2026 RECURVE

HOYT

WHITEPAPER

2026 RECURVE

IN-DEPTH

TECHNICAL COLLABORATIVE

Contents

Abstract

Hoyt Archery's 2026 recurve product line, comprising the Metrix Limb System, Xceed 2 Series Riser, and Formula SR Riser, establishes a new benchmark in recurve bow engineering. This white paper elaborates on the advanced design methodologies, material innovations, and rigorous testing protocols that define these products.

The Metrix Limb System leverages tailored rigidity profiles and cutting-edge carbon composites, while the Xceed 2 Series and Formula SR Risers deliver unmatched tuning precision and structural optimization. These advancements ensure exceptional accuracy, durability, consistency, and adaptability, solidifying Hoyt's leadership in recurve archery technology.

Introduction

For over 90 years, Hoyt Archery has been at the forefront of recurve bow innovation, notably with the Hoyt Dovetail System ("ILF"), which has become the foundation for all modern Olympic recurve designs and copied by virtually all manufacturers today. Other Hoyt innovations range from clickers to stabilizers to pistol grips on recurve bows.

The 2026 product line—Metrix Limb System, Xceed 2 Series Riser, and Formula SR Riser—builds on decades of engineering expertise and substantial investment in research and development. This white paper provides an in-depth exploration of the technical specifications, design principles, and expanded performance benefits of these systems, validated through comprehensive testing against industry and internal standards.

Metrix Limb System Design & Engineering

The Metrix Limb System redefines recurve limb design by abandoning uniform scaling in favor of individually engineered limbs tailored for each draw weight and length. This bespoke approach optimizes flexural and torsional rigidity, resulting in superior dynamic performance and energy transfer efficiency, critical for achieving consistent arrow flight and high scores in competitive settings.

Advanced Carbon Composites

The proprietary lamination process integrates high-modulus carbon fibers with a precision-engineered matrix, enhancing structural integrity, reducing vibration and accelerating limb recovery for faster arrow speeds. This ensures archers experience minimal hand shock and a cleaner shot release.

Environmental Protection

UV/IR-blocking coatings shield the limbs from solar degradation, while radiative thermal regulation maintains material integrity in extreme temperatures (from -20°C to 50°C). This allows consistent speed in diverse conditions, from indoor ranges to outdoor fields under intense sunlight or cold.

Tailored Rigidity Profiles

Each of the 144 total Metrix limb configurations (28–50 lbs, short/medium/long, HDS/Formula, Foam/Laminate core) is meticulously designed to match specific mechanical performance requirements. This customization minimizes energy loss, enhances arrow stability, and provides a smoother draw cycle, catering to archers of varying strengths and styles.

