AR-P 6510 series thick EBL resist

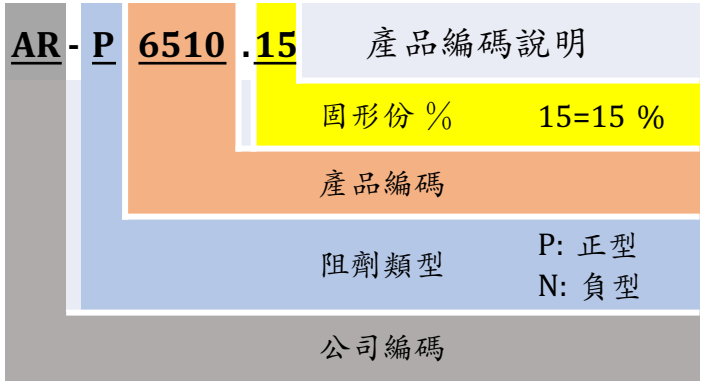
high film thickness with e-beam lithography

產品簡介：

本產品膜厚可依需要調整，厚度範圍介於10 — 250um。產品曝光以電子束，同步幅射或X光，毋需於黃光室作業。屬電子束微影阻劑中,高膜厚應用.

Product series & Code 產品比較及編碼說明：

		AR-P 6510.15	AR-P 6510.17
Film thickness@200rpm	um	45	95
Resolution best value	um	1	
Contrast		10	
Flash point	℃	42	
Storage 6 months	℃	10 - 22	



產品包裝:

250 ml /瓶
1 L /瓶

其它包裝可依客戶需求增加.

出貨:

本品未列於固定生產品項,價格交期需先詢問,預估交期為

✅ 4 – 8 週. 德國運出

AR-P 6510 series thick EBL resist

high film thickness with e-beam lithography

Product Features 產品特性

- e-beam (no yellow light required)
  電子束微影,毋需於黃光室作業
- excellent image quality
  微影品質優良
- solvent-based developer
  使用溶劑型顯影劑
- film thickness values of 10 μm to 100 μm
  目前版本膜厚為10 – 100 um. 調整配方可達250um
- process-stable
  製程穩定
- solvent-based developer
  使用溶劑型顯影劑
- high molecular weight poly(methyl methacrylate)
  高分子成份為聚甲基丙烯酸甲酯(PMMA)
- safer solvent PGMEA
  使用較安全溶劑丙二醇甲醚醋酸酯

AR-P 6510 series thick EBL resist

high film thickness with e-beam lithography

Property I

Parameter		AR-P 6510.15	AR-P 6510.17
Solids content 固型份	%	15	17
Viscosity@25°C 黏度	Pa.s	12.2	24.5
Film thickness@200 rpm膜厚	um	45	95
Resolution best value 解析度	um	1	
Contrast 對比		10	
Flash point 閃火點	°C	42	
Storage 6 months	°C	10 - 22	

Property II

Glass transition temperature	°C	105	
Dielectric constant		2.6	
Cauchy coefficients	N_0	1.480	
	N_1	41.9	
	N_2	0	
Plasma etching rates 5 Pa, 240-250 V Bias	nm/min	Ar sputtering	22
		O_2	350
		CF_4	61
		80 CF_4 + 16 O_2	169

AR-P 6510 series thick EBL resist

high film thickness with e-beam lithography

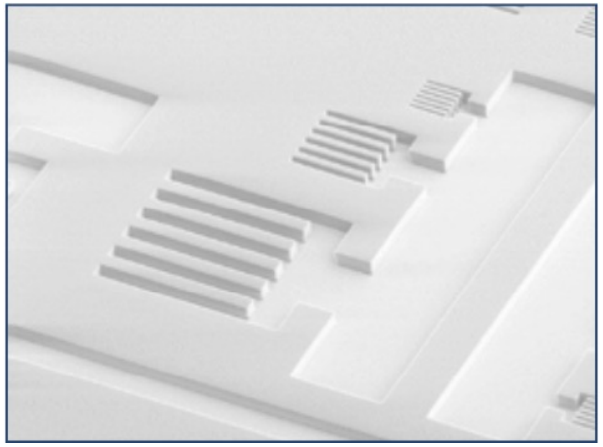
Film thickness values塗佈膜厚

Spin time時間/speed轉速		unit	product / film thickness	
120 sec	30 sec		AR-P 6510.15	AR-P 6510.17
200 rpm	350 rpm	um	45	95
350 rpm	500 rpm	um	28	56

