# EKYC 2015
# Basic Sword Construction for Div. I – III

# EKYC 2015 Sword Div. I-III

This guide uses rattan cores, but PEX or Siloflex (HDPE) cores are made in the same manner, with optional end caps

Tools:

- Tape Measure
- Wood saw
- File or coarse sand paper
- Scissors

With tools and materials in hand, this sword took about one hour to make.

Materials:

- Shaved rattan (between ¾" and 1" diameter)
- Fiber/strapping (glass filament) tape
- Pipe foam (rough skinned)
- Pipe (foam) insulation tape
- Duct tape of two contrasting colors
- Optional: grip tape
- Optional: rubberized pipe foam

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## Materials

Using the following foam has made construction fairly easy, but similar results can be achieved with other foam sizes. Keep in mind that in the East Kingdom the impact area needs at least ½" thick foam (Society only requires 3/8") and the thrusting tips need at least a 2-½" diameter with at least 2" of foam tip depth to pass inspection. I find it easiest to use pipe foam with a wall thickness of ¾". My foam of choice is: Tundra polyethylene pipe foam #46487 1-1/8" ID x 3/4" wall 6' long pipe foam.

Single pieces are ~$7 at Ace Hardware stores: Single Foam 46847 at ACE

A bulk (17 count) online source: Case of Foam 46847

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HINT: If you're building a great weapon (polearm or great sword) from 1" to 1-¼" rattan, a similar foam with a larger inside diameter is:

Tundra polyethylene pipe foam #46489 1 3/8" ID x 3/4" wall 6' long pipe foam.

A bulk (15 count) cost is ~$100

Case of Foam 46489

I find it is helpful to have a smaller sized and softer pipe foam for use inside the thrusting tip. I often use smooth skinned, often called "rubberized", pipe foam that can be found at Home Depot in ½" or 3/8" wall thickness. A single piece is ~$1.30

A slightly smaller (5/8" wall) pipe foam is Frost King branded Thermwell Products P12 Foam Insulation, 3-Feet. This can be found at Amazon for ~9.00 plus tax delivered for four pieces. This foam needs an extra step to finish the thrusting tip. Thermwell Pipe Foam

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The fiber tape needs to have strands of glass fibers (filaments) to have the appropriate strength. There are a lot of good choices available.

I use Scotch Extreme Application Packaging Tape w/Dispenser, Clear, 2” x 22 yds. This is available at Staples for ~$13.

Scotch Extreme

I also use Armacell brand Armaflex Foam Pipe Insulation Tape from Home Depot, which costs ~$8. This is helpful in getting a good fit and required to finish the smaller Thermwell foam. Foam tape

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Duct tape selection is often a matter of preferred colors. For a sword, the two colors must contrast enough that the opponent and marshal can distinguish the blade edges. This is less important for bottle maces or axes. Still, the markings should contrast enough that it is easy to determine if the weapon has a thrusting tip.

Some duct tape is thin and will tear easily. Some is very thick, and will often become hard when cold or aged. Select with some care, but most will be fine for indoor or summer fighting.

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Rattan can be difficult to find outside of SCA events. Many armor and heavy weapons vendors have rattan; It may be Shaved or Skin-On.

A good piece of shaved rattan will have none of the outside skin still on it. There should be no obvious growth marks. It should have nearly the same diameter from one end of the stick to the other. Staves are usually 9' in length and might produce several weapons.

We do not permit core sizes below ¾". Single-handed weapons use ¾" to 1" diameter pieces. Division 3 sized Great Weapons may use up to 1-¼" diameter if the entire weapon is longer than 5' 6" in length.

If shaved rattan is not available, a natural piece can have the growth rings removed by sanding or planing. Keep the core shape cylindrical so that there are no abrupt edges except at the cut. The thickness may vary from end to end.

Longer weapons will become "whippy" if the rattan is too thin. Some rattan is "whippier" than others, so select pieces for longer weapons with greater care. Skin-On rattan tends to be less whippy than shaved rattan at the same thickness, but will have more variation end to end.

