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

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**Plastics - Production quality control - Statistical method for  
using single measurements**

塑料 生产质量控制 采用单次测量的统计方法

**(English Translation)**

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### Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is modified to adopt ISO 25337:2010 "Quality control in plastics production using statistical methods based on single measurements".

Compared with ISO 25337:2010, this document has undergone the following structural adjustments.

---Appendix A corresponds to Appendix B in ISO 25337:2010;

---Appendix B corresponds to Appendix A in ISO 25337:2010.

The technical differences between this document and ISO 25337:2010, and the reasons therefor, are as follows.

---ISO 5725-1 (see Chapter 3) has been replaced with the normatively referenced GB/T 6379.1 to adapt to my country's technical conditions and add...

Operability;

---The accuracy requirements for the test methods have been changed (see 5.3) to increase operability.

The following editorial changes have been made to this document.

--- Formula (11) has been deleted as it is a duplicate of formula (1);

---Equations (B.1) and (B.2) in ISO 25337:2010 have been deleted, as they are duplicates of equations (2) and (3).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Plastics Standardization (SAC/TC15).

## Introduction

Typically, the test methods in the standard specify at least two or more measurements, and in some cases, also specify repeated operations.

However, for production quality control, performing a single measurement is a more common practice. In most production scenarios, standards specify...

Some repetitive operations are time-consuming and may increase production costs.

This document provides a statistical method for using only a single measurement in a production environment, whereas standard test methods require a certain number of measurements.

At least twice. The content of this document is for reference by enterprises in the process of production quality control and is not intended for public release or marketing purposes.

The purpose is to formulate customer technical specifications, etc.

If statistical calculations support reducing the number of repetitions for a specific test, the number of measurements can be reduced to a single measurement or to a specified number of repetitions.

The number of repetitions should be reduced to half, or even less than half. Reducing the variability of the experimental method is essential before reducing the number of repetitions.

This model is not only important in the plastics industry, but also in the production quality control process in other fields.

Single measurements are commonly used for quality control testing, and the "single measurement model" proposed in this document provides the basis for the following.

---Single measurement for production quality control;

---Reduce the number of repeated tests and/or modify test methods to use multiple test samples to reduce laboratory costs and shorten laboratory time.

Response time;

---Modify test methods that specify repetitive operations (such as drying to constant mass) to provide test methods that involve only a single operation, thereby reducing the complexity.

Short response time and reduced laboratory costs;

---Handling results that exceed production and/or acceptance limits;

---Considering the precision of testing methods and production capacity, cost-effectiveness is achieved by coordinating material production limits with the testing methods used.

Savings.

Plastic production quality control uses single measurement Statistical methods

## 1 Scope

This document describes a measurement model (SD model) for production quality control using single measurements on the production floor, even if it employs...

Standard test methods specify repeated measurements.

This document also describes a general method for expressing the precision of measurement results.

This document applies to test methods that specify the number of repeated measurements.

This document applies only to test methods where the test results follow a normal (i.e., Gaussian) distribution.

The statistical model in this document is based on the upper and lower limits of production, while also taking into account the accuracy and reproducibility of the testing methods.

The latter is included in the production limits to identify areas outside the production limits, due to the characteristics of the production process and/or testing methods.

The result may fall within this area.

This document is designed for project managers, laboratory directors, and production managers. Statisticians should provide necessary technical support when needed.

And statistical analysis.

If this document is used in conjunction with test method standards, it must be clearly stated in all relevant documents, such as product specifications and manufacturing standards.

Process specifications and contracts.

## 2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 6379.1 Accuracy (Correctness and Precision) of Measurement Methods and Results  
- Part 1: General Principles and Definitions (GB/T 6379.1-2004, ISO 5725-1:1994, IDT)

### 3 Terms and Definitions

The terms and definitions defined in GB/T 6379.1 and the following terms and definitions apply to this document.

Standard deviation during the production process.

The combined standard deviation of the production process and testing methods.

The square root of operator variance  $s^2_O$ , where operator variance is the weighted average of the squared standard deviations of individual operators.

**Note:** When following the prescribed testing procedures, it is assumed that all operators have substantially the same level of variability. If test results are obtained within a short period of time, then...