

# THE BOOK OF -FOAM ARMOR-

COMFY & AFFORDABLE

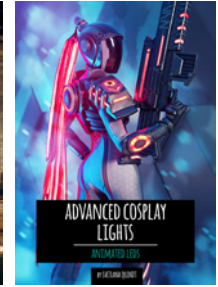
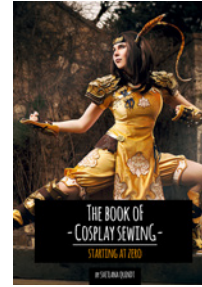
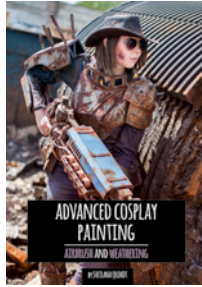


BY SVETLANA QUINDT

# GO MAKE SOMETHING!

Interested in armor, props, painting or sewing? Check out my other books!

[kamuicosplay.com/books](http://kamuicosplay.com/books)



Hello there! Thanks for buying my book! Since you have probably already looked at the cover, you know what this volume is all about: EVA foam! It's soft, flexible, lightweight and pretty darn cheap! After writing several books about working with thermoplastics (mainly Worbla) I figured it was about time I showed you something different.

Don't get me wrong. I still love Worbla. It's very beginner friendly and the main reason why I fell in love with armor making in the first place. You can find it or any similar thermoplastic in pretty much every crafting store nowadays and if you're interested I can recommend you to check out my [Book of Cosplay Armor Making](#) to get started.

In this book I'll guide you through every important step to help you create your very first comfy and affordable EVA foam armor. We'll start by planning your costume, creating the patterns, then cutting, gluing, priming, painting, sealing the foam and then finally attaching your finished armor pieces to your body.

Despite looking massive and huge, your costume will actually be very comfy, squishy and light as a feather! All you need are some basic tools (many of which you might already have from working with Worbla) and a few cheap foam mats! So grab your hobby knife, heat gun and glue and let's make some armor!

Let the foam begin!

## ABOUT THE AUTHOR



## KAMUI COSPLAY

We're Svetlana and Benni but most of you know us as Kamui Cosplay. If you're into making costumes, chances are you've already stumbled upon one of our videos, tutorials or books before. We consider ourselves very lucky to be able to make our living by helping creative people like you with their crafting dreams. We're humbled by all the love you send our way and try to give back as much as we can.

Thank you for your support by buying this book! Hopefully you will find it helpful and inspirational!



# What now? Foam or Worbla?

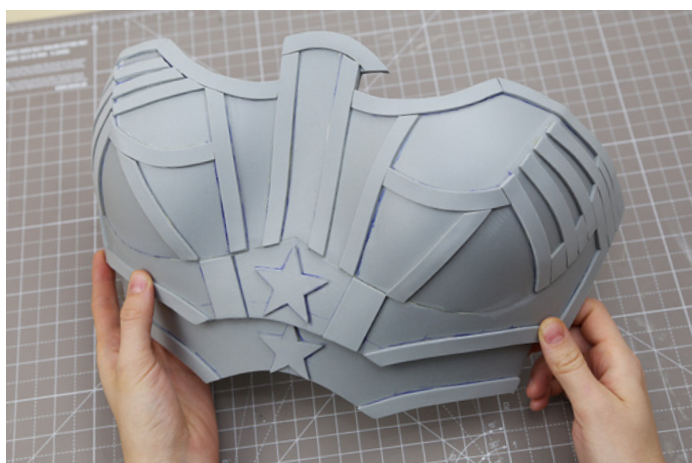
While Worbla quickly became one of the most popular crafting materials in the cosplay scene, EVA foam has always had a strong following as well. So how should you choose the right material when starting a new project? Let's begin by looking at what makes each material special.



Worbla



EVA foam



The magic of cosplay is that you can create anything out of everything, as long as you think creatively. However, of course there are some materials that are easier to work with and come with a huge range of helpful guides. Worbla and EVA foam both belong to this category.

Let's start with **Worbla**: It's stiff, pretty heavy but very easy to handle. Since you only need heat but no glue to stick parts of it together, I would say it's the more beginner friendly material. You can fix mistakes pretty easily and even use your scraps to model small details like it was (painfully) hot clay. It's super forgiving and you don't need to work very precisely to get good looking results. It is quite expensive though. Also, when you have a full set of armor, you will definitely feel the weight. I also wouldn't recommend staying in the sun too long if you don't want your armor to melt.

**EVA foam** on the other side isn't as forgiving. It's not as stretchable and therefore your patterns need to be more exact. In addition, keep in mind that foam armor insulates heat and can get quite warm. Since it's also very flexible, you need to use specific primers, glues and colors which might be harder to find. Aside from that, EVA foam only costs a fraction of Worbla. My favorite foam, which comes in 5mm thickness and a sheet of 1 x 0.5 m (40 x 20 inches) costs only around \$9 (7.50€). Using around five sheets for a huge costume means I barely have to pay \$45 (38€) for the main material on a project, which is pretty amazing, right? In addition it's soft and lightweight and therefore very comfortable to wear. You might look like a metal plated warrior, but you will feel like you're not wearing anything at all (better check in the mirror).

Both materials have their pros and cons and it's really up to you what you like more. Personally I switched from Worbla to EVA foam simply because working with thermoplastics wasn't challenging for me anymore. I also grew tired of wearing heavy and uncomfortable armor. I still use it from time to time, but after I got over the initial hurdle of figuring out how to work with foam, I really fell in love with it. There is simply no better feeling than wearing a huge armor set for a whole day at a convention and not feeling tired at all from wearing it. No matter what you choose, make sure to check out our YouTube channel. We have a ton of video tutorials about Worbla and foam:

[youtube.com/  
kamuicoplayofficial](https://youtube.com/kamuicoplayofficial)



## NOTE

Nova from Heroes of the Storm was the very first project I built completely out of EVA foam. Switching to a new material was very exciting to me since I really had no clue what I was doing. In the end it took way longer than I thought it would, but I learned so much from making this costume.



## NOTE

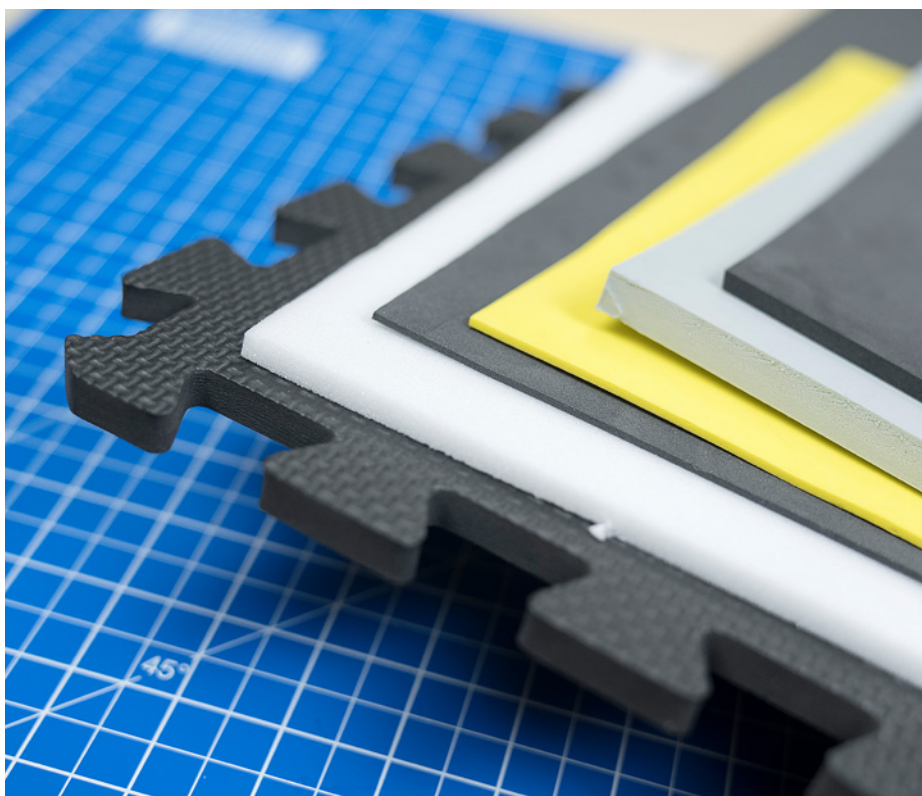
While plain EVA foam looks boring at first sight, all you need is some creative thinking to turn it into something special. My Fallout 4 armor and prop were just plain gray foam in the beginning, but with a bit of battle damage and the right paint job, I was able to turn it into real looking rusted metal!

# All the stuff you need

Every project requires different tools and materials, so I'm only going to show you the most basic ones here. Luckily you don't have to spend a lot of money when working with EVA foam. Great costumes can also be super affordable! Here is what you need for your shopping list.

## EVA foam

Good quality EVA foam is your most essential crafting material for this book. It comes in countless different names, sizes, thicknesses, densities and colors. Many also behave very differently when heat shaped or sanded. It might be quite the challenge to find the right one for your project. There are just so many different types and not all of them work equally well! In a couple of pages I'll give you a rundown on how to spot and where to find good quality foam. Just remember: You can never have enough materials (there is always a next project) and it's a good idea to stock up on different thicknesses too. Everything from 2mm, to 5mm and 10mm.



## Contact glue

Many glues work on EVA foam. Some people use hot glue while others prefer super glue. My personal favorite is contact glue (contact cement). The name says it all. You need to apply a very thin layer to both of the sides you want to connect. Let it dry until it's not tacky anymore (drying time depends on the brand, check the label) and then press them together. As soon as the two parts get into contact (hence the name) they will stick. The final bond is often so strong that you might damage the foam rather than the glue when you try to pull your pieces apart again. Barge contact cement is probably the most well known brand, but there are many more out there if you keep your eyes open.





## Primer

You should prime your armor before you paint it. A flexible material like foam also needs a flexible primer. Non-flexible ones like white glue, resin or other sandable spray primers will easily crack under a bit of pressure and ruin your pretty piece. In general you have two options. First, you can use a rubber coat spray primer like PlastiDip, GummiDip or other similar products. Keep in mind this stuff is super toxic and should always be applied outside or in a very well ventilated area or spray booth. Option two are flexible brush-on primers like Flexbond or Flexipaint. They take a bit longer to apply and might show some brush strokes, but they're neither toxic nor will you need a special place work with them. More on both of those on the following pages.



## Paint and varnish

Just like with the primers above, you also need flexible paint for your foam. Most acrylic color brands work fine, but there are always exceptions to the rule. Just make sure they stay flexible when cured with a test piece. We also use acrylic airbrush colors (Vallejo Model Air and Game Air) which are especially useful if you need shiny metallic colors that still flex. Applying regular spray paint from a can is mostly a bad idea, even if it says acrylic on the label. My experience is that they still crack when deformed. The general rule is: Always test a product before you use it on your finished piece. The same applies for acrylic based spray varnish. Some work and some don't. You won't know for sure until you try!



## Kwik Seal

When you work with EVA foam, you often end up with ugly seams or gaps between your parts or layers. Kwik Seal is perfect to fill in these flaws! Its true purpose is to seal tiles in your kitchen or bathroom, but that doesn't mean it can't make your armor look nicer too, right? Check your local hardware store for similar products if you can't find this brand. It's similar to silicone but dries out a lot faster, becomes clear and stays super flexible. Perfect for foam seams! Just apply a little bit with your finger, spread it on the gap and smooth it out with a drop of water. Repeat this two or three times and the result will be super nice!

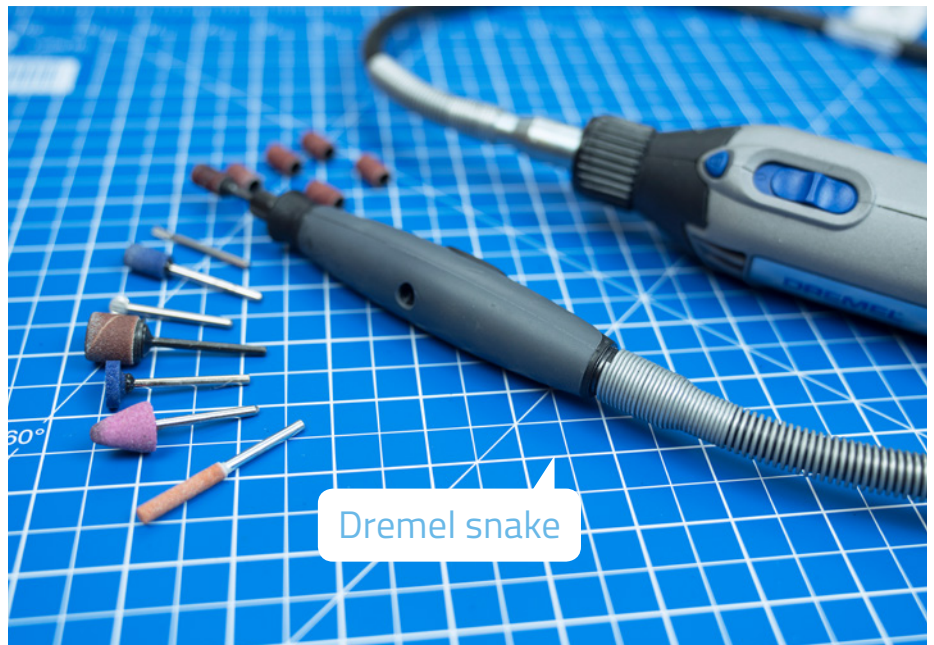
## Knives and grindstones

While you can still cut thin foam mats with regular scissors, you won't be able to go much thicker without switching to a knife. A sharp blade means nice and clean cuts and having clean cuts makes every cosplayer happy! To keep your knives sharp, get a grindstone or some 120 – 240 grit sandpaper and sharpen it when necessary. No need to throw it away once it's dull! There is already enough garbage on our planet and it would be a waste of money as well. For smaller details or more exact cuts, you might also want to get one or two X-Acto knives. They're always handy when it comes to details!



## Dremel

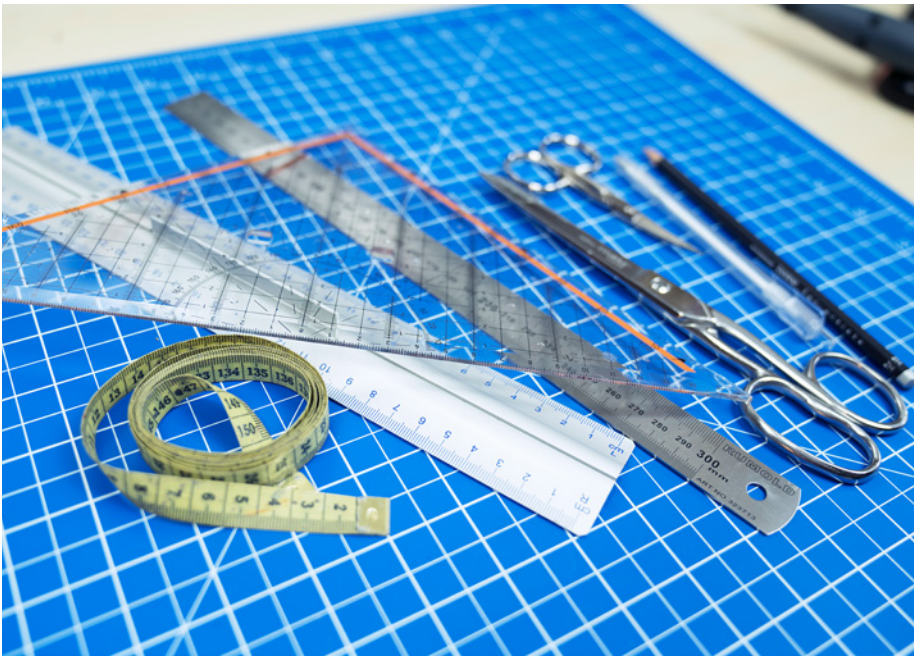
A Dremel is one of the most effective tools to turn your simple EVA foam into something awesome. Depending on the tip you choose (and there are dozens) you are able to create beveled edges, organic textures, interesting details and even fake rivets and screws. Each new tip gives you more options! They are also not expensive at all. A very basic Dremel will cost you around \$30 (25€) and I guarantee it will be one of your most versatile and beloved possessions. To get even better control over the quite massive tool, I suggest also thinking about buying a flexible shaft (also called a *Dremel snake* - I love that name). And no, sandpaper won't do the job.



## Heat gun

EVA foam can be easily heat shaped with a good heat gun. It's very similar to Worbla in that regard. Just warm it up properly, bend it into your desired shape, secure it so it stays that way, and then let it cool down again. To do this fast and effective, get a heat gun with a good amount of Watts (should have at least 1500W). In addition, this tool is also useful to heat seal your foam (it closes the pores) and to smooth out sanded areas by melting away all the small foam bits.





## Markers, rulers & scissors

Rulers, markers and a sharp pair of scissors are not only a must-have for every household, they also come in handy when creating foam armor. Rulers can never be too large and if they are made out of metal that's even better. Scissors should always be sharp and if you can, stock up on a few different sizes and get some curved ones too! Your marker should, well, mark and having a flexible measuring tape has never hurt anyone. Who knows, maybe even your good old circle (compasses) from school might be useful at some point! Just keep your stuff organized.



