

SIMULATION STUDIES OF A COUPLED VANE COMPRESSOR

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In this paper, the mathematical models of the novel Coupled Vane compressor (CVC) is formulated to study its operational characteristics and to assess its performance. Coupled Vane compressor, as the name implied, has two vanes coupled together. The unique feature of the compressor is that a set of two vanes are coupled together and they cut through the rotor diametrically. Theoretically, any rotor size which can accommodate the vanes will work with this design. This design removes most of the geometrical constraints imposed on the size of the rotor, as what happened in most of the rotary compressors. The ability to accommodate a significantly small rotor in this new design, makes it substantially more compact which also indirectly reduces material wastage, cost of machining and fabrication. This new design is intended to be used in refrigeration, household cooling and heating applications.

Keywords: vane compressor, rotor, coupled vanes, geometric model, thermodynamic model, vane dynamics, operating process.

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