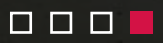


PRODUCTION

# Fluid-Packed™ Pumps

The standard in reciprocating rod-lift systems for more than 90 years



**Weatherford®**

# Experience is everything.

Our Fluid-Packed™ pump portfolio is backed by nine decades of field-proven refinement.

Reciprocating rod lift (RRL) is the industry workhorse. For more than 90 years, our Fluid-Packed pumps have led the way in engineering, manufacturing, and field service.

Available in a comprehensive array of both American Petroleum Institute (API) and specialty pumps, Fluid-Packed pumps are suited for any rod-pumping operation, including corrosive and abrasive wells. We have continually invested in engineering and metallurgy for all of our pumps, parts, and accessories to give you the most service life possible.

Our Fluid-Packed pumps and accessories—which are manufactured in facilities that are API 11AXQ1 and ISO 9002 certified—have a decades-long reputation for excellence in manufacturing. Our exacting quality-assurance and control standards confirm that every Fluid-Packed product is world class.

# Since 1924

Fluid-Packed pumps have set the standard for long run life and exceptional performance in rod-lifted wells.

**We offer comprehensive RRL systems and services.**

Weatherford is the only original equipment manufacturer to offer fully integrated rod-lift solutions, including manufacturing, service, repair, and refurbishment. With a complete well-optimization package, from sucker rods to wellsite automation to data analysis, we can create a solution to deliver what you need—a system designed specifically for your well, using the most advanced technology available.

Our equipment is the culmination of expert engineering and design combined with superior materials.





# Fluid-Packed API pump types and applications

Our sub-surface pumps, which are suited for all applications, are constructed with an externally or internally threaded, heavy-wall barrel for greater strength and rigidity. Our thin-wall barrel pumps are run in moderate well depths, and our tubing pumps combine a heavy-wall barrel and a proven stroke-through design.

## API Type-RW Pumps

Commonly run at moderate well depths, these thin-wall barrel pumps provide a large-bore API insert rod pump for any tubing size.

**RWA**—Features a stationary barrel and top anchor. Run in sandy wells, low-fluid-level gaseous wells, or wells in which you need to run pressure or temperature measuring devices.

**RWB**—Features a stationary barrel and bottom anchor. Run in wells with moderate operating conditions and low static fluid levels, high-fluid-level wells, or gaseous wells.

**RWT**—Features a traveling barrel and bottom anchor. Run in sandy wells, intermittently pumped wells, and wells in which you need to run pressure- or temperature-measuring devices.

## API Type-RH Pumps

Fluid-Packed plunger pumps are suited for deeper wells, severe pumping conditions, and wells with scale problems.

**RHA**—Features a stationary barrel and top anchor. Run in moderately deep wells with severe pumping conditions, wells with scale problems, sandy wells, low-fluid-level gaseous or foamy wells, and wells in which you need to run pressure- or temperature-measuring devices.

**RHB**—Features a stationary barrel and bottom anchor. Run in deep wells with severe pumping conditions, low static-fluid-level wells, gaseous wells, and wells that might exhibit fluid and/or gas pound.

**RHT**—Features a traveling barrel and bottom anchor. Run in deep wells with severe pumping conditions, intermittently pumped wells, and large-volume wells.

## API Type-TH Pumps

Fluid-Packed tubing pumps combine heavy walls, a full barrel, and stroke-through design that's suited for deep wells.

**THC**—Features a cup-type hold down. Run in wells that require greater capacity for the given tubing size.

**THM**—Features a mechanical hold down. Run in wells that require greater capacity for the given tubing size, where bottomhole temperatures may be a consideration.

# Fluid-Packed API pump parts and configurations

Though all API pump parts are interchangeable, our expertise lies in balancing part materials, the overall rod-lift configuration of your well, and the real-world pumping conditions in your well.

## Balls and Seats

Our balls and seats can handle any pumping condition and are available in 440 stainless steel, nickel carbide, cobalt alloy, titanium carbide, tungsten carbide, and silicon nitride. The seats are lapped with appropriately sized balls to provide a fluid-tight seal. Each assembly is tested per API 11AX specifications.

## Barrels

We offer barrels for mild to extremely abrasive and corrosive pumping conditions. Our barrels are available with nitride-hardened inside diameter (ID), chrome ID, or nickel-carbide plating for superior performance. We also offer unhardened and chrome ID barrels in carbon steel, corrosion-resistant steel, and brass. These barrel tubes meet or exceed API 11AX specifications with internal or external threads in most configurations.

## Cages

We offer cages—available in two insert-type designs and in either regular or hardline—made from brass, stainless steel, carbon steel, alloy steel, and nickel-copper alloy.

