Registered Data Sheet Perforating System Evaluation, API RP 19B Section 1

API Form 19B-Section 1 ☑ Conforms to All Requirements of Section 1 ☑ Special Test - See Remarks/Exceptions below

Service Company: Oiltech Services Pte. Ltd.
Gun OD & Trade Name: 3-3/8" 6 SPF 60° Phase Carrier
Charge Name: HSD 34BX 22.7g HMX XDP
Manufacturer Charge Part No.: OT60185 Date of Manufacture: 12 Oct 2010
Gun Type: TCP, Wireline, Retrievable Tubular Carrier with scallop
Phasing Tested: 60 degrees, Firing Order: X Top down ___ Bottom up
Debris Description: N/A

Explosive weight: 22.7 gm, HMX powder, Case Material: Steel
Max Temp, °F: 400 1 hr ___ 3 hr ___ 24 hr 300 100 hr ___ 200 hr
Maximum Pressure Rating: 20,000 psi, Carrier Material: Steel
Shot Density Tested: 6 Shots/ft: ___
Recommended Minimum ID for Running: See remarks in.
Available Firing Mode: X Selective X Simultaneous
Debris Weight: N/A gm/charge, Debris: N/A in³/charge

Remarks/Exceptions per Section 1.11: The only exception on this API 19B test is: It was performed with air instead of water in the gun to casing annulus to simulate a gas well environment.

Casing Data: 4-1/2" OD, Weight: 11.6 lb/ft, API Grade: ___ Date of Section 1 Test: ___
Target Data: 81" OD, Amount of Cement: 9,383 lb, Amount of Sand: 18,988 lb, Amount of Water: 4,877 lb.
Date of Compressive Strength Test: 15 Nov 2010 Briquette Compressive Strength: 6,405 psi, Age of Target: 50 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	0.14	0.45	0.63	0.45	0.14	0.00	0.14	0.45	0.63	0.45
Casing Hole Diameter, Short Axis, in	0.32	0.31	0.32	0.31	0.32	0.31	0.32	0.30	0.32	0.30	0.32
Casing Hole Diameter, Long Axis, in	0.35	0.33	0.34	0.34	0.35	0.33	0.34	0.33	0.34	0.33	0.36
Average Casing Hole Diameter, in.	0.34	0.32	0.33	0.33	0.34	0.32	0.33	0.32	0.33	0.32	0.34
Total Depth, in.	32.25	37.75	36.75	33.75	27.25	34.75	loss	32.75	31.25	35.25	30.25
Burr Height, in.	0.03	0.04	0.04	0.03	0.01	0.02	0.02	0.03	0.05	0.06	0.05

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	0.45	0.63	0.45	0.14	0.00	0.14	0.45		XXXXXX
Casing Hole Diameter, Short Axis, in	0.32	0.31	0.31	0.31	0.32	0.31	0.31	0.31	0.32	0.31		0.31
Casing Hole Diameter, Long Axis, in	0.35	0.34	0.34	0.34	0.34	0.34	0.33	0.33	0.34	0.34		0.34
Average Casing Hole Diameter, in.	0.34	0.33	0.33	0.33	0.33	0.33	0.32	0.32	0.33	0.33		0.33
Total Depth, in.	34.75	26.75	34.25	34.25	31.25	35.25	26.25	31.25	34.75	25.25		32.30
Burr Height, in.	0.04	0.02	0.04	0.04	0.05	0.06	0.03	0.04	0.03	0.04		0.04

Remarks: Maximum gun diameter after shooting in air is 3.65"

Manufacturer's Certification

Type of Certification: ___ Self X Third Party

I certify that these tests were made according to the procedures as outlined in API 19B: Recommended Practice for Evaluation of Well Perforators, Second Edition, September 2006. 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 that would be furnished to perforate a well for any operator. API neither endorses these tests nor recommends the use of the perforator system described.

X CERTIFIED BY / ___ RECERTIFIED	Hubert Menard	COO	23 Nov 2010	Oiltech Services Pte Ltd	25 Pandan Crescent, TIC Tech Centre #06-12, Singapore 128477
	(Company Official)	(Title)	(Date)	(Company)	(Address)

Name of test as it should appear on website: SPECIAL TEST: 3-3/8", HSD 34BX 22.7g HMX XDP, 60° Phasing, 6 SPF

Name of test as it appears on application and application date: Charge: HSD 34BX 22.7g HMX XDP, Gun: 3-3/8", 6 SPF, 60° Phase Carrier

energy API

GUN DEBRIS DATA SHEET FOR HOLLOW CARRIER PERFORATING SYSTEMS, PER API RP 19B SECTION 5

Hardware Description

Service Company: Oiltech Services Pte. Ltd.
Gun OD & Trade Name: 3-3/8" 6 SPF 60° Phase carrier
Gun Type: TCP, Wireline, retrievable tubular hollow carrier with scallop
Gun Assy Part No.: OT33362
Shots per Foot: 6
Phasing: 60°
Total Shot Positions in Gun: 31

Charge Description

Charge Name: HSD 34BX 22.7g HMX XDP
Charge Part No.: OT60185
Explosive Type: HMX
Grams per Chg: 22.7
Total Chgs Tested: 24
Case Mat.: Steel

Test Configuration: Casing O.D. 4-1/2 in. Casing wt. per Foot 11.6 lbs.

Debris Quantities and Description

5.2.3 - Net Pre Test Weight of Loaded Gun Assembly (less explosives and any other consumables)	46.35	kg
5.2.5 - Dry Weight of Expended Gun Assembly (before rolling procedure)	46.25	kg
5.2.7 - Weight of Debris Lost per Linear Foot of Perforations at Time of Detonation	25.5	gm
5.2.8 - Volume of Debris Lost per Linear Foot of Perforations at Time of Detonation	6.59	cc
5.3.2 - Weight of Debris Rolled From Gun per Linear Foot of Perforations (after 100 revolutions)	3.88	gm
5.3.4 - Volume of Debris Rolled From Gun per Linear Foot of Perforations (after 100 revolutions)	1	cc
5.3.5 - Average weight of gun debris per cc	3.88	gm/cc
5.3.7 - Total Volume of Debris Lost per Linear Foot of Perforations	7.89	cc
5.3.8 - Total Weight of Debris Lost per Linear Foot of Perforations	29.34	gm

5.3.9 -

No.	U S Seive Size	% by Wt.Retained	Debris Description Including Type of Material
1	12.70 mm (.500 in)	0.00	-
2	9.53 mm (.375 in.)	0.00	-
3	6.35 mm (.250 in.)	6.45	Steel Fragments
4	4.75 mm (.187 in.) # 4	0.65	Small Steel Fragments
5	2.36 mm (.094 in.) # 8	20.65	Small Steel Fragments
6	Through # 8 sieve	72.25	Steel Powder

5.3.10 - Avg Exit Hole Size in Gun: 0.43 in.

Test Date: 16 Nov. 2010

Remarks:

MANUFACTURER'S 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, Second Edition, September 2006. 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 other than what is specified in Section 5. 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. This test is designed for comparative purposes only, and should not be used to determine the amount of debris that will be left in any given well bore. API neither endorses these test results nor recommends the use of the perforator system described.

COMPANY: Oiltech Services Pte. Ltd. ADDRESS: 25 Pandan Crescent, TIC Tech Centre #06-12, Singapore 128477

X CERTIFIED BY: Hubert Menard (Company Official) — Chief Operation Officer (Title) — 23 November 2010 (Date)

RECERTIFIED BY:

Name of test as it should appear on website:

Name of test as it appears on application and application date: