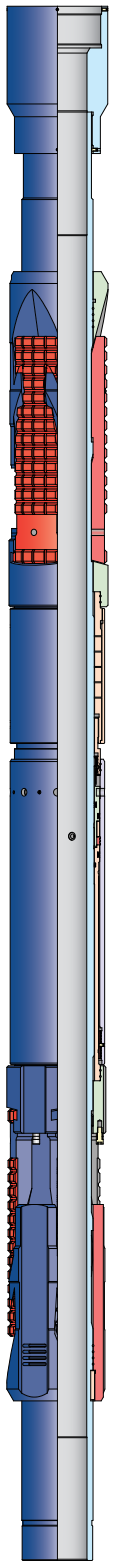
Openhole Whipstock Anchor
ROk-ANkOR® System



Weatherford has increased its openhole whipstock capabilities with the introduction of the patented openhole *ROk-ANkOR* system. The innovative design uses six mechanical slips to grip the formation with limited penetration, minimizing fracture damage in the immediate contact area during the setting event. In addition, the slip's robust construction provides a stable platform to handle the required load and torque during the lateral drilling phase.

The anchor enables the operator to position the anchor and whipstock in the openhole wellbore without a false bottom or cement barrier, accessing the pay zone in the shortest possible route. This permanent anchor enables multiple laterals to be orientated and be completed from one single, positive datum point. It is currently the only openhole, hydraulically actuated mechanical anchor that uses an orientation riser with a self-orientating latch. This distinctive feature enables close spacing of laterals with tight-tolerance directional control while also ensuring reliable and repeatable re-entry into any lateral bore by running the latch in tandem with a system-specific re-entry guide.

For additional flexibility and efficiency, an openhole, flow-through whipstock can also be used with the *ROk-ANkOR* system. This concave provides a production through bore, eliminating the need for a whipstock retrieval trip while also providing the potential for later mechanical re-entry capability into the mainbore.

Applications

- Sidetracking of an existing openhole wellbore where cementing operations or false bottoms are not achievable or economically feasible
- Sidetracking in highly compressive formations where standard drilling operations are ineffective at kickoff to access new or alternative targets
- Selective openhole sidetracking after target zones have been identified by openhole logging
- Multiple laterals from one datum point including positive and selective re-entry to each lateral

Openhole Whipstock Anchor ROk-ANkOR® System

Features, Advantages and Benefits

- This patented radial slip system grips the formation with six independent profiles, providing a solid foundation if a high load or torque is encountered during the drilling phase of the lateral, achieving multiple laterals with re-entry access from one permanent datum point.
- The slip interface reduces fracturing, high-compressive formations by limiting penetration and minimizing damage to the immediate contact area. The increased anchoring capability inhibits the formation from breakdown or fracture, preventing turning or skidding as well as delivering a permanent, rugged datum point for wells requiring intervention operations.
- The anchor has a 4 3/4-in. working ID, enabling intervention access to any lower productive zones for remedial operations, mitigating the need for special tool sizes to fit through standard bore.
- The latch assembly can be oriented repeatedly without disassembly, eliminating gyro trips in the re-entry phase, thereby reducing the risks inherent in oil production as well as nonproductive time.
- The orientation latch is splined in 4° increments, facilitating directional control and enabling the operator to choose the shortest route to the pay zone.
- With a 3.75-in. ID concave, the whipstock can remain in place, eliminating the retrieval procedure and enabling production and re-entry access to the main bore.
- The re-entry guide and the original whipstock use the same self-orientating latch, ensuring continued low-risk, full-bore re-entry capability into any lateral wellbore.
- A diamond-impregnated matrix can be applied to create additional stick force, providing a cost-effective and reliable anchor solution for openhole geothermal multilateral applications.

Specifications

Actuation method	Hydraulic-running tool
Openhole operating range (in./*mm*)	8-1/2 to 10-1/4 *215.9 to 260.4*
Orientation riser OD (in./*mm*)	8.25 *209.5*
ROk-ANkOR OD (in./*mm*)	8.25 *209.5*
Maximum working *ROk-ANkOR* ID (in./*mm*)	4.75 *120.6*
ROk-ANkOR slip material	4130/4145 (22 HRc Max)
ROk-ANkOR body material	4140/4142 (18 to 22 HRc)
Load capacity (lb/*kg*)	100,000 *45,359*
Torque capacity (ft/lb, *N•m*)	10,000 *13,558*

Hydraulic-Running Tool

Maximum running OD (in./*mm*)	6.25 *158.7*
Minimum running ID (in./*mm*)	2.00 *50.8*
Running-tool shear release (lb/*kg*)	60,000 *27,216*
Hydraulic differential to set (psi/*kPa*)	3,000 *20,684*

Openhole Whipstock Anchor ROk-ANkOR® System

Specifications (continued)

Orientation Riser

Maximum riser OD (in./*mm*)	8.25 *209.5*
Minimum riser ID (in./*mm*)	3.75 *95.2*
Latch-shear release from riser (lb/*kg*)	30,000 *13,608*

Concave

Maximum OD (in./*mm*)	8.00 *203.2*
Face angle	2° or 3°
Minimum flow-through whipstock ID (in./*mm*)	3.75 *95.2*
Maximum running-tool mill OD (in./*mm*)	8.50 *215.9*

Re-Entry Guide

Maximum OD (in./*mm*)	6.50 *165.1*
Minimum ID (in./*mm*)	2.25 *57.1*
Face angle	6°
Maximum running-tool OD (in./*mm*)	8.13 *206.5*

