American Petroleum Institute

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

Service Company: AVAILABLE TO ALL FROM OWEN OIL TOOLS
Explosive Weight: 8.4 gm, HMX powder, Case Material: STEEL
Gun OD & Trade Name: 1 11/16" SPIRAL SHOGUN / RAPTOR
Max. Temp, °F: 375 1 hr ____ 3 hr ____ 24 hr ____ 100 hr ____ 200 hr
Charge Name: 1 11/16" SHOGUN RAPTOR HMX
Maximum Pressure Rating: 20,000 psi, Carrier Material: STEEL
Manufacturer Charge Part No.: STP-1687-401NTX Date of Manufacture: 11-AUG-2003
Shot Density Tested: 6 Shots/ft
Gun Type: WIRELINE TROUGH TUBING STRIP, SEMI-EXPANDABLE
Recommended Minimum ID for Running: 1.781 in.
Phasing Tested: 40 degrees, Firing Order: X Top Down, ____ Bottom Up
Available Firing Mode: ____ Selective, X Simultaneous
Debris Description: STEEL CHIPS
Debris Weight: N/A gm/charge, Debris: N/A in^3/charge
Remarks: THE 1 11/16" SHOGUN SYSTEM INCLUDES 4 OR 6 SPF; 0 PHASE STRIP, +/- 45 DEG. STRIP, PHASEABLE LINK, AND SPRIAL PHASED (60° & 40°) RETRIEVABLE STRIP

SECTION 1 - CONCRETE TARGET

Casing Data: 4.5 OD, Weight: 11.6 lb/ft, L-80 API Grade, Date of Section 1 Test: 21-OCT-2003
Target Data: 60 OD, Amount of Cement: 7415 lb., Amount of Sand: 14950 lb., Amount of Water: 3876 lb.
Date of Compressive Strength Test: 21-OCT-2003, Briquette Compressive Strength: 6463 psi, Age of Target: 33 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.	1.70	0.67	0.14	0.00	0.14	0.67	1.70	2.59	2.59	1.70	0.67
Casing Hole Diameter, Short Axis, in.	0.22	0.23	0.25	0.23	0.24	0.22	0.27	0.20	0.25	0.26	0.25
Casing Hole Diameter, Long Axis, in.	0.22	0.23	0.26	0.24	0.27	0.24	0.28	0.21	0.25	0.26	0.27
Average Casing Hole Diameter, in.	0.22	0.23	0.26	0.24	0.26	0.23	0.28	0.21	0.25	0.26	0.26
Total Depth, in.	23.25	19.50	21.75	19.25	24.25	16.10	20.25	LOST	19.75	18.25	18.25
Burr Height, in.	0.07	0.06	0.05	0.03	0.07	0.07	0.02	0.04	0.03	0.02	0.07

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.	0.14	0.00	0.14	0.67	1.70	2.59	2.59	1.70	0.67	0.14	0.00	xxx
Casing Hole Diameter, Short Axis, in.	0.24	0.25	0.25	0.19	0.25	0.24	0.23	0.23	0.26	0.21	0.20	0.24
Casing Hole Diameter, Long Axis, in.	0.25	0.26	0.26	0.20	0.26	0.26	0.24	0.25	0.26	0.23	0.22	0.25
Average Casing Hole Diameter, in.	0.25	0.26	0.26	0.20	0.26	0.25	0.24	0.24	0.26	0.23	0.22	0.24
Total Depth, in.	LOST	18.25	19.63	18.75	18.00	LOST	15.25	22.75	16.25	17.25	20.25	19.31
Burr Height, in.	0.07	0.02	0.04	0.05	0.05	0.05	0.02	0.04	0.08	0.07	0.02	0.05

WITNESSING INFORMATION

Date of Notice of Intent to Test: September 29, 2003
Witnessed by: Ed Langford
Other Activities Witnessed: Target Pouring ____ Briquette: Preparation ____ Testing ____ Burr Height Measurements 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)	VICE PRESIDENT – ENGINEERING	10-22-03	OWEN OIL TOOLS	12001 County Road 1000 Godley, TX 76044
		(Title)	(Date)	(Company)	(Address)