

# Gauge Control

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The accurate control of film thickness in an extrusion operation is critical in the production of a high quality film. This is especially true for films which are stretched or oriented after extrusion.

The art of obtaining uniform thickness is well known. It involves delivering material a die at a uniform rate, with a uniform temperature and uniform viscosity. The uniformity should exist both with time and across the web. The art also involves continuous web thickness measurement and automatic control of die lip openings.

Many small installations are producing film without being able to justify continuous thickness measurement and automatic control of the extrusion die. Here are two simple suggestions for small operations that can result in improved gauge uniformity:

- a) Use some form of averaged thickness measurement to present the operator with a thickness profile which is accurate to +/- .5% or better. No matter what tool is used to measure thickness, this accuracy can be obtained by gauging a multiple number of sheets at one time or by averaging a series of measurements.
- b) Present the operator making the adjustments with a graphic display of the thickness measurements. The display should have a number of features. These should include: 1). The profile of thickness in percent of the average thickness versus the distance across the web. 2). The location the die adjusting bolts relative to the thickness measurement on the web. 3). Acceptable action standards, i.e., no adjustment, make an adjustment, or stop the operation to correct the problem. 4). The percentile deviation of the average thickness value from the desired standard.

A simple, and relatively inexpensive, way of implementing these suggestions is to input data from the gauge measurement device to a small personal computer with a color monitor. The monitor should be located at the operator's station and can be a real help to the operator in making good adjustments. The gauge input to the computer can be manual, although the cost of directing the output of the gauging device to the computer is small. Any of several programs could be used to display the gauge appropriately.

— Kenneth L. Knox

See also:

- Basic film calculations
- Gage control for tubular film production
- Thickness uniformity in blown film extrusion
- Orientation in sheet extrusion and its effect upon quality

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