### SAFETY NOTE

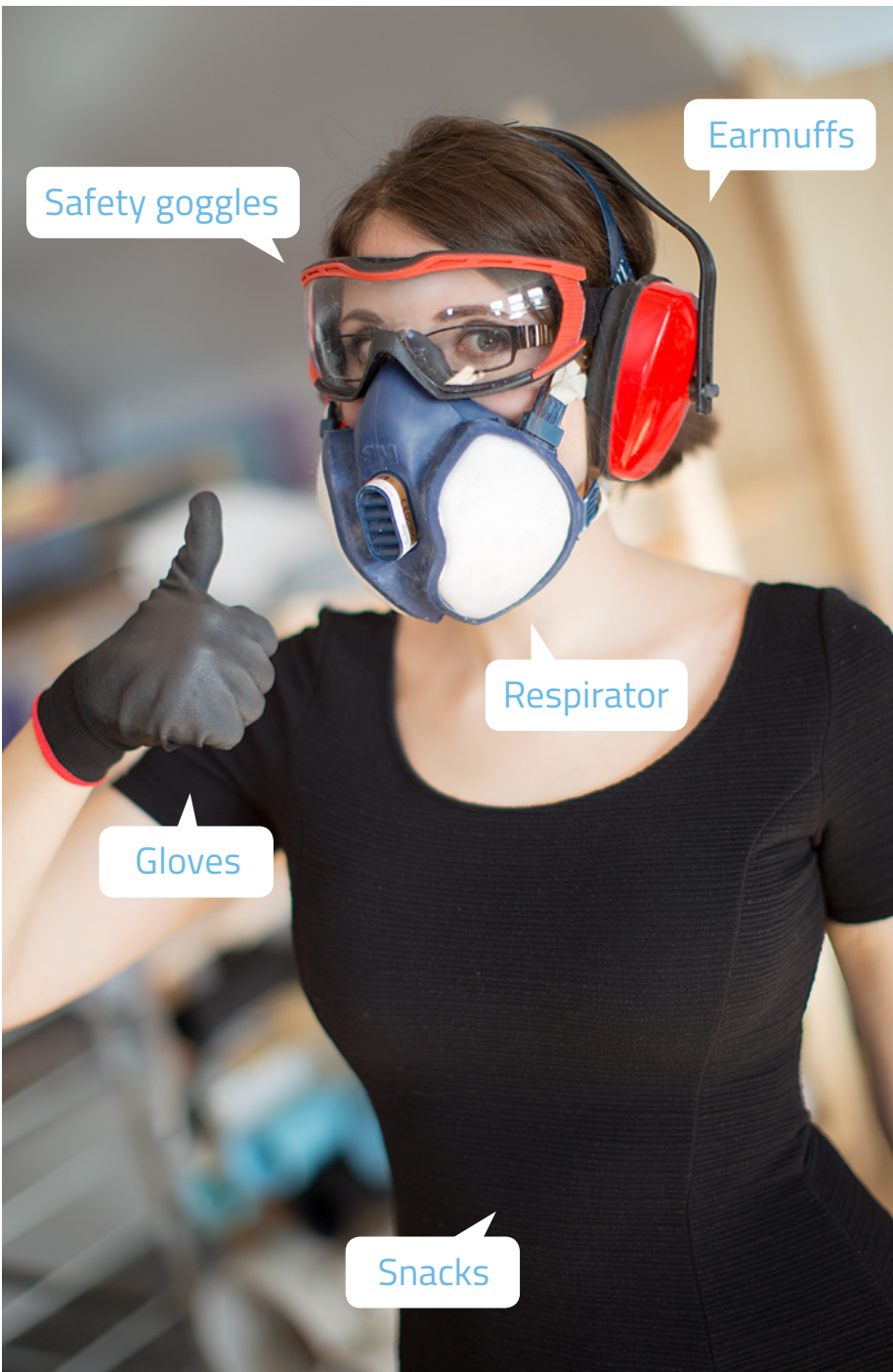
I can't stress this enough:  
Safety always comes first!

Breathing in foam dust or using spray cans in a closed off space is not only really bad for your health, but also for your pets and those who live with you. Please make sure to wear good respiratory protection and find a ventilated corner for your sanding work (or work outside if you can). I'm always wearing a respirator while I'm sanding EVA foam and have a special corner in my workshop especially for this work. In addition I hold the hose of my vacuum cleaner between my legs when I sand and let it suck all the nasty dust right in at the spot. This keeps my work area nice and dust free and also protects me from dangerous fire hazards (dust can ignite when sparks fly around, especially wooden dust)!

Safety goggles protect your eyes from flying foam bits and gloves protect your hands when you slip with your Dremel. Tie back your hair as well and consider getting earmuffs - it can get quite noisy.

I know this sounds like a lot but once you have a tiny piece of foam stuck in your eye, you will ask yourself why you didn't wear any protection. All of these safety products are pretty cheap as well, so there really is no reason for you not to use them.

Better safe than sorry!



Safety goggles

Earmuffs

Respirator

Gloves

Snacks



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# Finding the foam of your dreams!

Navigating your way through all the different materials can be quite challenging. They are called craft foam, EVA foam, Plastazote, puzzle mats, Evazote and all these other names. It can be pretty confusing! Allow me to guide you through this crazy foam jungle.

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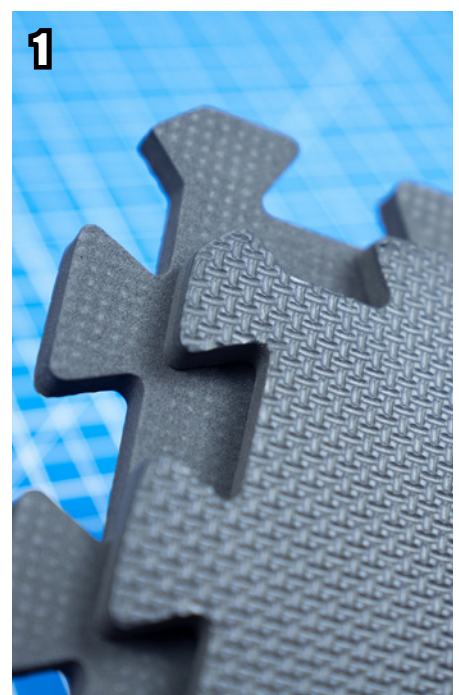
L200, Profoam, Cosfoam, Durafoam and all these other product names are all just that - names. Foam is still foam. Yes, they differ in thickness, density, color and chemical composition, but there is no one true version of EVA foam that magically does everything you want it to do. I use different foams for different projects too. Sure, I like working with some more than others but a good crafter can make any project out of any foam. It might just cost more time and effort.

The most important advice I can give you is to try out all the products that you have available in your country and then find your favorite. Many supply shops offer cheap or even free sample boxes of their foams so you can try and see how each of them feel and behave.

Let's take a look at a few popular examples that should be easy to find almost anywhere:

The most common type of **EVA foams** are probably puzzle mats (yoga mats), which were very popular when there were no real alternatives. They come in only one thickness and have a rough texture on their back **[1]**. This might be handy for specific sci-fi projects, but most of the time you probably need to get rid of it with a sanding tool. While this foam is nice and rigid, it also requires a lot of creativity to create a costume out of it. A word of caution: heating up cheap puzzle mats might release toxic fumes, so work in a well ventilated area, wear a respirator and keep your pets away.

**Craft foam** (foam rubber or foamies) is also pretty much the same product although it mostly comes only in mats that are 1-3mm thick. I don't think I need to show you how it looks here. I think you have already held it in your hands many times before. It's probably the most common version of foam on the planet and you can buy it literally anywhere.





Luckily nowadays there are a lot of other EVA foams that come without the annoying texture. My favorite is this gray high density EVA foam I found on [cosplayshop.be](https://cosplayshop.be) in Belgium. I use it in 2mm, 5mm and 10mm [2].

Two other very good products are **Evazote** and **Plastazote**. Both are trademarked names, so whenever you find them on ebay, Amazon or in other crafting stores, you can be sure they have the same good quality. These foams are also available in different thicknesses and densities which gives you plenty of options for your projects. Plastazote also comes in white and slightly translucent. This gives you the amazing opportunity to work with light effects and LEDs. More about that in my Monster Hunter example later.

The main differences between all these foams are their density, thickness, size and how small their pores are [3]. 5mm thickness is great for smaller parts and details, while 10mm might be more suitable for bulkier projects. A higher density foam makes sanding and priming a lot easier, but your costume pieces might turn out a bit heavier. And finally some EVA foams smell really bad and emit toxic fumes when heated up, so try to avoid those.

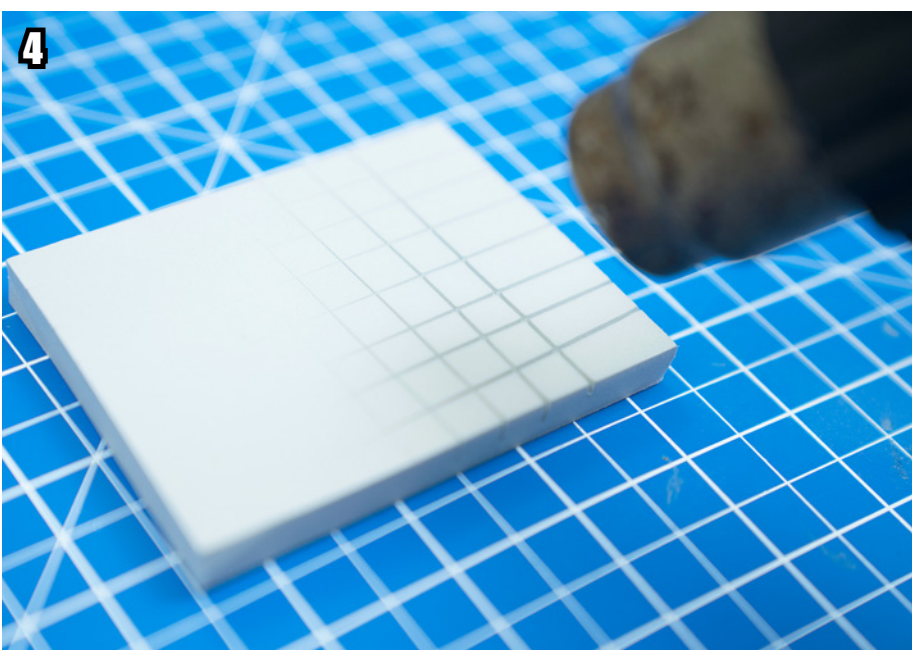
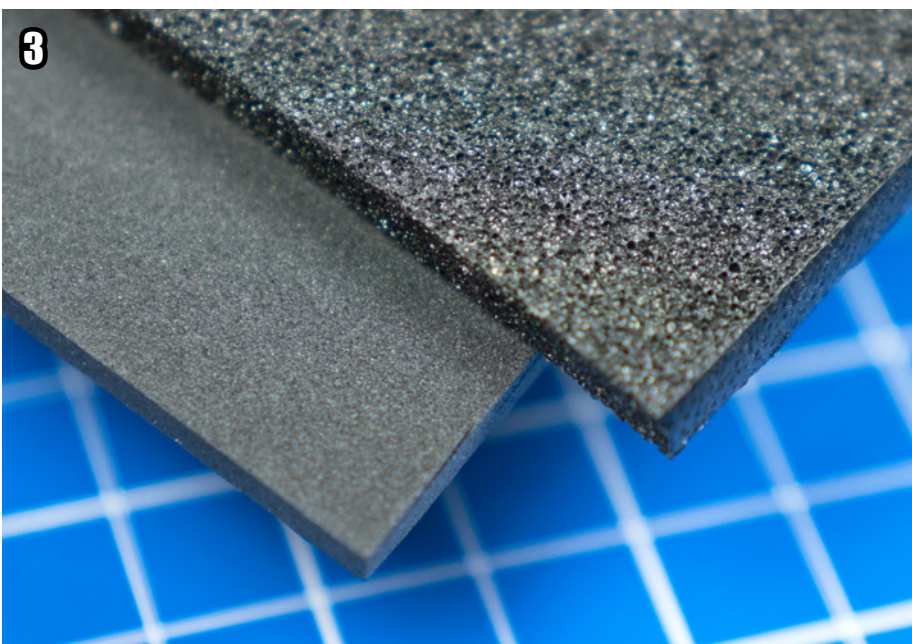
## Does it melt though?

The melting test is a good way to check how your foam behaves. Simply grab a sharp blade, cut a few lines into the material and heat it up with your heat gun. Some foams will now melt together and let the cuts disappear again. Others though will slightly shrink and expand the cut until it's clearly visible [4]. I actually prefer those, since this characteristic gives me an additional option to add interesting details to my armors or props. They also allow me to clean up sanded areas and rough cuts a lot easier. So, if you find a foam like this, keep it!

Now, knowing all these criteria might help you in your search for good material, but sadly there is no guarantee you'll find some. Depending on the country you live, it's possible you won't be very lucky. In this case, just stay with regular puzzle mats or craft foam. They will take some extra effort, but are just as good as every other fancy super foam from a special supply store.

Need help finding good crafting shops?  
I have a list on my website:

[kamuicosplay.com/links](https://kamuicosplay.com/links)



# Every piece starts with a pattern

To give you a complete look at how I create my EVA foam armor, I thought it would be a good idea to guide you through the entire process. That means everything from pattern making to the final attachments. I chose a breastplate, since it includes a challenging pattern, curved shapes and is useful for almost every project. Plus boobies are sexy!



Every armor piece starts with a pattern. Think of it like a cooking recipe. Sure you can just wildly throw all the ingredients together, but I bet, if you had only followed some simple rules, your hungry friends might still be alive! Creating a pattern isn't merely one small part of your costume, it's actually the most important part! It will define the size, shape and look of your final piece and should be made with great care.

While pattern making is actually just wrapping your desired body part in plastic wrap [1] and then in duct tape (or painters tape), creating one for a breastplate is actually a little bit more complicated (because boobs).

It's actually pretty important to secure the pattern in place and prevent it from sliding and slipping. So instead of just spreading tape all over the place, I created a tape harness around my torso. My husband Benni was my trusty assistant and helped me to cover my back. Somehow he never complains when he has to stick stuff to my half naked body. Anyway, first I put some tape all around my ribs and add then added tape suspenders on top [2-3]. I placed additional strips around my boobies and then finally started to cover all areas afterwards [4]. This way I made sure the pattern was tight but also copied the round shape of my chest properly.

## NOTE

To get a great fit of your final breastplate, make sure to wear the same underwear for the pattern making that you would wear for your final costume too. Otherwise your armor piece will turn out too small or too large later.



Next it was time to draw on the shapes. Like always I started with straight center lines at the front and the back of my torso, as well as under my arm pits and over my shoulders. Luckily it's not necessary to draw on the whole pattern. One side is enough since you can just mirror it afterwards. This way all your pieces are not only exactly the same shape and size, it's also easier and faster to create the final breastplate later.

After I was done with the middle lines, I had to draw the rest of the shape. Female breastplates are a little bit more complicated to pattern than male ones – for obvious reasons. While having boobs is nice, they sure give you a lot of headache when it comes to pattern making. First, I drew the bottom line of the cups (I followed my bra underneath), then marked the upper line and finally finished the rest of the shape [5-6]. Depending on the flexibility of your foam you also have to separate the cup into several pieces. Most of the time I add at least one additional line in the middle. The goal is, to be able to lay all your separate pattern pieces flat on the table once you cut them out. This means, you need to search for the biggest curves and separate your shapes there. It's also a good idea to set registration marks in certain intervals, so you can see where they have to fit together afterwards.

After I was satisfied with the drawings, I had to cut myself free again – or better, I asked Benni to do it for me. As I mentioned, you only need half of the pattern so you can totally mess up the other side to get out of your sweaty tape prison. Next I got rid of all the unnecessary material and cut all my pieces out [7]. At this point you can either copy your patterns to a thick paper and make more adjustments, or leave it as is. Since I planned to work with 5mm EVA foam, I just left the patterns the way they are [8]. If you plan to use 10mm foam however, I would suggest adding at least a few millimeters all around to make up for the thicker material. It really depends on how tight you want your final armor piece to be.



## NOTE

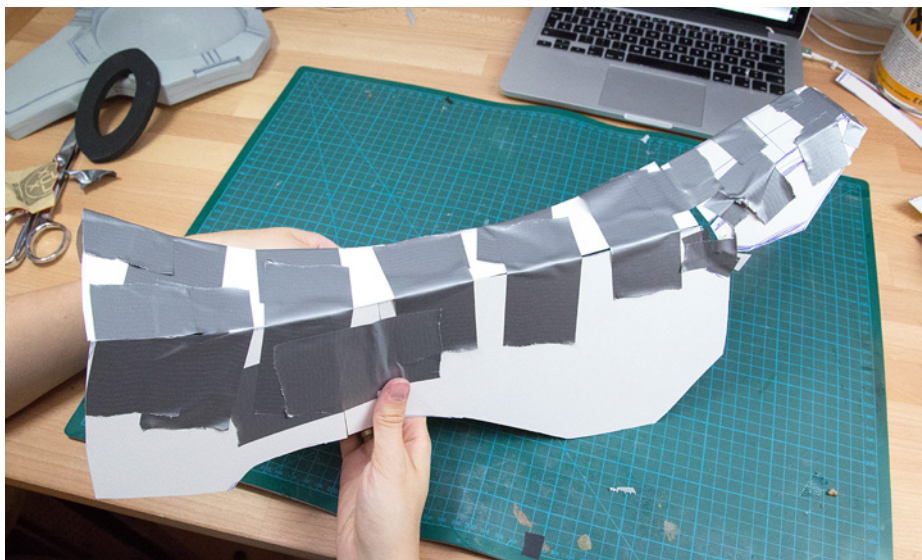
You can apply this technique to all other armor parts as well, no matter if it's a bracer, leg armor or even a helmet. Just add plastic wrap and tape and then draw your pattern on. It actually works on objects as well! Want cool foam horns? Just model them out of clay, make a tape pattern and copy them to foam! So many possibilities!

