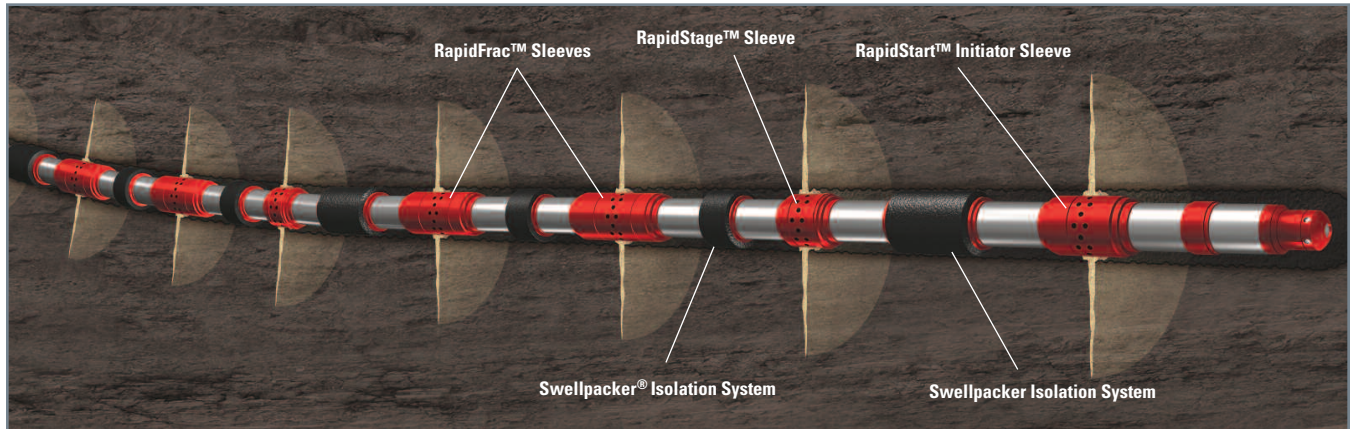
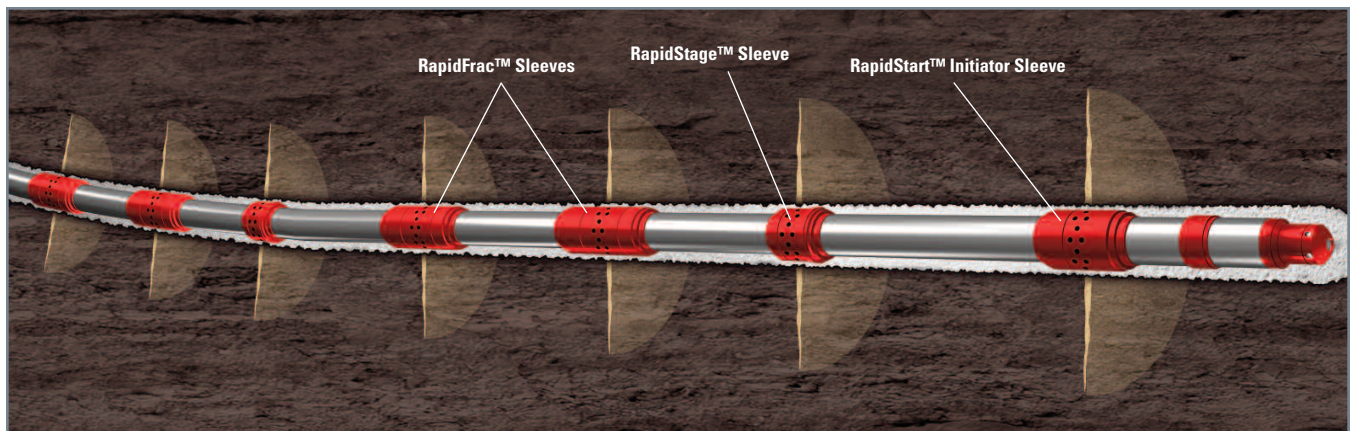


RapidFrac™ System

For use with Multi-Point Completions and Sub-Interval Fracturing



RapidFrac™ system for openhole applications

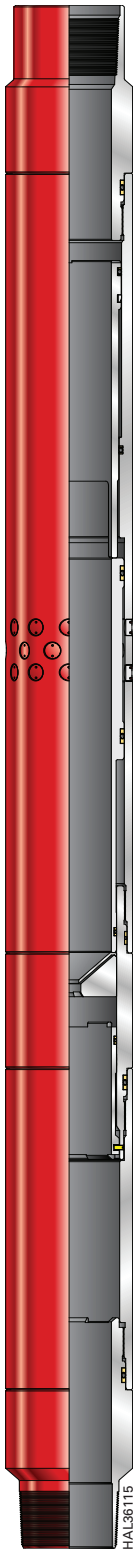


RapidFrac™ system for cemented applications

The RapidFrac™ system provides operators new options for completing horizontal multi-interval wellbores to enable highly accurate placement of fractures, with minimal or no intervention. This multi-entry sleeve system allows access to multiple fracture points within an isolated interval, and its unique ball activation feature enables a totally interventionless completion.

The RapidFrac completion assembly can be run into the wellbore using the VersaFlex® liner hanger system or production casing to surface. Based on reservoir conditions, isolation can be achieved with either the Swellpacker® isolation system or ZoneGuard™ SR packers for an openhole completion. Cement isolation is also an option for larger casing size sleeves.

