

Centurion SHD stabilized heavy duty pump

Extend ESP system run life

Features and benefits

- Wider vane openings
 - Reduces pump plugging and abrasive wear for enhanced run life
 - Extends ESP application range in viscous fluids
- Higher lift per stage
 - Maximum fluid draw down in wells with high gas content increases productivity and revenue per well
 - Enhances overall ESP system run life by minimizing system shut downs
- Patented proven hardened bearing design; particle swirl suppression ribs
 - Best-in-class abrasives handling extends pump run life, lowers total cost of ownership
 - Improves operating range for changing in-flow characteristics
- Higher pressure design
 - Expands deep set capabilities, which extends ESP application range
- Extended operating range
 - Enhanced run life in changing well conditions, minimizing system change-outs

The **Centurion pump line** offers industry leading technology for severe service pumping applications, providing operators the lowest total cost of ownership by extending electrical submersible pumping (ESP) system run life.

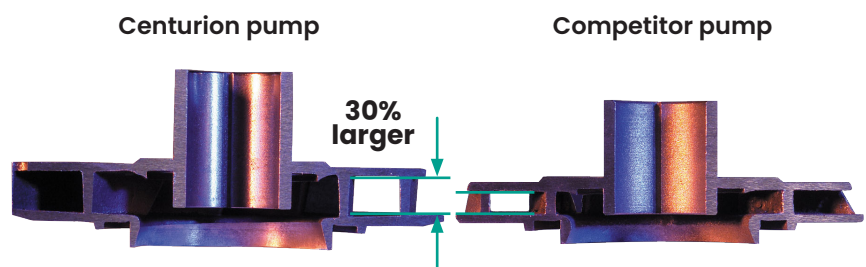
- A range of abrasion resistant Centurion pump designs provide customers the ideal level of protection for any application
- The Centurion design provides the highest lift per pump stage of any pump line in the industry
- Centurion pumps offer superior efficiency, which increases the operating range and reduces the mechanical complexity of the ESP system, thus improving overall equipment run life and lowering operating expenses

The Centurion pump design maximizes vane openings, optimizes flow paths and includes particle swirl suppression technology as the first line of defense against abrasive down-hole environments. Wider vane openings in the radial flow stages help prevent plugging from sand as well as lower erosional velocities of abrasive fluids.

The particle swirl suppression ribs in the diffusers reduce sand cutting damage in the stages and reduce the potential for housing perforations and loss of the ESP system down hole.

The **Centurion stabilized heavy duty (SHD) pump** design is ideal for wells with moderately abrasive down-hole conditions where additional radial support is required. The SHD design incorporates abrasion resistant Tungsten Carbide bearings in the intake and discharge as well as throughout the pump stack (based on an engineered length to diameter (L/D) ratio).

The most vulnerable areas within a pump are the topmost and lowest sections. The longest length of unsupported shaft is located in the topmost area, requiring the top bearings in the bearing to carry more radial load. The top bearing also is subject to abrasives that fall back into the pump on shut down. The bottom of the pump also has a long unsupported length of shaft and solids tend to accumulate in this intake area. The additional Tungsten Carbide bearings in the top, bottom and throughout the pump stack provide enhanced radial stabilization, reducing the tendency for vibration.



MIXED FLOW

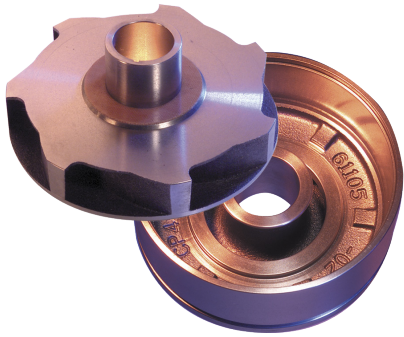
RADIAL FLOW

For wells where moderately abrasive conditions are present and radial support is required.

Tungsten Carbide bearings in the discharge are highly resistant to abrasive wear

Additional Tungsten Carbide bearings throughout the stack (based on L/D ratio)

Tungsten Carbide bearings in the intake are highly resistant to abrasive wear



The Centurion pump design maximizes vane openings, optimizes flow paths and includes particular swirl suppression technology.

