# XHRiC

## I-Line Anti-Reflective Coating

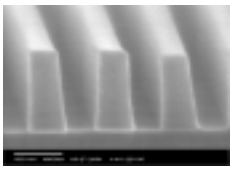
The XHRiC series of anti-reflective coatings has been specifically designed for advanced i-line dry patterning processes. The materials are highly absorbent with n-values of 1.81 and k-values of 0.34, providing excellent CD control by eliminating standing waves and reflective notching. These highly robust products have been successfully utilized in a wide range of processes at poly, gate and metalization levels for 0.25µm design rules.

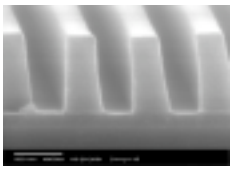
### XHRiC Features

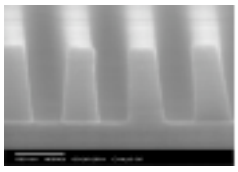
- Proven compatibility with nearly all i-line resists
- Demonstrated with the newest generation of resists
- Planar, thermal crosslinking BARC
- Spin bowl, drain compatible with EBR processes
- Optical properties are optimized for i-line performance
- Ultra low particle counts
- Low metal ions.

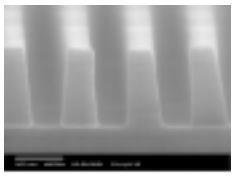
### Optical Properties

units measured in microns
n = 1.81 k = 0.34
Cauchy
A = 1.618 B = 9.08E-3 C = 2.9E-3


0.0 Focus


+0.1 Focus


+0.2 Focus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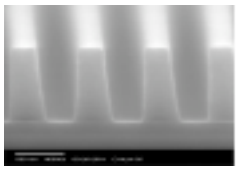
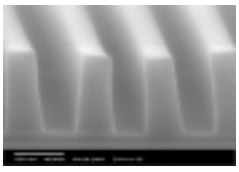
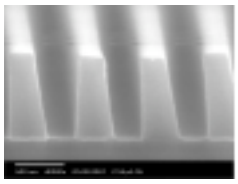
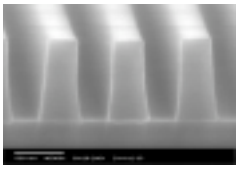
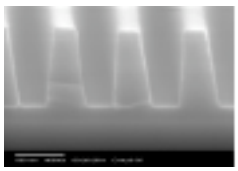

