Crossbow Report: Phantom CLS by TenPoint

by Jon Teater of Archery Evolution

Archery Evolution received the Phantom CLS™ produced by TenPoint. The Phantom CLS went through a standard and regimented performance test. The focus of these types of tests is to determine, for a specified product, the performance characteristics. Additionally, the goal is to provide those archers that enjoy shooting and/or hunting with appropriate objective information, as well as some subjective commentary, for aiding in the purchase process. With that said, this evaluation is by no means conclusive; some tests could not be performed due to limitation in resources, time, or budget. Each archer should assess what is important to him or her and interpret the results within the context of this article. As always, we recommend that anyone who is considering a crossbow, shoot as many different makes/models as possible to determine what best suits their individual needs and desires.

Due to the lack of testing methods/procedures available publically for crossbows, Archery Evolution has developed testing guidelines to help better understand the products that we will be evaluating. These methods are published and available online.

Production Information and Testing:

Introduction:

TenPoint, an Ohio based crossbow manufacturer, has focused on continual improvement and development of top-notch products. The company bases their 2009 product line on core features that are incorporated into each TenPoint series product. These features are stated to support accuracy, dependability and durability amongst this line. The Phantom CLS is TenPoints premier product, which is infused with core features as well as some premium technologies.

Phantom CLS

Contact Info	TenPoint www.tenpointcrossbows.com		
MSRP (with package- ACUdraw50)	$1,899	**Finish**	Realtree ® APG HD™
MSRP (with package- ACUdraw)	$1,999	**Stock**	Verton
String Material	Ultra Cam by Brownell		
Limbs	Pultruded Fiberglass with Laminate		

Performance at a Glance

Arrow	Speed	K.E.	Momentum
425 Grains	343.6	111.5	20.8
475 Grains	328.2	113.6	22.2
525 Grains	315.1	115.8	23.6

The Phantom CLS was provided to Archery Evolution as a package, and consists of a large number of components: The 3X Pro-View Scope, ACUdraw 50, 4-Arrow HX Quiver, Three-pack of TenPoint Pro Elite Premium Hunter arrows equipped with NAP® Spitfire® 100-grain broadheads, Six-pack of Ten Point Pro Elite arrows with blunt nocks and practice points, TenPoint Bow-Max™ travel case, SteddyEddy® monopod, TenPoint CareKit with carry case, deluxe sling, TenPoint Staff Shooter Field Cap and instructional DVD

The crossbow dimensions/weights measured out of the box:

Dimensions

Model	Axle to Axle	Axle to Axle (full draw)	Powerstroke	Rail*	Overall Length	Mass Weight (including scope)	Mass Weight (without scope)
Phantom CLS	20.8125"	17"	12.875"	17.5"	38.0625"	9.6 lbs	8.8 lbs

Note: The "Rail" measurements were taken from the front of the rail to the front of the string at the full-draw position

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Next, the crossbow went through a thorough inspection to determine any imperfections. The review focused on string/cables, eccentrics, limb and limb pockets, rail, prod, stock, butt plate, trigger housing, trigger and trigger guard. The product was almost impeccable; some minor wear was noted on the underside of the string serving. It is assumed the wear is due to the bore sighting and shooting that is done from the factory. In comparison to other products recently tested, the Phantom CLS is far above average in this department.

Thereafter, the product goes through a 100-150 shot cycling to verify functionality. Some minor testing was done, but the focus is to detect any issues or concerns with the product before starting the actual performance testing. The product performed fine during this portion of testing. No issues were discovered as we completed our shooting.

The crossbow is next evaluated on the five (5) criteria outlined below:

