Scientific Target Test

McKenzie, a Delta Sports company, is amongst the names at the top of the leader board in the target manufacturing arena. McKenzie seems to be best known for producing 3-D targets. Most archers can attest to the popularity of these targets in their local 3-D circuits. The company produces a multitude of products outside of their 3-D line, including decoys, bag targets and foam targets.

In 2007, McKenzie introduced the ShotBlocker Bowhunter. The ShotBlocker series falls within the company's layered foam line. The ShotBlocker series has grown to include seven offerings all using foam that is welded together at multiple spots. The more popular targets within this line are the nine spot models. This sub-segment includes the Utility, Backyard, Crossbow, and already mentioned Bowhunter model. McKenzie also offers a foam target that is smaller in stature, but equal in design to the nine spot models, called the TravelPro. The TravelPro is an easy sell to customers that have space restrictions or need a portable target.

The ShotBlocker Bowhunter is no doubt an eye-catcher. The vibrant blue body and black reference points create an excellent contrast for shooting. The other offerings within the foam line have a similar appeal. The company has a solid approach to designing these layered targets. The most noticeable is obvious – aesthetics. The targets produced by McKenzie, and available online or at my local pro shop, display a very clean look, present clear-cut faces and fall in a range of easy-to-carry sizes. The company remains keen on producing targets with simple, yet effective designs. However, the Bowhunter model isn't necessarily as simple as one may think. The company has included a wrap over two faces, which should increase curb appeal and test an archer's proficiency. The wrap is a simple addition, nevertheless beneficial, and for a short while this will provide added protection from the elements. The concept of simple and effective goes a long way with most people, and as mentioned above, the Bowhunter model exudes these qualities.

Penetration Test

Parameter (Shot)	Front of Target
1	23
2	~~22~~
3	26
4	27
5	25
6	28
7	22
8	29
9	~~32~~
10	27
Average Shots*	26

*** The average calculation does not consider the highest and lowest measurements**

The Test

There are very few technical reviews on targets, which has made developing test parameters a little difficult. With that said, evaluating targets is not as easy an endeavor as some may think. I am hopeful that this test will help all of us gain a better understanding of targets and the product that is spotlighted in this article. The test methods used and presented in this article are similar in nature to other tests I have done. Moreover, I have considered more recent philosophies on testing archery products as it relates to industry standards.

The test equipment used is as follows: an automated drawing/shooting machine, compound bow (set up at 60 pounds, 29 inches), carbon arrow, AMS fiberglass arrow (with chisel tip point, without outsert), load cell, hydraulic lift and high tensile rope.

The compound bow and arrow combination are measured for velocity during the test and included in this article. In addition, the target's distance from the bow is standardized.

Bow Setup and Distance from Target - Penetration Test		Weight (lbs)	Draw Length (inches)	Arrow Weight (grains)	Velocity (fps)*	Kinetic Energy (lb-ft)	Momentum	Distance to Target (ft)
	Compound Bow	60	29	360	290	67.24	14.88	10

*** The rating velocity is measured per ATA/BOW-104-2008**

The distance from the target is measured by taking the vertical projection of the bow's pivot point, to the approximate path of the arrow, and measuring 10 feet (+/- 1 inch) to the front of the target.

The testing is split into three parts, namely: Penetration Test, Arrow Removal Test and Durability Test.

Penetration Test (Hole in Hole)

The purpose of this test is to evaluate the design integrity and "stopping" characteristics of the ShotBlocker Bowhunter. As mentioned, the target is 10 feet away from the compound bow. The fast speeds of the arrow and close distance to the target is an extreme scenario when compared to normal shooting, but this was done with a purpose. The target is close to the bow to assure that the arrow is shot in the same hole as the previous one, since a small change in point of impact will invalidate the results.

The arrow is measured utilizing ATA Guidelines (ATA/ARR-201-2008). The actual arrow length used in this portion of the test is 29 inches. The arrow is marked 18.625 inches from the leading end of the arrow shaft, which is approximately 64 percent of the total arrow length. The distance from the front of the shaft is not derived arbitrarily. The remaining 10 or so inches of arrow gives an archer enough room to grip the shaft without making contact with the fletching as the arrow is pulled from the target.

The ShotBlocker Bowhunter is mounted to a hydraulic lift table. The table allows the target to be raised and lowered and moved left and right if needed; this permits the bow to remain in a single position. The bow is mounted to a rigid, sophisticated automated shooting machine. The bow is shot multiple times with an identical arrow at the same location until the arrow reaches 18.625 or greater. In some cases, the arrow will exceed the 18.625 inch threshold, which is tallied only if the previous shot did not reach the threshold mark. The test is repeated several times and the results are recorded. The average measurement represents the amount of shots it takes to meet or exceed the threshold marking.

The results illustrate the target's ability to endure heavy hits from an arrow at close range. On average, it takes 26 shots placed in the same location to reach 18.625 inches or greater of penetration based on the bow and arrow setup mentioned in this portion of the test.

Arrow Removal Test (Pull Test)

Many of us have probably wondered how much force it takes to remove an arrow from a target. That seems like a difficult thing to measure when dealing with many variables. The test that has been created allows me to measure the amount of force it takes to remove an arrow with some of the equipment I mentioned earlier.

An AMS fiberglass arrow is modified by removing the outsert and incorporating a chisel tip only onto the shaft. The modification of the arrow creates a similar profile to a typical hunting or target arrow. The fiberglass arrow is used because it has a stopping device and an AMS safety slide, which allows me to retract the arrow from the target. The fiberglass arrow is significantly heavier than most hunting arrows. Do not be put off because of this difference. The typical penetration of the fiberglass arrow into the ShotBlocker Bowhunter is approximately the same as the other hunting arrow used in this test. Any variation in penetration is mostly attributable to the differences in momentum. In addition, the friction coefficients of dry and clean fiberglass and carbon surfaces are very similar; therefore, it is difficult to say those differences create any disparity.

