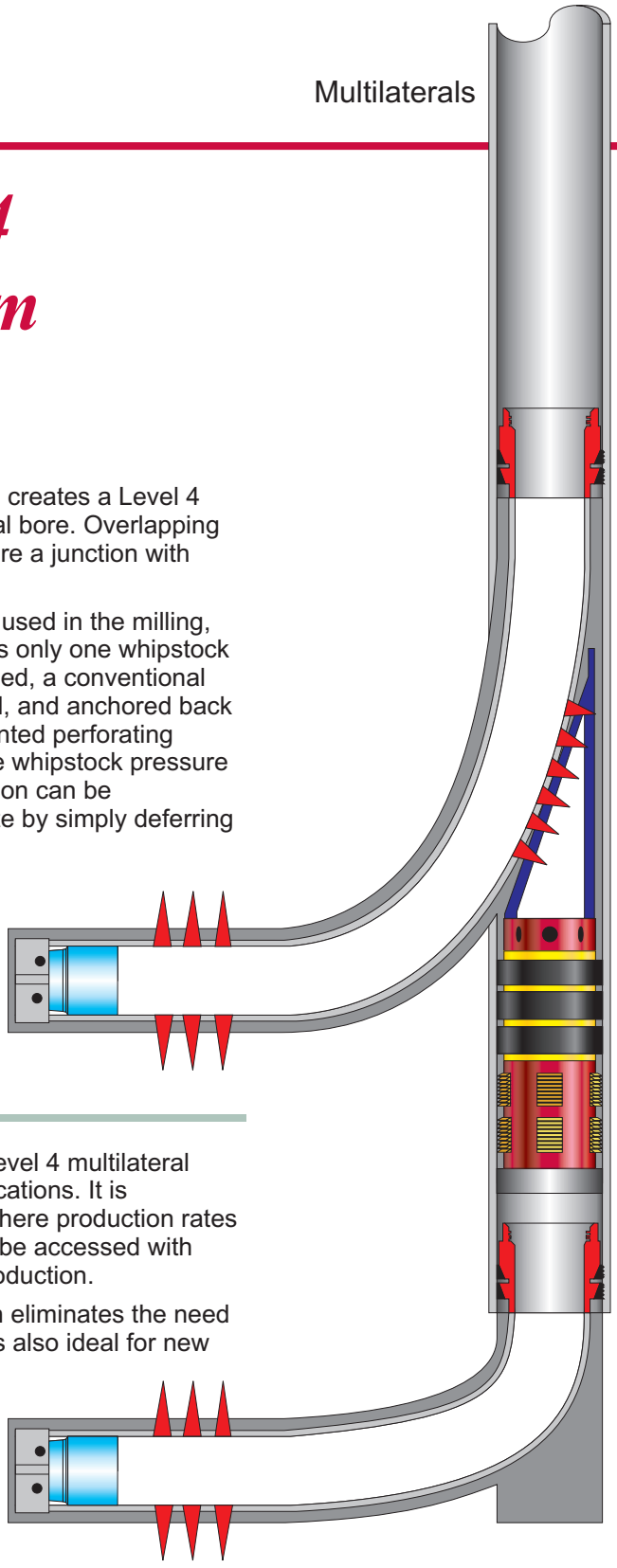
StarBurst™ Level 4 Multilateral System

7- and 9 5/8-in. Systems



Weatherford's *StarBurst* Level 4 multilateral system creates a Level 4 cemented junction with full-liner access to the lateral bore. Overlapping concentric strings, combined with the cement, ensure a junction with maximum support and formation isolation.

With its unique hollow whipstock-anchor assembly, used in the milling, drilling, and completion phases, the system requires only one whipstock run. After the window is milled and the lateral is drilled, a conventional lateral liner assembly is run in the lateral, cemented, and anchored back to the main bore above the window. A low-side-oriented perforating technique is then used to perforate the liner and the whipstock pressure plate to re-establish main-bore production. Production can be commingled, or the new lateral can be kept separate by simply deferring the whipstock perforation.

