



WELL CONSTRUCTION

SwageHammer™ Integrated Liner- Hanger System

Delivering the benefits of both conventional and expandable liner-hanger technologies in one easy-to-install system



The Rugged Choice for Challenging Wells

To develop high-pressure/high-temperature (HPHT), deepwater, and high-angle wells, you need cost-effective technologies that manage risks. The SwageHammer™ integrated liner-hanger system delivers the benefits of both conventional and expandable liner-hanger technology in a single, unibody platform. When wellbore integrity is critical and the cost of failure is high, the SwageHammer system reduces uncertainty and risk during liner installation and throughout the life of the well.

High Pressure, High Temperature, High Performance

The SwageHammer liner-hanger system withstands the harsh conditions of complex wells. Engineered to the strictest sealing requirements and tested to ISO 14310 V0 criteria, the system is validated for safe operation up to 400°F and 12,500 psi (204°C and 86.2 MPa)—even in high-angle and extended-reach applications. The system uses the hydraulically balanced SwageHammer running tool to significantly improve circulation performance. And the system design allows for greater annular flow area to enhance cement placement.

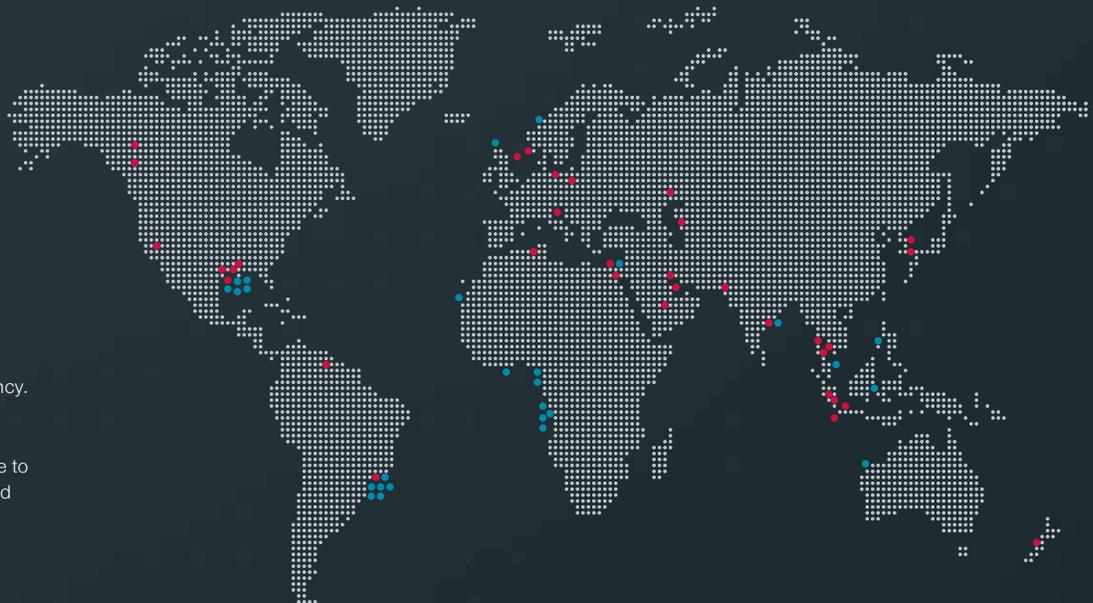
Reliability in Extreme Downhole Conditions

- 12,500 psi (86.2 MPa) pressures*
- 400°F (204°C) temperatures*
- Improved circulation area
- 700,000 lb (317,515 kg) loads*
- ISO 14310 V0 validation
- Extended-reach wells
- High-angle wells
- Onshore and offshore applications

* for 7- × 9 5/8-in. liner sizes

- HPHT
- Deepwater

Complex wells come with unique demands for reliability and efficiency. With the SwageHammer system, Weatherford delivers robust and effective liner-hanger performance to enhance well integrity in HPHT and deepwater conditions.



Hydraulic Activation Without a Hydraulic Cylinder

Unlike conventional liner hangers, the single-body SwageHammer system eliminates common leak paths by removing the hydraulic cylinder, ports, and internal seals. The hydraulics are on the running tools; therefore, when the running tools are removed, a complete and simplified pressure-integrity system remains in place. The system provides a highly reliable, gas- and fluid-tight seal up to 400°F and 12,500 psi (204°C and 86.2 MPa), and it supports loads in excess of 700,000 lb (317,515 kg) for the 7- × 9 5/8-in. liner size.

