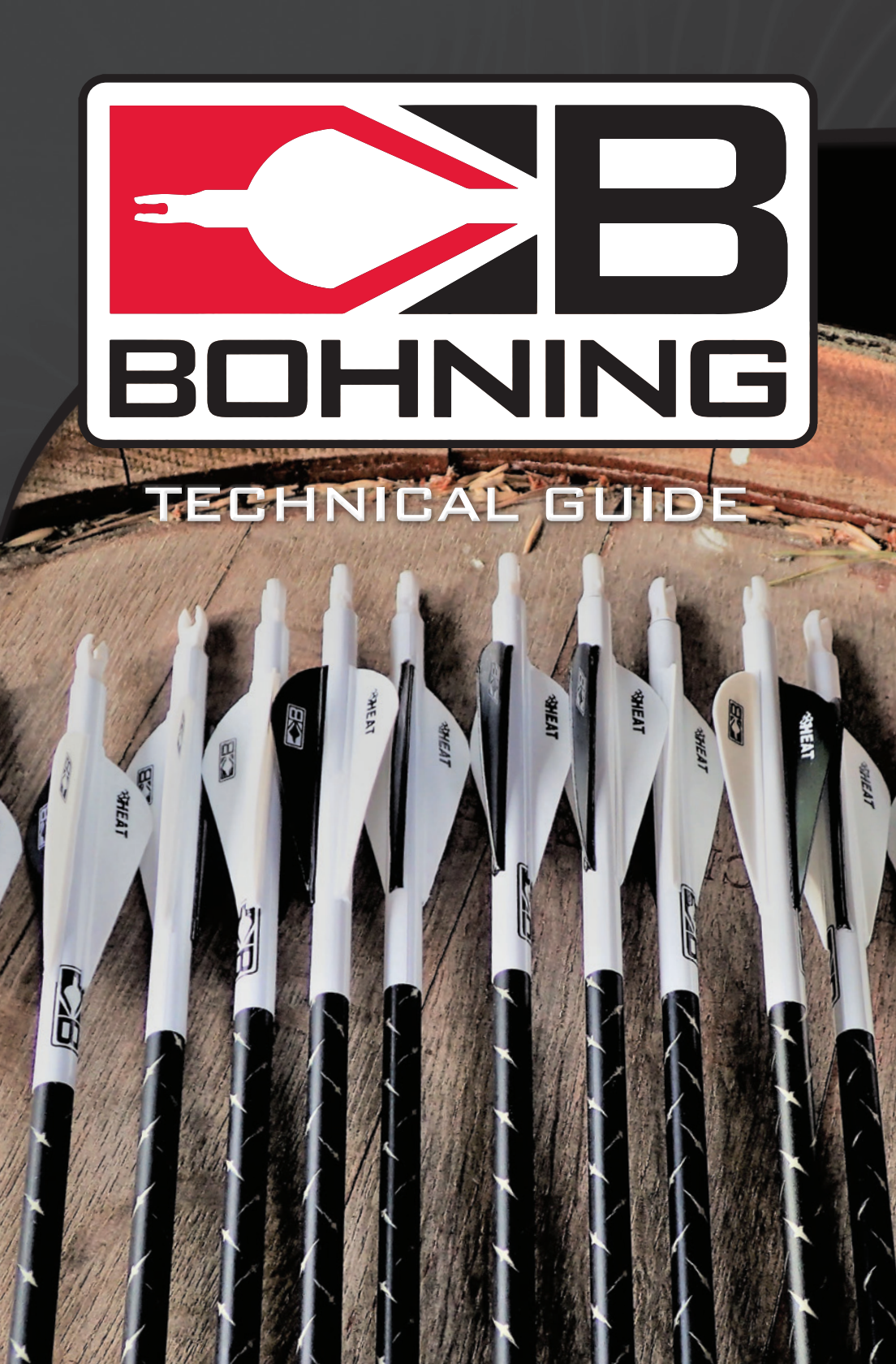
BOHNING

TECHNICAL GUIDE



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Updated May 2017

Installing or Removing Inserts, Points, and Outserts

INSTALLATION

Carbon and aluminum shafts: It is very important to clean the inside of the shaft using a cotton swab dipped in denatured alcohol. Continue cleaning, using new cotton swabs, until no traces of black residue remain. Then, install the insert or point with one of Bohning's adhesives (see table on pages 13-14 for recommended adhesives). We highly recommend Ferr-L-Tite Cool Flex for carbon shafts as it can be reversed without damaging your arrow.

Always wear heat-resistant gloves and eye protection. Do not touch hot surfaces or adhesives with bare skin.

- Using **Ferr-L-Tite®** and **Ferr-L-Tite® Cool Flex** (hot-melt adhesives): Hold the insert/point with a pair of pliers and heat it over a small flame. Then heat the stick of adhesive with the flame until the adhesive glosses over (just before melting). Quickly reheat the insert with the flame, then apply the adhesive all the way around it. Press the insert into the arrow shaft while rotating it one complete turn. This ensures the adhesive covers the full surface of both the insert and the interior of the shaft. Allow appropriate dry and cure time according to the table on pages 13-14.
    - Following installation of an insert, coat the screw-in point with a solid wax such as Tex-Tite®, Seal-Tite®, or Grit Guard prior to installing as this will help prevent it from unscrewing.
- Using **Insert Iron, Instant Gel, Blazer® Bond,** or **Fletch Fuse**: Coat the insert or point with the adhesive, then press into the arrow shaft while rotating one complete turn so the adhesive covers the full surface of both the insert and the interior of the shaft. Allow appropriate dry and cure time according to the table on pages 13-14.

Wooden shafts: Install using an adhesive recommended in the table on pages 13-14.

- Using **Ferr-L-Tite®** (hot-melt adhesive): Hold the outsert with a pair of pliers and heat it over a small flame. Heat the Ferr-L-Tite® with the flame until the adhesive glosses over (just before melting). Quickly reheat the outsert with the flame, then apply the Ferr-L-Tite® all the way around the interior of the outsert. Press the outsert onto the arrow shaft while rotating one complete turn. This ensures the adhesive covers the full surface of both the outsert and the exterior of the shaft. Allow appropriate dry and cure time according to the table on pages 13-14.

Heat the stick of adhesive with the flame until the adhesive glosses over

• Using **Insert Iron, Instant Gel, Blazer® Bond,** or **Fletch Fuse**: Coat the outsert with the adhesive, then press onto the arrow shaft while rotating one complete turn. This ensures the adhesive covers the full surface of both the outsert and the exterior of the shaft. Allow appropriate dry time and cure time according to the table on pages 13-14.

REMOVAL

Use caution not to burn yourself on hot surfaces, steam, or heated adhesives.

Carbon: Removing Inserts, Points, or Outserts from carbon shafts:

• If **Ferr-L-Tite Cool Flex** was used: Boil a pot of water, using enough water to submerge the entire insert. Keeping the heat consistent, submerge the insert into the water for 10-15 seconds. Remove the arrow and insert from the water, then, using a pair of pliers on the insert, gently remove it. If removed with excessive force, you may inadvertently pull the carbon fibers from the shaft along with the insert. There will most likely be adhesive residue remaining on the insert. To remove this residue from an insert or point, hold it with a pair of pliers over a flame until the adhesive melts off or dissipates. To remove the residue from an outsert, hold it vertically over the flame with a pair of pliers until the adhesive melts off or dissipates. We recommend doing this over a work surface that you don't mind getting dirty as the adhesive may drip. Before installing a new point or insert on your arrow, you will need to clean the interior of the shaft again as referenced in the Installation section.

• If **Ferr-L-Tite** was used: Bohning DOES NOT recommend using Ferr-L-Tite with carbon shafts due to the amount of heat needed for reversal - there is a high risk of ruining your arrow during removal. If Ferr-L-Tite is not heated enough when removing points, you may inadvertently pull the carbon fibers from the shaft along with the point. However, if it is heated too much, it can de-laminate the carbon.If it is absolutely necessary to remove points previously installed with Ferr-L-Tite from carbon shafts, please adhere closely to the following instructions: Apply a direct flame ONLY to the point and NOT DIRECTLY to the carbon shaft or too close to it. If using a propane torch, keep the flame on the point for 7-10 seconds (10-12 seconds for large points) before removing the point with a pair of pliers. Do NOT apply the force of the pliers directly to the carbon shaft as it could damage it. If using an alcohol burner, apply the flame approximately twice as long before removing the point. Before installing a new point on your arrow, you will need to clean the interior of the shaft again as referenced in the Installation section.

• If **Insert Iron, Instant Gel, Blazer® Bond,** or **Fletch Fuse** were used: these are not intended to be reversible - attempting to do so could damage your arrow.

