

## Boffer Weapons Construction Materials & Techniques

### Why Knowing how to Make a Boffer Weapon Matters

It is important that every player who wields a weapon knows the basics of how to design and construct a foam boffer weapon. Even if you do not make your own weapons, you should know what is inside the foam weapon you hold, and whether the weapon satisfies all the PORTAL safety requirements.

### How to Make a Boffer Weapon

All boffer weapons must be constructed according to the weapon guidelines given below. The guiding principle of these guidelines are that all weapons shall be constructed in such a manner, and using such materials, that will result in a weapon that can be used without concern by a certified player following all the rules. Different types of weapons require different construction techniques and materials. The sections below will outline how to make various kinds of weapons found in our game. Please read this entire section before attempting to make a weapon. Read each step carefully and follow the directions given.

If you wish to deviate from what is written here, please ask before you build! Portal is very open to new techniques and materials, but anything outside the of what is written here must be approved.

### Construction Materials

You will need the following things to construct a boffer weapon. All these items may be found at a good hardware store. Foam pipe insulation is sometimes difficult to find. If you need help obtaining a supply, please ask! PORTAL may also have weapon construction materials available at Events for purchase.

- A length of  $\frac{1}{2}$ -inch PVC or  $\frac{3}{4}$ -inch CPVC pipe. Note that CPVC and PVC are not quite the same thing:  $\frac{3}{4}$ -inch CPVC has an *outside* diameter of  $\frac{3}{4}$  of an inch;  $\frac{3}{4}$ -inch PVC has an *inside* diameter of  $\frac{3}{4}$  of an inch. This would lead you to believe that CPVC fits smoothly inside PVC; sometimes it does, but not always.

- 5/8-inch thick foam pipe insulation, also called closed cell foam. 5/8-inch is the minimum thickness that may be used. Use the dark gray colored foam; never use the thinner 3/8-inch foam. You can use this foam for either 1/2 inch or 3/4 inch pipe. You may cut the foam's diameter down to fit the pipe snugly.
- Open-cell foam, the type of soft foam found in pillows and cushions. This can be purchased at craft and fabric stores.
- A roll of 2-inch duct tape.
- Strapping tape. A layer of this under your duct tape will strengthen your weapon and lengthen its life. Do not overdo it; a single layer of strapping tape is enough.
- A saw, hacksaw, or pipe cutter to cut the pipe. PVC and CPVC come in 10 foot lengths; the hardware store will usually be willing to cut the pipe for you, but you will probably still have to buy a full 10 foot length.
- A razor blade and/or sharp knife and scissors
- A ruler, a pencil and a marker.
- Sandpaper or a file to smooth any rough edges after cutting the pipe.

Additionally, these items can help customize a weapon, though they are not necessary for basic construction:

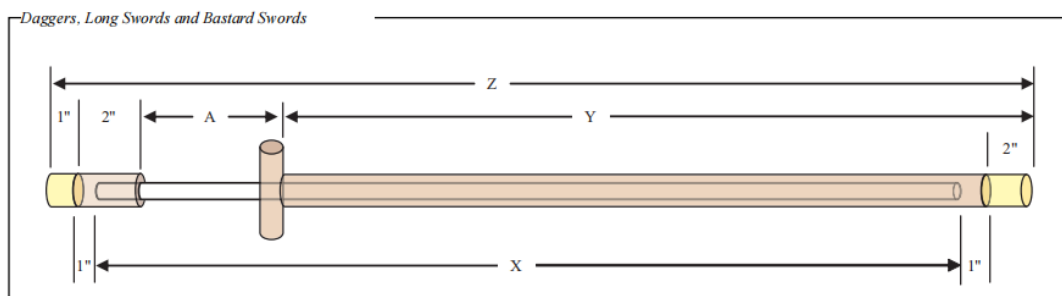
- Smaller-diameter PVC pipe or wooden dowel to reinforce the tubing of long weapons. At the hardware store, test whether the reinforcing dowel fits closely within the pipe you are using for the main body of your weapon.
- Colored cloth, duct, or electrical tape. Standard duct tape is usually gray or black, but you can use other colors of tape to "trim" your weapon. Note that completely white is used to indicate claws, White with a red stripe is used to indicate talons, and green tape indicates poison or venom blades.
- Indelible marking pen.
- Gems or other ornamentation.

