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Melt Rheology and Processing Variables on the Film Properties in Blown Film Extrusion

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Melt rheology and processing variables are the most important factors affecting the film properties in blown film extrusion. The main objective of this paper is to provide a relationship between the processing characteristics of low-density polyethylene (LDPE) and the properties of LDPE films obtained under different operating conditions. Two different grades of LDPEs were selected for the investigation of melt rheology and film production in a pilot plant operation. Die temperature and cooling rate were considered as the processing variables for their superior effect on the film strength. Films were produced at different processing conditions and their tearing, tensile, shrinkage, gloss and haze properties were determined. Crystalline properties of the films were also determined. Film properties were analysed statistically with respect to the processing variables. The effect of rheology, temperature and cooling rate on the mechanical and optical properties of LDPE films is discussed in this paper.