Sheet/Film Coextrusion Grows

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In a talk I gave the Coextrusion IV Retec in Chicago, I made a statement about the future of sheet and film products which I was surprised to find that few people took exception to. I said that I believe that all sheet and film products will be coextruded sometime in the future. Notice, I did not say when this complete conversion to coextrusion would be achieved. Why am I bold enough to say this?

Today, we find coextrusion being practiced to a degree in every major sheet and film application area. For rather extreme examples: garbage bags are being coextruded at one end of the spectrum and sophisticated multilayer barrier layer food packaging products are being extruded at the other end. What's in common over this spectrum. I believe the answer is economics. Garbage bag costs can be reduced via coextrusion: good product properties and a downgaged product are achieved. The same is true for the more exotic barrier layer products which are going into microwaveable shelf stable containers which contain 5-1 1 layers: necessary properties are obtained at lower costs than can be achieved by any other means in a plastic product. So quality products which sell well at the lowest price are the driving force.

The large degree of interest in improving products via coextrusion is leading to developments in all the fields which are important to successful coextrusion. Examples abound: coextrusion feedblocks and blown film dies are more versatile, easier to adjust and maintain, specialized adhesives are proliferating from companies like DuPont, USI, Exxon, etc., new polymers are being developed which are aimed at coextrusion applications, especially barrier polymers. There are other equipment developments which make coextrusion more practical, such as, microprocessor controllers which can control 5 or more extruders, gear pumps which can be incorporated in the process control to aid layer thickness control and uniformity, and even gauge controllers which can measure individual layer thick nesses as well as total gauge in some cases. In all these areas, there is much activity to ward improving and optimizing these systems for important coextrusion activities. Obviously, these comments just touch the surface of equipment developments which are allowing the coextrusion boom to become more practical, stable and economic.

Other obstacles which plagued coextrusion in the beginning times are being overcome. Chief among these is scrap recycle. Even PVDC is being successfully recycled on a commercial scale. Now we hear that Mobay has developed a special polycarbonate which can be extruded at a low enough melt temperature to allow successful coextrusion with PVDC. It almost appears that all you need do is spotlight an important need and either a resin manufacturer or a equipment supplier will solve the problem.

I believe the clincher to my statement is the fact that every sheet and film product which I can think of can benefit from a multi-layer structure for some reason. Coextrusion can change the surface characteristics in appearance (e.g., gloss and color) or its functionality (e.g., antistatic, uv resistance). Coextrusion is certainly the economic way to increase the barrier properties to oxygen and carbon dioxide transmission. It is an economic way to gain practical heat distortion with skins layers of polycarbonate, etc. We can just about always visualize ways to decrease costs by burying recycle which is not adequate as an exposed layer. Finally, the advances in high rate coextrusion equipment, 3000 lbs/hr plus, is making the resin the dominate cost factor in every pound of product: all the other costs (depreciation, labor, utilities) may only constitute 20% of the final product costs. That means small reductions in polymer costs/pound of product can mean major annual savings which can rapidly pay-off the extra equipment costs of a coextrusion line.

To me the puzzling question is: when will all sheet and film products benefit from coextrusion?

- Charles Finch

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