

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Revised 6/18/2013



East Kingdom
Barony of Bhakail
Youth Combat
Division 1-3

In this guide we will be making a basic PEX sword for use in SCA Youth Combat per East Kingdom standards. This method is useful in creating one and two handed swords with many options for variation and personalization.

By: Jaekel and Shamus
hstaphath@yahoo.com
(Rev June '13 Hroudland)

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3

Use the EKYC 2013 Interim Rules Basic Sword Construction for a build guide to rattan core weapons.



What you will need:

The materials are pictured above from left to right.

- * Nominal $\frac{3}{4}$ " or 1" PEX pipe, not *rolled* PEX. Use $\frac{3}{4}$ " for Div. 1. Div 2 and 3 may use $\frac{3}{4}$ " or 1". No smaller or larger sizes may be used.
- * $\frac{3}{4}$ " or 1" **CPVC** end caps (x 2). Note CPVC is beige, not white, and does not shatter. Rubber chair leg covers can also work.
- * Pipe foam
- * Strapping tape
- * Duct tape (two contrasting colors)
- * Hockey tape (optional)

Tools:

- * Scissors and/or knife
- * Something that will cut PEX pipe
- * Tape measure

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Cut, cap, and strap the PEX:

The first thing you need to do is find the proper length that the weapon should be and cut your PEX pipe to size accordingly.

PEX becomes impractical around 42” in length. It is whippy, which leads to control and calibration issues. We recommend you add no more than two (2) wraps of strapping tape around the length of the PEX to help with this. Keep weight limits in mind. Strap the caps in place as well.

Maximum weapon lengths:

60” finished length for Division 1

66” finished length for Division 2

72” finished length for Division 3, except spears which may be 90”

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Once you have estimated how long the finished sword will be, you will cut the PEX a bit shorter to allow for the caps and any thrusting tip & butt spike padding:

Single handed, with a thrusting tip but no butt spike, subtract 4 ¼”

Two handed, with a thrusting tip and a butt spike, subtract 5 ¼”

Note that previous generations of weapon construction called for a lateral layer of tape, as shown on the previous page, with a spiral layer on top of it, as shown above. PEX does not shatter with sharp edges in the way previous materials did, so strapping the length of the PEX, as well as the specific layering of strapping, is no longer required. Once again, taping the PEX core is optional except to attach the caps.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Pipe foam preparations:

We are now ready to add the first layer of pipe foam. Begin by marking where your handle area will be so you know where your “blade” will begin.

Have the youth fighter hold the strapped and capped PEX pipe with a gloved/gauntleted hand (that’s two gloved/gauntleted hands for a two handed weapon and, regardless, don’t forget to allow room at the bottom of the handle for a butt spike!) and mark about an inch above the top of the hand. Two handed swords may have no more than 18” of haft between the padding.

Now cut enough pipe foam to go from that mark to 2 1/2” beyond the end of the CPVC cap to allow for enough padding for a thrusting tip. The minimum padding that will pass inspection is 2” deep. Build it to 2 1/2” depth to offset any compression over time.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Foam Wrapping:

Depending on what type and size of pipe foam you get, the first piece of foam probably will not reach all the way around the PEX pipe. You will probably need to cut a small strip to fill this gap in as I have done above.

Use strategically placed duct tape to hold the foam together and in place. The foam should be on just tight enough so that it does not rotate around the pipe. Be careful not to overdo it with the duct tape by either using so much and/or by wrapping it so tightly that you negate the cushioning ability of the pipe foam.

This weapon has a butt spike. A weapon must be padded on the bottom at least 1" past the cap even if there is no butt spike to pass inspection. Build it to 1 ¼" depth to offset any compression over time.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Foam Wrapping (2nd Layer):

Enclose the “blade” and “butt spike” of the sword in a 2nd layer of pipe foam while again using strategically placed duct tape to hold the foam together and in place. The minimum diameter for a thrusting tip or butt spike is 2 1/2”. The foam is to be nominal 1/2” or more thick on the blade. While 1/2” foam from a plumbing store is usually within 1/64” and acceptable, a single layer of 3/8” foam is not.

Make sure to offset the seams of the pipe foam between the 2 layers! I have intentionally used slightly different colored pipe foam so that you can see what is meant by this in the above image.

Cut two 2 1/2” rolled bits of foam to fill in the centers of the thrusting tip and butt spike. To pass inspection this foam cannot have compressed to less than 2”.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Foam Wrapping (Completed):

With the thrusting tip and butt spike filled in with padding, the foam wrapping of your sword is now complete.

