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

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently **JIS B 0024:1988** is replaced with this Standard.

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

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 8015:2011**, Edition 2, with some modifications of the technical contents.

The dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JA.

Detailed information of the relation of this Standard to the GPS matrix model and other GPS Standards is given in Annex A.

1 Scope

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

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

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

NOTE 1 In the corresponding International Standard, **ISO GPS** system applies regardless of the indication of “Tolerancing **ISO 8015**” in or near the title block.

NOTE 2 The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 8015:2011 *Geometrical product specifications (GPS)—Fundamentals—Concepts, principles and rules* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. For standards indicated below, only the editions of the indicated year shall be applied and the revisions (including amendments) made thereafter shall not be applied.

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

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

ISO/IEC Guide 98-3:2008 *Uncertainty of measurement—Part 3: 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 Standard, the terms and definitions given in **ISO 17450-1:2011**, **ISO 17450-2:2012**, **ISO/IEC Guide 98-3:2008**, **ISO/IEC Guide 99:2007** and the following apply.

3.1

ISO GPS system

GPS system

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

3.2

default GPS specification

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

NOTE 1 Where defined, default specifications are usually recognizable by the introductory wording: “unless otherwise specified...”.

NOTE 2 The term “specification operator” is the general term of concrete operations for identifying the following six features: partition, extraction, filtration, association, collection and construction, which are referred to as “default specification operations” (see Figure C.2 of **ISO 17450-1:2011**).

NOTE 3 This part is omitted due to its irrelevance in this English version.

NOTE 4 This part is omitted due to its irrelevance in this English version.

3.3

ISO default GPS specification

default GPS specification defined by **ISO** standards or **JISs**

3.4

altered default GPS specification

default GPS specification defined by other means than that for **ISO** default GPS specification

3.5

ISO default GPS specification operator

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

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.

4.2 Functional limits

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 perfectly within the tolerance limits but not perfectly 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, association 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.

When only a specific clause of this Standard is excluded from application, it shall be indicated in or near the title block.

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 14638**.

NOTE 3 That “the entire **ISO** GPS system is invoked” means that fundamental and global GPS standards apply and that unless otherwise indicated, other International Standards or **JIS**s for GPS apply; e.g. the reference temperature given in **JIS B 0680** and the decision rules given in **JIS B 0641-1** apply. The purpose of the invocation principle is to provide the formal traceability for these GPS standards and rules.