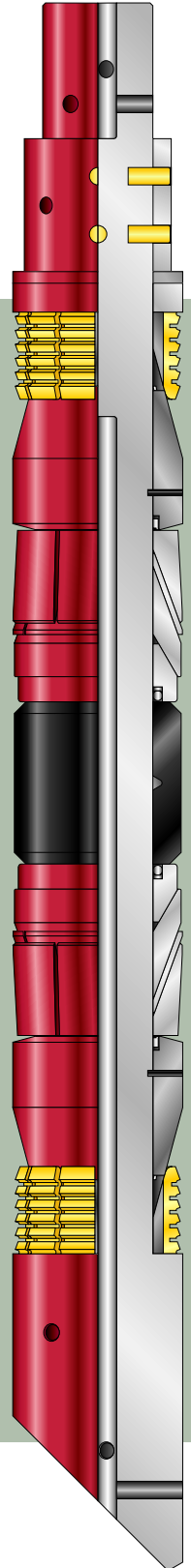




Weatherford®

FracGuard™ Composite Plugs



FracGuard™ Composite Plugs

Hotter Temperatures
Higher Pressures
Faster Drill-Up
Proven Reliable Operation
More Configurations

FracGuard plugs have captured a significant share of the market within three years of introduction because competitors cannot come close to FracGuard reliability and performance.



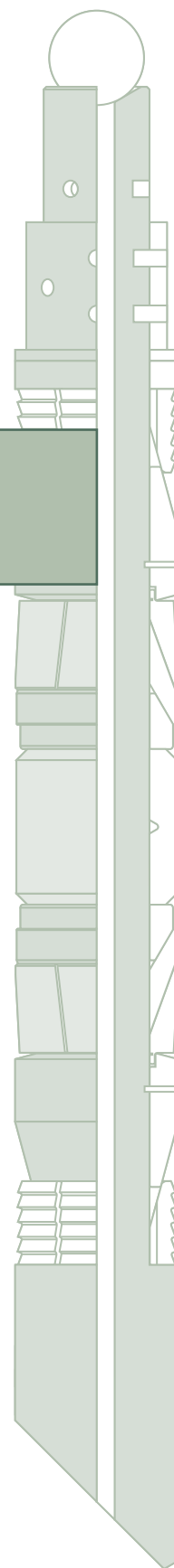
In keeping with our Simply ProductiveSM approach to production, Weatherford's *FracGuard* series composite bridge plugs isolate the formation above the plug for fracturing operations in both single- and multiple-zone stimulation applications. *FracGuard* plugs also work extremely well in underbalanced applications and in highly deviated, horizontal or multilateral wellbores. The flexibility of these tools lets you save operational time while protecting sometimes-sensitive formations.

