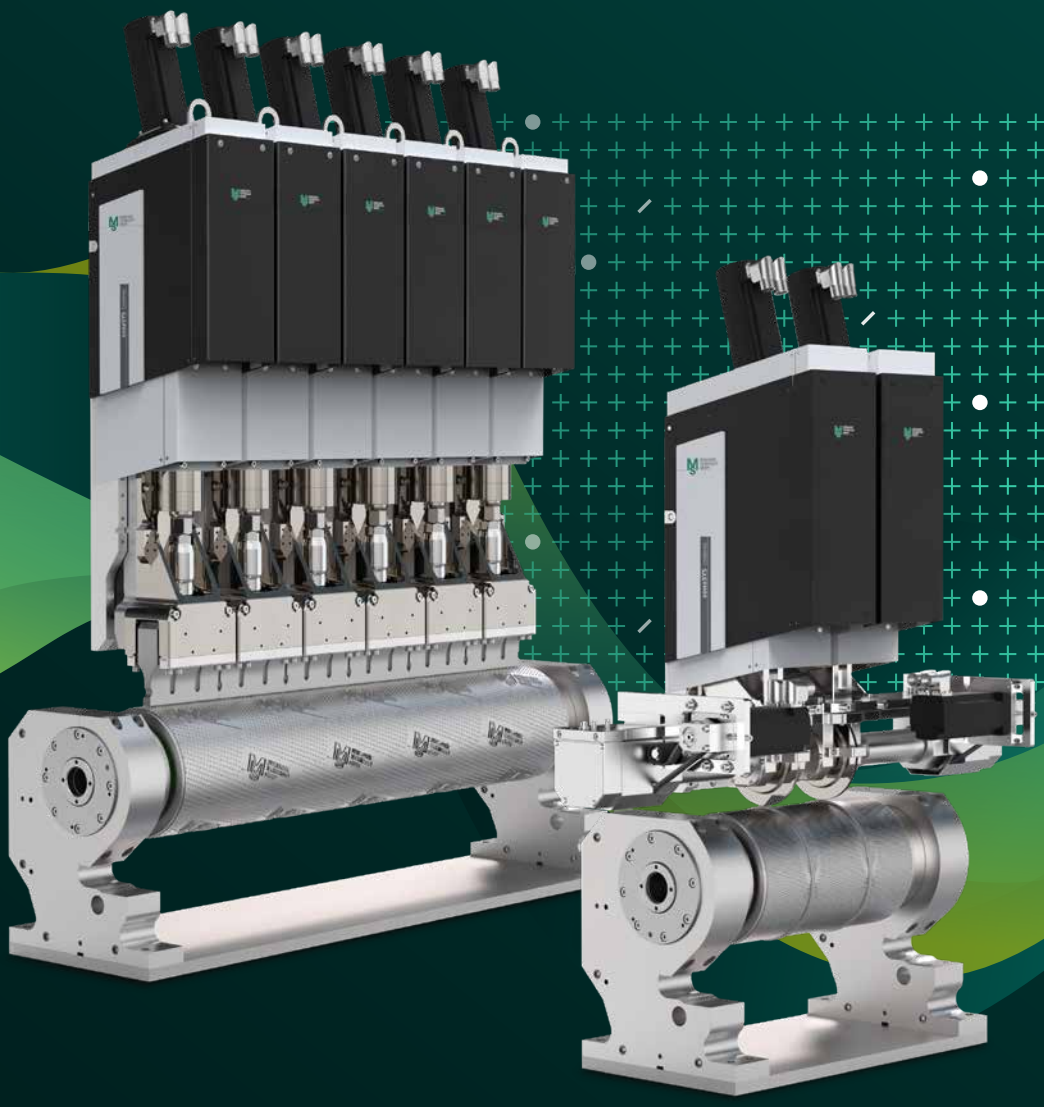
