

PosiFrac®

Multi-Stage Hydraulic Fracture System

- FREECAP® Industry-leading swellable packer technology
- Effective fracture stimulation maximizing reserves and well efficiency
- Flexible system that adapts to well characteristics
- Reliable, proven fracture sleeve technology
- Up to 35 fracture stages available
- Simplified system offers dependability and reduces risk



TAM INTERNATIONAL

SYSTEM DESCRIPTION:

TAM International's PosiFrac® Multi-Stage Hydraulic Fracture System offers a flexible, reliable means of completing horizontal open hole laterals-providing maximum stage isolation specific to the customer's wellbore environment. Each component of the PosiFrac System offers unique benefits over similar products in competing systems.

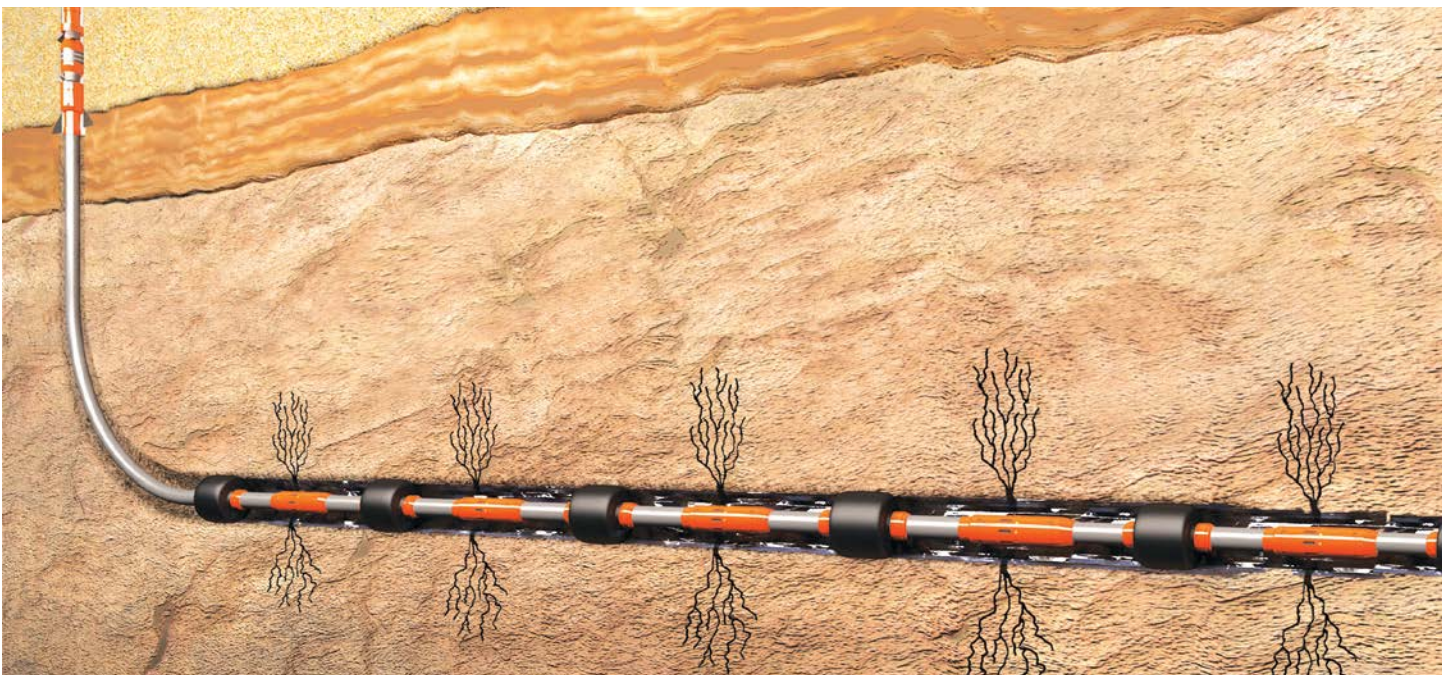
The PosiFrac Multi-Stage Hydraulic Fracture System is an all-inclusive service providing operators a complete system that enables highly accurate, positive placement of fracture treatments for hydraulically stimulating a horizontal wellbore. The PosiFrac System has five main components – the liner top packer, FREECAP® swellable packers, Ball- Activated Fracturing Sleeves, a Hydraulic-Activated Fracturing Sleeve and a Circulation Closing Valve. The system is conveyed using a liner hanger running tool that enables reliable, trouble-free installation.

