

## **Significance of Blend Ratios of h-LLDPE and LDPE on the Tear Properties of Blown Films**

*Mezghani Khaled, Furquan Sarfaraz*

Polyethylene is widely used for packaging applications. From the different grades of polyethylene, LLDPE and LDPE play a major role in the film blowing industry. In our study, blown films of h-LLDPE, LDPE, and their blends were produced using a twin screw extruder. The film blowing process parameters which significantly affect the properties of the film were all optimized and kept constant. All films were processed at a constant extruder temperature profile, blow ratio of 1.6, draw ratio of 21, mass flow rate of 8g/min, and die temperature of 230°C. The tear properties of all films were determined in the machine direction (MD) and the transverse direction (TD) using an Elmendorf tear tester. On one hand, similar values of the MD tear-resistance for the two homopolymers, h-LLDPE and LDPE, are measured to be 100 and 120 KN/m, respectively. On the other hand, the TD tear-resistance value of h-LLDPE is 180 KN/m, four times higher than that of LDPE, 45 KN/m. Even though LDPE film has low value of TD tear-resistance, small additions of this polymer to h-LLDPE produced blends with better TD tear-resistance films. It was observed that small additions of 5%, 10%, 15%, and 20% of LDPE to h-LLDPE increased the TD tear-resistance value up to 400 KN/m (220 KN/m increase). This large increment, 220 KN/m, of the TD tear-resistance was mainly due to the lamellar structural change as observed by SEM micrographs.