Conductive Coating AR-PC 5094.02 (Electra 92)

Top layer disspation of electron beam charges on insulating substrate
A new product for both polymer and novolac-based EBL resist applications

AR-PC 5094.02 Product Brief 產品說明

Electra 92 應用於電子束微影或顯微鏡分析,於絕緣基板上塗佈導電層,使電子束曝光時電荷得以逸散.
由於產品持續不斷優化，從溶劑改良到產品穩定性，塗佈品質等不斷改善，目前最新通用型版本的產品編號為：AR-PC 5094.02
產品適用於各類型阻劑，例如CSAR 62 （複合高分子copolymer）；Medusa 84 SiH (HSQ)， 酚醛樹酯（novolac)， PMMA等，涵蓋大部份阻劑類型，但不適用CAR阻劑[註1] （化學放大型）

與舊版本產品比較，及其生產狀況，請參考第七頁。

註1：適用於CAR type的版本目前開發中，待完成後發表。

產品包裝：

- ☑ 100 ml / 瓶
- ☑ 250 ml / 瓶
- ☑ 1,000 ml / 瓶

其它包裝可依客戶需求增加

出貨：

- ☑ 2 – 4週 德國運出
- ☒ 1週 國內庫存

（本產品目前暫無國內庫存)

價格詢問　其它諮詢　產品GHS標識

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AR-P 5094.02 Characterization 產品特性

- as a protective coating, this resist is not sensitive to light / radiation
  此導電保護塗佈材料對光/輻射不感應.
- thin, conductive layers for the dissipation of charges during electron exposure
  塗佈形成導電薄膜使電子束曝光時,電荷得以逸散
- for coating on all AR e-beam resists, e.g. CSAR 62, Medusa 84 SiH, except CAR resists
  適用於各類型阻劑,例如: CSAR 62, HSQ等。但不適用於化學放大型阻劑
- Improved properties compared to AR-PC 5092.02
  由前版本持續優化改良
- easy removal with water after exposure
  曝光後可輕易以水去除
- polyaniline-derivative dissolved in water
  主要成分為溶於水的聚苯胺衍生物

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AR-PC 5094.02 Property I		
Parameter		AR-PC 5094.02
Solids content 固型份	%	2
Viscosity@25℃ 黏度	mPa.s	1
Film thickness@4000 rpm 膜厚	nm	42
Film thickness@1000 rpm膜厚	nm	100
Resolution / Contrast	nm/--	- -
Storage temperature* 儲存溫度	℃	8 - 12

* Product is guaranteed 6 months shelf life from the data of sale if stored correctly.
  在正確的儲存條件下,產品保證的有效期為銷售日起6個月.
* Product can also be used without guarantee until the date indicated on the label.
  在無提供保證的情況下,產品可使用至標籤上所示的有效期.

