

# Armor Making for the Fiberglass Phobic

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## Introduction

The quest to find a fiberglass-free means of creating armor was begun by me after my initial fiberglass-based attempts to create an armored breastplate for a video game character resulted in my creating a shapeless, shell-like mass which *sort of* looked like armor if you squinted at it and used your imagination, and which would have fit me perfectly, had I been willing to have several of my ribs removed before attempting to wear it. It also resulted in heavy lung and finger damage (and my almost winning a [Darwin award](#)), thanks to my innate inability to use proper protection whilst working around mind-bendingly dangerous, flesh-hostile chemicals.

I figured out pretty quickly that if a doofus like me wanted to make costume armor, I'd have to find another way, and one which involved no risk or danger to my person whatsoever. I researched into various methods and materials and soon hit upon the idea of using thick ABS plastic. The problem with *thick* ABS plastic though, is that in order to shape it, you have to melt it in your oven. (Thereupon we run into the problem of toxic fumes --and that whole risk and danger thing.) Besides, if you're not careful in handling ABS plastic when it's warm, it can wind up looking like something a blind five-year-old put together while wearing boxing gloves.

Then I hit upon another idea. Craft foam. The kind you can buy in fun, festive, multi-colored sheet form at craft and fabric stores everywhere. It can be cut into virtually any shape, has the right combination of stiffness and flexibility, and takes glue well. The problem with craft foam, however, is that it's porous and prone to being stained. And paint will not stick to it very well (unless you cover it with a sealant.) [It is possible to make decent-looking armor this way](#), however, I wanted a method that was a little more durable and took a little less time. One day, while I was at (what was then) my job, I saw someone throwing away sheets of a thin, acrylic substance (which I later learned was *thin* ABS plastic,) which the company had been using it to make templates for carving patterns into granite slabs. I took some home, cut it into a shape, and hot-glued it over a piece of craft foam. It created a piece that was durable, had a smooth finish and took enamel paint very well. *Voila*. A new method of making costume armor was born.

## Guide to Materials

Most armor you'll make will require the following supplies:

### Craft Foam



(Aka "Foamies") This stuff can be found at most craft and fabric stores and comes in various thicknesses and sizes. (Most common thicknesses are 2mm, 3mm, and 6mm and most common sizes are 8-1/2" x 11" and 11" x 17".) [JoAnn's](#) has the most variety of sizes, as of this date (but for some reason the thickest foam ONLY comes in 8-1/2" x 11" sheets so if you want to make something BIG -like a breastplate-, you're going to have to hotglue several sheets together edge to edge to make a sheet large enough to place your pattern on.)

One alternative to buying craft foam from craft stores is to buy an industrial-grade version of it directly from an online supplier, like [McMaster-Carr.com](#). (Do a search for EVA foam on their website.) This gives you the advantage of buying it in larger sheets and at greater thicknesses.

Once you have the craft foam in your hands, you must then face the problem of what size and thickness of foam to use for your particular project. As a general rule of thumb, anything *structural* (that is, anything that will have other pieces of armor or raised decorations glued, strapped, or otherwise attached to it--like breastplates or bracers) should be made using 6mm (1/4") thick foam. Anything that's really small or that has movable or overlapping plates should be made out of 3mm (1/8") thick foam.

### Rigid Insulation Foam



This is a type of foam which is commonly used in the making of prop swords, weapons, etc. You can find it selling in most major hardware stores, and it comes in large, flat (often pink) sheets. In appearance and texture, it resembles a thick styrofoam. If you are going to make an oversized sword with this material, it's usually a good idea to use a slab that's at least 1" thick. It's also a good idea to seal the surface of the foam somehow, either by coating it with bondo or fiberglass, or by gluing large sheets of thin styrene (ABS plastic) over it. [Here is a good off-site tutorial which demonstrates how this material can be used to create a large, oversized weapon.](#)

## Polystyrene Sheeting



This will be, by far, the hardest item to locate. **This is what it looks like:** a thin sheet of translucent or white plastic, having a smooth surface, flexible enough to be bent, and thin enough to be cut with a scissors. It's most often sold in small, office-paper sized sheets, but it can sometimes be bought in large rolls. I buy mine directly from the granite company where I used to work (and where I have to show up in person and buy it directly. They, in turn, buy it from *T O Plastics Inc, Clearwater, MN 320-558-2407.* ) You can try searching for a commercial plastic retailer in your area. (Check the yellow pages under Plastics).