Technical Specifications

Draw Weights

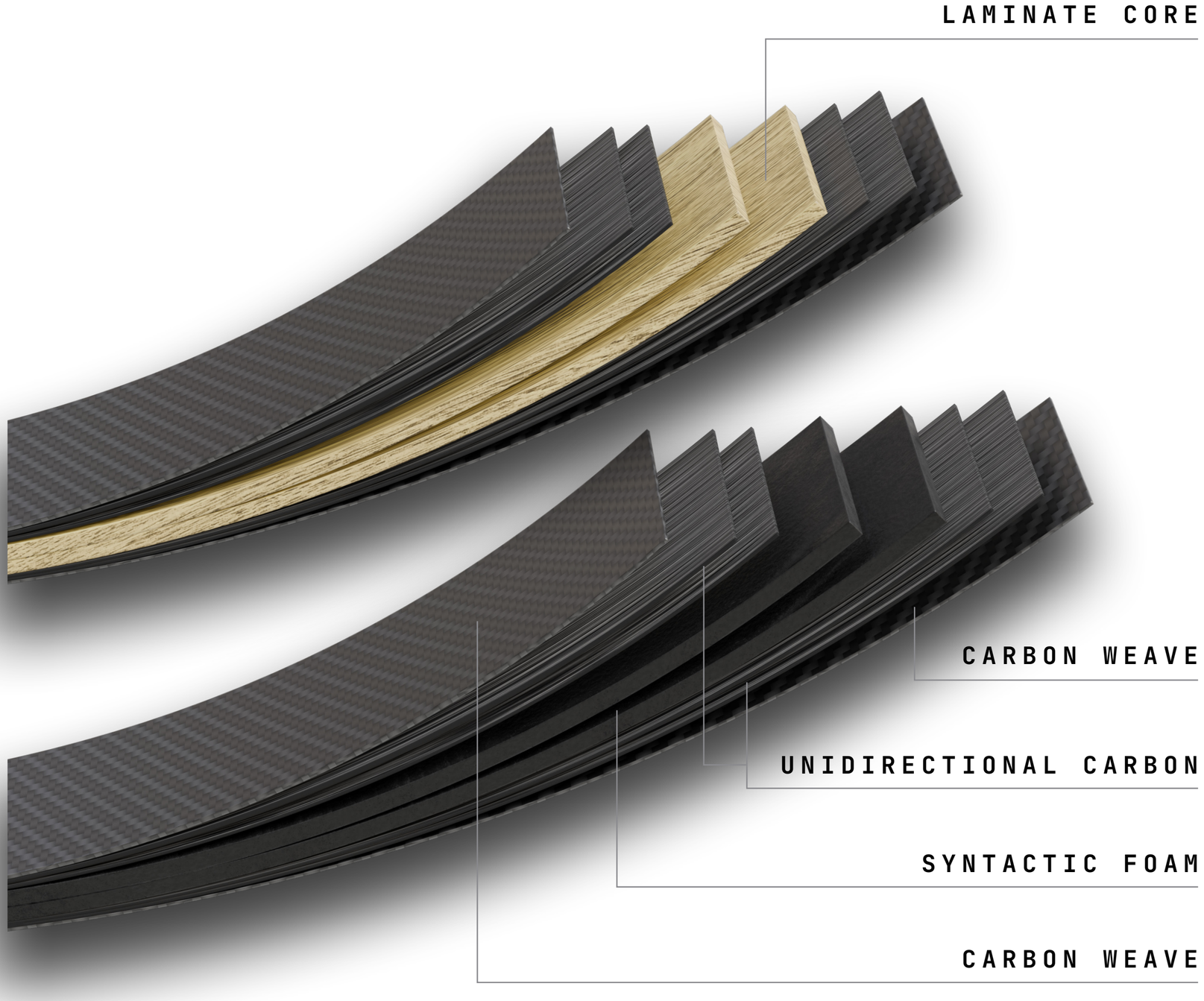
28–50 lbs, available in 2-lb increments for precise customization to archer preference and strength.

Limb Lengths

Short, Medium, Long (ATA standard **66", 68", 70"**), accommodating various bow lengths and draw lengths for optimal fit.

Configurations

- **Grand Prix Metrix:** Features Laminate or Syntactic Foam Core options, compatible with Hoyt Dovetail System (“ILF”) risers, offering versatility for a wide range of setups.
- **Formula Metrix:** Designed with Laminate or Syntactic Foam Core, compatible with Formula risers, ensuring seamless integration with Hoyt’s proprietary system for elite performance.



Manufacturing Process

Manufactured at Hoyt's state-of-the-art Salt Lake City facility, the Metrix Limb System combines automated precision with artisanal craftsmanship. Advanced robotics work in tandem with skilled technicians to ensure exact lamination and alignment and to oversee final assembly and quality checks.

Stringent quality controls, including ultrasonic and stress testing, guarantee consistency across millions of shot cycles. Environmental testing simulates extreme conditions to ensure reliability, and continuous improvement initiatives have advanced manufacturing consistency, enhancing overall quality and performance.

Expanded Performance Benefits

Increased Arrow Velocity

The optimized energy transfer system increases arrow speed by up to 5% compared to competitors, allowing for flatter trajectories and improved performance at longer distances (e.g., 70m Olympic ranges). This is achieved while maintaining forgiveness, ensuring minor form inconsistencies do not significantly impact shot accuracy.

Smooth Draw Cycle

The refined draw force curve eliminates stacking, providing a linear and comfortable draw experience. This reduces fatigue during long shooting sessions, enabling archers to maintain focus and consistency in tournaments.