## Free-form patterns

While skintight and fitting patterns for bracers or breastplates are quite easy to accomplish, it is far more challenging to create a template for a loose armor piece that doesn't even resemble the shape of your body anymore. The patterns for my Nova leg armor for example were just trial and error and cost me a lot of time to figure out.

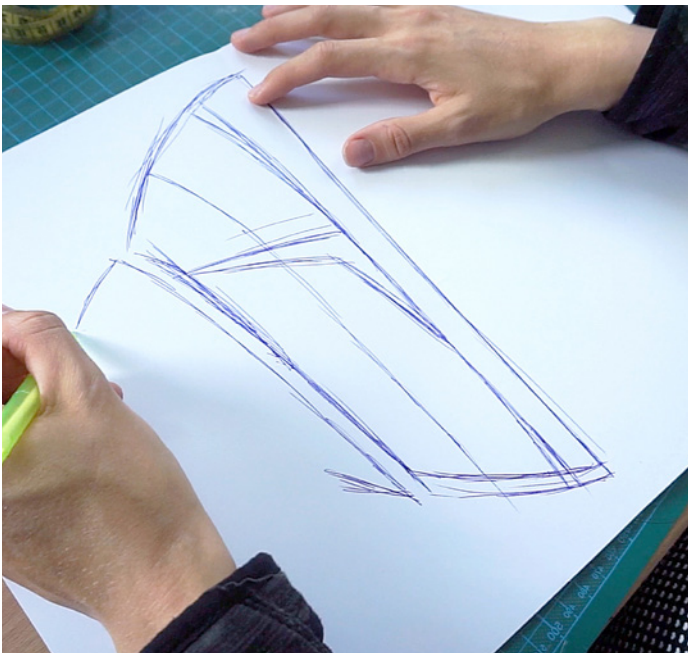
First I measured the length of my leg. Keeping these measurements in mind, I then drew some rough shapes on thicker paper, cut them out, taped them together and held them to my leg. Having such a simple and quickly-made paper dummy allowed me to make changes pretty easily! What didn't work was changed, cut out and taped again. Finally I got a result which looked quite promising! I only had to trace it to EVA foam and add more details to it.

Free-form patterns always take a lot of time and there is no right or wrong way to do it. If you want to save yourself additional headache, you can also build miniature paper patterns, take a photo and print them out in real life size afterwards. The most important tip I can give you is: don't get frustrated if your first try doesn't work out. It's the same for me and I have been doing this for years. Keep trying and you'll have your pattern at some point!



### NOTE

Check out my book of [Advanced Armor Making](#) if you want even more ideas for free-form pattern making. There I show a bunch of differently shaped patterns for really weird shoulder armor. All of them were also paper dummies in the beginning.



## Free-form mask

My Erazer Girl costume (more on that later in the book) required a futuristic looking mask I had to build out of foam. Making a duct tape pattern of my face wouldn't help much, so I simply measured how high and wide my face was (spoiler, it is pretty wide) and started sketching. I had quite some trouble finding the right position for the eyes. It was also pretty difficult to figure out how to separate my patterns into smaller slices so they would fit nicely around my head after I glued the pieces together.

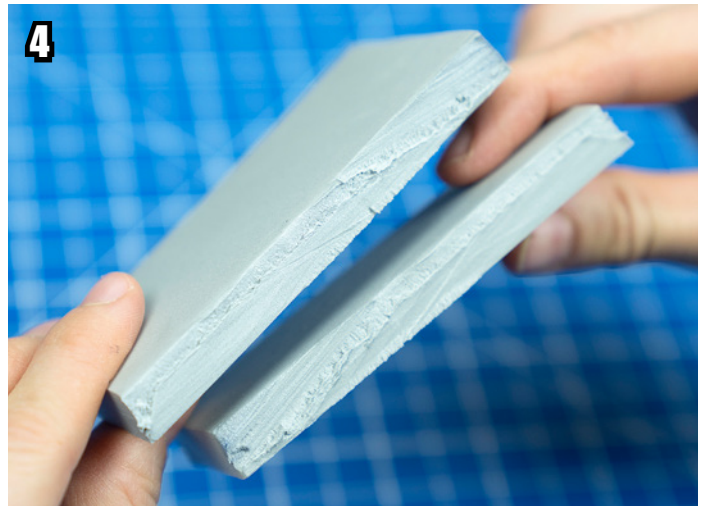
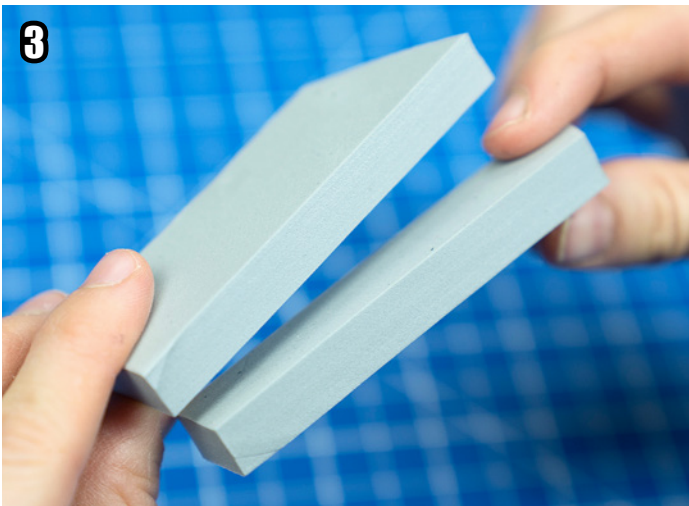
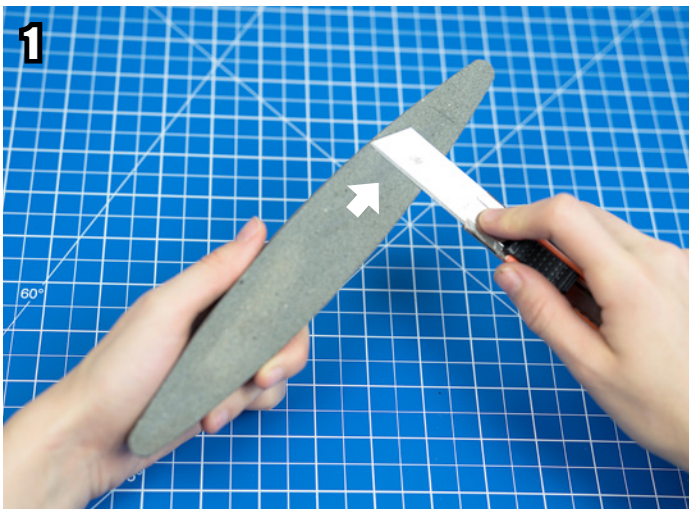
Just like for the legs, building a paper dummy helped immensely. I used thick paper, drew a rough design, cut every piece out, taped them together, looked in the mirror and adjusted all the parts until I got their right size and shape. After I was happy, I finally traced the patterns on 5mm EVA foam, glued them together and hoped everything would work. Even at this point I noticed a ton of flaws, so I had to go back to the drawing table and do it all over again. The second mask finally turned out perfect and I was able to prime and paint the whole thing.

## NOTE

Are you curious how I mounted the mask? Well, I actually covered my head in duct tape and made a fabric cowl based on this pattern. It was a bit difficult to see and breathe with the mask on, so I wanted to make sure it was possible to get out of it really fast. I simply glued several magnets to the mask and the cowl and was able to just snap it on and off. Easy right?

# How to cut, glue and heat-shape foam

Turning your patterns into real foam armor is super easy too! All you need is a sharp blade, some glue and a heat gun. There are still a few tips, rules and techniques that are quite helpful to know before you get started! So, let's begin making some armor!



## Start with a sharp blade

Sharpening a blade works well with sanding paper, but even better with a proper grinding stone. You'll get one for around \$10 (8€) on Amazon and with it you will always have nice and sharp knives. No need to create waste by throwing away replacement blades all the time! I wasn't sure about including this little guide but then I let Benni sharpen my scissors once (he didn't know what he was doing) and they have not been able to cut even a piece of paper since. So here we go:

Just place your blade almost flat on the grinding stone (at around 20°) and move it upwards while it is facing downwards **[1]**. Next, turn it around and repeat the same step but this time moving the blade downwards while it is facing upwards **[2]**. Easy right? Do this over and over until your knife is sharp enough to cut the foam like butter. It will get dull faster than you know, so be prepared to repeat this step very often. Clean cuts are super important to get nice glue seams so it's well worth the trouble.

## NOTE

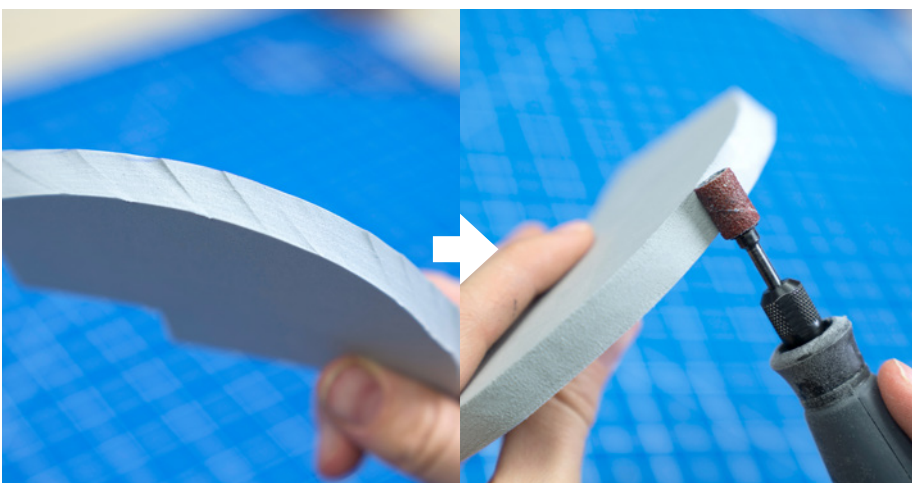
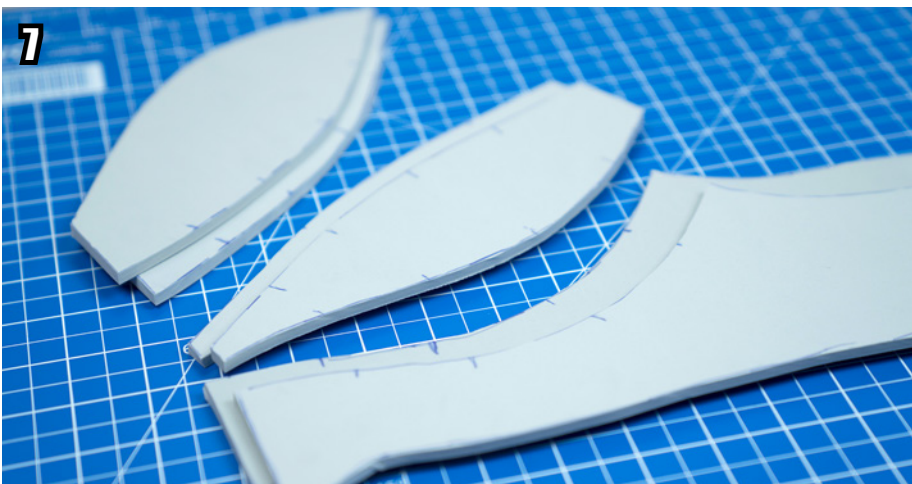
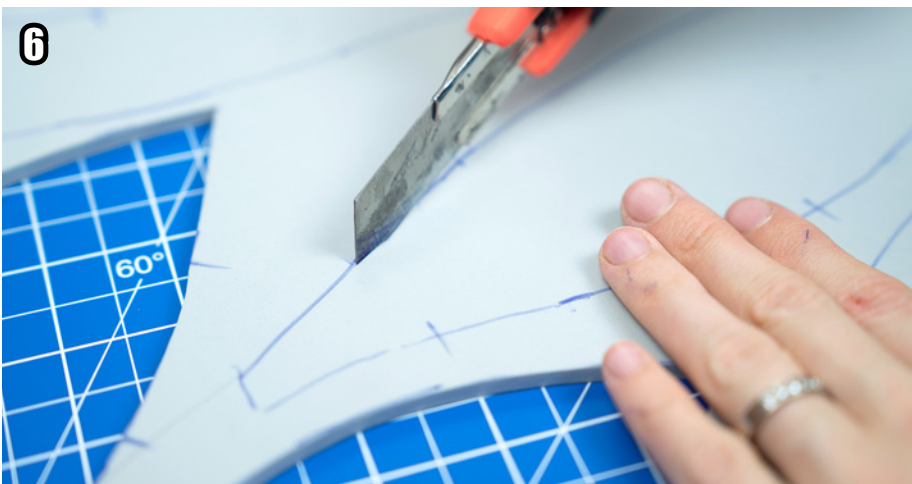
A cut with a nice and sharp blade should look completely smooth **[3]**. You should barely need any force to get through your foam. A dull blade on the other hand will get stuck inside your material and even rip it apart. It won't be easy to pull it through at all. The result is often messy, full of clumps and pretty rough **[4]**. It is in the case, it's clearly time to sharpen your blade again!



## Cut like a pro

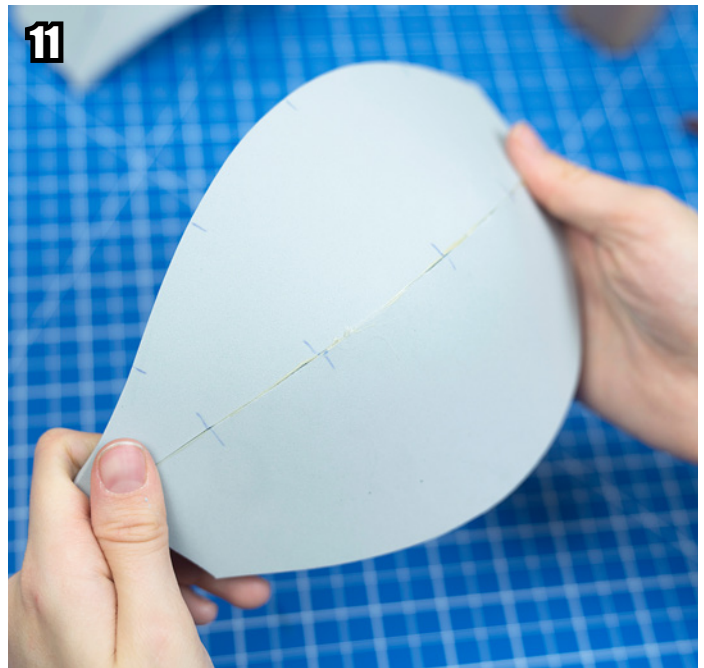
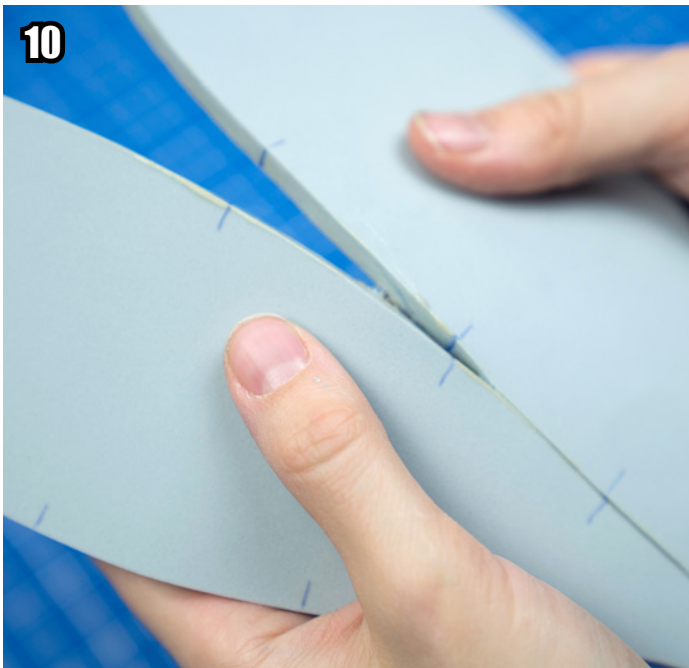
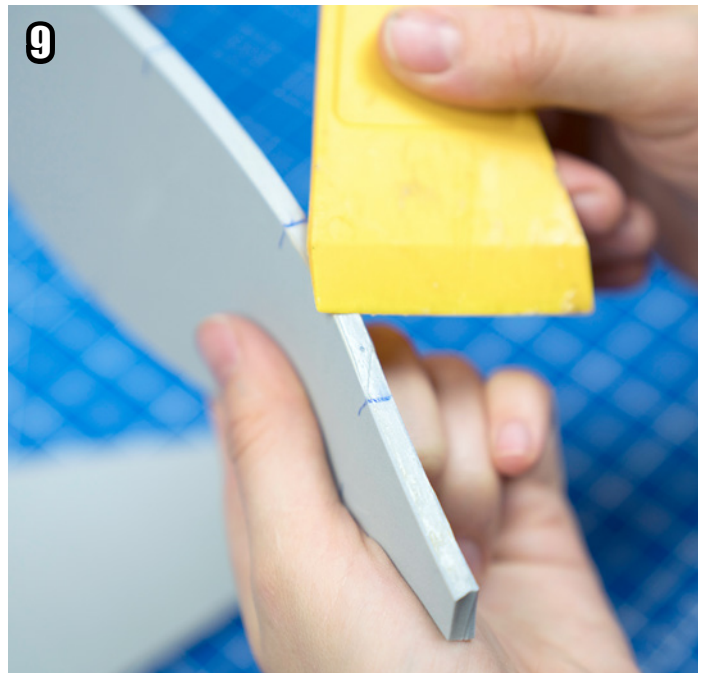
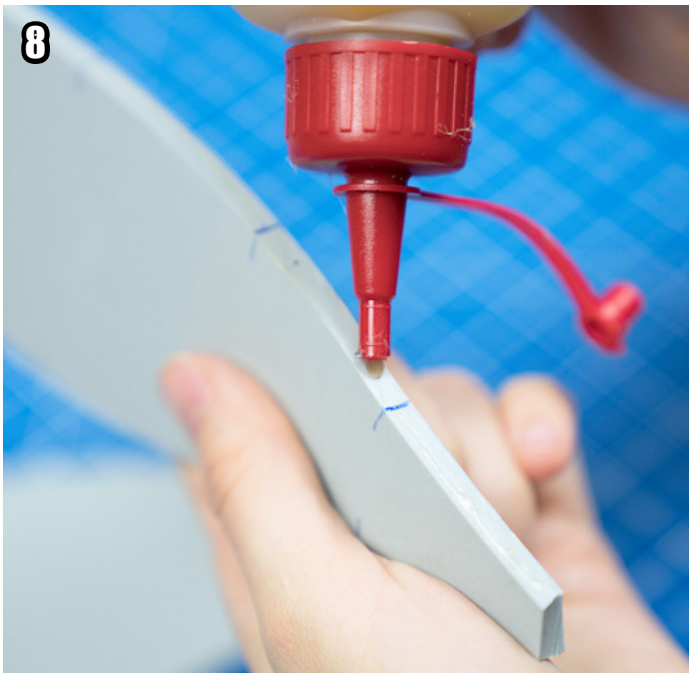
Okay, back to the breastplate. I took all my previously cut out tape pieces and placed them on 5mm high density EVA foam. Then I traced them using a simple ballpoint pen **[5]**. Since I only cut out half of my patterns before, I turned them around and traced them again but mirrored.

