

HAZLETON PUMPS

INTRODUCES THE SA HIPPO SUBMERSIBLE SLURRY PUMP ON-SITE MECHANICAL SEAL REPLACEMENT SYSTEM.

The *HIPPO* Submersible pump range has been successfully in use since 1984 and HAZLETON PUMPS decided to re-design this range of pumps in order that the mechanical seals can be replaced **on-site by the user** without having to remove the shaft, bearings, the electrical stator winding or the pump cables with the following benefits:

Handling and Transport:

With the average weight of the *HIPPO* Submersible Slurry Pump being approximately 1 Ton and mostly used in isolated locations the cost of removal the pump from operation as well as the transportation to the repair location will be at least 40% of the pump's repair cost.

Pump Replacement Parts:

It was also found that the mechanical seals have a limited life span compared to the other pump components and that should only the seals need replacing, having these seals replaced **on-site** would have major savings effect on the total cost of ownership of the pump.

On-Site Replacement:

Most owners of *HIPPO* Submersible Slurry Pumps have well equipped workshops with qualified artisans **on-site**. It would therefore be a bonus to operational requirements should the mechanical seals be replaced **on-site by the user**.

On-Site Training:

HAZLETON PUMPS will provide **on-site** training and support to the pump repair artisans as the replacement of the mechanical seals is not complicated and in most instances the pump operator could replace the mechanical seals.

Upgrade of existing pumps:

The existing *HIPPO* Submersible Slurry pumps can be upgraded so that the mechanical seals can be replaced **on-site by the user** at an affordable cost.



12 Ton *HIPPO* Submersible Slurry Pump that has been upgraded to be able to have the mechanical seals replaced **on-site by the user**.

IEC 60079-1 Flameproof Applications:

The HIPPO Flameproof Submersible Slurry pump's mechanical seal can also be replaced **on-site** provided that the artisan has been trained and is qualified in accordance with the IEC 60079-1 requirements.

Mechanical Seal Chambers:

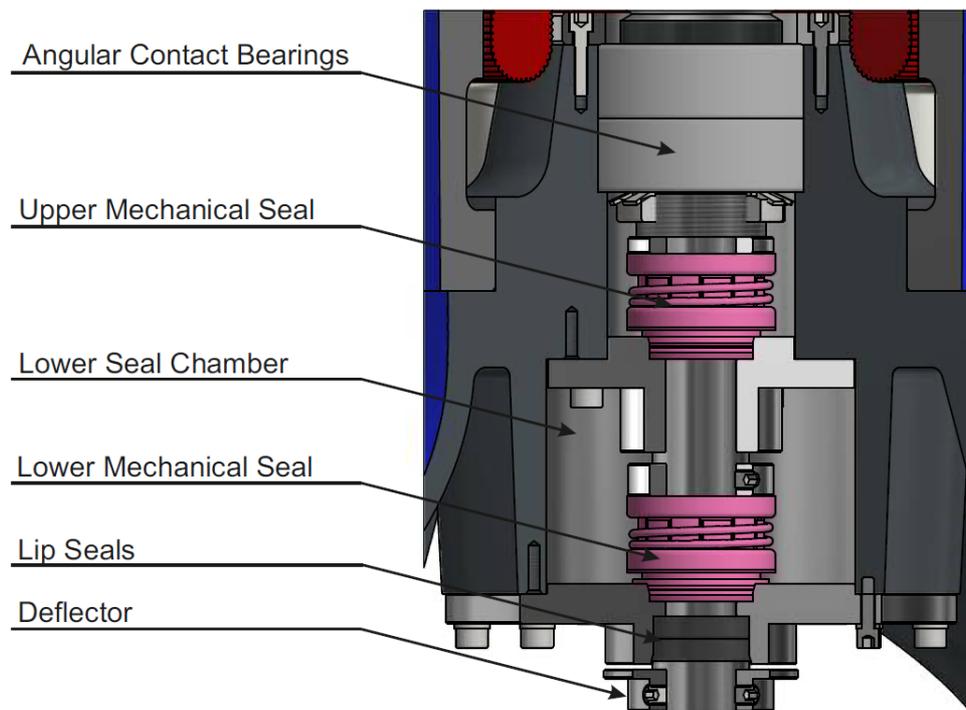
The original *HIPPO* Submersible pump was designed with two seal chambers with both seal chambers being filled with oil and the design had been changed in order that the mechanical seal could be removed without having to strip the pump's electrical drive unit completely.