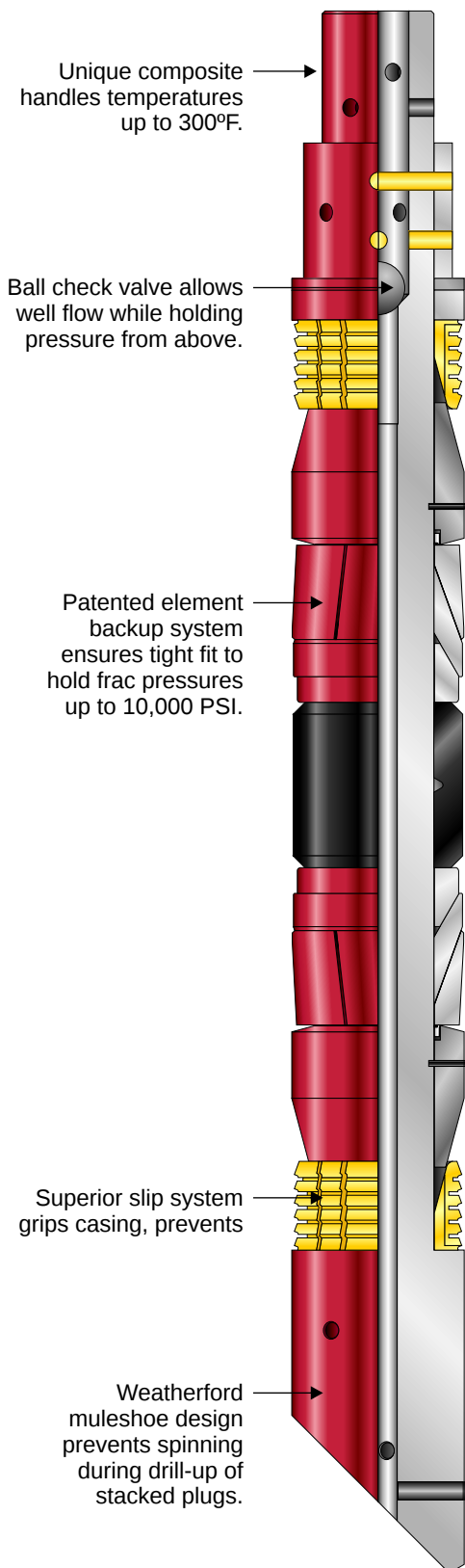
Operational integrity at higher temperatures for extended periods of time and at higher and “stacked” pressures sets *FracGuard* plugs apart. And *FracGuard* plugs are available in more standard configurations than most competitors' plugs—from 2 7/8- to 9 5/8-in. casing.

Weatherford's comprehensive cased-hole completion offering, backed by more than 40 years of experience in cased-hole systems, helps you maximize production rates. Our dynamic portfolio includes permanent and retrievable packer systems, flow controls, safety systems and intelligent well technologies.

Today we deploy systems on a global basis from Siberia to the Gulf of Mexico through Weatherford's extensive infrastructure. Our global footprint allows us to operate in all major oil-producing regions to service clients in even the most remote locations.

FracGuard composite plugs are available as a bridge plug or as a frac plug that allows backflow through the body. The frac plug is available in two styles—integral check valve or top-ball design. No other manufacturer can currently offer both.





Series 300 Integral
Ball Frac Plug

Hotter Temperatures

Only genuine Weatherford® FracGuard™ plugs can take temperatures up to 400°F (204°C) for extended periods without loss of pressure. We have successfully tested a Series 400 *FracGuard* bridge plug at 400°F and a differential pressure of 10,000 PSI for more than seven days, a claim no other manufacturer can make. For wells with temperatures under 300°F (149°C), the Series 300 *FracGuard* bridge plug is the perfect answer.

Now you can plan your frac program with complete flexibility—without concerns about the reliability of your frac plugs and bridge plugs.

Rising Temperatures

Weatherford clients in Oklahoma, Texas and north Louisiana have run more than 200 of the Series 400 *FracGuard* composite bridge and frac plugs in wells from 10,000 to 20,000 ft deep (3,050 to 6,100 m), at temperatures up to 390°F (200°C). Typically they run two *FracGuard* plugs in each well, with each plug holding frac pressures of 12,000 PSI (82,700 kPa). After the frac job, drilling up both plugs takes only about 1-1/2 hr total when a coiled-tubing drilling motor is used, and even less time

Higher Pressures

Only *FracGuard* plugs can take differential pressure up to 12,000 PSI, thanks to the high-strength composite body and the patented element backup system that keeps the sealing rubber super-tight against the casing.

Need more pressure? We can do that, too. Weatherford engineers have developed implementation techniques that allow you to stack pressures and reach more than 20,000 PSI. For more information, see SPE paper 16713, presented at the 2004 Offshore Technology Conference.

Faster Drill-Up



FracGuard plug cuttings look like wood chips and weigh very little. FracGuard plugs are the perfect choice for underbalanced or near-balanced wells.

21-Plug Salute

In the Rock Springs, Wyoming, area, operators have used *FracGuard* composite plugs in more than 20 wells with 4 1/2-in. casing and zones up to 17,000 ft deep (5,200 m). And they've stacked anywhere between 14 and 21 *FracGuard* plugs in a single well. Typical drill-up times range from 12 to 20 min per plug. In one recent application, 17 *FracGuard* plugs in one well were drilled top to bottom with a single bit in just over 3-1/2 hr—an average of 13 min per plug.

