2012 High Shot Density Perforating Systems Performance and Mechanical Data Summary

Perforating System Designation	Shot Density, spf	Phasing, °	Charge	API RP 19B Section 1						Maximum Explosive Load, g	Maximum Pressure Rating, psi	Weight of Loaded 20-ft Gun in Air (without adapters), lbm	Maximum Diameter Including Burrs, Shot in Liquid, in	Maximum Diameter Including Burrs, Shot in Gas, in
				Penetration, in	Entrance Hole, in	Area Open to Flow, in²/ft	Burr Height Avg/Max., in	Casing Size, in	Casing Weight, lbm/ft					
Deep Penetrators														
1.56-in HSD*	6	60	PowerJet* 1606, HMX	11.3	0.17	–	0.04/0.08	2⅞	6.4	3.5	20,000	76	1.72	1.75
2-in HSD	6	60	PowerJet Omega* 2006, HMX	21.8	0.22	–	0.05/0.08	3½	9.2	7.3	25,000	123	2.29	2.31
2-in HSD	6	60	PowerJet 2006, HNS	15.3	0.22	–	0.03/0.05	2⅞	6.4	8.0	25,000	123	2.16	2.21
2-in HSD	6	60	PowerJet 2006, HMX	18.7	0.23	–	0.02/0.08	2⅞	6.4	6.5	25,000	123	2.16	2.21
2-in HSD	6	60	HyperJet* 2006, RDX	9.6	0.33	–	0.05/0.08	3½	9.2	6.5	25,000	122	2.16	2.21
2-in Frac Gun*[†]	6	60	HyperJet 2006, RDX	9.6	0.33	–	0.05/0.08	3½	9.2	6.5	26,000	119	2.16	2.21
2¼-in HSD	6	60	PowerJet 2306, HMX	17.7	0.30	–	0.08/0.10	3½	9.2	8.7	20,000	155	2.46	2.48
2¼-in HSD	6	60	PowerJet 2306, HNS	15.7	0.27	–	0.06/0.09	3½	9.2	9.5	20,000	155	2.46	2.48
2½-in HSD	6	60	PowerJet Omega 2506, HMX	30.6	0.32	–	0.04/0.07	3½	9.2	12.0	25,000	171	2.78	–
2½-in HSD	6	60	PowerJet 2506, HNS	16.7	0.30	–	0.07/0.09	3½	9.2	13.5	25,000	174	2.66	2.75
2½-in HSD	6	60	PowerJet 2506, HMX	24.4	0.31	–	0.05/0.08	3½	9.2	10.5	25,000	176	2.66	2.75
2½-in HSD	6	60	HyperJet 2506, RDX	13.1	0.43	–	0.07/0.11	3½	9.2	10.5	25,000	176	2.66	2.75
2⅞-in HSD	6	60	PowerJet Omega 2906, HMX	36.0	0.34	–	0.05/0.08	4½	11.6	16.0	25,000	246	3.16	3.32
2⅞-in HSD	6	60	PowerJet 2906, HMX	25.3	0.38	–	0.06/0.08	4½	11.6	15.0	25,000	245	2.98	3.08
2⅞-in HSD	6	60	PowerJet Omega 2906, HNS	24.3	0.31	–	0.05/0.09	4½	11.6	17.6	25,000	249	3.16	3.32
2⅞-in HSD	6	60	PowerJet 2906, HNS	21.0	0.31	–	0.06/0.09	4½	11.6	19.5	25,000	239	2.96	3.08
2⅞-in HSD	6	60	UltraJet* 2906, HMX	22.1	0.36	–	0.07/0.09	4½	11.6	15.0	25,000	245	2.98	3.08
2⅞-in HSD	6	60	HyperJet 2906, RDX	15.0	0.39	–	0.06/0.09	4½	11.6	15.0	25,000	245	2.98	3.08
