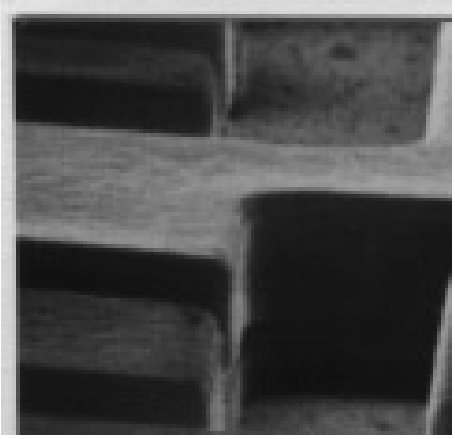
XL Family

436nm and 365nm Anti-Reflective Coating

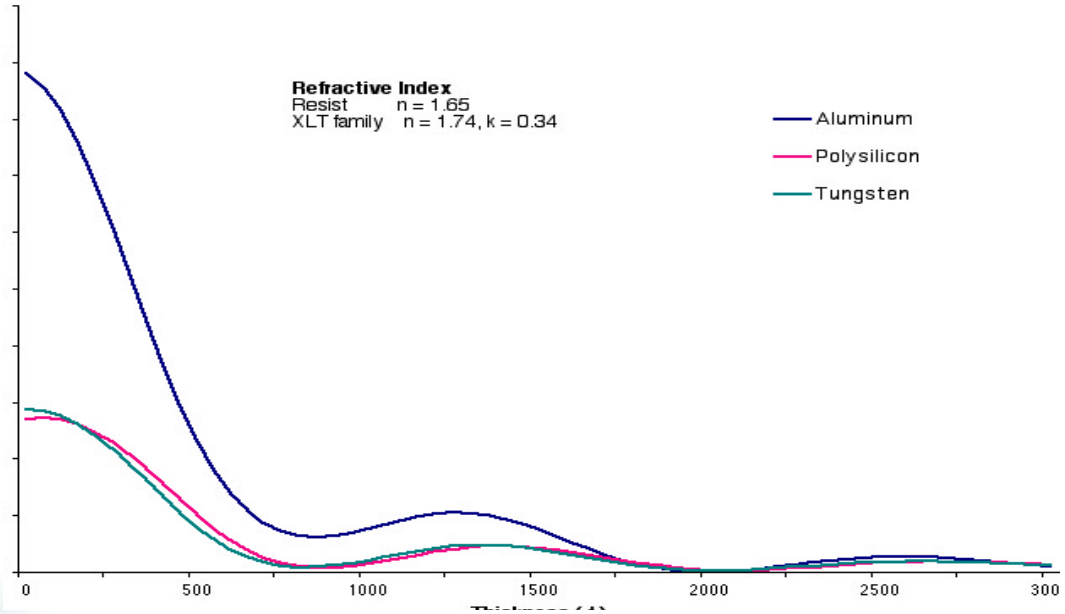


This family of products, developed for g and i-line lithography, is designed to develop simultaneously with the resist in aqueous base developer or by dry etch. This family features increased processing latitude and high absorbency levels to extend the BARC process into the sub-micron region. These features help provide increased CD control and eliminate standing waves and reflective notching.

◆ Optical Properties

Exposure Wavelenght	XLT Family		XLX Family	
	n	k	n	k
g-line	1.74	0.34	1.79	0.32
i-line	1.61	0.18	1.61	0.18

