

MECHANICAL ENGINEERING STUDENT SEMINAR

Thursday, May 11 2023 at 13:30, D. Dan and Betty Kahn Building, Auditorium 1.

Microchip Destruction using Thermite: An Evaluation of Effectiveness through Experiments and FEA

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This work investigates the effectiveness of using thermite to destroy microchips. Microchips contain sensitive data and their secure disposal is a critical concern for security reasons. The aim of this research is to evaluate the feasibility of thermite as a method for destroying microchips. This is done by conducting combined experiments and finite element analysis (FEA) to determine the level of thermal destruction associated with the burning of thermite.

In this study, metallic model chips were used to simulate the microchip and evaluate its surface temperature during the thermite destruction process. Thermocouples were employed to measure the temperature at the back of the model chips, which were subjected to controlled experiments of burning batches of thermite in different geometries. The ignition and burning was monitored by high-speed imaging while the thermocouple temperatures were sampled at an acquisition rate of 200 Hz. Results were used to estimate the temperature of the surface exposed to the thermite using an analytical model as well as FEA that was conducted to model the thermal effects of the different thermite geometries on the model chips.

The results of the experiments showed that thermite was effective in destroying the microchips, however with a moderate success rate of complete destruction. The FEA model also predicted the same level of surface temperature as the analytical model. The combined experimental and numerical FEA approaches provided a more detailed understanding of the thermite-microchip interaction. This will be useful in designing safer and more efficient destruction methods for microchips containing sensitive data.

Note: the seminar will be given in Hebrew