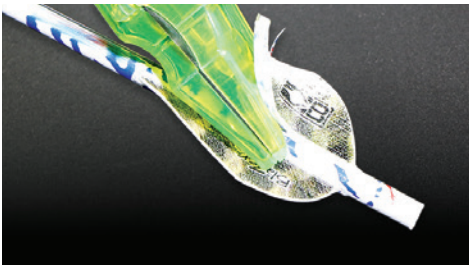
Aluminum: Removing Inserts, Points, or Outserts from aluminum shafts

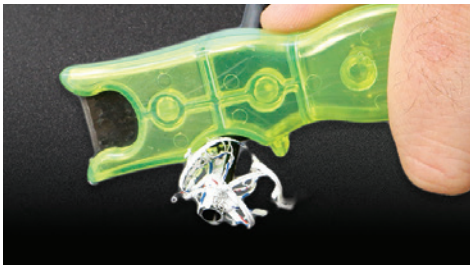
- If **Ferr-L-Tite Cool Flex** was used: Boil a pot of water, using enough water to submerge the entire insert. Keeping the heat consistent, submerge the insert into the water for 10-15 seconds. Remove the arrow and insert from the water, then, using a pair of pliers on the insert, gently remove it. There will most likely be adhesive residue remaining on the insert. To remove this residue from an insert or point, hold it with a pair of pliers over a flame until the adhesive melts off or dissipates. To remove the residue from an outsert, hold it vertically over the flame with a pair of pliers until the adhesive melts off or dissipates. We recommend doing this over a work surface that you don't mind getting dirty as the adhesive may drip. Before installing a new point or insert on your arrow, you will need to clean the interior of the shaft again as referenced in the Installation section.
- If Ferr-L-Tite was used: Using work gloves, hold the middle of the aluminum arrow gently with a pair of pliers, then apply flame directly to the insert and, if necessary, a small amount of heat directly to the part of shaft abutting the insert. Caution! If you apply heat for too long directly to the aluminum shaft it could discolor or distort the shaft. If using a propane torch, keep the flame on the insert for 10-12 seconds before removing it with a pair of pliers. Do NOT apply the force of the pliers directly to the shaft as it could damage it. If using an alcohol burner, apply the flame for 15-20 seconds before removing the insert. Before installing a new point or insert on your arrow, you will need to clean the interior of the shaft again as referenced in the Installation section.

Wooden shafts: We do not recommend trying to reverse outserts on wooden shafts.

Vanes, Adhesive, Wrap, & Paint Removal

Vanes & Adhesive: Use "The Stripper" or the "Strip-Pro" by Bohning to strip vanes and glue from shafts. Make sure adhesive residue is entirely removed by wiping with acetone or denatured alcohol. Soaking is not necessary.

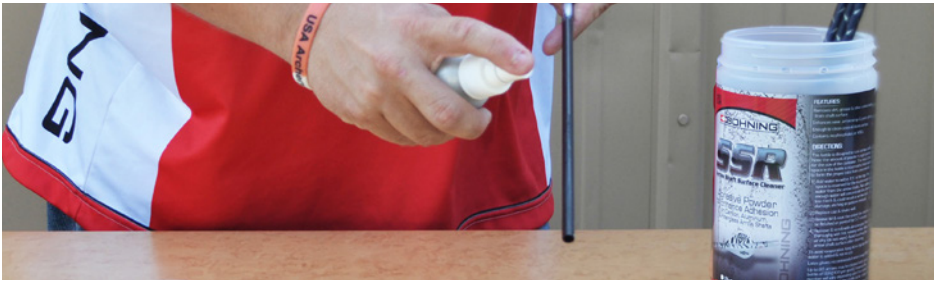




Wraps: There are three ways to remove wraps:

A. Use "The Stripper" or the "Strip-Pro" to remove the wrap.
B. Use a hair dryer to soften the adhesive and peel the wrap
C. Soak the wrapped shaft in boiling water and peel off the wrap

Then, use Bohning Wrap Adhesive Remover to remove all traces of residue from the shaft.



Paint: For carbon or aluminum shafts, soak the painted section of the shaft in acetone or Fletch-Lac thinner overnight, then scrub the paint off. For wooden shafts, we recommend using a chemical stripper specifically designed for wood.

Preparation

Check your work area (table, area and hands) for possible adhesion contaminants: oil, lotions, food, silicones, grease, carbon dust, WD-40 or other aerosol lubricants, etc.

If the jig has been previously used, clean by letting the clamp soak for a couple of hours in acetone (you may leave it overnight if more convenient). This will soften the dried glue and allow you to wipe it off easily. Numbering your clamps will allow you to identify if there are issues with any of them.

After you have cleaned your jig, make clean-up simple by using Bohning Clamp Release Tape on the clamps if using an instant glue. Clamp Release Tape prevents adhesive build-up on your jig and ensures you do not inadvertently glue your clamp to the arrow shaft in the fletching process. Do not let excess glue sit on your jig or Clamp Release Tape: wipe it off with a paper towel between each use.

For new arrow shafts: Ensure shaft is cut to proper length prior to cleaning.

Clean the outside of the arrow shaft

- For **carbon and aluminum shafts:** Clean shaft with Bohning SSR and scrub with a Scotch-Brite® pad. Rinse under HOT running water and let air dry, standing the shafts upright until dry.
- For **unfinished wooden shafts:** Sand the surface of the shaft smooth with a fine-grit sandpaper (minimum 220 grit). Use a tack cloth to remove sawdust. If desired, apply a stain, scrub the shaft with steel wool (staining will lif the wood grain), and remove dust with a tack cloth. To seal, we recommend dipping the entire shaft in a water-based Crest Lac Clear, or in a solvent-based Fletch-Lac. Please refer to the Dipping & Cresting section for further instructions.
- For **finished wooden shafts:** Simply wipe the shaft with a tack cloth to remove any dust and particles.

Applying Arrow Wraps

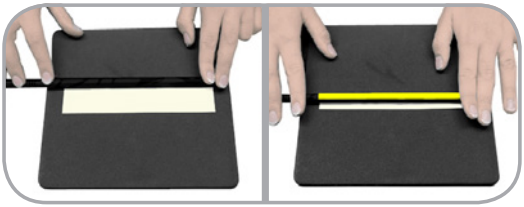
Wraps: Bohning Wraps help personalize your arrows and provide a convenient and effective surface for adhesion. All wraps are not equal. There are multiple grades of materials that are sold as arrow wraps. If a manufacturer has not obtained the correct surface coating and thickness, adhesion problems may arise. The material used by the Bohning Company has been tested and verified for adhesion strength and durability.

*Which size of wrap fits your arrow? See our reference chart in the back of the tech guide.

Applying Arrow Wraps:

1) Ensure your hands are clean and free of contaminants that may adversely affect adhesion.

2) Remove wrap from backing. Place adhesive side up on semi-soft surface (mouse pad).

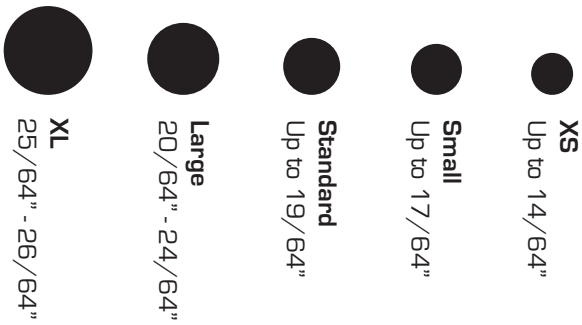


3) Align shaft with edge of wrap and roll with steady motion and downward pressure. Once wrap is applied, roll the shaft between your hands to fully activate the adhesive.

4) Place index fletching over the wrap seam to help secure the wrap.

Arrow Wrap Sizes:

Place your shaft over the spots to determine which size wrap you need.



Width of Arrow Wraps

XS - 0.875" (22.2mm)
Standard - 1.125" (28.6mm)
XL - 1.5" (38.1mm)
Small - 1" (25.4mm)
Large - 1.375" (34.9mm)

DIPPING UNFINISHED WOODEN ARROWS:

Overview: Applying a dip to the entire length of the unfinished arrow improves adhesion bonding in high humidity and prevent dents, chips, and other potential damage to the shaft. Bohning offers both water-based paints (Crest Lac, and previously, Acry-Lac) and solvent-based paints (Fletch-Lac).* Fletch-Lac paints may incur dangerous goods fees from your carrier if shipped via air.

Dilution: To dilute Crest Lac paints, use distilled water. Fletch-Lac paints may need to be diluted with Fletch-Lac Thinner (60% paint, 40% thinner).

Crest Lac Clear	Medium gloss, softer finish, low odor
Fletch-Lac Super Coat	High gloss, hard finish, thicker consistency
Fletch-Lac Clear Coat	High gloss, softer finish
Fletch-Lac Blue Clear	High gloss, softer finish When used over a crown dip, blue tint makes cresting appear brighter.

Process:

1) With the nock end down, dip the full length of the shaft to at least ¾ inch (19mm) from its end. Using push pins in the end of the shaft will allow you to dip the entire length of the shaft.

2) Hang the shaft to drip dry, allowing 24 hours between coats.

3) Sand the shaft with 000 steel wool between coats, removing dust with a tack cloth before the next coat. You may need 2-3 coats.

APPLYING A CROWN DIP TO WOODEN, ALUMINUM, FIBERGLASS, OR CARBON SHAFTS:

Overview: Applying a crown dip improves adhesion bonding in high humidity and prevent dents, chips, and other potential damage to the shaft. Bohning offers both water-based paints (Crest Lac, and previously, Acry-Lac) and solvent-based paints (Fletch-Lac). * Fletch-Lac paints may incur dangerous goods fees from your carrier if shipped via air.

Dilution: To dilute Crest Lac paints, use distilled water. Fletch-Lac paints may need to be diluted with Fletch-Lac Thinner (60% paint, 40% thinner).