The pommel end must be covered, even if a butt spike is not used. The size of the butt spike padding will help keep a youth fighter's hands from slipping off of their weapon and is generally worth the effort. Also, the diameter for a pommel that is not a thrusting tip must be large enough that it will not enter a 2" diameter opening in a youth fighter's face protection.

For this particular sword, we are adding butt spike legal padding for safety purposes even though we will not be marking and using the butt spike to strike with.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Duck Taping:

It is now time to start covering everything with duct tape (or “duck” tape, if you want to be silly about it).

We are starting with the butt spike. Wrap over the ends of the foam with as few strips of duct tape as possible to securely connect the foam layers to the handle area of the PEX pipe as shown above.

Some duct tape is thicker than others. It is stiff in cold weather. It might also be stiff until broken in, so softening the thrusting tip prior to use is wise. Thicker tape tends to hold up better, as does the foam beneath it. Keep in mind the environments you will likely use the weapon in, and if in doubt use the thinner tape.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Finger Guide (Optional):

This step is completely optional, though certainly recommended for any sword that does not have a cross guard (and, even then, it certainly wouldn't hurt to have it).

What we are doing here is adding a thin strip of foam padding on the handle along what will be the front "edge line" of the sword. This allows the youth fighter to have better control of the weapon and easily keep track of where the edges of the blade are during the chaos of combat without having to look.

We do not recommend padding the entire haft or pommel area. It is much harder to gage the calibration of a delivered blow through a hand that is holding mostly foam padding. It is also harder to hold for small hands.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Hand guard (Optional):

This step is also completely optional and involves adding a thin strip of foam padding around the base of the blade to form a simple, though surprisingly effective, hand guard.

At this point in the construction process, we have decided our two handed sword will be a one-edged Saracen or Japanese style sword.

We are therefore adding two layers of thin foam stripping (one on top of the other) to create a slightly more pronounced hand guard as shown above.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Finger Guide and Hand guard (Optional - Complete):

Once you have either or both of the optional sword elements in place, use duct tape to secure them in position as shown above.

If you chose to do neither, you need to flip ahead one more page. :-)

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Duck Taping (Continued):

Apply the duct tape laterally (end to end) along the blade. Tape as needed to cover the piping foam as shown above.

Cover the foam completely. Fewer layers, especially on the thrusting tip, are better.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Thrusting Tip and Blade Edge Tape:

Use a contrasting color (examples in red and green are pictured) of roughly 1/2" duct tape to mark the blade edges as shown in the image above. Be very careful to make sure that the piping foam seams don't end up along where the "blade edges" will be since the seams will not hold up very well to punishment that will be directed at them.

Aside from the blade edges, the cross mark and 2 circles of tape you see in the image are required to denote this as a thrusting tip and as a youth combat weapon.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Butt Spike / Pommel Tape:

If you are using a legal butt spike, you must have it marked just like the thrusting tip (as pictured above on the sword with the cross guard on the right).

Otherwise, you can leave the padded “pommel” of the sword either the same color you used for the blade or have a bit of fun with it as we did (pictured above on the left).

Remember, you are only required to have two contrasting colors of duct tape for your sword. One color may be used for the blade edges and division markings. The second color for everything else.

How did Jaekel and Shamus make the cross guard for the sword with green tape? Look to the next page.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Making flexible cross guards:

Additional material and tools for this option:

- * Rubber hose (thick walled). A 12" piece made the larger one shown.
- * Drill with various bit sizes
- * A sharp knife or X-Acto knife

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Rubber Hose Preparation:

We created the diamond shape cut in the rubber hose (as you see above) by drilling a large hole through the middle followed by a smaller hole to each side of that one and another smaller hole to each side of those.

An X-Acto knife was then used to connect the holes and finish the elongated diamond shape. I found that a 2" long cut worked best for feeding the PEX pipe through.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Lashing:

Use strapping tape to lash the rubber hose to the pipe. Cap the ends of the rubber hose with it, or use duct tape.

Remember that for safety the ends of the cross guards should not fit into a 2" diameter opening, and that there must be more than 1" of padding past the end of the rubber hose to pass inspection.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Padding: 2 pictures worth 2 thousand words.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Taping:

Cover with “duck” tape.

Shamus has become attached to using the shiny silver tape for the blade so that is why the blade and butt spike of our sword is shiny silver while the cross guard and base of the butt spike are done in the standard grey. It is not necessary for them to be different colors.

