

Title (en)

METHOD AND APPARATUS FOR MANUFACTURING A RARE EARTH METAL DOPED OPTICAL FIBER PREFORM

Title (de)

VERFAHREN UND VORRICHTUNG ZUM HERSTELLEN EINER MIT SELTENEM METALL DOTIERTEN VORFORM FÜR OPTISCHE FASERN

Title (fr)

PROCEDE ET DISPOSITIF DE PRODUCTION D'UNE PREFORME DE FIBRE OPTIQUE DOPEE AVEC UNE TERRE RARE

Publication

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Application

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Abstract (en)

[origin: WO0000442A1] A method and apparatus is disclosed for the manufacture of an optical fiber preform having incorporated therein a comparatively high concentration of rare earth metal dopant material, and which thus can be drawn and processed into an optical fiber having low numerical aperture, low core attenuation, and high pumping power absorption. The high concentrations of rare earth metal dopant material are accomplished through a "hybrid vapor processing" (HVP) method or a "hybrid liquid processing" (HLP) method, either being practiced in combination or independently of one another. The HVP method involves the vaporization of a rare earth metal halide by the exposure thereof to a sufficiently elevated temperature, independently, or contemporaneously with the transport of the resultant rare earth metal halide laden vapor, into a glass-forming oxidation reaction zone on a flowing stream of essentially an unreactive inert gas, such as helium. According to the HLP method, a first amount of rare earth metal dopant is provided according to the HVP method and/or other vapor source of rare earth metal dopant which is mixed with glass-forming vapors to form a deposited soot layer on the internal surface of a glass tube. The soot-deposited tube is then impregnated with a dopant solution comprising, a second amount of rare earth metal dopant. The tube is then thermally collapsed resulting in an optical preform with an enhanced amount of rare earth metal dopant incorporated at a comparatively high concentration. The apparatus comprises means, such as tubes, for introducing the rare earth metal dopant as a vapor, formed from a solid state form of the dopant, into the main glass deposition tube separately from glass-forming material vapors and oxygen for the reaction within the main tube.

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