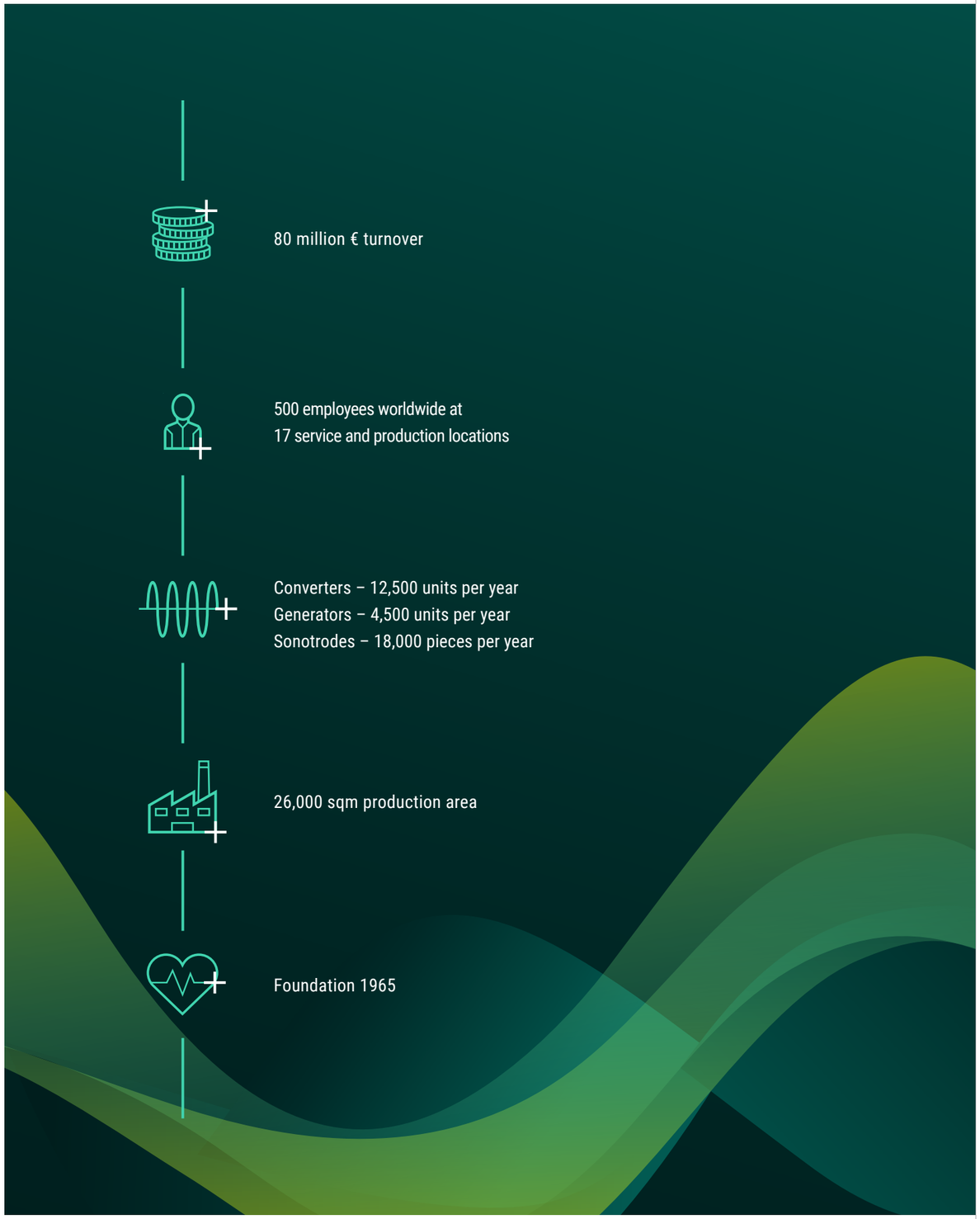
WE ARE
ULTRASONICS.