Durability

Advanced carbon composites and protective coatings ensure the limbs withstand intensive use, retaining performance after over 1 million shot cycles in testing. This longevity ensures reliability for professional and recreational archers alike.

Accuracy

Enhanced torsional stability and precise limb alignment improve shot-to-shot consistency, minimizing group sizes and boosting scoring potential in competitive settings.

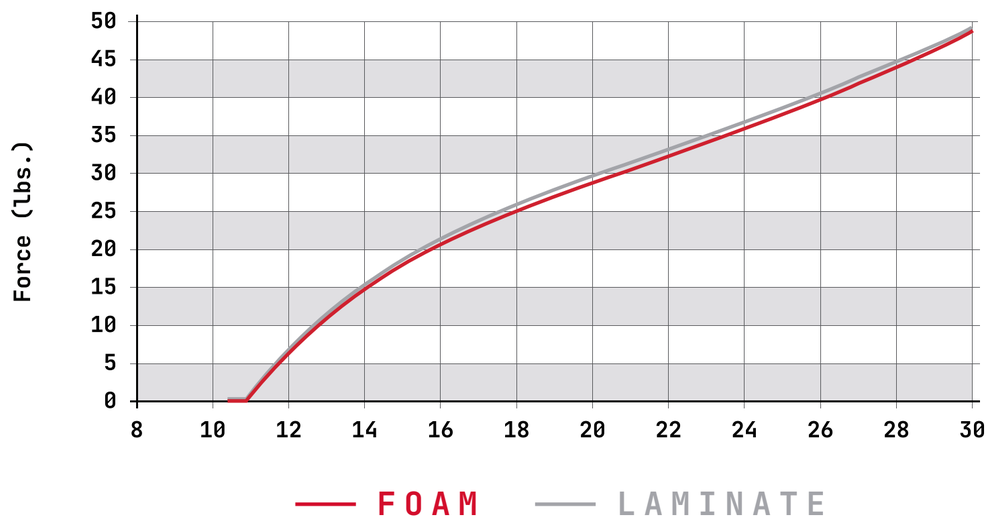
Environmental Resilience

Thermal regulation and UV/IR protection ensure consistent performance across extreme conditions, from humid tropical environments to arid deserts, making the Metrix Limb System ideal for global competitions.

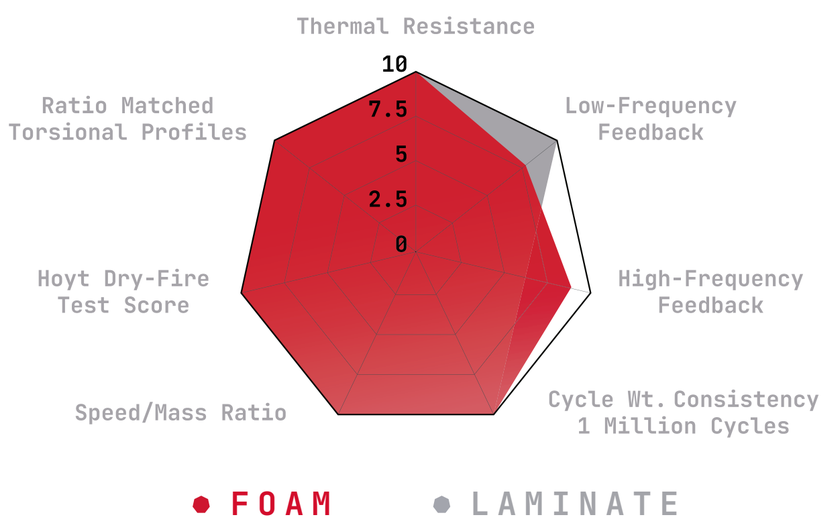
Customizability

The wide range of draw weights and limb lengths allows archers to fine-tune their setup for specific disciplines, such as target archery, field archery, or barebow, enhancing versatility and performance.

Metrix Force Draw Chart



Metrix Radar Chart



Thermal Performance

Abstract

This section evaluates the thermal performance of Metrix recurve limbs in comparison to leading competitor limbs based on temperature data from controlled tests. Thermal performance is assessed through temperature changes over a test period, where smaller increases indicate better heat dissipation, material stability, and resistance to thermal effects that could impact archery precision and durability.

