

# Converting for Flexible Packaging

## Converting for Flexible Packaging, Vol. 27 #1, March 2000

by Adolph Miller, Technomic Publishing, Lancaster, PA 1994, ISBN number 1-56676-061-5

There are a number of useful texts for the extrusion professional that while not dealing directly with the art of extrusion per se, cover either upstream or downstream portions of an extrusion operation. Books on feeding systems, pellet drying and handling, die design, sheet, film, and profile forming all fall into this category. One of these texts is *Converting for Flexible Packaging*, by Adolph Miller recently (1994) published by Technomic Publishing Co.

If the reader has seen the recent review of *Plastic Films: Technology and Packaging Applications*, by Kenton R. Osborne and Wilmer A. Jenkins also published through Technomic Publishing, Miller's text picks up almost where Osborne and Jenkins left off. Following some background and history about the packaging industry, Miller delves into many of the same unit operations treated by Osborne and Jenkins, but in more depth. He skips any treatment of the actual formation of the film, but picks up with analysis of surface treatments (plasma discharge, etc.), drying of a web, printing, coating, etc.

Each of these chapters follow similar characteristics. There is an outline of what the unit operation is and why it is performed, something about the history, variations on the operation or the equipment used, and some of the basic mathematics of that operation. For example, the chapter on drying of a moving web offers a mathematical treatment of the heat transfer to and from the moving web and some of the mathematics of the resultant mass transfer, the driving off of solvent.

The chapters on printing and coating show much of the combined art and science that is associated with this industry. There are a plethora of different roll stack configurations for applying different types of coatings and inks, and Miller relates the design of the film path to nature of the coating or printing process as well as the rheological and thermodynamic (how fast will the solvent dry?, surface tension of fluid vs. substrate) properties of the ink or coating system.

He offers an extensive treatment of the winding and slitting operations, providing the reader with some of the math behind different winding techniques etc., and how the key winding parameters affect residual tension, deformities in the roll, and possible changes to the structure of the film.

One treatment for the film packaging that would have been nice to see is how one handles clean room, or clean handling issues. What are the design considerations around bringing film or rolls in or out of clean facilities, what are equipment specification issues around particle elimination with rotating equipment? With the volume of plastic packaging that goes into the food and medical device markets, a treatment of this topic would be valuable to many readers.

- Robert E. Jerman