The following list contains the only approved materials core that may be used in the construction of a boffer weapon:

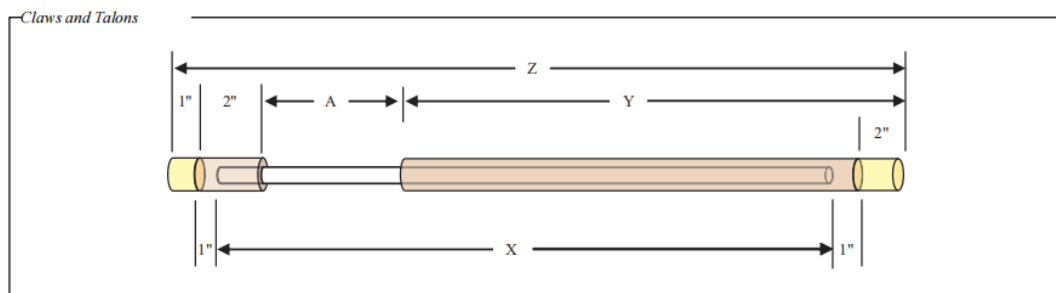
- 1/2-inch PVC or 1/2-inch and 3/4-inch CPVC for Claws and Daggers.
- 1/2-inch PVC or 3/4-inch CPVC for 1-Handed Edge, Blunt, or bastard weapons.
- 3/4-PVC for Polearms and Staves, or 1/2-inch PVC or 3/4-inch CPVC with a reinforcing wooden dowel for Polearms and Staves.
- Open cell foam.
- Closed cell pipe foam of at least 5/8-inch thickness but not more than 3/4-inch thickness.
- Stiff closed cell foam, or EVA foam, for cross guards or hand guards.
- Strapping tape, duct tape, gaffers tape, electrical tape (for decoration use only), silver tape, and Mylar tape (for decoration over duct tape, never on a striking surface).
- Gems, and other ornamentation of reasonable size on non-striking surfaces. No more than 6" up from the crossguard.

- Cloth on non-striking surfaces.
- Leather or sports grip for the handle.
- 14 gauge/0.064in./1.6277mm thinner wire for handle only.
- Laces, cording or piping for handle only.
- Wooden dowel for eliminating whip or as a counterweight in the handle. Wooden dowels cannot be longer than the handle when used as a counterweight, not counting the thrusting tip. Glue can be used to hold the dowel in place.
- Glues and adhesives.
- Paints or coloring that permanently adhere to the weapon and does not come off through normal use.
- Other materials maybe used upon approval by no less than 2 Arms Marshals.

## *Making Daggers, Long Swords and Bastard Swords*



## Claws and Talons



### Getting Started

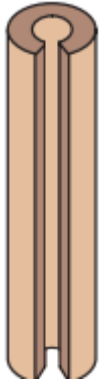
- The first step is to cut the pipe to the desired length and remove any burrs or chips from the ends of the pipe with a file or sandpaper. You want the ends to be slightly beveled to insure it does not cut through the foam. To determine what the length of the pipe is (X), you need to first determine the overall length of the weapon (Z). Then, using the formula below you can determine the pipe length: Pipe Length (X), inches =  $Z - 5$

- Next, tape the ends of the pipe over with two layers of duct tape, so the pipe will not cut into the foam and the foam cannot slip into the pipe.
- Next place a mark 1 inch from handle end and another mark at the length of your handle (A). If you plan on putting on a cross guard, you need to take that into account later.

### **Making a Cross Guard**

A cross guard can be made from the same 5/8-inch foam from which the blade is made or other foam material, but you cannot use pipe to make the cross guard: It is not necessary to have a cross guard and you do not put a cross guard on a claw.

- Cut a piece of foam to the desired length of the cross guard, eight inches will do. You can cut a wedge out of the foam to make it smaller.

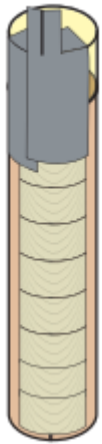


- Cut a hole in the center of the foam tube so that the pipe of the handle may be inserted through its center, forming a "T" with the blade. The hole should go through the seam so when you put the cross guard on, the seam points towards the handle. Be careful not to make the hole too big, or it will weaken the cross guard.
- Secure the cross guard in place with the bottom of the cross guard even with your second mark (A). Use a couple of strips of strapping tape connecting the cross guard to the handle. It is very important to secure the top and bottom of the cross guard well. This will ensure when you are done the foam does not move off the pipe.

### **Making the Blade**

- The pipe foam length is determined by taking the blade length (Y) and using the following formula:  
 Pipe Foam Length, inches =  $Y - 2$  Or, conversely, you can measure the pipe from the cross guard to the end of the pipe and add 1 inch. To be safe you can make the foam a

little longer and after taping down the blade, you can measure and trim the end, but it is very important to make sure there is 1 inch of foam hanging over the end of the pipe. Over time, the foam will move and if you make the foam come too close to the end of the pipe, it may poke through the end and will fail inspection.



