

COMPLETIONS

WFXØ™ VØ-RATED OPENHOLE GRAVEL- PACK SYSTEM

Improving multizone
gravel-pack reliability with
single-trip efficiency



Weatherford®

REDUCE RIG TIME, ENHANCE SAFETY, AND ADD FLEXIBILITY TO YOUR OPENHOLE **GRAVEL-PACKING OPERATIONS.**

Openhole gravel packing is critical to efficient recovery, but doing so across multiple zones presents challenges ranging from tool sticking and unreliable isolation to formation stress fractures.

The Weatherford WFXØ openhole gravel-pack system puts an end to these common problems. The first gravel-pack system to incorporate a VØ-rated quick connect, closing sleeve, and gravel pack packer provides reliable, gas-tight reservoir isolation without overstressing the formation.

The system provides single-trip, single-point gravel packing, which reduces the chance of tool sticking and saves a significant amount of rig time on every job. Whether your openhole well requires a straightforward, single-zone completion or a complex, multizone completion, you now have the flexibility to customize the modular WFXØ gravel-pack system to your needs.

VØ-RATED
LOWER COMPLETION
SEAL

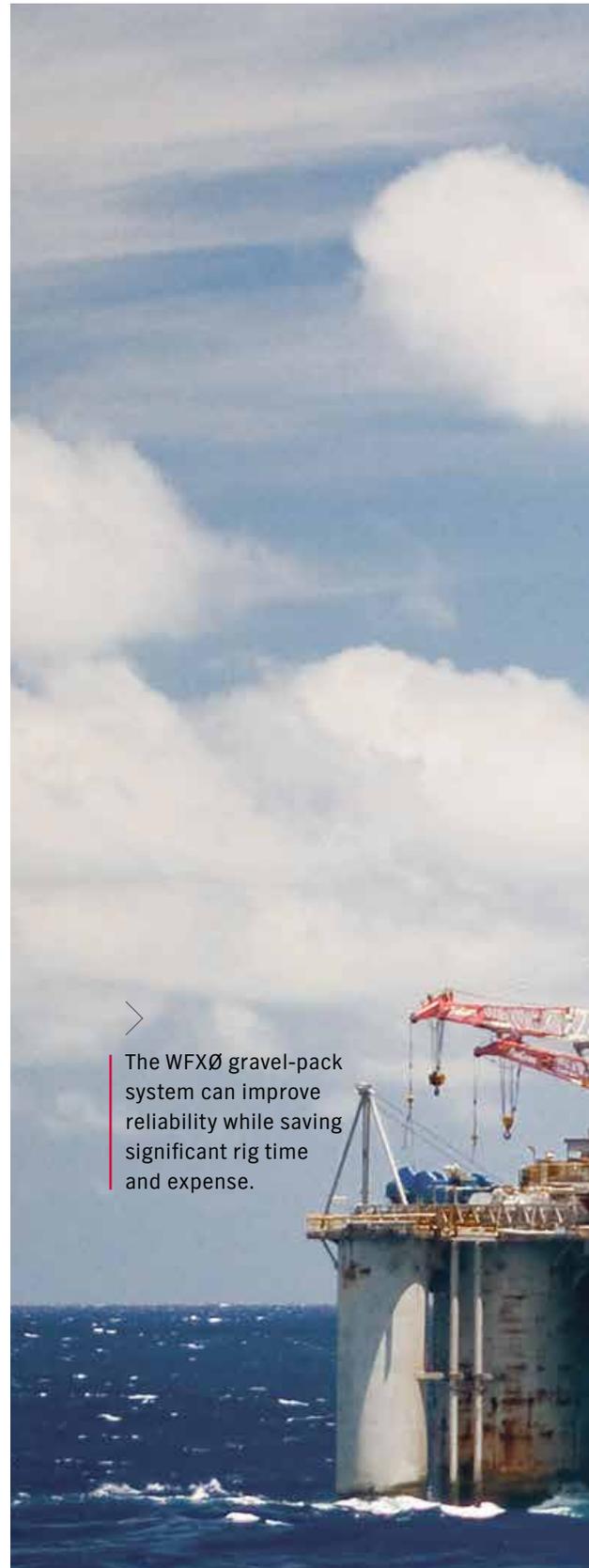
MODULAR
DESIGN FOR GREATER
FLEXIBILITY

MULTIZONE GRAVEL PACKING
ACROSS OPEN BOREHOLES
IN ONE TRIP

NO NEED
TO RUN AN
INTERMEDIATE COMPLETION



The WFXØ gravel-pack system can improve reliability while saving significant rig time and expense.





