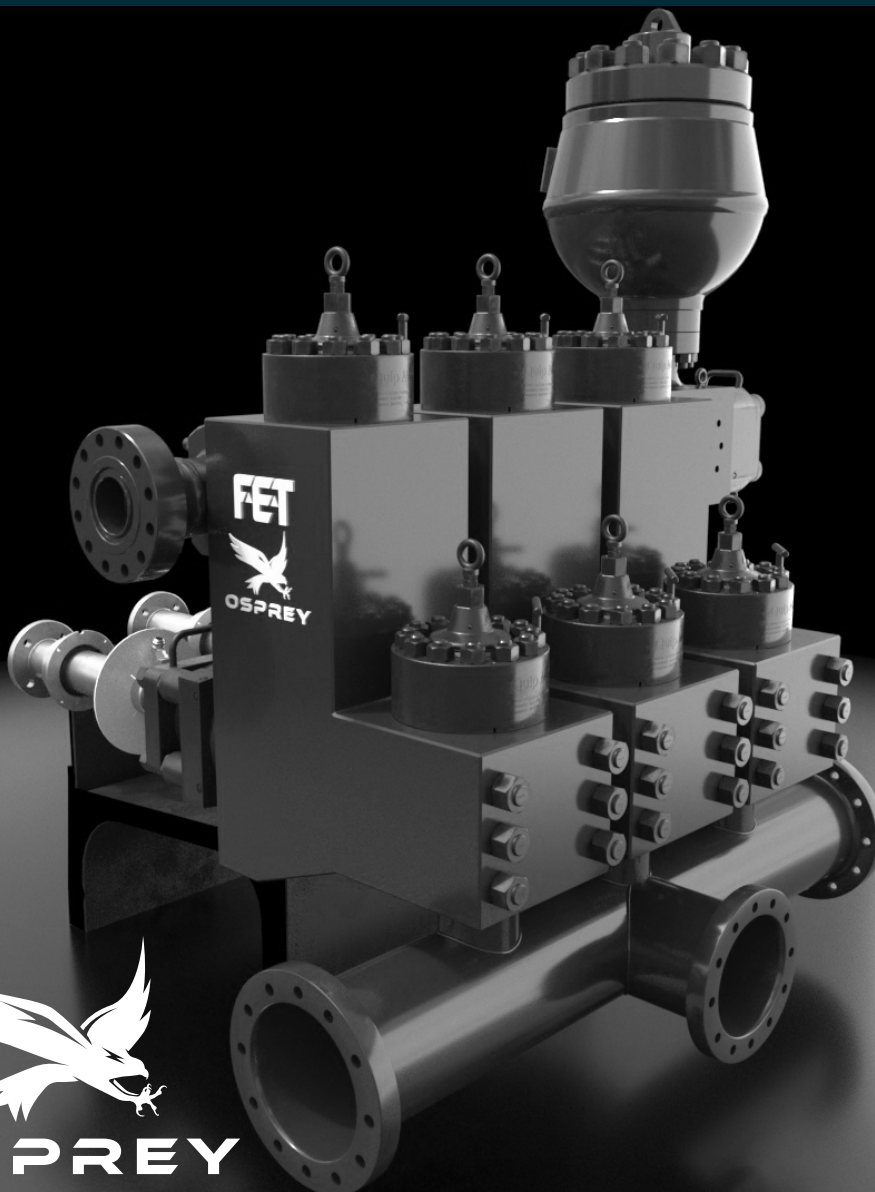


## LINERS

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## LINERS

FET liners are designed to provide unmatched performance and durability in the most severe drilling conditions on the planet. Our liner hulls are manufactured using a high-grade carbon steel forging to withstand the uplift forces present during mud pump operations. We then install our proprietary Chrome, Ceramic or Zirconia sleeves into the hull using a shrink fit process. All our liners utilize a high-pressure lip design on the sleeve to prevent slippage during high pressure operations.

### Features

- All Forum standard liners are manufactured with the “HP” lip design to prevent inner sleeve slippage.
- Our micro-finish honed ID helps assure piston durability, yet is not so smooth as to produce hydroplaning.
- The OD is numerically controlled, machined precisely to ensure continually correct registers and sealing surfaces to the pump bore and face.
- FET Liner Bore Tolerances:  $+.010''/-0.000''$ , add 5% to 10% bonus hours of service life to pistons and liners versus API standard.
  - API Liner Bore Specifications  $(+.015''/-0.000'')$ .
- Liner Sizes from 4" - 8" for all popular mud pumps.

### Steel Liners

Consists of a forged carbon steel hull with a shrink fit Chrome Steel sleeve. Suitable for all drilling applications, fluid types and a max working pressure of 7500psi.