- Next, test your foam on the pipe, if it is loose you will need to trim down the foam in the same way you did with the cross guard, cutting a wedge out at the seam. Either way, you must use strapping tape to secure the seam. This will insure your foam will not split, a very common reason for the weapon to fail. Put short, about 3 inch long strips over the seam. You want the fibers in the tape to be perpendicular to the seam.

### ***Daggers, Long Swords and Bastard Swords***

- Make sure you remembered to tape the ends of the pipe with duct tape. Then, slide the foam down the pipe to either the cross guard or the mark you made for the end of the handle/beginning of the blade. Make sure the foam extends 1 inch beyond the end of the pipe. Make sure the seam is not on the striking surface of the weapon, this is not possible to ensure with claws or swords without cross guards, but if you have a cross guard place the seam so it is on the top not the sides of the blade. This will make the weapon last longer.
- Next, using strapping tape, secure the blade to the cross guard or to the pipe. One or two layers should be good enough, but make sure all areas of the foam are secured.
- Use some scrap closed cell pipe foam to fill in the end of the blade. You want to stuff it pretty good. There will be a lot of stress here and foam will wear out, so do not be afraid to stuff it tight. However do not stuff it so full

that the foam bulges out of the top; a small bump is fine. Then cover the top with some strapping tape or duct tape, two pieces over the hole should do.

- Now you need to cut out the thrusting tip using the open cell foam. Trace the top of the blade onto the foam. Cut the foam out a little larger than your circle. Then trim it round, it does not have to be perfect, but close. The end result should be a 2 inch long cylinder just a little bigger than the pipe foam.
- Next, secure the tip to the pipe foam using duct tape. You need to slightly compress the foam to make it round, and you want to make sure you overlap the duct tape. If you cut your duct tape in 5 inch strips and over hang the top by about 1 inch you should get good coverage. Make two cuts into the duct tape that hang over the thrusting tip and fold down the flaps onto the thrusting tip. When you are done, the entire tip should be covered with duct tape.
- Next, you need to cover your weapon with duct tape. You need to plan this part out. You want to make sure you do not put too many layers of tape or your weapon will be heavy. Duct tape the cross guard first, then the blade. To make the weapon look nicer, put your duct tape on the sides of the blade first, then the top and bottom.

## **The Handle and the Pommel**

To create a safe pommel (butt end) for your weapon:

- Cut at least a 2-inch length of 5/8-inch foam, but no longer than 3-inches. This will be your pommel.
- Trim the foam if you need to. Either way, use strapping tape to close the seam. Make sure you tape the end of the pipe with tape. Slide the pipe foam over the end of the pipe, tape it down with strapping tape and stuff the end with scrap foam, ultimately covering the end with strapping tape or duct tape as you did with making the blade.
- Next, make a thrusting tip for your pommel just like you did for the blade, except this time it needs only be a 1 inch long cylinder.
- Tape the thrusting tip just like you did with the other end, but this time, make sure you over lap both the open cell foam tip and the pipe to help secure the pommel to the pipe.
- Then cover the tape with whatever color you wish. You will have at this point two layers of tape over the end. This is okay and will strengthen your pommel.