There are [online sources where the plastic can be found](#), and [plastic suppliers who might have it in stock](#). Hobby/Model shops such as [fantasyworldhobbies.com](http://fantasyworldhobbies.com), and <http://www.evergreenscalemodels.com/> are also good places to look. You can also try searching the [Thomas Register Online Database](#) for a company that sells this kind of sheeting. (Thanks to *Rydain* for this tip.) If all else fails, you could try searching [Ebay.com](http://Ebay.com) for the stuff. [A search under "styrene" should yield good results](#). I've noticed a few sellers selling larger sized sheets for use in vacuum-forming. The official name for this sheeting is *polystyrene* and it's actually the exact same thing as ABS plastic-- although the kind I use for my armor method comes in thin, translucent sheets, about the thickness of a sheet of tagboard **(.030 - .040 inches )**

Let me repeat that. The thickness of the plastic you buy should be **.030 - .040 inches**. --It's not the thick variety usually associated with the making of plastic armor (which usually has to be heated in an oven to get it to bend.)

Cost of the plastic I buy runs me about 8 dollars per 40" x 84" sheet (although I do get it at a discount. It will probably cost you a little to a lot more, especially if you factor in the cost of shipping.)

**THIS IS ALL I HAVE TO SAY ABOUT STYRENE, IT'S APPEARANCE AND THICKNESS, AND WHO MIGHT SELL IT. BELOW IS A LIST OF PLASTIC RETAILERS WHICH PEOPLE HAVE SENT IN TO ME:**

Alert reader **Alicia P.** sent me a link to a place where styrene blanks can be purchased online:

<http://www.modpodge.net/productSearchResults.asp?cat2ID=5&cat3ID=159>

Canadian Cosplayers - alert reader, **Aaron**, sent me a link to a place where they sell 4'x8' sheets of .030 polystyrene for about \$20.00 CDN each. (Located about 50 minutes out of Toronto in Hamilton.)

<http://www.paplastics.com/>

Yet another alert reader, **Junta**, sent me some links to plastic suppliers in the UK:

[Modeller's Mate](#)

[J. Perkins Distribution](#) (Plastic only sold in A4 sized sheets)

[Eagle Plastics](#)

Tony of the [Replica Prop Board](#) posted this link:

[Bay Plastics](#)

**Thanks to everyone who sent me links. If anyone else out there knows of a good place where this type of plastic can be purchased in person or online, please e-mail me and I'll post the information on this website.**

*One more note:* the plastic I buy is translucent. The kind you buy may not be, but that shouldn't affect it's properties (although it might affect the way you use it. I'll go into more detail about this later.)

*Note:* An alternative to using plastic, is to coat the surface of the foam with a sealer of some sort. (The craft foam tutorial I mentioned earlier suggested tacky glue for this purpose.) A reader named *Drenn* tells me that *Zinsser Bulls Eye 1-2-3* is also a good sealant to use. There are also resin coatings and foam fillers that can be used as well, but I usually find it's simply easier to glue plastic over the foam, rather than try and seal it, unless the foam is bent or positioned in such a way that I can't fit the plastic over it.

### Glue Gun and Glue Sticks



A decent glue gun should run you about 20 bucks and you can find them for sale at most fabric and crafts stores. A glue gun is used for melting sticks of thermal adhesive (what will heretofore be referred to as *hotglue*) and applying them to...whatever it is you want to apply them to. What's nice about hotglue is that it's good at bonding the craft foam and plastic together and is good for filling in cracks and spaces. (It can even be used as a molding compound. Just impress a shape into modelling clay, pull it out, squirt hotglue into the shape it leaves and then tear away the clay once the glue cools and sets. I once made a whole set of Sesshoumaru armor horns that way.)

