

On the Vacuum Pumps of Gradational Lead Screws with Compressibility

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ABSTRACT

This paper applying the differential geometry, coordinate system method, and conjugating surfaces meshing theory, the mathematical models of the screw rotor surfaces can be derived, can effective reduce noise when screw rotor revolve in high speed, opened root of screw rotor to enhance manufacturability and tool life, that the working efficiency can be increased and the mechanical loss thereof can be reduced, employ design of non-symmetrical compound curves in screw rotor contour and gradational lead screw, based on kinematic relation between screws, the model of dynamic simulation. Final, make four example of different gradational lead screw, obtain the change of screws rotor geometric characteristic include the air chamber volume and the compress of compress chamber, the length of the sealing, and compare of merit and shortcoming, and optimized design model of the screws for vacuum pumps of gradational lead screws with compressibility will be also proposed at last.

Keywords : Gradational Lead Screw ; Non-Symmetrical Compound Curves ; Vacuum Pump

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