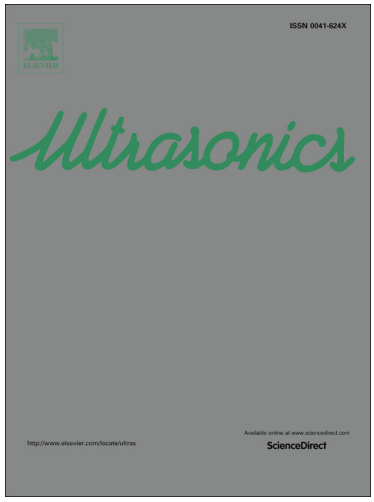

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Use of sputtered zinc oxide film on aluminium foil substrate to produce a flexible and low profile ultrasonic transducer

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ABSTRACT

A flexible and low profile ultrasonic transducer was fabricated for non-destructive testing (NDT) applications by DC sputtering of 3 µm thick, c-axis oriented, ZnO film on 50 µm aluminium foil. Due to the thin foil-based construction, the transducer can be applied to curved objects and used in sites of restricted accessibility. The device has been used to demonstrate detection of simulated defects in a 45 mm diameter steel pipe, and for thickness measurement on a 3.1 mm thick flat carbon steel plate. Centre frequency measured on the flat plate was 24-29 MHz, with -6dB bandwidth 4-7 MHz. The pulse duration depended on the couplant, at best 3 cycles or 0.12 µs using SONO