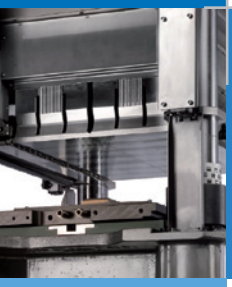
Packaging technology

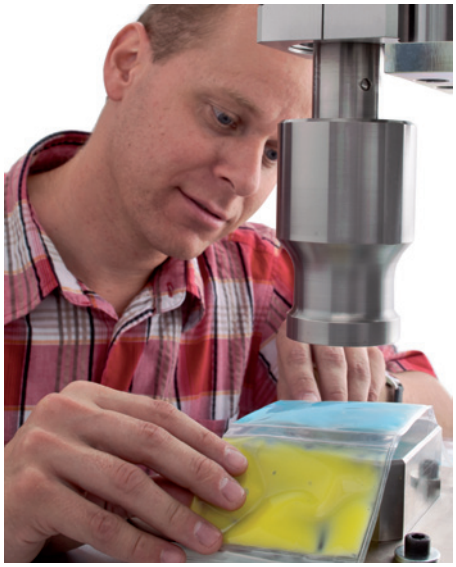
Ultrasonic systems
for sealing, welding,
cutting and punching



SONOTRONIC
ULTRASONICS TECHNOLOGY

Packaging by ultrasound

Individual packaging solutions for optimised processes



Combined sealing and punching

Our systems and solutions for sealing, welding, cutting and punching different types of packaging are based on highly developed ultrasonic technology.

A special technology with special features

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 weld quality, which means far fewer rejects.

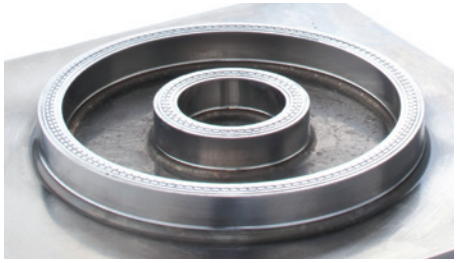
> “Environmentally friendly technology for efficient process design.”

Environmentally friendly process and low energy consumption

Compared with thermal processes, the energy consumed in ultrasonic welding is low. Energy is not supplied continuously but only when welding 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.

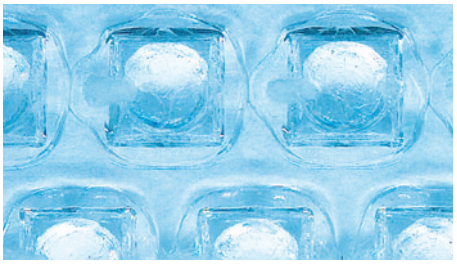
Appealing weld geometries for demanding packaging tasks

When developing the ultrasonic tools and anvils, we adapt the weld 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 welds.



Anvil for simultaneous sealing and punching

Film samples with various weld designs



Detailed view of the fused joint of a sealing seam

Optimised 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 optimised 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 and welding, 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 welding parameters guarantees process control and reliability. They can be transmitted to external EDP systems via one interface.

“Ultrasound – versatile possibilities.“

Modular systems and individual solutions

The versatility of ultrasonic technology makes countless 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 application, we also incorporate applications for zips or valves.

Sealing through areas in contact with the product

Advantages

- Consistent weld quality
- Visually appealing seam design
- Tight weld seams, even in areas which are in contact with liquids, fats, powders or fibres
- 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 welding parameters
- Environmentally friendly and energy saving

Tubular bags

Sealing system for outstanding seam quality

Our new 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.

> "Tight sealing even when film is in contact with content."

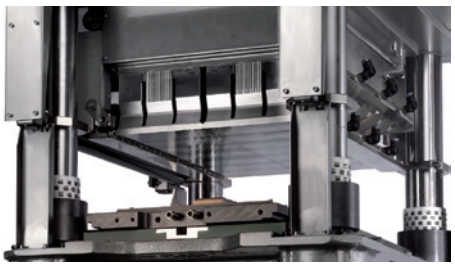
Ultrasonic sealing system for tubular bags

Advantages

- Consistent sealing results of outstanding quality
- No distortion of the seals (hot-tack)
- Expandable seam widths as a result of 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

Blisters, trays, pots and cups

Combined sealing and punching of a quality that can be validated



Sonotrode table with flat welding area

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.

Packaging that is not dependent on format

Because the sonotrodes, which emit the ultrasound, are arranged in one level welding area, the sonotrode table can be used irrespective of format. It is sufficient simply to change the anvil plate or the receiving tool to change the packaging format.

Sealing a tray in contact with product

This results in great flexibility of packaging design.

"The sonotrode table – the modular system for individual packaging tasks."

Advantages

- 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

Format-dependent blister pack with sonotrode

Packaging that is dependent on format

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

Advantages

- Format-dependent, customised and application-specific tools
- Considerable experience in tool design
- Own tool manufacture

Bags

Tight sealing with ultrasound

Flat-ended bag sealed by 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.

> "Sealing without changing the taste of the contents."

Tight seams and maximum flavour

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 flavour of the product is not changed.

Advantages

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

Cartons

Tight seals for coated cartons

Drink cartons with welded on closures

Cartons which are coated with a weldable 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 welded to the sealing layer of the carton by ultrasound.

> "Ultrasonic system to satisfy strict requirements."

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.

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 welding tools we use stainless steel or titanium.

Advantages

- Welding coated cartons
- Welding components of stainless steel or titanium

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 the 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.

> “Precision cuts and perfect edges.”

Advantages

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

Cutting cakes made up of different layers of dough

Cutting raw pretzels following brushing with the water-soda solution

Cutting pretzels after baking

Your partner for packaging solutions 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 solving packaging problems

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 welding problems.

Individually adapted and specially designed 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.

Inspection of the sealing seam in the test laboratory

"Advice and design from product development to product launch."

Company headquarters in Karlsbad, Germany

SONOTRONIC

Linked with success.

Since the company was established in 1974, SONOTRONIC has successfully designed and produced systems and components for joining plastics, based on ultrasonic, heating element and laser technology. Over and above this, we use the advantages of these forward-looking technologies to find optimum solutions for other applications as well.

With a powerful team of 200 qualified employees, we implement new ideas reliability and consistently. In so doing, we work closely with universities, research institutions, institutes and associations.

Today, our products are used in many different areas, i.e.:

- Automotive industry
- Packaging industry
- Food industry
- Textile industry
- Environmental technology
- White goods industry
- Electronic and electrical engineering
- Medical technology
- Special applications

Through our branches and partners, we are internationally represented and offer a worldwide service.

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