Negative Electron Beam Resist AR-N 7520series

High-resolution EBL resists for mix & match in semiconductor process

NextStep
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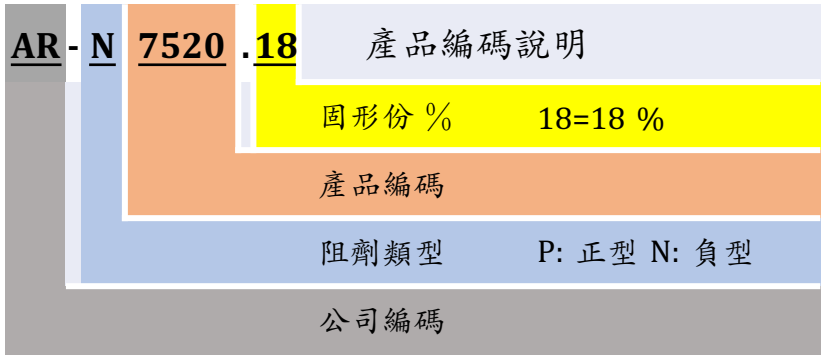
ALLRESIST

產品簡介:

AR-N 7520系列, 為負型電子束微影阻劑 (negative tone EBL resist). 可以電子束及紫外光曝光(deep UV, I line), 適合於半導體混搭製程(mix & match). 與新品(AR-N 7520 new)比較, AR-N 7520系列需要較高的曝光能量,優點是可獲得較為垂直圖案。 產品系列目前有:

Properties		AR-N 7520.073	AR-N 7520.18
Film thickness@4000rpm	nm	100	400
Resolution best value	nm	20	28
Contrast		10	
Flash point	°C	42	
Storage 6 months	°C	10 - 18	



產品包裝：

- ✅ 100 ml / 瓶
- ✅ 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
- ❎ 1 週。 國內庫存（本品項暫時無庫存）

✏️ 價格詢問　✏️ 其它諮詢　📩 產品GHS標識

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Characterization

- e-beam, deep UV, i-line
  曝光源可為電子束, 深紫外線, 紫外線(i-line)
- very high contrast, excellent transfer of structures, high-precision edges
  高對比, 良好的圖案轉移,結構邊緣精確
- mix & match processes between e-beam and UV exposure 248-365 nm
  適合電子束與紫外線 (248 - 365 nm)的混搭製程
- highest resolution, very process-stable (no CAR)
  非化學放大型,但解析度高,製程穩定
- plasma etching resistant, temperature stable up to 140 °C
  耐乾蝕刻, 高溫穩性定達140°C
- novolac, organic cross-linking agent
  主要成份含酚醛樹酯, 有機物架橋劑等
- safer solvent PGMEA
  溶劑使用較安全的丙二醇甲醚醋酸酯

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Property I			
Parameter		AR-P 7520.073	AR-P 7520.18
Solids content 固型份	%	7.3	18
Viscosity@25°C 黏度	mPa.s	2.3	4.2
Film thickness@4000 rpm膜厚	nm	100	400
Resolution best value 解析度	nm	28	
Contrast 對比度		10	
Flash point 閃火點	°C	42	
Storage 6 months	°C	10 - 18	

Property II			
Glass transition temperature	°C	102	
Dielectric constant		3.1	
Cauchy coefficients	N_0	1.630	
	N_1	122.0	
	N_2	0	
Plasma etching rates 5 Pa, 240 – 250 V Bias	nm/min	Ar sputtering	8
		O_2	169
		CF_4	41
		80 CF_4 + 16 O_2	90

