Positive Photoresists AR-P 1200 series

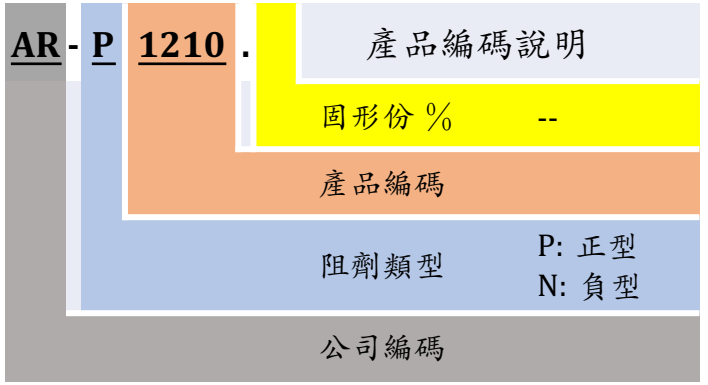
Ready-to-use positive spray resists for various applications

AR-P 1200 series 產品說明

AR-P 1200 系列產品為調配好的噴塗用正光阻， 適合各類型的應用。系列品依厚度範圍與配方分為下列產品編號:

		AR-P 1210	AR-P 1220	AR-P 1230
Film thickness	um	4 - 10	3 - 8	0.5 – 1.0
Resolution	um	1.0		
Contrast		3.0		
Flash point	°C	-9	-9	12
Storage 6 months*	°C	10 - 18		
Suitable application		vertical trench	54°C slope	planar wafer

*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



產品包裝:

✅ 250 ml/瓶
✅ 1 L /瓶
其它包裝可依客戶需求增加.

出貨:

本品項目前無固定生產排程，請先諮詢。
可能會有最少訂購數量，或需待批次生產。

價格詢問 | 其它諮詢 | AR-P 1210 GHS 標識 | AR-P 1220 GHS 標識 | AR-P 1230 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)
- AR-P 1210 positive resists for a uniform coverage of vertical trenches
  AR-P 1210正型噴塗光阻，適合垂直漕溝的平均覆蓋
- AR-P 1220 for etch profiles with 54° slopes
  AR-P 1220適合54°斜坡的結構
- AR-P 1230 for planar wafers good adhesion, smooth surface
  AR-P 1230適用於平面晶圓, 有良好接著度及平順的表面特性
- combination of novolac and naphthoquinone diazide
  主要成份為酚醛樹酯及叠氮基萘醌
- safer solvent PGMEA as well as methyl ethyl ketone
  使用較安全溶劑丙二醇甲醚醋酸酯及丁酮

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Property I				
Parameter		AR-P 1210	AR-P 1220	AR-P 1230
Solids content	%	4	4	4
Film thickness	um	4 - 10	3 - 8	0.5 - 1
Resolution	um	1.0	1.0	1.0
Contrast		3.0	3.0	3.0
Flash point	°C	1	9	37
Storage 6 months	°C	10 - 18		

Property II			
Glass trans. temperature	°C	108	
Dielectric constant		3.1	
Cauchy coefficients (AR-P 1220)		N_0	1.625
		N_1	74.4
		N_2	170
Plasma etching rate 5 Pa, 240-250 V Bias	nm/min	Ar-sputtering	8
		O_2	169
		CF_4	38
		80 CF_4 +16 O_2	90

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Parameters - spray coater “EVG® 150”	
Spray coater - EVG® 150, EV Group	AR-P 1210
Resist flow (drops/min)	25
ARM speed (mm/s)	200
N_2 pressure (kPa)	50
Exposure	EVG® 6200NT mask aligner
Sensitivity (film thickness)	170 mJ/cm^2 (4.5um)
Development with AR 300-44	90 sec
Minimum resolution (µm)	1.4
Process Chemicals	
Developer	AR 300-44
Remover	AR 300-76 / AR 300-73

