

Conclusions

Tape yarns composed from blends of polyolefins, i.e. polypropylene (PP) with linear low-density polyethylene (LLDPE) (1-octene comonomer) and additives such as ultraviolet (UV) light stabiliser and calcium carbonate (CaCO_3) were manufactured into tape yarns using an extruder E10. The yarn samples were drawn at a fixed draw ratio, and a fixed temperature regime was also used. The final width of the two types of samples manufactured was 3.4 mm and 2.5 mm, and four levels of nominal linear densities from 110 tex to 215 tex were chosen for the samples.

Examining the tape yarns, it was found that they have rather different ranges of different characteristics with respect to the place in the film width. For instance, for samples of 3.4 mm width, the values of linear density fluctuated by only 1.4%. The greatest influence on the measuring place was observed in data of the work of break i.e. 11.9%. The tape yarns of 2.5 mm and 3.4 mm width exhibited changes conditioned mainly by the differences in their linear densities. It should be mentioned that the fixed conditions of manufacturing are the main reasons for the stability of the breaking characteristics, but problems connected with the adjustment of the slit dye may aggravate the situation.

The effects of additives are as follows: The linear density of tape yarns with 8.0 wt% of Granic 422 is lower, and tenacity is higher compared with the samples containing 10.0 wt% of Granic 422. This linear density trend can be caused by different densities of PP and Granic 422, and the tenacity trend is additionally conditioned by differences in the composition, i.e. by the highest portion of PP in the tape yarns. Summarised values of the elongation at break, work of break, specific work of break, and breaking force for the above-mentioned two series were almost of the same magnitude.

The tape yarns made from PP granules with different melt flow index (MFI) values exhibited very similar breaking characteristics.

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