pixelligent

PixNIL® Formulations

Pixelligent's solvent-containing PixNIL® formulations are ready-to-use, one-component, UV curable nanocomposite materials. Incorporating Pixelligent's PixClear® ZrO_2, TiO_2, and PixCor® nanocrystals, these formulations offer a wide range of refractive indices while maintaining high transparency and low haze. The PixNIL® formulations can be applied by spin-coating to achieve film thicknesses appropriate for nanoimprinting various sub-micron structures such as binary, blazed, and slanted gratings with industry-relevant stamp types. PixNIL® based patterned and non-patterned films are reliable under high-temperature, high-humidity, UV exposure, and offer robust mechanical properties. Various dilutions are available for PixNIL® products to achieve the desired film thicknesses.

Formulation	Refractive Index (589 nm)	Nanocrystal Type	Key Benefit
PixNIL® SZ2-2S	1.72	Zirconia	Highest RI ZrO_2 formulation Consistent replication fidelity with slanted gratings Excellent UV Stability[a]
PixNIL® SCS3-2S	1.80	Core-shell	Combines high refractive index with UV stability[a] Stable under high-temperature/high-humidity[b] Consistent replication fidelity and wide process window
PixNIL® ST6	1.87	Titania	Combines high refractive index and consistent replication fidelity
PixNIL® ST18	1.92	Titania	Highest RI solvent formulation

(a) Q-SUN Xenon Arc, 2.4 W/m² at 420 nm wavelength, 400 nm UV cutoff (1 µm film thickness)
(b) 100 C and 85 C/85% RH exposure for 500 h

General Product Information

Benefits

- Fast UV cure
- Long pot life
- Stored at room temperature

Key Features

- Refractive index values from 1.72 to 1.92 at 589 nm
- Film thicknesses range from 100 nm to 1.5 um (depending upon dilution level)
- Acrylic Stamp compatibility
- UV Stable

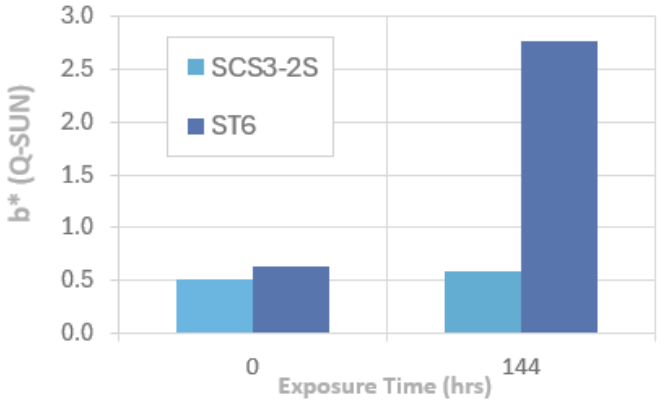
Applications

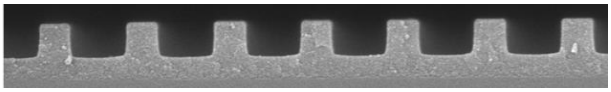
- Optical coatings
- Extended Reality
- Nanoimprinting
- Sensors

Suitable Substrates

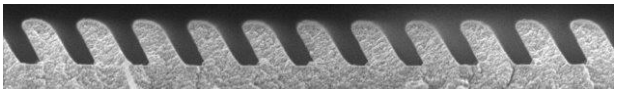
- Glass
- Silicon wafer
- Plastic

Q-Sun UV Reliability Data for PixNIL® Formulations





PixNIL® ST18 5:1 H:W Binary (0.4 µm H/0.2 µm W)



PixNIL® ST18 H:W Slanted Gratings (0.5 µm H/0.3 µm W)

pixelligent THE CLEAR SOLUTION®

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