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Geometriska produktspecifikationer (GPS) – Generella begrepp – Del 1: Modell för geometrisk specifikation och verifikation (ISO 17450-1:2011)

Geometrical product specifications (GPS) – General concepts – Part 1: Model for geometrical specification and verification (ISO 17450-1:2011)

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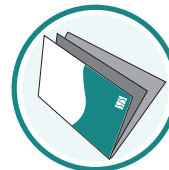
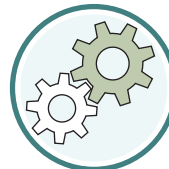
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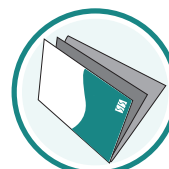
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Denna standard ersätter SIS-ISO/TS 17450-1:2005, utgåva 1.

The European Standard EN ISO 17450-1:2011 has the status of a Swedish Standard. This document contains the official version of EN ISO 17450-1:2011.

This standard supersedes the Swedish Standard SIS-ISO/TS 17450-1:2005, edition 1.

**Förhållandet till övriga delar under samma huvudtitel - Utdrag ur Förord i ISO 17450-1:2011/
Relations to other parts under the same general title - Extract from the Foreword of
ISO 17450-1:2011**

ISO 17450 consists of the following parts, under the general title *Geometrical product specifications (GPS) — General concepts*:

- *Part 1: Model for geometrical specification and verification*
- *Part 2: Basic tenets, specifications, operators, uncertainties and ambiguities*

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EUROPEAN STANDARD

EN ISO 17450-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2011

ICS 17.040.01

Supersedes CEN ISO/TS 17450-1:2007

English Version

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

Spécification géométrique des produits (GPS) - Concepts
généraux - Partie 1: Modèle pour la spécification et la
vérification géométriques (ISO 17450-1:2011)

Geometrische Produktspezifikation (GPS) - Grundlagen -
Teil 1: Modell für die geometrische Spezifikation und
Prüfung (ISO 17450-1:2011)

This European Standard was approved by CEN on 10 December 2011.

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Foreword

This document (EN ISO 17450-1:2011) 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 June 2012, and conflicting national standards shall be withdrawn at the latest by June 2012.

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Geometrical product specifications (GPS) — General concepts —

Part 1: Model for geometrical specification and verification

1 Scope

This part of ISO 17450 provides a model for geometrical specification and verification and defines the corresponding concepts. It also explains the mathematical basis of the concepts associated with the model and defines general terms for geometrical features of workpieces.

This part of ISO 17450 defines the fundamental concepts for the GPS system in order to:

- provide nonambiguous GPS language to be used in design, manufacturing and verification,
- identify features, characteristics and rules to provide the basis for specifications,
- provide a complete symbology language to indicate GPS specifications,
- provide simplified symbology by defining default rules, and
- provide consistent rules for verification.

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/IEC Guide 99, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC Guide 99 and the following apply.

3.1

real surface

(of a workpiece) set of features which physically exist and separate the entire workpiece from the surrounding medium

3.2

surface model

model representing the set of physical limits of the virtual or the real workpiece

NOTE 1 This model applies to all closed surfaces.

NOTE 2 The surface model allows the definition of single features, sets of features, and/or portions of features. The total product is modelled by a set of surface models corresponding to each workpiece.

3.2.1

nominal model

(of a workpiece) model of the perfect shape defined by the designer

NOTE The nominal model represents the design intent.

3.2.2

non-ideal surface model

skin model

(of a workpiece) model of the physical interface of the workpiece with its environment

NOTE See Clause 5.

3.3

geometrical feature

point, line, surface, volume or a set of these items

NOTE 1 The non-ideal surface model is a particular type of geometrical feature, corresponding to the infinite set of points defining the interface between the workpiece and its surroundings.

NOTE 2 A geometrical feature can be an ideal feature or a non-ideal feature, and can be considered as either a single feature or a compound feature.

