

Geometrical product specifications (GPS) -  
Dimensioning and tolerancing - Cones (ISO 3040:2016)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 3040:2016 sisaldab Euroopa standardi EN ISO 3040:2016 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 3040:2016 consists of the English text of the European standard EN ISO 3040:2016.
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 04.05.2016.	Date of Availability of the European standard is 04.05.2016.
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 17.040.30

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; koduleht [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; homepage [www.evs.ee](http://www.evs.ee); phone +372 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

English Version

Geometrical product specifications (GPS) - Dimensioning  
and tolerancing - Cones (ISO 3040:2016)

Spécification géométrique des produits (GPS) -  
Cotation et tolérancement - Cônes (ISO 3040:2016)

Geometrische Produktspezifikation (GPS) -  
Maßeintragung und Toleranzfestlegung - Kegel (ISO  
3040:2016)

This European Standard was approved by CEN on 1 November 2015.

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

## European foreword

This document (EN ISO 3040:2016) 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 November 2016, and conflicting national standards shall be withdrawn at the latest by November 2016.

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.

This document supersedes EN ISO 3040:2012.

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 3040:2016 has been approved by CEN as EN ISO 3040:2016 without any modification.

# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</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>
<b>4 Graphical symbol for a rate of taper for a cone</b> .....	<b>2</b>
<b>5 Dimensions and indication on a cone</b> .....	<b>2</b>
5.1 Dimensions on a cone.....	2
5.2 Indication of rate of taper value on drawings.....	4
<b>6 Tolerancing of a cone</b> .....	<b>5</b>
<b>Annex A (informative) Tolerancing of a cone: Examples</b> .....	<b>8</b>
<b>Annex B (informative) Relation to the GPS matrix model</b> .....	<b>23</b>
<b>Bibliography</b> .....	<b>24</b>

## 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](http://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](http://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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This fourth edition cancels and replaces the third edition (ISO 3040:2009), which has been technically revised:

- [Clause 6](#) on the tolerancing of cones has been revised;
- [Annex A](#) on former practice from ISO 3040:1990 has been deleted;
- a new informative [Annex A](#) with examples has been added.

## Introduction

This International Standard is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO 14638), applicable to a conical feature. It influences chain links A and B of the chain of standards on size, form, orientation, location and run-out.

For more detailed information about the relationship of ISO 3040 to other standards and to the GPS matrix model, see [Annex B](#).

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

In this International Standard, the figures illustrate the text only and should not be considered as design examples. For this reason, the figures are simplified and are not to scale.

No indications from the previous edition (ISO 3040:2009) have been made obsolete by this edition. Therefore, there is no 'former practice'.

# Geometrical product specifications (GPS) — Dimensioning and tolerancing — Cones

## 1 Scope

This International Standard specifies graphical indication applicable to a cone (right-angle circular cones) to define its dimensioning or to specify its tolerancing.

For the purposes of this International Standard, the term “cone” relates to right-angle circular cones only (any intersection by a plane perpendicular to the axis of the nominal cone is a circle).

NOTE 1 For simplicity, only truncated cones have been represented in this International Standard. However, this International Standard can be applied to any type of cone within its scope.

NOTE 2 This International Standard is not intended to prevent the use of other methods of dimensioning and tolerancing.

## 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 1119:2011, *Geometrical product specifications (GPS) — Series of conical tapers and taper angles*

ISO 81714-1, *Design of graphical symbols for use in the technical documentation of products — Part 1: Basic rules*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### rate of taper

$C$

ratio of the difference in the diameters of two sections of a cone to the distance between them

Note 1 to entry: It is expressed by the following formula (see also [Figure 1](#)).

$$C = \frac{D - d}{L} = 2 \tan \left( \frac{\alpha}{2} \right) \quad (1)$$

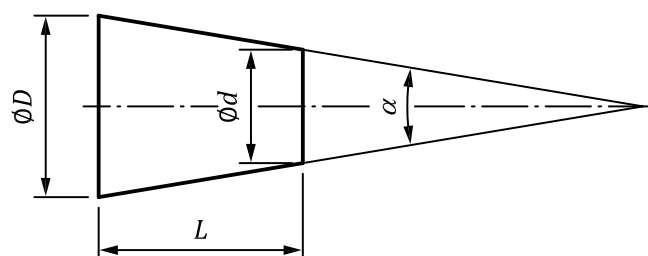


Figure 1