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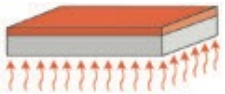
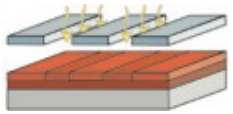
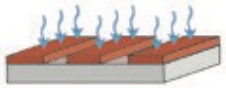
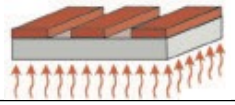
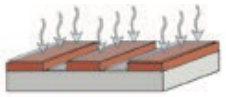
This diagram shows exemplary process steps for AR-P 1200resists with the EVG® 150. All specifications are guideline values which must be adapted to own specific conditions. For further information on process, 👉 “Detail instructions for optimum processing of photoresists”. For recommendations on wastewater treatment and general safety instructions ,👉 ”General product information on Allresist photoresists”.

表列為AR-P 1200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 1210**	**AR-P 1220**	**AR-P 1230**
	5.0 um	3.0 um	1.0 um
Soft bake (±1 °C) 	heated chuck: 70-80°C without further drying		
	non-heated chuck: 90°C x 2 min hot plate or 85°C x 25 min convection oven		
UV exposure 	Broadband UV, 365nm, 405nm, 436nm		
	Dose (E0, EVG®6200NT mask aligner) AR-P 1210 170mJ/cm^2 ,4.5 um		
Development (21-23±0.5°C) puddle 	AR 300-44	AR 300-44	AR 300-44
	4 min	3 : 1, 5 min	2 : 1, 6 min
Rinse	DI water, 30 sec		
Post-bake (optional) 	Not required		
Customer specific technology 	Generation of semiconductor property		
Removal 	AR 300-70 or O2 plasma ashing		

Processing Instructions for Spray Resists

Coating: For spray coating, resists are filled into the cartridges of the spray coater under yellow light. Gas formation in the resist supply line which is generally observed for AZ 4999 does not occur with AR resists.

The quality of the coating largely depends upon the respective spray coating device which is used. The best experiences we have had with the devices of EV Group. Adjustable device parameters such as dispensing rate, scanning speed, spray distance and chuck temperature exhibit a major influence on the film forming process. Commercially available spraying devices differ considerably with respect to their coating properties, and own experiments to determine the optimum parameters are therefore absolutely necessary.

Resists 1220/2220 and 1230/2230 form very homogeneous surfaces. Due to their specific solvent composition, solvent evaporation is reduced, but nevertheless a complete and at the same time sufficient coverage of the substrate is provided. Surfaces are thus considerably less rough as compared to AZ 4999.

If unheated chucks are used, coated substrates should be tempered on a hot plate at plate at 85 - 90 °C for 2-5 min or in a convection oven at 85 °C for 25 min to improve adhesion. A temperature of 90 °C should however not be exceeded to prevent edge retraction of the resist caused by possible softening processes.

With resists AR-P 1210 and 1220 as well as with AR-N 2210 and 2220 and under standard conditions, film thickness values of 4 - 8 µm can be obtained. Higher film thicknesses are possible with higher dispensing rates or using multiple coating steps.

In comparison with AZ 4999, these resists have a lower tendency to form disturbing beads. Resists AR-P 1230 and AR-N 2230 are thus well suited for the generation of thin films with a thickness of 0.5 - 1 µm and can be used for spray coating as well as for spin coating applications. The thickness of films produced via spin coating ranges between 50 to 120 nm.

塗佈:阻劑在噴塗方式的填充一般在黃光區進行,其它廠牌的容易在阻劑供應線上形成氣體, AR阻劑無此問題.

噴塗成膜的品質與使用的噴塗設備有直接的關係. Allresit噴塗阻劑是與EV集團設備上取得實驗參數. 可調整參數,例如: 噴塗速率,掃描速度, 噴頭距離, 卡盤溫度等都會影響到薄膜的形成. 市售的噴塗設備有各自的設計, 需進行參數實驗以獲得最佳成膜效果.

AR-P 1220及AR-P 1230,由於其特殊的溶劑組成可降低溶劑的揮發,同時也可完全覆蓋基板. 成膜平滑,相較於它廠有較低的粗糙度.

如果設備不俱加溫卡匣(chuck), 噴塗後基板需以熱板加熱85-90°C約2-5 min. 或對流烤箱85°Cx25min以改善黏度. 避免溫度超過90°C以防止因阻劑軟化而造成邊緣收縮.

