Kinpatsu cosplay

ARMOR MAKING

VOL 1 : CONSTRUCTION

Introduction

Welcome to the world of foamsmithing and armor creation!

Welcome to the 1st volume of our cosplay armor making series! Get ready to explore the world of foamsmithing and armor creation! This is book 1 of our 4 part series looking in depth at each step involved in creating foam armor. This book is all about construction and will serve as a foundation for working with foam! The next 3 books in the series will focus on detailing (2), priming and painting (3), and armor attachments (4)!

Since I started cosplay one of my favorite things has been to craft armor pieces. For people like myself who find sewing very difficult and technical, crafting with foam can be incredibly freeing and allows for so much creativity! It's also incredibly forgiving and great for beginner costume makers.

As I said, this first book is all about construction! You'll learn the basics of working with Eva foam and how to create and construct your own costume pieces. From the materials and tools, techniques for working with foam, pattern making and planning, all the way to building your own armor! By the end of this book you'll be ready to tackle your projects with more confidence!

I hope this book will help establish a foundation for you to expand off of and unleash your inner foam forger!

-Tayla Barter

Contents

All About Foam!

Before we get into crafting, let's take a look at what this wonderful material is and how it works! We'll explore the different kinds of foam available and where to get some for yourself!

What is EVA foam?

Craft foam or EVA foam is one of the most common materials used in costume making, both for hobbyists cosplayers and professional costumers in film and television!

EVA Foam is short for ethylene-vinyl acetate. This squishy foam is used for yoga mats, flip flops and even some packaging. It's likely that even if you've never used this material to create costumes you have come across it in everyday life!

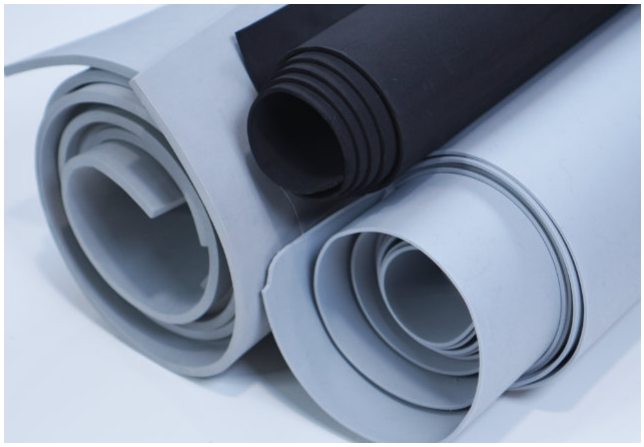
This foam comes in many thicknesses, colors, densities and textures! It can be cut by hand and molded with heat to create shapes. It can be carved, sanded and burnt. The possibilities are endless! Eva foam is also relatively lightweight compared to other armor materials like thermoplastic which makes it great for big costumes!

Different kinds of foam

Standard EVA Foam

Standard EVA foam or low density EVA foam is the most common type of foam used for armor making. The lower density makes it easy to heat-form, bend and shape for your pieces.

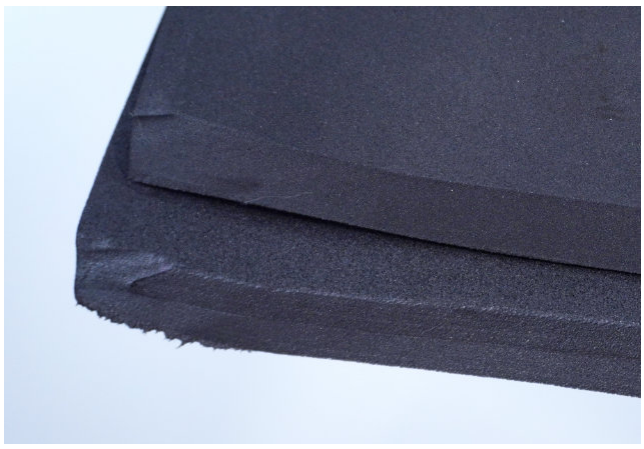
As I mentioned this comes in a range of colors and thicknesses for all your costume making needs!



High Density Foam

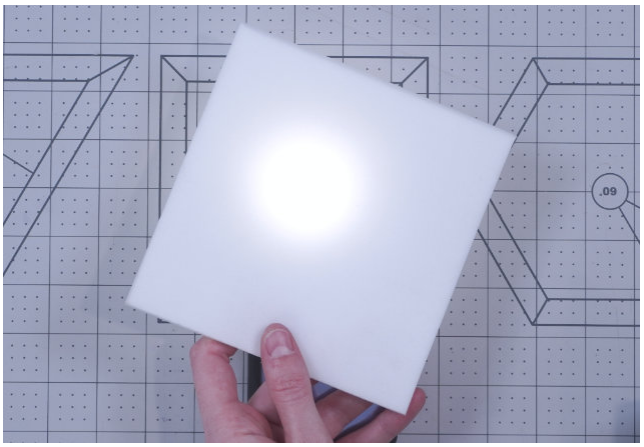
High density foam is less flexible and a bit harder. The foam is significantly less aerated during manufacturing which makes it that way! This also makes the surface much smoother than regular foam!

This kind of foam is great for prop making and for carving detail with a craft knife.



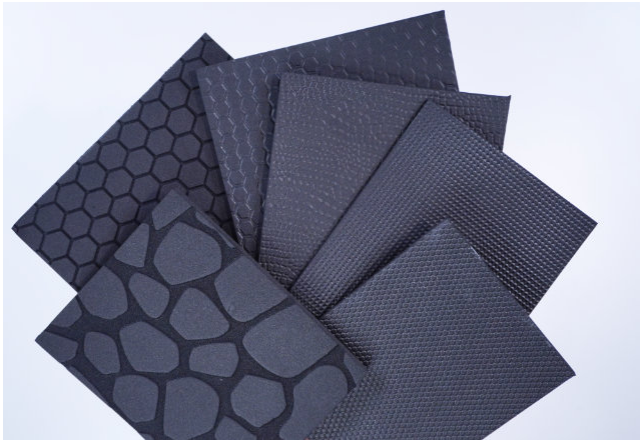
Translucent Foam

This foam is also known as Plastazote! It is a white / semi transparent foam which is great for diffusing lights, hence the name LED foam! This is not used much for construction but it is a wonderful option if you need a costume with lots of cool lighting effects!



Textured Foam

EVA foam doesn't only just come in different colors and sizes, it also comes with textures! Foam suppliers like Lumin's Workshop and Cosplay Fabrics create specialty foam with textures like carbon fiber, hexagons and scales to help add detail to your projects and make the process easier!



Foam Accessories

Gone are the days where you had to painstakingly create all your details by hand! In the modern age of costuming there are also tons of convenient foam accessories, which you can use to add some flare to your costumes. These accessories include Foam clay, pre-cut foam bevels, scales, spikes and more!

Where can I buy EVA foam?

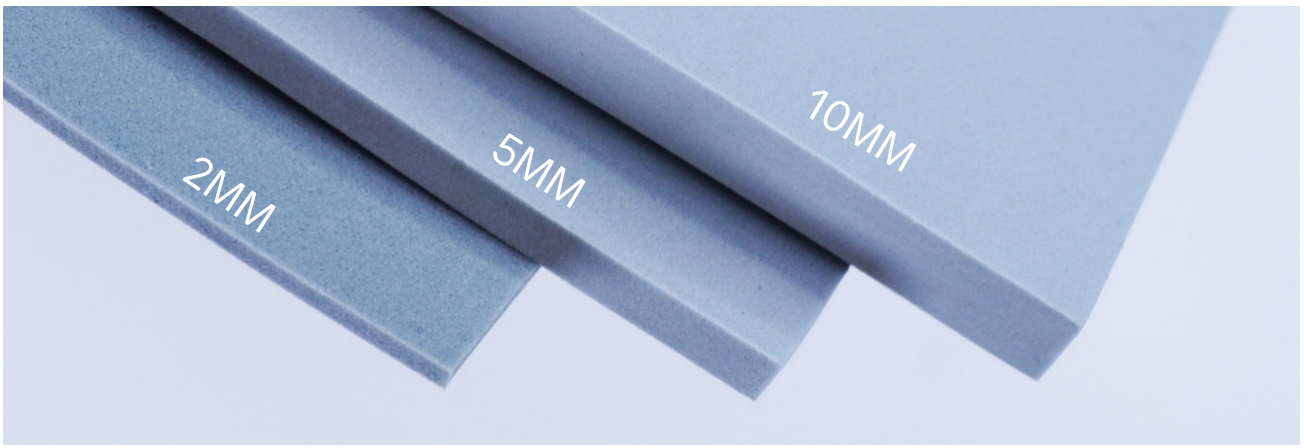
- Lumin's Workshop - Australia (Arda resale - USA & Canada)
- Costumeshop.be - Belgium
- Polyprops - UK
- Joann's - Cosplay Fabrics -USA
- TnT Cosplay supplies - USA
- Redmoon Cosplay Supplies - Canada
- True North Cosplay Supplies - Canada
- CosplaySupplies.com - USA
- Sondor - South Africa

Foam Thickness

EVA foam comes in a variety of thicknesses, from 1 mm - 20 mm, but you can get even thicker foam blocks from some suppliers! The most common thicknesses you'll find for making armor are 2 mm, 5 mm and 10 mm.

What thickness should I choose for my armor?

The thickness you need for your armor will depend a lot on the design. For very bulky, chunky armor, 10 mm would be a good choice. If your armor is more form fitting and snug, then 5 mm may be better. Every case will differ but here's a guide on how I choose what thickness I need.



2MM

- Too thin for most construction
- Great for Detailing
- Very good for covering in fabric e.g. Foam belts or Vests
- Can be used instead of interfacing in garments

5MM

- Best general thickness
- Not too thick or too thin
- Good for form fitting armor
- Good for complex shapes and curves
- Not good for pieces that may take a lot of strain and bend without additional support.
- Can be used for details.

10MM

- Thickest foam recommended for armor
- Sturdy and strong
- Good for large pieces that need support
- Not good for form fitting armor
- Harder to shape with heat
- Not really used for details but can be used for carving.

Tools

Now that we have covered what EVA foam is, let's look at some of the things you'll need for crafting your pieces!

1. Craft knives

Probably the most important tool for working with foam is your craft knife! These little blades come in a variety of sizes which can cut through large pieces of foam or cut out the tiniest details. The blades are replaceable so you can swap them out when they are dull to keep your cuts crisp.

1

2. Contact adhesive

This is the best glue for working with foam! Contact adhesive forms a strong bond after it dries and is resistant to heat and water!

2

3.Heat gun

Foam can be shaped with heat, so a heat gun is a great tool for creating shape and form in your work!
It's like a superpowered hairdryer! A heat gun will make foam malleable and easy to shape!

3

4. Rotary tool

This tool is super versatile! Rotary tools can be used for sanding, detailing, cutting, you name it! You can swap out the tip at the end with different bits for different purposes. For foam work the most common use is to sand the edges of foam into bevels or create detailed texture using a sanding band.

4

5. Protective gear

Safety first! Foam work can involve some nasty fumes, glue and dust! Using protective equipment like dust masks, respirators, goggles and gloves will help keep you safe from any dust particles or fumes!

