Standard Positive Photoresists AR-P 3500series

For the production of integrated circuits with wide process range

AR-P 3500 series 產品說明

AR-P 3500 系列產品為標準正型光阻,敏感度高，製程穩定,適合各類半導體製程。
目前產品依配方與厚度範圍有如下序號：

		AR-P 3510	AR-P 3510T	AR-P 3540	AR-P 3540T
Film thickness@4000rpm	um	2.0	2.0	1.4	1.4
Resolution	um	0.8	0.6	0.7	0.5
Contrast		4.0	4.5	4.5	5.0
Flash point	°C	46	46	46	46
Storage 6 months★1	°C	10 - 18			
Production status★2		routine	routine	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
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.

✏️ 價格詢問　✏️ 其它諮詢

出貨:

✅ 2 – 4 週。德國運出。
❎ 1 週。國內庫存。
(目前暫無國內庫存)

📩 AR-P 3500 GHS 標識
📩 AR-P 3500T 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
- very good adhesion properties.
  與基板介面接著度良好
- 3500 T: robust processing, suitable for TMAH developer 0.26n
  AR-P 3510T/3540T製程穩定,適合四甲基氫氧化銨(TMAH 0.26n)顯影
- plasma etching resistant, temperature-stable up to 120 °C
  耐電漿蝕刻,耐溫可達120°C
- 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 3510	AR-P 3510T	AR-P 3540	AR-P 3540T
Solids content	%	35	32	31	28
Viscosity@25°C	mPa.s	33	38	18	21
Film thickness@4000rpm	um	2.0	2.0	1.4	1.4
Resolution	um	0.8	0.6	0.7	0.5
Contrast		4.0	4.5	4.5	5.0
Flash point	°C	46			
Storage 6 months	°C	10 - 18			

Property II			
Glass trans. temperature	°C	108	
Dielectric constant		3.1	
Cauchy coefficients (AR-P 3540T)	N_0	1.627	
	N_1	71.4	
	N_2	164.8	
Plasma etching rate 5 Pa, 240-250 V Bias	nm/min	Ar-sputtering	7
		O_2	165
		CF_4	37
		80 CF_4 +16 O_2	88

