



## 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		Explosive Weight		22,5 gm,	RDX powder,	Case Material		Steel		
Gun OD & Trade Name		3,504" (89 mm) PKO89-AT		Max Temp, °F		302(150°C) 2hr	284(140°C) 5hr	266(130°C) 12hr	248(120°C) 30hr		230(110°C) 72hr	
Charge Name		ZPK89-AT-M-10		Maximum Pressure Rating		11603 (80 MPa)		psi,	Carrier Material		Steel	
Manufacturer Charge Part No.		ZPK89-AT-M-10	Date of Manufacture		April 07, 2014		Shot Density Tested		6,1 (20 shots/m)		shots/ft	
Gun Type		Expendable Gun TCP/Wireline		Recommended Minimum ID for Running		4,528 (115 mm)				in.		
Phasing Tested		60 degrees,	Firing Order:		Top Down	X	Bottom up	Available Firing Mode:		Selective	X	Simultaneous
Debris Description		N/A		Debris Weight		N/A		gm/charge,	Debris		N/A	in/charge
Remarks/Exceptions per Section 1.11		Casing used: 5,748" (146 mm)x0,374"(9,5 mm) GRADE D, GOST 632-80; Gun shot with water										
Casing Data		5,748" (146 mm)	OD, Weight		21,49 (31,98 kg/m)	lb/ft		API Grade,		Date of Section 1 Test		May 19, 2014
Target Data		39,37" (1000 mm)	OD, Amount of Cement		1918 (870 kg)	lb,		Amount of Sand		3836 (1740 kg)	lb,	
Date of Compressive Strength Test		May 19, 2014		Briquette Compressive Strength		7193,6	( 49,60 MPa)		psi,	Age of Target		32 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)	0.70 (17.8)	0.81 (20.7)	1.06 (26.9)	1.19 (30.2)	1.06 (26.9)	0.81 (20.7)	0.70 (17.8)	0.81 (20.7)	1.06 (26.9)	1.19 (30.2)	1.06 (26.9)
Casing Hole Diameter, Short Axis, in (mm)	0.89 (22.50)	0.91 (23.00)	0.93 (23.60)	0.95 (24.10)	0.88 (22.30)	0.88 (22.30)	0.91 (23.20)	0.91 (23.00)	0.92 (23.30)	0.91 (23.20)	0.91 (23.10)
Casing Hole Diameter, Long Axis, in (mm)	0.93 (23.70)	0.91 (23.20)	0.93 (23.70)	0.96 (24.40)	0.95 (24.10)	0.89 (22.50)	0.92 (23.40)	0.95 (24.10)	0.96 (24.50)	0.91 (23.20)	0.93 (23.70)
Average Casing Hole Diameter, in (mm)	0.91 (23.10)	0.91 (23.10)	0.93 (23.65)	0.95 (24.25)	0.91 (23.20)	0.88 (22.40)	0.92 (23.30)	0.93 (23.55)	0.94 (23.90)	0.91 (23.20)	0.92 (23.40)
Total Depth, in (mm)	9.6 (243)	8.9 (225)	8.3 (210)	9.1 (230)	8.1 (205)	9.3 (235)	9.5 (242)	10.5 (267)	7.9 (200)	10.2 (260)	8.9 (225)
Burr Height, in (mm)	0.06 (1.40)	0.15 (3.80)	0.12 (3.00)	0.09 (2.20)	0.04 (1.10)	0.07 (1.90)	0.06 (1.50)	0.07 (1.90)	0.13 (3.40)	0.12 (3.10)	0.09 (2.40)

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 (mm)	0.81 (20.7)	0.70 (17.8)	0.81 (20.7)	1.06 (26.9)	1.19 (30.2)	1.06 (26.9)	0.81 (20.7)	0.70 (17.8)	0.81 (20.7)			xxxxx: xxxxxx
Casing Hole Diameter, Short Axis, in (mm)	0.93 (23.60)	0.90 (22.80)	0.87 (22.10)	0.83 (21.00)	0.92 (23.40)	0.90 (22.80)	0.90 (22.90)	0.90 (22.80)	0.91 (23.10)			0.90 (22.91)
Casing Hole Diameter, Long Axis, in (mm)	0.99 (25.10)	0.97 (24.60)	0.92 (23.40)	0.88 (22.40)	0.97 (24.70)	0.95 (24.20)	0.96 (24.30)	0.96 (24.50)	0.98 (25.00)			0.94 (23.94)
Average Casing Hole Diameter, in (mm)	0.96 (24.35)	0.93 (23.70)	0.90 (22.75)	0.85 (21.70)	0.95 (24.05)	0.93 (23.50)	0.93 (23.60)	0.93 (23.65)	0.95 (24.05)			0.92 (23.42)
Total Depth, in (mm)	8.3 (210)	10.7 (273)	10.4 (264)	10.8 (275)	9.3 (235)	9.6 (245)	9.8 (250)	10.1 (257)	10.9 (277)			9.5 (241)
Burr Height, in (mm)	0.04 (1.10)	0.13 (3.30)	0.15 (3.90)	0.11 (2.80)	0.12 (3.00)	0.12 (3.00)	0.08 (2.00)	0.11 (2.90)	0.13 (3.20)			0.10 (2.55)

Remarks The gun can be used in gas wells. Penetration normalized to 5000 psi by method of SPE 27424 (approx. 3,8% / 1000psi) = 10,3 " ( 262 mm)

**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 describes.

API Witness A. Tovmachenko  May 22, 2014 (Date)

CERTIFIED BY A. Yakuba  Technical Director May 22, 2014 BVT, CJSC 41 Rabochaya St., Samara, 443041, Russian Federation (Company Official) (Title) (Date) (Company) (Address)

Name of test as it should appear on website: PKO89-AT / ZPK89-AT-M-10

Name of test as it should appear on application and application date: ZPK89-AT-M-10 / PKO89-AT April 04, 2014