Positive Photoresists AR-P 3100 series

Adhesion-enhanced resists for masks and fine scale application

AR-P 3100 series 產品說明

AR-P 3100 系列，產品配方強化與基板介面的接著度,適合各類精密微影製程的正型阻劑。

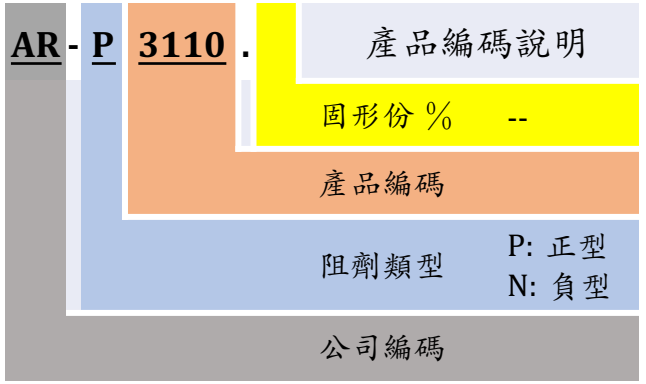
目前產品依配方與厚度範圍有如下序號：

		AR-P 3110	AR-P 3120	AR-P 3170
Film thickness@4000rpm	um	1	0.55	0.12
Resolution	um	0.5	0.4	0.4
Contrast		3.0		
Flash point	°C	46		
Storage 6 months★1	°C	10 - 18		
Production status★2		on-demand	routine	routine

★1 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

★1 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

★2 Production status：
on-demand：產品無固定排程生產，需先詢問價格。可能會有最小量訂單，或需等待批次生產排程。
Routine： 產品固定排程生產，交貨期約 2 - 4 週。



產品包裝:

✅ 250 ml/瓶
✅ 1 L /瓶
其它包裝可依客戶需求增加.

出貨:

✅ 2– 4 週。德國運出。 (AR-P 3120 / AR-P 3170)
(AR-P 3110無固定生產排程，需先詢問。

✏️ 價格詢問 ✏️ 其它諮詢 📤 AR-P 3100 series GHS 標識

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Characterization 產品特性

- broadband UV, i-line, g-line
  曝光波長: 寬頻紫外線, i-line (365nm) , g-line (436nm)
- high photosensitivity, high resolution
  高敏感度,高解析度
- strong adhesion to critical glass/chromium surfaces for extreme stresses during wet-chemical etching processes
  對玻璃,鉻等介面接著度良好,適合濕蝕刻製程
- for the production of CD masters and lattice structures
  適合CD母片及各式點陣結構
- AR-P 3170 also suitable for laser interference lithography
  AR-P 3170可用於雷射干涉微影
- plasma etching resistant
  耐電漿蝕刻
- combination of novolac and naphthoquinone diazide
  主要成份為酚醛樹酯及疊氮基萘醌
- safer solvent PGMEA
  使用較安全溶劑丙二醇單甲醚醋酸酯

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Property I				
Parameter		AR-P 3110	AR-P 3120	AR-P 3170
Solids content	%	28	21	8
Viscosity@25°C	mPa.s	12	5	2
Film thickness@4000rpm	um	1.00	0.55	0.12
Resolution	um	0.5	0.4	0.4
Contrast		3.0	3.0	3.0
Flash point	°C	42		
Storage 6 months	°C	10 - 18		

Property II			
Glass trans. temperature	°C	108	
Dielectric constant		3.1	
Cauchy coefficients	N_0	1.621	
	N_1	65.6	
	N_2	195.6	
Plasma etching rate 5 Pa, 240-250 V Bias	nm/min	Ar-sputtering	7
		O_2	165
		CF_4	38
		80 CF_4 +16 O_2	89

