Herrmann Ultraschall

How To Reduce Rejects In Your Packaging Process

5 Success Factors For Hermetic Seals With Ultrasonic Sealing

How many rejects are too many?

Increasing cost pressure is forcing companies in the packaging industry to make their processes more efficient, cost-effective and faster.

As a result, packaging companies can hardly afford high reject rates, although they are still widespread. Rejects are one of the most frustrating cost factors because they are avoidable, wasting valuable resources, materials, and production cycles.

The primary reason for the high reject rates in the packaging industry is often outdated or unsuitable joining processes for more challenging packaging materials.

Ultrasonics offer a modern, safe, and reproducible sealing technology. This particularly gentle and digitally traceable joining process significantly reduces waste in the packaging line over time.

Find out in this white paper how ultrasonics can help to make your packaging process safer, more efficient, and simultaneously more sustainable.

Reduce Your Reject Rates with Ultrasonics

SEALING THROUGH PRODUCT RESIDUE IN THE SEALING AREA

The main cause of rejects in packaging is contamination in the sealing area. Small particles, condensation, or product residues on the sealing surfaces can prevent conventional processes such like heat sealing from creating hermetic seals.

Studies have shown that the strength of the seal can decrease by up to 88% if the sealing area is contaminated.

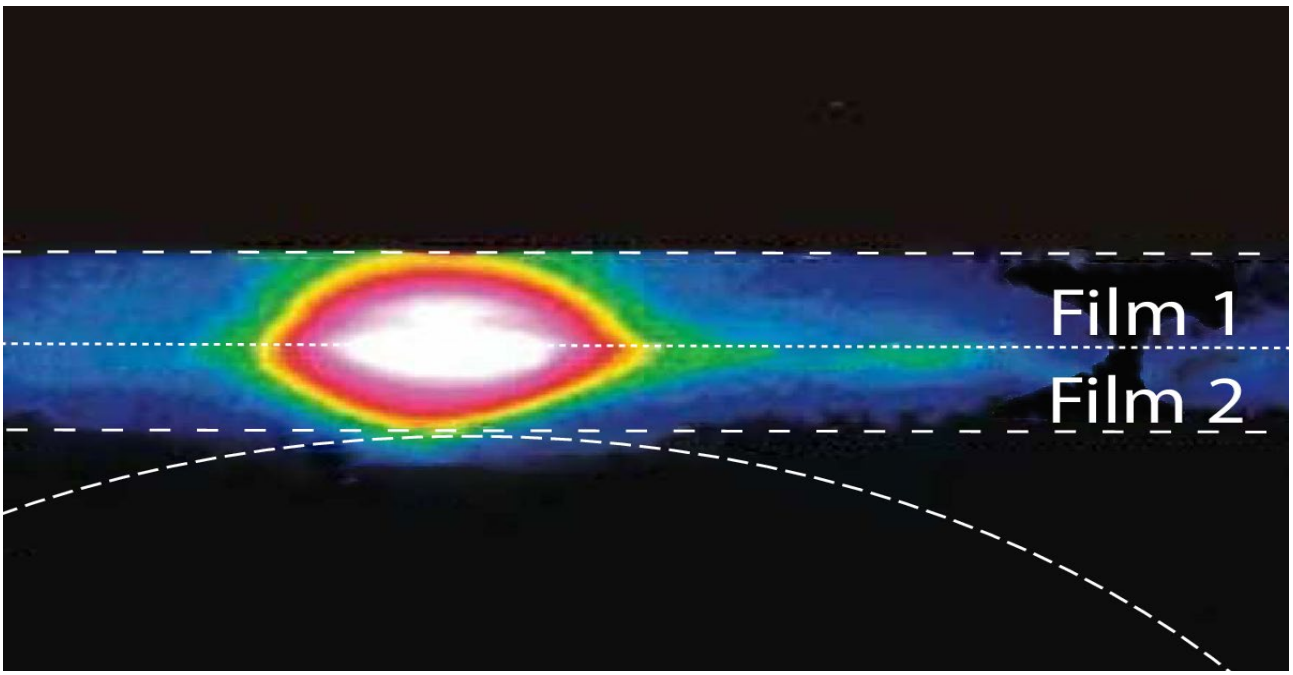
The result: leaky packaging leading to wasted contents or expensive repackaging.