## **The finishing touches...**

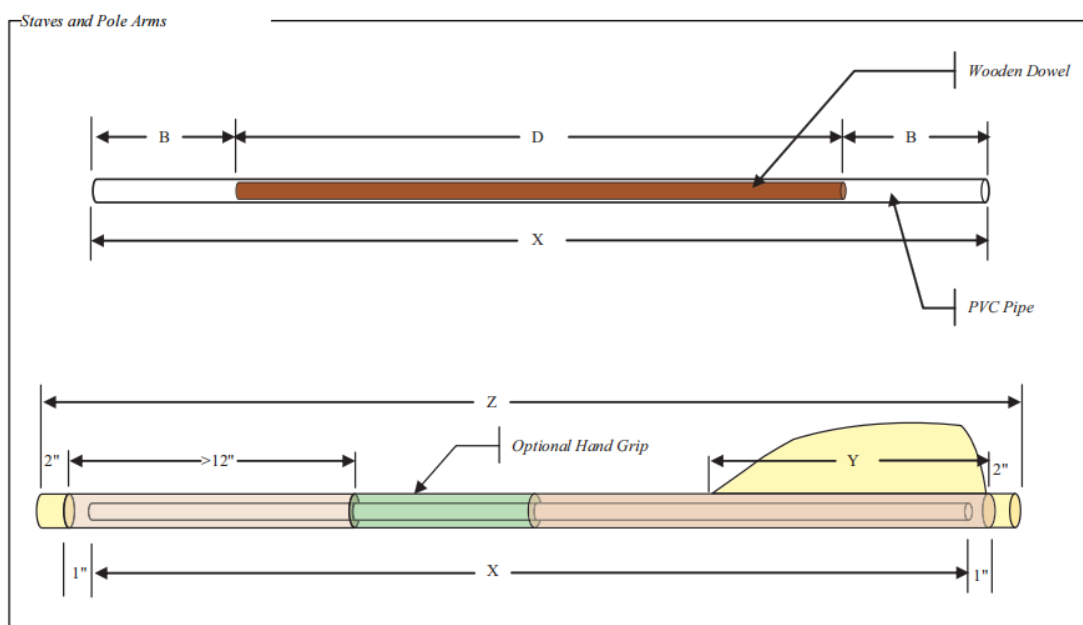
- Poke several holes in the thrusting tip on both ends with a pin or needle so the foam compresses easily. The tip should compress to about 1/3rd its original height and spring back quickly.
- The handle needs to be finished. You should grasp your weapon and test the size. You do not want your finger tips to touch the palm of your hand. You can use duct tape to fatten up the handle or placing closed cell foam on the

handle also works. You can finish off with duct tape, but cloth lace wrapping, gaffer tape, or hockey stick tape works well to keep the weapon's handle from being slippery.

- Lastly, add any decorations you wish to put on the weapon to finish it off. If you are going to use plastic gems, paint, cloth, or any other material, make sure you do not harden the striking surfaces or put any hard bits on any area that you might hit someone with normally. You cannot put sharp or protruding objects on your weapon.
- It is a good idea to write your name in indelible marker somewhere on your weapon. This is not required, but if the weapon card is lost and your name is on it, it can still be returned to you.

Your weapon is now (hopefully) ready for presentation to the Arms Marshal. Do not be surprised if your first weapon does not pass inspection; it takes practice to learn how to make a safe weapon.

## Making Staves and Pole Arms



The basic construction techniques for making these weapons are the same as making claws, daggers and swords. You need to cut the pipe using the same formula, use a file to bevel the ends, cover them with duct tape.

There are a few new things to consider when making these larger weapons. First, weapons over 50 inches tend to get whippy and whippy weapons will not pass weapons check, therefore only  $\frac{3}{4}$ -inch PVC or  $\frac{1}{2}$ -inch PVC or  $\frac{3}{4}$ -inch CPVC with a dowel can be used in their construction. Also, you need to decide how you will use your polearm. If you want to strike with the butt end, and

you want to make a handle – an area of the weapon that does not have foam on it – you need to make sure the butt end is covered with enough foam. Also, both ends of the weapon need to have a 2-inch thrusting tip.

The biggest care you need to take with these weapons is the dowel. Depending on the length you will most likely need a wooden dowel. You should purchase the dowel to fit snugly into the pipe. You may need to shave the dowel down in order for it to fit correctly. Also, you need to put the dowel in the middle of the weapon. Following are the rules for making pole arms and staves.

### **Getting started**

- Measure out how long you want your weapon to be (Z). Then cut the PVC pipe to this length (X), sanding or filing down the ends to a slight bevel. The length of the PVC pipe is given by this formula: Pipe Length (X), inches = Z – 6
- Next you need to cut your dowel to length. The length of the dowel (D) is given by this formula:  
Dowel Length (D), inches =  $X \div 2$
- Now you must insert the dowel, shaving it down slightly to fit. You should be able to slide the dowel in with out forcing or hammering it in. You need to center the dowel in the pipe. To determine how far the dowel should be from an end (B), you can use this formula: Length from End (B), inches =  $(X - D) \div 2$   
After you insert the dowel you should double check both ends to make sure it is centered.
- Now you need to secure the dowel in place by using a finishing nail about 1-inch long. Hammer the nail in about 3-inches from the end of the dowel, leaving a little sticking out both ends. Next cut both ends of the nail flush with the PVC pipe. Take your file and smooth out the nail so you cannot feel it when you run your finger over it. Lastly, take a piece of duct tape and wrap it once or twice over the area.
- Now you need to secure the other end. Rotate your pipe 90 degrees along the long axis and repeat the step above with another nail. You should double check your work and make sure the dowel is centered.
- Using duct tape, cover both ends of the pipe with two small pieces of tape.

