



ULTRASONIC WELDING TECHNOLOGY

**FOOD**

# Ultrasonic welding technology. For the food packaging industry.

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Packaging protects and ensures product quality. Food in particular requires the highest standards when it comes to the properties and functions of packaging – innovative packaging solutions are needed. These standards include maximum shelf life of the product, an attractive product presentation, ease of use, and consumer safety.

Hermann Ultraschall is a world-leading company in the field of ultrasonic welding and provides customized solutions for the secure sealing of food packaging. Our innovative and highly efficient technologies are suited to a wide range of processes and applications.



Spouts

Cups

Trays

Blister packs

Capsules

Pouches

Cartons

Bags



## Ultrasonic sealing of food packaging. **As unique as the product itself.**

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### Optimized solutions. For your specific requirements.

Attractive appearance, maximum shelf life, and a 100 % hermetic seal are decisive criteria for the consumer. The common goal of every production manager in the food industry is the continuous reduction of operational costs: fast, leaker free seals with a minimal rejection rate and reductions in the amount of packaging material consumed. For packaging material with thermoplastic sealing layers such as capsules, pouches, drink cartons, cups and trays, etc. ultrasonic sealing and cutting offer a range of technology advantages.

The proven technology of Herrmann Ultraschall welding equipment enables high integrity seals at fast cycle rates, regardless of contamination in the seal area. An attractive appearance is guaranteed through the avoidance of film shrinkage. The ultrasonic process does not require any pre-heating or cooling time, is available on demand, and also significantly reduces the time required for a format change-over. The use of cold tools protects those products which are thermally sensitive. Ultrasonics is superior both technologically and economically for food package sealing.

**Bags****Cartons**

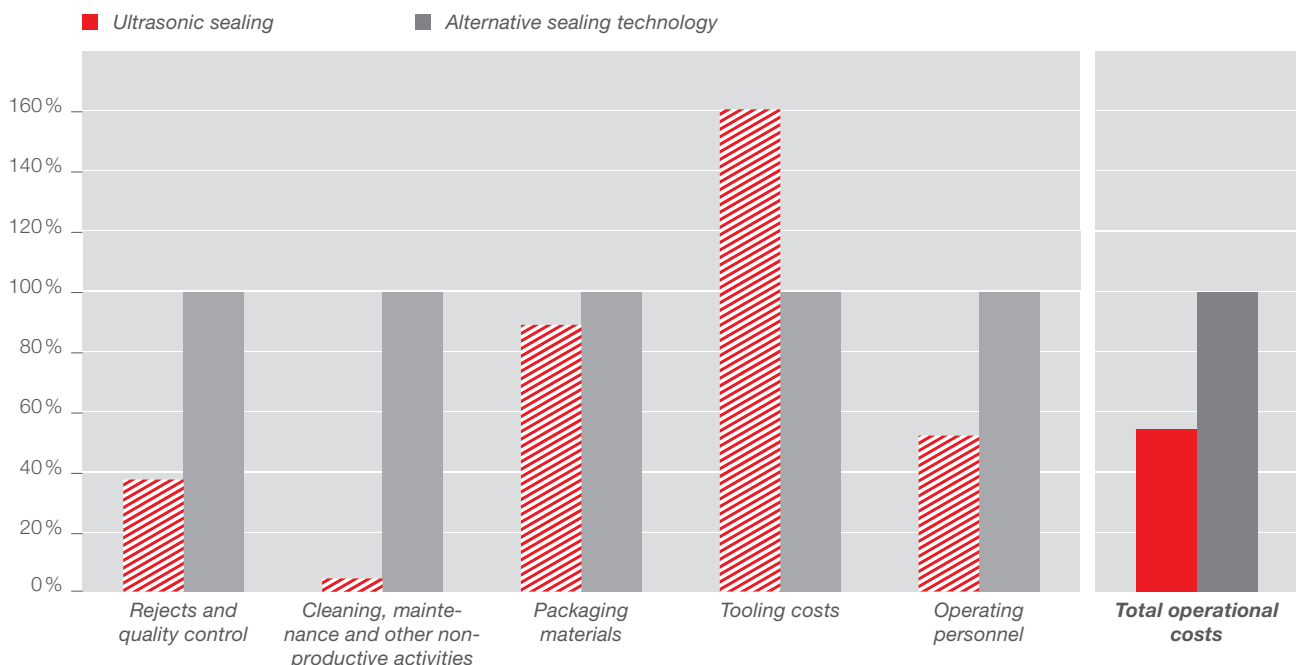
**Typical product requirements.  
Possible with technology from Herrmann Ultraschall.**

- Hermetic seal
- Attractive appearance
- Higher packaging quality
- Greater product safety
- Reduced amount of packaging material
- Environment friendly

## Highly efficient. Due to reduction of operational costs.

A significant reduction in operational costs for the sealing of packaging materials with Herrmann Ultraschall welding technology guarantees an increase in machine OEE (overall equipment effectiveness) compared to alternative processes.

