



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 22.7 gm, HMX powder, Case Material Steel

Gun OD & Trade Name 4-1/2" 12 SPF 135° Phase Carrier Max Temp, °F 400 1 hr 3 hr 300 24 hr 100 hr 200 hr

Charge Name HSD 34BX 22.7g HMX XDP Maximum Pressure Rating 12,000 psi, Carrier Material Steel

Manufacturer Charge Part No. OT60185 Date of Manufacture 2 Feb. 2010 Shot Density Tested 12 Shots/ft _____

Gun Type TCP, Wireline, Retrievable tubular carrier with scallop Recommended Minimum ID for Running _____ 5" _____ in.

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

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

Remarks/Exceptions per Section 1.11 Casing used was 29 lb/ft, since 32 lb/ft casing was not available

Casing Data 7" OD, Weight 29 lb/ft, API Grade, L-80 Date of Section 1 Test 12 Mar 2010

Target Data 79" OD, Amount of Cement 9,330 lb, Amount of Sand 18,889 lb, Amount of Water 4,852 lb.

Date of Compressive Strength Test 11 Mar 2010 Briquette Compressive Strength 6,879 psi, Age of Target 35 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 | 1.38 | 0.73 | 0.19 | 1.68 | 0.19 | 0.73 | 1.38 | 0.00 | 1.38 | 0.73 | |
| Casing Hole Diameter, Short Axis, in | 0.28 | 0.28 | 0.30 | 0.33 | 0.26 | 0.33 | 0.33 | 0.30 | 0.33 | 0.27 | 0.32 | |
| Casing Hole Diameter, Long Axis, in | 0.32 | 0.29 | 0.34 | 0.39 | 0.29 | 0.34 | 0.36 | 0.31 | 0.34 | 0.28 | 0.34 | |
| Average Casing Hole Diameter, in. | 0.30 | 0.29 | 0.32 | 0.36 | 0.28 | 0.34 | 0.35 | 0.31 | 0.34 | 0.28 | 0.33 | |
| Total Depth, in. | 12.90 * | 27.40 | 14.40 * | 22.90 | 29.40 | 17.40 | 16.90 | 31.90 | 11.90 * | 22.40 | 23.40 | |
| Burr Height, in. | 0.03 | 0.06 | 0.06 | 0.09 | 0.07 | 0.05 | 0.07 | 0.03 | 0.05 | 0.05 | 0.08 | |
| 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. | 0.19 | 1.68 | 0.19 | 0.73 | 1.38 | 0.00 | 1.38 | 0.73 | 0.19 | 1.68 | 0.19 | XXXXXX |
| Casing Hole Diameter, Short Axis, in | 0.30 | 0.28 | 0.33 | 0.31 | 0.31 | 0.32 | 0.28 | 0.30 | 0.30 | 0.28 | 0.30 | 0.30 |
| Casing Hole Diameter, Long Axis, in | 0.33 | 0.29 | 0.36 | 0.32 | 0.32 | 0.33 | 0.30 | 0.33 | 0.33 | 0.32 | 0.33 | XXXXXXXX |
| Average Casing Hole Diameter, in. | 0.32 | 0.29 | 0.35 | 0.32 | 0.32 | 0.33 | 0.29 | 0.32 | 0.32 | 0.30 | 0.32 | XXXXXXXX |
| Total Depth, in. | 30.90 | loss * | 17.40 | 24.40 | 26.90 | 18.40 | 29.40 | 28.40 | 29.90 | 26.40 | 27.90 | XXXXXXXX |
| Burr Height, in. | 0.05 | 0.06 | 0.06 | 0.09 | 0.07 | 0.03 | 0.04 | 0.06 | 0.05 | 0.04 | 0.04 | XXXXXXXX |

Remarks * Some part of the penetration was loss and was not included in the average.

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. Blair Managing Director 15 Mar 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: 4-1/2", HSD 34BX 22.7g HMX XDP, 135° Phasing, 12 SPF

Name of test as it appears on application and application date: Charge: HSD 22.7g HMX XDP, Gun: 4-1/2", 12 SPF, 135° Phase Carrier



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Service Company Oiltech Services Pte. Ltd. Explosive weight 22.7 gm, HMX powder, Case Material Steel
 Gun OD & Trade Name 4-1/2" 12 SPF 135° Phase Carrier Max Temp. °F 400 1 hr 3 hr 300 24 hr 100 hr 200 hr
 Charge Name HSD 34BX 22.7g HMX XDP Maximum Pressure Rating 12,000 psi, Carrier Material Steel
 Manufacturer Charge Part No. OT60185 Date of Manufacture 2 Feb. 2010 Shot Density Tested 12 Shots/ft _____
 Gun Type TCP, Wireline, Retrievable tubular carrier with scallop Recommended Minimum ID for Running _____ 5" _____ in.
 Phasing Tested 135/45 degrees, Firing Order: X Top down Bottom up Available Firing Mode: _____ X Selective _____ X Simultaneous
 Debris Description N/A Debris Weight N/A gm/charge, Debris N/A in³/charge

Remarks/Exceptions per Section 1.11 Casing used was 29 lb/ft, since 32 lb/ft is not available

Casing Data 7" OD, Weight 29 lb/ft, API Grade, L-80 Date of Section 1 Test 12 Mar 2010
 Target Data 79" OD, Amount of Cement 9,330 lb, Amount of Sand 18,889 lb, Amount of Water 4,852 lb.
 Date of Compressive Strength Test 11 Mar 2010 Briquette Compressive Strength 6,879 psi, Age of Target 35 days

| Shot No. | No 23 | No 24 | No 25 | No 26 | No 27 | No 28 | No 29 | No 30 | No 31 | No 32 | No 33 | |
|--------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| Clearance, in. | 0.00 | 1.38 | 0.73 | | | | | | | | | |
| Casing Hole Diameter, Short Axis, in | 0.31 | 0.26 | 0.31 | | | | | | | | | |
| Casing Hole Diameter, Long Axis, in | 0.33 | 0.28 | 0.34 | | | | | | | | | |
| Average Casing Hole Diameter, in. | 0.32 | 0.27 | 0.33 | | | | | | | | | |
| Total Depth, in. | 23.40 | 24.90 | 14.40 | | | | | | | | | |
| Burr Height, in. | 0.08 | 0.06 | 0.03 | | | | | | | | | |
| Shot No. | No 34 | No 35 | No 36 | No 37 | No 38 | No 39 | No 40 | No 41 | No 42 | No 43 | No 44 | Average |
| Clearance, in. | | | | | | | | | | | | |
| Casing Hole Diameter, Short Axis, in | | | | | | | | | | | | XXXXXXXX |
| Casing Hole Diameter, Long Axis, in | | | | | | | | | | | | 0.32 |
| Average Casing Hole Diameter, in. | | | | | | | | | | | | 0.32 |
| Total Depth, in. | | | | | | | | | | | | 24.50 |
| Burr Height, in. | | | | | | | | | | | | 0.06 |

Remarks * Some part of the penetration was loss and was not included in the average.

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.

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

Name of test as it should appear on website: 4-1/2", HSD 34BX 22.7g HMX XDP, 135° Phasing, 12 SPF

Name of test as it appears on application and application date: Charge: HSD 22.7g HMX XDP, Gun: 4-1/2", 12 SPF, 135° Phase Carrier