

ISO Intelligent Retrievable Well Barrier

Creates and continuously verifies a VO-rated barrier that isolates the wellbore without the need for a nipple profile

Applications

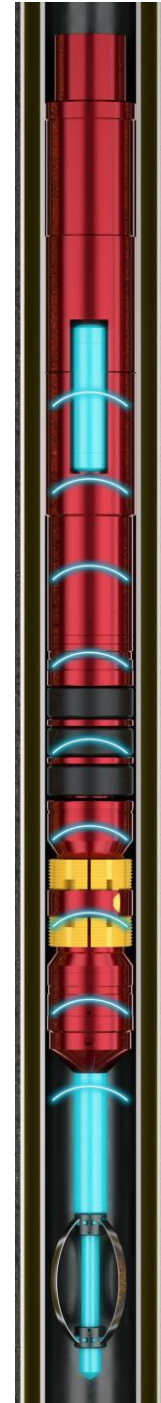
- Packer setting and completion installation
- Contingent plugging of completions with damaged nipples
- Temporary zonal isolation and plugging
- Hanging of completion accessories within the tubing string
- Temporary well suspension
- Pressure testing of production tubing and packer setting
- Wellhead repair and replacement

Features and Benefits

- Wireless data capture records pressure and temperature (P/T) readings from beneath the barrier.
- Flexible delivery transmits P/T data to surface in real time or memory mode.
- Hydrogenated nitrile butadiene rubber (HNBR) packing element provides a high-integrity VO-rated seal.
- Internal and external fishing neck provides options for removal from the wellbore.
- Short maximum running OD facilitates passing through wellbore restrictions.
- Versatile deployment enables the intelligent retrievable well barrier to be run by any means of conveyance, which enhances operational flexibility.
- Element booster system traps boost pressure into the elements for high-pressure and high-temperature applications.
- Flow area through the ports exceeds the ID area to mitigate the risk of debris plugging the well barrier in overbalanced situations.
- Optimized slip and casing contact minimizes potential damage to tubing.
- Slip system body lock rings prevent re-engagement of the slips after release.

Tool Description

The Weatherford ISO intelligent retrievable well barrier provides a VO-rated seal that holds pressure from above and below while protecting the bidirectional, low-stress slip system from debris contamination. Plug integrity is continuously monitored and verified by an acoustic P/T gauge mounted beneath the plug. The P/T data can be retrieved without interrupting operations.



An acoustic sensor (blue) wirelessly transmits P/T data up hole to a data recorder housed in the junk catcher above the plug. The data can be transmitted to surface in real time or can be retrieved from the junk catcher in memory mode.



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Tool Description (continued)

This intelligent retrievable well barrier can be set on electric line, slickline, tubing, or coiled tubing (CT) to temporarily isolate the well. The plug releases with as little as 3,000 lb (1,361 kg) to facilitate use of slickline, but can also be easily retrieved on tubing or CT using a standard GS retrieval tool. Retrieval is achieved by means of an internal sleeve that is shifted down to equalize the pressure and then sheared up to release. This minimizes the risk of the plug releasing before equalization. Rotational locking during milling operations facilitates removal in the event that the plug cannot be retrieved conventionally. An external fish neck, incorporated into the design, provides an alternative retrieval method.

The ISO intelligent retrievable well barrier is tested to ISO 14310 V0 standards for high-performance reliability. Its 10,000-psi (68.95-MPa) pressure rating provides a high-integrity seal to minimize loss-of-containment risk and associated health, safety, and environmental risks. The plugs are compatible with existing standard and trip-saver junk catchers to minimize inventory requirements.