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More readily available core materials include PEX (nominal sizes ¾" and 1") and Siloflex (polyethylene/HDPE nominal sizes ½", ¾" and 1"). Sizing varies a bit by Division. Don't buy it in rolls, buy it in straight lengths. These materials are good for single-handed weapons. None of those materials should have an outside diameter less than ¾". Not all Kingdoms permit these cores.

Siloflex pipe has become harder to find at big box stores. The 2' length may not be as long as desired.

- Only Division 1 may use ½" diameter such as this: 1/2 inch Poly Pipe
- Any Division may use ¾". 3/4 inch Poly Pipe
- Divisions 2 and 3 may use 1" 1 inch Poly Pipe

PEX pipe in 5' and 10' lengths remains easily found at big box stores. White, blue, and red are often found side by side.

- Any Division may use ¾" 3/4 inch PEX Pipe
- Divisions 2 and 3 may use 1" 1 inch PEX Pipe

Close the ends of the pipe with strapping tape or leather. You can also use CPVC caps of the same nominal size as the PEX. 3/4 inch CPVC cap.

Some plastic leg tips can fit over Siloflex**.** 1 inch leg tips for 3/4 inch siloflex

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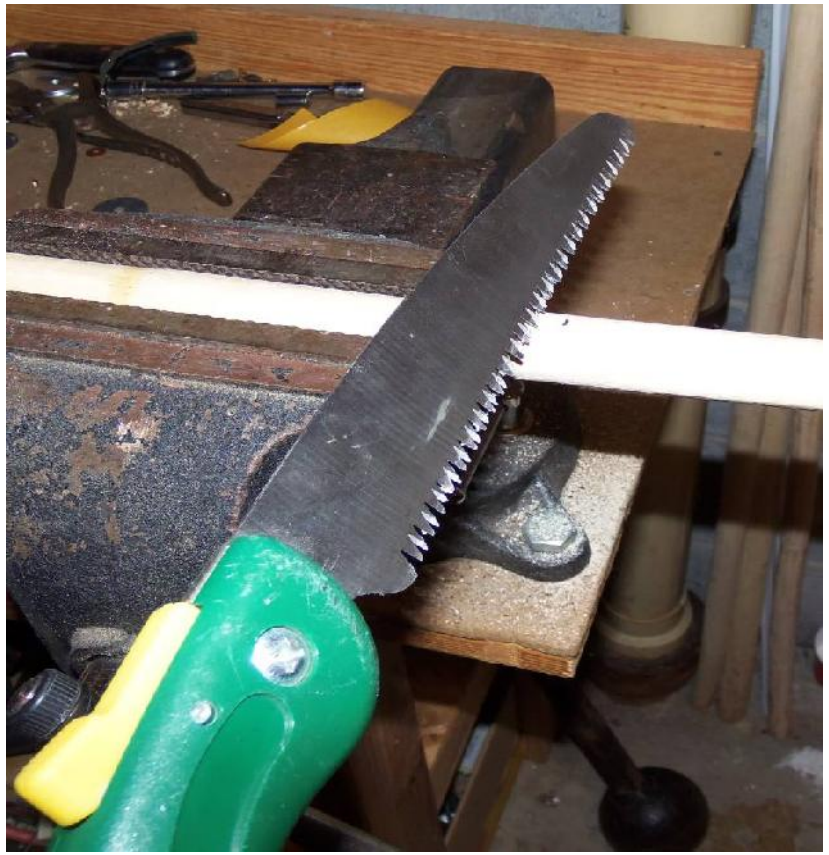
## Making the Sword

Take a measurement from the wrist to the floor.  On this fighter, at 26-½”, the finished sword will not touch the ground when this fighter holds it. Lengthen or shorten your sword as desired.

Make the cut. A vice is helpful. A folding saw can be found at: Folding saw for Rattan cutting



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Round the ends slightly. I am using a Red Devil Dragon Skin Holder (3329) Holder and Sanding Sheet (3331) Sheet

The end remains primarily flat with the edges slightly rounded.

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Taping of core materials is no longer required. However, you may still wish to do this, especially to stop shaved rattan from "stringing". The following method is recommended.

With short, fairly straight pieces of rattan, lay a long strip of 2" fiber tape on the table and then lay the core upon it. The tape should be longer than the core so that it can wrap over both ends.