Applications

- The *StarBurst* system is a low-risk, economical Level 4 multilateral solution that is effective in new and re-entry applications. It is particularly well suited for wells in mature fields where production rates are declining and nearby additional reserves can be accessed with laterals while maintaining the original wellbore production.
- With its practical, cost-reducing technology, which eliminates the need for expensive assemblies, the *StarBurst* system is also ideal for new development drilling.

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Features, Advantages and Benefits

- The *StarBurst* system allows production from the existing wellbore as well as the lateral.
- The system provides a cost-effective way of maximizing reservoir exposure and increasing reservoir recovery without the cost or potential environmental consequences of drilling additional vertical wells.
- The unique hollow whipstock is suitable for both milling and production operations. The recessed pressure plate ensures pressure integrity during milling. Retrieval of the whipstock is not required, so risk of not recovering the whipstock is eliminated.
- Special mills prevent damage to the pressure plate and provide an elongated window.
- The lateral liner tieback to the main bore provides mechanical integrity and connectivity with full access to the lateral and production access to the main bore.
- Overlapping concentric strings, combined with cement, provide sand control at the junction.
- The *StarBurst* system is compatible with conventional or intelligent completions.

Options

- Available high-temperature packer for the 9 5/8-in. system
- Available special mill assembly for the 7-in. system in dual-string casing exit applications

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Specifications

	Imperial	*Metric*	Imperial	*Metric*
System size (in./*mm*)	**7 × 4-1/2**	***177.8 × 114.3***	**9-5/8 × 7**	***244.5 × 177.8***
Casing weight (lb/ft, *kg/m*)	29 to 32	*43.2 to 47.6*	40 to 53.5	*59.5 to 79.6*
Maximum OD (in., *mm*), whipstock	5.81	*147.6*	8.20	*208.3*
Maximum size (in., *mm*), liner	4.50	*114.3*	7.00	*177.8*
OD (in., *mm*), perforating gun	2.875	*73.0*	3.375	*85.7*
Number of perforations	49		33	
Flow area after perforating (in.^{2}, *cm*^{2})	2.50	*16.1*	2.80	*18.1*
Maximum OD (in., *mm*), packer body	5.75	*146.1*	8.00	*203.2*
OD (in., *mm*), packer gauge ring	5.81 to 6.08	*147.6 to 154.4*	8.22 to 8.44	*208.8 to 214.4*
Minimum ID (in., *mm*), packer/shear sub	1.75	*44.5*	3.00	*76.2*
Recommended setting pressure (psi, *kPa*), packer	2,500	*17,237*	2,500	*17,237*
Maximum differential pressure (psi, *kPa*), below packer[a]	5,000	*34,474*	5,000[b]	*34,474*[b]
Maximum differential pressure (psi, *kPa*), above packer[a]	3,500	*24,132*	3,500[b,c]	*24,132*[b,c]
Maximum temperature (°F, °*C*)	275	*135*	275[c]	*135*[c]
DLS generated by whipstock	10.8		11.2	
Whipstock angle	3°			
Window length (ft, *m*)	15	*4.6*	17	*5.2*
Overall length (ft, *m*), whipstock/packer assembly	21.0	*6.4*	25.7	*7.8*
Material	Carbon steel			
Maximum OD (in., *mm*), mill	5-7/8 to 6	*149.2 to 152.4*	8.50	*215.9*
Shear release *(recommended)*				
Running tool from whipstock (lb, *kg*)	20,000	*9,072*	30,000	*13,608*
Whipstock-packer assembly (contingency) (lb, *kg*)	70,000	*31,751*	120,000	*54,431*
Whipstock from packer (contingency) (lb, *kg*)	120,000	*54,431*	N/A	
Torque rating (ft-lb, *N•m*), system	8,000	*10,847*	10,000	*13,558*

[a]Packer tested per ISO CD 14310 Grade V3 standards.
[b]The 40 lb/ft casing is rated for 2,500 psi from above and 3,000 psi from below.
[c]Optional packer is rated for 5,000 psi from above and below at 302°F (150°C).

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