SAND CONTROL

TERRAFORM® OPENHOLE PACKER SYSTEM

Reduces completion costs by providing cased-hole functionality in openhole environments

DRILLING & FORMATION EVALUATION
WELL CONSTRUCTION
COMPLETION & STIMULATION
PRODUCTION

Weatherford®

REDUCE COSTS. PROTECT THE FORMATION. REDUCE COMPLEXITY.

The right completion is an economic game-changer. As day rates for deepwater rigs increase to nearly US $1 million and the cost of well construction materials continues to rise, advances in openhole completion technologies can save you millions. TerraForm® openhole packers are premium completion solutions for your most important wells. TerraForm packers not only save CAPEX, but they also provide life-of-well zonal isolation, protect your formation, and help to deliver a more effective frac pack or gravel pack.

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SIGNIFICANT SAVINGS

$20 MILLION

The only tools of their kind, TerraForm packers significantly reduce completion costs for multizone gravel pack wells in deep water. A deepwater operator in the Gulf of Mexico saved more than US $20 million using our TerraForm packers.

Saved 20 days of rig time

No casing for the openhole zone

No cementing services required for the lower completion

No perforating services required

CONFIDENCE FOR THE LIFE OF YOUR WELL

Our TerraForm packers use proprietary cup-seal isolation (CSI) technology. It provides a downhole seal that actively molds to the changing geometry of the wellbore throughout the life of the well. The packer system has up to 24 individual setting mechanisms around the circumference of the elastomer seal, which give you unprecedented wellbore expansion capabilities.

The TerraForm packer system includes a unique clutch mechanism that eliminates any possibility of the tool harming the reservoir or creating microfractures, regardless of wellbore irregularity. The packer typically seals the zone at 120 psi (0.83 MPa) with a hard limit of 200 psi (1.38 MPa), which is a massive reduction from compression-set packers. And though the seal performance for compression-set elements fluctuates with temperatures, the cup seals of the TerraForm packer are tension-set, which enables them to hold form through thermal swings.

Traditional packers versus TerraForm packers

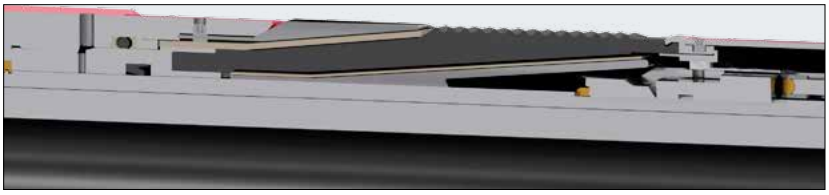
	Compression-set packers	TerraForm packers
Seal expansion	1/8 in. to 1/4 in.	1 in. to 1-1/2 in.
Sealing pressure	2,000 psi (10.34 MPa)	200 psi (0.83 MPa)
Potential ovality	1.05	1.2
Setting mechanisms	1	24

ZERO FAILURES

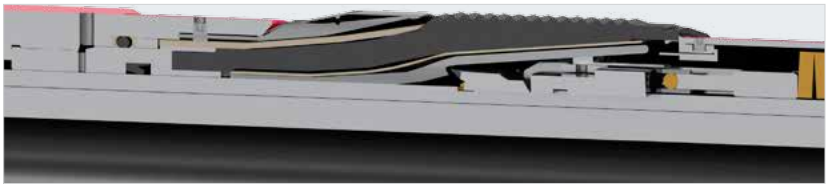
Every TerraForm packer installed in this offshore field still provides zonal isolation today.

An offshore operator near Angola changed their smart-injection system from water to gas, which resulted in severe fluctuations in both temperature and pressure. Even after 7 years of use, the TerraForm packer provides a reliable seal before, during, and after thermal swings.

Hydraulic or mechanical actuation releases a mechanical lock, which begins the setting sequence and shifts the packer levers under the cup-seal assembly.



The levers bend to engage the underside of the cup seal and radially expand the cup. The packer can achieve up to 1.2 ovality because the system includes as many as 24 individually driven levers.



When the cup encounters the openhole wellbore, the proprietary clutch mechanism limits to 200 psi (0.83 MPa) the pressure that each of the 24 levers applies to the reservoir.

Setting is complete once the levers have fully expanded and the packer is uniformly set across the circumference of the wellbore. The integral spring assembly maintains additional setting force, which enables the seal to continually re-form to match any future reservoir changes.

TERRAFORM PORTFOLIO

Model CSI

This tool includes two opposing and self-energizing unidirectional cup-seal packer assemblies that are coupled together.

Model CZI

This tool includes two unidirectional cup-seal packer assemblies that are coupled with an internal thermal-expansion joint. A ROKANKOR* anchoring system is installed between the cup seals to maintain tension in the completion string.

Model SZI

This tool includes two unidirectional cup-seal packer assemblies that are coupled together with an internal shunt annulus running the length of the packer. The internal shunt annulus communicates with the shunted screen to provide continuous slurry communication across multiple zones.

ROKANKOR Anchoring System

This premium anchoring system contains hydraulically set upper and lower slips that hold at least 150,000 lb (68,039 kg), depending on size and uniaxial compressive strength (UCS).


Model CSI


Model CZI

Model SZI

ROKANKOR Anchoring System

ALL WEATHERFORD TERRAFORM PACKERS

Openhole packers provide life-of-well zonal isolation for non-uniform wellbores. Deployed on base pipe, these packers are designed for high-value deepwater wells and are particularly suited for high expansion in oval wellbores, which are commonly underreamed. TerraForm packers are actuated either mechanically or hydraulically, and they set immediately.

To discover all of the advantages of our complete selection of zonal isolation options, visit **weatherford.com** or contact your authorized Weatherford representative.

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