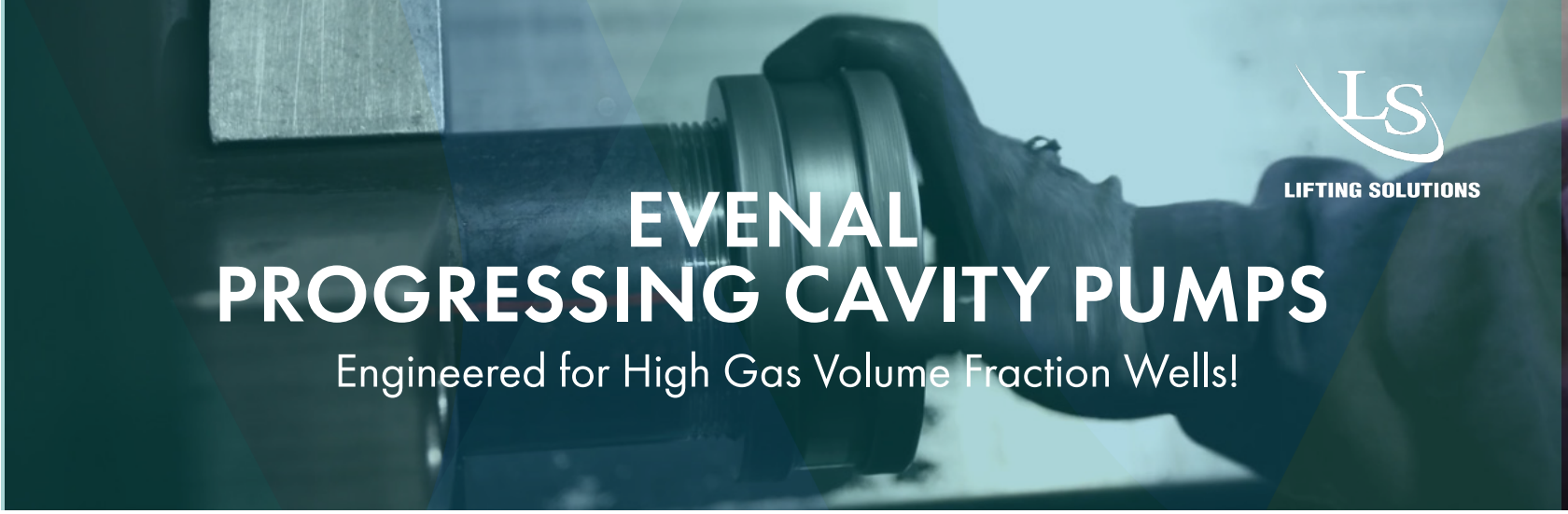


LIFTING SOLUTIONS

EVENAL PROGRESSING CAVITY PUMPS

Engineered for High Gas Volume Fraction Wells!

PRODUCT OVERVIEW

The EvenAL Progressing Cavity Pump (PCP) is specifically designed to target short runtimes in applications where high free gas or foamy oil is being produced through the pump reducing the liquid volumetric efficiency. This unique fit for purpose design results in even pressure distribution across the pump with the main goal of extending pump run time.

CHALLENGE

A significant challenge when moving oil from the pressurized downhole reservoir to surface is managing the gas dissolved within the oil. This is heavily influenced by the pressure, volume and temperature relationship. In the reservoir, high pressure keeps the gas in solution but as the oil ascends through the wellbore the pressure decreases causing the gas to expand and separate from the liquid phase. Think of it like a bottle of soda being opened. The expansion of the gas increases the volume of the mixture, otherwise known as emulsion, and can overwhelm the pumping system which prefers liquid flow.

PROGRESSING CAVITY PUMPS THAT OUTPERFORM

The fit between the rotor and the stator is an important driver of pump efficiency. If the pump fit is tight, pressure will be concentrated towards the top of the pump and can cause premature damage in this area. If the pump fit is loose, there will be improved pressure distribution across the pump, however this can also result in poor overall performance and run time. With high Gas Volume Fraction (GVF) these problems are magnified.

