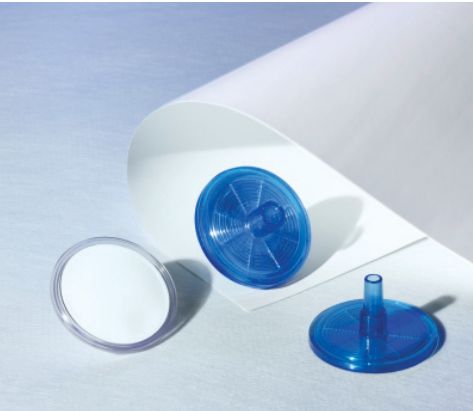


EMD Millipore Microfiltration



Branson helps EMD Millipore seal a delicate microfiltration membrane in a critical medical device

Background

As part of their product line serving the life sciences industries, EMD Millipore supplies microfiltration membranes for bioscience research, as well as for use in the manufacture of high-tech medical devices requiring advanced filtration. In many cases, these extremely delicate filter membranes must be sealed flawlessly to a plastic housing in order to filter out potential microscopic contaminants, water and air. EMD Millipore was recently working with a Utah medical manufacturer that had chosen an EMD Millipore microfiltration membrane for use in its new microfiltration device.

Challenge

During testing, the manufacturer found that they were unable to seal the EMD Millipore membrane successfully to its plastic housing. The manufacturer tried heat sealing and ultrasonic welding. Both processes degraded the PVDF 125 µm membrane enough so that the seal would not hold because of the pressure created by the membrane's 0.2-micron pore size. To complicate the challenge further, the seal needed to withstand the demands of high-volume production, as the manufacturer anticipated producing 1 million products per year.

Solution

EMD Millipore sought an expert in ultrasonics and brought in Branson to help optimize the tooling and assembly process and solve their customer's problem. Branson engineers evaluated the equipment, materials characteristics, and welding specifications that were being used unsuccessfully to create the required seal. To solve the problem, Branson designed custom-tailored process parameters, using Amplitude Profiling™. Tool and horn assembly using FEA (finite element analysis) also maximized the effectiveness of high-frequency (40 kHz) ultrasonic welding, precisely matching weld specifications to the properties of the materials being bonded.

Results

Prototype testing using the reconfigured horn fixture and new weld specifications delivered the results that EMD Millipore and their customer were looking for. The Utah device manufacturer could count on a consistent, repeatable, 360° hermetic seal that would withstand the demands of high-volume production and a shortened cycle time, which also lowered overall production costs.

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