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Flemish Twisted Bow Strings & Footed Arrow Shafts

by:

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The purpose of this paper is not to provide a discussion of the pros and cons of string making as much as to provide specific instructions in how to make a tapered end Flemish twisted bowstring from standard materials. For a more detailed discussion please go online to Stefan's Florilegium at http://www.florilegium.org/files/ARCHERY-FAQ/string-mak-FAQ.html or to volume 2 of the Traditional Bowyers Bible for a detailed description and discussion using traditional natural materials.

Materials

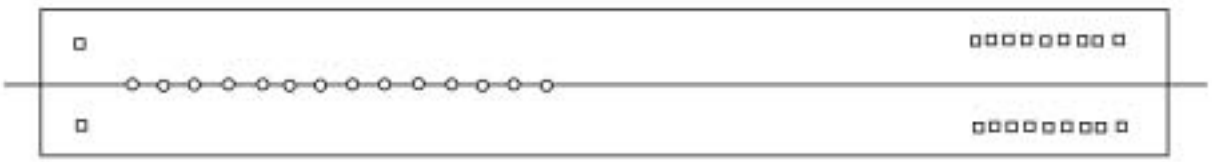
String: In order to make a bowstring it is necessary to have certain basic materials. Fast-flite bowstring is generally not recommended due to its lack of give which can cause some bows to shatter. The preferred and readily available material from most mail order houses is B50 nylon waxed bowstring. It will require 10 to 18 strands for most bowstrings so it is usually worthwhile to buy a couple of quarter lb spools in different colors if you are going to be making very many strings.

Wax: Beeswax works fairly well and you can buy a small cake of regular beeswax that is specifically formulated to work with making bowstrings.

Server and serving: this material is wrapped around the center of the string to reduce wear on the string where the arrow is nocked. A spool of heavy thread in various colors is available from archery suppliers along with a serving tool which facilitates wrapping the string snugly with the serving. Braided serving is somewhat more expensive than the regular serving but is extremely durable. For crossbow string it is the only serving that I use due to the abrasion that occurs from the string rubbing against the stock.

String jig: If you are going to be making a lot of different strings then I recommend that you may want to invest $30-40 in a commercially available jig that is easily adjustable. If you are going to want to make a dozen strings a year for yourself and your friends then you may not want that expense. Following are instructions on how to make a simple jig such as what I use and that can make strings from AMO lengths of 48" up to 72 inches.

Obtain a flat 1x4 board 30 inches long and some small finishing nails plus 1- 16d nail. Mark a centerline down the length of the board. Starting 1-1/4 inch from one end drive 2 nails 1/2 inch deep into the board æ inch on each side of the centerline. Starting at 3 3/4 inches from the end drill 13 1/2 inch deep holes every 1 inch along the centerline. The hole diameter should be just large enough that the 16d nail will fit into it snugly but can be easily removed. Number the holes, starting from the one closest to the end, 48,50,52….74. These will be the string lengths corresponding to the AMO bow lengths.



Measure 27-3/4 inches from the nails that you put into the board and place 2 nails æ inch on each side of the centerline. Place 8 more pairs 1/2 inch apart working back toward the center so that you have a line of nails 1-1/2 inch apart. Starting at the end pair label them 0, 1, 2, ….7, 8. These will count the strands that are going into your string. When done you should have a board looking roughly like the layout shown.

Making the string: with the jig in front of you in the orientation shown, take a spool of B50 and tie it to the nail in the top right of the jig. String it down around the lower right nail, the length of the board to the lower left nail, up around the peg in one of the drilled holes, back to the upper left nail and back down the length of the jig to the next to the last upper right nails. Continue to run the string down to the next to last lower right nail and then repeat as before until the required number of strands have been run. Run a sharp knife down the centerline between the two rows of nails on the right of the jig and remove the bundle of strands being careful to not tangle them. Wax the entire bundle with the beeswax by pulling it between your thumb and the cake of wax. Wax the last foot of the bundle at each end particularly heavily and set the bundle aside.

Repeat the process to create another bundle of strands- preferably with a different color although this is not required.

Take both bundles and match the lengths together. Then place the pair of bundles between your thumb and forefinger of your left hand with 8 inches of bundles extending to the right. The balance of the bundle is off to the left out of the way for now. While holding the bundles in the left, take one bundle between the thumb and forefinger of the right hand and twist the strands together rolling the bundle toward you. Do the same with the other bundle and "braid" it to the other bundle by putting it on top of the other bundle and twisting the two bundles together with the top of the twist going away from you. This combination will lock the strands into place and keep them from untwisting. Continue to twist the strands together and braid the bundles until you have about 3 inches braided. This will make a one inch diameter loop. Braid less for smaller loops.

Next make the loop of the braided section bringing the loose ends to the base of the braid that you have been holding in your left hand. Separate the strands of one bundle and thread the loose end of the bundle through the "eye" that is formed and twist the bundle together as before being careful to keep the direction of twist the same. Continue to twist and braid the bundles together until about 1 inch below the last strand tail.

Hook the loop over a nail and stretch the string out and untangle any tangles. Take the other end in your left hand as before, twist and braid, and form the loop as before. Continue to twist and braid and push the braid into the main bowstring until you have braided about an inch below the last tail. Hook the other end over a nail and pull the string out gently while twisting the whole string in the direction that it was twisting at each end. This will remove any counter twist that would undo your braiding work. Then twist the string until it is about the right length for the bow (approximately 3 inches shorter than the nock ends) and fit it on to the bow. It should have a brace height of about 6-8" depending on the bow and the owner preference. Wax the entire string heavily.

