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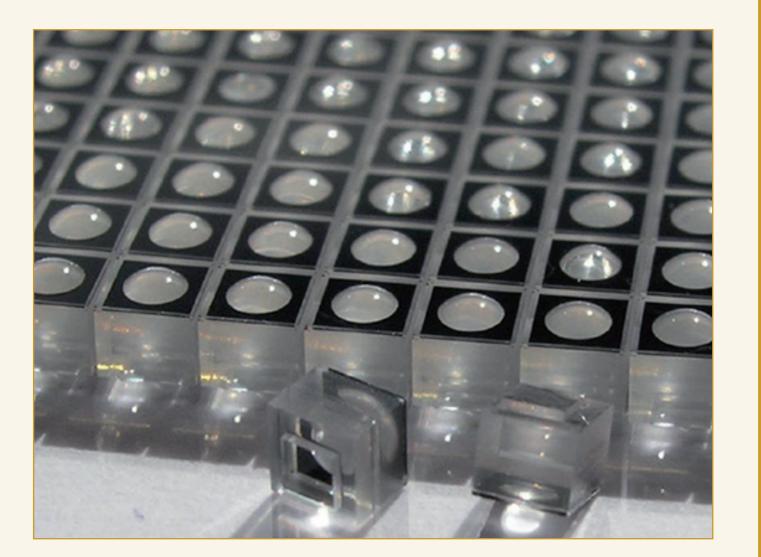
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micro resist technology

OrmoComp[®] and OrmoClear[®]FX

UV-curable Hybrid Polymers For Micro and Nano Optical Components



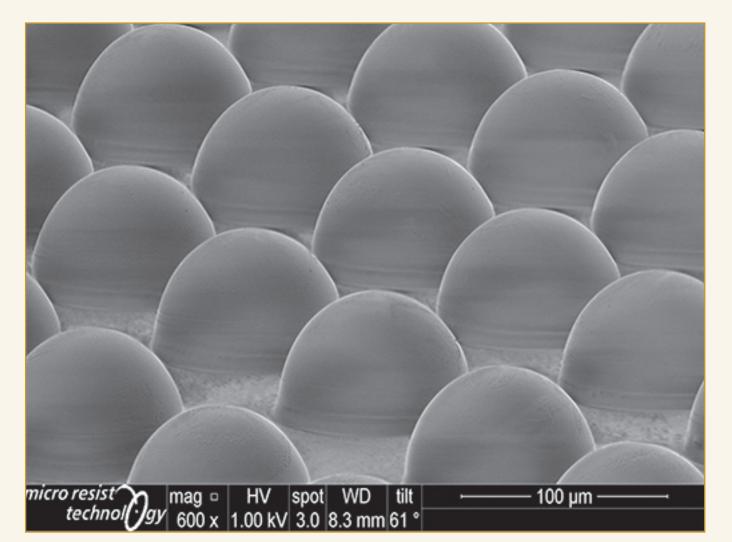
Unique features

Applications

⁻ Excellent transparency for VIS and near UV down to 350 nm [—] Micro

[–] Micro lenses and micro lens arrays

Mass-manufactured OrmoComp[®] micro lenses (1.3 mm diameter, 250 µm height) on glass (courtesy of FhG IOF, Germany)



Replicated OrmoComp[®] micro lens array, fabricated via UV moulding.

Excellent thermal stability of cured patterns

- up to 300 °C (short term), 270 °C (long term)
- [–] High mechanical and chemical stability of cured patterns
- [–] High resolution down to 100 nm feature size
- Compatible to UV imprint and UV moulding (hard molds, PDMS molds)
- [–] Compatible to UV lithography with proximity exposure
- [—] Ready-to-use solutions, solvent-free formulations

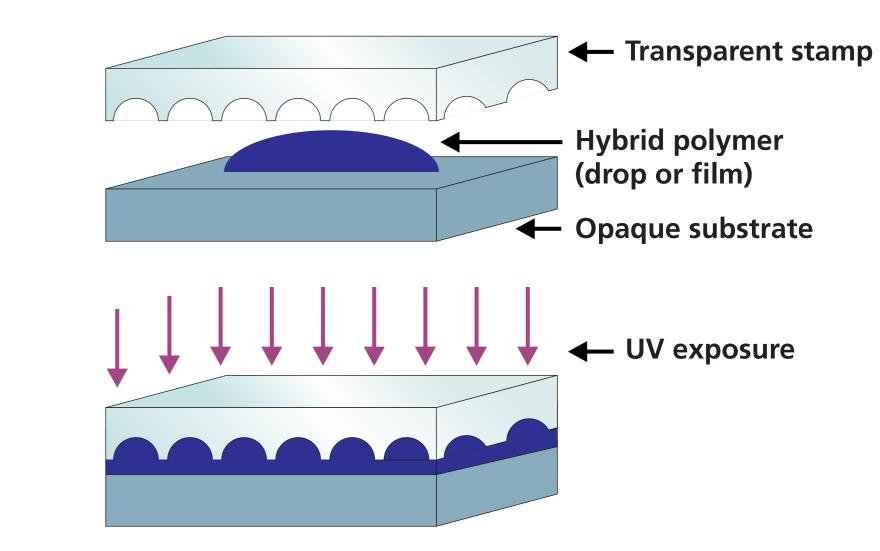
OrmoComp[®]

