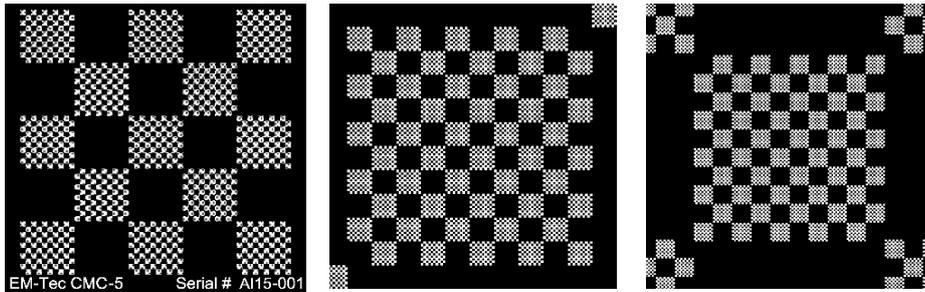




Wafer Level Certificate of Traceability for EM-Tec Checkerboard Calibration Standard



Product Numbers: 31-T37000-U, 31-T37000-1, 31-T37000-2, 31-T37000-6, 31-T37000-8

Product Description: EM-Tec Checkerboard Calibration Standard, 5x5 mm on 6x6 mm chip

Product Serial Numbers: AI05-XXX

The accuracy of these products was determined by reference comparison to working standards traceable to the National Institute of Standards and Technology (NIST), Test No. 861/280822-11.

Direction	Line	Average pitch	Standard Deviation (2 σ)*
X	1.0 mm	1.000 mm	$\pm 2.10 \mu\text{m}$
X	100 μm	100.01 μm	$\pm 0.09 \mu\text{m}$
X	10 μm	10.01 μm	$\pm 0.01 \mu\text{m}$
X	1 μm	1.001 μm	$\pm 0.001 \mu\text{m}$
Y	1.0 mm	0.999 mm	$\pm 2.23 \mu\text{m}$
Y	100 μm	99.98 μm	$\pm 0.13 \mu\text{m}$
Y	10 μm	10.01 μm	$\pm 0.01 \mu\text{m}$
Y	1 μm	1.001 μm	$\pm 0.001 \mu\text{m}$

* Corrected for sample size using the appropriate Student t-factor.

Measurements are reported with an uncertainty ($k = 2$)** of $\pm 0.012 \mu\text{m}$. Statements of Conformity are not provided in this report. Review the results and verify that they meet the requirements for the intended use. Physical damage to and/or contamination of the calibration standard occurring after calibration may invalidate the reported measurements. Use this product at $25^\circ\text{C} \pm 5^\circ\text{C}$ and at less than 80% RH.

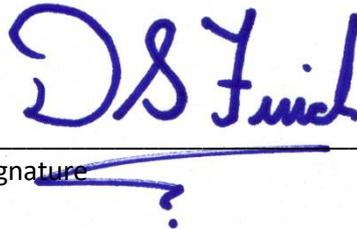
** Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$. The reported expanded measurement uncertainty is stated as the standard measurement uncertainty multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%.





Equipment used:

Instrument	Model number	Serial #	NIST Certified CD/Recalibration	Resolution	Repeatability
FE-SEM	FEI Apreo 2	9958357	CD-PG01-0211	0.9nm	0.03%



Dudley S Finch
Certified by

Signature

August 17th, 2023
Date

This certificate shall not be reproduced without the permission of Micro to Nano BV.

The EM-Tec Checkerboard calibration standard is manufactured on a silicon wafer gold over chromium. These materials are deemed inert under normal working conditions. Under normal operation there would be no mechanical contact with the surface and the calibration features. When this calibration standard is stored and used in a clean environment, it can be used for at least 5 years.