ULTRASONIC
TECHNOLOGY
GROUP



Shaping Nonwovens

EN



The MS Ultrasonic Technology Group is a globally recognized technology and innovation leader in ultrasonic joining technology and develops and builds flexible custom machines, pioneering series machines, modular systems and efficient components for high-performance complete solutions.

This enables optimal welding, punching, sealing, cut-off sealing and riveting of thermoplastic materials, textiles and nonwovens as well as cutting of food and other products.

Thereby, it is important for MS to manage all the essential steps that contribute to the success of its products itself. This is the only way to be sure that quality standards are met from the creation of the machine frame to the last screw.

In order to be able to ensure sustainable growth, MS is focusing on the constant expansion of its portfolio of applications and entry into new market segments. This is part of the company's goal to present itself to the market as a full-service provider of power ultrasonics.

The MS Ultrasonic Technology Group is part of the listed MS Industrie AG, with internationally active companies.

WE ARE **ULTRASONICS.**

Concentrated competence for you in Ettlingen

— In addition to the company's many activities, MS also focuses on continuous welding of nonwovens and other materials.

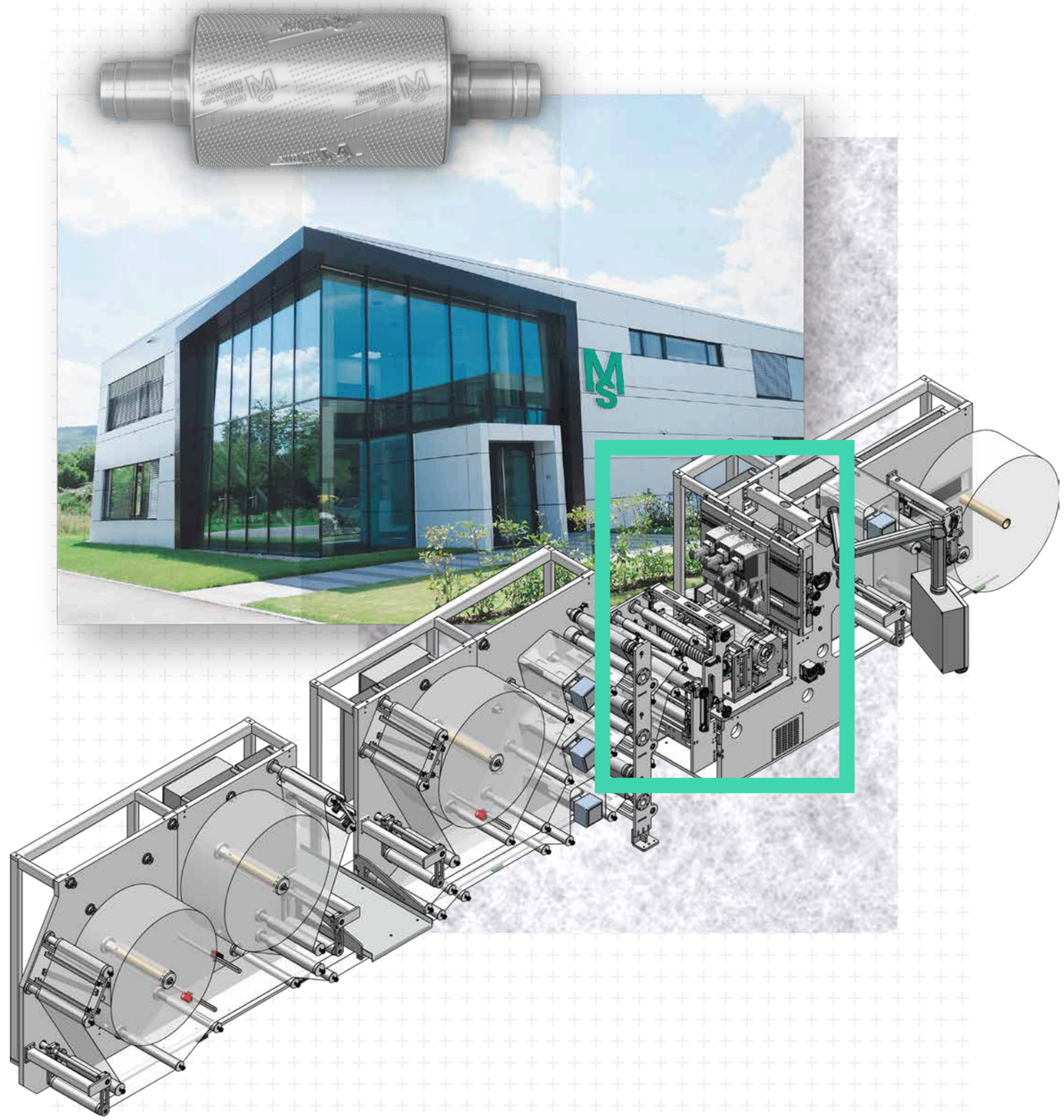
— The company's more than 30 years of experience in the development and manufacture of high-quality and innovative ultrasonic components, coupled with know-how in drive and control technology, is also being applied to this business segment. This means that customers receive ready-to-integrate systems with maximum precision from one provider. With the MS Competence Center in Ettlingen (Germany), MS is fulfilling the wish of many customers to expand the portfolio of applications to include continuous joining, embossing and perforating of nonwovens and sealing of packaging.