AR-P 6510 series thick EBL resist

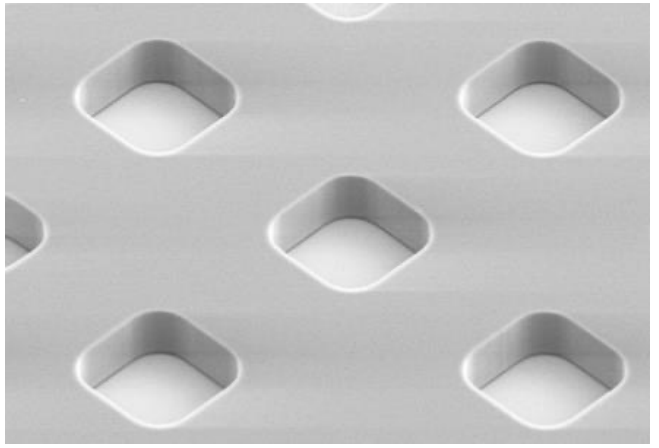
high film thickness with e-beam lithography

Structure resolution



AR-P 6510.17
Film thickness 40 µm,
structures up to 5 µm

Resist structures



AR-P 6510.17 (diluted),
exposure with e-beam
(developer AR 600-55),
film thickness 5 µm

Process parameters

Substrate	Si 4” wafer
Soft-bake	100 °C x 4 hours, convection oven
Exposure	e-beam
Development	AR 600-56 x 20 min.
Stopper	AR 600-60, 3 min

Process chemicals

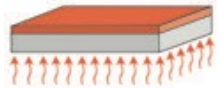
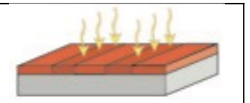
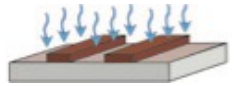
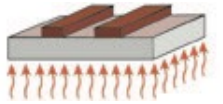
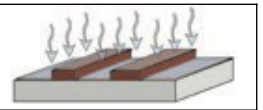
Adhesion promoter	AR 300-80 new
Developer	AR 600-56
Thinner	AR 300-12
Stopper	AR 600-60
Remover	AR 600-71, AR 300-76

AR-P 6510 series thick EBL resist

high film thickness with e-beam lithography

Process conditions

This diagram shows exemplary process steps for AR-P 6500 resists. All specifications are guideline values which have to be adapted to own specific conditions. For further information on processing, 👉“Detailed instructions for optimum processing of e-beam resists”. For recommendations on waste water treatment and general safety instructions, 👉”General product information on Allresist e-beam resists”.
表列為AR-P 6510.17阻劑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 6510.17 45 um@350rpm x 5 min
Soft bake (± 1°C) 	95°C x 60 min hot plate. (temperature ramps recommended), or 90°C x 3 hours, convection oven(temperature ramps recommended)
e-Bean exposure dose (E_0): 	e-beam Exposure dose (E_0): 5,000 μC/cm^2
Development (21-23±0.5°C) puddle 	AR 600-56, 15 min
Stopper / Rinse	AR 600-60, 30 sec / DI water, 30 sec
Post-bake (optional) 	100 °C x 10 min hot plate, or 95 °C x 60 min convection oven for complete drying and slightly enhanced plasma etching resistance
Customer specific technology 	LIGA application or the fabrication of X-ray masks
Removal 	AR 600-71, or O_2 plasma ashing

AR-P 6510 series thick EBL resist

high film thickness with e-beam lithography

Processing instructions

Prior to spin coating it is recommended to remove gases which may possibly be present. The highly viscous resist should therefore rest a few hours before use. A warming of resist bottles in a water bath to 50 °C max. to reduce the viscosity and the utilisation of ultrasound support the removal of gas bubbles. Resist deposition should be performed as carefully as possible to avoid any additional introduction of air bubbles. Slow spin speeds and low exposure times are advantageous (200 to 350 rpm, > 3 min). Edge bead formation can be reduced if the rotational speed is briefly increased towards the end of the coating procedure (for 10 s to max. 500 rpm). The amount of resist will also influence the film thickness; for 4 inch-wafers, the use of at least 10 g of resist are recommended. In order to obtain optimum film qualities, own experiments of each user are required.

建議塗佈之前先去除此高黏度阻劑中可能存在的氣泡：
－靜置數小時
－以不超過50℃溫水浴加熱瓶身以降低阻劑黏度
－輔以超音波處理以去除氣泡
－阻劑滴定時小心操作，以避免氣泡產生
建議以低轉數塗佈阻劑（200 – 350 rpm, >3 min)
塗佈程序最後段，建議短暫提高轉數(500rpm max. 10 sec)以降低阻劑在基板邊緣堆積隆起(edge beads)
滴定的阻劑數量也會影響厚度；以4寸晶元為例，建議滴定量為10g。
高黏度，高膜厚的阻劑，使用者的經驗與設備的良好搭配可獲得高品質膜厚。