

MATHEMATICAL MODELING AND OPTIMIZATION OF THE OPERATION OF THE STIRLING PISTONLESS ENGINE

The results of this completed dissertation analyze the liquid piston stirling engine. The engine has been theoretically described, using mathematical models that allowed the import of all the parameters that affect the engine. This was achieved by conducting a series of experiments where the parameters that affect the engine were consecutively changed and suitable measurements were made. The experiments were conducted with the support of the systems and facilities of the Technological University of Cyprus in the Mechanical engineering laboratory. The engine design was based on various models from researchers that had previously worked with it (West, C. D., 1983), (Walker, G., 1980). The engine was build by the guiding assistant professor Dr.Vasileios Mesaritis, with some adjustments to improve its operation. The purpose was to improve the engine's efficiency, although understanding the engine is the path that future researchers should take to optimize it.

A key characteristic of the liquid piston stirling engine is that it does not have moving mechanical parts and the work it produces is achieved by swinging liquid columns. Such engines are usually called Fluidyne and are used for pumping liquids because of their simple operation and manufacture (West, C. D., 1983), (Walker, G., 1980).