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# Track 3
# Design and Simulation

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# SIMULATION OF PASSIVE AIR-COOLING SYSTEM FOR AN ARC WELDING MACHINE

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## ABSTRACT

Welding is a critical process in various industries, where metal components are joined together to create strong and durable structures. However, one of the significant challenges faced during welding is managing the heat generated in the welding area. Excessive heat can lead to problems such as warping, distortion, and reduced weld quality. Passive air-cooling system uses natural circulation of air around the welding zone to reduce temperature, improving weld quality, reducing overheating risks, and extending equipment lifespan. This demand requires critical examination of Passive air-cooling during arc-welding. A mathematical model has been developed and simulated and observed the dissipation of heat in the weld-bead as well as the work-pieces. The result obtained can be extended to develop alternative cooling systems.

***Keywords**:* Passive cooling system, Arc welding, Simulation, Natural circulation, Overheat