

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, CJSC</u>		Explosive Weight <u>32,5</u> gm, RDX powder,		Case Material <u>Steel</u>	
Gun OD & Trade Name <u>4,5" (114 mm) PKO114-AT</u>		Max Temp, °F <u>302(150°C)</u> 2hr <u>284(140°C)</u> 5hr <u>266(130°C)</u> 12hr		248(120°C) 30hr <u>230(110°C)</u> 72hr	
Charge Name <u>ZPK114-AT-M-03</u>		Maximum Pressure Rating <u>11603 (80 MPa)</u> psi,		Carrier Material <u>Steel</u>	
Manufacturer Charge Part No. <u>ZPK114-AT-M-03</u> Date of Manufacture <u>April 18, 2014</u>		Shot Density Tested <u>6,1</u> (20 shots/m) shots/ft			
Gun Type <u>Expendable Gun TCP/Wireline</u>		Recommended Minimum ID for Running <u>5,748</u> (146 mm) in.			
Phasing Tested <u>60</u> degrees, Firing Order: <u>Top Down</u> <input checked="" type="checkbox"/> <u>Bottom up</u>		Available Firing Mode: <u>Selective</u> <input checked="" type="checkbox"/> <u>Simultaneous</u>			
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: 6,61" (168 mm)x0,42"(10,6 mm) GRADE D, GOST 632-80; Gun shot with water</u>					
Casing Data <u>6,61" (168 mm)</u> OD, Weight <u>27,65 (41,15 kg/m)</u> lb/ft		API Grade, <u></u>		Date of Section 1 Test <u>May 19, 2014</u>	
Target Data <u>125,98" (3200 mm)</u> OD, Amount of Cement <u>19180 (8700 kg)</u> lb,		Amount of Sand <u>38360 (17400 kg)</u> lb,		Amount of Water <u>9973,6 (4524 kg)</u> lb.	
Date of Compressive Strength Test <u>May 19, 2014</u>		Briquette Compressive Strength <u>7628,7</u> (<u>52,60 MPa</u>) psi,		Age of Target <u>31</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>0,75 (19,1)</u>	<u>0,81 (20,7)</u>	<u>0,94 (24,0)</u>	<u>1,01 (25,7)</u>	<u>0,94 (24,0)</u>	<u>0,81 (20,7)</u>	<u>0,75 (19,1)</u>	<u>0,81 (20,7)</u>	<u>0,94 (24,0)</u>	<u>1,01 (25,7)</u>	<u>0,94 (24,0)</u>	
Casing Hole Diameter, Short Axis, in (mm)...	<u>0,48 (12,10)</u>	<u>0,48 (12,20)</u>	<u>0,48 (12,20)</u>	<u>0,51 (12,90)</u>	<u>0,47 (11,90)</u>	<u>0,48 (12,10)</u>	<u>0,48 (12,10)</u>	<u>0,50 (12,70)</u>	<u>0,48 (12,10)</u>	<u>0,48 (12,20)</u>	<u>0,49 (12,40)</u>	
Casing Hole Diameter, Long Axis, in (mm)....	<u>0,51 (13,00)</u>	<u>0,51 (12,90)</u>	<u>0,54 (13,60)</u>	<u>0,52 (13,10)</u>	<u>0,48 (12,20)</u>	<u>0,51 (13,00)</u>	<u>0,48 (12,20)</u>	<u>0,51 (12,90)</u>	<u>0,49 (12,40)</u>	<u>0,48 (12,30)</u>	<u>0,51 (12,90)</u>	
Average Casing Hole Diameter, in (mm).....	<u>0,49 (12,55)</u>	<u>0,49 (12,55)</u>	<u>0,51 (12,90)</u>	<u>0,51 (13,00)</u>	<u>0,47 (12,05)</u>	<u>0,49 (12,55)</u>	<u>0,48 (12,15)</u>	<u>0,50 (12,80)</u>	<u>0,48 (12,25)</u>	<u>0,48 (12,25)</u>	<u>0,50 (12,65)</u>	
