



LuxNIL® P289-U

High refractive index UV curable dispersion in PGMEA

FEATURES: High Refractive Index, EXCELLENT adhesion to plastic and glass substrates, OPTICALLY Clear

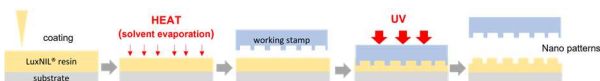
PRODUCT DESCRIPTION:

- LuxNIL® P289-U is a UV-curable inorganic organic dispersion in PGMEA that is suitable for AR/VR/MR applications.
- Base chemistry: Inorganic nano particles in acrylate binder.

PRODUCT USE:

- Diffractive Optical Elements (DOE)
- AR/VR/MR
- Photo Nano-Imprint Lithography (P-NIL)

PROCESS FLOW



LuxNIL® P289-U OPTICAL PROPERTIES

Properties	LuxNIL®P289-U
n_{589}	1.96
Transmission* [§]	86%
Haze*	0.2%
Clarity*	100%

*1 micron film on borosilicate glass.
[§]No correction for surface reflection

TYPICAL PROPERTIES

Uncured resin

Solid content: **40%**

Viscosity at 25 °C, mPa.s or cps 2-4

Shelf life (20 - 30°C): 6 months

Pot life or working life (20 - 30°C): 3 months

Cured film

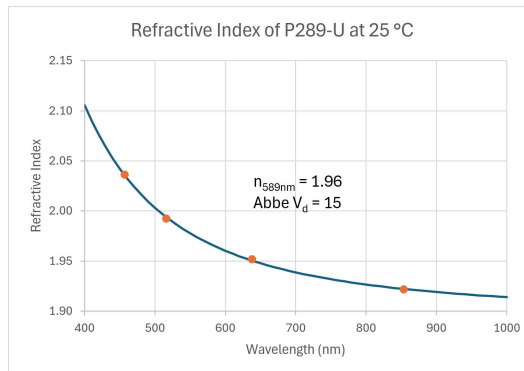
Shrinkage (volume, %) <1

Refractive index of cured film (25 °C)

@589 nm **1.96**

Operating temperature: -40 to 100 °C

LuxNIL® P289-U RI vs wavelength



GENERAL USAGE INFORMATION:

Storage: After receipt in amber HDPE bottles, room temperature storage (15-30°C) in the original container is required

APPLICATION NOTES:

PROCESS:

- 1) Coating step for film forming: LuxNIL® P289-U is used as a nano imprint lithography resin. LuxNIL® P289-U can be applied by spin coat, roll coat, or gravure coat.
- 2) **Solvent removing step:** after coating, heat is applied at 70 to 90 °C for 60 sec to remove PGMEA. Due to high dispersion loading, for best imprints, solvent removal at 70 - 80 °C for 60 sec is suggested.
- 3) Nano-imprint-lithography: replication of nano features with a working stamper is conducted. **Pressure might be required for imprint process.**
- 4) UV cure: UV cure to fix the nano features.
- 5) Working stamp is removed.
- 6) Final heat conditions at 150 °C for 4 hrs after imprint step will help remove all residual solvent, and full refractive index can be obtained.

Suggested coating thickness for LuxNIL® P289-U: 1,000 to 2,000 nm

UV CURING CONDITIONS:

*Metal halide/medium or high Mercury UV: UV-A (320-400 nm), intensity: 100-1,000 mW/cm²

*or LED-365 nm, UV light intensity: 100 to 1,000 mW/cm²

LuxNIL® P289-U should be cured between two substrates or in an inert atmosphere.

RECOMMENDED UV Conditions: LED-365 nm, 250 mW /cm² x 100 to 200 sec. Cure is done between 2 substrates or in an inert atmosphere.

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