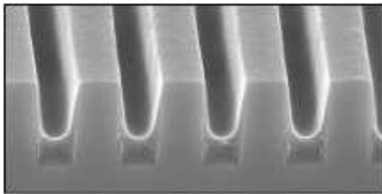
ARC i-CON®

365nm Anti-Reflective Coating

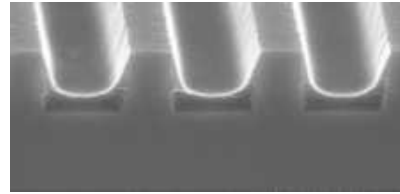
The i-CON series of anti-reflective coatings have been specifically designed for superior coverage over high topography. The materials have excellent optical properties for the control of substrate reflectivity and the enhancement of CD resolution and control. i-CON can be used to achieve feature sizes of < 0.25µm.

i-CON's formulation combines the features of high conformality and fast etch rates. It has about a 30% faster etch rate than most advanced i-line photoresists.

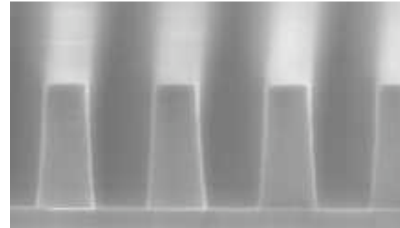


Step Height: 0.67µm
Line Width: 0.35µm
BARC Thickness 2130Å

72% Conformality 1:1
Step Coverage: 320Å
Trench Thickness: 2200Å



76% Conformality 1:2
Step Coverage: 210Å
Trench Thickness: 1800Å



DOF + 0.4µ to – 0.4µ
0.35µm Profile
0.0µ Focus
Resist: OiR620
Resist Thickness: 990nm

ARC i-CON Features

- Reflectance on Poly Silicon with 70nm coating - ~ 1.0%
- 20°C bake range (170-190°C)
- Spin bowl compatible BARC
- ≤300nm - 350nm resolution nodes
- Highly conformal on 5,000Å and 7,000Å topography

