



NILcure® product line

Imprint resins for UV-NIL - perfect for any application

CONTACT

JOANNEUM RESEARCH
Forschungsgesellschaft mbH

MATERIALS

Institute for
Surface Technologies
and Photonics

Franz-Pichler-Straße 30
8160 Weiz, Austria

Phone +43 316 876-3000

Fax +43 316 876-3010

materials@joanneum.at

www.joanneum.at/materials

NILcure® characteristics

- Suitable for gravure printing, slot-die coating and inkjet printing
- Excellent adhesion to plastics, silicon, glass, metals and other substrates
- Exceptional anti-sticking properties
- Imprinting of high aspect ratio micro- and nanostructures
- Self-replicability: imprints usable as secondary stamps

Application examples

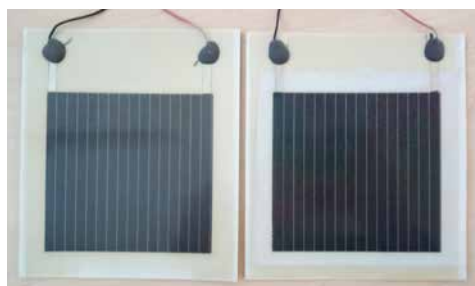
- Capillary flow control: wicking, microfluidic devices
- Superhydrophobicity: water and dirt repellency
- Scratch resistant surfaces with micro- and nano features
- Withstanding harsh artificial weathering tests and real-world applications
- Biobased, recyclable and compostable microfluidic chips



NILcure® resin for drag reducing riblet foils



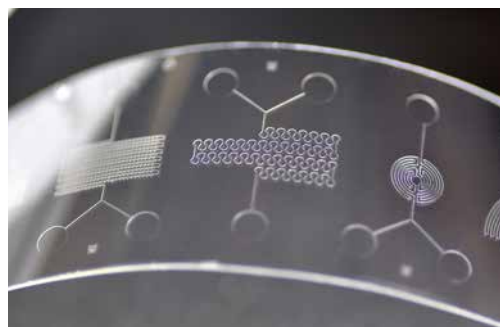
NILcure® resin for optical light guiding structures



NILcure® resin for antireflective, dirt-repellent solar cell coatings



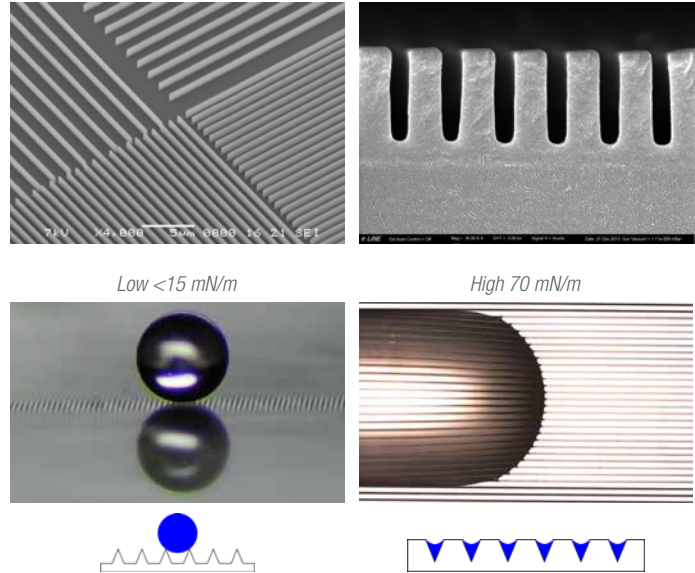
NILcure® resin for high refraction and high dispersion decorative foils



NILcure® resin for microfluidic lab-on-a-chip applications

Basic resin properties

- Customized polymer matrix and additives
- Biobased UV curable resin product line
- Low cytotoxicity
- Low leakage of components
- Water soluble resins for lift-off processes (VOC free)
- Residual free imprinting (avoiding etching process)
- Self-replicability
- Resistant against UV radiation and weathering



Tunable properties

- Surface energy – from superhydrophobic to hydrophilic
- Mechanical properties – from stiff to elastic
- Optical properties – low / high refraction and dispersion
- Wide viscosity range of uncured resins

Property tuneable	from	to
Young's Modulus Elongation	5 MPa 100 %	1000 MPa 5 %
Surface energy	15 mN/m	70 mN/m
Refractive Index @589nm	1.4	1.8
Viscosity	10 mPas	10 Pas

Table 1: Resin properties can be adjusted independently

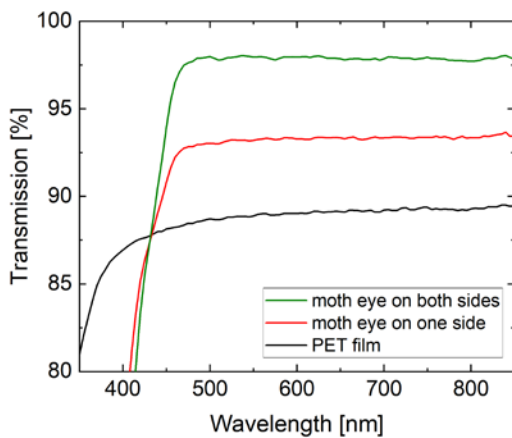


Figure 1: Transmission of pure PET film compared to one-sided and double-sided structuring with moth-eye structures

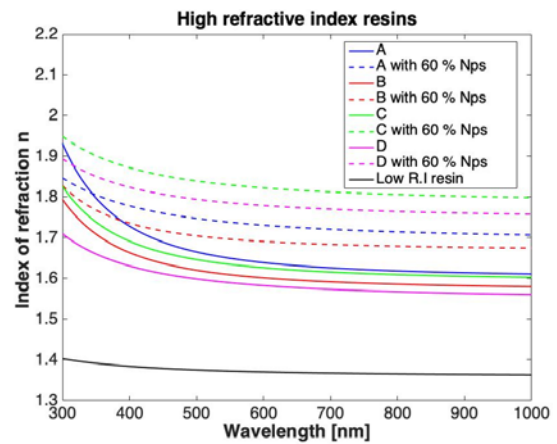


Figure 2: Refractive index ranges for different high refractive index NIL.cure® resins with and without addition of nanoparticles and one comparison to a resin with a low refractive index