

Ultrasonic systems for Packaging & Food Sealing, punching and cutting



Packaging by ultrasound

Individual packaging solutions for optimized processes

Our systems and solutions for sealing, cutting and punching different types of packaging are based on highly developed ultrasonic technology. The extremely gentle process makes ultrasonic technology ideal for packing heat-sensitive products. The contents are not heated because the tools are cold. Because the welds are completely gas and liquid tight, it is possible with ultrasound to seal packaging in one step and at the same time punch it out. Even product that adheres in the sealed area does not affect the seal quality, which means far fewer rejects.

Environmentally friendly process and low energy consumption

Compared with other thermal processes, the energy consumed in ultrasonic sealing is low. Energy is not supplied continuously but only when sealing takes place. The cost of maintaining and cleaning the duly adapted ultrasonic systems (IP68 possible) is even reduced, because the ultrasonic tools are self-cleaning and are not contaminated by residues of packaging material or package contents.

Appealing seal geometries for demanding packaging tasks

When developing the ultrasonic tools and anvils, we adapt the seal geometries individually to the packaging requirements and properties of the packed products. Ultrasound makes it possible to produce seals with peel or solid, firmly bonded positive sealings.

Optimized packaging materials for versatile applications

In order to achieve optimum fusion joints, the packaging materials must have thermoplastic sealing layers. Ultrasound is therefore also suitable for cartons or papers, as well as packaging materials of more complex structure. In order better to match the packaging materials to ultrasound technology, they are continuously optimized in consultation with packaging material manufacturers.



Less packaging and no additives

By use of ultrasound, packaging companies save packaging materials, because both laminates and monofilms can be reliably and tightly worked. Only a small film overlap is needed in the sealing area for the preferred narrow welds. Moreover, during ultrasonic sealing, no additives whatsoever are used, thus making type-specific disposal possible.

More efficient processes with results that can be validated

Processing and tooling times are very short for our ultrasonic systems. This sharply increases the productivity of packaging machines. Continuous monitoring of the sealing parameters guarantees process control and reliability. They can be transmitted to external EDP systems via one interface.

Modular systems and individual solutions

The versatility of ultrasonic technology makes many applications possible. Using modular systems and individual solutions, we satisfy the demands of our customers and their packaging tasks – from standard formats to special formats. Depending on the application, we also incorporate applications for zips or valves.

Vorteile

- Consistent seal quality
- Tight seal seams, even in areas which are in contact with liquids, fats, powders or fibres
- Visually appealing seam design
- Cold tools
- No machine heating up times
- Contents are not heated or destroyed when the machine stops
- Very short process times
- Very good process control and reliability by monitoring sealing parameters
- Environmentally friendly and energy saving



Tubular bags

Sealing system for outstanding seam quality

Our ultrasonic sealing system for vertical (VFFS) and horizontal (HFFS) tubular bag machines is an innovation in packaging technology. It delivers absolutely tight seal seams and is extremely material and energy efficient.

Gentle process with short sealing times

The cold tools press the tubular bag together for sealing. The ultrasonic oscillations of the sonotrodes then cause the molecular chains in the sealing area to break open with formation of heat and new joints to be formed. In a very short time, excellent quality seal seams are produced.

Fewer production faults for packaging companies

Production faults are drastically reduced with the use of ultrasound, because the contents themselves are not heated. Also, the contents to be found in the seal area are separated by the ultrasonic effect during the sealing process. The quality of the seam produced and the barrier layers of the bag film are not affected.



Ultrasonic sealing system for tubular bags



Sealing through contaminated areas

Advantages

- Consistent sealing results of outstanding quality
- No distortion of the seals (hot-tack)
- Expandable seam widths by modular sonotrode systems
- Reduced film consumption
- Narrow sealing seams (down to < 1 mm possible)
- Tight sealing of very thin films, even when they are in contact with contents
- No destruction of barrier layers
- Far fewer production faults
- Reduced maintenance costs
- Can be used in vertical (VFFS) and horizontal (HFFS) tubular bag machines



Blister packs, trays, pots and cups

Combined sealing and punching

With the patented, modular sonotrode table, blister packs, trays, pots or cups can be sealed and punched in one step. This dispenses with subsequent punching machines and the packaging process is shorter.

Format-independent packaging

Because the sonotrodes, which emit the ultrasound, are arranged in one level sealing area, the sonotrode table can be used irrespective of format. It is sufficient simply to change the anvil plate or the parts nest tool to change the packaging format. This results in great flexibility of packaging design.



Sonotrode table with flat sealing area

Format-dependent packaging

For format-dependent packaging solutions with ultrasound, we not only adjust the parts nest tools to the packed goods but also the sonotrodes themselves. Depending on the application, sealing and punching tasks are also combined in this case.



