

ICS 17.040.30

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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 24637.4-2020

**Geometrical product specifications (GPS) - General concepts -
Part 4: Geometrical characteristics for quantifying GPS
deviations**

Issued on: April 28, 2020

Implemented on: November 1, 2020

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

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Foreword

GB/T 24637 "Geometric Technical Specifications for Products (GPS) General Concepts" is divided into 4 parts.

---Part 1.Geometric specifications and inspection models;

---Part 2.Basic principles, specifications, operation set and uncertainty;

---Part 3.Elements to be tested;

---Part 4.GPS deviation quantification of geometric features.

This part is Part 4 of GB/T 24637.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

This part uses the redrafting method to modify and adopt ISO 17450-4.2017 "Geometrical Technical Specifications for Products (GPS) General Concepts No.

Part 4.GPS deviation quantification of geometric features.

Compared with ISO 17450-4.2017, this part has technical differences. The corresponding technical differences and their reasons are as follows.

---Regarding normative reference documents, this section has made adjustments with technical differences to adapt to my country's technical conditions and adjustments.

The situation is collectively reflected in Chapter 2 "Normative Reference Documents", and the specific adjustments are as follows.

* Replace ISO 25378 with GB/T 38761 which is modified to adopt international standards.

This part is proposed and managed by the National Standardization Technical Committee for Product Geometric Technical Specifications (SAC/TC240).

Drafting organizations of this section. Hangzhou Changgeng Measurement Technology Co., Ltd., China Machinery Productivity Promotion Center, Beijing Times Peak Technology Co., Ltd.,

Shanghai Institute of Metrology and Testing Technology, Zhengzhou University.

1 Scope

This part of GB/T 24637 gives the GPS deviation quantification rules for a single GPS feature.

This section is suitable for quantifying GPS deviations that represent geometric features.

Note. GPS deviation can be local or global. The GPS feature defined by the local GPS deviation is a parameter, which is

The number (see Table 1) converts the local deviation set into a global feature.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article

Pieces. For undated references, the latest version (including all amendments) applies to this document.

GB/T 38761 Product Geometric Technical Specification (GPS) Features and Condition Definition (GB/T 38761-2020, ISO 25378.2011, MOD)

3 Terms and definitions

The following terms and definitions defined in GB/T 38761 apply to this document.

3.1

Local geometric deviation

The local distance value from a point "P" on the input element to the point on the reference element, the local distance value is positive or negative.

Note 1.d(P) defines any local geometric deviation of any point (P) of the input element.

Note 2.The local geometric deviation $d(P)_{An}$ can be defined in an n-dimensional reference space A_n belonging to the reference element.

Note 3.There are local geometric deviations at any point of the input features (see Figure 1). Each local geometric deviation can be corresponded with reference elements in the reference space A_n

The point and the coordinate corresponding to the local geometric deviation are expressed.

Note 4. The local geometric deviation can be expressed in the reference space A_n by the point coordinates on the change curve.

Note 5. When the deviation element intersects the reference element, the local geometric deviation is equal to zero.

3.2

Reference space

A_n

A space defined by n curvilinear coordinate axes, which belong to a reference element, and the input is defined based on the reference element

The local deviation of each point on the feature.

Note. For the reference line n is equal to 1, and for the reference surface n is equal to 2.

3.2.1

Surface reference space

A_2

The reference space (3.2) when the reference feature is a polygon.

Note. The reference space is a two-dimensional size reference element.

3.2.2

Line reference space

A_1

The reference space (3.2) when the reference element is a straight line.

Note. The reference space is a one-dimensional size reference element.

3.2.3

Bidirectional reference space

Two line reference spaces that have the same line reference feature and are orthogonal to any point P on the reference feature (3.2.2)

The combination.

3.3

Quantization function

Quantify a mathematical function of a geometric feature with a complete set of local

deviations.

Note. The quantization function can be a statistical function (see Table 1).

3.4

Statistical Features

Geometric features defined by a set of local geometric deviations mathematically.

Note. The statistical characteristics are defined by the quantization function. Table 1 gives formulas for several statistical characteristics.

3.4.1

Max

A set of characteristic maximum values of local geometric deviations.

Note. See Table 1.

3.4.2

Minimum

A set of characteristic minimum values of local geometric deviations.

Note. See Table 1.

3.4.3

Mean

A set of characteristic average values of local geometric deviations.

Note. See Table 1.

3.4.4

Median

A set of characteristic median values of local geometric deviations.

Note 1. The median value divides the overall local geometric deviation into two equal parts (50% each). Depending on the overall distribution, the median and mean may be the same.

It may be different.

Note 2. See Table 1.

3.4.5

Median

The characteristic average of the maximum value (3.4.1) and the minimum value (3.4.2).