Fletch-Lac	High gloss, hard finish	Available in various color options in Fluorescent, Metallic, Gloss, and Flat finishes
Crest Lac	Medium gloss, softer, low odor	Available in various color options in Fluorescent, Metallic & Gloss finishes

Basic Crown-Dipping Instructions:

1) Ensure arrow shafts are properly cleaned – please refer to Preparation section on pages 6-7.

2) Mark the end of your dipping zone on each shaft with masking tape.

3) Fill dip tube with desired color.

4) For wooden or fiberglass arrows, dip the shaft in the paint until you reach the masking tape. For carbon or aluminum arrows, insert Dip'n Plug Ring prior to dipping – this prevents paint from entering the inside of the shaft.

5) Carefully remove the shaft from the dipping tube and hold above tube until the paint is no longer streaming and starts to drip.

6) Repeat steps 3-5 when using Fletch-Lac paints (Crest Lac paints are naturally thicker and don't require more than one dip)

7) Hang arrows to dry using Bohning's Arrow Hanger. If you plan on cresting your arrows, let dipped shaft dry at least 24 hours.

8) To clean a glass dip tube after using Crest Lac paints, pour leftover paint back into original container, then immediately rinse dip tube with water until clean. Do not allow paint to dry inside tube! To clean a glass dip tube using Fletch-Lac paints, pour leftover paint back into original container, then allow remaining paint to dry in dip tube before scrubbing clean with a soft bristle brush. The paint will flake away from surface of dip tube.

Cresting

Overview: Cresting your shafts allows you to identify and personalize your arrows in a unique way. Using Bohning's Professional Crester allows for a quicker and more precise crest.

Preparation:

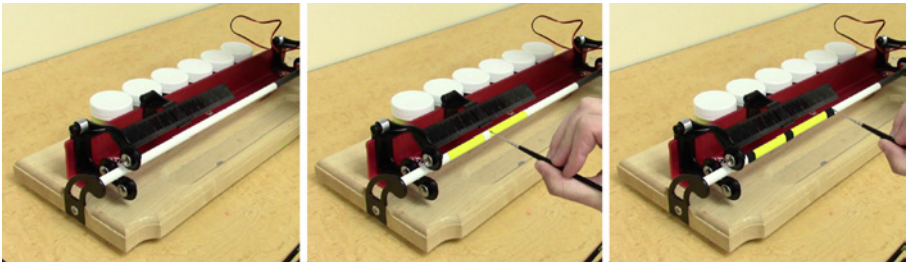
If you crown-dipped your arrow shafts, ensure the paint has fully dried. Be sure all cresting paints are mixed well before starting. Gather other necessary tools such as paint brushes, paper towel, and a small cup of water.

Basic Cresting Instructions:

1) If cresting on an un-dipped shaft, ensure arrow shafts are properly cleaned by referring to the Preparation section on pages 6-7.

2) If desired, lay out your cresting pattern prior to starting the cresting process.

3) With your crester running, dip a small brush in paint, then hold the tip of the brush to the spinning arrow shaft and press lightly.



Tip: Start with wide bands of paint and lighter cresting colors. This way, as you apply the darker colors later on it will cover any mistakes and leave a clean line.

3) Continue until your pattern is complete.

4) Allow crester to continue rotating until paint is dry to touch – this prevents paint from dripping and sagging.

5) Allow arrows to finish drying overnight using Bohning's Arrow Hanger.

6) When paint is completely dry, dip arrows in Crest Lac Clear to protect the crested portion. It is best to apply two thins coats of Crest Lac Clear, sanding shafts with an abrasive pad between coats. Never use Fletch-Lac or other solvent-based paints to dip over a crested arrow as they may dissolve the cresting!

New to Dipping & Cresting? Keep it simple with Bohning's Dip Kit and Professional Cresting Kit which provide you with all the necessary equipment and materials. The Dip Kit includes one glass Dip Tube which holds four arrows at once and accommodates up to an 11" crown dip, one Arrow Hanger, three Dip 'n Plug Rings, two pints of Crest Lac Clear, and two pints of Crest Lac White.

The Professional Cresting Kit includes one Cresting Machine (newly upgraded carbon-brush motor runs 10x as long!) six 1-oz jars of Crest Lac paints (black, red, yellow, blue, silver, & gold) and four styles of paint brushes. Also available with international power supplies.

Creative Cresting:

Looking for a way to keep the members of your club or team motivated? Try creating a system to recognize achievements by applying certain color rings and combinations. For example, a red ring crested onto an archer's arrow may signify the achievement of a proper technique, while gold rings may represent each first place taken in his or her flight.

Adhesives

When choosing an adhesive, there are many factors which will affect your decision. Some of these include:

Application: different uses (fletching, installing inserts, etc.) require different adhesives. The material of the arrow shaft will also be a determining factor.

Environment: some adhesives are best in high humidity, while others work best in low humidity

Viscosity (resistance to flow): For most applications, you may choose the thickness of glue according to your personal preference.

Time: each adhesive requires a specific clamp time and cure time

Bohning glues do NOT require an accelerator or adhesive primer

	Applications	Shaft Type	Clamp Time (time in jig)	Cure Time (before using arrow)	Useful Information
Solvent-based adhesives					
FLETCH-TITE PLATINUM®	Vanes Feathers Tapered nocks	Carbon Cedar Aluminum Fiberglass Wraps Painted	5 Minutes	Minimum of 24 hours, but 48 hours is best	-Flexible (non-brittle) bond - absorbs shock when shooting into a target repeatedly, does not crack or become brittle -Along with other applications, use this glue on tip & tail of vanes or feathers for added security -Easy jig clean-up. Simply scrape glue off with fingernail. -Best for low humidity application -Two years expiration on unopened tubes -Do NOT store solvent-based adhesives in the refrigerator -To prevent glue from drying out prematurely, ensure cap & tip are tightly sealed. Glue may also be stored inside a plastic bag or container for additional security.

CHART CONTINUED ON PAGE 14

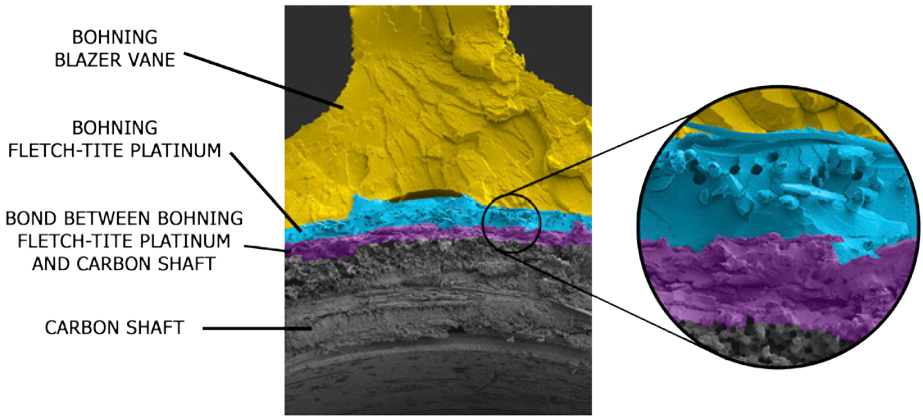
CHART CONTINUED FROM PAGE 13

Cyanoacrylate adhesives * All cyanoacrylate (CA) glues can leave white marks on the shaft. If desired, carefully use acetone to wipe off, using caution around wraps & inks. CA glues are NOT recommended for press-fit nocks as it will render the nock material brittle.					
INSTANT GEL*	Vanes Points Inserts Outserts Swedged nocks	Carbon Cedar Aluminum Fiberglass Wraps Painted	2 Minutes	4 Hours	-Instant, rigid-bonding glue in a gel form -High viscosity (thicker formula) -Begins curing on contact -Best for high humidity application -One year expiration on unopened tubes - To prevent it from drying out prematurely, glue may be stored inside a plastic bag or container & kept in a refrigerator NOT containing food or beverages.
BLAZER® BOND*	Vanes Points Inserts Outserts Swedged nocks	Carbon Cedar Aluminum Fiberglass Wraps Painted	20 Seconds	2 Hours	-Fastest cure -Instant, rigid-bonding glue in liquid form -Medium viscosity (Bohning's most liquid CA glue) -Begins curing on contact -Best for high humidity application -One year expiration on unopened tubes - To prevent it from drying out prematurely, glue may be stored inside a plastic bag or container & kept in a refrigerator NOT containing food or beverages.
FLETCH FUSE*	Vanes Points Inserts Outserts Swedged nocks	Carbon Cedar Aluminum Fiberglass Wraps Painted	30 Seconds	2 Hours	-Instant, rigid-bonding glue in a liquid form -Medium viscosity (thicker than Blazer® Bond but not as thick as Instant Gel) -Begins curing on contact -Best for high humidity application -One year expiration on unopened tubes - To prevent it from drying out prematurely, glue may be stored inside a plastic bag or container & kept in a refrigerator NOT containing food or beverages.
Other adhesives					
FERR-L-TITE®	Points Inserts Outserts	Cedar Aluminum	n/a	As soon as it has reached room temperature (approximately 5 minutes)	-Hot melt adhesive -Heat reversible on aluminum shafts- flame required -No expiration
FERR-L-TITE® COOL FLEX™	Points Inserts Outserts Pin Bushings	Carbon Aluminum Fiberglass	n/a	As soon as it has reached room temperature (approximately 5 minutes)	-Hot melt adhesive (low melt temperature) -Heat reversible- no flame required (use hot water to soften) -No expiration
INSERT IRON	Points Inserts Outserts	Carbon Cedar Aluminum Fiberglass	n/a	48 Hours (72 Hours if air is dry)	-Strongest glue -Cures with moisture – best when applied in humid conditions -One year expiration on unopened bottles -Do NOT store in the refrigerator -To prevent glue from drying out prematurely, ensure cap & tip are tightly sealed. Glue may also be stored inside a plastic bag or container for additional security.
FLETCHING TAPE	Feathers Mylar vanes	All	n/a	Immediate	-Pressure sensitive adhesive -No expiration