The analysis reveals that Metrix limbs exhibit an average temperature rise of approximately 20.75°F across key sections, compared to 28.33°F for leading competitor limbs—a 27% reduction. Metrix limbs exhibit a temperature change that is approximately 27% less than leading competitor limbs. This demonstrates Metrix's superior thermal management, making it a preferred choice for consistent performance in demanding conditions.

Introduction

Recurve limbs in archery must maintain structural integrity and performance under varying thermal loads. This comparative study uses empirical data from temperature measurements on Metrix and leading competitor limbs, focusing on start and end temperatures across butt, mid, and tip sections on both sky and ground sides. The data highlights Metrix limbs' ability to minimize temperature escalation, ensuring greater stability. All temperatures are in Fahrenheit (°F), with changes calculated as end minus start values. Averages represent the mean of top and bottom limb measurements for each section, providing a comprehensive view of overall limb behavior.

Methodology

Temperature readings were recorded at the start and end of the test for top and bottom limbs on sky and ground sides, segmented into butt, mid, and tip areas. Changes were derived for each section, and aggregate averages were calculated across all sections to quantify overall thermal performance.

Data was extracted from detailed tables, ensuring alignment between individual and averaged values for accuracy. Comparisons focus on average changes to account for the full limb pair (top and bottom).

Thermal Performance (cont'd)

Results

This section **compares the thermal performance of the Metrix Limb System with leading competitor white limbs**, based on aggregated temperature rise (ΔT) data collected under controlled conditions (ambient temperature of 100°F, 15% humidity, clear skies, 4200 ft MSL altitude, from 11:30 to 13:00, with natural grass temps at 85°F and artificial turf at 147°F). The key metric is ΔT, where lower values indicate better thermal stability. The comparison highlights the effectiveness of Metrix's black ground side in enhancing heat dissipation through black-body radiation.

Metrix's black ground side leverages black-body radiation to minimize heat buildup, resulting in an overall ΔT of 1.6°F compared to leading competitor white limbs' 11.9°F, a 10.3°F advantage. This thermal efficiency enhances performance consistency, making Metrix ideal for high-thermal-load environments.

Thermal Performance Summary

AGGREGRATED AVERAGES	COMPETITOR (°F)	HOYT METRIX (°F)
SKY SIDE ΔT	19.05	1.8
GROUND SIDE ΔT	10.25	2.6
OVERALL ΔT	11.9	1.6

Discussion

The superior thermal performance of Metrix limbs can be attributed to advanced material composition and design that enhance heat dissipation. Leading competitor limbs experience more pronounced heating in butt sections (up to +35.5°F on sky side), potentially leading to greater performance variability. In contrast, Metrix's balanced changes suggest improved resilience, reducing risks of thermal-induced inaccuracies during prolonged use.

Conclusion

Based on the test data, Metrix recurve limbs exhibit markedly better thermal stability than leading competitor limbs, with an overall 27% reduction in temperature rise. This translates to enhanced reliability, precision, and durability for archers. The current analysis strongly supports Metrix as the superior option for thermal performance.

Applications & Maintenance

The Metrix Limb System is optimized for target archery, field archery, and barebow, offering superior vertical stability to minimize release variability and improve consistency across disciplines. Recommended strings, such as HMPE fibers (e.g., Dyneema, BCY 652, 8125G), ensure optimal energy transfer and durability. Hoyt OEM strings employ 20 strands of BCY 652 with .014 Halo serving.

