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Australian Standard®

# Geometrical product specifications (GPS)—General concepts and requirements for GPS measuring equipment



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 8 July 2007.
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The following are represented on Committee ME-027:

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- Engineers Australia
- National Association of Testing Authorities Australia
- National Measurement Institute
- Queensland University of Technology
- Society of Manufacturing Engineers
- The CMM Group
- The University of Queensland
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# Geometrical product specifications (GPS)—General concepts and requirements for GPS measuring equipment

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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 the general requirements for simple measuring equipment to facilitate communication between manufacturers or suppliers and purchasers or users when specifying such equipment.

This Standard is identical with and has been reproduced from ISO 14978:2006, *Geometrical product specifications (GPS)—General concepts and requirements for GPS measuring equipment*.

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

(a) Its number appears on the cover and title page while the international standard number appears only on the cover.

(b) In the source text 'this International Standard' should read 'this Australian Standard.'

(c) A full point substitutes for a comma when referring to a decimal marker.

The terms 'normative' and 'informative' are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

References to International Standards should be replaced by references to Australian Standards, as follows:

| *Reference to International Standard* | | *Australian Standard* | |
|---|---|---|---|
| ISO | | AS | |
| 1 | Geometrical Product Specification (GPS)—Standard reference temperature for geometrical product specification and verification | — | |
| 1101 | Geometrical Product Specifications (GPS)—Geometrical tolerancing—Tolerances of form, orientation, location and run-out | — | |
| 5459 | Geometrical Product Specifications (GPS)—Geometrical tolerancing—Datums and datum systems | — | |
| ISO/TS | | AS | |
| 14253 | Geometrical Product Specifications (GPS)—Inspection by measurement of workpieces and measuring equipment | 4826 | General Product Specifications (GPS) |
| 14253-1 | Part 1: Decision rules for proving conformance or non-conformance with specifications | 4826.1 | Inspection by measurement of workpieces and measuring equipment |

| ISO/TS | | AS | |
|---|---|---|---|
| 14253-2 | Part 2: Guide to the estimation of uncertainty in GPS measurement, in calibration of measuring equipment and product verification | — | |
| 17450 | Geometrical Product Specifications (GPS)—General concepts | — | |
| 17450-2 | Part 2: Basic levels, specifications, operators and uncertainties | — | |
| International vocabulary of basic and general terms in metrology (VIM), BIPM, IEC, IFCC, ISO, IUPAC, IUPAP. | | — | |
| International vocabulary of basic and general terms in metrology (VIM), BIPM, IEC, IFCC, ISO, IUPAC, IUPAP. | | 3807 | Vocabulary of basic and general terms in metrology |
| Guide to the expression of uncertainty in measurement (GUM), BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML. | | — | |

# CONTENTS

*Page*

# INTRODUCTION

This International Standard is a geometrical product specification (GPS) standard and is to be regarded as a global GPS standard (see ISO/TR 14638). It influences chain links 5 and 6 of all chains of standards in the general GPS matrix.

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

This International Standard contains guidance for writing the standards for specific measuring equipment.

This International Standard is intended to give the user a basic understanding of the use of ISO standards for GPS measuring equipment. This International Standard presents and defines general concepts to be used in connection with GPS measuring equipment to avoid multiple repetitions in the ISO standards for specific GPS measuring equipment. This International Standard is also intended as guidance for the manufacturer to evaluate and present specifications for characteristics for GPS measurement equipment.

This International Standard should be close at hand when reading and using ISO standards for a specific GPS measuring equipment.

NOTES

AUSTRALIAN STANDARD

# Geometrical product specifications (GPS) — General concepts and requirements for GPS measuring equipment

## 1 Scope

This International Standard specifies the general requirements, terms and definitions of characteristics of simple GPS measuring equipment, e.g. micrometers, dial gauges, callipers, surface plates, height gauges, gauge blocks, but not necessarily excluding more complicated equipment. It forms the basis for standards defining and describing the design characteristics and metrological characteristics for measuring equipment. It also gives guidance for the development and content of standards for GPS measuring equipment.

This International Standard is intended to ease the communication between manufacturer/supplier and customer/user and to make the specification phase of GPS measuring equipment more accurate. This International Standard is also intended as a tool to be used in companies in the process of defining and selecting relevant characteristics for measuring equipment to be used in the quality assurance of measuring processes, i.e. in calibration and in workpiece measurements.

This International Standard also includes terms which are frequently used in connection with the characterization of specific measuring equipment.

## 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 1:2002, *Geometrical Product Specifications (GPS) — Standard reference temperature for geometrical product specification and verification*

ISO 1101:2004, *Geometrical Product Specifications (GPS — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 5459:—[1)], *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Datums and datum systems*

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*

ISO/TS 14253-2:1999, *Geometrical Product Specifications (GPS) — Inspection by measurement of workpieces and measuring equipment — Part 2: Guide to the estimation of uncertainty in GPS measurement, in calibration of measuring equipment and product verification*

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

*International vocabulary of basic and general terms in metrology (VIM)*, BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, 1987

1) To be published. (Revision of ISO 5459:1981.)