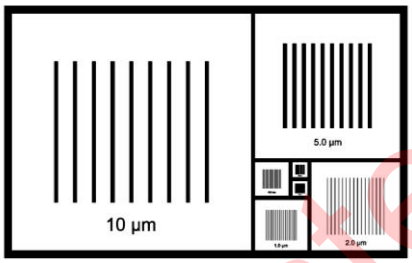
**AISthesis Products**
Advanced Imaging Products for Nanotechnology, Engineering and Life Sciences
PO Box 1950, Clyde NC 28721

ACCREDITED CERT #4904.01

# Wafer Level Certificate of Traceability for Pelcotec™ Critical Dimension Magnification Standard


Product Number: **Pelcotec™** 708-01 CDMS-0.1T-ISO-Etched

Product Description: 2.5x2.5mm, **Pelcotec™** 2mm-100nm Critical Dimension Magnification Standard

Wafer Identifier: CD-BH05

As Received Condition: New

As Returned Condition: N/A

Date of Receipt: N/A

Customer name and contact information:

TED PELLA, INC.
Microscopy Products for Science and Industry
P.O. Box 492477
Redding, CA 96049-2477
Tel: 530.243.2200
www.tedpella.com

The accuracy of this product with Wafer Identifier CD-BH05 was determined using a Field Emission Scanning Electron Microscope (FE-SEM) by reference comparison to working standards traceable to the National Institute of Standards and Technology (NIST), using CP 01 FE-SEM Imaging of Critical Dimension Magnification Standards (CDMS) and CP 02 Certification of Critical Dimension Magnification Standards. Die were sampled according to method SOP 08 Sampling Die. The data applies only to the CDMS products identified in this report. All results are “as-is”. Repair and/or adjustments are not possible.

Below are the average ISO 17025:2017-compliant Certified 10 µm Pitch Measurements unique to Die with Wafer Identifier CD-BH05 and traceable to NIST Certified Standard CD-PG01-0211.

| Line | ISO 17025:2017 Compliant Certified Average Pitch on Wafer | Position of Measurement |
|---|---|---|
| 0-10 µm | 9.998 µm | ± 7.5 µm from center |
| 10-20 µm | 10.000 µm | ± 7.5 µm from center |
| 20-30 µm | 10.003 µm | ± 7.5 µm from center |
| 30-40 µm | 10.000 µm | ± 7.5 µm from center |
| 40-50 µm | 10.002 µm | ± 7.5 µm from center |
| 50-60 µm | 9.999 µm | ± 7.5 µm from center |
| 60-70 µm | 10.000 µm | ± 7.5 µm from center |

| | | |
|---|---|---|
| 70-80 µm | 9.998 µm | ± 7.5 µm from center |

| | |
|---|---|
| Average | 10.000 µm |
| 2-Sigma * | 0.0331 µm |

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

Measurements are reported with an uncertainty (k=2)** of ± 0.012 µm. 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 or contamination of the CDMS occurring after calibration may invalidate the reported measurements. Use this product at 25ºC ± 5ºC 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%.

| Line | Number of Lines | Position of Measurement | Non-ISO 17025:2017 Compliant Average Measured Distance (first to last line) | Average Pitch of Wafer |
|---|---|---|---|---|
| 2.0 mm | 2 | ± 1.00mm from center | 2.00 mm | 2.00 mm |
| 1.0 mm | 2 | ± 0.5mm from center | 1.00 mm | 1.00 mm |
| 0.5 mm | 2 | ± 0.25mm from center | 0.500 mm | 0.500 mm |
| 0.25 mm | 2 | ± 0.125mm from center | 0.250 mm | 0.250 mm |
| 5.0 µm | 12 | ± 20 µm from center | 55.01 µm | 5.00 µm |
| 2.0 µm | 16 | ± 10 µm from center | 30.04 µm | 2.00 µm |
| 1.0 µm | 17 | ± 5 µm from center | 16.02 µm | 1.00 µm |
| 500 nm | 20 | ± 4 µm from center | 9.52 µm | 501.0 nm |
| 250 nm | 21 | ± 2.5 µm from center | 5.02 µm | 250.8 nm |
| 100 nm | 52 | ± 2.5 µm from center | 5.12 µm | 100.3 nm |

The average pitch is derived from the stated length that was determined using measurements (taken center-to-center) over the stated number of lines (i.e., length divided by the number of lines minus one).

Date of Analysis: January 25th, 2024

Equipment used:

| Instrument | Model | Serial # | Resolution | Repeatability | Temperature | Humidity | Ref. |
|---|---|---|---|---|---|---|---|
| FE-SEM | FEI Apreo2 | 9958357 | 0.9nm | 0.030% | 21.9 ± 0.1 °C | 33.3 ± 0.8% | CD-PG01-0211 |

Location: AISthesis Products, Inc., PO Box 1950, Clyde North Carolina 28721.

Notes:

D.S. Finch
Certified by

Signature

H. Haehlen
Authorized by

Signature

January 25th, 2024
Date report issued.


P.O. Box 1950, Clyde, North Carolina 28721 Tel: 828.627.6555 E-mail: CDMS@aisthesisproducts.com

End of report.