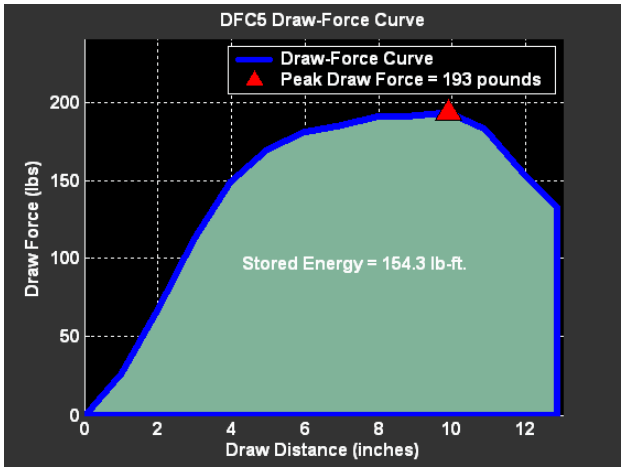
Test Category	Assessment
Dynamic Efficiency	Provides an indication of the amount of energy output by a crossbow relative to the energy expended through drawing the crossbow back. An assessment is made with multiple projectile weights.
Speed per inch of Power-Stroke	Provides an indication of the amount of speed output by the crossbow over the distance from the full-draw position to the static brace height position. An assessment is made with multiple projectile weights.
Noise Output	Provides an indication of the noise output characteristics of a bow at the "point blank" range utilizing a series of shots with multiple projectile weights
Trigger Force	Provides an indication of the amount of force required to discharge a given crossbow
Precision Test	Provides an indication of how close groups are shot together by utilizing a shooting machine and shooting from a bench rest or other supportive device.

Detailed Test Results

Dynamic Efficiency:

The dynamic efficiency portion of the test utilizes a Revere Load-Cell controlled by a winch device; the load-cell connects to the crossbow with a cocking aid. The crossbow is mounted in a shooting platform that controls any movement that might be experienced as Force-Draw curves are taken. The stored energy obtained from the Force-Draw curve, is used in conjunction with speed measurements to calculate dynamic efficiency.

Peak Force		**193.0**	**lbs**
Stored Energy		**154.3**	**lb-ft**
Dynamic Efficiency	**425 grains**	**72.2**	**percent**
Dynamic Efficiency	**475 grains**	**73.6**	**percent**
Dynamic Efficiency	**525 grains**	**75.1**	**percent**



Speed/ Performance Measurements:

shot	Weight (grains)	Pact Chrono	CE Pro-Chrono	shot	Weight (grains)	Pact Chrono	CE Pro-Chrono	shot	Weight (grains)	Pact Chrono	CE Pro-Chrono
1	425	343.6	342	1	475	328.7	327	1	525	315.8	314
2		343.4	342	2		328.6	327	2		315.5	314
3		343.7	342	3		328.0	327	3		315.1	314
4		343.7	342	4		327.9	327	4		314.6	314
5		343.7	342	5		327.7	327	5		314.7	314
avg (fps)		343.6	342	avg (fps)		328.2	327	avg (fps)		315.1	314

Speed per inch of Power-Stroke:

Speed measurements were taken with three (3) different arrow weights to provide an adequate profile of the crossbows' velocity. A 2009 Pact Chronograph XP and a Competition Electronics Pro-Chrono IR are set in tandem to record results. Also, the average speed measurements were divided by the power-stroke to determine the speed per inch of power-stroke.

	Weight	Speed Per Inch of PS
Speed per inch of Power-Stroke	425 grains	26.7
	475 grains	25.5
	525 grains	24.5
Measured Power-Stroke (inches)		12.875

Noise Output:

Sound measurements were recorded with three (3) different arrow weights to determine the average noise output, the average noise is A-weighted (dB A) (mimics the human ear). A CEL-430 sound level meter is used for this test.

Sound Measurements			
Weight (grains)	425	475	525
Parameter	Peak A -Weighted Noise (dBA)		
1	~~93.3~~	92.1	~~90.6~~
2	92.9	92.0	90.9
3	92.9	91.9	90.9
4	92.9	~~91.7~~	90.9
5	~~92.5~~	~~93.2~~	~~91.0~~
6	93.2	91.8	90.9
7	93.2	92.2	90.8
8	93.1	92.2	90.8
9	92.9	92.2	90.7
10	93.0	92.0	91.0
Average	93.0	92.1	90.9
Total Avg Max	92.0		

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Trigger Analysis	
	Trigger Pull (lbs)
1	3.24
2	~~3.23~~
3	3.52
4	3.47
5	3.56
6	3.65
7	3.41
8	~~3.72~~
9	3.25
10	3.29
11	3.31
12	3.41
13	3.55
Average Trigger Pull (lbs)	3.42
Distance Traveled (inches)	0.4795

Trigger Force:

The Trigger Force measurements were recorded in pounds and averaged. An Imada Digital Force Gauge is used in determining the Trigger Force.

Precision Measurements:

Provides an indication of how close groups are shot together by utilizing a shooting machine and shooting by hand from a bench rest or other supportive device. Extreme spread is the predominate method used to calculate group size.