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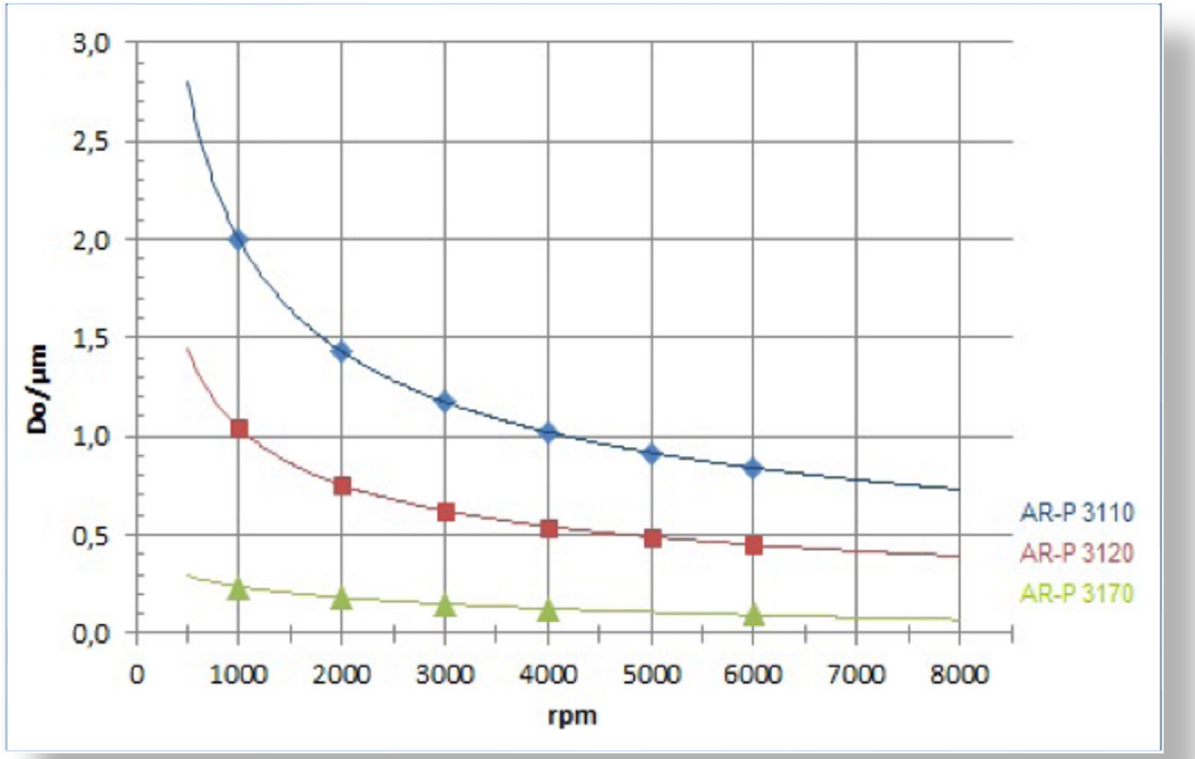
AR-P 3100series Spin curve