The EvenAL PC Pump has several advantages over conventional PCP geometry by allowing a non-uniform, tapered compression set that decreases from intake to discharge. This novel design allows for a looser fit in the top portion of the pump backed up by tighter stages towards the intake of the pump resulting in even pressure distribution. This promotes uniform pressure distribution across the pump, while maintaining higher compression fit at the bottom to maintain adequate seal and improve overall pump longevity as a result.

PRODUCT FEATURES AND BENEFITS

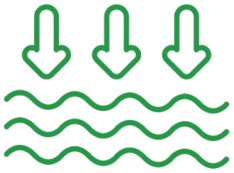
- Engineered to handle the complexities of heavy, foamy oil production in directional wellbores where landing the pump intake below perforations is not possible.
- Compatible with existing/conventional rotors, allowing interchangeability between the EvenAL PC Pump and conventional PC Pumps.
- Enables more precise pump sizing while ensuring improved pressure distribution across the pump, and delivering the required liquid flow rate without the need to increase speed.
- Enables effective utilization of the bottom sections early in operation, preventing excessive pressure loading on the top section of the stator.
- Extends pump lifespan, reducing operational costs, minimizing downtime, and lowering the frequency of workovers and maintenance

Extended Run Life

Reduces wear and tear, ensuring the pump lasts longer in high-stress environments.

High Gas Tolerance

Optimized to handle high GVF in challenging well conditions.



Uniform Pressure Distribution

Evenly distributes pressure across the pump lengh, preventing overloading of short sections.

EVENAL PROGRESSING CAVITY PUMP PRODUCT LINE OVERVIEW

Series	Stator Tube OD in (mm)	Model Size m3/day/100rpm	Model Range bbls/day/100rpm	Standard Stator Connection		Rotor Connection
				Size in (mm)	OD in (mm)	Size in (mm)
3-3/4 Series	3.75 (95.3)	36	226B	3-1/2 (88.9) EUE Pin	4.18 (106.2)	1 (25.4) API Pin
3-3/4 Series	3.75 (95.3)	54	340B	3-1/2 (88.9) EUE Pin	4.18 (106.2)	1 (25.4) API Pin
3-3/4 Series	3.75 (95.3)	85	535B	3-1/2 (88.9) EUE Pin	4.18 (106.2)	1 (25.4) API Pin

EVENAL PROGRESSING CAVITY PUMP SIZING GUIDELINES

Downhole Viscosity Profile			Downhole Temperature and Target Speed Rotor Sizing Guidelines								
			30°C Max Temp			50°C Max Temp			70°C Max Temp		
Category	Range (cp)	Typical Application	100	200	300	100	200	300	100	200	300
Low	up to 50	Light crude oil, dewatering gas wells, emulsion with low oil content	XL	LG	MM	LG	MM	SM	MM	SM	XS
Med-Low	Up to 500	Medium crude oil, higher water cut production with some viscosity increase	LG	MM	SM	MM	SM	XS	SM	XS	-
Medium	Up to 5,000	Heavy crude oil production, with some water cut effect on the emulsion	MM	SM	XS	SM	XS	-	XS	-	-
High	Up to 20,000	Extra heavy crude oil production, bitument production with diluent use	SM	XS	-	XS	-	-	-	-	-
Ultra-High	20,000+	Highly viscous bitumen, cold heavy oil production, high oil cuts	XS	-	-	-	-	-	-	-	-

ROTOR SIZING DETAIL

Rotor specifications are typically determined with water on the test bench. Viscosity correlations above are required to ensure proper fit in applications where viscosity is prevalent. The baseline rotor sizing detail with water is detailed as follows:

XS Rotor Sizing target is 0% efficiency at 300rpm 70°C
SM Rotor Sizing target is 0% efficiency at 300rpm 50°C
MM Rotor Sizing target is 20% efficiency at 300rpm 50°C
LG Rotor Sizing target is 50% efficiency at 300rpm 30°C (0% efficiency at 150rpm)
XL Rotor Sizing target is 70% efficiency at 300rpm 30°C (40% efficiency at 150rpm)

Speed, temperature and viscosity correlations are required to ensure even pressure distribution in the FloAL PCP. It is important that the FloAL is not sized too tight for a given application to ensure design intent and prevent concentration of pressure at the discharge of the PCP when pumping fluids with any gas volume fraction (GVF).