

Crossbow Report: Vision 175 by Horton

by Jon Teater of Archery Evolution

Archery Evolution received the new Vision 175 produced by Horton. The Vision 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:

Horton, one of the oldest crossbow manufacturers, is keen on providing products that boast innovation. The Vision 175 is developed on a similar platform as its big brother, the reCon 175, but without some of the tactical features. The crossbow has some unique technologies and features that will draw interest from a visual and shooting perspective.

The Vision 175 was provided to Archery Evolution as a package, which includes a multitude of components that were examined thoroughly for any imperfections. The crossbow was received with the following items: cocking aid, Mult-A Range ® 4X32 Scope with lighted reticle and rings (allen-key style hex wrench included), scope cleaning cloth, quiver (the quiver mounting bracket was pre-installed), quantity three (3) Lighting Strike MX Arrows (fletched, nocks and inserts installed and field point included), manual and service string. Additionally, the stirrup, which is not installed, but provided in the package, requires one bolt for installation; an allen-key style hex wrench is provided to torque down the mentioned hardware.

The crossbow dimensions/weights measured out of the box:

Vision 175			
Contact Info Horton www.crossbow.com			
MSRP (with package)	\$800	Finish Stock	Realtree ® APG ™ Composite
Limbs	Glass filled composite*		
Performance at a Glance			
Arrow	Speed	K.E.	Momentum
425 Grains	299.0	84.4	18.1
475 Grains	285.2	85.8	19.3
525 Grains	272.8	86.8	20.4

* Limbs come with a lifetime warranty

Dimensions & Weight

Model	Axle to Axle	Axle to Axle (full draw)	Powerstroke	Rail*	Overall Length	Mass Weight (including scope)	Mass Weight (without scope)
Vision 175	16.125"	9.8125"	12.9375"	14.375"	34.4375"	9.2 lbs	8.4 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 review revealed minor tooling marks on the eccentric, specifically in the inlet that houses the string post and in the inlaid cutouts of the cams. Additionally, the cams did not have any noticeable sharp edges or burrs. A small void in film dipping was noted on the butt plate. Overall, this product was up to par as compared with competitors, and the mentioned imperfections were determined to have no affect on performance.

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 primary issue noted was string serving separation. The high load and acute string angle created by the Frontal String Technology at full-draw is the distinguished cause of the separation. No other items were discovered during this portion of evaluation.

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

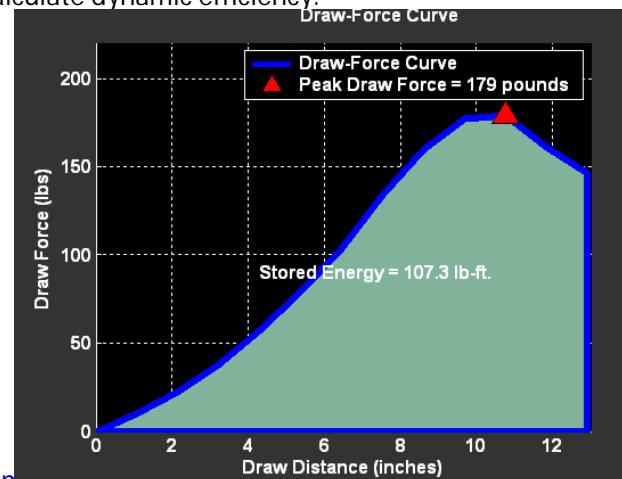
Test Category	Assessment
Dynamic Efficiency	Provides an indication of the amount of energy output by a crossbow relative to the energy expended through drawing the crossbow back. An assessment is made with multiple arrow weights.
Speed per inch of Power-Stroke	Provides an indication of the amount of 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 arrow 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 arrow 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	179.0	lbs
Stored Energy	107.3	lb-ft
Dynamic Efficiency	425 grains	78.6 percent
Dynamic Efficiency	475 grains	80.0 percent
Dynamic Efficiency	525 grains	80.9 percent



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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	299.2	296	shot	1	475	285.3	282	shot	1	525	272.7	269
2		298.8	295		2		285.2	282		2		272.8	270
3		299.1	296		3		285.2	282		3		272.9	269
4		299.1	295		4		285.1	282		4		272.8	269
5		298.8	295		5		285.1	282		5		272.8	269
avg (fps)		299.0	295	avg (fps)			285.2	282	avg (fps)			272.8	269

Speed per inch of Power-Stroke:

	Weight	Speed Per Inch of PS
Speed per inch of Power-Stroke	425 grains	23.1
	475 grains	22.0
	525 grains	21.1
Measured Power-Stroke	12.9375 inches	

of power-stroke.