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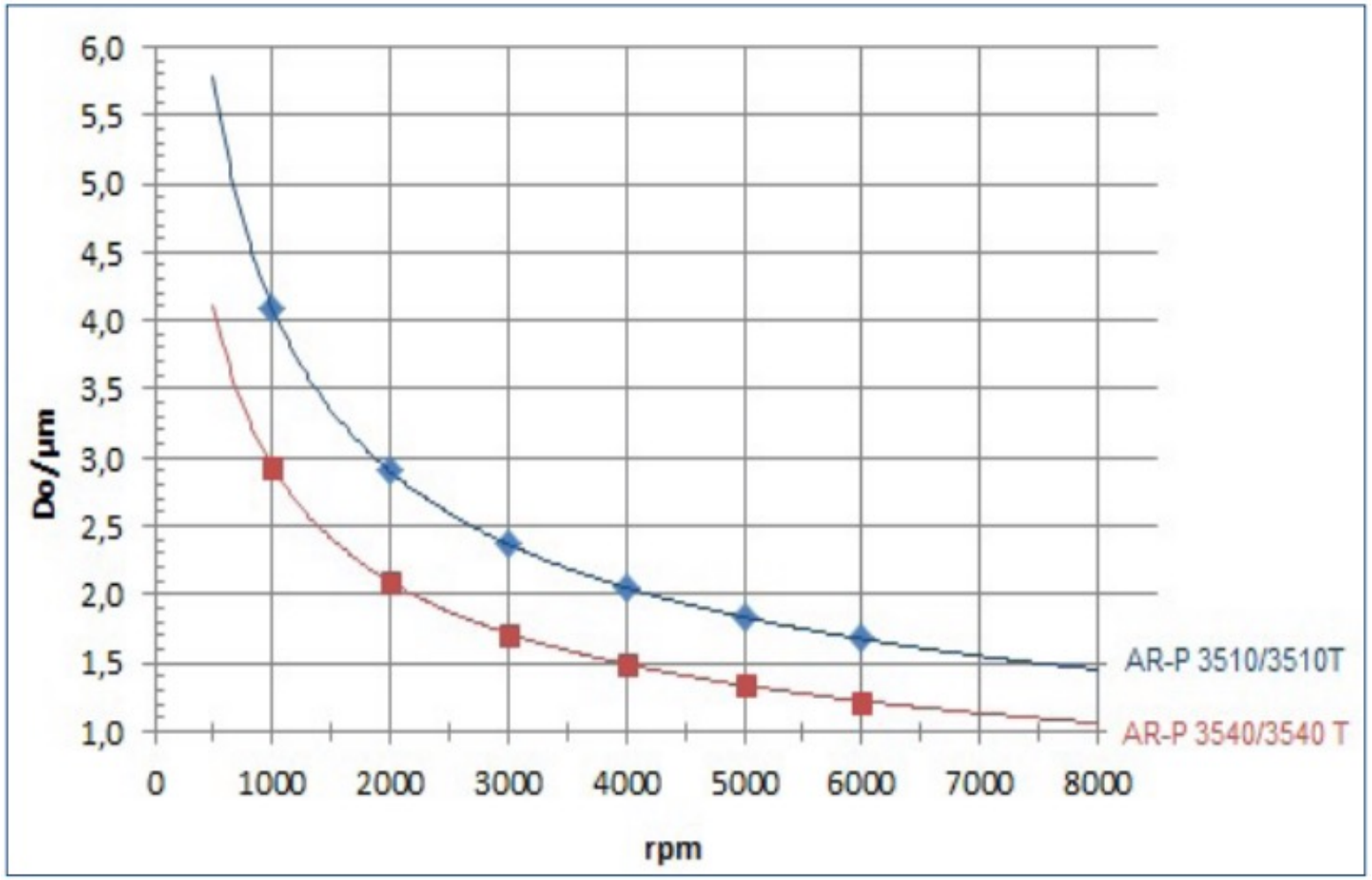
AR-P 3500 series Spin curve



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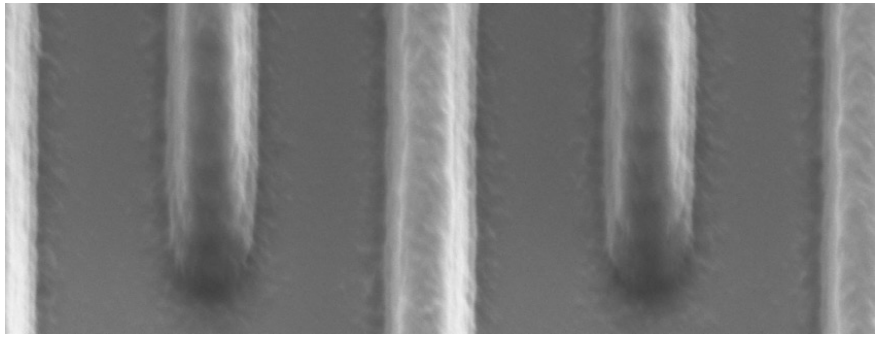
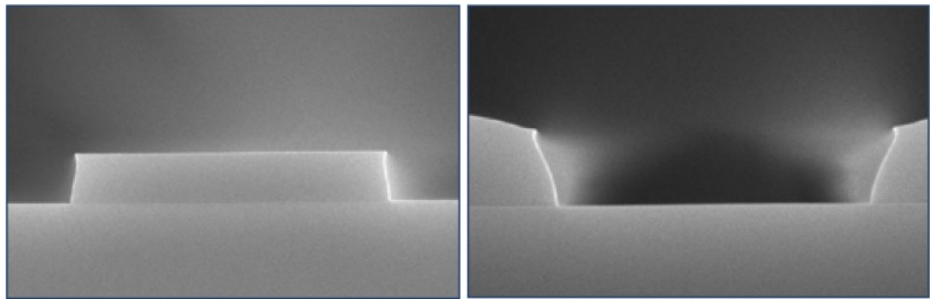
Structure resolution