6. Primers

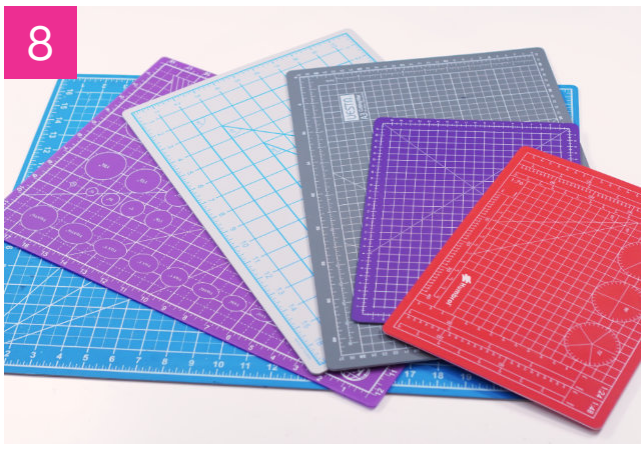
Once you finish building your foam project you need to remove the foam texture! Using a primer on your foam will smooth it out. Flexible foam primers like Hexflex, Flexbond and Plastidip are great options for priming foam.

7.Paint

The final part of creating a project is the paint job! Painting your piece is like adding spice to a meal and it will take your armor to the next level! there are a ton of amazing paints to use including spray paints, acrylic paints, oil paints, and airbrush paints.

8. Cutting Boards

These colorful mats are perfect to cut your EVA foam on! They help protect your craft knives from being blunted but also help protect your furniture and work surfaces from being damaged while cutting!



Pattern Making

Before you can get started on building your foam pieces, you need to create your own templates and patterns for your armor so you have something to work from!

Proportioning!

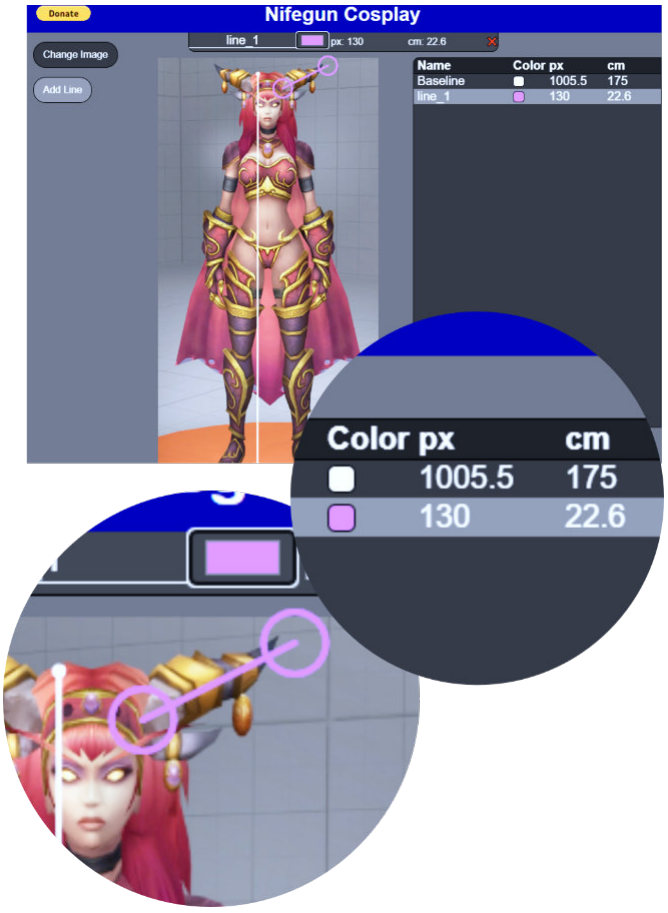
One of the most important things for creating a successful costume is getting your proportions right! Too big or too small and the whole thing might look a little wacky!

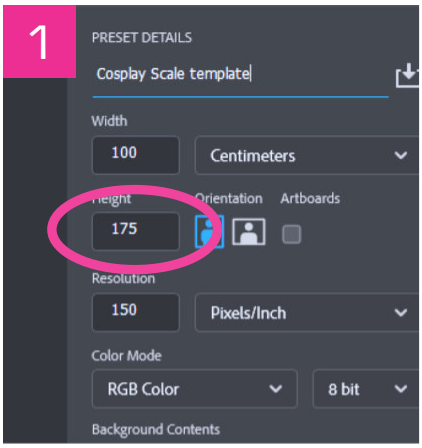
One of the easiest ways to correctly proportion your costume is to use your own height as a reference point and then scale the costume pieces based on this!

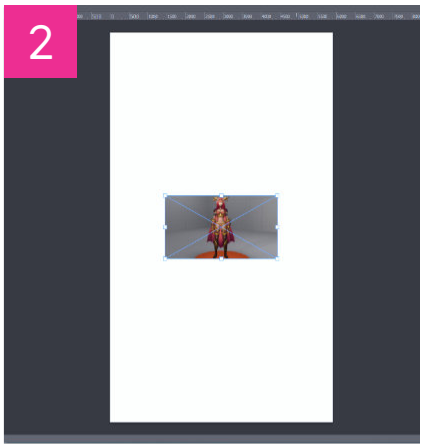
An easy way to do this is with a website called Nifegun! This was a website made to help cosplayers easily scale their costumes! Go to nifegun.com and upload your reference picture of your character. Full-body photos without perspective distortions work best!

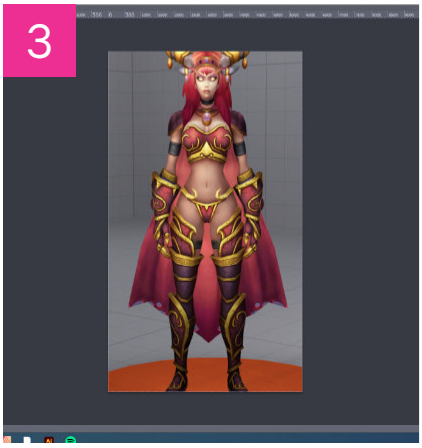
Once your picture is uploaded, position your baseline for the height of the character. Then input your height as the measurement.

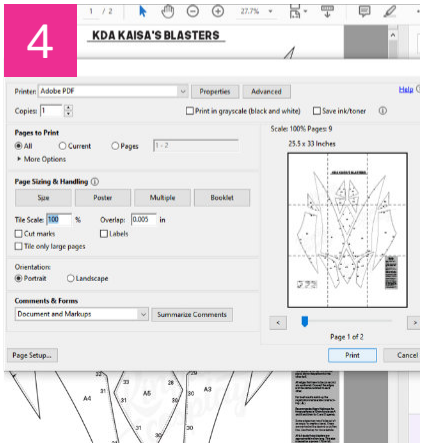
Any additional measurements you take on the reference will now be calculated based on your height and will be the right size for you!











Life-size Reference!

Another way to do this without nifegun is by using a digital program like Photoshop or affinity photo.

Start by creating a document with your height dimension. **(See fig. 1-2)**

Bring in your photo of your character and scale it up to that height. **(See fig. 3)**

Now you will have a life-size image you can trace over, measure, or even print out to full size!

If you want to print out your life-size reference, save out your image as a JPG or PDF.

Then you can open this with the program Adobe Reader DC

Set your print preferences to “Poster” with 100% scale. This will then split the image onto as many pages as it needs to print! **(See fig. 4)**

Tape the pieces together and now you can easily stand in front of your reference and craft and make patterns with this as a guide! **(See fig. 5-6)**

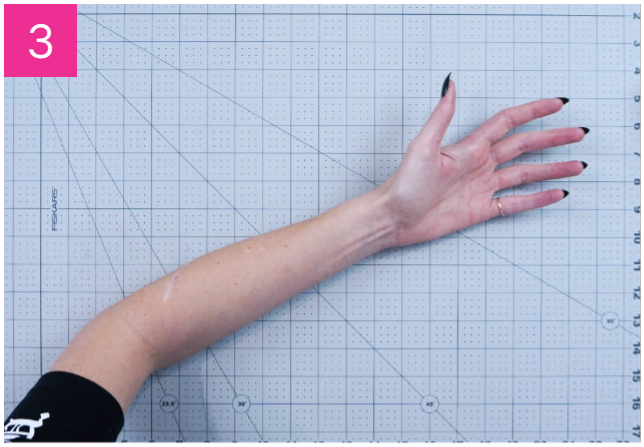
Tape Method

This is my favorite method for creating armor patterns and one of the most reliable methods to ensure the right size and fit! To make a tape pattern you need plastic wrap, tape, a pen, and scissors. **(See fig. 1)**

Start by wearing formfitting clothing or whatever you will wear under your armor pieces. For armor that is bigger than you and not formfitting, you can pad yourself with newspaper or bubble wrap to get the shape you want! **(See fig. 2-4)**

Wrap yourself in the cling film where the pattern will be made. **(See fig. 5)**

Then tear off pieces of tape and lay them onto the plastic. Don't make the tape too tight! If the pattern is too tight it will not fit you correctly afterward. You want a snug but comfortable fit! **(See fig. 6)**



Now you can use a pen to draw on the lines and details for your armor. Include seams for attachments or curved shapes. You'll also want to add registration marks to help put the pieces back together later! **(See fig. 7)**

For larger pieces like breastplates, you may need someone to help you with the back.

Use scissors to carefully cut the tape off. Don't cut yourself or your clothing! Then you can cut out the pieces.
(See fig. 8-9)

This is now your final pattern! You can trace this onto paper for a neat version! **(See fig. 10-11)**

For foam patterns, you may need to add a few centimeters onto the sides to account for the foam thickness! If you use 10 mm EVA foam you need to enlarge your pattern by 5 - 10 mm on each side to ensure it's not too tight! For 5mm EVA foam, you need to add 2 - 5 mm on each side for a good fit!

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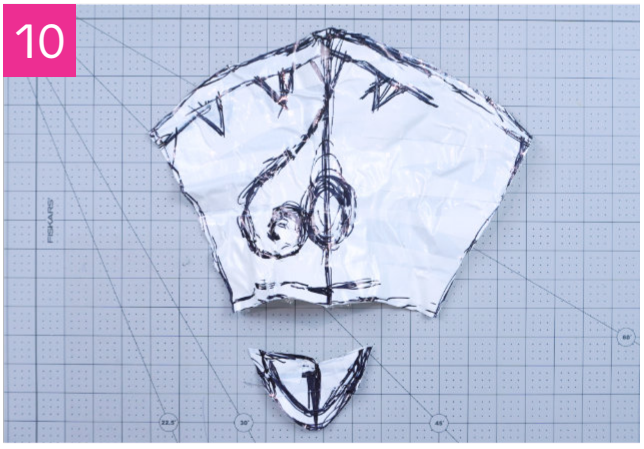

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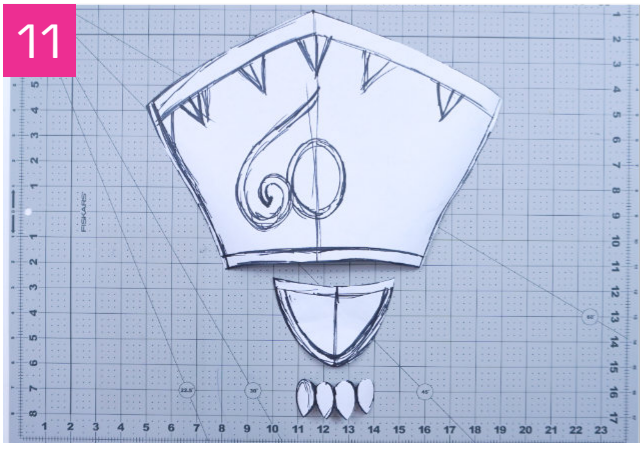

Result

Tracing

One of the easiest ways to create a pattern is to trace it in a graphic design application like Adobe Illustrator or Affinity Designer.