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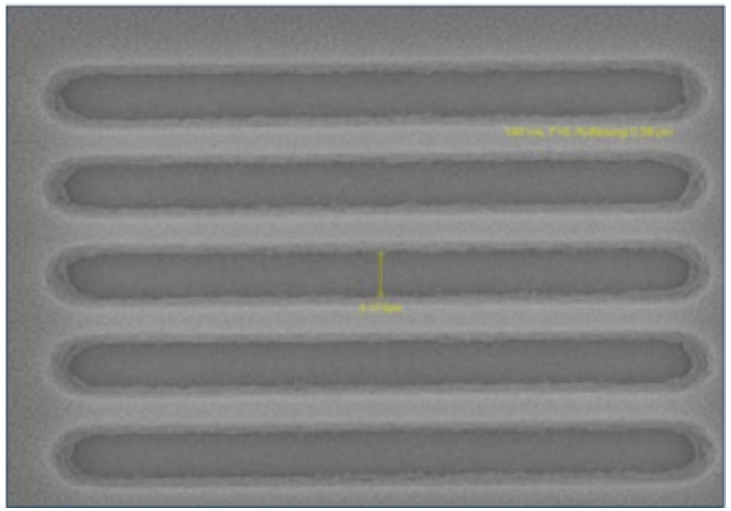
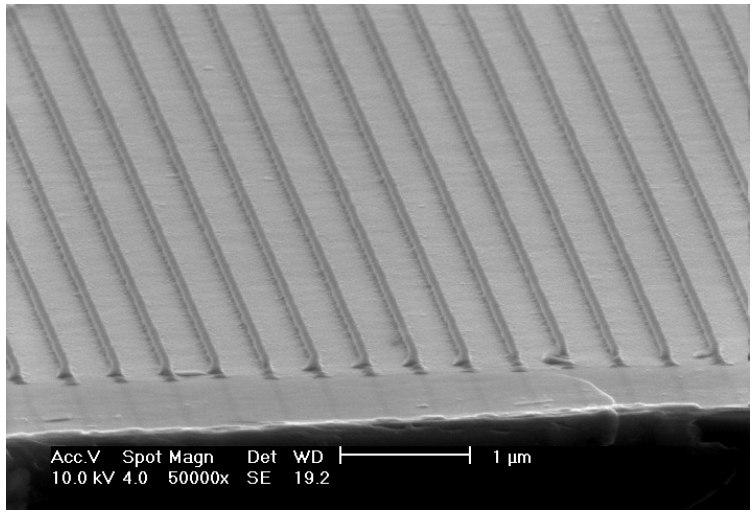
Structure resolution



AR-P 3120 Film thickness 0.6 µm Resist structures 0.38 µm L/S

Resist structure



70-nm-lines generated with AR-P 3170 by laser interference lithography

Process parameter

Substrate	Si 4” wafer
Soft-bake	95 °C x 90 sec, hot plate
Exposure	i-line stepper (NA: 0.65)
Development	AR 300-47,1:1, 60 sec,20°C

Process chemicals

Adhesion promoter	AR 300-80
Developer	AR 300-26, AR 300-47
Thinner	AR 300-12
Remover	AR 300-76, AR 300-73

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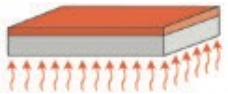
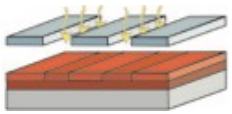
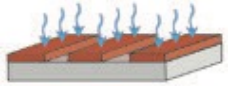
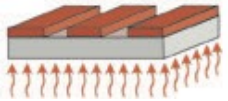
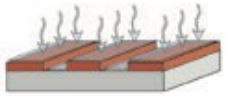
This diagram shows exemplary process steps for AR-P 3100 resists. All specifications are guideline values which must be adapted to own specific conditions. For further information on processing, 👉“ Detailed instructions for optimum processing of photoresists”. For recommendations on wastewater treatment and general safety instructions, 👉”General product information on Allresist photoresists”.
圖示AR-P 3100系列產品製程參數的範例. 所有參數為參考值,使用者應依設備環境實際狀況加以調整

Coating 	AR-P 3110	AR-P 3120	AR-P 3170
	1.0 um 4000rpm x 60 sec	0.55um 4000rpm x 60 sec	0.12um 4000rpm x 60 sec
Soft bake (±1 °C) 	100°C x 1min hot plate, or		
	95°C x 25 min convection oven		
UV exposure 	Broadband UV, 365nm, 405nm, 436nm/Dose (E0, stepper)		
	70 mJ/cm^2	65 mJ/cm^2	60 mJ/cm^2
Development (21-23±0.5°C) puddle 	AR 300-26 (2 : 5)	AR 300-47 (5 : 1)	AR 300-47 (3 : 1)
	60 sec	60 sec	60 sec
Rinse	DI water, 30 sec		
Post-bake (optional) 	115°C x 1 min hot plate, or		
	115°C x 25 min convection oven		
Customer specific technology 	Generation of semiconductor property		
Removal 	AR 300-70 or O2 plasma ashing		