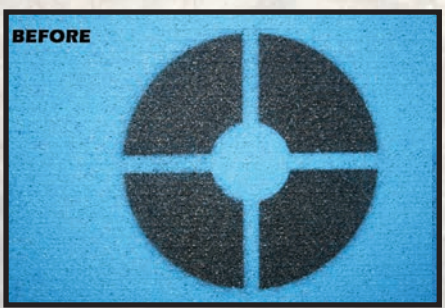
As mentioned in the previous segment of the test, the target is mounted to a heavy duty hydraulic lift table. The bow fires an arrow at the target, and a machine retracts the arrow with the use of weight measuring equipment. The bow is shot at various locations on the target, but never in the same hole as previously shot. The force measurements are recorded and averaged.

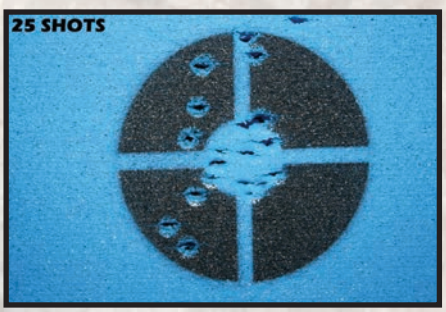
The results confirm that it takes on average 58.7 pounds of peak force to remove an arrow from the ShotBlocker Bowhunter. The test represents data from 10 shots, and the results are based on the bow and arrow setup mentioned in this segment of the test.

ArrowTrade Scorecard

Evaluation Criteria	Score
Craftsmanship	
Design Integrity	
Ease of Pull	
Features	
Performance	

Note: The ratings are based on the following color codes:
Blue = exceptional,
Green = above average,
Light Green = average,
Yellow = marginal,
Red = unacceptable





Bow Setup and Distance from Target - Arrow Removal		Weight (lbs)	Draw Length (inches)	Arrow Weight (grains)	Velocity (fps) *	Kinetic Energy (lb-ft)	Momentum	Distance to Target (ft)
	Compound Bow	60	29	1142	170	73.30	27.68	10

*** The rating velocity is measured per ATA/BOW-104-2008**

Durability Test

A compound bow is fired at approximately 10 feet away from the target. The bow is shot 25 times and is oriented so the arrow hits within a 2 inch circle. The target is photographed before and after the bow is shot. The test revealed no pass-throughs. The face was only slightly impacted by the intense shooting as shown.

Arrow Removal Test

Average (lbs)*	58.7

*** The average calculation does not consider the highest and lowest measurements**

Pros/Cons

The ShotBlocker Bowhunter is designed first and foremost to stop arrows; this includes broadhead and field point tipped arrows. As indicated on the company website, the ShotBlocker model features Welded-Core Technology. The technology creates uniform foam compression. The benefit to the user is both internal and external foam consistency. We can agree that soft or weak spots on a target are a major concern. The testing indicated very consistent foam compression and stopping characteristics throughout. The use of foam has its pluses. Foam can be manufactured to be very uniform and homogeneous. It also is typically less abrasive and has less negative impact on the outer layer of the arrow than some other target materials.

The friction created through the foam/arrow contact creates a force that is difficult to overcome, and the results of the hole-in-hole test demonstrate that the Bowhunter model has ample stopping characteristics. From another perspective, the numerous shots required to penetrate deeply into the target give way to a different concern – difficult arrow removal. This is not uncommon compared to targets I have tested and owned over the years, and the foam does an excellent job of making contact with the arrow, which is what you want. I can personally attest to the fact that I did not struggle to remove arrows during the test, but some archers may have concerns about this aspect. Therefore, I'd suggest that those customers considering a layered foam target from McKenzie also buy arrow lube and/or an arrow puller like the Bednar Perfect Puller recently introduce by TenPoint Crossbows.

As already mentioned, the company designed this target and others within their three lines to be simple and effective. The foam layered line does not have plates, bands, cables, wires or straps. Their lack enhances longevity based on the simple KISS (Keep It Simple) principle we have all come to believe in. The bottom line is that archers are looking for a product that will last, and I am of the opinion that this target should survive as long, if not longer, than most competitors' products. Further, to strengthen mine or anyone's opinion on this target, consider the technology that has gone into the design. The Welded-Core Technology solidifies the interior as well as the exterior because the layers are bonded together at multiple points. People that are familiar with foam targets have at one time or another experienced target chunking or slivering. This Welded-Core construction helps eliminate those issues. Consumers should be aware that with all the pluses there is a negative. The ShotBlocker Bowhunter is porous. As expected, this target is susceptible to the elements – especially water intrusion. For that reason, I recommend utilizing a tarp or some other protective means when the target is not in use, or store the target in a garage or shed.

The other major selling point for the ShotBlocker Bowhunter is the lightweight design. It is by far one of the lightest targets I've tested. I personally do not like lugging around heavy targets, which may in many cases be a factor of size rather than composition. This target is created with a perfect balance of size, weight and stopping power.

Overall

The product has some superb features. The clean, crisp shooting faces and lightweight design are the standout characteristics. The samples tested demonstrated consistent foam density, which is a big plus for archers that shoot as much surface area as possible. The Welded-Core Technology adds greatly to the target's integrity and sets this target apart from the competition. I believe the Iowa-based company is going to continue to refine its line of targets and offer an even larger selection in years to come.