

INSidr

Perforating shock and debris reduction technology

APPLICATIONS

- Deepwater and high-pressure (HP) wells
- Big hole or deep penetrating shaped charges
- Debris management

BENEFITS

- Reduces gun shock, protecting tubing and completion equipment
- Significantly decreases shaped-charge debris
- Increases area open to flow with diminished concern for debris

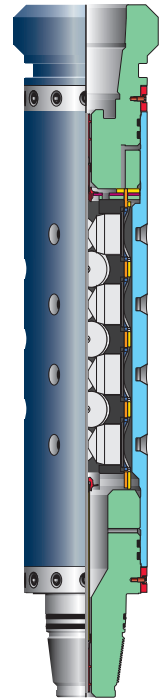
FEATURES

- Compatible with existing gun systems
- Available with the 6.62-in and 7-in HP HSD* high shot density perforating gun systems
- Compatible with PowerFlow Max* slug-free big hole shaped charge or PowerJet Omega* deep penetrating perforating shaped charge

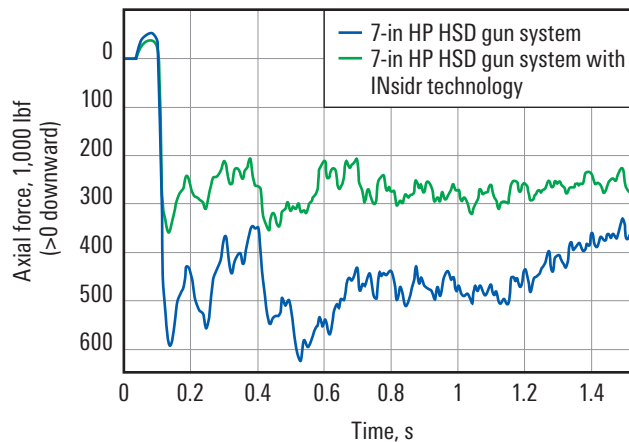
The INSidr* perforating shock and debris reduction technology is the newest innovation in HP HSD guns that minimizes fallout of shaped-charge debris.

Perforating gun shock can be excessive and, unless managed properly, can cause major damage to the lower assembly or completion. Proven PURE Planner* perforation job planning application has added a new gun-shock module that predicts the peak incremental dynamic loads that can cause mechanical damage. Once the peak loads are identified, the gun-shock software is used as a job design tool to modify both the gunstring and bottomhole assembly to lower the peak loads to a manageable figure.

Perforation debris can cause problems during both tubing-conveyed perforating and well cleanup operations. Using INSidr technology significantly reduces debris volume as confirmed with official API RP19B Section 5 debris tests.



HP HSD gun system with INSidr technology.



Comparison of predicted dynamic loads for two different HP HSD gun systems shot at 19,000 psi.

INSidr Technology – Gun Specifications

OD, in	3.5	4.72	6.62	7.0
Debris, g/ft	n/a	n/a	1,243 [†]	180 [†]
Debris, cm ³ /ft	n/a	n/a	404	102
Maximum pressure, psi [MPa]	27,000 [186.2] ^{††}	21,500 [148.2] ^{††}	27,000 [186.2] [§]	32,000 [220.6] [§]
Max. O-ring temperature rating, degF [degC]				
Viton®	375 [191]	375 [191]	375 [191]	375 [191]
Chemraz®	460 [238]	460 [238]	n/a	n/a
Max. temperature	Explosive time-temperature dependent			
Fluid limitation	Liquid only			
Charge	PJO3506 HNS	PJO4705 HNS	PF Max6618 HMX	PF Max6618 HMX
Max. diameter including burrs, [‡] in [mm]	4.03 [102.4]	5.17 [131.3]	6.94 [176.3]	7.20 [183]
Shots per foot, spf	6	5	18	18
Phasing, °	72	72	120	120

[†] API RP19B Section 5 Debris Tests

[‡] Shot in liquid

[§] 350 degF

^{††} 400 degF