

## **Single Layer 5% 950K PMMA in Anisole E-Beam Resist Process**

Revision 1.5 January 25, 2008

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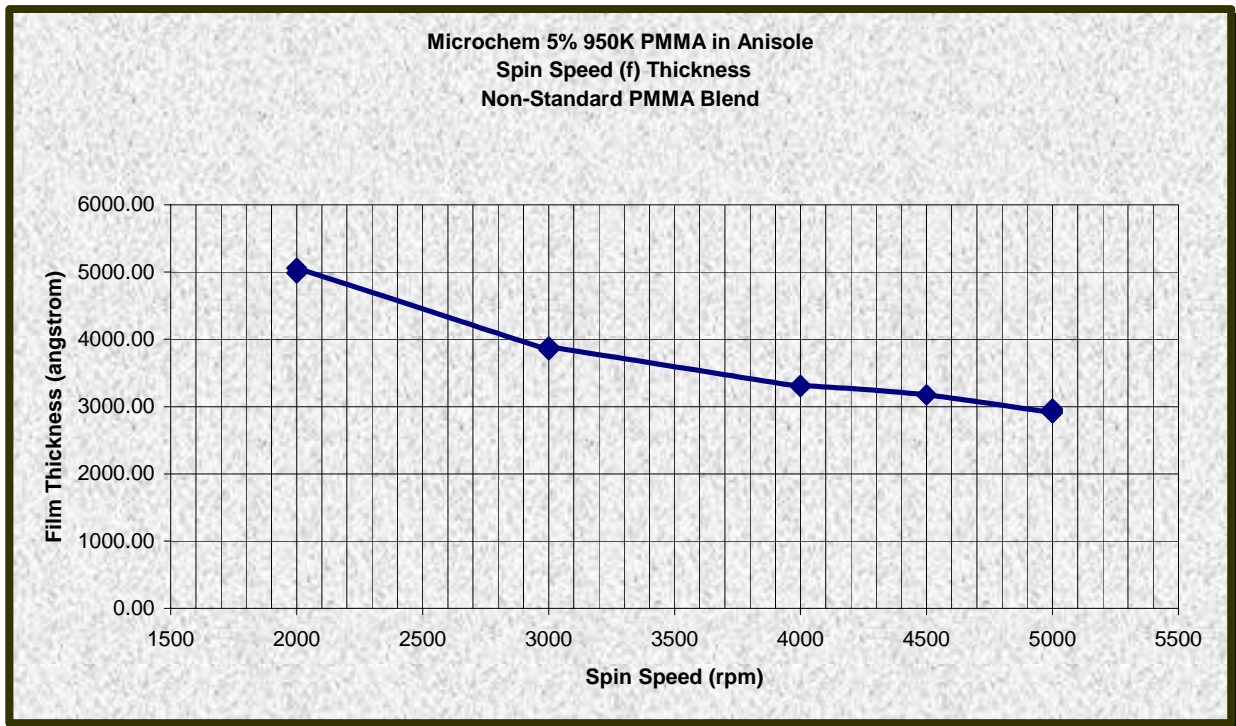
Single Layer 5% 950K PMMA in Anisole – 300 nm thin films for features to <50 nm.

1. **Standard Wafer Clean** suitable for your substrate type.
2. **Singe Bake:** 150 degrees for 30 minutes.
3. **Spin:** 5% 950K MW PMMA in ANISOLE at 4.5krpm for 40 seconds  
Layer Target Thickness:  $d = 300 - 310$  nm
4. **Post Bake:** 2 minutes at 200 degrees Celsius on hotplate.
5. **Exposure:** Raith: 10 keV Dose-to-Clear for most areas is  $120$  to  $140 \mu\text{C}/\text{cm}^2$ .  
Note: Try  $140 - 180 \mu\text{C}/\text{cm}^2$  for Photonic crystals and sub 100 nm area features.  
Single Pixel Lines can be exposed at  $380$  to  $420 \mu\text{C}/\text{cm}^2$
6. **Develop:** MIBK:IPA 1:3 for 40 - 45 seconds with gentle agitation.
7. **Rinse** to stop development: IPA for 15 or 30 seconds. Non-critical time.
8. Microscope Inspection: High Power Visual inspection at 200 and 1000X Mag.  
  
HPV Inspection Check Points:  
Are patterns developed out and are all patterned areas fully cleared or resist?  
Inspect for Particulates, excessive Line Edge Roughness (LER), proper resist CD's to design CD specifications, and evaluate film adhesion to substrate.  
Do the CD's in the design match the exposure result CD's measured?
9. Post Processing: Deposit Metal Thin films or RIE etching suitable to process result desired.

This process is under SNF engineering evaluation and your comments are invited!

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Microchem 5% 950K MW PMMA Thickness (f) Spin Speed Chart:



Area Features Size versus Dose-to-Clear:

