

First edition
2013-10-01

**Geometrical product specifications
(GPS) — Surface texture: Areal —
Part 603:
Nominal characteristics of non-contact
(phase-shifting interferometric
microscopy) instruments**

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

*Partie 603: Caractéristiques nominales des instruments sans contact
(microscopes interférométriques à glissement de franges)*



Reference number
ISO 25178-603:2013(E)

© ISO 2013



COPYRIGHT PROTECTED DOCUMENT

© ISO 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

This is a preview of "ISO 25178-603:2013". [Click here to purchase the full version from the ANSI store.](#)

Contents

Page

Foreword	iv
Introduction	vi
1 Scope	1
2 Terms and definitions	1
2.1 Terms and definitions related to all areal surface texture measurement methods.....	1
2.2 Terms and definitions related to <i>x</i> - and <i>y</i> -scanning systems.....	8
2.3 Terms and definitions related to optical systems.....	10
2.4 Terms and definitions related to optical properties of the workpiece.....	12
2.5 Terms and definitions specific to phase-shifting interferometric microscopy.....	12
3 Descriptions of the influence quantities	13
3.1 General.....	13
3.2 Influence quantities.....	14
Annex A (informative) Components of a phase-shifting interferometric (PSI) microscope	16
Annex B (informative) Phase-shifting interferometric (PSI) microscope — Theory of operation ...	17
Annex C (informative) Errors and corrections for phase-shifting interferometric (PSI) microscopes	22
Annex D (informative) Relation to the GPS matrix model	25
Bibliography	27

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 213, *Dimensional and geometrical product specifications and verification*.

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

- *Part 1: Areal surface texture drawing indication*
- *Part 2: Terms, definitions and surface texture parameters*
- *Part 3: Specification operators*
- *Part 6: Classification of methods for measuring surface texture*
- *Part 70: Material measures*
- *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 interferometric microscopy) instruments*
- *Part 605: Nominal characteristics of non-contact (point autofocus probe) instruments*
- *Part 606: Nominal characteristics of non-contact (focus variation microscopy) instruments*
- *Part 701: Calibration and measurement standards for contact (stylus) instruments*
- *Part 702 Calibration of non-contact (confocal chromatic probe) instruments*

This is a preview of "ISO 25178-603:2013". [Click here to purchase the full version from the ANSI store.](#)

— *Part 703: Calibration and measurement standards for non-contact (interferometric) instruments*

The following part is under preparation: *Part 72: XML file format x3p*

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 chain of standards on areal surface texture.

This part of ISO 25178 describes the metrological characteristics of phase-shifting interferometric (PSI) profile and areal surface texture measuring microscopes, designed for the measurement of surface topography maps. For more detailed information on the phase-shifting interferometry technique, see [Annex A](#) and [Annex B](#).

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.

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