Sealing a tray in contact with product

Advantages

- Customized and application-specific tools
- Considerable experience in tool design
- Own tool manufacture
- Modular system
- Free formatting
- Combined sealing and punching
- Clean, non-sharp punched edges
- Rapid tool change
- Long tool life
- Sealing and punching quality that can be validated



Bags

Tight sealing with ultrasound

Our ultrasonic systems are used, amongst other things, to seal prefabricated, flat-ended bags and flat bags. However, various special formats are not only sealed but also punched or cut to size with ultrasound. Zips or valves can also be incorporated at the same time.

Tight seams and maximum flavor

The main advantage of ultrasound compared with other technologies is that the bags can be sealed absolutely tightly even when the sealing area is in contact with the contents. Mechanical pre-pressing by the cold sealing tools and the subsequent ultrasound effect force the contents out of the sealing area. The flavor of the product is not changed.



Advantages

- The taste of the contents is not affected
- Tight seams even in sealing areas in contact with product
- Application-adapted systems

Cartons

Tight seals for coated cartons

Cartons which are coated with a sealable surface are suitable for working with ultrasound.

Secure closures

In drinks cartons this coating is usually made from PE. The closures, which are likewise made from PE, are tightly sealed to the sealing layer of the carton by ultrasound.

Use of high-quality materials

In order to comply with the special production requirements of food packaging, our ultrasonic system complies with the IP68 safety standard. For the sealing tools we use stainless steel or titanium.

Cartons as information carriers

A further application of cartons is welding to blister trays. The layer on the carton must be adapted to the material of the blister. The transparent blisters, which are usually deep-drawn from PET, show the product to its best advantage whilst the welded on carton serves to provide product information.



Advantages

- Sealing of coated cartons
- Sealing components of stainless steel or titanium
- Ultrasonic systems with IP68 safety standard

Cutting with ultrasound

High precision with low material wear

Whether in large industrial bakeries, in confectionery manufacture or cheese-making – our ultrasonic cutting technology is versatile in application.

Individual cutting geometries for perfect cuts

Bakery products containing cream or sugary layers, as well as other dough or fat-containing foods, can be cut or trimmed in a controlled way by ultrasound to produce a quality that is visually appealing. The cutting geometries of the tools for longitudinal or cross cuts are individually tailored to product requirements.

Permanently clean cutting tools

As a result of ultrasonic vibrations, only slight product residues remain adhered to the sonotrode, so that to a certain extent, it demonstrates a self-cleaning action.

Long tool life with low wear

Because of the ultrasonic vibrations, cutting sonotrodes work with a lower initial pressure than conventional cutters. At the same time, sonotrode wear is less and the cutting quality is considerably better. In addition, the use of ultrasonic cutting systems has a positive effect on the maintenance and down times of the equipment.



Cutting raw pretzels after brushing with the water-soda solution

Advantages

- Pleasing cut and form stability
- Product-specific cutting geometry
- Cutting sonotrodes with little product adhesion and self-cleaning action
- Reduction in maintenance and down times
- Cutting of products almost irrespective of consistency



Your partner for packaging with ultrasound

Development partner and system supplier

As your partner for packaging solutions with ultrasound, we will accompany you from product development through to product launch.

Experience in packaging solutions

In our technical application laboratories we look into your packaging problems and conduct experiments, trial runs and development projects on your behalf. In finding the optimum solution we apply the latest analytical and test methods. With our many years of experience and our special know-how in the field of ultrasonic technology, we are also able to solve difficult sealing problems.

Individual ultrasonic systems

For the various requirements and customer requests, we individually adapt our innovative ultrasonic systems or produce special one-off designs. We develop and manufacture our systems to be fitted both into new installations and into existing ones.

Tested quality

All our ultrasonic packaging systems are perfectly matched to one another and comply with the safety class, IP68. We satisfy customer requirements by continuous quality and environmental management in our company, according to the tried and tested standards DIN EN ISO 9001 and DIN EN ISO 14001.



SONOTRONIC Nagel GmbH

Headquarters
Becker-Goering-Str. 17-25
76307 Karlsbad
Germany
Phone: +49 7248 9166-0
Fax: +49 7248 9166-144
info@sonotronic.de
www.sonotronic.de

SONOTRONIC, Inc.

Branch USA
31132 Century Drive
Wixom, MI 48393, USA
Phone: +1 248 987 5970
Fax: +1 248 987 5964
info@sonotronic.com
www.sonotronic.com

Linked with success.

Industry solutions

- Automotive
- Plastics
- Packaging & Food
- Technical Textiles
- Environmental

Products

- Special machines
- Standard machines
- Ultrasonic systems
- Ultrasonic components

Technologies

- Ultrasonic
- Infrared
- Hot plate
- Hot air