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Laser utrasonics for quality control of resistance spot welding

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In the automotive industry spot welds are used for joining structural components and parts of the vehicle chassis together, and a car typically contains thousands of spot welds. Today the quality of the spot welds is mainly controlled by manual destructive testing (microscopy) and conventional ultrasonic transducers with coupling. This results in a high uncertainty due to operator dependency and the limitation of only testing a small fraction of all the spot welds. By using laser ultrasonics (LUS) for quality control of spot welds it is believed that the quality of all spot welds can be controlled in an automated and non-destructive way.

We will present a comparative study where the spotweld diameter on a total of over 220 spot welds is determined and compared by using three different methods, (1) LUS, (2) destructive testing and (3) the commercially available Tessonic resistance spot weld analyzer (RSWA).

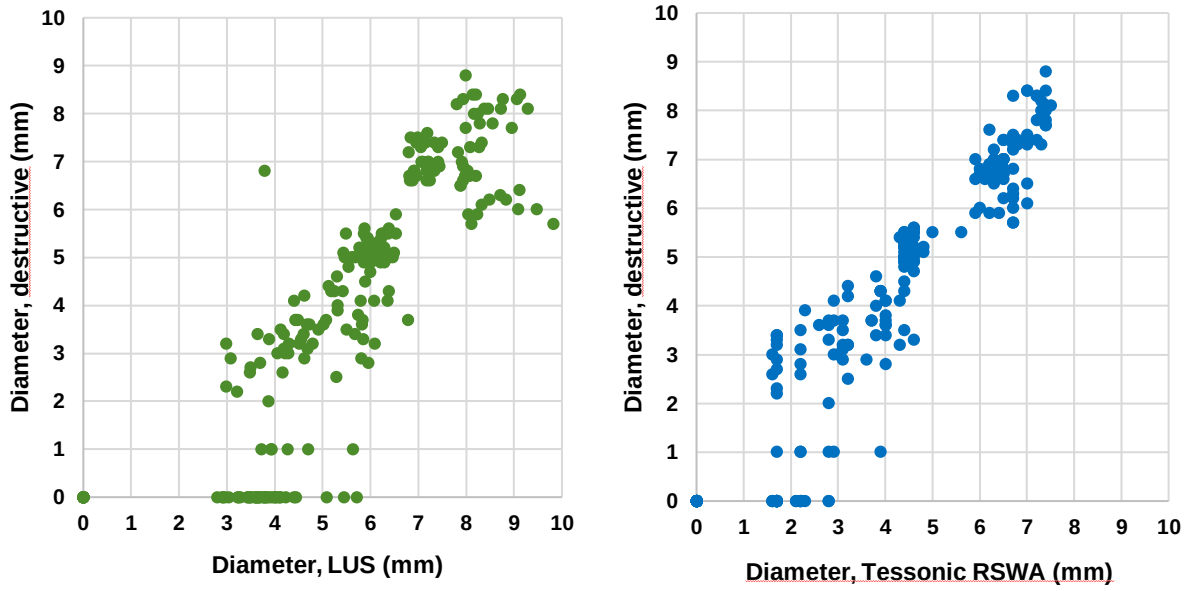

Figure 1 Graph showing the spot weld diameter determined by LUS (left) and Tessonic RSWA (right) plotted against the diameter measured by destructive testing.