

HF-1 Series Feed-Through Production Packer

Remotely Isolate Zones with High Pressures and High Loads

Halliburton WellDynamics' premier HF-1 packer is a single-string, retrievable, cased-hole packer with a facility for bypass of multiple electrical and/or hydraulic control lines. The HF-1 packer can be used as both the top production packer and as one of many lower packers isolating adjacent zones.

It is designed for higher loads and greater pressures than standard production packers. This durability is accomplished through a unique slip configuration and additional body lock ring.

Benefits

- Cause less damage to casing using a multi-cone full coverage slip system
- Bypass multiple electrical and/or hydraulic control lines
- Avoid damage to control line during setting
- Use as both top production packer and as a lower isolation packer

Features

- Hydraulically activated interlock mechanism prevents premature setting
- Control line or tubing pressure set
- No body movement during setting
- Unique full-coverage slip system
- Premium threaded connections throughout
- NBR element with anti-extrusion system
- Qualified for high tensile or compressive loads
- Tailpipe can be left in tension or compression
- Fully retrievable after installation

Anti-Pre-Set Mechanisms

The HF-1 packer incorporates a hydraulically activated interlock system which can be adjusted prior to running in the hole. The interlock system allows the packer to be run in highly deviated or horizontal wells, eliminating the risk of pre-setting due to casing drag. Test segments are provided to permit internal pressure testing to full rating without setting the packer in the workshop or on the rig floor.



HF-1 Packer

Setting Mechanisms

- Tubing pressure set
- Control line set

The HF-1 packer is designed for tandem setting with the tailpipe in tension, compression, or neutral. The setting mechanism is independent of tubing movement or pressure induced tubing forces. The setting action will not impart loads on, or damage any of the penetrations or lines.

Release Mechanisms

- Punch and pressure release
- Shift and pressure release
- Mechanical shift release

The release mechanism is recessed and selective, allowing for the passage of other tool strings. Axial loads are supported in both directions so the tool cannot be released by tubing forces.

Connections

The HF-1 packer is made up directly to the tubing string via integral premium thread connections. The packer design ensures full metal-to-metal thread integrity is maintained through the entire mandrel.

Penetrations

Multiple hydraulic and/or electrical control lines can pass through the HF-1 packer. All connections are sealed using WellDynamics' FMJ connectors.

Elastomeric Seals

Material for setting chamber seals and tubing to lower annulus is chosen based on application conditions.

Integral Element Anti-Extrusion System

The packing element used in the HF-1 packer is multi-piece NBR sealing elements. It incorporates an anti-extrusion system that

provides high resistance to swab off, which permits increased running speeds and high annular circulation rates (up to 8 BPM) prior to setting. The system has been qualified through multiple thermal cycles using both water and nitrogen as test media.

Load and Functional Performance

A full scale test program is performed on all HF-1 packers to validate setting, pressure and load ratings, and retrieval. Most packers are ISO 14310 V0 rated.

Retrievable Feed-Through HF Packers																		
Type	Casing OD in.	Casing weight ft/lb	Mandrel Size in.	Maximum OD in.	Bore ID in.	Maximum Feed-Through	Maximum Differential Across Element psi	Working Pressure psi	Working Temperature °F	Required Setting Pressure psi	Element Type	ISO 14310 Rating						
HF1 Series (722HF1) Production / Isolation	7	23	2 7/8	6.180	2.315	5	5,000	5,000	75 - 275	4,500 for Tubing Set 6,500 for Control Line Set	Nitrile	V3						
			3 1/2		2.750		7,500	7,500			Nitrile	V3						
		26	3 1/2	6.090	2.750		7,500	7,500			Nitrile	V3						
			29	2 7/8	5.995		2.315	7,500			7,500	Nitrile	V3					
		3 1/2		2.315			Nitrile					V0						
		2.750	Nitrile	V3														
	32	3 1/2	5.905	2.750	7,500	7,500	7,500	Nitrile	V3									
								7 5/8	33.7	3 1/2	6.570	2.750	5	7,500	7,500	75 - 275	4,500 for Tubing Set 6,500 for Control Line Set	Nitrile
	39	6.430	10,000	10,000	Nitrile	V0												
	9 5/8	43.5	4 1/2	8.515	3.812	6	7,500	7,500	75 - 275	4,500 for Tubing Set 6,500 for Control Line Set	Nitrile	V3						
			5 1/2		4.562						7,500	7,500	75 - 275	Nitrile	V3			
		47	3 1/2	8.440	2.750		7,500	7,500	10,000		75 - 275	Nitrile	HNBR	V3				
					3.525										(a) 7,500 (b) 10,000	7,500	10,000	75 - 275 40 - 300
			3.788		7,500		7,500	75 - 275	Nitrile		V0							
			3.813									7,500	7,500	75 - 275				
			3.954		7,500		7,500	75 - 275	Nitrile		V0							
		4.560	7,500	7,500	75 - 275		Nitrile	V0										
		53.5	3 1/2	8.300	2.750		(a) 7,500 (b) 10,000	7,500	10,000		75 - 275 40 - 275	Nitrile	HNBR	V0 V3				
					3.525										7,500	7,500	75 - 275 40 - 275	Nitrile
			4 1/2		4.560		7,500	7,500	75 - 275		Nitrile	V0						
4.625		7,500	7,500	75 - 275	Nitrile		V3											
71.8	4 1/2	7.890	3.525	7,500	7,500	75 - 275	Nitrile	V0										

Further sizes shown on next page

Retrievable Feed-Through HF Packers continued

Type	Casing OD in.	Casing weight ft/lb	Mandrel Size in.	Maximum OD in.	Bore ID in.	Maximum Feed-Through	Maximum Differential Across Element psi	Working Pressure psi	Working Temperature °F	Required Setting Pressure psi	Element Type	ISO 14310 Rating
HF1 Series (722HF1) Production / Isolation	10 3/4	60.7	5 1/2	9.430	4.562	6	6,000	6,000	75 - 275	4,500 for Tubing Set 6,500 for Control Line Set	Nitrile	V0
		65.7	5 1/2	9.330	4.562		(a) 7,500 (b) 10,000	7,500 5,000	40 - 275		Nitrile HNBR	V0 V3
	11 7/8	71.8	4 1/2	10.550	3.688	5	5,000	5,000	75 - 275	4,500 for Tubing Set 6,500 for Control Line Set	Nitrile	V3
HFP Series (722HFP) Production / Isolation	9 5/8	53.5*	5 1/2	8.300	4.562	5	10,000	10,000	100 - 350	6,500	Alfas®	V0
	9 7/8	62.8	4 1/2	8.440	3.788	5	10,000	10,000	100 - 220	6,500	Alfas	V3
		68**	4 1/2	8.440	3.813		15,000	15,000	80 - 350			V0

Notes:

Available in two setting options: tubing set or control-line set

Available in three releasing options: straight shift and pull method, knock-out plug and pump method, punch and pump method

Available in various metallurgy, elastomers and thread connections to suit well conditions

Refer to individual specification sheets for additional details.

*Pending qualification testing

**Pending qualification - 8.5-in. special drift casing. Maximum casing ID 8.710

Contact Halliburton for additional information.

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For more information on any of the details featured here, please email us at welldynamics@halliburton.com.

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