

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 $\frac{3}{4}$ " 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

EKYC 2015 Sword Div. I-III

Materials

Using the following foam has made the construction fairly easy, but similar results can be achieved with other foam sizes. Keep in mind the impact area needs at least $\frac{1}{2}$ " thickness of foam, and thrusting tips need at least a $2\frac{1}{2}$ " diameter with at least 2" of foam tip depth to pass inspection. I find it easiest to use a pipe foam with a wall thickness of $\frac{3}{4}$ ". 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](#)



EKYC 2015 Sword Div. I-III

HINT: If you're building a great weapon 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 was (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](#)



EKYC 2015 Sword Div. I-III

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](#)



EKYC 2015 Sword Div. I-III

The duct tape selection is often a matter of preferred colors. For a sword they 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 easily determined 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.



EKYC 2015 Sword Div. I-III

Rattan can be difficult to find outside of SCA events. Many armor and heavy weapons vendors will have rattan, some shaved and some not.

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 weapon to the other. Staves are usually 9' in length and might produce several weapons. In the East we do not permit core sizes below $\frac{3}{4}$ " though you may find some smaller at Pennsic. Single handed weapons use $\frac{3}{4}$ " to 1" diameter pieces. Division 3 sized Great Weapons may use up to $1\frac{1}{4}$ " 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.



EKYC 2015 Sword Div. I-III

More readily available core materials include PEX (nominal sizes $\frac{3}{4}$ " and 1") and Siloflex (polyethylene / HDPE nominal sizes $\frac{1}{2}$ ", $\frac{3}{4}$ " 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. Not all Kingdoms will 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 a $\frac{1}{2}$ " diameter such as this: [1/2 inch Poly Pipe](#)
- Any Division may use $\frac{3}{4}$ ". [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 $\frac{3}{4}$ " [3/4 inch PEX Pipe](#)
- Divisions 2 and 3 may use 1" [1 inch PEX Pipe](#)

Close the ends with strapping tape or leather. You may also use CPVC caps of the same nominal size as PEX. [3/4 inch CPVC cap](#).

Some plastic leg tips can fit over Siloflex. [1 inch leg tips for 3/4 inch siloflex](#)



EKYC 2015 Sword Div. I-III

Making the Sword

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



Make the cut. A vice is helpful. A folding a saw can be found at: [Folding saw for Rattan cutting](#)



EKYC 2015 Sword Div. I-III

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.



EKYC 2015 Sword Div. I-III

Taping of cores is no longer required. For those wishing to do this, especially to stop shaved rattan from “stringing”, the following method is recommended.



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



The first length will fold over like shown. Add a second, or perhaps even a third length, to cover all of the outside of the core. The layers are meant to overlap slightly.

EKYC 2015 Sword Div. I-III

Two lengths of the thick foam must be cut. Leave room between them for the hilt. The foam for the blade must extend at least 2" past the end of the core. I make it 2 $\frac{3}{4}$ " longer. The foam at the pommel end must extend past the core at least 1. I make it 1 $\frac{1}{4}$ " longer.



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

EKYC 2015 Sword Div. I-III

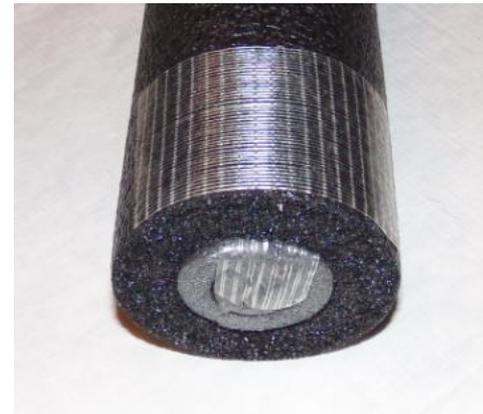
Cut a piece of the smaller foam ~3" in length. This is a good spot to use the smooth skinned (rubberized) foam which is not used for blades. This is optional and the regular foam, shown, is also fine.



Insert the foam into the end.



