
**Geometrical product specifications
(GPS) — Fundamentals — Concepts,
principles and rules**

*Spécification géométrique des produits (GPS) — Principes
fondamentaux — Concepts, principes et règles*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 8015:2011](https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-f64f9c181100/iso-8015-2011)

[https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-
f64f9c181100/iso-8015-2011](https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-f64f9c181100/iso-8015-2011)



iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 8015:2011

<https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-f649c181100/iso-8015-2011>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction.....	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Fundamental assumptions for the reading of specifications on drawings.....	2
4.1 General	2
4.2 Functional limits	2
4.3 Tolerance limits	2
4.4 Workpiece functional level	2
5 Fundamental principles	2
5.1 Invocation principle.....	2
5.2 Principle of GPS standard hierarchy.....	3
5.3 Definitive drawing principle	3
5.4 Feature principle.....	4
5.5 Independency principle.....	4
5.6 Decimal principle.....	4
5.7 Default principle	4
5.8 Reference condition principle.....	5
5.9 Rigid workpiece principle.....	5
5.10 Duality principle.....	5
5.11 Functional control principle.....	5
5.12 General specification principle.....	6
5.13 Responsibility principle.....	6
6 Rules for indication of default specification operators.....	6
6.1 General	6
6.2 General ISO default GPS specification	6
6.3 Altered default GPS specification.....	7
7 Rules for indication of special specification operators	8
7.1 General	8
7.2 Added complementary information (requirements) to the ISO basic specification.....	8
8 Rules for statements in parentheses	8
Annex A (informative) Relation to the GPS matrix model.....	9
Bibliography.....	10

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 8015 was prepared by Technical Committee ISO/TC 213, *Dimensional and geometrical product specifications and verification*.

This second edition cancels and replaces the first edition (ISO 8015:1985), which has been technically revised.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 8015:2011](https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-f649c181100/iso-8015-2011)

<https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-f649c181100/iso-8015-2011>

Introduction

This International Standard is a geometrical product specification (GPS) standard and is to be regarded as a fundamental GPS standard (see ISO/TR 14638). It influences all other standards in the GPS matrix system, i.e. all global, general and supplementary standards, as well as any other kind of document in the GPS matrix system.

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

This International Standard covers a number of fundamental principles that apply to all GPS standards and technical product documentation that is based on the GPS matrix system. Until this current version of this International Standard was published, these principles were implied, but not formulated explicitly.

This International Standard also covers the indication of ISO default specification operators and particularly the indication of non-default specification operators, either by direct indication or by the use of company-specific or drawing-specific defaults.

For the purpose of this International Standard, a concept is considered as an abstract idea, a principle is considered as a standardized truth based on concepts upon which rules are based, and a rule is considered as a standardized procedure (for action).

IT&T STANDARD PREVIEW
(standards.iteh.ai)

[ISO 8015:2011](https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-f649c181100/iso-8015-2011)

<https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-f649c181100/iso-8015-2011>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 8015:2011

<https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-f649c181100/iso-8015-2011>

Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules

1 Scope

This International Standard specifies fundamental concepts, principles and rules valid for the creation, interpretation and application of all other International Standards, Technical Specifications and Technical Reports concerning dimensional and geometrical product specifications (GPS) and verification.

This International Standard applies to the interpretation of GPS indications on all types of drawings.

For the purposes of this International Standard, the term “drawing” is to be interpreted in the broadest possible sense, encompassing the total package of documentation specifying the workpiece.

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

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

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement — Guide to the expression of uncertainty in measurement (GUM:1995)*

ISO/IEC Guide 99:2007, *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 17450-1, ISO 17450-2, ISO/IEC Guide 98-3, ISO/IEC Guide 99 and the following apply.

3.1

ISO GPS system

GPS system

geometrical product specification and verification system developed in ISO by ISO/TC 213

1) To be published. (Revision of ISO/TS 17450-1:2005)

2) To be published. (Revision of ISO/TS 17450-2:2002)

3.2
default GPS specification

GPS specification in which the specification operator is defined by standards or regulations

NOTE Where defined, default specifications are usually recognizable by the introductory wording: “*unless otherwise specified...*”.