Important components of the total operational costs



## Advantage through efficiency. With revolutionary technology.

The greater up-front investment of purchasing ultrasonic technology compared to alternative sealing technologies is quickly recovered through a permanent reduction in operational costs.

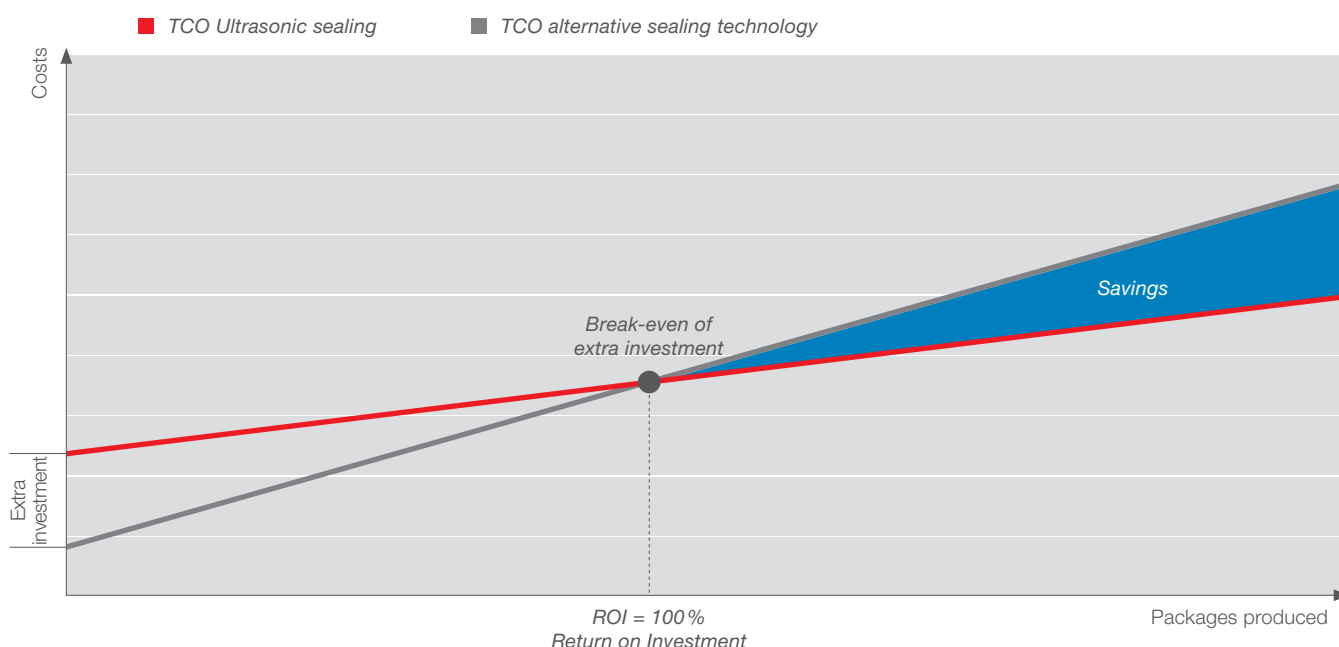
### Reduction of operational costs

- Reduction in product rejects and quality control costs through hermetic seals regardless of seal area contamination
- Significant reduction in packaging material through smaller sealing lines, reduced head space and the use of less complex and costly materials
- Shorter sealing times increase cycle rates and production output – overall shorter production periods
- Drastic reduction in non-productive system time due to reduced cleaning requirements maintenance and the elimination of typical preheat and cool down during change-overs.

## Highly efficient. Returns on the extra investment (ROI).

The higher initial investment for the ultrasonic system compared to other sealing technologies is quickly recovered through the reduction in operational costs.

Comparison of total operational costs – Total Cost of Ownership (TCO)



## Environmentally friendly and energy efficient



Ultrasonic welding technology is considered an environmentally friendly technology. It uses up to 75 % less electric energy than traditional methods of package sealing. Power is only drawn during the actual weld time. Cold sealing tools eliminate the need for consumables such as Teflon tape or sealing wax. With ultrasonic systems, packaging can be produced energy efficient and easy recyclable as no additives are included.

