Reclosable CT Frac Sleeve

Precise multistage stimulation with flexibility for water and gas shutoff

**APPLICATIONS**
- Cemented multistage stimulation with single-entry fracture placement
- Openhole multistage stimulation, using openhole packers
- Gas or water shutoff

**BENEFITS**
- Simplifies multistage stimulation operations
- Enables rigless zonal shutoff later in the life of the well

**FEATURES**
- Reclosable sleeve that is opened and closed with CT
- Premium coatings and scraping mechanisms that are proven in harsh thermal environments
- Large frac port area that ensures access to fracture planes
- Fullbore access, enabling cementing and reentry for subsequent stimulation or workovers
- Reliable shifting tool technology with positive indication of sleeve actuation
- Fail-safe opening and closing
- Short sleeve length to facilitate handling and installation

**Selective stimulation and shutoff**
The reclosable CT frac sleeve enables selective single-point multistage stimulation and adds flexibility for rigless zonal shutoff later in the life of the well.

The two-position fullbore sleeve is designed for the most common high-pressure and high-rate fracturing operations. The inner sleeve is run in a pinned configuration. The pin is sheared when required, providing positive indication that the specified port has opened before fracturing.

The sleeve can be opened, closed, reopened for production, and reclosed for zonal shutoff, enabling operators to tailor production over the life of the well using the shifting tool. This is accomplished using premium sealing technology, advanced coatings, and inner-bore scraping mechanisms, all proven in harsh thermal environments.

**Reliable shifting tool**
The compact shifting tool is designed to self-centralize and rated to 10,000 psi [69 MPa] differential pressure. Individual hydraulically controlled keys ensure maximum performance during actuation. Each key is engineered to withstand as much as 45,000 lbf [20,017 daN] of overpull without tool damage.

The shifting tool is a fracture-in-place solution with no requirements for isolation or related service tools, even after hundreds of stages are fractured. The fully compartmentalized and hydraulically balanced design with multiple layers of solids control ensures that no solids will interfere with the tool’s operation.

**Fail-safe operation**
The shifting tool works with the sleeve’s adjustable detent locking system, which locks the sheared sleeve to prevent accidental manipulation. A clear change on the weight indicator accompanies release of the shifting tool, providing operators with a reliable surface indication that the sleeve has shifted. The tool is designed to release only when the sleeve is fully actuated (100% open or 100% closed). If required, the shifting tool keys can also be retracted by releasing hydraulic pressure from the tool (when the operator stops pumping through the tool).
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4.5-in. Reclosable CT Frac Sleeve

**Sleeve Specifications**

- **Max. OD**: 5.47 in [138.9 mm]
- **Min. ID in casing weight of**
  - 11.6 lbm/ft [17.3 kg/m] 3.92 in [99.6 mm]
  - 13.5 lbm/ft [20.1 kg/m] 3.92 in [99.6 mm]
  - 15.1 lbm/ft [22.5 kg/m] 3.80 in [96.5 mm]
- **Sleeve weight**: 70 lbm [32 kg]
- **Total length**: 29.86 in [758.4 mm]
- **Up position/lower position**: Stimulation/closed
- **Fracture port area**: 11.2 in² [72.3 cm²]

**Casing Specifications**

- **Size**: 4.5 in [114.3 mm]
- **Weight**: 11.6–13.5 lbm/ft [17.3–20.1 kg/m]

**Sleeve Operating Data**

- **Tensile**: 260,000 lbf [115,654 daN]
- **Max. pressure**: 15,000 psi [103 MPa]
- **Temperature rating**: 285 degF [141 degC]
- **Up shifting weight**: 3,000–5,000 lbf [1,334–2,224 daN]
- **Down shifting weight**: 3,000–5,000 lbf [1,334–2,224 daN]
- **Torque**: 12,000 lbf.ft [16,270 N.m]

**Tool Specifications**

- **Gauge ring max. OD**
  - for 11.6–13.5 lbm/ft [17.3–20.1 kg/m] 3.75 in [95.3 mm]
  - for 15.1 lbm/ft [22.5 kg/m] 3.65 in [92.7 mm]
- **Min. ID (no orifice)**: 0.63 in [16 mm]
- **Length**: 28.62 in [726.9 mm]
- **Top connection (PAC)**: 2.375 in [60 mm]
- **Bottom connection (PAC)**: 2.375 in [60 mm]
- **Max. tensile force (on keys)**: 37,000 lbf [16,458 daN]
- **Working pressure**: 1,000–3,000 psi [6.9–20.7 MPa]

5.5-in. Reclosable CT Frac Sleeve

**Sleeve Specifications**

- **Max. OD**: 6.96 in [176.8 mm]
- **Min. ID in casing weight of**
  - 17.0 lbm/ft [25.3 kg/m] 4.80 in [121.9 mm]
  - 20.0 lbm/ft [29.8 kg/m] 4.70 in [119.4 mm]
  - 23.0 lbm/ft [34.2 kg/m] 4.60 in [116.8 mm]
- **Sleeve weight**: 150 lbm [68 kg]
- **Total length**: 34.34 in [872.2 mm]
- **Up position/lower position**: Stimulation/closed
- **Fracture port area**: 14.8 in² [95.5 cm²]

**Casing Specifications**

- **Size**: 5.5 in [139.7 mm]
- **Weight**: 17.0–23.0 lbm/ft [25.3–34.2 kg/m]

**Sleeve Operating Data**

- **Tensile**: 600,000 lbf [266,893 daN]
- **Max. pressure**: 15,000 psi [103 MPa]
- **Temperature rating**: 285 degF [141 degC]
- **Up shifting weight**: 3,000–5,000 lbf [1,334–2,224 daN]
- **Down shifting weight**: 3,000–5,000 lbf [1,334–2,224 daN]
- **Torque**: 18,000 lbf.ft [24,405 N.m]

**Tool Specifications**

- **Gauge ring max. OD**
  - for 17–20 lbm/ft [25.3–29.8 kg/m] 4.57 in [116.1 mm]
  - for 23 lbm/ft [34.2 kg/m] 4.44 in [112.8 mm]
- **Min. ID (no orifice)**: 1.0 in [25.4 mm]
- **Length**: 26.37 in [669.8 mm]
- **Top connection (PAC)**: 2.375 in [60 mm]
- **Bottom connection (PAC)**: 2.375 in [60 mm]
- **Max. tensile force (on keys)**: 45,000 lbf [20,017 daN]
- **Working pressure**: 1,000–3,000 psi [6.9–20.7 MPa]