

ANSYS Investigation on Stability and Performance of a Solar Driven Inline Alpha Stirling Engine

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Abstract : The stable operation of an inline Stirling engine will be achieved when both engine configurations and operating conditions are optimum. This paper presents stability and performance investigation of an inline Stirling engine using ANSYS. Dynamic motion of engine pistons such as the displacer and the power piston are both obtained. For engine design, the optimum parameters are given such as engine specifications, engine characteristics and working conditions to yield the maximum efficiency and reliability. The prototype was built and tested and it is used as a validation case. The comparison of both experimental and simulation results are provided and discussed. Results were found to be encouraging to initiate a Stirling engine project for 3 kW power output. The working fluids are air, hydrogen, nitrogen and helium.

Keywords : stirling engine, solar energy, new energy, dynamic motion

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