

REFRIGERATION OF POWER PLATES IN INDUCTION KITCHENS

(ASSIGNMENT 1 – ELEVATOR PITCH)

In this presentation I talk about my end of grade project that was about the refrigeration of power plates in induction kitchens. The purpose of this project was to analyze the refrigeration of the IGBT transistors which are responsible for the power regulation of an induction cooker. The study used numerical simulation techniques (CFD) supported by ANSYS FLUENT software, model 15.0. Due to the generation of heat in the transistors, the heat increases beyond cutting temperature reducing the performance. In order to find a solution an analysis of the overall fluid dynamic and thermodynamic behaviour was carried out. The result was a lack of flow between the fins that's why we decided to use an element for directing the flow. Thanks to these first simulations we saw a lack of similarity in the temperatures along the heatsink. For decreasing this gradient of temperatures we proposed the use of a different number of fins along the heatsink. Reducing to the half the number of fins in the first part the temperature of the first IGBT was increased but the one of the most critical IGBT was reduced, extending the life of these devices. The problem that shows this idea is that when it comes to making the heatsink will lose material and with this money, as it is currently manufactured by extrusion. What is proposed for a future is the study of new types of fins, as the bonded fins, to reduce the economic impact of manufacturing.