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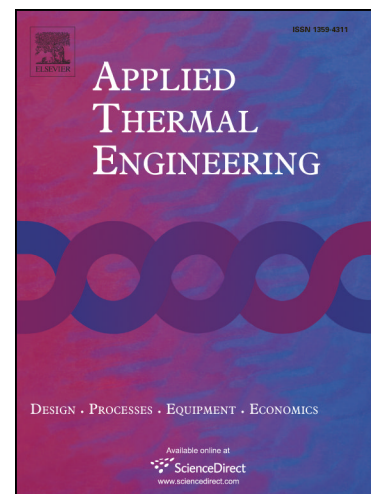
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Influence of inlet flow maldistribution and carryover losses on the performance of thermal regenerators

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Abstract

Void (dead) volumes represent a penalty to the thermal performance of Active Magnetic Regenerators (AMR). While much effort has been put in designing AMRs with small void volumes, in most designs, penalties associated with inlet flow maldistribution and pressure loss may increase with the reduction of the void volumes. In this work, an experimental evaluation of the combined effect of void volume and inlet flow maldistribution is carried out. The analysis is performed based on the regenerator thermal effectiveness determined experimentally in a passive regenerator test apparatus. The results show that the negative impact of inlet flow maldistribution on the regenerator effectiveness is more significant than that of the void volume.

Keywords: Active Magnetic Regenerator (AMR), magnetic refrigeration, dead volumes, inlet flow maldistribution, passive regenerator apparatus.

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