Xceed 2 Series Design & Engineering

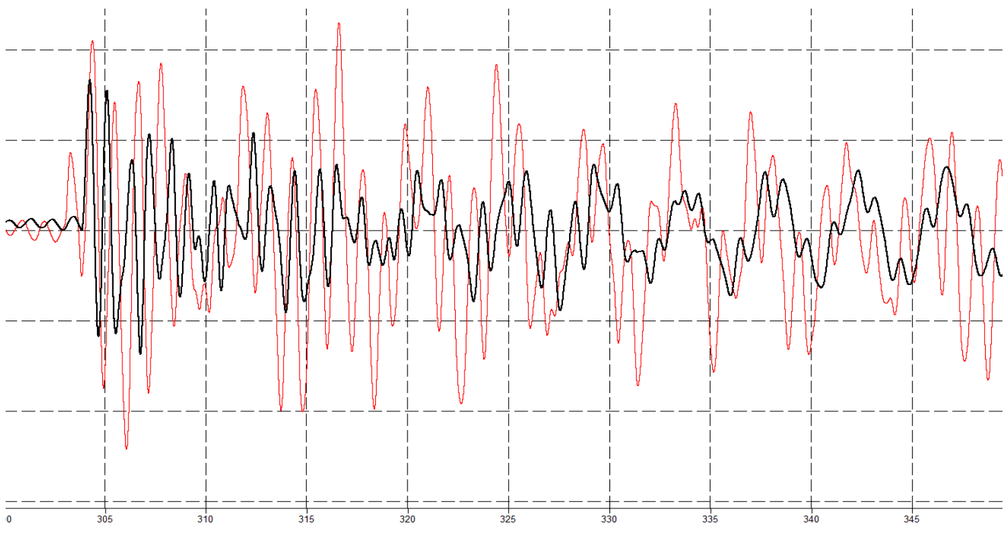
The Xceed 2 Series Riser, **built on the Grand Prix (ILF) platform**, upholds Hoyt's Classic Geometry for consistent limb alignment and minimal tuning variability, making it a favorite among precision-focused archers. Its innovative features enhance performance and user experience:

Monobloc (MB) Verta-Tune System

Increases triaxial rigidity by 15%, ensuring a stable platform for arrow launch. This reduces flex under load, maintaining consistent arrow flight and simplifying the tuning process.

Vibration Reduction

Strategically placed dampening nodes reduce post-shot oscillation by up to 8%, resulting in less vibration and faster recovery, enhancing confidence and focus, while reducing wear and tear on accessories such as sights.



MB Verta-Tune Direct Clicker Interface

Enhances haptic clicker feedback by 55%, providing a crisp, audible click in noisy environments (e.g., crowded tournaments). This improves timing precision for archers relying on clicker feedback.

Optional Pocket Weight System

Optional Pocket weight system or damper system (included). Can be used to fine-tune balance or adjust post-shot feel.

Technical Specifications

Mass Weight

3.0 lbs (1.37 kg)

Note: *This mass weight includes all components including pocket hardware, limb bolts, Vertatune plate, grip, and stabilizer bushings, and is within 20 grams of the previous model, which had weights reported without these installed components.*

