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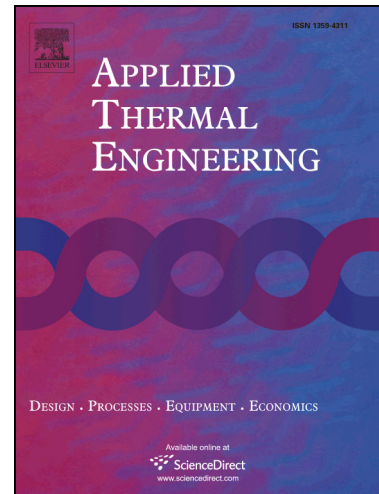
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Comparison of heat transfer models for reciprocating compressor

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Abstract. One of the main factors affecting the efficiency of reciprocating compressor is heat transfer inside the cylinder. An analysis of heat transfer could be done using numerical models or integral correlations developed mainly from approaches used in combustion engines; however their accuracy is not completely verified due to the complicated experimental set up. The goal of this paper is to analyse the effect of heat transfer on compressor efficiency. Various integral correlations were compared for different compressor settings and fluids. CoolProp library was used in the code to obtain the properties of common coolants and gases. A comparison was done using the in-house code developed in Matlab, based on 1st Law of Thermodynamics.

Keywords:

Reciprocating compressor, heat transfer, integral correlations, volumetric efficiency, isentropic efficiency

Highlights:

- Comparison of integral heat transfer models
- Influence of heat transfer model on volumetric and isentropic efficiency
- Various gases used as working fluid

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