2009 Compound Hunting Bow Evaluation

APA Innovations Mamba MX2 Test Results

By *Anthony Barnum*

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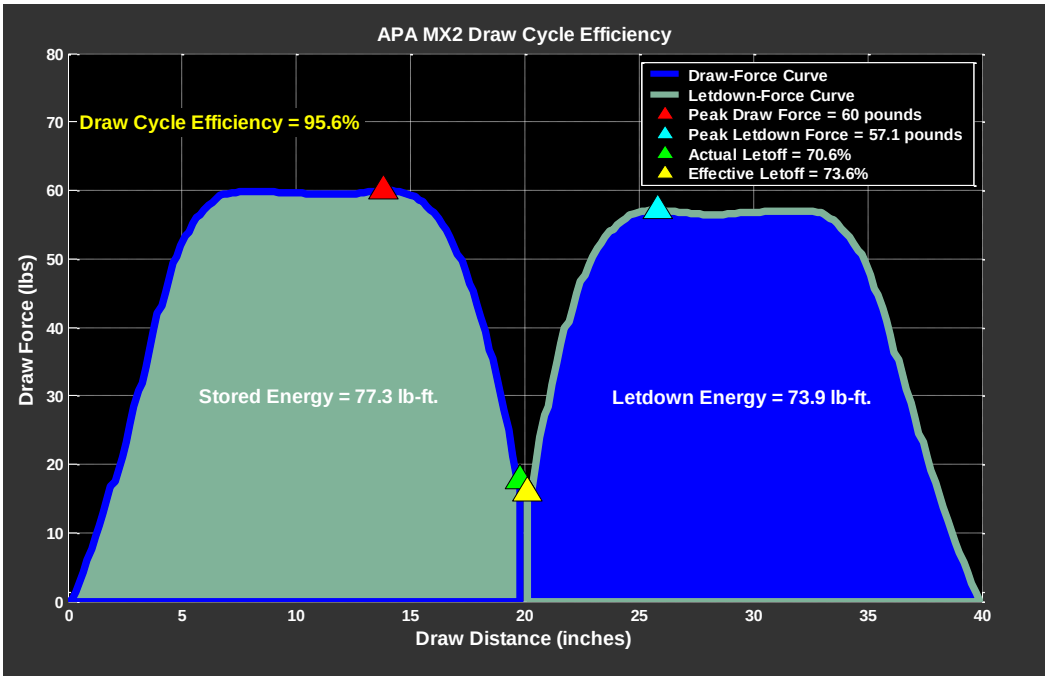


Introduction:

Continuing to raise the bar for usability in the field, APA Innovations' flagship model, the Mamba MX2, offers even more unique design features than last year's Viper, which was laden with versatility. The Xtreme Venom Cam, a new dual cam system utilized by the Mamba MX2, not only employs modularly adjustable draw-length but also includes a new Cam Lock Press system that allows the archer to repair his or her bow in the field. The cam system combines a series of holes machined into the eccentrics with a stainless steel pin to allow the user to lock the bow in a partially drawn position. This stainless steel pin is housed in the Tool Center, which also includes a nock alignment tool, a broadhead wrench, and a carbide blade sharpener. Above the tool center is a front riser bridge that adds rigidity to the riser, helping to prevent torque while undergoing the rigors of the draw cycle. This riser bridge doubles as a convenient carry handle and is complimented by a "fang" that is built into the riser, which provides the means to hang the Mamba MX2 on a nearby branch. All of these features are combined into a powerful shooting package.

