

7-in High-Pressure HSD High Shot Density Perforating Gun System

High shot density with high-pressure performance featuring PowerFlow, PowerFlow Max, and CleanPack Max charges

APPLICATIONS

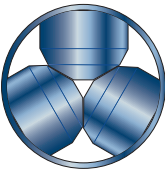
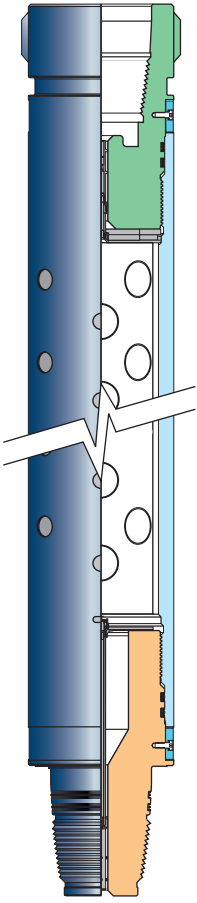
- Sand control completions
 - Gravel packs
 - High-rate water packs
 - Frac packs

The 7-in high-pressure (HP) HSD* high shot density gun system is designed for perforating heavyweight, high-strength 10½-in casing in wellbore pressures to 30,000 psi.

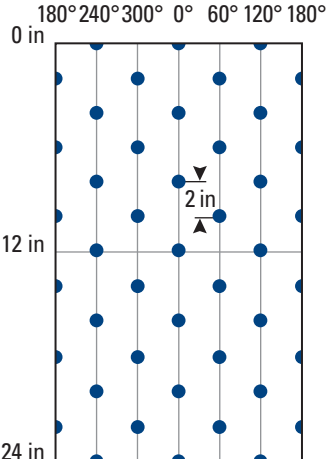
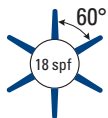
Sand control requires high shot density, optimized phasing, and big hole charges to maximize the area open to flow. PowerFlow* and PowerFlow Max* slug-free big hole shaped charges are ideal for this application. Perforation debris is limited by the patented loading technique that causes the charge case to break into large pieces when the gun is fired. This debris is too large to exit the gun body, which is highly practical for perforating operations in horizontal or highly deviated wells. INsidr* perforating shock and debris reduction technology can be used to add an additional level of debris reduction for maximizing the area open to flow. INsidr technology also reduces the gun shock that is common in high-pressure wells to protect tubing-conveyed perforating and completion equipment.

For special applications, other phasings and shot densities can be made on request.

The 7-in HP HSD guns are usually conveyed using tubing or coiled tubing, but can also be run on wireline.



Charge packing
7-in HP HSD gun, 18 spf,
120°/60° phasing.



18 spf, 120°/60° Phasing

Shot pattern for the 7-in HP HSD gun system for 10½-in casing.

7-in High-Pressure HSD High Shot Density Perforating Gun System

Mechanical Specifications

| | |
|---|---|
| Outside diameter, in | 7 With fin standoffs: 8.25 |
| Shots per foot (spf), phasing, ° | 18, 120/60 |
| Shot spacing, in | 2 |
| Temperature rating, degF [degC] | 350 [175] |
| Pressure rating, psi | 30,000 |
| Min. casing size, in | 9 ⁵ / ₈ |
| Nominal lengths, ft | 5, 10, 20 |
| Interval missed between guns, in | 21.6 |
| Max. outside diameter including burrs, in | Shot in liquid: 7.20 |
| Loaded 20-ft gun weight in air, lbm | With INsidr technology: 1,433 Without INsidr technology: 1,955 |
| Tensile load, lbf | 623,000 [†] |

[†] Based on worst-case material and machining tolerances

API Statistics[†]

API RP 19B shot in 10¹/₈-in 77.22-lbm/ft Q-125 casing

| Charge | Explosive Type, Max. Weight, g | Shots per Foot, Phasing, ° | Entrance Hole, in | Burr Avg./Max., in | Area Open to Flow, in ² /ft | Penetration, in | Temperature, degF | Target Strength, psi | Test Date |
|-----------------------------------|--------------------------------|----------------------------|-------------------|--------------------|--|-----------------|------------------------|----------------------|-----------|
| PowerFlow 6618 [‡] | HMX, 34.0 | 18, 120/60 | 0.66 | 0.15/0.34 | 6.16 | 6.0 | 1 h: 400 100 h: 300 | 7,618 | 02/2004 |
| PowerFlow Max 6618 ^{‡,§} | HMX, 38.8 | 18, 120/60 | 0.93 | 0.08/0.14 | 12.22 | 7.8 | 1 h: 400 100 h: 300 | 6,390 | 11/2011 |
| MultiFlow 6618 ^{‡,††} | HMX, 37.2 | 18, 120/60 | 0.49 | 0.09/0.18 | 3.39 | 11 | 1 h: 400 100 h: 300 | 4,601 | 06/2009 |

[†] Entrance hole, penetration, temperature

[‡] API 19B and 43 Registered Perforation Systems

[§] With INsidr shock and debris reduction technology; shot in 9⁵/₈-in 47.0-lbm/ft L-80 casing

^{††} Shot in dual casing string: 11¹/₈ in 71.8 lbm/ft and 10¹/₈ in 79.29 lbm/ft

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