

1.10.43. ULTRASOUND DETECTION DURING RESISTANCE SPOT WELDING

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Resistance spot welding is a commonly used method of welding in mass production, such as electrical industry and specially production in the automotive industry. These industries usually require welds, which are reliably welded exhibiting a full penetration and required weld nugget cross-section. Classical non-destructive verification methods such as ultrasound and x-ray are extremely time-consuming and mostly unreliable. With the development of advanced sensor systems and feasibility of computer technology, are created conditions for the implementation of ultrasonic control of the formation of the weld nugget during welding. At the Institute of Welding they use a portable welding gun with integrated ultrasonic transmitter in the upper electrode and receiver in the lower electrode. With on-line (during welding) weld monitoring, we can obtain insight into the formation of the weld nugget. A reliable on-line diagnostic does not consume additional time which is usually spent for quality control, and also reduces the element of subjective assessment, which is still high at using classical methods. The on-line obtained information can be used for adaptive control of welding process and/or data for traceability of technology operations. The paper presents the results of research on weld-pieces made of mild and high-strength steel, which are often used for production of bodywork parts in the automotive industry.