

ナノインプリント量産プロセス用離型剤フリーソリューション AGC's advanced solutions for Nanoimprint mass production

UVナノインプリント用含フッ素UV硬化樹脂：NIFシリーズ UV-curable Fluoropolymer for UV Nanoimprint : NIF series

用途 Applications

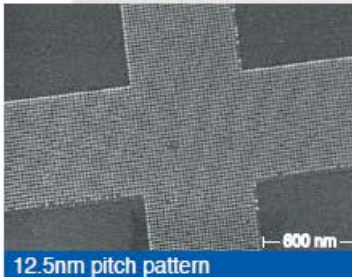
- LED、半導体、ハードディスクメディア、光学部材、光学フィルム
FPD、太陽電池、バイオチップ、MEMS 他
LED, Semiconductor, Hard disk media, Optical device, Optical film,
FPD, PV, Biochip, MEMS etc.

特徴 Features

- UVインプリントのレプリカモールド、永久膜、レジストに適している
Suitable for replicated mold, permanent layer and resist of nanoimprint
- 高離型性
Excellent demolding property
- 離型剤レスで使用可
Release layer free process
- 無溶剤
Solvent Free



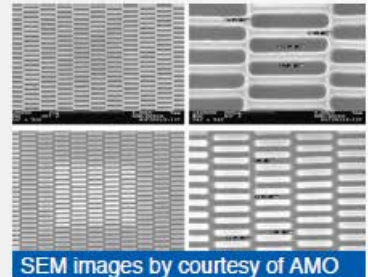
NIF



12.5nm pitch pattern



Photonic Crystal Structure



SEM images by courtesy of AMO

NIF replica mold grade

- UV Transparency

- Mechanical property
- Adhesion strength with substrate

NIF permanent layer grade

- Transparency (Visible)
- Refractive index ($\sim > 1.59$)
- Durability (moisture, light, heat)
- Antistatic property
- Abrasion resistance
- Adjustment of viscosity (6–1200mPa·s)

- Release property
- Low viscosity (inkjet, spin, die coating)
- Solvent Free
- Filling speed into mold
- Sensitivity
- Throughput

NIF resist grade

- Dry etching resistance (CF₄, C₆F₈, Cl₂, BCl₃, Ar, O₂ etc.)
- Wet etching resistance
- Very thin residual layer



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NIF Product Line

NIF-M series (for Rigid & Flexible Replica mold)

Viscosity	Sensitivity	Contact Angle (water)	Transparency
App.17mPa·s	>150mJ/cm ²	93±2°	76% (35umt@365nm)

- **Substrate:** Quartz·Glass... ... primer layer is required
PET·PC·PMMA without primer layer
- **Applications:** UV & Thermal imprint, SOG, PDMS, Nickel electroforming etc.

NIF-R series (Resist)

Grade	Viscosity	Sensitivity	Contact Angle (water)	Dry etching resistance (Selectivity)
for Fluorinated gas etching	>9mPa·s	>110mJ/cm ²	90±2°	0.5-1 (Si)
for Chlorinated gas etching	>65mPa·s	>400mJ/cm ²	90±2°	0.5-1 (GaN) >0.7 (Sapphire)

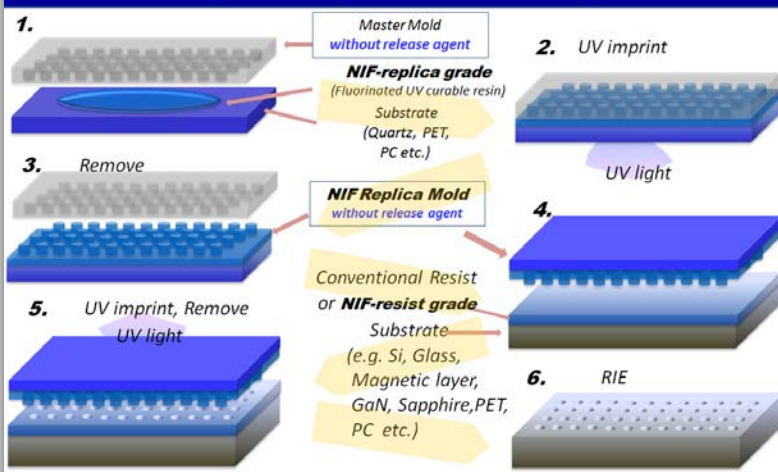
- **Substrate:** Quartz·Si·Sapphire·GaN·GaAs·ITO·Al, etc.
Primer less grade is also available.
- **Resist removing:** Both of wet and dry process are available.
- **Solvent dilution for adjustment of viscosity** is available.

NIF-P series (Permanent layer)

Viscosity	Sensitivity	Contact Angel (water)	Transparency	Refractive index
6 - >1,200mPa·s	>290mJ/cm ²	90±2°	ca.100% at 400-800nm	1.48-1.60

- **Substrate:** Quartz·Si·Metal·ITO·Aramid·TAC·Polycarbonate etc.

NIF Release agent free process for Mass production



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