More information on Fletch-Tite Platinum, the original adhesive by Bohning:

In 2013, in response to industry changes, Bohning Archery improved its formula for Fletch-Tite Platinum by replacing one of the ingredients, creating an even stronger adhesive. Since then, the evolution of arrow shafts and their coatings prompted Bohning to continue its research and testing to further enhance the adhesive. In 2016, Bohning completed that quest - an alteration to the manufacturing process combined with new chemicals has resulted in a Fletch-Tite Platinum that is superior to previous formulas, including its ability to withstand shock and vibration. Like all solvent-based adhesives, this product works best in low-humidity environments.

For our international customers, the good news doesn't end there. Bohning's Fletch-Tite Platinum can now be packaged to meet "Excepted Quantities" International ocean and air transportation requirements in order to eliminate dangerous-goods fees. This means Fletch-Tite Platinum will ship much like any other Bohning archery product.



Solvent Adhesive Comparison Testing

Fletch-Tite Platinum vs. Old Formulas

Adhesive	Shaft Type	Chamber	PSI
Platinum 2016	Carbon	Ambient	293.85
Platinum 2016	Aluminum	Ambient	368.54
Platinum 2013	Carbon	Ambient	201.66
Platinum 2013	Aluminum	Ambient	263.25
Platinum Old Formula	Carbon	Ambient	150.10
Platinum Old Formula	Aluminum	Ambient	135.70

Fletch-Tite Platinum vs. Competitor Brand

Adhesive	Shaft Type	Chamber	PSI
Platinum 2016	Carbon	Ambient	293.85
Platinum 2016	Aluminum	Ambient	368.54
Competitor Brand*	Carbon	Ambient	195.74
Competitor Brand*	Aluminum	Ambient	190.10
Platinum 2016	Carbon	Humidity	229.04
Platinum 2016	Aluminum	Humidity	104.44
Competitor Brand*	Carbon	Humidity	117.17
Competitor Brand*	Aluminum	Humidity	86.15

Ambient testing was performed per ASTM Standards at 70°F and 50% RH. Humidity testing was performed at 100°F and 95% RH. All shafts were cleaned using the Bohning approved shaft preparation method. All fletchings were white Blazer vanes that were cured for 48 hours before testing.

* Multiple competitor products were used. The results were collated and the highest values from competitor product results are shown for each category.

Choosing your Vane

Do Not Clean Bohning Vanes: All Bohning vanes are primed for optimal adhesion. Do NOT remove the primer by sanding or rubbing with solvents. Bohning primer is compatible with all known archery adhesives. It is OK (although not necessary) to apply a primer on the vanes if your instant glue comes with one.

		Indoor	Outdoor			Hunting		
Blazer Material	Average Weight (grains)	Indoor Spots	Outdoor Field	Outdoor FITA	Outdoor 3-D	Fixed Blade	Mechanical	Crossbow
Air Vane	4.5		✓	✓	✓			
Blazer®	6	✓	✓	✓	✓	✓	✓	✓
Blazer® QuikFletch®	27					✓	✓	
Blazer® Stretch Fletch™	40					✓	✓	
Blazer® X2	4	✓	✓	✓	✓		✓	
Ice	6.5		✓	✓	✓			
Killer	12.5	✓				✓	✓	
Mini Blazer®	4.5	✓	✓	✓	✓		✓	
X Vane® - Parabolic 3”	8.5	✓			✓	✓	✓	✓
X Vane® - Shield Cut: 1.5”, 1.75” & 2.25”	3, 3.5, 5	✓	✓	✓	✓			
X Vane® - Shield Cut: 3” & 3.5”	10, 12	✓					✓	✓
Impulse Material								
Impulse™ 3” & 4”	4, 5		✓	✓	✓			
Bolt Material								
Bolt	11.5							✓
Heat	6					✓	✓	

VANE RECOMMENDATIONS FOR ARCHERY DISCIPLINES

Although the most important factors in choosing a vane are your bow / arrow set-up and personal preference, some vanes tend to work best for certain archery styles given the commonalities within the styles.

Indoor

The large diameter arrows normally used when shooting indoor typically work best with higher profile and/or longer vanes (0.5” profile height or more and/or 3” length or more) which give the arrows more stability. If you experience vane clearance

issues such as contact with the rest, cable guard, or riser, then lower profile vanes are best. Helicals/offsets should be determined based on what works best with your personal setup.

Outdoor

The small diameter arrows normally used when shooting outdoor typically work best with lower profile and/or shorter vanes (0.45" profile height or less and/or 3" length or less) which have less surface area, thus decreasing the amount of wind drag on the arrow.

Hunting

The use of fixed-blade broadheads creates a "planing" effect in arrows which can typically be negated by the use of a higher profile vane (0.5" or more). If your setup requires a lower profile vane, we recommend using a stiffer vane material to compensate for lack of vane height. When using a mechanical broadhead, there is more flexibility when selecting a vane and personal preference can be a stronger guiding factor. Fletching your vanes on a 3 degree helical has been continually shown to be the optimal setup in most hunting situations.

VANE MATERIAL GUIDE

Blazer® Material

Our Blazer material is exclusive, proprietary, and stronger than our competitors' standard plastic vanes –try ripping a competitor's plastic vane with your hands, then try the same with a Blazer material vane! Blazer material has a mid-range stiffness that makes it strong and versatile.

Impulse™ Material

Bohning's Impulse vanes are made from a lightweight & flexible material developed to out-perform mylar vanes (used in Olympic-style archery) and traditional feathers. It is the fruit of more than two years of research that began with tests and analyses on various materials from two teams of aerospace engineers in Boston and San Diego. Bohning then went on to perform their own tests on multiple innovative polymers and composite materials, studying their extrusion processibility, as well as their physical and adhesive properties. The winning material was created by the addition of microscopic glass beads to Blazer® material, rendering it lightweight and pliable. This material behaves much like a mylar vane or natural feather, but it is stronger and easier to fletch. For more information on how we tested for arrow rest impact probability, aerodynamic stability, consequences of impact, & resistance to wind gusts, and how we chose the profiles for Impulse vanes, please see our YouTube video "Bohning Archery Impulse Vane."

Bolt Vane Material

Bolt material is the stiffest vane material Bohning produces. It is 16% stiffer and slightly lighter-weight than Blazer material. For example, in the chart above, compare the weights of the 3.5" X Vane (12 grains) with the Bolt Vane (11.5 grains): both are the exact same profile, but the X Vane is made using Blazer material, while the Bolt Vane is made of Bolt material. We developed Bolt material for use with high-speed bows, specifically crossbows, however, we soon found another great use for it in the creation of the Heat Vane. As modern compound bows are becoming more centrally-aligned, some archers wanted slightly more clearance for their comfort. Bohning found a solution in the Heat Vane. It is slightly lower-profile than the Blazer Vane, giving it more clearance, but the addition of 0.5 inches (12.7mm) in length means it has the same surface area as the Blazer Vane. The stiffer Bolt material also aids in stabilization.

Fletching

We recommend fletching your arrows using one of Bohning's Fletching Jigs: Tower®, Blazer®, Big Jig, or Pro Class. Bohning jigs are designed to apply the correct amount of pressure along the entire length of the vane or feather. Results may vary if other jig brands are used.

Tower® Jig

Blazer® Jig

The Big Jig

Pro Class Jig

CHOOSING A JIG

Tower® Jig: Fast, precise, and versatile - fletches 3 vanes at once. Applies more pressure than other jigs. One base with interchangeable arm options for feathers, plastic vanes, mylar vanes, or Impulse vanes. Choose from straight, one degree, two degree, or three degree helical arms. Engineering-grade polymer allows you to soak arms overnight in acetone to remove CA glue build-up without damaging jig. Hint: Fletch-Tite Platinum can be easily scraped off with a fingernail – no jig cleaning or clamp release tape necessary! See our Tower Jig series on the Bohning Archery YouTube Channel

Blazer® Jig: Fletches one vane at a time. For vanes 2.5" or shorter. Two clamp options for a straight fletch on smaller arrow shafts, or a 3 degree right helical on standard size arrow shafts.

Big Jig: Fletches one vane a time. Same setup as Blazer Jig, but for vanes up to 4" in length. Capable of 3 or 4 fletch application. Two clamp options for a 1 degree or 3 degree right helical fletch. Clamps also available for Impulse vanes.

Pro Class Jig: Most economical – fletches one vane at a time. Numerous configuration options with magnetic "snap" clamp. For vanes or feathers up to 5.5" long. Capable of 3 or 4 fletch application.

