

## A thermoelectric power generating heat exchanger: Part I – Experimental realization - DTU Orbit (09/11/2017)

### A thermoelectric power generating heat exchanger: Part I – Experimental realization

An experimental realization of a heat exchanger with commercial thermoelectric generators (TEGs) is presented. The power producing capabilities as a function of flow rate and temperature span are characterized for two different commercial heat transfer fluids and for three different thermal interface materials. The device is shown to produce 2W per TEG or  $0.22\text{W cm}^{-2}$  at a fluid temperature difference of  $175\text{ }^{\circ}\text{C}$  and a flow rate per fluid channel of  $5\text{ L min}^{-1}$ . One experimentally realized design produced 200W in total from 100 TEGs. For the design considered here, the power production is shown to depend more critically on the fluid temperature span than on the fluid flow rate. Finally, the temperature span across the TEG is shown to be 55–75% of the temperature span between the hot and cold fluids. © 2016 Elsevier Ltd. All rights reserved.

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