The Upper Seal Chamber also houses the pump shaft, bearings, electrical winding and the upper mechanical seal while the Lower Seal Chamber only houses the lower mechanical seal.

Both Seal Chambers are also fitted with probes, installed to measure the conductivity of the oil which will become conductive should the mechanical seals start to fail.

The lower mechanical seal will always fail first and when this occurs a warning light or alarm will be activated to warn of this seal's failure. When the upper seal fails the oil in the upper chamber becomes conductive and the electrical control panel will switch off the pump instantaneously before the electrical stator winding or bearings are contaminated.

Mechanical Seal Chambers



The hydraulic end with the mechanical seals is easily removed and the stator housing and the total Upper Seal Chamber can be rinsed out using a suitable solvent and dried. The mechanical seals are replaced, and the mechanical seal chambers are re-filled with oil.

To extend the lifespan of the mechanical seals, double lip seals are also installed below the lower mechanical seals and a deflector is installed on the shaft below the lip seals to displace larger solids and protect the lower clamp plate. The Hydraulic End can be re-assembled, and the pump put back into operation without the pump being removed from site.

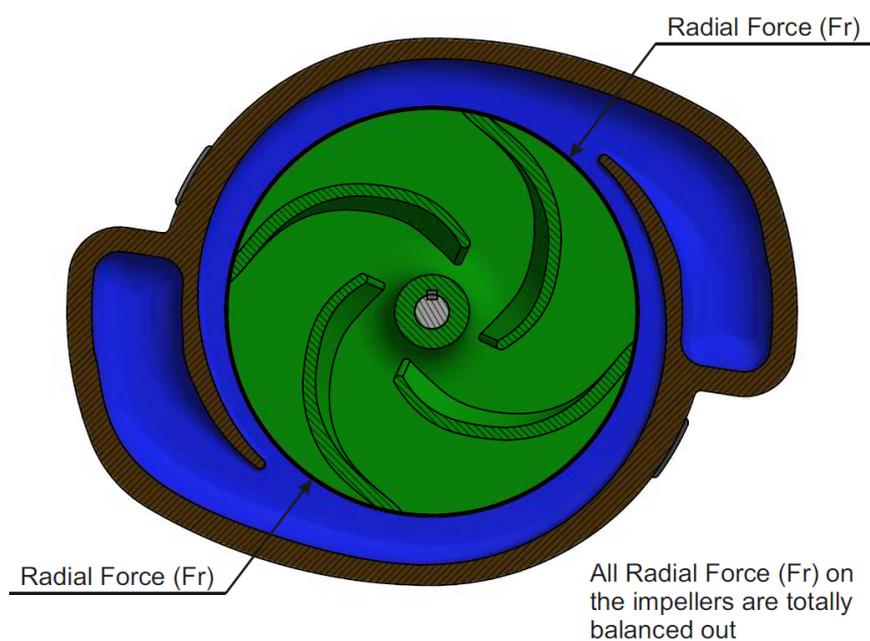
The addition advantages:

The design of the HIPPO Submersible Slurry pumps is such that the oil serves the function of dissipating the heat generated from the Electrical Winding as well as to lubricate the bearings and the mechanical seals. This design factor allows the *HIPPO* Submersible Pumps to have the capabilities of running dry continuously and if the seal chamber is monitored the electrical winding will never fail - even when the inflow rate varies or stops totally.