Some competitor jigs only use gravity to apply pressure. We find that this does not apply enough downward force for proper adhesion.

Do Not Clean Bohning Vanes: All Bohning vanes are primed for optimal adhesion. Do NOT remove the primer by sanding or rubbing with solvents. Bohning primer is compatible with all known archery adhesives. It is OK (although not necessary) to apply a primer on the vanes if your instant glue comes with one.

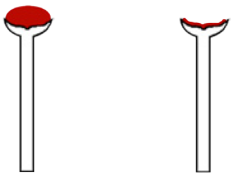
BASIC FLETCHING INSTRUCTIONS

1) Make sure your jig is properly set-up so that the base of the vane is completely flush with the shaft. Test this by putting a vane and shaft in the jig WITHOUT any glue and adjust it as needed.

2) Seat vane securely in the clamp. Apply Bohning glue to vane base. See the illustration to the right to determine appropriate quantities of glue.

a. For Fletch-Tite Platinum, using a steady stroke, fill the entire length of the vane base with a bead of glue. If there is an excessive amount of glue squeezing out from under the vane after removed from the jig, use slightly less during the next application – very small amounts of glue squeezing out are okay though.

b. For instant glues, dab the base of the entire length of the vane using small dots of glue. If there is any glue squeezing out from under the vane when removed from the jig, use less during the next application.



Fletch-Tite® Platinum

Instant Glues like Blazer® Bond

3) Follow jig instructions for specific arrow shaft insertion, etc. Allow proper clamp time in the jig according to glue instructions (or reference adhesive chart on pages 13-14)

4) Carefully remove arrow from jig, dot tip and tail of vane with a small amount of glue for added security, and allow proper cure time according to glue instructions.

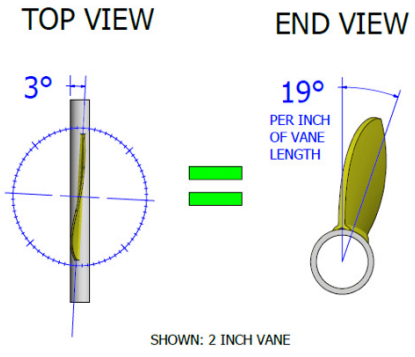
FLETCHING WITH A HELICAL/OFFSET

Manufacturers use different ways of classifying helicals/offsets, which can be confusing when making comparisons. First of all, let's clarify that helicals and offsets are essentially the same thing. A helical is defined as **any** vane angle that is not a 0° straight fletch. An offset is, quite simply, a minor helical and usually refers to anything between 0° and 2°. A vane that is fletched at **greater** than 2° appears more twisted due to way it wraps around the shaft, however, a vane fletched at less than 2° still has a helical "twist," it is just less noticeable.

There are two main ways to specify the degree of an offset /helical. Figures A and B show the same helicals represented in different ways.

1) Top View of the shaft: this is the classification used by Bohning & most other manufacturers, in which offsets/ helicals are measured independent of vane length.

2) End View of the shaft: this is the measurement system used by some jig manufacturers in which the offset/helical is given **per inch of vane length** (eg 10° /inch), making the values appear higher. Note – measurements in this system can vary with arrow diameter.



COMPARISON CHART

Top View Helix Angle	End View Helix Angle Equivalent*						
Any length vane	Vane Length in inches						
	1.0	1.5	2.0	2.5	3.0	3.5	4.0
1°	6.5°	9.75°	13°	16.25°	19.5°	22.75°	26°
2°	13°	19.5°	26°	32.5°	39°	45.5°	52°
3°	19.5°	29.25°	39°	48.75°	58.5°	68.25°	78°
4°	26°	39°	52°	65°	78°	91°	104°

*Values based on standard carbon shaft diameter (0.30 inches OD)

Adhesion Trouble-Shooting

PREVENTING ADHESION PROBLEMS

- Proper shaft prep is very important for strong adhesion. Reference pages 6-7.
- Follow all instructions and allow proper clamp and cure time for adhesives.
- For best results with Fletch-Tite Platinum®: fletch arrows and allow to cure in a controlled climate with low humidity (30-50% relative humidity). If humidity is too high (especially above 70% relative humidity) we recommend fletching with an instant adhesive such as Blazer® Bond, Fletch Fuse, or Instant Gel.
- Make sure none of these items are in your fletching area: Silicone-based aerosols, carbon dust, oils, chemicals, pet hair, food, beverage, etc.
- Use the correct amount of glue on vane base. Reference pages 13-14.
- Clean jig clamps/arms frequently with acetone and use Bohning's Clamp Release Tape to prevent CA adhesive build-up (which impedes downward pressure).
- Ensure your adhesive is still viable.

IDENTIFYING ADHESION PROBLEMS

If your vane has fully or partially separated from the arrow shaft, the following scenarios may help you narrow down the cause:

Adhesive is on the shaft, vane base is free of adhesive: usually indicates a problem with vanes. Some brands of vanes are manufactured using a release agent and must be cleaned prior to fletching. Other brands require the application of a primer to the vane base prior to fletching. Bohning vanes do not require either of these steps as they come with primer already applied to the base – for this reason we recommend that you NOT CLEAN YOUR BOHNING VANES.

Adhesive is on the vanes, arrow shaft is free of adhesive: usually indicates a problem with the arrow shaft. Repeat the arrow cleaning procedure on pages 5-7 and try again. Some shafts need additional abrasion. If all else fails, the best solution may be to use a wrap or to dip the arrow shaft.

Adhesive is on both vane and arrow shaft: could indicate a jig not properly set¬up, inadequate clamp time, or a damaged clamp (if you have numbered your clamps, look for a pattern in the failure). It could also indicate that the glue has not been allowed to cure for the recommended amount of time prior to shooting, or that there is a contaminant on parts of the shaft or vanes.

Bowstring Waxes

Waxes protect your bowstrings from the weather (all Bohning waxes are waterproof) and extend the life of your strings by reducing friction between the strands when shooting. We recommend waxing your bowstrings at the first indication of wear in string fibers (after approximately 200 shots). Some signs of wear include fraying of the string and discoloration. Bohning offers several wax options, each with slightly different usage recommendations.

FEATURES				
SEAL-TITE®	**TEX-TITE®**	**XCCELERATOR WAX**	**STRING SHIELD**	**GRIT GUARD**
Silky feel	Tacky feel	Soft feel	Liquid	Non-tacky formula prevents dirt from collecting on strings
For synthetic strings	For natural & synthetic strings	For natural & synthetic strings	For synthetic strings	For natural & synthetic strings
Silicone-based	Natural-based	Natural-based	Silicone-based	Hydrocarbon-based
Remains soft even in cold weather	The original Bohning wax	Fast saturation	Ultra-fast saturation	Premium conditioners restore suppleness to old strings
Odorless		Greatly reduces abrasion and friction found at slides, wheels, and rollers.	Liquid formula penetrates fibers of individual strands on string	Odorless
Vegan		Odorless	Odorless	
		Vegan	Vegan	

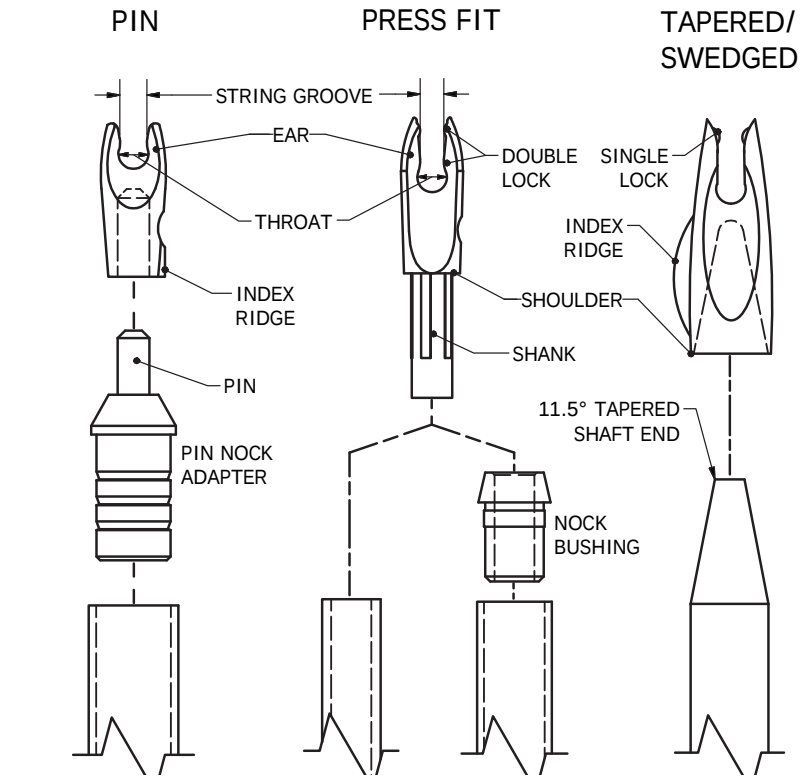
CHART CONTINUED ON PAGE 24

CHART CONTINUED FROM PAGE 23

APPLICATION TO BOWSTRINGS				
SEAL-TITE®	**TEX-TITE®**	**XCCELERATOR WAX**	**STRING SHIELD**	**GRIT GUARD**
Step 1 all waxes: start with a clean string: using a rag dipped in warm water, or by wrapping a serving thread around the string & moving it up and down, remove dirt and old wax.				
SEAL-TITE®	**TEX-TITE®**	**XCCELERATOR WAX**	**STRING SHIELD**	**GRIT GUARD**
Step 2: Warm the tube of wax by rolling it between your hands. Remove the lid and push or twist the bottom to move the wax up in the tube. Apply wax liberally to bowstrings. Rub wax into string fibers briskly using your fingers or a leather strip – as the wax warms, it melts into the string fibers.			**Step 2:** Apply thin coat to bowstring using the foam applicator.	**Step 2:** Lower the sides of the applicator box and apply wax liberally to bowstrings. Rub wax into string fibers briskly using your fingers or a leather strip – as the wax warms, it melts into the string fibers.
OTHER USES				
For **Seal-Tite**, **Tex-Tite**, & **Grit Guard**: Apply to nock shank on press-fit nocks for easier insertion and indexing Apply to pin bushings for easier installation & indexing of tight-fitting pin nocks Apply to point & broadhead threads to keep them from loosening and to help prevent rusting				