The best brand of hotglue to use is the all-purpose kind they sell at **Michaels craft stores**. (I've used other glue brands only to find they don't bond as well.)

### **GEM-TAC Adhesive**



This stuff can be found at Hancock's Fabrics and Michael's Crafts (and at many other stores, I'm sure,) and I find it's useful for applying raised designs to my armor. Unlike Tacky Glue, this stuff gels quickly, sticks to styrene really well, and is waterproof. (It takes about a day to dry and a few days to fully cure.)

This is what I've been able to do with it so far... (Click to enlarge the picture.)



It ain't cheap (It costs around 6 bucks a bottle,) but for what it can do, I'd say it's well worth it.

### **Other Materials You Need**

**Scissors**-- I recommend a nice heavy, high-precision scissors--something that will clip through soft plastic and leave nice, sharp edges on your craft foam. Cheapie, orange-handled scissors (like the kind you find at Wal-Mart) probably won't cut it. (No pun intended)

**Craft (X-Acto) Knife**-- For precision carving. Try to buy one with as heavy a blade as possible--you don't want it snapping off in the plastic in mid-cut and the blade flying up and hitting you in the eye or some other equally useful and sensitive body part. Box cutters (the kind with disposable blades) are also a good choice.

**Needle and Thread.** - Make sure they're heavy, but not TOO heavy. (You'll have a tough time pulling a needle through plastic if it's the size of a cable. On the other hand, you don't want your needle to break on you.) You can expect to have your needles *bend* on you from time to time though, so you'd best keep a steady supply of them on hand.

**Craft Pliers** - The needlenose variety. Useful for grasping onto needles and pulling them through layers of foam and plastic.

**Paint** - I'll elaborate more on this in the [How to Paint Your Armor](#) Section later.

**Buttons, jewel settings, rhinestones, studs, etc...** - for decorating your armor. Plastic pearl buttons make excellent rivets and will take paint well. You can buy decorative (and cheap) plastic buttons, gemstones, and jewel settings at Michael's and other craft stores.

**Plastic Christmas Ornaments** - They can be cut in half with tinsnips or a heavy scissors, and their highly reflective surfaces make excellent gemstones. (If you've ever cosplayed a CLAMP character, you know that some anime character costumes have HUGE jewels in them. These work great for those.)

**PVC Pipe** - Useful in making handles for staffs and swords. What it is is a hollow plastic tubing which can be sawn off to any length. (Ask the folks at the hardware store to cut it for you, if you don't feel like cutting it yourself.)

**Silver Vinyl** - A [certain costumer in Japan](#) has a method for making armor which involves heat-shaping craft foam, then covering it with silver/colored vinyl. (It's too bad his site is in Japanese, so his methods can only be inferred from his pictures.) Here's [a website which does offer an English translation of this method](#), if you're interested...

**Tagboard and Newspaper** - These items will come in handy when it comes to making your armor patterns. Tagboard will behave a lot like your plastic sheeting, so it's the best choice to use for patternmaking.

## Making Your Pattern

Pattern-making is a skill which requires practice. Lots of it. If you have experience tailoring or have sewn clothing from paper patterns, you'll probably have an easier time trying to figure out how to draft patterns for armor. (Just think of it as really stiff clothing.) If you haven't done anything like it before, well... then you're in for an interesting time. There are [many websites which can teach you the basics of sewing and/or creating patterns](#). You could also check out the websites of professional armorers or [The Armour Archive](#) and see if they offer any tips for fitting and creating armor.

One of the best places to look for sewing tutorials and advice about patternmaking are [the forums at Cosplay.com](#). Do a thread search for the character outfit you're looking for or post a thread of your own. You're bound to find *something* useful...

Okay. Here's a quick and dirty run-down on patternmaking. Let's start with some simple shoulder armor. Say, the shoulder armor worn by Zelda from the many and varied incarnations of The *Legend of Zelda* game series.

First thing you do, is to get yourself some reference pictures....

