

## **Influence of processing technique on mechanical and physical properties of polymer nanocomposites**

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The use of nanofillers (especially layered silicates) is steadily growing in polymer processing due to their great potential of enhancing mechanical and physical properties. In order to obtain this improvement, a homogenous dispersion of the nanofiller must be achieved. Depending on the particle structure (agglomerated, intercalated or exfoliated) a significantly higher level of improvement of the mechanical and physical properties can be achieved with a very small amount of filler. The degree of dispersion is exceedingly linked with the energy and time used for processing nanocomposites. The energy and time themselves are depending on the type of processing technique and processing conditions. The influence of the residence time on the exfoliation and the amount of energy needed to create a stable 3D physical network is still not known precisely, but would be of major interest according to an optimization of mechanical and physical properties of the nanocomposite. In this study, the effect of different processing techniques (injection molding, compounding and extrusion) on the dispersion of the nanofiller is investigated. The differences in the degree of dispersion according to dissimilarity of the chosen processing techniques are compared via various methods such as barrier test, scratch test, tensile test, impact test and stability test executed on pipes.