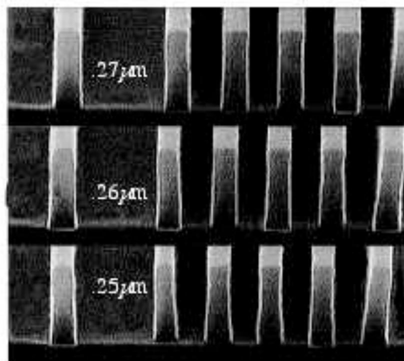
Optical Properties @ 365nm

Units measured in microns

n = 1.81 k = 0.37

Cauchy's Coefficient

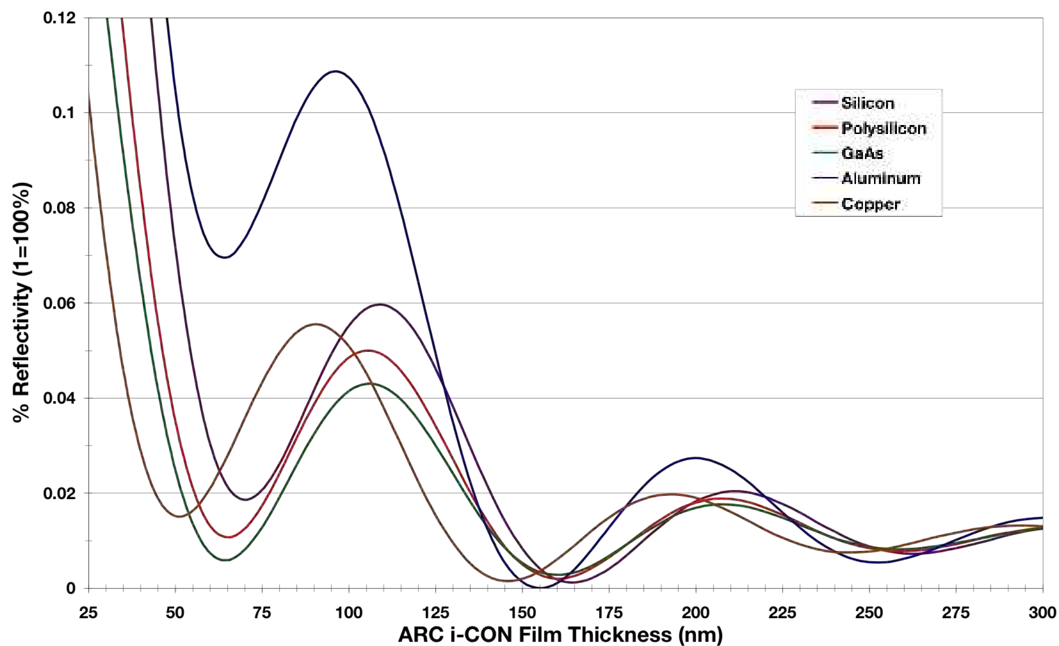
A = 1.587 B = 1.3E-02 C = 1.8E-03



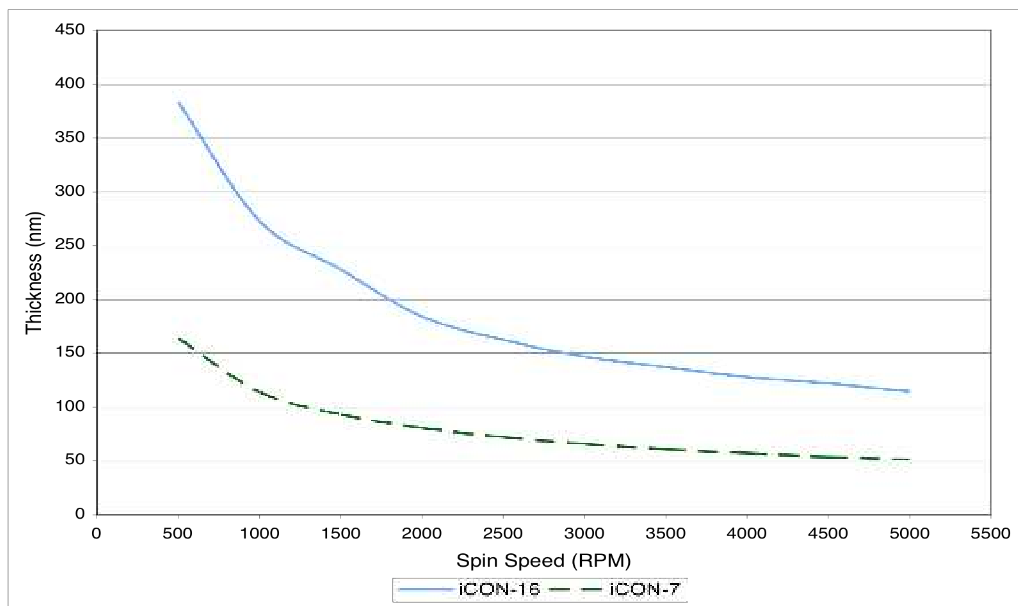
Sub = i-CON –16 1600Å
Resist = Sumitomo PFI-88
PAB = 90˚ C/ 60 sec
PEB = 110˚ C / 60 sec
Expo = NA = .57, s = 0.6
Dev = SOPD, 60 sec

SEMS compliments of
Sumitomo Chemical Co., Ltd.

ARC i-CON® Reflectivity Curve



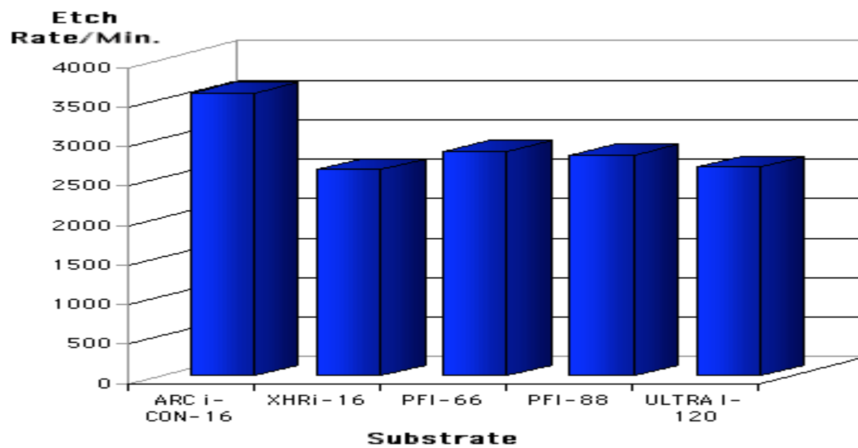
ARC i-CON® Spin Speed Curve



ARC i-CON® Processing Conditions

- Coat: i-CON is applied by a spin coat process. Apply with dynamic dispense at 700 rpm and immediately (no spread spin) ramp to final 2500 rpm spin for 60 seconds. Use standard EBR and backside process at 1500 rpm or less with a standard photoresist and EBR solvent.
- Bake: Single stage hotplate bake range of 170° C to 190° C for 60 seconds.
- Resist Coat: Resist can be applied over i-CON without any modification to the standard resist spin or bake process. Adhesion promoter is not recommended.
- Exposure: Standard exposure conditions for i-line photoresists.
- Resist Development: Use a standard photoresist development process.
- Dry Etch: i-CON can be dry etched using a number of plasma etch methods; including:
  O_2, $O_2/CHF_3/Ar$, C_2F_6, Cl_2, or HCl.
- i-CON can be removed by an oxidizing plasma or an oxidizing solvent strip process.

ARC i-CON® Etch Rate Graph



ARC i-CON® Typical Properties

Generic Properties:		
Ions (Al, Cu, Mg, Mn, K)	<25ppb	
Ions (Ca, Fe, Na)	<50ppb	
Shelf Life @ 21°C ± 5°C	12 months	
Percent Water	≤0.1%	
Liquid Particles 0.3mm/ml	≤20/ml	
Product Specific Properties	ARC i-CON-7	ARC i-CON-16
Thickness (Å) @ 2500 rpm	700Å	1600Å
Bake range 170 - 190°C		

Brewer Science, Inc.
2401 Brewer Drive
Rolla, Missouri 65401 U.S.A.
t. 573.364.0300 f. 573.364.6880

Brewer Science Europe, Ltd.
Wells House, Stephensons Way
Wyvern Business Park
Derby, DE21 6LY - England
t. 44.1332.545888 f. 44.1332.545878

Brewer Science Asia, Ltd.
1902A, The Centrium
60 Wyndham Street, Central
Hong Kong, SAR - China
t. 852.2501.4322 f. 852.2501.4311

All statements, technical information and recommendations contained herein are based on tests we believe to be accurate, but the accuracy or completeness thereof is not guaranteed and the following is made in lieu of warranty expressed or implied. Neither the seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising from the use or inability to use the product. Before using, user shall determine the suitability of the product for his intended use, and user assumes all risk and liability whatsoever in connection therewith. No statement or recommendation not contained herein shall have any force or effect unless in an agreement signed by officers of the seller and manufacturer.
ARC®, I-CON® are registered trademarks of Brewer Science, Inc.®, Rolla, Missouri, USA, WiDE, Wet i, IMBARC, NEXT and Wet I applications are pending.

Doc. Control: 660001F Effective Date 02/05/07