Service Company: AVAILABLE TO ALL

Explosive Weight: 32.0 gm, RDX powder, Case Material: ZINC

Gun OD & Trade Name: 5-1/8" 12SPF 135 DEG PH TWISTLOCK

Max. Temp, °F: 325 1 hr, 24 hr: 200

Charge Name: 5" MIRAGE 12SPF RDX SH

Maximum Pressure Rating: psi, Carrier Material: STEEL

Manufacturer Charge Part No.: 101307494

Date of Manufacture: 02/13/03

Shot Density Tested: 12

Recommended Minimum ID for Running in: 135
degrees, Firing Order: X

Debris Description: ZINC POWDER

Remarks: Debris Weight gm/charge, Debris in3/charge

SECTION 1 - CONCRETE TARGET

Casing Data: 7-5/8" OD, Weight 33.7 lb/ft, L-80 API Grade, Date of Section 1 Test: APRIL 17, 2003

Target Data: 72" OD, Amount of Cement 6,345 lb, Amount of Sand 12,710 lb, Amount of Water 3,274 lb,

Date of Compressive Strength Test: APRIL 17, 2003, Briquette Compressive Strength 5,576 psi, Age of Target: 34 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. ............................... 70 91 82 73 95 73 82 91 70 91 82
Casing Hole Diameter, Short Axis, in. ............................... 86 81 86 87 85 86 85 82 88 85 81
Casing Hole Diameter, Long Axis, in. ............................... 87 84 87 91 86 89 87 85 91 89 86
Average Casing Hole Diameter, in. ............................... 87 83 87 89 86 88 86 84 90 87 84
Total Depth, in. ............................... 6.9 6.4 LOST 6.4 6.0 5.9 5.9 6.2 6.4 6.4 7.1
Burr Height, in. ............................... 0.9 10 0.7 10 10 11 11 .14 .08 .09 .15

Shot No. No. 12 No. 13 No. 14 No. 15 No. 16 No. 17 No. 18 No. 19 No. 20 No. 21 No. 22
Clearance, in. ............................... 73 95 73 82 91 70 91 82 .73 95 .73
Casing Hole Diameter, Short Axis, in. ............................... 92 .86 .84 .88 .85 .83 .86 .85 .92 .87 .85
Casing Hole Diameter, Long Axis, in. ............................... 97 .96 .87 .91 95 .96 .92 .89 .95 .88 .88
Average Casing Hole Diameter, in. ............................... 95 .91 .86 .90 .90 .89 .87 .94 .90 .87 NEXT
Total Depth, in. ............................... 7.0 7.6 6.9 7.0 6.1 7.2 5.9 6.0 7.1 6.9 7.0
Burr Height, in. ............................... 12 .11 .11 .11 .12 .13 .10 .13 .12 .11 .08 .15

WITNESSING INFORMATION

Date of Notice of Intent to Test: MARCH 25, 2003

Witnessed by: JERRY BALDWIN

Other Activities Witnessed: Target Pouring _____     Briquette: Preparation_____   Testing_____    Burr Height Measurements_____

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 RESEARCH & ENGINEERING MANAGER JET RESEARCH CENTER 8432 S. IH35W, ALVARADO, TX. 76009
(Company Official) (Title) (Company) (Address)

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

Service Company: AVAILABLE TO ALL

Explosive Weight: 32.0 gm, RDX powder, Case Material: ZINC

Gun OD & Trade Name: 5-1/8" 12SPF 135 DEG PH TWISTLOCK

Max. Temp. °F: 325 1 hr, 3 hr, 24 hr, 100 hr, 200 hr

Charge Name: 5" MIRAGE 12SPF RDX SH

Maximum Pressure Rating: 18,000 psi, Carrier Material: STEEL

Manufacturer Charge Part No.: 101307494 Date of Manufacture: 02/13/03

Shot Density Tested: 12 Shots/ft

Recommended Minimum ID for Running: in.

Phasing Tested: 135 degrees, Firing Order: X Top Down, Bottom Up

Available Firing Mode: Selective, Simultaneous

Debris Description: ZINC POWDER

Debris Weight: gm/charge, Debris in3/charge

Remarks

SECTION 1 - CONCRETE TARGET

Casing Data: 7-5/8" OD, Weight: 33.7 lb/ft, L-80 API Grade, Date of Section 1 Test: APRIL 17, 2003


Date of Compressive Strength Test: APRIL 17, 2003, Briquette Compressive Strength: 5,576 psi, Age of Target: 34 days

Shot No. Clearances: No. 23 .82 in., No. 24 .91 in.,...

Casing Hole Diameter, Short Axis: .84 in., .91 in.,...

Casing Hole Diameter, Long Axis: .93 in., .94 in.,...

Average Casing Hole Diameter: .89 in., .93 in.,...

Total Depth: 5.9 in., 6.5 in.,...

Burr Height: .12 in., .12 in.,...

Shot No. Clearances: No. 34 .82 in., No. 35 .86 in.,...

Casing Hole Diameter, Short Axis: .86 in., .90 in.,...

Casing Hole Diameter, Long Axis: .88 in.,...

Average Casing Hole Diameter: 6.6 in., 11...

Burr Height: .11 in.,...

WITNESSING INFORMATION

Date of Notice of Intent to Test: MARCH 25, 2003, Witnessed by: JERRY BALDWIN

Other Activities Witnessed: Target Pouring X, Briquette: Preparation X, Testing X, 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.

CERTIFIED BY

RESEARCH & ENGINEERING MANAGER

JET RESEARCH CENTER

8432 S. IH35W, ALVARADO, TX. 76009

API Form Specialized Test