+0.4 Focus


-0.1 Focus


+0.5 Focus

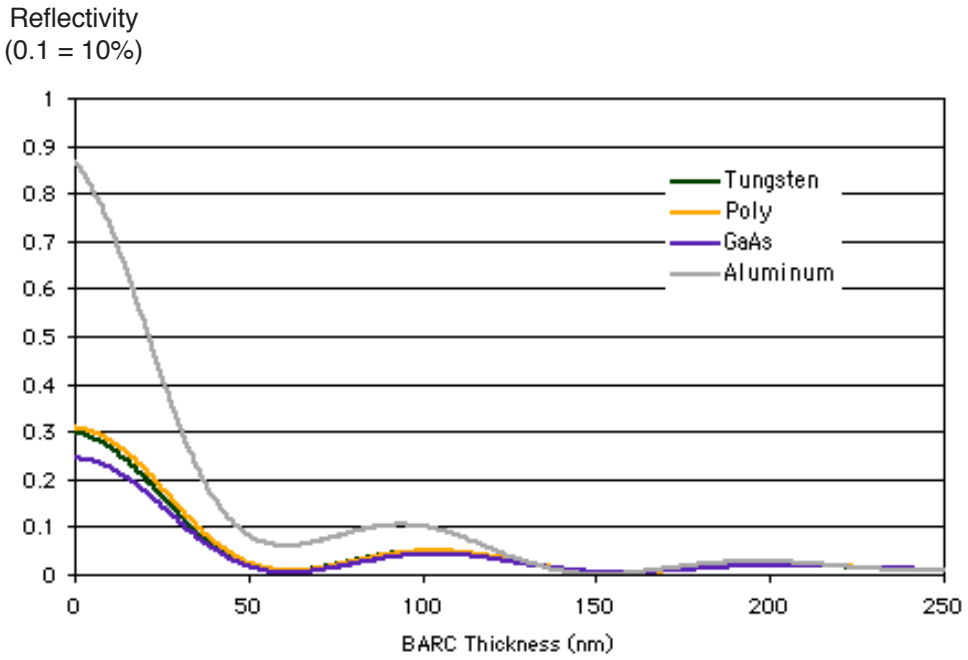

-0.2 Focus


+0.6 Focus

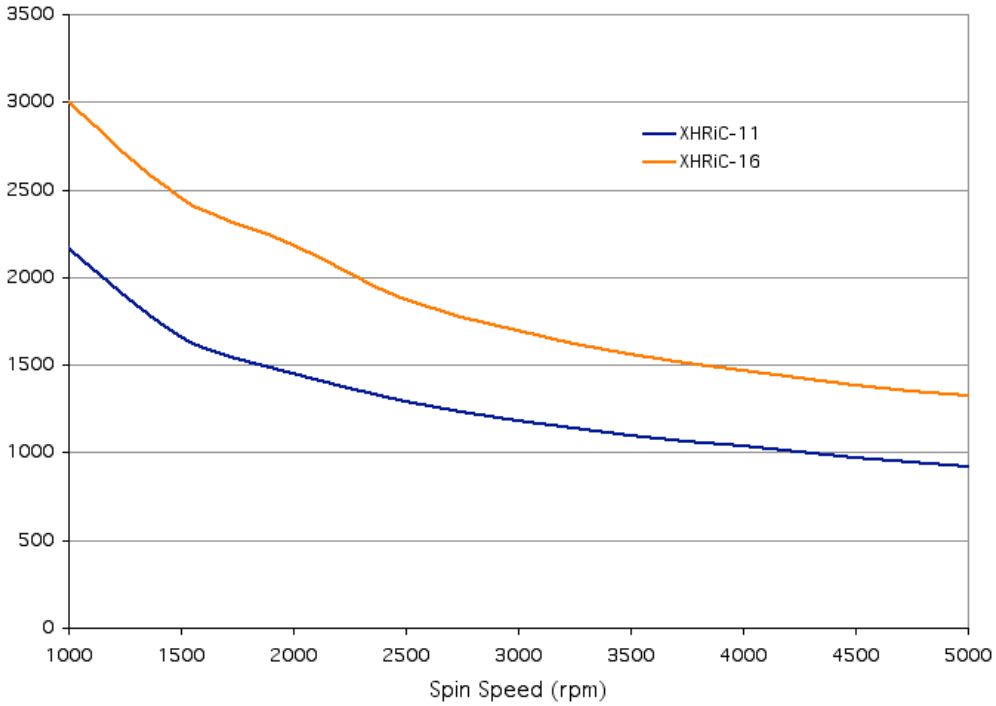
### Processing Conditions

BARC Thickness: 160nm
BARC Bake: 175˚C/ 60sec
Exposure: 220mJ/cm2
Photoresist: Arch Chemical®OiR620
Photoresist Thickness: 990nm

## XHRiC Reflectivity Curve




## XHRiC Spin Speed Curve



## XHRiC Typical Properties

| Generic Properties: | XHRiC-11 | XHRiC-16 |
|---|---|---|
| Thickness (Å) | 1100±50 | 1600±50 |
| @3500rpm, 175°C | | |
| Normalized Film Absorbance | 0.59±0.05 | 0.85±0.06 |
| Ions (Al, Cu, K) | <20ppb | <25ppb |
| Ions (Ca, Fe, Na) | <50ppb | <50ppb |
| Shelf Life @21°C | 1 year | 1 year |

## XHRiC Processing Conditions

- XHRiC is applied by a spin coat process. Apply with dynamic pump dispense in a range from 2600 - 2900 rpm and immediately (no spread spin) ramp to final 2000-5000 rpm spin for 30 seconds. Use standard EBR and backside process at 1500 rpm or less with and standard photoresist EBR solvent.
- Bake: Single stage hotplate bake at 175°C ± 20°C for 60 seconds.
- Resist Coat: Resist can be applied over XHRiC without any modification to the standard resist spin or bake process. Adhesion promoter is not recommended.
- Exposure: In most applications, exposure dose may need to be increased from that of a stand alone resist process by 20-50% due to a reduction in reflected light.
- Resist Development: Use a standard photoresist development process.
- Dry Etch: XHRiC can be dry etched using a number of plasma etch methods; including: $O_2$, $O_2/CHF_3/Ar$, $C_2F_6$, $Cl_2$, $N_2/O_2$, $O_2$/HBr and HCl.
- Stripping: XHRiC can be removed by an oxidizing plasma or an oxidizing solvent strip process.

## Brewer Science Contact Information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