You can import your image and scale it to the size you want. Then use the pen tool to trace it! **(See fig. 1)**

This works great for simple armor shapes that are relatively flat or even shoulder armor that can be easily mirrored! **(See fig. 2-4)**

Paper Mock up

Another way to create patterns is to make a paper or cardboard mockup first. **(See fig. 5)**

You can cut and tape together pieces of paper to create your shape. **(See fig. 6)**

Then when you are happy with how it looks you can cut this up to use as your final pattern. **(See fig. 7-8)**

Clay Method

This method involves making a miniature version of your piece first using clay to create your pattern! This is a great method for more complex shapes that can't be made with paper or the tape method!

Start by making a small-scale sculpture of your armor piece from clay. I like to use Super Sculpey for this! You can also use plasticine clays like Monster Clay or Plastilina. **(See fig. 9)**

Measure your finished sculpture when you are done so you know how much you need to enlarge it later.

Once you are happy with your sculpture you pop it in the freezer so that it can cool and harden.

When the clay is frozen you can take it out of the freezer and start to pattern it with the tape method. Take pieces of tape and apply them to the surface of the sculpture. Then you can draw on your seams and registration marks with a pen. **(See fig. 10-12)**

Use a craft knife to cut along your seams and remove the pattern. Stick the pattern pieces to a piece of paper. You can then scan this with your phone or a scanner. **(See fig. 13)**

Then you can scale up your pattern to full size and print this out and then use this for your final full-size pattern! **(See fig. 14-15)**

Cutting Foam

So now that you have made some patterns, it's time to get started with foam! Cutting foam isn't complicated. But getting good results can be tricky. I've put together a few tips and tricks you can use when cutting your material to get the best results possible!

1

How to cut foam

To cut EVA foam the best tool for the job is a craft knife! When cutting foam you want to take a very sharp craft knife and cut the foam in a single smooth cut. **(See fig. 1)**

Be sure to keep your blade at a straight, 90-degree angle to the foam. If you turn your blade it will create angled edges that may not line up straight with each other. **(See fig. 2-3)**

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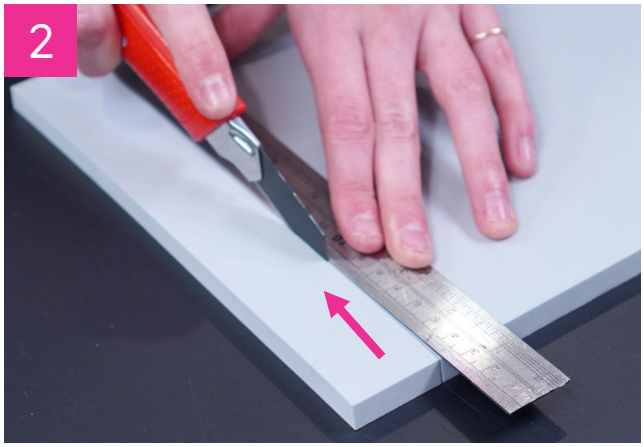

To maintain a sharp blade you can sharpen your knife with a small knife sharpener **(See fig. 4)** or a piece of high grit sandpaper (i.e. 600 - 1200 grit).

You can also replace the blades or snap the blunt sections off to keep them sharp.

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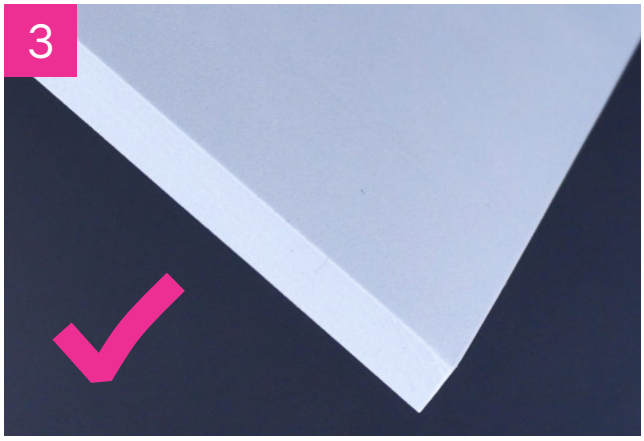

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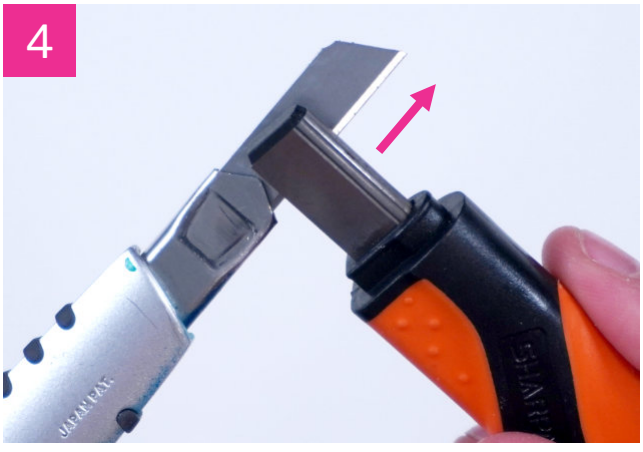
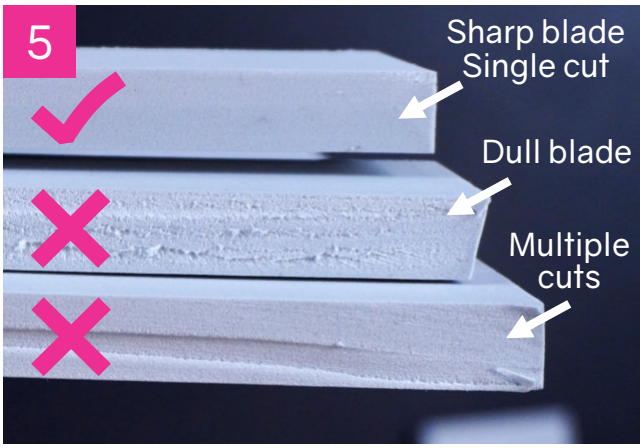


Keeping the blade sharp is very important! If your blade is not sharp enough it will create ripped edges on the EVA foam instead of a clean and smooth edge.

It's also important to cut through the foam in a single motion. If you have to come back and cut over the same line it will create an edge with multiple cut lines. **(See fig. 5)**

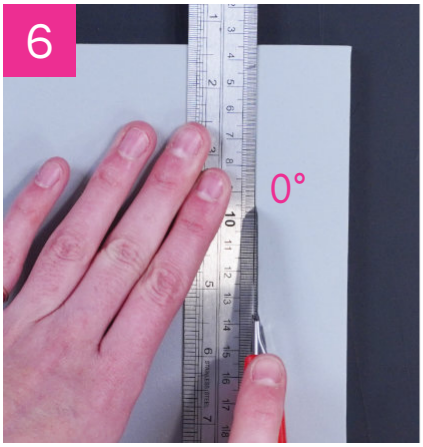


Cutting at angles

Sometimes in order to create certain shapes or details, you will need to cut foam edges at an angle to create a beveled edge. To create a bevel edge on foam, lean your knife to a 45-degree angle. Then cut through the foam along your edge. **(See fig. 6-7)**

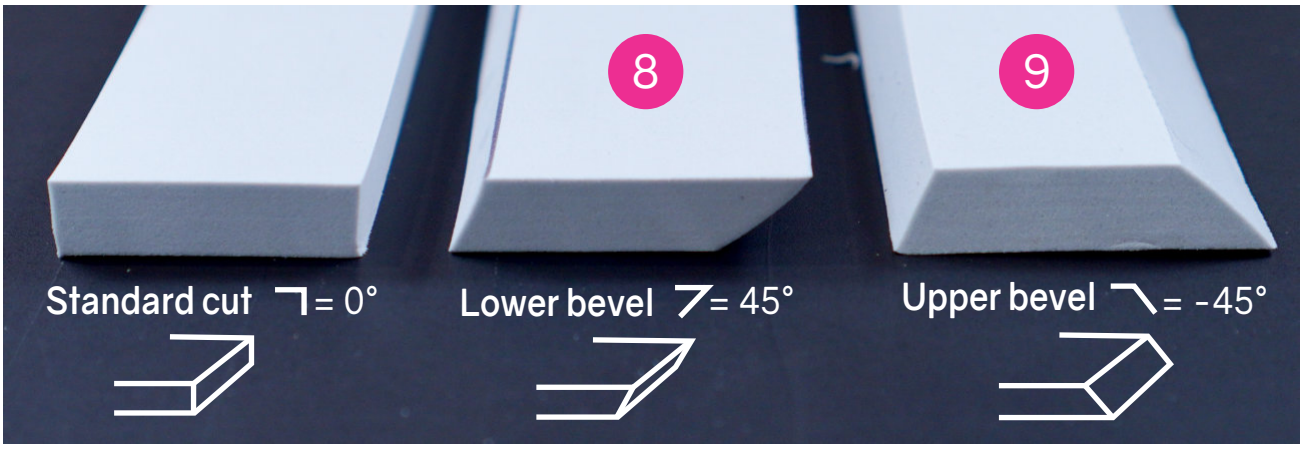
Lower bevel

Aside from a straight cut, this is the most common angle you will need to create for foam work! To create a lower bevel, lean your blade over at a 45-degree angle with the blade pointed towards the foam and underneath it. Then cut along the edge. **(See fig. 8)**



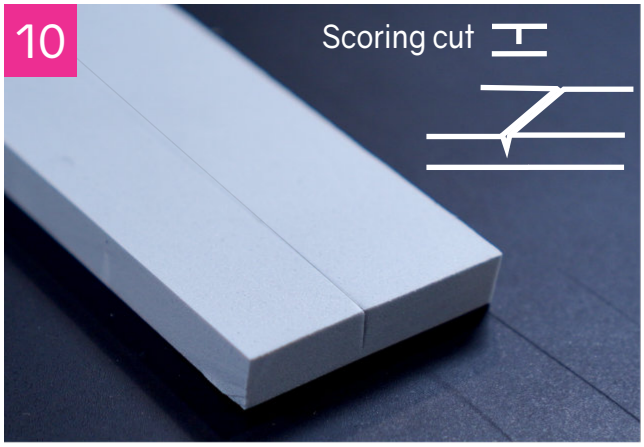
Upper bevel

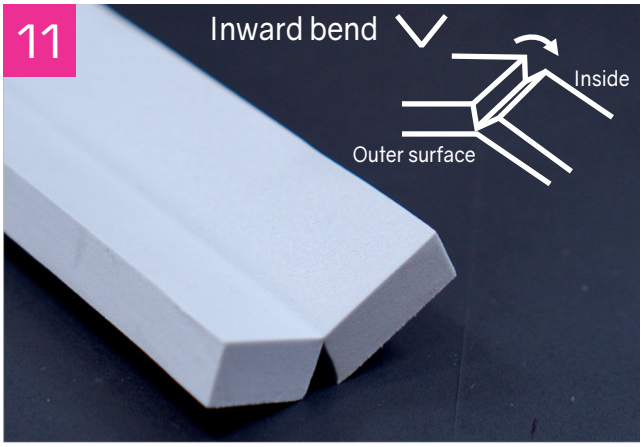
For an upper bevel, angle your knife at a -45 degree angle, with the blade pointed away from the foam. Then cut along the edge. **(See fig. 9)**



