



Wafer Level Certificate of Traceability for Micro-Tec LCS-10 Compound Magnification Calibration Standard

Product Numbers: 31-T33400-U, 31-T33400-10 and 31-T33400-11

Product Description: Micro-Tec LCS-10 10mm linear compound scale, 1, 0.1, 0.01mm div., Si/Cr, opaque

Product Serial Number: LCS-10 VB01-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 both horizontal and vertical fiducial lines:

Line	Average certified distance with (1 σ range)	Standard Deviation (1 σ)	Total expanded uncertainty (3 σ)
0-1 mm	1.000 (0 to 0.997-1.003) mm	$\pm 0.30\%$	$\pm 0.90\%$
0-2 mm	2.000 (0 to 1.994-2.006) mm	$\pm 0.30\%$	$\pm 0.90\%$
0-3 mm	3.000 (0 to 2.991-3.009) mm	$\pm 0.30\%$	$\pm 0.90\%$
0-4 mm	4.000 (0 to 3.988-4.012) mm	$\pm 0.30\%$	$\pm 0.90\%$
0-5 mm	5.000 (0 to 4.985-5.015) mm	$\pm 0.30\%$	$\pm 0.90\%$
0-6 mm	6.000 (0 to 5.982-6.018) mm	$\pm 0.30\%$	$\pm 0.90\%$
0-7 mm	7.000 (0 to 6.979-7.021) mm	$\pm 0.30\%$	$\pm 0.90\%$
0-8 mm	8.000 (0 to 7.976-8.024) mm	$\pm 0.30\%$	$\pm 0.90\%$
0-9 mm	9.000 (0 to 8.973-9.027) mm	$\pm 0.30\%$	$\pm 0.90\%$
0-10 mm	10.000 (0 to 9.970-10.030) mm	$\pm 0.30\%$	$\pm 0.90\%$
0-0.1 mm	0.100 (0 to 0.0996-0.1004) mm	$\pm 0.40\%$	$\pm 1.20\%$
0-0.2 mm	0.200 (0 to 0.1992-0.2008) mm	$\pm 0.40\%$	$\pm 1.20\%$
0-0.3 mm	0.300 (0 to 0.2988-0.3012) mm	$\pm 0.40\%$	$\pm 1.20\%$
0-0.4 mm	0.400 (0 to 0.3984-0.4016) mm	$\pm 0.40\%$	$\pm 1.20\%$
0-0.5 mm	0.500 (0 to 0.4980-0.5020) mm	$\pm 0.40\%$	$\pm 1.20\%$
0-0.6 mm	0.600 (0 to 0.5976-0.6024) mm	$\pm 0.40\%$	$\pm 1.20\%$
0-0.7 mm	0.700 (0 to 0.6972-0.7028) mm	$\pm 0.40\%$	$\pm 1.20\%$
0-0.8 mm	0.800 (0 to 0.7968-0.8032) mm	$\pm 0.40\%$	$\pm 1.20\%$
0-0.9 mm	0.900 (0 to 0.8964-0.9036) mm	$\pm 0.40\%$	$\pm 1.20\%$
9.90-9.91 mm	9.910 (9.90 to 9.90994-9.91006) mm	$\pm 0.60\%$	$\pm 1.80\%$
9.90-9.92 mm	9.920 (9.90 to 9.91988-9.92012) mm	$\pm 0.60\%$	$\pm 1.80\%$
9.90-9.93 mm	9.930 (9.90 to 9.92982-9.93018) mm	$\pm 0.60\%$	$\pm 1.80\%$
9.90-9.94 mm	9.940 (9.90 to 9.93976-9.94024) mm	$\pm 0.60\%$	$\pm 1.80\%$
9.90-9.95 mm	9.950 (9.90 to 9.94970-9.95030) mm	$\pm 0.60\%$	$\pm 1.80\%$
9.90-9.96 mm	9.960 (9.90 to 9.95964-9.96036) mm	$\pm 0.60\%$	$\pm 1.80\%$
9.90-9.97 mm	9.970 (9.90 to 9.96958-9.97042) mm	$\pm 0.60\%$	$\pm 1.80\%$
9.90-9.98 mm	9.980 (9.90 to 9.97952-9.98048) mm	$\pm 0.60\%$	$\pm 1.80\%$
9.90-9.99 mm	9.990 (9.90 to 9.98946-9.99054) mm	$\pm 0.60\%$	$\pm 1.80\%$





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 #	Objective Lenses	NIST Certified CD/Recalibration	Repeatability
Light Microscope	Motic BA310MET	117000 0170	10x, 0.25N.A, 20x 0.4N.A. & 50x 0.55N.A. Plan Achromat	CD-PG01-0518 / June 2016	0.07%

Dudley S Finch
Certified by

Signature

August 14th 2015
Date

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