

## MICRO-TEXTURED BORON NITRIDE NANOPATELET MODIFIED POLYETHYLENE FILMS

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### Abstract

Linear low density polyethylene (LLDPE) micro-textured films filled with boron nitride nanoplatelets (BNN) were produced by continuous melt extrusion. Nanoparticles displayed a significant extent of dispersion inside the matrix. The addition of BNN led to more than 10-fold increase of the in-plane thermal conductivity (TC) of the nanocomposite (7.7 W/m.K vs 0.3 W/m.K for pure LLDPE), and 1.3-fold increase of through thickness TC. To increase the surface area available for convective heat transfer, micro-textured films (T-BNN) were produced from a micro-patterned die. Nanoplatelets were aligned parallel to the film machine direction. Film stiffness and tensile strength are comparable to the base LLDPE. Textures and BNN lubricant property helped to decrease the coefficient of friction.