



Tool Data

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Thicknesses and Pinholes of SiO₂, SiN_x, and a-Si Films prepared by PECVD, No 1

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Thicknesses and Pinholes of SiO₂, SiN_x, and a-Si Films prepared by PECVD, No 1

Keywords

Thicknesses, Pinholes, SiO₂, SiN_x, a-Si, PECVD

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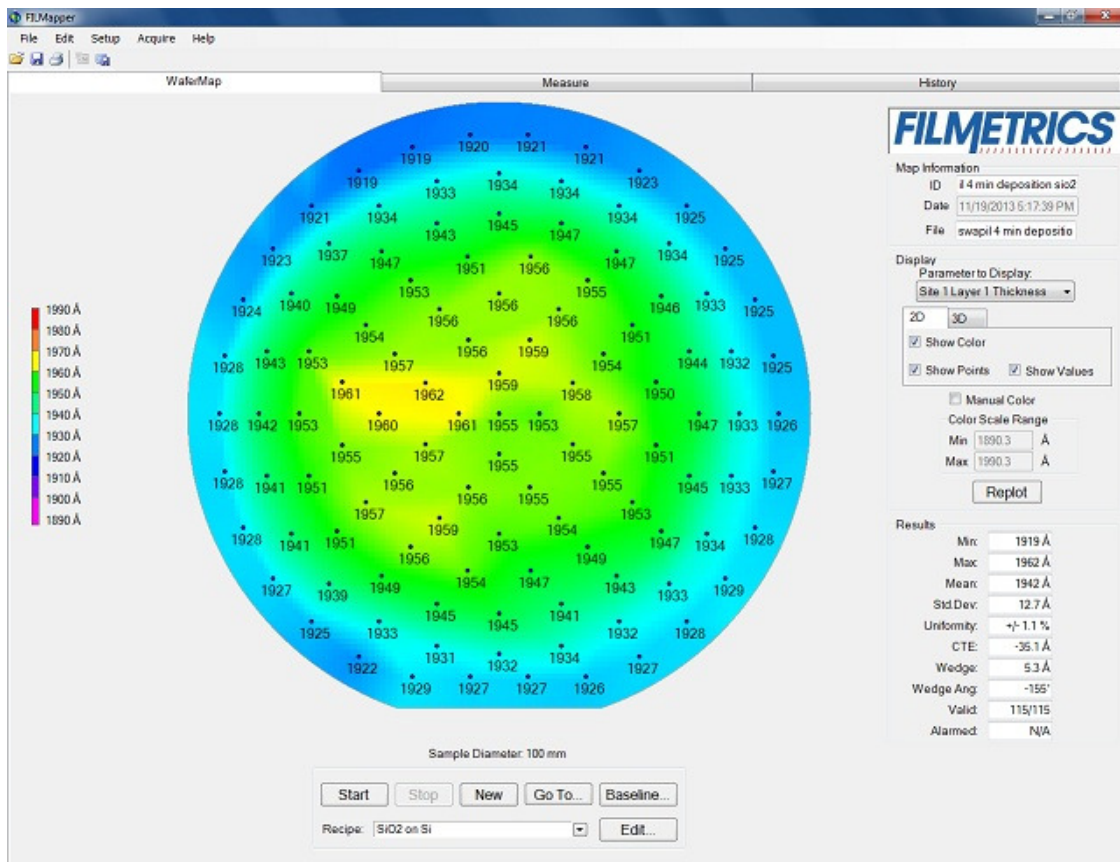
Thicknesses and Pinholes of SiO₂, SiN_x, and a-Si Films prepared by PECVD, No1, (Graduate Student Fellow Program)

Prepared by Swapil Paliwal (3/24/2014)

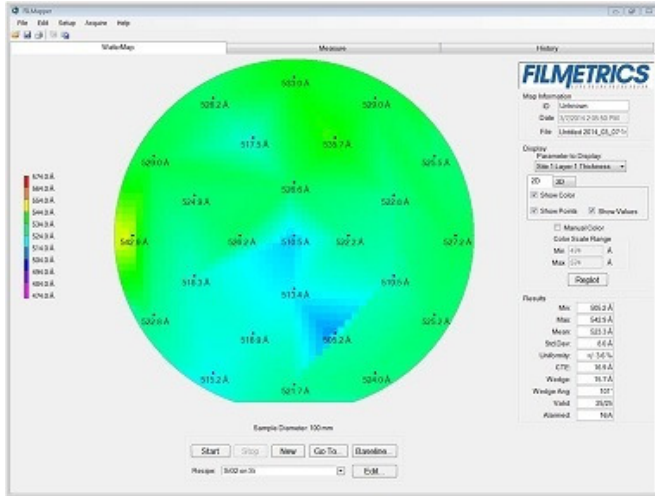
SiO₂

Thickness

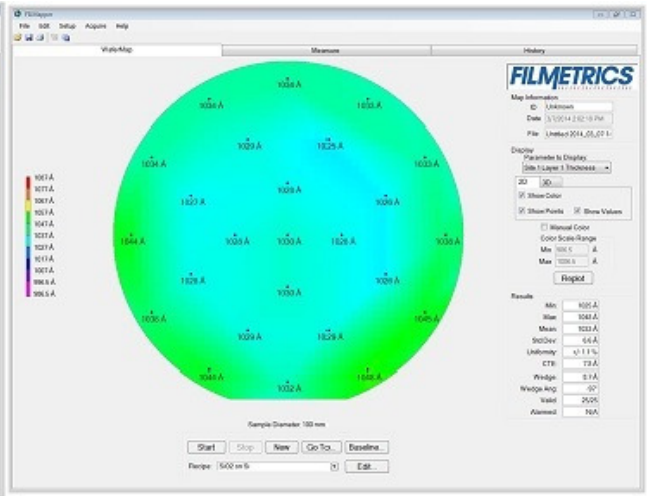
- 1/29/14
- Default recipe
- Deposition rate = 48.6 nm/min
 - Filmetrics F50: thickness mean = 194.2 nm and uniformity = 1.1 % for 4 min deposition.