The Nock Guide

The Modern Nock



Choosing the Right Nock

APPLICATION	RECOMMENDED NOCK	REASON
Outdoor: 3D, Field, & Fita Indoor Target	**Pin nocks** Blazer Standard Throat Pin Nock Blazer Small Throat Pin Nock Smooth Release Pin Nock **Press-fit nocks** are commonly used as well	Using pin nocks, your arrows are less likely to "robin hood" in tight-group shooting situations. It is also an easy way to nock large diameter shafts. Some archers choose hunting nocks due to personal preference
Hunting	**Press-Fit Nocks** Double-lock style: Blazer, A, F, or H.E. or Signature Nock	The double-lock style of the Blazer, A, F, & H.E. nock, and the "single lock" style of the Signature Nock, ensure the nock will not fall off the string if the bow is let down.
NASP	Legend Nock, F Nock	NASP-approved nocks
Traditional	Classic Nock, Legend Nock, T Nock	Designed for swedged-end arrow shafts
Bowfishing	Legend Nock	Designed for swedged-end arrow shafts, including fiberglass
Crossbow	Flat or Halfmoon Nock	Designed to handle the rigors of high-speed bolts

*These recommendations are guidelines only and do not necessarily reflect all usable combinations

Nock Terms

Double Lock- Two sets of small nubs in the string groove that "snap" the nock onto the string

Ears- The two protrusions of the nock that clip onto the bow string

Index Ridge- A small rib on one side of the nock that helps an archer orient the arrow by feel

Nock Bushing- An adapter used to fit relatively small press fit nocks into larger arrow shafts

Pin- The short metal post that a pin nock is pressed onto when installed

Pin Nock Adapter/Bushing- The metal insert necessary to install a Pin Nock on a hollow shaft

Shank- The part of some nocks that fits inside of an arrow shaft or nock bushing

Shoulder- The base of the nock that sits flush against the end of the shaft or adapter

Single Lock- A single set of nubs in the string groove that "snap" onto the bowstring

String Groove- The space between the ears of a nock, measured at the narrowest part

Swedged Shaft – An arrow shaft with a tapered end

Tapered Shaft End – An 11.5 degree cone at the end of a swedged arrow shaft ideal for glue-on nocks

Throat – The bottom of the string groove where the string sits during shooting

Installing Nocks

There are 3 kinds of nocks, all which require a slightly different approach: press fit nocks, pin nocks, and swedged nocks.

Press Fit Nocks

There are many methods for installing nocks, many of which are NOT recommended as they have a tendency to damage nocks. Never push the nock ears against a hard surface, use pliers to twist into place, or bite the nock! Instead, always use a plastic indexing tool to insert and index your nocks. We recommend using the Bohning Nock Indexing Tool, the Deluxe Broadhead Wrench, or the Nock-Out Tool. Using bowstring wax on press fit nocks can be useful for indexing, especially if the nock fit is very tight. Simply apply a small amount of wax to the nock shank and rotate the nock as you insert it until it is in the proper position. Never glue press fit nocks. If your nock fit is too loose, we recommend using plumber's thread tape or a plastic bag around the nock shank to ensure a tighter fit.

Pin Nocks

Bohning recommends Ferr-L-Tite Cool Flex for inserting pin nock adapters as it allows the adapter to be easily removed using hot water.

Caution: Do not touch hot surfaces or adhesives with bare skin. Always wear heat-resistant gloves and eye protection when performing this task.

Hold the adapter with a pair of pliers and heat it over a small flame. Heat the Cool Flex with the flame until it glosses over (just before melting). Quickly reheat the adapter with the flame, then apply the Cool Flex all the way around the adapter. Press the adapter into the arrow shaft while rotating one complete turn. This ensures the Cool Flex covers the full surface of both the adapter and the interior of the shaft. Allow Cool Flex to cool to room temperature (approximately 5 minutes) before shooting arrows.

Once the adapter is securely installed in the shaft, fully seat a pin nock over the adapter using the Bohning Nock Indexing Tool and rotate it to the correct index position. If the nock fits a little too snug on the pin adapter, use a little bowstring wax such as Tex-Tite to aid with insertion. Do not use excessive force to install the pin nock onto the adapter as this could cause cracks in the nock and lead to nock failure. Instead try a different nock, and if multiple nocks fit too tightly, change out the

pin adapter using one from a new package (some arrow manufacturers have looser tolerances than others for adapters).

Swedged Nocks

These are the only nocks that should ever be glued in place. Bohning's swedged nocks (Classic Nocks, T-Nocks, and Legend Nocks) are made from a different material than the rest of the nock line. This material doesn't degrade upon contact with instant glues.

Typically these nocks are installed prior to fletching, so indexing is not a concern. To install, simply apply 3-4 drops of Bohning Fletch-Tite Platinum, Blazer® Bond, Fletch Fuse, or Instant Gel to the tapered surface at the end of the shaft. Use caution as with CA glues as these adhesives bond to skin instantly!

Using light pressure, twist the swedged nock onto the tapered end, gradually increasing the downward pressure until the nock has been rotated one full turn. This ensures the adhesive covers the full surface of both the shaft and the interior of the nock. If indexing is required (e.g. for bowfishing shafts or pre-fletched arrows) turn the nock until the correct orientation is achieved before the glue dries. Wipe up any excess glue with a paper towel or cotton swab.

Inspecting Your Nock

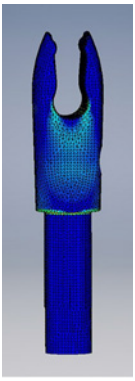
The smallest crack in your nock can lead to a major failure on your next shot. Just like your arrow shaft, it is important to inspect your nock before every shot. Nock damage often occurs at the target when arrows come into contact with each other. For example, you may graze one of your arrows, creating a tiny crack in the shoulder of your nock. From that crack, other minuscule cracks may be radiating deep into the nock, potentially propagating into a major fracture the next time the arrow is shot. This, of course, could both harm you and damage your equipment. When in doubt, replace the nock.

Bohning Nock Development & Testing

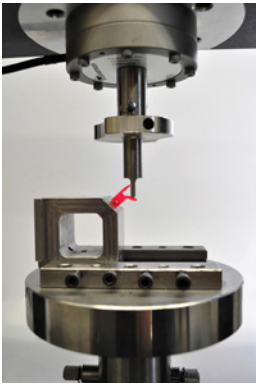
Not all nocks are created equal.

Today's bows are becoming increasingly efficient. A higher percentage of the energy stored in a bow's limbs is transferred to the arrow than ever before. The potential energy stored in your bow is transferred to the arrow via a single component: your nock. The question is, has your nock kept up with bow technology? At Bohning, we have dedicated significant time in testing and research into developing nocks that will withstand the rigors of shooting both today's and tomorrow's high-energy bows.

Every nock we design has to go through an extensive series of tests and refinements before it ever hits the store shelves. Special care is taken early in the design phase to ensure each nock is as strong and resilient as possible. Before a design is cut into steel, computer simulations are run to find any potential weak points in the nock's geometry. Only after multiple tests and refinements is an injection molding tool built. This is done in-house. Our expert team of engineers and machinists have more than 112 years of combined experience! This vast body of knowledge, skill, and experience is how Bohning nocks are set apart from the competition. Producing multiple identical nocks per machine cycle; each having the same exact dimensional, material, and strength properties as the next is proof of highly skilled craftsmanship.



But what does this mean for our customers? Every Bohning nock is molded to incredibly tight tolerances and subjected to meticulous standards of workmanship and quality. This translates to superior consistency at a fraction of the cost.



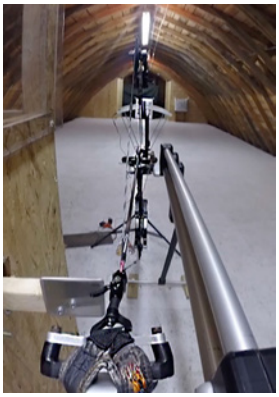
And that is just the beginning.
Once production-ready nocks have been run, they are not ready for the shelves until they have passed an exhaustive battery of testing, both in the lab and on the range. Using state-of-the-art destructive testing methods, our nocks are bent, crushed, and abused to expose possible design flaw or material defect.

