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: BVT, CJSC
Gun OD & Trade Name: 4,5" (114 mm) PK0114-AT
Charge Name: ZPK114-AT-M-10
Manufacturer Charge Part No.: ZPK114-AT-M-10 Date of Manufacture: August 28, 2012
Gun Type: Expendable Gun TCP/Wireline
Phasing Tested: 60 degrees, Firing Order: Top Down: Bottom up: X
Debris Description: N/A

Explosive Weight: 27,5 gm, RDX powder, Case Material: Steel
Max Temp, °F: 302(150°C) 2hr 284(140°C) 5hr 266(130°C) 12hr 248(120°C) 30hr 230(110°C) 72hr
Maximum Pressure Rating: 11603 (80 MPa) psi, Carrier Material: Steel
Shot Density Tested: 6,1 (20 shots/m) shots/ft
Recommended Minimum ID for Running: 5,748 (146 mm) in.
Available Firing Mode: Selective: X Simultaneous
Debris Weight: N/A gm/charge, Debris: N/A in/charge

Remarks/Exceptions per Section 1.11: Casing used: 6,61" (168 mm)x0,42"(10,6 mm) GRADE D, GOST 632-80
Casing Data: 6,61" (168 mm) OD, Weight 27,65 (41,15 kg/m) lb/ft API Grade, Date of Section 1 Test: October 01, 2012
Target Data: 39,37" (1000 mm) OD, Amount of Cement 1896 (860kg) lb, Amount of Sand 3792 (1720 kg) lb, Amount of Water 985,5 (447 kg) lb.
Date of Compressive Strength Test: October 01, 2012 Briquette Compressive Strength 6076,9 (41,90 MPa) psi, Age of Target 31 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 (mm)	0.71	(18.1)	0.78	(19.7)	0.91	(23.0)	0.97	(24.7)	0.91	(23.0)	0.78	(19.7)	0.71	(18.1)	0.78	(19.7)	0.91	(23.0)	0.97	(24.7)	0.91	(23.0)
Casing Hole Diameter, Short Axis, in (mm)	0.88	(22.30)	0.89	(22.70)	0.89	(22.50)	0.87	(22.00)	0.90	(22.90)	0.93	(23.60)	0.86	(21.90)	0.91	(23.00)	0.97	(24.70)	0.93	(23.60)	0.85	(21.70)
Casing Hole Diameter, Long Axis, in (mm)	0.88	(22.40)	0.94	(23.80)	0.98	(24.80)	0.93	(23.50)	0.96	(24.40)	0.96	(24.40)	0.90	(22.90)	0.98	(24.90)	1.01	(25.70)	0.94	(23.80)	1.09	(27.70)
Average Casing Hole Diameter, in (mm)	0.88	(22.35)	0.92	(23.25)	0.93	(23.65)	0.90	(22.75)	0.93	(23.65)	0.94	(24.00)	0.88	(22.40)	0.94	(23.95)	0.99	(25.20)	0.93	(23.70)	0.97	(24.70)
Total Depth, in (mm)	6.3	(161)	5.9	(151)	7.3	(186)	7.5	(191)	6.9	(176)	7.5	(191)	7.7	(196)	7.5	(191)	7.5	(191)	6.3	(161)	6.9	(176)
Burr Height, in (mm)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.04	(1.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.02	(0.50)	0.04	(1.00)	0.00	(0.00)	0.00	(0.00)

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	
																							xxxxxx	xxxxxx
Clearance, in (mm)	0.78	(19.7)	0.71	(18.1)	0.78	(19.7)	0.91	(23.0)	0.97	(24.7)	0.91	(23.0)	0.78	(19.7)	0.71	(18.1)	0.78	(19.7)						
Casing Hole Diameter, Short Axis, in (mm)	0.86	(21.90)	0.89	(22.50)	0.88	(22.40)	0.98	(24.90)	0.94	(23.80)	0.89	(22.70)	0.91	(23.10)	0.91	(23.20)	0.92	(23.30)					0.90	(22.94)
Casing Hole Diameter, Long Axis, in (mm)	0.98	(25.00)	0.98	(25.00)	1.03	(26.10)	0.99	(25.20)	1.00	(25.40)	1.06	(26.80)	0.98	(25.00)	1.03	(26.10)	0.99	(25.20)					0.98	(24.91)
Average Casing Hole Diameter, in (mm)	0.92	(23.45)	0.94	(23.75)	0.95	(24.25)	0.99	(25.05)	0.97	(24.60)	0.97	(24.75)	0.95	(24.05)	0.97	(24.65)	0.95	(24.25)					0.94	(23.92)
Total Depth, in (mm)	7.0	(179)	9.3	(236)	7.1	(181)	6.3	(161)	6.1	(156)	6.1	(155)	7.1	(181)	7.1	(181)	9.1	(231)					7.1	(182)
Burr Height, in (mm)	0.00	(0.00)	0.02	(0.50)	0.00	(0.00)	0.04	(1.00)	0.00	(0.00)	0.00	(0.00)	0.04	(1.00)	0.07	(1.80)	0.02	(0.50)					0.01	(0.37)

Remarks: The gun can be used in gas wells. Penetration normalized to 5000 psi by method of SPE 27424 (approx. 3,8% / 1000psi) = 7,4 " (189 mm)

Manufacturer's Certification

Type of Certification: X 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 describes.

API Witness: A. Tovmachenko October 04, 2012 (Date)

X	CERTIFIED BY	A.Yakuba	Technical Director	October 04, 2012	BVT, CJSC	41 Rabochaya St., Samara, 443041, Russian Federation
	RECERTIFIED BY	(Company Official)	(Title)	(Date)	(Company)	(Address)

Name of test as it should appear on website: PK0114-AT / ZPK114-AT-M-10

Name of test as it should appear on application and application date: PK0114-AT / ZPK114-AT-M-10