



**SLOVENSKI STANDARD**  
**SIST EN ISO 16610-61:2015/oprA1:2018**  
**01-september-2018**

---

**Specifikacija geometrijskih veličin izdelka (GPS) - Filtriranje - 61. del: Linearni ravni filtri - Gaussovi filtri - Dopolnilo A1 (ISO 16610-61:2015/DAM 1:2018)**

Geometrical product specification (GPS) - Filtration - Part 61: Linear areal filters - Gaussian filters - Amendment 1 (ISO 16610-61:2015/DAM 1:2018)

Geometrische Produktspezifikation (GPS) - Filterung - Teil 61: Lineare Flächenfilter: Gauß-Filter - Änderung 1 (ISO 16610-61:2015/DAM 1:2018)

Spécification géométrique des produits (GPS) - Filtrage - Partie 61: Filtres surfaciques linéaires: Filtres Gaussiens - Amendement 1 (ISO 16610-61:2015/DAM 1:2018)

**Ta slovenski standard je istoveten z: EN ISO 16610-61:2015/prA1**

---

**ICS:**

17.040.20	Lastnosti površin	Properties of surfaces
17.040.40	Specifikacija geometrijskih veličin izdelka (GPS)	Geometrical Product Specification (GPS)

**SIST EN ISO 16610-61:2015/oprA1:2018 en,fr,de**



# DRAFT AMENDMENT

## ISO 16610-61:2015/DAM 1

ISO/TC 213

Secretariat: BSI

Voting begins on:  
2018-07-02Voting terminates on:  
2018-09-24

---

---

### Geometrical product specification (GPS) — Filtration —

#### Part 61:

#### Linear areal filters — Gaussian filters

#### AMENDMENT 1

*Spécification géométrique des produits (GPS) — Filtrage —*  
*Partie 61: Filtres surfaciques linéaires : Filtres Gaussiens*  
*AMENDEMENT 1*

ICS: 17.040.20

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

This document is circulated as received from the committee secretariat.

**ISO/CEN PARALLEL PROCESSING**



Reference number  
ISO 16610-61:2015/DAM 1:2018(E)

© ISO 2018



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

## Introduction

This Amendment 1 to International Standard ISO 16610-61 is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO/TR 14638). It influences chain link n of the chains of standards on surface texture.

Amendment 1 to International Standard ISO 16610-61 develops a concept of handling end effects in the case of the linear areal Gaussian filter.



# Geometrical product specification (GPS) — Filtration —

## Part 61: Linear areal filters — Gaussian filters

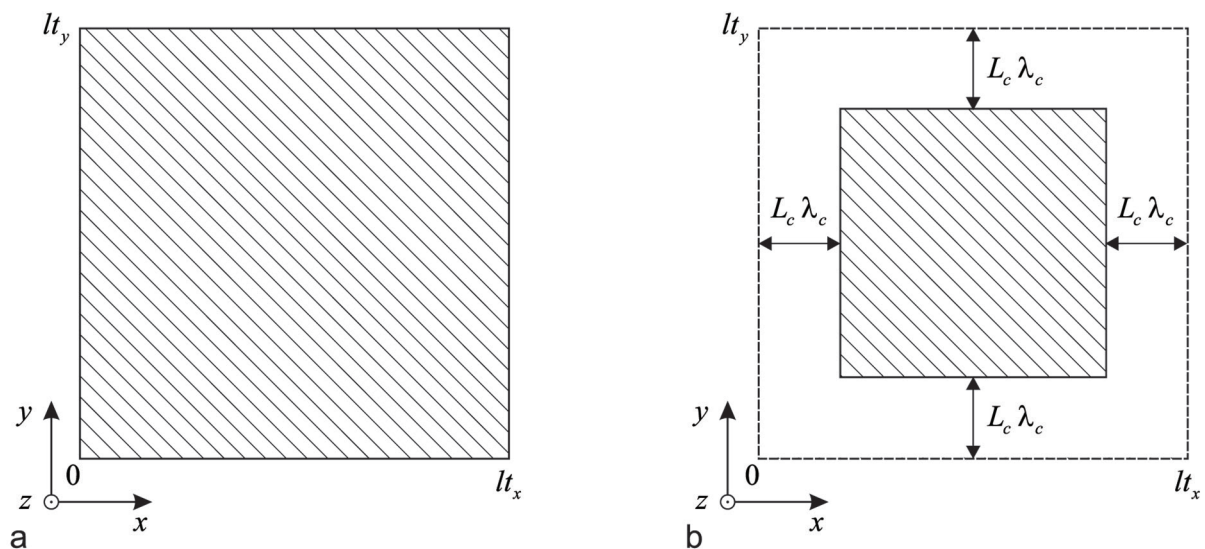
### AMENDMENT 1

After clause 6.2, add a new clause 7:

