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

GB/T 47792.2-2026

**Automated liquid handling systems - Part 2: Measurement
procedures for the determination of volumetric performance**

自动液体处理系统 第2部分：容量性能的测量程序

(English Translation)

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Foreword

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This document conforms to GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting is scheduled.

This document is Part 2 of GB/T 47792 "Automatic Liquid Handling Systems". GB/T 47792 has the following parts published.

--Part 1: Terminology and General Requirements;

--Part 2: Measurement Procedures for Capacity Performance;

This document is modified to adopt ISO 23783-2:2022 "Automatic liquid handling systems - Part 2: Procedures for measuring capacity performance".

This document has undergone significant structural adjustments compared to ISO 23783-2:2022. A comparison of the structural numbering changes between the two documents is provided below.

See Appendix D for the table.

This document differs significantly from ISO 23783-2:2022. The relevant clauses are indicated in vertical margins.

The straight lines (|) are marked. A summary of these technical differences and their reasons can be found in Appendix E.

The following editorial changes have been made to this document.

--The notes in ISO 23783-2:2022 regarding ISO 23783-1:2022 and ISO 23783-3:2022 have been deleted;

--The description of the URLs for the ISO and IEC terminology databases in ISO 23783-1:2022 has been removed;

--The note regarding traceability-related testing equipment in ISO 23783-2:2022 has been removed;

--In Appendix A, the informative reference ISO/IEC Guide 98-3 has been replaced with JJF 1059.1-2012;

--Appendix D, "Comparison of this document with ISO 23783-2:2022 structural numbering," has been added;

--Added Appendix E "Technical Differences between this Document and ISO 23783-2:2022 and the Reasons Therefor";

--The references have been adjusted.

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 National Light Industry Council.

This document is under the jurisdiction of the National Technical Committee on Standardization of Glass Instruments (SAC/TC 178).

Introduction

Automated liquid handling systems can replace traditional manual pipetting tools, automatically completing high-precision liquid handling tasks and effectively reducing human error.

It also supports process control and traceability, and is widely used in drug discovery, clinical testing, and other fields. Due to the inherent limitations of automated liquid handling systems...

The performance parameters vary, and there is no clear and effective measurement method to verify the key issues. Therefore, this document is formulated to standardize the performance of these parameters.

This document outlines the performance requirements and testing methods for dynamic liquid handling systems, providing technical support for the analysis and improvement of product manufacturing quality. (For the reader's convenience...) the book "Automatic Liquid Handling Systems" is written in three parts. These three parts are interconnected yet independent, together forming a complete system.

The relevant content includes the performance requirements and testing methods for dynamic liquid handling systems.

GB/T 47792 "Automatic Liquid Handling Systems" is proposed to consist of three parts.

--Part 1: Terminology and General Requirements. The purpose is to define the types, terminology, and general requirements related to automated liquid handling systems.

--Part 2: Measurement Procedures for Capacity Performance. The purpose is to specify the testing procedures for the capacity performance of automated liquid handling systems.

content.

--Part 3: Measurement, Specification, and Reporting of Capacity Performance. The purpose is to specify capacity performance data for automated liquid handling systems.

The methods for collecting and inspecting data, and the reporting requirements for capacity performance.

Automated Liquid Handling System

1 Scope

This document establishes the testing procedures for the capacity performance of automated liquid handling systems.

This document applies to automated liquid handling systems equipped with liquid handling devices.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are listed below.

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 6682 Specifications and test methods for water used in analytical laboratories (GB/T 6682-2008, ISO 3696:1987, MOD) GB/T 47792.1-2026 Automated liquid handling systems - Part 1: Terminology and general requirements (ISO 23783-1:2022) MOD) GB/T 47792.3-2026 Automated liquid handling systems - Part 3: Determination, specification and reporting of capacity performance (ISO 23783-) 3.2022, MOD) ISO 8655-6 Piston-operated volumetric instruments - Part 6: Weight reference measurement procedures for volume determination metric apparatus-Part 6: Gravimetric reference measurement procedure for the determination of volume)

3 Terms and Definitions

The terms and definitions defined in GB/T 47792.1-2026, as well as the following terms and definitions, apply to this document.

weighing method

A method for determining the mass, density, and temperature of the test medium contained in a measuring vessel, and calculating its capacity at a standard temperature.

Photometric method

Chemical substances are identified by measuring the degree of absorption (absorbance) or

the intensity of emitted light (luminosity) of a sample solution at a specific wavelength.

Methods for determining concentration or properties.

Note 1: Photometry typically involves using spectroscopic instruments, such as spectrophotometers, to detect the concentration of specific compounds or biomolecules in a sample.

Note 2: This method is based on Lambert-Beer Law, which describes the relationship between absorbance and the concentration of the absorbing substance in the solution and the optical path length.

The linear relationship between them. The expression of Lambert-Beer Law is shown in formula (1).

$A = -\lg(I/I_0) = -\lg T = klc$ (1) in the formula.

A -- The absorbance of the substance, expressed in absorbance units (AU).

I -- Intensity of transmitted monochromatic light, measured in candela (cd).

I_0 -- Intensity of incident monochromatic light, measured in candela (cd).

T -- Transmittance of the material;