AR-P 3540 T Film thickness 1.5 µm Resist structures 0.5 µm

Temperature stability



Structures without hard bake and with tempering at 140 °C (hot plate, 1 mm) with AR-P 3540

Process parameter

Substrate	Si 4” wafer
Soft-bake	95 °C x 90 sec, hot plate
Exposure	g-line stepper (NA: 0.56)
Development	AR 300-44, 60 sec ,22°C

Process chemicals

Adhesion promoter	AR 300-80
Developer	AR 300-26/AR 300-44(T)
Thinner	AR 300-12
Remover	AR 300-76, AR 300-76(T)

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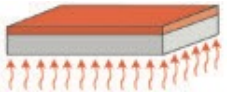
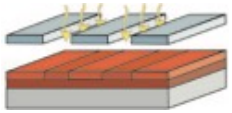
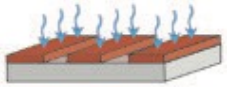
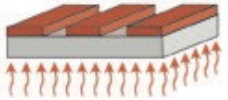
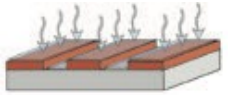
This diagram shows exemplary process steps for AR-P 3500series resists. All specifications are guideline values which must be adapted to own specific conditions. For further information on processing, ☛" Detailed instructions for optimum processing of photoresists". For recommendations on wastewater treatment and general safety instructions, ☛"General product information on Allresist photoresists".
圖示AR-P 3500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 3510	AR-P 3540T	
	2 um@4000rpm x 60 sec	1.4 um@4000rpm x 60 sec	
Soft bake (±1 °C) 	100°C x 1 min, hot plate. or,		
	95°C x 25 min, convection oven		
UV exposure 	Broadband UV, 365nm, 405nm, 436nm/Dose (E_0, stepper)		
	55 mJ/cm^2	120 mJ/cm^2	
Development (21-23±0.5°C) puddle 	AR 300-26, (1 : 5) x 60 sec	AR 300-44 x 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 properties or lift-off		
Removal 	AR 300-70 or O2 plasma ashing		

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Reference data for process tuning

Development recommendations

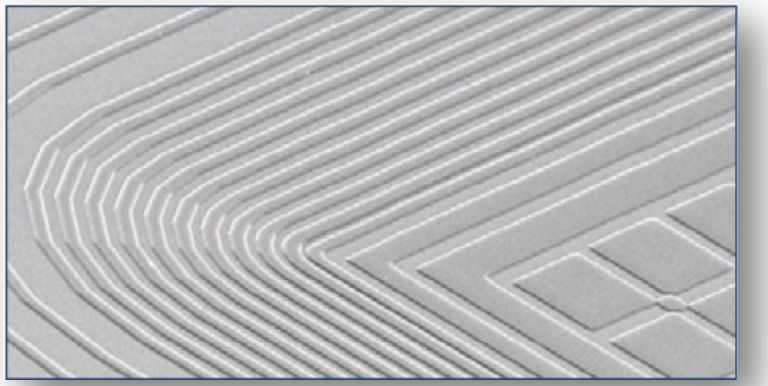
Resist	Developer		
	AR 300-26	AR 300-35	AR 300-40
AR-P 3510/AR-P 3540	1 : 5	1 : 1	AR 300-47, 1 : 1
AR-P 3510T/AR-P 3540T	1 : 2	undilute	AR 300-44

