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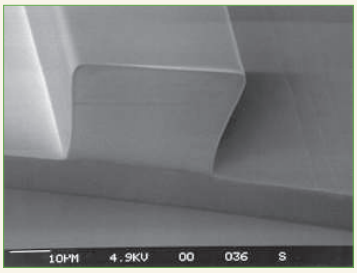
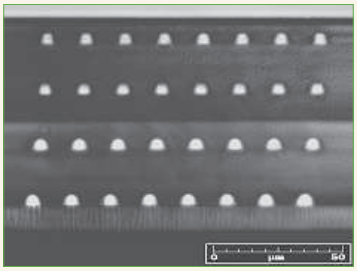
Core and Cladding systems for waveguiding

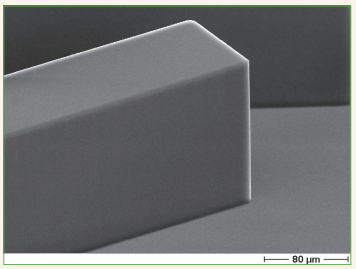
Comparison of the material systems OrmoCore & OrmoClad and EpoCore & EpoClad



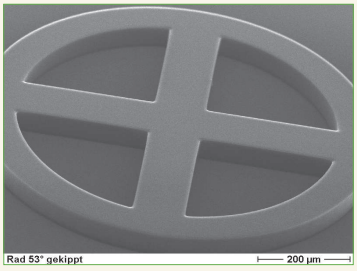
Undercladding of Ormoclad and 30 µm Ormocore of a multimode wave guide on silicon - ACREO/ Schweden



Multilayer optical fan out consisting of 5 µm Ormocore on Ormoclad
FHG - IOF/ Jena

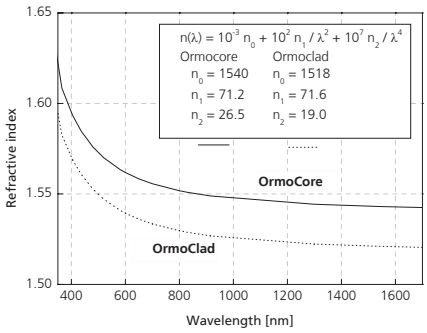
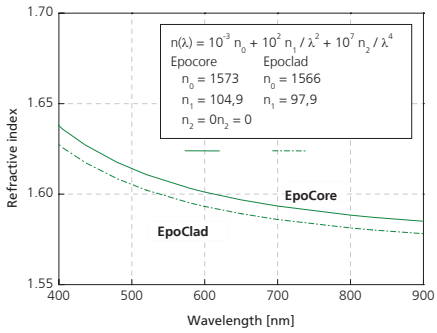


EpoCore Waveguide with smooth surface and vertical sidewalls



No microcracks on critical spots of EpoCore pattern

ls.15.06.18

OrmoCore and OrmoClad	EpoCore and EpoClad
lowest optical loss, main application in tele communication (1310 nm, 1500 nm) and data communication (600 – 900 nm)	low loss, main application in opto-electronical devices of the printed circuits boards industry (850 nm)
Properties	
UV curing, inorganic-organic hybrid polymer, solvent free, high-viscosity, silicon-containing	UV curing, solvent containing, high-viscosity, epoxy based
Optical loss	
< 0.06 dB/ cm @ 630 nm < 0.2 dB/ cm @ 1310 nm < 0.6 dB/ cm @ 1550 nm	0.2 dB/ cm @ 830 nm
Processing	
liquid, high-viscosity, sticky layer after prebake, proximity exposure or contact exposure with anti-adhesion layer on mask, no post exposure bake, hardbake recommended	solid, non-sticky layer after prebake, proximity or contact exposure, post exposure bake, hardbake optional
Thermal stability	
270 °C	230 °C
Shrinkage	
2 – 5 %	< 3 %
Refractive index	
	

Hybridpolymers (ORMOCER®s) - OrmoCore and OrmoClad

Hybrid polymers based on ORMOCER®s for micro-optics licensed by the Fraunhofergesellschaft zur Förderung der Angewandten