The system uses RapidFrac sleeves and a RapidStage™ sleeve within a single interval. This exposes the reservoir face to multiple fracture points, similar to the “plug and perf” process, without the loss of time, waste of water resources or extended exposure of personnel. Numerous fracture points can be used within an isolated interval in a given zone. Up to 20 intervals can be used for the completion.



RapidFrac™ Sleeve

RapidFrac Sleeve

The RapidFrac sleeve uses a delayed opening mechanism that enables a single ball to open multiple RapidFrac sleeves before landing on the RapidStage sleeve, which is isolated within an interval.

Once the ball lands on the RapidStage sleeve, increased casing ID pressure will open the RapidStage sleeve during which time the RapidFrac sleeves are metering to the open position, allowing multiple fracture points (sub-intervals) within the interval.

Each RapidFrac and RapidStage sleeve has ports that can be modified to allow each sleeve within a sub-interval to be tailored to specific flow requirements to maximize the stimulation treatment. Each interval uses our proven composite balls, which can be launched from Halliburton's Pneumatic Ball Launcher. After stimulation, cleanup is assisted by flowing all lower zones simultaneously.

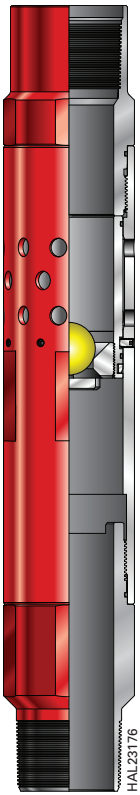
Features

- 10,000 psi pressure rating
- 350 °F
- High fracturing rates
- Used with a variety of isolation methods
- 90-180 second delay on initial opening for each RapidFrac sleeve
- Single ball activates all sleeves in a given interval
- Maximum of 20 intervals per well
- Composite ball activated
- Standard service

Benefits

- Alternative to “plug and perforate” process
- Eliminate the necessity of wireline intervention and its associated risks
- Reduces stimulation cycle time from weeks to days or from days to hours with continuous pumping
- Reduces over displacement of proppant
- Reduces water requirements when compared to pumping plugs and guns on depth
- Number of flow ports on each RapidFrac and RapidStage sleeve may be tailored for a specific treatment regimen

Maximum Treatment Rates				
Zone	Tool Size (in.)	Composite Ball Size (in.)	Baffle Size (in.)	Max. Rate bbl/min
1	4 1/2	1.750	1.665	40
2	4 1/2	1.875	1.790	46
3	4 1/2	2.000	1.915	53
4	4 1/2	2.125	2.040	60
5	4 1/2	2.250	2.165	67
6	4 1/2	2.375	2.290	75
7	4 1/2	2.500	2.415	84
8	4 1/2	2.625	2.540	93
9	4 1/2	2.750	2.665	100
10	4 1/2	2.875	2.790	100
11	4 1/2	3.000	2.915	100
12	4 1/2	3.125	3.040	100
13	4 1/2	3.280	3.155	100
14	4 1/2	3.443	3.310	100
15	4 1/2	3.615	3.473	100
16	5 1/2	3.792	3.645	100
17	5 1/2	3.975	3.822	100
18	5 1/2	4.168	4.005	100
19	5 1/2	4.370	4.198	100
20	5 1/2	4.580	4.400	100



RapidStage™
Sleeve

RapidStage™ Sleeve

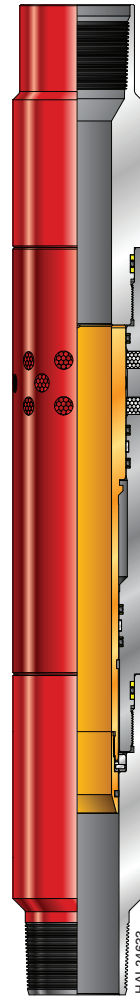
The ball-activated RapidStage sleeve allows selective stimulation through the production string for multiple intervals. Designed to allow for interventionless stimulation, the RapidStage sleeve is an efficient, one-time only open sleeve. The sleeves are shifted using balls of graduated size that are released at the wellhead using Halliburton's remote-control pneumatic ball launcher. Opening the sleeve diverts the flow from the completion string to the annulus through ports in the RapidStage sleeve. After stimulation, cleanup is assisted by flowing all lower zones simultaneously.

RapidStart™ Initiator Sleeve

The RapidStart™ Initiator sleeve allows for an interventionless stimulation treatment and serves as the toe opening sleeve in a frac sleeve completion. The RapidStart Initiator sleeve is activated using tubing/casing pressure that exceeds a predetermined shear pinned value. The Initiator sleeve uses an air-chambered sleeve that operates solely off of absolute tubing pressure. Once opened, the Initiator sleeve can be used for stimulation of the first zone and/or as the flow path to pump the first ball down to the lowest zone comprising the RapidFrac and RapidStage sleeves.

In conclusion, the RapidFrac system offers several important benefits:

- Allows for continuous pumping of multi-zone treatments
- Helps reduce completion cycle time and improve production
- Reduces water requirements as compared to "plug and perf"



RapidStart™
Initiator Sleeve

For more information on how the RapidFrac™ system can help you with selective multi-zone operations, contact your Halliburton representative or email completions@halliburton.com.