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.

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

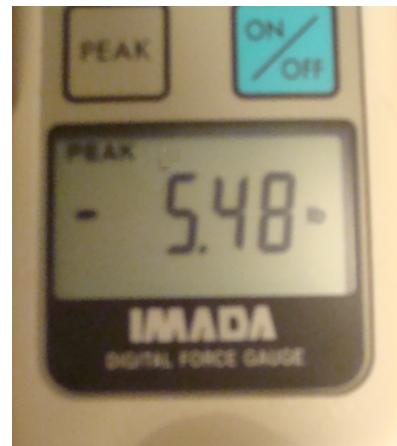
Sound Measurements			
Weight (grains)	425	475	525
Parameter	Peak A -Weighted Noise (dBA)		
1	86.9	86.0	85.8
2	86.5	85.9	85.6
3	86.7	85.8	85.3
4	87.0	86.0	85.6
5	87.0	86.4	85.6
6	86.7	86.0	85.4
7	86.5	85.8	85.1
8	86.6	85.8	85.3
9	87.1	85.9	85.3
10	86.7	85.8	85.3
Average	86.8	85.9	85.4
Total Avg			
Max			86.0



Trigger Force:

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

Trigger Analysis		
		Trigger Pull (lbs)
1		5.66
2		5.42
3		5.48
4		5.52
5		5.20
6		5.50
7		5.53
8		5.90
9		5.45
10		5.42
11		5.22
12		5.19
13		5.61
Average Trigger Pull (lbs)		5.46
Distance Traveled (inches)		0.1945



Projectile Precision

	Model/ Brand	Arrow Weight	Distance (yards)	Spread 1 (inches)	Spread 2 (inches)	Average
Shooting with Platform	Easton Pwr Bolt	446	40	0.635	0.348	0.491
Shooting with Platform	Lighting Striker	433	40	0.845	1.178	1.011
Shooting by hand	Easton Pwr Bolt	446	40	1.032	2.215	1.623

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.



Overview:

The product did extremely well in the performance tests. The performance results were complemented by the "shootability" of the product throughout the testing. The areas of ergonomics, balance and aesthetics stood out

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as the test began. The products foremost feature is its compact design. The design radius allows the archer to maneuver in tight situations; this aspect of the crossbow is created through a shortened stock and frontal string technology. The mentioned technology is supported by a limb design that sustains an immense amount of deflection, over six (6) total inches, which is rather impressive. Also, the thumbhole stock has a MonteCarlo cheek piece that adds much needed comfort when shooting. The stock design allows the archer to stay more aligned with the trigger and provides additional control. Another beneficial feature is the slotted forearm, which supports full hand contact and aids in steadyng the crossbow. The forearm is located at the center balance point, which allows for excellent control.

Although the product has some great features, we noted some areas that could be improved. The projectile retention spring does not provide adequate downward pressure to make contact with the bolt; this is an important aspect of crossbows as it allows proper control of the bolt when shooting, especially from various angles. Another aspect that would be advantageous is additional buffering on the rail to reduce friction that occurs as the string makes contact when the crossbow is shot. Horton provides rail lubricant to reduce friction, the lubricant should be applied after twenty-five (25) shots. Additionally and as mentioned earlier, a tighter serving is needed on the string to minimize premature wear and abrasion.

The areas of strength as compared to competitors were apparent. The Vision's smaller stature is currently unrivaled to other products offered commercially. The housing block is extremely rigid, and has an affixed weaver rail, which allows for a multitude of sight attachments. A major feature that was comforting is the safety mechanism, which employs as the product is drawn, through the cocking aid, and the string deposits in the trigger housing. One of the major improvements, as compared to competitors, is the decreased vibration when the product is shot. The design effectively reduces vibration with an opposing limb configuration; this supports increased accuracy, reduced shot noise and decreased wear on components. Another favorable attribute is the minimal noise created when shooting. In comparison, some of the products recently tested were producing noise, in the same test environment, at 6-8 decibels higher. The most impressive element that distinguishes this product thus far is the performance results of the precision testing. The Vision 175 shot each projectile directly in the same hole as before with the Easton Power Bolts. The cumulative average extreme spread is presently the lowest reported, and the spread of smallest group is .348 inches. In addition, the measurements taken during the precision test when shooting by hand, in this case off sandbags, were also impressive at a distance of 40 yards. Overall, the Vision 175 was a very complete crossbow and from a cost perspective, the price (package only) is much lower as compared to competitors.

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.