### **Adding the Pipe Foam**

- If you do not plan on having a handle for your weapon, simply take two pieces of pipe foam and put it over your weapon, leaving 1-inch of foam at both ends hanging over the pipe. You should put one piece on first, tape it down with several pieces of strapping tape then add the second piece of foam taping it to the first with several pieces of strapping tape.



- If you plan on having a handle on your weapon, you need to cut two pieces of pipe foam. Figure out how large a handle you want and where you want it. Then make sure there is 12-inches of pipe foam from the end of your handle to the butt end of the weapon. These 12-inches do not include the extra 2-inches of open cell foam for the thrusting tip. You can make a pole arm with only 4 inches of foam at the end – the same way you would make a sword – but then you may NEVER use that end to attack someone.
- Now you should finish the ends of the weapon by filling the ends with pipe foam scraps, covering the end with duct tape, and making two 2 inch thrusting tips out of open cell foam just like you would with a sword. Tape the tips down with duct tape, just like with a sword.
- You should have something that looks like a staff, and in fact if you are making a staff, you can skip ahead to Finishing Up below.

### **Making the Business End**

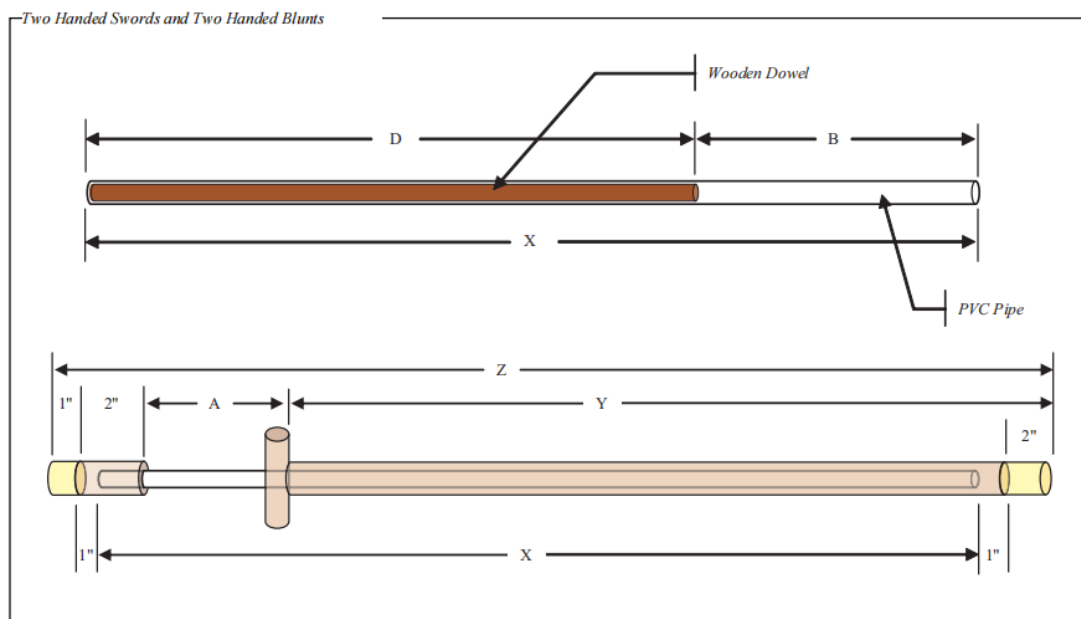
- The bladed end of the pole arm is made out of open cell foam. You should trace out the pattern for the head of your weapon. Since the weapon is already padded, there is one rule as to how much extra padding you need. The length of the bladed end (Y) is fixed and must be followed. When cutting out the foam, it may help you to use an electric knife which cuts the foam very easily.
- After shaping the bladed end, attach it to the weapon with strapping tape, which tends to be stickier than duct tape. Also using some glue to secure the blade to the pipe foam is okay, just make sure not use a glue that will melt or dissolve either types of foam. Many super glues and hot glues will do this.
- Next, take duct tape and completely cover the open cell foam blade, overlapping the pipe foam to make sure the blade is secure.

### **Finishing Up**

- Cover the weapon from top to bottom in duct tape, much in the same way as the sword instructions above. Be sure to overlap the tape and cover all surfaces with the duct tape.
- Poke several holes in the thrusting tip on both ends with a pin or needle so the foam compresses easily. The tip should compress to about 1/3rd its original height and spring back quickly. Also, poke several holes in the blade if you have one.
- If there is a handle it needs to be finished. You should grasp your weapon and test the size. You do not want your finger tips to touch the palm of your hand. You can use duct tape to fatten up the handle or by placing closed cell foam on the handle also works. You can finish off with duct tape, but cloth or lace wrapping, gaffer tape, or hockey stick tape works well to keep the weapon's handle from being slippery.

