

Innovative Manufacturers Develop New Approaches For Efficiency In Single Serve Container Blow Molding

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Favorable Market Conditions Continue To Drive Growth In Single Serve Container Blow Molding.

Prospects for vigorous growth in consumer blow molded packaging are currently very favorable.

According to Mastio, a St. Joseph, Missouri consulting firm specializing in research and market trends in the plastics industry, this market will grow at an annual average rate of 6.1 percent through 2008, reaching 8.6 billion pounds of resin consumed by the end of that year.

A corresponding report, distributed by Bharat Book Bureau during 2006, predicts that U.S. plastic container demand is expected to exceed 200 billion units in 2010, consuming nearly 15 billion pounds of plastic resins. The study attributes a significant share of that upward progress to dramatic increases in consumer demand for single serve containers.

In the processing equipment market, these facts have contributed to optimism reflected by the Packaging Machinery Manufacturers Institute (PMMI) which, in November 2006, announced that it expects U.S. shipments of packaging machinery to grow at a cumulative annual rate of 2.8 percent over the next three years, reaching \$6.26 billion by 2008. Charles Yuska, president and CEO of Arlington, Va.-based PMMI states: "Packaging machinery end users are replacing older machines with new models with more advanced technology and innovative designs to increase production speeds and reduce labor costs."

As a preface to the technical discussion below, it's important to appreciate that the demand for small single serve containers for food, milk, juice, nutritional drinks and liquid yogurts is one of the fastest growing market segments for plastic bottles, not only in the United States but also on a global basis. The trend is driven by many popular applications including these few: school milk programs conversion from paper to plastic, new package developments targeted at the convenience and health food markets, and changing economical factors and consumer habits in Latin American and Asian countries.

Challenges In Single Serve Container Blow Molding:

As production requirements for a single type package can reach 100, 200, or even 400 million containers per year, processors are looking for the best, least complex, and the most economical machinery that can handle these extreme production rates.

Some blow molding machinery manufacturers have begun promoting tandem blow, the process of blow molding two bottles per parison that have been configured in a neck-to-neck or base-to-base arrangement in the mold. Their rationale is not necessarily that this technique produces better bottles, but that it is the only way to increase output without incurring the additional cost of multiple machines.

However, producing two identical bottles in tandem blow process is a problematic challenge, especially with free falling parisons typically used by shuttle and reciprocating blow molding machines.

Why?

Because the parison shape is never identical from the top to bottom in the mold and achieving an identical material distribution in the top and bottom containers can be next to impossible. Additional variation is added by trying to balance and set up four, six, eight or more parisons to be identical. Even with wheel machines the physical variations in bottles blown in tandem process can never be totally eliminated.

Innovative Processing Equipment Manufacturers

Are Developing Technology To Solve The Challenges Of High Speed Single Serve Container Blow Molding:

Wilmington Machinery, Wilmington, North Carolina, is one example of an experienced blow molding processing system manufacturer that has turned its attention to overcoming challenges in blow molding single serve containers at high speeds.

Wilmington Machinery has designed a new system for producing small bottles that utilize a single parison and individual cavities, instead of tandem, in order to produce the highest quality bottles with the least variation in material distribution bottle-to-bottle, and with the smallest weight variation.

The result?

Processing speed, efficiency --- plus cost savings to the customer.

Wilmington Machinery's focus is on very high output applications requiring a minimum of 250,000 bottles per day or 75 million per year. As its prime objective, the company aimed to eliminate the problems associated with high speed bottle handling and to make their new system extremely simple to set up, operate and maintain.

The result is the Wilmington High Speed Small Bottle (SB) rotary blow molding wheel system. The Wilmington SB process blow molds small bottles in a single cavity mold and uses a proprietary method of guiding the containers from under the blow molder through the trimmer at extremely high speeds with maximum efficiency. The Wilmington SB system's success is made possible by miniaturization of Wilmington's proven mechanical clamping systems --- a technology originally perfected in their larger wheel machines --- combined with a proven technique for accurately positioning the clamps and molds relative to each other.

The Wilmington SB Series is designed specifically for high speed, high volume single serve dairy, food, juice and liquid yogurt applications for containers 200 to 500 ml. A smaller clamp has been added to handle bottles sizes as small as 80 ml. These machines are economical, extremely simple and can be built with up to 60 cavities at speeds up to 30,000 bottles per hour depending upon the container. Like their larger machines, the extrusion rates and layer configuration can be designed to match any application such as white-black-white or barrier bottles.

The Results:

Technical breakthroughs such as Wilmington Machinery's High Speed Small Bottle Series now gives processors the ability to blow each bottle in individual molds while totally eliminating the need for high maintenance bottle knockout systems, complicated bottle takeout devices and cut off knives or shear steels.

Customers have reported they were amazed at the easy-start up and operating of Wilmington's 24 station demonstration wheel at speeds up 240 BPM. Bottles literally fall out of the molds on their own and because Wilmington Machinery developed the technique to blow 100 percent of the entire parison, bottles and flash never stick together. This process works as well for polypropylene, including multilayer, as it does for HDPE.

Photo Caption:

Wilmington Machinery's Small Bottle Series