

## UNDERSTANDING INDUCTION SEALING

### General

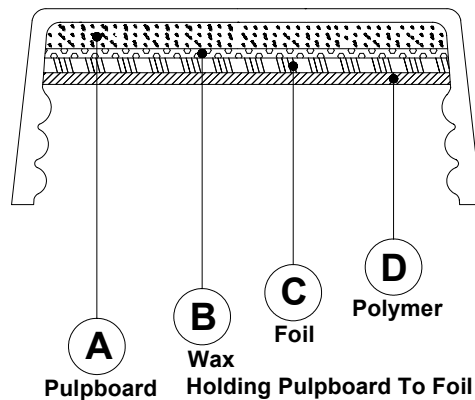
Induction sealing is a non-contact heating process that accomplishes the hermetic sealing of a container when using a closure that includes a heat-sealable foil laminate. The *Super Seal™ Jr. Induction Cap Sealer* converts a line voltage (230 VAC – 50 Hz) to a high-frequency magnetic field in the sealing head. It is this magnetic field that performs the work by inducing currents into the metal foil liners inserted into the closures of your containers. The induced currents cause sufficient heating of the substrate in the closure to melt the polymer coating allowing it to bond to the container surface once it has cooled.

### Multilayer Foils

The typical induction inner seal begins as a multi-laminate liner inside a closure.

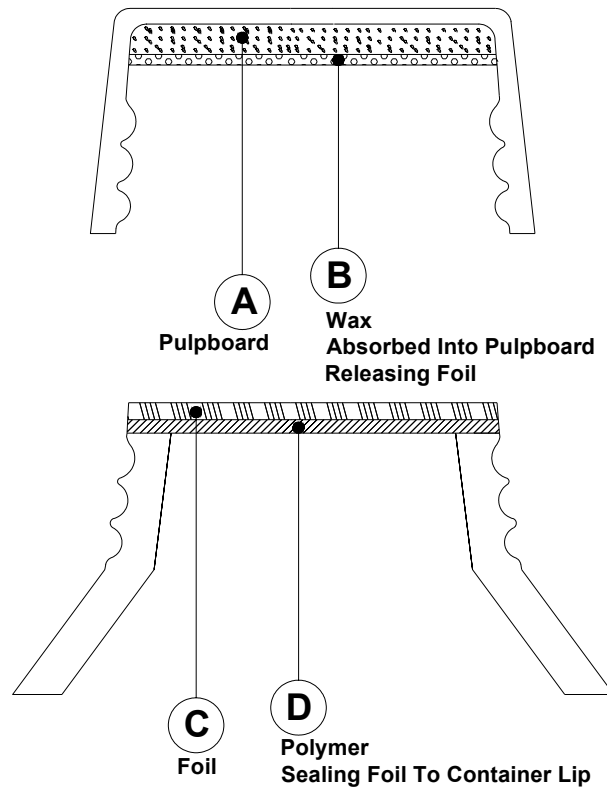
- A) A layer of pulp board
- B) A layer of wax
- C) Aluminum foil
- D) A layer of polymer

The layer of polymer (D) must be compatible with the container material and capable of heat sealing to the lip of the container (**Figure 1**).



**Figure 1**

When a multilayer closure is placed into the magnetic field produced by the sealing head several things occur. The induced current heats the foil portion of the liner and the heat melts the wax layer, which is absorbed into the pulp board, releasing the foil from the pulp board. At the same time the polymer coating melts, bonding the foil to the lip of the container once it is cooled sufficiently (**Figure 2**). The melt and bonding temperatures vary depending on materials used in your package. Refer to **TIPS FOR ACHIEVING PROPER SEALS** in **SECTION 3 – PRINCIPLES OF OPERATION**.



**Figure 2**

### **Single Piece Foils**

Unlike the previously mentioned foil with pulp board backing, the liner is laminated with foam or paper backing. When the liner (C) is heated causing the polymer (D) to adhere to the container, the entire liner with backing is attached to the mouth of the container. There is no separation of components when the cap is removed.

### **Material Variations**

Depending on the inner seal material used, this seal can meet the FDA requirements for “*tamper evident*” packaging or the seal can provide leakage protection and shelf life extension, often referred to as a “*freshness seal*.” Many varieties of inner seal materials have been developed and are available from a number of suppliers. Assistance from the supplier is available in selecting the proper liner required for the multitude of products and a variety of containers.