

OPTICAL-GRADE POLYMERS for nanoimprinting

Materials for consumer electronics applications

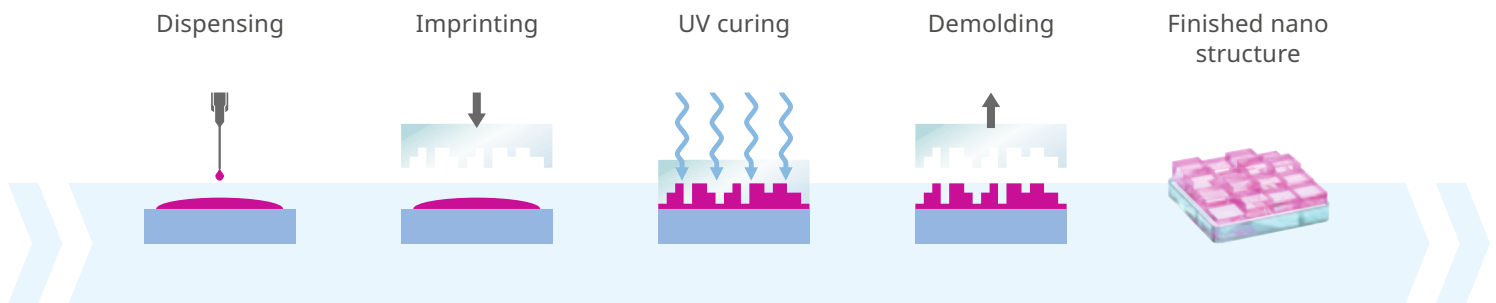
Nanostructured optical elements with features within or below the range of the operating wavelength act as diffractive optical elements (DOE) and can shape incoming light to almost any geometry. In the simplest cases, a nanoimprinted grating diffracts the light for spectroscopic

applications, while in more complex scenarios, multi-level DOEs made from DELO's optical-grade polymers are utilized to generate structured light / dot projections or as diffusors.

Imprint process

The imprint process, also known as nanoimprint lithography (NIL), allows for efficient and high-quality replication of optical elements directly at wafer-level. With the ability to fabricate 2.5D structures in a single process step, wafer-

level imprinting is a versatile and cost-effective mass-manufacturing process especially suited for miniaturized optics with high functionality and dense packaging.



(Adhesives / polymers are represented in magenta in all illustrations)

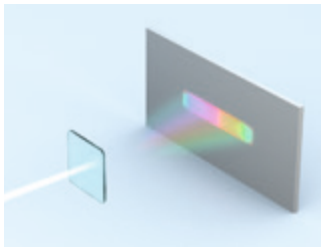


Discuss your project and your requirements with our experts:

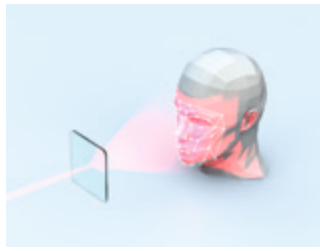
wlmo-experts@DELO.de

Applications

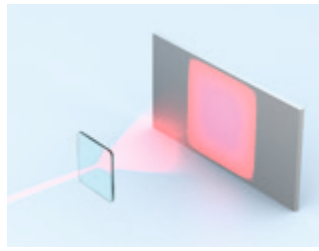
Diffraction grating



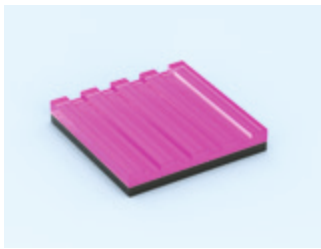
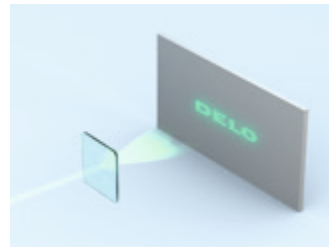
Structured light



DOE diffusors



Arbitrary beam shapes



Material requirements

- › Low viscosity to enable thin imprint layers and small features
- › High transmission in the operating spectrum of the device
- › Optical and dimensional stability during humidity and temperature exposure
- › Refractive index matching the optical design
- › High adhesion to the substrate, e. g. glass

Material solutions

- › ■ DELO PHOTOBOND OM4310: high refractive index
- › ■ DELO KATIOBOND OM6600: fast curing
- › ■ DELO KATIOBOND OM6611: high temperature resistance
- › ■ DELO KATIOBOND OM6607: low viscosity, inkjettable

Refractive index
@ 589 nm, solid

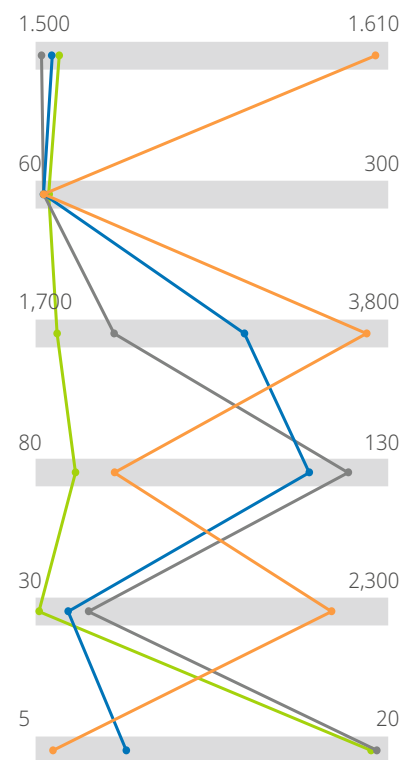
Light curing time
for imprint [s]

Young's modulus
[MPa]

Glass transition
temperature
DMTA [°C]

Viscosity [mPa·s]

Compression
shear strength
glass/glass [MPa]



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