

# High-Performance Liner Retention System

The Forum Energy Technologies high-performance Liner Retention System (LRS) is a key component of the Osprey Mud Pump Fluid End solution and adds multiple benefits to the overall drilling operation. The system reduces liner change out times by up to 90%, significantly improves safety, and substantially lowers lifecycle costs by reducing maintenance operations and drilling downtime.

Since 1993 the P-Quip LRS has been the system of choice for over 5,000 drilling rigs worldwide, from the smallest land rigs to the largest offshore installations. During this time, we have continually refined and enhanced the system to not just meet but exceed today's operational requirements.

The P-Quip LRS is designed to secure liners while operating mud pumps at high pressures. Our patented spring mechanisms minimize Liner movement during high-pressure operations by consistently applying calculated retention force to the liner, resulting in improved liner and piston life. Since the spring force is of known value under and over tightening is almost impossible. This is critical when using today's high-performance ceramic and zirconia liners to eliminate premature failures.

Our patented system is safe, efficient, and easy to operate, with a complete liner change out taking less than 15 minutes.

## Safe:

- Inherently safe, no hammers or cheater bars required to install
- Easy operation with a conventional air- or hand-operated hydraulic pump

## Efficient:

- Decreased downtime, up to 90% faster liner change out times
- 50% Lower lifecycle cost over 10 years versus competition
- Scope 3 GHG Footprint reduced by 5x over life of Rig
- Proven life of up to 20 years

## Easy to Operate:

- Automatic clamping means no more under- or over-tightening
- Direct replacement for OEM equipment [plug and play]
- Versions available for most pumps 1,000HP to 3,000HP