

Ultrasonic systems for processing technical textiles



Textile processing with ultrasound

Sustainable technology with convincing advantages

By its innovative, eco-friendly developments, such as ultrasonic thermofixing and ultrasonic washing, SONOTRONIC is setting new standards in the field of textile finishing. Additionally, we offer machines and components for making up textiles.

A unique technology for various applications

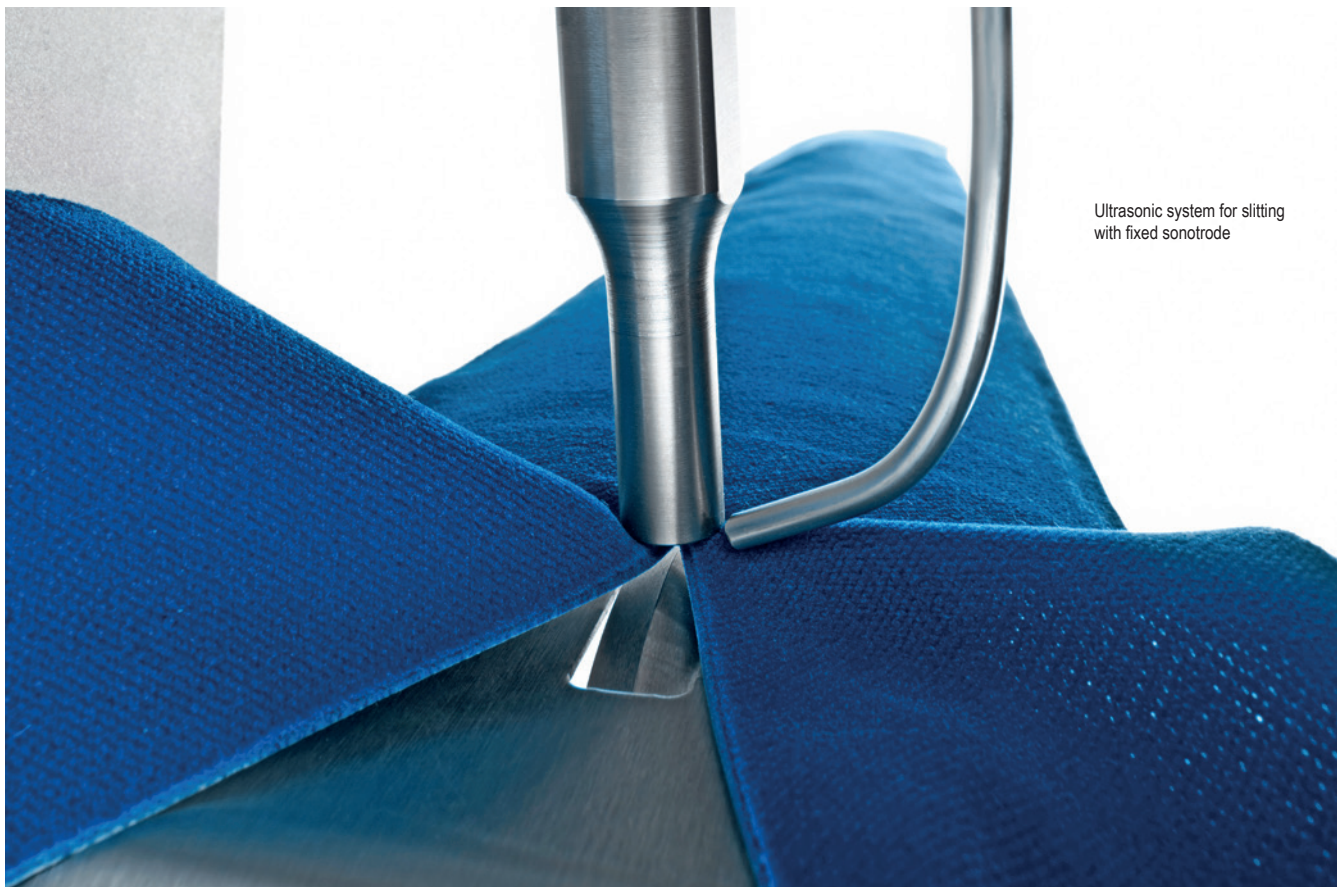
Many applications and processes in the textile industry are optimised by the advantages of ultrasonic technologies. Our technologies for welding, roll seam welding, cutting, punching, and embossing of textiles by ultrasound have already become established in the market. We also incorporate various ultrasonic technologies into individual, special textile processing machines, which we build for customized applications.