### Properties and advantages

- Very low energy required due to optimum efficiency
- Energy is focused specifically in the seal area and only during the actual weld time
- System is ready on-demand, no preheating required
- No power dissipation through heat radiation as with typical thermal processes

**BLUECOMPETENCE**  
Alliance Member

Partner of the Engineering Industry  
Sustainability Initiative

## Highest welding quality. For capsules and spouts.



### Sealing of lid film

Either printed or non-printed lid film is welded tightly onto thermo-formed or injection molded plastic containers such as coffee capsules. The film is positioned and securely held by a vacuum in the welding tool. This ensures a reliable process and product protection.



### Welding of seal-/adapter rings

Ultrasonic welding of a filter to a sealing ring and capsule protects the filler material due to the use of cold tools, unlike hot sealing processes. A single process step allows connecting several different functional elements with each other.



### Welding of injection molded lids/bottoms

With a clearly reduced welding time when sealing injection molded lids onto plastic capsules, the output of the packaging machine can be substantially increased. In addition to its overall efficiency, ultrasonic welding can produce clean and attractive seals.

### Welding/embedding of filters

Non-woven lining and perforated films or filters are welded or embedded into capsules by using ultrasonic welding technology. The permanent 'reference/actual' comparison of the process parameters ensures repeatability of the welding results.



## Highest welding quality. For valves and zippers.



### Functional components on film

Aroma protection valves are indispensable in coffee bean packaging. Screw caps or spouts represent a clean and user-friendly solution for product consumption. Ultrasonic technology welds injection molded functional components quickly and safely on numerous types of film and maintains an attractive appearance of the package by avoiding film shrinkage. The barrier properties of the package are not compromised.



### Pressure lock – zipper

In resealable packaging the product is protected and can be dispensed as needed. The pressure seal strip (zipper) is ultrasonically integrated during the manufacturing of the packaging. To ensure straightforward resealability, the ends are also ultrasonically welded (zipper crush).



## Highest sealing quality. For flexible packaging.



### Longitudinal seal – bags – VFFS

Ultrasonic welding in longitudinal applications enhances product protection and increases the machine output due to the reduced product drop height. Clean overlap and fin-seal joints can be welded on a continuous or intermittent basis. Packaging materials are saved due to the minimum overlapping of the films. If cross seals are ultrasonically welded, then it is often possible to use reasonably priced packaging materials without a heat-shield layer.

### Cross seal – bags – VFFS

Ultrasonic welding achieves a hermetic seal, even with contamination in the sealing area. Therefore, the required head space above the product contents is reduced, which decreases the film consumption and increases the machine output. It is possible to produce completely air-free pouches with liquid.



Hanging aids (Euro-holes)





### Top seal – stand-up-pouch – HFS/HFFS

Whether it is olives, beans or juices – tight joints are guaranteed by ultrasonic sealing technology. This applies to hot-fill, aseptic or retort pouches. It is possible to substantially reduce the costs of manual quality checks due to the closed-loop digital monitoring of the seal quality per bag (overfilling, filling errors, folds, etc.).



### Top seal – sachet/pouch – HFFS

The vibration of ultrasonic tooling allows for obtaining reliable joint quality despite a dusty filling environment. Burns caused to the package during machine downtimes are safely prevented.

### Longitudinal seal – flow wrappers – HFFS

The use of cold sealing tools reduces the number of rejects due to gentle product handling, even during machine downtime (i.e. chocolate bar). Problematic cold sealing adhesives are no longer needed.



### Cross seal – flow wrappers – HFFS

The digital ultrasonic generator ULTRAPACK enables a monitoring of the joint quality for each pouch. A hermetic seal is also guaranteed regardless of seal area contamination.

## Highest sealing quality. For carton packaging.

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### Gable top seal

Ultrasonic welding technology is suitable for the hermetic welding of coated carton packaging materials. A tight seal is also guaranteed in the seam area, both with and without aluminum barriers, especially in the case of sealing through contamination. Burns to the packaging material are avoided.

### Spout

Ultrasonic welding is an ideal technology for the safe and reproducible sealing of spouts on carton packages.



### Top seal

The use of ultrasonic welding guarantees a production process with extremely short sealing times and reproducible welding results. The buildup of exhaust gases is also prevented.

## Highest sealing quality. For special applications.

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### Tear open function/hanging aids

The ultrasonic process allows for the sealing of packaging with simultaneous integration of important functional elements for storage and opening like the Euro-hole (see page 10). This means work stations in the machine can be omitted and investment and operational costs are reduced.

### Sealing and separating blister packs

The gentle weld process with ultrasonic vibrations enables the use of thinner and more reasonably priced films for the packaging of the product. Additional hot sealing layers in the film are not required.



