

## Overview of the company

Berlekamp Plastics was founded in 1929 by Kenneth I. Berlekamp, Sr. The original function of the operation was in the manufacture of metal signs, imprinted glassware and silk-screened decals. At the end of World War 2, Berlekamp became interested in the injection molding process. Using a converted machine that produced rubber goods, adjustment was made so that injection molded parts would be produced. According to the Society of Plastic Engineers Berlekamp was the first person to use the injection molding process to produce a “novelty” item as it was then known, of a key tag in the shape of a razorback hog for the University of Arkansas.

The company has been at its current location since 1973 and operates out of two buildings, employing from 12 to 20 people. One hundred percent of the operations are carried out in these two buildings. Ken Berlekamp, Jr and his wife Sandra took over the company in 1978 and remain sole owners of the operation.

## Process to manufacture injection molded: nameplates, badges, plaques and other promotional products.

### Design Concept

- a. Clients provide vector art files which are then examined and if necessary modified to fit our process. Using proprietary software, the art file is processed to create a tool path, like CAD (Computer Aided Design) system.
- b. A .PDF proof is sent for approval. Revisions are made when necessary until final approval is received.

### Creating the cavity with which the casting or part is made.

- c. The approved vector artwork is used to cut the cavity called the setup; depending upon the size of the part and the quantity of the project, more than one cavity may be made.
- d. After the setup is made, the cavity is polished and inspected for defects.
- e. A preproduction part is molded and decorated with hot stamp foil and the casting is inspected for defects. Defects are corrected, or a new cavity is made if necessary.
- f. Due to the proprietary nature of this process, all setups remain on the property of Berlekamp Plastics, Inc.
- g. Maximum size is 6” x 17”

### Mold the part using the injection molding process

- h. The setup is placed into a proprietary master mold base with other projects that will be molded in the same plastic color.
- i. Using the injection molding process, the parts are molded and trimmed from a common runner system.
- j. The molding machine operator inspects each part for defects; if any are found the defective part along with the common runner bar are reground. Reground resin is added back into the system with virgin material and the plastic is reused.

- k. Parts passing quality control are placed into a bin system and transferred to the next step in the operation.

#### Tip coat decoration using the hot stamp process.

- l. The bin is taken from the molding area to the linear hot stamp area where the parts are placed on a conveyor belt that passes under a heated silicon roller. As the part goes under the heated roller, hot stamp foil is transferred to the raised areas on the design.
- m. The linear hot stamp machine is operated with two employees, one at each end of the conveyor belt. At one end the feed operator places the part on the belt, adjusting belt speed and roller temperature. At the end of the belt, the takeoff operator inspects the part for defects. If any are found, depending on the defect, the part is returned to the feed operator and the part is recoated. Parts that pass quality tolerances are placed into a bin and either transferred to a second decoration process for design with more than one (1) print color, or to the final attachment phase of the process.

#### Second color options.

- n. For designs that require more than one color, the parts are either transferred to a spray paint booth or vertical hot stamp area.
  - i. If a change of color to the background area is required, a spray mask is made with openings exposing those areas where the color change is to occur. These areas will then be spray painted with acrylic lacquer.
  - ii. If extra colors to the raised areas are necessary, this is achieved using the vertical hot stamp process. A silicon die is made into the shape of the design requiring a different color. The die is mounted to the underside of a metal heated head. Adjustments are made to pressures, temperature, and the time the silicon die is in contact with the part. Then the part is placed on a table under the heated head and hot stamp foil is threaded between the foil and the part. Using two hand switches, the operator energizes the controls and the head is lowered, contacting the part. After the head returns to the raised position, the part is removed, and the operator inspects the part for defects. Depending on the defect, the part is placed into a different bin where it will be transferred to be reground and the plastic remolded for other projects or it will be re-stamped and placed into a bin with other parts that have passed quality control.

#### Attachment.

- o. The final inspection takes place when any attachment is applied to the back of the part. The attachment could be adhesive strips, die cut adhesive that is cut to trace the shape of the part, or other pads, pins, clips, hangers or easels depending upon the project.
- p. Adhesive backing is provided in either a strip form or die cut form.
  - i. For die cut adhesive to trace the shape of the part for full coverage of the back of part, sheets of material are placed into a laser machine where a vector line art path has been created that the laser follows to cut the material. The areas on the sheet which are not in the shape of the part are removed and the remaining adhesive is placed by hand by an operator onto the back of the part.

- ii. For parts requiring a strip of adhesive, a roll of adhesive is placed on a device which allows the operator to advance the material to the proper liner area on the back of the part. The operator inspects the part for defects and when none are found the operator manually applies adhesive by cutting from the roll with a knife blade.

#### Pack and shipping.

- q. Depending upon the project, the parts are manually counted and may be inserted into an open-end poly bag and then placed into a carton or the poly bag is heat sealed before being placed into the carton.
- r. For parts not requiring poly bagging, the parts are manually counted and placed into a corrugated carton for shipment with enough material placed into the carton to keep the parts in place so as not to be damaged during transfer from our manufacturing facility in Northwest Ohio to the final destination.