

SHAPED CHARGE PERFORMANCE DATA

FracXact™ Uniform Hole Charges

Part No.	Description	E.H. Avg. (in.)‡	E.H. St.Dev. (%)‡	Gun O.D. (in.)	Casing Type (OD lb/ft steel)	Pen. Avg. (in.)†
TG21FX1-3	TopGun FracXact; 21gm RDX; 0.42in hole	0.40	5.6%	3 1/8	6.0" 24.5# P-110	16.2
		0.41	3.8%	3 1/8	5.5" 23.0# P-110	16.8
		0.41	5.5%	3 1/8	5.5" 20.0# P-110	17.1
		0.40	5.0%	3 1/8	5.0" 18.0# P-110	17.0
		0.40	5.0%	3 1/8	4.5" 15.1# P-110	15.7
		0.41	4.7%	3 1/8	4.5" 13.5# P-110	17.4
		0.43	9.2%	3 1/8	4.5" 11.6# P-110	17.0
		0.44	8.2%	3 1/8	4.5" 11.6# L-80	15.1
TG21FX1-2	TopGun FracXact; 21gm RDX; 0.38in hole	0.39	3.7%	3 1/8	6.0" 24.5# P-110	16.8
		0.39	3.5%	3 1/8	5.5" 23.0# P-110	16.7
		0.38	5.2%	3 1/8	5.5" 20.0# P-110	15.2
		0.39	5.6%	3 1/8	5.0" 18.0# P-110	17.3
		0.39	5.8%	3 1/8	4.5" 15.1# P-110	16.5
		0.40	6.8%	3 1/8	4.5" 13.5# P-110	17.2
		0.42	7.2%	3 1/8	4.5" 11.6# P-110	17.3
		0.44	6.2%	3 1/8	4.5" 11.6# L-80	16.3
TG21FX1-1	TopGun FracXact; 21gm RDX; 0.32in hole	0.30	6.6%	3 1/8	6.0" 24.5# P-110	31.5
		0.31	5.8%	3 1/8	5.5" 23.0# P-110	29.3
		0.31	6.3%	3 1/8	5.5" 20.0# P-110	29.4
		0.32	4.2%	3 1/8	5.0" 18.0# P-110	27.4
		0.32	3.4%	3 1/8	4.5" 15.1# P-110	29.5
		0.32	5.4%	3 1/8	4.5" 13.5# P-110	30.1
		0.34	4.8%	3 1/8	4.5" 11.6# P-110	30.5
		0.35	4.6%	3 1/8	4.5" 11.6# L-80	31.8
TG17FX1-30	TopGun FracXact; 17gm RDX; 0.30in hole [Limited Entry]	0.30	5.5%	3 1/8	5.5" 23# P-110 *	28.7 *
		0.29	6.6%	3 1/8	5.5" 20# P-110	
		0.29	3.7%	3 1/8	5.0" 18# P-110	
		0.29	4.7%	3 1/8	4.5" 13.5# P-110	
		0.33	5.1%	3 1/8	4.5" 11.6# L-80	
TG16FX1	TopGun FracXact; 16gm RDX; 0.38in hole	0.34	10.9%	2 3/4	5.5" 20# P-110	17.5 *
		0.37	4.0%	2 3/4	4.5" 15.1# P-110 *	
		0.38	7.0%	2 3/4	4.5" 13.5# P-110	
		0.40	6.8%	2 3/4	4.5" 11.6# P-110	
		0.40	9.7%	2 3/4	4.5" 11.6# L-80	
TG16FX1-28	TopGun FracXact; 16gm RDX; 0.28in hole [Limited Entry]	0.28	6.6%	2 3/4	5.5" 20# P-110	29.0 *
		0.28	4.5%	2 3/4	4.5" 15.1# P-110 *	
		0.29	4.6%	2 3/4	4.5" 13.5# P-110	
		0.32	6.4%	2 3/4	4.5" 11.6# P-110	
		0.33	5.6%	2 3/4	4.5" 11.6# L-80	
TG15FX1-26	TopGun FracXact; 15gm RDX; 0.26in hole [Limited Entry]	0.24	7.1%	2 3/4	5.5" 20# P-110	27.0 *
		0.27	5.7%	2 3/4	4.5" 15.1# P-110 *	
		0.26	4.1%	2 3/4	4.5" 13.5# P-110	
		0.26	3.7%	2 3/4	4.5" 11.6# L-80	
TG15FX1-25	TopGun FracXact; 15gm RDX; 0.25in hole [Limited Entry]	0.25	7.0%	2 3/4	5.5" 20# P-110	29.6 *
		0.26	3.8%	2 3/4	4.5" 15.1# P-110 *	
		0.27	3.5%	2 3/4	4.5" 13.5# P-110	
		0.29	3.0%	2 3/4	4.5" 11.6# L-80	

