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Mechanical Seals for Zero Leakage

By Thomas Yoon

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A centrifugal water pump contains a few basic components as follows:

- 1) The housing for containing the water.
- 2) The impeller attached to a rotating shaft that moves the water.
- 3) The coupling that transmits the rotating action of a motor (or other prime movers) to the pump shaft.
- 4) The seal between the housing and the rotating shaft.
- 5) The bearings for ensuring that the shaft turns smoothly.
- 6) The inlet and the outlet ports for channeling the water flow through the pump.

In order for a pump to work, the pump impeller must generate pressures inside the pump housing. The seal between the housing and the rotating shaft plays a critical role in making the pump work.

One of the most common ways of sealing a rotating pump shaft is by using mechanical seals.

The 3 components of a mechanical seal are:

- 1) The rotating component that moves together with the rotating shaft.
- 2) The stationary component that is fixed to the pump housing.
- 3) The spring that presses the rotating component onto the stationary component axially.

Rotating Component

Mechanical Seals for Zero Leakage

This is a ring, usually consisting of 2 types of materials – a soft carbon piece with a highly polished axial surface, and a rubber material or o–ring that is able to grip the shaft for sealing against water leak through the shaft surface.

Stationary Component

The stationary ring is usually made of stainless steel, although there are some made of ceramic or similar hard materials. The axial surface is also highly polished. At the circumference of the stationary piece, a rubber o–ring will be installed to seal

against water leak through the pump housing.

Spring

The spring(s) is installed around the shaft and rotates with the rotating component. The purpose of the spring is to press the rotating component of the mechanical seal against the stationary component so that the matching surfaces are in contact with each other axially to the shaft.

Because the axial rubbing surfaces in contact are very highly polished, there is almost no leak there. Water does not leak through the pump housing opening because of the o–ring pressed between the stationary component and the pump housing. Water will also not leak through the shaft because of the o–ring in the rotating component gripping against the shaft.

So, if there is a leak in a mechanical seal of a pump, look for the sources of leak in those 3 places. Surely one of them is not sealing properly.

For more information on mechanical seals and pump troubleshooting, download the free software from

Pump Troubleshooter

Many years of working experience in Marine, Facilities, Construction has given the author material for writing e–books and articles related to engineering, and management.

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Water Pumps - All You Want To Know

By Barney Garcia

Water pumps are instruments, which help in movement of water from low pressure to high–pressure area. The movement could be due to pressure or suction.

Broader Categories There are two broader categories, which provide the basis of classification. First is the positive displacement type. Here, the fluid moves from a section of reduced volume to the increased one. This ensures a regular flow in spite of the changes in pressure. However it contains a release valve to prevent severe fluctuation. The other is the dynamic one. Here, the movement of fluid relies upon its own momentum. The Dynamic water pumps can be divided into 2 parts depending upon the motion of the fluid.

Rotary Motion– Centrifugal Pump This type of water pumps has a component called Impeller, which drives the fluid and converts its energy into pressure. The water is stored in a Pump Casing. It is essential to avoid leakage of fluid by using labyrinth seals, mechanical seals or gasket. The motor provides current for the pump to run. It is necessary to use oil to avoid friction and maintain the flow. The actual movement is caused due to the rotation of the fluid therein.

Linear Motion–Jet Pump The jet water pumps are the most common example of the linear motion of the fluid. These do not possess any moving parts that drive the water inside it. These are also called Eductors or air ejectors. Such pumps works on the principle of creating low pressure. The movement completely relies on the changes in the fluid. But there efficiency decreases with increase in pressure. Hence, instead of pumping water they are commonly used to remove water. These make use of nozzles and a freeder stream. Although care must be given to ignite it properly otherwise it would star pumping water instead of drawing it.

In a nutshell, one can say that Water pumps work on the principle of compression or physical lifting both for pumping water and removing it. They are used in swimming pools for sanitizing the water. These also help in retaining the chlorine composition in the beach water by sucking the water vapor using these pumps.

Barney Garcia writes about many different topics. He is a proud contributing author and invites you to his websites.

<http://www.pumps-for-all.info>

and

<http://www.water-pumps-galore.info>



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