The first length folds over like shown. Add a second or perhaps even a third length to cover all of the outside of the core. The layers should overlap slightly.

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Cut two lengths of the thick foam. Leave room between them on the weapon's haft for the hilt. The foam for the blade must extend at least 2" past the end of the core. I make it 2-¾" longer than the core. The foam at the pommel end must extend past the core at least 1. I make it 1-¼" longer.


The hollow ends of pipe foam need to be filled next. I use the smaller Armacell foam for this.

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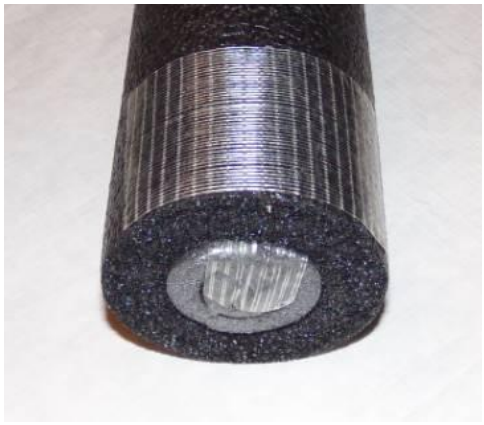
1. Cut a piece of the smaller foam ~3” in length. This is a good spot to use the smooth skinned (rubberized) foam which is not used for blades, though the regular foam, shown, is also fine.

3. Insert the foam cylinder into the end of the thrusting tip.

2. Split the foam on the seam, and then roll it into a tight cylinder. Tape the roll with fiber tape so it will not unwind .



4. Once completely inserted, tape over the seam of the outer foam where it is gapping.

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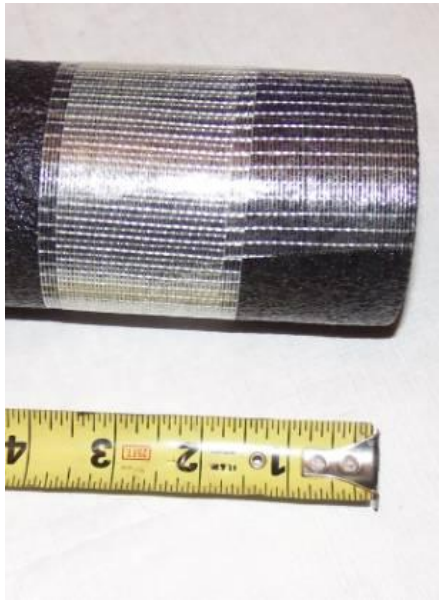
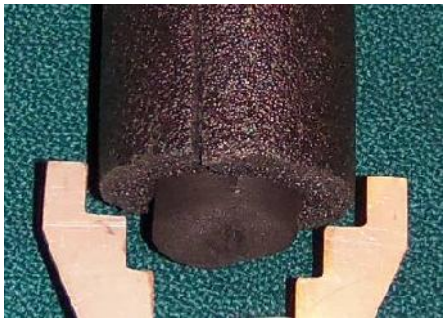
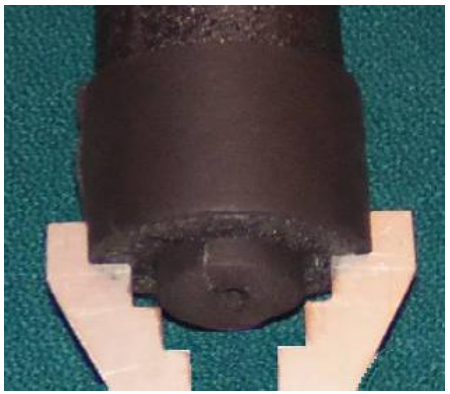
A few additional wraps of fiber tape, centered about 3” from the end, will help stiffen the tip for thrusting. Depending upon the foam characteristics, I may use 2 to 4 wraps.

The thrusting tip diameter shown is larger than the 2-½” minimum, which is good.





If the thrusting tip diameter is too small, add a wrap of the Armaflex foam tape. Note the use of the rubberized foam in the tip.



The gauge shown should be available in 2015 from Munitions Grade Arms.