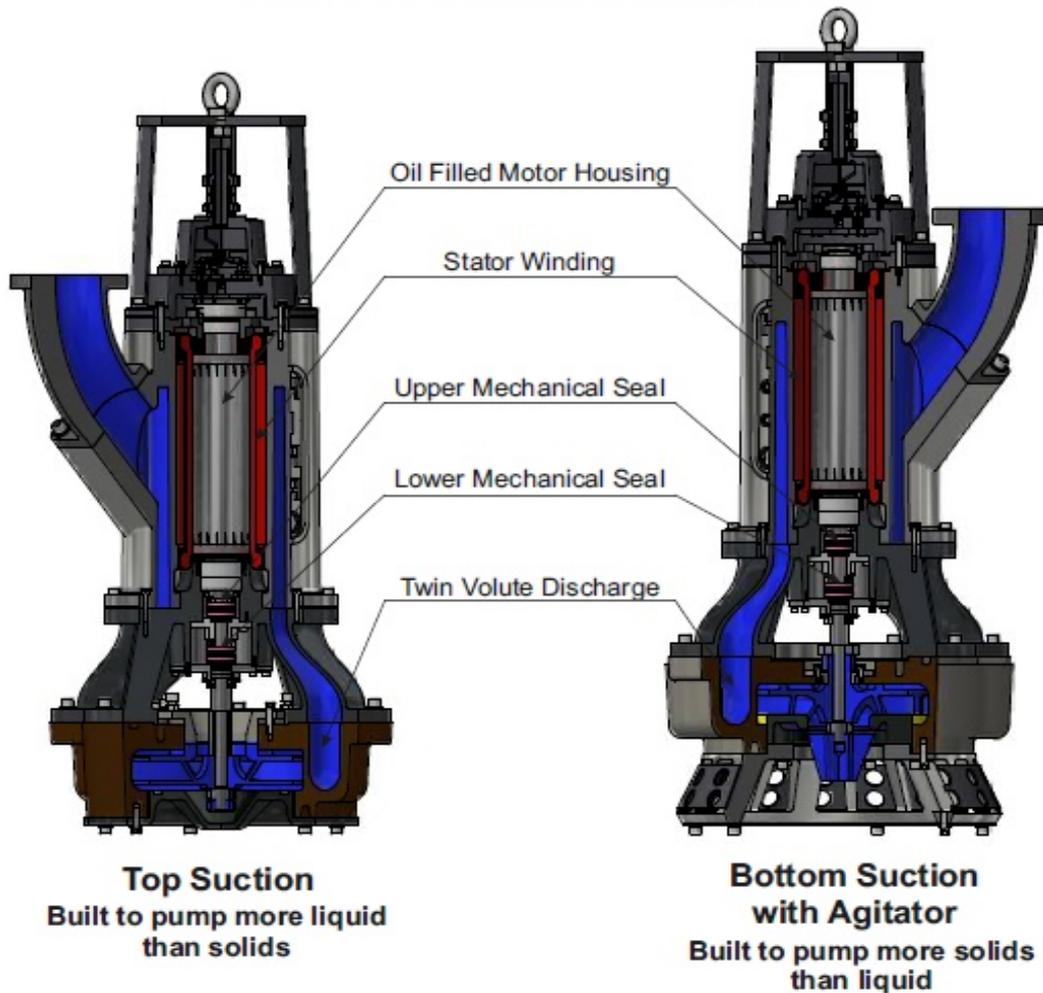
Shaft vibration:

One of the major causes of mechanical seal failure is vibration of the pump shaft and by utilizing a double discharge volute design all the radial forces on the impeller will be balanced out and thus minimizes the shaft vibration, extending the mechanical seal life.

Twin Volute Discharge Design



Hippo Submersible Slurry Pump



Electrical Control Panel:

Should the submersible pump be overloaded to the extent that the power absorbed being greater than the maximum power that the electrical windings had been designed for, the windings will also burn out. To avoid this an overload relay will be fitted to the electrical control panel. In most cases additional protection relays are also installed in the electrical control panel which are as follows:

- **Mechanical Seal Failure Detection:** Is achieved by having probes installed in the stator and the lower seal chamber. The probe will measure the conductivity of the oil in the chambers and should the seal fail the oil will be contaminated and become conductive.
- **Thermistors:** PT100 probes are installed in the stator housing as close to the bearing as possible to detect bearing failure and stop the submersible before serious is caused to the pump.

Should all the above-mentioned points be adequately addressed the total cost of ownership of the submersible pump will be kept to a minimum.