

IsoRite® Isolated Multilateral Completion Systems

FOR MULTILATERAL WELLS THAT REQUIRE RE-ENTRY CAPABILITY TO ACCESS THE LATERAL

ISORITE® COMPLETION SYSTEM

The IsoRite® completion system is specifically designed for multilateral wells that require re-entry capability to access the laterals through the completion during the life of the well. This capability eliminates the requirement to pull the completion, should access to the lateral be required for cleaning, stimulation, zonal isolation, or data acquisition. The IsoRite completion system utilizes a completion window that is an integral part of the production string, and is equipped with landing profiles and sealbores to enable the setting of deflectors for lateral access or isolation sleeves for lateral control.

FEATURES

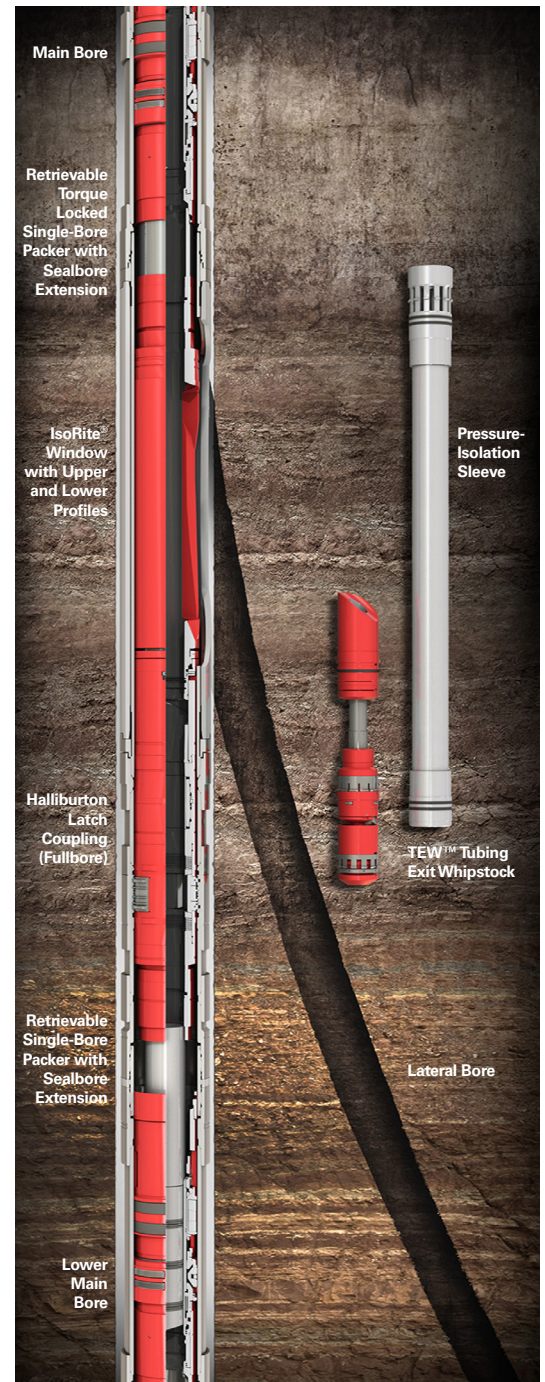
- » Incremental completion system for through-tubing lateral re-entry in TAML levels 2 and 4 multilateral wells
- » Selective lateral re-entry access with wireline, coiled tubing, or work string utilizing the TEW™ tubing exit whipstock
- » Selective isolation of lateral, using the through-tubing pressure-isolation sleeve
- » Capability to install flow control devices
- » Allows placement of intelligent completions above or below window, close to reservoir

BENEFITS

- » Lateral re-entry without need to pull completion
- » Eliminates multiple trips for multilateral intervention operations
- » Incremental modular system can be used to upgrade existing junctions
- » Intervention compatibility through intelligent completions

TYPICAL ISORITE SYSTEM INSTALLATION

- » Run in hole (RIH) with lower packer assembly and set
- » RIH with IsoRite window and upper packer assembly, and set in latch coupling
- » Install upper completion and seal into upper packer
- » RIH with wireline/coiled tubing and pull isolation sleeve
- » Produce the well
- » Perform lateral re-entry operations with TEW tubing exit whipstock
 - » Alternatively, use plugs or isolation sleeves to accomplish selective flow control



