



API Form 19B-Section 1

Conforms to All Requirements of Section 1

Special Test - See Remarks/Exceptions below

Service Company BashVzryvTechnologii, CJSC  
 Gun OD & Trade Name 3,5" (89 mm) PKO89-AT  
 Charge Name ZPK89-AT-M-03  
 Manufacturer Charge Part No. 01 021 Date of Manufacture Sept. 07, 2015  
 Gun Type Expendable Gun TCP/Wireline  
 Phasing Tested 60 degrees, Firing Order: Top Down  Bottom up  
 Debris Description N/A

Explosive Weight 27,7 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 15011,4 (103,5 MPa) psi, Carrier Material Steel  
 Shot Density Tested 6,1 (20 shots/m) shots/ft  
 Recommended Minimum ID for Running 4,528 (115 mm) in.  
 Available Firing Mode: Selective  Simultaneous

Remarks/Exceptions per Section 1.12 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 October 12, 2015  
 Target Data 106,30" (2700 mm) OD, Amount of Cement 13800,94 (6260 kg) lb, Amount of Sand 27601,88 (12520 kg) lb, Amount of Water 7176,05 (3255 kg) lb.  
 Date of Compressive Strength Test October 12, 2015 Briquette Compressive Strength 5438,7 ( 37,50 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)...	0.43 (11.00)	0.44 (11.30)	0.43 (10.90)	0.43 (11.00)	0.43 (10.90)	0.43 (10.80)	0.47 (11.90)	0.43 (10.80)	0.43 (10.90)	0.42 (10.60)	0.41 (10.50)
Casing Hole Diameter, Long Axis, in (mm)...	0.47 (12.00)	0.47 (11.90)	0.44 (11.20)	0.43 (11.00)	0.44 (11.10)	0.44 (11.20)	0.47 (12.00)	0.43 (11.00)	0.43 (11.00)	0.44 (11.20)	0.43 (10.90)
Average Casing Hole Diameter, in (mm).....	0.45 (11.50)	0.46 (11.60)	0.44 (11.05)	0.43 (11.00)	0.43 (11.00)	0.43 (11.00)	0.47 (11.95)	0.43 (10.90)	0.43 (10.95)	0.43 (10.90)	0.42 (10.70)
Total Depth, in (mm).....	38.8	986.5	41.1	1044.5	44.3	1124.5	LOST	36.8	934.5	37.0	939.5
Burr Height, in (mm).....	0.09 (2.20)	0.09 (2.30)	0.07 (1.90)	0.08 (2.10)	0.08 (2.00)	0.04 (0.90)	0.09 (2.20)	0.08 (2.00)	0.08 (2.00)	0.07 (1.90)	0.09 (2.30)

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)...	0.46 (11.60)	0.43 (11.00)	0.43 (10.90)	0.44 (11.20)	0.42 (10.60)	0.43 (11.00)	0.43 (10.80)	0.40 (10.20)	0.42 (10.70)			0.43 (10.93)
Casing Hole Diameter, Long Axis, in (mm)...	0.48 (12.10)	0.43 (11.00)	0.43 (11.00)	0.44 (11.20)	0.43 (10.80)	0.43 (11.00)	0.43 (10.90)	0.43 (10.90)	0.43 (10.80)			0.44 (11.21)
Average Casing Hole Diameter, in (mm).....	0.47 (11.85)	0.43 (11.00)	0.43 (10.95)	0.44 (11.20)	0.42 (10.70)	0.43 (11.00)	0.43 (10.85)	0.42 (10.55)	0.42 (10.75)			0.44 (11.07)
Total Depth, in (mm).....	LOST	LOST	38.6	979.5	46.4	1179.5	LOST	LOST	37.0	939.5	41.5	1054.5
Burr Height, in (mm).....	0.06 (1.50)	0.08 (2.10)	0.07 (1.80)	0.04 (1.10)	0.08 (2.10)	0.06 (1.60)	0.04 (1.00)	0.05 (1.30)	0.09 (2.20)			0.07 (1.83)

Remarks The gun can be used in gas wells. Penetration normalized to 5000 psi by method of SPE 27424 (approx. 3,8% / 1000psi) = 40,3 " ( 1025 mm)

WITNESSING INFORMATION

Witnessed by: K. Poliakov

Optionally Witnessed Activities: Target Pouring  Briquette Preparation  Briquette Testing  Burr Height Measurement

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.

Penetration data recorded in API RP 19B Section 1 may not directly correlate to penetration downhole

CERTIFIED BY A.Yakuba Director for Project Management October 16, 2015 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-03

Name of test as it appear on application and application date: PKO89-AT / ZPK89-AT-M-03 August 19, 2015