
**Geometrical product specifications
(GPS) — Geometrical tolerancing —
Datums and datum systems**

*Spécification géométrique des produits (GPS) — Tolérancement
géométrique — Références spécifiées et systèmes de références
spécifiées*





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Published in Switzerland

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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 5459 was prepared by Technical Committee ISO/TC 213, *Dimensional and geometrical product specification and verification*.

This second edition cancels and replaces the first edition (ISO 5459:1981), which has been technically revised.

Introduction

ISO 5459 is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO/TR 14638). It influences the chain links 1 to 3 of the chain of standards on datums.

The ISO/GPS Masterplan given in ISO/TR 14638 gives an overview of the ISO/GPS system of which this standard is a part. The fundamental rules of ISO/GPS given in ISO 8015 apply to this standard and the default decision rules given in ISO 14253-1 apply to specifications made in accordance with this standard unless otherwise indicated.

For more detailed information of the relation of this International Standard to the GPS matrix model, see Annex G.

For the definitive presentation (proportions and dimensions) of symbols for geometrical tolerancing, see ISO 7083.

The previous version of ISO 5459 dealt only with planes, cylinders and spheres being used as datums. There is a need to consider all types of surfaces, which are increasingly used in industry. The definitions of classes of surfaces as given in Annex B are exhaustive and unambiguous.

This edition of ISO 5459 applies new concepts and terms that have not been used in previous ISO GPS standards. These concepts are described in detail in ISO/TR 14638, ISO 17450-1 and ISO 17450-2; therefore, it is recommended to refer to these standards when using ISO 5459.

This International Standard provides tools to express location or orientation constraints, or both, for a tolerance zone. It does not provide information about the relationship between datums or datum systems and functional requirements or applications.

Geometrical product specifications (GPS) — Geometrical tolerancing — Datums and datum systems

1 Scope

This International Standard specifies terminology, rules and methodology for the indication and understanding of datums and datum systems in technical product documentation. This International Standard also provides explanations to assist the user in understanding the concepts involved.

This International Standard defines the specification operator (see ISO 17450-2) used to establish a datum or datum system. The verification operator (see ISO 17450-2) can take different forms (physically or mathematically) and is not the subject of this International Standard.

NOTE The detailed rules for maximum and least material requirements for datums are given in ISO 2692.

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 128-24:1999, *Technical drawings — General principles of presentation — Part 24: Lines on mechanical engineering drawings*

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

ISO 1101:2004/Amd 1:—¹⁾, *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out — Amendment 1: Representation of specifications in the form of a 3D model*

ISO 2692:2006, *Geometrical product specifications (GPS) — Geometrical tolerancing — Maximum material requirement (MMR), least material requirement (LMR) and reciprocity requirement (RPR)*

ISO 3098-0, *Technical product documentation — Lettering — Part 0: General requirements*

ISO 3098-5, *Technical product documentation — Lettering — Part 5: CAD lettering of the Latin alphabet, numerals and marks*

ISO 14660-1:1999, *Geometrical Product Specifications (GPS) — Geometrical features — Part 1: General terms and definitions*

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

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

ISO 81714-1, *Design of graphical symbols for use in the technical documentation of products — Part 1: Basic rules*

1) To be published.