



**Weatherford®**

## Fluid Packed™ Pumps

### Set the Standard in Reciprocating Rod Pump Systems

The Fluid Packed™ Pump difference is the result of over seven decades of solving rod pumping problems. It's the right combination of manufacturing, engineering and application expertise. It's highly trained professionals working with you every step of the way. It's technical field service and application knowledge aimed at properly matching equipment to your intended production. And then helping you keep it all onstream. It's availability of pumps and accessories throughout the oil field. And, most important, it's more than half a century of leadership in developing practical, cost-effective solutions to special pumping problems.

Exclusively manufactured by Weatherford, the Fluid Packed Pump line offers a wide variety of API pumps, specialty pumps and accessories. Options include a range of materials to provide longer pump life, even in the most severely corrosive and abrasive pumping environments.

#### **API RHA, RHB AND RHT PUMPS**

These Fluid Packed Insert Pumps are constructed with an externally threaded, heavy-wall barrel for greater strength and rigidity. The RHB stroke-through design is applicable to wells of greater depth.

#### **API RWA, RWB AND RWT PUMPS**

Most commonly run at moderate well depths, these thin-wall barrel pumps provide the largest bore API Insert Rod Pump for any given tubing size.

#### **API TH PUMPS**

The Fluid Packed Tubing Pump combines a heavy-wall barrel and stroke-through design with the largest possible bore for any tubing size. The TH pump may be safely operated in deep wells.

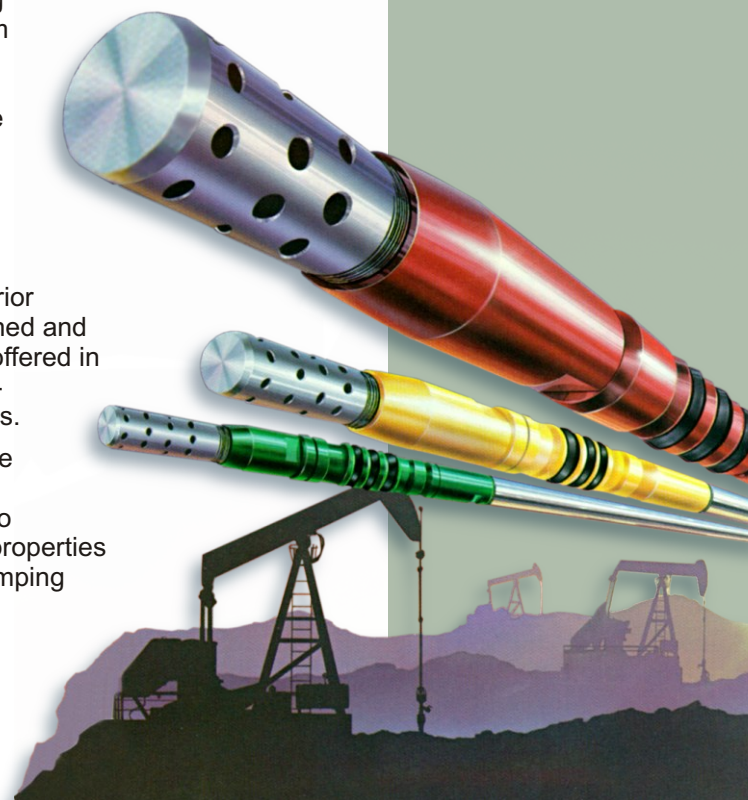
#### **FLUID PACKED PUMP PARTS**

**Barrels** - Fluid Packed Pump Barrels are available for a wide variety of pumping conditions, ranging from mild to extremely abrasive and corrosive service. The barrels are designed to meet or exceed API 11AX specifications. Barrels are internally nitrided, chrome plated or nickel carbide plated for superior performance. Unhardened and chrome ID barrels are offered in carbon steel, corrosion-resistant steel and brass.

**Plungers** - Plungers are available in a variety of materials and finishes to provide superior wear properties for a wide variety of pumping conditions.

