American Petroleum Institute

API Perforator Design Registration

REGISTERED DATA SHEET PERFORATING SYSTEM EVALUATION, API RP 19B SECTION 1

Service Company Available to all Design Number

Gun OD & Trade Name 2 1/8" Low Debris Link

Charge Name 2 1/8" Piranha Next Generation, HMX (DSC 02-12-22)

Manufacturer Charge Part No. TG30HNG Date of Manufacture Dec 17th 2002

Gun Type Fully Expendable Trough Tubing Gun, Link 6 SPF 45°

Phasing Tested 45 degrees, Firing Order X Top Down, ____ Bottom Up

Debris Description Case and Link: Steel chips Caps: Breaks in two ore three parts

Remarks * Debris fill in 4 ½" 11.6#, 5 ½" 17# and 7" 32# Casing is 0.172", 0.115", 0.074" Respectively per charge.

Explosive Weight 14.5 gm, HMX powder, Case Material Steel

Max. Temp, °F 375 1 hr ____ 3 hr ____ 24 hr ____ 100 hr ____ 200 hr

Maximum Pressure Rating 20.000 psi, Carrier Material Steel

Shot Density Tested 6 Shots/ft

Recommended Minimum ID for Running 2.25 in.

Available Firing Mode ____ Selective, X Simultaneous

Debris Weight 165 gm/charge, Debris * in^3/charge

SECTION 1 - CONCRETE TARGET

Casing Data 5 ½" OD, Weight 17 lb/ft, L-80 API Grade, Date of Section 1 Test Jan 21st 2003

Target Data 72" OD, Amount of Cement 5710 lb., Amount of Sand 11420 lb., Amount of Water 2969 lb.

Date of Compressive Strength Test Jan 21st 2003, Briquette Compressive Strength 7132 psi, Age of Target 32 days

Shot No.	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11
Clearance, in.	0.00	0.201	0.955	2.159	2.769	2.159	0.955	0.201	0.00	0.201	0.955
Casing Hole Diameter, Short Axis, in.	0.285	0.317	0.267	0.241	0.269	0.275	0.327	0.325	0.304	0.272	0.222
Casing Hole Diameter, Long Axis, in.	0.288	0.330	0.268	0.268	0.269	0.300	0.366	0.360	0.323	0.284	0.256
Average Casing Hole Diameter, in.	0.287	0.324	0.268	0.255	0.269	0.288	0.347	0.343	0.314	0.278	0.239
Total Depth, in.	25.050	28.800	29.050	28.800	31.425	26.175	24.675	29.050	26.050	20.050	26.550
Burr Height, in.	0.019	0.048	0.051	0.061	0.053	0.076	0.045	0.018	0.066	0.068	0.043

Shot No.	No. 12	No. 13	No. 14	No. 15	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22	Average
Clearance, in.	2.159	2.769	2.159	0.955	0.201	0.00	0.201	0.955	2.159			1.106
Casing Hole Diameter, Short Axis, in.	0.269	0.320	0.320	0.315	0.278	0.203	0.244	0.270	0.328			0.285
Casing Hole Diameter, Long Axis, in.	0.270	0.328	0.324	0.336	0.289	0.232	0.248	0.273	0.330			0.295
Average Casing Hole Diameter, in.	0.270	0.324	0.322	0.326	0.284	0.218	0.246	0.272	0.329			0.290
Total Depth, in.	28.050	26.800	28.550	28.300	25.050	20.800	28.300	26.300	24.800			26.631
Burr Height, in.	0.038	0.051	0.047	0.032	0.081	0.058	0.053	0.080	0.053			0.052

WITNESSING INFORMATION

Date of Notice of Intent to Test: April 22th 2002 Witnessed by: V. Smirnoff (API Certified)

Other Activities Witnessed: Target Pouring ____ Briquette: Preparation ____ Testing X Burr Height Measurement X Samples Taken: Concrete X Casing X

CERTIFICATION

I certify that these tests were made according to the procedures as outlined in API RP 19B: Recommended Practices for Evaluation of Well Perforators, First Edition, November 2000. All of the equipment used in these tests, such as the guns, jet charges detonator cord, etc., was standard equipment with our company for the use in the gun being tested and was not changed in any manner for the test. Furthermore, the equipment was chosen at random from stock and therefore will be substantially the same as the equipment, which would be furnished to perforate a well for any operator. The American Petroleum Institute neither endorses these test results nor recommends the use of the perforator system described.

X CERTIFIED BY ____ RECERTIFIED

(Company Official) Perforating Projects Manager (Title) Jan 31st 2003 (Date) Explosivos Tecnologicos Argentinos S.A. (Company) Ruta 25Km.13 Pilar- Bs.As. Argentina (Address)