

HOLLOW-CORE ANTI-RESONANT FIBER WITH HIGH SINGLE-MODE PERFORMANCE AND ULTRA-LOW LOSS

Abstract

The present invention relates to a hollow-core anti-resonant fiber with highly single-mode performance and ultra-low loss. The hollow-core anti-resonant fiber includes an outer cladding and an inner cladding. The inner cladding is composed of nested structural elements, which are arranged along a circumferential direction of the inner wall of the outer cladding and are connected to the inner wall of the outer cladding, and a central cavity surrounded by the inner cladding forms a core, characterized in that each nested structural element includes three or more layers of nested glass tubes with different radii, wherein at least one inner nested glass tube of at least one layer of inner nested glass tubes deflects to one side relative to an outer nested glass tube adjacent thereto, with a deflection angle of 5 to 55 degrees. Through the structural change of the claddings, the present invention concurrently features a reasonable and fabricable shape of the nested structural elements, an optimized combination of nested dimensions, and deflection of the inner nested glass tubes, thereby significantly increasing the leakage loss of LP11 mode while less affecting the performance of a fundamental mode, finally effectively improving the single-mode performance of the fiber.

(Fig. 1)