◆ XL Family Reflectivity Curve at g-line



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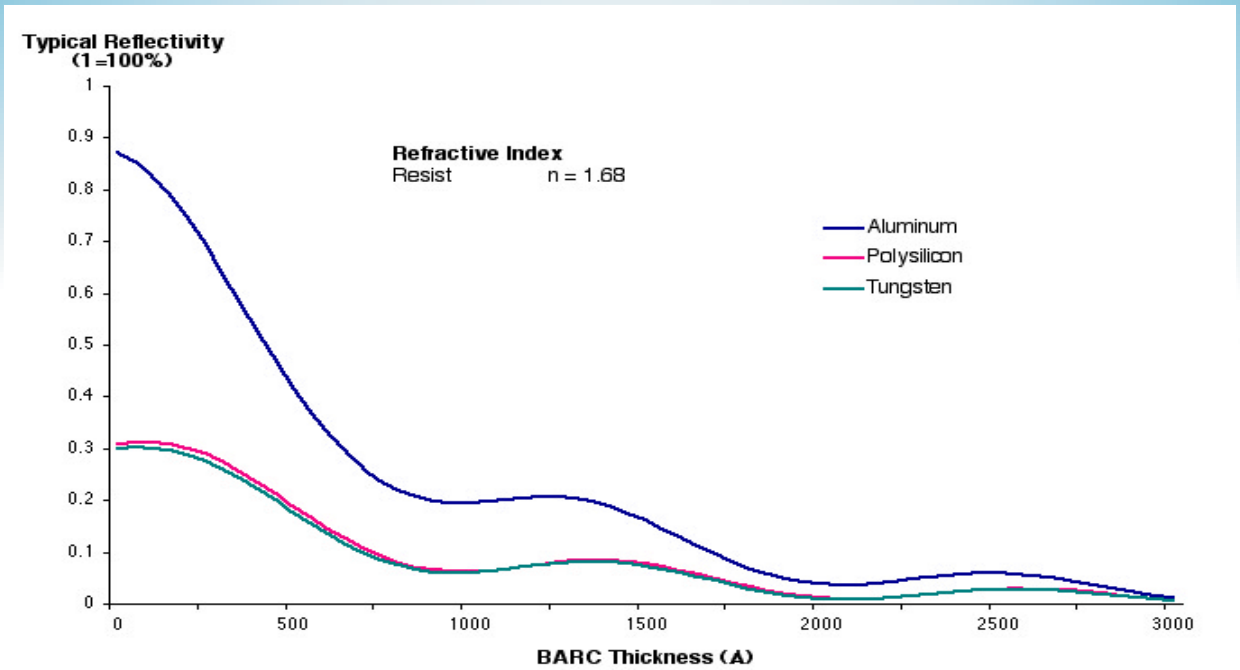
XL Family Reflectivity Curve at i-line



Processing Conditions - Wet Developable

- Coat: Apply in the same manner as resist on spin coating equipment. For most process applications, use a dynamic dispense at 700 rpm then ramp to the final 2500-5000 rpm spin for 60 seconds. Optimized spin speed as well as shorter spin times could help step coverage.
- Bake: Processing temperature ranges are as follows:

  Contact:

  1st stage: 95-125°C for 20-45 seconds

  2nd stage: 152-178° C for 40-60 seconds

  This information can be used as a general guideline for developing your process, but bake temperatures need to be determined by each user to provide optimum bake and develop latitudes.
- Resist Coat: Resist can be applied over the BARC without any modification to your standard resist spin or bake process.
- Exposure: Since there will be a reduction in reflected light, base exposure doses may need to be increased in most BARC applications.
- Resist Develop: ARC is designed to be developed simultaneously with resist in aqueous base developers (> 0.25 normal). Use your standard photoresist development parameters. A shorter develop time could help improve BARC process latitude.
- ARC Stripping: BARC can be removed in the same cleaning process used to strip post processed photoresist. This can be any common resist stripper or oxygen/ozone based plasma strippers.