- Lastly, add any decorations you wish to put on the weapon to finish it off. If you are going to use plastic gems, paint, cloth, or any other material make sure you do not harden the striking surfaces or put any hard bits on any area that you might hit someone with normally. You cannot put sharp or protruding objects on your weapon.
- It is a good idea to write your name in indelible marker somewhere on your weapon. This is not required, but if the weapon card is lost and your name is on it, it can still be returned to you.

## *Making Two Handed Swords and Blunts*



By now you have been exposed to many different construction techniques. Two handed swords and two handed blunts incorporate the methods used to make swords and pole arms. The instructions for these weapons are listed only in an outline, for more detail look to the instructions for making swords and pole arms.

- Start with the pipe, cut it to length, bevel file the ends, and tape them up.
- If you are using pipe that requires a dowel you can use the formula below to determine the length:

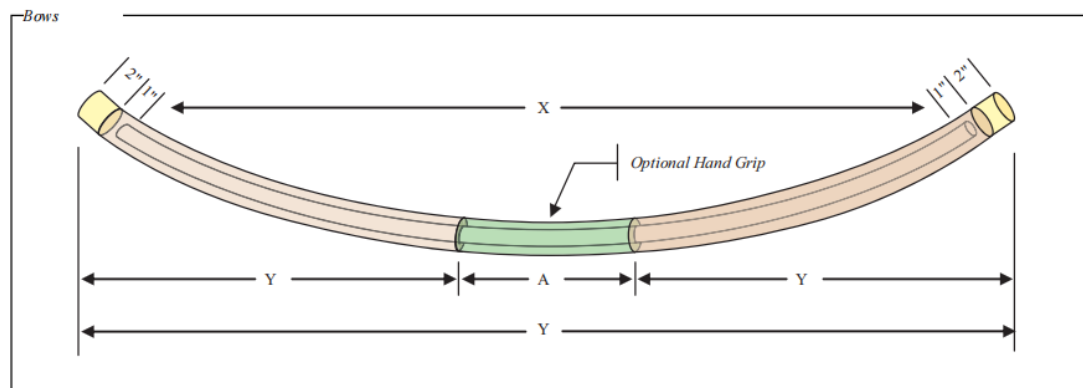
Dowel Length (D), inches =  $X \div 3$

Use the same procedure with the finishing nails, rotating the pipe 90 degrees. The end of the dowel should line up with the end of the pipe.

- Mark out the handle.
- Make the cross guard, if you wish one, and attach it to the pipe.

- Cut the pipe foam, use strapping tape to close up the seam and slide it onto the pipe, taping the foam to the cross guard or pipe.
- Fill in the tip, tape it over, and attach a 2 inch thrusting tip.
- Make the butt end, use strapping tape to secure it closed and to the pipe, fill the butt end, attach the 1 inch thrusting tip.
- If you are making a blunt weapon, cut the open cell foam out, shape it and attach it to the pipe foam.
- Cover the weapon with tape.

## Making Bows



The most difficult part of making a bow is bending the PVC pipe. PVC has a low melting temperature and can be softened with only a hair dryer. **WARNING!!** Please wear a chemical respirator and other appropriate protective gear and equipment when heat bending PVC. Do not heat PVC with fire! It is combustible and you are liable to set it on fire when using an open flame. Care should also be taken to heat and cool the PVC as few times as possible. PVC tends to get more brittle when heating.

- Start with the pipe, cut it to length and bevel file the ends. Do not tape the ends at this point.
- Next prepare a flat hard surface with markings for the general shape you want the bow to have.
- Heat the PVC until it just starts to deform. Place it on the floor and gently bend the PVC into the desired shape.
- Take care not to flatten any point of the PVC.
- Let the PVC cool completely before moving onto the next step.
- From here the construction is similar to other weapons. Some things to note:
- The max length listed on page 248 is equal to Y in the diagram above and is measured from tip to tip, not over the length of the PVC pipe. You need to take this into account when cutting the PVC pipe before you bend it.

- When measuring the length of the pipe foam, make sure you measure on the outside of the pipe and add some more. How much more depends on the length of pipe. When you put the pipe foam on the pipe it will be shorter than you expect.

To make the string of the bow, use a length of elastic. Attach both ends to the ends of the bow to the pipe foam with duct tape. Do not stretch the elastic, it should have most of its stretchiness left to allow for expansion in combat.

