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Meltblowing - a commercially feasible production technology for nanofibers

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Abstract

Melt blowing has been known to produce nonwoven webs with fiber diameters in the range of a few microns. With recent advances in technology, it has been possible to produce nonwoven webs with diameters in the range of few nanometers. There has been continuing interest in nanofibers for filtration and related applications. Several techniques have been researched over the years. Although many have been successful in the laboratory scale, for several reasons, they have not seen commercial success. The meltblown approach allows the production of nanofiber webs from thermoplastic polymers with relatively higher production rate, and is the most promising one for large-scale production. Special dies made from two different designs have been retrofitted in the traditional melt blowing line at the university of Tennessee nonwovens research laboratory (UTNRL) pilot lines to produce nanofiber webs from thermoplastic polymers. It has been demonstrated that melt blown webs with average diameters less than half a micron have been consistently produced from several polymers including polypropylene, polyesters and polylactic acid. Results from this ongoing research work will be discussed.

Biography

Gajanan Bhat completed his PhD in 1990 from Georgia Institute of Technology, Atlanta, GA. He has been a faculty member at the University of Tennessee, Knoxville for the past 22 years, and currently is the director of nonwoven materials research laboratory (UTNRL), a world-renowned center for polymer-based nonwovens research. He has published more than 200 research papers and has three US patents. He has been the president of the Fiber Society, and is an active member of INDA, TAPPI and the Textile Institute.