

tech.topic

Secondary Blow Molding Operations

After the high density polyethylene (HDPE) leaves the blow molding machine, it travels through several secondary operations. This report covers these operations, including some problems that may occur along the way. Follow all the machine manufacturers' recommendations for safe operation.

After the containers are trimmed, they may pass through a leak detector. Leak detectors are becoming commonplace in the blow molding industry. Detectors may be located on the trimmer itself or downstream. The detector senses a change in pressure in the bottle over time. If a pressure loss is detected, the container is rejected.

TRIMMER

The trimmer is the most dangerous piece of equipment in this process. NEVER put your hands past the guards or remove the guards during operation.

Once the flash is cooled enough for proper removal, the container is transferred to one of several different types of trimmers. Rotary trimmers are normally used for non-handle containers that are produced by captured parisons and need only facing of

the neck and removal of the tail. With the move to prefinished neck systems, rotary trimmers are no longer used as often as they once were.

For flash on containers with handles, the bed-type trimmer is most commonly used. This type of trimmer utilizes cups or buckets that index the container to the trimming station. Here, a lower movable nest picks the container from the bucket and moves it upward. The container contacts the fixed upper nest where the flash is broken off and removed for recycling. The lower nest now moves down and returns the container to the bucket. The bucket then indexes, and the entire cycle is repeated.

The most common problem associated with trimmers is a bent bucket that crushes the bottle, which in turn jams the trimmer. If a thorough check indicates that the buckets are straight, check the bottle for ease of flash removal. You should be able to remove the flash by hand. If the flash can be removed, check the timing and alignment of the trimmer. If the flash cannot be removed easily, a check of the molding process is in order. Refer to Table 1 for causes and solutions to trimming problems.

(Continued on Page 2)

tech.topic

Secondary Blow Molding Operations *(continued)*

TABLE 1 -TRIMMING PROBLEMS

CAUSE

1. Flash too hot
2. Excessive flash
3. Molds not closing completely
4. Mold Problems
 - Mismatched molds
 - Worn pinch-offs
 - Plugged dowel pin holes
 - Plugged vents
 - Neck pre-finish system damaged or misaligned
5. Incorrect bottle weights

SOLUTION

1. Flash too hot
 - Reduce mold and/or melt temperatures
 - Increase blow time
 - Add cooling fans to conveyor
2. Excessive Flash
 - Straighten parison drop
 - Increase drop time and/or melt temperatures
 - Decrease preblow pressure
3. Molds not closing completely
 - Adjust tie bars
 - Shim molds
 - Rebuild toggle linkage
 - Rebuild rotary actuator

4. Mold Problems
 - Replace guide pins and bushings
 - Rebuild mold
 - Clean dowel pin holes
 - Clean vents
 - Replace or align properly
5. Incorrect bottle weights
 - Adjust weights to specification

LEAK DETECTORS

After the containers are trimmed, they may pass through a leak detector. Leak detectors are becoming commonplace in the blow molding industry. Detectors may be located on the trimmer itself or downstream. The detector senses a change in pressure in the bottle over time. If a pressure loss is detected, the container is rejected.

Leak detectors are capable of sensing pencil-point holes when adjusted. Leak detectors should be checked for proper operation once a shift. Simply puncture a container ahead of the detector and observe whether the container is rejected.

BOTTLE CONVEYORS

After the bottle leaves the trimmer, it must be transported to a decorating, filling or packaging operation. Air conveyors, solid belt conveyors and cable conveyors are some types used. The latter is most commonly used in the dairy industry. Cable conveyors use a continuous cable that moves the containers by contact friction through its channels.

(Continued on Page 3)

tech.topic

Secondary Blow Molding Operations *(continued)*

Most dairies have literally hundreds of feet of conveyor to allow sufficient bottle storage during the faster filling operation. In this type of layout, it is desirable to install breaks on the conveyor system. This allows sections of bottles to be separated, preventing them from being crushed. If crushing is a major problem, the use of ovalized tooling helps improve the top load strength of the bottles.

DECORATING

Most containers are decorated with some form of label to identify the product. Identification can be accomplished by several different methods, such as silk screen printing, offset lithograph, decal transfer, spray painting, hot screen printing, paper or plastic-coated paper labels, hot stamping, and designs via engraved molds. Except for engraved molds, hot stamping paper or plastic-coated labels and hot screen printing, polyethylene surfaces must be treated to ensure adhesion of the inks.

The most common decorating methods used in the dairy industry are hot screen printing and plastic-coated labels. Both of these methods can be used with an engraved mold design. In hot screen printing, heated ink is applied through a screen that is porous only in the areas to be printed. The screen is contained in a frame, which is heated and serves as a reservoir for the ink. A squeegee is drawn across the screen to force the ink through the open mesh onto the container surface.

After decorating, the container moves to either a filling line or packaging station to complete the blow molding process.

For more information about blow molding, contact your LyondellBasell sales or technical service representative.