INTERNATIONAL STANDARD

ISO 16610-61

First edition
2015-07-01

Geometrical product specification (GPS) — Filtration —

Part 61: Linear areal filters — Gaussian filters

Spécification géométrique des produits (GPS) — Filtrage —

Partie 61: Filtres surfaciques linéaires : Filtres Gaussiens

Reference number
ISO 16610-61:2015(E)

© ISO 2015



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015, Published in Switzerland

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
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword ... **iv**
Introduction ... **vi**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Characteristics of linear planar Gaussian filters ... **2**
4.1 General ... 2
4.2 Weighting function of linear planar filters ... 2
4.3 Transmission characteristics of linear planar Gaussian filters ... 4
4.3.1 Transmission characteristic of the long wave component ... 4
4.3.2 Transmission characteristic of the short wave component ... 5
4.4 Separable weighting functions ... 6
5 Characteristics of linear cylindrical Gaussian filters ... **6**
5.1 General ... 6
5.2 Weighting function of linear cylindrical Gaussian filters ... 6
5.3 Transmission characteristics of a linear cylindrical profile ... 7
5.3.1 Transmission characteristic of the long wave component ... 7
5.3.2 Transmission characteristic of the short wave component ... 9
6 Other Information ... **11**
6.1 General ... 11
6.2 Filter Designations ... 11
Annex A (informative) **Examples** ... **12**
Annex B (informative) **Concept diagram** ... **15**
Annex C (informative) **Relationship to the filtration matrix model** ... **16**
Annex D (informative) **Relationship to the GPS matrix model** ... **17**
Bibliography ... **18**

© ISO 2015 – All rights reserved

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 (see 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 (see 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 16610 consists of the following parts, under the general title *Geometrical product specifications (GPS) — Filtration*:

— *Part 1: Overview and basic concepts*

— *Part 20: Linear profile filters: Basic concepts*

— *Part 21: Linear profile filters: Gaussian filters*

— *Part 22: Linear profile filters: Spline filters*

— *Part 28: Profile filters: End effects*

— *Part 29: Linear profile filters: Spline wavelets*

— *Part 30: Robust profile filters: Basic concepts*

— *Part 31: Robust profile filters: Gaussian regression filters*

— *Part 32: Robust profile filters: Spline filters*

— *Part 40: Morphological profile filters: Basic concepts*

— *Part 41: Morphological profile filters: Disk and horizontal line-segment filters*

— *Part 49: Morphological profile filters: Scale space techniques*

— *Part 60: Linear areal filters: Basic concepts*

— *Part 61: Linear areal filters: Gaussian filters*

— *Part 71: Robust areal filters: Gaussian regression filters*

 © ISO 2015 – All rights reserved

— *Part 85: Morphological areal filters: Segmentation*

The following parts are planned:

— *Part 26: Linear profile filters: Filtration on nominally orthogonal grid planar data sets*

— *Part 27: Linear profile filters: Filtration on nominally orthogonal grid cylindrical data sets*

— *Part 45: Morphological profile filters: Segmentation*

— *Part 62: Linear areal filters: Spline filters*

— *Part 69: Linear areal filters: Spline wavelets*

— *Part 70: Robust areal filters: Basic concepts*

— *Part 72: Robust areal filters: Spline filters*

— *Part 80: Morphological areal filters: Basic concepts*

— *Part 81: Morphological areal filters: Sphere and horizontal planar segment filters*

— *Part 89: Morphological areal filters: Scale space techniques*

© ISO 2015 – All rights reserved

Introduction

This part of ISO 16610 is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO/TR 14638). It influences chain links 3 and 5 in the GPS matrix structure..

The ISO/GPS Masterplan given in ISO/TR 14638 gives an overview of the ISO/GPS system of which this part of ISO 16610 is a part. The fundamental rules of ISO/GPS given in ISO 8015 apply to this part of ISO 16610 and the default decision rules given in ISO 14253-1 apply to specifications made in accordance with this part of ISO 16610, unless otherwise indicated.

For more detailed information about the relation of this part of ISO 16610 to the GPS matrix model, see Annex D.

This part of ISO 16610 specifies the metrological characteristics of linear areal Gaussian filters for the rotationally symmetric filtration of nominal planar surfaces and the filtration of nominal cylindrical surfaces. It specifies, in particular, how to separate long and short wave components of a surface.

© ISO 2015 – All rights reserved

Geometrical product specification (GPS) — Filtration —

Part 61:
Linear areal filters — Gaussian filters

1 Scope

This part of ISO 16610 specifies linear areal Gaussian filters for the rotationally symmetric filtration of nominal planar surfaces and the filtration of nominal cylindrical surfaces. It specifies, in particular, how to separate long and short wave components of a surface.

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 16610-1, *Geometrical product specification (GPS) — Filtration — Part 1: Overview and basic terminology*

ISO 16610-20, *Geometrical product specification (GPS) — Filtration — Part 20: Linear profile filters: basic concepts*

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

ISO 16610-60, *Geometrical product specification (GPS) — Filtration — Part 60: Linear areal filters: Basic concepts*

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

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16610-1, ISO 16610-20, ISO 16610-21, ISO 16610-60, ISO/IEC Guide 98-3:2008, ISO/IEC Guide 99, and the following apply.

3.1
linear areal filter
areal filter which separates surfaces into long wave and short wave components and is also a linear function

[SOURCE: ISO 16610-60, 3.1]

3.1.1
linear planar filter
linear areal filter (3.1) that separate surfaces into long wave and short wave components, which applies to nominal planar surfaces

[SOURCE: ISO 16610-60, 3.1.1]

© ISO 2015 – All rights reserved