- 3/9/14
- Default recipe
- Deposition rate = 51.6 nm/min
- 1 min dep: uniformity = 3.6 %
- 2 min dep: uniformity = 1.1 %
- The thicknesses are shown below with standard deviation.



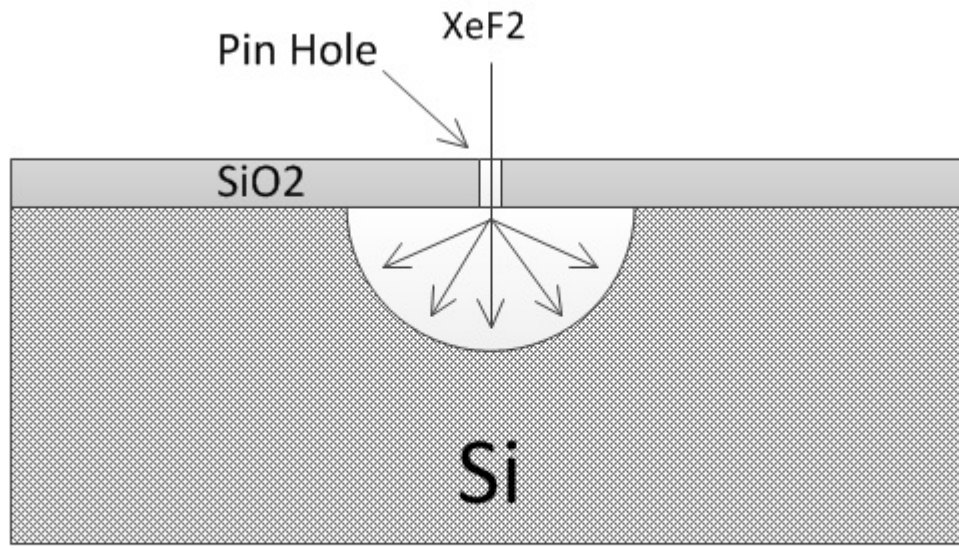
1 min deposition $d = 52.3 \pm 0.8$ nm



2 min deposition $d = 103.3 \pm 0.7$ nm

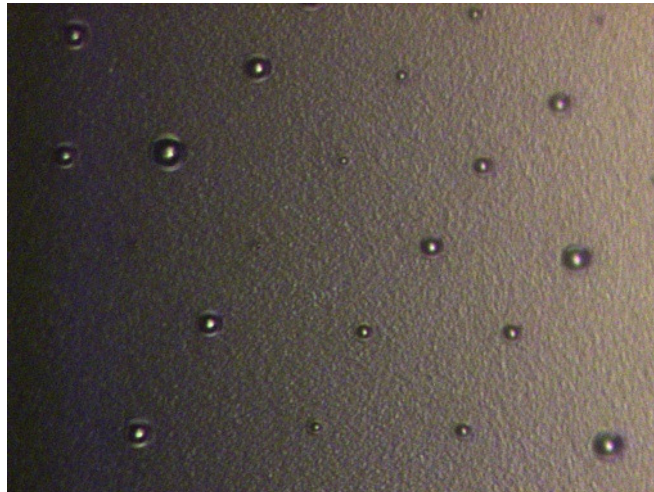
SiO₂ deposition by PECVD

Pin Holes



XeF₂ etching of Si through pin hole

- 2/10/14
- Prepared by Swapil Paliwal
- 20 nm thick SiO₂ on Si, prepared by PECVD
- XeF₂ Etcher
 - The number of cycles: 30
 - Etch time: 60 sec
 - The pressure of XeF₂: 3.0 Torr.
 - The pressure of N₂: 2.0 Torr

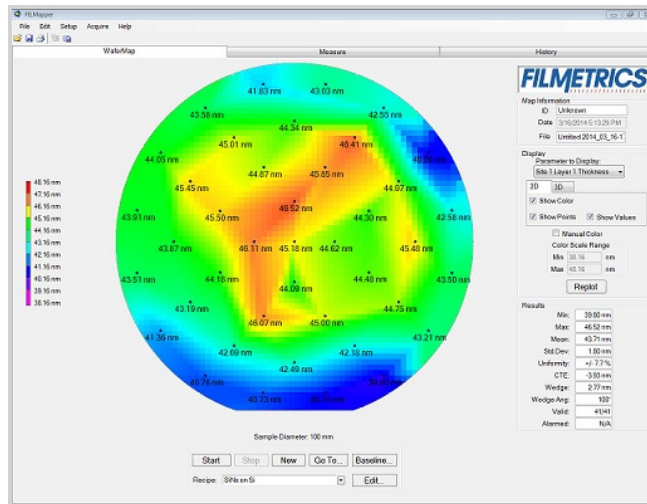


Optical microscope image (x20) of XeF₂ etching of Si under 20 nm thick SiO₂ film through pin holes

Si3N4

Thickness and refractive index

- 3/24/14
- Prepared by Swapil Paliwal
- Default recipe
- Deposition rate = 10.5 nm/min
- Filmetrics F50:
 - Thickness, mean = 43.7 nm and uniformity = 7.7 % for 4 min 10 sec deposition.
 - Refractive index = 2.0250 at 632.8 nm



- Filmetrics F50:
 - Thickness mean = 86.9 nm and uniformity = 9.0 % for 8 min 20 sec deposition.
 - Refractive index = 1.975 at 632.8 nm

