



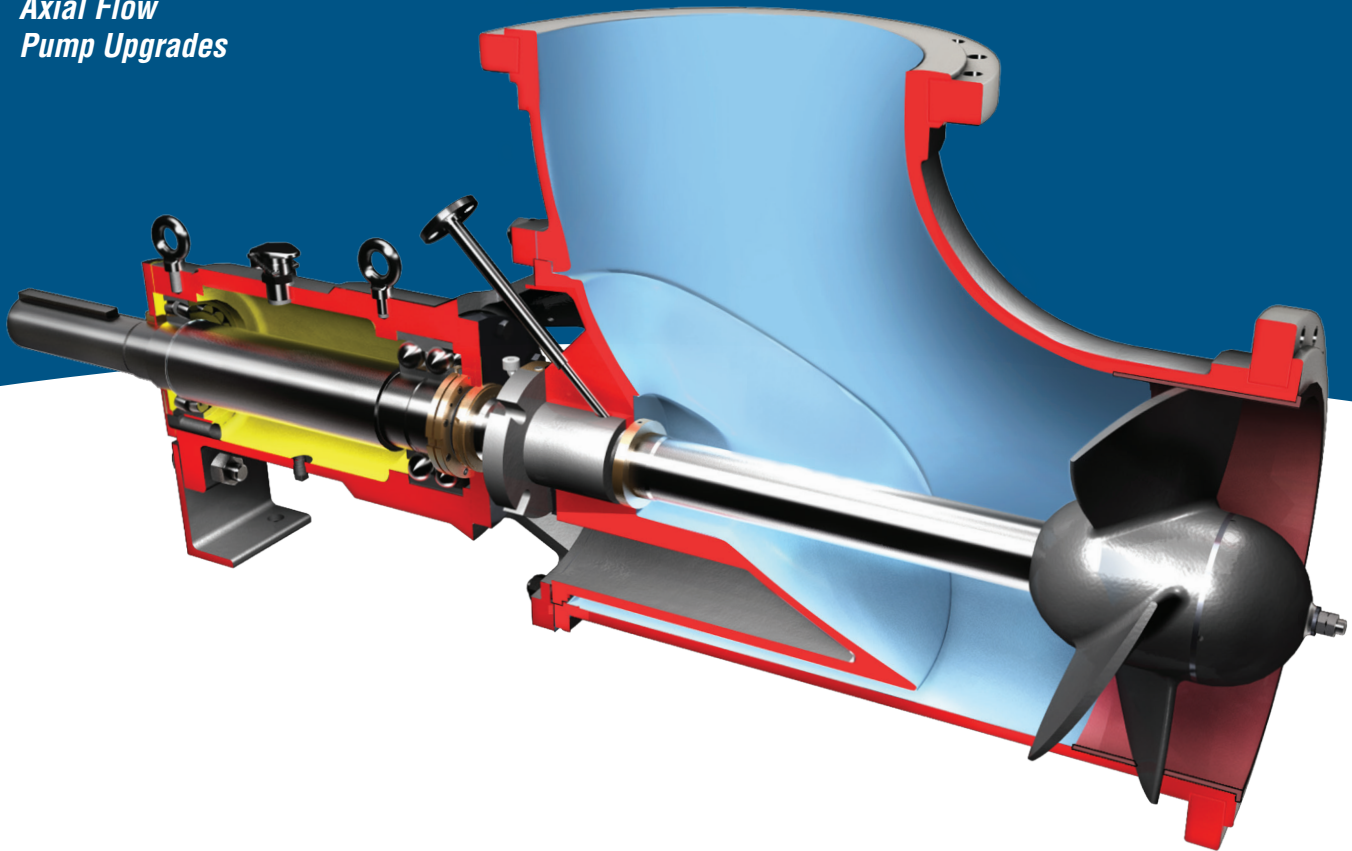
# ***Axial Flow Pump Upgrades***

For Lawrence Pumps® AFH9000  
and Other OEMs' Pumps



***Experience In Motion***

## Axial Flow Pump Upgrades



### **Boost Performance and Reliability**

*Through its Lawrence Pumps® brand, Flowserve offers numerous hydraulic and mechanical upgrades for all makes and models of axial flow circulator pumps. Upgrade older Lawrence Pumps 9000 series units, or even models from other OEMs, with technology and features available on today's AFH9000 pumps. Whether the pumps are used in evaporator, crystallizer, aeration or wastewater circulation systems, these upgrades can significantly impact pump reliability and performance and, as a consequence, plant revenues.*