AR-P 1210及AR-P 1220在標准參數下,膜厚可達4–8 um. 更高的膜厚可調整噴塗速率或採取多次噴塗.

相較它廠噴塗阻劑,AR-P 1230不易形成氣泡. 適合0.5 – 1.0um厚度成膜. 同時適合噴塗與旋轉塗佈方式成膜. 以旋轉塗佈方式,厚度約介於 50 – 120 nm.

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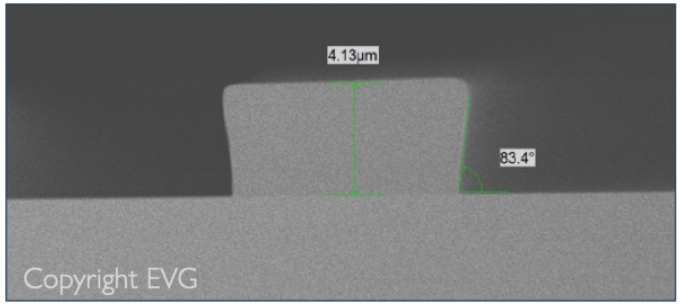
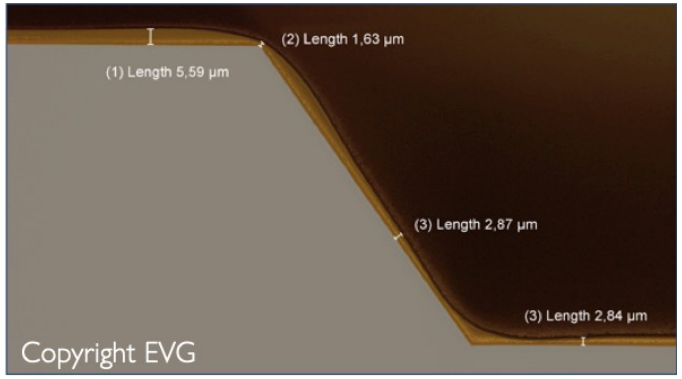
Processing Instructions for Spray Resists

Exposure: For an exposure of positive resists, the entire UV-range of 300 to 450 nm can be utilized, while for the exposure of negative resists, a range between 300 to 436 nm is recommended. The exposure time generally depends on the film thickness. For a film thickness of about 5 µm, the sensitivity of positive resists is approx. 200 mJ/cm^2. Negative-tone resists with approx. 70 mJ/cm^2 are substantially more sensitive and require shorter exposure times, which is advantageous for the exposure of wafers with extreme topologies in order to prevent un- desirable reflexions.
Thin films generated with AR-P 1230 and AR-N 2230 require lower exposure doses.
For negative resists, a cross-linking bake after exposure is mandatory!
曝光:正型噴塗式光阻曝光紫外光波長範圍是 300nm 至 450nm. 負型的光阻建議範圍是 300nm 至 436nm. 曝光時間則視膜厚調整. 5um厚度的正型, 曝光劑量是200 mJ/cm^2, 5um厚的負型則僅需70 mJ/cm^2, 高敏感度及短的曝光時間的優點可避免產生不必要的紫外光反射, 非常適合已有高低圖案的晶圓.
AR-P 1230及AR-N 2230需要較低的曝光劑量. 負型光阻需要曝後烤以完成高分子架橋.

Development: The development time strongly depends on the respective film thickness and amounts to approximately 5 minutes for 5 µm films. If edges are only marginally covered, a 3 : 1 dilution (3 parts developer : 1 part water) is recommended. For the development of thin films of about 0.5 µm, the developer should be diluted up to 2 : 1.
顯影: 顯影時間與膜厚有直接關係, 大約是5um需時5min. 如果邊緣區域覆蓋不良, 建議將顯影液稀釋約3:1 (3份顯影液:1份水). 如果是0.5um的低膜厚,建議顯影液稀釋比例是2:1.



Lift-off structures with AR-N 2220 after spray coating



Very good coverage of groove bottom and of upper edge