**Features:**

- 26% chrome steel sleeve
- Bore hardness of 60-64 HRC [695-789HV]
- Rated up to 7500psi working pressure
- Service life of up to 1,000 pumping hours
- Surface Finish ID 16-20 RMS

### Ceramic Liners

Consists of a forged carbon steel hull with a shrink fit Ceramic sleeve. Suitable for all drilling applications, fluid types and a max working pressure of 7500psi.

**Features:**

- High density Ceramic sleeve
- Minimum bore hardness of 74 HRC [1300HV]
- Rated up to 7500psi working pressure
- Service life of up to 3,000 pumping hours
- Reduced liner and piston wear
- Surface Finish ID of 8 RMS
- Liner ID can be re-honed to +0.005 for repeated use

### Zirconia Liners

Consists of a forged carbon steel hull with a shrink fit Zirconia sleeve. Suitable for all drilling applications, fluids and a max working pressure of 7500psi.

**Features:**

- Zirconia sleeve
- Minimum bore hardness of 63 HRC [763 HV]
- Rated up to 7500psi working pressure
- Service life of up to 5,000 pumping hours
- Reduced liner and piston wear
- Liner ID can be re-honed to +0.005 for repeated use
- Surface Finish ID of 4-8 RMS



## Liner Configurations

Liner Part Numbering Scheme (Includes rubber liner gasket. Urethane gasket available upon request.)

Chrome (Grey) = 64##-##G

Ceramic (Blue) = 64##-##C

Zirconia (Red) = 64##-##Z

Liner Style	4	4.5	4.75	5	5.25	5.5	5.75	6
National 12-P-160	6434-40#	6434-45#	6434-48#	6434-50#	6434-53#	6434-55#	6434-58#	6434-60#
Gardner Denver PZL	6413-40#	6413-45#	6413-48#	6413-50#	6413-53#	6413-55#	6413-58#	6413-60#
Gardner Denver PXL	6414-40#	6414-45#	6414-48#	6414-50#	6414-53#	6414-55#	6414-58#	6414-60#
Emsco FB-1600	6426-40#	6426-45#	6426-48#	6426-50#	6426-53#	6426-55#	6426-58#	6426-60#
National 10-P-130	6433-40#	6433-45#	6433-48#	6433-50#	6433-53#	6433-55#	6433-58#	6433-60#
National 14-P-220	6439-40#	6439-45#	6439-48#	6439-50#	6439-53#	6439-55#	6439-58#	6439-60#
Emsco F-1000	6424-40#	6424-45#	6424-48#	6424-50#	6424-53#	6424-55#	6424-58#	6424-60#
Drillmec 14-T-220	6439-40#	6439-45#	6439-48#	6439-50#	6439-53#	6439-55#	6439-58#	6439-60#
Oilwell A1700	6450-40#	6450-45#	6450-48#	6450-50#	6450-53#	6450-55#	6450-58#	6450-60#

## Liner Configurations

Liner Part Numbering Scheme (Includes rubber liner gasket. Urethane gasket available upon request.)

Chrome (Grey) = 64##-##G

Ceramic (Blue) = 64##-##C

Zirconia (Red) = 64##-##Z

Liner Style	6.25	6.5	6.75	7	7.25	7.5	8
National 12-P-160	6434-63#	6434-65#	6434-68#	6434-70#	6434-73#	6434-75#	Request
Gardner Denver PZL	6413-63#	6413-65#	6413-68#	6413-70#	6413-73#	6413-75#	Request
Gardner Denver PXL	6414-63#	6414-65#	6414-68#	6414-70#	6414-73#	6414-75#	Request
Emsco FB-1600	6426-63#	6426-65#	6426-68#	6426-70#	6426-73#	6426-75#	Request
National 10-P-130	6433-63#	6433-65#	6433-68#	6433-70#	6433-73#	6433-75#	Request
National 14-P-220	6439-63#	6439-65#	6439-68#	6439-70#	6439-73#	6439-75#	Request
Emsco F-1000	6424-63#	6424-65#	6424-68#	6424-70#	6424-73#	6424-75#	Request
Drillmec 14-T-220	6439-63#	6439-65#	6439-68#	6439-70#	6439-73#	6439-75#	Request
Oilwell A1700	6450-63#	6450-65#	6450-68#	6450-70#	6450-73#	6450-75#	Request

## OUR CORE VALUES

### No One Gets Hurt

The safety of our employees and customers is our first priority coupled with a healthy respect for the environment.

### Integrity

In everything we do, in every interaction, both internally and externally, we strive to operate with the utmost integrity and mutual respect.

### Customer Focused


Our products enhance our customer's performance and we listen to their needs and work with them to solve their challenges.


### Good Place To Work

We are committed to creating a workplace that fosters innovation, teamwork and pride. Every team member is integral to our success and is treated equally and fairly.

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#### **Forum Energy Technologies**

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