2⅞-in OrientXact*	5	±10	PowerJet OX 2905, HMX	26.2	0.21	–	na	5½	17.0	15.1	20,000	356	3.19	3.20
3⅛-in HSD	6	60	PowerJet Omega 3106, HMX	36.9	0.34	–	0.06/0.10	4½	11.6	20.0	20,000	301	3.57	–
3.12-in Frac Gun	6	60	PFrac* 3106, RDX	24.9	0.44	–	0.06/0.10	4½	11.6	22.5	15,000	280	3.50	–
3.12-in Frac Gun	6	60	PowerJet Omega 3104, HMX	37.5	0.38	–	na	4½	11.6	17.9	15,000	280	3.50	–
3⅛-in HSD	6	60	34JL UltraJet, HMX	24.0	0.41	–	0.07/0.11	4½	11.6	22.7	20,000	286	3.57	–
3⅜-in HSD[‡]	6	60	PowerJet 3406, HMX	36.5	0.37	–	0.06/0.09	4½	11.6	22.7	20,000	334	3.66	–
3⅜-in HSD[‡]	6	60	PowerJet 3406, HNS	28.8	0.31	–	0.05/0.10	4½	11.6	25.0	20,000	335	3.66	–
3⅜-in OrientXact[§]	5	±10	PowerJet OX 3505, HMX	37.7	0.34	1.52	0.06/0.07	5½	17.0	22.5	20,000	564	na	3.78
3⅜-in HSD[‡]	6	60	UltraJet 3406, HMX	31.4	0.44	–	0.06/0.13	4½	11.6	22.7	20,000	335	3.66	3.70
3⅜-in HSD[‡]	6	60	HyperJet 3406, RDX	22.5	0.49	–	0.06/0.11	4½	11.6	22.7	20,000	335	3.66	3.70
3.5-in HSD	6	72	PowerJet Omega 3506, HMX	44.2	0.44	–	0.06/0.14	5	15.0	27.0	25,000	370	3.72	–
3.5-in HSD	6	72	PowerJet Omega 3506, HNS	33.7	0.32	–	0.05/0.11	5	15.0	28.0	25,000	374	3.72	–
4-in HSD	5	72	PowerJet Omega 4005, HMX	51.7	0.48	–	0.07/0.12	5½	17.0	38.8	12,000	496	4.44	–
4-in HSD	5	0/180	PowerJet 4006, HMX	36.5	0.46	–	0.07/0.10	5½	17.0	26.0	12,000	425	na	4.37
4½-in HSD[††]	5	72	PowerJet Omega 4505, HMX	59.2	0.43	–	0.08/0.13	7	32.0	38.8	11,000	504	4.74	–
4½-in HSD[††]	5	72	PowerJet 4505, HMX	46.4	0.47	–	0.08/0.15	7	32.0	38.6	11,000	504	4.74	–
4½-in HSD[††]	12	135/45	PowerJet 4512, HMX	30.2	0.34	–	0.07/0.12	7	32.0	22.0	11,000	495	4.91	–
4½-in HSD[††]	12	135/45	PowerJet Omega 4512, HMX	34.0	0.35	–	0.07/0.12	7	32.0	22.0	11,000	495	4.91	–
4½-in OrientXact[‡‡]	4	±10	PowerJet OX 4504, HMX	43.8	0.29	1.58	0.06/0.08	7	32.0	38.8	11,000	568	4.74	4.77
4½-in HSD[††]	5	72	UltraJet 4505, HMX	42.6	0.46	–	0.08/0.13	7	32.0	38.3	11,000	485	4.74	–
4½-in HSD[††]	5	72	HyperJet 4505, RDX	37.0	0.57	–	0.11/0.16	7	32.0	38.8	11,000	487	4.74	–
4⅝-in HSD Bigshot 21*[§§]	21	120/60	PowerJet 4521, HMX	21.0	0.32	–	0.06/0.11	7	32.0	15.0	15,000	665	4.93	–
4.72-in HSD	5	72	PowerJet 4505, HMX	48.3	0.51	–	0.07/0.15	7	32.0	38.6	20,000	606	4.95	5.16
