

# IMPROVING INDUCTION SEALING: 10 PRACTICAL TECHNIQUES

Optimising seals for efficiency, tamper resistance  
and product integrity



## EXECUTIVE SUMMARY

Induction sealing is critical for protecting products across industries such as food, beverages, pharmaceuticals, and chemicals. When set up and managed correctly, it ensures tamper-evidence, freshness, and leak prevention. If overlooked, even small errors can lead to costly rejects and downtime.

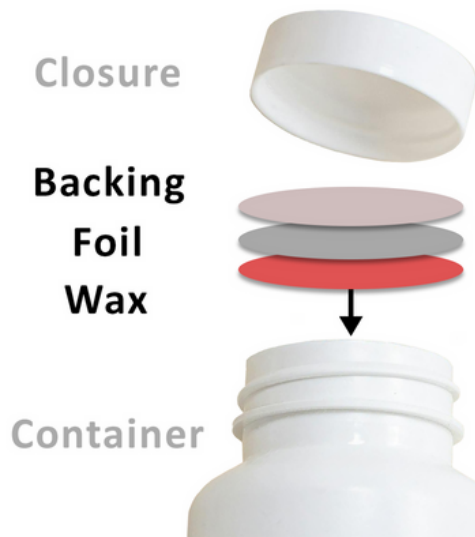
Our latest Whitepaper, *Improving Induction Sealing: 10 Practical Techniques*, outlines practical steps to optimise sealing operations, from adjusting guide rails and conveyor speeds to selecting the right seal materials and applying the correct torque. With these practices, businesses can reduce waste, improve efficiency, and deliver consistent, high-quality packaging.



# INTRODUCTION

Induction sealing is a vital packaging technology for industries such as food and beverages, pharmaceuticals, cosmetics, and chemicals, where safety, freshness, tamper evidence and product protection are essential.

The induction sealing process works by applying an electromagnetic current to a foil liner located inside the bottle cap. The current heats the foil, melting the sealant layer and bonding it to the container's rim. The result is a clean, airtight seal ready for packaging and distribution.



This whitepaper outlines ten practical methods for improving induction sealing performance and reducing rejects.

# PRACTICAL TECHNIQUES

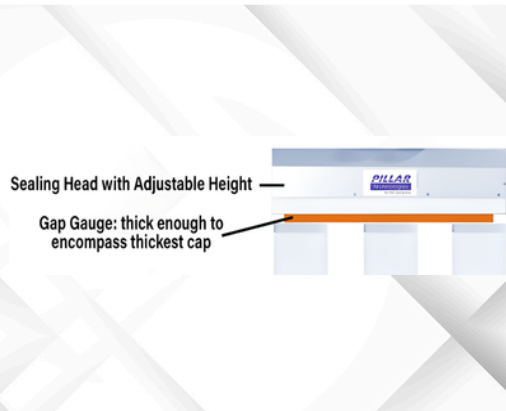


## 1. ADJUST THE GUIDE RAILS

Guide rails ensure bottles travel consistently beneath the sealing coil. Misaligned rails can cause bottles to miss the optimal sealing zone. If metal rails are positioned too close to the sealing head, they may disrupt the electromagnetic field. In some instances, plastic guides-rails are required.

## 2. ALIGN THE COIL

The sealing coil must be accurately aligned for a uniform seal. Even slight deviations can lead to inconsistent sealing results. Your Packserv technician will be able to set the machine up with the correct parameters for your production line, and alignment settings can be checked regularly.



## 3. SET THE GAP

The gap, the distance between the coil and the foil liner, directly affects seal integrity. Establish a consistent clearance to eliminate unnecessary power adjustments. As a guideline, a 3-5mm gap is ideal between the thickest cap (such as child-resistant enclosures) and the sealing head. Measure and standardise this distance across all cap types in production.