Projectile Precision						
	Model/ Brand	Arrow Weight	Distance (yards)	Spread 1 (inches)	Spread 2 (inches)	Average
Shooting with Platform	Easton Pwr Bolt	446	40	0.472	0.112	0.292
Shooting with Platform	Pro Elite	426	40	0.427	0.448	0.437
Shooting by hand	Easton Pwr Bolt	446	40	1.245	1.684	1.464

Overview:

The Phantom CLS came to Archery Evolution as a complete crossbow with numerous accessories that should benefit the consumer. The product was well contained inside the Bow-Max case, the interior of the case has numerous pads and straps to support and control the product. TenPoint has paid attention to every detail when putting these packages together, and upon opening the case, we were all impressed with the presentation. The most apparent feature is the REALTREE® APG HD™ camouflage that covers almost every component. TenPoint has developed some significant innovations that are noticeable when shooting the product. The patented GripSafety™ is a key feature that the archer must press to allow the crossbow to fire; this feature also supports a preventive measure of keeping fingers and thumbs below the path of the string. Another key characteristic is the rigid CLS Riser and Limb Pocket System, which maintains significant control over the split limbs and was developed through Finite Element Analysis. The Phantom CLS has an ACRA-ANGLE™ barrel that is considered an essential element for accurate shooting. In general, the stock design has some very noteworthy elements that aid the archer when shooting. The thumbhole stock, contoured

fore-grip and proper weight distribution creates a design that can be well controlled and balanced when shooting.

Although the product has some great features, we noted some areas that could be improved. The product produces respectable projectile speeds, but the efficiency of the product is low in comparison to some of the products recently tested. An efficient design leads to the potential of increased speeds and overall creates better product performance. Another aspect that would be advantageous is an overall smaller design. The product aligns with the "butt to strut" (overall length) dimensions of other products tested, but the width (axle to axle) is slightly longer than the competition. A smaller dimensional crossbow benefits the archer by increasing maneuverability.

The product has great areas of strength as compared to competitors. The first notable feature is the power touch trigger, which is the overall lightest tested thus far. The triggers light pull supports increased accuracy, as depicted in the "shot by hand" portion of the Projectile Precision test. The trigger is designed to have a short distance that the weight stacks and reaches a definite breaking point, which is 100% predictable.

Another major feature that is beneficial and unique is the ACUdraw 50; this feature reduces the draw weight by 50%. The ACUdraw 50, consisting of T-handles and clips, is integrated into the butt stock. The location of the unit is ideal for quickly loading the crossbow. The mechanism used to load the crossbow can be rapidly auto-retracted. After retraction, the clips are controlled by magnets, reducing the concern of anything dangling during or after the shot. An additional attribute that is favorable is the 3x Pro-View Scope. The scope is preinstalled and bore-sighted from the factory, saving precious time when starting to fine-tune the crossbow. In addition, the scope provides the option to illuminate the dots in the duplex crosshairs; the illumination is either red or green in color and is controlled by a five-position rheostat.

One very impressive aspect, although it may seem minor, is the weight tolerances of the three-pack of TenPoint Pro Elite bolts. Many products have projectiles included with their packages that have weight variances of upwards to 7-8 grains amongst several bolts. The Pro Elite bolts all weighed within 1 grain of each other and based on our testing this supported increased precision when shooting numerous bolts. The advertising speeds of the mentioned bolts aligned very closely with the testing done by Archery Evolution. The speed of the Phantom CLS was quite impressive, but more remarkable is the precision shooting of this product. The Phantom CLS shot each projectile directly in the same hole as previous with both the Easton Power Bolts and the Pro Elite Bolts. The cumulative average extreme spread is presently the lowest reported, and with the Easton Power Bolt, the average spread measured 0.292 inches. Overall, this product had many original features and innovations. The crossbow produced great performance results that with strike a favoring opinion with many consumers.

Special Thanks: We would like to thank the manufacturer and sponsors who supported this event; without them and their support, this evaluation would never have been possible.

SpyderWeb Targets were used throughout this test, we were fortunate since these targets were extremely easy for removing arrows. They withstood numerous shots at close distances and we never had a pass-through.

The Easton Carbon Power Bolts were great and allowed for numerous weight configurations; these were used in the performance tests.

The Gold Tip Crossfire series were used in the beginning stages of testing when the product was put through a 100-150 shot cycle test. These arrows survived some extensive shooting.

Scorpion Venom Archery Lubricants provided wax, lubricants and crossbow rail lube. The rail lube is stated to have the ability to increase speeds upward to 1-2 fps.