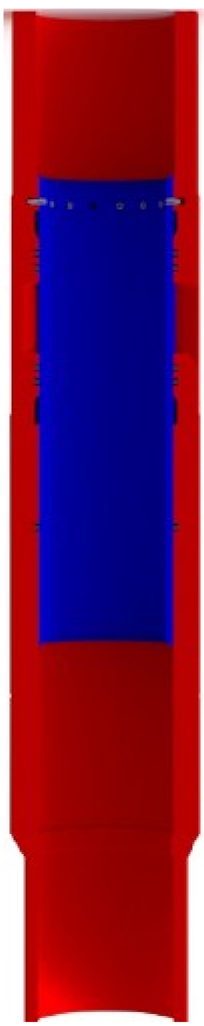
8Sigma Energy Services

infinityfrac™ ultra-high stage count ball-drop system

place up to 364 pin-point stages per wellbore

Technical Specifications



The infinityfrac™ MSHF system is an interventionless, large bore frac port opened by a dissolvable ball rated to 18,000 psi differential working pressure on the ball and seat.

Graduated seats with only 0.010 inch diameter increments between stages provides port selectivity and overlap for mechanically engaging the balls and opening the sleeves without relying on electronics, collets profiles or keyways.

Benefits

- The frac ports are opened and treated sequentially by dropping balls, starting from the deepest stages and moving to shallower stages as the stages are completed.
- Up t o 364 single point-of-entry stages can be placed per well. Up to ten entry-points per stage for limited entry applications.
- All ball seats are millable in the opened and closed positions.
- The frac port's ODs are only 0.200 inches larger than a premium casing coupling improving RIH characteristics.
- A simplified one-piece sleeve housing with no internal Acme connections facilities challenging wellbore installations.
- Wear resistant materials integrated with an erosion reducing geometry eliminates missed seating events.
- No flushes required between activation balls and treatment fluids.
- Optionally HPHT compatible (400°C, 18,000 psi differential rating) with the hottest well being run to date at 330°C.
- The frac ports can be isolated by annulus cement, or open-hole packers.
- Frac ports are permanently locked open with a body lock ring.
- No handling pups required - sleeves can be lifted onto the stump and can be torqued through.

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Technical Specifications

Tool Nominal Size (inch) [mm]	4.50 [114.3]					
Casing Weight (ppf) [kg/m]	11.6 [17.26]		13.5 [20.09]		15.1 [22.47]	
Casing Connections [All Available]	API	Premium	API	Premium	API	Premium
Burst Rating (psi)	15,487	15,021	15,640	16,135	19,655	16,782
Collapse Rating (psi)	14,761	14,336	14,900	15,348	18,500	15,932
Tensile Rating (klbf)	683,327					
Torsional Strength (ft-lbf)	11,846					
Maximum OD (inch) [mm]	5.300 [134.6]					
Minimum ID of Largest Ball Seat (inch) [mm]	3.70 [94.0]	3.60 [91.4]	3.70 [94.0]	3.50 [88.9]	3.60 [91.4]	3.40 [86.4]
Loss of ID per Stage | Ball Seat Increment (inch) [mm]	0.010 inch [0.25 mm]					
Total Available Stages	270	260	270	250	260	240
Minimum ID of Lowermost Ball Seat (inch) [mm]	1.00 [25.4]					
Maximum Temperature Rating	750ºF [400ºC]					
Total Overall Length (inch) [mm]	24 [0.70]					
Maximum Ball and Seat Differential (psi) [MPa]	18,000 [124]					
Shift and Actuation Pressure (psi) [MPa]	1500 [10.3]					

Procedures	
Assembly and QAQC	OP-PRO-3P-IFPP-ALL-A
Field QAQC, RIH, Reaming, Floatation, Cementing, Perforating	
Actuation and Stimulation	

Technical Specifications

Tool Nominal Size (inch) [mm]	5.50 [139.47]							
Casing Weight (ppf) [kg/m]	17.0		20.0		23.0		26.0	
Casing Connections [All Available]	API	Premi-um	API	Premi-um	API	Premi-um	API	Premi-um
Burst Rating (psi)	13,900	10,720	16,635	15,143	19,727	15,225	24,365	18,345
Collapse Rating (psi)	12,984	10,367	15,800	14,828	18,563	14,522	22,614	17,334
Tensile Rating (klbf)	986,273							
Torsional Strength (ft-lbf)	15,843							
Maximum OD (inch) [mm]	6.30 inch [160 mm]							
Minimum ID of Largest Ball Seat (inch) [mm]	4.65 [118]	4.55 [116]	4.55 [116]	4.30 [109]	4.45 [113]	4.20 [106]	4.20 [106]	4.00 [101]
Loss of ID per Stage | Ball Seat Increment (inch) [mm]	0.010 inch [0.25 mm]							
Total Available Stages	364	354	354	330	344	330	330	300
Minimum ID of Lowermost Ball Seat (inch) [mm]	1.00 [25.4]							
Maximum Temperature Rating	750°F [400°C]							
Total Overall Length (inch) [mm]	24 [0.70]							
Maximum Ball and Seat Differential (psi) [MPa]	18,000 [124]							
Shift and Actuation Pressure (psi) [MPa]	1500 [10.3]							

Procedures	
Assembly and QAQC	OP-PRO-3P-IFPP-ALL-A
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