Next, I began cutting them out. I stuck my newly sharpened blade into the foam in a 90 degree angle and started following all along the marked lines **[6]**. The more of your blade touches the foam, the easier it is to cut, so hold your knife very flat and try to move as far as you can without stopping. Curves are always more challenging than straight lines and not every cut will turn out perfect. That's alright though, it happens to all of us, no matter how experienced. We can always fix those pieces later so it's really not that big of a deal. After a few more minutes I had all my pieces cut out **[7]**.



## NOTE

Cutting round shapes and curves is just the worst - especially with thick foam. More often than not, your results will look super messy and rough. Not a good base to apply glue! Don't worry though, you can fix this easily with a Dremel! Just grab a sanding drum and move it over the surface. It will be clean in a heartbeat!



## Gluing the pieces together

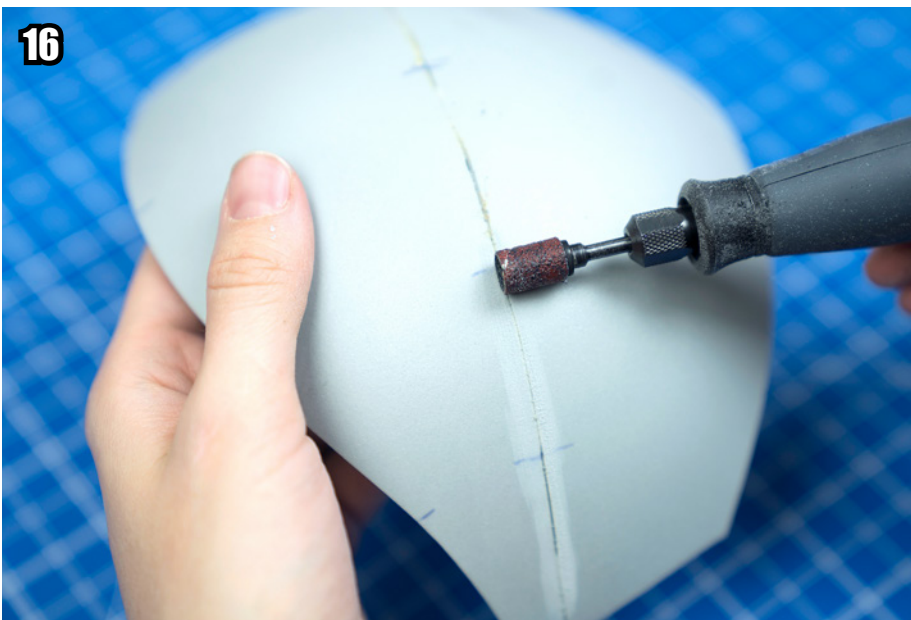
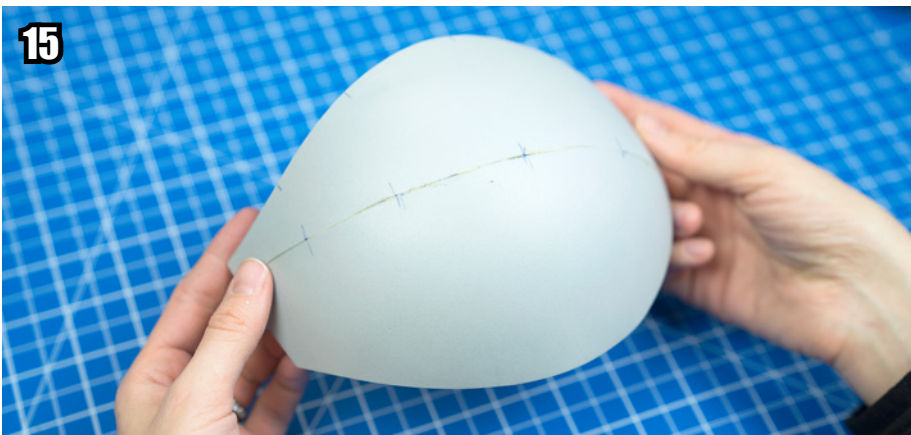
Finally we're getting somewhere! Gluing everything together is a very exciting step, since we can finally see if our patterns actually work! In my experience, contact cement works the best with all types of foam - EVA or not. I applied a thin layer of it to both of the edges that I want to glue together **[8-9]**. A squeeze bottle and a plastic spatula are very useful tools for this step. Many contact glues come in large cans and applying it with a brush can be a very messy undertaking. Note here that less glue is more. Get rid of all excessive adhesive with a scrap of foam or piece of paper. It's essential to keep your glue

layer super thin, otherwise your pieces won't stick together properly or the result will be nasty wide gaps.

Once it dried out, I just pressed both sides together very carefully **[10]**. You can see that I also copied my markings from the patterns to the foam and they are actually really handy for this work step. Sometimes the foam stretches or deforms (especially when you try to glue big pieces), so it's nice to have several fix points that you can align **[11]**.

## NOTE

Every contact glue has a different drying time. My favorite glue dries in only a few seconds, so I can work very fast with it. Other brands take anywhere between 1-15 minutes before they have set and stick together on contact. Make sure to check the labels for further instructions!



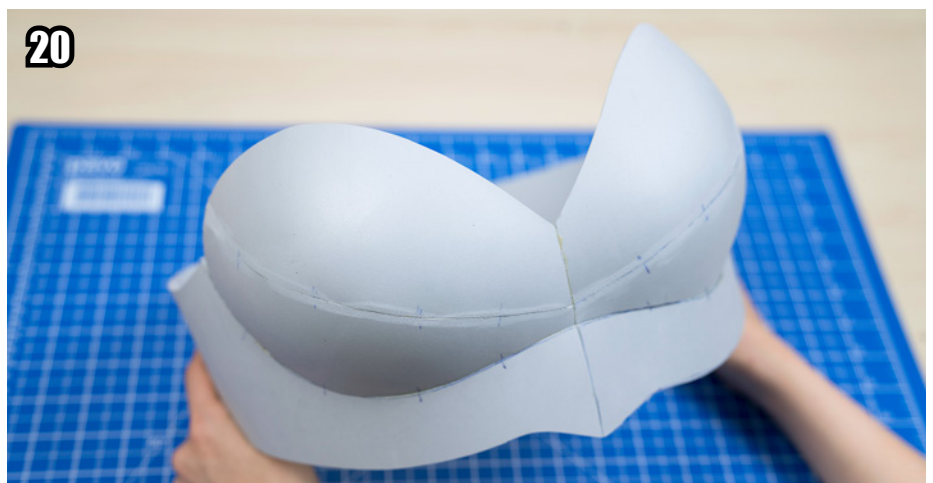
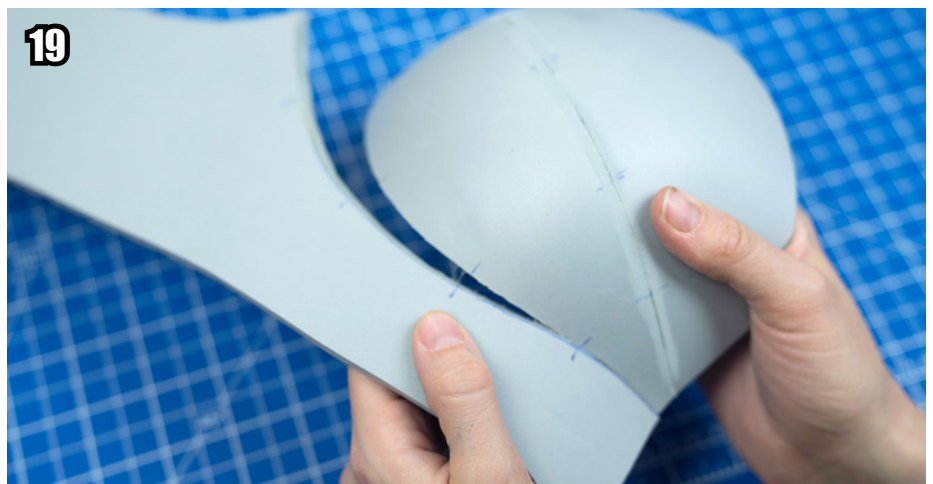
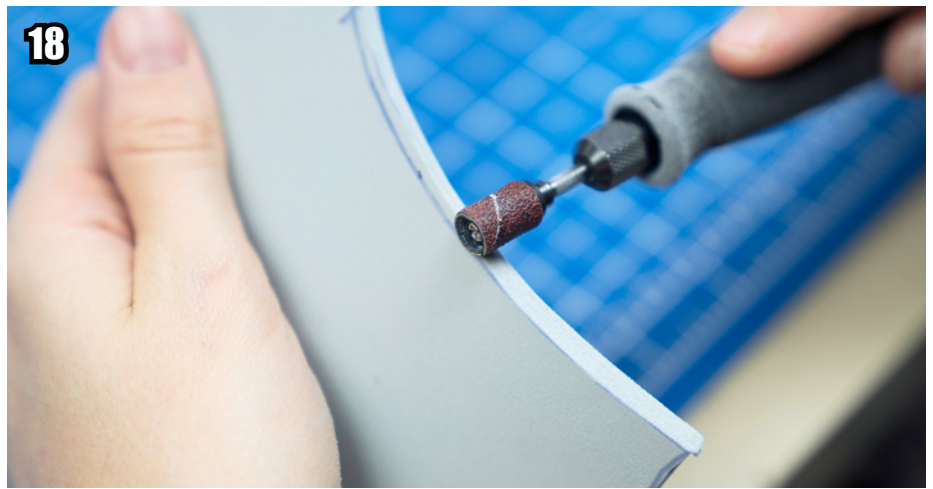
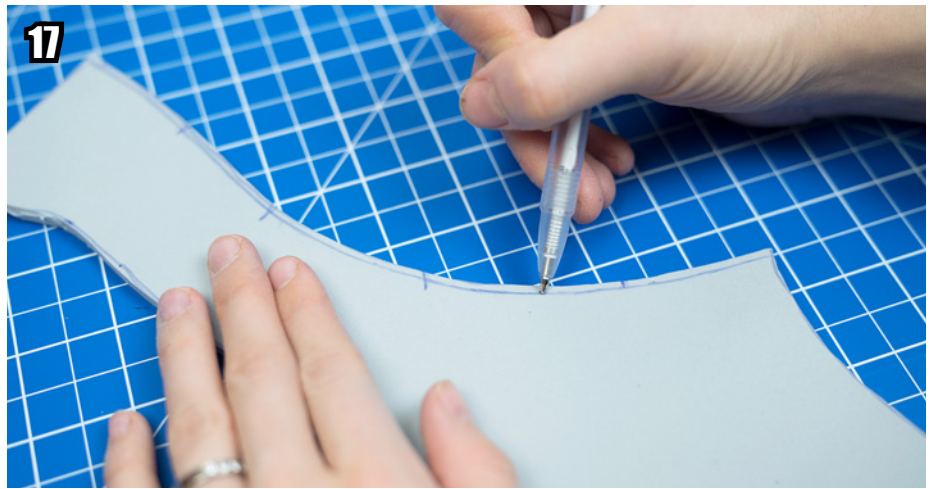
## Heat shaping the foam

To turn my pattern into a nice round boobie shape, there was one further step I had to take. Heat shaping my foam! I grabbed my trusty hot air gun and evenly heated up the foam from both sides [12]. Then I took a clear acrylic sphere (anything else round shaped from your household works as well) [13] and pressed my foam over the dome while it was still hot [14]. Foam actually cools down pretty quickly, so hurry up with this part! It's important to hold the shape in this position until it has completely cooled down again. I often use some tape to secure it in place and wait for at least five to ten minutes just to be sure it doesn't deform again. It's well worth the hassle though because afterwards your foam will look nice and round [15]!

Keep in mind that different foams also have different heat shaping abilities. Some products will be super easy to shape with minimal effort while others might be more reluctant to change their form. An alternative to dragging your hot foam over a sphere is to push it into a round shape with your fist. Works as well! Just stay curious and keep your eyes and mind open to other creative ways of heat shaping your foam!

Now that I had some nice round boobie cups, I only needed to fix the glue seam. It's almost impossible to connect two pieces in such a perfect way that neither excess glue was squished out nor one of the two parts slightly overlaps the other. I just fetched my Dremel and carefully cleaned the seam until the surface was completely even [16]. Maximum speed and a fine grit are the way to go. Don't worry if it looks a little rough after you sanded it. We will fix this in a bit!

After I was finished with my boobie cups, I still had to attach them to the rest of my breastplate. Since they had to be connected at an angle, it was first necessary to bevel their edges with my Dremel. This part isn't rocket science and doesn't have to be very exact, so I just held both parts up and guessed. I drew on a line to mark the area I needed to sand away **[17]** and then dremeled the material a bit **[18]**. I always do long and fast movements on maximum speed - never resting my Dremel on the same spot for too long. This way I'm able to create a nice and even edge, which I can easily glue together afterwards **[19]**. Finally I repeated this for the other side as well and the basic shape of my breastplate was done **[20]**: Yay!



## NOTE

Contact cement often comes in big cans and dries out pretty quickly when left open. Additionally its fumes are flammable and quite toxic. Not the best conditions, right? To solve both of these problems at once, I actually fill my contact cement into little squeeze bottles. I'm using an old spoon, but a funnel made out of paper, Worbla or aluminum foil probably works even better. I also fill up a few bottles at the same time to always have some glue available when I need it. Keep in mind though that after some time your half empty bottle will still dry out since there is a lot of air inside.

## More handy foam tips

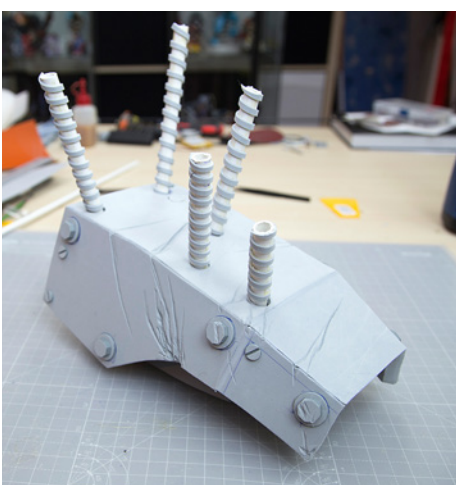
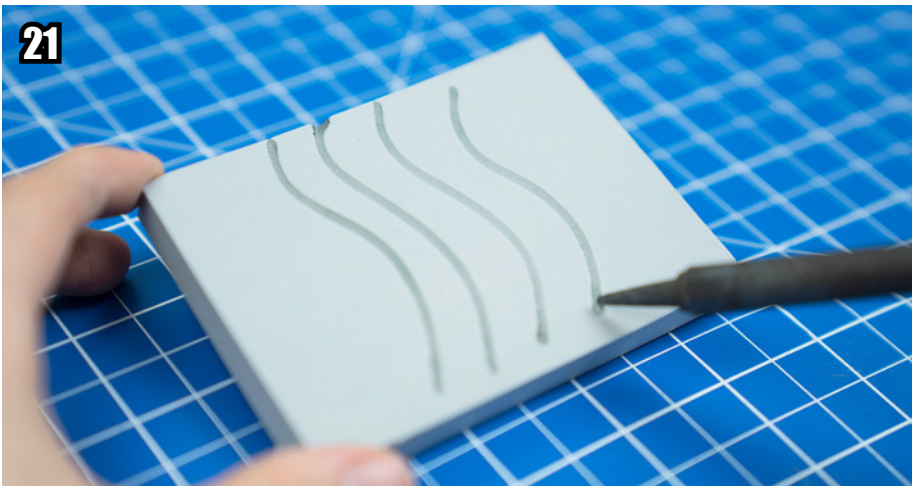
It's useful to know that EVA foam can be burned with a soldering iron too [21]. You can create a lot of cool textures or details this way! If you plan to do this regularly, I suggest buying a cheap wood burning tool or soldering iron just for that job. You probably won't be able to solder any more wires with it after a while. Also keep in mind that the fumes are very toxic and this should only be done in a very well-ventilated area or outside. You'll see how I used this technique later in this book for my Monster Hunter costume.

