

Falcon Ball-Actuated Frac Valve

APPLICATIONS

- Uncemented horizontal, deviated, and vertical wells for
 - zonal isolation during multistage fracturing
 - isolated matrix acidizing treatments
 - casing integrity issues when stimulation is required
 - stimulation of sandstone, carbonate, and shale plays

BENEFITS

- Low pressure drop across ball seats reduces power requirements during fracturing, thereby decreasing costs.
- Design eliminates loss of well production caused by broken balls or balls stuck in seats.

FEATURES

- Reclosable ball-actuated frac valves for zonal shutoff after fracturing for control of water-producing zones, restimulation, and other rework
- Valve ratings to 10,000 psi [68,948 kPa] and 350 degF [177 degC]
- Large exit ports to maximize flow area
- Progressively larger balls with nonlinear increments based on engineering calculation of load forces for every stage
- Multiple ball seats for increased flow rate and minimized pressure drop across the seat
- Ball seat design that facilitates intact flowback of balls during fracture cleanup
- Easily interchangeable ball seat sizes
- Magnesium balls that are light, strong, extrusion resistant, and easy to mill
- Frac balls made using ELEMENTAL* degradable technology that eliminate the need to flow back or mill frac balls after the fracturing operations
- Antirotational device for easy milling of balls and seats
- Ability to reclose the frac valve using a special shifting tool before or after milling the ball seats

The Falcon* ball-actuated frac valve is an integral component of the Falcon uncemented multistage stimulation system, which is run in hole on a liner and is used for selective stage stimulation. This valve allows communication to be established with each zone to be fractured.

Depending on the valve to be activated, an appropriately sized ball is dropped from the surface and pumped down until it lands on the ball seat. As pressure is applied, the ball causes a sleeve to shift down and expose the fracture ports, establishing communication with the formation.

The valve can be closed using a special shifting tool before or after milling the ball seats. The ability to close the sleeves offers several advantages:

- the ability to close a water-producing zone
- the ability to close the valves and restimulate the well zone- by-zone.

The spherical ball seat geometry promotes ball flowback and prevents stuck balls during fracturing that can result in loss of production from the stimulated zones below. All balls flow off seats at less than 500 psi [3.447 MPa] back pressure—the lowest in the industry.

The use of frac balls made using ELEMENTAL degradable technology eliminates the need to flow back or mill the frac balls after fracturing, as they degrade predictably and fully at bottomhole conditions.



The Falcon ball-actuated frac valve consists of balls that seat in the valve and allow the frac sleeve to open as pressure increases. Options for a single- or multiple-ball seat are available to suit the number of zones to be fractured.

Falcon Ball-Actuated Frac Valve Specifications

Size, in [mm]	3.5 [88.9]	4.5 [114.3]	5.5 [139.7]
Max. OD, in [mm]	4.60 [116.84]	5.625 [142.88]	7.655 [194.44]
Min. ID after millout, in [mm]	2.832 [71.93]	3.75 [95.25]	4.79 [121.67]
Length, ft [m]	2.38 [0.725]	2.24 [0.85]	2.24 [0.85]
Max. burst pressure rating, psi [kPa]	10,000 [68,948]	10,000 [68,948]	10,000 [68,948]
Temperature rating, degF [degC]	325–350 [162–177]	325–350 [162–177]	350 [177]
Connections	Multiple connections available on request		
Opening pressure, psi [kPa]	2,280–2,520 [15,700–17,400]	1,821–2,231 [12,558–15,382]	1,933–2,140 [13,324–14,753]
Body tensile strength, lbf [kN]	180,000 [801]	359,000 [1,596]	636,175 [2,829]
Body torsional strength, lbf.ft [N.m]	10,000 [13,558]	10,000 [13,558]	10,000 [13,558]