Ultrasonics reliably seals through product residues. The vibrations generated during ultrasonic sealing displace the contents from the sealing area, reducing one of the main causes of rejects.

Packaging benefits from this regardless of the nature of the contents. Ultrasonics can seal through liquids, moist pet food or whole lettuce leaves.

COLD JOINING PROCESS

In ultrasonic sealing, materials are joined by frictional heat under the simultaneous effect of mechanical force. Unlike heat sealing, which applies heat from the outside, ultrasonic sealing generates heat inside the materials during the brief sealing time of approximately 100 to 300 milliseconds.



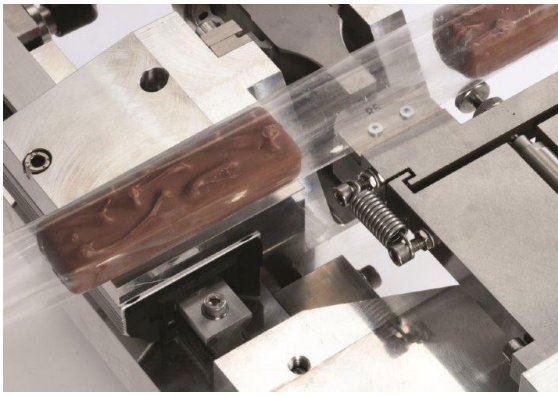
This eliminates common causes of rejects such as film shrinkage or burns.

In fact, the short joining process with cold sealing tools is particularly gentle on the packaging materials.

This makes ultrasonic sealing particularly suitable for eco-friendly packaging with narrow process windows, such as mono-materials or paper-based packaging materials.

Another advantage of the cold sealing tools is that they keep both the packaging materials and the filling material free from thermal influences.

This ensures that heat-sensitive products, like chocolate, can be securely sealed without affecting the consistency or appearance.



CLEAN WELDING TOOLS

When heat-sealing modules come into contact with packaging contents, they can stick to the modules. Such contamination prevents reliable sealing.

This not only results in rejects but also requires halting production for cleaning, which adds to costs.

Ultrasonic welding eliminates this risk. The vibrations generated during the sealing process prevents any filling materials from sticking to the tools.

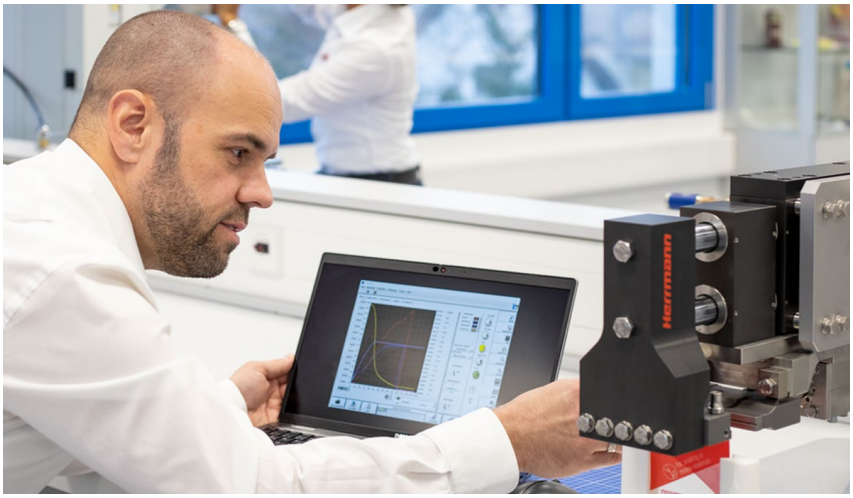
This minimizes the cleaning effort, protects the welding components and reduces the reject rate.