AR-PC 5094.02 Property II		
Conductivity (@ 60nm FT)	S/m	1.2

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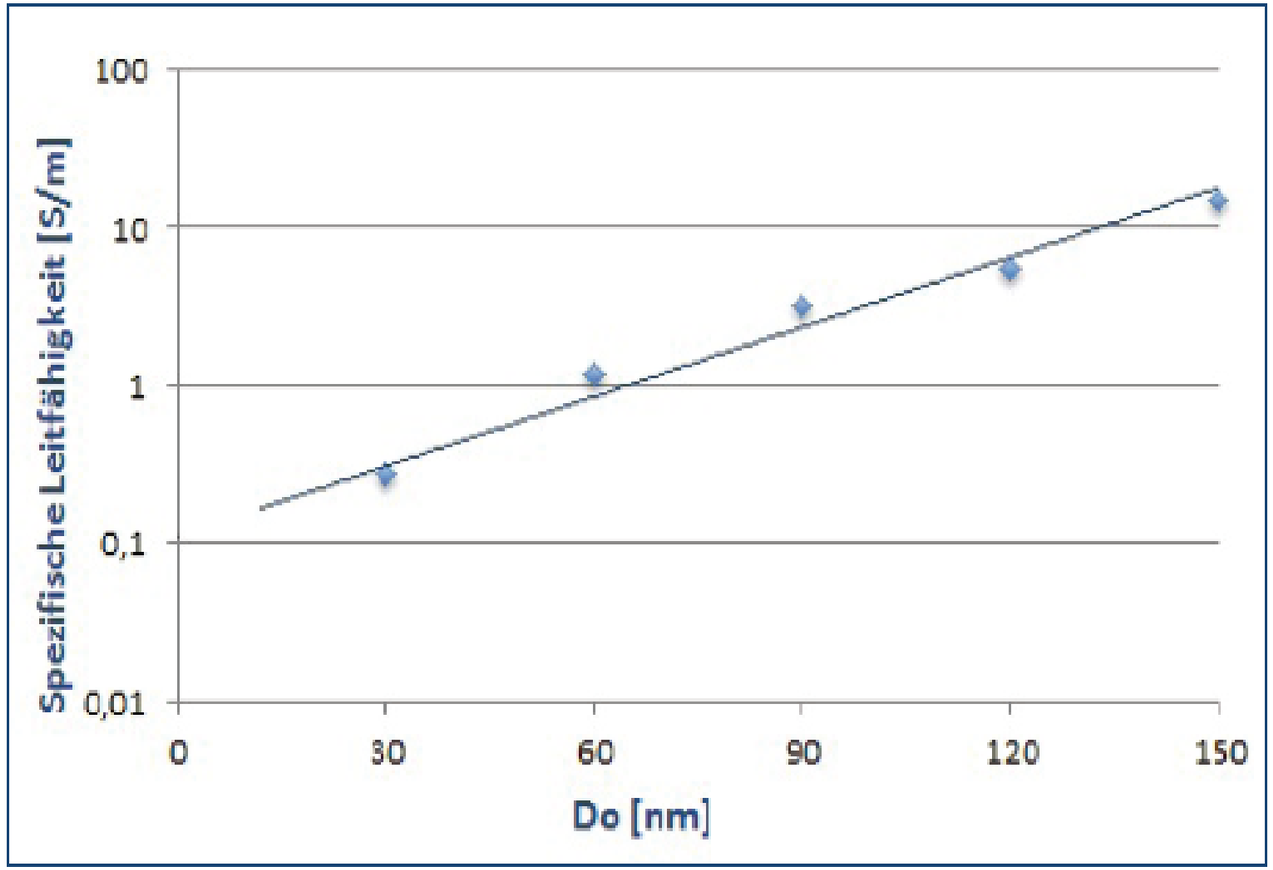
Conductivity

Conductivity measurements of AR-PC 5094.02 layers obtained after spin deposition. For thinner films, the resistance increases and the conductivity decreases.

AR-PC 5094.02的導電度於塗佈後測得. 膜厚越低,其導電阻抗增加而導電度下降. 如下圖.



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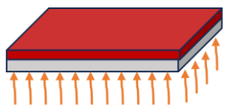
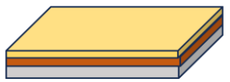
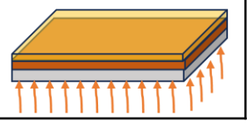
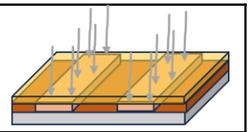
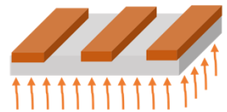
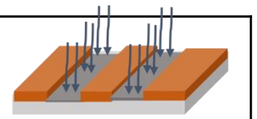
Process conditions – conduction coating for PMMA resist

This diagram shows exemplary process steps for resist Electra 92 - AR-PC 5094.02 and PMMA-resist AR-P 664.04. All specifications are guideline values which must be adapted to own specific conditions.

本製程參數是以 AR-PC 5094.02 (Electra 92) 與AR-P 664.04 (PMMA resist)為範例. 建議使用者依實際材料組合調整參數.