Scoring Cut

A scoring cut is a cut that does not go all the way through the foam surface. To create a scoring cut, cut along the foam, without pressing all the way through the material. Scoring cuts can then be bent open to create certain shapes. **(See fig. 10-11)**





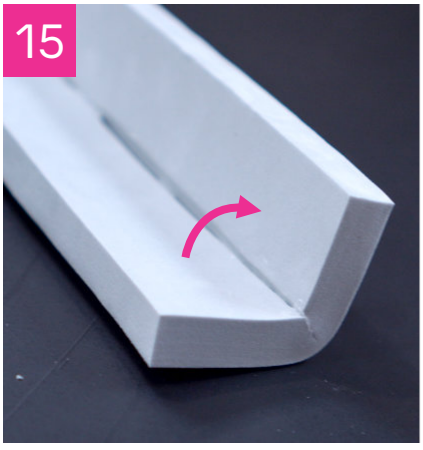
V channel cut

V channel cuts are similar to scoring cuts in that you don't cut all the way through the foam. But you cut at an angle to create a V shape. First, cut along your line at a 45-degree angle in one direction. **(See fig. 12)**

Then cut at a 45-degree angle in the opposite direction. **(See fig. 13)**

Remove the piece of foam in the center. Now you have a v channel. **(See fig. 14)**

This can be bent and glued together to create shapes in foam. **(See fig. 15-16)**



Scissors

Even though cutting foam with a craft knife is my preferred method for working with foam, scissors are a valuable cutting tool with many uses! **(See fig. 17)**

Cutting thinner 2mm foam is often easier with scissors, especially when it comes to smaller, detailed pieces. Cutting out these tiny swirls and getting around the corners with scissors was much easier! **(See fig. 18-19)**

Scissors can also be used to create rounded, beveled edges by cutting away the sharp corners. **(See fig. 20)**

Rotary tool to the Rescue!

Sometimes the cuts we make just aren't clean enough! But there's a way to fix this. Use your rotary tool with a sanding drum to clean up and smooth out any rough edges. **(See fig. 21-22)**

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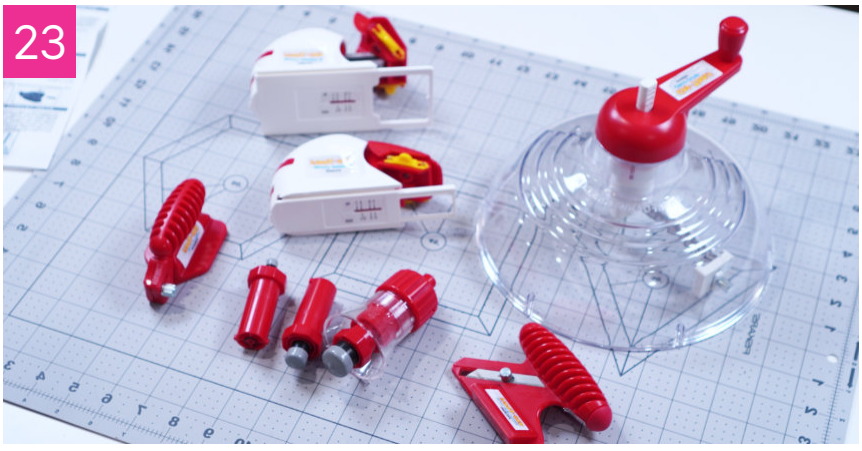

Other cutting tools!

Costume-making has come a long way! Nowadays there are specialized tools for working with foam! These tools from Costools can help you create perfect circular cuts, v groove cuts, bevel edges, and more in your foam projects. **(See fig. 23)**
(Sponsored by Costools)

Gluing Foam

Contact Adhesive

The best kind of glue for foam is contact adhesive. Contact adhesive creates a strong bond that is moisture resistant and can withstand additional heat. **(See fig. 1)**

To glue together foam pieces, apply the glue to each side of the foam you will be joining. You can use a brush or a scrap piece of foam to spread it evenly. **(See fig. 2-3)**

Let the glue get tacky and lightly sticky. You want it to dry a bit but not completely! This is when contact adhesive will form the best bond. You can use a heat gun or hairdryer to speed up this process.

Press the edges together and they will connect on contact!
(See fig. 4-5)

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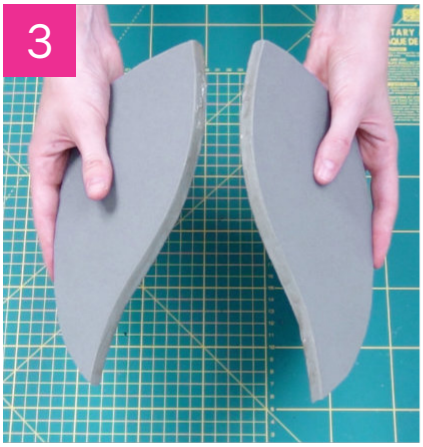

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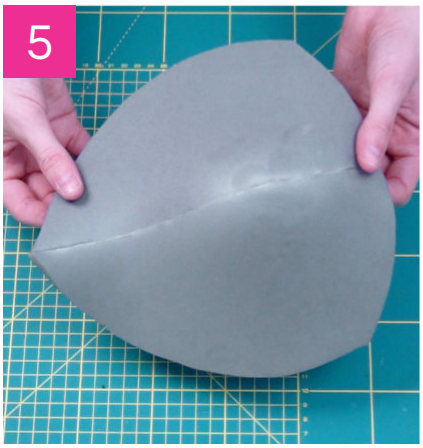

If your seams do not stick it may be one of these reasons:

- Not enough glue
- The glue dried in that area.
- The glue was still too wet
- The foam didn't absorb the glue (high density foam)

Hot Glue

Hot glue is an invaluable tool for crafting! **(See fig. 6)**

But not for gluing the edges of foam together and here's why!

Contact glue is relatively thin, so when glued together it looks seamless. Hot glue is thick and gooey. So when you press the edges together some glue may leak out the sides.

While contact glue bonds together instantly when it's tacky, hot glue doesn't. You need to hold the pieces together while they cool down. And if you let go they will separate. **(See fig. 7-8)**

When working with foam you often need to apply heat to the pieces. Applying heat after gluing together edges is fine with contact glue! It's bonded and won't open up again!

But if you apply heat to hot glue it will reactivate the glue and the seams will pop open! **(See fig. 9-11)**

Hot glue is less ideal for construction but it's still OK for adding on certain details and attachments!

6

Safety Note:

Contact adhesive and glue thinners are very toxic! They release nasty fumes so you should use an appropriate respirator when using them and only use it in a well ventilated area or outside and away from pets and other people!

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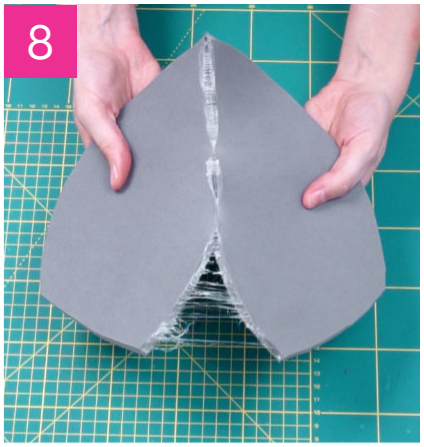

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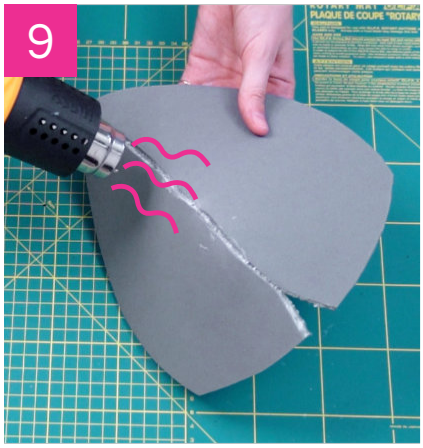

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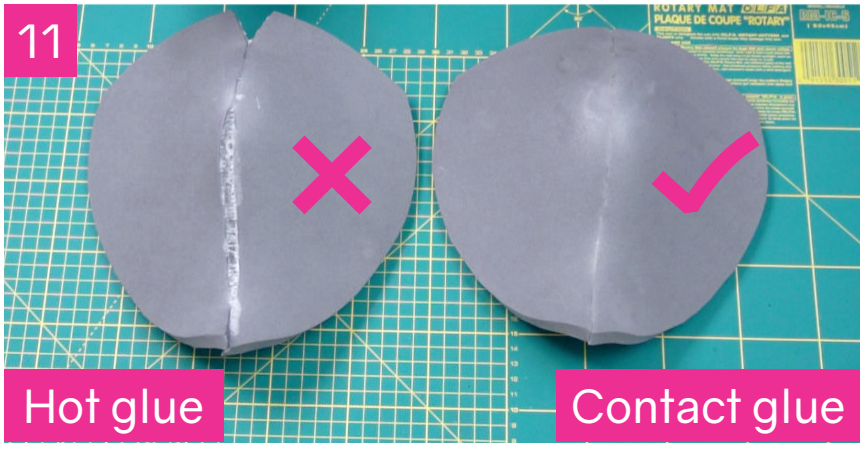

Shaping

Heat Shaping

EVA foam can be heated up and formed into shapes. To heat up your foam you will need a heatgun! This is essentially a hairdryer with superpowers and puts out a lot of heat which helps to shape foam!

Can I use a Hairdryer instead?

Yes and no! You can heat foam with a hairdryer, but it likely will not put out as much heat as you need to shape your foam correctly.

To shape EVA foam, first heat up the surface with the heat gun. Then you can bend the foam into shape. Let it cool down and it will maintain its shape.
(See fig. 1-4)

You can also form foam over objects. For things like breastplate cups and shoulders, press the foam over a sphere to get the rounded shape.
(See fig. 5-7)

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Darts

In sewing, darts are triangular shapes used to create 3D shapes with fabric and help form curves. The same principle applies to foam too!

To form a dart with foam, cut out the triangular section from the foam You can then glue the edges together with contact adhesive. You can use several darts to help shape and form an EVA foam piece into shape. **(See fig. 8-10)**

But the more darts you add the more seams you will need to clean up later when working towards a smooth finish.

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Curves and Registration Marks

Shapes can be formed by gluing together curved pieces.

This shoulder piece is formed by gluing together 2 curved pieces at the center. This creates a rounded shape. **(See fig. 11-12)**

But gluing pieces together alone doesn't always result in an ideal shape! So you will need to heat form them as well in order to get the final shape you want. **(See fig. 13)**

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For more complex shapes registration marks are very important! **(See fig. 14-15)**

After creating your pattern you will need to glue your foam shape together and line up the registration marks to achieve your final shape. **(See fig. 16-18)**

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But my Registration Marks don't line up?

Yes! This is because sometimes the foam needs to be pushed or stretched in order to form certain shapes! Especially for pieces like horns and helmets!