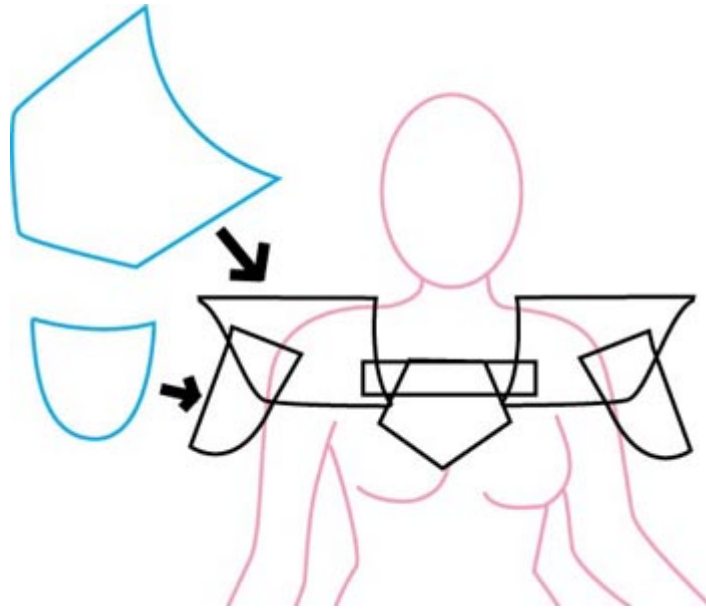


Unfortunately in this case, no two reference pictures of this character seem to be alike. That happens sometimes, and *when* that happens, you're going to have to use your imagination, as I was forced to during *my* attempts to make this armor. Here's the design I eventually came up with:



The first step in building the armor was to determine its shape, width, and how many parts it was going to be made of. This I did by draping thin cardboard over my shoulders and drawing the pattern out with a marker. The model for the armor should, of course, stand as still as possible while the pattern-marking is going on (if the model happens to be *you* and your name isn't Plasticman, then you'll probably need to have a friend help you.)

As this was a relatively simple project, I was quickly able to determine the sizes and shapes of the various pieces I would need to build the armor (as crudely illustrated by the drawing below in which I appear to be naked, faceless, and have much nicer boobs than I do in real life. Sigh.)

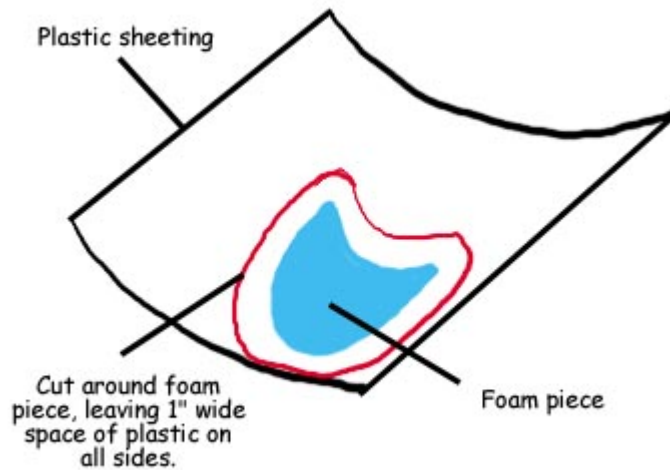


With the pattern made, I then set about the task of constructing the armor

## Basics of Armor Construction

Once you've determined the number of pieces you'll need to construct your armor and what shape and size each individual piece will be, you are ready to begin making the pieces out of foam and plastic. First step is to lay your cardboard pattern over a piece of craft foam, trace around it and cut it out. (You may have to hotglue sheets of craft foam edge to edge if the pattern piece is too large to fit over a single individual sheet.) Once you have cut all your pieces from the foam, the next step is to cover the pieces with the plastic sheeting.

Step One: Roll out your sheeting and then place one of your foam pieces onto it. Trace around it with a marker, leaving a generous area of sheeting (about 1" wide) around the piece. (You don't want to be cutting it too close; you'll see why in a moment.) Cut the traced area of sheeting out with a heavy scissors. Do the same for all of your armor pieces.