**Chrome** - Plated Plungers are made from one-piece

*It's the right combination of manufacturing, engineering and application expertise*



## Fluid Packed™ Pumps

seamless carbon steel tubing. The OD is overlaid with 006-inch minimum thickness of hard chromium plate to provide a minimum hard wear surface of 67 HRC. Box or pin end designs are available in all sizes.

The plunger OD of the Spray Metal Plunger is spray welded with a metal alloy consisting of chromium borides, chromium carbides and complex combinations of each suspended in a nickel matrix. The corrosion and abrasive resistant surface has a minimum hardness of 56 HRC.

**Balls and Seats** - Fluid Packed Balls and Seats are available in materials to handle a wide variety of well conditions. Seats are lapped with appropriate sized balls to ensure a fluid-tight seal. Each assembly is tested per API 11AX specifications. Materials include 440 stainless steel, nickel carbide, cobalt alloy, titanium carbide, tungsten carbide, ceramic and silicon nitride.

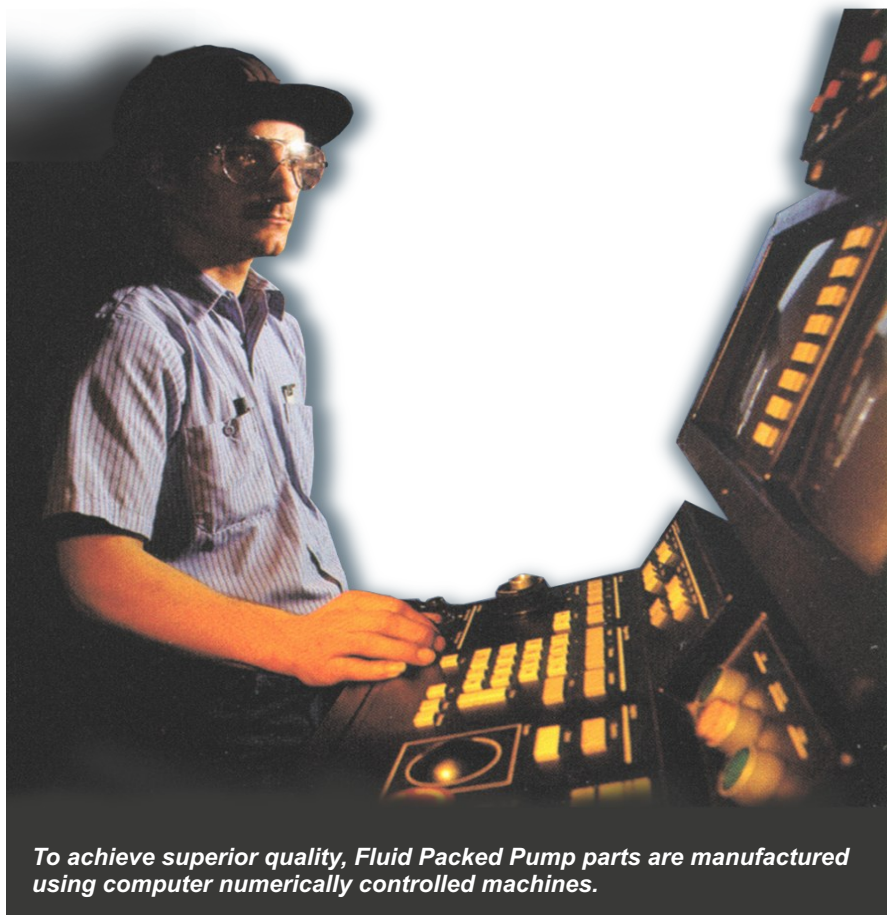
**Nipples** - Precision Seating Nipples as well as Extension and Strainer Nipples are available.

**Cages** - Available in two insert-type designs, Weatherford Cages are manufactured in brass, stainless steel, carbon steel, alloy steel and nickel copper alloy in either regular or hardline.