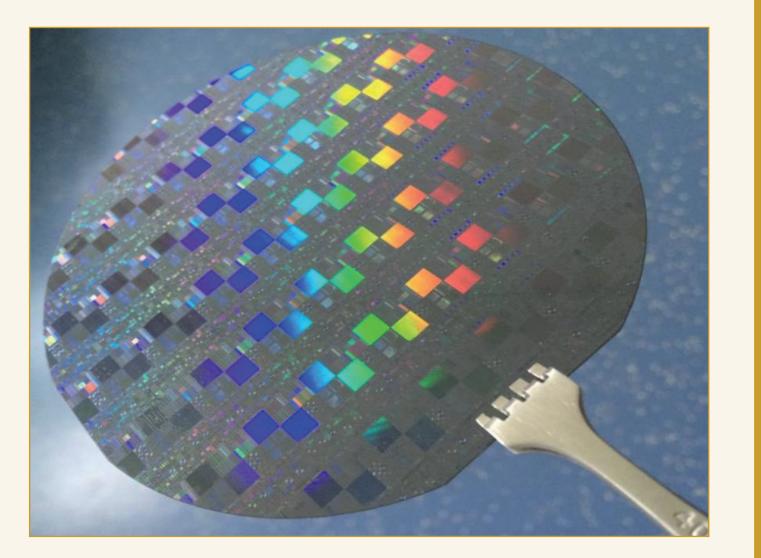
- Well-established in industrial large-volume production of optical components
- Very fast UV curing

[–] Diffractive optics

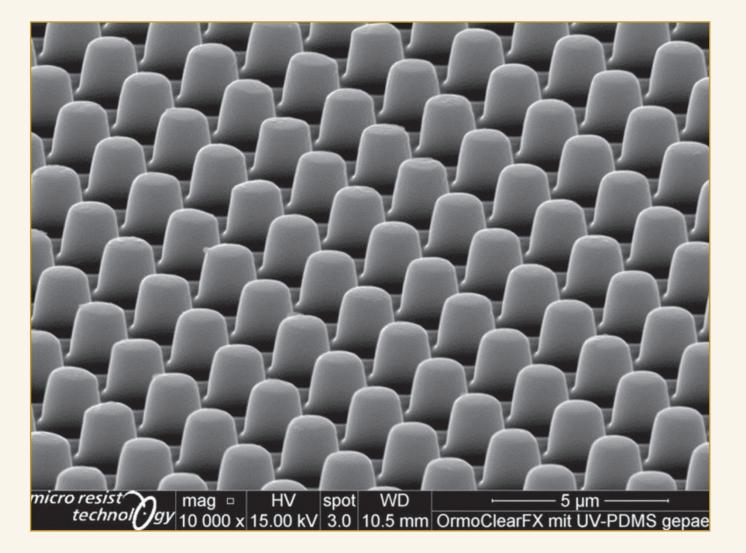
- Micro optical components based on advanced design concepts
- Moulded gratings and prisms
- [–] Optical couplers and connectors
- [–] Microfluidic systems

Process flow - UV imprint



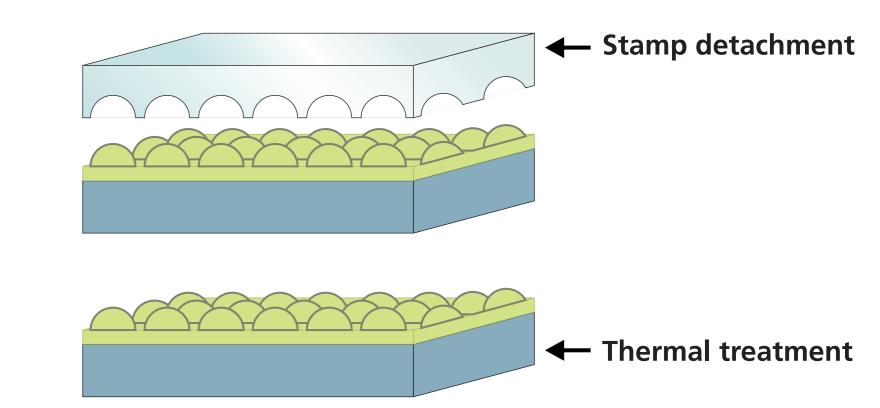


Micro- and nanostructured OrmoClear®FX on a 4 inch wafer. Fabricated by UV-SCIL using a PDMS mold (courtesy of FhG IISB, Germany)



OrmoClear®FX

- [–] 2nd generation product with lower volume shrinkage
- [–] Higher flexibility after UV curing
- [–] Alternative to OrmoComp[®] with lower high volume price