Next step is to apply hotglue to surface of the foam. If the piece you're working on is large, it might be wise to apply the glue and overlay the plastic in small sections at a time, --otherwise if you try gluing it all in one go, areas of the glue might cool on you before you get the chance to lay down the plastic sheeting. Take care not to apply *too much* glue, --if the area you're gluing becomes too hot, the plastic might buckle and warp when you try to lay it down.

Now comes the tricky bit--pressing the plastic sheeting onto the foam. It would be wise to touch the plastic to the foam at one edge and gently press it towards the other edge. If your armor is something which has a curve to it (like, say, a bracer which goes around the forearm) you should curl the armor in your hands as you press the plastic on. At this point, you'll discover the reason why it was so important for you --back when you were cutting out the sheeting--to leave a generous area of sheeting around the foam; curling the armor will create more surface area on the outside of the armor than on the inside. (If you had cut the plastic to exactly match the foam piece, then you'd now be finding yourself in a situation where you didn't have enough plastic to cover the surface of the foam.) You'll notice, once the glue has cooled, that the armor will retain it's curled shape, thanks to the surface tension created by the now-cool layer of glue. One thing to be careful of here: Do not, I repeat, DO NOT curl the armor TOO much. Foam is spongy, and if you curl an armor piece too far it will spring back, creating ripples in the surface of the plastic once it cools. Best to only give it only a *slight* curl --or to not curl it at all --than to curl it too much.

If your piece has any sort of edge or decoration to it, then now's the time to apply it. In the case of the Zelda armor, the decoration consisted mainly of scrollwork. This I cut out of 2mm craft foam which I glued to the surface of the armor. I then took a needle and thread and tacked down the decoration for added security. You can see the kinds of threads I made in the picture below. It's not pretty, but then again, it's not meant to be seen. You'll most likely need a pliers to pull your needle and thread through the various layers of foam, plastic and glue you'll have at this point. (Try to be as precise as you can. It may be hard to determine the position of the needle when you try to push it from one side of the armor to the other, but it shouldn't be *impossible*.)



Next step is to cover the scrollwork with plastic sheeting. Determine the size and shape of plastic sheeting you'll need to cover the decoration--being as generous as you can in your estimation--and cut it out. Apply hotglue to the surface of the decoration, making sure not to miss any spots. Press the plastic sheeting onto the decoration very carefully, making sure all surface areas of the scrollwork are touched by the plastic. Hold the plastic in place until it cools.



Now comes the fun part. Take your craft/X-acto knife and use it to carve away all the plastic which isn't sitting on top of the raised decoration. Polystyrene can be hell to carve when you're working with curves so be VERY careful. Use a light touch. Try to avoid slashing your own wrists (either accidentally or out of frustration.) Try not to slice *into* the foam if you can avoid it. (Foam, while it's easy to cut with a scissors, leaves rough, shreddy edges if you cut it with a craft blade.)



This is roughly what you should have when you are finished...



Once you have all of your armor pieces constructed, you can then begin painting them.

**NOTE:** If the styrene sheeting you bought is opaque, you'll have to do the above steps differently. You'll have to cut the decoration out of foam, glue it to the plastic first, cut it free of the plastic and THEN hotglue it to the surface of the armor. (You can tack it down by using small stitches at the edges of the decoration.)

**Note X 2:** If you want to create a more organic, flowing type of raised decoration, draw it on with Gem-Tac (*that adhesive stuff I mentioned earlier in the Materials section,*) and let it dry for at least a day. It should dry tough and flexible. (If the design you want to create has lots of fine detail or scrollwork, you may find it easier to create with Gem-Tac. If your

raised design has lots of sharp edges or clean, precise lines, you'd be better off sticking to the plastic-covered foam. )

## Painting Your Armor

First step in painting your armor is to find a nice, flat place outside that's out of the path of the wind and sun. The next step is to lay down enough newspaper to cover Mount Rushmore at least three times over. (The first coating of your armor will be made using spray paint, which you *don't* want to be getting it all over the place.) There are many different kinds of spray paint, of course, but the kind I prefer to use is **Testor's model spray paint**. For steel/silver armor, I sometimes like to use **chrome spray paint** which can be found in fine automotive departments everywhere. Of course, **automotive paints** --being paints that were designed to go on flexible surfaces like fenders--are a good choice to use when painting your armor, but I prefer the Testor's. (Whatever paint you use, make sure it's compatible with polystyrene. Test it on a scrap of your plastic sheeting if you're unsure how the two will react together.)