While heat shaping works wonders on EVA foam, it's actually quite likely that the material will try to get back into its original shape after some time. Later in this book you'll see that applying several layers of primer will prevent that. Another solution is actually to stack several layers of foam over each other [22]. As you can see in the picture on the left, every new layer on top is slightly larger. By heat shaping all layers before and gluing them together already rounded, they won't be able to lose these curves ever again. This is the reason why I mostly prefer to work with 5mm EVA foam. I'm using one layer for the base and build up the thickness with additional 5mm pieces. This will keep their shape for a long time.

Another amazing product I only found out about a day before I wanted to finish this book is Foam Clay [23]. Wait, clay you ask? Yes, clay! Air drying foam clay! You just grab, squeeze (I love squeezing it), shape and sculpt it like regular clay or even press it into a mold! Within 48 hours it has dried into real foam. This means, you can cut, sand and even heat it up and shape it again. In addition the result is extremely lightweight and just as affordable as regular EVA foam. It's pretty amazing stuff really and I can't wait to use it in my future projects!

## NOTE

Your Dremel is the perfect tool to add battle damage. Instead of just painting on scratches and cracks, it looks far more convincing if you swing your Dremel a few times over your armor. Just don't be scared to harm and even destroy your precious costume piece. If you build a battle worn armor, then it should also look like it has seen some fights, right? As you might imagine, I had quite some fun with my Fallout foam costume.



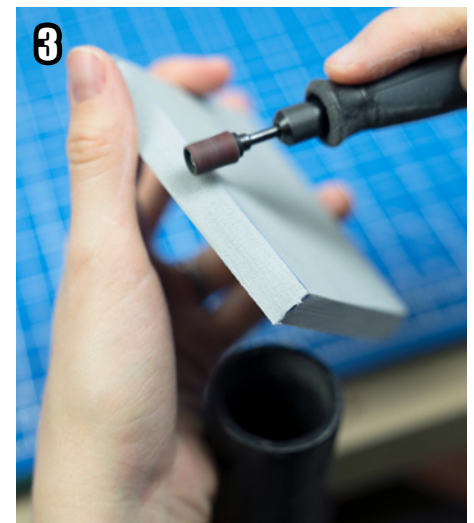
# Become a Dremel master!

I love my Dremel! It's handy, it's versatile and it makes my projects look way better. You'll already get a nice version for about \$30 (25€) on Amazon, so no need to spend a fortune. Each different tip gives you countless new possibilities for creating details, textures or even sculpting entire three-dimensional foam carvings.

Aside from that you can turn your Dremel into a little saw, a polishing tool, a drill and far more - just attach a different tip and go wild! I would only stay away from the wireless Dremels, since excessive sanding work constantly kills the battery. There is nothing more annoying than having to wait for your tool to recharge while you want to continue working. Also, some Dremels are quite big, especially for smaller feminine hands. Think about getting a Dremel snake (flexible shaft attachment)! It limits the vibration and is much easier to work with **[1]**.

The most useful tip for me is the sanding drum (the grindstone is okay too). It's just a piece of sanding paper glued to a cylinder and you can easily replace it at any point. You find them in different grits too. The higher the number, the finer the sanding. I mainly work with 120, which is good enough for details, but also works for huge sanding jobs. While it's great for high density EVA foam, it might be too rough for softer materials however- better check your own foam!

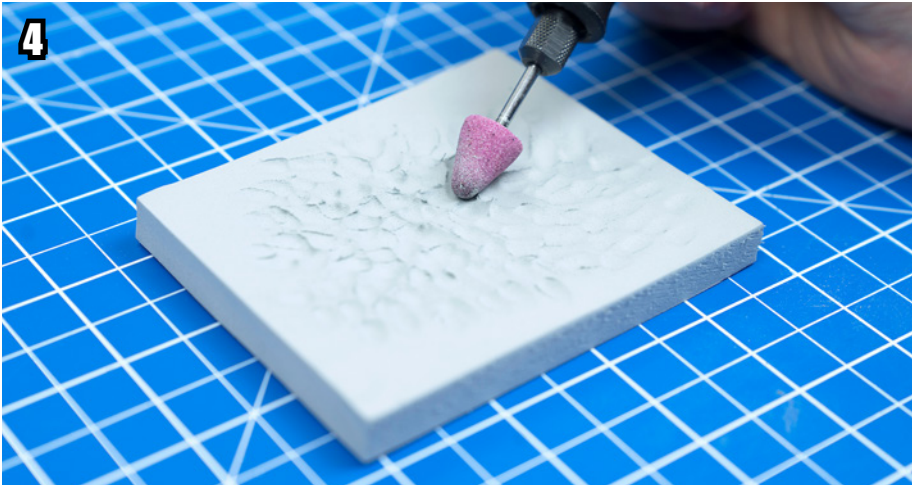
As a beginner and even as an experienced crafter it's always a good idea to mark the area you want to remove. This gives you more control over the final result and makes the whole step less stressful **[2]**. Remember: Dremel fast and never stay on the same spot for too long **[3]**.



## NOTE

Foam dust is really nasty and bad for your health. That's why I always have my vacuum hose right next to where I sand. It immediately gets sucked away. This can become a problem however, especially if you have to work on really small pieces. One slip and they are gone too! Luckily I have a really smart (and handsome - edit by Benni) husband, who 3D printed this little hose attachment for me. No more lost pieces! You can also use a mesh fabric but it might get clogged after a while.



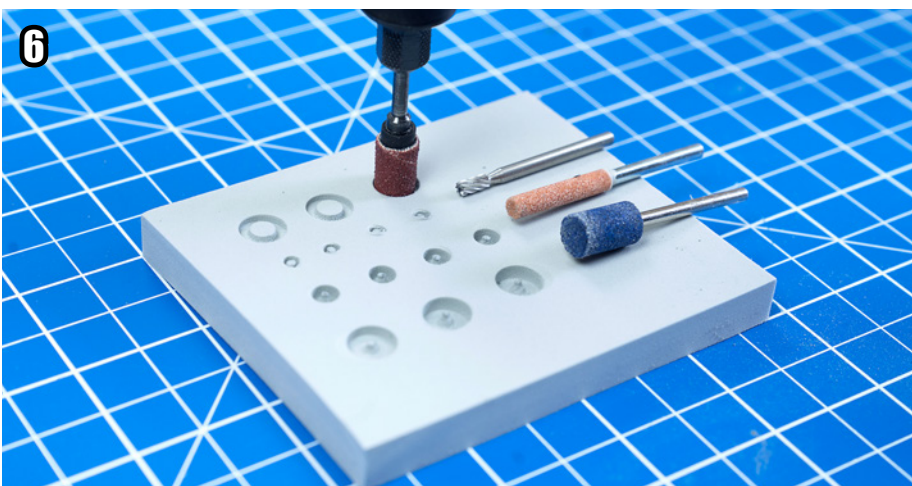
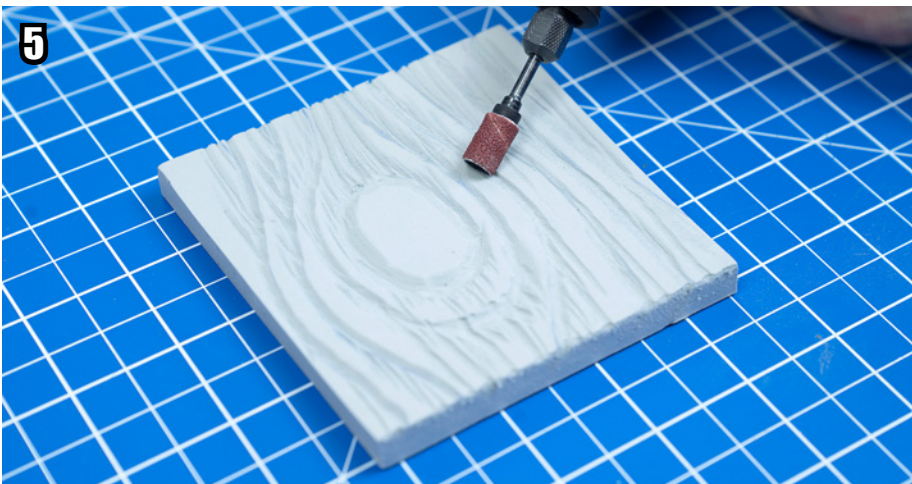


## Try everything

Every new tip grants you a new way to shape your foam. Using a round grinding tip for example, allows you to turn your plain gray foam into hammered steel [4]. It may not look like much now, but with the right paint-job you can turn this boring piece into very convincing metal. If you're curious, I've written about several cool painting techniques in my [Advanced Painting Book](#).

Here is another example: if you only use the tilted edge of a sanding drum, you can create wood or other organic looking shapes [5]. It may take a bit of practice but the possibilities are really endless.

Turn your sanding bits to a 90 degree angle and press them into the foam from above and you get cool rivets [6]! Since the Dremel tip will only sand into the material on the outer edges but leave the middle unharmed you also can use this to create screws or other technical looking details.



## NOTE

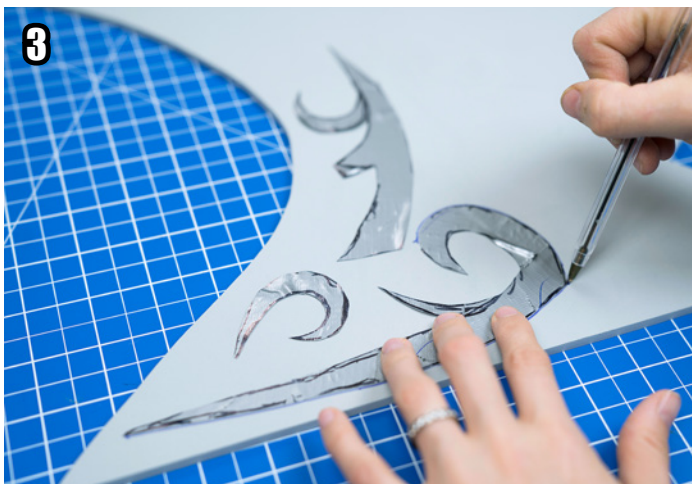
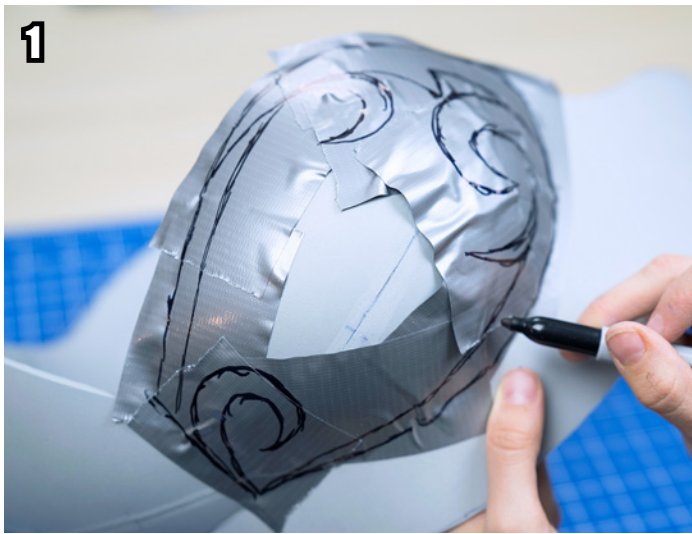
Over the years I've grown my Dremel tip collection quite a bit. I bought pretty much everything I found and store a good amount of replacement sanding drums and different grits and sizes. Just... in case, you know! A big pack of 100 drums only cost a few bucks on ebay. Always stay on the lookout for new Dremel tips. You never know what amazing details you could make with them!

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# It's all in the details, baby!

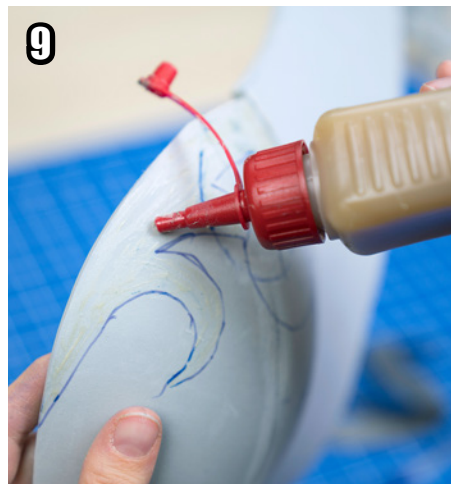
While the largest costume will still look boring without details, you can even turn a small and simple project into something awesome with the right amount of extra effort. My favorite technique for foam details is to glue on additional beveled pieces. They can be simple and straight or intricate and swirly. Both of them will involve a lot of sanding.

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For my breastplate I wanted to create a few clean looking swirly ornaments. As you can see on the previous page, I first covered the boobie cup in additional duct tape and drew on all the shapes I needed **[1]**. Then I removed the tape and cut my newly created detail pattern out with a pair of scissors **[2]**. Afterwards I traced them on more of my gray 5mm EVA foam **[3]**. So far, so familiar, right? I cut these out as well and marked them all with a line in the middle **[4-5]**. This was just my orientation for the next step. I set my Dremel to maximum speed and carefully sanded a beveled edge until I reached the marked line from both sides **[6]**.



Finally, I had to heat seal the material with my hot air gun **[7]**. Using a Dremel on foam is never very smooth. It always turns the surface rough and fuzzy. Hitting it with a heat gun for a few seconds however will make it better. The little foam lint will melt, the surface will even out and the tiny surface pores will close. Be cautious though, different foam types melt differently. My gray high density EVA foam for example turns very smooth through heat while others barely melt at all. You'll need a thick coat of primer to create a nice surface on those. Just make sure to test this before you choose your foam for a project.



To apply my finished ornaments I marked their position on the breastplate with a ballpoint pen and filled this area with contact cement **[8-9]**. The backside of my detail piece also got some glue as well. Next, I carefully pressed on every part **[10]** and finished the borders of my breastplate with additional strips of 2mm foam **[11]**. Despite being pretty thin, I also had to cut them out in a specific shape. Gluing straight stripes on curves might result in ugly wrinkles otherwise.



After this, I only worked over a couple of more spots with my Dremel and then heated up the entire breastplate one last time to bring it into its final shape - all details included. I also secured the back with duct tape, so it wouldn't move back into its original shape again. Applying the primer, which is our next step, might deform it again and I wanted to prevent that.

# Prime time!

EVA foam should always be heat sealed and primed before you paint it. If you apply color directly to the raw material, it's quite possible that the pores of the foam will soak it right in. A good product also conceals the texture of your foam a bit, so that your result looks even smoother. With no primer your paint job might crack, chip or rub off. Since foam is flexible, you also need to use a flexible primer.

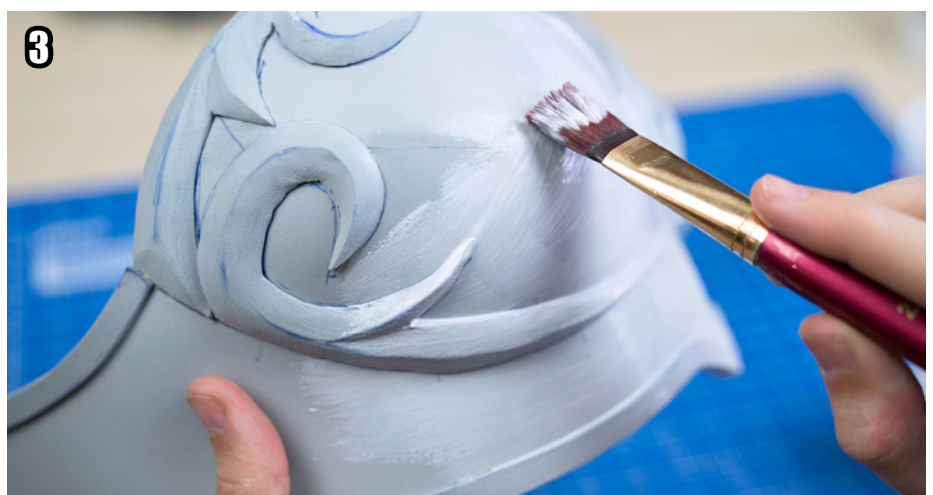
Before I could prime my breastplate, I first had to do something about the annoying boob seam. By dremeling over this connection and especially while heat sealing the foam during my last work step, the seam opened up quite a bit and looked really rough. To fix that I used a product called Kwik Seal. I just put a tiny bit of it on my fingertip and smeared it over the seam **[1]**. Kwik Seal is water based, so to smooth it out I only had to dip my finger in water and clean it up afterwards. Once it dried out (it shrinks a bit), I repeated this step a second time and finally got a nice and shiny surface with no more visible seam **[2]**.

