



ZEP SPIN CURVES

This document provides thickness curves and spinning guidelines for various formulations of ZEP-520A electron beam resist. Please refer to the Headway spinner SOP before reading this document.

- Resist formulation: Stock ZEP-520A and dilute ZEP-520A in Anisole 1:1, 1:2, 1:3 (by volume)
- Spread cycle: RPM = 100, RAMP = 1, Time = 10 sec
- Spin cycle: Const. ramp method: RPM = 1000 – 5000, RAMP = 1 – 5, Time = 40 sec (*Preferred*)
Const. time method: RPM = 1000 – 5000, RAMP = 2, Time = 40 sec
- Pre-bake: 10 min @ 170°C on hot plate (set-point temp. ~ 270°C)

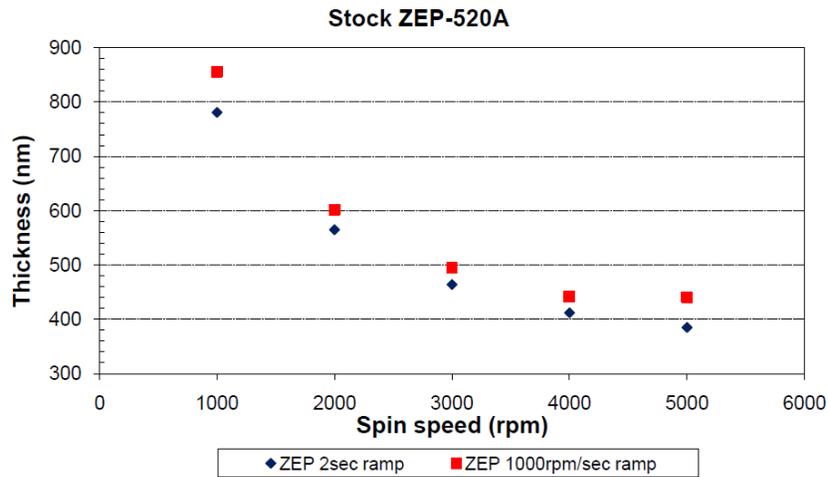


Figure 1 Spin curves for stock ZEP-520A using two different ramping schemes: a constant 2 sec ramp time (blue diamonds) and a constant 1000 rpm/sec ramp rate (red squares)

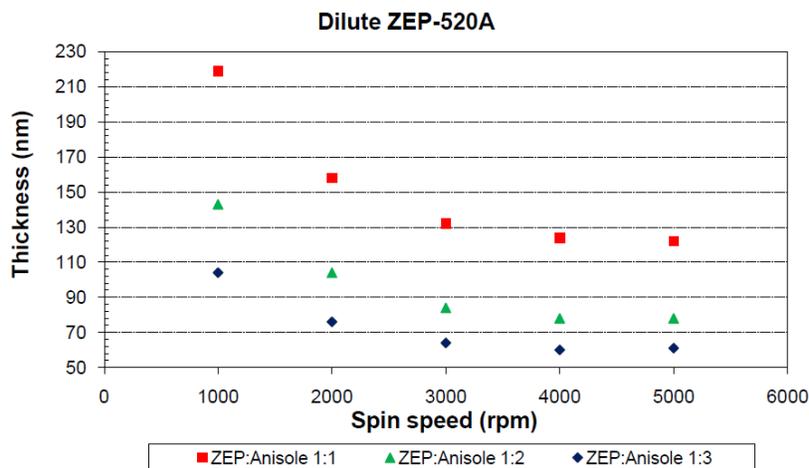


Figure 2 Spin curves for dilute ZEP-520A:Anisole formulations 1:1 (red squares), 1:2 (green triangles), and 1:3 (blue diamonds). A constant 1000 rpm/sec ramp rate was used in all cases.



ADDITIONAL DATA:

Stock ZEP-520A:

Spin cycle: 8000 RPM @ 1000 rpm/sec RAMP	Thickness: 431 nm	(MSE: 8.64)
Spin cycle: 8000 RPM @ 2 sec RAMP	Thickness: 331 nm	(MSE: 5.82)
	(30% thinner)	

Dilute ZEP-520A: Anisole 1:3:

Spin cycle: 8000 RPM @ 1000 rpm/sec RAMP	Thickness: 61 nm	(MSE: 1.87)
Spin cycle: 8000 RPM @ 2 sec RAMP	Thickness: 43 nm	(MSE: 1.80)
	(42% thinner)	

NOTES:

- The stock ZEP-520A bottle is present in the fridge. Please pour the resist solution into a separate labeled plastic container for your use and store in the fridge. If you would like to test-use some ZEP, please use the small containers labeled 'Nanofab Stock' and marked with a green sticker on the lid. These are present in 1:0, 1:1, 1:2, and 1:3 ZEP-520A:Anisole formulations.
- With a constant ramp rate (e.g., 1000 rpm/sec), there is almost no thickness change beyond 4000 rpm.
- The examples in Fig. 1 and in the additional data section demonstrate that the resist thickness is dependent on the ramping scheme.
- The fastest RPM the Headway spinner can operate is 8000 RPM. In order to access speeds beyond 4000 RPM, use RPM3 after RPM2 on the Headway spinner pre-sets. Check RPM2 after changing RPM3 to ensure that RPM2 has not changed.
- In order to measure ZEP films on the ellipsometer, use the following optical constants as starting parameters (check the fit constants dialog box):
Alpha = 1.54, Beta = 0.005, Gamma = 0.0002

If you have any questions regarding the above, please contact Mohammad Ali Mohammad (eb1.nanofab@ualberta.ca). If you require training on the spinner, please contact the qualified trainers mentioned in the Headway resist spinner SOP. Should none of the above contacts be available, please contact any staff member for assistance.