Before you apply paint to your armor piece, make sure the surface of said piece is completely clean and free of globs or strings of hotglue. You may have to go over the surface of the armor with a damp cloth. You can scrape stubborn gluespots off the surface of your armor, although this might leave streaks. If you want to smooth over a dirty or scratched section of your armor, you can use special hobby sandpaper, usually sold in craft stores in the model section. Since the plastic sheeting you're working with is pure **polystyrene** --the exact same stuff model cars and planes are made out of-- this sandpaper works really well on it. (Of course, your best bet is to just *be careful* and not randomly dribble glue all over the surface of your armor so such sanding and cleaning will not be necessary...)

Lay down your armor piece onto the newspaper and then begin coating it with the paint, taking care not to breathe in any of the fumes or to accidentally spray it all over yourself so you wind up looking like Shirley Eaton in that *Goldfinger* movie. Spray evenly, making sure you give the piece an adequate coating from all directions. Don't spray *too much* paint at once. Several light coatings of paint are preferable to one heavy, dripping coat.



As I mentioned before, you want to keep your piece out of the path of the wind, so dust, twigs and other debris don't get blown onto it. Also, make sure your armor (or prop or weapon, or whatever

it is you made using this method) is set in a place where it's shady. Styrene and hotglue are both thermo-sensitive, meaning they can melt when subjected to prolonged heat, (like... oh...that given off by the sun, fr'instance...) It doesn't take long for the spray paint to dry. Once it has, you can then begin fine detailing the piece. I prefer to use **Testor's enamel paint** --the kind that comes in the small bottles--for this step. Remember to shake the bottle of paint thoroughly before you open it, and keep in mind that this sort of paint will NOT wash out with water. (If you want to reuse your brushes, you should buy a bottle of brush cleaner or paint thinner to wash them in. Also, buy model brushes--don't use soft or natural fiber brushes as the hair will fall out and get all over the piece as you paint it.) This kind of paint is dangerous to breathe so, if you're working with it indoors, make sure you do so in a well-ventilated area, (near an open window, or in a vent hood if you're lucky enough to have one...)

A long long time ago, back in my days as a theater minor in a college costume shop, I learned a method of painting armor so that it looked realistic and "fought in". Using a scrap piece of plastic sheeting as a palette, mix silver (or *gold*, if you're making bronze or golden armor) and black paint together. Dab the mixed paint over the surface of the armor using a large plastic brush. Dab darker paint around the edges and shinier paint near the middle of the piece, where the most wear would be. (This technique is basically using the same principle as *antiquing* where you take a cloth dipped in black paint and rub it all over the surface of a shiny object to make it appear older. That's another technique you could use for painting your armor, although I prefer my mixing and dabbing technique because I feel it gives me more control over the armor's final appearance.) Once the surface of the armor has been painted, dip your brush in pure silver (or gold) paint and apply it to the raised decoration in long, smooth strokes. This will make the decoration stand out more and help achieve the antiquing effect.

One benefit to this technique, besides giving the armor a more realistic metal appearance, is that it can conceal a lot of surface flaws. (Just dab darker paint into those areas you wish to hide. But don't do it excessively or else it will draw attention TO the area, not AWAY from it.) You can see examples of my painting techniques in the various descriptions of my armoring projects in the other areas of this site.

Another alternative to using Testor's paint on armor - **Rub 'n' Buff** gold and silver leaf. It's a metallic wax paste which comes in a tube and which can be rubbed onto the surface of your armor. It creates a more reflective surface than paint, but it's also prone to streaking. (It's probably allright if you're going to use it on a small item--like a piece of jewelry, fr'instance, but you may want to use chrome paint on your larger armor pieces.)

