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Shixue Wang, Tianxi Xie, Hongxi Xie

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# Experimental study of the effects of the thermal contact resistance on the performance of thermoelectric generator

Shixue Wang<sup>a,b</sup> Tianxi Xie<sup>a</sup> Hongxi Xie<sup>c</sup>

<sup>a</sup> School of Mechanical Engineering, Tianjin University, Tianjin 300072, China

<sup>b</sup> Key Laboratory of Efficient Utilization of Low and Medium Grade Energy, Tianjin University, Tianjin 300072, China

<sup>c</sup> Hefei General Machinery Research Institute, Anhui 230031, China

**Abstract:** Semiconductor thermoelectric generation technology is promising for application to waste heat recovery and is increasingly attracting research interest. The objective of the present study was to determine how the performance of a thermoelectric generator (TEG) was affected by the thermal contact resistance. The effects of the interface material and loading pressure—factors that determine the thermal contact resistance—on the TEG performance were experimentally investigated and analyzed. It was found that, for a given temperature difference between the cold and hot sources, the actual temperature difference of the thermoelectric module and the output power significantly increased when an interface material was applied to the contact surface. In addition, with increasing loading pressure, there was a decrease in the thermal contact resistance between the two sides of the thermoelectric module, and an increase in both the actual temperature difference across the module and the output power. Further, for a given loading pressure, an increase in the thermal resistance of the thermoelectric module was accompanied by an increase in the average temperature of the module, a decrease in the ratio of the thermal contact resistance to the total thermal resistance, and an increase in the output power.

**Keywords:** thermoelectric generator; thermoelectric module; thermal contact resistance; loading pressure; interface material

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\*Corresponding author

Tel.: +86-22-27402567; fax: +86-22-27402567; email: wangshixue\_64@tju.edu.cn.

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