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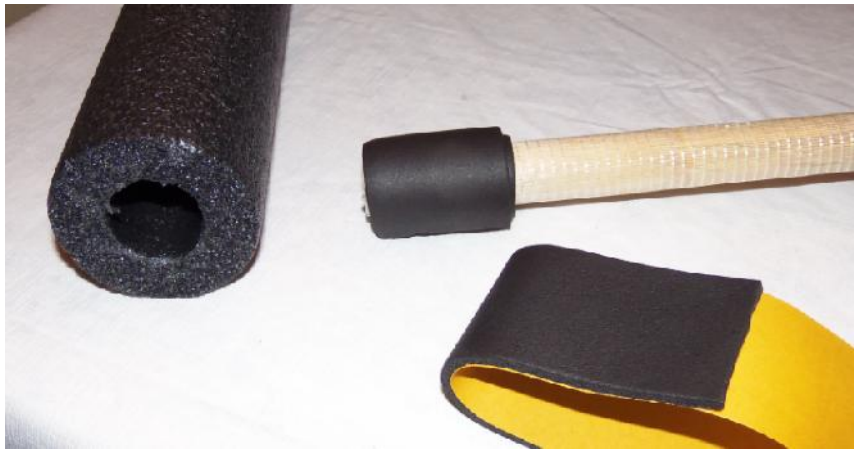
We need to fill in the gap between the core and the foam near the handle.

Wrap the Armaflex foam insulating tape around the core until it is nearly as big as the inside diameter of the pipe foam.



I usually make two wraps for a short sword, as shown, and three wraps for a longer blade. Wrap the foam around the core in the same direction to keep it from unraveling while inserting the core into the foam.

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While inserting the core into the pipe foam you may find that turning it helps. Make sure that you turn it in the direction that does not peal off the foam tape. Use fiber tape over any gap in the outer foam.

Apply the base layer of duct tape. The tape should extend past the foam and lie against the core. It will also loop over the tip and down the opposite side. Do not compress the foam.

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Multiple layers of tape are added, overlapping slightly, until the foam is completely covered. Gather the extra length of tape around the core.

A contrasting color of duct tape must be applied to mark the blade edge. Note the “X” on the end to denote a thrusting tip. The two rings around the blade help us to recognize that it is a Youth Combat weapon. The blade’s edge tape ends a bit above the end of the foam near the hilt.

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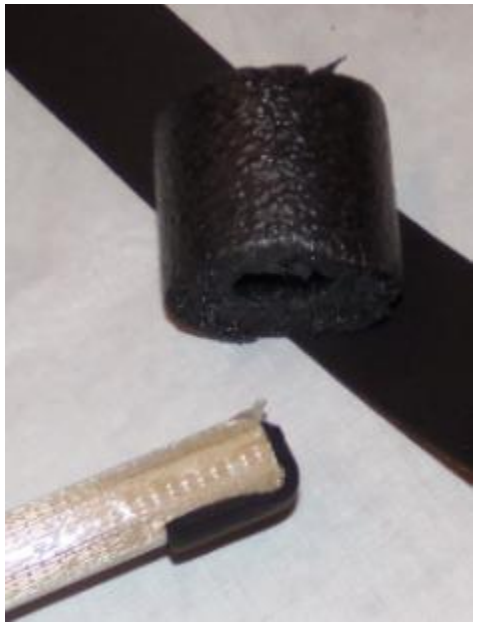
The pommel end must have foam attached as well. Because this end will not be used for thrusting, the large foam can be cut down.

Make a plug of ~1-1/4” depth of the smaller foam for use inside the larger foam.



Use a small amount of the foam tape if needed to tighten the fit.

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Use a layer of fiber tape to close any gaps in the foam. Cover the end foam with a base layer of duct tape.

The duct tape that attaches the foam to the hilt from both the blade and the pommel should be taped firmly to the core. I use grip tape to do this, as well as to cover the hilt area.

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The finished hilt.

When held, the sword should not touch the ground if the rattan was cut at wrist height.

I would like to thank Jaekel and Shamus of Bhakail. Their excellent PVC core guide inspired this work and has made weapon making much easier for many youths, their parents and we marshals.

Hroudland

2/21/2015