

ICS 17.040.40

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

GB/T 18779.5-2020

**Geometrical product specifications(GPS). Inspection by measurement
of workpieces and measuring equipment - Part 5: Uncertainty in
verification testing of indicating measuring instruments**

Issued on: December 14, 2020

Implemented on: July 1, 2021

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

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Foreword

GB/T 18779 "Geometric Technical Specifications for Products (GPS) Measurement Inspection of Workpieces and Measuring Equipment" is divided into 6 parts:

- Part 1: The rules for determining qualified or unqualified inspections according to specifications;
- Part 2: Guidelines for Evaluation of Uncertainty of GPS Measurement in Measuring Equipment Calibration and Product Inspection;
- Part 3: Guidelines on reaching a consensus on the expression of measurement uncertainty;
- Part 4: The basis for determining the functional limits and specification limits in the rules;
- Part 5: Uncertainty of inspection of indicating measuring instrument;
- Part 6: General rules for acceptance/rejection of instruments and workpieces:

This part is Part 5 of GB/T 18779:

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 14253-5:2015 "Geometrical Technical Specifications for Products (GPS) Workpieces and Measuring Equipment

Measurement and Inspection Part 5: Uncertainty of Inspection of Indicating Measuring Instruments:

The technical differences between this part and ISO 14253-5:2015 and the 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 10360-1 with GB/T 16857:1 equivalent to the international standard (see Chapter 3);
- * Replace ISO 14253-1 (see Chapter 3, Chapter 4) with GB/T 18779:1 equivalent to the international standard;
- * Replace ISO /T R14253-6 (see Chapter 3) with GB/T 18779:6 modified to adopt international standards;
- * Replace ISO 14978 with GB/T 24634 equivalent to the international standard (see Chapter 3);
- * Replace ISO 17450-2 (see Chapter 3) with GB/T 24637:2 modified to adopt international standards;
- * Replace ISO /IEC Guide99:2007 with JJF1001-2011 (see Chapter 3);
- * Replace ISO /IEC Guide98-3:2008 with JJF1059:1-2012 (see Chapter 3);

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

Drafting organizations of this section: China Jiliang University, Beijing Institute of Metrology and Testing Science, China Machinery Productivity Promotion Center, China Metrology Science

Research Institute, Beijing Great Wall Metrology and Testing Technology Research Institute of Aviation Industry Corporation of China:

Introduction

This part of GB/T 18779 belongs to the general standard in the product geometric technical specification (GPS) (see GB/T 20308), it affects GPS

The F link in the matrix model:

The GPS matrix model in GB/T 20308 summarizes the GPS system, and this part is a part of the system: Unless otherwise stated

It is clear that the GPS basic rules given in GB/T 4249 are applicable to this part, and the default rules given in GB/T 18779:1 are applicable in accordance with this part:

Developed specifications:

The rule for judging compliance or non-conformity is based on the measurement uncertainty generated during the test:

Measurement practice makes metrologists and practitioners familiar with measurement uncertainty: Any factors that may affect the measurement results are considered inaccurate

The components are determined and quantized, and finally included in the combined uncertainty: The purpose of measurement is to collect quantitative information given to be measured, without certainty

Indicates the reliability of the information:

In the inspection of indicator measuring instruments, the purpose of measurement is to check one or more metrological characteristics of indicator measuring instruments, not to measure

Measure the characteristics of the geometric features of the workpiece: In this case, the estimated uncertainty (that is, the uncertainty of the detection value) quantifies the detection value

Accuracy: The detection work is to check the quality of the indicating measuring instrument through the detection value, not the uncertainty of the detection value:

The uncertainty of the detection value used for indicator measuring instruments is not easy to evaluate conceptually, and careful consideration is needed to determine which uncertainty

The weights need to be counted, and which ones don't:

Some inspections of indicating measuring instruments may be related to quantities other than the displayed value of the instrument, or a single inspection may simultaneously check the displayed value of the instrument

And other measurement characteristics, for example, the inspection of the micrometer, check its indication error (limited by MPE) and measuring force (limited by MPL): Correct

For inspections related to other measurement characteristics or part of them other than the displayed value of the instrument, this part of GB/T 18779 is not applicable:

It is related to the quantities defined in ISO /IEC Guide 98-3 (GUM) and GB/T 18779:2, and does not require the progress of this part of GB/T 18779:

Step by step guidance:

A strict definition of the uncertainty of the detection value when inspecting an indicator measuring instrument is given: The application of traditional uncertainty evaluation is based on this

Definition, and according to ISO /IEC Guide 98-3 (GUM) and GB/T 18779:2 to determine which uncertainty components need to be included:

Product Geometric Technical Specification (GPS)

Measurement inspection of workpiece and measuring equipment

Part 5: Indicating measuring instruments

Test uncertainty

1 Scope

This part of GB/T 18779 specifies the concept and terminology for evaluating the uncertainty of detection values: Inspection of GPS-indicating measuring instruments

In the test, the test value is obtained through the instrument according to the test agreement reached between the institutions:

Note: The measurement uncertainty of the measured value is different from the measurement uncertainty caused by the indicating measuring instrument when measuring the workpiece: In this part of GB/T 18779 only

Involving the former: For the latter, see JJF1059:1 and GB/T 18779:2:

When the inspection of an indicating measuring instrument includes multiple detection values, some are related to the instrument display value, and some are related to other measurement characteristics:

Off, this part of GB/T 18779 only involves the former:

This section specifies how to evaluate the uncertainty of the test value after the test protocol is determined, and does not involve the applicability of the test protocol:

This section applies to all specifications of the indicating measuring instrument in the GPS general standard (see GB/T 20308):

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 16857:1 Technical Specification for Product Geometrical Quantities (GPS)

Acceptance Testing and Re-inspection Testing of Coordinate Measuring Machines Part 1: Words

Exchange (GB/T 16857:1-2002, eqvISO 10360-1:2000)