Thermal characteristics of long-period gratings 266 nm UV-point-by-point induced

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In this work, long-period gratings optically produced in hydrogen-loaded photosensitive fibers by pointby-point ultraviolet irradiation at 266 nm are demonstrated. The gratings growth kinetic is studied during and after the UV inscription for time intervals up to 600 h, and results of temperature characterizations from 25 _C to 1200 _C are presented. Thermal and strain sensitivities are measured, resulting in values between _0.044 nm/_C and _0.0044 nm/_C and (–0.19 ± 0.15) pm/le over the range of 0–125 le, respectively. Two different processes (annealing and quenching) to reach the grating thermal stabilization are compared and discussed. The use of 266 nm as writing wavelength associated with high laser fluences allowed to be obtained gratings where the refractive index modulation remained for temperatures up to 1200 _C. LPG coupling thermo-optic coefficient and refractive index sensitivities were obtained with the grating immersed in six different external media, with refractive indices ranging from 1.0000 to 1.4315. Moreover, changes of thermal sensitivity from negative to positive values were quantified, with behaviours transitioning from linear to nonlinear, depending on the refractive index of external medium.

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