— MS is expanding with an innovative and specialised location while retaining a high in-house production depth and support of all departments with the main location in Spaichingen (Germany).The embossing rollers through to complete systems are also manufactured there.

— Tests, evaluations and optimisations of various welding tasks take place in two application laboratories and a measurement and analysis laboratory.

OUR COMPETENCIES ON SITE

+ Application-technical consulting of your welding tasks
+ Support with the design of embossing rollers
+ Conduction of feasibility studies
+ Welding trials to determine the process parameters
+ Individualised process optimisation
+ Problem solving for problematic welding applications
+ Inspection of the quality characteristics (impermeability, porosity, stability)
+ Microscopic analysis of the welding joints in 3D
+ Preparation of samples and pre-series production



ENERGY EFFICIENCY –
BEST IN INDUSTRY

Faster, safer, cleaner, more efficient

The ultrasonic technology has been used for more than 70 years for joining thermoplastics, or thermoplastics with other materials. Furthermore there is the possibility to use this technology for cutting or cut'n'seal processes.

Ultrasonic welding has established itself as clever and sustainable for the joining of thermoplastics. It requires neither additional material (glue) nor time or cost-intensive processes. The process is sustainable, requires little resources and is very clean in comparison to other methods.

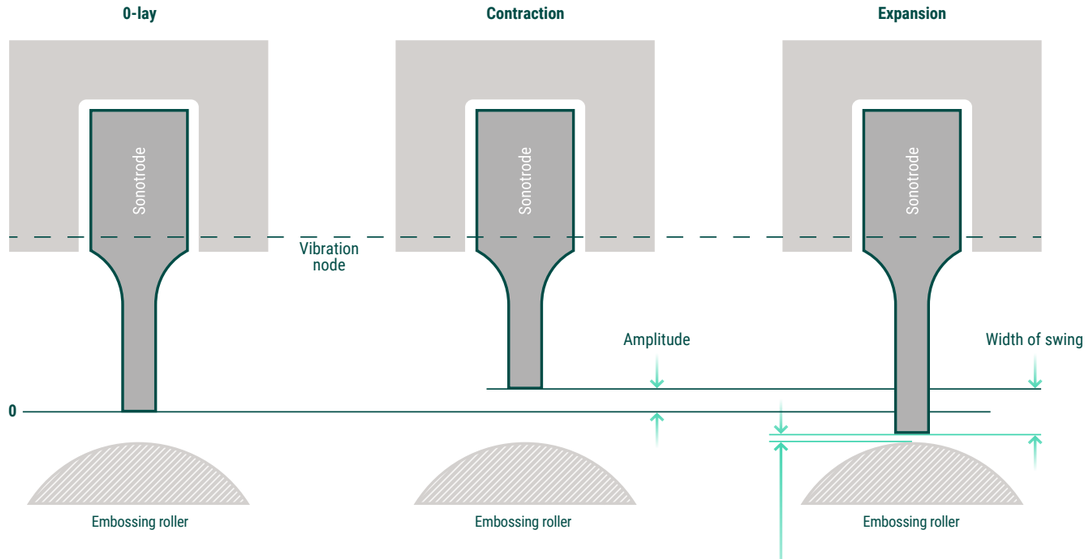
Ultrasonic waves are generated by the high frequency vibrations: a generator creates electricity from the supply which is converted to a mechanical vibration via a transducer. Through this vibration motion (frequency range approximately 20 kHz to 100 kHz) on the sonotrode surface (amplitude) energy is applied to the workpiece. The ultrasonic process is started by the resonant unit. The resonant unit is made up of the piezoelectrical transducer, the amplitude transformation piece (Ampli or Booster) and the welding tool (sonotrode).

