



## 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 <u>BVT, JSC</u>	Explosive weight <u>27,5</u> gm, RDX powder,	Case Material <u>Steel</u>
Gun OD & Trade Name <u>4,016" (102 mm) PKO102-AT</u>	Max Temp, °F <u>302 (150 °C)</u> 2 hr <u>284 (140 °C)</u> 5hr <u>266 (130 °C)</u>	12 hr <u>248 (120 °C)</u> 30 hr <u>230 (110 °C)</u> 72 hr
Charge Name <u>ZPK102-AT-M-10</u>	Maximum Pressure Rating <u>11603 (80 MPa)</u> psi, Carrier Material <u>Steel</u>	
Manufacturer Charge Part No. <u>ZPK102-AT-M-10</u> Date of Manufacture <u>13 May, 2011</u>	Shot Density Tested <u>6,1 (20 shots/m)</u>	Shots/ft _____
Gun Type <u>Expendable Gun TCP/Wireline</u>	Recommended Minimum ID for Running _____	<u>4,921 (125 mm)</u> _____ in.
Phasing Tested <u>60</u> degrees, Firing Order: _____ Top down <u>X</u> Bottom up	Available Firing Mode: _____	<u>Selective</u> _____ Simultaneous
Debris Description <u>N/A</u>	Debris Weight <u>N/A</u> gm/charge, Debris _____	<u>N/A</u> _____ In/charge
Remarks/Exceptions per Section 1.11 <u>Casing used: 5,748" (146 mm) × 0,374" (9,5 mm) GRADE D, GOST 632-80</u>		
Casing Data <u>5,748" (146 mm)</u> OD, Weight <u>21,37 (31,8 kg/m)</u> lb/ft	API Grade, _____	Date of Section 1 Test <u>14 June, 2011</u>
Target Data <u>39,37" (1000 mm)</u> OD, Amount of Cement <u>1885,3 (855 kg)</u> lb,	Amount of Sand <u>3770,6 (1710 kg)</u> lb,	Amount of Water <u>981,2 (445 kg)</u> lb.
Date of Compressive Strength Test <u>14 June, 2011</u>	Briquette Compressive Strength <u>6222,0</u> psi,	Age of Target <u>33</u> 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).....	<u>0.56 (14.2)</u>	<u>0.6 (15.3)</u>	<u>0.69 (17.6)</u>	<u>0.74 (18.8)</u>	<u>0.69 (17.6)</u>	<u>0.6 (15.3)</u>	<u>0.56 (14.2)</u>	<u>0.6 (15.3)</u>	<u>0.69 (17.6)</u>	<u>0.74 (18.8)</u>	<u>0.69 (17.6)</u>
Casing Hole Diameter, Short Axis, in (mm) ....	<u>0.84 (21.28)</u>	<u>0.83 (21.1)</u>	<u>0.79 (20.18)</u>	<u>0.81 (20.62)</u>	<u>0.85 (21.49)</u>	<u>0.79 (20.04)</u>	<u>0.83 (21.03)</u>	<u>0.87 (22.11)</u>	<u>0.94 (23.92)</u>	<u>0.94 (23.91)</u>	<u>0.84 (21.24)</u>
Casing Hole Diameter, Long Axis, in (mm).....	<u>0.9 (22.84)</u>	<u>0.9 (22.73)</u>	<u>0.82 (20.74)</u>	<u>0.9 (22.74)</u>	<u>0.9 (22.8)</u>	<u>0.89 (22.47)</u>	<u>0.95 (24.03)</u>	<u>0.94 (23.92)</u>	<u>1 (25.47)</u>	<u>1.05 (26.57)</u>	<u>0.85 (21.67)</u>
Average Casing Hole Diameter, in. (mm) .....	<u>0.87 (22.06)</u>	<u>0.86 (21.92)</u>	<u>0.81 (20.46)</u>	<u>0.85 (21.68)</u>	<u>0.87 (22.15)</u>	<u>0.84 (21.26)</u>	<u>0.89 (22.53)</u>	<u>0.91 (23.02)</u>	<u>0.97 (24.7)</u>	<u>0.99 (25.24)</u>	<u>0.85 (21.46)</u>
Total Depth, in (mm) .....	<u>6.7 (169.5)</u>	<u>6.5 (164.5)</u>	<u>6.5 (164.5)</u>	<u>6.7 (169.5)</u>	<u>6.7 (169.5)</u>	<u>6.1 (154.5)</u>	<u>6.7 (169.5)</u>	<u>6.5 (164.5)</u>	<u>6.3 (159.5)</u>	<u>6.3 (159.5)</u>	<u>6.7 (169.5)</u>
Burr Height, in (mm) .....	<u>0.12 (3.01)</u>	<u>0.06 (1.44)</u>	<u>0.13 (3.18)</u>	<u>0.13 (3.28)</u>	<u>0.1 (2.53)</u>	<u>0.13 (3.38)</u>	<u>0.07 (1.89)</u>	<u>0.06 (1.43)</u>	<u>0.07 (1.88)</u>	<u>0.13 (3.24)</u>	<u>0.12 (2.94)</u>