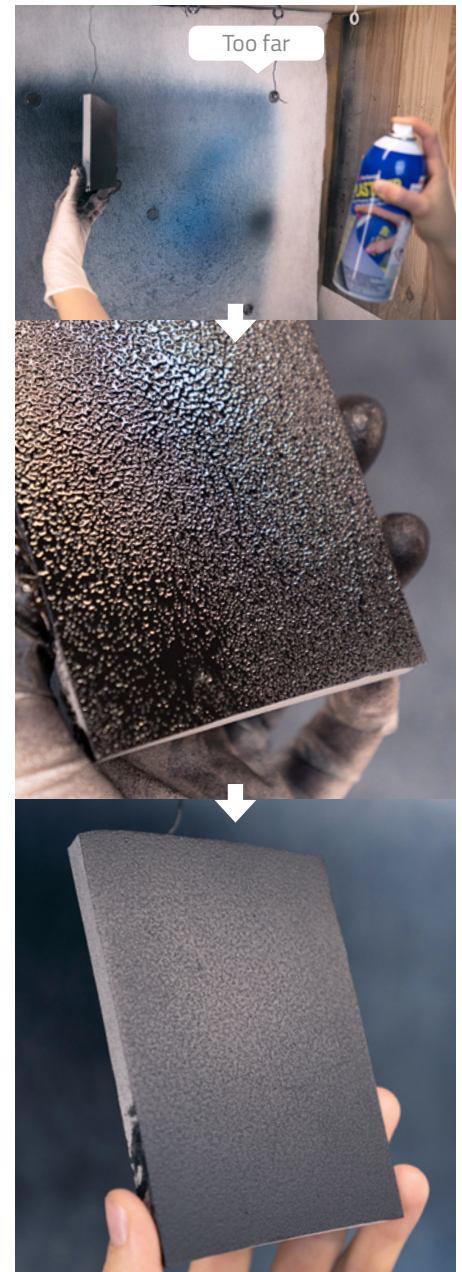
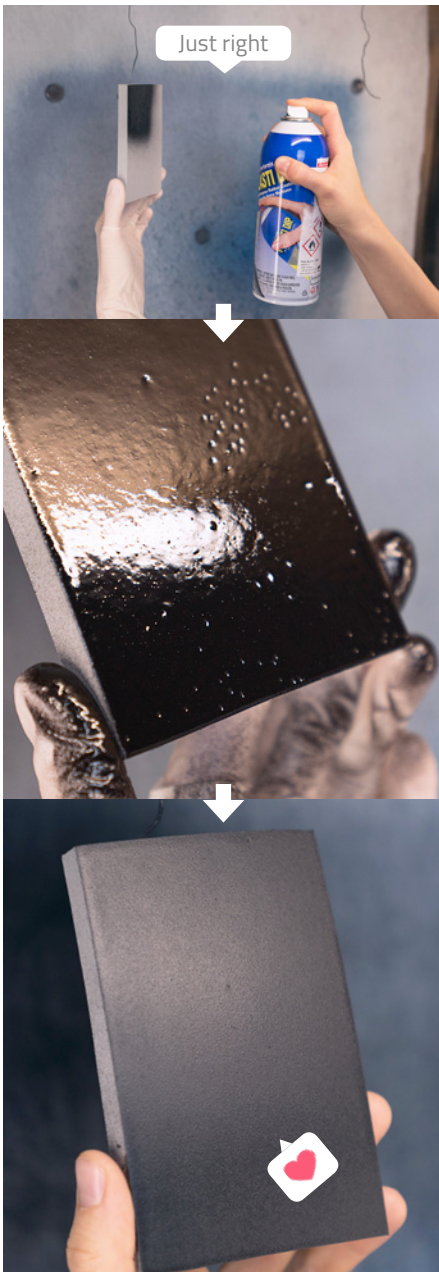
To keep this example as simple and cheap as possible, I chose to use Flexbond as a primer. Flexbond is a brush-on primer similar to white glue (PVA glue). The big difference however is that it stays flexible when dry - perfect for foam! I grabbed a big brush and dunked it into a cup of Flexbond. Then I applied it nice and evenly all over my breastplate **[3]**. Your application should be thick and covering, but be careful that it doesn't drip. Any drops that dry out will create nasty bumps. If you see one, dip your finger into water and smooth it out again. While the primer is still white at the beginning, it will turn translucent once it dries out. This is your cue to apply the next layer. I'm using three layers in total, since the result makes my foam more stiff and the surface nice and shiny.

And that's pretty much all you need to know about priming with Flexbond. It's really easy and you can use the opportunity to finally zone out a little bit. I only say Netflix and prime!

## NOTE

One alternative to Flexbond is called Flexipaint. Both are very similar products. Many crafting stores actually offer flexible foam primers. They all use different names however. Just keep your eyes open!





## PlastiDip like a pro

Another option to prime your foam is the spray on rubber PlastiDip. It's originally from the automotive industry, so check that section in your hardware store if you want to find it. While you are able to smoothly prime a full set of armor in a really short amount of time, you need a special place to do it (please don't do it in your living room). Not only does it release toxic and flammable fumes, it also needs special waste disposal. Also note, that PlastiDip doesn't fill gaps and smooth out rough surfaces like Flexbond. And above all that, is not even that easy to handle. So, while I kept the Flexbond section quite short and simple, I wanted to cover PlastiDip in a bit more detail.

It's very important to spray PlastiDip only in a well ventilated area. This means outside, in an open garage, or, like in my case, in a special spray booth that sucks out the fumes.

Once you've found a fitting work area, grab some hot water (not boiling hot, just tap water hot) and warm up your spray can. This step is essential for a smooth application and to avoid nasty splatters. Next shake it like a crazy corgi for at least one minute and begin applying your primer at around 15-20cm (6-8 inches) distance. Start spraying a little bit next to your foam (so you don't get drips on your surface) and then move across your piece and back again. Do this until it's completely covered in a nice and shiny coat. A few bubbles are okay. Now let it dry and apply two more layers the same way. This should be enough to give you durability and stiffness.

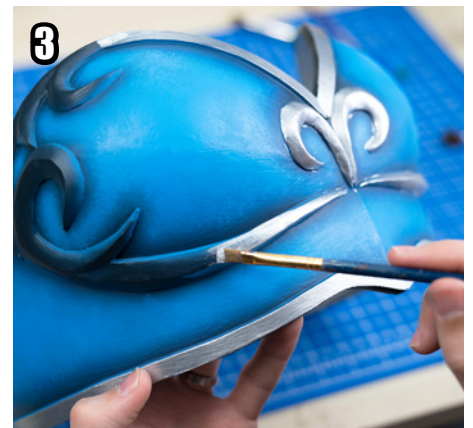
Applying PlastiDip sadly isn't that easy every time. Only a slight difference in the distance of your can, the room temperature, or humidity can change or even completely ruin the result.

Always do a test sample on a scrap of foam before priming your precious armor piece! Apply your PlastiDip too close or too thick, and you'll get nasty and drippy bubbles all over. Apply it too far away, and it will dry before it even hits your foam. This in turn will lead to a spotty and textured surface and might even look dusty in some cases. Very annoying! If it's very humid, you might get bubbles no matter what you do! PlastiDip is not an exact science. You can try to fix bubbles or textures with some acetone, but it's far from an optimal solution. It also comes in different colors, transparent and as a brush-on. While they may be handy for some projects, it's even more difficult to apply them smoothly. I'm personally not a fan and just stick to the black spray cans.

If it works, there really is no better way to prime your foam evenly, smooth and fast. Don't want to take that risk? Just go with Flexbond!

# Now let's give it some color

Since I already have two books out about painting, I won't dive into much detail here. When it comes to color you can really go all out. Create complicated patterns, use an airbrush, apply special effects and all that. The most important part when painting EVA foam, however, is to only use flexible paint.



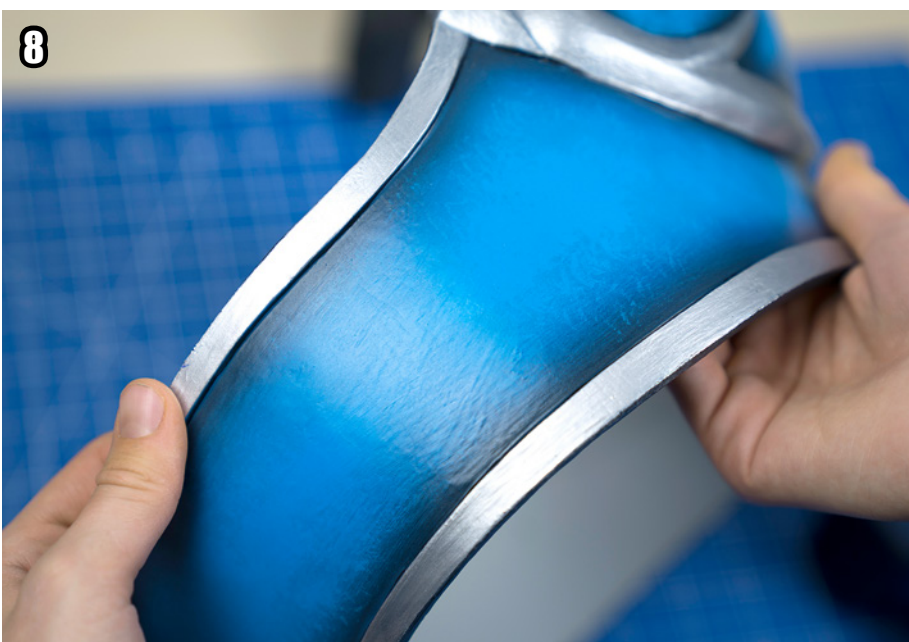
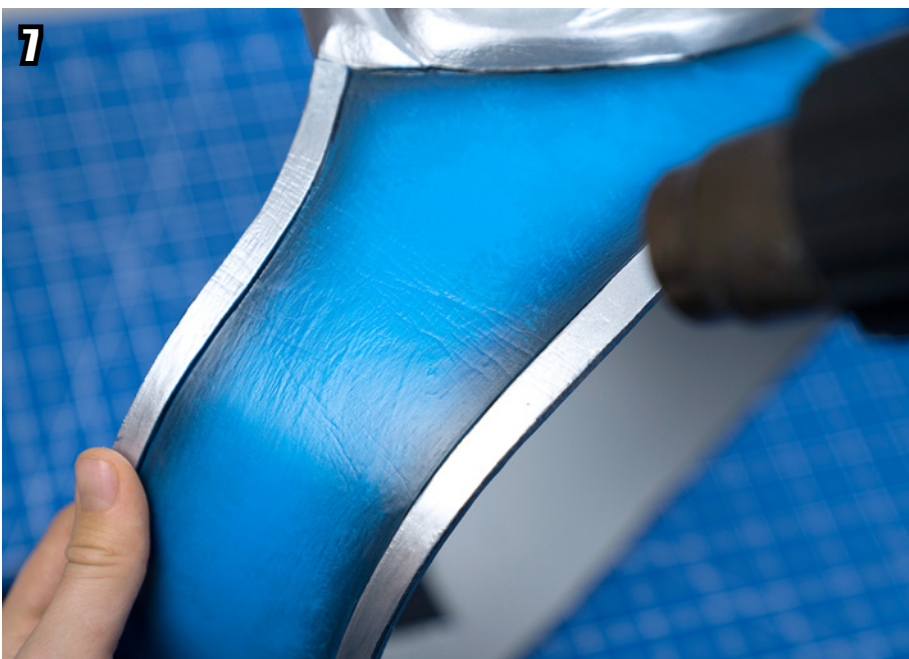
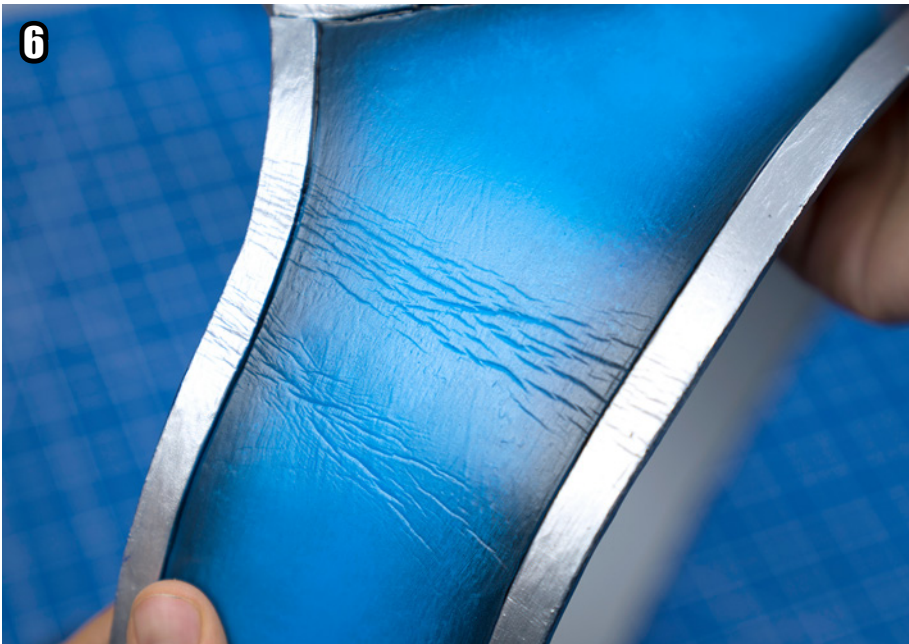
When painting foam, I only use acrylic colors. You can either brush them on or use an airbrush for that. Both techniques work equally well and they both have their advantages and disadvantages. For the sake of this example however I decided to go with the cheapest option, which is with a regular brush. I started by applying a layer of dark shadowy blue first [1]. If you want to have as few brush strokes visible as possible, I recommend using a high quality brush or even a make-up brush.

Next I added brighter blue highlights by dabbing some color in the center of my shapes [2]. Once I was done, I took a smaller brush and some

high pigmented silver paint and applied it to my detail swirls [3]. Make sure to check out my [Book of Cosplay Painting](#) for more instructions. Keep in mind to avoid any paints that might crack. Lacquers, spray paints or even some water based colors don't like to be squished or twisted.

The same applies to varnishes. To seal my finished paint job and make it waterproof, I applied a thick layer of satin gloss spray varnish [4-5]. The brand I use is a German product called LUKAS, which is also acrylic based. It works fine on flexible foam but I also tried other brands that didn't like to be flexed at all.

As always, just try out the products you have available locally, until you find something that work for you! Pro-tip: don't try to use clear PlastiDip as your varnish. It will dry really milky and ruin your paint job.



## Fixing foam wrinkles

If you kept your primer, paint and varnish flexible, you don't need to worry about chipped or cracked paint anymore. Did you know however that the other big advantage is, that you can also easily repair your wrinkled armor with just a little bit of heat?

Many cosplayers have been there. You want to go to a convention and only have like two minutes to pack. So you throw your newly built foam armor into your suitcase and rush to the convention. After you've arrived, you open up your luggage again and - oh no! Your shiny foam armor is full of wrinkles **[6]**! What now? It's easy! Just grab your heat gun and set it to low power. Swing it fast and carefully over the messed up area but don't linger too long on one spot **[7]**. You'll notice pretty quick that your wrinkles start to magically disappear and are completely gone after just a few seconds **[8]**. This works for Flexbond as well as for PlastiDip. As long as you have a heat gun with you, your foam costume will always look like new!

Just be careful you don't heat up the same area of the material too much. Otherwise the air inside your foam might expand and create bubbles that will be stuck under your primer. This means high density EVA foam with small pores is easier to fix than sheets with larger visible pores.

Watch my video about priming EVA foam:  
<https://youtu.be/ROZIkW96hFI>

### NOTE

I can only repeat what I already said: make sure to test all this before. As mentioned, you need the right primer, the right paint and the right varnish, which all can be heated up. This doesn't work with white glue or spray paint for example. As long as you have the right combination though, your costume is save for the future!



## Attaching armor pieces to your body

EVA foam is super soft and lightweight, so luckily your attachments don't need to be very strong to do their job. A few small velcro pieces here, and a bit of hot glue there, and you are good to go! So don't panic, this part is really quick and easy!

My favorite solution to attach any kind of foam armor is a combination of velcro tape, belts and hot glue. For my example, I started by sewing one side of the velcro to a short fabric belt and hot glued it to the inside on the back of my breastplate. The velcro counterpart was then glued directly to the other side so that I could connect those two pieces and close the breastplate **[1]**. It's important here to keep the rough side with the tiny hooks *away* from your skin, since you can get hurt or your fabric underneath might get destroyed if it rubs against it.

In addition to the attachments on the back, I also placed two more belts over my shoulders like an X. For this part I'm attaching one piece of the velcro inside the boobie cups, do a short test fitting to figure out the right length of the belts, and then glue them permanently to the back afterwards **[2-3]**. I'm also reinforcing the velcro with a *lot* of hot glue all around. I'm using a cross shape here, since it prevents my belts from sliding down sideways and gives me the opportunity to mount additional shoulder armor on top.

Without pauldrons, the shoulder belts wouldn't even be necessary. However, I still wanted to show you how they look, just in case. The breastplate is actually light enough that the little piece of velcro in the back is enough to hold it into place. Or you could use translucent bra holders instead. Keep in mind that this is just one possible suggestion and you might even find a better solution for your own armor attachment!



One of my favorite methods to attach bracers, leg armor and other skin tight mounted pieces works with fabric. In the pictures on the left you can see a fabric bracer, which I sewed out of cheap jersey. Using elastic fabric makes the fit extra tight and comfy at the same time. To fasten the material around my arm, I added velcro to both sides [4]. There also is a strip of velcro on the back of my arm and on the foam piece I want to attach [5]. Just imagine it's a beautifully detailed foam bracer. Always attach the fuzzy side to the fabric, not the hook side, otherwise you might ruin your costume if you throw it together with the other fabric parts in a box later. Also make sure to cover all the edges around in additional hot glue. If only one little corner gets loose, the whole piece will come off really fast. If all that is right, I just need to press my unbelievably intricate bracer to my arm - and it's attached safe and sound!

I also like to work with belts and D-rings. If you've read my [Book of Cosplay Armor Making](#) with Worbla, you might remember this attachment technique. One belt with a D-ring gets sewn onto my fabric suit and one belt with two pieces of velcro gets glued to my armor piece [6]. Boom! The armor holds perfectly!