1st Resist Coating 	AR-P 662.04 on insulating substrates (quartz, glass, GaAs) 140nm@4000 rpm, 60 sec
Soft-bake (± 1 ℃) 	150 °C, 2 min hot plate or 150 °C, 30 min convection oven
2nd Conductive coating 	AR-PC 5094.02 60 nm@2000rpm, 60 sec
2nd soft-bake (± 1 ℃) 	90 °C, 2 min hot plate or 85 °C, 25 min convection oven
E-beam exposure 	ZBA 21, 20 kV Exposure dose (E_0): 110uC/cm^2 (AR-P 662.04, 140 nm)

Removal (Conductive layer) 	AR-PC 5094.02 DI-water, 60 sec
Development (21 – 23 ℃ ± 0.5 ℃) 	AR-P 662.04 AR 600-56, 2 min Stop: AR 600-60, 30 sec
Post-bake (optional) 	130 °C, 1 min hot plate or 130 °C, 25 min convection oven for slightly enhanced plasma etching stability
Users-specific process 	Generation of e.g. semiconductor properties, etching, sputtering
Removal 	AR 600-71 or O2 plasma ashing

Processing instruction

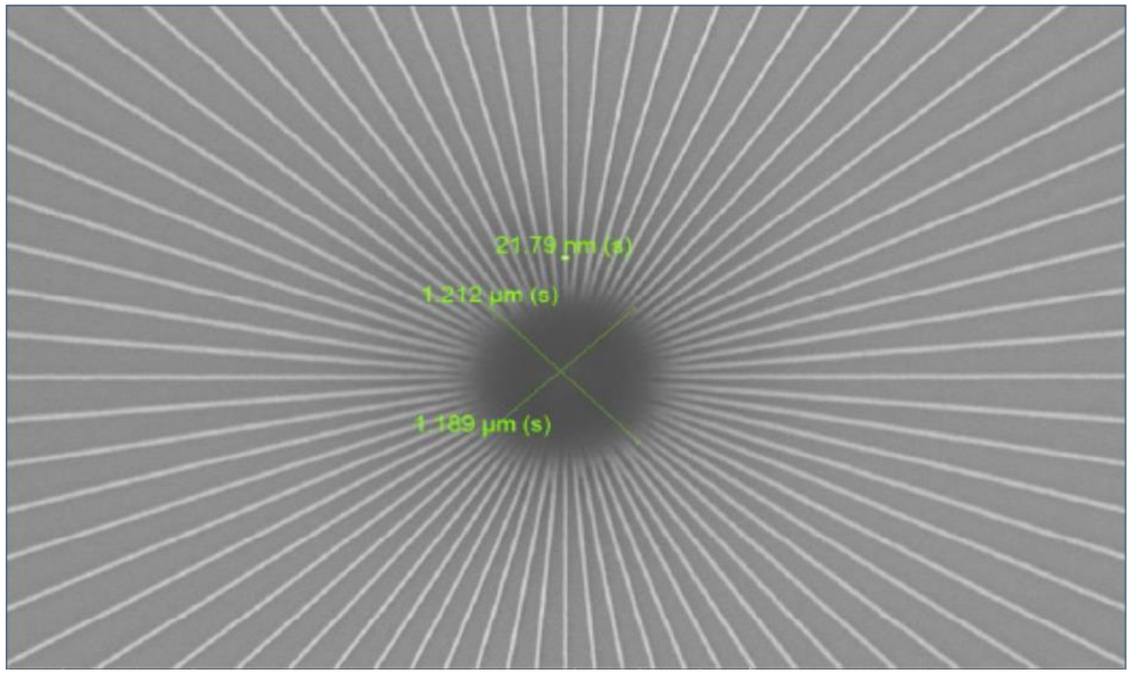
The conductivity may be varied by adjusting the thickness with different rotational speeds. Thicker layers of 90 nm thus have a 2.5 times higher conductivity as compared to 60 nm thick layers. For the build-up of an even conductive layer, the substrate should be wetted with the resist solution before the spin process is started.

