

## Aquastorm Pump Seal Damage When Your Pump Runs Dry

Running a pump "Dry" can rapidly cause mechanical pump seal damage. Most pumps require the use of a mechanical seal where the motor shaft enters the pump housing to connect to the pump impeller. This seal can rapidly be damaged if the pump is ever allowed to run dry even for a very short period of time. Mechanical pump seals are actually lubricated by the fluid they are pumping. The seal has a head which usually has a graphite-based sealing surface which is spring loaded to push against a seat which is usually ceramic based. Contrary to popular belief these seals are designed to leak.

This leaking action allows a very thin layer of the fluid being pumped to flow between these two surfaces lubricating them as the spring-loaded head rotates with the motor shaft against the stationary seat. With a proper design the mechanical seal has just enough of the liquid flowing through the mating surface of the seal to allow lubrication across the entire mating surface without visible leakage. The fluid is a vapor as it leaves the seal on the outside of the pump housing. This fluid in addition to lubricating also cools the mating surfaces of the mechanical seal.

If the pump runs dry for even a brief period without this lubrication and cooling taking place the friction of these surfaces moving against each other will rapidly cause wear, overheating, and material transfer from one surface to another as the 2 surfaces attempt to friction weld themselves together. The rapid wear that occurs during the pump running dry will cause the two previously smooth surfaces to become very coarse with circular grooves and ridges that will no longer provide a seal and are impossible for the liquid to effectively lubricate causing leakage and further wear when the pump is again pumping.

A leaking mechanical pump seal can cause many problems for the pump. The most obvious is the puddle of water around the pump which may get into the electric motor of the pump especially if the water sling is missing or damaged. Water and electric motors is never a good thing, in addition to water and electricity being a bad mix the water can contaminate the bearing grease causing premature bearing failure. The other problem that can occur is that air can be drawn in through the seal. This is typically in the form of foam from the tank.

Running dry is not the only thing that can cause a mechanical pump seal to fail. Using the wrong lubricant when installing the new seal can also cause failure. Use of Silicone based lubricants or, PTFE based lubricants can cause the sealing surfaces to absorb the lubricant and the material to soften causing material to transfer from one surface to the other resulting in seal failure. Even touching the mating surfaces of the seal with your fingers can cause the oils from your skin to transfer to the mating surfaces of the seal where they repel the water that is supposed to leak through the seal lubricating and cooling it. Again this will cause a failure of the seal very similar to dry running due to the lack of lubrication and cooling. Once a mechanical pump seal is damaged the only option is replacement.

If you have further questions, please contact Electrovert Technical Support @ 800-737-8110 or [etsc@itweae.com](mailto:etsc@itweae.com).