Appealing seam geometries

When developing the ultrasonic tools and anvils, we individually adapt the seam geometries to our customers' requirements and to the properties of the various materials. When separating thermoplastic textiles, punched and trimmed edges are already neatly sealed during the separation process by the action of ultrasound.

Environmentally friendly process

Compared with other 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 is even reduced, because the ultrasonic tools are self-cleaning and not contaminated by textile residues.



Ultrasonic system for slitting with fixed sonotrode



Ultrasonic system for continuous slitting

No vapour produced

Another advantage of ultrasound is that no harmful vapours are produced during the process. Because the ultrasound tools themselves are cold, the material only becomes warm in the join or separation area. At the same time the machine requires no warming up time and the work pieces are not damaged when the machine is stopped.

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 textile processing machines. Continuous monitoring of the welding parameters guarantees process control and reliability. They can be transmitted to external EDP systems via one interface.

Innovative finishing processes with ultrasound

SONOTRONIC has also transferred the positive characteristics of ultrasound to another application and developed a new method for the finishing of narrow fabrics: the patented ultrasonic thermofixing and ultrasonic washing.

Components, standard and special machines

As experts in ultrasonic technology, we develop and manufacture the principal components ourselves. We use our ultrasonic technology in standard and special machines in the textile industry. In addition, our ultrasonic systems and components can be incorporated in existing installations or new machine concepts. In this, we work closely with well-known partners in the textile industry.

Advantages

- Consistent quality
- Visually appealing seam design
- Simultaneous edge sealing
- Cold tools
- No machine heating up times
- Materials are not heated or destroyed when the machine stops
- No vapour generated
- New methods for the finishing
- Very short process times
- Process control and reliability by monitoring welding parameters
- Environmentally friendly and energy saving

Joining with ultrasound

Good seam resistance and appealing seam geometries

Ultrasonic welding can be used anywhere in textile processing where thermoplastic materials are used.

Applications

Ultrasonic welding is used to join narrow fabric or technical textiles of various kinds, as well as for welding injection molded parts to textile materials, e.g. elastic tapes with carriers for sports items, clamping elements or filters for the domestic products and automobile industries.

Strong welds without perforation

Compared with other joining processes, ultrasonic welding is particularly suitable if quick welding times and excellent process reliability are required, or if pinhole perforations and subsequent taping are to be avoided. Ultrasonic welding is also characterized by appealing visual design and the quality and strength of the welds.

Joining without additives and vapours

The heat required for welding is generated directly in the join of the material. As a result, no additives, such as thread or adhesives are needed. Compared with other thermal welding processes, ultrasound has the advantage that no harmful vapours occur and energy is only supplied to the tool during the welding process.

Advantages

- Joining elastic and non-elastic textiles
- No pinhole perforations
- Visually appealing seam design
- Individual anvil or sonotrode embossing (including company logos)
- Very rapid welding times
- Process control and reliability
- Material only heated in the join
- Cold welding tools
- No vapour generated
- Environmentally friendly and energy saving



Punching and trimming with ultrasound

Simultaneous edge sealing means high cut quality

Specially adapted ultrasonic tools and ultrasonic trimming and punching systems from SONOTRONIC make them very versatile.

Applications

Amongst other things, ultrasonic punching and trimming is used to cut-to-length and perforate narrow thermoplastic fabrics or non-woven fleeces in various sectors.

Sealed cutting edges with no fraying

Ultrasonic technology improves cutting quality and performance. Moreover it is possible to seal the fabric simultaneously by ultrasound during cutting or punching, which results in neat trim edges and prevents the material from fraying. The direct mode of action of ultrasound means that no heating or cooling down periods are needed when starting and stopping the machine or when changing tools.

Continuous separation welding with fixed sonotrode

As an addition to the ultrasonic roll seam systems, SONOTRONIC has expanded its portfolio with a compact system for continuous separation welding with fixed sonotrode. The system is particularly suited to blanks and edge trimmings of broad textile fabric.

