World Academy of Science, Engineering and Technology
International Journal of Aerospace and Mechanical Engineering
Vol:9, No:04, 2015

Optimum Design of Attenuator of Spun-Bond Production System

Authors : Nasser Ghassembaglou, Abdullah Bolek, Oktay Yilmaz, Ertan Oznergiz, Hikmet Kocabas, Safak Yilmaz

Abstract : Nanofibers are effective material which have frequently been investigated to produce high quality air filters. As an environmental approach our aim is to achieve nanofibers by melting. In spun-bond systems extruder, spin-pump, nozzle package and attenuator are used. Molten polymer which flows from extruder is made steady by spin-pump. Regular melt passes through nozzle holes and forms fibers under high pressure. The fibers pulled from nozzle are shrunk to micron size by an attenuator, after solidification they are collected on a conveyor. In this research different designs of attenuator system have been studied and also CFD analysis have been done on them. Afterwards, one of these designs tested and finally some optimizations have been done to reduce pressure loss and increase air velocity.

Keywords : attenuator, nanofiber, spun-bond, extruder
Conference Title : ICFDM 2015 : International Conference on Fluids Dynamics and Mechanics
Conference Location : Venice, Italy
Conference Dates : April 13-14, 2015