## **How Not to Make a Weapon**

The following may not be used under any circumstances in weapon construction.

- Steel, aluminum, copper or any other metal. Metal has little or no ability to absorb shock or to flex. If you accidentally hit someone on the head or another vulnerable part of the body, serious injury could occur. Do not use a metal core inside the PVC pipe; if the weapon breaks during combat, you will have a sharp splinter of metal sticking through the foam.
- Foil, metal, or stiff plastic tapes. These can cause serious cuts.
- Other plastics or fiberglass. These materials will chip and splinter when subjected to the repeated stress of combat and can lead to injury. Wooden dowels can only be used to reinforce weapons.

PORTAL is serious about these rules. Any attempt to conceal these materials in the construction of a weapon will be found and disciplinary action will be taken. Violate these rules, and someone will get hurt.

These basic precepts are the most important ones in LAIRE weapon construction:

- No hard ends or edges may protrude from the weapon.
- All surfaces that could come in contact with another player must be padded.
- No illegal materials will be tolerated in overall weapon construction.
- No sharp foam points, with or without duct tape over them, are allowed.
- No lanyards are allowed. You cannot attach your weapon to your person by any means out-of-game ever.

## **Notes on Weapon Construction**

Bring extra construction materials to each event. If your weapon fails inspection for any reason, it may be possible to make repairs at the event.

## **PVC and Pipe Insulation**

We have found that though it is slightly harder to slide foam over PVC than CPVC, PVC is a thicker and stiffer pipe to work with. Be sure to check the

exterior diameter of your tubing with the interior diameter of the insulating foam you buy. Foam is sold to fit different sizes of pipe, and nothing is more frustrating than getting home only to discover your foam is too large to fit snugly, or too small to fit over the pipe at all.

### **The Tips of Weapons**

Thrusting tips should be no less than 1-inch high (compacted) and no more than 2-1/2-inches high. Tips that are too large are easily broken or torn, and excessively compacted ones are too hard for safe play. Try not to lean on your weapon when it is point down, as this degrades and compacts the tip. Keep an eye on the striking surfaces of your weapon, as foam will decay and break down over time. When it starts to feel too soft or you can easily feel pipe, it is time to rebuild your weapon.

### **Long Weapons**

Weapons over 3-feet long should be constructed of 3/4 inch CPVC tubing, or 1/2 inch or larger PVC tubing, and possibly with reinforcement pipe as well. If a weapon is too "whippy" or flexible, it will not be approved. Pole arms must be padded at least 15 inches below the bottom of the striking surface, or padded over their entire length if you are going to strike with the butt end of the weapon. Javelins and thrown weapons, such as throwing daggers, must be constructed entirely of foam. They may not contain any PVC. Spears are not throwing weapons in this game. Wooden dowels can be used to stiffen long weapons, but only when encased in PVC or CPVC tubing. This is an advanced weapon construction technique, and you should check with an Arms Marshal before you attempt it. A general guideline is that the dowel should fit snugly into the tube it reinforces, or be taped along its length to make sure it does not rattle.

### **Special Weapons**

No weapon may be used that can trap or hook a player's weapon or body. "Trapping" does not include pinning a weapon with another weapon while outdoors. No weapon can have sections connected by rope, chain, or cord (nunchucks, flails, whips, etc.). A weapon *cannot* be attached to your wrist by a lanyard. This is to prevent entanglements and possible injury. Weapons entirely covered with white duct tape are assumed to be the "claws" of a monster in-game. Under no circumstances may player characters wield a claw without the appropriate skill or express permission of a Plot Marshal.

If you are planning to make an unusual weapon, it is a good idea to make a sketch and show it to an Arms Marshal before you begin construction.