Riser Lengths

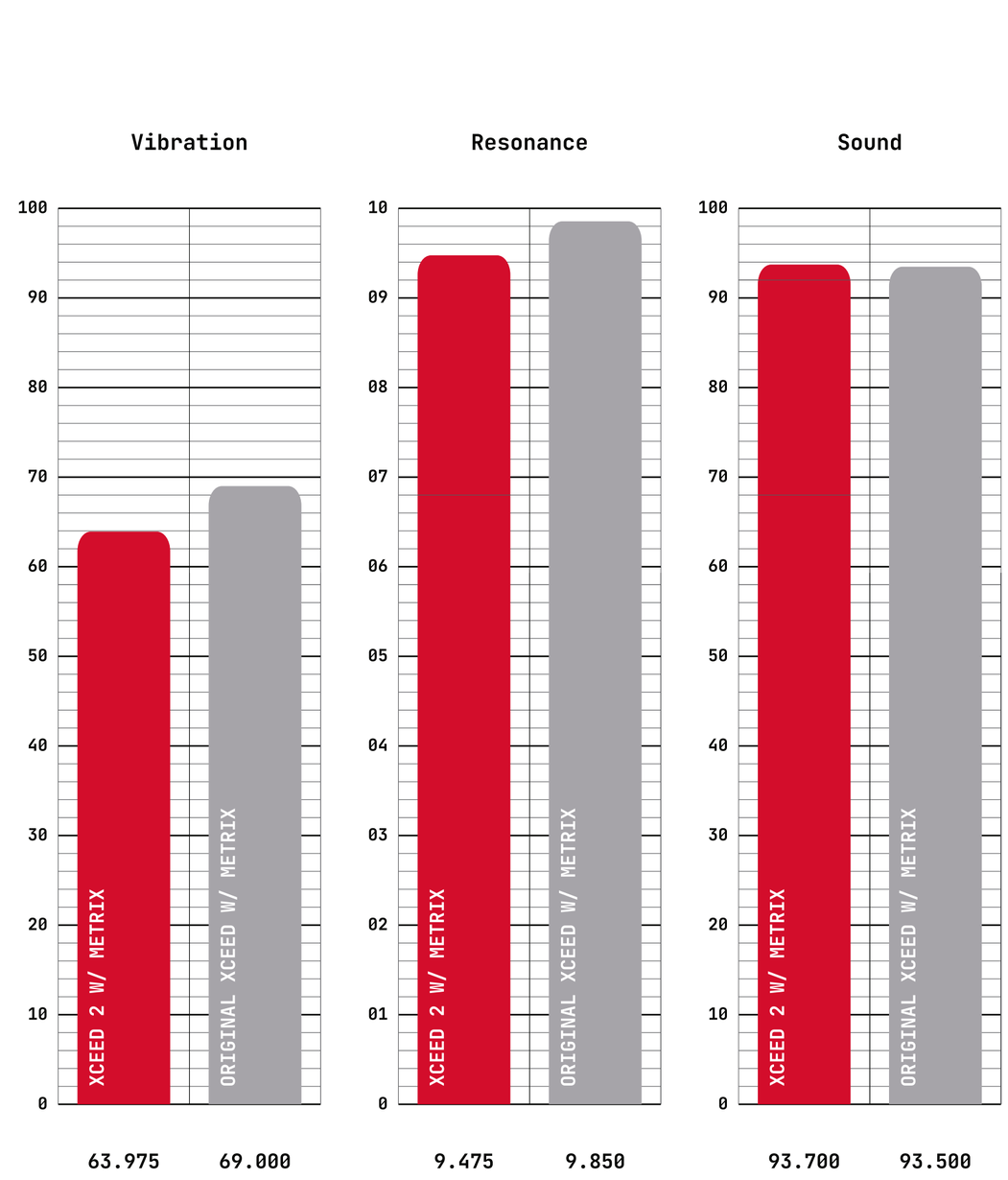
Available in **25"** and **27"** to suit different draw lengths and shooting styles. Left and right hand available.

Compatibility

Supports ATA standard stabilizers and Hoyt Recurve Barebow Weight System, offering flexibility for target and barebow archers.

Maintenance

Maintenance is straightforward. Clean limbs and hardware with water and gentle soap to remove debris. Thoroughly dry and lightly apply dry lubricants (e.g., Hornady One Shot Cleaner/Lube, Motul Chain Dry Lube, Muck-Off Dry Lube, Motorex Dry Lube) to dovetail hardware. This will help to keep metal to metal surfaces lubricated, smooth and in good working order to prevent wear and unwanted noise. Check limb detent spring retention screw for tightness regularly.



