pattern illumination. This document does not cover methods using varying pattern illumination during the measurement.

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 25178-600:2019, *Geometrical product specifications (GPS) — Surface texture: Areal — Part 600: Metrological characteristics for areal topography measuring methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
focus variation
FV
measurement method whereby the sharpness of a series of surface images that is acquired during an axial scan in an optical instrument is used to measure the surface topography

Note 1 to entry: In this document, surface image is an image of a surface obtained by capturing the reflected light from the surface with or without a fixed pattern illumination.

Note 2 to entry: In this document, sharpness is a quantity of the surface image calculated by the neighbourhood information indicating best focus. Other names for sharpness are for example contrast.

Note 3 to entry: Focus variation without fixed pattern illumination only works on optically rough surfaces (see ISO 25178-600:2019, 3.4.5). If fixed pattern illumination is used, optically smooth surfaces (see ISO 25178-600:2019, 3.4.4) can also be measured.