

Sealing an aluminum disk onto a plastic cap

Objective Heat an aluminum disk onto a plastic cap at a rate of 90 per minute for a cap sealing application in the bottling industry

- Material**
- Plastic cap (top and bottom) with an outside diameter of 1.85" (47 mm)
 - Aluminum disk with an outside diameter of 0.8" (20 mm)

Temperature 300 °F (149 °C)

Frequency 80 kHz

- Equipment**
- Ambrell EKOHEAT 30 kW, 50 to 150 kHz induction heating system equipped with a remote heat station containing six 1.0 µF capacitors.
 - A single position, one turn 12" helical coil designed and developed for this application.

Process The aluminum disk was placed into the top cap and the bottom cap was threaded onto the top. The cap was then placed 1/8" (3.2 mm) away from the coil. The EKOHEAT was turned on and the cap heated to the target temperature in three seconds.

This process resulted in a strong bond between the plastic and the aluminum. With the 12" (305 mm) coil that can heat multiple caps at the same time and a heating time of three seconds, the targeted production rate of 90 caps per minute can be achieved and exceeded.

- Results/Benefits**
- Precise heating: Induction heating enabled the aluminum to seal to the plastic cap quickly without the cap being damaged.
 - Speed: The customer desired a quick rate which would make in-sourcing the process worthwhile, and induction heating exceeded the targeted production rate thanks to its fast heating.
 - Clean and flameless heating: Given the plastic cap, clean, flameless heating was required to maintain its integrity.



The 12" coil with six caps (top and bottom) and six aluminum disks (not seen in picture) prior to heating