4.72-in HSD	5	72	PowerJet Omega 4705, HNS	44.4	0.36	–	0.09/0.14	7	32.0	38.8	20,000	606	4.95	5.16
4.72-in HSD	5	72	PowerJet 4505, HNS	34.4	0.40	–	0.06/0.10	7	32.0	38.0	20,000	623	4.95	5.16
4.72-in HSD	12	135/45	PowerJet 4512, HNS	22.8	0.31	–	0.06/0.11	7	32.0	22.5	20,000	610	4.99	5.16
5-in HSD	8	135/45	UltraJet 5008, RDX	20.2	0.54	–	0.11/0.22	7	32.0	24.0	12,000	620	5.19	5.22
7-in HSD	12	135/45	PowerJet Omega 4505, HMX	53.2	0.43	–	0.08/0.16	9⅝	47.0	38.8	10,000	1,168	7.28	–
7-in HSD	12	135/45	PowerJet 4505, HMX	43.6	0.44	–	0.08/0.15	9⅝	47.0	38.6	10,000	1,169	7.05	–
7-in HSD	12	135/45	UltraJet 4505, HMX	39.9	0.45	–	0.08/0.16	9⅝	47.0	38.3	10,000	1,123	7.05	–
7-in HSD	27	120/60	PowerJet Omega 7027, HMX	35.5	0.29	–	0.05/0.09	9⅝	47.0	20.0	10,000	1,110	7.05	–
7-in HSD	12	135/45	HyperJet 4505, RDX	37.0	0.57	–	0.11/0.16	9⅝	47.0	37.0	10,000	1,128	7.05	–
Big Casing Entrance Hole														
2-in HSD	6	60	PowerFlow* 2006, HMX	4.5	0.45	0.95	0.06/0.12	3½	9.2	6.4	25,000	119	2.16	2.21
2¼-in HSD	6	60	PowerFlow 2306, HMX	4.8	0.52	1.27	0.07/0.11	3½	9.2	–	20,000	149	2.46	2.48
2½-in HSD	6	60	PowerFlow 2506, HMX	5.2	0.64	1.93	0.08/0.12	3½	9.2	11.2	20,000	151	2.66	2.75
2½-in HSD	6	60	35B UltraPack, RDX	5.8	0.62	1.81	0.06/0.12	3½	9.2	10.5	25,000	167	2.80	2.80
2⅞-in HSD	6	60	38C CleanPACK*, HMX	6.6	0.70	2.31	0.06/0.08	4½	11.6	15.0	25,000	231	3.09	3.20
2⅞-in HSD	6	60	38C CleanPACK, RDX	8.4	0.62	1.81	0.09/0.13	4½	11.6	15.0	25,000	231	3.09	3.20
3⅛-in HSD	10	135/45	PowerFlow 3412, HMX	4.7	0.67	3.53	0.09/0.13	5	15.0	14.2	20,000	259	3.34	–
3⅜-in HSD[‡]	12	135/45	PowerFlow 3412, HMX	4.5	0.64	3.86	0.07/0.10	5½	17.0	14.2	20,000	339	3.52	3.58
4-in HSD	5	120	PowerFlow 5008, RDX	6.3	0.95	3.55	0.09/0.12	5½	17.0	30.0	20,000	414	4.19	–
4½-in HSD	6	120	PowerFlow 5008, RDX	6.0	0.93	4.08	0.12/0.18	7	32.0	30.0	12,000	437	4.74	–
4⅝-in HSD Bigshot 21[§§]	21	120/60	PowerFlow 4621, RDX	5.9	0.83	11.3	0.13/0.24	7	32.0	19.0	15,000	555	4.82	–
4⅝-in HSD Bigshot 21[§§]	21	120/60	PowerFlow 4621, HMX	6.1	0.83	11.3	0.15/0.28	7	32.0	19.4	15,000	555	4.82	–
4.72-in HSD Bigshot 21[§§]	21	120/60	PowerFlow 4621, RDX	5.4	0.73	8.80	0.12/0.26	7	32.0	19.0	20,000	596	na	–
5-in HSD	8	135/45	PowerFlow 5008, RDX	5.8	0.98	6.05	0.11/0.22	7	32.0	30.0	11,000	553	5.19	–