IsoRite® completion system in a LatchRite® junction

ISORITE FEED-THROUGH COMPLETION SYSTEM

For Selective Inflow Control With Re-Entry Capabilities to Access the Lateral

The IsoRite feed-through (FT) system is a TAML level 2 or 4 completion based off of the existing standard IsoRite completion system. It is specifically designed for multilateral wells that require re-entry capabilities to access the laterals through the completion, with a selective inflow control during the life of the well. The system incorporates control line feed through the completion window, allowing placement of control valves and gauges above and below. This accommodates lateral flow control and monitoring, while still maintaining through-completion intervention capability. The window is equipped with landing profiles and sealbores that enable the setting of a TEW whipstock for lateral access or a top-pressure isolation sleeve for lateral control. The IsoRite FT system also uses a self-orienting latching mechanism, automatically aligning and latching the window at landing depth without the need for string rotations. This prevents unnecessary rotation of control lines.

TYPICAL ISORITE FT SYSTEM INSTALLATION

- » RIH with IsoRite FT window, packers, and intelligent completion
- » RIH to casing self-orienting latch coupling depth, and then let the window self-orient and latch into coupling
- » Mark the pipe on surface, and pick up and perform tubing hanger spaceout
- » RIH and latch IsoRite FT window and land tubing hanger
- » Set the packers against the landing nipple, ceramic disk, or pumpout plug
- » Retrieve or pump out plug, or break ceramic disk

FEATURES

- » Incremental completion system for through-tubing lateral re-entry in levels 2 and 4 multilateral wells
- » Selective lateral re-entry access with wireline or coiled tubing, utilizing the TEW whipstock
- » Selective isolation of lateral, using the through-tubing pressure-isolation sleeve
- » Arrangement of control lines bypass allows placement of intelligent completions above or below the windows, close to reservoir
- » Self-aligning collet latch mechanism requires no string rotation

BENEFITS

- » Selective lateral re-entry through stackable modules without need to pull completion
- » Selective inflow control
- » Eliminate multiple trips for multilateral intervention operations
- » Incremental modular system can be used to upgrade existing junctions
- » Intervention compatibility through intelligent completions



IsoRite® FT completion system in a MillRite® TAML 4 junction

IsoRite® Isolated Multilateral Completion System Technical Specifications

TAML Levels 2 and 4 IsoRite and IsoRite FT Completions

| | | |
|-------------------------------|---|---|
| System Casing Size, in. (mm) | 7 (177.8) | 9 5/8 (244.5) |
| Casing Weight, lbf/ft (kg/m) | 26 to 32 (38.7 to 47.6) | 43.5 to 53.5 (64.7 to 79.6) |
| Lateral Hole Size, in. (mm) | 6 (152.4) | 8 1/2 (215.9) |
| Lateral Liner Size, in. (mm) | 4 1/2 (114.3) | 7 (177.8) |
| System and Tubing Sizes,* in. | 7 x 3 1/2** 7 x 4 1/2** | 9 5/8 x 3 1/2** 9 5/8 x 4 1/2** |
| Profile Sizes, in. (mm) | 2.75 (69.9) 3.44 (87.0) 3.75 (95.0) 3.812 (96.8) | 2.75 (69.9) 3.44 (87.0) 3.75 (95.0) 3.812 (96.8) |

* Casing x upper and lower tubing size

** Tubing connections and standard landing nipple profiles

IsoRite FT System Design

Window

| | |
|-------------------------------|-----------|
| Load to deflect collet | 10,000 lb |
| Load to deflect orienting key | 1,200 lb |
| Collet latch pushing force | 15,000 lb |
| Pullout load when latched in | 17,000 lb |
| Tested set-down load | 40,000 lb |

TPI™ Pressure-Isolation Sleeve

| | |
|--------------------------------------|----------|
| Push load to land collet in place | 3,000 lb |
| Pull load to release RO running tool | 6,600 lb |

TEW™ Tubing Exit Whipstock

| | |
|------------------|----------|
| Shear to set | 4,400 lb |
| Shear to release | 2,000 lb |



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