For smaller pieces even magnets can be enough for the attachment! Neodymium (rare earth) magnets work best. One magnet gets glued onto fabric and then covered with an additional piece on top. The other one gets hot glued to the EVA foam [7]. You can dremel a little hole to keep it in place. Pretty easy right?



## NOTE

I know some people like to use snap buckles. They are available in all kinds of sizes, colors and shapes. I'm using them only rarely since I find velcro to be much more convenient, but they might give you new ideas for your own projects. There are a million different ways to create a costume attachment.

# Medion - Erazer Girl

Erazer Girl is the brand mascot of the German PC supplier Medion and was one of my commissions in 2017. My customer wanted to have a fully armored suit that was comfy, easy to get into, simple to repair and a breeze to travel with. Obviously EVA foam was the perfect material for this project.

Since the original design looked more like a female cyborg than a human being in a bodysuit, I wanted the armor pieces to be very skintight and fitting. I also didn't want any attachment to be visible between the armor and the black bodysuit underneath.

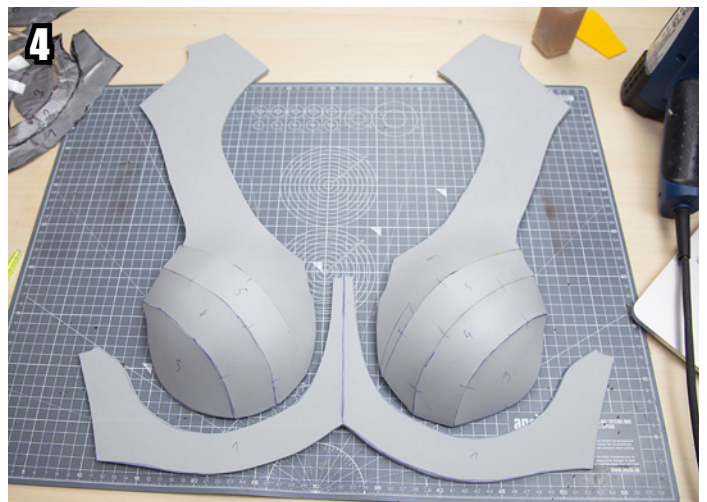
How did I begin with the project? You guessed it! Plastic wrap and duct tape! Since all armor parts were supposed to be tight, I luckily only had to draw on the patterns. I sketched all necessary details directly on the tape and already thought about how I would add more interesting layers afterwards [1].

Sadly my favorite high density foam is not especially flexible. While this wasn't a problem for most of the costume pieces, I had to separate the boobie cups into four separate slices to create the round shape I needed for the breastplate.

Next, I cut myself free and the patterns out [2]. I traced them to 5mm foam, cut them out too, and then started gluing the cups together [3-4]. They were still pretty angular, so just like for my previous example in this book, I heated them up and dragged them over an acrylic sphere.

After dremeling the ugly seams away, the result was pretty clean and I was able to connect the cups to the rest of the breastplate.

To be able to get into the armor piece, I separated it into a front and back piece, which I connected with velcro under my armpits and over my shoulders. I attached the velcro strips only at the very end, so for my first fitting test, I simply used more tape to hold it in place as you can see on the next page [5].





Before painting, I heat sealed the surface and primed them with three thick layers of PlastiDip (Flexbond would have worked as well of course, but we were in bit of a hurry). Afterwards Benni airbrushed the breastplate in a dark metallic blue and gave it an even more interesting texture with some laser cut tape stencils [6]. One tiny bottle of Vallejo airbrush colors really goes a long way too. We painted this entire armor set with only five little bottles. Each of only them costs around \$3 (2.50€) so as you can see, a fancy paint job doesn't have to be expensive.

The only thing missing now was some satin gloss spray varnish and my sci-fi breastplate was done!

## NOTE

If you compare this breastplate with the one from before, you'll notice that their patterns are quite different. This shows that even similar costume pieces can be constructed in completely individual ways. There is no right or wrong way to do it. When it comes to pattern making, simply place your seams where it feels right. Try to separate the curves where they are the roundest though. As you can see on the right, my Erazer Girl breastplate consisted out of a front and a back piece, while some of my other examples go all around my body. Both ways work and it's up to you what you prefer!



## EVA foam panties

Here is one thing you never knew you wanted - foam panties! I feel like I'm repeating myself, but you can really use the tape technique for pretty much everything. Here I even wrapped my butt in tape and drew on some panty patterns [7]. You can imagine that Benni didn't complain about helping me draw those lines. After that I cut them out, copied all shapes to 5mm EVA foam and glued them together [8]. Since I still had to get

in somehow, I separated my panties into a front and back piece. After priming them both with PlastiDip and painting them, I glued velcro at the sides and especially stack them into each other so they are flat for traveling. I really love how comfy they turned out [9-10]!

## NOTE

If you have to make armor panties for your costume, using foam is a really good idea. Since Worbla is pretty heavy and sturdy, it will constantly slide down and rub against the inside of your thighs. Super uncomfortable! With foam panties however you can run and jump around and barely notice them. Sitting is also no problem! You get wrinkles after a while? Just fix them with heat!



## Flexible shoe covers

Creating the armor for my shoes worked similarly but also a bit different. I used a combination of 2mm and 5mm EVA foam for example. To get the patterns for the armor, I covered the shoe completely in tape and drew on all the shapes **[11]**. So far, so good. Instead of simply gluing all pieces directly on my shoe however, I also sewed a well fitting fabric shoe cover out of stretch vinyl **[12]**. This handy shoe-sock is closed with a strip of velcro at the back and can be put on and off the shoe within seconds.

Following that, I heat shaped my primed, painted and sealed foam pieces and glued them onto my shoe cover using fabric glue **[13]**. My favorite product for this is Gutermann HT2 fabric glue. I kept on working until all the parts were attached and then repeated the same process for the second boot as well **[14]**. As a final work step I traced the bottom shape of my shoe to a piece of sole rubber, cut it out and glued it on as well. Without this extra protection, the fabric might not hold on for quite as long. *These boots are made for walking* after all.

## NOTE

I'm actually using this little trick quite often for my costumes. By creating boot covers, I'm able to turn a single pair of shoes into dozens of variations. This way I'm always wearing my favorite pair of comfy shoes and even save some money since I don't need to buy new ones for every new costume. I can even travel to a convention with three different outfits but bring only one pair of shoes!

## Foam fabric bracer

To create the bracer for this costume, I wrapped my arm in tape again, made a pattern, traced it on foam, primed, painted and sealed all parts. I used a combination of 2mm and 5mm foam [15-16]. After I was done with the paint job, I used the same basic pattern of my arm and traced it onto fabric. I cut it out and sewed velcro to the left and right side, so I could close it tight. To get a perfect fit, I got into the fabric bracer and covered the inner side of the foam pieces with my trusty fabric glue. The adhesive takes quite some time to dry and I had to press all foam pieces onto the fabric for several minutes, but once it dried out the bond was strong and reliable [17].

I actually used the very same technique for the shin armor and the upper leg armor. Even my gloves were made this way! Now, since you know how the whole wrapping, patterning, foam shaping and painting works, you can imagine that it wasn't actually that complicated to bring the Erazer Girl to life. It just took some patience and a lot of fabric glue.

If you're curious about how I made the armored glove [18], just check out the tutorial link below.

My video about how I built the Erazer Girl:  
<https://youtu.be/NovgPB4UAXU>

### NOTE

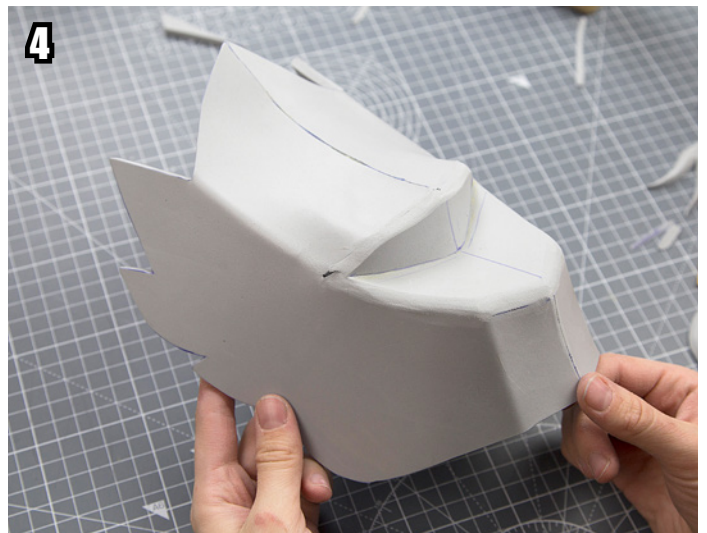
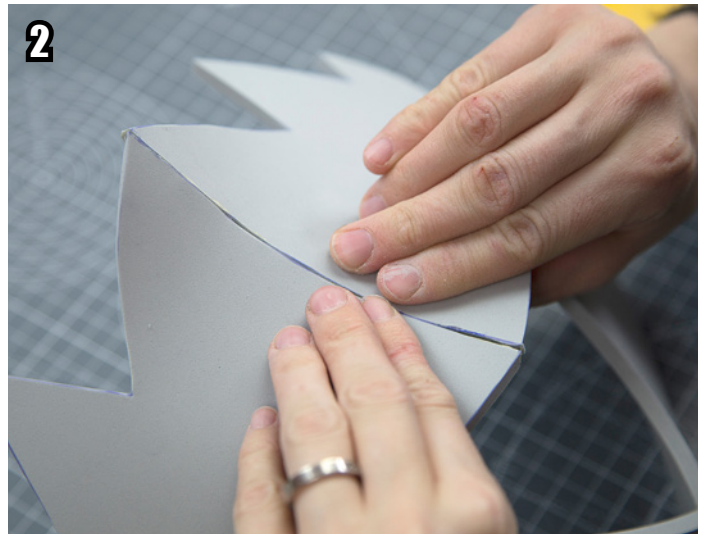
Be careful when using fabric and velcro together. The hooks might destroy your fabric quite badly. This happens especially when you are using lycra or jersey or sewed the wrong side of the velcro on. Always attach the fuzzy side to your fabric or bodysuit and the hook side to your armor pieces. Another solution is to use stretch vinyl, or a similar fabric that is not affected by velcro tape.





# FFXIV - Monk

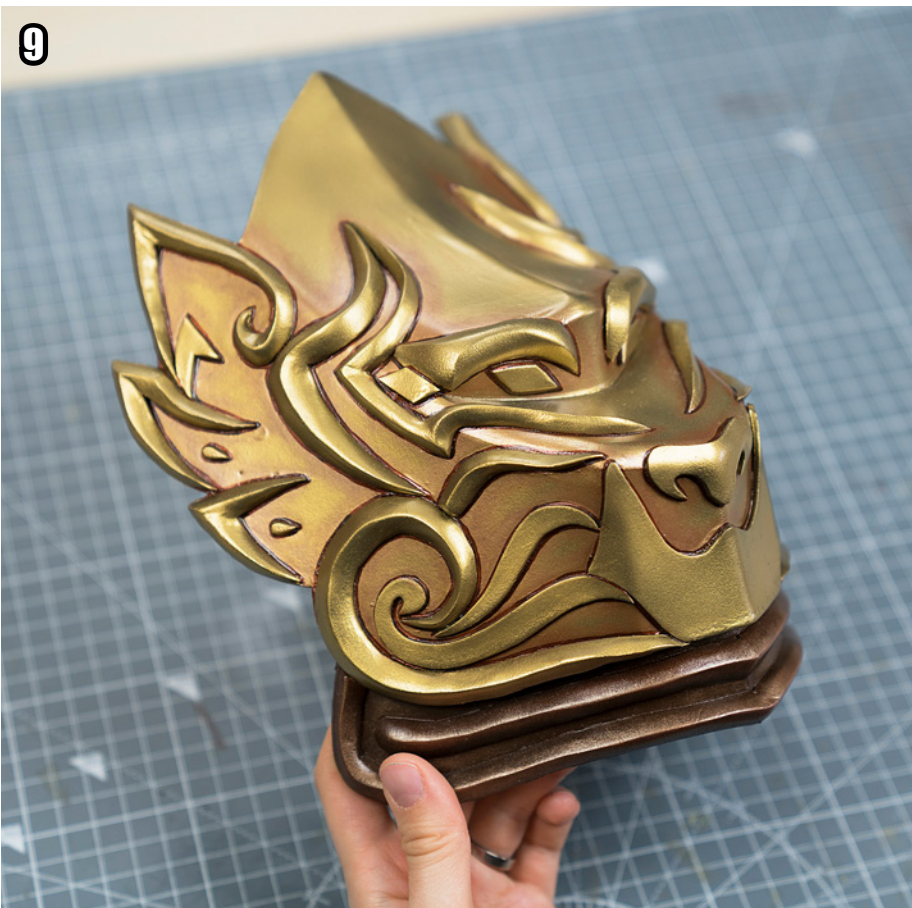
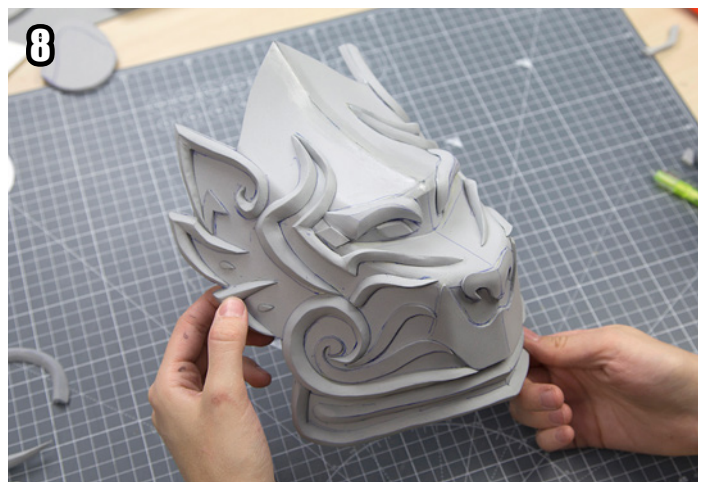
My Monk from Final Fantasy XIV was mainly a fabric costume but with a few fancy armor pieces attached to it. I wanted to mount them all directly to my dress, so lightweight EVA foam was the way to go. Sadly the shapes were also pretty complicated. No tape patterns this time!



Unlike many of my other projects, the Monk armor was very hit or miss. Most of the parts had a very abstract design and making a duct tape pattern based on my body wasn't helpful here at all. In addition all costume pieces had very intricate shapes and details that were very hard to figure out from the blurry reference artworks. My only real help was a Chinese 3D model viewer (the things you can find on Google) that allowed me to look at the parts from all sides.

After checking them carefully, I started drawing a freehand paper dummy of the basic shoulder shape on thick paper. Afterwards I cut it out, tested it, adjusted it, drew a new dummy and cut it out again. I experimented a long time, until finally I got something that was at least *close* to the shape I wanted **[1]**. The shoulders were actually supposed to look like an abstract lion head with a skull, snout and eyes. I'm sure you can see all of that in my pattern too!

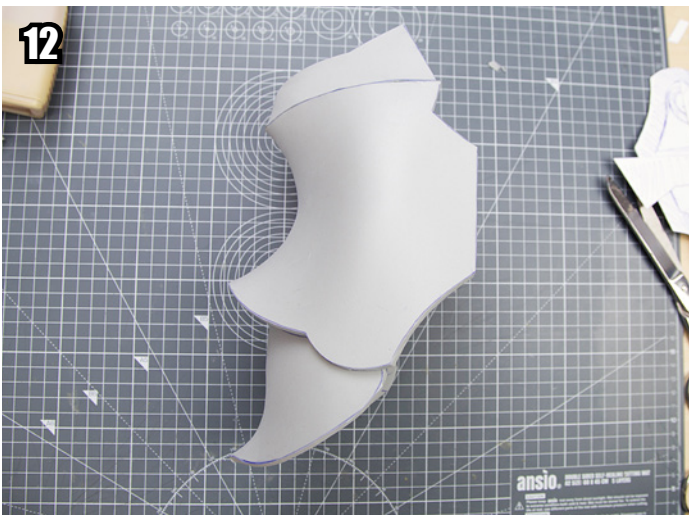
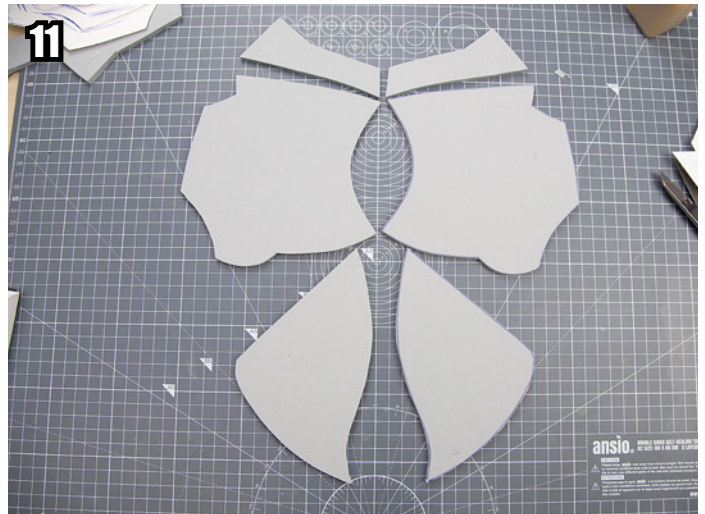
Jokes aside - once I started gluing it together the shape became much clearer **[2-4]**. Like I said, it took me quite a few tries to figure out this shape. The important thing is to not give up and keep going no matter how frustrating the process is. You can do it!



After the basic shape of my shoulder was done, the next step was to add little three dimensional ornaments. For this, I grabbed my original pattern, made a copy on paper and used it to draw on all the details. Next, I copied them to my favorite gray foam and cut them out [5].