#### 7 Treatment of end effects

##### 7.1 General

Depending on the chosen nesting indices, the filtered surface may be significantly smaller than the unfiltered surface (see Figure 8 for linear planar Gaussian filters and Figure 9 for linear cylinder Gaussian filters). If a loss of valid data points is not acceptable the moment retainment criterion with  $p=1$  shall be applied (see ISO 16610-28:2016).



a) valid data points (hatched area) before filtering      b) valid data points (hatched area) after filtering

#### Key

$ltx$  measuring length in  $x$  direction

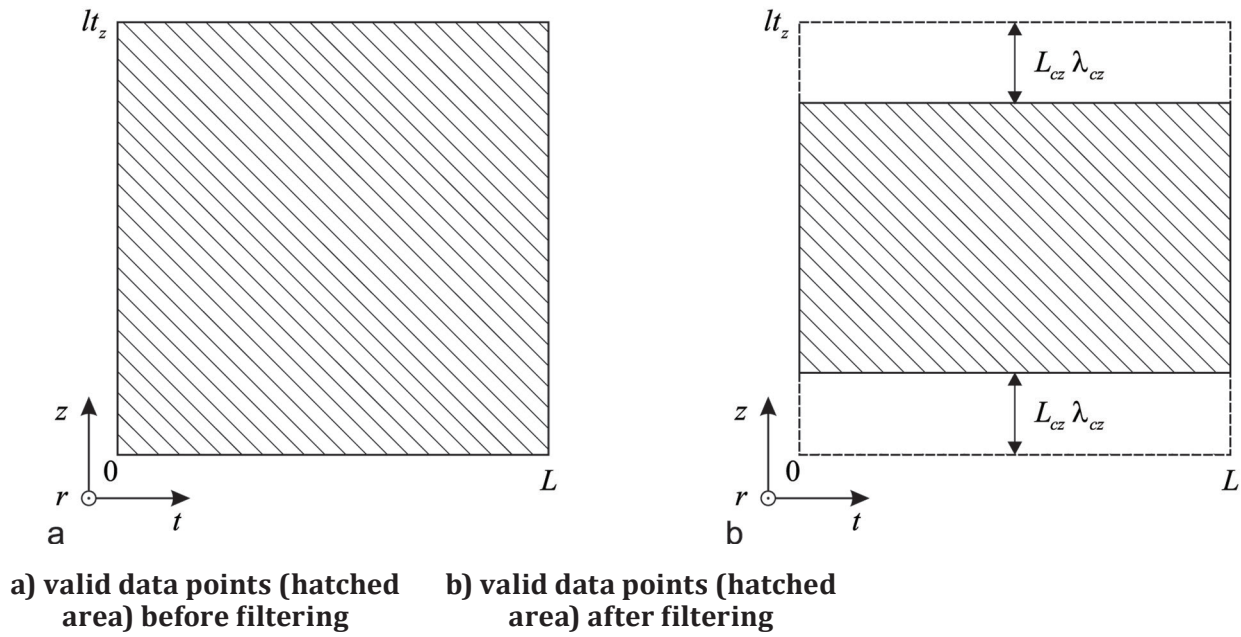
$lty$  measuring length in  $y$  direction

$\lambda_c$  nesting index (cut off wavelength) of the planar Gaussian filter

$L_c$  truncation index of the Gaussian filter

Figure 8 — Valid data points before and after filtering with linear planar Gaussian filters

## ISO 16610-61:2015/DAM 1:2018(E)

**Key**

$L$  circumferential measuring length in  $t$  direction

$lt_z$  measuring length in  $z$  direction

$\lambda_{cz}$  nesting index (cut off wavelength) in  $z$  direction of the cylinder Gaussian filter