Total Depth, in (mm).....	<u>48,7 (1237)</u>	<u>46,9 (1191)</u>	<u>Lost</u>	<u>Lost</u>	<u>44,7 (1136)</u>	<u>50,0 (1270)</u>	<u>48,5 (1232)</u>	<u>49,5 (1257)</u>	<u>43,7 (1111)</u>	<u>Lost</u>	<u>48,0 (1218)</u>	
Burr Height, in (mm).....	<u>0,06 (1,50)</u>	<u>0,05 (1,30)</u>	<u>0,06 (1,60)</u>	<u>0,06 (1,50)</u>	<u>0,06 (1,60)</u>	<u>0,05 (1,20)</u>	<u>0,04 (1,00)</u>	<u>0,06 (1,60)</u>	<u>0,04 (1,10)</u>	<u>0,06 (1,50)</u>	<u>0,07 (1,80)</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>0,81 (20,7)</u>	<u>0,75 (19,1)</u>	<u>0,81 (20,7)</u>	<u>0,94 (24,0)</u>	<u>1,01 (25,7)</u>	<u>0,94 (24,0)</u>	<u>0,81 (20,7)</u>	<u>0,75 (19,1)</u>	<u>0,81 (20,7)</u>			<u>xxxxx; xxxxxx</u>
Casing Hole Diameter, Short Axis, in (mm)...	<u>0,47 (12,00)</u>	<u>0,50 (12,60)</u>	<u>0,52 (13,10)</u>	<u>0,47 (12,00)</u>	<u>0,51 (13,00)</u>	<u>0,48 (12,30)</u>	<u>0,48 (12,10)</u>	<u>0,47 (12,00)</u>	<u>0,48 (12,10)</u>			<u>0,48 (12,31)</u>
Casing Hole Diameter, Long Axis, in (mm)....	<u>0,47 (12,00)</u>	<u>0,50 (12,70)</u>	<u>0,52 (13,30)</u>	<u>0,49 (12,50)</u>	<u>0,52 (13,20)</u>	<u>0,50 (12,60)</u>	<u>0,50 (12,60)</u>	<u>0,48 (12,30)</u>	<u>0,48 (12,30)</u>			<u>0,50 (12,70)</u>
Average Casing Hole Diameter, in (mm).....	<u>0,47 (12,00)</u>	<u>0,50 (12,65)</u>	<u>0,52 (13,20)</u>	<u>0,48 (12,25)</u>	<u>0,52 (13,10)</u>	<u>0,49 (12,45)</u>	<u>0,49 (12,35)</u>	<u>0,48 (12,15)</u>	<u>0,48 (12,20)</u>			<u>0,49 (12,50)</u>
Total Depth, in (mm).....	<u>Lost</u>	<u>50,5 (1282)</u>	<u>49,8 (1266)</u>	<u>50,2 (1274)</u>	<u>48,0 (1219)</u>	<u>49,0 (1245)</u>	<u>Lost</u>	<u>48,2 (1225)</u>	<u>Lost</u>			<u>48,3 (1226)</u>
Burr Height, in (mm).....	<u>0,06 (1,60)</u>	<u>0,08 (2,00)</u>	<u>0,07 (1,90)</u>	<u>0,04 (1,10)</u>	<u>0,07 (1,90)</u>	<u>0,08 (2,10)</u>	<u>0,06 (1,60)</u>	<u>0,09 (2,30)</u>	<u>0,05 (1,30)</u>			<u>0,06 (1,58)</u>

 Remarks The gun can be used in gas wells. Penetration normalized to 5000 psi by method of SPE 27424 (approx. 3,8% / 1000psi) = 53,1 " (1348 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)

<input checked="" type="checkbox"/>	CERTIFIED BY	<u>A. Yakuba</u>	Technical Director	<u>May 22, 2014</u>	BVT, CJSC	<u>41 Rabochaya St., Samara, 443041, Russian Federation</u>
	RECERTIFIED BY	(Company Official)	(Title)	(Date)	(Company)	(Address)

 Name of test as it should appear on website: PKO114-AT / ZPK114-AT-M-03

 Name of test as it should appear on application and application date: ZPK114-AT-M-03 / PKO114-AT April 04, 2014