



REGISTERED DATA SHEET PERFORATING SYSTEM EVALUATION, API RP 19B SECTION 1

Gun Dà Trade Name 2 1/8" Fully Expendable Low Debris Link. BH HMX Charge Name 2 1/8" Fully Expendable Low Debris Link. BH HMX Charge Name 2 1/8" Fully Expendable Low Debris Link. BH HMX Charge Name 2 1/8" Fully Expendable Low Debris Link. BH HMX Charge Name 2 1/8" Fully Expendable Low Debris Link. BH HMX Charge Name 2 1/8" Fully Expendable Low Debris Link. BHMX Charge Name 2 1/8" Fully Expendable Link. But Link. State Link. Stat	Service Company <u>Available to all Design Number</u> Explosive Weight <u>14.5 gm, HMX</u> powder, Case Material <u>Steel</u>							
Manufacturer Charge Part No. TG 30HNGBH Date of Manufactureulv2 28* 2004	Gun OD & Trade Name 2 1/8" Fully Expendable Low Debris Link, BH HMX Max. Temp, °F 400 1 hr 3 hr 24 hr 100 hr 200 hr							
Recommended Minimum D for Running 2.25 jn.	Charge Name 2 1/8" Piranha Next Generation BH HMX (DSC 04-07-41) Maximum Pressure Rating 20.000 psi, Carrier Material Steel							
Phasing Tested	Manufacturer Charge Part No. TG 30HI	Shot Density Tested		6	Shots/ft			
Debria DescriptionCase & Link:small steel chips: Steel cap breaks in two or three parts Debria Weight 165 gm/charge Debris In ³ /charge Pebris fill in 4 ½* 11.8#. 5 ½* 17#. 7* 32# casing is 0.172*, 0.115*. 0.074* Respectively per charge. SECTION 1 · CONCRETE TARGET SECTION 1 · CONCRETE TARGET Casing Data 4.1/2* OD, Weight 11.8 Ib/ft, L-80 API Grade, Date of Section 1 Test August 30 th 2004 Target Data 40° OD, Amount of Cement 1900 Ib. Amount of Sand 3800 Ib. Amount of Water 990 Ib.	Gun Type Retrievable Trough Tubing Gu	Recommended Minimum ID for Running 2.25 in.						
Section 1 - Concrete TArget Casing Data	Phasing Tested 45 degrees, Firi	Available Firing ModeSelective,Simultaneous						
Section 1 - Concrete Target Casing Data 4.1/2" OD, Weight 11.6 ib/ft, L-80 API Grade, Date of Section 1 Test August 30" 2004 Amount of Weight 11.6 ib/ft, L-80 API Grade, Date of Section 1 Test August 30" 2004 Amount of Weight 11.6 ib/ft, L-80 API Grade, Date of Section 1 Test August 30" 2004 Amount of Weight 11.6 ib/ft, L-80 API Grade, Date of Section 1 Test August 30" 2004 Amount of Weight Amount	Debris DescriptionCase & Link:small steet chips; Steet cap breaks in two or three parts			Debris Weight 165 gm/charge, Debris * in³/charge				
Casing Data								
Target Data 40" OD, Amount of Cement 1900 Ib. Amount of Sand 3800 Ib. Amount of Water 990 Ib.			SECTION 1	- CONCRETE TARGET				
Date of Compressive Strength Test August 31th 2004 Briquette Compressive Strength 6356 psi, Age of Target 31 days	Casing Data 4 1/2" OD,	Weight 11.6	lb/ft,	L-80API Grade,	Date of Section 1	1 TestAugust 3	90 th 2004	
Shot No. No. 1 No. 2 No. 3 No. 4 No. 5 No. 6 No. 7 No. 8 No. 9 No. 10 No. 11	Target Data 40" OD,	Amount of Cement	<u>1900</u> lb.,	Amount of Sand	3800 lb	o., Amount of Water_	990 lb.	
Shot No. No. 1 No. 2 No. 3 No. 4 No. 5 No. 6 No. 7 No. 8 No. 9 No. 10 No. 11	Date of Compressive Strength Test_Auc	ust 31th 2004	Briquette Compressive Str	rength6356	psi, Age of	Target	31 days	
Casing Hole Diameter, Short Axis, in	Shot No.	No. 1 No. 2	No. 3 No. 4	No. 5 No. 6	-	_	No. 11	
Casing Hole Diameter, Long Axis, in	Clearance, in.	0.00 0.162	0.704 1.487	1.875 1.487	0.704 0.162		0.704	
Average Casing Hole Diameter, in	Casing Hole Diameter, Short Axis, in	0.60 0.59	0.53 0.52	0.51 0.50	0.52 0.58	0.50 0.60		
Total Depth, in	Casing Hole Diameter, Long Axis, in	0.63 0.61	0.56 0.60	0.52 0.52	0.58 0.60	0.55 0.63	0.60	
Burr Height, in	Average Casing Hole Diameter, in	0.615 0.600		<u>0.515</u> <u>0.510</u>	0.550 0.590	0.525 0.615	0.585	
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	•						7.501	
Clearance, in	Burr Height, in	0.036 0.023	0.052 0.049	0.028 0.052	<u>0.065</u> <u>0.080</u>	0.040 0.058	0.062	
Casing Hole Diameter, Short Axis, in	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	
Casing Hole Diameter, Short Axis, in	Clearance, in	1.487 1.875	1.487				0.878	
Average Casing Hole Diameter, in		0.64 0.53	0.52					
Total Depth, in	Casing Hole Diameter, Long Axis, in	0.66 0.60	0.56				0.587	
WITNESSING INFORMATION Date of Notice of Intent to Test: July 27 th 2004 Witnessed by: J. Smirnoff (API Certified) Other Activities Witnessed: Target Pouring Briquette: Preparation Testing X Burr Height Measurement X Samplee Taken: Congrete X Casing X CERTIFICATION I certify that these tests were made according to the procedures as outlined in API RP 19B: Recommended Practices for Evaluation of Well Perforators, First Edition, November 2000. 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, which would be furnished to perforate a well for any operator. The American Perpeture Institute neither endorses these test results nor recommends the use of the perforator system described.	Average Casing Hole Diameter, in						0.569	
WITNESSING INFORMATION Date of Notice of Intent to Test:								
Date of Notice of Intent to Test: July 27 th 2004 Witnessed by:	Burr Height, in	0.084 0.061	0.079			<i></i>	0.055	
Other Activities Witnessed: Target Pouring Briquette: Preparation Testing _X _Burr Height Measurement _X Samplee Taken: Congrete _X Casing _X CERTIFICATION I certify that these tests were made according to the procedures as outlined in API RP 19B: Recommended Practices for Evaluation of Well Perforators, First Edition, November 2000. 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, which would be furnished to perforate a well for any operator. The American Peinselment in a fitting the same as the equipment of the perforator system described.	WITNESSING INFORMATION ///							
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RECERTIFIED DAR DE Company Official) (Title) (Date) (Company) (Address)								

PERFORATING PROJECTS MANAGER