Textile Processing

Ultrasonic systems for making-up:
welding, embossing, punching,
cutting, and slitting

Ultrasonic systems for finishing:
thermofixing and washing
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 customised 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

“Environmentally friendly technology for efficient process design.”

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

Laboratory tests with ultrasonic standard machine
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 ultrasound technology, we develop and manufacture the principal components ourselves. We use our ultrasound technologies in standard and special machines in the textile industry. In addition, our ultrasound 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
- Very good process control and reliability by monitoring welding parameters
- Environmentally friendly and energy saving
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 moulded 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 characterised 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 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
- Excellent 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. Amongst other things, ultrasound 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.

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 broken on contact with sonotrode and anvil
- Cold punching and cutting tools
- No vapour generated
- Environmentally friendly and energy saving

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.
Ultrasonic washing
Highly efficient, environmentally friendly process

Apart from making up, ultrasound is also used in the finishing of textiles. Currently 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 consumption
- Reduction of energy consumption
- Washing in “cold” water
- More flexibility
- Reduced use of chemicals
- Compact machine design
- High shortening of the washing process
- Only 1-3 passes instead of 4-8
- Short washing distance
- 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, imitation 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 ultrasound 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 pleasing embossings.

Advantages
- Short embossing time
- Little application of force
- Environmentally friendly and energy-saving
Ultrasonic thermofixing
Energy-efficient textile finishing in a minimum of space

SONOTRONIC’s ultrasonic fixing units fundamentally revolutionise and rationalise 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 dispensed with. In all, the energy input when thermofixing by ultrasound is reduced by up to 90 percent, compared with conventional processes.

Great 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 ultrasound 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
- Reduction of 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.

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.

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.

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