Remover for AR Resists

AR-P 600-71, 300-76, 300-70, 300-72, 300-73 remover

For the stripping of tempered photoresist and e-beam resist films

Characterisation

- aqueous-alkaline solution (AR 300-73) or organic solvents (all others)

Remover recommendations after tempering:
- photoresists up to 180 °C: AR 600-71, 300-76
- photoresists up to 200 °C: AR 300-76, 300-71
- PMMAs up to 200 °C: AR 600-71, 300-76
- copolymers up to 210 °C: AR 600-71, 300-76
- CSAR 62 up to 200 °C: AR 600-71, 300-76
- novolac e-beam resists 150 °C: AR 300-73, 300-76

Properties

Parameter / AR	600-71	300-76 new	300-70, -72	300-73
Main component	dioxolane	DMG	NEP	TMAH
Density at 20 °C (g/cm3)	1.02	1.08	1.03	1.00
Non-volatiles max. (%)	0,002			
Flash point (°C)	3	103	98	-
Filtration (µm)	0,2			
Storage temperature (°C)	10-18	10-22	10-22	10-22

Remover recommendations

🟩 optimally suitable 🟩 suitable 🟨 limited suitability 🟧 unsuitable

Properties / Remover AR average time for removal at 1.5 µm	600-71	300-76 new * heated to 80 °C		300-70, 300-72 * heated to 80 °C		300-73 $^{+}$ heated to 50 °C	
Suitability for tempered photoresist films (21 °C)	efficient all-rounder	universal, replacing the reprod. toxic, NEP: = AR 300-70, -72		universal, especially for thin films, but toxic for reproduction		special: AR-BR 5400, AR-P 3100, 3500, 3700	
120 °C	10 s	25 s		20 s		30 s	
150 °C	15 s	3 min	25 s *	2 min	20 s *	2 min	60 s $^{+}$
180 °C	4 min	2 h	60 s *	2 h	50 s *	2 h	2 min $^{+}$
200 °C			30 min *		25 min *		30 min $^{+}$
Suitability for tempered e-beam resist films (21 °C)	efficient all-rounder	universal, replacing reprod. -toxic NEP:		universal, but toxic for reproduction		special: AR-N 7520, 7700	
PMMA 150 °C	20 s	20 min	10 s *	18 min	10 s *	15 min $^{+}$	
PMMA 180 °C	2 min	30 min	30 s *	28 min	30 s *	25 min $^{+}$	
PMMA 200 °C	3 min	42 min	50 s *	40 min	50 s *		
Copolymer 190 - 210 °C	5 s		60 s *		50 s *	20 min $^{+}$	
CSAR 62 150 °C	30 s		60 s *		50 s *	10 min $^{+}$	
CSAR 62 180 - 200 °C	40 - 60 s		5 min *		4 min *	15 - 25 min $^{+}$	
Novolac-based 85 - 120 °C	3 - 50 s except 7700	5 s * except 7520, 7700		5 s * except 7520, 7700		25 s - 3 min $^{+}$	
Novolac-based 150 °C	5 s - 7 min except 7520, 7700	30 s * except 7520, 7700		10 s * except 7520, 7700		10 s - 50 min $^{+}$	

Processing instructions for removers

Substrates coated with resist are exposed to the effect of the remover by immersion (puddle or dip). To reduce the dissolution time for tempered layers, removers AR 300-70, 300-72 and 300-76 may be heated to up to 80 °C, remover AR 300-73 to up to 50 °C or megasound may be helpful in this case. It is recommended to rinse off the remover with DI water, clean remover or with a suitable thinner. A stripping of very hard-baked layers (> 220 °C) with remover is hardly possible any more. In this case, oxidizing acids or oxygen plasma may be used for stripping. Further detailed remover specifications for a large variety of resists are listed on the following pages.

Remover for AR Resists

Remover recommendations

< 20/60 s optimally suitable | < 5/30 min suitable | < 1-6 h limited suitability | ≥ 6 h unsuitable

Product AR	Film thickness (µm)	Tempering (°C)	Recommend.	600-71	300-76		300-70, 300-72		300-73	
				21 °C	21 °C	80 °C	21 °C	80 °C	21 °C	50 °C
AR-P 3100 Example 3110	1.5	95 - 120	300-76 300-73	< 20 s	< 20 s		< 20 s		< 20 s	
		150		3 h	< 20 s		< 20 s		< 60 s	
		180		6 h	< 5 min	< 60 s	< 5 min	< 60 s	1 h	< 60 s
		200				< 30 min		< 30 min		< 30 min
AR-P 3200 Example 3220 AR-P 1200	10	95	300-76 600-71	< 20 s	< 20 s		< 20 s		< 5 min	< 60 s
		120		< 20 s	< 60 s		< 60 s		< 30 min	< 5 min
		150		< 20 s	< 5 min	< 60 s	< 5 min	< 60 s	< 30 min	< 5 min
		180		4 h	1 h	< 30 min	1 h	< 30 min		< 30 min
		200				1 h		1 h		2 h
AR-P 3500 Example 3540	1.5	95 - 150	300-76 600-71	< 20 s	< 20 s		< 20 s		< 20 s	
		180		< 5 min	< 5 min	< 20 s	< 5 min	< 20 s	< 60 s	< 20 s
		200				< 1 h		< 1 h	3 h	< 30 min
AR-P 3500 T Example 3540 T	1.5	95 - 120	300-76 600-71	< 20 s	< 20 s		< 20 s		< 20 s	
		150		< 5 min	< 60 s	< 20 s	< 5 min	< 20 s	< 30 min	< 5 min
		180			< 30 min	< 5 min		< 5 min		< 30 min
		200				1 h		1 h		
AR-P 3700 / 3800 Example 3740	1.5	95	300-76 600-71	< 20 s	< 20 s		< 20 s		< 60 s	
		120		< 20 s	< 20 s		< 20 s		< 5 min	< 20 s
		150		< 20 s	< 60 s		< 60 s		< 5 min	< 20 s
		180		< 30 min	< 5 min	< 60 s	< 5 min	< 60 s	< 30 min	< 60 s
		200				< 30 min		< 30 min	6 h	< 30 min
AR-P 5300 Example 5350	1.5	95 - 150	300-76 600-71	< 20 s	< 20 s		< 20 s		< 20 s	
		180		< 60 s	< 60 s		< 60 s		< 60 s	
		200				1 h		1 h		< 30 min
AR-PC 500(0) Example 504	2.0	150	300-76 600-71	< 5 min	< 1 h	< 5 min	< 1 h	< 5 min		< 5 min
		190		< 30 min	1 h	< 5 min	1 h	< 5 min		4 h

