

Investigation of Dispersion of Carbon Nanoparticles in Polymer Melt for the Fabrication of Functional Filaments

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Abstract : Nanocomposites have become more and more important as the implementation of nanoparticles in polymer allows additional functions in common industrial parts. Especially in the fabrication of filaments or fibres nanomodification is important, as only very small fillers can be added to the very fine fibres (common diameter is 20 μm , fine filament are 1 μm). Discharging fibres, conductive fibres, and many other functional fibres raise in their importance nowadays. Especially the dispersion quality is essential for the final enhancement of the filament properties. In this paper, the dispersion of carbon nanoparticles in polymer melt is enhanced by a newly developed sonication unit of ITA and BANDELIN electronic GmbH & Co. KG. The first development steps of the unit fabrication, as well as the first experimental results of the modification of the dispersion, are shown. Special focus will be laid on the sealing of the new sonication unit as well as the positioning and equipment size when being implemented in an existing melt spinning unit. Furthermore, the influence on the thereby manufactured nano-modified filaments will be shown.

Keywords : dispersion, sonication, carbon nanoparticles, filaments

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