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Reference data for process tuning

Development recommendations

Resist	Developer		
	AR 300-26	AR 300-35	AR 300-47
AR-P 3110	1: 2 to 1 : 3	pure	6 : 1
AR-P 3120	1 : 3	5 : 1	5 : 1
AR-P 3170	1 : 4	2 : 1	3 : 1

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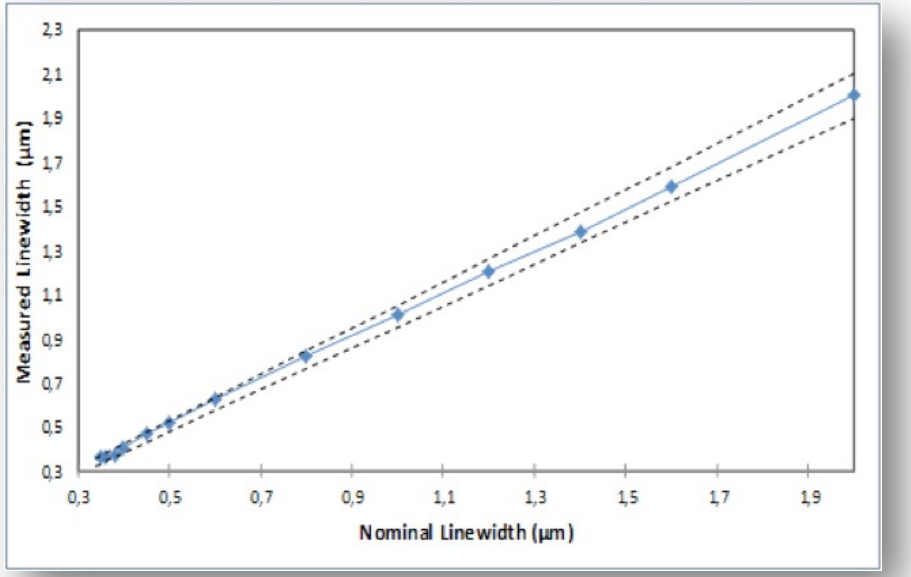
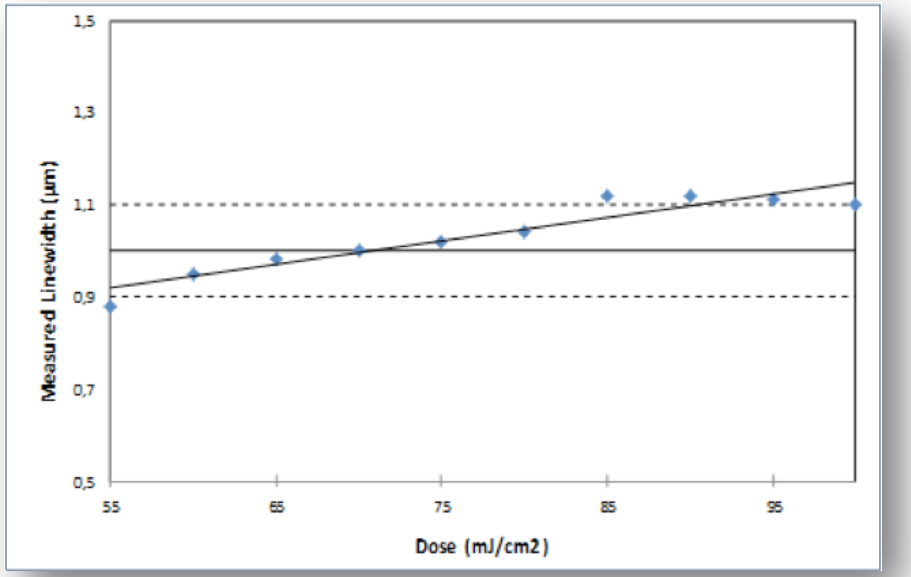
Linearity



Up to a structure width of 0.38, a very good agreement is obtained. REM measurement: Thickness 560 nm, i-line stepper (NA: 0.65 NA), Developer AR 300-47 1 : 1.