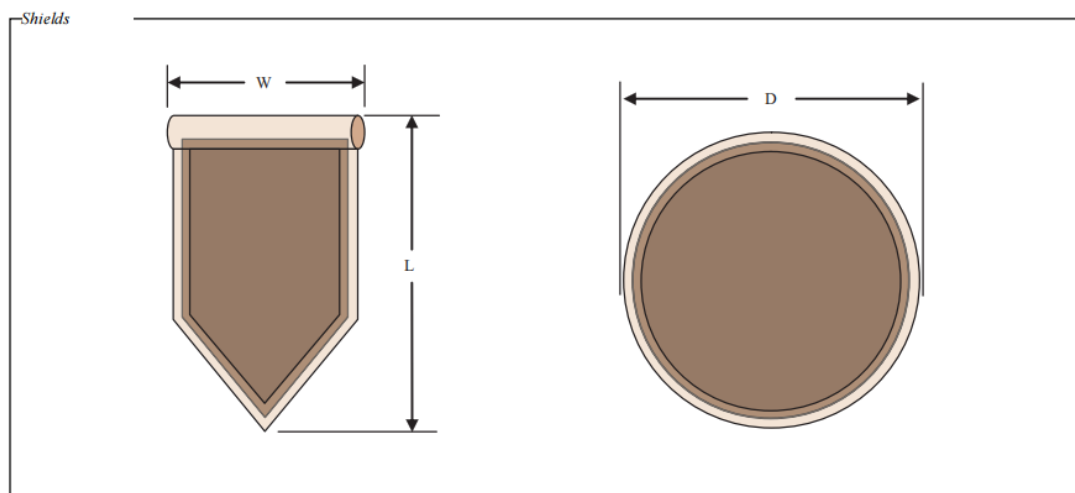
## Weapon Care

When storing your weapon, you should lay the weapon down flat. This will greatly extend the life of your weapon.

Weather can greatly shorten the life of a weapon. If your weapon gets wet, be sure to allow the weapon to dry out fully. The tape used in constructing your weapon may peel off when wet. The open cell foam used on the tips will retain water and rot or grow moldy if not dried out. The closed cell pipe foam will also break down if left wet

for long periods of time. During cold Events, the closed cell foam and tape tends to get harder, be careful of your swings during these Events. Tapes used in construction of a weapon may become brittle or the glue can lose its adhesiveness in cold weather. Do not store your weapon in the cold for long periods of time. Also, during snowy Events, take care to not leave your weapon in the snow for a long time. Heat, hot weather and high humidity can be particularly devastating to the materials used to construct your weapon. Do not leave your weapon in a car or near a heater. The glues will dry out, the foam will melt, and the tape will crack and peel.

## Making a Shield



Shields can be made of either wood, plastic or cardboard. Plywood with a 1/4-inch thickness works well, too much thicker and the shield gets too heavy and becomes uncomfortable, but is not illegal. You can go up to 3/8-inch or 1/2-inch thick shield. Particleboard or plastic board, which is a wood and plastic composite material, is also acceptable. Hard woods such as oak or pine tend to be too heavy for their thickness and should be avoided. Plastic snow boards cut down to size or other pre-fabricated plastics are also acceptable. Several layers of a corrugated cardboard called tri-board works very well and is light.

Use a strong glue such as Gorilla Glue or Elmer's Wood Glue to hold the layers together.

Round shields are the easiest to size, but difficult to cut perfectly round. To determine the correct size use the formula below:

Shield Diameter (D), inches =  $2 \times \sqrt{\text{Area} \div \pi}$ .

For square shields (not depicted in the diagram above) the following equation is easily used to determine the width based on the area and max length:

Shield Width (W), inches =  $A \div L$ .

### **Putting on the Handles**

The next step is to add the handle and forearm strap. You can use any material you wish to do this, even an actual handle from the hardware store (most of these are uncomfortable and not recommended). Leather or canvas straps work well also. You can bolt the handles to the shield, but make sure you put the head of the bolt or screw on the outside the shield. Tape up the end of the bolt or

use an acorn nut to cover the exposed bolt. If you are using leather or canvas to make your straps, you can cut slits in the shield and loop the straps through the shield and sew the loop closed.

Where exactly you place the handle and forearm strap is up to you, what ever feels comfortable for you to hold. There is no rule for this.

### **Putting the Foam on the Edges**

After you have the shield cut out, you should tape the edges of the shield to make sure it will not cut through the foam. Cut the corners off the shield first and add extra tape to pad the corners well. If you are using wood and plan on painting your shield, you should do it now. Duct tape will stick to paint better than wood. Next, use duct tape to tape down the closed cell pipe foam to the shield. You could use a strong glue like Gorilla glue to tack down the foam if you wish; this will help to make the shield last longer. You should still tape down the foam with duct tape.

If you are not painting your shield or if you are using cardboard, you will need to tape the surface of your shield. When using cardboard, be careful to overlap the duct tape well, this will prevent water from getting your shield wet.

### **Finishing Touches**

You can put extra foam bits on your shield to give it more flair. You should use open cell foam for this. Remember safety when you do this. Pointy foam shapes are disallowed, even in the construction of a shield. Make sure you do not have anything sticking out from the shield, such as spikes of any kind. You cannot bash with a shield and having pointed things protruding from your shield is a safety hazard.