If a registration mark doesn't line up, you need to gently stretch or press the foam pieces and force them into position so they meet each other at the correct point. **(See fig. 19-20)**

This can help create very complex curves and shapes on your foam. **(See fig. 21)**

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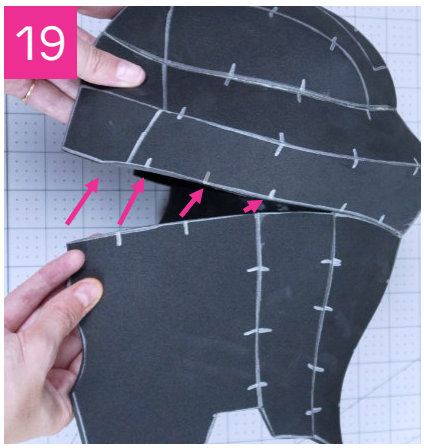

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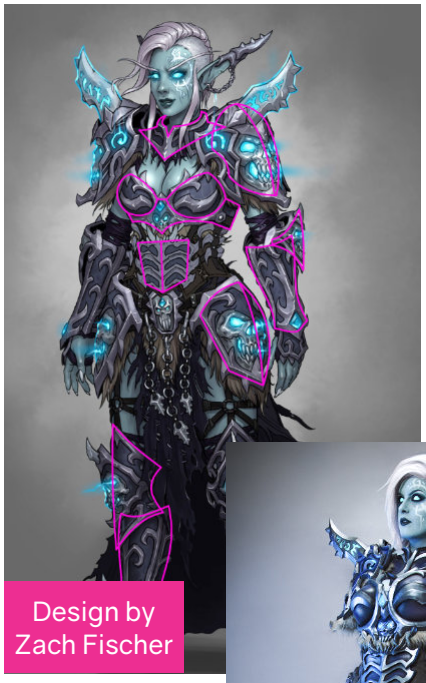
Planning an armor Build

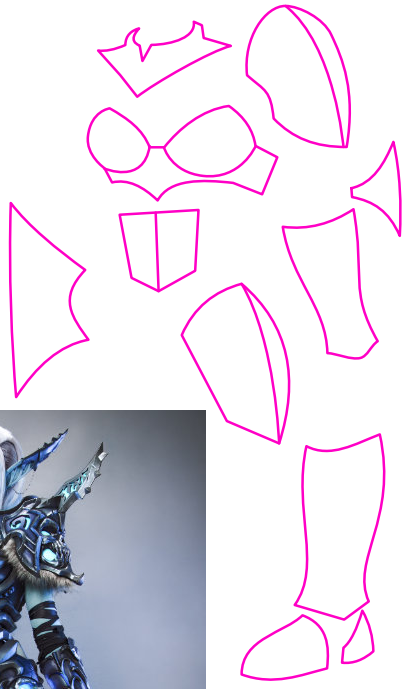
Breaking down your reference

Now that we have gone over the technical stuff it's time for you to make your own armor build! But where do you begin?

It's often best to start breaking down your costume and looking at the pieces. A very detailed armor piece might seem scary! But when you break it down it may be very simple underneath! Look at what components make up your armor and the base shapes that you need to make.



Design by Zach Fischer



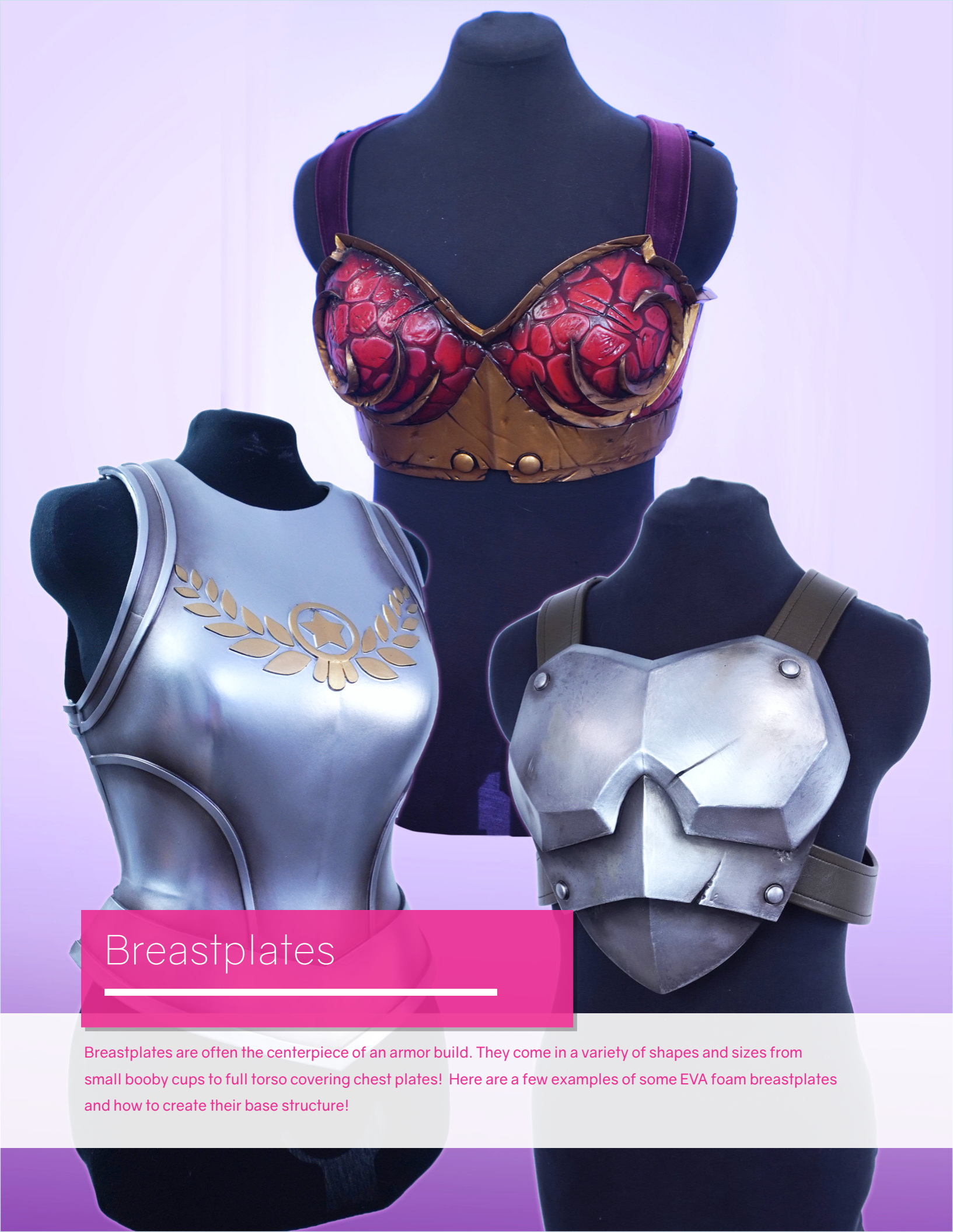
Planning

Now that you have broken down the project you can make a plan for the build!

You can look at how you need to pattern each piece, what kind of thickness of foam you want to use for the pieces, and even make a list of tasks you need to accomplish for each piece and what materials you will need!
Having a plan can help make the project easier to tackle.

How to work out how much foam you need?

The best way to work out how much foam you need for a project is with your patterns! Start by making your patterns and laying them out on the floor. You can measure the patterns and then through this, you can see how much foam you will need for each project!



Breastplates

Breastplates are often the centerpiece of an armor build. They come in a variety of shapes and sizes from small booby cups to full torso covering chest plates! Here are a few examples of some EVA foam breastplates and how to create their base structure!

Booby Armor

The first example we will show you here is a classic! The good old booby armor breastplate! A staple armor piece for any aspiring warrior woman!

Start by creating your pattern using the tape method. Wrap yourself up and apply the tape. **(See fig. 1)**

Then draw on your details. Here I've added in a dart for the cup to help get the curved shape. And I've placed it underneath a detail so that the seam will be hidden later. **(See fig. 2)**

Cut out your pattern pieces and trace them onto paper for a neat final version. **(See fig. 3)**

To make a breastplate like this I recommend using 5 mm EVA foam. This breastplate is for Alexstrasza so I'm using this dragon scale foam sponsored by Cosplay Fabrics (also available from Joann's.)
(See fig. 4)

Trace your pattern onto the EVA foam. Mirror the pattern and flip it over to trace the other side.
(See fig. 5)

Use a sharp craft knife to cut out the pieces. For the openings where the cups will go, you need to cut at a 45-degree angle so you get a bottom bevel. This will help the cups join the breastplate when they are glued in place. **(See fig. 6)**

When everything is cut out it will look like this! **(See fig. 7)**

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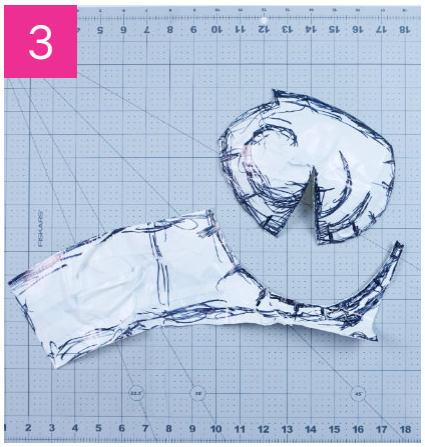

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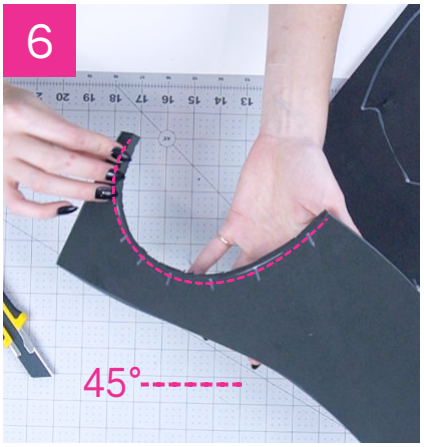

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You'll then need to heat form your cups into a rounded shape using a heat gun. **(See fig. 8-10)**

Then you can glue the darts together at the center to finish forming the shape of the cups. **(See fig. 11-12)**

Heat form the base of the breastplate as well and glue it together in the center. **(See fig. 13-14)**

Now you can apply contact glue to the surface of the cups along the bottom where they connect to the breastplate base. **(See fig. 15)**

Apply more glue along the inner edge of the breastplate. Then when the glue is tacky you can carefully line up the registration marks and glue the cups into place. **(See fig. 16-17)**

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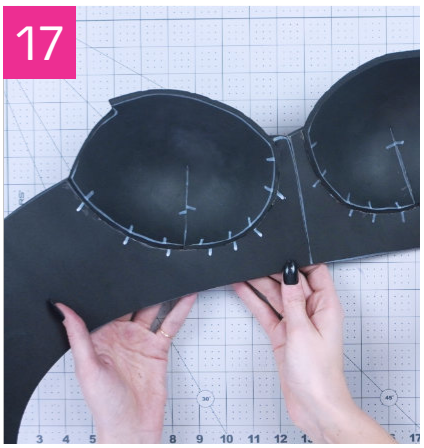

Now the base construction is done! **(See fig. 18)**

You can then glue on additional details, prime the foam surface with a primer of your choice and paint everything! **(See fig. 19–22)**

This kind of breastplate attaches with a corset method at the back and straps over the shoulders. **(See fig. 23–24)**

Full Breastplate

Now for a full breastplate! This method works for both male and female breastplates (minus a few curves!) The breastplate I'm making is for a knight peach fan art design by Fonte Art.