On the range, our final and most rigorous test is performed*: accelerated lifecycle testing. Using a custom built bow capable of shooting arrows at kinetic energy levels exceeding 110 ft-lbs (nearly twice that of most hunting bows), we put our nock designs through the gauntlet. No design is approved until a single nock can reliably withstand over 1000 shots under these conditions without any sign of wear. See our Nock Testing video on the Bohning Archery YouTube Channel!

Kinetic Energy

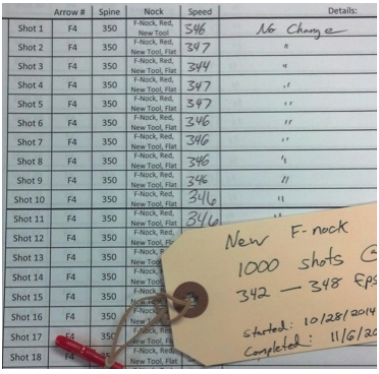
So why focus on kinetic energy (KE)? The answer is simple: KE is the best factor we have for quantifying an arrow's stopping power down range. It is also an excellent way of measuring a bowstring's effect on a nock during the shot. A nock's ability to withstand repeated use under demanding conditions is a testament to its resilience. In engineering terms, resilience is the capacity of a material to transmit

kinetic energy without permanent deformation. By testing our nocks at extreme levels of kinetic energy rather than just extreme speeds alone, we ensure our nocks are the most resilient on the market.



In archery, mental focus is just as important as all of the practice and careful preparation of your equipment– you shouldn't have to question the reliability of your nock. Only Bohning nocks take the guesswork out of the equation for you.

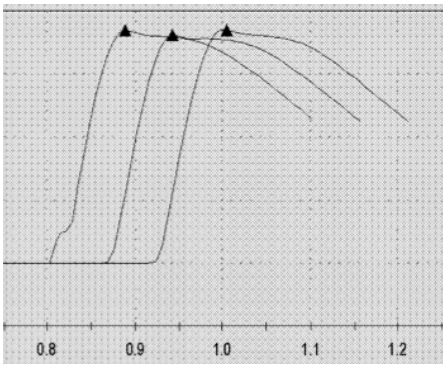
*Swedged nocks (Classic Nocks, T-Nocks, and Legend Nocks) have not been tested according to the 1000 shots scenario.



	Arrow #	Spine	Nock	Speed	Details:
Shot 1	F4	350	F-Nock, Red, New Tool	346	16 Change
Shot 2	F4	350	F-Nock, Red, New Tool, Flat	347	"
Shot 3	F4	350	F-Nock, Red, New Tool, Flat	344	"
Shot 4	F4	350	F-Nock, Red, New Tool, Flat	347	"
Shot 5	F4	350	F-Nock, Red, New Tool, Flat	347	"
Shot 6	F4	350	F-Nock, Red, New Tool, Flat	346	"
Shot 7	F4	350	F-Nock, Red, New Tool, Flat	346	"
Shot 8	F4	350	F-Nock, Red, New Tool, Flat	346	"
Shot 9	F4	350	F-Nock, Red, New Tool, Flat	346	"
Shot 10	F4	350	F-Nock, Red, New Tool, Flat	346	"
Shot 11	F4	350	F-Nock, Red, New Tool, Flat	346	"
Shot 12	F4	350	F-Nock, Red, New Tool, Flat		
Shot 13	F4	350	F-Nock, Red, New Tool, Flat		
Shot 14	F4	350	F-Nock, Red, New Tool, Flat		
Shot 15	F4	350	F-Nock, Red, New Tool, Flat		
Shot 16	F4	350	F-Nock, Red, New Tool, Flat		
Shot 17	F4	350	F-Nock, Red, New Tool, Flat		
Shot 18	F4	350	F-Nock, Red, New Tool, Flat		

New F-nock
1000 shots
342 — 348 fps
started: 10/28/2014
completed: 11/6/20

Shot tracking sheet



Side by side nock compression testing

Bohning Nocks

	Nock Type	Double Lock?	Weight (grains)			
Press-fit	**Blazer®**	✓	10.3			
	Signature		12.7			
	A	✓	7			
	F	✓	6			
	H.E.	✓	7.7			
Pin Bushing	**Original Blazer Pin** (standard throat, small throat)		standard throat: 5	small throat: 5		
	Smooth Release Pin		5			
Tapered	**Classic** (11/32", 5/16")		11/32": 13	5/16": 10		
	Legend (5/16", 9/32")		5/16": 11	9/32": 8		
	T (1/4", 5/16", 9/32", 11/32")		1/4": 5.9	5/16": 13.9	9/32": 14.8	11/32": 15

Arrow Spine:

The spine of an arrow shaft is simply a measure of its stiffness. Static spine is the most common as it gives the stiffness of a shaft while at rest. Dynamic spine refers to the stiffness of an arrow while in flight and may vary with rotation and other factors. Since dynamic spine is difficult to measure, static spine is the industry standard for measuring an arrow's stiffness.

Static spine is measured by supporting a horizontal arrow shaft by two points 28 Inches (711 mm) apart. A 1.94 lb (880g) weight is hung from the shaft exactly halfway between the two supports. The maximum vertical deflection of the shaft at the weight is then measured in inches. This value is the static spine of the arrow shaft, in thousandths of an inch. For example: an arrow that sags 0.350 Inches has a static spine of 350. Most carbon arrow manufacturers print this number directly on the shaft. Note: This value should not be confused with the diameter or weight of an arrow shaft.

Easton	Wrap	Nock	Tower Jig Post	Tower Jig Ring
AC Pro Field	Standard	F / Pin	F / Pin	Small
ACC	XS	F Nock	Standard	Small
ACC Pro Hunting	Small	HE Nock	HE Nock	Small
ACE	Small	F / Pin	F / Pin	Small
ACG	XS	F / Pin	F / Pin	Small
Aftermath	Small	HE Nock	HE Nock	Small
Apollo	Small	F / Pin	F / Pin	Small
Axis	Small	A Nock	A Nock	Small
BloodLine	Small	HE Nock	HE Nock	Small
Bloodline Camo	Small	HE Nock	HE Nock	Small
Bloodline Crossbow	Large	Half moon or Flat	Crossbow	Large
Bowfire	Standard	Blazer / Signature	Standard	Small
Camo Hunter XX75	Standard	Blazer / Signature	Standard	Small
Carbon One	Small	F / Pin	F / Pin	Small
da'Torch	Standard	Blazer/Signature/A	Standard	Small
Deep Six FMJ	Small	F Nock	F Nock	Small
Deep Six Injexion	Small	F Nock	F Nock	Small
Epic	Standard	HE Nock	HE Nock	Small
Fat Boy	Large	Blazer / Signature / F (bushing)	Standard / F	Large
F Nock	Standard	F Nock	Standard	Small
Flatline	Standard	Blazer / Signature	Standard	Small
Flatline Crossbow	Large	Half Moon or Flat	Crossbow	Large
FMJ	Small	A Nock	A Nock	Small
FMJ Crossbow	Large	Half Moon or Flat	Crossbow	Large
FMJ Dangerous Game	Small	A Nock	A Nock	Small
Full Bore	XL	Blazer / Signature / F (bushing)	Standard / F	Small
Gamegetter	Standard	Blazer / Signature (bushing)	Standard	Small
H Nock	Standard	HE Nock	HE Nock	Small
Hexx	Small	HE Nock	HE Nock	Small
ION	Small	HE Nock	HE Nock	Small
Legacy	Standard	Legend	Swedge	Small
Light Speed 3D	Standard	F Nock	Standard	Small
Neos	Small	Legend	Swedge	Small
Nemesis	Small	HE Nock	HE Nock	Small
Realtree	Small	A Nock	A Nock	Small
SuperDrive 23	Large	Blazer / Signature	Standard / F / Pin	Large
SuperDrive 25	XL	Blazer / Signature	Standard / F / Pin	XL
Traditional	Small	A Nock	A Nock	Small
Under Armour Axis	Small	HE Nock	HE Nock	Small
X7 Eclipse	Large / XL	Blazer / Signature / F (bushing)	Standard / F	Large / XL
X10	XS	Pin Nock	Pin Nock	Small
X10 Protour	XS	Pin Nock	Pin Nock	Small
X23 Shafts	Large	Blazer / Signature / F (bushing)	Standard / F	Large
X27 Shafts	XL	Blazer / Signature / F (bushing)	Standard / F	XL
XX75 Genesis	Standard	F / Legend	Standard / F	Small
XX75 Jazz	XS	Legend	Swedge	Small
XX75 Magnum X Bow	Large	Half Moon or Flat	Crossbow	Large
XX75 Platium Plus	Large	Blazer / Signature / F	Standard	Large
XX75 Tribute	Standard	Legend	Swedge	Small
23/64	Large	Blazer / Signature / F (bushing)	Standard / F	Small
27/64	XL	Blazer / Signature / F (bushing)	Standard / F	XL

