



**Slim-line
Perforating System For
Re-frac Operations**

DS Echo™

New solutions improving re-frac effectiveness

As recompletions become an increasingly compelling alternative to drilling and completing new wells, solutions are emerging that improve the refracturing and recompletion processes. One such solution is DS Echo™, a Factory-assembled, Performance-assured™ perforating system purposely designed for re-frac operations in existing shale wells.

DS Echo's slim-diameter design enables the system to be deployed inside the new secondary casing of a well previously completed with traditional plug-n-perf operations.

Optimized shaped charge performance

DS Echo is armed with EchoFrac™ shaped charges developed specifically for re-frac applications. EchoFrac charges deliver uniform entry-hole diameter (EHD) and enough perforating punch to penetrate two layers of casing, regardless of gun positioning. The result is better fracture treatments, and ultimately, better production volumes.

EchoFrac's clean perforations of both casings ensure the integrity of the cement sheath between the inner and the outer strings, as well as the cement-to-formation bond. This eliminates fracture migration between perforation tunnels, and delivers optimum reservoir stimulation. EchoFrac charges provide consistent Area Open to Flow (AOF) while maintaining effective isolation of all stages and perforations.



The EchoFrac shaped charges in the DS Echo gun system maintain cement integrity between inner and outer casing while creating uniform EHD and consistent AOF.

DS Echo is a revolutionary step in re-frac safety, efficiency and reliability

Proven reliability and safety with Intrinsically Safe™ technology

Like all members of DynaEnergetics' Factory-assembled, Performance-assured DynaStage (DS) product family, DS Echo arrives at the wellsite fully assembled and ready to arm with the wireless IS2™ TF intrinsically safe™ initiating system.

The DS Echo, and its entire detonation system can be tested at surface, leading to unmatched reliability and peace of mind. And it takes less than a minute to assemble, arm and test each system.

DS Echo has raised the bar for re-frac safety, efficiency and reliability. It is the industry's only fully factory-assembled perforating system specifically designed to run inside secondary casings of existing wells while delivering equal entry hole diameter, consistent area of flow, for maximum stimulation of the reservoir.

GUN OD (IN)	CHARGE TYPE	EXPLOSIVE	INNER CASING			OUTER CASING			AVG* EHD (IN)	AVG EHD INNER CSG (IN)	AVG EHD OUTER CSG (IN)	STD DEV
2-1/2"	EchoFrac DP30	11g. RDX	3-1/2"	9.2#	P110	4-1/2"	13.5#	P110	0.29	0.31	0.31	7.1%
2-1/2"	EchoFrac DP30	11g. RDX	3-1/2"	9.2#	P110	4-1/2"	15.1#	P110	0.28	0.30	0.31	7.5%
2-3/4"	EchoFrac DP30	15g. RDX	4"	11.6#	P110	5-1/2"	23#	P110	0.28	0.28	0.34	7.4%
2-3/4"	EchoFrac DP30	15g. HMX	4"	11.6#	P110	5-1/2"	23#	P110	0.29	0.29	0.34	8.9%

*smallest entry hole through both casings considered only

**gun configuration 6spf, 60deg.

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