

Acoustic Signature Analysis for Welding Defects Formation in GMAW Process

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This research presents the welding defect monitoring technique during Gas Metal Arc Welding (GMAW) process by using acoustic signal analysis. A dynamic microphone was used as a sound transducer to detect acoustic wave from the welding arc. The welding motion and welding parameters were controlled by using FANUC Robot Series R-J3Iband FANUC Series 100i and Panasonic welder power source, respectively. Welding defects; *porosity, misalignment and excessive melt-through*, were simulated by preparing the samples in such the way that such defect would be created in design samples. Acoustic signal during actual arc welding was collected simultaneously and processed in time – domain and frequency domain. The results shown that porosity, misalignment and excessive melt-through can be easily classified both in time domain and frequency domain. This technique can be used to monitor defect part during manufacturing stage.

Keyword: Acoustic Signal Detection/ Welding Defects/ Porosity/ Misalignment/
Excessive Melt-through.