## 4. REGULATE CONVEYOR SPEED

Conveyor speed influences contact time - the duration each bottle remains beneath the sealing coil. A consistent speed ensures even heat distribution and reliable seals. To regulate the speed of the conveyor, calculate the amount of time your product spends under the coil being heated from entry to exit. This will ensure that all of your products are being sealed effectively and evenly.

- Formula: Dwell Time = Sealing Head Length/Speed of Line.
- Example: 0.5m sealing head/30 metres per minute;  
Dwell Time = - 0.0167 minutes.

Monitor conveyor performance regularly to maintain consistency across production runs.



## 5. CONTROL THE OPERATING WINDOW

The “Operating Window” defines the acceptable range of power settings that achieve an effective seal without damaging caps or bottle necks.

Establish the minimum power required for complete sealing. This can be done by setting the desired speed and trialling power settings to “baseline”, the minimum power required for the foil to completely seal the power required to completely seal around the bottle lip without burning or melting the inside of the cap, or the inside of the bottle lip under the foil.

Incrementally increase power by 2% until reaching the maximum threshold that avoids burning or distortion.

Record both parameters and communicate them across the production team.

Accurate control of the Operating Window is essential to maximise uptime and maintain product quality.

## 6. SELECT THE CORRECT SEAL

Seal performance begins with material selection. Key considerations include:

- **Product composition:** Aggressive ingredients such as acids, solvents, alcohol, or vinegar may require protective barrier layers.
- **Liner type:** Single-piece liners (paper, board, or foam backing) versus two-piece liners (wax-bonded backing that separates after sealing).
- **Removal characteristics:** Peelable, tamper-evident, or permanent seals should be matched to product and consumer requirements.

Ensuring compatibility between seal and product minimises the risk of leaks, corrosion, or compromised packaging.

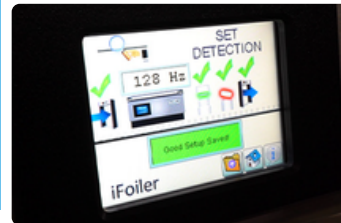


## 7. APPLY THE CORRECT TORQUE

When sealing, the cap torque presses the liner against the bottle finish, allowing the induction process to bond the seal. Incorrect torque can result in weak or incomplete seals. Verify torque levels routinely to maintain consistency, with the use of a cap torque tester.

## 8. CONFIGURE ALARM SYSTEMS

Induction sealers can include alarm functions that signal when performance falls below thresholds. Properly configured under-seal and over-seal alarms are essential for preventing faulty seals from reaching customers. Adjust alarm set-points based on evolving parameters and review them periodically as production requirements evolve.



## 9. INSPECT AND REJECT WITH SEALING UNIT VERIFICATION (SUV) TECHNOLOGY

Routine inspection is critical for quality assurance. Optional extras with the induction sealers are available with features such as:

- Missing foil detection.
- Overseal alarms.
- Seal loss alarms.

These tools support proactive monitoring, enabling faulty products to be rejected before packaging and distribution. Incorporating SUV technology significantly improves production process confidence, increases compliance and reduces waste.

## 10. CONFIRM RESULTS WITH THERMAL IMAGING

Thermal imaging provides a visual diagnostic of sealing performance by detecting emitted infrared radiation and translating it into thermographic images. This allows operators to identify uneven heating, pinpoint the root cause of sealing issues, and make real-time corrections.

Integrating thermal imaging into quality control protocols adds a layer of assurance and speeds up troubleshooting.



# CONCLUSION

## OPTIMISING INDUCTION SEALING FOR CONSISTENT QUALITY

When properly configured and monitored, induction sealing ensures tamper resistance, leak protection, freshness and overall product integrity. Inefficient setup, however, can increase rejects, waste resources, and impact profitability.

By applying these ten best practices, businesses can optimise sealing operations, reduce downtime, and enhance packaging performance. The result is improved efficiency, cost savings, and greater confidence in product quality.



**Talk to Packserv's Technical Team About Induction Sealing Optimisation.** Our experts can help you choose the right induction sealer.