### **Decades of Axial Flow Pump Innovation**

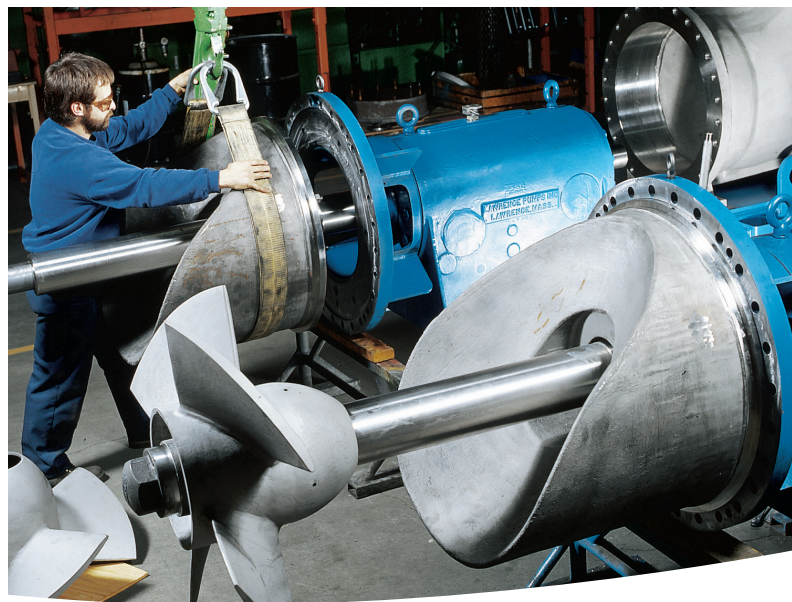
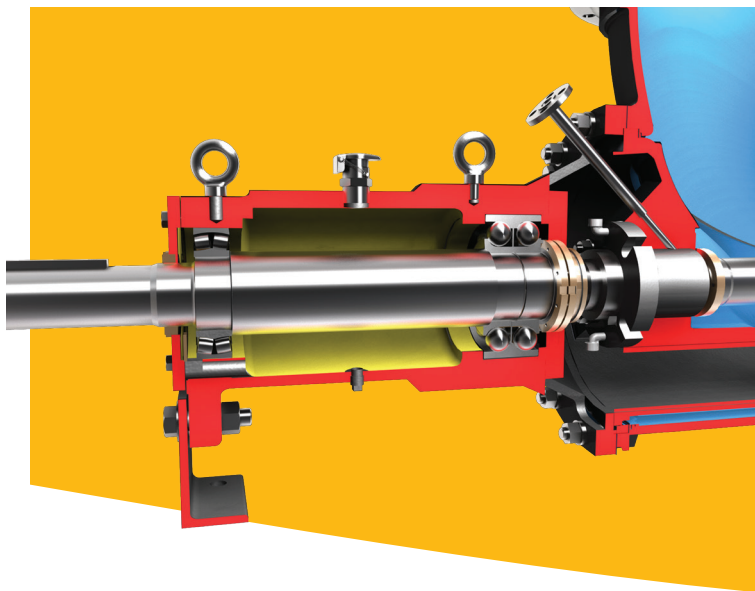
Flowserve Lawrence Pumps has been manufacturing axial flow circulating pumps for corrosive and abrasive services since 1935. It has consistently improved pump designs and technologies to increase reliability, operational life and environmental safety, and is recognized as an innovator with proven performance in a wide range of applications.

### **Global Aftermarket Support Services**

Flowserve provides its globally installed base of Lawrence Pumps axial flow pumps with unmatched technical and aftermarket support via an extensive worldwide network of service and repair centers.

Flowserve also provides upgrades and aftermarket support services for axial flow pumps from other OEMs.





### ***Bearing Frame Durability***

**One-piece, 360° Bearing Frame** with deep metal-to-metal fit provides superior alignment compared to 180° designs, for increased seal and bearing life. An adjustable back foot eliminates “soft foot” and ensures a stable foundation.

**V-belt Specific Bearing Arrangement** moves the radial bearing to the outboard location where it can more effectively carry the high radial loads created by the belt drive. Deep-groove ball or spherical roller bearings are typically used. Thrust loads are supported by back-to-back angular contact ball bearings at the inboard location. Both bearings are sized for a minimum design life of 50 000 hours.

**Non-contacting Labyrinth Oil Seals** protect the bearings from contaminants and prevent shaft wear associated with lip seals. Costly sleeved locknuts are also eliminated.

**Fully Confined Casing O-ring** is easier to seat than a gasket and less likely to be damaged in the process. Casing alignment and sealing are improved. Numerous O-ring materials are available and selected to suit the application.

### ***Custom Elbow Dimensions***

Replacing aged equipment can sometimes require piping changes to accommodate the new dimensions. Flowserve can construct custom elbows to fit the existing dimensions so costly piping modifications can be avoided.

### ***Replaceable Sweep Liner***

For slurry applications, a replaceable liner may be installed in the elbow suction to protect against erosion along the sweep path of the propeller. Liners are typically bolted or welded in place and may be made from metallic or non-metallic materials.

### ***Shaft and Seal Reliability***

**Shaft Materials** can be upgraded to reduce or eliminate problems associated with deflection or corrosion, resulting in improved mechanical seal reliability. Common and exotic materials available.

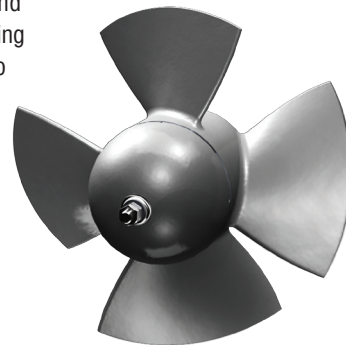
**Mechanical Seals** offer superior leak protection over packing. Single, double and split seals may be fitted. Cartridge and gas seals also available.

**A Throat Bushing and Slinger** may be installed to minimize ingress of process particulates into the seal chamber. Seal flush fluid consumption may be substantially reduced as a result.

**Lightweight Propeller Cap Design** reduces the overhung weight of the rotor to minimize shaft deflection and improve mechanical seal reliability.

### ***Hydraulic Upgrades***

Abruptly or gradually over time, plant production requirements can change. Whether the challenge is to get higher heads and flows at the same operating speed or lower NPSHR to eliminate cavitation, Flowserve engineers can design custom propellers to precisely fit the pump’s hydraulics to the new duty point.





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