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Ultrasonics technology in the non-woven and textile industry

Continuous Ultrasonic Welding System for Textile Pilot Plant Station

Branson Ultrasonics, based in Dietzenbach, offers a broad range of welding technologies stemming from over 50 years of experience. In order to be able to optimally review task definitions in the non-woven and textile industries in the future, Branson has established an application-related laboratory in which ultrasonics processes are realised under production-like conditions in cooperation with the customer. The core of the pilot plant station is an ultra-sonicwelding machine for continuous joining of webs with a high velocity.

The system is capable to recreate two different, continuously operating processes for the non-stop processing of multi-layered composites. By integrating this system Branson can cover the entire range of possible procedural techniques in its own pilot plant station. Thus an optimal solution can be found for every task definition under production-like conditions.

Welds can be carried out by a driven, rotating horn and driven anvil wheel. In this combination the horn and anvil function like a pair of rolls and transport the welded product at the same time. This is of special benefit for the welding of very fleecy or thick materials, because the frictional resistance is reduced. A standing horn is advanced by a servo motor onto a contoured roll to create sandwich composites.

In order to achieve a constant and quality welding, Branson uses a patented power control system. Here, the power of the ultrasonic generator is monitoring cyclically and feeds it back to the control loop. The result is a constant welding quality because warming / length extents are compensated.

The advance of the ultrasonics unit as well as the adjustment of the gap due to the weld process is done by a servo motor. A flexible horn fixation will compensate short material thickness tolerances and will give us an additional safety for the horn.This new method of controlling was developed in cooperation with the company Schobertechnologies GmbH, which has long experience in developing and manufacturing of precisions tools, installation units and special machines for rotation production technologies.

Rotating ultrasonics unit with driven anvil wheel

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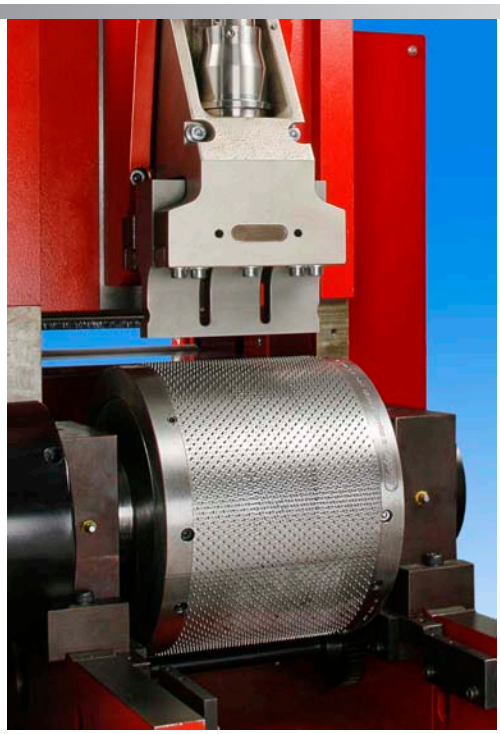

Stationary ultrasonics unit with driven contour wheel

In addition to basic research tests concerning the weldability of materials, two materials can be fed into the welding machine by driven roll pairs at a velocity of up to 300 m/min under production-like conditions. The integrated compensator and the edge control with opto-electronic material monitoring regulate an exact web run to also transport different materials at high speed reliably to the welding station. A third layer of material can be brought into the weld process automatically as needed.

Suitable materials

- Thermoplastic fabrics
- Composite materials
- Coated papers
- Blended fabric
- Nonwoven
- Films

Significant advantages of ultrasonic systems

Compared to conventional methods, ultrasonic systems offer many advantages, regardless of whether the processing is cycled or non-stop:

- low energy consumption due to high efficiency
- no consumables such as glue, clamps, sewing thread
- no rejects when the system is at standstill
- no heat radiation or risk of material damage
- steady quality of the welding
- clean cut edges without thickened material during parting
- no delay when controlling the system
- less harmful substances emitted than during thermal processes
- short process times

Examples for the various welding procedures

Cycle Welding

- Filters
- Edge bindings
- Loops
- Closure systems
- Labels
- Velcro strips
- Button holes
- Wristbands
- Zippers
- Belts
- Bandages
- Watch bands

Continuous Welding

- Climate mats
- Panty liners
- Curtains
- Nappies
- Dressing Materials
- Corsetry
- Sun screens
- Incontinence products

Continuous cutting and parting

- Selvedges
- Prepregs
- Awnings
- Films
- Tarpaulins
- Blinds

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