Nock Selection

Beman	Wrap	Nock	Tower Jig Post	Tower Jig Ring
Bone Collector	Small	A Nock	A Nock	Small
Bone Collector Jr	Small	HE Nock	HE Nock	Small
Carbon Diva	Large	Blazer / Signature	Standard	Large
Carbon Flash	Small	N/A	N/A	N/A
Centershot	Small	HE Nock	HE Nock	Small
Dead Ringer	Large	Blazer / Signature / F	Standard	Large
ICS Bowhunter	Standard	Blazer / Signature / F	Standard	Small
ICS Bowhunter Jr	Standard	Blazer / Signature	Standard	Small
ICS Crossbow Hunter	Large	Half Moon or Flat	Crossbow	Large
ICS Hunter	Standard	Blazer / Signature / F	Standard	Small
ICS Hunter Patriot	Standard	Blazer / Signature / F	Standard	Small
ICS Hunter Pro	Standard	Blazer / Signature	Standard	Small
ICS Hunter Lost Camo	Standard	Blazer / Signature	Standard	Small
MFX	Small	A Nock	A Nock	Small
Nightfall	Small	A Nock	A Nock	Small
Pork Chop	Large	HE Nock	HE Nock	Large
Pork Chop Crossbow	Large	Half Moon or Flat	Crossbow	Large
Spe3d	Standard	Blazer / Signature / F	Standard	Small

Victory	Wrap	Nock	Tower Jig Post	Tower Jig Ring
Ares	Standard	Blazer / Signature	Standard	Small
Performance Junior	Standard	Blazer / Signature	Standard	Small
Pink Arrow Proj	Standard	Blazer / Signature	Standard	Small
Rip	Small	A Nock	A Nock	Small
Rip Camo	Small	A Nock	A Nock	Small
VAP	XS	F Nock	F Nock	Small
VAP Camo	XS	F Nock	F Nock	Small
VAP Pink	XS	F Nock	F Nock	Small
VAP VooDoo	XS	N/A	Swedge	Small
Venus	Standard	Blazer / Signature	Standard	Small
VForce	Standard	Blazer / Signature	Standard	Small
VForce Camo	Standard	Blazer / Signature	Standard	Small
VForce HV	Standard	Blazer / Signature	Standard	Small
VForce JR	XS	Blazer / Signature	Standard	Small
VForce Pink	Standard	Blazer / Signature	Standard	Small
VX23	Large	Pin Nock	Pin Nock	Large
VX25	Large	Pin Nock	Pin Nock	Large
VX27	XL	Pin Nock	Pin Nock	XL
X-Killer	XL	Pin Nock	Pin Nock	XL
Xbolt	Large	.303 Half Moon	Crossbow	Large

Bloodsport	Wrap	Nock	Tower Jig Post	Tower Jig Ring
Apocalypse	Standard	Blazer / Signature	Standard	Small
Athena	Standard	Blazer / Signature	Standard	Small
Bloodsport 1	Small	F / Pin	F Nock	Small
Blood Sport 2	Standard	Blazer / Signature	Standard	Small
BS Three	XL	Pin or N/A	Pin Nock	XL
BS Four	XL	Pin or N/A	Pin Nock	XL
FPS Hunter	Standard	Blazer / Signature	Standard	Small
Impact Hunter	Small	F / Pin	F Nock	Small
Judgement	Standard	Blazer / Signature	Standard	Small
Punisher	Standard	Blazer / Signature	Standard	Small

Carbon Express	Wrap	Nock	Tower Jig Post	Tower Jig Ring
Carbon Rebel	Large	Blazer / Signature	Standard	Large
Carbon Rebel Hunter	Large	Blazer / Signature	Standard	Large
CXL Pro	Large	Pin Nock	Pin Nock	Large
Flu Flu	Large	Blazer / Signature	Standard	Large
Game Slayer	Large	Blazer / Signature	Standard	Small
Heritage	Standard	Blazer / Signature	Standard	Small
Hot Pursuit	Standard	HE Nock	HE Nock	Small
Line Jammer Pro	XL	Pin Nock	Pin Nock	XL
Maxima Blu RZ	Standard	Blazer / Signature	Standard	Small
Maxima Blu RZ Select	Standard	Blazer / Signature	Standard	Small
Maxima Blue Streak	Standard	Blazer / Signature	Standard	Small
Maxima Blue Streak (Crossbolt)	Large	.2985 Half Moon or Flat	Crossbow	XL
Maxima Blue Streak Select	Standard	Blazer / Signature	Standard	Small
Maxima Hunter	Standard	Blazer / Signature	Standard	Small
Maxima Hunter (Crossbolt)	Large	.2985 Half Moon or Flat	Crossbow	Large
Maxima Mathews	Standard	Blazer / Signature	Standard	Small
Maxima Red	Standard	Blazer / Signature	Standard	Small
Mayhem	Standard	Blazer / Signature	Standard	Small
Mayhem (Crossbolt)	Large	.2985 Half Moon or Flat	Crossbow	Large
Mayhem Hot Pursuit	Standard	Blazer / Signature	Standard	Small
Mayhem Hunter	Standard	Blazer / Signature	Standard	Small
Medallion-Pro	XS	Pin Nock	Pin Nock	Small
Medallion XR	XS	Pin Nock	Pin Nock	Small
Mutiny	Standard	Blazer / Signature	Standard	Small
Mutiny Slasher	Standard	Blazer / Signature	Standard	Small
Nano Pro	XS	Pin Nock	Pin Nock	Small
Nano Pro Extreme	XS	Pin Nock	Pin Nock	Small
Nano SST	XS	Pin Nock	Pin Nock	Small
Nano XR	XS	Pin Nock	Pin Nock	Small
Piledriver (Crossbolt)	Large	.2985 Half Moon or Flat	Crossbow	Small
Pile Driver Extreme	Small	A Nock	A Nock	Small
Pile Driver Hunter	Standard	Blazer / Signature	Standard	Small
Predator	N/A	N/A	F Nock	Small
Predator II	N/A	N/A	F Nock	Small
Terminator XP	Large	Blazer / Signature	Standard	Large
Thunder Express Youth	Small	Blazer / Signature	Standard	Small
ThunderStorm	Standard	N/A	F Nock	Small
X-Buster	Large	Pin Nock	Pin Nock	Large
X-Jammer 27 Pro	XL	Pin Nock	Pin Nock	Small
Whitetail	Standard	Blazer / Signature	Standard	Small
Whitetail (Crossbolt)	Large	.2985 Half Moon or Flat	Crossbow	Large

Black Eagle	Wrap	Nock	Tower Jig Post	Tower Jig Ring
Carnivore	Standard	Blazer / Signature	Standard	Small
Challenger	Large	Blazer / Signature / F / Pin (bushing)	Standard / F	Large
Deep Impact	Small	F Nock	F Nock	Small
Executioner	Large	.303 Half Moon or Flat	Crossbow	Large
Magnum	XL	Blazer / Signature / F (bushing)	Standard / F	XL
Outlaw	Standard	Blazer / Signature	Standard	Small
Outlaw Pink Crested Edition	Standard	Blazer / Signature	Standard	Small
Rampage	Small	A Nock	A Nock	Small
Renegade	Small	A Nock	A Nock	Small
Spartan	Standard	A Nock	Standard	Small
X-Bow	Large	.303 Half Moon or Flat	Crossbow	Large
X-Impact	XS	F Nock	F Nock	Small
Zombie Slayer	Standard	Blazer / Signature	Standard	Small
Zombie X-Bow	Large	.303 Half Moon or Flat	Crossbow	Large
PS23	Large	Blazer / Signature / F / Pin	Standard	Large

Gold Tip	Wrap	Nock	Tower Jig Post	Tower Jig Ring
Falcon Youth	Standard	Blazer / Signature	Standard	Small
Fiberglass Youth	Standard	Classic	N/A	Small
Hunter	Standard	Blazer / Signature / F (Bushing)	Standard	Small
Kinetic	Small	A Nock	A Nock	Small
Laser II	Large	.303 Half Moon	Crossbow	Large
Laser III	Large	.303 Half Moon	Crossbow	Large
Laser IV	Large	N/A	Crossbow	Large
Lightning Youth	Standard	Blazer / Signature	Standard	Small
Name The Game	Standard	Blazer / Signature / F (Bushing)	Standard	Small
Nine .3 Max	Large	Standard / Blazer / Pin (Bushing)	Standard / Pin	Large
Pierce	XS	Pin (Bushing)	Pin	Small
Team Primos	Standard	Blazer / Signature / F (Bushing)	Standard	Small
Ted Nugent	Standard	Blazer / Signature / F (Bushing)	Standard	Small
Traditional	Standard	Blazer / Signature / F (Bushing)	Standard	Small
Twister	Standard	A Nock	A Nock	Small
Ultralight	Standard	Blazer / Signature / F (Bushing)	Standard / F	Small
Velocity	Standard	Blazer / Signature / F (Bushing)	Standard	Small

Kill'n Stix	Wrap	Nock	Tower Jig Post	Tower Jig Ring
Hawkeyes	Standard	Blazer/Signature	Standard	Large
Original	Standard	Blazer/Signature	Standard	Large
Ventilator	Small	A Nock	A Nock	Small
Micro Ventilator	Small	F Nock	F Nock	Small
Micro Ventilator LT	Small	F Nock	F Nock	Small
Tournament	Large	Blazer/Signature or F or Pin (bushing)	Standard / F	Large
Tournament XL	XL	Blazer/Signature or F or Pin (bushing)	Standard / F	XL
Karnage	Large	.303 Halfmoon or flat	Crossbow	Large