The energy generated causes a warming only to the bonding surface of the workpiece and does not result in any disturbance to the surrounding area, whereby the workpiece is joined gently. The strong joint forms in the short time during cooling of the mating part. The result of the joining is a clean and stable connecting joint between workpieces, and for cutting or cut'n'seal a clean and flawless cut surface.

For continual ultrasonic welding the mechanical vibrations are transferred to nonwovens by applying pressure. Through the friction of molecular and boundary surface of the individual workpieces, warmth is created that allows the absorbing coefficient of the material to increase. Point by point the nonwoven starts to melt. The reproducibility and welding quality is paramount for processing continuous sheet materials.

The continual welding and continuous operation makes continuous welding joints without interruption possible.

The ultrasonic technique is a very good alternative to other joining and cutting processes with high efficiency and broad forward-looking possibilities. In contrast to other processes there is no damage to the product itself – no matter which process - cutting, sealing, welding, cut'n'seal, punching, or riveting.



Speed dependant force regulation with precise position monitoring guarantees constant welding quality

THE ADVANTAGES OF ULTRASONIC WELDING

- Very short processing times
- Minimal to no disturbance of the workpiece with cold welding tools
- Low energy needs for welding and thereby a high efficiency factor
- No solvent or additives necessary (unmixed recycling)
- Enables reproducible welding results over a variety of welding parameters
- Various thermoplastic materials can be welded together
- The welding tools do not heat up, thereby dispensing with warm-up and cool-down times and the tools can be quickly changed out
- No risk of injury by hot machine parts
- Very good integrability into existing systems
- Opportunity to use intelligent networking and automatic control – Industry 4.0
- Energy saving compared to conventional joining technologies
- No additional supplies (e.g. glue) necessary
- High material web speeds possible
- Softness of the nonwoven is maintained due to the precise application of energy to the jointing points
- High stability with multi-material joints
- Constant, speed independent product quality
- Elasticity behaviour of elastic joints are not affected
- Maximised filtration performance via minimised joining surface

Various ultrasonic applications

By using individual embossing rollers and sonotrodes, various processing possibilities emerge. In addition to the continuous welding – laminating, embossing, perforating, and cutting of nonwovens are also possible.

High speeds and energy savings can be achieved at the same time with continuous processing of nonwovens. None of the processes requires supplementary consumables; strong bonds of the nonwoven are achieved purely through ultrasonic welding.

Welding – Long seam

Welding – Cross seam

Embossing

Lamination

Perforation

Cutting

APPLICAITON AREAS

Absorbent Hygiene Products
- Baby diapers
- Adult diapers
- Incontinence products
- Feminine hygiene
- Make-up products (e.g. cleaning pads)
- Disposable underwear

Agriculture and horticulture
- Field coverings, Agrotextiles
- Root control bags
- Biodegradable planting pots

Automotive and transportation
Interior
- Headlining
- Acoustic pads
- Dashboard insulation
- Carpet and floor coverings
- Seats (Upholstery, seat middle, seat reinforcement, pull strips, piping)
- Recirculation air filter

Motor
- Filtration (fuel filter, AdBlue filter, oil filter, cabin air filter)

Construction
- Air filtration
- Roof lining membrane
- Carpet backing
- Dry ridges
- Drainage membrane

Food and drink
- Foodstuff packaging (meat, cheese, fish, etc)
- Liquid filtration (tea, coffee, wine, milk, etc)
- Absorbent pads
- Sacks, pouches and bags

