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Published in:

Book of Abstracts. International Conference on Thermoelectrics (ICT) 2015

Publication date:

2015

Document Version

Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):

Bjørk, R. (2015). The universal influence of contact resistance on TEG efficiency. In Book of Abstracts. International Conference on Thermoelectrics (ICT) 2015

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The universal influence of contact resistance on TEG efficiency

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We present an investigation of the influence of both electrical and thermal contact resistance on the efficiency of a segmented thermoelectric generator [1]. For the study, 12 different segmented *p*-legs and 12 different segmented *n*-legs are considered, using 8 different *p*-type and 8 different *n*-type thermoelectric materials. For all systems, a universal influence of both the electrical and thermal contact resistance is observed on the leg's efficiency. The universal behaviour allows the maximum tolerable contact resistance for a segmented system to be found, i.e. the resistance at which a leg of only the high temperature thermoelectric material has equal efficiency as a segmented leg with contact resistance at the interface, as shown in Fig. 1.

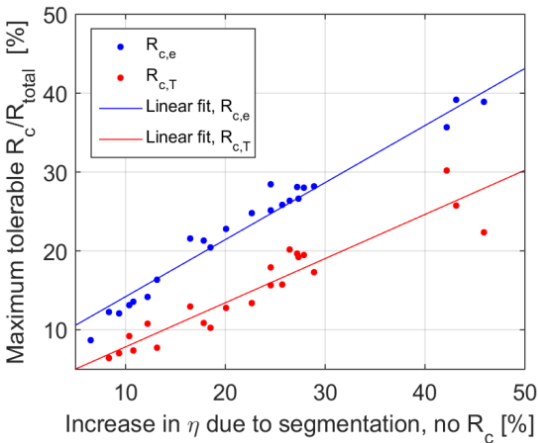


Figure 35: The maximum tolerable pure electrical or thermal contact resistance for a segmented TE leg as function of the gain in efficiency due to the segmentation.

The author would like to thank the European Commission for sponsoring the NanoCaTe (FP7-NMP Project No. 604647) project.

References:

[1] R. Bjørk, The universal influence of contact resistance on the efficiency of a thermoelectric generator, Accepted Journal of Electronic Materials (2015)