Fabrication and development of flat fibers

ABSTRACT

This paper reports the parameters that affect the fabrication of Flat Fibers, including preform size and doping, furnace temperature, preform feed speed, fiber drawing speed, fiber dimension, fiber quality and shape, vacuum pressure and core dimension. The feed and draw speed generally follows the simplified mass conservation law to draw the fiber to a specific dimension. The preform wall thickness affects the vacuum pressure and furnace temperature that is needed to 'flatten' the fiber. The preform wall thickness is directly proportional to the volume of glass inside the neck-down region. The wall thickness of the preform and its dopant will also affect the size of the cladding and core dimension. Finally, some issues associated with the fabrication of Flat Fibers are also observed and discussed, including fabrication of Flat Fibers with non-uniform dimensions, deformed shapes, unwanted airholes and poor quality of the Flat Fibers.

Keyword: Flat fibers; Planar devices; Specialty optical fibers