

Evaluating the technical feasibility of integrating electrical insert into the galley structure of an aircraft

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Zodiac Aerospace is considered a company specializing in the development and manufacturing of aircraft interior solutions, including the production of galleys and electrical inserts. The galley can be considered the kitchen of an aircraft, of which the electrical inserts are the kitchen equipment that cause for the kitchen to be functional. Zodiac Aerospace aims to optimize the use of an aircraft's on-board space. The primary manner in which the optimizing is done, is through attempting to reduce weight and bulk of on-board equipment such as electrical inserts to improve aircraft performance. Hence putting the emphasis and aim of this bachelor assignment on evaluating the technical feasibility of the optimization of an aircraft's on-board space by integrating electrical inserts into the aircraft's galley. (The electrical inserts consist of an oven--including hot air supply and ducting--and a beverage maker)

The design process of achieving this aim starts off with an analytical phase. This consist of a Zodiac Aerospace product analysis, similar market product analysis, user analysis, intellectual property research and regulations research. The conclusions of the analytical researches shape the technology definition, which hold all the requirements that the concept should adhere to. After the requirements are established, the ideation phase is initiated. Through the use of a morphological matrix, several ideas have been

generated and combined to create a total of six concepts. From these six concepts, the best concept has been chosen through the use of a compliance matrix.

This concept showcases the integration of the oven and beverage maker. The main idea here is that the functional components of the inserts have been removed from the main body and placed elsewhere. In addition to this, the functionalities of the inserts have been centralized and moved away from the inserts as well. This provides the oven alone with a 120% volumetric heating capacity increase. This can be used to increase the oven size. However, it also creates the opportunity for more storage space or other functional compartments to be put into the galley structure. To evaluate the technical feasibility of this concept, an extensive RAMSSHEEP analysis has been executed. This resulted in a recommendation of pursuing the further development of this concept. With some financial investment and further engineering resources, this concept can be of great value to optimize the use of on-board space.

The result of this bachelor assignment is a 3D CAD model with a technical feasibility study and a recommendation of the continuation of the development of this concept.