APA Innovations Mamba MX2

Contact Info: APA Innovations
www.apaarchery.com

MSRP:	$799.90	**Draw Length:**	26"-31" *
Cams:	Xtreme Venom Cam	**Draw Weight:**	50-80*
Limbs:	14 ½" Composite	**Brace Height:**	7 3/8" *
Grip:	Two-piece laminate	**Axle to Axle:**	32" *
Let-off:	75% *	**Mass Weight:**	4.4 lbs.
String:	Scorpion		
Damping:	Bowjax		*Advertised
Finish:	Vanish Hybrid		

Performance at a Glance (60 lbs, 29"):

Arrow	Speed	K.E.	Momentum
300 Grains	306.0	52.4	13.1
360 Grains	283.3	64.1	14.6
420 Grains	264.5	65.2	15.9
540 Grains	235.6	66.5	18.2

Arrow (Grains):	300	360	420	540
Dynamic Efficiency:	80.7%	83.0%	84.4%	86.1%
Speed Per Inch of PS:	15.5	14.3	13.4	11.9
Noise Output (dBA):	87.6	87.2	85.9	81.4
Total Vibration (G):	458.7	447.3	383.6	292.6

The Mamba MX2 sample that was provided to Archery Evolution was measured to have a brace-height of 7.460 inches, while the axle-to-axle length was measured to be 32 3/8 inches. The requested 29 inch, 60 pound model was measured straight out of the box to have a 30 1/8 inch draw length and peak draw-weight of 61.8 pounds. At these settings, the Mamba MX2 achieved an average speed of 320.3 fps when shot by hand in the out of box configuration with a 300 grain arrow. After changing the module to bring the bow down to the specified 29" draw, the peak draw-weight changed to 62.2 pounds; at these settings, the Mamba MX2 achieved an average speed of 314.3 fps when shot by hand with a string loop installed and 312.5 fps when shot from the shooting machine. Per request from APA, a slight adjustment to limb bolts was made to bring the Mamba MX2 down to the peak draw-weight specification of 60.0 pounds.

A thorough examination of the finish quality showed some imperfections. Various "pin-prick" areas void of film dip finish were noticed near several of the riser cut-outs, on the front riser bridge, and on the limb pockets. Only one major blemish was noted on the corner of the lower limb pocket, where bare aluminum was visible. This blemish may have been caused during the shipping process and is only noted from a quality inspection perspective. Otherwise, the grip area, limbs, and cams all looked very good from a finish perspective; the smooth, rounded edges and unique cutouts add to the aesthetic appeal of the MX2

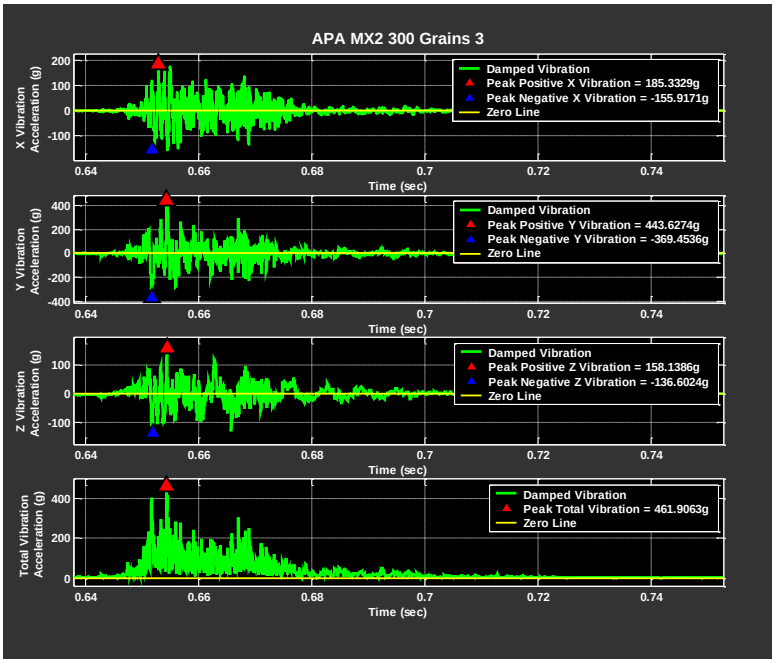
Detailed Test Results:

Speed / Performance Measurements:

Speed measurements were made with 4 different arrow weights to determine the average speed of the bow per inch of Power Stroke. Utilizing the stored energy obtained from the Force-Draw curve, average dynamic efficiency was calculated.

