

SHAPED CHARGE

Tech Kit

Shaped Charge Performance

Steelhaus Energetics provides quality energetics designed to consistently deliver equal entrance hole perforations for enhanced reservoir performance. The EX family of charges deliver entrance hole variances less than 5%, per API RP 19B Section 1 test standard.

3 1/8" CARRIER CHARGE PERFORMANCE

Charge	Casing	Avg EH [in]	Variation [%]	Penetration [in]	Test Type	RDX Weight [gms]
EX35	5.5_20_P110	0.35	4.3	18.6	API 19B	18.9
	5.5_23_P110	0.35	< 5.0	19	Barrel*	18.9
EX38	5.5_20_P110	0.38	4.8	20	Barrel*	18.7
	5.5_23_P110	0.38	4.7	19.7	API 19B	18.7
EX40	5.5_20_P110	0.40	4.3	21.4	API 19B	19.4
	5.5_23_P110	0.40	4.4	22.1	API 19B	19.4
EX42	5.5_20_P110	0.42	4.3	21	Barrel*	20.4
	5.5_23_P110	0.42	4.2	21.5	API 19B	20.4
EX45	5.5_20_P110	0.45	4.7	20.0	API 19B	22.5
	5.5_23_P110	0.45	3.0	21	Barrel*	22.5

NOTE: Barrel*: barrel tests provide accurate entrance hole measurements. Extreme do not record penetration from barrel test. The EX charges have shown consistent penetration results in both 5.5" – 20lb/ft and 5.5" – 23lb/ft. Therefore, we are confident in the estimated penetration data provided. Additional testing or modeling can be done upon request for casing sizes not provided.



EX35 RDX SHAPED CHARGE

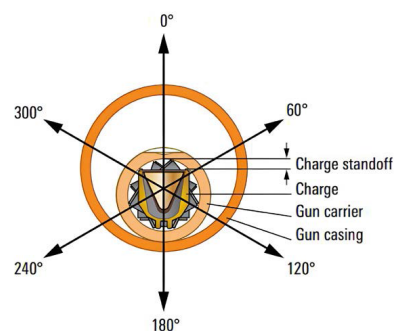
Equal Entry Hole Charge

EX35, RDX, Equal Entry Hole Charge

The EX series of shaped charges are a new line of energetics designed to consistently deliver equal entrance hole perforations, with variances less than 5%, per API RP 19B Section 1 test. Low variation in hole size is key in placing limited entry completions as designed. Also available in HMX for high temperature applications.

SPAN modeling or QC testing for charge performance in casing sizes other than shown is available upon request.

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Gun standoff around the wellbore.

SPECIFICATIONS

Gun Size [in]	Temp Rating - 1 hr [°F]	Temp Rating - 100 hr [°F]
3-1/8 or 3-3/8	340	240

PERFORMANCE DATA

Gun Size [in]	Casing Weight	Avg. Entrance [in]	Entrance Hole Deviation [%]	Penetration [in]	Explosive Weight [gms]	Test
3 1/8	5.5" - 20.0# - P110	0.35	4.3	18.5	18.9	API RP 19B Sec. 1

EX38 RDX SHAPED CHARGE

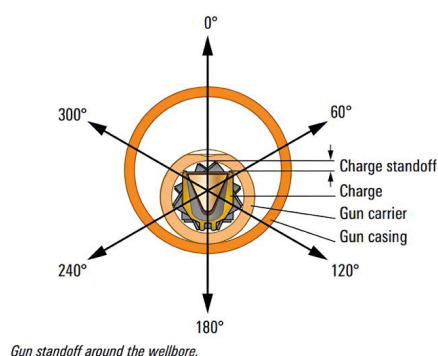
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PERFORMANCE DATA

Gun Size [in]	Casing Weight	Avg. Entrance [in]	Entrance Hole Deviation [%]	Penetration [in]	Explosive Weight [gms]	Test
3 1/8	5.5" - 20.0# - P110	0.38	4.8	~20**	18.7	Barrel - [API Pending]
3 1/8	5.5" - 23.0# - P110	0.38	4.7	19.7	18.7	API RP 19B Sec. 1

**5.5" - 20.0# - P110 API Witnessed test will be performed in Q1. Penetration data will be updated with results.



EX40 RDX SHAPED CHARGE

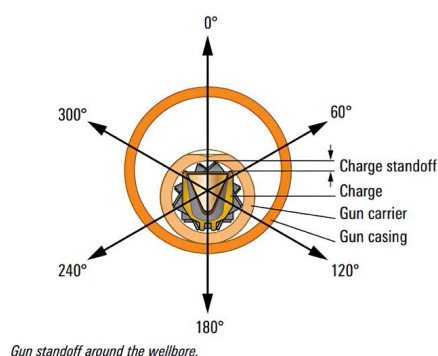
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Gun Size [in]	Casing Weight	Avg. Entrance [in]	Entrance Hole Deviation [%]	Penetration [in]	Explosive Weight [gms]	Test
3 1/8	5.5" - 20.0# - P110	0.40	4.3	21.4	19.4	API RP 19B Sec. 1
3 1/8	5.5" - 23.0# - P110	0.40	4.4	22.1	19.4	API RP 19B Sec. 1

EX42 RDX SHAPED CHARGE

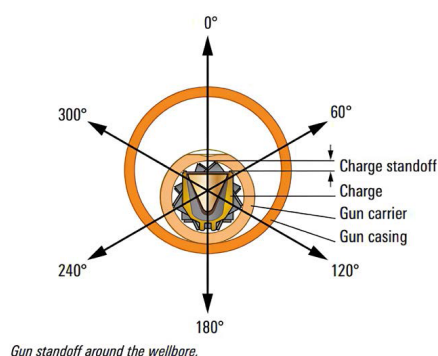
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3 1/8	5.5" - 23.0# - P110	0.42	4.2	21.5	20.4	API RP 19B Sec. 1

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EX45 RDX SHAPED CHARGE

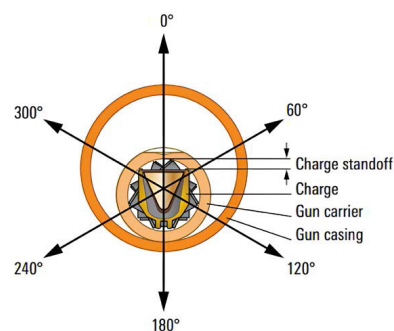
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3 1/8	5.5" - 23.0# - P110	0.45	3.0		22.5	Barrel