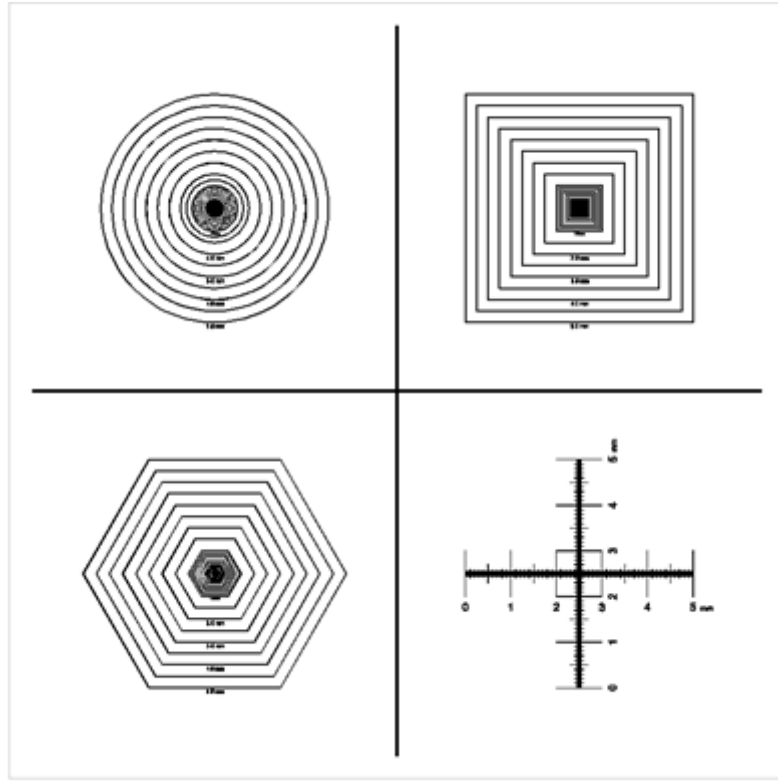




Wafer Level Certificate of Traceability for Micro-Tec MTC-5F Multiple Target Graticule Calibration Standard



Product Numbers: 31-T33600-U, 31-T33600-3, 31-T33600-7, 31-T33600-9, 31-T33600-10 and 31-T33600-11

Product Description: Micro-Tec MTC-5F Multiple target graticule calibration standard, bright field

Product Serial Number: MTC-5-XB-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.

The following applies to all fiducial lines and patterns:

Distance (pitch)	Average pitch	Standard Deviation (1 σ)	Total expanded uncertainty (3 σ)
2 μm	2.00 μm	$\pm 0.60\%$ (1.988-2.012 μm)	$\pm 1.80\%$
5 μm	5.00 μm	$\pm 0.60\%$ (4.97-5.03 μm)	$\pm 1.80\%$
10 μm	10.00 μm	$\pm 0.60\%$ (9.94-10.06 μm)	$\pm 1.80\%$
15 μm	15.00 μm	$\pm 0.60\%$ (14.91-15.09 μm)	$\pm 1.80\%$
20 μm	20.01 μm	$\pm 0.60\%$ (19.89-20.13 μm)	$\pm 1.80\%$
25 μm	25.01 μm	$\pm 0.60\%$ (24.86-25.16 μm)	$\pm 1.80\%$
30 μm	30.02 μm	$\pm 0.23\%$ (29.84-30.20 μm)	$\pm 1.80\%$
35 μm	35.02 μm	$\pm 0.60\%$ (34.81-35.23 μm)	$\pm 1.80\%$
40 μm	40.03 μm	$\pm 0.60\%$ (39.79-40.27 μm)	$\pm 1.80\%$





45 µm	45.04 µm	±0.60% (44.77-45.31 µm)	±1.80%
50 µm	50.06 µm	±0.60% (49.76-50.36 µm)	±1.80%
55 µm	55.05 µm	±0.60% (54.72-55.38 µm)	±1.80%
60 µm	60.05 µm	±0.60% (59.69-60.41 µm)	±1.80%
65 µm	65.07 µm	±0.60% (64.68-65.46 µm)	±1.80%
70 µm	70.06 µm	±0.60% (69.64-70.48 µm)	±1.80%
75 µm	75.05 µm	±0.60% (74.60-75.50 µm)	±1.80%
80 µm	80.07 µm	±0.60% (79.59-80.55 µm)	±1.80%
85 µm	85.07 µm	±0.60% (84.56-85.58 µm)	±1.80%
90 µm	90.08 µm	±0.60% (89.54-90.62 µm)	±1.80%
95 µm	95.08 µm	±0.60% (94.51-95.65 µm)	±1.80%
100 µm	100.10 µm	±0.60% (99.50-100.70 µm)	±1.80%
0.125 mm	125.18 µm	±0.60% (124.43-125.93 µm)	±1.80%
0.15 mm	150.15 µm	±0.60% (149.25-151.05 µm)	±1.80%
0.2 mm	200.20 µm	±0.60% (199.00-201.40 µm)	±1.80%
0.3 mm	300.35 µm	±0.60% (298.55-302.15 µm)	±1.80%
0.35 mm	350.28 µm	±0.60% (348.18-352.38 µm)	±1.80%
0.4 mm	400.51 µm	±0.60% (398.11-402.91 µm)	±1.80%
0.5 mm	500.58 µm	±0.60% (497.58-503.58 µm)	±1.80%
0.6 mm	600.73 µm	±0.60% (597.13-604.33 µm)	±1.80%
0.7 mm	700.85 µm	±0.60% (696.64-705.06 µm)	±1.80%
0.8mm	800.90 µm	±0.60% (796.09-805.71 µm)	±1.80%
0.9 mm	900.96 µm	±0.60% (895.55-906.37 µm)	±1.80%
1.0 mm	1.00 mm	±0.60% (0.994-1.006 µm)	±1.80%
1.5 mm	1.50 mm	±0.60% (1.491-1.509 µm)	±1.80%
2.0 mm	2.00 mm	±0.60% (1.988-2.012 µm)	±1.80%
2.5 mm	2.50 mm	±0.60% (2.485-2.515 µm)	±1.80%
3.0 mm	3.00 mm	±0.60% (2.982-3.018 µm)	±1.80%
3.5 mm	3.50 mm	±0.60% (3.479-3.521 µm)	±1.80%
4.0 mm	4.00 mm	±0.60% (3.976-4.024 µm)	±1.80%
4.5 mm	4.50 mm	±0.60% (4.473-4.527 µm)	±1.80%
5.0 mm	5.00 mm	±0.60% (4.970-5.030 µm)	±1.80%

The average pitch was determined using ten randomly sampled die. 80 center-to-center measurements were taken across each of the ten die. The total expanded uncertainty includes both Type A and Type B uncertainties corrected for sample size using an appropriate Student t-factor. Equipment used:

Instrument	Manufacturer	Serial #	NIST Certified CD/Recalibration	Resolution	Repeatability
FE-SEM	FEI Verios	9922551	CD-PG01-0518 / June 2020	0.9nm	0.03%

Dudley S Finch
Certified by

Signature

August 8th 2019

Date

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TSB 31-T33600 Global Certificate of traceability 2019-08-08 Revision 1

