



Nanoimprint

AMONIL® & AMOPRIME – low viscosity imprint resist and adhesion promoter

AMO GmbH has been engaged in research and development of UV-Nanoimprint Lithography within an array of projects for over 15 years. Based on this wealth of experience we were able to design AMONIL®, an organic-inorganic composite material that is ideally suited for UV-based Nanoimprint Lithography. The resist combines outstanding coating and molding properties with excellent pattern fidelity and a reasonable plasma stability.

Application

- UV-based Nanoimprint Lithography

Specification

- Base material viscosity: 50mPa s
- Photo initiator designed for UV-curing
- Capability for step&repeat cycles > 1000 imprints demonstrated
- Exposure dose: 2J/cm² using quartz mold

Features

- Applied by standard spin-coating process
- Usable with quartz, PDMS and PFPE molds
- Good adhesion to silicon substrates
- Average adhesion to SiO₂, Ti, Au, PE
- Adhesion is vastly improved using AMOPRIME for substrate preparation
- Use of AMOPRIME allows imprinting on GaAs, GaN, InP, Al₂O₃

Description

- Organic-inorganic composite material

Availability

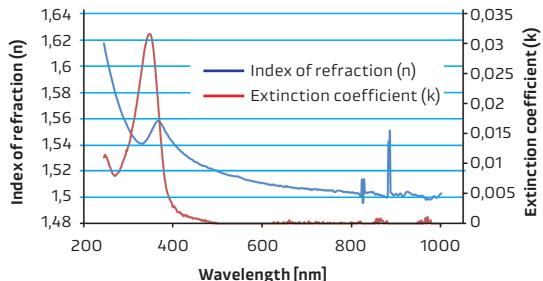
- AMONIL® available in three versions with film thicknesses from 100 nm to 800 nm
- AMOPRIME available as adhesion promoter



AMO NIL Availability

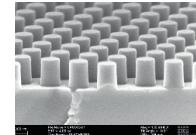
Imprint Resist	Thickness @ 3000 rpm	Quantity 100 ml	Quantity 200 ml	Quantity 500 ml	Quantity 1000 ml
AMONIL MMS10	100 nm	X	X	X	X
AMONIL MMS4	200 nm	X	X	X	X
AMONIL MMS1	800 nm	X	X	NA	NA
Adhesion Promotor	Thickness @ 3000 rpm	Quantity 100 ml	Quantity 200 ml	Quantity 500 ml	Quantity 1000 ml
AMOPRIME	<10 nm	X	X	X	X

Extinction coefficient k and index of refraction n of liquid AMONIL

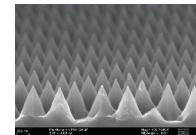


Exemplary etch processes usable for etching with AMONIL resist

Gas type	Flow rates [sccm]	Etcher	ICP/ECR-power [W]	RF-power [W]	Target material	Target material etch rate [nm/min]	AMONIL etch rate [nm/min]
HBr	50	Oxford Plasmalab 100 (ICP)	1000	50-150	Si	20-150	10-150
SF ₆ /C ₄ /F ₈ /He	7/10/15	Oxford Plasmalab 100 (ICP)	200	20	Si	50	50
CHF ₃ /Ar	25/75	Oxford Plasmalab 100 (ICP)	0	150	SiO ₂	25	32
BCl ₃ /Ar	50	Roth&Rau (ECR)	500	100	Ti	100	100
CHF ₃ /Ar/He	23/10/2	Roth&Rau (ECR)	1000	100	SiO ₂	50	50



Examplifying etch results in silicon using different process parameters



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