

CFD analysis of heat transfer through stirling engine with different regenerators

ABSTRACT

As the energy prices arise globally, the idea of increasing energy efficiency has been a constant challenge for the industry. In line with the National Transformation 2050, the National Green Technology Master Plan (GTMP) aims at reducing the CO₂ emissions to 192.3 million tonnes eq/year by 2030, which is why waste heat recovery is crucial as by reusing this heat sources, heating efficiency increases, resulting in lower fuel used. Thus, this study will be focused on modelling of a Stirling engine which can be used for waste heat recovery and identify the effect of different porosity of regenerator materials to the heat transfer performance of the engine. Finally, the study will try to determine the best material to be used as regenerator for optimum heat transfer rate. In order to achieve this, computational fluid dynamics (CFD) modelling and analysis will be performed to predict the effect of those techniques to the heat transfer performance of Stirling engine.

Keyword: CFD; Energy efficiency; Heat transfer; Stirling engine