

Fibers Presence Effects on Air Flow of Attenuator of Spun-Bond Production System

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Abstract : High quality air filters production using nanofibers, as a functional material, has frequently been investigated. As it is more environmentally friendly, melting method has been selected to produce nanofibers. Spun-bond production systems consist of extruder, spin-pump, nozzle package and attenuators. Spin-pump makes molten polymer steady, which flows through extruder. Fibers are formed by regular melts passing through nozzle holes under high pressure. Attenuator prolongs fibers to micron size to be collected on a conveyor. Different designs of attenuator systems have been studied in this research; new analysis have been done on existed designs considering fibers effect on air flow; it was comprehended that, at fibers presence, there is an air flow which agglomerates fibers as a negative effect. So some new representations have been designed and CFD analysis have been done on them. Afterwards, one of these representations selected as the most optimum and effective design which is brought in this paper.

Keywords : attenuator, CFD, nanofiber, spun-bond

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