Improved thermal and strain performance of annealed polymer optical fiber Bragg gratings

We report on a detailed study of the inscription and characterization of fiber Bragg gratings (FBGs) in commercial step index polymer optical fibers (POFs). Through the growth dynamics of the gratings, we identify the effect of UV-induced heating during the grating inscription. We found that FBGs in annealed commercial POFs can offer more stable short-term performance at both higher temperature and larger strain. Furthermore, the FBGs' operational temperature and strain range without hysteresis was extended by the annealing process. We identified long-term stability problem of even the annealed POF FBGs.
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