**One caveat about using Testor's paint. It will react negatively to vinyl.** (Specifically, it will rub off onto anything vinyl that comes into contact with it.) This is important to remember if any part of the costume you're wearing is made of vinyl fabric or if you're thinking of securing the armor to your body with vinyl straps. (You could try using **acrylic paint** to paint your armor instead of Testor's--acrylic paint will NOT react negatively to vinyl-- but be warned, it will not stick to the surface of the plastic sheeting as well. You should sand the plastic first and then coat the painted acrylic surface with an acrylic varnish.) If Testor's paint *should* come into contact with vinyl and stain it, it can be easily removed with paint thinner or brush cleaner, so don't worry if that happens. (For the record, leather and suede will NOT react negatively to testor's paint, so it should be safe to use for your costumes.)

Once your armor pieces have been painted, you can spray them with a **clear sealant** (although be warned, this can take some of the sheen off the surface of the armor and can cause the paint to run if excessively applied. Also, some clear sealants/ top coats you can buy are heat-sensitive, meaning they will cloud up if the armor is heated in any way. Even a short ride in a hot car may be enough to initiate this process. Be sure if you buy a **clear sealant/top coat/clear coat spray**, that it's the kind that can be used on outdoor and/or waterproof surfaces. )

Now that you've finished painting the armor, it's time to assemble it. This can be accomplished by

hotgluing one piece to another, although I prefer to sew the pieces together. Just fit the pieces together and draw a needle and thread through them both a few times. Secure the thread in the back of the armor with a knot and then dab it with hotglue for extra security. You'll have exposed threads on the front surface of the armor, but these can be effectively covered up with paint (My advice: try to get the attaching threads close to the edges of your armor--or in some other equally inconspicuous place. In some cases, the threads can be covered up with decorative denim studs--these studs in turn will look just like metal rivets and add a touch of authenticity to your armor.) However you attach the pieces together, the armor should be durable and the joints slightly flexible.

This is, once again, how my Zelda armor looked once I had finished it.



After finishing the shoulder armor, I went and made a headpiece for my Zelda ensemble. I did this by buying one of those "prom tiaras" from a mall boutique and gluing sculpey pieces to the front of it. **Sculpey** is a kind of bakeable clay, and it's another useful material to make armor and accessories out of, but be warned,--Testor's and spray paint WILL NOT DRY when directly applied to it. You'll HAVE to cover its surface with a primer before painting it. Sculpey is also not very flexible and is rather heavy. If you're trying to make a big piece, you might want to consider using **Paperclay** instead. (A useful site for reading up on paperclay and other molding materials is cosplay goddess Sarcasm-hime's [Tips, Tricks and Useful Sites.](#))



I made a pair of Triforce earrings using thin (2mm) craft foam covered on both sides with plastic sheeting and painted gold. The foam and plastic are fairly lightweight materials, so if you're looking to make earrings that *look* huge, but won't place undue strain on your earlobes, this method is probably your best bet.



Well, that's my armoring method in a nutshell. Since you've been such good listeners thus far, I'll reward you with some

## **Bonus Armoring Advice**

### **I. Helpful Things to Remember When Constructing Your Armor**

**1. Be neat.** Glue dribbles, warped edges or paint jobs that look like they've been applied by blindfolded blind people are all things which will detract from the "wow factor" of your armor. (If you don't care how cheesy your armor looks then don't bother spending your hard-earned money on foam and plastic--use cardboard instead. You'll achieve the exact same effect at only 1/4th the price.)

**2. Try not to burn or hurt yourself.** Hotglue is called hotglue for a reason. Label warnings on cans of spray enamel have been printed there for a *reason*. Do NOT wield a craft knife or anything with a sharp edge when you are tired. Nothing stifles one's enthusiasm for a project more than having to drive 15 miles to the nearest hospital at midnight to get one's blood-spewing injured hand stitched up in a crowded emergency room. (*I know this from experience...*)

## II. Helpful Things to Remember When Wearing Your Armor

**1. All armor--no matter what material it's made of-- is going to be hot to wear.** Make sure wherever you wear it has adequate ventilation and, if possible, air conditioning. Don't go out and stand in the midday sun for hours on end if you can avoid it (unless you WANT to die of heatstroke). If you're standing in line waiting to go onstage for a costume contest, ask the people running the contest if they'll let you stand someplace cool and have someone fetch you when it's your turn to go on. (Or better yet, just take the armor *off* and don it only when it's your turn to go.) Drink plenty of water even if this makes you go to the bathroom a lot.--It might be wise to have a friend around who can help you get in and out of the armor if and when the need arises.