- **Tight lock:** *FracGuard* cast-iron slips completely prevent the plug from spinning when you drill it out. You get quick drill-up without tearing up your casing.
- **Quick drill-up:** The proprietary Weatherford composite is tough against temperature and pressure but easy to drill. Use tubing, drillpipe or coiled tubing with conventional junk mills or tri-cone bits. Our InZone™ Coiled Tubing Directional Drilling (CTDD) Services group has all the tools you need. Or, you can use the Weatherford "bit-release setup," and drill out plugs with your production string. No separate drillstring to rent, no extra trips!
- **No spinning parts:** The tip of some competitive plugs can break loose to create spinning debris that's tough to drill out. The special Weatherford muleshoe eases entry of the plug into the well and later provides a positive grip that completely prevents spinning when you're drilling out stacked plugs.
- **Super-light cuttings:** Cuttings from a *FracGuard* plug are very lightweight, similar in appearance to wood chips. This is the perfect plug for your underbalanced or near-balanced well or wherever you want to use a lightweight drilling fluid.

Proven Reliable Operation

Steel is steel, but there are literally thousands of possibilities for modern composites. Weatherford has developed a unique, patented composite material and manufacturing technology to guarantee that every *FracGuard* plug gives you the same outstanding reliability and performance. Hundreds of our plugs are run every month with a success rate that no other competitor can match.

Configurations and Sizes for Every Well

Available for casing sizes from 2-7/8 to 9-5/8 in., the FracGuard™ composite plug comes with your choice of bridge plug, integral-ball frac plug or a floating top-ball frac plug in most sizes. No other manufacturer offers all these choices. The top-ball design provides a larger flow area for higher return rates while the integral design keeps the ball in place inside the plug.

FracGuard composite frac plugs are available in the Series 300 standard version (for temperatures up to 300°F)

FracGuard Composite Matrix					Series 300				Series 400							
Size	Weight Range	Casing Min.	Casing Max.	OD	Pressure Rating		Frac?	Ball Type	Pressure Rating		Frac?	Ball Type				
					Above	Below			Above	Below						
					(in./mm)	(lb/ft)			(in./mm)	(in./mm)			(in./mm)	(PSI/mPa)	(PSI/mPa)	(PSI/mPa)
2-7/8	6.4-8.6	2.259	2.441	2.120				12,000	8,000	Y	T					
73.03		57.38	62.00	53.85				82	55							
3-1/2 88.90	12.95	2.750	2.750	2.560	10,000	8,000	Y	I	12,000	10,000	Y	I				
		69.85	69.85	65.02	69	55			82	69						
	9.2-10.2	2.922	2.992	2.695	10,000	8,000	Y	I	12,000	10,000	Y	I				
		74.22	76.00	68.45	69	55			82	69						
4-1/2 114.30	9.5-13.5	3.920	4.090	3.660	10,000	10,000	Y	I,T	12,000	10,000	Y	I,T				
		99.57	103.89	92.96	69	69			82	69						
	15.1-16.6	3.754	3.826	3.595	10,000	10,000	Y	I,T	12,000	10,000	Y	I,T				
		95.35	97.18	91.31	69	69			82	69						
5-1/2	15.5-23	4.670	4.950	4.370	10,000	10,000	Y	I,T	12,000	10,000	Y	I,T				
139.70		118.62	125.73	111.00	69	69			82	69						
7	23-32	6.094	6.366	5.800	10,000	8,000	Y	I								
177.80		154.79	161.70	147.32	69	55										
9-5/8	36-53.5	8.535	8.921	8.375	8,000	6,000	Y	I								
244.48		216.79	226.59	212.73	55	41										

