

AN INVESTIGATION IN THE FABRICATION OF FIBER-BASED COUPLER

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Abstract:

Optical coupler is an important component in a fiber optics system. To obtain a coupler, two fiber must be sufficiently close such that electrostatic field carried by the fiber overlap and partial transfer of energy to the other fiber occurred. In this work, the investigation on the fabrication of fiber based coupler is performed by using Acupler2000 fiber optic coupler manufacturing system. If two lined up fibers are sufficiently close such that the fields overlap, light can be coupled from one fiber to another. The two lined up fibers are twisted each other on the fiber holder of the pulling stage. The main control computer kept sampling the PDI and PD2 light intensity readings and calculated the coupling ratio, excess loss throughout the full process. The PDI, PD2, coupling ratio, excess loss and motor pulling distances displayed on the working window are updated continuously. The main control computer stopped the pulling process when the coupling ratio reached the desired value. The flow gas pressure is 1 bar. The desired value of excess loss for 50:50 coupling ratio is 0.07 dB with an insertion loss of 3.40 dB. The investigation showed to change coupling ratio at data setting and the value of coupling ratio for 90/10, 80/20, 70/30, 60/40, and 50/50 can achieved. Among the ten samples of SMF-28e, the best coupler obtained has an excess loss of 0,09 dB and an insertion loss of 3.11 dB. The processes in fabrication of coupler such as twisted technique and stripped the centre of fiber technique influenced the excess loss and insertion loss.