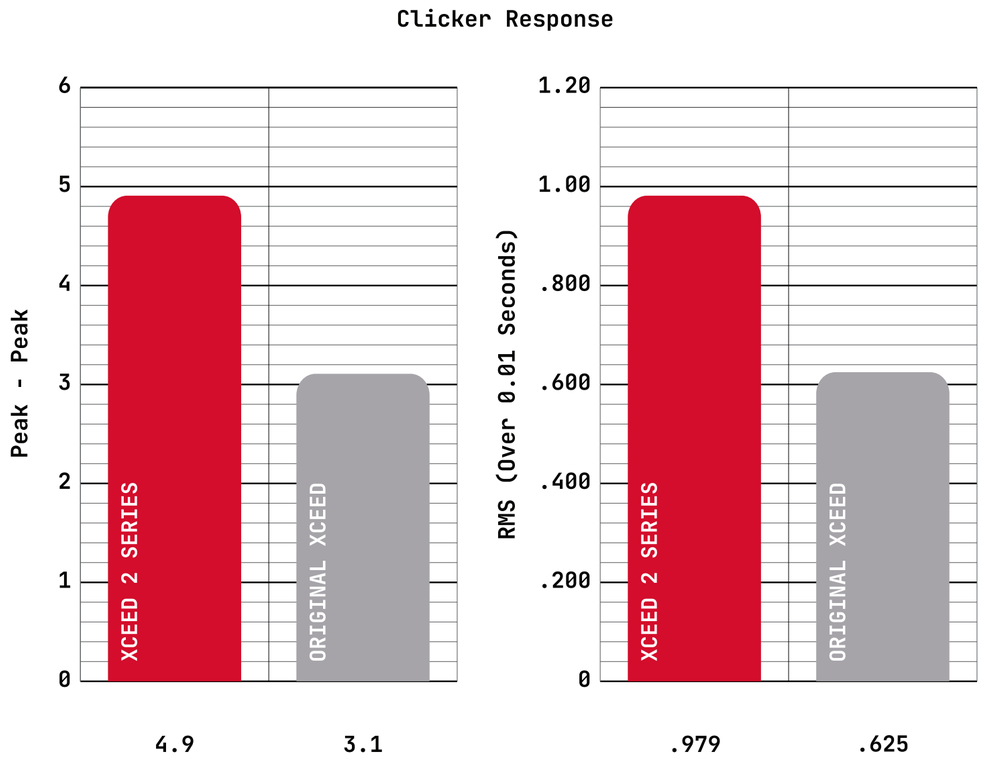
Expanded Performance Benefits

Tuning Stability

The Monoblock Verta-Tune System enhances dynamic limb alignment, reducing tuning time and maintaining consistency across sessions, critical for competitive archers who demand reliability.

Enhanced Clicker Haptics

The improved clicker interface provides clear, consistent feedback via enhanced transmission of the clicker impulse to the bow hand, allowing archers to refine their release timing, which is essential for achieving tight groupings at long distances, or dealing with auditory distractions in crowded shooting environments. Measurements show up to a 55% improvement in tactile feedback from the clicker with the new system.



Balanced Handling

The neutral center of mass ensures smooth handling, reducing hand torque and improving shot-to-shot consistency, particularly during extended shooting sessions.

Barebow Compatibility

The stabilizer mounting options enhance compatibility with barebow setups, allowing for seamless integration of weights such as the Hoyt Barebow Weight System to achieve optimal balance and minimal hand interference.

Durability & Aesthetics

CNC Machined from 6061-T6 aluminum billet with an advanced corrosion-resistant finish, the riser maintains its performance and appearance over time, even under heavy use.

Formula SR Design & Engineering

The Formula SR Riser **advances the Formula platform** with a lowered grip position and optional damped limb pocket system, maintaining Hoyt's lowered pivot "Advanced Geometry" for consistent alignment and dynamic shot execution. Key features include:

Lowered Grip Position

Shifts the grip downward to center arrow departure, changing relative nock travel and symmetry. Allows for a longer sight window in the Formula system.

Dampened Limb Pocket System

Reduces post-shot oscillation, providing clearer feedback and a quieter shot, allowing archers to focus on their form and follow-through. Included damper and optional weight may be used simultaneously with the pocket weight system in Formula risers.

Monobloc Verta-Tune System

Enhances rigidity and tuning precision, ensuring consistent limb alignment and optimal energy transfer for maximum arrow speed and accuracy.

Longer Sight Window

Ensures all archers can achieve indoor sight marks without visual interference.

Technical Specifications

Mass Weight

3.0 lbs (1.37 kg)

Note: *This mass weight includes all components including pocket hardware, limb bolts, Vertatune plate, grip, and stabilizer bushings, and is within 20 grams of the previous model, which had weights reported without these installed components.*

Riser Length

25”, left and right hand available.

