"TESLA TURBINES"

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The Tesla turbine is an unconventional, promising technology that has not yet been fully explored and optimized. Other applications have yet to be investigated and developed. The boundary layer theory underlies the operation of the Tesla turbine, also known as the Prandtl turbine or boundary layer turbine. It employs stickiness and viscosity rather than friction to carry out its job.

Due to the boundary layer effect, abrasive discs positioned on the shaft transmit energy from the fluid to the rotor. The fluid enters the discs tangentially, spirals to the center, and then departs axially. The fluid rotates the rotor by transferring its kinetic energy to the discs. Compressible fluids and those that are not can both be utilized. The manufacturing of Tesla turbines is substantially simpler than that of conventional turbines.

The turbine may also be utilized with fluids that contain particles since it is unaffected by the fluid's composition. A Tesla turbine may be used as a pump since it is a reversible turbo machine. Axially at the center, the fluid enters a pump arrangement.

The fluid exits the circle in a spiral after receiving energy from the discs.

Construction and Working: The Tesla turbine is made up of several discs that are arranged parallel to one another on a shaft. The nozzles are tangential to the shaft, that is, oriented inward, and are situated at the edge of the cylindrical casing. To allow fluid to pass between the discs, there are tiny spaces between them.

Near the center of the turbine are the output ports. Tangentially from the outside, the fluid enters the turbine. The space between the discs is where it is aimed. The discs are pulled in the flow direction by the flowing fluid. As a result, the fluid transfers kinetic energy to the discs. The discs rotate with the shaft due to the energy that has been transmitted.

As a result, the liquid slows down and spirals towards where the outlet ports are located in the middle.

Factors Affecting Performance: Several factors have an impact on the Tesla turbine's performance. Among them is the number of discs, which may be increased to improve the torque produced.

- The distance between the discs should have a gap that is twice as thick as the border layer.
- Nozzle count: As the nozzle count rises, the torque obtained rises as well.
- Reynolds number: The laminar boundary layer's thickness is influenced by the Reynolds number.
- Flow velocity: The fluid's flow velocity determines how much kinetic energy is sent to the turbine.

Applications: The rotors of the Tesla turbine are turned by using fluids as the driving force. When used in low-power applications, it is beneficial, but when used in high power applications, it is not particularly effective.

Tesla turbines have been the subject of several tests for a variety of uses, including steam turbines and car turbos. The ability of Tesla turbines can be employed in situations where the working fluid contains particles, such as salt water or unclean water, makes this one of its most significant uses. Both fluids with low and high viscosities can be used with it.

The Tesla pump, on the other hand, is frequently employed in applications that call for the pumping of abrasive fluids like industrial wastes, etc., even though the Tesla turbine has not been effectively used commercially since its inception.

Tesla pumps are currently often utilized for blood transfusions. Conclusion: Unconventional, promising, and yet completely investigated and optimized is the Tesla turbine. There are still undeveloped and unexplored uses.

The purpose of this article does not extend to the full performance improvement of Tesla turbines