### Sealing of tea bags

Not only is the bag (cross and longitudinal) ultrasonically sealed, but the string can also be attached to the bag and the tag by using ultrasonics. Therefore, a metal clip or an environmentally unfriendly adhesive can be omitted.

### Tamper-evident weld

The first opening guarantee offers the consumer the best possible product quality and prevents otherwise unseen manipulation by third parties. This important function is guaranteed 100% by the integrated process monitoring. On PET applications in particular, ultrasonics quickly reaches the high melting point and therefore results in an increase in production output.



# Innovative technology.

## Leading in speed and precision.

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### Capsule module

This complete solution consists of an ultrasonic generator, stack, guiding rail, force build-up and drive system. Due to the compact modular design, multi-lane solutions can be presented on a space-optimized basis. The ULTRAPACK ultrasonic generator ensures reproducible product quality.

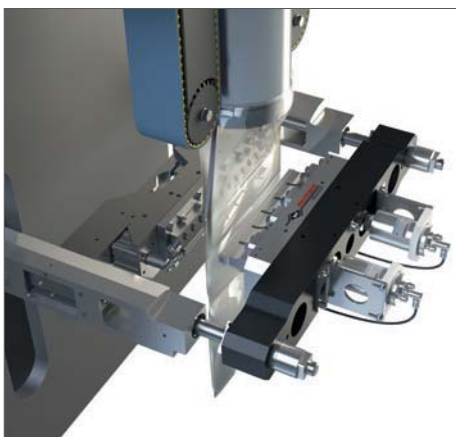
- Repeatable product quality
- Scalable machine integration
- Easy tool changes (quick change)
- Additional options can be integrated



### Top seal module

Misallocations or double allocations as well as relevant process errors are safely recognized and suspect pouches are rejected, due to intelligent measuring and control technology with highly accurate distance measurement. High-cost quality returns from the market are prevented. The design, as a flexible modular system, allows for easy and rapid integration in different types of machines.

- Safe recognition of faulty pouches
- Reduction of quality assurance costs
- Modular design with high longevity under extreme environmental conditions



### Cross seal module

This precisely guided system safely seals through product contamination in the seal area and allows for higher cycle rates. Narrow seals and reduced head space above the product contents save packaging materials. Operating costs are significantly reduced while the quality of products is ensured.

- Performance enhancement
- Safe welding despite seal area contamination
- Product protection due to cold tools
- Packaging material savings
- Modular interfaces

# Continuous support from the beginning.

## ULTRASONIC ENGINEERING.

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The expert teams at Herrmann Ultraschall will support during every phase of your project. This includes packaging material tests, production-related trials in the application labs, on-site assistance during start of production, as well as after-sales and training services. The cost-effectiveness of the processes is always the number one focus.



### Ultrasonic laboratory packaging

#### Verification of weldability

- Activation of the material through ultrasonics
- Inspection of seal tightness through penetration substances and pressure tests
- Estimation of the development effort
- Guiding price information

#### Seal design consulting

- Form design of seal contours
- Customized weld seals based on customer requirements
- Concept consulting on new packaging shapes and designs

#### Weld process development

- Preparation of the weld concept
- Development and manufacturing of application-specific ultrasonic weld tools
- Identification of the process frame

#### Test rigs

- Design and configuration of application-specific test rigs
- Near-production tool layout
- Statements on machine integration
- Inspection of the drive concept

#### Prototype production

- Small series production
- Release by the customer
- Validation by the final customer

#### Training and seminars

- Hands-on user training
- Training on site at the packaging machine

#### Machine integration

- Collision analyses
- FEM-supported tool calculations
- Mechanical and electrical interface definition
- Development of design concepts

#### TCO analysis

- Identification of the break-even-point
- Return rate in comparison with alternative joining processes

#### Start-up and in-production optimization

- On-site integration and start-up of the ultrasonic sealing systems by our service specialists
- Ensuring a smooth startup of production with the packaging machine (fast ramp-up)
- Fine-adjustment of the sealing process for quality optimization

#### After-Sales-Service

- 24-hour technician hotline based on aftersales agreement
- Preventative maintenance and servicing measures
- Tool (change) management
- Targeted production process optimization



**FIRST CLASS TECHNOLOGY. WORLDWIDE.**



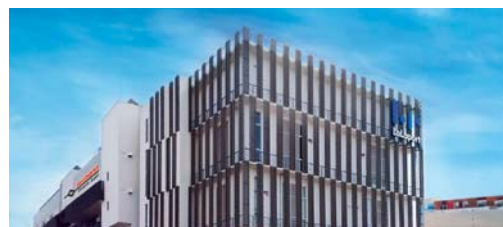
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