CALIBRATION & VERIFICATION

SERVICE CERTIFICATE

SERIAL NUMBER: 011006709908

DATE OF CALIBRATION: 10.08.2023

ENGINEER

Chris Reynolds
Service Technician

CALIBRATION OVERVIEW

Calibration	Objective	Reference	Actual	Deviation	Tolerated Deviation	Last Calibration	State
Vertical	IFM G4 10x	999.57µm	1000.206µm	0.636µm	1.0µm	10.08.2023	OK
Lateral	IFM G4 5x	50.003µm	50.018µm	0.015µm	0.025µm	10.08.2023	OK
	IFM G4 10x	24.0µm	24.002µm	0.002µm	0.015µm	10.08.2023	OK
	IFM G4 20x	24.0µm	23.998µm	0.002µm	0.015µm	10.08.2023	OK
	IFM G4 50x	24.0µm	23.995µm	0.005µm	0.015µm	10.08.2023	OK
	IFM G4 100x	24.0µm	23.994µm	0.006µm	0.015µm	10.08.2023	OK

LATERAL CALIBRATION

To prove the quality of the measurement device, the following measurements were performed using the IF-CalibrationTool:

Calibration Results

Objective	Description	Value	Uncertainty/State
IFM G4 5x	Alicona	50.003µm	0.2µm
	Alicona	50.018µm	0.5µm
	Deviation	0.015µm	OK
	Tolerated Deviation	0.025µm	
IFM G4 10x	Alicona	24.0µm	0.2µm
	Alicona	24.002µm	0.5µm
	Deviation	0.002µm	OK
	Tolerated Deviation	0.015µm	
IFM G4 20x	Alicona	24.0µm	0.2µm
	Alicona	23.998µm	0.5µm
	Deviation	0.002µm	OK
	Tolerated Deviation	0.015µm	
IFM G4 50x	Alicona	24.0µm	0.2µm
	Alicona	23.995µm	0.5µm
	Deviation	0.005µm	OK
	Tolerated Deviation	0.015µm	
IFM G4 100x	Alicona	24.0µm	0.2µm
	Alicona	23.994µm	0.5µm
	Deviation	0.006µm	OK
	Tolerated Deviation	0.015µm	

TRACEABILITY OF THE CALIBRATION TOOL TO THE NATIONAL STANDARD

The lateral part of this calibration tool was calibrated with an IFM system with the serial number 075215506515

The aforementioned IFM system was calibrated with an Alicona Calibration Tool with the serial number 002030004914.

The lateral part of the calibration tool with the serial number 002030004914 and the calibration mark 014ALICONA18 was calibrated by the DAkkS calibration laboratory D-K-18737-01-00 with the calibration label 1855 D-K-18737-01-00 2014-12.

The DAkkS calibration laboratory D-K-18737-01-00 uses a position measurement system LMS IPRO.

The position measurement system LMS IPRO is calibrated with a two-dimensional position standard verified by the PTB Braunschweig (Calibration Certificate No. 50573 PTB 12).

VERTICAL CALIBRATION

To prove the quality of the measurement device, the following measurements were performed using the IF-CalibrationTool:

Calibration Results

Description	Value	Uncertainty/State
Kolb & Baumann	999.57µm	0.15µm
Alicona	1000.206µm	1.0µm
Deviation	0.636µm	OK
Tolerated Deviation	1.0µm	

TRACEABILITY OF THE CALIBRATION TOOL TO THE NATIONAL STANDARD

The vertical part of this calibration tool was calibrated by the DAkkS calibration laboratory D-K-15077-01-00 with the calibration label 80495-23/18/12580.

The traceability to national standards is guaranteed by measurement against comparison with DAkkS-calibrated gauge blocks of Calibration Certificate N_ 12255 D-K-15077-01-00 2017-07.

MEASUREMENT SETTINGS

Objective	IFM G4 10x
Vertical Resolution	1.0µm
Lateral Resolution	3.9µm
Polarizer	Off

MEASUREMENT UNCERTAINTY

All stated uncertainties are expanded measurement uncertainties obtained by multiplying the standard measurement uncertainties by the coverage factor k=2. They have been determined in accordance with the "Guide to the Expression of Uncertainty in Measurement (GUM)". The measurand values lie, with a probability of approximately 95%, within the coverage interval given by the expanded uncertainties.

USED SOFTWARE

The Softwareversion which was used for all adjustments and calibrations is the IF-ServiceSoftware 3.2.

USED CALIBRATION TOOLS

The measurement device was calibrated with standardized, tested and certified calibration tools. This guarantees the accurate, efficient and first class use of the device.

IF-CalibrationTool

Calibration Mark:	041ALICONA18
Date of Last Calibration:	18.09.2018 (lateral part) 06.08.2018 (vertical part)