DRAFT INTERNATIONAL STANDARD ISO/DIS 14405-3

ISO/TC **213** Secretariat: **DS**

Voting begins on **2013-07-18** Voting terminates on **2013-10-18**

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Geometrical product specifications (GPS) — Dimensional tolerancing —

Part 3: Angular sizes

Spécification géométrique des produits (GPS) — Tolérancement dimensionnel —

Partie 3: Tailles angulaires

ICS 17.040.10

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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Published in Switzerland

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 14405-3 was prepared by Technical Committee ISO/TC 213, *Dimensional and geometrical product specifications and verification*.

ISO 14405 consists of the following parts, under the general title *Geometrical product specification (GPS) — Dimensional tolerancing*:

— *Part 1: Linear sizes*

— *Part 2: Dimensions other than linear sizes*

— *Part 3: Angular sizes*

Introduction

This part of ISO 14405 is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO 14638). In the general GPS matrix, it influences chain links “Symbols and indications”, “Tolerance zones and parameter” and “Feature characteristics” of the chains of standards.

This part of ISO 14405 is a global GPS standard which influences on angle in the general GPS matrix

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

For more detailed information on the relation of this part of ISO 14405 to other standards and to the GPS matrix model, see Annex C.

Geometrical product specfication (GPS) — Dimensional tolerancing — Part 3: Angular sizes

1 Scope

This part of ISO 14405 establishes the default specification operator for angular size and defines a number of special specification operators for features of size with angular size: cone, frustum (truncated or not), wedge (truncated or not), two opposite straight lines (cross section of a wedge/truncated wedge and a plane perpendicular to the medium plane of the wedge/truncated wedge, cross section of a cone/frustum and a plane containing the axis of revolution of the cone/frustum).

This part of ISO 14405 also defines the specification modifiers and the drawing indications for these angular sizes.

This part of ISO 14405 covers the following angular sizes:

- Local angular size;
  - Angular size between two lines;
  - Section angular size;
  - Portion angular size;
- Global angular size;
  - Direct global angular size;
  - Least squares angular size;
  - Minmax angular size;
- Rank order angular size;
  - Maximum angular size;
  - Minimum angular size;
  - Average angular size;
  - Range angular size;
  - Mid range angular size;
  - Median angular size;
  - Quadratic range of angular size.

This part of ISO 14405 defines the meaning of tolerances of angular sizes indicated as:

— + and/or – limit deviations, e.g. 0°/-0,5°, or;

— indicated with upper limit of size (ULS) and/or lower limit of size (LLS), e.g., 35° max. or 15° min. 34°/36;

— with or without modifiers

This standard gives a set of tools box, to express several types of angular size characteristic. It does not give any information on the relationship between a function or a use and an angular size characteristic.

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 3098-2:2000, *Technical product documentation — Lettering — Part 2: Latin alphabet, numerals and marks*

ISO 8015:2011, *Geometrical Product Specifications (GPS) — Fundamental principles — Concepts, principles and rules*.

ISO 10579:2010, *Geometrical product specifications (GPS) — Dimensioning and tolerancing — Non-rigid parts*

ISO 14405-1:2011, *Geometrical product specification (GPS) — Dimensional tolerancing — Linear sizes*.

ISO 14405-2:2012, *Geometrical product specification (GPS) — Dimensional tolerancing - Dimensions other than linear sizes*.

ISO 14660-2:1999, *Geometrical product specification (GPS) — Geometrical features — Part 2: Extracted median line of a cylinder and a cone; Extracted median surface; Local size of an extracted feature*.

ISO 17450-1:2011, *Geometrical product specification (GPS) — General concepts — Part 1: Model for geometric specification and verification*.

ISO 17450-2:2012, *Geometrical product specification (GPS) — General concepts — Part 2: Basic tenets, specifications, operators and uncertainties*.

ISO 81714-1:2010, *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 terms and definitions given in of ISO 8015, ISO 14660-2, ISO 17450-1, ISO 17450-2, ISO14405-1, ISO14405-2 and the following apply.

3.1
feature of size with angular size
geometrical shape defined by angular dimension which is a size

Note 1 to entry: The feature of size with angular size can be a cone, a frustums, a wedge (truncated or not), two opposites straight lines (cross section of a wedge/truncated wedge and a plane perpendicular to the medium plane of the wedge/truncated wedge, cross section of a cone/frustums and a plane containing the axis of revolution of the cone/frustums).

Note 2 to entry: Figures 1 and 2 illustrate feature of size with angular size type wedge, cone, frustrum and two lines.

Note 3 to entry: Figure 3 illustrates the case of feature of size with angular size and angular distance between two planes which is not a feature of size with angular size and shows that a feature of size with angular size exists when the normal vectors to the surface of the two opposite lines are of opposite sign.