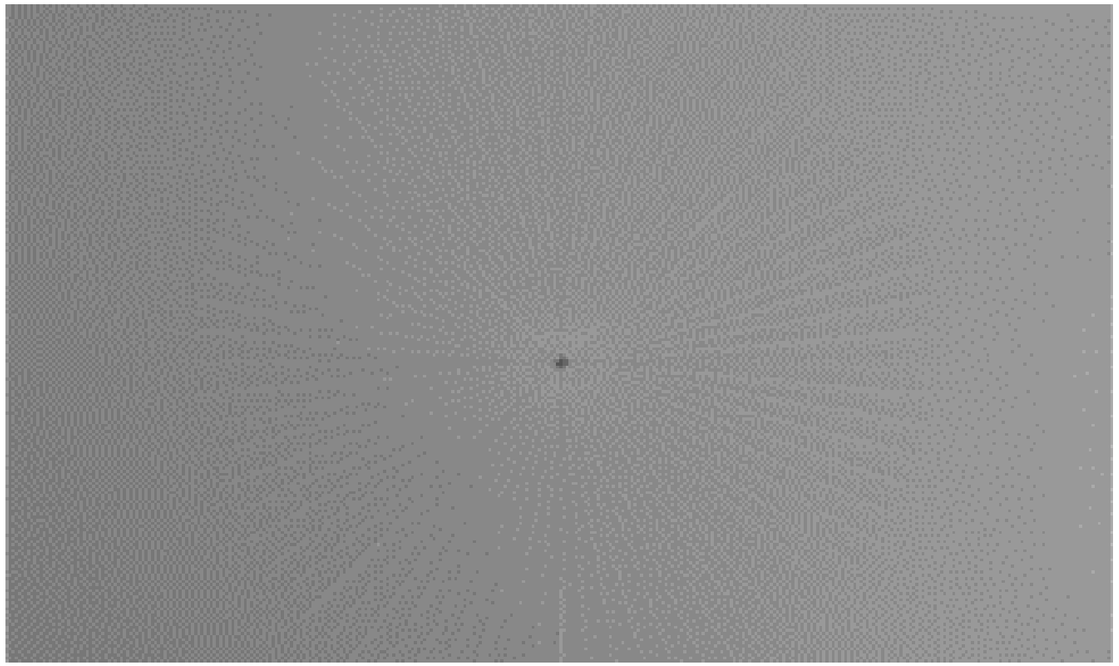
導電度可依導電層厚度加以調節. 90nm厚的導電層比60nm厚其導電度高約2.5倍.

導電層塗佈前先以阻劑的溶劑濕潤基板可獲得較均勻的厚度.

Medusa 84 SiH (HSQ) on quartz with AR-PC 5094.02 導電塗層與HSQ搭配範例

Siemens star written on quartz with the new conductive coating Electra 92 (AR-PC 5094.02) spun on to prevent charge build-up. This variant of Electra 92, specially developed for HSQ, has excellent coating and adhesion properties.
© B. Drent, AMOLF NanoLab Amsterdam
Electra 92 (AR-PC 5094.02)為新版導電塗層，對HSQ有良好塗佈特性及黏著度。
下圖為Medusa 84 SiH搭配新版Electra 92於石英基板寫出西門子星標的範例。





NextStep
Ready for NextStep

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ALLRESIST

Electra 92 variants comparison 各版本優化比較表及生產狀況

Properties		AR-PC 5090.02	AR-PC 5091.02	AR-PC 5092.02	AR-P 5094.02
Solids content 固型份	%	2	2	2	2
Viscosity@25℃ 黏度	mPa.s	1	1	1	1
Film thickness 膜厚	nm	42 – 100 @4000 – 1000rpm	31 – 80 @4000 – 1000rpm	42 – 100 @4000 – 1000rpm	42 – 100 @4000 – 1000rpm
Specific conductivity (@60nm FT) 導電度	S/m	~ 10^0	~ 10^0	~ 10^0	1.2
Conductive polymer (高分子類型)		polyaniline-derivative	polyaniline-derivative	polyaniline-derivative	polyaniline-derivative
Solvent (使用溶劑)		Water & IPA	Water & IPA	Water	water
Resist compatibilities (適用阻劑類型)		non-novolac PMMA co-polymer (CSAR 62) HSQ (Medusa 82)	novolac base resist	(universal type) novolac base resist PMMA co-polymer (CSAR 62) HSQ (Medusa 82) and others	universal except CAR*
Production status		discontinue	discontinue	phase out (on-demand)*	routine
Remark 說明		*1 適用於化學放大型(CAR resist)的版本開發中，將於近日發表。 *2 on-demand為無固定排程，需預定生產。可能會有最小數量，或等待生產批次。			