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A THEORETICAL STUDY ON THE NOVEL STRUCTURE OF VANE COMPRESSOR FOR HIGH EFFICIENCY

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Aiming at the problem of excessive mechanical loss of the conventional vane compressor, this paper proposes a novel vane compressor structure. This compressor can significantly reduce the mechanical frictional loss through converting sliding friction between vane tip and cylinder into rolling friction by using a rolling bearing. The structure and operation principle are introduced in this paper, and mechanical friction loss calculation models of these two kinds of compressor are theoretically analyzed. The results show that mechanical loss of the novel vane compressor can be reduced by nearly 38 % under the same working conditions. At the same time, the actual tested results indicated that the total power consumption of compressor decreased 160,1 W (6,89 %), and the COP increased by 11,89 %.

Keywords: Keywords: vane compressor, rotor, rolling bearing, mechanical loss, friction power calculation, experiment, results verification.

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