Focus width AR-P 3540 T g-line stepper

Ridge	DOF@230mJ	Dose range
1.5 um	> 2.0 um	110 – 260 mJ/cm^2
1.0 um	> 1.5 um	130 – 260 mJ/cm^2
0.7 um	> 1.25 um	160 – 250 mJ/cm^2
0.5 um	> 1.0 um	190 – 240 mJ/cm^2

Best edge steepness: 180-200 mJ/cm^2

Resist structures



AR-P 3500
Film thickness 2 µm Resist structures 5 µm

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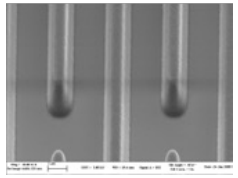
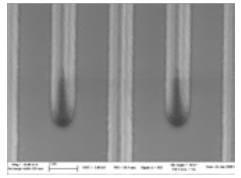
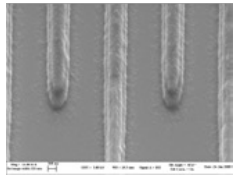
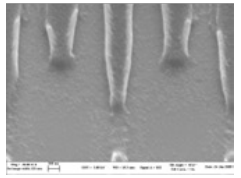
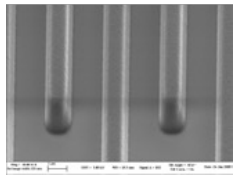
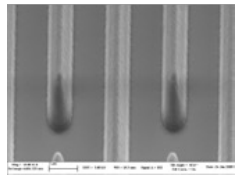
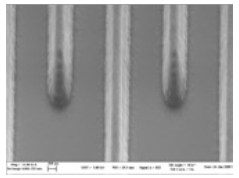
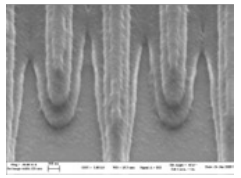
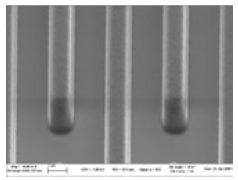
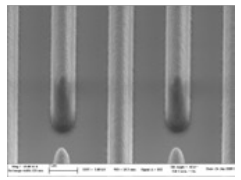
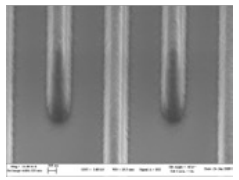
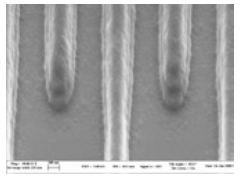
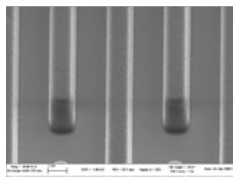
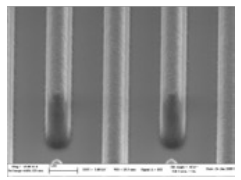
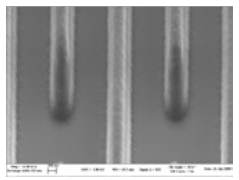
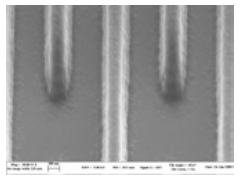
Focus width

Film thickness 1.5 µm on Si-wafer, dose: 230 mJ/cm²

Focus	1.5 um L/S	1.0 um L/S	0.7 um L/S	0.5 um L/S
- 1.0				
- 0.75				
- 0.5				
- 0.25				

Tempering:

95 °C, 90 s, hot plate (contact), exposure: g-line stepper (NA: 0.56; 0.75 s).
Development: AR 300-44, 60 s, 22 °C, puddle

