

## Ultrasonic technology for respiratory masks

Assembling multi-layer filter material into masks

PLASTIC WELDING

METAL WELDING

CUTTING

CLEANING

SIEVING



01

Bronschhofen (CH), 03/2020

Face masks significantly help to protect the respiratory tract from dust and prevent viral infections. Effective mouth protection significantly helps to slow down the spread of viruses. The multi-layer filter material is assembled into finished masks using ultrasound technology. It can also be used to attach additional parts such as nose-shaped bracket, breathing valves and carrying straps.

Well-known manufacturers of face masks have been relying on Telsonic's ultrasonic connection technology for several years. Depending on the intended use, respiratory masks consist of different layers of non-woven fabric and a lower and upper cover layer. The starting product for the masks are flat pre-cut parts, which are produced from roll material using ultrasound. On the one hand, the pre-cut parts must correspond to a certain shape; on the other hand, the cut edge of the mask material must not be open. This two-fold requirement can be ideally realized with ultrasonic cutting technology. With a forming die and a tool oscillating at ultrasonic frequency, contour parts can be cut out economically and, at the same time, the edge zone is sealed by heating in the cutting area. The appropriate holes and feedthroughs can be simultaneously integrated for inserting valves or looping in a carrying strap.



02



03

- 01 Respiratory masks with a wide range of applications
- 02 Fully configured respiratory mask
- 03 Flat cuts with openings for the carrying straps or a valve

Simultaneously cutting out the pre-cut parts and sealing the edge zone in a single operation makes the production process extremely cost-effective. Telsonic's modular ultrasonic components offer maximum flexibility for installation in automatic production lines. Ultrasonic technology offers comprehensive options regarding cost-effectiveness, joining quality and welding data logging. The amplitude and constant-performance operation of the digital ultrasonic generator MAG ensures consistent joining quality. The Telso®Flex control software offers various welding modes and trigger functions as well as the option of multi-stage amplitude and force profiles. This allows all cutting, Cut'n'Seal and joining operations to be optimally covered.

Various cutting and joining tasks are required for the production of respiratory masks, for example:

- » Production of the mask cut (Cut'n'Seal application)
- » Welding of the edge area using individual points or contour cutting with simultaneous sealing
- » Welding in the breathing valve
- » Fixing the nose bracket
- » Fixation of the carrying strap

by Reinhard Züst, Technical Consultant, TELSONIC AG (Switzerland)



04 Cutting die for cutting and valve opening made of hardened steel

05 Reinhard Züst, Technical Consultant, TELSONIC AG