Pressure-Balanced Running Tools

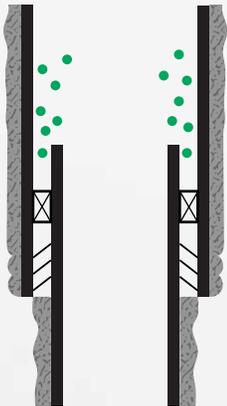
The robust, pressure-balanced SwageHammer running and setting system can vigorously rotate, ream, push, pull, and drill the liner successfully to total depth (TD). The system withstands high circulation pressures or sudden pressure surges without prematurely setting the hanger or releasing the running tools during running, drilling, and reaming operations.

Advantages Over Expandable Liner-Hangers

- No plug bump necessary to release running tools
- Running tools released prior to cementing to facilitate tool retrieval
- Custom metallurgy that matches existing liner-hanger for enhanced performance

Advantages Over Conventional Liner-Hangers

- No hydraulic cylinder on the body
- No ports or internal seals to cause potential leak paths
- Hydraulically balanced running tools to reach TD efficiently



The Economics of a Leaking Liner System

Improper installation and unreliable seals can have a negative impact on your overall operational budget. The SwageHammer system has an integrated design and a patented seal to eliminate potential leak paths, reduce your risks, and minimize your financial losses from:

- Nonproductive time
- Remediation costs
- Deferred production
- Total cost of failure



A Fully Integrated Liner-Hanger System

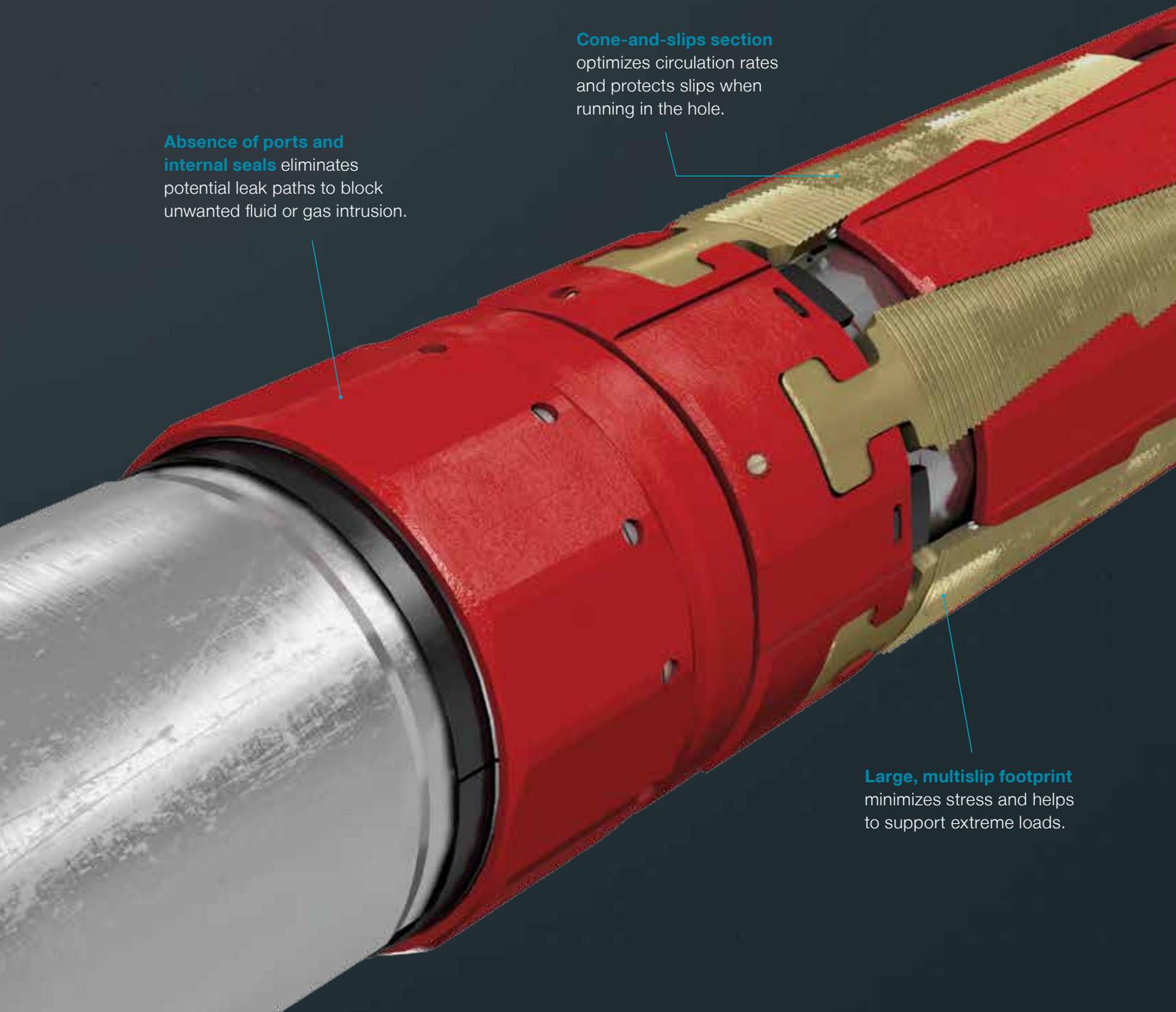
Our SwageHammer fully integrated liner-hanger system uses a pressure-balanced running tool that is unaffected by circulation pressure—so there's no risk of premature setting when circulating the liner to bottom. And the system design eliminates the hanger hydraulic chamber, so there's no path for potential leaks. The system also prevents gas migration and isolates annular pressures using our patented SwageSet sealing element as a permanent, extrusion-resistant liner-top barrier.