Once again, you're going to start with a tape pattern! Wrap yourself with the cling wrap and layer on the pieces of tape. Be sure to wear whatever you need under the costume! I wear a corset with this breastplate so I patterned over it to get the right fit. **(See fig. 1)**

Draw on your details and registration marks. I used a princess seam up the sides to help get the curves of the breastplate right. **(See fig. 2-3)**

Cut everything off carefully and use this to create your final patterns. **(See fig. 4)**

You can then trace this onto 5MM EVA foam and cut the pieces out with a sharp craft knife. Mirror the pattern for the other side so you have an even shape. **(See fig. 5)**

Use a heat gun to preform the round edges around the chest. **(See fig. 6)**

Then you can use contact glue to join the edges. Carefully line up your registration marks to get the correct shape! **(See fig. 7-8)**

Glue together the whole front of the breastplate. **(See fig. 9-10)**

Then you can glue together the back pieces. For this kind of breastplate, you want to have a single front piece, and 2 separate back pieces to get into later, so don't join the breastplate fully! **(See fig. 11)**

Full fitted breastplates are often not very practical! Large pieces like this take a lot of strain when you move around and bend forward so if you just use foam it may result in cracking and creasing!

To prevent this and add additional support and structure you can use thermoplastic like Worbla inside.

Worbla is a thin sheet of plastic that when heated becomes soft and sticky. It can be formed into shape and when it cools down it goes back to being rigid. **(See fig. 12-13)**

Cut a piece of Worbla large enough to cover the inside of the breastplate. **(See fig. 14)**

Then heat this up with your heat gun and press it inside the shape. You can trim off the excess with scissors and let it cool down, preferably on a mannequin or taped to your body so it holds its shape! **(See fig. 15)**

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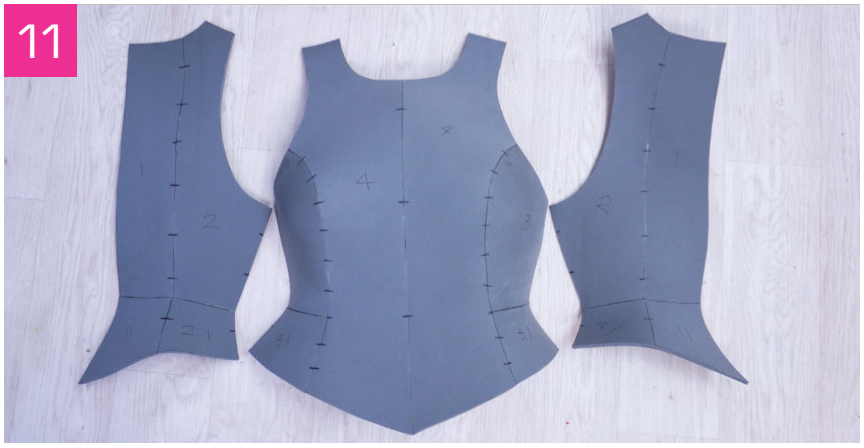

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Now the breastplate construction is complete! It will be strong and sturdy and won't get damaged when bending and moving as easily. **(See fig. 16-17)**

Glue on additional details with more EVA foam, prime the surface to remove the foam texture, and then paint everything with a nice metallic paint!

This type of breastplate closes at the side seam and shoulders with Velcro. Then it laces up at the back with a corset method. **(See fig. 18-20)**

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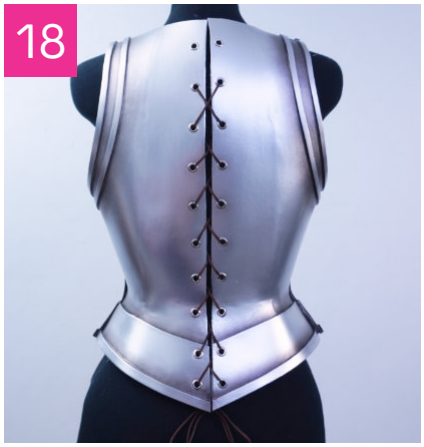

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Peck Plate

Our last breastplate example is for the guys! This is a slightly more complex build with layered pieces and angles!

You can start by making a pattern using a sculpture method. We used a mini 3D print for our pattern which works the same! **(See fig. 1)**

Create your tape pattern then scan it into a computer to make the final version! **(See fig. 2)**

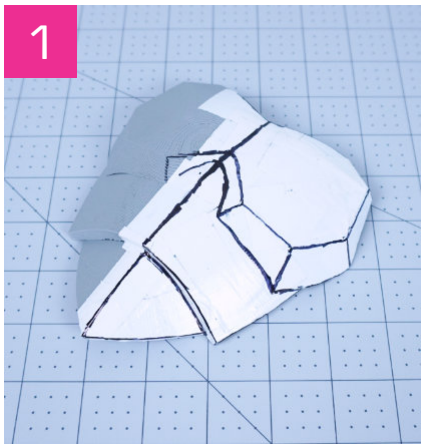
The bottom 2 layers need to be thick and strong so you can trace them onto 10 mm EVA foam and cut them out. Cut one side of the center seam at a 45 degree angle for a bottom bevel. **(See fig. 3)**

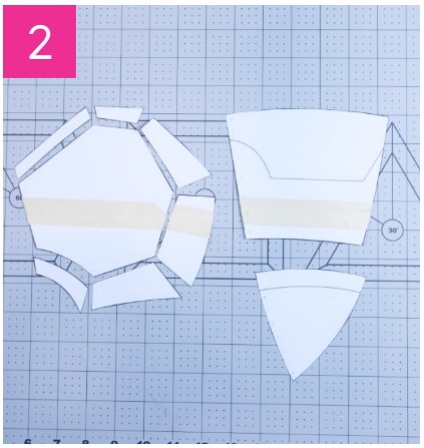
For the peck section, you can use 5 mm EVA foam. You need to cut out some of the pieces with a 45-degree angle again so when they are glued together they'll form nice sharp points and angles. **(See fig. 4)**

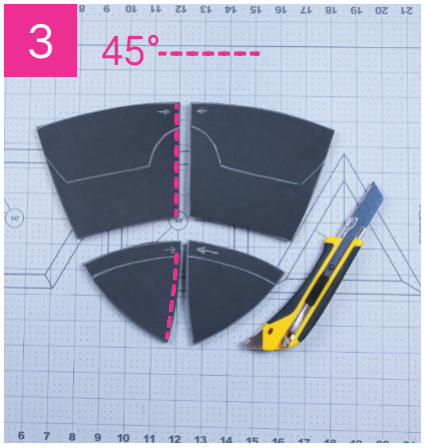
Glue together the 2 bottom layers at the center. Then glue together the pieces to form your pecs. Here you can see how the angles you cut create the shapes when glued together! **(See fig. 5)**

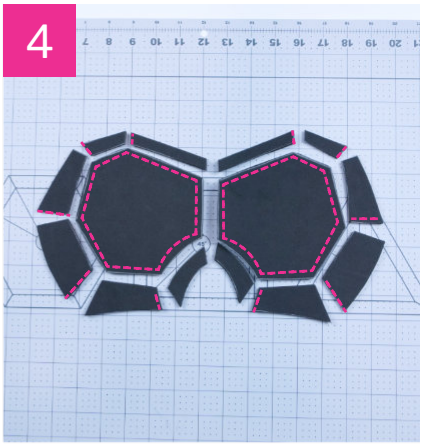
You can then glue each layer on top of the next. Now the breastplate is built! **(See fig. 6-7)**

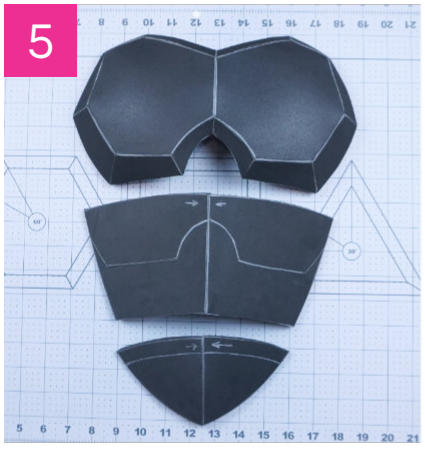
This breastplate attaches with some leather straps over the shoulders and around the sides! **(See fig. 8)**











Shoulder Armor

Shoulder armor can be intimidating. They are often very rounded, complex shapes! Very scary! But in fact, when you break it down shoulder armor can be some of the easiest pieces to build! Here's a look at some examples of shoulder armor and how to create them!

Simple Shoulder

One of the simplest ways to make a shoulder piece is to simply glue together 2 halves! Done!

For this shoulder armor, start by drawing out the shape you want for your shoulder piece as if you were viewing it from the side. **(See fig. 1)**

Trace this onto 5mm EVA foam and cut out the pattern twice. **(See fig. 2)**

Use heat to pre-shape the armor. **(See fig. 3)**

Then you can glue the edges together at the center to form the shape! **(See fig. 4)**

Use more heat to refine the shape into its final form! **(See fig. 5)**

You can then glue on additional details and paint it! For this Alexstrasza armor, I covered it in fabric! **(See fig. 6-8)**

This shoulder attaches to the breastplate straps.

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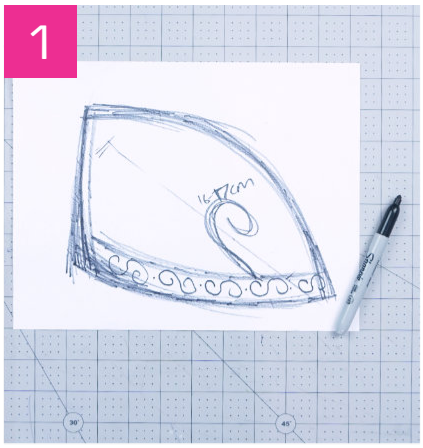

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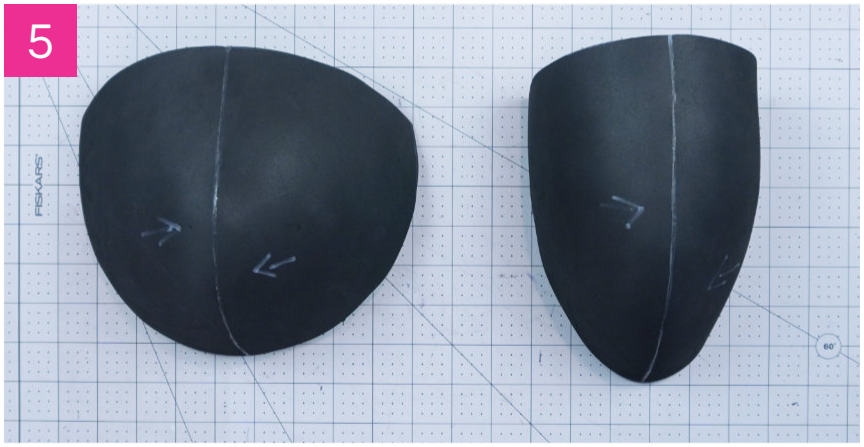

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XL Shoulder

This next example, which I made for a Rengar costume, looks very intense! But the base construction is simply 2 pieces glued together! With lots of layering on top to create details. Start by drawing out your base shape for the shoulder at roughly the size and shape you want it. Trace the pattern onto 10mm EVA foam and cut it out twice. **(See fig. 1-2)**

You can then glue the two pieces together at the center to form the shape and use heat to refine it! **(See fig. 3)**