Remover for AR Resists

Remover recommendations

< 20/60 s optimally suitable | < 5/30 min suitable | < 1-6 h limited suitability | ≥ 6 h unsuitable

Product AR	Film thickness (µm)	Tempering (°C)	Recommend.	600-71	300-76		300-70, 300-72		300-73	
				21 °C	21 °C	80 °C	21 °C	80 °C	21 °C	50 °C
AR-N 4300 Example 4340	1.5	95	300-76 (300-72)	< 20 s	< 20 s	🟩	< 20 s	🟩	< 60 s	🟩
		110		🟧	< 60 s	🟩	< 60 s	🟩	1 h	< 60 s
		120		🟧	< 30 min	< 5 min	< 5 min	🟩	6 h	< 30 min
		150		🟧	1 h	< 30 min	< 30 min	< 5 min	🟧	< 30 min
		180		🟧	6 h	1 h	1 h	< 30 min	🟧	🟧
		200		🟧	🟧	🟧	5 h	1 h	🟧	🟧
AR-N 4400 Example 4400-50	50	95	600-71 600-70	< 20 s	< 5 min	< 5 min	< 5 min	< 60 s	< 60 s	🟩
		120		< 5 min	6 h	< 60 s	5 h	< 60 s	6 h	< 30 min
		150		< 5 min	🟧	1 h	🟧	1 h	🟧	2 h
		180		< 30 min	🟧	2 h	🟧	2 h	🟧	🟧
		200		4 h	🟧	🟧	🟧	🟧	🟧	🟧
AR-P 617 Example 617.08	0.5	190	600-71 300-76	< 5 min	< 1 h	< 60 s	< 1 h	< 60 s	🟧	< 30 min
		210		< 5 min	6 h	< 5 min	6 h	< 5 min	🟧	< 30 min
AR-P 630-670 Example 671.05	0.5	150	600-71 300-76	< 20 s	< 30 min	< 20 s	< 30 min	< 20 s	🟧	< 30 min
		180		< 5 min	< 30 min	< 60 s	< 30 min	< 60 s	🟧	< 30 min
		200		< 5 min	< 1 h	< 60 s	< 1 h	< 60 s	🟧	🟧
AR-P 6200 new Example 6200.09	0.4	150	600-71 300-76 300-73	< 20 s	< 30 min	< 5 min	< 30 min	< 5 min	< 30 min	< 5 min
		180		< 60 s	< 30 min	< 5 min	< 30 min	< 5 min	< 1 h	< 30 min
		200		< 60 s	< 30 min	< 60 s	< 30 min	< 60 s	🟧	< 30 min
AR-N 7500 Example 7500.18	0.4	85-150	300-76 300-73	< 20 s	< 20 s	🟩	< 20 s	🟩	< 20 s	🟩
		180		🟧	🟧	6 h	🟧	4 h	3 h	< 10 min
AR-N 7520 new Example 7520.17	0.4	85	300-73 300-76	< 20 s	< 20 s	🟩	< 20 s	< 20 s	< 60 s	🟩
		105		< 20 s	< 20 s	🟩	< 20 s	< 20 s	< 5 min	🟩
		120		🟧	🟧	4 h	🟧	3 h	< 30 min	< 5 min
		150		🟧	🟧	6 h	🟧	4 h	🟧	< 1 h
AR-N 7700 Example 7700.18	0.4	105	300-73 300-76	🟧	< 1 h	< 30 s	🟧	< 1 h	< 1 h	< 60 s
		120		🟧	🟧	🟧	🟧	🟧	< 1 h	< 5 min
		150		🟧	🟧	🟧	🟧	🟧	3 h	< 30 min
AR-N 7720 Example 7720.18	1.4	105-120	300-76 (300-72)	< 60 s	< 20 s	🟩	< 20 s	🟩	< 20 s	🟩
		150		< 5 min	3 h	< 5 min	1 h	< 5 min	< 90 s	🟩
		180		🟧	🟧	< 30 min	< 30 min	< 30 min	< 60 min	< 5 min
		200		🟧	🟧	1 h	🟧	1 h	🟧	🟧

The average times required for removal as listed under "properties" are divided into time clusters (< 20 s, < 60 s …) for better orientation. Remover recommendations generally apply to the commonly used tempering at 150 °C and 180 °C.The recommendation for remover AR 300-72 is indicated in brackets, since this remover is highly effective, but also classified as toxic for reproduction and thus not prioritized by Allresist. As replacement, we recommend the equivalent removers AR 300-76 and 600-71.