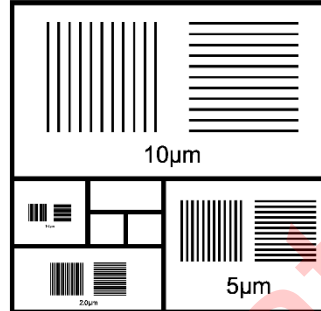
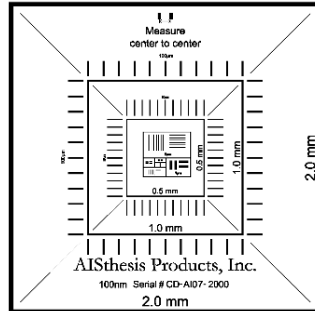


# AISthesis Products

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



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



Product Number: Pelcotec™ 693-1 CDMS-XY-1T-ISO

Customer name and contact information:

Product Description: 2.5x2.5mm, Pelcotec™ 2mm-1µm  
Critical Dimension Magnification Standard.



Wafer Serial Number: CD-AI07

As Received Condition: New

P.O. Box 492477

Redding, CA 96049-2477

As Returned Condition: N/A

Tel: 530.243.2200

Date of Receipt: N/A

[www.tedpella.com](http://www.tedpella.com)

The accuracy of this product with Wafer Identifier CD-AI07 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 07 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 ISO 17025:2017 Accredited Average 10 µm Pitch Measurements unique to Wafer Number CD-AI07 and traceable to NIST Certified Standard CD-PG01-0211.

### X-Direction

Line	ISO 17025:2017 Accredited Average Pitch on Wafer	Position of Measurement
0-10 µm	10.011 µm	± 7.5 µm from center
10-20 µm	10.003 µm	± 7.5 µm from center
20-30 µm	10.012 µm	± 7.5 µm from center
30-40 µm	10.004 µm	± 7.5 µm from center
40-50 µm	10.011 µm	± 7.5 µm from center
50-60 µm	10.005 µm	± 7.5 µm from center

60-70 $\mu\text{m}$	10.011 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
70-80 $\mu\text{m}$	10.006 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
80-90 $\mu\text{m}$	10.010 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
90-100 $\mu\text{m}$	10.005 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
Sum	100.078 $\mu\text{m}$	
Average	10.0078 $\mu\text{m}$	
2-Sigma *	0.0094 $\mu\text{m}$	

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

Y-Direction

Line	ISO 17025:2017 Accredited Average Pitch on Wafer	Position of Measurement
0-10 $\mu\text{m}$	10.010 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
10-20 $\mu\text{m}$	10.004 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
20-30 $\mu\text{m}$	10.013 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
30-40 $\mu\text{m}$	10.006 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
40-50 $\mu\text{m}$	10.010 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
50-60 $\mu\text{m}$	10.005 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
60-70 $\mu\text{m}$	10.012 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
70-80 $\mu\text{m}$	10.007 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
80-90 $\mu\text{m}$	10.011 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
90-100 $\mu\text{m}$	10.005 $\mu\text{m}$	$\pm 7.5 \mu\text{m}$ from center
Sum	100.083 $\mu\text{m}$	
Average	10.0083 $\mu\text{m}$	
2-Sigma *	0.0090 $\mu\text{m}$	

\* 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 or contamination of the CDMS 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%.

Below are the Non-ISO 17025:2017 Accredited Average Pitch Measurements unique to Wafer Number CD-AI07 and traceable to NIST Certified Standard CD-PG01-0211.

X-Direction

Line	Number of Lines	Position of Measurement	Non-ISO 17025:2017 Accredited Measured Distance (first to last line)	Average Pitch of Wafer
2.0 mm	2	$\pm 1.00\text{mm}$ from center	2.000 mm	2.000 mm
1.0 mm	2	$\pm 0.5\text{mm}$ from center	1.000 mm	1.000 mm
0.5 mm	2	$\pm 0.25\text{mm}$ from center	0.500 mm	0.500 mm
0.10 mm	2	$\pm 0.125\text{mm}$ from center	1.001 mm	100.076 mm
5.0 $\mu\text{m}$	12	$\pm 20 \mu\text{m}$ from center	55.019 $\mu\text{m}$	5.002 $\mu\text{m}$
2.0 $\mu\text{m}$	16	$\pm 10 \mu\text{m}$ from center	30.039 $\mu\text{m}$	2.003 $\mu\text{m}$
1.0 $\mu\text{m}$	17	$\pm 5 \mu\text{m}$ from center	16.021 $\mu\text{m}$	1.001 $\mu\text{m}$

Y-Direction

Line	Number of Lines	Position of Measurement	Non-ISO 17025:2017 Accredited Measured Distance (first to last line)	Average Pitch of Wafer
2.0 mm	2	± 1.00mm from center	2.000 mm	2.000 mm
1.0 mm	2	± 0.5mm from center	1.000 mm	1.000 mm
0.5 mm	2	± 0.25mm from center	0.500 mm	0.500 mm
0.10 mm	2	± 0.125mm from center	1.001 mm	100.076 mm
5.0 µm	12	± 20 µm from center	55.019 µm	5.002 µm
2.0 µm	16	± 10 µm from center	30.039 µm	2.003 µm
1.0 µm	17	± 5 µm from center	16.021 µm	1.001 µm

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: December 2<sup>nd</sup>, 2024

Equipment used:

Instrument	Model	Serial #	Resolution	Repeatability	Temperature	Humidity	Reference
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

December 2<sup>nd</sup>, 2024  
Date report issued.

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End of report.