But they are so big? How do they sit on the shoulders correctly? For giant shoulders like this, you will need to make a smaller shoulder piece inside with foam padding to get it to sit on your shoulder at the desired height. **(See fig. 4)**

Then you can go wild with adding lots of foam details and even carved spikes from some foam insulation board! These shoulders also attach to the breastplate and have a cord linking them at the back to balance them. **(See fig. 5-6)**

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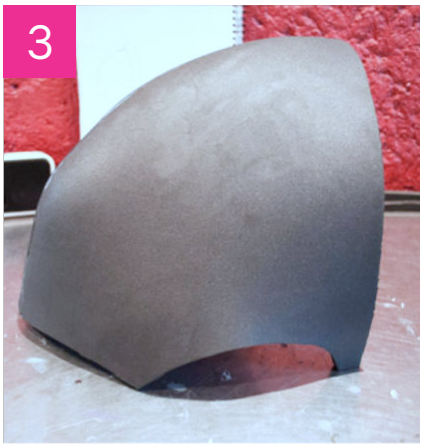

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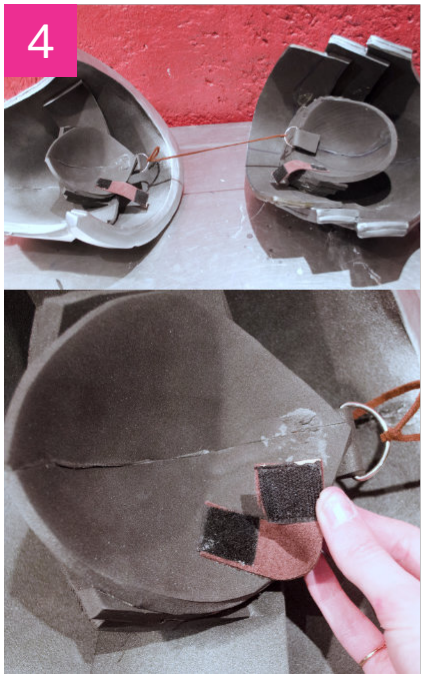

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Complex Shoulder

The last example is for shoulders with a more complex shape.

For this kind of armor, you can start by creating a paper mockup of your pattern. **(See fig. 1)**

Cut this up to use for your final pattern. **(See fig. 2)**

Trace the pattern onto 5mm EVA foam. **(See fig. 3)**

Then you can cut out the pieces. For the pieces that flare out at the ends, you'll need to cut the edges at a -45 degree angle to get them to attach to the edges of the shoulder correctly. **(See fig. 4)**

Glue together the shoulder base. **(See fig. 5-6)**

Then you can glue together the flared pieces on each edge. **(See fig. 7-9)**

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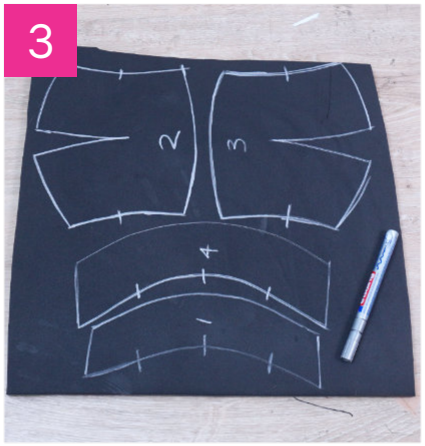

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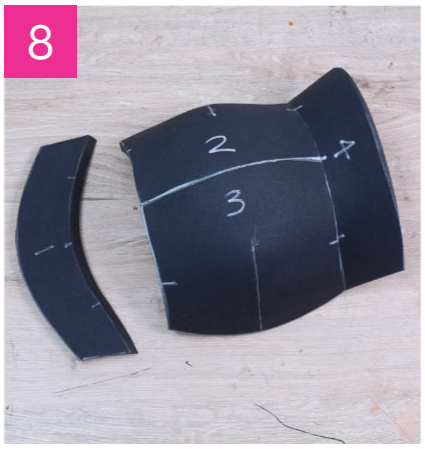

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This shoulder piece also has a second layer underneath.

For this, you can just repeat the process for the basic shoulder shapes and draw out the shape. **(See fig. 10)**

Glue them together at the center and use heat to refine the shape. **(See fig. 11–12)**

Then you can glue this piece to the underside of your main shoulder piece. **(See fig. 12–16)**

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Glue on some additional foam details. **(See fig. 17)**

Then you can prime and paint! **(See fig. 18–20)**

These shoulder plates, like the others, attach to the breastplate in the front as well as around the arms and have a piece of string securing them together that goes behind the neck. **(See fig. 21–24)**

Arm Armor

Working our way down the body to arms! This next section will show you a few examples of different kinds of arm armor, including how to create large foam arm pieces, fitted pieces, and even elbow armor and claws!

Full Arm Piece

Let's start with a full arm piece! Start by making a pattern using tape. This arm armor is bigger than a normal arm so you will have to add padding with bubble wrap or newspaper.

Tape up the arm and draw on your details. **(See fig. 1)**

Then you can cut out the pieces and trace them to create your final pattern. This armor is made to slip on and off. So make sure the bottom opening is wide enough to fit around your hand. **(See fig. 2)**

Trace your pattern onto 5mm EVA foam and cut out the pieces. **(See fig. 3)**

Use heat to pre-shape the pieces so they are rounded. **(See fig. 4)**

Then you can glue the base together at the edges. **(See fig. 5)**

Glue on the handpiece to the end of the arm armor. **(See fig. 6)**

Then you can add on additional details with foam and pre-cut bevels! Prime, paint and it's done! **(See fig. 7-8)**

As mentioned before this arm armor doesn't need attachments and can just slip on and off. When wearing it you can add in some additional foam pieces to keep it secure and in place.

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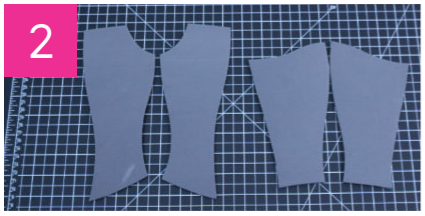
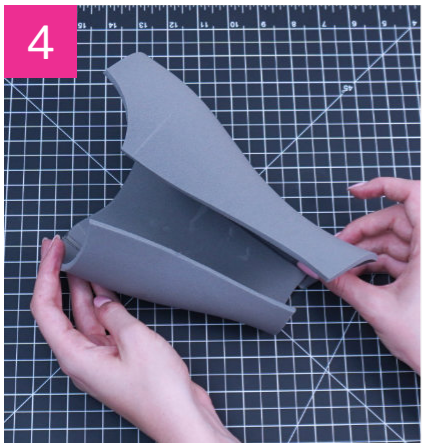
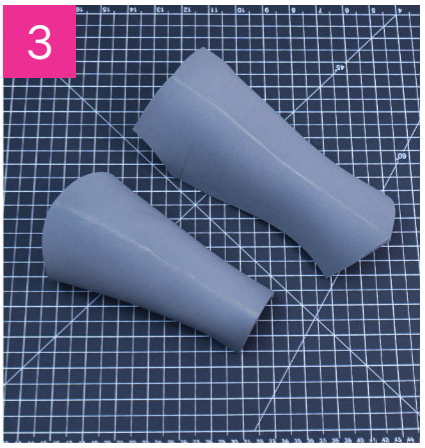
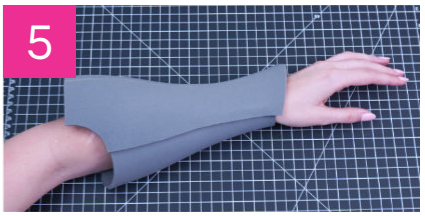








For arm armor that is form-fitting and can't be pulled over your hand, the process is similar!

Create your tape pattern and draw on the details. Then cut it off and use it to make the final pattern. **(See fig. 1)**

Trace the pattern onto 5mm EVA foam and cut out the pieces. **(See fig. 2)**

Glue together the top pieces and the bottom pieces respectively. **(See fig. 3)**

You can then glue the top and bottom pieces together on 1 side only. Leaving the other side open. **(See fig. 4)**

This armor can then be opened and closed at the side seam with Velcro. **(See fig. 5-6)**

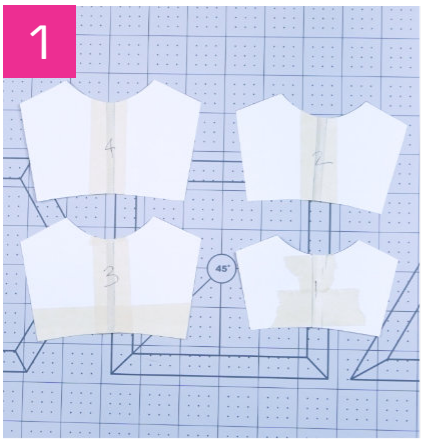
Half Arm Piece

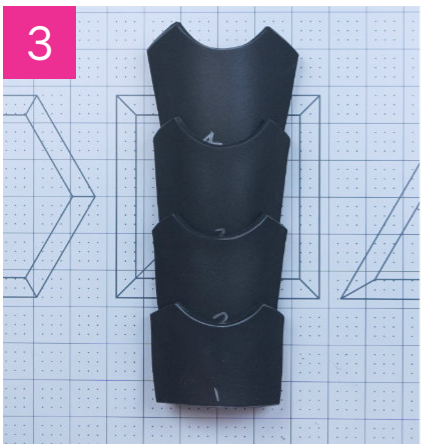
This is the simplest kind of arm armor! It only covers half the arm making it really easy to take on and off.

Create a pattern by drawing out your segmented pieces. **(See fig. 1)**

You can then shape them with heat and glue the layers on top of each other. **(See fig. 2-3)**

Prime the armor and paint it. Then you can add some leather straps and Velcro strips to attach it around your arm. **(See fig. 4)**





Elbows

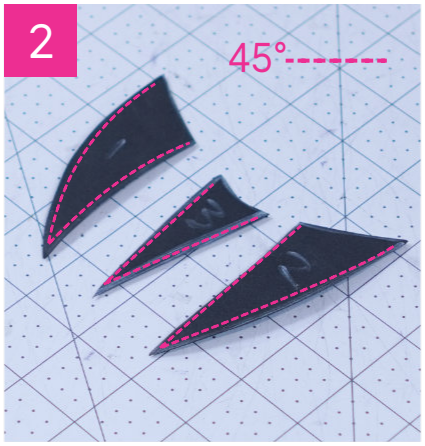
For elbow pieces, a good hack to keep them in place is to make them part of your armor! Glue the elbow piece directly to your base forearm shape! **(See fig. 1)**
Then you can add your details around it and the elbow and arm become one! **(See fig. 2)**

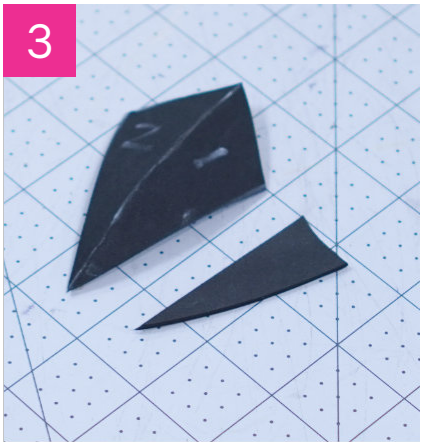
Claws

Eva foam claws are also super easy! For these Alexstrasza claws, you can start by making a paper mockup. **(See fig. 1)**

Use this to then create your pattern and trace the pieces onto 2 mm high-density foam. High-density foam is good for claws because they need to be a little sturdier. **(See fig. 2)** Be sure to cut the claws at a 45-degree angle to join the pieces!