PRECISE CONTROL OF PARAMETERS

Before ultrasonic sealing is implemented, optimal sealing parameters are determined for each application.

The key parameters include

- Weld exposure time
- Amplitude
- Welding force



These parameters and many more are used to determine an optimal process window through feasibility tests in the ultrasonic laboratory. They are saved in the generator and can be reliably reproduced later in the packaging system, ensuring consistent sealing results.

Depending on the application, fluctuations in the composition of the packaging materials can also be adjusted for, due to this exact reproducibility.

SEAMLESS PROCESS MONITORING

With accurate parameter control, the sealing process itself can be closely monitored. If deviations occur, like when two pouches end up in the sealing area, the generator detects the error and immediately sends a signal. This allows for the immediate rejection of defective packaging.

Previously, leaking packages were often only detected during transportation, resulting in the disposal of entire pallets because individual leaks could no longer be reliably identified. Alternatively, the process had to be checked manually. However, this is not always reliable and means additional personnel costs.

Continuous, automated process monitoring by the generator‘s controller, detects issues immediately after the welding process, significantly reducing waste and protecting valuable food products.

Smart use of data

Precise process monitoring has another significant advantage: up to 150 pieces of sealing data can be measured, saved and exported for each sealing process.

This data forms a valuable foundation for optimizing the sealing process and further reducing reject rates.

CUSTOMER STORY: SALAD BAGS

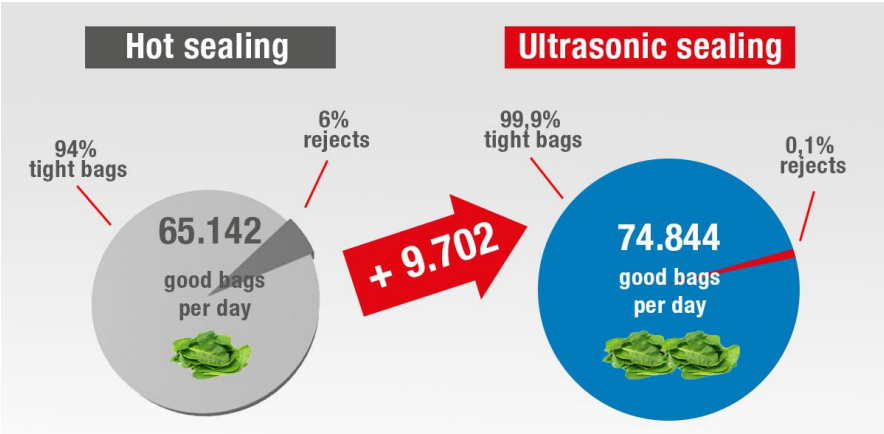
A customer packages salad bags using classic heat sealing, resulting in rejects of 6 to 14 percent. The primary issue is that contamination catches in the sealing area, preventing a hermetic seal from forming.

The high reject rates create significant challenges, as the quality of packaging must be manually inspected, and the lettuce has to be re-sealed. Additionally, there are customer complaints due to not all leaking packaging being identified.

Switching to ultrasonics

After initial trials with the customer, the ultrasonic laboratory demonstrated that the modules could effectively seal through the leaves of lettuce. As a result, up to 99.9 percent of the salad bags were hermetically sealed.

In the customer‘s 3-shift operation, this resulted in an increase of over 9,700 bags per day, bringing the total manufacturing output to around 75,000 bags.



EXPERIENCE THE BENEFITS OF A TRUSTED ADVISOR

Switch now and save

Ultrasonics is an easy way for companies in the food and packaging industry to simultaneously package more efficiently and sustainably.

A connection we call “valuetainable.“

The big advantage: existing systems with alternative welding processes can be converted to ultrasonic sealing. Our Trusted Advisors are available at every phase of the project, from sealing feasibility trials to integration, maintenance and training.

Contact us and make your packaging process valuetainable!

Have questions? We are here for you!

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