**2. Be careful if your armor is huge and ungainly or has sharp edges.** Especially when you're walking around in big convention crowds or trying to step onto elevators. You might find it wiser to save your big-ticket armor outfits for the masquerade and wear something more comfortable for walking the halls.

**3. Don't try and fight in the armor.** It's durable, but it will not hold up in combat. This kind of armor is *purely* for show. (If your armor should get cut or damaged in any way, make sure you have a mini-glue gun and a small roll or sheet of plastic with you for repairs.)

## III. Storing Your Armor or Shipping it by Mail

**1. Get yourself a box (or boxes) large enough to keep your armor in.** If you don't have box of suitable size handy, don't spend money buying one from a packing store. Just go to your local grocery or hardware store and ask them on what day they receive their weekly shipments and if they'd let you secure a box from them at that time. (Or, better yet, go diving in their dumpster. You're bound to find something good. Just make sure the box you choose doesn't have any stains or anything gross hanging from it. A lot of businesses have a separate dumpster reserved *just for* cardboard, but still, trash can find their way into these things sometimes, so it's wise to be careful.)

**2. Once you've secured your box, wrap your armor either in bubble wrap or in clear plastic grocery bags and place it gently in the box, heavier pieces first, lighter pieces on the top.** *Don't* cram your armor in so tightly that it's pressing hard against the sides of the box--it may crack, especially if the place you're shipping it to or from is suffering from a bout of cold weather. If, after packing your armor, you find you have a lot of space left at the top, fill it with plastic baggies, newspaper or bits of styrofoam--something high-volume yet lightweight. Tape the box securely (and remember to put extra tape on the bottom so it doesn't fall out.)

**3. DON'T FORGET, WHEN SHIPPING YOUR ARMOR, TO PUT YOUR RETURN ADDRESS**

## **ON THE PACKAGE.**

**4. Make sure, when shipping your armor, that you budget out enough money to do so.** The post office LOVES to slap oversize shipping charges on any package which looks even slightly bigger than the norm, so your best bet --if you're shipping a suit of armor or something of that size-- is to reserve at least 30 dollars for shipping and insurance charges. (You may be able to get by with paying less, if you ship it FedEx.) DO NOT FAIL to put insurance on your armor. Put what you think the armor is worth (and prepare, if it gets lost, to provide PROOF to the post office that the armor is actually worth that much--if you sold it at an auction, provide an ebay or paypal receipt or a check stub which dates when and from whom you received the payment.)

## **IV. Miscellaneous Advice Sent In By Other People...**

**Tom Tipping sent me the following tip via e-mail:**

*Hi, I found your armor making pages while searching for ideas for making Alphonse Elric's armor for my son. He wants to portray Al at AX2005. I've been making costumes for over 20 years. When I read about how you made Link's Mirror Shield, it reminded me of a trick I used for a shiny, metallic finish. My son wanted to be the Green Power Ranger for Halloween and I needed to make golden shoulder pieces. I tried using 'fusing web' (Pellon or Wonder Under) on mylar gift wrap. I then fused the mylar to a heavy fabric. It worked. The texture of the fabric comes through. You might want to try this the next time you need a 'mirror' finish. Use of a chemical adhesive, like spar varnish or urethane foam sealant, may allow for 'cold vacu-forming'.*

**I might try this method at some point in the near future. If anyone else cares to try it out, let me know how it goes... If anyone else has another tip they'd like to share, feel free to e-mail it to me at [dietzt@REMOVEMEcloudnet.com](mailto:dietzt@REMOVEMEcloudnet.com).**