Coextruded Sheets

Coextruded sheets
Vol. 21 #1, June 1994

Melt disturbances in coextruded sheets are caused by poor layer viscosity control (excluding elastic effects).

The primary sources of poor viscosity control can arise from several different sources:

1. Poor melting
2. Non uniform melt temperature profiles entering the die.
3. Poor resin selection giving a melt viscosity mismatch between layers.

I call these the first, second, and third kind of melt disturbances, respectively. In reality, melt disturbance is due to the poor viscosity match of melt layers. The source of the upset determines what kind of disturbance it is and, therefore, what is the appropriate troubleshooting approach. To avoid all kinds of melt disturbances, you must insure that the low viscosity material is on the outside layer, otherwise the layers will rearrange. This is best controlled by resin viscosity selection, or melt temperature levels, (Melt Disturbance of the Third Kind.)

The first and second kind of melt disturbance is due to something being broken. In the first kind, unmelted polymer enters the die because the screw is not doing its job. Process changes may fix the problem, or a new screw may be required. This type is usually the result of an output increase exceeding the capabilities of the screw. Poor melt temperature profile control is most often due to problems with a melt pipe or perhaps a die heater. Poor temperature zoning or controller tuning, as well as a burned out heater, may be the source of the problem.

In order to effectively fix the problems of coextrusion melt disturbance, you must learn to differentiate between the primary sources of poor layer viscosity control.

- E. Mount

See also:

- Coextrusion: opportunities and challenges
- Correcting flow instabilities in coextrusion
- Extrusion evaluation through pressure and melt temperature analysis
- Interfacial instabilities during coextrusion of LDPEs
- "Wave" pattern instability in multilayer coextrusion

Return to Consultants' Corner