**Other Parts** - Pull tubes, valve rods and other fittings are manufactured in a wide variety of materials to suit specific well conditions. Fluid Packed Pump steel valve rod guides are offered with hardened valve rod bores. Guides are also available with internal wear rings to increase the run life.

*Our pump recommendations will take into consideration all the different well conditions, the various materials available and the manufacturing processes. Then match the equipment to the conditions and your intended production.*

Even though all API pump parts are interchangeable, their materials and configurations are different. Finding solutions to specific well problems requires balancing all these differences. For example, API specifications do not deal with different materials to meet different operating conditions. If you're experiencing abrasion or corrosion problems our pump recommendations will take into consideration all the different well conditions, the various materials available and the manufacturing processes. Then match the equipment to the conditions and your intended production. The same with parts design. API specifications do not cover designs for specific pumping problems. Fluid Packed Pump parts do.



*To achieve superior quality, Fluid Packed Pump parts are manufactured using computer numerically controlled machines.*

## FLUID PACKED SPECIALTY ROD PUMPS

Fluid Packed specialty rod pumps are designed for pumping applications that cannot be efficiently or economically handled with standard API models. The following specialty products can be furnished in materials appropriate for most well conditions.

**Three-Tube Pumps** - These pumps are designed especially for extremely abrasive production or may be fitted for high-temperature operation.

**Hollow-Valve Rod Pumps** - Pumps designed to improve the rigidity of valve rods and distribute pump discharge over a larger tubing area. Greater stroking efficiency and longer life for the valve rod, guide and rod string are advantages of this pump. Repair time and maintenance costs are greatly reduced.

**Large Volume Stroke-Through Pumps** - This pump combines the high-volume displacement in 2 3/8-inch tubing with the stroke-through construction of an API RH Pump. This unique combination produces high volumes while combating scale buildup in the barrel.

**Sandy Fluid Pumps** - Especially designed for pumping sand laden fluids, these pumps use a short barrel assembly that strokes on a long plunger.

**Oversize Tubing Pumps** - These pumps utilize heavy-wall, internally threaded barrels connected to smaller bore tubing. The non-retrievable standing valve requires an on-off sucker rod connector.



*Spraymetal coating operations are precisely controlled to achieve uniformity and strong adhesion of coating on plungers.*

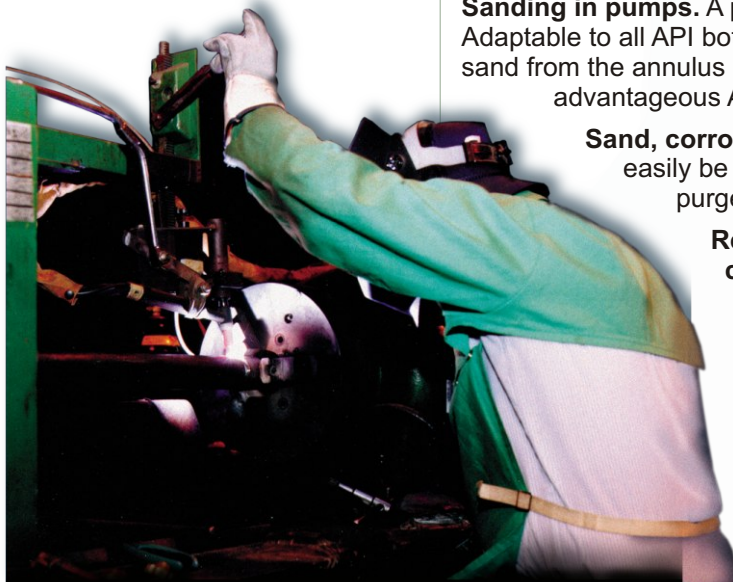
## FLUID PACKED PUMP ACCESSORIES

At Weatherford, design and field engineers know your production problems from experience. With firsthand knowledge, they develop accessory components to solve your specific pumping problems. The result? A growing family of accessories that widens the application range of API pumps and improves your pumping performance.

