



Case Study:

Frac system deployed for 3-well, 90-stage pad in the Bakken, USA

Tendeka's first multi-stage FracRight™ system deployed to successfully complete a 3-well, 90-stage pad for major North Dakota Bakken operator.

Well Data

Location: North Dakota, USA

Well Type: Oil Producer - Shale

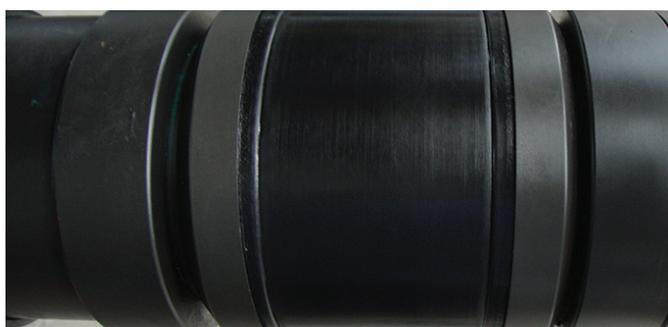
Installation Date: July 2015

Liner Size: 4½"



Tendeka has long been a leading provider of swellable packer products used extensively in open-hole, multi-stage frac completions across North America. With the new FracRight ball-drop sleeve system, and the DHP Liner Hanger, Tendeka can now provide the full lower completion system for up to 60 stages.

In July 2015, three Bakken wells were completed for a leading unconventional operator with the full FracRight system. A hybrid frac design was used, consisting of 30 ball-drop stages and 10 composite frac plugs. The 10,000ft long 4-1/2" liners were deployed and anchored using the DHP Liner Hanger system, which is specifically designed to run open-hole completions into long, horizontal laterals with a dozens of swellable packers and frac sleeves. The DHP is a robust and compact liner hanger that provides an economical, 10ksi, V3-rated tie-back for both stimulation and production. The liners were successfully pressure tested to 9500psi, and no pressure build up was observed over 3 months thanks to the 10ksi rated equipment selected for the job.



Tendeka Solution

For access to the reservoir, 30 of the FracRight Solo Sleeves were installed to provide ball-drop activation for each frac stage. The composite frac balls are designed to maximize ball seat support using a sophisticated interference design algorithm to select the optimal ball diameters ranging from 1.43" to 3.55" diameter. Each ball seat is rotationally locked for easy mill-out, and each of the frac stages were compartmentalized using Tendeka's proprietary SwellRight water-swellable packers, rated to 5000psi. SwellRight packers provide reliable zonal isolation even in high-salinity, produced water environments.

Project Results

In October 2015, the 3 wells on the pad were successfully stimulated with no downtime and no missed stages. All 30 of the sleeve activation pressures were easily observed in both the Bakken and 3-Forks reservoirs. The remaining 10 stages in each well were stimulated with composite frac plugs, also isolated with SwellRight water-swellable packers.

Tendeka is currently installing FracRight equipment on a second 4-well pad, and is scaling up operations based in Williston, North Dakota.