Then you can glue together the edges to form little triangle claws! These can be glued directly to gloves to keep them in place. **(See fig. 3-6)**





Leg armor

Leg armor has some of the most satisfying shapes and design aspects to create! As with all armor, it can range from very simple to very complex! Here's how to create 2 versions of leg armor that may be used in some costume designs!

Full Leg Armor

For full covering leg armor same as with most armor pieces you need to start with your tape pattern!

If your calves are small like mine you can bulk them up for shape with bubble wrap! For this pointed boot, you can also use bubble wrap or newspaper to create the shape. **(See fig. 1-2)**

Apply your tape and then draw on the lines for your seams. **(See fig. 3)**

For this leg piece, I'm using 10 mm EVA foam to make it bulky. So you need to make sure you adjust your pattern and enlarge it on the sides to ensure you get a good fit! **(See fig. 4-6)**

Trace your pattern onto the foam and cut out the pieces. **(See fig. 7)**

Then you can begin gluing them together. Leave the seam at the back open! **(See fig. 8-9)**

Use a heat gun to heat up the foam then bend it into a rounded shape. **(See fig. 10-13)**

This leg piece for knight peach has a flare around the bottom. To create extra details like this you can make a mockup with paper! **(See fig. 14-15)**

Use this pattern to trace onto 5mm Eva foam and cut it out. You need to cut the edges that attach to the leg at a 45-degree angle to allow them to join correctly. **(See fig. 16)**

Glue this into place around the leg with contact adhesive. **(See fig. 17-19)**

Knee Armor

For knee armor, you can use the tracing method to trace the shape of your armor as if you were viewing it from a side angle. **(See fig. 20)**

Cut out the pattern pieces twice. **(See fig. 21)**

Then you can glue them together at the center and use heat to give them a better shape. **(See fig. 22–26)**

Glue on the extra layer at the back. **(See fig. 28)**

Then just like the elbows in the arm section, you can glue the knees directly to your leg armor to keep them in place. **(See fig. 29)**

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Shoe Armor

For the shoe portion, you can use your tape pattern to trace onto 5mm EVA foam and cut out the pieces. **(See fig. 30-32)**

For the toe that forms a point, cut the pieces at a 45-degree angle. When you glue them together they will then make a nice pointed shape! **(See fig. 33-34)**

Glue together the 2 layers of the shoe. **(See fig. 35)**

Then glue on the final tip for the toe. **(See fig. 36)**

Use heat to form this into shape around the shoe. **(See fig. 37-38)**

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You can then glue on additional details like foam strips and googly eyes for rivets! **(See fig. 39-40)**

This leg armor attaches at the back with a silver zipper. **(See fig. 41)**

For the shoe armor, you can make a silver boot cover and glue the armor directly onto it or secure it with Velcro. **(See fig. 42-44)**

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Half Leg Armor

For half leg armor, the process is similar! Start with your tape pattern! **(See fig. 1-2)**

Use this to trace onto paper for the final version. I used half the pattern and mirrored it so it was symmetrical. **(See fig. 3-4)**

Trace the pattern onto 5mm EVA foam and cut out the piece. **(See fig. 5)**

This armor needs to have a second piece that attaches around the ankle, so I made a paper mockup and used this to trace and cut out more 5mm EVA foam. **(See fig. 6)**

Use a heat gun to heat up the foam and shape it so it's rounded. **(See fig. 7)**

Then you can glue the main leg piece onto the ankle section. Leave the seam for the ankle open as this is where the armor will attach with Velcro. **(See fig. 8-9)**

Then you can glue on extra details. **(See fig. 10)**

For this shoe armor you can take the patterns you made earlier and trace them onto foam.

This armor is just made of 2 pieces glued together at the center and then shaped with heat! **(See fig. 11-13)**

The leg piece attaches at the ankle with Velcro and then has a second strap around the top!

The shoe's then glue directly onto a fabric boot cover! **(See fig. 14-16)**

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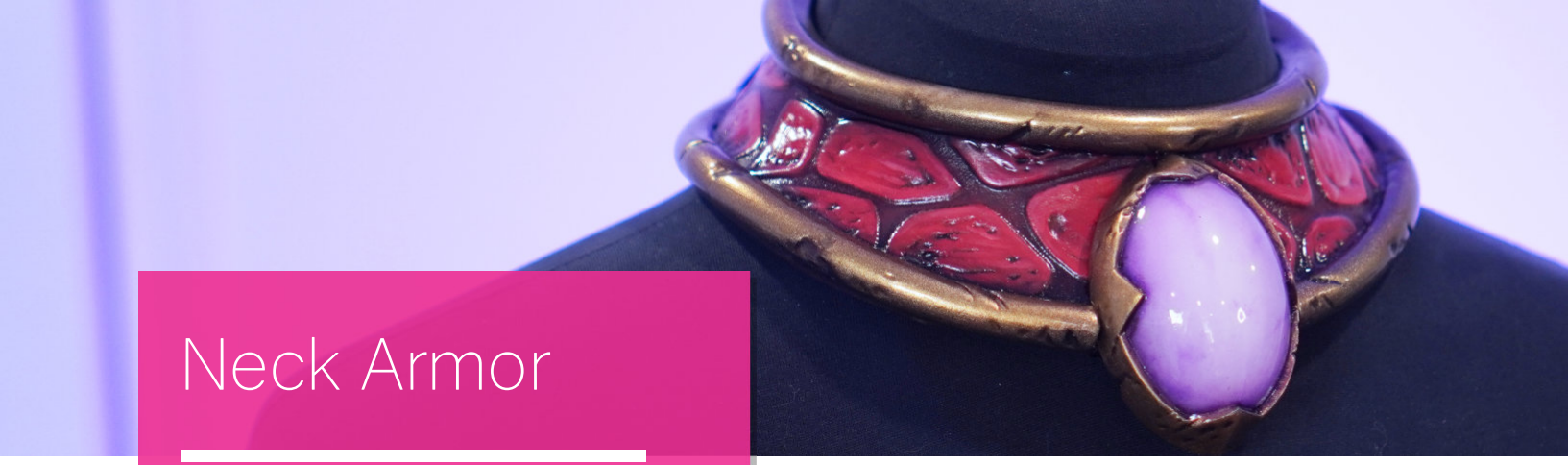

Neck Armor

Necklace

Even your neck needs armor sometimes! Start by creating a pattern with cling wrap and tape around your neck. **(See fig. 1)**

Use the pattern to trace onto paper and make a neat version. **(See fig. 2)**

You can then trace this onto 5 mm EVA foam and cut it out! **(See fig. 3)**

Use heat to form it into shape. **(See fig. 4)**

You can then glue on some details and paint it! **(See fig. 5)**

This neck armor attaches with a corset method at the back. **(See fig. 6-7)**

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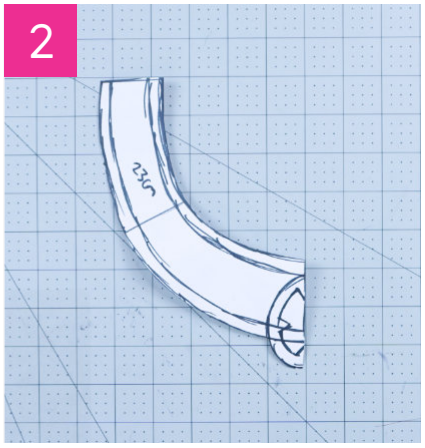

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Full Gorget

For full neck armor, start with your tape pattern! This armor goes over a breastplate so I'm patterning it on top of the breastplate piece. **(See fig. 1)**

Apply the tape and draw on the lines for the seams. This neck armor has a seam at the shoulder, the back, and around the neck where the collar joins. **(See fig. 2)**

Trace your pattern onto 5mm EVA foam and cut out the pieces. **(See fig. 3-4)**

Glue the base of the neckpieces together, leaving the back seam open. **(See fig. 5)**

Then use heat to form this into shape! **(See fig. 6)**

Once it's formed you can then glue the piece for the collar into place! **(See fig. 7-9)**

This neckpiece attaches at the back with Velcro between the 2 seams.

Hip Armor

Simple Tassets

For these little hip pieces or tassets, you can draw out the shape of the pieces onto paper. I drew one half to make sure they were symmetrical. **(See fig. 1)**

Trace these onto 10mm EVA foam and cut out 2 pieces. Cut one piece with a 45-degree angle at the center where they join they form a point. **(See fig. 2)**

You can then glue the 2 halves together at the center. **(See fig. 3-4)**

Add on your details and paint! Then repeat this for the other 2 pieces so you have 3 in total. **(See fig. 5-7)**

These attach to a leather belt with some Velcro.

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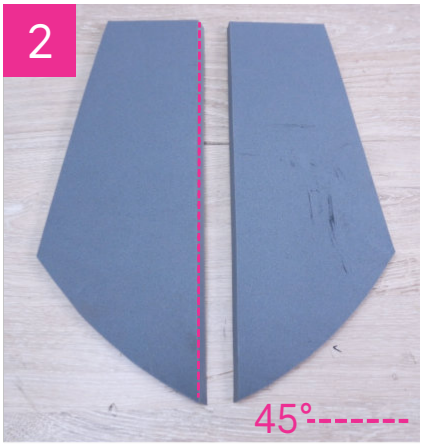

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Armored Panties

Wait, what? Yes, armored panties. Even underwear can be armor!

For this Alexstrasza underwear, you can start by making your tape pattern. (See fig. 1-2)

Use this to trace onto 2 mm EVA foam and glue together the pieces. (See fig. 3)

For the belt that goes around the waist, you can trace the pieces onto 2 pieces of 10mm EVA foam and glue them together so they are really thick! (See fig. 4)

Carve these into shape with a craft knife and use a rotary tool to smooth them out. (See fig. 5)

The foam underwear needs to be covered in fabric so it's still flexible! But the armored belt can be primed and painted. (See fig. 6)

Glue on some additional foam and fabric details and some elastic straps. (See fig. 7)

Then the belt can attach to these with Velcro (See fig. 8)

Now you have some foam panties!

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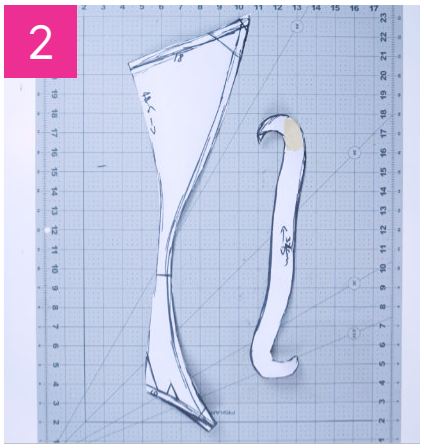

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Stay tuned for volume 2 : Detailing!

Thank you!

Thank you so much for reading this book and for your support! As I mentioned at the start of this book this is volume 1 of a 4 part series! Our next books will look at foam detailing, priming and painting, and construction!

We really hope it's given you the confidence to try some new techniques, experiment, and further your crafting! We cannot wait to see what you make! Happy Crafting!

- Tayla and Eric

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