



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. Explosive weight 45 gm, RDX powder, Case Material Steel

Gun OD & Trade Name 7" 12 SPF 135° Phase Carrier Max Temp, °F 340 1 hr 3 hr 24 hr 100 hr 200 hr

Charge Name HSD 51C 45g RDX BH Maximum Pressure Rating 13,000 psi, Carrier Material Steel

Manufacturer Charge Part No. OT60720 Date of Manufacture 16 June 2010 Shot Density Tested 12 Shots/ft _____

Gun Type TCP, Wireline, Retrievable Tubular Carrier Recommended Minimum ID for Running _____ in.

Phasing Tested 135/45 degrees, Firing Order: Top down Bottom up Available Firing Mode: X Selective X Simultaneous

Debris Description Steel Fragments Debris Weight N/A gm/charge, Debris N/A in³/charge

Remarks/Exceptions per Section 1.11 _____

Casing Data 9-5/8" OD, Weight 47 lb/ft, API Grade, L-80 Date of Section 1 Test 29 July 2010

Target Data 54" OD, Amount of Cement 5,078 lb, Amount of Sand 10,279 lb, Amount of Water 2,639 lb.

Date of Compressive Strength Test 28 July 2010 Briquette Compressive Strength 6,032 psi, Age of Target 33 days

	No 1	No 2	No 3	No 4	No 5	No 6	No 7	No 8	No 9	No 10	No 11	
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	1.35	0.74	0.20	1.63	1.35	0.74	1.35	0.00	1.35	0.74	
Casing Hole Diameter, Short Axis, in.	0.91	1.18	0.95	1.02	1.28	0.92	1.14	1.13	0.90	1.11	0.93	
Casing Hole Diameter, Long Axis, in.	0.97	1.22	0.97	1.07	1.32	0.95	1.20	1.19	0.95	1.16	0.96	
Average Casing Hole Diameter, in.	0.94	1.20	0.96	1.05	1.30	0.94	1.17	1.16	0.93	1.14	0.95	
Total Depth, in.	5.47	7.47	5.47	7.47	8.47	6.47	loss	loss	6.47	loss	6.47	
Burr Height, in.	0.05	0.06	0.08	0.06	0.05	0.06	0.07	0.10	0.05	0.06	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.	0.20	1.63	1.35	0.74	1.35							XXXXXX
Casing Hole Diameter, Short Axis, in.	0.95	1.13	0.93	1.11	1.07							1.04
Casing Hole Diameter, Long Axis, in.	0.98	1.18	0.97	1.23	1.11							1.09
Average Casing Hole Diameter, in.	0.97	1.16	0.95	1.17	1.09							1.07
Total Depth, in.	6.47	5.47	4.97	loss	5.97							6.39
Burr Height, in.	0.02	0.06	0.04	0.04	0.04							0.06

Remarks _____

Manufacturer's Certification

Type of Certification: _____ Self 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.

CERTIFIED BY John T. Bar Managing Director 2 August 2010 Oiltech Services Pte. Ltd. 25 Pandan Crescent #06-12, TIC Tech Centre, Singapore 128477

RECERTIFIED _____ (Company Official) _____ (Title) _____ (Date) _____ (Company) _____ (Address)

Name of test as it should appear on website: 7", HSD 51C 45g RDX BH, 135° Phasing, 12 SPF

Name of test as it appears on application and application date: Charge: HSD 51C 45g RDX BH, Gun: 7", 12 SPF, 135° Phase Carrier

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

Hardware Description				Charge Description	
Service Company <u>Oiltech Services Pte. Ltd.</u>				Charge Name <u>HSD 51C 45g RDX BH</u>	
Gun OD & Trade Name <u>Carrier / Tube, 7.00" HSD, 12 SPF, 135° - 45°, 4 ft</u>				Charge Part No. <u>OT60720</u>	
Gun Type <u>TCP and Wireline Hollow Carrier, Non-reuseable</u>		Gun Assy Part No. <u>H428597 / OT37029</u>		Explosive Type <u>RDX</u> Grams per Chg <u>45</u>	
Shots per Foot <u>12</u>		Phasing <u>135° / 45°</u>		Total Chgs Tested <u>30</u> Case Mat. <u>Steel</u>	
Total Shot Positions in Gun <u>37</u>					

Test Configuration: Casing O.D. 9-5/8 in. Casing wt. per Foot 47 lbs.

Debris Quantities and Description

5.2.3 - Net Pre Test Weight of Loaded Gun Assembly (less explosives and any other consumables) -----	166.27	kg
5.2.5 - Dry Weight of Expended Gun Assembly (before rolling procedure) -----	164.60	kg
5.2.7 - Weight of Debris Lost per Linear Foot of Perforations at Time of Detonation -----	1,673	gm
5.2.8 - Volume of Debris Lost per Linear Foot of Perforations at Time of Detonation -----	48.67	cc
5.3.2 - Weight of Debris Rolled From Gun per Linear Foot of Perforations (after 100 revolutions) -----	369.56	gm
5.3.4 - Volume of Debris Rolled From Gun per Linear Foot of Perforations (after 100 revolutions) -----	67.20	cc
5.3.5 - Average weight of gun debris per cc -----	13.75	gm/cc
5.3.7 - Total Volume of Debris Lost per Linear Foot of Perforations -----	115.87	cc
5.3.8 - Total Weight of Debris Lost per Linear Foot of Perforations -----	1,038.56	gm

5.3.9 -	No.	U S Sieve Size	% by Wt.Retained	Debris Description Including Type of Material
	1	12.70 mm (.500 in)	10.01	Steel Fragments
	2	9.53 mm (.375 in.)	26.04	Steel Fragments
	3	6.35 mm (.250 in.)	29.48	Steel Fragments
	4	4.75 mm (.187 in.) # 4	10.15	Small Steel Fragments
	5	2.36 mm (.094 in.) # 8	11.34	Small Steel Fragments
	6	Through # 8 sieve	12.98	Steel Powder

5.3.10 - Avg Exit Hole Size in Gun 0.68 in. Test Date 30 July 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: John T. Blair Managing Director 2 August 2010
 _____ RECERTIFIED BY: Company Official _____ Title _____ Date

Name of test as it should appear on website: _____

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