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Performance Check on ABM3000HR Mask Aligner

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Keywords
ABM3000HR

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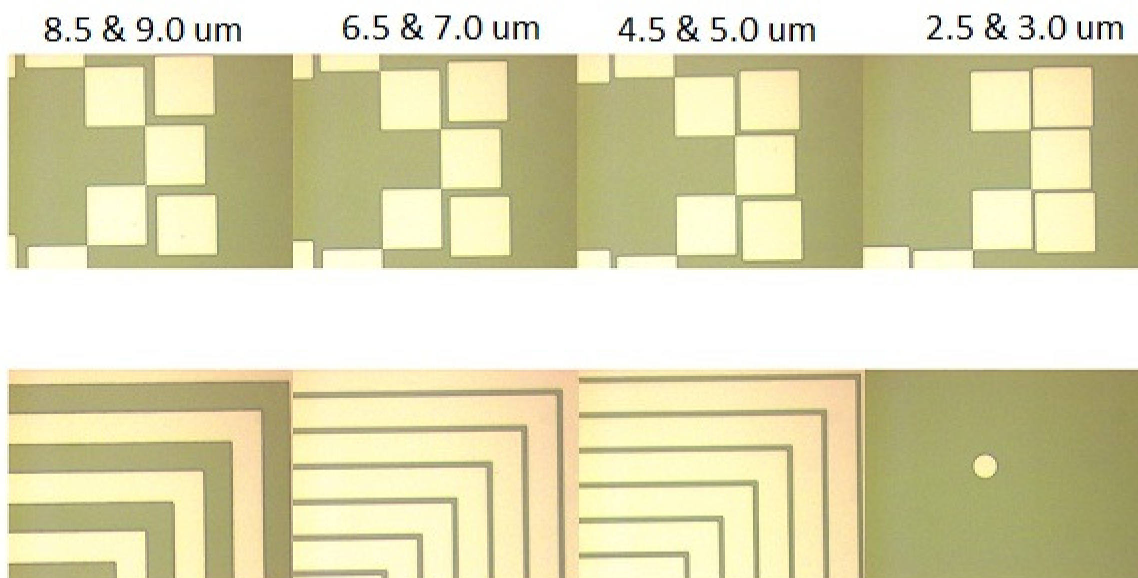
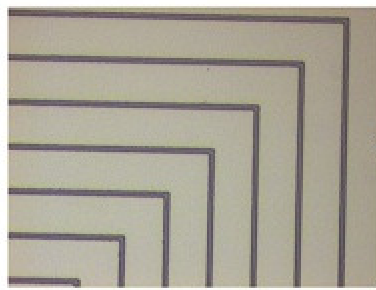
On-site Inspection on ABM3000HR mask aligner (Graduate Student Fellow Program)

Prepared by Lin Zhao and Prashanth Gopalan

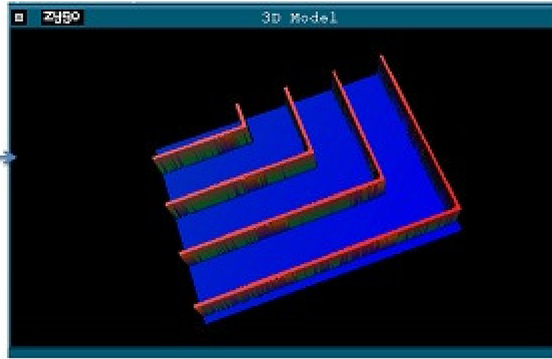
Exposure

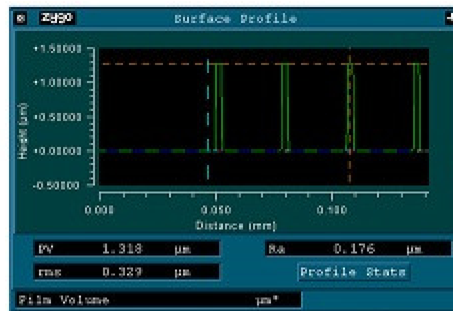
- 2/10/2014
- Resist: S1818
- Lithography tool: ABM3000HR
- Cleaning: Acetone Sonic-5min, IPA Sonic-5min
- Spinner: 5500RPM, 30 sec
- Pre-bake: 110C, 45 sec, a metal plate was placed on the hotplate, and then the sample was baked on the metal plate. The sample was covered by a beaker to block the turbulent air flow by ventilation of the bench.
- Exposure Time: 4 sec using 400 nm (37.9 mW/cm2) of ABM3000HR, 151.6 mJ/cm2
- Develop: MF-319, 60 sec
- P7 2D profiler: thickness = 1.2 µm
- Zygo 3D optical profiler: thickness = 1.3 µm





Optical Image (0.7")

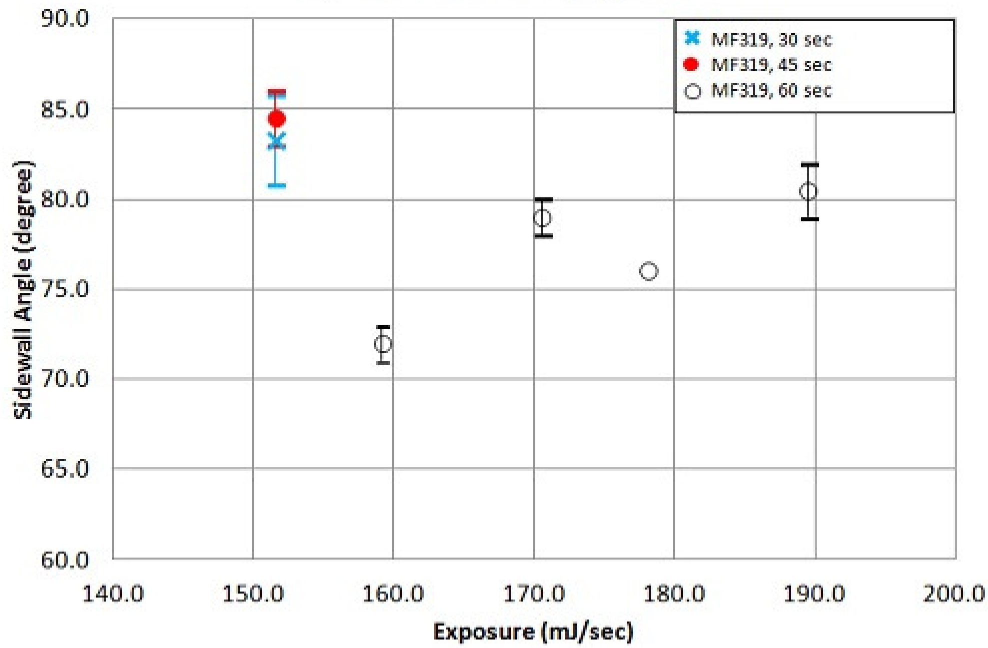


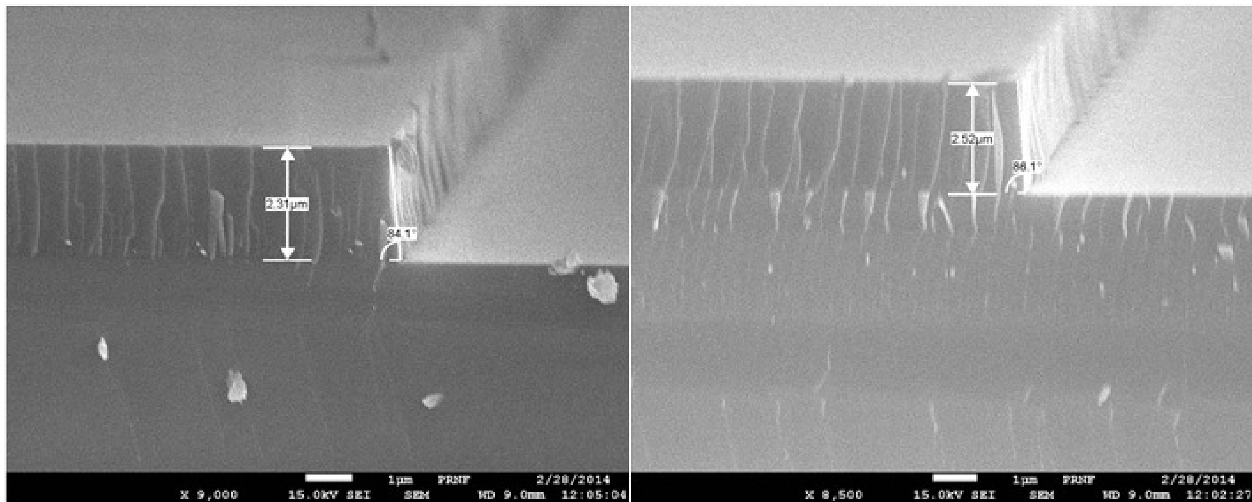


Zygo Film Thickness: 1.318um

Sidewall Angle

- Lithography tool: ABM3000HR
- Cleaning: Acetone Sonic-5min, IPA Sonic-5min
- Spinner: 2500 or 3000 rpm, 30 sec
- Thickness: ~2 µm
- Pre-bake: 110C, 45 sec, a metal plate was placed on the hotplate, and then the sample was baked on the metal plate. The sample was covered by a beaker to block the turbulent air flow by ventilation of the bench.
- Exposure Time: 4.0, 4.2, 4.5, 4.7, and 5.0 sec using 400 nm (37.9 mW/cm2) of ABM3000HR
- Develop: MF-319, 30, 45 and 60 sec





SEM images of cross-sections of S1818 resist films. The film was spin-coated at 2500 rpm. The exposure at 400 nm was 151.6 mJ/sec, and the developing time in MF319 was 45 sec. Sidewall angles were 84.1 and 86.1 °.

Sidewall angle

- 3/24/2014
- Lithography tool: ABM3000HR
- Resist: S1813
- Cleaning: Acetone Sonic-5min, IPA Sonic-5min
- Spinner: 5500RPM, 60sec
- Thickness:~1.3 µm
- Pre-bake: 110C, 45sec, with metal plate and beaker
- Exposure Time: 3.8 sec using 400 nm (37.9 mW/cm2) of ABM3000HR, 144 mJ/cm2
- Develop: MF-319, 25sec

- The result: 80.5-85.8 º.