

# Economic Small Bottle Container Molding For The Dairy and Yogurt Industry

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Today consumers want convenience when they purchase products. And in drink packaging industry consumers want a single serve container. This trend has made the single serve food and beverage packaging is one of the fast growing segments for plastic bottles.

Whether the need is for light weight HDPE bottle for milk and yogurt drink products or multilayer containers for barrier or hot fill applications, we know producers are looking for ECONOMICAL blow molding options. So how can a molder save money blow molding these small single serving containers?

We have found that molders can save money by molding on continuous rotary blow molder system utilizing small individual molds with a unique design that eliminates hot flash. Molder can now produce single serve containers from 100 ml to 500 ml for either monolayer or multilayer configurations. This technological break though significantly cuts equipment costs...plus reduces the operating cost while allowing for less expensive and simplified bottle trimming.

People have asked: "Exactly how does a **SB** (Small Bottle) Wheel reduce my cost per bottle?"

To answer that question it is necessary to note that the top three costs typically associated with bottle production are material, labor and utilities (electric). Depreciation, also a cost-related consideration, is based upon the price or capital investment required.

Therefore, in direct response to the question above, the Wilmington **SB** system can reduce labor, reduce utility cost and lower depreciation by:

- Reducing Kw required per bottle

- Increasing bottles produced per man-hour
- Lowering investment cost more significantly than other machinery types

Let's first talk about electrical savings.

Wilmington's **SB** Blow Molding System has the potential to reduce the amount of hot flash (typically tails and blow dome) by as much as 33% compared to other extrusion blow molding processes. That is, for a typical single serve bottle, the flash (the part cut off and put in regrind) is 30-40% of the bottle weight depending upon many factors. The **SB** system eliminates the typical tail at the bottom of the bottle and therefore allows us to achieve as much as a 33% reduction of flash. This results in requiring only 38.5 grams per bottle with flash (32 gram +20%) versus a typical 41.6 gram requirement from standard processes (32 gram + 30%). At a rate of 300 bottles per minute, this requires 122 lbs/hr less of molten HDPE plastic. Using a Kw rate of \$.08 per Kw hour, that is a saving of about \$14,000 per year.

The advantage in energy savings, however, does not stop there.

A monolayer 30 cavity Wilmington **SB** machine would most likely compete directly with reciprocating screw type machines. It requires two reciprocating machines to match the capacity of a single **SB** system. Reciprocating machines have electric drives for the extruder, just like the Small Bottle system. However each "recip" may have a 40-60 horsepower hydraulic pump motor for the clamp and accumulator circuit. The single **SB** system has only a single 3 horsepower motor to drive the clamping system as compared to 80-120 horsepower for the two recips. 80 horsepower over 8000 hours at \$.08 per Kw produces an additional saving of about \$38,000 per year.

Additional energy-related cost savings include the cost associated with transporting extra resin, cost to regrind flash and store, plus labor involved with the movement, tracking and storing of the extra regrind. Utility cost is typically the third highest cost to a producer after material and labor.

Labor savings, using Wilmington's **SB** System, are achieved because the **SB** enables processors to use a single high output machines versus several smaller machines. Previous methods to

produce small portion size container included reciprocating screw blow molders, injection blow molding, numerous shuttle blow molders side-by-side and some wheels blowing neck-to-neck configurations. The reality is that a single **SB** 24 can produce the same number of containers as two reciprocating style machines. Therefore, a converter could possibly reduce labor requirements by an operator per shift. Based upon a modest cost of \$25,000 per year and 8000 hours, that could equate to a savings of \$100,000 per year or more.

In terms of basic production power, the Wilmington **SB** (Small Bottle) systems can go up to 60 cavities. A typical 30 cavity machine running a 7 second cycle produces 260 BPM (Bottles Per Minute) or 15,000 per hour. The limit in BPM is bottle cooling time which depends on bottle design. By upgrading to a 60 cavity machine at a 7 second cycle, a **SB** machine could produce 500 BPM or 30,000 per hour.

Depreciation savings come from having a lower cost per cavity capital outlay. Based upon what we think is typical machinery pricing, a 24 cavity Small Bottle system with a 3.5" extruder system is 10-15% less than two (2) 12 cavity systems to produce the equivalent number of containers. Plus, it requires less floor space. The cost savings comes from the machine design and also a simple high speed downstream trimming system utilizing a bulk cooling conveyor, a high speed unscrambler and a high speed spin trimmer. For small, symmetrical bottles there are several suppliers of either fixed blade or rotary spin trimmers that can handle 300 per minute rates.

Wilmington "SB" series models are available in a variety of sizes (18 to 60 cavities) with 1 to 7 layers extrusion configurations. Ideal products for the new Wilmington "SB" series include liquid yogurt, all single serve dairy products, hot fill drinks, juices and single serve retort beverages.

For more than three decades, Wilmington Machinery has been designing and building high quality specialty and standardized Rotary Blow Molding Machines, and Structural Foam Machines. For additional details about Wilmington "SB" series contact: Jeff Newman, (910) 452-5090.  
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