

Effects of Unstable Torch Flame for a Fused Single Mode Fiber

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Coupled 1x2 Single Mode Fiber (SMF-28e<sup>®</sup>) is successfully fabricated using a slightly unstable torch flame at a temperature range 800-1350°C by injecting hydrogen gas flowing at pressure of 1 bar. The fiber structure and geometry are investigated for both core and cladding before and after fusion. Coupled fiber is studied using Field Emission Scanning Electron Microscopy (FESEM) and Electron Dispersive X-Ray (EDX) System. The pulling length speed, coupling time, coupling coefficient and evolution of coupling ratio from 1% until 75% are examined to study the heating effects at the coupling region. The result shows that the core and cladding geometry of fiber are reduced 80-92%. Their structures are changed which are shown by the changes in the refractive indices. These phenomena have wide applications in industrial communications and sensors such as for optical switching and tunable filtering.