Eliminate dedicated deep-set barrier runs.

Installing conventional gravel-pack systems in deepwater applications requires at least three round trips for running the lower, intermediate, and upper portions of the completion.

The WFXØ system eliminates the need to run the intermediate completion. By integrating our OptiBarrier™ ball valve into the lower completion, the system acts as a deep-set isolation barrier.

Working in deepwater applications where expenses routinely exceed \$1 million per day, our system saves approximately 2 to 3 days of installation time.

SAVE 2 TO 3 DAYS
OF INSTALLATION TIME
AT A RATE OF
≈US \$1M/DAY



GAIN GREATER CONTROL IN YOUR OPENHOLE GRAVEL-PACK COMPLETIONS.

Our innovative WFXØ gravel-pack system improves reliability, minimizes downtime, and boosts life-of-well production. The WFXØ system offers:

The first VØ-rated gravel-pack system

- Delivers the highest possible ISO and API gas-tight ratings
- Eliminates the need for a dedicated, deep-set barrier run

Cased-hole functionality in the open hole

- Incorporates the premium TerraForm® packer to provide reliable seals in the open borehole
- Avoids overstressing the formation

Single-trip, single-point multizone gravel packing

- Simplifies and shortens your gravel-packing operations
- Reduces time and costs of repeatedly deploying and retrieving the gravel-pack assembly

Reliability in any operating conditions

- Withstands the rigors of even the toughest deepwater applications

Modular design

- Provides unmatched system flexibility
- Reduces unnecessary components and related expenses

The fewest moving parts of any comprehensive gravel-pack system

- Reduces chances of mechanical failures
- Minimizes the need for costly, time-consuming interventions



WFXØ SYSTEM +
TERRAFORM PACKER + STT =

EFFECTIVE, SINGLE-TRIP GRAVEL PACKING

Retain gas-tight seals in any operating conditions.

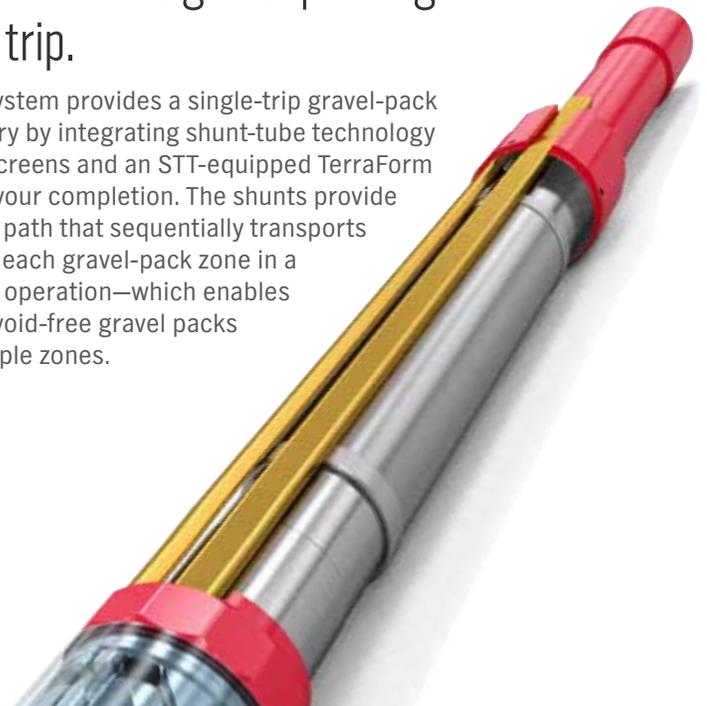
The WFXØ system is the first VØ-rated gravel-pack system. The VØ rating, which allows no gas leakage, is the highest possible gas-tight rating available under ISO/API standards. The system incorporates three VØ-rated components—the WFXØ packer, WFXØ closing sleeve, and WFXØ quick connect—that stand up to the rigors of deepwater environments.

Attain cased-hole functionality in openhole environments.