In addition, the SwageHammer system has many components that suit it for the challenges of today's wells. For example, the polished bore receptacle (PBR) optimizes the burst, collapse, and sealing integrity of the total system while maximizing flow-by area. A cementing packoff in the hanger-packer body provides a positive seal during cementing operations.

Absence of ports and internal seals eliminates potential leak paths to block unwanted fluid or gas intrusion.

Cone-and-slips section optimizes circulation rates and protects slips when running in the hole.

Large, multislip footprint minimizes stress and helps to support extreme loads.



Elimination of hydraulic cylinder on the hanger body simplifies hanger setting.

SwageSet element resists swabbing and enables high circulation rates.

Running tools are released after the hanger is set, prior to cementing, which ensures tool retrieval.

Swage technology for increased reliability

Our unique swage technology consists of ridge-shaped Atlas* elastomers bonded to an expandable metal ring. The VO-validated seal is formed by transferring set-down weight through the PBR into the integral ring, which swages out against the casing to seal the packer element against the host-casing ID.

The anti-extrusion seal at the liner top isolates gas migration, high-pressure stimulation treatments, and tieback completions. Compared to conventional all-elastomer seals, our seal is less susceptible to swabbing off when running in the hole, drilling, reaming, or circulating at high flow rates during well cleanup or cementing.



