

# PLASTIC BLOW MOLDING HANDBOOK

Edited by Norman Lee



Dynacraft BSC, Inc.

**Exhibit 1006**

Dynacraft v. Mattel

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CHAPTER

2

# Extrusion Blow Molding

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Blow molding is the forming of a hollow object by "blowing" a thermoplastic molten tube called a parison in the shape of a mold cavity. Extrusion blow molding is the most widely used of many blow molding methods.

There are probably more differences in equipment for blow molding than for any other plastics fabrication technique. A blow molding machine may be the size of an office desk or may occupy a large room, making hollow objects as small as a pencil or as large as 5,000 gallons capacity or greater. There are also a great many operating variables in a blow molding process, which make it one of the more complex processes. This chapter covers five topics:

- Blow molding markets, summarized briefly.
- Processes and Equipment
- Controlling wall distribution, the heart of blow molding. Unlike injection molding, in which the wall thickness is automatically set by the dimensions of the mold core and cavity, many variables in blow molding affect wall thickness.
- Special blow molding techniques using moving sections mold with which the Phillips Plastics Technical Center has done much work.
- Blow molding applications and resins

### MOVING SECTION MOLDS

The Phillips Plastics Technical Center has done extensive work with moving section molds. One technique is being used commercially to make a threaded neck off the parting line of a mold. This is done with a reciprocating plug. The sequence is:

1. Blow the parison against the extended plug (Fig. 2-33)
2. Retract the plug during the blow operation (Fig. 2-34)

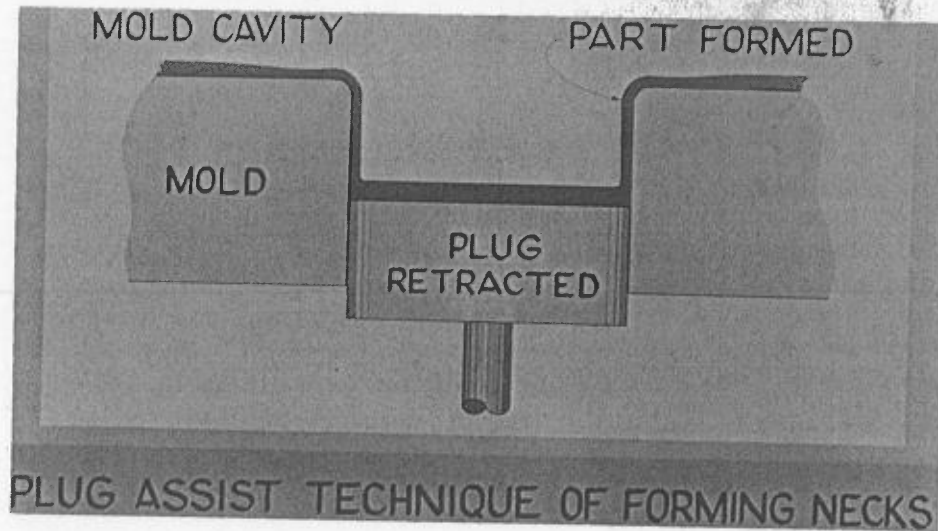
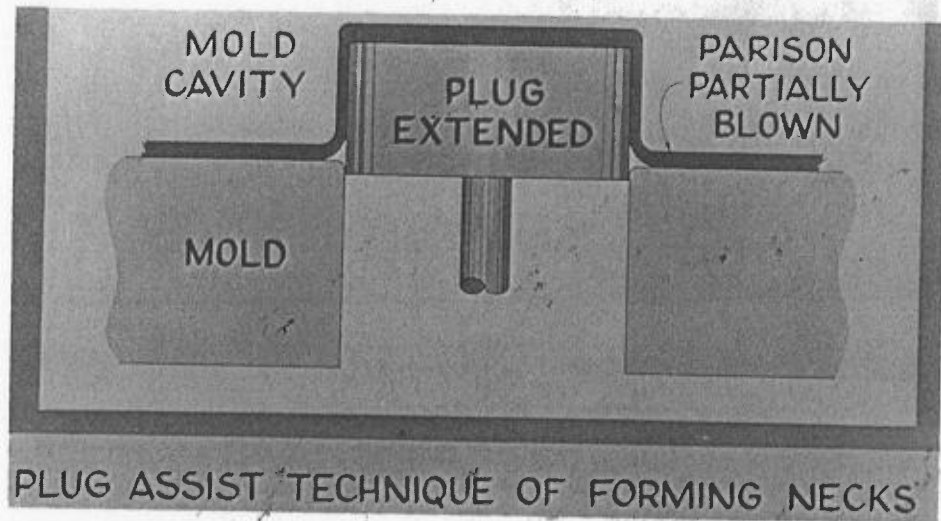


Figure 2-34 Plug assist: plug retracted.



