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Geometrisk produktspecifikation (GPS) – Ytstruktur: Arealmätning – Del 601: Nominella egenskaper hos släpnålsinstrument (ISO 25178-601:2010)

Geometrical product specifications (GPS) – Surface texture: Areal – Part 601: Nominal characteristics of contact (stylus) instruments (ISO 25178-601:2010)

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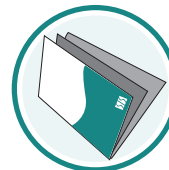
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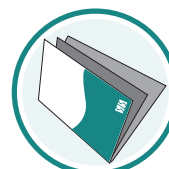
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 25178-601

July 2010

ICS 17.040.20

English Version

**Geometrical product specifications (GPS) - Surface texture:
Areal - Part 601: Nominal characteristics of contact (stylus)
instruments (ISO 25178-601:2010)**

Spécification géométrique des produits (GPS) - État de surface: Surfacique - Partie 601: Caractéristiques nominales des instruments à contact (à palpeur) (ISO 25178-601:2010)

Geometrische Produktspezifikation (GPS) - Oberflächenbeschaffenheit: Flächenhaft - Teil 601: Merkmale von berührend messenden Geräten (mit Taster) (ISO 25178-601:2010)

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Foreword

This document (EN ISO 25178-601:2010) 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of an identical text or by endorsement, at the latest by January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

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Introduction

This part of ISO 25178 is a geometrical product specification standard and is to be regarded as a general GPS standard (see ISO/TR 14638). It influences chain link 5 of the chain of standards on roughness profile, waviness profile, primary profile and areal surface texture.

For more detailed information of the relation of this standard to the GPS matrix model, see Annex C.

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

Part 601: Nominal characteristics of contact (stylus) instruments

1 Scope

This part of ISO 25178 defines the metrological characteristics of contact (stylus) areal surface texture measuring instruments.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the cited editions apply. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3274:1996, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Nominal characteristics of contact (stylus) instruments*

ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

ISO 10360-1, *Geometrical Product Specifications (GPS) — Acceptance and reverification tests for coordinate measuring machines (CMM) — Part 1: Vocabulary*

ISO/IEC Guide 99:2007, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3274, ISO 4287, ISO 10360-1 and ISO/IEC Guide 99 and the following apply.

3.1 General terms and definitions

3.1.1

coordinate system of the instrument

right hand orthonormal system of axes (X,Y,Z) defined as:

- (X,Y) is the plane established by the areal reference guide of the instrument;
- Z-axis is in the plane of the stylus trajectory and is perpendicular to the (X,Y) plane (see Figure 1)

NOTE Normally, the X-axis is the tracing direction and the Y-axis is the stepping axis.

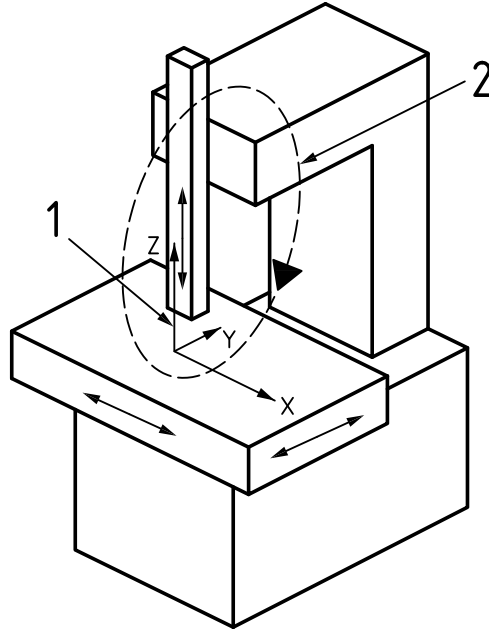
3.1.2

measurement loop

closed chain which comprises all components connecting workpiece and the stylus tip, e.g. the means of positioning, the workholding fixture, the measuring stand, the drive unit, the probing system (pick-up)

See Figure 1.

NOTE The measurement loop will be subjected to external and internal disturbances which influence the measurement uncertainty.



Key

- 1 coordinate system of the instrument
- 2 measurement loop

Figure 1 — Coordinate system and measurement loop of the instrument

3.1.3

user adjustment

(of a measuring instrument) adjustment employing only the means available to the user

NOTE This is an operation normally carried out by the user. It involves the use of a material measure, usually supplied with the instrument. The result of this operation automatically or manually adjusts certain parameters in order that the instrument operates correctly.

3.1.4

residual correction error

difference between the value of a quantity obtained after correcting the systematic error and the real value of this quantity

NOTE The residual error is composed of random errors and uncorrected systematic errors.

3.2 Terms and definitions relative to lateral scanning system

3.2.1

lateral scanning system

system that performs the scanning of the surface to be measured in the (X,Y) plane

NOTE Typically, the lateral scanning system is composed of the **drive unit X** (3.2.3) and **drive unit Y** (3.2.4).

3.2.2

areal reference guide

component of the instrument that generates the reference surface, in which the **probing system** (3.3.1) moves relative to the surface being measured according to a theoretically exact trajectory

NOTE In the case of areal surface texture measuring instruments, the reference guide establishes a reference surface (see ISO 25178-2). It can be achieved through the use of two perpendicular reference guides (see ISO 3274:1996, 3.3.2) or one reference surface guide.

3.2.3

drive unit X

component of the instrument that moves the **probing system** (3.3.1) or the surface to be measured along the reference guide on the X-axis and provides the horizontal position of the stylus tip in terms of the lateral X coordinate of the profile

3.2.4

drive unit Y

component of the instrument that moves the **probing system** (3.3.1) or the surface to be measured along the reference guide on the Y-axis and provides the horizontal position of the stylus tip in terms of the lateral Y coordinate of the profile

3.2.5

lateral position sensor

component of the drive unit that provides the lateral position of the pivot

NOTE 1 See Figure 2 for the definition of the pivot.

NOTE 2 The lateral position can be measured using, for example, a linear encoder, a laser interferometer, or a counting device coupled with a micrometer screw.

3.3 Terms and definitions relative to the probing system

3.3.1

probing system

⟨surface texture⟩ component of the instrument consisting of the **stylus** (3.3.4), the pivot, the **probe** (3.3.2) and the **digitizing system** (3.3.3)

NOTE 1 The axis of rotation around the pivot is parallel to the Y axis.

NOTE 2 The probing system is commonly called a “pick up”.

3.3.2

probe

⟨surface texture⟩ device that converts the height into a signal during measurement

NOTE In earlier standards this was termed a “transducer”.

3.3.3

digitizing system

device which converts analogue signals into digital ones

NOTE 1 The digital signal as a function of the x and y coordinates forms the extracted mechanical surface.