3.3
ISO default GPS specification

default GPS specification defined by ISO standards

3.4
altered default GPS specification

default GPS specification defined by other means

3.5
ISO default GPS specification operator

specification operator containing only default specification operations in the default order and defined by ISO standards

4 Fundamental assumptions for the reading of specifications on drawings

4.1 General

The following assumptions regarding the interpretation of tolerance limits are the basis for the overall rules of the GPS system.

General and individual specifications written on the drawing shall always be respected and are linked by default to the assumptions given in 4.2 to 4.4.

[ISO 8015:2011](https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-f649c181100/iso-8015-2011)

4.2 Functional limits

<https://standards.iteh.ai/catalog/standards/sist/ab9efd90-df4d-4638-8d45-f649c181100/iso-8015-2011>

It is assumed for interpretation that the functional limits are based on an exhaustive investigation done by experiment or theory, or a combination of both, so the functional limits are known with no uncertainty.

4.3 Tolerance limits

It is assumed for interpretation that the tolerance limits are identical to the functional limits.

4.4 Workpiece functional level

It is assumed for interpretation that the workpiece functions 100 % within the tolerance limits and 0 % outside the tolerance limits.

5 Fundamental principles

5.1 Invocation principle

Once a portion of the ISO GPS system is invoked in a mechanical engineering product documentation, the entire ISO GPS system is invoked, unless otherwise indicated on the documentation, e.g. by reference to a relevant document.

“Unless otherwise indicated on the documentation” means e.g. that if it is indicated on the documentation that it has been prepared in accordance with a regional, national or company standard, then that standard and not the ISO GPS system shall be used to interpret those elements of the specification that are covered by that standard.

“Tolerancing ISO 8015” can optionally be indicated in or near the title block for information, but is not required to invoke the ISO GPS system.

NOTE 1 The most common way to invoke the ISO GPS system is to use one or more GPS specifications in a drawing.

NOTE 2 The ISO GPS system is defined in the International Standards published by ISO/TC 213. See also ISO/TR 14638.

NOTE 3 That “the entire ISO GPS system is invoked” means that e.g. fundamental and global GPS standards apply and consequently that e.g. the reference temperature given in ISO 1 and the decision rules given in ISO 14253-1 apply unless otherwise indicated. The purpose of the invocation principle is to provide the formal traceability for these GPS standards and rules.

5.2 Principle of GPS standard hierarchy

The ISO GPS system is defined in a hierarchy of standards that includes the following types of standards in the given order:

- fundamental GPS standards;
- global GPS standards;
- general GPS standards;
- complementary GPS standards.

The rules given in standards at a higher level in the hierarchy apply in all cases unless rules in standards at lower levels in the hierarchy specifically give other rules.

The rules given in fundamental GPS standards, e.g. this International Standard, apply in all cases, unless the rules in a specific standard at a lower level give other rules that apply within its scope.

The rules given in global GPS standards, e.g. ISO 1, apply in all cases, unless the rules in a specific general or complementary GPS standard give other rules that apply within its scope.

All rules given in fundamental and global GPS standards apply in addition to the rules specifically given in general GPS standards, e.g. ISO 1101, except in the cases where the rules in the general GPS standard are explicitly different from the rules given in fundamental and global GPS standards and unless the rules in a specific complementary GPS standard give other rules that apply within its scope.

All rules given in fundamental, global and general GPS standards apply in addition to the rules specifically given in complementary GPS standards, e.g. ISO 2768-1, except in the cases where the rules in the complementary GPS standard are explicitly different from the rules given in fundamental, global and general GPS standards.

5.3 Definitive drawing principle

The drawing is definitive. All specifications shall be indicated on the drawing using GPS symbology (with or without specification modifiers), associated default rules or special rules and references to related documentation, e.g. regional, national or company standards. Consequently, requirements not specified on the drawing cannot be enforced.

A drawing may include specifications relating to several stages of completion of the product. In this case, it shall be indicated which stage each indication refers to, unless it is the final stage.

As part of the ISO GPS system, this International Standard and the principles and rules defined in it apply to all product specifications where the ISO GPS system is invoked (see 5.1), even though it is not explicitly referenced in the drawing.

NOTE As stated in the Scope, for the purposes of this International Standard, the term “drawing” is to be interpreted in the broadest possible sense, encompassing the total package of documentation specifying the workpiece.