

**Geometrical product specifications (GPS) - Surface texture: Areal - Part 605: Nominal characteristics of non-contact (point autofocus probe) instruments (ISO 25178-605:2014)**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 25178-605:2014 sisaldab Euroopa standardi EN ISO 25178-605:2014 inglisekeelset teksti.	This Estonian standard EVS-EN ISO 25178-605:2014 consists of the English text of the European standard EN ISO 25178-605:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 22.01.2014.	Date of Availability of the European standard is 22.01.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 17.040.20

### **Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele**

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:  
Aru 10, 10317 Tallinn, Eesti; [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

### **The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation**

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:  
Aru 10, 10317 Tallinn, Estonia; [www.evs.ee](http://www.evs.ee); phone 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

ICS 17.040.20

English Version

Geometrical product specifications (GPS) - Surface texture:  
Areal - Part 605: Nominal characteristics of non-contact (point  
autofocus probe) instruments (ISO 25178-605:2014)

Spécification géométrique des produits (GPS) - État de  
surface: Surfacique - Partie 605: Caractéristiques  
nominales des instruments sans contact (capteur autofocus  
à point) (ISO 25178-605:2014)

Geometrische Produktspezifikation (GPS) -  
Oberflächenbeschaffenheit: Flächenhaft - Teil 605:  
Merkmale von berührungslos messenden Geräten (Punkt-  
Autofokus-Sensor) (ISO 25178-605:2014)

This European Standard was approved by CEN on 13 January 2014.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

## Foreword

This document (EN ISO 25178-605:2014) 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 July 2014, and conflicting national standards shall be withdrawn at the latest by July 2014.

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.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### Endorsement notice

The text of ISO 25178-605:2014 has been approved by CEN as EN ISO 25178-605:2014 without any modification.

# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
3.1 Terms and definitions related to all areal surface texture measurement methods.....	2
3.2 Terms and definitions related to x- and y-scanning systems.....	9
3.3 Terms and definitions related to optical systems.....	11
3.4 Terms and definitions related to optical properties of workpiece.....	12
3.5 Terms and definitions specific to point autofocus profiling.....	13
<b>4 Descriptions of the influence quantities</b> .....	<b>14</b>
4.1 General.....	14
4.2 Influence quantities.....	14
<b>Annex A (informative) General principles</b> .....	<b>16</b>
<b>Annex B (informative) Spot size and focal shift</b> .....	<b>20</b>
<b>Annex C (informative) Beam offset direction and maximum acceptable local slope</b> .....	<b>23</b>
<b>Annex D (informative) Features of an areal surface texture measuring instrument</b> .....	<b>26</b>
<b>Annex E (informative) Others: Non-measured point (autofocus error)</b> .....	<b>28</b>
<b>Annex F (informative) Relation to the GPS matrix</b> .....	<b>29</b>
<b>Bibliography</b> .....	<b>31</b>

## 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 the chain link 5 of the chains of standards on roughness profile, waviness profile, primary profile, and areal surface texture.

For more detailed information on the relationship of this standard to the GPS matrix model, see Annex G.

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

The point autofocus optical principle can be implemented in various set-ups. The configuration described in this document comprises three basic elements: an autofocus optical system, an autofocus mechanism, and an electronic controller.

This type of instrument is mainly designed for areal measurements, but it is also able to perform profile measurements.

This part of ISO 25178 describes the metrological characteristics of an optical profiler using a point autofocus probe for the measurement of areal surface texture.

For more detailed information on the point autofocus method, see [Annex A](#). Reading this annex before the main body may lead to a better understanding of this standard.

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

## Part 605: Nominal characteristics of non-contact (point autofocus probe) instruments

### 1 Scope

This part of ISO 25178 describes the metrological characteristics of a non-contact instrument for measuring surface texture using point autofocus probing.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4287:1997, *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 14406:2010, *Geometrical product specifications (GPS) — Extraction*

ISO 14978:2006, *Geometrical product specifications (GPS) — General concepts and requirements for GPS measuring equipment*

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

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

ISO 25178-6:2010, *Geometrical product specifications (GPS) — Surface texture: Areal — Part 6: Classification of methods for measuring surface texture*

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

ISO 25178-602:2010, *Geometrical product specifications (GPS) — Surface texture: Areal — Part 602: Nominal characteristics of non-contact (confocal chromatic probe) instruments*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4287, ISO 10360-1, ISO 14406, ISO 14978, ISO 25178-2, ISO 25178-3, ISO 25178-6, ISO 25178-601, ISO 25178-602 and the following apply.