

CERTIFICATE OF CALIBRATION

DATE OF ISSUE 12 June 2023

CERTIFICATE NUMBER: 23BSM00183



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Date of Calibration: 12 June 2023

Calibration Technician: Peh Shi Min

Customer: **HOYA MEDICAL SINGAPORE PTE LTD**
455A JALAN AHMAD IBRAHIM,
SINGAPORE 639939

Weight Unit used: g

Job Number: 212235

Calibration Type: As-Found

Contact Person : 0 Contact Number: 0

The calibration was carried out in accordance with procedure QP-QMS-21 Rev. 14, by placing weights on the load receptor as listed below:

Serial Number (s)	Certificate Number	Date of Calibration	Weight Class	Packaging	Issued by
38529083	M2304031S	6 April 2023	E2	Box weight	TCS

Weighing Instrument & Environment

Manufacturer: **Sartorius**

Capacity: **5200 g**

Model / Type: **MSA5203S-100-DE**

Range Tested: **5000 g**

Serial No.: **32709585**

Readability: **1 mg**

Tag / Inventory No: **05-800175-15**

On-Site Location: **Mixing Room**

Reason for Calibration: ☐ New Installation ☒ Re-calibration / Annual calibration ☐ Service / Repair

Temperature (°C) before tests: **23.2 °C**

After Tests: **23.3 °C**

Humidity (% RH) before tests: **43.5 % RH**

After Tests: **47.5 % RH**

Ambient Condition: ☐ Very stable ☒ Stable ☐ Unstable ☐ Very unstable

Mass values are reported on a weight-in-air basis where the mass is that of a hypothetical weight of density 8 000 kg m⁻³, which it balances in air density 1.2 kg m⁻³ at a temperature of 20 degrees celsius.

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council.

Method of calibration carried out is in accordance with QP-QMS-21 Rev.14 and with reference to UKAS Lab 14 Edition 6 (2019).

This certificate provides traceability to recognised national standards which realize the units of measurement according to the International System of Units (SI)

Values stated apply to the condition of the equipment at time of calibration. Calibration interval of this equipment should be determined by the user.

This certificate may not be reproduced other than in full, except with the written approval of the issuing laboratory. Calibration certificates without signatures are not valid.

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Weight Unit used: g

Repeatability Test			
At Low Load:		500 g	
Standard deviation:	0.0004		
Range:	0.001	g	
At Half Load:		2500 g	
Standard deviation:	0.0005		
Range:	0.001	g	
At High Load:		5000 g	
Standard deviation:	0.0005		
Range:	0.001	g	
Maximum Standard deviation:	0.0005		

Hysteresis Test			
Hysteresis is less than	<	1.0000	

Operating Range Based On
USP Chapter 41: 1.000 g to 5200 g

* Operating range is with reference to the guideline stated in USP Chapter 41

Linearity Test		
Applied Load (g)	Result (g)	Deviation (g)
500.000	500.000	0.000
1,000.000	1,000.000	0.000
1,500.000	1,500.000	0.000
2,000.001	2,000.000	-0.001
2,500.001	2,500.000	-0.001
3,000.001	3,000.000	-0.001
3,500.001	3,500.000	-0.001
4,000.001	4,000.000	-0.001
4,500.001	4,500.000	-0.001
5,000.002	5,000.001	-0.001
:	:	-
:	:	-
:	:	-
Maximum Deviation:	-0.001	
Maximum % deviation:	0.0000%	

Eccentricity Test		
Nominal Weight used:		5000 g
Centre (1) :		5,000.000
Front Left (2) :		4,999.999
Rear Left (3) :		5,000.000
Rear Right (4) :		5,000.000
Front Right (5) :		4,999.999
Centre (6) :		5,000.000
Maximum Error +/-:	0.001	

Remarks:
NIL

Expanded Uncertainty of Measurement: 0.027 g

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.

The uncertainty evaluation has been carried out with reference to UKAS M3003 4th Edition.

The results of this calibration is applicable only to the item bearing the serial number stated within this certificate

Revision 14, dated 01 Nov 2022



Peh Shi Min
Calibration Technician



Cliff Chia
Technical Manager