When incorporated into the WFXØ system, the TerraForm openhole packer system provides life-of-well zonal isolation and formation protection. The TerraForm packer uses proprietary cup-seal isolation technology that conforms tightly to non-uniform wellbores. With up to 24 independent setting mechanisms around the circumference of the elastomer seal, the packer provides effective expansion and isolation capabilities, even in oval wellbores. And because the cup seals are tension set, they hold form and maintain a robust seal through thermal swings.

Achieve multizone gravel packing in a single trip.

The WFXØ system provides a single-trip gravel-pack slurry delivery by integrating shunt-tube technology (STT) sand screens and an STT-equipped TerraForm packer into your completion. The shunts provide a secondary path that sequentially transports the slurry to each gravel-pack zone in a single pump operation—which enables successful, void-free gravel packs across multiple zones.





OPTIBARRIER BALL VALVE
(ISO 28781 V1 and API 19V V1)

- Provides a deep-set, bidirectional, and fully testable reservoir barrier for deepwater applications
- Opens and closes on demand using mechanical activation, hydraulic means, or radio-frequency-identification (RFID) technology
- Maximizes flow area by maintaining a fullbore inside diameter



SHUNT-TUBE TECHNOLOGY

Single-trip Gravel Packing

- Provides complete gravel packing across the entire screen length by enabling the gravel-pack slurry to easily pack voids between sand screens and the borehole
- Facilitates single-trip gravel packing by providing an uninterrupted flow path that extends to all producing zones
- Is compatible with any Weatherford sand screen
- Is a built-in feature of the Terraform SZE packer



WFXØ COMPLETION STRING



WFXØ GRAVEL-PACK PACKER
(ISO 14310 VØ and API 11D1 VØ)

- Provides a gas-tight VØ seal
- Prevents differential-pressure transmission through the element, which eliminates boost pressure that could damage the mandrel
- Preserves casing integrity with a cylindrical slip system that evenly distributes loads through 360° of the casing
- Simplifies packer retrieval by preventing the slips from reengaging the lower cone
- Provides a 10,000-psi (69-MPa) differential pressure rating; a 400,000-lb (181,437-kg) hanging capacity; a 20,000-ft-lb (21,116-N·m) rotational torque capacity for extended-length screen placement; and a 10-bbl/min (1,590-L/min) washdown capacity



WFXØ GRAVEL-PACK CLOSING SLEEVE
(ISO 14998 VØ and API 19AC VØ)

- Provides a flow path for up to 500,000 lb (226,796 kg) of gravel-pack slurry to enter the annulus above the sand screens at rates of up to 10 bbl/min (1,590 L/min)
- Opens and closes multiple times as needed
- Enables deployment of long assemblies by torsionally locking the sleeve to the packer
- Minimizes erosion of ports and adjacent casing
- Isolates seal surfaces from the flow path of slurry
- Pressure test post-gravel pack
- Provides a 10,000-psi (69-MPa) differential pressure rating and 20,000-ft-lb (27,116-N·m) torque capacity





TERRAFORM SIZE

Openhole Packer

- Enables multizone, openhole gravel packing with cased-hole functionality
- Provides a continuous flow path for gravel-pack slurry by connecting to sand screens equipped with external shunt tubes
- Conforms to non-uniform wellbores with proprietary cup-seal isolation technology
- Maintains a tight seal through changing well conditions with up to 24 independent, tension-set mechanisms, which enables life-of-well zonal isolation and formation protection



MAJOR COMPONENTS



WFXØ QUICK CONNECT

(ISO 14998 VØ and API 19AC VØ)

- Enables making up the gravel-pack packer to the blank pipe/screen without rotating the assembly or using casing tongs
- Reduces guesswork and enhances safety with a self-aligning profile that eliminates complex drill-floor operations
- Provides 10,000-psi (69-MPa) differential pressure rating and 17,250-ft-lb (23,388-N·m) torque capacity
- Enables a post-assembly pressure test on the rig floor



WFXØ SETTING TOOL

- Connects to and supports the completion string during deployment and generates the force necessary to set the WFXØ packer
- Prevents fluid-circulation pressures—up to 6,000 psi (41 MPa)—from prematurely setting the WFXØ packer during washdown operations
- Prevents excessive setting force that could potentially damage the casing or liner
- Enables extended-length completions to be carried to total depth with a high-torque rotational lock and 400,000-lbf (1,779,289-N·m) weight-down capacity
- Includes a 20,000-ft-lb (27,116-N·m) torque capacity