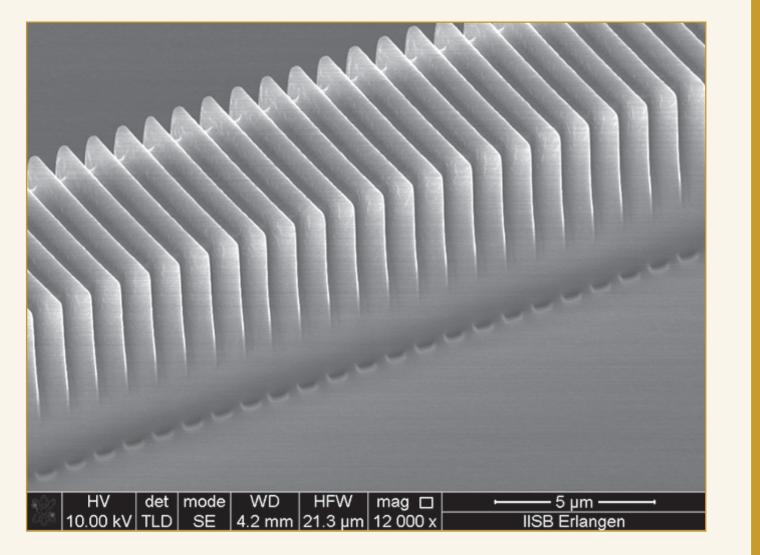


Heat Heat

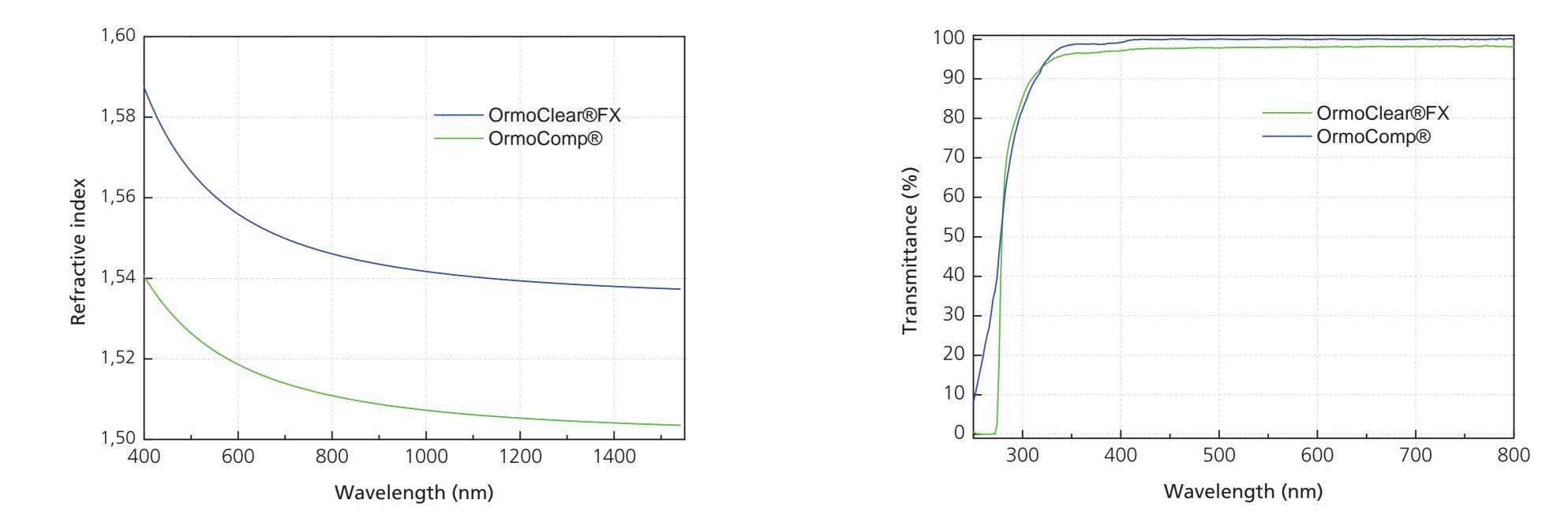
Properties OrmoComp[®] & OrmoClear[®]FX

Parameter	OrmoComp®	OrmoClear [®] FX
Solvent-free	Yes	Yes
Viscosity [Pa·s]	2 ± 0.5	1.5 ± 0.3
Spectral sensitivity [nm]	300 – 410	300 – 410
Volume shrinkage during UV curing [%]	5 – 7	3 – 5
Film thickness upon spin coating [µm] 3000 rpm 6000 – 1000 rpm	20 10 - 60	20 10 - 60
RI @ 589 nm, 25 °C, cured	1.520	1.555
dn/dT (589 nm) [10 ⁻⁴ /K]	-2.0	-2.7

OrmoClear[®]FX pillar structures generated by UV-NIL process using PDMS mold



OrmoClear[®]FX surface relief Bragg gratings, fabricated by UV-SCIL using a PDMS mold (courtesy of FhG IISB, Germany)



OrmoComp[®]: DE 30 210 075 433; IR 1 091 982 ; TW 100030626; OrmoClear[®]: DE 30 210 075 434; IR 1 091 359 ; TW 100030628 Hybrid polymers based on ORMOCER[®]s for micro-optics licensed by the Fraunhofergesellschaft zur Förderung der Angewandten Forschung in Deutschland e.V.