Just like for the details on my breastplate example from earlier, I marked a middle line on the top and beveled the edges on both sides [6]. While some ornaments were simple and straight, others were winding and had hard to reach curves and angles. It took me three full days just to dremel all these ornaments (remember, I also had to make a mirrored second shoulder)! To keep my workshop and lungs nice and clean, I always wore a respirator and dremeled over the hose of my vacuum cleaner.

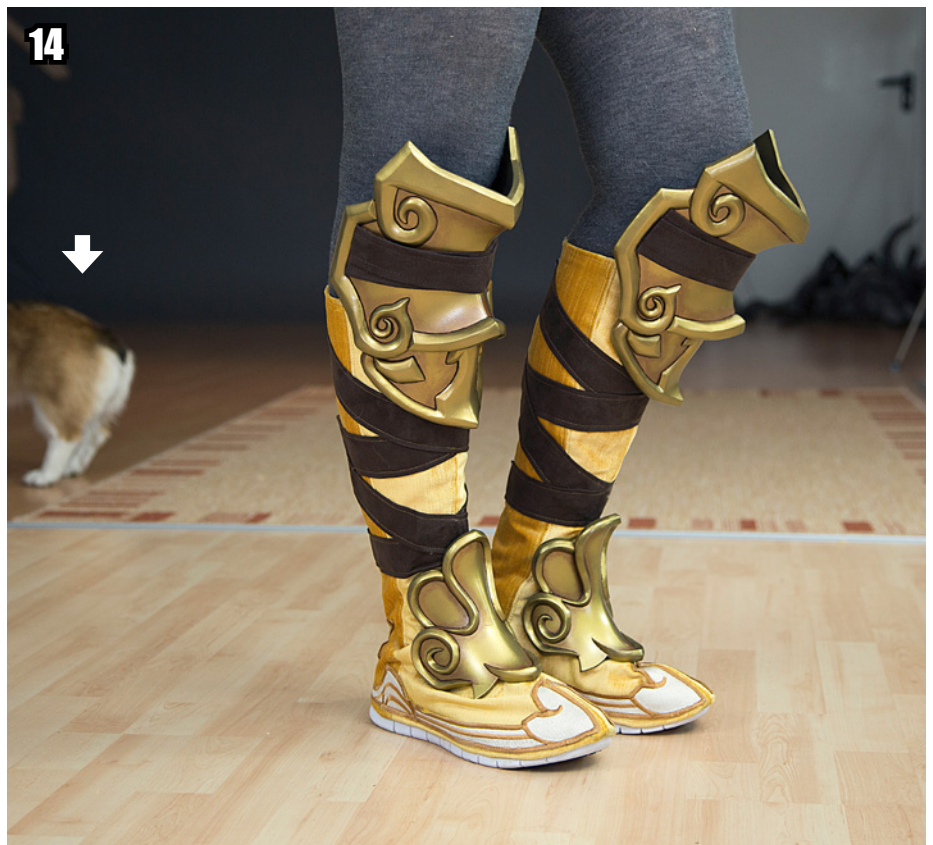
Once all parts were done, I heat sealed the foam to burn away remaining dust particles and finally glued them on [7]. Already looks more like a lion head now, right? All that was missing was a couple of PlastiDip coats and a lot of golden airbrush color [8].



I used pretty much the same approach to get the patterns for my leg armor as well. Lots of trial and error - lots of wasted paper. After a while, I decided to separate this piece into three sections **[10]**. Once I cut them out of foam and heat shaped them to look rounder, they were indeed very close to the shape I wanted **[11-12]**. A few Dremel swirls later, and this is what I got **[13]**.

The final armor pieces turned out really lightweight. A simple strip of velcro on the dress (and shoes) and one on the inside of my foam armor was already enough to attach them.

I'm still amazed how comfy foam costumes turn out to be. You can run, jump and do all kinds of stunts in them, without having to worry about your armor breaking apart or hitting you in the face. Even wearing it all day long at a convention was no problem at all.



Here is a video about my Monk armor:  
<https://youtu.be/ZMWPfVihT00>



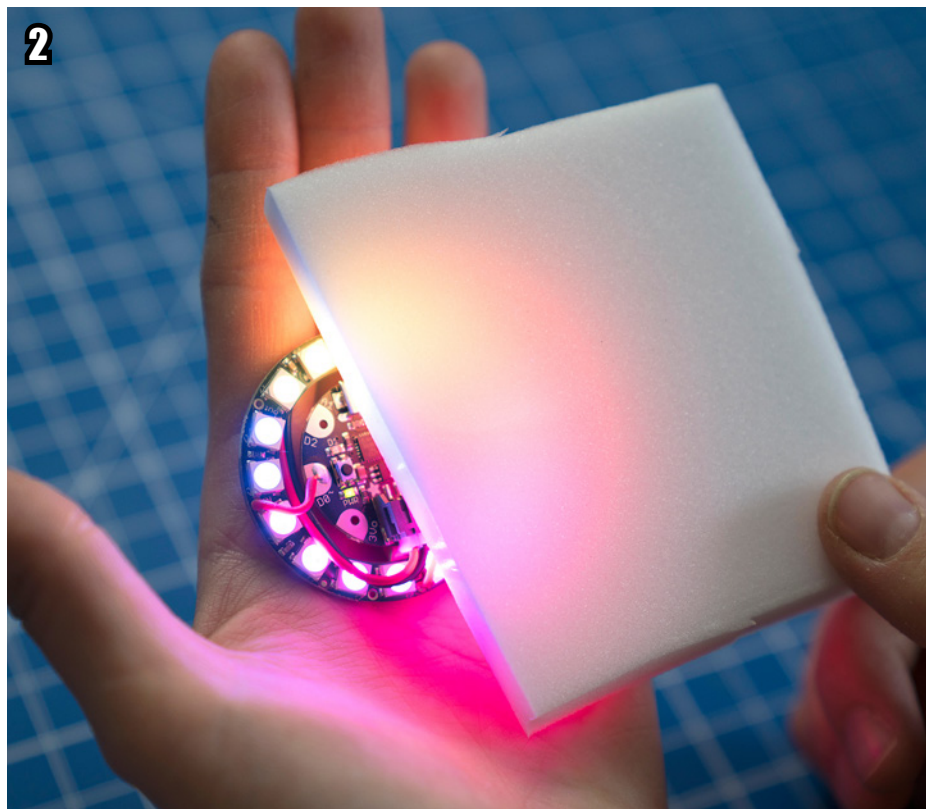
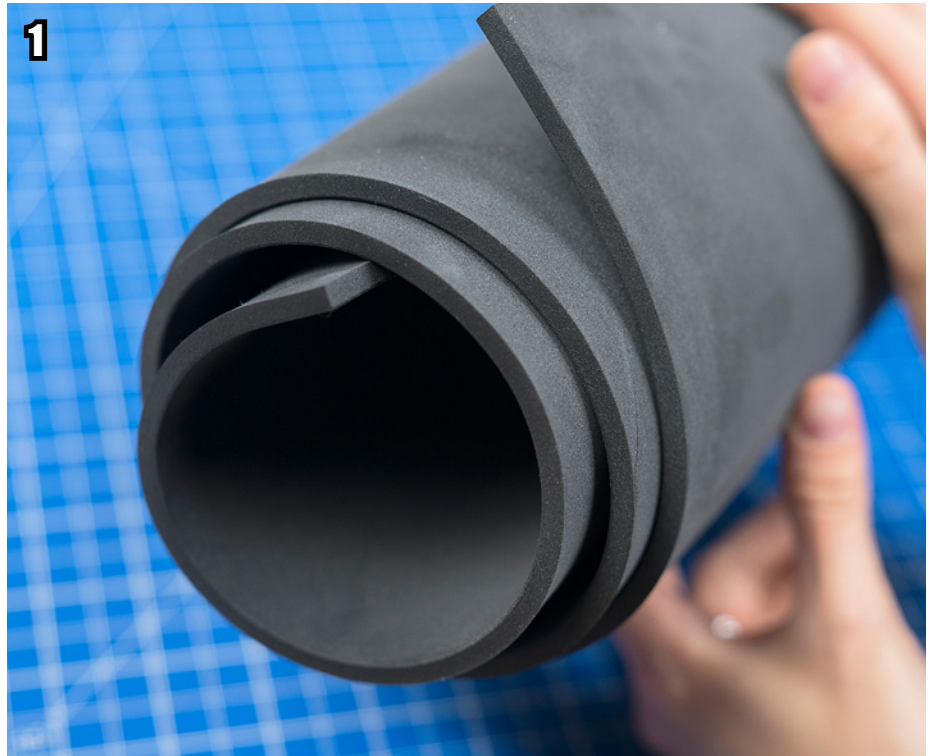
# Monster Hunter - Zinogre

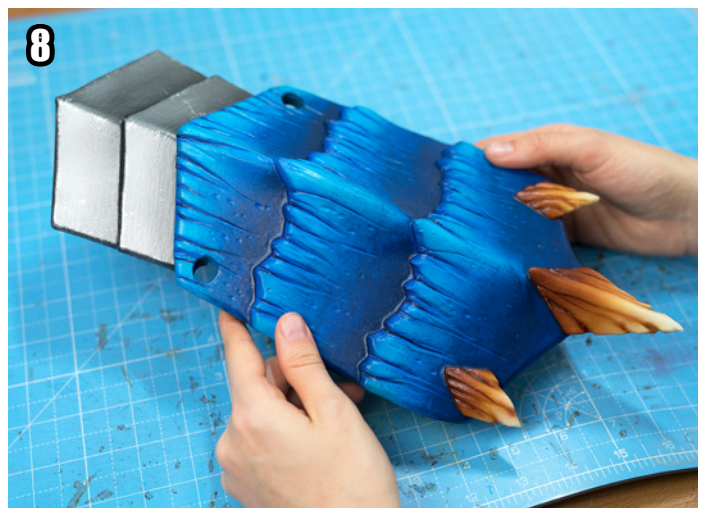
EVA foam armor doesn't always need to be clean, sleek and futuristic. The material is also amazing to create natural looking textures and organic shapes. My Zinogre armor, which is basically made out of monster pieces like skin, bone and claws, was the perfect project to try out a few new techniques.

In the video game Monster Hunter, your job is to protect your village from monsters. You go on a hunt, slay them and build even stronger armor from their dead bodies (so romantic). My Zinogre armor set was supposed to look like it was made out of the skin, claws and fur of the Zinogre, a legendary thunder wolf. In the game, this monster even creates lightning to attack you! So cool. Anyway! As you know, I love experimenting, so the texture of the build as well as adding LEDs to the costume made this project really exciting for me!

Before I started, I actually first wanted to figure out if my whole idea of the armor would even be possible. I tested a few materials and decided to use a more lightweight and less dense, black foam instead of my usual gray high density one [1]. Not because it's better or more suitable for this project, but simply because I wanted to show you that you can also make cool armor if you use a different foam than me! That's the whole point of my book. Experiment. After dremeling a few edges, cutting and burning them, it turned out that my heat gun wasn't able to clean up this material quite as nicely as my gray foam. Being less dense, it was also easier to make mistakes with my Dremel. But hey, at least it was easier to heat shape!

I also wanted to add lights to my costume. The Zinogre is a thunder doggo after all! For this I've picked up yet another material called Plastazote LD45. After some tests, it turned out that this white foam is slightly translucent and therefore was the perfect candidate to diffuse my LED strips [2]. As long as I would use a translucent primer and a light coat of paint on top, my lights would be still visible. Plastazote is a pretty common foam worldwide, so it shouldn't be difficult for you to find a distributor near your location. I got mine from [cosplayshop.be](https://www.cosplayshop.be).





While most of my other foam projects were pretty flat and had maybe one or two layers, the Zinogre armor was made out of several 5mm elements that I built up on top of each other.

Let's start with the hip plates. I made a paper pattern that I then copied to the black EVA foam. I shaped the first layer by cutting a little triangle gap into the back of the middle section. After filling it with contact cement, I heated up the material and pressed the gap together

to bring the whole piece into shape. This created a pretty interesting edge [3]. Afterwards I repeated this step for three additional but smaller layers. To turn these flat foam pieces into an organic looking monster skin, I cut them out pretty rough and dremeled deep scars into their surface with a sanding bit [4].

Next I glued them in place [5] and added additional lines and marks with my soldering iron [6]. This already looked pretty interesting. I added

more foam details to the top and the bottom [7] and handed over the finished piece to Benni who then primed it with Flexbond and painted it using airbrush colors.

I tried using clear PlastiDip as my primer, but wasn't happy with the result. It made the leftover clumps even more visible. Flexbond, however, did a great job on smoothing out the rough sanded surface of the black foam, while keeping the white one translucent.

## Legs that could kill

I don't think I need to explain every single step of the process for the legs. If you've followed the book carefully thus far, you know what I am about to say. I wrapped myself in tape for the legs, drew some paper dummies for the knee armor and then refined their shapes until I was satisfied. Creating the base for my Zinogre leg armor was actually pretty straightforward [9-10].

Adding all the organic details and textures on top, however, was more time consuming. I followed the same steps as for the hip armor on the last page and glued on smaller 5mm pieces. Dremeling and soldering them took me a while but it definitely helped to make them look more like monster skin [11]. You've probably noticed that I created all of the white scales using the slightly translucent Plastazote. This is because some of them had LEDs hidden beneath. Since this is not a book about how to solder LED strips however (check out my [Advanced LED](#) book for that) I will not go into more detail about that here. If I wanted to build this costume without any lights, I could have just used the same black EVA foam for everything of course.

Last but not least, Benni worked his airbrush magic on my finished pieces and made them look even nicer [12]. The last picture really shows how much of a difference a good paint job can make. All the textures and details are already there in the left picture but covering them in the right coat of paint really brings it to a whole new level.

### NOTE

In case you're wondering how all these armor parts stayed in place - pretty much the same way as for my Erazer Girl costume. The boots were just a fabric shoe cover (over the same shoes actually) and the shin armor was glued to a fabric tube that was secured with velcro at the back. The upper leg armor was also just attached to some fabric around my thighs. Additionally I connected it with some straps to the belt around my hips. This was to prevent them from sliding down. And finally the knee caps were fastened with a strap to the upper leg armor and a string around the knee itself. Pretty easy right? Holds perfect!



## Glowing foam scales

I think the Zinogre example really shows, how a simple pattern can turn into quite an elaborate costume with just the right amount of details. The bracer started super simple too. As always I made a simple duct tape pattern around my arm... HA! Got you! No I didn't. I just used an old pattern that was lying around my workshop **[13]**! Fooled you, huh? Once you made a pattern for a part of your body, why do the same work again? Just use your old patterns and save some time! I always keep all the patterns I made in a handy folder. Bracers, shoulders, breastplates, boot covers, leg armor and everything else gets reused quite often.

Anyway, back to the topic. After tracing the shapes to 5mm foam and then heat shaping them, I glued on and wired up three LED strips **[14]**. After that I covered those with scales made out of Plastazote LD45. The scales may look quite complicated, but in fact it was a simple V shape I just copied over and over **[15]**. To achieve their sharp edge in the middle, I cut out some material from the back and glued it together.

Since I needed the scales to stay translucent for my light to shine through, black PlastiDip was out of the question for priming this time. I did some tests with the translucent version, but wasn't simply able to get a smooth result. Instead I decided to use Flexbond. It dries out clear or at worst milky, but that would only help to diffuse my lights even further. Three layers were enough.

For the paint job Benni decided to use his airbrush. Vallejo acrylic colors are usually not translucent, but if you have a double action airbrush pistol, you can actually control how much paint comes out at once. This is very useful to control how thick your application will be. If you are careful, you can apply just enough color so your piece looks fully covered. When you turn on the lights however, they still shine through **[16]**. It's a really cool effect and not hard to achieve at all.

Check out how I made my armor glow:  
<https://youtu.be/HtyVLuAvdqE>





The breastplate was actually the first armor piece of the Zinogre that I finished. I like to start my projects by building the hardest but most eye catching part first, and then use this as a reference for the rest of the costume. Indeed it was very hard to find a good balance between the look of a shiny armor and the rough texture of a dead monster skin. Covering *everything* in scales and bone would have been too much. I actually needed a piece that said "Stop, that's enough texture, you maniac!" and the breastplate was just that. It's very important to take a step back from your work every now and then and look at it from a distance.

In addition I also used this part for my experiments. I first had to figure out how well the Plastazote would work (I have never worked with it before), which thickness I would need to have the light shine through enough and if it would

actually be possible to paint at all. Additionally I wanted to figure out how bulky I wanted my costume to be. Did I want to work with 5mm, 10mm or maybe even more? While it's super exciting to just start with all parts of your costume, I noticed that - at least for me - it's quite handy to have a finished piece for guidance. So, once my breastplate was finished, I mounted it on my dress form and looked at it all the time, just to make sure I didn't lose track of what I was doing.

The total cost for the whole costume including foam, primers, paints, varnishes and attachments was maybe around \$120 (100€), with an additional \$240 (200€) on top for all the LEDs and electronics (these were optional). I believe especially the Zinogre proves greatly that a huge and elaborate costume doesn't need to be expensive. All you need is time, patience and passion!

## NOTE

I hope this example showed you that experiments are not only fun, they can also lead you to totally new and interesting ideas and materials. I truly enjoyed working with a new material that I was not used to yet and I hope this book encouraged you to do the same. Working with foam is a ton of fun and there are still so many more materials out there that I haven't even thought of yet. It's really quite exciting! I hope you feel inspired now and I wish you the best of luck with your projects! You can do it!



What?! This was book number ten?

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