Application example

**Sewing machine threader head**

**Task**
The threader head of a sewing machine consists of individual parts that are manufactured from various materials. The thread catch, manufactured from a precise stamped/bent part made of stainless steel, must be reliably fixed to the injection-moulded plastic basic element without play. For solidity reasons, the rivet heads must be fully formed, and burr formation from excessive plastic must be avoided as much as possible.

**Solution**
The ultrasonic welding process is used for the double head rivet joint. Both traditional rivet heads are simultaneously formed with a centre point using a double-contour sonotrode at a frequency of 35 kHz and high amplitude. A combined electro-mechanical holding-down device and differential scanning and rivet path limitation system is used for defined switching off of the ultrasonics.

**Configuration advantages**
Using ultrasonics, rivet joints can be created precisely and without play. After melting of the plastic, the ultrasonics are switched off in a defined way and the rivet heads solidify under continuing pressure from the sonotrode, which guarantees a firm and play-free connection. For even rivet head formation and precise quality, it is important that the vibrating sonotrode does not touch the metal part. This is ensured through a differential holding-down device, scanning and path-limitation system, which compensates for the thickness tolerances of the parts. In this way there is scarcely any metal contact and burr formation is minimised.

The application was created on a USP750 35kHz ultrasonic welding system with differential part scanning and rivet path limitation system.