

ABSTRACT

INTEGRATED HOLLOW-CORE OPTICAL FIBER PREFORM, OPTICAL FIBER AND FABRICATION METHOD THEREOF

The present disclosure relates to an integrated hollow-core optical fiber preform, an optical fiber and a fabrication method thereof. Initially, holes are drilled to obtain a preform which is then subjected to a drawing process with gas fed into the drilled holes for pressurization control, resulting in an optical fiber with an anti-resonant ring structure. This method employs mechanical drilling to achieve precise positioning of the azimuth angle of the anti-resonant unit, ensuring axial uniformity and preventing any azimuthal shift during the drawing process. Furthermore, no additional materials are introduced for positioning the anti-resonant unit, thereby minimizing contamination from impurities and enhancing properties such as attenuation and strength of the optical fiber. Additionally, gas pressure control expands the anti-resonant unit during the drawing process, reducing its wall thickness and consequently lowering attenuation in this hollow-core optical fiber.

Figure 1