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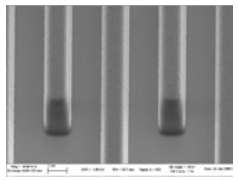
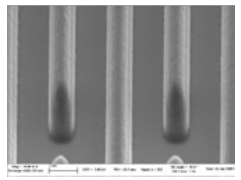
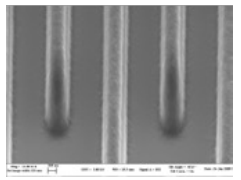
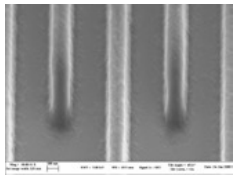
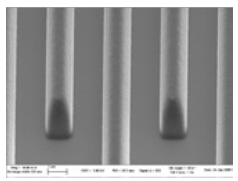
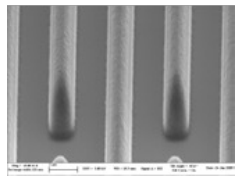
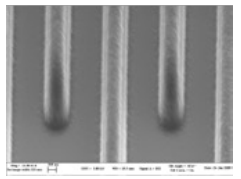
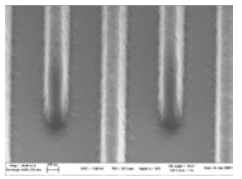
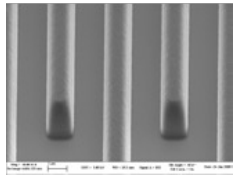
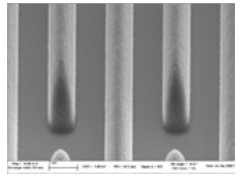
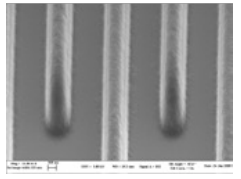
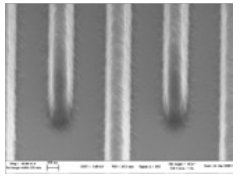
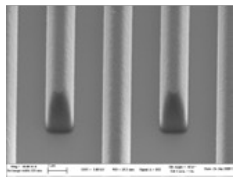
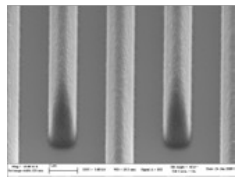
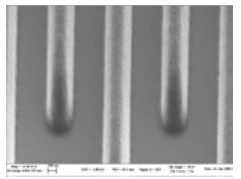
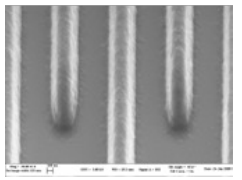
Focus width

Film thickness 1.5 µm on Si-wafer, dose: 230 mJ/cm²

Focus	1.5 um L/S	1.0 um L/S	0.7 um L/S	0.5 um L/S
0.0				
+ 0.25				
+ 0.5				
+ 0.75				

Tempering:

95 °C, 90 s, hot plate (contact), exposure: g-line stepper (NA: 0.56; 0.75 s).
Development: AR 300-44, 60 s, 22 °C, puddle