6.625-in HSD	18	120/60	PowerFlow 6618, HMX	6.8	0.91	11.7	0.13/0.24	9⅝	47.0	34.0	20,000	1,426	6.73	–
6.625-in INsidr*	18	120/60	PowerFlow Max 6618, HMX	7.0	0.94	12.5	0.06/0.16	9⅝	47.0	38.8	27,000	1,606	6.94	–
6.625-in INsidr[†††]	18	120/60	PowerFlow Max 6618, HMX	6.2	0.86	10.5	0.07/0.25	9⅞	62.8	38.8	27,000	1,606	6.94	–
6.625-in HP HSD	18	120/60	PowerFlow Max 6618, HMX	7.8	0.96	13.0	0.04/0.20	9⅝	47.0	38.8	27,000	1,352	6.89	–
6.625-in HP HSD[†††]	18	120/60	PowerFlow Max 6618, HMX	7.3	0.90	11.5	0.04/0.22	9⅞	62.8	38.8	27,000	1,352	6.89	–
6.625-in HP HSD[†††]	18	120/60	CleanPack Max 6618, HMX	7.4	0.87	10.7	0.04/0.18	9⅝	47.0	37.8	27,000	1,290	6.87	–
6.625-in HP HSD[†††]	18	120/60	CleanPack Max 6618, HMX	6.5	0.73	7.5	0.06/0.15	9⅞	62.8	37.8	27,000	1,290	6.87	–
7-in HSD[‡‡‡]	18	120/60	PowerFlow 7018, RDX	7.4	1.15	18.7	0.16/0.22	9⅝	47.0	45.0	10,000	1,236	7.13	–
7-in HSD[‡‡‡]	18	120/60	PowerFlow 7018, HMX	7.1	1.14	18.53	0.13/0.21	9⅝	47.0	49.5	10,000	1,236	7.13	–
7-in HSD[‡‡‡]	14	140/20	58C UltraPack, RDX	12.2	0.95	9.92	0.12/0.23	9⅝	47.0	61.0	10,000	1,234	7.27	–
7-in HSD[‡‡‡]	12	135/45	64C CleanPACK, RDX	10.1	1.13	11.41	0.10/0.22	9⅝	47.0	59.0	10,000	1,184	7.75	–
7-in HP HSD Insidr*	18	120/60	PowerFlow Max 6618, HMX	7.8	0.93	12.22	0.08	9⅝	47.0	38.8	30,000	1,735	7.20	–

Notes: Every attempt has been made to verify the accuracy of the data tabulated; contact your Schlumberger representative for further information. Other shot densities and phasings are available; Schlumberger also custom designs perforation systems to meet specific needs.
na = not available
HP = high pressure
Blue type identifies API 19B Registered Perforation Systems; unofficial API data is listed for the other systems.
[†] Available with PowerJet 2006 and UltraJet 2006 shaped charges
[‡] Available in 3⅜-, 3.5-, and 3.67-in perforating systems
[§] Available in 3.5-in perforating systems
[††] Available in 4½-, 4⅝-, 4.72-, and 5-in perforating systems
[‡‡] Available in 4.72-in perforating systems rated for high pressure
[§§] Available in 4⅝-, 4.72-, and 5-in perforating systems
[†††] Q 125 casing
[‡‡‡] Available in 7-in perforating systems rated for high pressure