

WELL COMPLETIONS | SAND CONTROL

EquiFlow[®] washpipe-free module

ICD completion with mechanical isolation plugs

FEATURES

- Eliminates the need for washpipe
- Washdown and openhole displacement
- Mud cake breaker placement
- Set openhole packers where required
- ICDs will fully open prior to production/injection
- Can remain non activated for any time period
- No fluid communication through screen jacket
- Can be retrofitted into existing ICDs

BENEFITS

- No additional operational steps
- Saves rig time and washpipe rental cost
- Reduces risk of hole related issues due to time left open

Overview

Completions with inflow control devices (ICDs) are designed to balance flow in injectors and producer wells. The balanced flow contributes to the delay of water and gas breakthrough and extends the life of the well. ICD completions have also the potential to increase total oil recovery.

These ICD lower completions are traditionally deployed with washpipe or an inner string to accommodate effective fluid circulation, displacement and washdown capability. While this functionality offers multiple benefits, the following points should be considered:

Time – ICD lower completions are typically deployed with a wash string, which provides circulation capability at the toe, enabling the ability to wash past any obstructions. Make-up time can be considerable.

Hole – Making-up the wash string, leaves the hole open for a longer period of time, increasing the risk of hole collapse / wellbore related issues, which may prevent full deployment to TD, which is critical with ICD completions.

Fluid – ICD solutions deployed with or without a washpipe allow the movement of wellbore through the screen jacket, this increases the risk of partial plugging from wellbore fluids / debris.

Technology

The EquiFlow[®] ICD can be equipped with mechanical isolation plugs to temporally plug the ICD flow path, offering a washpipe-free installation method for ICD completions.



The mechanical control mechanism is incorporated into the ICD to temporarily isolate the flow paths and retain pressure while the lower completion is run in hole.

Applications

This solution is ideal for deepwater and extended-reach applications, which provides washdown capability and pressure integrity for operational requirements, such as fluid displacements or setting packers hydraulically.

The EquiFlow® Washpipe-Free module is suitable for all ICD applications.

- Injectors
- Producers
- Sandstone/carbonate formations
- Open/Cased hole completions

Operational sequence

The EquiFlow® Washpipe-Free Modules retain any required pressure, (e.g. circulation pressure) as per the completion's operational sequence, providing the capability of circulation and wash-down. Once at target depth, the bottomhole assembly (BHA) is pressurized. Once the opening activation pressure of the module exceeds the running pin shear pressure, it's activated to open. When reducing the "ambient" pressure to a preset level, the modules open the flow paths of the ICD ports to enable hydrocarbon production or fluid injection.



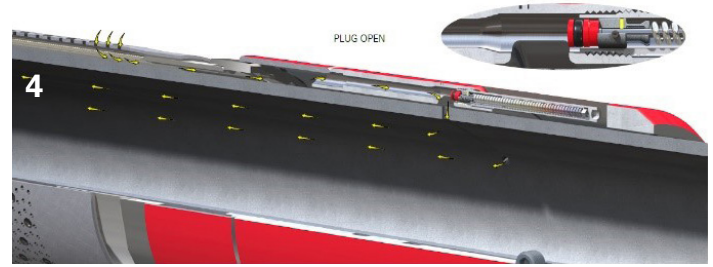
During deployment



Pressure-up to shear pin, plug maintains seal



Retaining collet disengages



Bleed off pressure, spring retracts and opens port

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