WFXØ SERVICE STRING



WFXØ RESETTABLE SHIFTER

- Closes the gravel pack closing sleeve following gravel packing operations
- Allows multiple attempts to work clear of debris to close the gravel pack closing sleeve
- Enables pressure testing of the closing sleeve to verify that it has successfully closed and sealed
- Incorporates an emergency release to collapse the shifting keys for service string retrieval via high-magnitude overpull



WFXØ SHIFTING TOOL

- Opens and closes the WFXØ closing sleeve—alongside a resettable shifter—to provide reliable, repeatable closures
- Supports the WFXØ closing sleeve and can be adapted for other applications
- Provides multiple release methods to the closing sleeve as needed for contingency operations
- Enables post-gravel-pack pressure tests of the closing sleeve



WFXØ REVERSE OUT FLAPPER

- Provides full hydrostatic communication with the formation during all phases of the gravel pack completion
- Redirects reverse circulation back up through the tubing during reverse-out operations
- Can be cycled on or off at will to accommodate various operations
- Ensures hydrostatic pressure communication to mitigate swabbing effects during string manipulation
- Opens as the work string is retrieved from the completion to allow fluid to pass through the wash-pipe, facilitating breaker placement, acidizing operations, and retrieval to surface



WFXØ CROSSOVER TOOL

- Controls the flow of fluid treatments, gravel-pack slurry, and returning carrier fluids during packing operations
- Maintains wellbore hydrostatic pressure
- Enables packer-test, gravel-pack, and reverse-circulating positions
- Enables hydraulic confirmation of positions from surface
- Includes fewer moving parts to enhance reliability



MAJOR COMPONENTS



WFXØ POSITIVE POSITION TOOL (PPT)

- Confirms operating positions by applying set-down weight through the PPT and against indicator subs
- Acts with position couplings to provide unmistakable depth control during gravel-pack operations
- Includes a 170,000-lbf (756,198 N-m) weight-down capacity that supports high-pressure pumping and extended-reach, horizontal applications

EXPERIENCE **SERVICE EXCELLENCE** FOR THE LIFE OF YOUR WELLS.

Our completions portfolio delivers superior equipment quality and downhole performance. We use the same manufacturing, testing processes, and safety procedures worldwide to provide service excellence anywhere you operate, for as long as your wells are active.

Strict Quality Control

We control the manufacturing process for all of our completions technologies. With 17 manufacturing plants strategically located around the world, we produce our technologies in house and conduct all assembly and testing internally.

Rigorous Testing

Our facilities in Houston, Texas, and Aberdeen, UK, serve as primary testing and R&D centers. We accurately simulate real-life operating conditions to verify that our systems perform as intended under the harshest subsea conditions. While we test our equipment well beyond minimum API and ISO requirements, we also test our technologies at third-party facilities to enhance testing objectivity.

Consistent Service Quality

Our comprehensive, in-house programs help us to improve service reliability and to enhance operational safety. These programs prescribe detailed procedures that are consistently performed in accordance with all international management-system standards.



Every component of the WFXØ gravel-pack system undergoes multiple levels of quality control to deliver the top-tier performance you've come to expect from Weatherford.







GRAVEL PACK MULTIPLE OPENHOLE ZONES IN A SINGLE TRIP.

The VØ-rated Weatherford WFXØ gravel-pack system increases openhole gravel-pack efficiency and reliability. Robust, yet simple to operate, the WFXØ system eliminates dedicated deep-set barrier runs and enables single-trip, multizone gravel packing. For more information about this innovative system, visit weatherford.com.

CONNECT WITH WEATHERFORD



© 2017 – 2018 Weatherford. All rights reserved. 12511.00

TerraForm is a registered trademark of Weatherford in the US, United Kingdom, Norway, European Union, and Australia. Weatherford products and services are subject to the Company's standard terms and conditions, available on request or at weatherford.com. For more information contact an authorized Weatherford representative. Unless noted otherwise, trademarks and service marks herein are the property of Weatherford and may be registered in the United States and/or other countries. Weatherford products named herein may be protected by one or more U.S. and/or foreign patents. Specifications are subject to change without notice. Weatherford sells its products and services in accordance with the terms and conditions set forth in the applicable contract between Weatherford and the client.