



CORRELATIONS BETWEEN PROCESSING CONDITIONS, STRUCTURE AND PROPERTIES OF BI-ORIENTED BLOWN FILMS

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A commercial low-density polyethylene (LDPE) was used to produce bi-oriented blown films under different operating conditions, using a prototype laboratorial extrusion line developed in-house for the production of both conventional and bi-oriented films. Correlations were established between parameters describing the thermo-mechanical history associated with each condition, process stability, level of orientation developed, and final film properties. Process stability was judged qualitatively, in terms of bubble stability and film thickness homogeneity. Orientation levels were estimated from thermal shrinkage measurements. Mechanical and optical properties were determined by uniaxial tensile testing and haze and gloss measurements, respectively.

Bi-orientation temperature, stretching ratio (defined by the blow-up and draw-down ratios) and cooling conditions (determined by cooling air flow rate and velocity) strongly influence the orientation levels induced and, consequently, the final film characteristics.