For this great sword, Shamus requested a 3rd layer of foam on the butt spike to help balance it. Keep in mind that no weapon is to weigh more than 8 ounces per foot of length.

Creating Basic PEX Swords for SCA Youth Combat – Division 1-3



Handle Wrapping:

Finish the sword by wrapping the handle with either duct tape or hockey tape. The sword pictured above was finished using hockey tape.

For an extra sticky grip, you can also try using tennis racquet tape.

If you are creating a single handed weapon, place a lanyard on it. You may wish to tape the end of the lanyard on during this step.

Now that your weapon is ready, “LAY ON”!

By: Jaekel and Shamus
hstaphath@yahoo.com
(Rev June '13 Hroudland)

So what can be done differently?

Just to be clear, strapping tape will not required on the length of the core in the rules set for fall of 2013. It is a good choice for holding the end caps on. Using more than 2 layers of strapping tape is not very beneficial and should not be done. Weight can become a concern.

If you wish to use leather, or several layers of strapping tape, to cap the ends of the core, that can be made to work. But a sharp edge on the end cuts of the PEX could lead to premature failures. We have concern about the pipe “coring” the foam if tape or soft leather is used for capping the ends.

An alternative material for caps came from Kendric Cameron of the Mid-Realm “and fit perfectly on 3/4" ID (7/8" OD) PEX”:

<http://www.homedepot.com/p/Shepherd-7-8-in-White-Plastic-Leg-Tips-4-Pack-89108/100140214#.UbaVRvmG2So>

If the thrusting tip or butt spike seems to be just under 2 1/2” in diameter, consider wrapping it with Armacell foam insulation tape such as :

<http://www.homedepot.com/p/Armacell-2-in-x-30-ft-R-1-Foam-Insulation-Tape-TAP18230/100539553>

Society has accepted Siloflex as a core material with nominal 3/4” and 1” sizes. The East has been testing the 160 psi rated material, though Society did not advise on a specification. We expect that by fall of 2013 that the East will accept Siloflex as well.

Siloflex is susceptible to temperature changes and we believe PEX is more stable in this regard. Rattan seems unaffected by heat. For a short weapon this may not matter.

An advantage of siloflex is that the 1” size has a large circumference, and fits larger hands well.

PEX in 1” diameter pipe, or staves, is often found at Lowes, as are the CPVC caps for it. Home Depot and Lowes usually have 3/4” and the CPVC caps for it. Lowes is also a good place to source Siloflex. Do not try to use rolled PEX or Siloflex.

Thoughts on the various core materials, circumference from small to large:

Rattan, shaved or natural, as small as 3/4" nominal OD (outside diameter): Except for the smallest hands or cross-kingdom events, consider 3/4" PEX instead. This material is allowed for any legal length weapon except javelins. Total lengths that are smaller than 42" are best. It is not temperature sensitive like PEX and Siloflex.

PEX, 3/4" nominal usually is 7/8" OD: Division 1 may use this diameter. Permitted for other divisions, but usually it is too small for the hand before Division 3 is reached. This material is allowed for any legal length weapon. It is good for javelins. Total lengths that are smaller than 42" are best, though javelins require a minimum of 48".

Rattan, shaved or natural, 7/8" to 1" nominal OD: This material is allowed for any legal length weapon except javelins. It is the recommended cross-kingdom core (SCA wide acceptance) for any other weapon up to 66" total length.

Siloflex, 160psi, 3/4" nominal, is 1 1/16" OD: Consider 1" PEX instead. Division 1 may use this diameter. It is permitted for other divisions. This material is allowed for any legal length weapon. It is good for javelins. Total lengths that are smaller than 42" are best, though javelins require a minimum of 48".

PEX, 1" nominal is 1 1/8" OD: This material is allowed for any legal length weapon, except javelins, in Div 2 and 3. Total lengths that are smaller than 48" are best.

Rattan, shaved or natural, from 1" to a nominal maximum of 1 1/4" OD: Not permitted for javelins. It is the recommended cross-kingdom core (SCA wide acceptance) for any other weapon longer than 66" total length. It is allowed ONLY in Div. 3 for weapons longer than 66" total length.

Siloflex, 160PSI, 1" nominal, is 1 9/32" OD: Except for the largest hands, consider 1" PEX or 1" rattan instead. This material is allowed for any legal length weapon, except javelins, in Div 2 and 3. Total lengths that are smaller than 48" are best.

And golf tubes, any diameter though they tend to run big, are permitted (grandfathered) weapons but NOT recommended for new builds in Division 1. Up to 60" allowed. Not for Javelins.