Speed per inch of Power Stroke: 13.8
Dynamic Efficiency: 83.5%

Speed Point Blank - 29" ± 1/4", 60# ± 1#	APA Innovations Mamba MX2							
	Brace Height = 7.460		Draw Weight = 60.0		Draw Length = 29		Axle-to-Axle = 32 3/8	
Grains	300 Grains		360 Grains		420 Grains		540 Grains	
Chronograph	BFM	Pro-Chrono	BFM	Pro-Chrono	BFM	Pro-Chrono	BFM	Pro-Chrono
1	306.2	305	283.4	282	~~264.2~~	263	235.6	235
2	306.0	305	283.4	282	264.5	263	235.6	235
3	~~305.8~~	305	~~283.5~~	282	264.6	263	~~235.4~~	235
4	~~306.4~~	305	~~283.0~~	282	~~264.7~~	263	235.5	235
5	305.9	305	283.1	282	264.4	263	~~235.7~~	235
Avg. Speed	306.0	305	283.3	282	264.5	263	235.6	235
Kinetic Energy	62.4	62.0	64.1	63.6	65.2	64.5	66.5	66.2
Momentum	13.1	13.1	14.6	14.5	15.9	15.8	18.2	18.1
Power Stroke	19.790							
Speed per inch of Power Stroke	15.5	15.4	14.3	14.2	13.4	13.3	11.9	11.9
Avg. Speed per inch of PS	13.8							
Stored Energy	77.3							
Dynamic Efficiency	80.7%	80.2%	83.0%	82.2%	84.4%	83.4%	86.1%	85.6%
Avg. Dynamic Efficiency (BFM)	83.5%							



Vibration Measurements:

Vibration measurements were made with 4 different arrow weights to determine the average vibration in 3 dimensions as well as the total average vibration.

Positive X-Vibration: 159.9 g
Negative X-Vibration: -152.6 g

Positive Y-Vibration: 333.8 g
Negative Y-Vibration: -367.7 g

Positive Z-Vibration: 128.0 g
Negative Z-Vibration: -139.7 g

Total Vibration: 395.6 g

Sound Measurements:

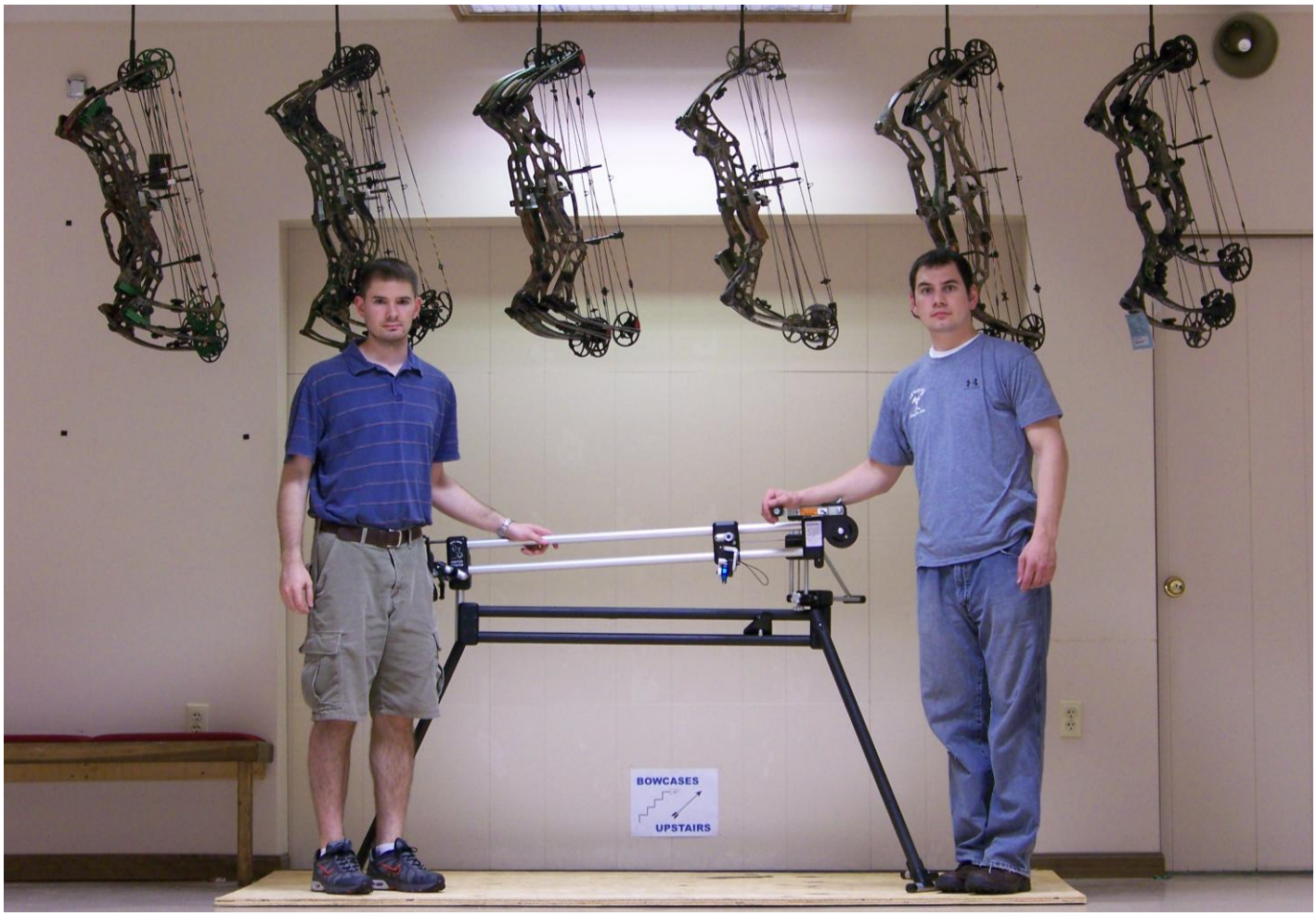
Sound measurements were made with 4 different arrow weights to determine the average sound output, the average A-Weighted sound output (mimicking the human ear) and the average C-Weighted sound output.

