

Modification of a Sensor Board for Improvement in Monitoring Metal Fill During Lost Foam Casting

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EXTENDED ABSTRACT

The objective of this project is to improve an existing sensor board, used to monitor metal fill during lost foam casting. The primary improvement will allow the output voltage of the board to be dependent only upon the change in mutual capacitance of the board's two capacitive probes, whereas, in the current design, the output voltage is dependent upon both the mutual capacitance of the probes, and the capacitance between the receiver probe and the grounded metal. A secondary objective of the project is to allow the circuit to be simulated in SPICE-based simulation software. Some modifications have been made to the original circuit board during the simulations, and it has been shown that the output voltage is now only dependent upon the mutual capacitance of the probes. Although the majority of the sensor board has been successfully simulated, there are still some minor components, such as the squarewave oscillator and the power supply portion of the circuit, that were not included in the simulations due to time constraints. Future work will need to be done to achieve simulation data for the entire circuit board.