

Ragnarok Unlimited Multistage Frac System

The Ragnarok™ unlimited multistage frac system is a multi-open-close frac sleeve that is deployed as part of the casing. Each sleeve is stimulated by deploying the Ragnarok bottom hole assembly (BHA). The sleeve is initially opened and closed through only upward shifting motions. This allows the sleeves to be reliably opened and closed in a single trip for all stages.

The sleeve also incorporates the patented i-Valve™ sealing system that is ISO 14998 V0 qualified to provide barrier-qualified isolation of the reservoir while installing the upper completion. The large inner diameter allows for full access for future wellbore operations.

Applications

- Drill pipe conveyed fracturing system
- Thru tubing, single-trip multistage fracturing



Technical data - Ragnarok sleeve

Casing Size	Weight	Max. OD	Min. ID	Length	Temp. rating
in. (mm)	lb/ft (kg/m)	in. (mm)	in. (mm)	in. (mm)	°F (°C)
5.500 (139.7)	20.0 - 23.0 (29.70 - 34.23)	6.250 (158.75)	4.606 (116.99)	86.9 (2,208.0)	350 (177)

Features

- Ragnarok DS frac sleeve for open-frac-close operation in the up-only direction
- Based on proven i-Valve system, with the option for ISO 14998 V0 qualified seals for reliable multi open-close shifting operations
- ISO 14998 V0 seals provide barrier-qualified isolation of reservoir while installing the upper completion
- Single-trip, thru tubing/drill pipe conveyed frac system for efficient stimulation of multiple stages
- No-go profiles for clear depth correlation
- Sleeve shifting weights are observable at surface
- Ragnarok service BHA has no packer elements, slips, or rotating components
- Built-in contingency release mechanisms

Benefits

- Simplified BHA reduces the risk of component failure
- Each sleeve closes post-frac with an upward movement, allowing pressure test confirmation possibility
- No downward shifting required for initial open-frac-close operation
- High set-down weight capacity to compensate for tubing movement during frac
- Robust and debris-resistant for high proppant concentrations
- Large flow area for higher rates
- Compatible with a range of contingency solutions
- Designed for both cemented and openhole applications