AS 4826.1—2001
ISO 14253-1:1998

Australian Standard™

Geometrical Product Specifications (GPS)—Inspection by measurement of workpieces and measuring equipment

Part 1: Decision rules for proving conformance or non-conformance with specifications

Standards Australia

This Australian Standard was prepared by Committee ME-027, Engineering Tolerance Systems, Metrology, Surface Quality. It was approved on behalf of the Council of Standards Australia on 28 February 2001 and published on 19 March 2001.

The following interests are represented on Committee ME-027:

Australian Industry Group

The CMM Group

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PREFACE

This Standard was prepared by the Standards Australia Committee ME-027, Engineering Tolerance Systems, Metrology, Surface Quality.

The objective of this Standard is to provide engineers with decision rules for determining when the characteristics of a workpiece or measuring equipment are in conformance or non-conformance with a given tolerance for a workpiece or the limits of permissible errors for measuring equipment, taking into account the uncertainty of measurement.

This Standard is identical with and has been reproduced from ISO 14253-1:1998 *Geometrical Product Specifications (GPS)—Inspection by measurement of workpieces and measuring equipment,* Part 1: *Decision rules for proving conformance or non-conformance with specifications.*

This Standard is a Geometrical Product Specification (GPS) Standard and is to be regarded as a global GPS Standard (see ISO/TR 14638, *Geometrical Product Specifications (GPS)—Masterplan)*. It influences the chain links 4, 5 and 6 of all chains of general GPS Standards.

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

The estimated uncertainty of measurement is to be taken into account when providing evidence for conformance or non-conformance with specification.

The problem arises when a measurement result falls close to the upper or lower specifications limit. In this case it is not possible to prove conformance or non-conformance with specifications, since the measurement result plus or minus the expanded uncertainty of measurement includes one of the specification limits.

Therefore a supplier/customer agreement should be foreseen in order to solve the problems which could arise. This Standard explains how to handle specification and uncertainty, and establishes decision rules for having conformance or non-conformance with specification.

The term ‘informative’ has been used in this Standard to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text ‘this part of ISO 14253’ should read ‘this Australian Standard’.

References to International Standards should be replaced by references to equivalent Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian or Australian/New Zealand Standard*	
ISO		AS/NZS	
3534	Statistics—Vocabulary and symbols		
3534.2	Part 2: Statistical quality control	—	
8402	Quality management and quality assurance—Vocabulary	ISO 8402	Quality management and quality assurance—Vocabulary
Guide to the expressions of uncertainty in measurement (GUM)		—	
International vocabulary of basic and general terms in metrology (VIM)		3807	Vocabulary of basic and general terms in metrology

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1 Scope

This part of ISO 14253 establishes the rules for determining when the characteristics of a specific workpiece or measuring equipment are in conformance or non-conformance with a given tolerance (for a workpiece) or limits of maximum permissible errors (for a measuring equipment), taking into account the uncertainty of measurement.

It also gives rules on how to deal with cases where a clear decision (conformance or non-conformance with specification) cannot be taken, i.e. when the measurement result falls within the uncertainty range (see 3.23) that exists around the specification limits.

This part of ISO 14253 applies to specifications defined in general GPS standards (see ISO/TR 14638), i.e. standards prepared by ISO/TC 213, including

— workpiece specifications (usually given as tolerance limits), and

— measuring equipment specifications (usually given as maximum permissible errors).

It may also apply to specifications other than those defined in connection with general GPS standards.

This part of ISO 14253 does not apply to inspection using limit gauges. Inspection with limit gauges is covered by ISO/R 1938.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 14253. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 14253 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of valid International Standards.

ISO 3534-2:1993, *Statistics — Vocabulary and symbols — Part 2: Statistical quality control.*

ISO 8402:1994, *Quality management and quality assurance — Vocabulary.*

Guide to the expression of uncertainty in measurement (GUM), 1st edition, 1995.

International vocabulary of basic and general terms in metrology (VIM). BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML, 2nd edition, 1993.