THERMAL SURVEY IN AUTOCLAVE TO DETERMINE THE THERMOCOUPLE AND MOULD TOOL POSITION

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“I declare that the content present in this thesis are my own work which was done at Universiti Teknologi MARA (UiTM) unless stated otherwise. The thesis has not been previously submitted for any other degree.”

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ABSTRACT

An autoclave is a machine that acts like a pressure cooker. This pressure chamber is being used in many industries to carry out industrial process that required elevated pressure and temperature that different form the room temperature and ambient air pressure. Thermal survey is a 'try and error' method to determine the arrangement of the panels during curing process. Among the issue faced by the user in aerospace industries is the oversoaking of the panels due to uneven heat distribution. The purpose of this research is to analyse the heat distribution inside the autoclave during curing process using simulation techniques. The autoclave was drawn based on the actual model that being used in the industry by Composite Technology Research Malaysia Sdn. Bhd. (CTRM Sdn. Bhd.). The simulation by using Solidworks software was used to investigate the heat distribution on the design by taking consideration of the appropriate boundary conditions and various parameters. The boundary condition was set according to the actual specification given by the CTRM Sdn. Bhd. The flow was set to turbulence and the volume flow for inlet was set to 7 bar and the temperature was set to 265^{o}C. The results shows, the heat distribution of the hot air gathered at the lower part and middle part of the device. This area receive more hot air than the other area. As a conclusion, this is the most possible and suitable position to place the mould tool so that it will receive a good amount of hot air. With this simulation, it gives benefit to the industry as it will save cost and time and does not need to run the actual survey to find the suitable position to place the mould tool.

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