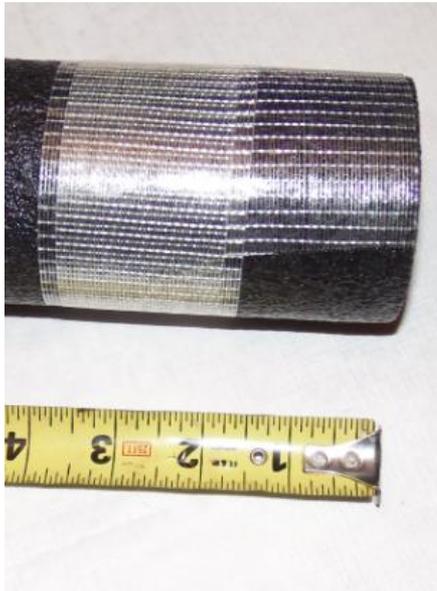
Spilt the foam on the seam, and then roll it. Tape the roll so it will not unwind with fiber tape.



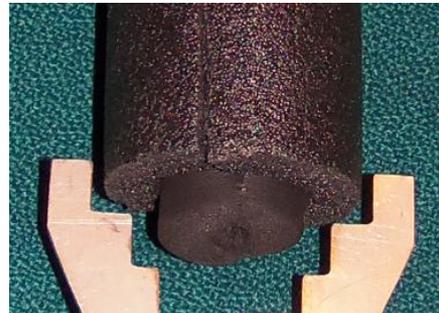
Once completely inserted, tape over the seam of the outer foam where it is gapping.

EKYC 2015 Sword Div. I-III

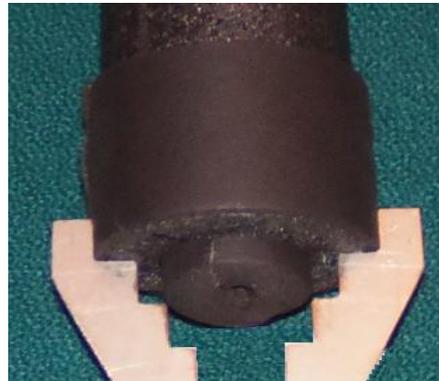
A few additional wraps of fiber tape, centered about 3" from the end, will help stiffen the tip for thrusting. Depending upon the foam characteristics, I may use 2 to 4 wraps.



The thrusting tip diameter shown is larger than the 2 ½" minimum.



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.

EKYC 2015 Sword Div. I-III



We'll 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 turning the core into the foam.

EKYC 2015 Sword Div. I-III

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 will not peel off the foam tape. Use fiber tape over any gap in the outer foam.



Apply the base layer of the 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.



EKYC 2015 Sword Div. I-III

Multiple layers will be added, overlapping slightly, until the foam is covered. Gather the extra length 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 it is a Youth Combat weapon. The blade edge tape ends a bit above the end of the foam near the hilt.

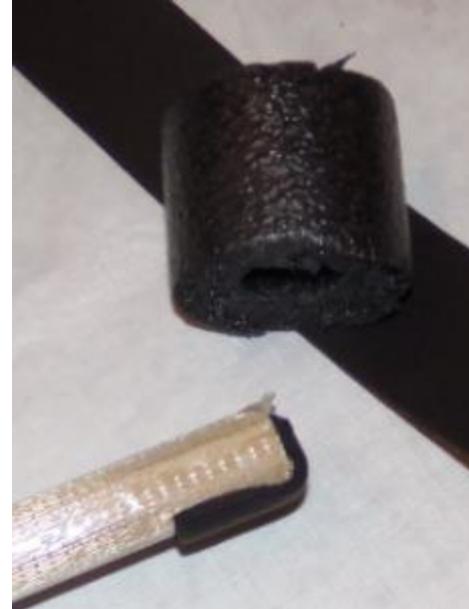


EKYC 2015 Sword Div. I-III

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.

EKYC 2015 Sword Div. I-III

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



The tape which gathered at either end of the hilt should be taped firmly to the core. I use grip tape for this, as well as covering the hilt area.



EKYC 2015 Sword Div. I-III

The finished hilt.



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

1/2/2015

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