‡ Entry hole data from eccentrically-oriented 12-shot gun system testing

* Denotes casing utilized & penetration achieved for single-shot testing in concrete

† Single-shot testing; penetration measured in concrete

Good Hole / Big Hole Charges

Part No.	Description	Pen. Avg. (in.)†	E.H. Avg. (in.)‡	Gun O.D. (in.)	Casing Type (OD lb/ft steel)
TG15GH1	TopGun Good Hole; 15gm RDX	23.0	0.44	2 ¾	4.5" 11.6# L80
TG19GH1	TopGun Good Hole; 19gm RDX	30.5	0.54	3 ½	4.5" 11.6# L80
		30.5	0.54	3 ¾	4.5" 11.6# L80
		28.0	0.40	3 ½	5.5" 20# P110
		25.1	0.42	3 ¾	5.5" 20# P110
TG21GH1	TopGun Good Hole; 21gm RDX	29.2	0.55	3 ¾	4.5" 11.6# L80
TG23GH1	TopGun Good Hole; 22.7gm RDX	31.8	0.55	3 ½	4.5" 11.6# L80
		31.8	0.55	3 ¾	4.5" 11.6# L80

† Penetration measured in concrete; Average of 12 single shots across varying water clearances

‡ Entry hole data from eccentrically-oriented 12-shot gun system testing

Deep Penetrator Charges

Part No.	Description	Pen. Avg. (in.)†	E.H. Avg. (in.)‡	Gun O.D. (in.)	Casing Type (OD lb/ft steel)
TG19DP1	TopGun Deep Penetrator; 19gm RDX	27.0	0.35	3 ½	5.5" 20# P-110
TG21DP1	TopGun Deep Penetrator; 21gm RDX	20.3	0.35	3 ½	5.5" 20# P-110
TG23DP1	TopGun Deep Penetrator; 22.7gm RDX	25.9	0.36	3 ½	5.5" 20# P-110
TG15SP1	TopGun Super Penetrator; 15gm RDX	33.1	0.38	2 ¾	5.5" 20# P-110
TG18SP1	TopGun Super Penetrator; 18gm RDX	33.6	0.39	2 ¾	5.5" 20# P-110
TG21SP1	TopGun Super Penetrator; 21gm RDX	36.9	0.34	3 ½	5.5" 20# P-110
TG23SP1	TopGun Super Penetrator; 22.7gm RDX	36.6	0.43	3 ½	4.5" 11.6# L-80
		35.6	0.32	3 ¾	5.5" 20# P-110
TG19XP1	TopGun Xtra Penetrator; 19gm RDX	36.3	0.34	3 ½	5.5" 20# P-110
TG21XP1	TopGun Xtra Penetrator; 21gm RDX	36.8	0.33	3 ½	5.5" 20# P-110
TG23XP1	TopGun Xtra Penetrator; 22.7gm RDX	33.6	0.33	3 ½	5.5" 20# P-110

† Penetration measured in concrete; Average of six single shots across varying water clearances

‡ Entry hole data from eccentrically-oriented 12-shot gun system testing

Circulation / Puncher Charges

Part No.	Description	Wall Thickness (in.)	E.H. Avg. (in.)	Casing Pen. (in.)	Gun O.D. (in.)
TG20CS1	TopGun Good Circulation Small; 2.0gm RDX	0.190	0.39	<0.100	1 ⅜
		0.250	0.20	<0.100	1 ⅜
TG39CS2	TopGun Good Circulation Small; 4.0gm HMX	0.190	0.45	<0.100	1 ⅞
		0.375	0.31	<0.100	1 ⅞
TG39CM2	TopGun Good Circulation Medium; 4.0gm HMX	0.375	0.42	<0.100	1 ⅞
		0.500	0.23	<0.100	1 ⅞
TG39CL2	TopGun Good Circulation Large; 4.0gm HMX	0.500	0.21	<0.100	1 ⅞
		0.580	0.18	<0.100	1 ⅞

Most charge designs alternatively offered with HMX explosives; HNS charges also available upon request.