All-in-One Design

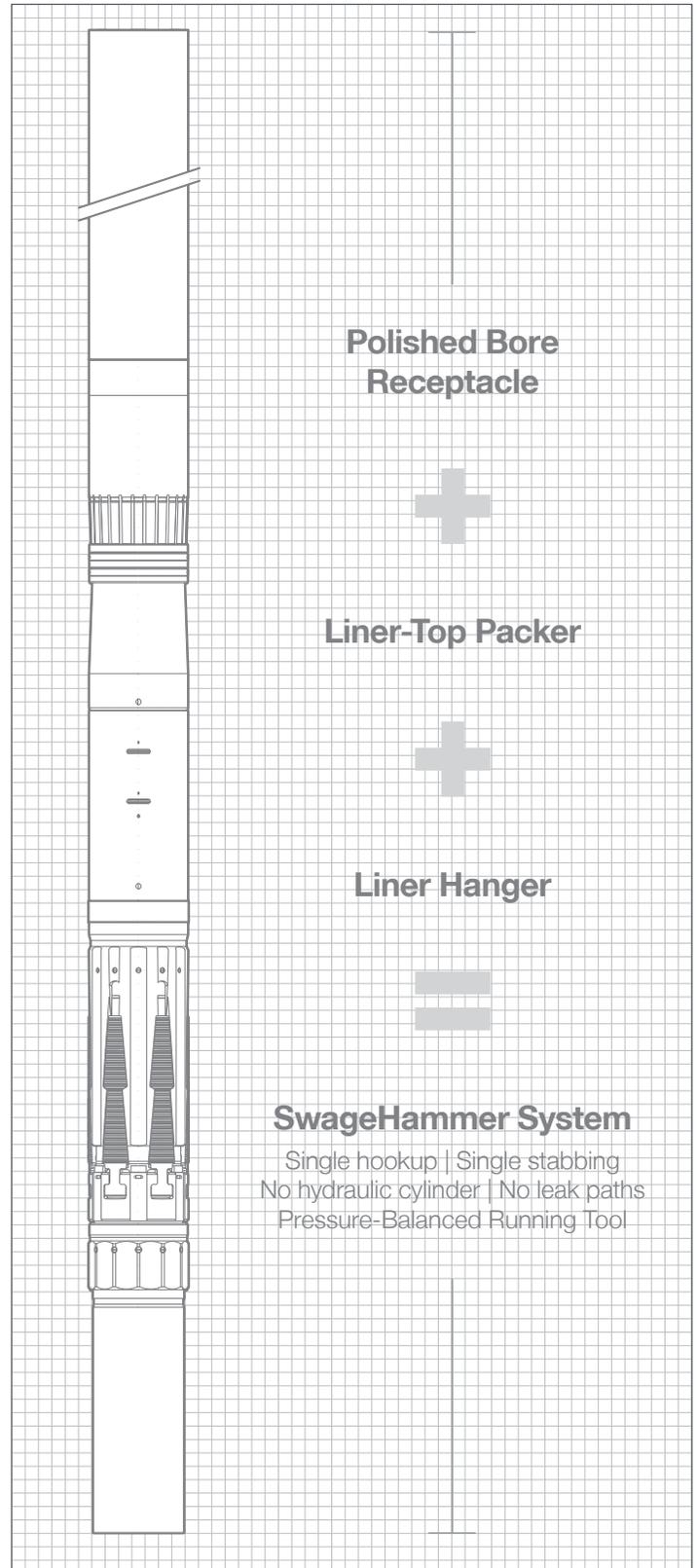
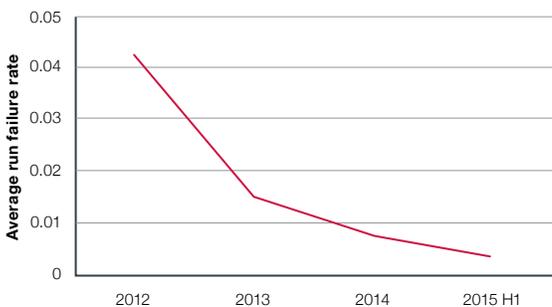
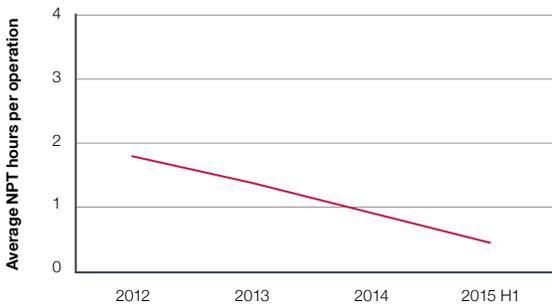
Building on the success of Weatherford premium hydraulic-set rotating liner-hangers, we developed the SwageHammer liner-hanger system by combining a high-performance packer and a hydraulic-set hanger in a common body. The major liner-system components—including the unibody packer and hanger, PBR tieback, and running tools—all run together as one integrated package. This streamlined design eliminates variables that can cause time-wasting mistakes. A single hookup procedure and a single stabbing and testing process result in proper installation that reduces nonproductive time and associated costs.

Confidence in High-Pressure and High-Temperature Wells

The unique SwageHammer liner-hanger system provides a dependable, gas- and fluid-tight seal that exceeds the industry's latest standards. The simplicity and enhanced capabilities of this system empower you to work in challenging environments with confidence.

Commitment to Dependability and Efficiency

The Weatherford Well Construction Products team takes pride in our continued effort to increase reliability, reduce nonproductive time, and create efficiencies for our customers.



There's More to Well Integrity Than Just Cement

Cement is an initial protective barrier that helps establish zonal isolation and well integrity. Proper casing and liner placement increase the effectiveness of this cement barrier. Your liner-hanger system is the next barrier that protects the wellbore. By selecting the optimal liner system for downhole conditions, you can enhance life-of-well integrity.



Casing centralization

Increase stand-off, prevent differential sticking, and eliminate channeling

- Casing accessories
- Centralizers
- Placement software services



Casing installation

Reach total depth safely and efficiently

- Float equipment
- Surge reduction systems
- Torque-and-drag reduction
- Liner hanger system



Wellbore isolation

Prevent fluid migration and reduce well construction costs

- Inflatable packers
- Isolation systems
- Swellable packers



Integrity confirmation

Measure cement bond quality

- Cement-bond-logging tools
- Liner-top packers



Cement placement

Ensure effective cement slurry displacement

- Stage cementing tools
- Wiper plugs and darts
- Plug locator system
- Cement heads

The one-of-a-kind SwageHammer integrated system is the latest addition to our trusted portfolio of liner-hanger technologies. To find out more about maximizing your production through risk reduction, visit weatherford.com or contact your Weatherford representative.



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