Optimum exposure dose



Underexposure leads in the case of complete development (more than 55 ml/cm2) to narrower trenches, while overexposure results in a widening of trenches.

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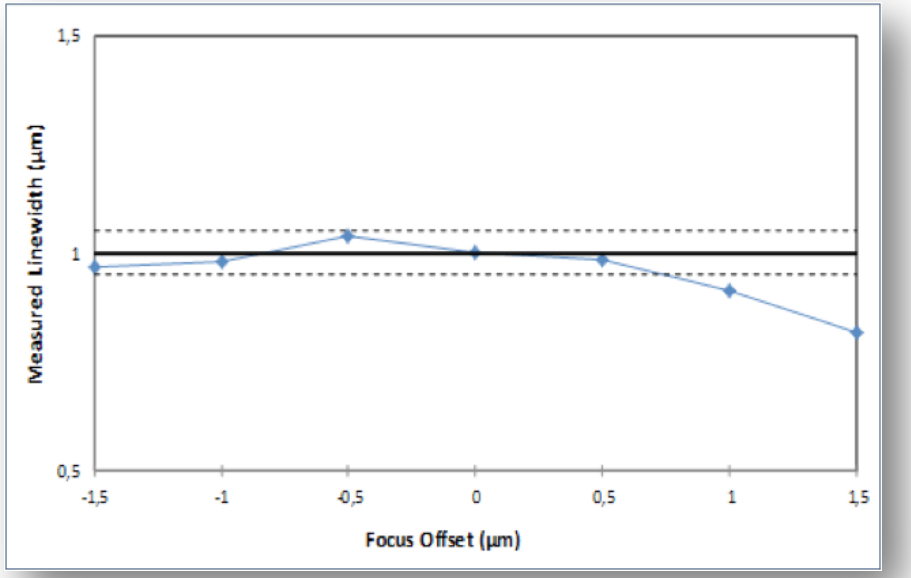
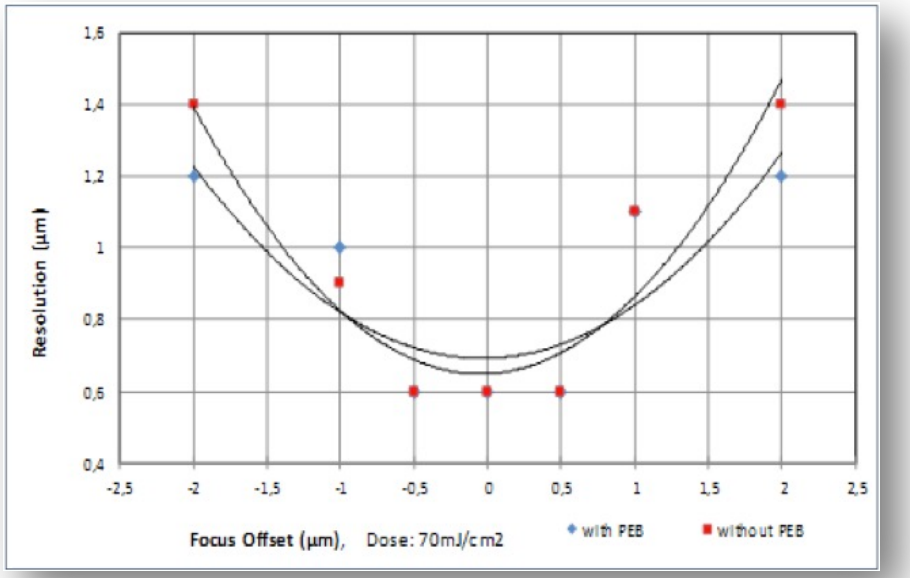
Focus variation



The intended structure sizes can here be realised by varying the focus between -1.5 to 0.8 (parameter see grafic linearity).