  

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).....	<u>0.6 (15.3)</u>	<u>0.56 (14.2)</u>	<u>0.6 (15.3)</u>	<u>0.69 (17.6)</u>	<u>0.74 (18.8)</u>	<u>0.69 (17.6)</u>	<u>0.6 (15.3)</u>	<u>0.56 (14.2)</u>	<u>0.6 (15.3)</u>			<u>xxxxxx</u>
Casing Hole Diameter, Short Axis, in (mm) ....	<u>0.89 (22.57)</u>	<u>0.93 (23.64)</u>	<u>0.81 (20.5)</u>	<u>0.79 (20.15)</u>	<u>0.89 (22.65)</u>	<u>0.9 (22.77)</u>	<u>0.83 (21.12)</u>	<u>0.81 (20.6)</u>	<u>0.87 (22.13)</u>			<u>0.85 (21.65)</u>
Casing Hole Diameter, Long Axis, in (mm) .....	<u>0.9 (22.93)</u>	<u>0.99 (25.23)</u>	<u>0.84 (21.28)</u>	<u>0.88 (22.25)</u>	<u>0.91 (23)</u>	<u>0.91 (23.1)</u>	<u>0.87 (22.13)</u>	<u>0.83 (20.95)</u>	<u>0.94 (23.99)</u>			<u>0.91 (23.04)</u>
Average Casing Hole Diameter, in (mm) .....	<u>0.9 (22.75)</u>	<u>0.96 (24.435)</u>	<u>0.82 (20.89)</u>	<u>0.84 (21.2)</u>	<u>0.9 (22.83)</u>	<u>0.91 (22.94)</u>	<u>0.85 (21.63)</u>	<u>0.82 (20.78)</u>	<u>0.91 (23.06)</u>			<u>0.88 (22.35)</u>
Total Depth, in (mm) .....	<u>7.1 (179.5)</u>	<u>6.7 (169.5)</u>	<u>6.1 (154.5)</u>	<u>6.9 (174.5)</u>	<u>6.7 (169.5)</u>	<u>6.7 (169.5)</u>	<u>6.5 (164.5)</u>	<u>7.1 (179.5)</u>	<u>6.7 (169.5)</u>			<u>6.6 (167.3)</u>
Burr Height in (mm).....	<u>0.15 (3.68)</u>	<u>0.09 (2.4)</u>	<u>0.15 (3.81)</u>	<u>0.11 (2.89)</u>	<u>0.11 (2.79)</u>	<u>0.12 (2.94)</u>	<u>0.11 (2.79)</u>	<u>0.17 (4.39)</u>	<u>0.12 (3.09)</u>			<u>0.11 (2.85)</u>

Remarks The gun can be used in gas wells. Penetration normalized to 5000 psi by method of SPE 27424 (approx. 3.8% / 1000psi) = 6.9" (175,0mm)

**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 described.

API Witness	<u>A. Tovmachenko</u>	<u>17 June, 2011</u>	(Date)			
<u>X</u> CERTIFIED BY	<u>A. Yakuba</u>	<u>17 June, 2011</u>	Technical Director	<u>BVT, JSC</u>	<u>224 Leninskaya St., Samara, 443001, Russian Federation</u>	
RECERTIFIED	(Company Official)	(Date)	(Title)	(Company)	(Address)	

Name of test as it should appear on website: ZPK102-AT-10

Name of test as it appears on application and application date: ZPK102-AT-M-10