## Plungers

Our plungers are available in a variety of materials and finishes that provide superior wear protection in a wide variety of pumping conditions.

**Chrome-plated plungers:** We manufacture chrome-plated plungers from a single piece of seamless carbon-steel tubing. The outside diameter (OD) is overlaid with a minimum 0.006-in. thick, hard-chromium plate that provides a hard-wearing surface of 67 HRC or better on the Rockwell hardness scale. Box or pin end designs are available in all sizes.

**Spraymetal-plated plungers:** We spray-weld the OD of our spraymetal-plated plunger with a metal alloy that consists of chromium borides and chromium carbides suspended in a nickel matrix. The corrosion- and abrasive-resistant plating provides a hard-wearing surface of 56 HRC or better on the Rockwell hardness scale.

**Spraymetal NCA pin plungers:** The superior construction of these plungers includes a friction-weld process for the pin, eliminating another possible failure point.

## Rod Guides

Our steel valve-rod guides feature hardened valve-rod bores and are available with internal wear rings that increase run life.

## Seating Nipples

We offer precision seating nipples along with extension and strainer nipples.

## Other Parts

We manufacture pull tubes, valve rods, and other fittings in a wide variety of materials to match any well condition.

## 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		
Nitrided alloy 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 to 75 HRC	X	X		X	X	X
Nickel-carbide-coated 443 brass	X		X		72 to 75 HRC	X	X	X	X	X	X

\*Special order item

# Fluid-Packed specialty pumps

Fluid-Packed specialty rod pumps are designed for applications that cannot be efficiently or economically handled with standard API models. Our specialty products can be manufactured in a wide variety of materials for most well conditions.

## Multitube Pumps

These pumps are suited for extremely abrasive or high-temperature wells.

## Hollow-Valve Rod Pumps

These pumps improve the rigidity of valve rods and distribute pump discharge over a larger tubing area. They provide improved stroke efficiency and longer rod-string life, which reduces failures and increases production.

## Large-Volume Stroke-Through Pumps

These pumps combine the high-volume displacement of 2 3/8-in. tubing with the stroke-through construction of our API-type RH pump. This unique combination, intended for shallow applications, produces high volumes while combating scale buildup in the barrel.

## Sandy-Fluid Pumps

These pumps, which use a short barrel assembly that strokes on a long plunger, are suited for pumping sand-laden fluid.

## Sand-Tolerant Pumps

With a unique wiper assembly and filter coupling that lubricate the plunger/barrel interface and mitigate sand damage, these pumps significantly extend run life, reduce workovers, and avoid production losses.

## Oversize Tubing Pumps

We use heavy-wall, internally threaded barrels connected to smaller-bore tubing. The nonretrievable standing valve requires an on-off tool to facilitate pump and tubing removal.





## Fluid-Packed pump accessories solve your common challenges.

Our first-hand knowledge helps us to design accessory components that widen the application range of API pumps and improve pumping performance. The following are among the common problems solved by our accessories:

### **Sanding-In Pumps**

The automatic top seal is adaptable to all API bottom-lock pumps and excludes sand from the annulus area, which expands the potential of API bottom-lock pumps.

### **Sand- and Corrosion-Restricted Plunger Fall**

The bottom-discharge valve purges dead fluid from the tubing annulus, which solves these issues.

### **Flow Resistance in Heavy-Crude Applications**

Pumping heavy crude becomes more difficult as viscosity increases. The full-flow tubing pump increases fluid passage by as much as 44 percent, which improves pump filling and plunger fall for more efficient heavy-oil production. The valves can be adapted to many standard API tubing pumps.

### **No Seating Nipple in the Well**

The insert pump anchor reliably anchors and packs off the pump. The tool easily sets and releases with a simple vertical motion, with no rotation required in tubing sizes from 2-3/8 to 4-1/2 in.

### **Split Cages and Spun-Out Ball Guides**

The insert guided cage features an advanced design and metallurgy that increases valve life and reduces pump repair costs.

### **Gassy Wells and Fluid-Pound Problems**

Our gas-fighter accessory series includes the Two-Stage II for insert pumps. It features a two-stage action that improves efficiency in gassy wells and eliminates destructive fluid pound. We also offer the gas-lock breaker, which positively opens gas-locked pump valves.

### **Problems Associated With Pulling the Pump**

Lively wells can flow when you pull a pump. The bottomhole check valve prevents gas and oil blowouts into the tubing while the pump is unseated.

The Weatherford line of Fluid-Packed™ pumps has been standard in reciprocating rod-lift systems for more than 90 years. For more information, contact your Weatherford representative or email **[po-info@weatherford.com](mailto:po-info@weatherford.com)**.



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