WHITE PAPER | BUSINESS CASE

From Leakers to Leaders

Revolutionizing the process and sealing of wet fill pouches, eliminating leakers to save millions in production

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An American family-owned wet fill food processing company, and one of the largest suppliers of Meals Ready-to-Eat (MREs) to the U.S. Military, challenged the industry norm of high leaker rates by replacing traditional heat sealing with ultrasonic sealing technology from Herrmann Ultrasonics. The results were immediate and substantial:

- Leaker rates dropped significantly.
- No quality issues after the ten day post-incubation period.
- Line staffing was reduced from two dedicated operators to one, with reassigned personnel redeployed to other areas of production.
- Production uptime increased due to fewer line stoppages from pouch failures.
- The investment achieved full financial payback (ROI) in eight months.

Today, the facility operates 14 ultrasonic Top Seal Modules across seven dual-head lines, with the most recent machines arriving factory-equipped with Herrmann's latest-generation TSM-30 duplex technology.

Born to Serve: The SOPAKCO Story

Founded in 1943 to produce shelf-stable rations for American troops during World War II, SOPAKCO has grown into one of the largest suppliers of Meals Ready-to-Eat (MREs) in the United States. Today, the company operates two U.S. facilities, employs more than 600 people, and maintains an inventory of approximately two million emergency meals ready to ship when disaster strikes.

The Business Challenge: The Hidden Cost of Heat Sealing

MREs and other shelf-stable meals rely on hot fill or wet fill packaging, in which heated, liquid, or semi-liquid foods such as soups, stews, and sauces are poured into flexible pouches that are then sealed and retorted for long-term shelf stability. The process is messy by nature: fill nozzles drag product across the pouch, steam condenses on the walls, and contents slosh into the seal area, so nearly every pouch reaches the sealer with product in the seal zone.

Traditional heat sealing cannot displace that contamination. Heated jaws trap food directly in the seal, creating “leakers,” pouches that fail on the fill line, during retort processing, or days later. Across the industry, leaker rates which are common and have long been accepted as a normal cost of doing business.

The failed pouches are only part of the cost. Heat-sealed lines typically carry:

- **Waste:** Lost product, cleanup, and disposal from every leaker.
- **Staffing:** Two dedicated operators per line for filling, sealing oversight, and pouch inspection.
- **Lost capacity:** Line stoppages from pouch failures, plus floor space and inventory staging tied up during inspection.

Combined, the true cost of heat sealing is far greater than the price of the sealing equipment itself.

The Solution: Ultrasonic Sealing with the Herrmann Top Seal Module

Herrmann Ultrasonics' Top Seal Module (TSM) takes a fundamentally different approach. When the jaws close, the sonotrode generates high-frequency vibrations that first displace food product from the seal zone, then generate frictional heat within the film's sealant layer to form a molecular bond. The sealing tools stay cold, there is no warm-up time, and the result is a hermetic seal produced in a fraction of a second, even when contamination is present. Onboard sensor technology, including Herrmann's HDM (High-Distance Measurement) sensor, monitors every seal cycle and signals the packaging machine's PLC to automatically reject any suspect pouch, replacing subjective manual inspection with digital precision.

Because SOPAKCO's products must meet U.S. military standards, validation came first. Herrmann, working with Clemson University, deliberately contaminated SOPAKCO production pouches, sealed them ultrasonically, and subjected them to burst pressure, hot-tank immersion, tensile strength, and cross-section microscopy testing, with all feasibility testing provided at no charge. In 2008, the first TSM was installed directly into an existing packaging machine from SOPAKCO's hot filling machine supplier, and the results were immediate.

"They saw an immediate decrease in product failures," says Eric Colley, Key Account Manager in Packaging at Herrmann Ultrasonics. "That is the entire point of ultrasonics: to immediately start working once it's installed on the machine."

SOPAKCO went on to convert one to two lines per year and, by 2024, began purchasing new machines from its hot filling machine supplier that arrive factory-equipped with Herrmann's latest-generation TSM-30 duplex heads.

The Impact: Savings That Compound Across Every Line

The business case for ultrasonic sealing was measurable from the first production run and grew with each line conversion. SOPAKCO's investment achieved **full financial payback in approximately three months**.

Cost driver	Heat sealing	Herrmann ultrasonic sealing
Leaker rate	Industry standard	Achieved a higher standard
Operators per line	Two dedicated operators	One operator
Energy use	Jaws held at constant heat	Approximately 75% less energy
Startup	Warm-up required	Ready to produce immediately

Where the savings come from:

- **Reduced waste:** Cutting the leaker rate reduced wasted product, lost production time, and disposal costs across all seven lines.
- **Faster time to shipment:** Quality products reached first-time acceptance and shipped on time.
- **Higher uptime:** Fewer leakers mean fewer line stoppages for cleanup, fewer batches lost to contamination, and more consistent throughput.
- **Lower energy costs:** The TSM's tools remain cold and consume energy only during the brief sealing cycle. Across 14 modules running multiple shifts, this supports both cost savings and sustainability goals.
- **Lower maintenance costs:** On the TSM-30, food-grade lubrication fittings extend component life, chemical-resistant coatings prevent washdown corrosion, and a cam-driven design reduces mechanical complexity and cost.

What began as a single line conversion more than 18 years ago has expanded to seven dual-head lines and 14 TSM modules. SOPAKCO has effectively standardized on ultrasonic sealing for its hot fill and wet fill production, streamlining production, reducing downtime, and saving millions in production costs.

Beyond MREs: The Same Business Case for Every Wet Fill Application

The same challenge, and the same savings opportunity, exists wherever pouches are filled with liquid, semi-liquid, or heated products, from retail soups and sauces to retort meals, wet pet food, baby food, and emergency rations. In one example, a wet pet food producer reduced its leaker rate significantly after switching to Herrmann's TSM. Ultrasonic sealing can also produce flat, clean seals on sustainable monomaterial films that are prone to distortion under thermal sealing.