



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 Available to all from Titan Specialties Ltd. Explosive weight 21 gm, HMX powder, Case Material Steel

Gun OD & Trade Name 4-1/2" EXP Gun, 12 SPF 135/45 Degree Max Temp, °F 400 1 hr 3 hr 24 hr 100 hr 200 hr

Charge Name 4-1/2" 21 Gm HMX GH Maximum Pressure Rating 19,500 psi, Carrier Material H.T. Steel

Manufacturer Charge Part No. EXP-4521-431 Date of Manufacture 04 Aug 2010 Shot Density Tested 12 Shots/ft 12

Gun Type Hollow Steel Carrier, Expendable (HC, E) Recommended Minimum ID for Running 4.92 in.

Phasing Tested 135/45 degrees, Firing Order: Top down Bottom up Available Firing Mode: Selective Simultaneous

Debris Description Small steel chips, usually retained in carrier Debris Weight n/a gm/charge, Debris n/a in³/charge

Remarks/Exceptions per Section 1.11 _____

Casing Data 7" OD, Weight 32 lb/ft, API Grade, L-80 Date of Section 1 Test 30 Sept 2010

Target Data 60" OD, Amount of Cement 2,068 lb, Amount of Sand 4,136 lb, Amount of Water 1,075 lb.

Date of Compressive Strength Test 30 Sept 2010 Briquette Compressive Strength 5,350 psi, Age of Target 28 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.	0.00	1.31	0.69	0.18	1.59	0.18	0.69	1.31	0.00	1.31	0.69
Casing Hole Diameter, Short Axis, in.	0.50	0.60	0.50	0.58	0.24	0.58	0.50	0.26	0.54	0.23	0.57
Casing Hole Diameter, Long Axis, in.	0.54	0.62	0.52	0.61	0.25	0.59	0.54	0.26	0.57	0.26	0.59
Average Casing Hole Diameter, in.	0.52	0.61	0.51	0.60	0.25	0.59	0.52	0.26	0.56	0.25	0.58
Total Depth, in.	19.45	29.20	26.95	17.45	25.45	17.95	21.70	22.95	19.45	25.45	25.20
Burr Height, in.	0.06	0.08	0.07	0.07	0.09	0.07	0.07	0.08	0.05	0.07	0.07

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.	0.18	1.59	0.18	0.69	1.31	0.00	1.31	0.69	0.18	1.59	0.18	XXXXXX
Casing Hole Diameter, Short Axis, in.	0.60	0.23	0.57	0.53	0.25	0.54	0.26	0.47	0.59	0.24	0.57	0.45
Casing Hole Diameter, Long Axis, in.	0.61	0.27	0.60	0.55	0.27	0.56	0.27	0.51	0.61	0.28	0.58	0.47
Average Casing Hole Diameter, in.	0.61	0.25	0.59	0.54	0.26	0.55	0.27	0.49	0.60	0.26	0.58	0.46
Total Depth, in.	18.33	25.20	18.95	20.45	24.20	16.95	22.70	23.45	19.70	23.70	19.70	22.02
Burr Height, in.	0.07	0.09	0.06	0.07	0.07	0.08	0.08	0.07	0.08	0.09	0.07	0.07

Remarks _____

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 described.

CERTIFIED BY Kenneth B. Bolwick CEO 08 Oct 2010 Titan Specialties Ltd. 143 HCR 4361, Milford, TX 76670

RECERTIFIED (Company Official) (Title) (Date) (Company) (Address)

Name of test as it should appear on website: 4.50-in. EXP 12 SPF w/ GH EXP-4521-431

Name of test as it appears on application and application date: _____



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Service Company Available to all from Titan Specialties Ltd. Explosive weight 21 gm, HMX powder, Case Material Steel
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 Charge Name 4-1/2" 21 Gm HMX GH Maximum Pressure Rating 19,500 psi, Carrier Material H.T. Steel
 Manufacturer Charge Part No. EXP-4521-431 Date of Manufacture 04 Aug 2010 Shot Density Tested 12 Shots/ft 12
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Shot No.	No 23	No 24	No 25	No 26	No 27	No 28	No 29	No 30	No 31	No 32	No 33
Clearance, in.	0.69	1.31									
Casing Hole Diameter, Short Axis, in	0.53	0.26									
Casing Hole Diameter, Long Axis, in	0.55	0.26									
Average Casing Hole Diameter, in.	0.54	0.26									
Total Depth, in.	21.70	22.33									
Burr Height, in.	0.09	0.08									

Shot No.	No 34	No 35	No 36	No 37	No 38	No 39	No 40	No 41	No 42	No 43	No 44	Average
Clearance, in.												XXXXXXX
Casing Hole Diameter, Short Axis, in												0.45
Casing Hole Diameter, Long Axis, in												0.47
Average Casing Hole Diameter, in.												0.46
Total Depth, in.												22.02
Burr Height, in.												0.07

Remarks _____

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CERTIFIED BY Kenneth B. Balaboch CEO 08 Oct 2010 Titan Specialties Ltd. 143 HCR 4361, Milford, TX 76670
 RECERTIFIED (Company Official) (Title) (Date) (Company) (Address)

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