Expanded Performance Benefits

Tuning Consistency

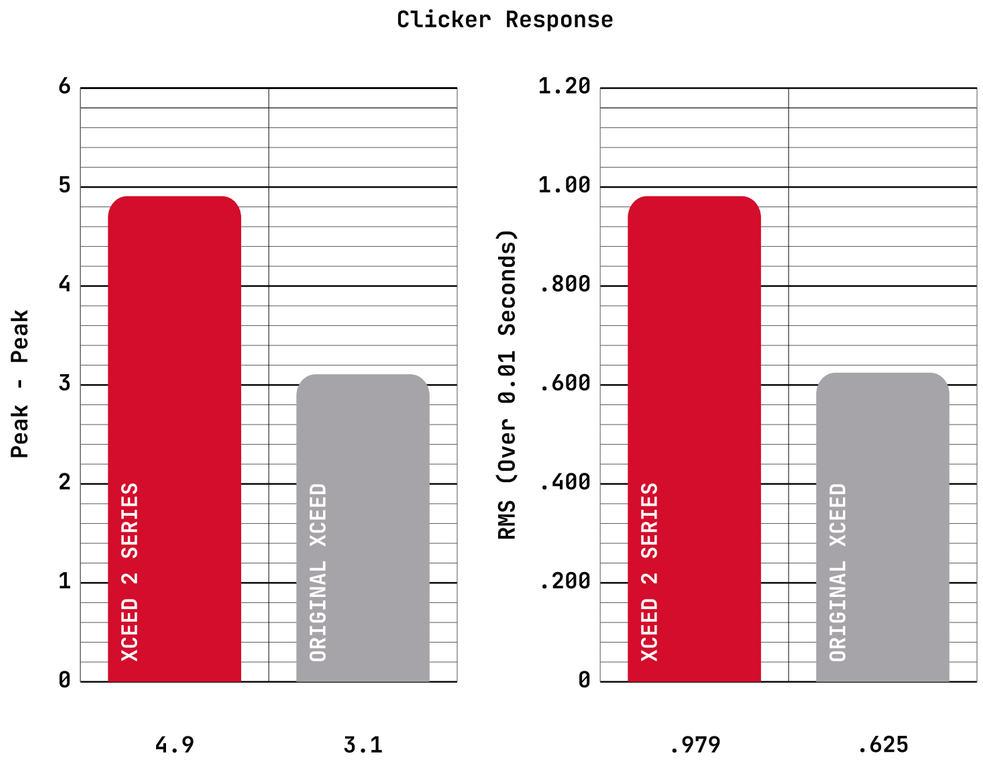
The Monobloc Verta-Tune System ensures precise adjustments, reducing setup time and maintaining performance across varying conditions, from practice to competition.

Superior Vibration Suppression

The damped limb pocket system minimizes residual vibrations, providing a smoother shooting experience and clearer feedback for refining technique.

Enhanced Clicker Haptics

The improved clicker interface provides clear, consistent feedback via enhanced transmission of the clicker impulse to the bow hand, allowing archers to refine their release timing, which is essential for achieving tight groupings at long distances. Testing shows 55% more transmitted/felt impulse with the new design.



Dynamic Follow-Through

The top-biased balance promotes a natural follow-through, enhancing shot execution and reducing the need for corrective movements, ideal for competitive archers aiming for high scores.

Versatility

Compatible with Formula limbs and accessories, the riser supports a wide range of setups, making it suitable for both elite and aspiring competitive archers of all disciplines.

Robust Construction

CNC Machined from 6061-T6 aluminum billets, the Formula SR withstands rigorous use while maintaining structural integrity, ensuring high-performance and long-term reliability.

Testing & Validation

The 2026 product line underwent extensive testing, including head-to-head comparisons with leading competitors. The Metrix Limb System demonstrated better consistency in arrow grouping and 15% higher durability under stress testing. Environmental stress tests, simulating extreme temperatures, humidity, and UV exposure, all based upon new Hoyt testing standards, confirmed the line's reliability across diverse conditions, from indoor arenas to outdoor ranges.

The new standards far exceed normal industry practice and parameters. These results validate the superior performance and resilience of the 2026 product line.

Conclusion

The Hoyt 2026 recurve product line—Metrix Limb System, Xceed 2 Series Riser, and Formula SR Riser—sets a new standard in recurve archery through advanced materials, tailored engineering, cohesive manufacturing, and rigorous testing. These products deliver unmatched precision, durability, and adaptability, empowering archers to achieve peak performance across disciplines. For further details, visit hoyttarget.com or contact an Authorized Hoyt Dealer.