Starting about 2 inches above the nocking point on the string while stretched on the bow, lay the tail of the serving along the string and start wrapping the serving around and over the tail. After about 6 wraps or so pull it tight and continue wrapping letting the serving tool do most of the work. Practice will show you the correct tightness of the serving. It should be snug but not so tight it causes the string to twist. Continue to wrap serving until about an inch short of where you will stop. Lay a loop of string along the string with the tails along the serving and continue to wrap for about another 1/2 to 3/4 inch. Pull out and cut off a length of serving and thread through the loop. Pull the tails and the loop should pull the loose end under the serving.

The string should be done and ready to shoot with the addition of a arrow nocking point.

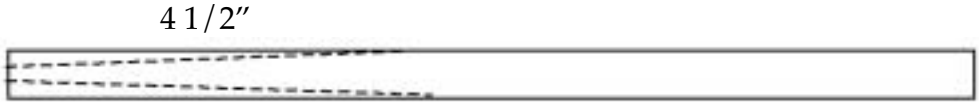
This article is intended mainly as a guide in the making of what is known as the footed shaft. Further and more detailed information is available in Volume Three of the Bowyers Bible on the making of both the 2 and 4 spline footed shaft. In this article we will discuss only the 2 spline as it is fairly simple to make with minimal tools. Source of information is primarily Volume 3 of the Bowyers Bible.

The footed shaft has been in use in various forms among both the American Indian and Europeans for centuries. In 19th century England it was developed into a fine art form. In either case it has quite practical application since it provides a method of repairing broken self arrow shafts as well as the footed portion of hardwood being significantly tougher than the softwood of the self arrow. Very few folks take the time to make such arrows since they are extremely time intensive- requiring time on the order of hours per arrow to make. They are, however one of the most beautiful arrows that it is possible to own.

Tools and materials:
You can use power equivalents of any handtool and vastly speed up the construction of the arrows. For our purposes today though we will discuss the construction of the arrows using strictly hand tools. The following list is required in order to make the basic shaft.

1) patience in generous quantities
2) broken shaft self arrows or a new shaft
3) 7/16 squares of Purpleheart or other straight grained wood 8 inches long
4) Handsaw
5) Block Plane (6-1/2" plane is available from Home Depot for about $10)
6) Titebond 2 glue
7) Coarse and fine Rasps
8) Coarse and fine sandpapers with block
9) 2-C clamps
10) Ruler or tape measure
11) Vice

First take the arrow shaft that you will be using and determine the direction of the grain of the wood. Although not absolutely required to be this way, generally the growth rings of the arrow should be horizontal to the ground (and perpendicular to the string) when the arrow is nocked. Mark a line on the center of the end of the shaft that will be perpendicular to the string when the arrow is nocked. Next mark a line around the shaft
4-1/2" to 5" from the end on what will be the top and bottom of the shaft when the arrow is nocked. Set the block plane to take a very thin shaving from the wood, place the shaft on a flat backing and taper the arrow shaft evenly on both sides from the 5" mark to the end mark being careful to keep the surfaces as flat and parallel as possible. The end of the shaft when finished should be the same thickness as the saw kerf will be in the footing block.

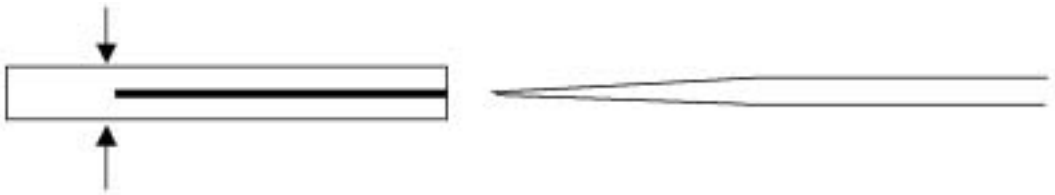


Next take the 7/16 square of Purpleheart or other straight grain footing material and measure 5 inches from one end and make a mark along the center of the square. The grain growth rings should be parallel to the 5 inch slot that you will cut along the marked centerline of the square. If you have access to a bandsaw then by all means

use it. Otherwise some practice will probably be required to clamp the square in a vice or to a table and cut a straight saw kerf down the center of the square.

Once the slot is cut then place a C clamp just below the saw kerf in order to keep the square from splitting when the arrow shaft is forced into the saw kerf.

Next open the saw kerf slightly and fill the kerf with glue. Then place the arrow shaft in the center of the kerf and tap it all the way in until it bottoms out in the bottom of the saw kerf. Take extra time to make sure the block and the arrow shaft are aligned or you will have a great deal of difficulty later in getting the footing true to the arrow shaft and may even have to scrap the effort.



Clamp point

Once the arrow has been position all the way into the block and centered then lightly clamp the end of the slot end of the block being careful not to apply so much pressure as to crush the arrow shaft. Allow to dry overnight before removing the clamps.

Repeat this process as necessary to make the requisite number of shafts.

Now get out your supply of patience and apply liberally. Starting with a coarse rasp shape remove all of the wood that does not look like an arrow from the block. In reality this means patiently rasp or whittle the material away until you have a round shape that is slightly larger than the arrow shaft. Use the fine rasp to take it down a little closer and finally the sandpaper to get the proper diameter of the hardwood shaft. Purpleheart will turn purple with exposure to air.

Once the block is made to match the arrow shaft then, seal the shaft, add a taper for the arrow point and nock , fletch and point the shaft.

Overall you can expect to spend a minimum of two hours or more per shaft. Although the time required is far greater than that for a normal self arrow- the results are well worth it and will mark you as a skilled and serious archer/fletcher.