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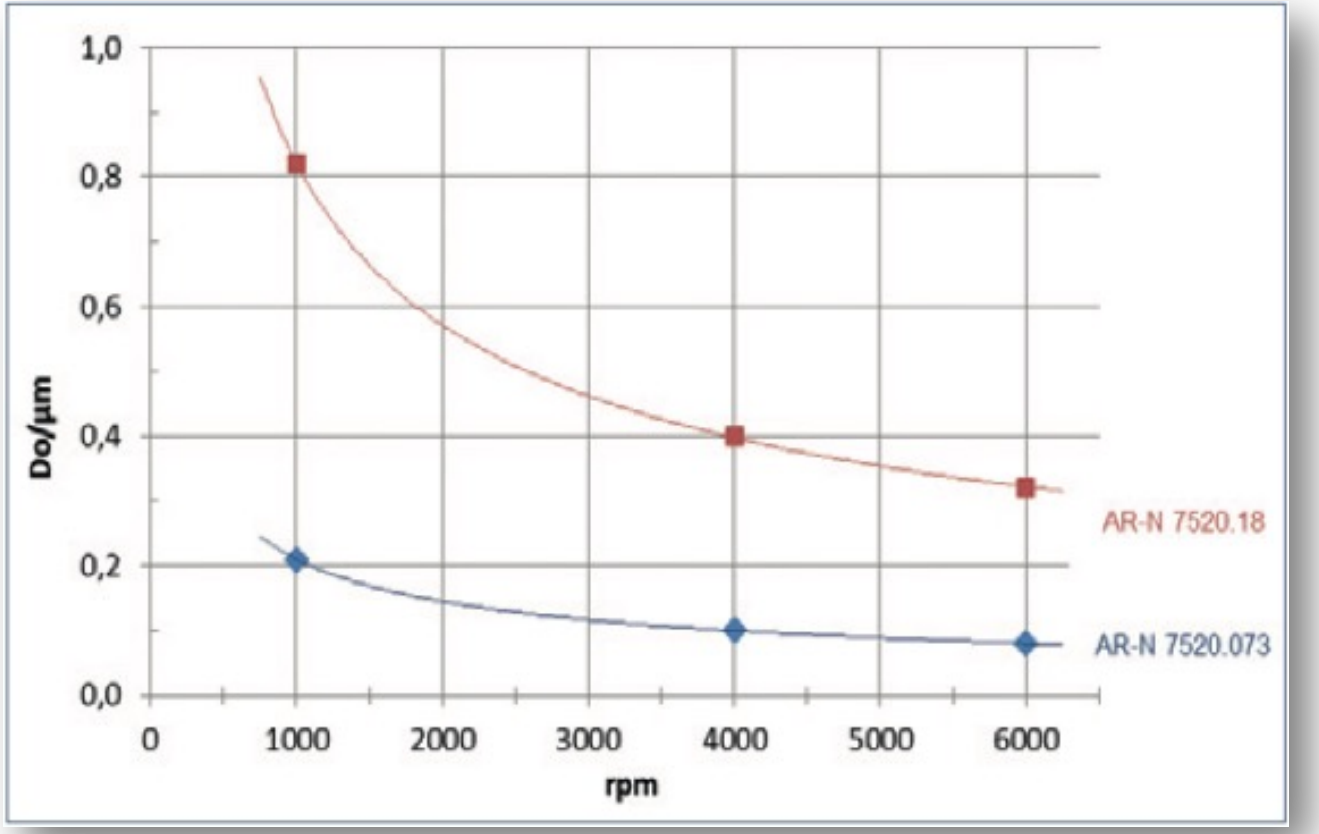
AR-N 7520series spin curve



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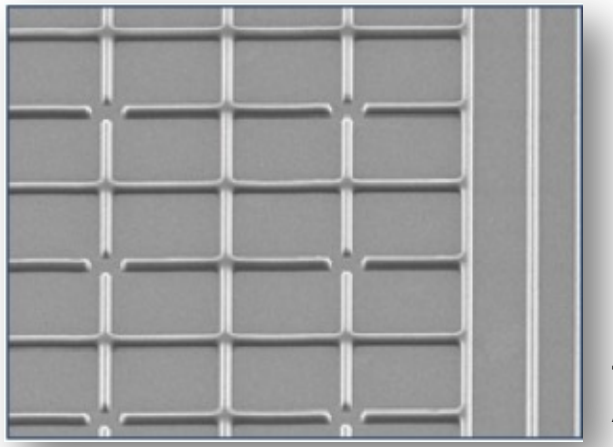
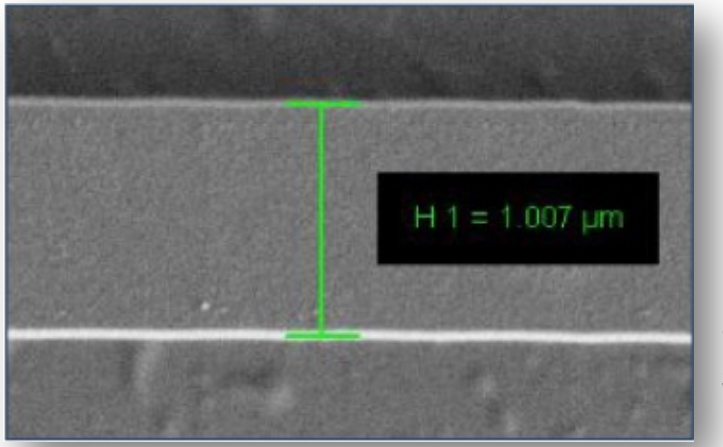
Structure resolution



