

Proceedings of SPIE, Vol. 3291, Diffractive and Holographic Device Technologies and Applications V, pp. 89-103 (1998).

"Holographic Recording Properties in Thick Films of ULSH-500 Photopolymer", D.A. Waldman, H.-Y.S. Li, and E.A. Cetin, Polaroid Corporation, 750M-5C, Cambridge, MA 02139.

Abstract

The photopolymer holographic recording material, ULSH-500, based upon cationic ring-opening polymerization, has been further optimized for recording in an increased film thickness of 200 μm . The dynamic range attained, at least $M/\# = 16$, is substantially greater than previously reported, while concurrently the inherent low transverse shrinkage and high sensitivity characteristics of the material have been retained. Dynamic range or cumulative grating strength, $\Sigma \eta_i^{0.5}$, has been determined from co-locationally recorded peristrophic and angle multiplexed plane-wave gratings which exhibit low diffraction efficiencies between about 0.1 and 0.2 %. Good Bragg selectivity consistent with the imaged thickness and sinc function behavior is observed for the multiplexed holograms, and both the angular response and the diffraction efficiency are stable without the need for post-imaging fixing procedures. Sensitivity is in the range of 1 to 10 cm/mJ , and the refractive index modulation achievable during consumption of the ac