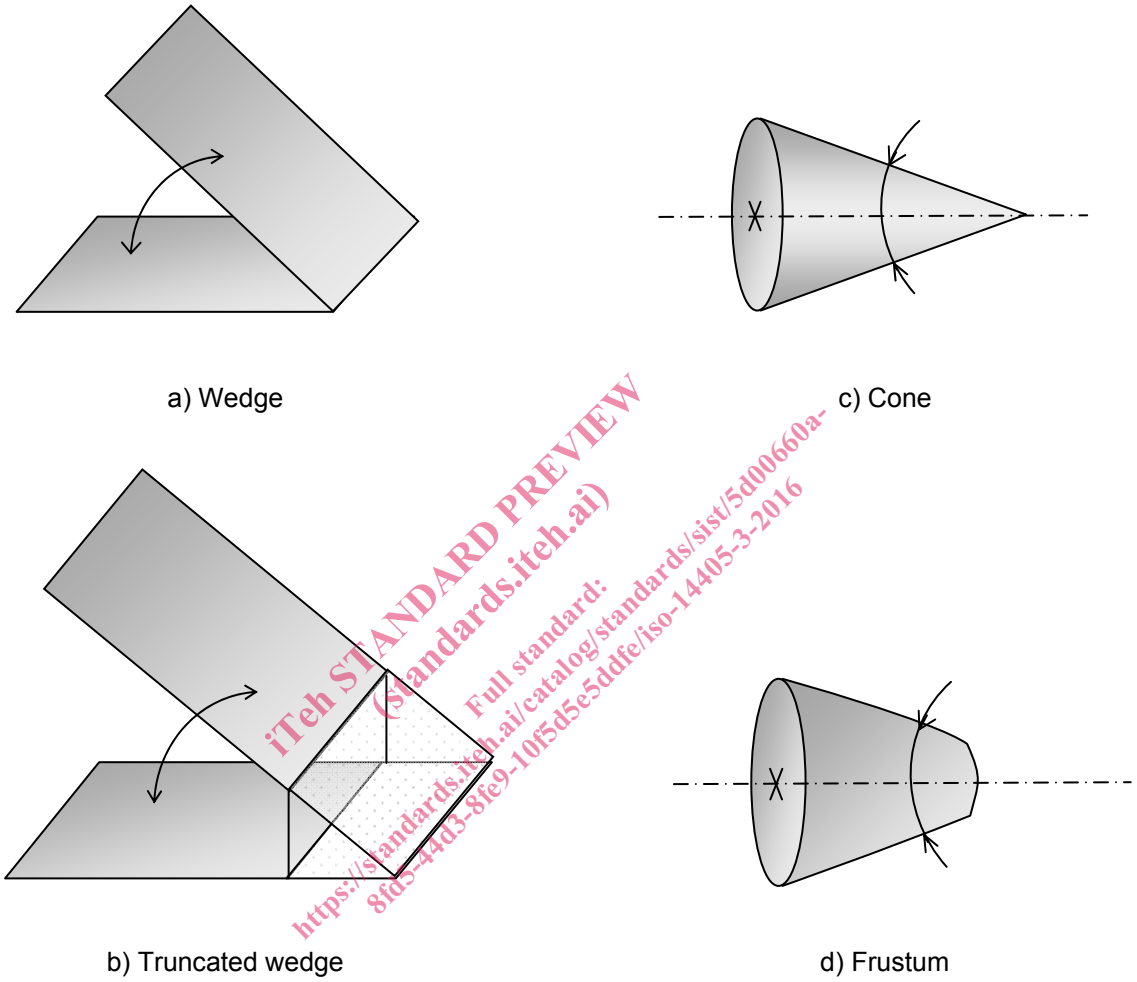
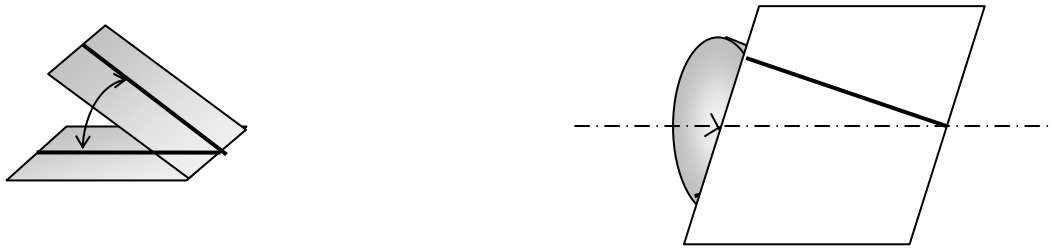


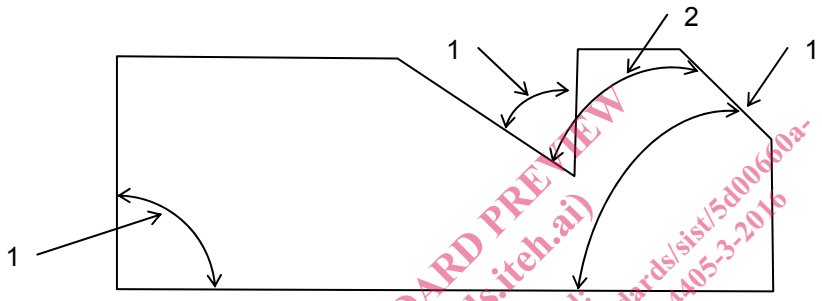
Figure 1 – Example of feature of size with angular size relative to surfaces



a) two opposite lines of a wedge

b) two opposite generatrix lines of a cone

Figure 2 — Example of features of angular size relative to two lines



Key
1 Feature of size with angular size
2 Non feature of size with angular size

Figure 3 — Features of angular size or not

3.2
local angular size
local angular size characteristic
angular size characteristic having by definition a non-unique result of evaluation along and/or around the feature of size with angular size

Note 1 to entry: For a given feature, an infinity of local angular sizes exists.

Note 2 to entry: In Figures 4, 5 and 6 examples of local angular size are shown. These examples do not take into account the rank-order angular size.