

**Geometrical product specifications (GPS) -  
Dimensioning and tolerancing - Cones (ISO 3040:2009)**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 3040:2012 sisaldab Euroopa standardi EN ISO 3040:2012 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 3040:2012 consists of the English text of the European standard EN ISO 3040:2012.
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 14.03.2012.	Date of Availability of the European standard is 14.03.2012.
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 01.100.20

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

English Version

**Geometrical product specifications (GPS) - Dimensioning and  
tolerancing - Cones (ISO 3040:2009)**

Spécification géométrique des produits (GPS) - Cotation et  
tolérancement - Cônes (ISO 3040:2009)

Geometrische Produktspezifikation (GPS) - Maßeintragung  
und Toleranzfestlegung - Kegel (ISO 3040:2009)

This European Standard was approved by CEN on 19 February 2012.

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, 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

**Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Foreword

The text of ISO 3040:2009 has been prepared by Technical Committee ISO/TC 213 “Dimensional and geometrical product specifications and verification” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 3040:2012 by 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 September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

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.

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, 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 3040:2009 has been approved by CEN as a EN ISO 3040:2012 without any modification.

# Contents

Page

Foreword .....	iv
Introduction.....	v
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	1
4 Graphical symbol for a cone .....	2
5 Dimensioning of cones .....	2
5.1 Characteristics of cones .....	2
5.2 Indication of rate of taper on drawings .....	4
5.3 Standardized series of cones .....	4
6 Tolerancing of cones .....	5
6.1 General .....	5
6.2 Tolerancing of cone, cone angle specified .....	5
6.3 Tolerancing of cone; rate of taper specified .....	6
6.4 Tolerancing zone of cone simultaneously defining the axial location of the cone .....	7
6.5 Tolerancing of cone relative to a datum system (simultaneously defining coaxiality) .....	8
Annex A (informative) Former practice — Tolerancing of cone separate from the tolerance of the axial location of the cone .....	9
Annex B (informative) Relation to the GPS matrix model .....	10
Bibliography .....	11

## Introduction

This International Standard 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 1 and 2 of the chain of standards on angles.

For more detailed information on the relation of this International Standard to other standards and to the GPS matrix model, see Annex B.

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.

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

## 1 Scope

This International Standard establishes the definition of cones and specifies the graphical symbol to be used for their indication and methods for their dimensioning and tolerancing.

For the purposes of this International Standard, the term “cone” relates to right-angle circular cones only.

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 referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1119:1998, *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 It is expressed by the following formula (see also Figure 1):

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