

SVENSK STANDARD

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Geometrisk produktspecifikation (GPS) – Ytstruktur: Arealmätning – Del 3: Specifikationsoperatorer (ISO 25178-3:2012)

Geometrical product specifications (GPS) – Surface texture: Areal – Part 3: Specification operators (ISO 25178-3:2012)

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The European Standard EN ISO 25178-3:2012 has the status of a Swedish Standard. This document contains the official version of EN ISO 25178-3:2012.

**Förhållandet till övriga delar under samma huvudtitel - Utdrag ur Förord i ISO 25178-3:2012/
Relations to other parts under the same general title - Extract from the Foreword of
ISO 25178-3:2012**

ISO 25178 consists of the following parts, under the general title *Geometrical product specifications (GPS) — Surface texture: Areal*:

- *Part 2: Terms, definitions and surface texture parameters*
- *Part 3: Specification operators*
- *Part 6: Classification of methods for measuring surface texture*
- *Part 70: Physical measurement standards*
- *Part 71: Software measurement standards*
- *Part 601: Nominal characteristics of contact (stylus) instruments*
- *Part 602: Nominal characteristics of non-contact (confocal chromatic probe) instruments*
- *Part 603: Nominal characteristics of non-contact (phase-shifting interferometric microscopy) instruments*
- *Part 604: Nominal characteristics of non-contact (coherence scanning interferometry) instruments*
- *Part 701: Calibration and measurement standards for contact (stylus) instruments*

The following parts are under preparation:

- *Part 1: Indication of surface texture*
- *Part 605: Nominal characteristics of non-contact (point autofocus probe) instruments*
- *Part 606: Nominal characteristics of non-contact (focus variation) instruments*

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Denna standard är framtagen av kommittén för Mätteknik GPS och Ytstruktur, SIS/TK 507/AG 6.

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EUROPEAN STANDARD

EN ISO 25178-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2012

ICS 17.040.20

English Version

**Geometrical product specifications (GPS) - Surface texture:
Areal - Part 3: Specification operators (ISO 25178-3:2012)**

Spécification géométrique des produits (GPS) - État de surface: Surfaique - Partie 3: Opérateurs de spécification (ISO 25178-3:2012)

Geometrische Produktspezifikation (GPS) - Oberflächenbeschaffenheit: Flächenhaft - Teil 3: Spezifikationsoperatoren (ISO 25178-3:2012)

This European Standard was approved by CEN on 6 July 2012.

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Foreword

This document (EN ISO 25178-3:2012) 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 2013, and conflicting national standards shall be withdrawn at the latest by January 2013.

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The text of ISO 25178-3:2012 has been approved by CEN as a EN ISO 25178-3:2012 without any modification.

SS-EN ISO 25178-3:2012 (E)

Introduction

This part of ISO 25178 is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO/TR 14638). It influences the chain link 3 of the chains of standards on areal surface texture.

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 relation of this part of ISO 25178 to the GPS matrix model, see Annex E.

This part of ISO 25178 specifies the specification operators according to ISO 17450-2.

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

Part 3:

Specification operators

1 Scope

This part of ISO 25178 specifies the complete specification operator for surface texture (scale limited surfaces) by areal methods.

2 Normative references

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

ISO 14406:2010, *Geometrical Product Specifications (GPS) — Extraction*

ISO 14660-1:1999, *Geometrical Product Specifications (GPS) — Geometrical features — Part 1: General terms and definitions*

ISO/TS 16610-1:2006, *Geometrical Product Specifications (GPS) — Filtration — Part 1: Overview and basic concepts*

ISO 16610-21:2011, *Geometrical product specifications (GPS) — Filtration — Part 21: Linear profile filters: Gaussian filters*

ISO 17450-1:2011, *Geometrical Product Specifications (GPS) — General concepts — Part 1: Model for geometrical specification and verification*

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

ISO 25178-2:2012, *Geometrical Product Specifications (GPS) — Surface texture: Areal — Part 2: Terms, definitions and surface texture parameters*

3 Terms and definitions

For the purposes of this document, the terms and definitions given ISO 14660-1, ISO 16610-1, ISO/TS 14406, ISO 17450-1, ISO 17450-2 and ISO 25178-2 and the following apply.

3.1

lateral period limit

<optical> spatial period of a sinusoidal profile at which the optical response falls to 50 %

NOTE The lateral period limit depends on the heights of surface features and the optical method used to probe the surface.

1) To be published.

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4 Complete specification operator

4.1 General

The complete specification operator (see ISO 17450-2) consists of all the operations required for an unambiguous specification. It consists of a full set of unambiguous specification operations in an unambiguous order. For areal surface texture, the complete specification operator defines the type of surface, method of extraction, association method and filtration for surface texture by areal methods.

If form error is to be included in the measurand, then a S-F surface shall be specified; otherwise, an S-L surface shall be specified.

4.2 Method of extraction

4.2.1 Evaluation area

4.2.1.1 General

The evaluation area consists of a rectangular portion of the surface over which an extraction is made.

The orientation of the evaluation area shall be controlled by the specification.

NOTE 1 If the nesting index is the same in orthogonal directions, then the orientation does not matter.

NOTE 2 The orientation of the evaluation area is typically influenced by the form; this means that the sides of the rectangular area are parallel/orthogonal to the nominal geometry (e.g. cylinder axis, sides of a rectangular flat, etc.).

4.2.1.2 S-F surface

For an S-F surface, if not otherwise specified, the evaluation area shall be a square.

If the F-operation is a filtration operation, then the length of the sides of the square evaluation area is the same length as the filter "nesting index".

If the F-operation is an association operation, then the length of the side of the square evaluation area is used as a substitute for the F-operation nesting index value. This chosen value for the F-operation nesting index is used for all subsequent operations.

The value of the nesting index for the F-operation is normally chosen from the following series:

..., 0,1 mm; 0,2 mm; 0,25 mm; 0,5 mm; 0,8 mm; 1,0 mm; 2,0 mm; 2,5 mm; 5,0 mm; 8,0 mm; 10 mm; ...

NOTE 1 An example of an F-operation with a nesting index is a spline filter. The total least squares fit of the nominal form is an example of an F-operation without a predefined nesting index.

NOTE 2 The value of the F-operation nesting index is typically chosen to be five times the scale of the coarsest structure of interest.

4.2.1.3 S-L surface

For an S-L surface, if not otherwise specified, the evaluation area shall be a square whose sides are the same length as the L-filter nesting index value.

The value of the nesting index for the L-filter is normally chosen from the following series:

..., 0,1 mm; 0,2 mm; 0,25 mm; 0,5 mm; 0,8 mm; 1,0 mm; 2,0 mm; 2,5 mm; 5,0 mm; 8,0 mm; 10 mm; ...

NOTE The value of the L-filter nesting index is typically five times the scale of the coarsest structure of interest.

4.2.2 Type of surface

The default surface is the mechanical surface (see ISO 14406) obtained with a radius chosen in accordance with the F-operation or L-filter and S-filter nesting index values given in Tables 1 and 2.