Advantages

- Consistent punching and trimming quality
- Neatly sealed cut edges without fraying
- No thickening of the cut edges, no subsequent ironing required
- Cut&Seal in the case of multi-layer textiles
- Reduced punching force
- Excellent process control and reliability
- Contact switch-off when sonotrode and anvil touch
- Cold punching and cutting tools
- No vapour generated
- Environmentally friendly and energy saving



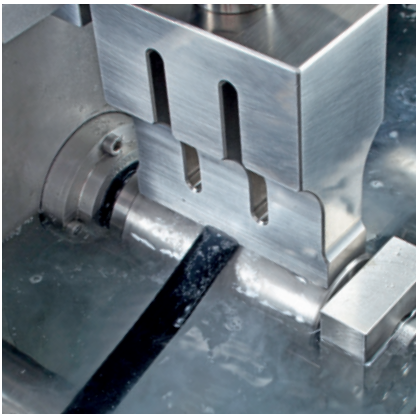
Ultrasonic washing

Highly efficient, environmentally friendly process

Apart from making up, ultrasound is also used in the finishing of textiles. SONOTRONIC has adapted the technology to washing and has developed innovative ultrasonic washing units.

Applications

Ultrasonic washing is ideal for the energy-efficient washing out of sizing agent and spinning oils prior to dyeing and for removing non-fixed dye particles from narrow fabrics or broad fabrics, ropes or cord, after thermofixing.



Efficient process

Simply passing through an ultrasonic washing unit is enough to replace several baths of conventional, highly tempered systems. At the same time the washing distance is shorter and because ultrasound is used, water and energy consumption, as well as the use of chemicals are reduced when washing.

Incorporation in machines

Depending on the type of fabric or degree of soiling, one or more directly connected ultrasonic washing units can be linked into finishing processes. Because of the compact design, subsequent installation in existing systems or incorporation in new machine concepts is a simple matter.

Advantages

- Reduction of water and energy consumption
- Washing in "cold" water
- Reduced use of chemicals
- More flexibility
- High shortening of the washing process
- Compact machine design
- Increased efficiency as a result of several units being connected one behind the other

Embossing with ultrasound

Individual embossing of patterns and logos

With ultrasonic embossing, individual texts or logos can be stamped with little force into, for example, artificial leather, corsetry or non-woven fleeces. Ultrasonic embossing units are used as built-in components both in standard and special machines in the textile and automotive industries.

Little force and embossing time

The thermoplastic material is heated by the ultrasonic oscillations, with the result that the amount of force used in ultrasonic embossing is significantly less than in mechanical processes. The sonotrode presses the heated material into the anvil, by which it is very quickly transformed on the surface. The result is top-quality, visually appealing embossings.

Advantages

- Short embossing time
- Little application of force
- Environmentally friendly and energy-saving



Ultrasonic thermofixing

Energy-efficient textile finishing

SONOTRONIC's ultrasonic fixing units fundamentally revolutionize and rationalize the finishing of narrow fabrics.

Heat generation right in the material

With patented ultrasonic thermofixing, the material is continuously drawn through between an anvil, which generates a regulated contact pressure, and the sonotrode. Several ultrasonic units connected one behind the other rapidly generate the necessary heat in the material for thermofixing and calendering without long preheating.

A clear reduction in energy consumption

Long preheating and the associated effective loss of energy are eliminated. In all, the energy input when thermofixing by ultrasound is reduced by up to 90 percent, compared with conventional processes.

High degree of flexibility

Ultrasonic thermofixing is particularly distinguished by its flexibility: Because there is only little material in the machine during thermofixing, it is possible to process even small quantities of material by ultrasound.

