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(JSA)

**Geometrical Product Specifications  
(GPS)—Acceptance and reverification  
tests for coordinate measuring  
machines (CMM)—Part 6 : Estimation  
of errors in computing Gaussian  
associated features**

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## Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard from Japanese Standards Association (JSA), with a draft of Industrial Standard based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

This Standard has been made based on **ISO 10360-6 : 2001** *Geometrical Product Specifications (GPS)—Acceptance and reverification tests for coordinate measuring machines (CMM)—Part 6 : Estimation of errors in computing Gaussian associated features* for the purposes of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

**JIS B 7440** consists of the following 6 parts under the general title *Geometrical Product Specifications (GPS)—Acceptance and reverification tests for coordinate measuring machines (CMM)*.

*Part 1 : Vocabulary*

*Part 2 : CMMs used for measuring size*

*Part 3 : CMMs with the axis of a rotary table as the fourth axis*

*Part 4 : CMMs used in scanning measuring mode*

*Part 5 : CMMs using multiple-stylus probing systems*

*Part 6 : Estimation of errors in computing Gaussian associated features*

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In the event of any doubts arising as to the contents,  
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## Contents

	Page
Introduction .....	1
1 Scope .....	2
2 Normative references .....	2
3 Terms and definitions .....	3
4 Basic requirements .....	3
5 Reference data sets and reference parameter values .....	4
5.1 General .....	4
5.2 Initial estimates of parameter values .....	4
6 Test parameter values and converted test parameter values .....	5
7 Units .....	6
8 Numerical uncertainty .....	6
9 Application of the test method .....	7
9.1 Principle .....	7
9.2 Basis for comparison .....	8
9.3 procedure .....	9
10 Compliance with specification .....	10
11 Test certificate .....	10
Annex A (normative) Procedure for generating reference data sets .....	13
Annex B (informative) Relation to the GPS matrix model .....	20
Bibliography .....	22

**Geometrical Product Specifications (GPS)—  
Acceptance and reverification tests for  
coordinate measuring machines (CMM)—  
Part 6 : Estimation of errors in computing  
Gaussian associated features**

**Introduction** This Japanese Industrial Standard has been prepared based on the first edition of **ISO 10360-6** *Geometrical Product Specifications (GPS)—Acceptance and reverification tests for coordinate measuring machines (CMM)—Part 6 : Estimation of errors in computing Gaussian associated features* published in 2001 without modifying the technical contents.

This Standard is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see **TR B 0007**). It influences link 5 of the chains of standards on size, distance, radius, angle, form, orientation, location, run-out and datums.

For more detailed information of the relation of this Standard to other standards and the GPS matrix model see annex B.

Coordinate measurement technology is widely used in industrial metrology to assess features of a workpiece. A common requirement is to fit an associated feature to a data set consisting of coordinate measurements of a real feature. This fitting is carried out by software.

Software for calculating an associated feature provides values of parameters of the associated feature that are descriptive of the size, shape, location and orientation of the feature. These parameters are useful for the purpose of carrying out calculations involving the feature, often in conjunction with other associated features and other information, and in determining the extent to which a workpiece satisfies dimensional and positional specifications.

The reliability of information about features that is determined from associated features is influenced by the quality of the software for computing these features.

The tests defined in this Standard are concerned with assessing the correctness of the parameters of computed associated features as measured by a coordinate measuring machine (CMM) or other coordinate measuring system. Although different criteria may be used to compute associated features (for example, by minimizing the Euclidean or Chebyshev norm of residuals), this test is applicable for software designed for unconstrained Gaussian (least-squares) features.

In the case of reverification tests of CMMs, the software test of this Standard usually does not provide new or different information in comparison with that obtained by an acceptance test, since software is supposed to be stable over time. However, a reverification test of the software may be useful following possible corruption or alteration of the software under test.

For software already in existence, the evaluation of the performance may not be obtained only by fulfilling the requirements of this Standard. However, such cases do not necessarily exclude the ability of the software to perform correct computation of measurements.