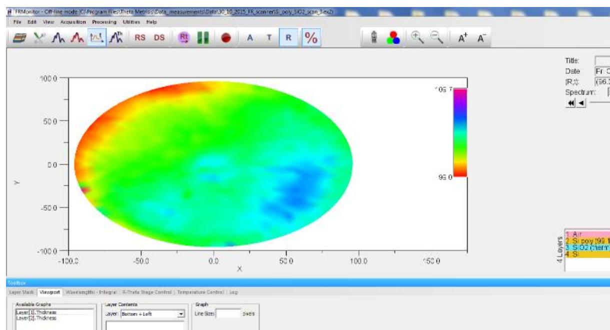
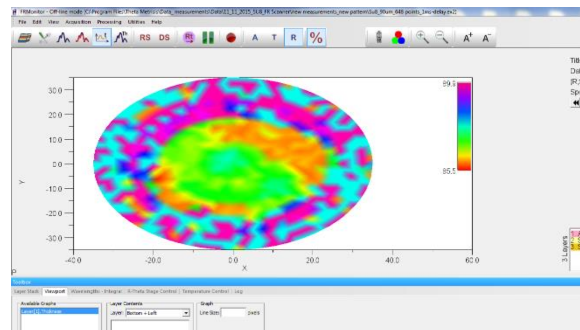
MAPPING

For the fast and automated mapping of film thickness a dedicated FR-tool configuration (FR-Scanner) is employed. In this case, fast and accurate measurement of film thickness and all other parameters on pre-defined points over large areas is performed through a user-friendly GUI. In the following figures the mapping of thick SU-8 spin coated on 3-inch Si wafer and SiO_2 thermally grown on 8-inch Si wafer are illustrated as shown in the FR-monitor software.

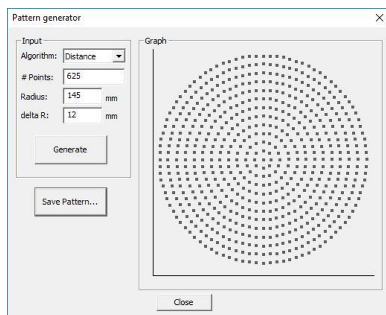


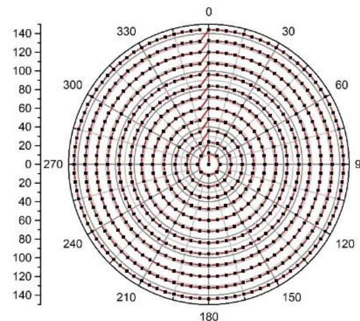
Film thickness mapping of a polycrystalline silicon layer deposited on a 8 inch Si wafer



SU-8 film thickness mapping on a 3inch Si wafer

FR-Scanner scans the samples under test in very high speed by rotating the stage and by moving linearly the optical head on top (polar scanning) and without bending of the reflection probe. The pattern can be generated through FR-Monitor. For example, in the following image a pattern generated for 300mm wafers can be shown, that includes 625points in (R,theta) positions. Each full scan over the 300 mm wafer, lasts approximately 1min and 30sec.





Left: FR-Monitor's pattern generator utility. Right: Graph of the generated pattern showing the sequence of the measurements performed (first measurement is on the center of the wafer).

For the calculation of the statistical parameters and the representation of the point distribution, some points can be excluded according the statistics calculation parameters. These excluded points are considered as "extreme" points, which can alter the statistics in the unwanted way, so the user can exclude them.

In the image bellow, the thickness mapping of the Si wafer coated with MIR703 coating is illustrated taking into account the a) 0.2% and b) 0.1% as acceptance variation from the central value (median), considering that the qualified points have a maximum difference of ±0.2% and 0.1% accordingly to the median thickness. The black areas illustrate the rejected points.

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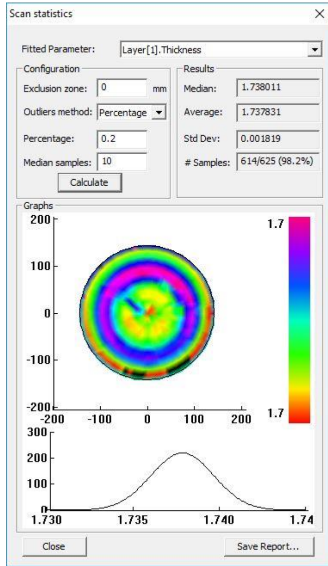

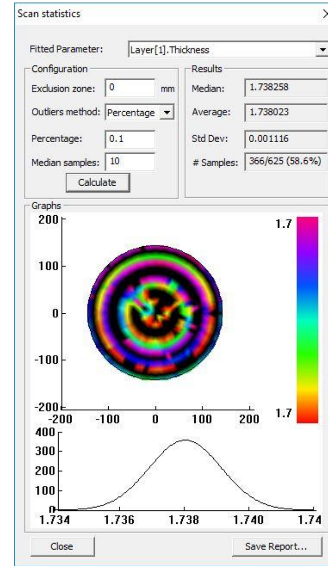

Figure 12a: Thickness mapping, statistical results and Gaussian plot of the qualified points of "MIR703" wafer taking into account 0.2% and of the central value.

Figure 12b: Thickness mapping, statistical results and Gaussian plot of the qualified points of "MIR703" wafer taking into account 0.1% and of the central value.

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