SPECIFICATIONS

Inspections are set up to test the system's thin film thickness and RI measurement accuracy, matching, precision, stability.. This section summarizes the setup, execution, and analysis of each test.

4.1	**System Accuracy**	<u>SE Accuracy using golden system:</u> +/- 1.5 Å for films <125Å +/- 1Å for films 125Å -300Å +/-0.3% for films 300Å to 1um *or* +/-1.0% for films 300Å to 1um <u>using VLSI standards</u> <u>SE RI Accuracy using golden system</u> +/- 0.02 for films <350Å to 1.0um oxide +/- 0.02 for films <350Å to 1.0um nitride <u>SE RI Accuracy using VLSI standards</u> +/- 0.007 for films <350Å to 1.0um oxide +/- 0.010 for films <350Å to 1.0um nitride <u>DBS Accuracy using golden system or VLSI standards:</u> +/- 1.0% for films 250Å to 1.0um
4.2	**System Precision (3 sigma)**	<u>SE Precision:</u> *Thickness (t) only on single layer oxide or nitride films* ; 20-100Å ≤ 0.10Å 100-300Å ≤ 0.30Å 300-2000Å ≤0.50Å 2000Å1um ≤ 0.025% *t and RI n, k @ 633nm on >300 Å on single layer oxide or nitride films*; 300-2000Å ≤ 2.0Å ≤ 0.003 2000Å-1um ≤ 0.1% ≤ 0.002

<table>
<tr><td></td><td></td><td><u>DBS Precision:</u>
Thickness (t) only on single layer oxide or nitride films;

500-2000Å ≤ 0.75Å
2000Å-1um ≤0.05%

DBS Reflectivity Precision:
Measurement in actual reflectivity units on 1x objective- assumes normalized reflectivity to the incident intensity (an ARU of 1.0 indicates 100% of incident intensity is reflected).
193nm (optional) 0.010
248nm 0.005
365nm 0.001
436nm 0.001

Precision is measured by performing a 30 site measurement at the center of the wafer within a 2 mm diameter. Precision is defined as the average 3-sigma standard deviation of the 30 site test.</td></tr>
<tr><td>4.3</td><td>System Stability (3 Sigma)</td><td><u>SE Stability (short term):</u>
Thickness (t) only on single layer oxide or nitride films;
20-100Å ≤ 0.25Å
100-300Å ≤ 0.40Å
300-2000Å ≤1.50Å
2000Å-1um ≤ 0.075%

t and RI n, k @ 633nm on >300 Å on single layer oxide or nitride films;
300-2000Å ≤ 2.5Å ≤ 0.004
2000Å-1um ≤ 0.15% ≤ 0.004

t and RI n, k @ 193nm on >250 Å on single layer SiON films;
250-1200Å ≤ 2.5Å
n ≤ 0.002
k ≤ 0.003
<u>DBS Stability (short term):</u>
Thickness (t) only on single layer oxide or nitride films;
500-2000Å ≤ 2.5Å
2000Å-1um ≤ 0.25%</td></tr>
</table>

		• Note: Wafers must be uniform and stable. SE Short Term Stability is measured by performing a series of Precision tests. The Precision test is repeated three times per day for three to five days for stability measurements. Stability is defined as the 3-sigma standard deviation of the mean values of the series of test. A ten loop run is acquired during install and stability is determined from this ten loop run. ▪
4.4	**System Blind Stepping**	0.5% allowable to fail. A failure is determined by visual inspection. "Blind stepping" tests the stage position accuracy using pattern recognition. "Blind Stepping" globally aligns the wafer and then moves the stage to a series of measurement locations. Film thickness measurements at these locations verify how accurately the stage was positioned to these locations. Factory test includes measurement a 20um box at 29 sites on Prometrix 8 inch wafer, cycle 30 wafers. Field test includes measurements on all sites on the Prometrix 8 inch wafer.
4.5	**System Transportability**	Pattern and monitor tests should work properly without any training. User should see no failures during each test. Groping is considered a failure. "Transportability" tests the transportability of recipes between like systems. This test transports and successfully runs three DBS recipes that were created on another system (same model) to the system under acceptance, using DBS 1x, 4x and 15x. The field test will also, use a customer wafer and recipe to show transportability between the same model system (ASET-F5x to ASET-F5x).