Incorporation in machines

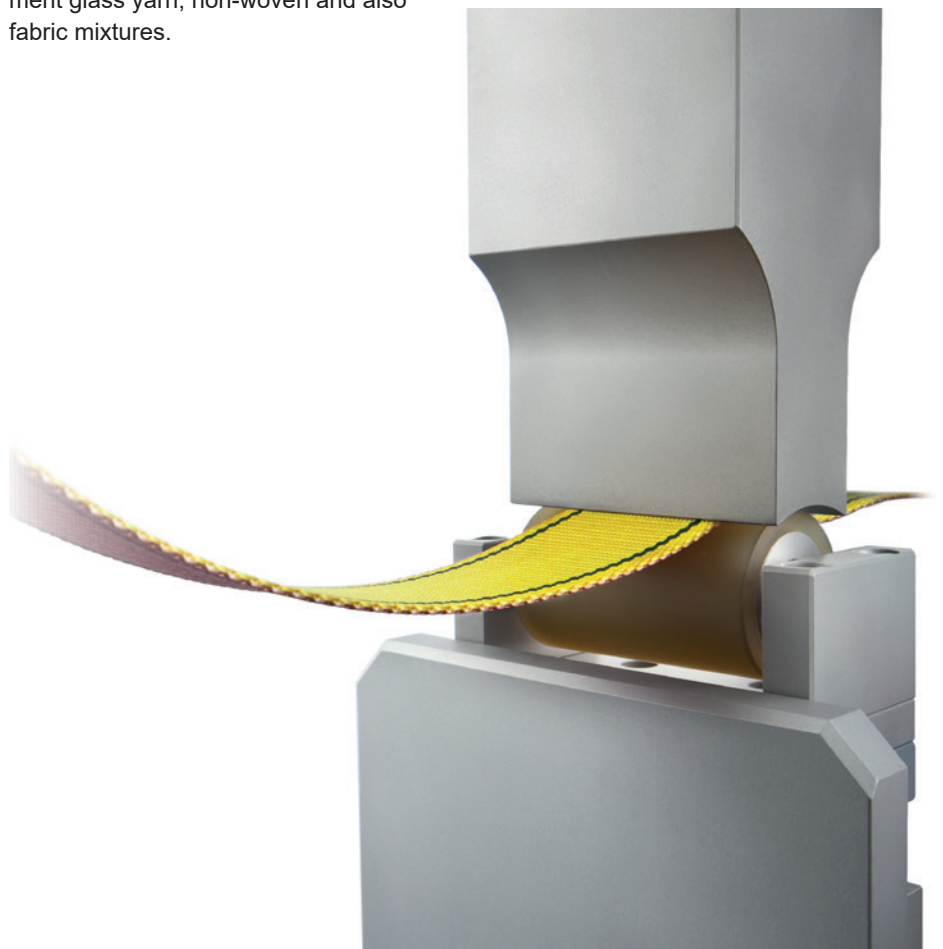
In order to make use of the advantages of ultrasonic technology for thermofixing, the ultrasonic units can be incorporated into existing systems or new machine concepts. The number of units required is dependent on the material and process. Product and application-specific parameters can then be retrieved from the control, so that drafting devices at the drawing-in and pulling off ends bring about optimum shrinkage or stretching.

Materials

Ultrasonic thermofixing is suitable for finishing ribbons, yarns, twisted threads, ropes and cords. The optimum effect is achieved with materials made from synthetic textiles, such as PA, PES, PP, aramid, Dyneema®, filament glass yarn, non-woven and also fabric mixtures.

Advantages

- Reduced energy consumption
- Thermofixing and calendering by ultrasound
- Facility to develop new products
- Flexible reaction to market demands
- Minimum use of material in the machine
- Efficient handling of small quantities of material
- Rapid starting and stopping of the machine almost without loss of material
- Compact machine design



Your partner for textile processing with ultrasound

Technology and system integration in one unit

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

Experience in solving textile processing problems

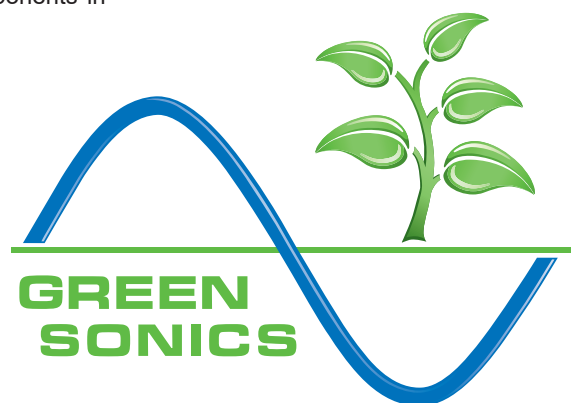
In our technical application laboratories, we deal with your problems concerning textile making up and finishing and conduct experiments, trial runs, and development projects on your behalf. In finding the optimum solution, we apply the latest analytical and test methods. With our many years of experience and our special know-how in the field of ultrasonic technology, we are also able to solve difficult problems concerning joining, separating, embossing, washing, or thermofixing of thermoplastic textiles.

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. We have also been working with partners for many years, who use our ultrasonic components in their textile machines.

Tested quality

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.



Sustainable ultrasonic technology
by SONOTRONIC



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