

TECHNICAL BRIEF

SPECIFICATION OF SAW WAFER POLISH

The polished surface of a SAW substrate is a critical wafer attribute for the device manufacturer. While many customers have specifications for gross surface texture imperfections in the polished surface (scratches, "orange peel", etc.), most simply describe the actual surface finish merely as "SAW" or "mirror" polish. Sawyer has always recognized the importance of quantitatively defined product characteristics as the basis for

communication with customers and for continuous improvement. Consequently, we were first in the industry to quantify the specification for the roughness of the polished wafer surface and employ state-of-the-art measurement equipment.

Surface finish or roughness can be quantitatively defined as the distance between the microscopic peaks

Title: Sawyer
Note: Wafer 1

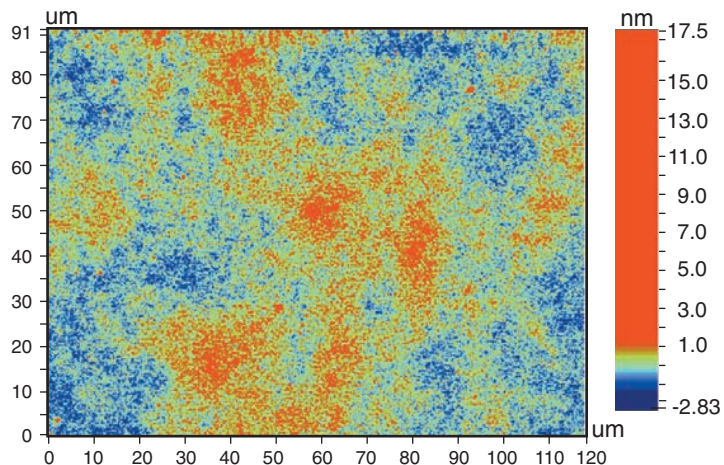
Date: 10/25/2005

Mag: 25.4x
Size: 736 x 480
Sampling: 330.37 nm

Surface Stats:

Rq: 0.35 NM
Ra: 0.28 NM
Rt: 6.20 NM
Rrms: 0.66 NM

Surface Data



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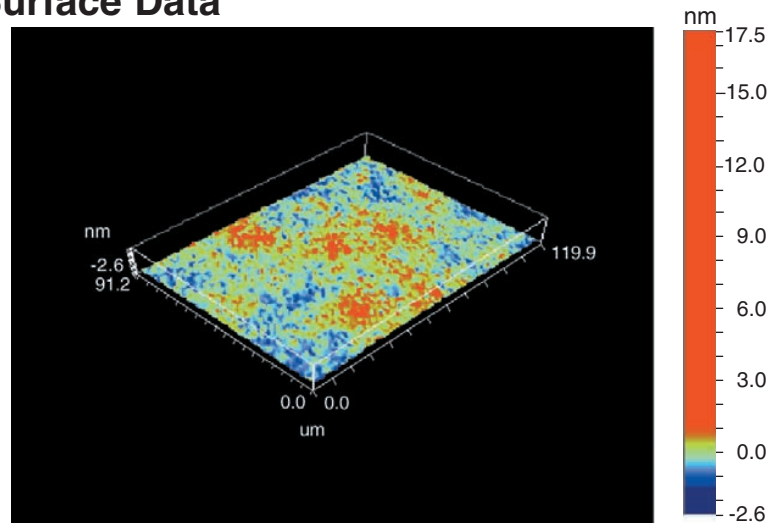
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and valleys of the machined surface. It may be expressed as an average of all peak-to-valley distances (Ra) or as a root mean square (Rrms) or as the worst peak-to-valley difference observed (Rt).

Our process baselines for the surface finish of both the polished propagation surface and the lapped back side have been established and are monitored by measurements performed in house using a Veeco WYKO NT2000 advanced measurement system. Process changes and improvements are qualified in this manner as well.

The WYKO NT2000 employs phase-shifting interferometry and vertical scanning interference microscopy. Measurement of a polished surface with resolution as low as .1 nm is well within the capabilities of this system. This system eliminates the tediousness of microscope assessments of surface finish. Contact surface profile instruments often lack the sensitivity to adequately define the SAW polished surface and can damage the wafer surface.

Based on our experience with the WYKO NT2000 measurement system we have established the following specification for the polished propagating surface of our SAW substrates.

The polished propagating surface shall have a root mean square surface roughness (Rrms) of 0.6 nm or less when measured at 20x magnification with a non-contact surface profiler.

The surface profiles and contour maps for the polished propagating surface of a typical SAW wafer are provided for illustration.

Revised: December 2005