



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 BashVzryvTechnologii, CJSC
 Gun OD & Trade Name 4" (102 mm) PKO102-AT
 Charge Name ZPK102-AT-M-04
 Manufacturer Charge Part No. 01 045 Date of Manufacture Sept. 08, 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 4,921 (125 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 133,86" (3400 mm) OD, Amount of Cement 21644,98 (9818 kg) lb, Amount of Sand 43166,5 (19580 kg) lb, Amount of Water 11256,8 (5106 kg) lb.
 Date of Compressive Strength Test October 12, 2015 Briquette Compressive Strength 6207,4 (42,80 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).....	<u>0,60 (15,2)</u>	<u>0,64 (16,3)</u>	<u>0,73 (18,6)</u>	<u>0,78 (19,8)</u>	<u>0,73 (18,6)</u>	<u>0,64 (16,3)</u>	<u>0,60 (15,2)</u>	<u>0,64 (16,3)</u>	<u>0,73 (18,6)</u>	<u>0,78 (19,8)</u>	<u>0,73 (18,6)</u>
Casing Hole Diameter, Short Axis, in (mm).....	<u>0,38 (9,60)</u>	<u>0,38 (9,60)</u>	<u>0,37 (9,50)</u>	<u>0,37 (9,40)</u>	<u>0,37 (9,30)</u>	<u>0,37 (9,30)</u>	<u>0,37 (9,30)</u>	<u>0,39 (9,90)</u>	<u>0,38 (9,60)</u>	<u>0,38 (9,60)</u>	<u>0,39 (9,90)</u>
Casing Hole Diameter, Long Axis, in (mm).....	<u>0,39 (9,80)</u>	<u>0,39 (10,00)</u>	<u>0,39 (10,00)</u>	<u>0,37 (9,50)</u>	<u>0,39 (9,80)</u>	<u>0,37 (9,50)</u>	<u>0,38 (9,60)</u>	<u>0,42 (10,60)</u>	<u>0,39 (9,90)</u>	<u>0,36 (9,20)</u>	<u>0,41 (10,40)</u>
Average Casing Hole Diameter, in (mm).....	<u>0,38 (9,70)</u>	<u>0,39 (9,80)</u>	<u>0,38 (9,75)</u>	<u>0,37 (9,45)</u>	<u>0,38 (9,55)</u>	<u>0,37 (9,40)</u>	<u>0,37 (9,45)</u>	<u>0,40 (10,25)</u>	<u>0,38 (9,75)</u>	<u>0,36 (9,05)</u>	<u>0,40 (10,15)</u>
Total Depth, in (mm).....	<u>LOST</u>	<u>LOST</u>	<u>LOST</u>	<u>49,0 1244,5</u>	<u>52,7 1339,5</u>	<u>52,1 1324,5</u>	<u>51,6 1309,5</u>	<u>LOST</u>	<u>53,1 1349,5</u>	<u>53,7 1364,5</u>	<u>51,0 1294,5</u>
Burr Height, in (mm).....	<u>0,06 (1,40)</u>	<u>0,06 (1,50)</u>	<u>0,06 (1,40)</u>	<u>0,04 (1,10)</u>	<u>0,08 (2,10)</u>	<u>0,08 (2,00)</u>	<u>0,04 (1,00)</u>	<u>0,06 (1,40)</u>	<u>0,07 (1,80)</u>	<u>0,06 (1,60)</u>	<u>0,07 (1,90)</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>0,64 (16,3)</u>	<u>0,60 (15,2)</u>	<u>0,64 (16,3)</u>	<u>0,73 (18,6)</u>	<u>0,78 (19,8)</u>	<u>0,73 (18,6)</u>	<u>0,64 (16,3)</u>	<u>0,60 (15,2)</u>	<u>0,64 (16,3)</u>			<u>xxxxxx xxxxxx</u>
Casing Hole Diameter, Short Axis, in (mm).....	<u>0,38 (9,60)</u>	<u>0,37 (9,50)</u>	<u>0,37 (9,50)</u>	<u>0,38 (9,70)</u>	<u>0,39 (9,80)</u>	<u>0,38 (9,60)</u>	<u>0,37 (9,30)</u>	<u>0,37 (9,40)</u>	<u>0,37 (9,50)</u>			<u>0,37 (9,51)</u>
Casing Hole Diameter, Long Axis, in (mm).....	<u>0,39 (10,00)</u>	<u>0,41 (10,30)</u>	<u>0,39 (9,90)</u>	<u>0,39 (9,80)</u>	<u>0,39 (9,90)</u>	<u>0,39 (9,90)</u>	<u>0,40 (10,20)</u>	<u>0,39 (9,90)</u>	<u>0,38 (9,60)</u>			<u>0,39 (9,89)</u>
Average Casing Hole Diameter, in (mm).....	<u>0,39 (9,80)</u>	<u>0,39 (9,90)</u>	<u>0,38 (9,70)</u>	<u>0,38 (9,75)</u>	<u>0,39 (9,85)</u>	<u>0,38 (9,75)</u>	<u>0,38 (9,75)</u>	<u>0,38 (9,65)</u>	<u>0,38 (9,55)</u>			<u>0,38 (9,70)</u>
Total Depth, in (mm).....	<u>52,1 1324,5</u>	<u>49,6 1259,5</u>	<u>LOST</u>	<u>54,7 1389,5</u>	<u>54,1 1374,5</u>	<u>58,6 1489,5</u>	<u>LOST</u>	<u>52,1 1324,5</u>	<u>53,3 1354,5</u>			<u>52,71 (1339)</u>
Burr Height, in (mm).....	<u>0,05 (1,30)</u>	<u>0,07 (1,70)</u>	<u>0,09 (2,20)</u>	<u>0,06 (1,50)</u>	<u>0,08 (2,00)</u>	<u>0,07 (1,90)</u>	<u>0,07 (1,90)</u>	<u>0,06 (1,60)</u>	<u>0,04 (1,00)</u>			<u>0,06 (1,62)</u>

Remarks The gun can be used in gas wells. Penetration normalized to 5000 psi by method of SPE 27424 (approx. 3,8% / 1000psi) = 55,1" (1400 mm)

WITNESSING INFORMATION

Witnessed by: K. Poliakov
 Optionally Witnessed Activities Target Pouring Briquette Preparation Briquette Testing Burr Height Measurements

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: PKO102-AT / ZPK102-AT-M-04

Name of test as it appear on application and application date: PKO102-AT / ZPK102-AT-M-04 August 19, 2015