Processing Conditions - Dry Etch

- Coat: Apply in the same manner as resist on spin coating equipment. For most process applications, use a dynamic dispense at 700 rpm then ramp to the final 2500-5000 rpm spin for 60 seconds. Optimized spin speed as well as shorter spin times could help step coverage.
- Bake: Processing temperature ranges are as follows:

  Contact:

  1st stage: 95-125°C for 20-45 seconds

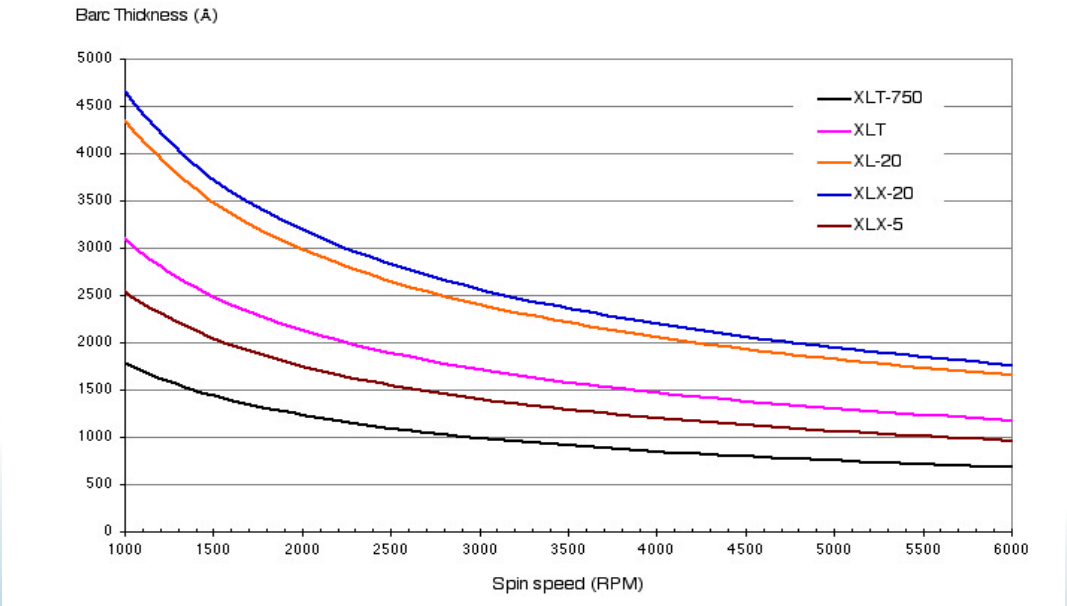
  2nd stage: 186-195° C for 60 seconds

The upper limit is approximately 200°C. This information can be used as a general guideline for developing your process, but bake temperatures need to be determined by each user to provide optimum bake and develop latitudes.

Resist Coat: Resist can be applied over the BARC without any modification to your standard resist spin or bake process.

- Exposure: Since there will be a reduction in reflected light, base exposure doses may need to be increased in most BARC applications.
- Resist Develop: Use your standard photoresist parameters.
- Developer Attack of XLSeries Film: Due to variations in hotplate and oven temperatures, an increase in the BARC bake temperature will be required if the XLX Family film is attacked by the resist development process. Increased bake temperatures will reduce XLX Family solubility in developer.
- Dry Etch: The XL family may be dry etched by plasma etch in a variety of gases including O_2, CHF_3/Ar, C_2F_6, Cl_2, and HCl
- Stripping: BARC can be removed in the same cleaning process as the strip post processed photo-resist. This can be any common resist stripper or oxygen/ozone based plasma strippers.

Spin Speed Curve



◆ Typical Properties

Product Specific Properties	XLT	XL-20	XLX-20
Thickness (Å)	1300Å±150Å	2400Å±130Å	2350Å±100Å
Spin process	5000 rpm	3000 rpm	3500 rpm
Normalized Film			
Absorbance @436nm	0.61	1.14	1.08
Viscosity (cst)	10.0	13.0	15.0
Ions (Al, Cu, Mg, Mn, K)	<200ppb	<500ppb	<50ppb
Shelf Life @ 0°C	1 year	9 months	1 year
Shelf Life @ 21°C	7 days	14 days	7 days

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