400 nm lines with
AR-N 7520.073

Resist structures



1 µm line with high-precision edges, AR-N 7520.18, Resist. thickness 340 nm, 1,400µC/cm^2, 100 kV

Process parameter

Substrate	Si 4” wafer
Soft-bake	85 °C x 90 sec, hot plate
Exposure	Raith Pioneer, 30 kV
Development	AR 300-47 (4:1) x 60 sec, 22 °C

Process chemicals

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

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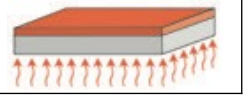
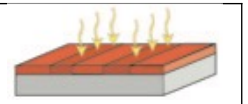
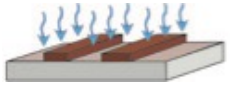
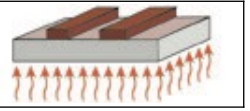
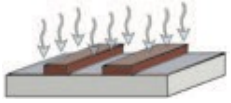
Process conditions

This diagram shows exemplary process steps for resists of AR-N 7520series. All specifications are guideline values which must be adapted to own specific conditions. For further information on processing, ☛ “Detailed instructions for optimum processing of e-beam resists”. For recommendations on wastewater treatment and general safety instructions, ☛ ”General product information on Allresist e-beam resists”.

圖示AR-N 7520series 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-N 7520.18	AR-N 7520.073
	400 nm@4000rpm x 60 sec	100 nm@4000rpm x 60 sec
Soft bake (± 1°C) 	85 °C x 2 min hot plate or	
	85 °C x 30 min convection oven	
e-Bean exposure dose (E_0): 	Raith Pioneer, 30 kV / 100 nm line & space	
	500 µC/cm²	300 µC/cm²
Development (21-23±0.5°C) puddle 	AR 300-47 (4 : 1), 90 sec	AR 300-47 (4 : 1), 50 sec
Rinse	DI water, 30 sec	
Post-bake (optional) 	85 °C x 1 min hot plate, or 85 °C x 25 min convection oven for enhanced plasma etching resistance	
Customer specific technology 	Generation of semiconductor properties	
Removal 	AR 300-76, or O_2 plasma ashing	

Developer recommendation	Optimal	Suitable	
Developer	AR 300-26	AR 300-35	AR 300-47
AR-N 7520.18 / AR-N 7520.073	2 : 3 / 1 : 3	2 : 1 / un-dilute	4 : 1

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Processing instructions

These resists are predestined for e-beam exposure, but also suitable for UV exposure. Mix & match processes are possible, if both exposure methods are carefully coordinated. During e-beam exposure, the resist works in a negative mode. (For details on Mix & Match, see AR-N 7520 new).

Due to their composition, resists AR-N 7520 are approximately 8 x more insensitive than resists of the series AR-N 7520 new. The required higher dose predestines these resists for the production of very precise structural edges, since due to the high electron density edges are perfectly reproduced. For the very high imaging quality however, longer writing times have to be accepted.

The developer dilution should be adjusted with DI water such that the development time is in a range between 20 s and 120 s. By dilution of the developer, contrast and development rate can be influenced to a large degree. A stronger dilution results in an increased contrast and a reduced development rate.

AR-N 7520系列是設計為電子束微影阻劑,但也適合於紫外線曝光. 兩種曝光參數經適當調配,可用於半導體混搭製程(mix & match).阻劑在電子束曝光下為負型模式.(混搭製程細節,請參考產品AR-N 7520new)

由於配方成份不同,AR-N 7520的敏感度比AR-N 7520new低,差異達8倍. 由於需要的曝光劑量高,此產品適合生產精確的圖案邊緣. 但所需的時間同時也較長.

顯影劑濃度視需要以純水調整,建議的顯影時間,溫度為20 – 120 sec.
稀釋顯影劑對對比度及顯影率影響很大. 稀釋過度會降低對比度及顯影速率.