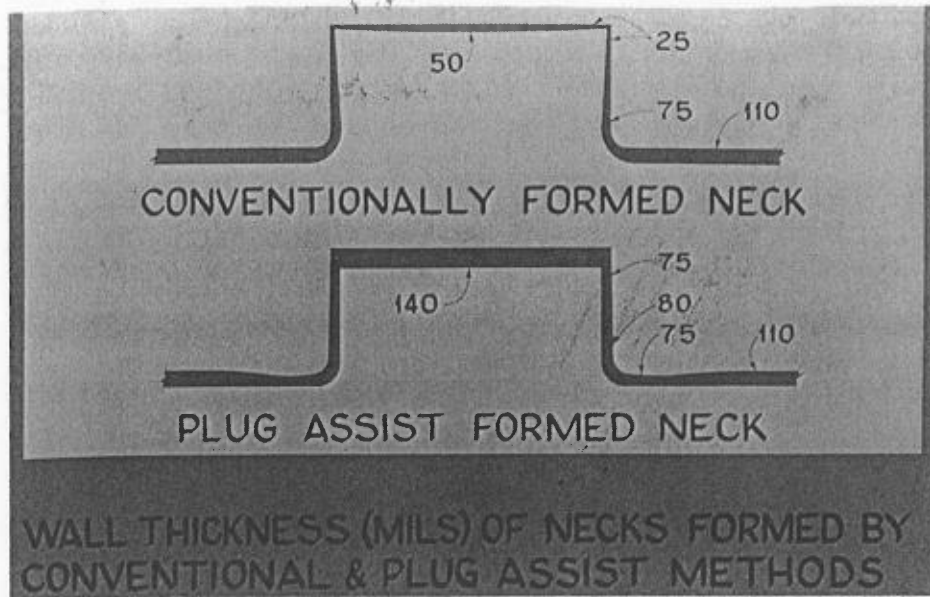


Figure 2-35 Plus assist wall distribution.

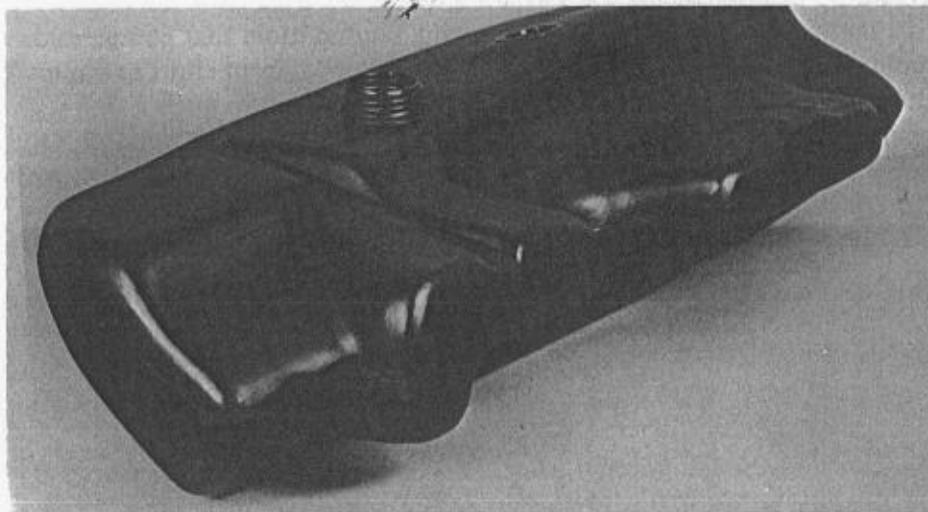


Figure 2-36 Scorpion snowmobile fuel tank.

Wall distribution is significantly improved from conventionally molded necks, as shown in Figure 2-35. Blow time and plug movement times must be precise. This type of neck was made commercially on a snowmobile fuel tank (Fig. 2-36) by Crosby Manufacturing, using high molecular weight HDPE. It saves either a postmolding operation of a fusion-welded neck, or a molded-in encapsulated anchor ring for postmold neck attachments.

Moving section molds are used to make water cooler lids having integral handles. Many millions of cooler lids have been made by both Igloo and Gott. An integral handle lid has been in production at Igloo for twenty years

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