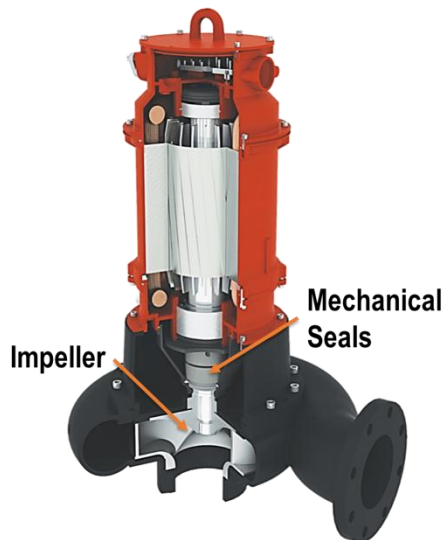


DexPel™ - Expel the problems and protect the mechanical seals in submersible pumps

Submersible pumps which are subjected to wastewater or water with solids often tend to fail without the right seal protection system.



The problems with mechanical seals in submersible pumps:

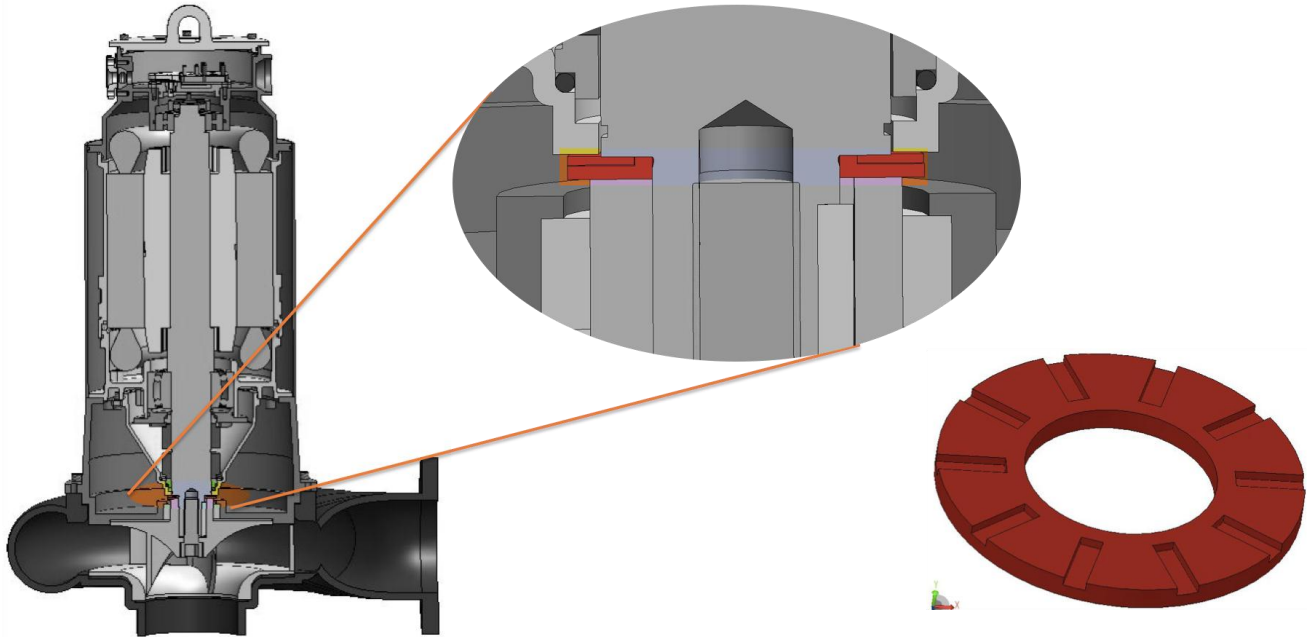
Submersible pumps are widely used nowadays in applications where there are hard and abrasive solid particles, typically in wastewater and sewage pumping. In the developing world, where the clear demarcation between sewer lines and storm water drains is absent, there is ingress of hard solid particles in the pumps, typically sand, which damages the mechanical seals in a pump. Once the seals fail, it is a cascading effect on the overall operation of the pump and often the pump needs to be taken out for repair resulting in precious downtime and lost revenues to the operator.

How hard particles damage the mechanical seals:

Hard, and many times heavy particles in liquids being pumped, particularly sand, have a tendency to pass through any nook and corner of the pump parts since such particles are very small in size. Mechanical seals have two lapped faces rubbing on one another under pressure. This mechanism provides the required sealing ensuring the liquid does not leave the intended pressurised chamber (casing). However, although the seal faces are rubbing against each other under a pressure, small hard particles do make way onto the seals faces and damaging the seals. Once the seal faces are damaged, in no time the sealing mechanism fails and pump needs repair. However, if the hard small particles can be diverted or not allowed to come near the mechanical seal, then the chances of seal failure due to hard particles can be eliminated and protect the seals.

How the new design approach protects the mechanical seals:

Fortunately, physics allows us to have a solution for preventing hard and heavy particles from coming near the mechanical seals. Soft small particles are not a problem at all. By using the inherent rotation of the shaft, a device called an expeller is mounted on the backside of the impeller. The expeller rests on the shaft between the impeller and the mechanical seals. When hard heavy particles enter the space near the mechanical seal,



the expeller provides an outward force to such particles due to the particles' own weight. heavier the particles, more is this outward force. Due to this expelling outward force, the particles are thrown away from the mechanical seals and not allowed to build up near the seal faces. The biggest challenge is when the pump is stopped and needs to be restarted. In such cases, when the pump stops, there is a chance that the hard particles may migrate towards to seal faces, and when the pump starts again, they damage the seals. To prevent this the expeller is provided with groves so that when the pump stops working, the particles first tend to settle in the groves instead of migrating towards the seal faces. When the pump starts the particles are again thrown outward and away from the seals.



Benefits of the Dexpel™ design:

- Protects mechanical seals without added bulk
- Provides clean liquid to seals for longer life
- Takes up very little energy to protect the seals
- Abrasion resistant material options of the Expeller for long life

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pumps
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