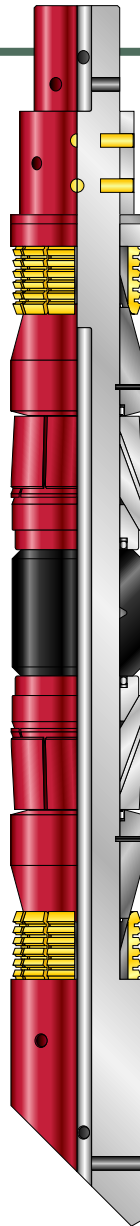
Frac plug types: I = Integral-ball; T = Top-ball

Count on the technology leader in composite plugs: **Weatherford**



Series 300 FracGuard™ Bridge Plug

- Compact design and full circle element backup system
- Suitable for applications up to 300°F (149°C)
- Available in frac plug versions in most sizes



Series 400 FracGuard Bridge Plug

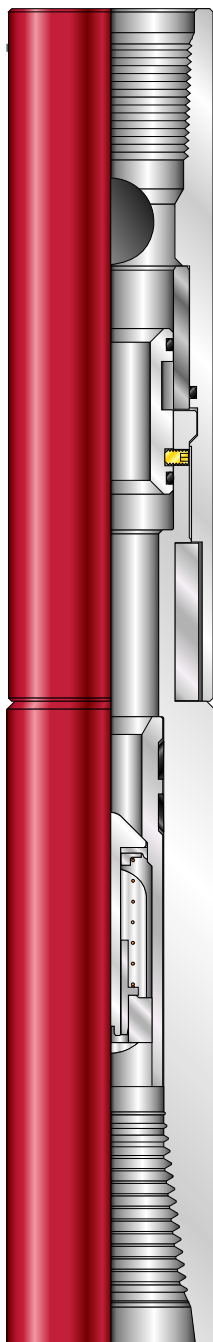
- High-strength composite body and superior element backup system
- Suitable for applications up to 400°F (204°C) and 12,000 PSI
- Available in frac plug versions in selected sizes



FracGuard Top-Ball Frac Plug

- Hollow center uses a phenolic check valve ball to seal pressure above the plug, while allowing flow from below.
- Ball is dropped from surface and seats on top of the plug mandrel, which is useful when full flow area through the plug is required.

Weatherford offers a wider variety of frac and bridge plugs than any other manufacturer.



Protecting the Reservoir : Bit-Release Sub (BRS) Drill-Out Accessory

When a multizone production tubing string calls for single-trip reliability, the BRS uses pump pressure to drop the drill bit from the tubing string after the drill-out run. Particularly well suited for underbalanced drilling applications, the BRS eliminates the need to trip out with a drill bit and trip in with a separate production string, saving valuable rig time. In addition, the field-proven BRS features a built-in float valve to alleviate pressure from the wellbore.

Additional features and advantages:

- Sub cannot release before actuation, preventing premature disconnection from the bit caused by excessive overpulls on the tubing during drill-out operations.
- Torque, tensile and compression ratings exceed those for production tubing.
- Full tubing ID after disconnect avoids flow restriction, enabling interventions through the tubing after disconnect.
- The BRS is ideal for flanged-up completions.
- The BRS features a wireline entry profile on the bottom of the tubing string.

Standard Connection*		Max. OD in./mm	Min. ID** in./mm	Float Valve Size	Phenolic Ball Size in./mm	Part Number
Tubing Box Up	Box Down					
1.900-in. IJ 10 Rd	4THD N ROD	2.000 50.80	1.500 38.10	1R	0.75 19.05	BRS19
2 3/8-in. EUE 8 Rd	2 3/8-in. API REG	3.250	2.100	1R	1.500	BRS20
	2 7/8-in. API REG	82.55	53.34		38.10	BRS21
2 7/8-in. EUE 8RD	2 3/8-in. API REG	3.500	2.500	1R	1.500	BRS25
	2 7/8-in. API REG	88.90	63.50		38.10	BRS26
3 1/2-in. EUE 8RD	2 7/8-in. API REG	4.250	2.992	1R	1.625	BRS34
	3 1/2-in. API REG	107.95	76.00	1F-2R	41.28	BRS35

* Alternate connections may be available by special order.

**After release of bit



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