

Solutions for Injection Molding In-Mold Labeling

problem

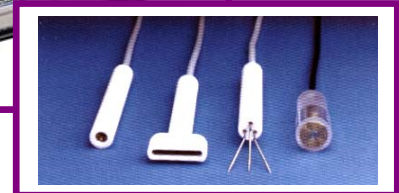
The use of IML (In-Mold Labeling) in the injection molding process provides significant advantages for the manufacturer or marketer of the product as well as the end user. It eliminates secondary steps in the manufacturing process and the end result is permanent. It does, however, present some design challenges. How do you hold the label in place in the mold cavity during injection? The most obvious is to incorporate vacuum ports into the mold tool. This results in high tooling costs and the vacuum ports can result in "pimples" in the graphics on the surface of the finished part. If the robot misses the label, or the label should shift or rupture when the mold is shot, molten plastic may be drawn into the vacuum ports resulting in costly downtime for cleanup of the mold.

The Simco Chargemaster® Electrostatic Charging System provides a reliable and cost effective means of holding the label in its proper location in the mold cavity. When a static charge is placed on the label it will electrostatically attract and adhere to the grounded metal surface of the molding die while the mold is shot. The need for complicated, costly mold tool design for vacuum hold-down is eliminated.

There are two methods for charging the label. Both require a SIMCO Chargemaster Power Supply and one or more arc resistant charging applicators. The conventional method, as shown in Figure 1, requires the charging



Charging Bar and CH30 Power Supply



Charging Applicators

applicator(s) be mounted directly behind the label on the robot's end-of-arm tool. As the robot places the label in the mold cavity, the charging power supply is activated by the robot's PLC, electrostatically charging the label. The vacuum on the end-of-arm fixture holding the label is switched off and the label electrostatically adheres to the mold cavity as the robot retracts from the press.

An example of a simplified method is shown in Figure 2 and does not require mounting the high voltage charging components on the end-of-arm tool. An anti-static foam mat material is cemented to a

grounded metal plate (the size and shape of the label) on the robots' end-of-arm tool fixture. Suction cups are imbedded in the foam and are flush with the working surface. The robot picks the label from the magazine using suction, with the label held flat against the foam. The label is oriented and passed by the static charging applicator bar which is mounted external to the press. The label is then placed onto the surface of the mold cavity, the vacuum is switched off and the label transfers from the foam to the metal die. The robot is retracted and the mold is shot.

results

Electrostatic charging of the label provides a cost effective, reliable means for holding the label in the mold during injection molding. The label becomes homogeneous with the surface of the molded part and will remain for the life of the product.

Contact Simco for further information on electrostatic equipment requirements and tips on end-of-arm tool design.