$L_{cz}$  truncation index of the Gaussian filter in  $z$  direction

**Figure 9 — Valid data points before and after filtering with linear cylinder Gaussian filters**

## 7.2 Generalized filter operation for linear planar Gaussian filters

For linear planar Gaussian filters, the generalized filter operation is defined by [Formula \(19\)](#)

$$w(x, y) = \int_{\Omega_x} \int_{\Omega_y} z(x-u, y-v) \times (b_{00}(x, y) + u \times b_{10}(x, y) + v \times b_{01}(x, y)) \times s(u|\lambda_c) \times s(v|\lambda_c) dv du \quad (19)$$

where

$\Omega_x = [\max(x - lt_x, -L_c \lambda_c), \min(x, L_c \lambda_c)]$  is the integration interval in  $x$  direction,

$\Omega_y = [\max(y - lt_y, -L_c \lambda_c), \min(y, L_c \lambda_c)]$  is the integration interval in  $y$  direction,

$b_{00}(x, y), b_{10}(x, y), b_{01}(x, y)$  shift variant correction functions.



The shift variant correction functions can be calculated by solving the matrix equation

$$\begin{pmatrix} \mu_{00}(x, y) & \mu_{10}(x, y) & \mu_{01}(x, y) \\ \mu_{10}(x, y) & \mu_{20}(x, y) & \mu_{11}(x, y) \\ \mu_{01}(x, y) & \mu_{11}(x, y) & \mu_{02}(x, y) \end{pmatrix} \begin{pmatrix} b_{00}(x, y) \\ b_{10}(x, y) \\ b_{01}(x, y) \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$$

where

$$\mu_{qr}(x, y) = \int_{\Omega_x} u^q \times s(u|\lambda_c) du \times \int_{\Omega_y} v^r \times s(v|\lambda_c) dv.$$

In the interior  $L_c \lambda_c \leq x \leq lt_x - L_c \lambda_c$  and  $L_c \lambda_c \leq y \leq lt_y - L_c \lambda_c$  the filter behaviour is given by Formula (4).

NOTE 1 The filter operation according to [formula \(19\)](#) is not separable.

NOTE 2 For  $L_c \rightarrow \infty$ , the linear planar Gaussian filter is equal to the linear planar Gaussian regression filter according to ISO 16610-71:2014 with  $p = 1$ ).

### 7.3 Generalized filter operation for linear cylinder Gaussian filters

For linear cylinder Gaussian filters, the generalized filter operation is defined by [Formula \(20\)](#)

$$w(z, t) = \int_{\Omega_z} \int_{\Omega_t} r(z-u, t-v) \times (b_0(z) + u \times b_1(z)) \times s(v|f_c) \times s(u|\lambda_{cz}) dv du \quad (20)$$

where

$\Omega_t = [-L_{ct} L/f_c, L_{ct} L/f_c]$  is the integration interval in  $t$  direction,

$\Omega_z = [\max(z - lt_z, -L_{cz} \lambda_{cz}), \min(z, L_{cz} \lambda_{cz})]$  is the integration interval in  $z$  direction,

$b_0(z), b_1(z)$  shift variant correction functions.

The shift variant correction functions can be calculated by solving the matrix equation

$$\begin{pmatrix} \mu_0(z) & \mu_1(z) \\ \mu_1(z) & \mu_2(z) \end{pmatrix} \begin{pmatrix} b_0(z) \\ b_1(z) \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} \text{ where } \mu_q(z) = \int_{\Omega_z} u^q \times s(u|\lambda_{cz}) du \times \int_{\Omega_t} s(v|f_c) dv.$$

In the interior  $L_{cz} \lambda_{cz} \leq z \leq lt_z - L_{cz} \lambda_{cz}$  the filter behaviour is given by Formula (15) and Formula (16).

NOTE 1 The filter operation according to [Formula \(20\)](#) is separable.

NOTE 2 For  $L_{ct} \rightarrow \infty$  and  $L_{cz} \rightarrow \infty$ , the linear cylinder Gaussian filter is equal to the linear cylinder Gaussian regression filter according to ISO 16610-71:2014 with  $p = 1$ ).