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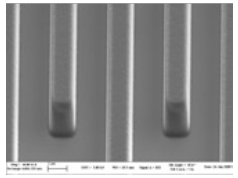
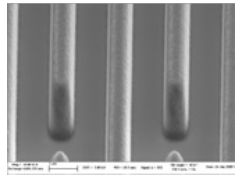
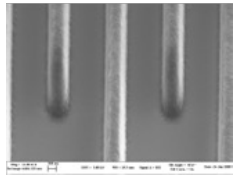
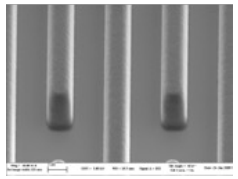
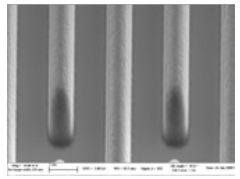
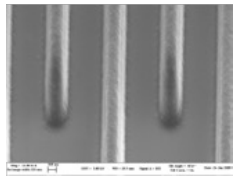
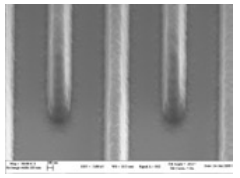
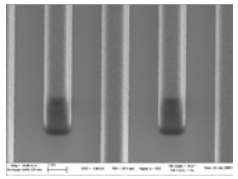
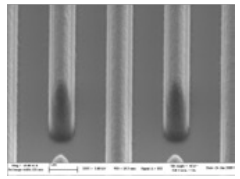
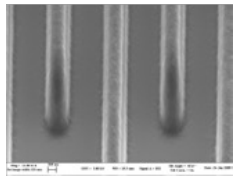
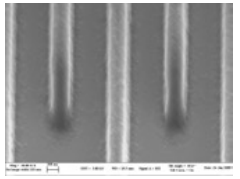
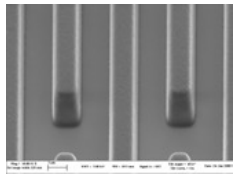
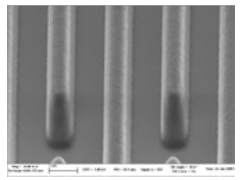
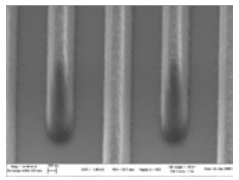
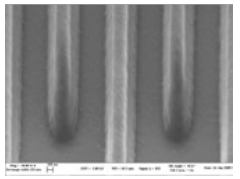
Linearity

Film thickness 1.5 µm on Si-wafer, focus: 0.0

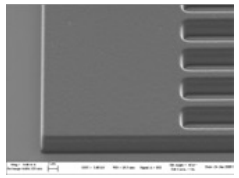
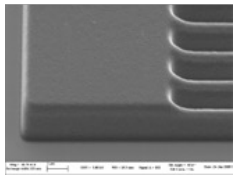
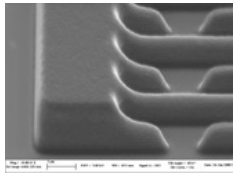
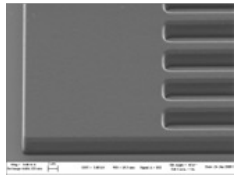
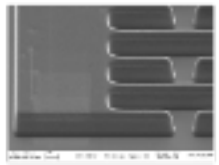
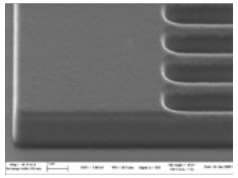
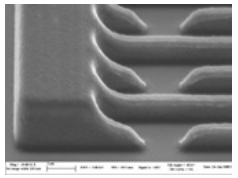
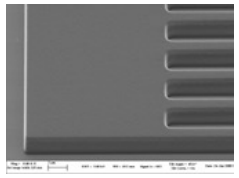
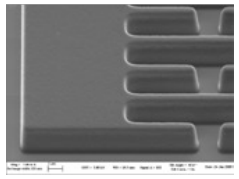
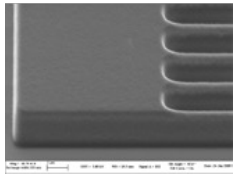
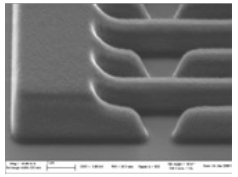
Dose	1.5 um L/S	1.0 um L/S	0.7 um L/S	0.5 um L/S
160 mJ				
190 mJ				
210 mJ				
230 mJ				

Standard Positive Photoresists AR-P 3500series

For the production of integrated circuits with wide process range

Dark field erosion

Film thickness 1.5 µm on Si-wafer, focus: 0.0

Dose	1.5 um L/S	1.0 um L/S	0.7 um L/S	0.5 um L/S
190 mJ				
210 mJ				
230 mJ				

Tempering:

95 °C, 90 s, hot plate (contact), exposure: g-line stepper (NA: 0.56; 0.75 s).
Development: AR 300-44, 60 s, 22 °C, puddle