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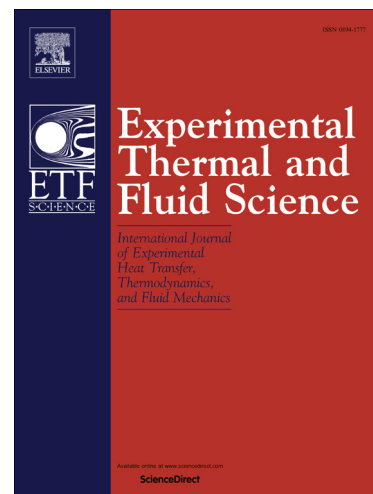
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Experimental Study on Oscillating Flow Steam Engine in a Single Micro Tube

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ABSTRACT

Oscillating flow steam engine can be a cost-effective solution for recovering work from waste heat due to its structural simplicity. In the present study, the effects of design parameters and operating conditions of oscillating flow steam engine such as tube diameter, heating section temperature, cooling section length ratio and compression ratio are experimentally investigated. The pressure variation due to boiling and condensation induces a continuous oscillating flow in a single micro tube, which can generate work using crank-piston system. The indicated work and cycle efficiency both increase as the heating section temperature and compression ratio are increased. The investigated oscillating flow steam engine achieved indicated work of 1 W with the cycle efficiency of $\eta = 5\%$ at $T_{\text{heat}} = 230^\circ\text{C}$ and $T_{\text{cool}} = 80^\circ\text{C}$ in a $D = 1.0$ mm tube.

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