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Geometrical product specifications (GPS) - Filtration - Part 40: Morphological profile filters: Basic concepts (ISO 16610-40:2015)

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NSAI	T +353 1 807 3800	Sales:
1 Swift Square,	F +353 1 807 3838	T +353 1 857 6730
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NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 16610-40

June 2015

ICS 17.040.20

English Version

Geometrical product specifications (GPS) - Filtration - Part 40: Morphological profile filters: Basic concepts (ISO 16610-40:2015)

Spécification géométrique des produits (GPS) - Filtrage - Partie 40: Filtres de profil morphologiques: Concepts de base (ISO 16610-40:2015)

Geometrische Produktspezifikation (GPS) - Filterung - Teil 40: Morphologische Profilfilter: Grundlegende Konzepte (ISO 16610-40:2015)

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Foreword

This document (EN ISO 16610-40:2015) 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.

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INTERNATIONAL STANDARD

ISO 16610-40

First edition
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Geometrical product specifications (GPS) — Filtration —

Part 40: Morphological profile filters: Basic concepts

Spécification géométrique des produits (GPS) — Filtrage —
Partie 40: Filtres de profil morphologiques: Concepts de base

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CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
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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).

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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*.

This first edition of ISO 16610-40 cancels and replaces ISO/TS 16610-40:2006 which has been technically revised.

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*

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

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

— *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*

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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 the chain links 3 and 5 of all chains of standards.

The ISO/GPS Masterplan given in ISO 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 C.

This part of ISO 16610 develops the terminology and concepts for morphological operations and filters, including envelope filters.

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Geometrical product specifications (GPS) — Filtration —

Part 40: Morphological profile filters: Basic concepts

1 Scope

This part of ISO 16610 sets out the basic concepts and terminology for morphological operations and filters, including envelope filters.

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 17450-1:2011, *Geometrical product specifications (GPS) — Geometrical concepts — Part 1: Model for geometrical specification and verification*

ISO 16610-1:2015, *Geometrical product specifications (GPS) — Filtration — Part 1: Overview and basic concepts*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16610-1, ISO 17450-1, and the following apply.

3.1
morphological operation
binary operation involving two geometrical objects as sets, resulting in another geometrical object

Note 1 to entry: Dilation and erosion are two primary morphological operations, and closing and opening are two secondary morphological operations.

Note 2 to entry: Geometrical objects are point sets, i.e. set of points.

3.2
morphological filter
morphological operation (3.1) that is both *monotonically increasing* (3.11) and *idempotent* (3.12)

3.3
envelope filter
closing (3.10) or *opening* (3.9) filter, whose output envelops the input profile or surface

Note 1 to entry: A closing filter generates the upper envelope; an opening filter generates the lower envelope.

3.4
Minkowski addition
vector sum of points in two given geometrical sets

3.5
Minkowski subtraction
binary operation defined using *Minkowski addition* (3.4) of two sets

Note 1 to entry: It is the complement of the Minkowski addition of the complement of the first set with the second set.

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