Unweighted Sound Output: 104.3 dB
A-Weighted Sound Output: 85.5 dBA
C-Weighted Sound Output: 95.1 dBC

The addition of the 12 inch B-Stinger Pro Stabilizer with a 14 ounce weight yielded a reduction of peak A-weighted sound Output when measured with a 360 grain arrow.

B-Stinger Reduction: 2.6%

Noise & Vibration	APA Innovations Mamba MX2											
	Brace Height = 7.460			Draw Weight = 60.0			Draw Length = 29			Axle to Axle = 32 3/8		
Parameter	Peak Noise Output (dB)				Peak A-Weighted Noise Output (dBA)				Peak C-Weighted Noise Output (dBC)			
Grains	300 Grains	360 Grains	420 Grains	540 Grains	300 Grains	360 Grains	420 Grains	540 Grains	300 Grains	360 Grains	420 Grains	540 Grains
Measurement	Max				Max				Max			
1	~~106.6~~	~~105.5~~	~~103.2~~	~~104.7~~	~~89.6~~	~~88.0~~	~~86.6~~	~~86.6~~	~~98.8~~	~~94.5~~	~~93.7~~	~~94.3~~
2	~~104.7~~	~~104.1~~	103.7	103.8	87.8	87.3	85.8	81.9	97.0	95.1	~~95.2~~	93.9
3	105.3	105.4	103.7	103.6	88.1	86.8	86.2	81.4	97.5	94.8	95.0	~~93.1~~
4	104.8	104.5	~~104.1~~	103.7	87.0	~~86.3~~	85.7	~~80.3~~	96.1	94.9	94.9	93.2
5	105.0	104.7	103.6	~~103.4~~	~~86.5~~	87.4	~~84.3~~	81.0	~~95.3~~	~~95.2~~	94.8	93.5
Average	105.0	104.9	103.7	103.7	87.6	87.2	85.9	81.4	96.9	95.0	94.9	93.5
Total Average Max	104.3				85.5				95.1			



Anthony Barnum

Jonathan Teater

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