3.3.1

ideal feature

feature defined by a parametrized equation

NOTE 1 The expression of the parametrized equation depends on the type of ideal feature and on its intrinsic characteristics.

NOTE 2 By default, an ideal feature is infinite. To change its nature, it is appropriate to specify this by adding the term "restricted" as in "restricted ideal feature".

3.3.1.1

attribute of an ideal feature

property intrinsically attached to an ideal element

NOTE 1 Four levels of attributes can be defined for an ideal feature: 1) shape; 2) dimensional parameters from which a size can be defined in the case of dimensional feature; 3) situation feature; and 4) skeleton (when the size is set equal to zero).

NOTE 2 If the ideal feature is a feature of size, then one of parameters of the shape can be considered as a size.

3.3.1.1.1

dimensional parameter

linear or angular dimension of an ideal feature used in the expression of its parametrized equation

NOTE A dimensional parameter can correspond to a size of a feature of size.

3.3.1.1.2

skeleton feature

geometrical feature resulting from the reduction of a feature of size when its size is set equal to zero

NOTE 1 In the nominal model, the skeleton feature is a geometrical attribute of a nominal integral feature. A nominal integral feature and its skeleton belong to the same invariance class and have the same situation feature.

NOTE 2 In the non-ideal feature, several possible skeleton features exist for the same integral feature.

EXAMPLE In case of a torus, there are two dimensional parameters, one of which is a size (the small diameter of the torus). Its skeleton is a circle; its situation features are a plane (containing the circle) and a point (centre of the circle).

3.3.1.1.3

situation feature

point, straight line, plane or helix, from which the location and/or orientation of a geometrical feature can be defined

See Figures 1 to 4.

NOTE 1 A situation feature is a geometrical attribute of an ideal feature.

NOTE 2 No dimensional parameters are linked to a situation feature.

NOTE 3 In many cases, instead of using the situation helix, the axis of a situation helix is used.

EXAMPLE In the case of a torus, there are two dimensional parameters, one of which is a size (the small diameter of the torus). Its skeleton is a circle and its situation features are a plane (containing the circle) and a point (centre of the circle).

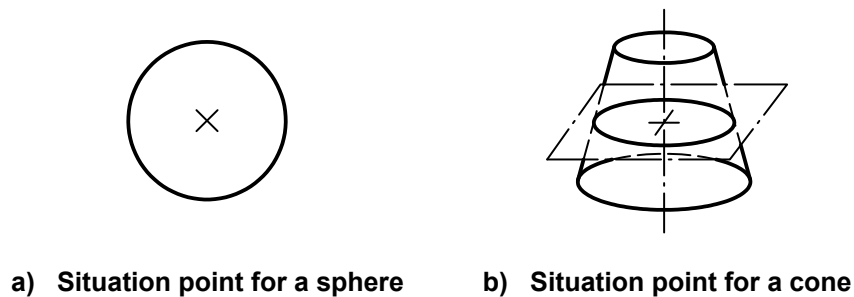


Figure 1 — Example of situation points

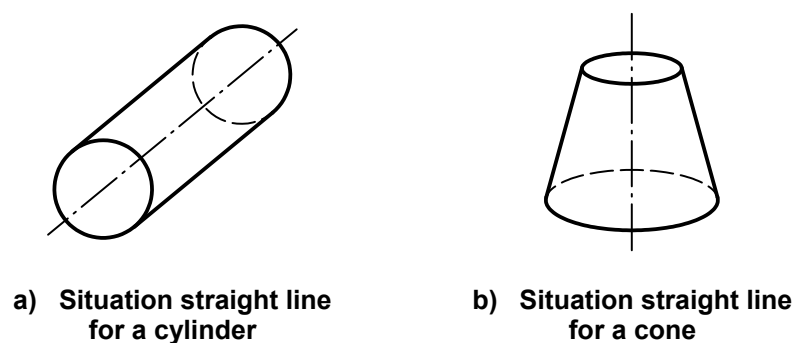


Figure 2 — Example of situation straight lines