

# Mission Products

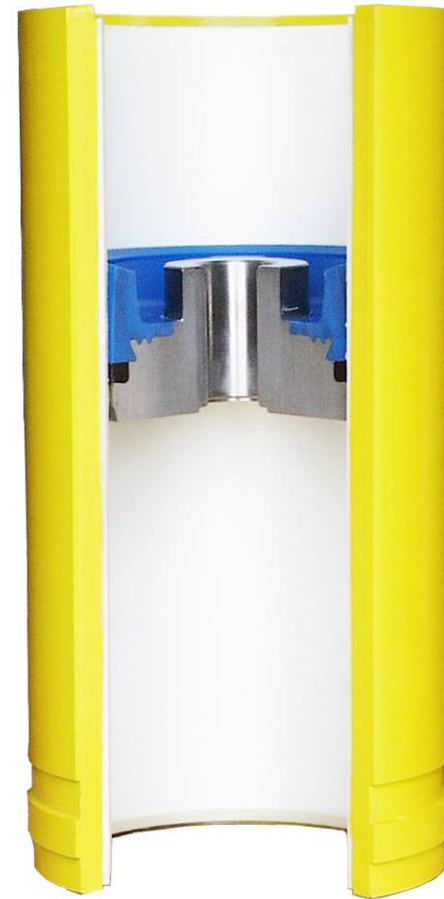
# Mission Products = Safety

## Products that offer:

- **Longest run times**
  - Extended product life reduces personnel interaction time with equipment, which greatly reduces risk potential
- **Fast, easy, and safe product change-outs**
  - Mission's innovative products are designed to reduce weight, use of hammers, pinch points, time aloft and other hazardous maintenance operations
- **Personnel safety**
  - Engineering's primary consideration when designing new products

# Ceramic Liner

- Hardest liner sleeve material available
- Corrosion resistant
- Alloy steel hull material
- Suitable for pump maximum pressure for the particular bore size
- Lowers operating costs
- Run times as high as 8 to 12 times longer than conventional liners
- Field Proven with run times up to 14,000 hours

