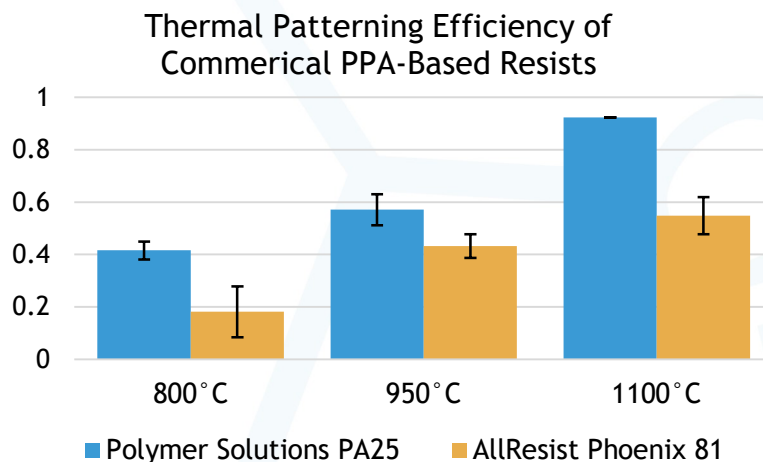
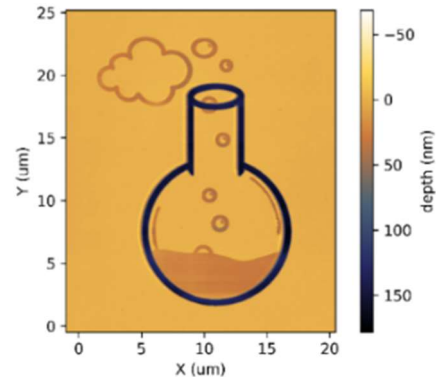


Polymer Solutions Inc has developed a unique family of photo-thermal resists for use with Heidelberg's NanoFrazor patterning tools. The polymer resists are composed of cyclic, low ceiling temperature (T_c) poly(aldehydes). T_c is the thermodynamic temperature which separates polymer from monomer. The T_c of our polymers is below room temperature making the polymer meta-stable at room temperature. The Polymer Solutions resists very rapidly and cleanly decompose into monomer *only when triggered during patterning* because the mechanism of depolymerization is suppressed. The Polymer Solutions family of resists have the following attributes.

High Sensitivity and Resolution Thermal (tSPL)

Patterning: Cleaving a single bond in the polymer chain initiates the spontaneous and complete depolymerization of the polymer. The resolution of our resists is shown in the NanoFrazor written pattern at right.



Rapid Low Temperature tSPL

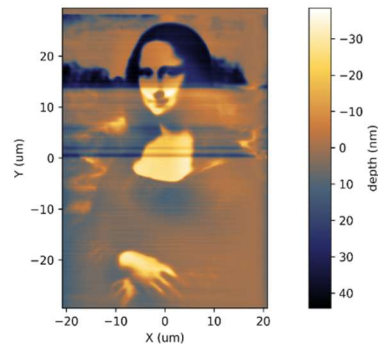
Writing: Polymer Solutions offers several products optimized to user needs. PA25 produces the most volatile products allowing for the lowest temperature and cleanest patterning, as shown in the graph at left. Note the patterning is performed twice on the AllResist PPA to minimize tip effects on the data. The patterning efficiency is the highest available from any resist.

Long Shelf Life: Polymer Solutions resists are stable for long periods of time. When stored in a freezer, the resist will be stable for years, although the recommended 'use by' date is six months to ensure freshness. Freezer-stored resists have held stable for years. The long shelf-life originates from the high purity of Polymer Solutions materials. The resists are stable enough to be shipped at room temperature in dry form or formulated in solution.

Chemical Resistance: Polymer Solutions offers several resists designed to meet NanoFrazor patterning needs. PA25 is the fastest, lowest patterning temperature resist. PH75 has the highest

chemical and reactive ion etching resistance. PA15 is a compromise between patterning speed and chemical resistance.

Efficient 3-D Photopatterning: Polymer Solutions has developed advanced formulations of each resist (PA25-L, PA15-L and PH75-L) for NanoFrazor 3-D laser photo-patterning. The laser patterning resists have higher sensitivity and lower thickness dependence than conventional NanoFrazor resists. The 3-D figure at right was patterned using PA25-L.



Spin Coating: Resist solutions are typically cast onto substrates using a spin coating process. The following table was constructed using methoxybenzene (also known as anisole) as the solvent. After spin coating, the thin film should be soft baked on a hotplate to remove residual solvent. In the case of anisole, films are typically heated for 4 min at 85°C.

Concentration (wt%)	Film Thickness (nm)																													
	8	10	11	12	14	16	18	20	23	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	125	150	190	225	250	300
0.5	6k		2k																											
1						6k	4k		2k																					
2										6k	4k		2k																	
4																			6k				4k			2k				
8																												6k	4k	2k

Pricing and Availability: Polymer Solutions resists are very competitively priced, and volume or blanket-order discounts are available. Our resists can be shipped, usually immediately, dry (for customer formulation) or preformulated in-solvent.

Product	Attribute
PA25 (500 mg, 1 g, 5 g or higher)	Highest sensitivity & lowest temperature iSPL patterning
PA25-L	Enhanced 3-D laser patterning
PH75 (500 mg, 1 g, 5 g or higher)	Highest chemical and reactive ion etching resistance
PH75-L	Enhanced 3-D laser patterning
PA15 (500 mg, 1 g, 5 g or higher)	Balance of high sensitivity and chemical resistance
PA15-L	Enhanced 3-D laser patterning

Contact Polymer Solutions for pricing and availability:

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