Focus variation (with and without PEB)



Without PEB, a higher resolution is obtained since the focus curve is steeper (PEB, 90 ˚C, 60 s).

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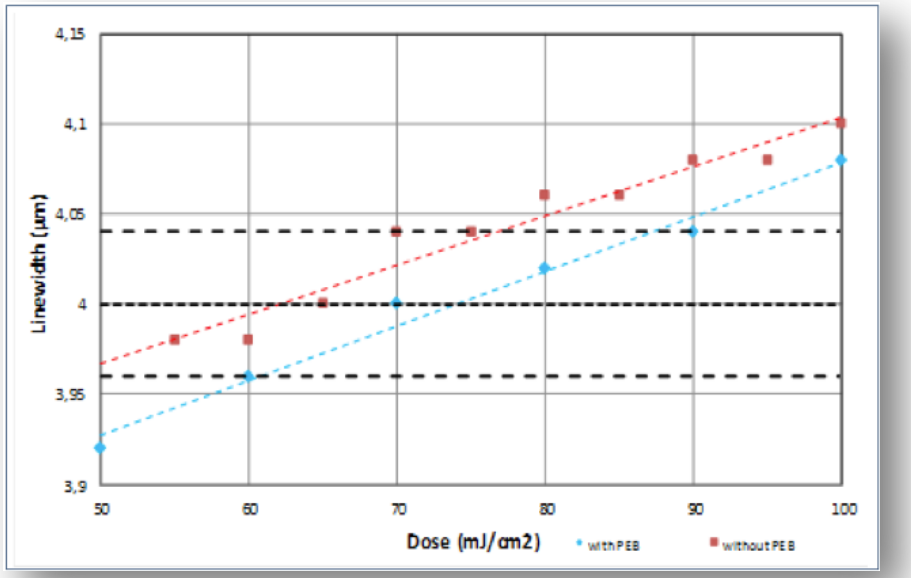
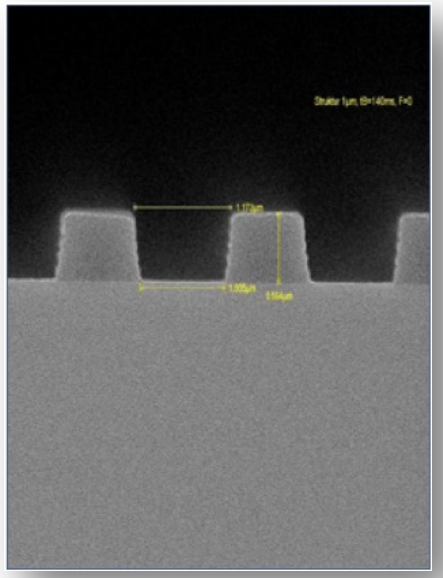
Optimum exposure dose

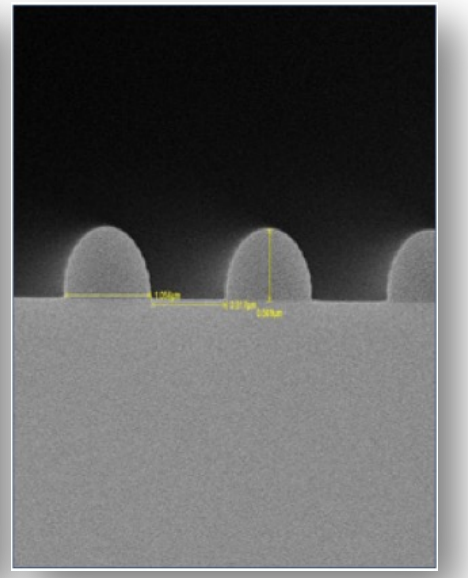


Optimum dose, with hard bake (110 ˚C) and without hard bake. The additional hard bake requires 15 % more light (PEB, 90 ˚C, 60 s).

Thermal properties of resist structures



Un-tempered



Hard bake 115 ˚C