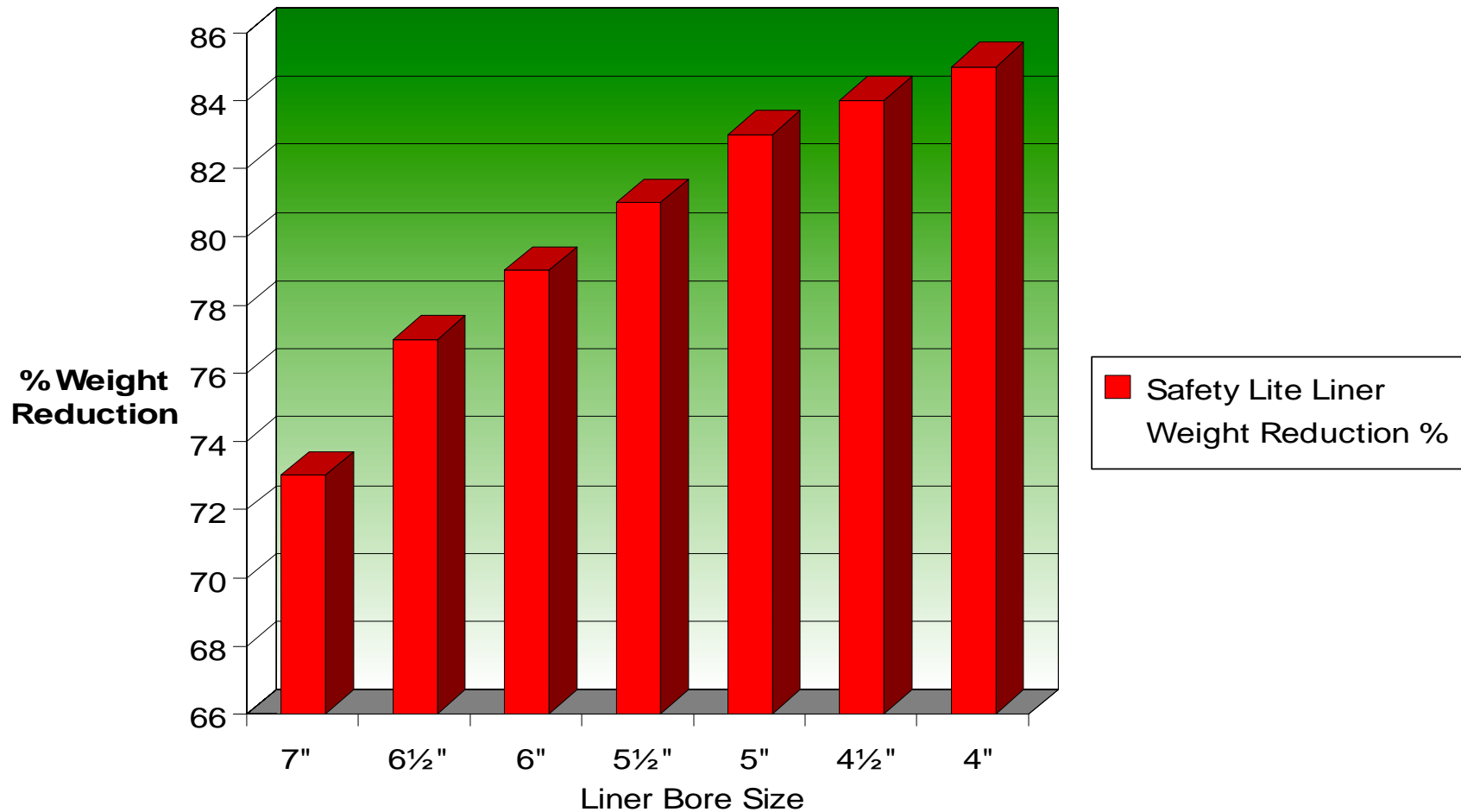


# Safety Lite Liner™

- Housing assembly bolts onto existing fluid ends without fluid end modification
- No special tools required for installation
- No sledge hammers required
- Liner change-outs as quick as 15 minutes
- Up to 84% weight reduction when compared to OEM chrome iron liners – liner weight approximately 40 pounds rather than 200 pounds (example)

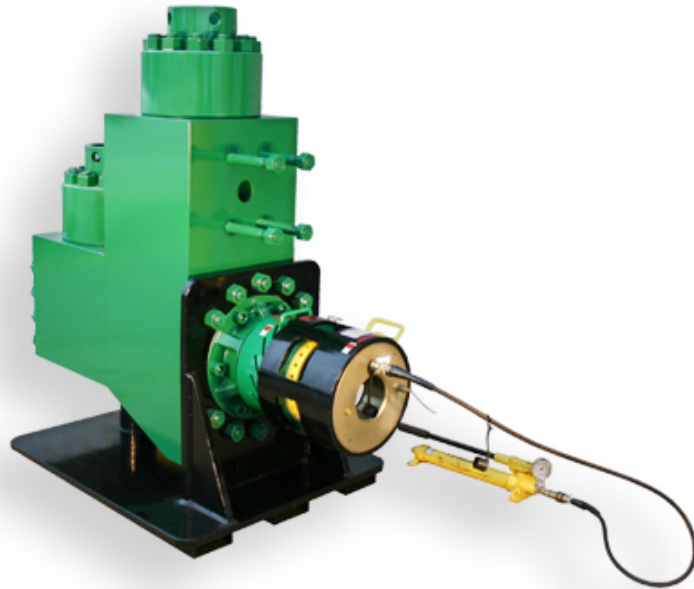


# Safety Lite Liner™ vs. OEM Chrome Iron Liner



Production Solutions

# Blak-JAK™ Liner Retention System



- Simple compact design
- Easy installation
- Liner change-outs as quick as 15 minutes
- No hydraulics on pump while in operation – mechanical retention
- Separate hydraulic jack and liner retention to reduce amount of weight lifted by crew
- Produces a high evenly distributed load for a positive liner seal. This reduces the possibility of liner washout

# Blak-Jak Being Installed



Production Solutions

**NOV** NATIONAL OILWELL VARCO

One company ... unlimited solutions

# Blak-JAK™ Washpipe Cartridge System

- Quick change cartridge system
- 25% lighter than competing designs
- Designed for simple and quick assembly and disassembly
- Cartridge is repacked on rig floor, not at swivel
- Utilizes standard packing and washpipe with optional packing available
- Eliminates need for hammers
- Users have commented that at times it is fast enough to possibly eliminate tripping back to safe zone on many wells



# Blak-JAK HydrA-LIGN™ Piston Rod System



- Self alignment capabilities of the Sub Rod allow up to .060" of correction in any one direction, or up to .120" total correction
- Piston change-out times reduced to less than 5 minutes
- No clamps, eliminating pinch points
- Longer run times due to self-aligning capabilities
- Extends life of other mud pump expendable parts

# Fluid End Expendables

- Widest variety of elastomers in market for
  - Pistons
  - Valve Inserts
  - Gaskets
- Longer run times due to correct elastomers for operating conditions
- Less downtime



# Blue Lightning™ Piston

- Designed for up to 7500 PSI service
- Highest operating temperature urethane available in the market
- Unique natural bearing & self centering feature allows longer run times at elevated pressures
- Resistance to tear and abrasion
- Heat treated alloy steel piston body
- Exclusive anti-extrusion device

