

International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal

Volume 5, Issue 6, March 2025

Design and Development of a Centrifugal Pump without a Mechanical Seal

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Abstract: Centrifugal pumps are widely used in various industries for fluid transport. Traditional centrifugal pumps often rely on mechanical seals to prevent leakage, but these seals are prone to wear, failure, and require regular maintenance. This research explores the design, development, and testing of a centrifugal pump that eliminates the need for a mechanical seal, offering a potentially more reliable and cost-effective solution. The study investigates different seal-less pumping mechanisms, focusing on magnetic coupling and other innovative approaches. Computational fluid dynamics (CFD) is employed to analyze the pump's hydraulic performance characteristics, including flow rate, head, and efficiency. The results are compared with those of conventional centrifugal pumps with mechanical seals. The research aims to demonstrate the feasibility and potential advantages of seal-less centrifugal pumps for specific applications

Keywords: Centrifugal pumps

