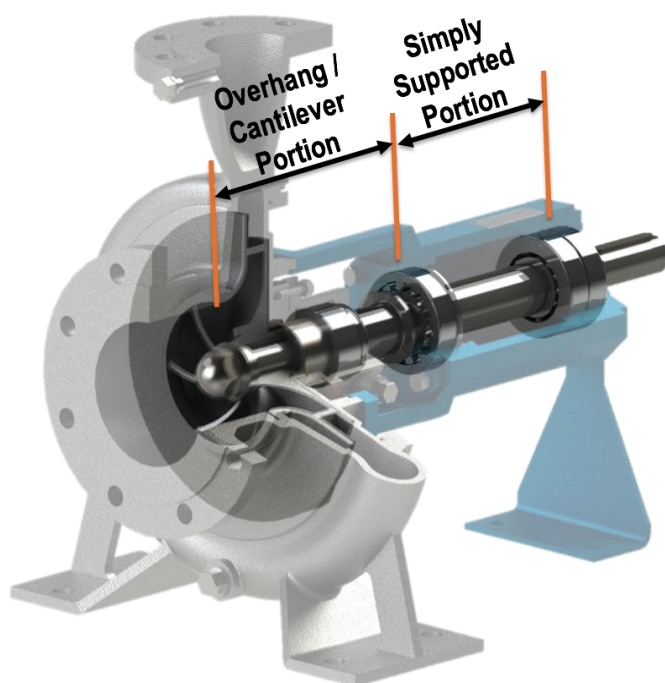


XSpan™ - Higher reliability in overhung end suction pumps allowing wider operating range

How a radical new design thinking of the bearing span in an overhung end suction pump increases reliability & increases the allowable operating range.



The conventional concept of overhang in an end suction horizontal pump:

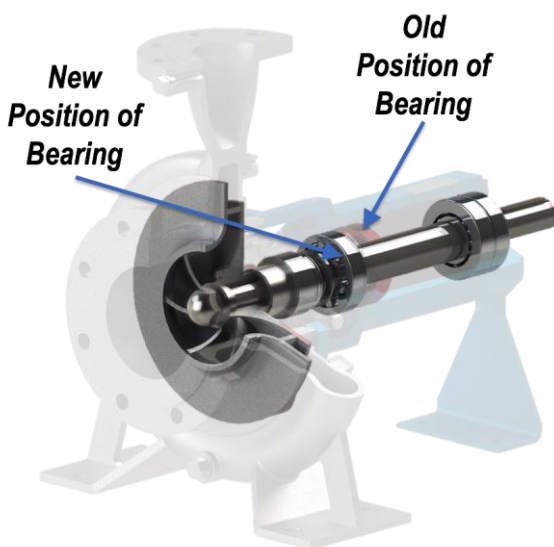
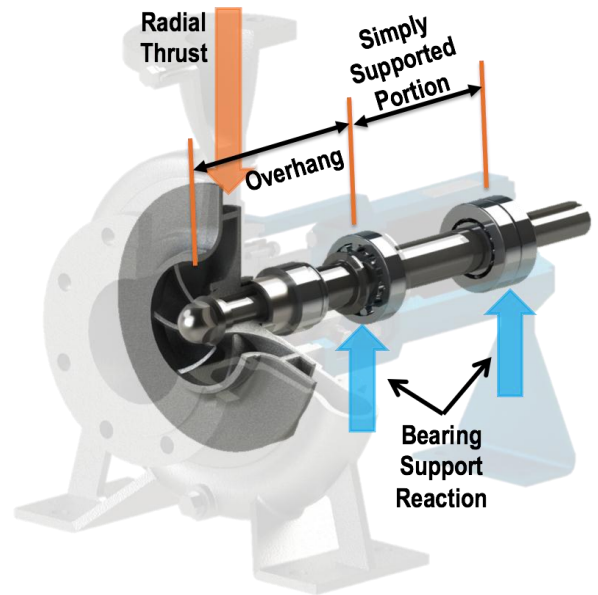


A horizontal end suction overhung pump is characterised by a rotating assembly of shaft, impeller, and mechanical seal simply supported by ball bearings. During operation, the overhang portion of the shaft (with impeller and mech seal) experiences the thrust emanating from the liquid leaving the pump, i.e. radial thrust. The radial thrust is a function of the casing pressure (often the discharge pressure) and the area between the two impeller shrouds. This radial thrust results in deflection of the overhung part of the pump and the ball bearing experiences a bending moment which is calculated as the radial thrust

times the length of the overhang. The ball bearing is designed to handle the bending moment. More is the radial thrust (which increases as the pump operates away from BEP near shutoff), more is the bending moment; and longer is overhang, more is the bending moment. In addition to the bending moment on the bearing, the mechanical seal also experiences deflection. The stationary part of the mechanical seal and the rotating part are closely aligned to achieve the sealing. More the deflection between the stationary and the rotating part (due to shaft deflection), more are the chances of seal failure.

XSpan™ technology for enhanced reliability & mechanical seal life:

The purpose of the revolutionary XSpan™ design is to reduce the impact of the radial thrust on the ball bearing and on the mechanical seal. XSpan™ increases the span between the ball bearings in the simply supported portion of the shaft and enhances the radial thrust handling capability of the pump. By increasing the bearing span, the overhang length is reduced which reduces the bending moment on the ball bearing and also reduces the deflection on the shaft. With lesser deflection, there is less chance of mechanical seals getting damaged. Since lower overhang length reduces the bending moment, the life of the bearing is further enhanced. With higher radial thrust handling capability, the vibrations of the pump are contained and the probable mechanical damage if the pump operates near to shut off (highest pressure point) is also reduced.



Benefits of the XSpan™ design:

- Longer bearing life
- Less vibrations
- Enhanced mechanical seal life