Specifications

Casing/Tubing			Maximum OD	To Pass Restriction	Tool Length	Temperature Rating ^(b)	ISO Validation Grade	Pressure Rating Above	Pressure Rating Below
Size	Weight	ID Range							
2-7/8 in. ^(a) (73.03 mm)	6.4 to 8.7 lb/ft (9.5 to 12.9 kg/m)	2.373 to 2.494 in. (60.27 to 63.35 mm)	2.280 in. (57.91 mm)	2.313 in. (58.75 mm)	98.1 in. (2,491.7 mm)	40 to 325°F (4 to 163°C)	V0	10,000 psi (69 MPa)	10,000 psi (69 MPa)
3-1/2 in. ^(a) (88.90 mm)	9.2 to 9.3 lb/ft (13.7 to 13.9 kg/m)	2.93 to 3.06 in. (74.37 to 77.75 mm)	2.720 in. (69.09 mm)	2.750 in. (69.85 mm)	98.1 in. (2,491.7 mm)	40 to 325°F (4 to 163°C)	V0	10,000 psi (69 MPa)	10,000 psi (69 MPa)
4-1/2 in. (114.30 mm)	11.6 to 13.5 lb/ft (17.3 to 20.1 kg/m)	3.853 to 4.069 in. (97.87 to 103.35 mm)	3.650 in. (92.71 mm)	3.688 in. (93.68 mm)	98.3 in. (2,496.8 mm)	40 to 325°F (4 to 163°C)	V0	10,000 psi (69 MPa)	10,000 psi (69 MPa)
	15.1 lb/ft (22.5 kg/m)	3.752 to 3.904 in. (95.30 to 99.16 mm)	3.600 in. (91.44 mm)	3.630 in. (92.20 mm)					
5-1/2 in. (139.70 mm)	20 to 23 lb/ft (25.3 to 34.2 kg/m)	4.578 to 4.976 in. (116.28 to 126.39 mm)	4.470 in. (113.54 mm)	4.562 in. (115.87 mm)	103.6 in. (2,631.4 mm)	40 to 325°F (4 to 163°C)	V0	10,000 psi ^(c) (69 MPa)	10,000 psi ^(c) (69 MPa)
	17 to 23 lb/ft (25.3 to 34.2 kg/m)	4.578 to 4.976 in. (116.28 to 126.39 mm)	4.535 in. (115.19 mm)	4.562 in. (115.87 mm)	103.6 in. (2,631.4 mm)	40 to 325°F (4 to 163°C)	V0	10,000 psi ^(c) (69 MPa)	10,000 psi ^(c) (69 MPa)
	23 to 26 lb/ft (34.2 to 38.7 kg/m)	4.445 to 4.765 in. (112.90 to 121.03 mm)	4.380 in. (111.25 mm)	4.410 in. (112.01 mm)				10,000 psi ^(c,d) (69 MPa)	10,000 psi (69 MPa)
		4.445 to 4.665 in. (112.90 to 118.49 mm)	4.280 in. (108.71 mm)	4.312 in. (109.52 mm)					
7 in. (177.80 mm)	23.0 to 29.0 lb/ft (34.2 to 43.2 kg/m)	6.087 to 6.466 in. (154.61 to 164.24 mm)	5.940 in. (150.88 mm)	6.000 in. (152.40 mm)	133.6 in. (3,393.44 mm)	40 to 325°F (4 to 163°C)	V0	10,000 psi ^(a) (69 MPa)	10,000 psi ^(a) (69 MPa)
	29.0 to 38.0 lb/ft (43.2 to 56.6 kg/m)	5.801 to 6.208 in. (147.35 to 157.68 mm)	5.720 in. (145.29 mm)	5.750 in. (146.05 mm)				8,000 psi ^(a, c) (55 MPa)	8,000 psi ^(a, c) (55 MPa)

(a) Currently in development and testing - specifications are subject to change

(b) 40°F requires a change of elastomers

(c) 275°F

(d) 8,000 at 325°F



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Battery Life

The ISO intelligent retrievable well barrier features a SonicGauge™ battery gauge that measures battery life which is dependent on both the downhole temperature (which causes battery self-discharge) and the data transmission frequency (which expends battery power). The table below gives examples of achievable system life at specified temperatures when a 2 double-C lithium battery pack is used.

Data Sampling Frequency	Battery Life at Specified Temperatures				
	122°F (50°C)	167°F (75°C)	212°F (100°C)	257°F (125°C)	302°F (150°C)
5 minutes	2.5 months	2.5 months	2.5 months	2.5 months	2 months
10 minutes	5 months	5 months	4.5 months	4 months	3.5 months
30 minutes	13 months	12 months	10.5 months	8.5 months	6 months
1 hour	22 months	19 months	15 months	12 months	8 months
2 hours	34 months	27 months	20 months	14 months	9 months
4 hours	48 months	34 months	24 months	17 months	10 months
8 hours	60 months	40 months	26 months	18 months	10 months
12 hours	65 months	42 months	28 months	18 months	11 months
24 hours	71 months	46 months	29 months	19 months	11 months