Geotextiles and construction engineering
- Dam, canal and pond lining
- Drainage membrane
- Filtration
- Sedimentation and erosion protection
- Weed control
- Root barriers

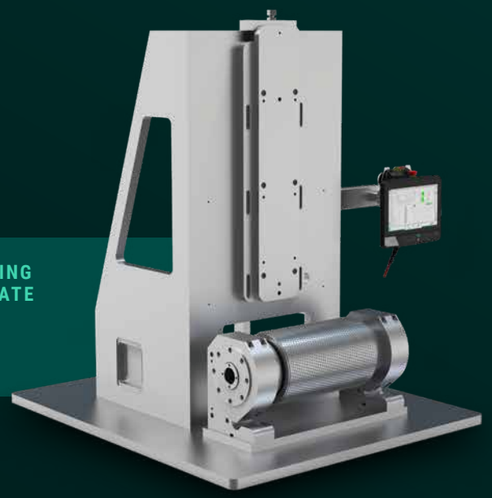
Household
- Covering for pocket springs, duvet covers, pillow covers, blankets
- Carpet, carpet backing
- Vacuum bags
- Cover material
- Detergent pouches, dryer sheets
- Furniture / cushions (lining, cushion backing, dust covers, spring covers and door bottom sweep)
- Mops
- Wipes (household care, floor care, cleaning, animal care etc)
- Filtration (PCs, exhaust hood, vacuum)

Medical
- Surgical: disposable scrub caps, gowns, face masks, (medical FFP2 etc), scrubs, shoe covers
- Sponges, bandages, rags, washing mitts
- Bed sheets
- Isolation gowns
- Disposable gowns
- Pads
- Treatment package
- Heat packages
- Colostomy bag
- Wound dressings
- Sterile packaging
- Liquid filtration (water, blood)

Everything from one source, individually manufactured in-house

EMBOSSING ROLLERS MS sonxCOM ROLL

+ Individually manufactured in-house embossing rollers

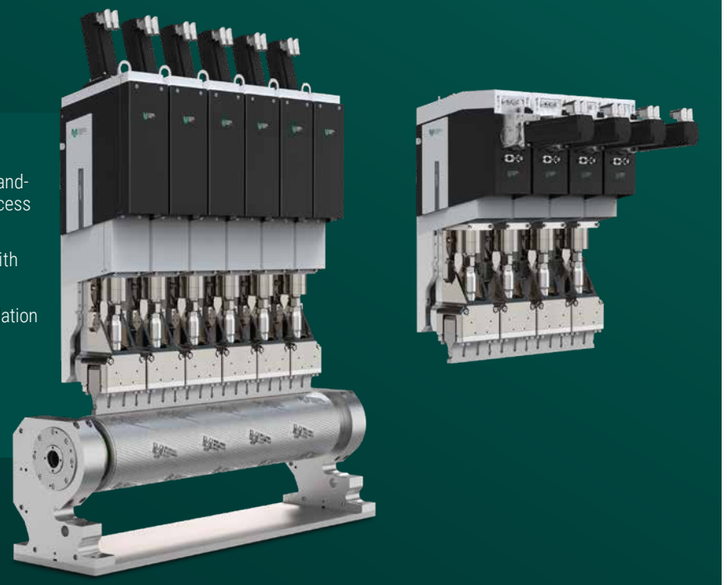


EMBOSSING ROLLER WITH BEARING MOUNTING AND MOUNTING PLATE

+ Welded console
+ For absorbing high welding forces

MS sonxSYS COMBINE STC

+ Standing sonotrode, servo drive, hand-held operating device, welding process control
+ For large-area lamination, even with high power requirements
+ Different variants for variable installation situations:
  - MS sonxSYS COMBINE STC-H – with horizontal drive
  - MS sonxSYS COMBINE STC-V – with vertical drive



MS sonxSYS COMBINE ROC

+ Rotating sonotrode, servo drive, handheld operating device, welding process control
+ For longitudinal seams without frictional resistance

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