

DIN EN ISO 23783-2:2024-04 (E)

Automated liquid handling systems - Part 2: Measurement procedures for the determination of volumetric performance (ISO 23783-2:2022)

Contents	Page
European foreword	3
Foreword	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Abbreviated terms	6
5 Measurement methods	7
5.1 Overview of methods suitable for measuring ALHS performance	7
5.2 Photometric methods	14
5.2.1 Dual-dye ratiometric photometric method	14
5.2.2 Single-dye photometric method	14
5.2.3 Fluorescence method	14
5.3 Gravimetric methods	14
5.3.1 Single channel method	14
5.3.2 Regression analysis	15
5.4 Hybrid photometric/gravimetric method	15
5.5 Dimensional methods	15
5.5.1 Optical image analysis of droplets	15
5.5.2 Optical image analysis of capillaries	16
6 Equipment and preparation	16
6.1 Test equipment	16
6.2 Manually operated single- and multi-channel pipettes	17
6.3 Preparation for testing	17
7 Thermal expansion	18
8 Traceability and measuring system uncertainty	18
8.1 Traceability	18
8.2 Estimation of measuring system uncertainty	18
8.2.1 Whole system approach	18
8.2.2 Measurement model approach	18
9 Reporting	19
Annex A (normative) Calculation of liquid volumes from balance readings	20
Annex B (normative) Dual-dye ratiometric photometric procedure	23
Annex C (normative) Single dye photometric procedure	29
Annex D (normative) Gravimetric procedure, single channel measurement	34
Annex E (normative) Gravimetric regression procedure	38
Annex F (normative) Photometric/gravimetric hybrid procedure	44
Annex G (normative) Optical image analysis of droplets	53
Annex H (normative) Fluorescence procedure	62
Annex I (normative) Optical image analysis of capillaries	75
Bibliography	81