**Sanding in pumps.** A problem solved by the Automatic Top Seal. Adaptable to all API bottom-lock pumps, the Automatic Top Seal excludes sand from the annulus area, expanding the application of this advantageous API pump design.

**Sand, corrosion and restricted plunger fall.** This problem can easily be eliminated with the Bottom Discharge Valve which purges dead fluid from the tubing annulus.

**Resistance to flow of viscous fluids in heavy crude pumping.** Efficient pumping of heavy crude is made more difficult by resistance to flow of the more viscous fluid. The Full-Flow Tubing Pump is specially designed to increase the fluid passage up to 44% - improving pump filling and plunger fall for increased production in heavy oil. The valves can be adapted to many of the standard API tubing pumps.



*Highly skilled people combined with reliable equipment make Weatherford's pump parts the best in the industry.*

*Our quality assurance and control standards ensure you receive a world class product.*

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### No seating nipple in the well.

The Insert Pump Anchor is a reliable tool for anchoring and packing off the pump. Easily set and released by simple vertical motion, no rotation is required.

**Split cages and spun-out ball guides.** These situations cause expensive pump failure and costly pulling time. The Insert Guided Cage utilizes advanced design and metallurgy to increase valve life and reduce pump repair costs. Gassy wells and fluid pound problems. These issues are no match against the Weatherford

Gas Fighter Accessory series. The Two Stager II for insert pumps has a two-stage action that improves efficiency in gassy wells and eliminates destructive fluid pound. The Gas Lock Breaker positively opens gaslocked pump valves.

**Troublesome problems associated with pulling the pump.** Lively wells tend to flow in heads when pulling a pump. The Bottomhole Check Valve is a safety valve designed to prevent gas and oil from blowing out into the tubing when the pump is unseated.

### MANUFACTURING AND ENGINEERING EXCELLENCE

Fluid Packed Pumps and accessories have a longstanding reputation for excellence in manufacturing. Our quality assurance and control standards ensure you receive a worldclass product. Our Fluid Packed Pump facilities are API 11AX, Q1 and ISO 9002 Certified.

### Barrel Selection Guide

Metallurgy	Availability				Inside Surface Hardness	Service					
	Rod Type		Tubing Type			Corrosion			Abrasion		
	Metal	Cup	Metal	Cup		Mild	Moderate	Severe	Mild	Moderate	Severe
Precision - 1026 Steel	X	X	X	X	90 HRB/23 HRC	X			X		
Precision - 443 Brass	X	X	X	X	85 HRB (Min)	X	X	X	X		
Mitrided - Alloy Steel	X		X		58 HRC (Min)	X	X		X	X	X
Carburized - Carbon Steel	X		X		58 HRC (Min)	X	X		X	X	X
Chrome Plated ID - 1026 Steel	X	X	X	X	67 HRC (Min)	X			X	X	X
Chrome Plated ID - 443 Brass	X	X	X	X	67 HRC (Min)	X	X		X	X	X
Chrome Plated ID - Nickel Copper Alloy*	X	X	X	X	67 HRC (Min)	X	X		X	X	X
Nickel Carbide Coated - 1026 Steel	X		X		72-75 HRC	X	X		X	X	X
Nickel Carbide Coated - 443 Brass	X		X		72-75 HRC	X	X	X	X	X	X

\*Special order item

### Plunger Selection Guide for Corrosive Service

Plunger Material	Abrasion			H <sub>2</sub> S			CO <sub>2</sub>			Oil vs. Water Ratio		
	Mild	Moderate	Severe	Mild	Moderate	Severe	Mild	Moderate	Severe	Water*	50%	Oil
Spraymetal	X	X	X	X	X		X	X		X	X	X
Chrome Plated	X	X	X	X			X			X	X	X
Spraymetal w/Monel Ends	X	X	X	X	X	X	X	X	X	X	X	X

\*Special clearances required



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