

Maximum Permissible Error (MPE): Why It Matters for Quality Control

Category: Insights

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Introduction

Organizations rely on measuring instruments to maintain high product quality and process accuracy. The **Maximum Permissible Error (MPE)** defines the maximum allowed measurement error that an instrument can have while still producing reliable results. Understanding and managing MPE helps companies consistently meet compliance and reduce unnecessary costs.

What Is Maximum Permissible Error (MPE)?

Experts define the Maximum Permissible Error as the threshold of measurement error an instrument must not exceed for its measurements to remain trustworthy. Companies set this limit based on the instrument's application and the precision required by the manufacturing or testing process.

Global Standards Using MPE

International standards emphasize accurate MPE definition and management, such as:

- [ISO/IEC 17025](#): Testing and calibration laboratories must keep instruments within MPE limits to meet competency standards.
- [ISO 10012](#): Provides guidelines for measurement management systems, including MPE criteria for metrological confirmation.
- [OIML R 76](#): Establishes MPE values based on weighing instrument classes.
- [IEC 61557](#): Sets MPE requirements for electrical measurement devices.

How Organizations Define MPE

Companies calculate or assign MPE by balancing process requirements, instrument capabilities, and expected measurement conditions. This tailored MPE acts as the acceptance criterion during calibration and ongoing quality

assessment.

Importance of Correct MPE Definition

Setting the right MPE:

- Guarantees only suitable instruments support production quality.
- Prevents costly premature replacements or excessive verifications.
- Supports compliance with international quality standards.

Real-Life Examples

- A balance in a calibration lab must not exceed its MPE, or technicians must repair or replace it.
- Electrical safety devices must meet MPE standards defined by IEC to prevent malfunctions.

Challenges of Manual Management

Companies rarely can rely solely on spreadsheets to handle MPE tracking and metrological confirmation accurately. Spreadsheets often cause errors, lack audit traceability, and limit scalability.

Consider investing in software solutions, such as QX-GS, to automate and document the entire process reliably.

Learn More About Managing Metrological Confirmation

For a deeper understanding of effective metrological confirmation processes or software solutions, visit:

[OIML R 76 – Weighing instruments](#)

[Measurement Management Systems ISO 10012 Guide](#)