

# induction sealing

## SELECTING AN INDUCTION SEALER

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*If you package tablets or capsules in bottles, induction sealing may give you an advantage. Induction sealing creates a visible seal that assures consumers of the product's safety. As a consequence, you're more likely to earn their repeat business. This article discusses induction sealing components, selection, and installation.*

Using an induction sealer requires you to cap bottles with a closure that includes a foil inner-seal, sometimes called a liner. As the capped bottles travel along the conveyor, the induction sealer fuses the inner-seals to the bottle openings using an electromagnetic field. After the bottle exits the electromagnetic field, the foil cools. The hermetic, air-tight inner-seal provides visual tamper evidence, prevents leakage, promotes child resistance, and protects your product from dust, mist, fumes, vapors, and gases. In some cases, the inner-seal also extends shelf life.

### Components

The two major components of an induction sealer are the power supply and the sealing coil.

**Power supply.** The power supply (inverter) transforms input power into the power and frequency necessary to seal bottles. The power supply's kilowatt rating indicates its suitability for the application. In general, the more bottles to seal (and thus the faster the bottling line) and the larger the bottle opening, the higher the kilowatt rating required. Manual or handheld systems require as little

as 0.5 kilowatt, while high-speed lines may require 6 kilowatts, which is the largest unit on the market. The industry workhorse has a 2-kilowatt rating.

### Waterless systems have replaced water-cooled systems as the most popular type of induction sealer.

**Sealing coil.** The sealing coil is a metal conductor surrounded by ferrites and enclosed in a non-conductive housing. The ferrites direct and focus the electromagnetic field for sealing efficiency. Virtually any coil configuration is possible, but the two basic designs are flat coils and tunnel (or channel) coils. Flat coils are used for the inner-seals of child-resistant or standard flat caps ranging from 20 to 120 millimeters in diameter. Tunnel coils are used with spouted, dispensing, push-pull, yorker, or flip-top caps, most of which are not used to package solid dosage forms. You can mount either coil design over an existing conveyor or you can unitize the system by placing the coil and the power supply on a cart for easy movement from line to line.

Waterless (air-cooled) systems have replaced water-cooled systems as the most popular type of induction sealer. While custom water-cooled systems are still the preferred choice in wash-down environments or specialized hazardous chemical plants, waterless systems, for the most part, are replacing standard water-cooled units.

Why? Because waterless (air-cooled) sealers are half the size and eliminate the need for water recirculators, water filtration, hoses, radiators, pumps, and flow switches. In short, air-cooled systems minimize maintenance, are more reliable, and cost less to own and operate.

### Getting your money's worth

When evaluating the purchase of an induction sealer, you should recognize that the return on investment lies mainly in the long-term benefit of adding an inner-seal, which is difficult to quantify. But when comparing induction sealers, look at the service life you can expect from the machine and the quality of service you can expect from the supplier.

First you need to decide whether adding an inner-seal to your bottle will significantly improve your packaging. Next, look at the sealer's electronics, which typically dictate its life expectancy. Induction sealers are manufactured to last a long time. In fact, some sealers in daily use today are more than 25 years old. However, the availability of the electronics used to build the equipment is always a factor. As electronics are upgraded, replacement parts are harder to find. Reputable manufacturers design equipment based on components that they can replace for years to come.

When examining a supplier's service (after-sale support), ask if the vendor will

- troubleshoot the system with you over the phone or by sending a service technician, or must you return the system to the factory for service?
- furnish the power supply independent of the sealing coil? If the two components are separate, the failure of one won't force you to remove the entire system from service.
- supply replacement parts quickly? Ideally, the parts will arrive at your plant the day after you order them.

Finally, you may want to choose a system that's large enough to accommodate many shapes and sizes of caps and bottles, as well as one that can handle high line speeds. That way, you won't need to replace the unit if your application changes or your output increases. Paying a little more now for a larger power supply or more flexible coil design may save you money in the future. If you know that the application will change, look for a system that allows you to interchange sealing coils without tools. Contract packagers often purchase more than one sealing coil so they can seal a wide variety of cap sizes and styles.

When comparing price quotes, make sure you compare systems with equally sized power supplies, identical coil designs, and the same coil mounting arrangement,

either stationary or portable. The quote may also include one or more of the options described in the next section. If you're unsure what a quote includes, ask for more detail.



*An inner-seal provides tamper evidence, prevents leakage, and extends shelf life.*

While price is one important criterion, you shouldn't select a system based solely on the initial price. Make sure to factor in the overall costs that you may incur in the long run. If you're thinking of buying used equipment, be careful. It may use water cooling, which will entail higher maintenance costs than air cooling. Used machines may also be obsolete or lack service support. Always consult the manufacturer to determine the age, type, and history of a used induction sealer. Most used equipment will not come with a warranty.

### Optional equipment

The most popular options include

- Seal-integrity detector. These detect missing foil, loose caps, cocked caps, and stalled bottles.
- Pneumatic reject device. This works in tandem with the seal-integrity detector, ejecting potentially unsealed products onto a tray so that bottles with faulty seals don't reach the end of the line.
- Visible or audible alarms. They let you know of a problem even if you're at a distance from the system.
- Validation support. IQ/OQ is mandatory on most pharmaceutical packaging lines, and installation qualification and operational qualification are also becoming popular in the dietary supplement and food industries.



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### Installation

Induction sealers are easy to install. The sealer requires 3 to 5 feet of straight, unimpeded conveyor for mounting or placing the sealing coil. The coil is always mounted parallel to the conveyor. To prevent accidental heating, keep the sealing zone clear of metal components. T&C

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