FEATURES:

- Industry-leading swellable technology in the FREECAP swellable packer provides a positive annular barrier for the required fracture pressures
- Annular isolation fits the well's completion fluid design and does not require circulation of an initiation fluid
- The Ball-Activated Fracturing Sleeves provide a large flow area from liner ID to annulus, allowing for efficient stimulation placement
- Torque-thru design allows for ease of makeup and installation in the wellbore
- Ball seats are designed for erosion resistance and milling efficiency
- System uses industry-proven dissolvable balls

BENEFITS:

- Running costs and safety issues related to perforating guns and bridge plugs are eliminated
- Completion cycle time is reduced
- Open hole completions provide free access to natural fractures, improving wellbore-to-reservoir communication
- Swellable packers reduce risk of formation damage from hydraulic/mechanical systems and provide flexibility for maximum wellbore contact with improved sealing in irregular wellbores
- Variety of swellable packer elastomer compounds allows for customization of completion to match wellbore environment
- Proven sleeve design allows for maximum reliability





LINER TOP PACKER:

TAM offers a selection of hydraulically activated dual bore liner top packers. Typical configuration is with a tieback receptacle and a right-hand release running tool. The packer can be set in a variety of casing sizes and weights. The setting port of the liner top packer is isolated with the running tool while running in hole, eliminating the possibility of premature setting. Additionally, proprietary slip design greatly reduces potential for presetting.



FREECAP SWELLABLE PACKER:

Positive zonal isolation can be achieved with FREECAP swellable packers, which allow for any one of a number of swellable elastomer compounds to be used depending on wellbore conditions. This variety of compounds allows TAM to design a completion based on the customer's wellbore conditions rather than requiring the customer to change the wellbore conditions to accommodate the packers.

Typical seal length is 5 ft, which provides up to 7,500 psi differential pressure rating. A 15,000 psi differential pressure rating can be achieved by increasing the seal length.



BALL-ACTIVATED FRACTURING SLEEVE:

The Ball-Activated Fracturing Sleeve (BFS) is a component of the system used as a means to establish direct communication between the liner/casing string and the formation. Multiple sleeves installed on the liner string are operated by releasing graduated ball sizes, which land on the corresponding ball seat. Pressure is then applied to shift the sleeve to the open position, allowing the formation to be fractured.

HYDRAULIC-ACTIVATED FRACTURING SLEEVE:

The Hydraulic-Activated Fracturing Sleeve (HFS) is an interventionless fracturing sleeve that incorporates redundant opening functions. Differential pressure is created by applying pressure against the setting ball in the Circulation Closing Valve. When a predetermined shear pressure is reached, the sleeve opens. Once opened, the sleeve can be used for stimulation of the first zone and/or as the flow path to pump the ball down to the first Ball-Activated Fracturing Sleeve.



CIRCULATION CLOSING VALVE:

The Circulating Closing Valve (CCV) assembly is designed to be used at the toe of the liner system. The CCV allows for circulation as the PosiFrac System is being run in hole. A ball-actuated mechanism isolates the internal casing pressure, enabling activation of the Hydraulic-Activated Fracturing Sleeve with pressure.



TOOL SPECIFICATIONS:

TYPICAL 4-1/2 IN. SYSTEM

5-1/2 in. system is also available. Contact your TAM Representative for more information.

Tool	OD		ID		Length		Material	Connection**	Pressure (psi)
	(in)	(mm)	(in)	(mm)	(in)	(mm)			
Liner Top Packer	5.70	144.78	4.00	101.60	77.25	1962.15	P-110, L-80	LTC or BTC	10,000
Swellable Packer	5.625	142.88	3.92	99.57	***	***	P-110, L-80	LTC or BTC	10,000
Ball-Activated Fracturing Sleeve*	5.625	142.88	4.00*	101.60*	28.35	720.09	P-110, L-80	LTC or BTC	10,000
Hydraulic-Activated Fracturing Sleeve	5.625	142.88	3.380	85.85	56.18	1426.97	P-110, L-80	LTC or BTC	10,000
Circulation Closing Valve	5.000	127.00	2.900	73.66	21.00	533.40	P-110, L-80	LTC or BTC	10,000

* ID on frac sleeve depends on ball seat, from 0.908 in. to 3.658 in., 3.875 in. after drill out

**Premium connections are available

*** 5 ft (152.4 cm) element

FRECAP SWELLABLE ELASTOMER TYPES:

Packer Type (Swell Fluid)	Water	Oil
Standard Swell	✓	✓
High Temperature Steam Injection, Thermal Recovery, Geothermal	✓	✓
Slow Swell Times	✓	✓
Fast Swell Times	✓	✓
Low Temperature / High Salinity	✓	
Low Temperature / Heavy Oil		✓
Hybrid (Swells in Water and Oil)	✓	



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