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## Common Blow Molding Problems and Their Solutions

During a normal blow molding operation a number of blow molding problems commonly occur, including parison curl, uneven pinch-offs, excessive flash and incomplete handles.

### PARISON CURL

This occurs during the extrusion of the parison as a result of too cold a melt temperature. Sometimes called "doughnutting," parison curl usually results from one of three conditions:

1. Too cold mandrel or die
  - If the curling occurs when the blow molding machine is started, then gradually disappears as the machine approaches operating temperature, check the mandrel or die. Allow longer warm-up period before starting production.
  - Check whether the die heater, with which most blow molding machines are equipped, is working. If the heater is not operating properly, a very long warm-up time is needed.
2. Die or mandrel misalignment
  - If the machine is fully warmed up and parison curl occurs, check the die and mandrel alignment. Usually the mandrel edge is recessed within the die. As a result, the parison contacts the die and tends to hang up on one side and curl. Sometimes this misalignment has been purposeful in an attempt to blow a bottle lighter in weight than that for which the tooling was designed.
  - Obtain new tooling or machine the die to bring the mandrel back to a flush or lower position with the die face.
  - Parison curl also can result from air leaking around the tooling, thus cooling the mandrel or die. Adjust the blow pin height to stop the leak.
3. Foreign matter or degraded resin in the die
  - Uneven build-up of foreign material on the die can distort the parison as it is extruded. Thoroughly clean the die to prevent foreign matter from accumulating.

### UNEVEN PINCH-OFFS

A worn pinch-off results in flash that is difficult to trim from the bottle. Flash with ragged edges attached to the bottle is a clear indication of such a situation. The difficulty in trimming is due to uneven thickness in an area at the junction of the flash and the container wall.

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## Common Blow Molding Problems and Their Solutions *(continued)*

Using beryllium or steel inserts in the mold definitely enhances the mold's useful life. In the event that the mold halves are made from a single piece of machined aluminum, follow the steps listed below.

- Make a tool as shown in Figure 1. This is done by fixing a piece of ¼" drill rod into a wooden handle - an all wooden file handle or a piece of dowel.
- Grind and polish the free end of the rod and then use it on the mold as shown in Figure 2.
- The blunt pinch-off edges can be quickly sharpened using this technique.



*Figure 1: An improvised, pinch-off, reworking tool made from a drill rod and a discarded file handle.*



*Figure 2: Apply the tool with both force and judgment to sharpen worn pinch-offs.*

### EXCESSIVE FLASH

Excessive flash can be due to any of the following:

- A resin displaying excessive swell
- Excessive pre-blow air pressure
- A misaligned mold assembly.

A typical example of a bottle with excessive flash can be seen in Figure 3.

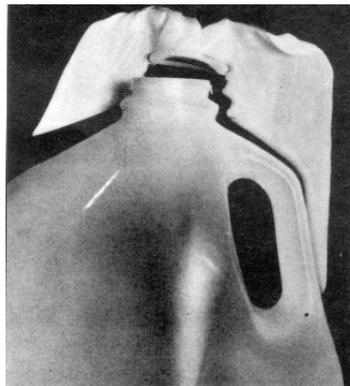
Reduce pre-blow air pressure slightly to determine if problem diminishes. If not, loosen the platen adjusting bolts and nudge the mold assembly a few hundredths of an inch towards the handle. Retighten the bolts and restart the machine. Usually the problem disappears. If not, call your resin supplier for further assistance.

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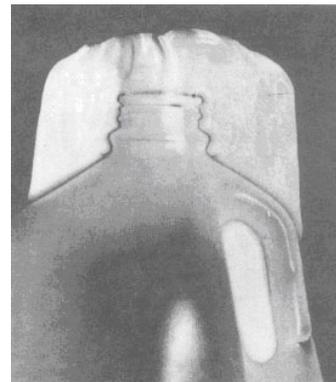


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## Common Blow Molding Problems and Their Solutions *(continued)*



**Figure 3: Bottle with flash down the entire handle.**



**Figure 4: With the flash ending far too high on the handle, a blowout and a useless bottle result.**

### INCOMPLETE HANDLES

A typical example of a bottle with an incomplete handle is shown in Figure 4. When the flash ends high on the handle, the likelihood of a blowhole occurring at the base of the handle is very high. We recommend that you take action opposite to that recommended for the problem of "Excessive Flash." Adjust the flash so that it is about halfway down the handle to take care of the problem.

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